Dell EMC PowerEdge MX740c

Technical Guide

Regulatory Model: E04B Series
Regulatory Type: E04B001

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Contents

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System overview

The Dell EMC PowerEdge MX portfolio delivers a fully managed, high performance system that will free up valuable IT resources and personnel so you can focus on innovation. Break free from the bounds of technology silos and routine, daily and time consuming operational management to realize your IT and digital business transformations.

PowerEdge MX, a unified, high performance kinetic infrastructure, provides the agility, resiliency and efficiency to optimize a wide variety of traditional and new, emerging data center workloads and applications. With its kinetic architecture and agile management the MX portfolio dynamically configures compute, storage and fabric, increases team effectiveness and accelerates operations. Its responsive design delivers the innovation and longevity customers of all sizes need for their IT and digital business transformations. PowerEdge MX ecosystem consists of a new chassis infrastructure, compute sleds, fabric switches, and a storage sled, all managed by Dell EMC OpenManage Enterprise-Modular Edition.

Topics:

Introduction

Designed for PowerEdge MX kinetic infrastructure ecosystem, the PowerEdge MX740c compute sled, with dense compute, large memory capacity and rich set of storage subsystem options, delivers the flexibility and agility needed in today's software-defined data centers. This full-featured, storage-rich, flexible 2-socket compute sled is ideal for many workloads including virtualization, collaborative, and software-defined workloads.

New Technologies

The following table shows the new technologies available on the PowerEdge MX740c:

Table 1. New technologies

Technologies	Description
2nd Generation Intel(R) Xeon(R) Scalable processors	• Up to 28 cores • Up to 3.8 GHz • Intel® Ultra Path Interconnect (UPI), up to 10.4 GT/s, with up to 2 links between sockets. • Integrated PCIe Gen3 48 lanes/socket
Intel® C628 chipset	• Intel® Platform Controller Hub (PCH) • Optional Intel® QuickAssist Technology (QAT)
DDR4 memory	MX740c supports four DIMM types: • RDIMM: Registered DIMM – Provides for higher capacity options and advanced RAS features. • LRDIMM: Load Reduced DIMM – Provides maximum capacity but higher power consumption. • NVDIMM: Non-Volatile DIMM – Provides a persistent memory solution with NAND and DRAM that maintains data in power loss, system crash, or normal shutdown. This solution requires a battery as a power source for an AC loss condition. • DCPMM: Intel® Optane™ DC persistent memory: Provides a persistent memory solution with intel 3D cross point that maintains data in power loss, system crash, or normal shutdown. This solution does not require a battery for AC power loss.

Technologies	Description
iDRAC with Lifecycle Controller	Works in conjunction with OpenManage Enterprise – Modular, embedded systems management solution for Dell EMC servers, features hardware and firmware inventory and alerting, faster performance and many more features.

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System features

The PowerEdge MX740c compute sled is a unique design for the PowerEdge MX7000 chassis and is not compatible with other PowerEdge modular chassis.

The MX7000 chassis has the following features:

- Sleds
  - 8 single-width or 4 double-width sleds
  - Double wide sleds in slots 1-2, 3-4, 5-6, 7-8
- Power supply units
  - Up to 6 front loading power supply units
- Fans
  - 4 x 60 mm front fan modules
  - 5 x 80 mm rear fan modules
- Right control panel ear
  - Power button and LED indicators
  - 2 USB Type-A and 1 USB type Micro-AB
  - 1 Mini DisplayPort
- Left control panel ear - three configurations
  - LCD with QuickSync
  - LCD without QuickSync
  - LED indicators only

For additional information, please refer to the PowerEdge MX7000 Technical Guide.

Topics:

Product comparison

The following table shows the comparison between the PowerEdge MX740c (designed for PowerEdge MX7000 chassis) and PowerEdge M640/FC640 (designed for PowerEdge M1000e/VRTX and FX2/FX2S chassis) modular compute sleds:

Table 2. Comparison table

Feature	PowerEdge MX740c	PowerEdge M640/FC640
Processor	• One or two Intel® Xeon(R) Scalable Processors • One or two 2nd Generation Intel(R) Xeon(R) Scalable processors • Up to 28 cores per socket • Max TDP: 205W	• One or two Intel® Xeon(R) Scalable Processors • Up to 28 cores per socket • Max TDP: 165 W
Chipset	• Intel® C628 • Optional Intel® QuickAssist Technology (QAT)	• Intel® C621
Memory	• 24 DIMM slots • 12 slots enabled for NVDIMM-N or DCPMM • Maximum capacity (RDIMM): 1.5TB • Maximum capacity (LRDIMM): 3TB • Maximum capacity (NVDIMM-N): 192GB	• 16 DIMM sockets • Maximum capacity (RDIMM): 1TB • Maximum capacity (LRDIMM): 2TB

Feature	PowerEdge MX740c	PowerEdge M640/FC640
	• Maximum capacity (DCPMM): 6144GB	
Storage Controllers	• S140 Software RAID • HBA330 MX • H730P MX Performance RAID, 2GB NV cache • H745P MX Performance RAID, internal and external drive connect, 8GB NV cache • HBA330 MX mini-mezz, HBA, external drive connect, no cache	• S140 Software RAID • H330 Entry/Value RAID, no cache • H730P Performance RAID, 2GB NV cache
Drive Support	• 2.5-inch 12Gb SAS • 2.5-inch 6Gb SATA • 2.5-inch NVMe	• 2.5-inch 12Gb SAS • 2.5-inch 6Gb SATA • 2.5-inch NVMe
Drive Backplanes	• 6 x 2.5-inch SAS/SATA • 6 x 2.5-inch SAS/SATA/NVMe • 4 x 2.5-inch SAS/SATA/NVMe for NVDIMM implementations	• 2 x 2.5-inch SAS/SATA/NVMe
Internal Boot	Choice of BOSS (Boot Optimized Storage Subsystem) or IDSDM (Internal Dual SD Module)	Choice of BOSS (Boot Optimized Storage Subsystem) or IDSDM (Internal Dual SD Module)
I/O Slots	• Two PCIe 3.0 x16 Mezz slots (Fabric A and B) • One PCIe 3.0 x16 Mini-mezz slot (Fabric C)	• One bNDC (Ethernet) • Two PCIe 3.0 x8 Mezz slots (M1000e) • Two PCIe 2.0 x8 switch mezz (VRTX) • PCIe adapter for FX2S enablement (FX2)
USB	• One internal USB 3.0 port • One external USB 3.0 port • One USB 2.0 management port to iDRAC • One USB 3.0 + USB 2.0 port for IDSDM	• One internal USB 3.0 port • One external USB 3.0 port • One USB 2.0 management port to iDRAC • One USB 3.0 + USB 2.0 port for IDSDM
Video	• Integrated VGA controller in iDRAC, VGA over LAN • 4Gb DDR4 shared with iDRAC application memory	• Integrated VGA controller in iDRAC, VGA over LAN • 4Gb DDR4 shared with iDRAC application memory
Management	iDRAC9	iDRAC9
Security	• Optional TPM 1.2/2.0 • Cryptographically signed firmware • Silicon Root of Trust • Secure Boot • System Lockdown • System Erase	• Optional TPM 1.2/2.0 • Cryptographically signed firmware • Silicon Root of Trust • Secure Boot • System Lockdown • System Erase
Fans	In chassis	In chassis
Power Supplies	Power provided by chassis	Power provided by chassis
Chassis	MX7000	• M640: M1000e / VRTX • FC640: FX2 / FX2S

Specifications

Table 3. Technical specifications

Features	Specifications
Form factor	Full-height, single-width compute sled

Features	Specifications
Processor	• Intel® Xeon(R) Scalable Processor Family • 2nd Generation Intel(R) Xeon(R) Scalable processors
Processor sockets	2 sockets
Internal interconnect	Intel Ultra Path Interconnect (UPI) up to 10.4 GT/s and up to two links between sockets.
Chipset	Intel C628 Optional Intel® QuickAssist Technology (QAT)
Memory	• Supports RDIMM, LRDIMM, NVDIMM-N, and DCPMM • DDR4 2400 MT/s, 2666 MT/s, and 2933 MT/s • 8GB, 16GB, 32GB, 64GB, and 128GB • Minimum 8GB per module • 3TB (LRDIMM) or 1.5 TB (RDIMM) maximum RAM • Support up to 192GB NVDIMM • Support up to 6144GB DCPMM
Drive support	• 2.5-inch 12Gb SAS • 2.5-inch 6Gb SATA • 2.5-inch NVMe
Drive backplanes	• 6 x 2.5-inch SAS/SATA • 6 x 2.5-inch SAS/SATA/NVMe (universal BP) • 4 x 2.5-inch SAS/SATA/NVMe (universal BP) for NVDIMM implementations
RAID controller	• S140 (SATA and NVMe) • HBA330 MX • PERC H730P MX Performance RAID, 2GB NV cache • PERC H745P MX Performance RAID, internal and external drive connect, 8GB NV cache • HBA330 Mini-Mezzanine card HBA, external drive connect, no cache
Mezzanine slots	• Two PCIe 3.0 x16 Mezzanine slots (Fabrics A and B) • One PCIe 3.0 x16 Mini-mezzanine slot (Fabric C)
Video	• Integrated VGA controller in iDRAC, VGA over LAN • 4Gb DDR4 shared with iDRAC application memory
Internal boot options	Choice of BOSS(Boot Optimized Storage Subsystem) (M.2 module) or IDSDM (Internal Dual SD Module)
USB	• One internal and one external USB 3.0 port • One USB 2.0 management port to iDRAC • One USB 3.0 + USB 2.0 port for IDSDM
Trusted Platform Module	Optional TPM 1.2, TPM 2.0

Systems management	• Embedded /At-the-Chassis:
	  • OpenManage Enterprise - Modular Edition
	  • Quick Sync 2 Bluetooth Low Entegy (BLE)/wireless module
	• Embedded / At-the-Server - Compute Sled:
	  • iDRAC9
	  • iDRAC Direct
	  • iDRAC RESTful API with Redfish
	• Consoles:

Features	Specifications
	• OpenManage Enterprise • OpenManage Essentials • OpenManage Power Center • Mobility: • OpenManage Mobile (requires OM Enterprise or OM Essentials)

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Chassis view and features

The MX740c is a full-height, single-width, two socket compute sled for the MX7000 chassis.

Topics:

- Front view of the system
- Internal system view
- Locating the Service Tag of your system

Front view of the system

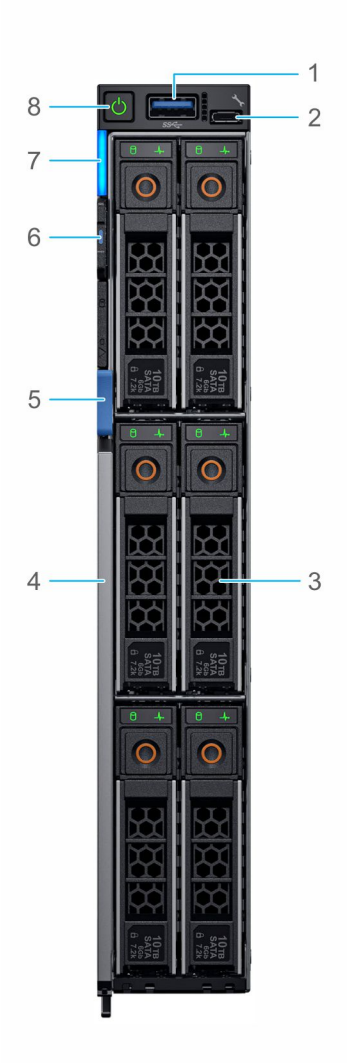

Figure 1. Front view of the 6 drive configuration

1. USB 3.0 port
2. iDRAC direct port
3. Hard Drive/SSD
4. System handle release

5. System handle release button
6. Information tag
7. System status LED
8. Power button

Internal system view

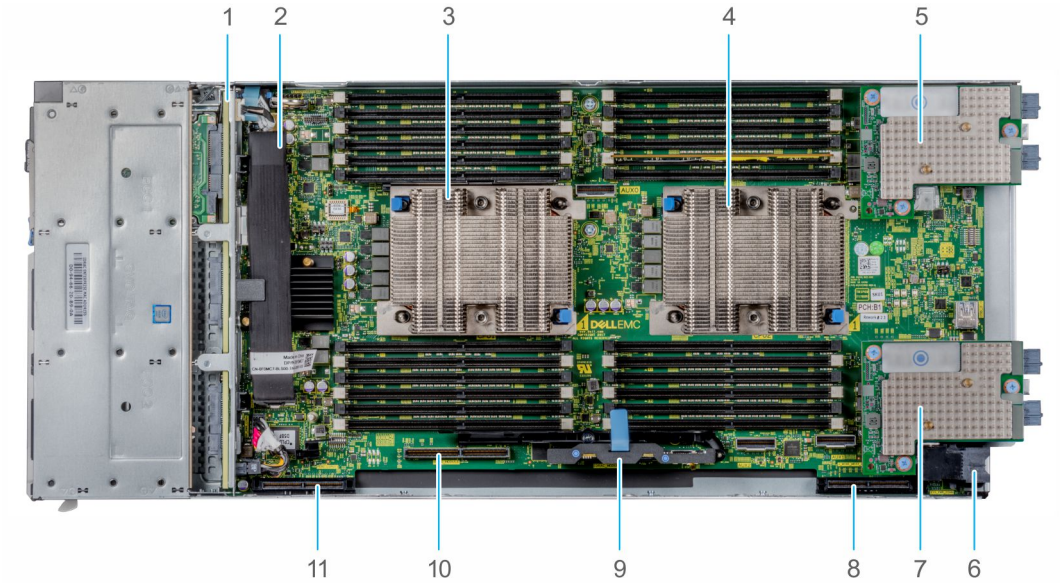

Figure 2. Inside the system

1. Drive backplane
2. Backplane to PERC cable
3. Processor 1 (heat sink)
4. Processor 2 (heat sink)
5. Mezzanine card A1 (Fabric A)
6. Power connector
7. Mezzanine card B1 (Fabric B)
8. Mini Mezzanine connector
9. iDRAC module
10. BOSS or IDSDM module connector
11. PERC connector

Locating the Service Tag of your system

The System Information Tab contains the system's unique Express Service Code and Service Tag. This information is used by Dell EMC to identify system configuration, warranty terms, and to route support calls to the appropriate personnel. A Quick Resource Locator (QRL) label on the System Information Tab links to a web page that shows the exact factory configuration and specific warranty purchased.

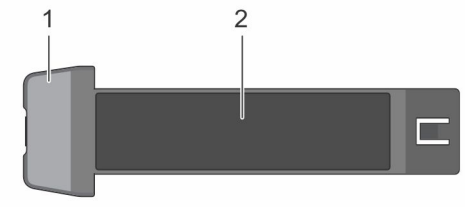

Figure 3. Locating Service Tag of your system

1. Information tag
2. Service tag

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Processor

The 2nd Generation Intel® Xeon® Processor Scalable Family is the most advanced compute core featuring a new core micro architecture optimized to accelerate a wide range of compute workloads. It delivers improved TCO through the best per core performance per dollar. The 2nd Generation Intel® Xeon® Processor Scalable Family will have named medal designations with different levels of features according to the medal designation below:

- Platinum (8xxx) - Best performance and business agility, and hardware enhanced security.
- Gold (6xxx) - Great performance, fast memory, and more interconnect/accelerator engines.
- Gold (5xxx) - Better performance and advanced reliability.
- Silver (4xxx) - Efficient performance at lower power.
- Bronze (3xxx) - Entry performance.

Topics:

Processor features

The following list highlights the features of the 2nd Generation Intel® Xeon® Scalable Processor family:

- Up to 28 cores with Intel® HT Technology (2 threads/core)
- Intel® Turbo Boost technology (excludes Bronze processors)
- Between 70W-205W TDP
- 768GB/socket memory capacity on all standard processors
- 2TB/socket memory capacity on select processors designated by "M"
- 3.84TB socket memory capacity on select processors designated by "L" for PowerEdge servers.
- Socket P
- 14nm process Technology
- Rebalanced Cache Hierarchy: 1.375MB Last level Cache/core
- 2S, 4S, 8S scalable (note: 4xxx (Silver) & 3xxx (Bronze) do not support 4S or 8S platforms
- Support for Intel AVX-512
- Intel® Ultra Path Interconnect (UPI) with bandwidth up to 10.4GT/s
- 6 DDR4 channels per CPU
- 2133, 2400, 2666, 2933 speeds at 2 DIMMs per Channel; no 3 Dimms per channel support
- MPX (Memory Protection Extensions) support
- Integration of next-generation Intel® Omni-Path Fabric controller on select -F processors
- Up to 48 PCIe lanes per CPU with x16, x8 & x4 Bifurcation support
- PCI Express 3.0 (2.5, 5.0, 8.0 GT/s)
- Separate Reference with Independent Spread Spectrum Clocking (SRIS)
- MCTP Scaling
- Per Core P-State (PCPS)
- Uncore Frequency Scaling (UFS)
- Energy Efficient Turbo (EET)
- On die PMAX detection

Supported processors

Table 4. Supported processors for MX740c

Intel SKU	Clock Speed	Max Turbo	Cache	Cores-Threads	UPI Speed	Hyper-Threading	Turbo	TDP	DDR4 Speed
8180M	2.50 GHz	3.80 GHz	38.50 MB	28–56	10.4 GT/s	Yes	Yes	205 W	2666 MT/s
8180	2.50 GHz	3.80 GHz	38.50 MB	28-56	10.4 GT/s	Yes	Yes	205 W	2666 MT/s
8176M	2.10 GHz	3.80 GHz	38.50 MB	28–56	10.4 GT/s	Yes	Yes	165 W	2666 MT/s
8176	2.10 GHz	3.80 GHz	38.50 MB	28-56	10.4 GT/s	Yes	Yes	165 W	2666 MT/s
8170M	2.10 GHz	3.70 GHz	35.75 MB	26–52	10.4 GT/s	Yes	Yes	165 W	2666 MT/s
8170	2.10 GHz	3.70 GHz	35.75 MB	26-52	10.4 GT/s	Yes	Yes	165 W	2666 MT/s
8168	2.70 GHz	3.70 GHz	33.00 MB	24-48	10.4 GT/s	Yes	Yes	205 W	2666 MT/s
8164	2.00 GHz	3.70 GHz	35.75 MB	26-52	10.4 GT/s	Yes	Yes	150 W	2666 MT/s
8160M	2.10 GHz	3.70 GHz	33.00 MB	24-48	10.4 GT/s	Yes	Yes	150 W	2666 MT/s
8160	2.10 GHz	3.70 GHz	33.00 MB	24-48	10.4 GT/s	Yes	Yes	150 W	2666 MT/s
8153	2.00 GHz	2.80 GHz	22.00 MB	16-32	10.4 GT/s	Yes	Yes	125 W	2666 MT/s
6154	3.00 GHz	3.70 GHz	24.75 MB	18-36	10.4 GT/s	Yes	Yes	200 W	2666 MT/s
6152	2.10 GHz	3.70 GHz	30.25 MB	22-44	10.4 GT/s	Yes	Yes	140 W	2666 MT/s
6150	2.70 GHz	3.70 GHz	24.75 MB	18-36	10.4 GT/s	Yes	Yes	165 W	2666 MT/s
6148	2.40 GHz	3.70 GHz	27.50 MB	20-40	10.4 GT/s	Yes	Yes	150 W	2666 MT/s
6146	3.20 GHz	4.20 GHz	24.75 MB	12-24	10.4 GT/s	Yes	Yes	165 W	2666 MT/s
6144	3.50 GHz	4.20 GHz	24.75 MB	8-16	10.4 GT/s	Yes	Yes	150 W	2666 MT/s
6142M	2.60 GHz	3.70 GHz	22.00 MB	16-32	10.4 GT/s	Yes	Yes	150 W	2666 MT/s
6142	2.60 GHz	3.70 GHz	22.00 MB	16-32	10.4 GT/s	Yes	Yes	150 W	2666 MT/s
6140M	2.30 GHz	3.70 GHz	24.75 MB	18-36	10.4 GT/s	Yes	Yes	140 W	2666 MT/s
6140	2.30 GHz	3.70 GHz	24.75 MB	18-36	10.4 GT/s	Yes	Yes	140 W	2666 MT/s
6138	2.00 GHz	3.70 GHz	27.50 MB	20-40	10.4 GT/s	Yes	Yes	125 W	2666 MT/s
6136	3.00 GHz	3.70 GHz	24.75 MB	12-24	10.4 GT/s	Yes	Yes	150 W	2666 MT/s
6134M	3.20 GHz	3.70 GHz	24.75 MB	8-16	10.4 GT/s	Yes	Yes	130 W	2666 MT/s
6134	3.20 GHz	3.70 GHz	24.75 MB	8-16	10.4 GT/s	Yes	Yes	130 W	2666 MT/s
6132	2.60 GHz	3.70 GHz	19.25 MB	14-28	10.4 GT/s	Yes	Yes	140 W	2666 MT/s
6130	2.10 GHz	3.70 GHz	22.00 MB	16-32	10.4 GT/s	Yes	Yes	125 W	2666 MT/s
6128	3.40 GHz	3.70 GHz	19.25 MB	6-12	10.4 GT/s	Yes	Yes	115 W	2666 MT/s
6126	2.60 GHz	3.70 GHz	19.25 MB	12-24	10.4 GT/s	Yes	Yes	125 W	2666 MT/s
5122	3.60 GHz	3.70 GHz	16.50 MB	4-8	10.4 GT/s	Yes	Yes	105 W	2666 MT/s
5120	2.20 GHz	3.20 GHz	19.25 MB	14-28	10.4 GT/s	Yes	Yes	105 W	2400 MT/s
5118	2.30 GHz	3.20 GHz	16.50 MB	12-24	10.4 GT/s	Yes	Yes	105 W	2400 MT/s
5117	2.00 GHz	2.80 GHz	19.25 MB	14-28	10.4 GT/s	Yes	Yes	105 W	2400 MT/s
4116	2.10 GHz	3.00 GHz	16.50 MB	12-24	9.6 GT/s	Yes	Yes	85 W	2400 MT/s
4114	2.20 GHz	3.00 GHz	13.75 MB	10-20	9.6 GT/s	Yes	Yes	85 W	2400 MT/s

Intel SKU	Clock Speed	Max Turbo	Cache	Cores-Threads	UPI Speed	Hyper-Threading	Turbo	TDP	DDR4 Speed
4112	2.60 GHz	3.00 GHz	8.25 MB	4-8	9.6 GT/s	Yes	Yes	85 W	2400 MT/s
4110	2.10 GHz	3.00 GHz	11.00 MB	8-16	9.6 GT/s	Yes	Yes	85 W	2400 MT/s
4108	1.80 GHz	3.00 GHz	11.00 MB	8-16	9.6 GT/s	Yes	Yes	85 W	2400 MT/s
3106	1.70 GHz	-	11.00 MB	8-8	9.6 GT/s	No	No	85 W	2133 MT/s
3104	1.70 GHz	-	8.25 MB	6-6	9.6 GT/s	No	No	85 W	2133 MT/s

Table 5. Supported 2nd Generation Intel Xeon Scalable Processor Specifications for MX740c

Intel SKU	Clock Speed	Non- AVX Max Turbo	Non-AVX All core Turbo	Cache	Cores-Threads	UPI Speed	TDP	Max DDR4 Speed	Max Memory per Socket
8280	2.70 GHz	4.00 GHz	3.30 GHz	38.50 MB	28-56	10.4 GT/s	205 W	2933 MT/s	1.0 TB
8280M	2.70 GHz	4.00 GHz	3.30 GHz	38.50 MB	28-56	10.4 GT/s	205 W	2933 MT/s	2.0 TB
8280L	2.70 GHz	4.00 GHz	3.30 GHz	38.50 MB	28-56	10.4 GT/s	205 W	2933 MT/s	4.5 TB
8276	2.20 GHz	4.00 GHz	3.00 GHz	38.50 MB	28-56	10.4 GT/s	165 W	2933 MT/s	1.0 TB
8276M	2.20 GHz	4.00 GHz	3.00 GHz	38.50 MB	28-56	10.4 GT/s	165 W	2933 MT/s	2.0 TB
8276L	2.20 GHz	4.00 GHz	3.00 GHz	38.50 MB	28-56	10.4 GT/s	165 W	2933 MT/s	4.5 TB
8270	2.70 GHz	4.00 GHz	3.40 GHz	35.75 MB	26-52	10.4 GT/s	205 W	2933 MT/s	1.0 TB
8268	2.90 GHz	3.90 GHz	3.50 GHz	35.75 MB	24-48	10.4 GT/s	205 W	2933 MT/s	1.0 TB
8260	2.40 GHz	3.90 GHz	3.10 GHz	35.75 MB	24-48	10.4 GT/s	165 W	2933 MT/s	1.0 TB
8260M	2.40 GHz	3.90 GHz	3.10 GHz	35.75 MB	24-48	10.4 GT/s	165 W	2933 MT/s	2.0 TB
8260L	2.40 GHz	3.90 GHz	3.10 GHz	35.75 MB	24-48	10.4 GT/s	165 W	2933 MT/s	4.5 TB
8260Y	2.40 GHz	NA	NA	35.75 MB	24-48	10.4 GT/s	165 W	2933 MT/s	1.0 TB
8253	2.20 GHz	3.00 GHz	2.50 GHz	22.00 MB	16-32	10.4 GT/s	125 W	2933 MT/s	1.0 TB
6262V	1.90 GHz	3.60 GHz	2.50 GHz	33.00 MB	24-48	10.4 GT/s	135 W	2400 MT/s	1.0 TB
6258R*	2.70 GHz	4.00 GHz	3.4 GHz	38.5 MB	28-56	10.4 GT/s	205W	2933 MT/s	1.0 TB
6254	3.10 GHz	4.00 GHz	3.90 GHz	24.75 MB	18-36	10.4 GT/s	200 W	2933 MT/s	1.0 TB
6252N	2.70 GHz	3.60 GHz	3.00 GHz	33.00 MB	24-48	10.4 GT/s	150 W	2933 MT/s	1.0 TB
6252	2.10 GHz	3.70 GHz	2.80 GHz	35.75 MB	24-48	10.4 GT/s	150 W	2933 MT/s	1.0 TB
6248R*	3.00 GHz	4.00 GHz	3.6 GHz	35.75 MB	24-48	10.4 GT/s	205W	2933 MT/s	1.0 TB
6248	2.50 GHz	3.90 GHz	3.20 GHz	27.50 MB	20-40	10.4 GT/s	150 W	2933 MT/s	1.0 TB
6246R*	3.40 GHz	4.10 GHz	4.0 GHz	35.75 MB	16-32	10.4 GT/s	205 W	2933 MT/s	1.0 TB
6246	3.30 GHz	4.20 GHz	4.10 GHz	24.75 MB	12-24	10.4 GT/s	165 W	2933 MT/s	1.0 TB
6244	3.60 GHz	4.40 GHz	4.30 GHz	24.75 MB	8-16	10.4 GT/s	150 W	2933 MT/s	1.0 TB
6242R*	3.10 GHz	4.10 GHz	3.8 GHz	35.75 MB	20-40	10.4 GT/s	205W	2933 MT/s	1.0 TB
6242	2.80 GHz	3.90 GHz	3.50 GHz	22.00 MB	16-32	10.4 GT/s	150 W	2933 MT/s	1.0 TB
6240R	2.40 GHz	4.00 GHz	3.20 GHz	35.75 MB	24-48	10.4 GT/s	165 W	2933 MT/s	1.0 TB
6240M	2.60 GHz	3.90 GHz	3.30 GHz	24.75 MB	18-36	10.4 GT/s	150 W	2933 MT/s	2.0 TB
6240L	2.60 GHz	3.90 GHz	3.30 GHz	24.75 MB	18-36	10.4 GT/s	150 W	2933 MT/s	4.5 TB
6240Y	2.60 GHZ	3.90 GHz	3.30 GHz	24.75 MB	18-36	10.4 GT/s	150 W	2933 MT/s	1.0 TB
6240	2.60 GHz	3.90 GHz	3.30 GHz	24.75 MB	18-36	10.4 GT/s	150 W	2933 MT/s	1.0 TB
6238R	2.20 GHz	4.00 GHz	3.00 GHz	38.5 MB	28-56	10.4 GT/s	165 W	2933 MT/s	1.0 TB

Intel SKU	Clock Speed	Non- AVX Max Turbo	Non-AVX All core Turbo	Cache	Cores-Threads	UPI Speed	TDP	Max DDR4 Speed	Max Memory per Socket
6238L	2.1 GHz	3.70 GHz	2.70 GHz	30.25 MB	22-44	10.4 GT/s	140 W	2933 MT/s	4.5 TB
6238M	2.1 GHz	3.70 GHz	2.70 GHz	30.25 MB	22-44	10.4 GT/s	140 W	2933 MT/s	2.0 TB
6238	2.70 GHz	3.70 GHz	2.70 GHz	30.25 MB	22-44	10.4 GT/s	140 W	2933 MT/s	1.0 TB
6234	3.3 GHz	4.00 GHz	4.00 GHz	24.75 MB	8-16	10.4 GT/s	130 W	2933 MT/s	1.0 TB
6230R	2.10 GHz	4.00 GHz	3.00 GHz	35.75 MB	26-52	10.4 GT/s	150 W	2933 MT/s	1.0 TB
6230N	2.30 GHz	3.50 GHz	2.90 GHz	27.50 MB	20-40	10.4 GT/s	125 W	2933 MT/s	1.0 TB
6230	2.10 GHz	3.90 GHz	2.80 GHz	27.50 MB	20-40	10.4 GT/s	125 W	2933 MT/s	1.0 TB
6226R	2.90 GHz	3.90 GHz	3.6 GHz	22 MB	16-32	10.4 GT/s	150 W	2933 MT/s	1.0 TB
6226	2.70 GHz	3.70 GHz	3.50 GHz	19.25 MB	12-24	10.4 GT/s	125 W	2933 MT/s	1.0 TB
6222V	1.80 GHz	3.60 GHz	2.40 GHz	27.50 MB	20-40	10.4 GT/s	115 W	2400 MT/s	1.0 TB
6208U	2.90 GHz	3.90 GHz	3.6 GHz	22 MB	16-32	10.4 GT/s	150 W	2933 MT/s	1.0 TB
5222	3.80 GHz	3.90 GHz	3.90 GHz	16.50 MB	4-8	10.4 GT/s	105 W	2933 MT/s	1.0 TB
5220R	2.20 GHz	4.00 GHz	2.9 GHz	35.75 MB	24-48	10.4 GT/s	150 W	2666 MT/s	1.0 TB
5220S	2.70 GHz	3.90 GHz	2.70 GHz	24.75 MB	18-36	10.4 GT/s	105 W	2667 MT/s	1.0 TB
5220	2.20 GHz	3.90 GHz	2.70 GHz	24.75 MB	18-36	10.4 GT/s	125 W	2666 MT/s	1.0 TB
5218R	2.10 GHz	4.00 GHz	2.90 GHz	27.5 MB	20-40	10.4 GT/s	125 W	2666 MT/s	1.0 TB
5218N	2.3 GHz	3.70 GHz	3.00 GHz	22.00 MB	16-32	10.4 GT/s	110 W	2667 MT/s	1.0 TB
5218	2.30 GHz	3.90 GHz	2.80 GHz	22.00 MB	16-32	10.4 GT/s	125 W	2666 MT/s	1.0 TB
5217	3.00 GHz	3.70 GHz	3.40 GHz	11.00 MB	8-16	10.4 GT/s	115 W	2666 MT/s	1.0 TB
5215	2.50 GHz	3.40 GHz	3.00 GHz	13.75 MB	10-20	10.4 GT/s	85 W	2666 MT/s	1.0 TB
5215M	2.50 GHz	3.40 GHz	3.00 GHz	13.75 MB	10-20	10.4 GT/s	85 W	2666 MT/s	2.0 TB
5215L	2.50 GHz	3.40 GHz	3.00 GHz	13.75 MB	10-20	10.4 GT/s	85 W	2666 MT/s	4.5 TB
4214R	2.4 GHz	3.50 GHz	3.00 GHz	16.5 MB	12-24	9.6 GT/s	100 W	2400 MT/s	1.0 TB
4210R	2.4 GHz	3.2 GHz	2.9 GHz	13.75 MB	10-20	9.6 GT/s	100 W	2400 MT/s	1.0 TB
4216	2.10 GHz	3.20 GHz	2.70 GHz	22.00 MB	16-32	9.6 GT/s	100 W	2400 MT/s	1.0 TB
4215R	3.20 GHz	4.00 GHz	3.6 GHZ	11.00 MB	8-16	9.6 GT/s	130 W	2400 MT/s	1.0 TB
4215	2.50 GHz	3.50 GHz	3.00 GHz	11.00 MB	8-16	9.6 GT/s	85 W	2400 MT/s	1.0 TB
4214	2.20 GHz	3.20 GHz	2.70 GHz	16.50 MB	12-24	9.6 GT/s	85 W	2400 MT/s	1.0 TB
4214Y	2.20 GHZ	NA	NA	16.5 MB	12- 24	9.6 GT/S	85 W	2400 MT/s	1.0 TB
4210	2.20 GHz	3.20 GHz	2.70 GHz	13.75 MB	10-20	9.6 GT/s	85 W	2400 MT/s	1.0 TB
4208	2.10 GHz	3.20 GHz	2.50 GHz	11.00 MB	8-16	9.6 GT/s	85 W	2400 MT/s	1.0 TB
3206R	1.9 GHz	-	-	11.00 MB	8-8	9.6 GT/s	85 W	2133 MT/s	1.0 TB
3204	1.90 GHz	-	-	8.25 MB	6-6	9.6 GT/s	85 W	2133 MT/s	1.0 TB

NOTE: *Available 1H 2020

Table 6. Supported processor levels and features

Processor levels	Features
81xx-Platinum	• 2S-2UPI, 2S-3UPI, 4S-2UPI, 4S-3UPI, and 8S-3UPI capability • 6-ch DDR4 @ 2666

Processor levels	Features
	• 3 UPI links @ 10.4 GT/s • Intel® Turbo Boost • Intel® Hyper-Threading • Intel® AVX-512 (2 512-bit FMAs) • 48 lanes PCIe Gen3 • Node Controller Support • Advanced RAS
61xx-Gold	• 2S-2UPI, 2S-3UPI, 4S-2UPI, and 4S-3UPI capability • 6-ch DDR4 @ 2666 • 3 UPI links @ 10.4 GT/s • Intel® Turbo Boost • Intel® Hyper-Threading • Intel® AVX-512 (2 512-bit FMAs) • 48 lanes PCIe Gen3 • Node Controller Support • Advanced RAS
51xx[1]-Gold	• 2S-2UPI & 4S-2UPI capability • 6-ch DDR4 @ 2400[1] • 2 UPI links @ 10.4 GT/s • Intel® Turbo Boost • Intel® Hyper-Threading • Intel® AVX-512 (1[1]512-bit FMA) • 48 lanes PCIe Gen3 • Advanced RAS
41xx-Silver	• 2S-2UPI • 6-ch DDR4 @ 2400 • 2 UPI links @ 9.6 GT/s • Intel® Turbo Boost • Intel® Hyper-Threading • Intel® AVX-512 (1 512-bit FMA) • 48 lanes PCIe Gen3 • Standard RAS
31xx-Bronze	• 2S-2UPI • 6-ch DDR4 @ 2133 • 2 UPI links @ 9.6 GT/s • Intel® AVX-512 (1 512-bit FMA) • 48 lanes PCIe Gen3 • Standard RAS

Chipset

The PowerEdge MX740c systems use the Intel® C628 chipset with optional Intel(R) QuickAssist technology (QAT) that provides extensive I/O support. Functions and capabilities include:

- ACPI Power Management Logic Support, Revision 4.0a
- PCI Express Base Specification Revision 3.0
- Integrated Serial ATA host controller, supports data transfer rates of up to 6 Gb/s on all ports
- xHCI USB controller with SuperSpeed USB 3.0 ports
- Direct Media Interface
- Serial Peripheral Interface
- Enhanced Serial Peripheral Interface

- Flexible I/O-Allows some high speed I/O signals to be configured as PCIe* root ports, PCIe* uplink for use with certain PCH SKUs, SATA (and sSATA), or USB 3.0.
- General Purpose Input Output (GPIO)
- Low Pin Count interface, interrupt controller, and timer functions
- System Management Bus Specification, Version 2.0
- Integrated Clock Controller / Real Time Clock Controller
- Intel® High Definition Audio and Intel® Smart Sound Technology
- Integrated 10/1 Gb Ethernet
- Integrated 10/100/1000 Mbps Ethernet MAC
- Supports Intel® Rapid Storage Technology Enterprise
- Supports Intel® Active Management Technology and Server Platform Services
- Supports Intel® Virtualization Technology for Directed I/O
- Supports Intel® Trusted Execution Technology
- JTAG Boundary Scan support
- Intel® QuickAssist Technology
- Intel® Trace Hub for debug

5

Memory

The PowerEdge MX740c supports up to 24 DIMMs, with up to 3 TB of memory and speeds up to 2933 MT/s.

There are four different types of DIMMs:

- RDIMM: Registered DIMM – Provides for higher capacity options and advanced RAS features. It is the most commonly used DIMM type, and offers the best mix of frequency, capacity, and rank structure choices.
- LRDIMM: Load Reduced DIMM – Provides maximum capacity beyond that of an RDIMM but at a higher power consumption. Uses a buffer to reduce memory loading to a single load on all DDR signals, allowing for greater density.
- DCPMM (also known as Intel Optane DC persistent memory): Provides a large memory capacity at an affordable price. Any application can take advantage of DCPMM in Memory Mode with a compatible operating system. Unlock more performance and persistency when using an application that supports App Direct Mode. DCPMM is used along with RDIMMs or LRDIMMs and a maximum number of 6 DCPMMs can be used per CPU. This persistent memory technology does not require a battery.
- NVDIMM: Non-Volatile DIMM – Provides a persistent memory solution with NAND and DRAM that maintains data in power loss, system crash, or normal shutdown. This solution requires a battery as a power source for an AC loss condition. It can be used along with RDIMMs.

Intel® Optane™ DC Persistent Memory (DCPMM)

Intel® Optane™ DC Persistent Memory is a new memory technology that allows customers to reach a large memory capacity at an affordable price. Also, when operating the memory in “App Direct Mode” the memory is persistent.

DCPMMs come in three capacities: 128 GB, 256 GB, and 512 GB. DCPMMs must be accompanied by a RDIMM or LRDIMM in the first slot of the same channel. That means each CPU may be populated with up to 6 DCPMMs and a minimum of 6 RDIMMs or LRDIMMs. For best performance, it is recommended to have all 12 DIMMs slots per CPU populated.

Intel Optane DC persistent memory operates in two modes, Memory Mode and Application Direct Mode.

Table 7. Memory modes

Trait	Memory Mode	App Direct Mode
Application support	Any application	Application must state that it supports "App Direct Mode"
DRAM	Used as cache and is not available as system memory.	Both DCPMM and DRAM are available as system memory
Persistence	No	Yes

Supported memory

The table below lists the memory technologies supported by the PowerEdge MX740c.

Table 8. Memory technologies

Feature	MX740c (DDR4)
DIMM Type	RDIMM, NVDIMM-N, LRDIMM, DCPMM
Transfer Speed	2933 MT/s, 2666 MT/s, 2400 MT/s
Voltage	1.2 V (DDR4)

Supported DIMMs for MX740c with Intel(R) Xeon(R) Scalable processors.

Table 9. Memory speeds

DIMM type	DIMM speed (MT/s)	DIMM capacity (GB)	Ranks per DIMM	Data width	DIMM voltage
RDIMM	2666	8	1	x8	1.2 V
RDIMM	2666	16	2	x8	1.2 V
RDIMM	2666	32	2	x4	1.2 V
LRDIMM	2666	64	4	x4	1.2 V
LRDIMM	2666	128	8	x4	1.2 V
NVDIMM	2666	16	1	x4	1.2 V
DCPMM	2666	128	NA	x6	1.2 V

Supported DIMMs for MX740c with second Generation Intel(R) Xeon(R) Scalable processors.

Table 10. Supported memory with second Generation Intel(R) Xeon(R) Scalable processors.

DIMM Type	DIMM Speed 1 DPC - 2 DPC	DIMM Capacity (GB)	Ranks per DIMM	Data Width	DIMM voltage
RDIMM	2666 MT/s - 2666 MT/s	8	1	x8	1.2 V
RDIMM	2933 MT/s - 2666 MT/s	16	2	x8	1.2 V
RDIMM	2933 MT/s - 2666 MT/s	32	2	x4	1.2 V
RDIMM	2933 MT/s - 2666 MT/s	64	2	x4	1.2 V
L RDIMM	2666 MT/s - 2666 MT/s	128	8	x4	1.2 V
NVDIMM-N	2666 MT/s	16	1	x4	1.2 V
DCPMM	2666 MT/s	128	NA	x6	1.2 V

Memory speed

The MX740c supports memory speeds of 2933 MT/s, 2666 MT/s, and 2400 MT/s depending on the processor installed. All memory operates at the same voltage. By default, the speed is the highest common supported speed between the CPUs and DIMMs. The operating speed of the memory is also determined by the maximum speed that is supported by the processor, the speed settings, and the operating voltage of the system that are in the BIOS.

The table below lists the memory configuration and performance details for MX740c, based on the quantity and type of DIMMs per memory channel.

Memory configurations

The MX740c servers support flexible memory configurations ranging from capacities of 8 GB (minimum) to 3 TB (maximum). The MX740c supports up to 12 DIMMs per processor (up to 24 DIMMs in a dual- processor configuration). Each server has six memory channels per processor, with each channel supporting up to 2 DIMMs.

System supports a flexible memory configuration, according to the following population rules:

- Speed: If DIMMs of different speeds are mixed, all channels across all processors operate at the slowest DIMM's common frequency.
- DIMM type: Only one type of DIMM is allowed per system: RDIMM, or LRDIMM. These types cannot be mixed.
- DIMMs with different data widths can be mixed. For 14G, DIMMs with x4 and x8 data widths are supported and mixing is allowed.
- Can mix DIMMs with different capacities.
  - Population rules require the largest capacity DIMM be placed first (slot A1 populated first, then A2, and so on. The second CPU mirrors the first CPU population).
  - Maximum of two different capacity DIMMs allowed in a system.

- Mixing of DIMMs with different ranks are allowed.
  - Maximum of two different rank DIMMs allowed in a system.

Memory RAS features

Reliability, Availability, and Serviceability (RAS) features help keep the system online and operational without significant impact to performance, and can decrease data loss and crashing due to errors. RAS aids in rapid, accurate diagnosis of faults which require service.

The table below describes the memory RAS features supported on the MX740C.

Table 11. RAS features

Feature	Description
Dense configuration optimized profile	Increased memory reliability can be a result from this selectable platform profile that adjusts parameters to reduce faults regarding refresh rates, speed, temperature, and voltage.
Memory demand and patrol scrubbing	Demand scrubbing is the ability to write corrected data back to the memory once a correctable error is detected on a read transaction. Patrol scrubbing proactively searches the system memory, repairing correctable errors.
Recovery from single DRAM device failure (SDDC)	Recovery from Single DRAM Device Failure (SDDC) provides error checking and correction that protects against any single memory chip failure and multi bit errors from any portion of a single memory chip.
Failed DIMM isolation	This feature provides the ability to identify a specific failing DIMM channel pair, thereby enabling the user to replace only the failed DIMM pair.
Memory mirroring	Memory mirroring is a method of keeping a duplicate (secondary or mirrored) copy of the contents of memory as a redundant backup for use if the primary intrasocket memory fails. The mirrored copy of the memory is stored in memory of the same processor socket.
Memory address parity protection	This feature provides the ability to detect transient errors on the address lines of the DDR channel.
Memory sparing (rank)	Memory sparing allocates one rank per channel as a spare. If excessive correctable errors occur in a rank or channel, they are moved to the spare area while the operating system is running to prevent the errors from causing an uncorrectable failure.
Memory thermal throttling	This feature helps to optimize power or performance and can also be used to prevent DIMMs from overheating.

6

Storage

With a variety of storage controllers and drive types, the PowerEdge MX740c provides expandability that allows you to tailor your storage to match your workload and operational demands. Options include boot devices, a portfolio of PERC controllers and HBAs, SAS and SATA hard drives and SSDs, and NVMe SSDs.

Topics:

Supported hard drives

The MX740c supports up to six 2.5-inch, hot-swappable SAS, SATA hard drives, SSDs, or PCIe NVMe PCIe SSD drives. The drives are supplied in a hot-swappable drive carrier and connect to the system board or RAID controller through the backplane.

NOTE: When NVDIMMs are installed in the MX740c, the available 2.5-inch drive bays are reduced to 4 to accommodate the battery needed to protect the DIMMs during a power loss.

RAID controllers

PERC provides a base RAID HW controller without consuming a PCIe slot by using a small form factor and high density connector to the system board.

The following table shows the PERC series offerings.

Table 12. Supported PERC controllers

RAID controllers	Interface Support	Cache Memory Size	RAID Levels	RAID Support	MX740c Max Drives Supported	
S140 Software RAID	6Gb/s SATA NVMe	No Cache	0,1,5,10	Software RAID	6	Internal drive support
HBA330 MX	12Gb/s SAS 6Gb/s SATA	No Cache	No RAID Pass-Thru Only	No RAID SAS HBA	6	Internal drive support
H730P MX	12Gb/s SAS 6Gb/s SATA	2GB NV	0,1,5,6,10,50,60	Hardware RAID	6	Internal drive support
H745P MX	12Gb/s SAS 6Gb/s SATA	8GB NV	0,1,5,6,10,50,60	Hardware RAID	6 internal, 112 from MX5016s storage sled	For use with both internal drives and MX5016s storage sled
HBA330 mini-mezz	12Gb/s SAS	No Cache	No RAID Pass-Through Only	No RAID SAS HBA	112	For use with MX5016s storage sled

Internal Dual SD module (IDSDM)

The PowerEdge MX740c supports an optional Internal Dual SD module (IDSDM). The IDSDM module supports two microSD cards which are available in capacities of 16GB, 32GB, and 64GB. There are two dip switches on the IDSDM module for write-protection. One IDSDM card slot is dedicated for redundancy.

The IDSDM shares the same location as the BOSS-S1 module and connects using a Dell EMC-proprietary PCIe x1 slot that uses a USB interface to the host.

NOTE: The PowerEdge MX740c supports either the optional IDSDM or the BOSS S-1 module but cannot support both simultaneously.

The intended use of IDSDM is to support hypervisor boot: a minimal OS that primarily resides in memory and does not depend on the IDSDM heavily for I/O. Writes should be minimized as the SD media can wear out.

The IDSDM card provides the following features:

- Full RAID-1 functionality
- Enables support for Secure Digital eXtended Capacity (SDXC) cards
- USB interface to the host system
- I2C interface to the host system and onboard EEPROM for out-of-band status reporting
- Dual card operation - maintains a mirrored configuration by using SD cards in both the slots and provides redundancy
- In addition to the redundancy setting, a separate BIOS setup option exists for IDSDM port enable or disable

It is recommended that customers use Dell EMC branded microSD cards associated with the IDSDM configured systems.

vFlash

vFlash is a dedicated microSD card on the iDRAC module and is connected to and controlled by iDRAC. It emulates USB flash storage to the operating system (OS), but its contents can be updated remotely through the iDRAC network. Some applications of vFlash include:

- Backup and restore the platform in case you need to replace the motherboard.
- Download a custom image and instruct the BIOS to boot to it.
- Store data for the local OS user.

vFlash microSD cards are available in 16GB capacities. It is recommended that customers use Dell EMC branded microSD cards associated with the iDRAC module.

Boot Optimized Storage Solution (BOSS)

BOSS is a simple RAID solution card designed specifically for booting the system's operating system, which supports up to two 6 Gbps M.2 SATA drives. This card has a x8 connector using PCIe gen 2.0 x2 lanes, available only in the low-profile and half-height form factor.

The following table shows the specifications for the BOSS module:

Table 13. BOSS module specifications

Feature	BOSS-S1 Card
RAID Levels	RAID 1
Support for NON-RAID disks	Yes (supports up to two disks)
Stripe Size	64K
Battery Back Unit	No
Non-Volatile Cache	No
VC Cache Function	No Cache - Write through only
Maximum number of virtual disks	1
Maximum number of virtual disks per disk group	1
Maximum number of drives supported	2
Drive Type	6Gbps M.2 SATA SSDs
PCIe Support	Gen 2
Disk Cache Policy	Drive Default
TRIM	Non-RAID Disk mode only

Management applications for the BOSS-S1 controller

The management applications enable you to manage and configure the RAID system, create and manage the disk group, and provide online maintenance. The management applications for BOSS card include:

- **Unified Extensible Firmware Interface (UEFI) RAID Configuration Utility** - Storage management application integrated into the System BIOS (F2).
- **Dell EMC OpenManage Storage Management** - Enables you to perform controller and enclosure functions for all the supported the RAID controllers and enclosures from a single graphical or command-line interface. For more information, see the Dell EMC OpenManage Storage Management User's Guide

BOSS features

The BOSS card support the following features:

- Fast initialization
- SMART Info
- Auto-Rebuild
- Non-RAID migration
- TRIM (Non-RAID PD)

NOTE: For the most up-to-date and detailed information, please visit www.dell.com/PERC

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Networking and PCIe

The following list are supported mezzanine cards for the PowerEdge MX740c:

Table 14. Networking and PCIe components

Device	Fabric	Ports	Max Port Speed	Supported Fabric Slots
Intel® XXV710 Dual Port 25GbE Mezz Ethernet Adapter	Ethernet	2	25Gb	Fabric A, Fabric B
QLogic 41232 Dual Port 25GbE Ethernet Mezz Adapter	Ethernet	2	25Gb	Fabric A, Fabric B
QLogic 41262 Dual Port 25GbE Storage Offload Ethernet Mezz Adapter	Ethernet (CNA)	2	25Gb	Fabric A, Fabric B
Mellanox ConnectX-4 LX Dual Port 25GbE Ethernet Mezz Adapter	Ethernet	2	25Gb	Fabric A, Fabric B
Emulex LPm31002 Dual Port FC16 Mini-Mezz Adapter	Fibre Channel	2	16Gb	Fabric C
Emulex LPm32002 Dual Port FC32 Mini-Mezz Adapter	Fibre Channel	2	32Gb	Fabric C
QLogic 2692 Dual Port FC16 Mini-Mezz Adapter	Fibre Channel	2	16Gb	Fabric C
QLogic 2742 Dual Port FC32 Mini-Mezz Adapter	Fibre Channel	2	32Gb	Fabric C
Dell EMC PERC HBA330 MX Mini-Mezz Adapter	SAS	2	12Gb	Fabric C

Mezzanine card slots

The following list are the supported internal PCIe slots for the PowerEdge MX740c:

- Two PCIe Gen3 x16 mezzanine card slots (Fabric A and Fabric B)
- One PCIe Gen3 x16 mini-mezzanine card slot (Fabric C)

8

Power, thermal, and acoustics

Power

Lower overall system-level power draw is a result of Dell EMC's breakthrough system design. PowerEdge servers maximize performance per watt through a combination of power and cooling, energy efficient technologies, and Dell EMC PowerEdge 14G tools. Additionally, PowerEdge servers have an extensive collection of sensors that automatically track thermal activity, which helps regulate temperature thereby reducing server noise and power consumption.

Dell EMC Enterprise Infrastructure Planning Tool is a power planning tool that is now available as a standalone executable and will support PSU sizing in addition to workload estimates. EPIT is located at www.dell.com/calc

The MX740c obtains power from the MX7000 chassis which contains the power supplies. For detailed information about chassis power please consult the MX7000 Technical Guide.

Thermal

PowerEdge servers have an extensive collection of sensors that automatically track thermal activity, which helps regulate temperature thereby reducing server noise and power consumption. The sensors in the MX740c interact with the chassis management services module which regulates fan speed. All fans which cool the MX740c are contained in the MX7000 chassis.

Thermal management of PowerEdge MX740c delivers high performance for the right amount of cooling to components at the lowest fan speeds across a wide range of ambient temperatures from 10°C to 35°C (50°F to 95°F) and to extended ambient temperature ranges (see Environmental Specifications section). The benefits to you are lower fan power consumption (lower server system power and data center power consumption) and greater acoustical versatility.

For detailed information about thermal please consult the MX7000 Technical Guide.

Table 15. Thermal restriction matrix

Ambient Support	25 ° C	30 ° C	35 ° C	40 ° C ~ 45 ° C Expanded Operating Temperature
CPU	No restriction	No restriction	No restriction (The recommended operating temperature for processors with Thermal Design Power (TDP) > 165W is under 32°C)	Does not support processor with TDP > 140W Does not Support Gold 6146 Gold 6144 Gold 6134 Gold 6132 Gold 6128 Gold 5122 No support for 6234(130W8c), 5217(115W8c) and 5222(105W4c) processors.
DIMM	No restriction	No restriction	No restriction	Does not support NVDIMM
Drives	No restriction	No restriction	No restriction	Does not support NVMe (PCIe SSDs)
Mezzanine Cards	No restriction	No restriction	No restriction	Does not support mezzanine cards with power above 30W

Acoustics

For detailed information about acoustics please consult the MX7000 Technical Guide.

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Supported Operating Systems

The Dell EMC PowerEdge MX740c sled supports the following operating systems:

- Canonical(R) Ubuntu(R) Server LTS
- Citrix(R) XenServer(R)
- Microsoft(R) Windows Server(R) with Hyper-V
- Red Hat(R) Enterprise Linux
- SUSE(R) Linux Enterprise server
- VMware(R) ESXi(R)

For more information about the specific versions and editions, go to www.dell.com/ossupport.

10

Dell EMC OpenManage systems management

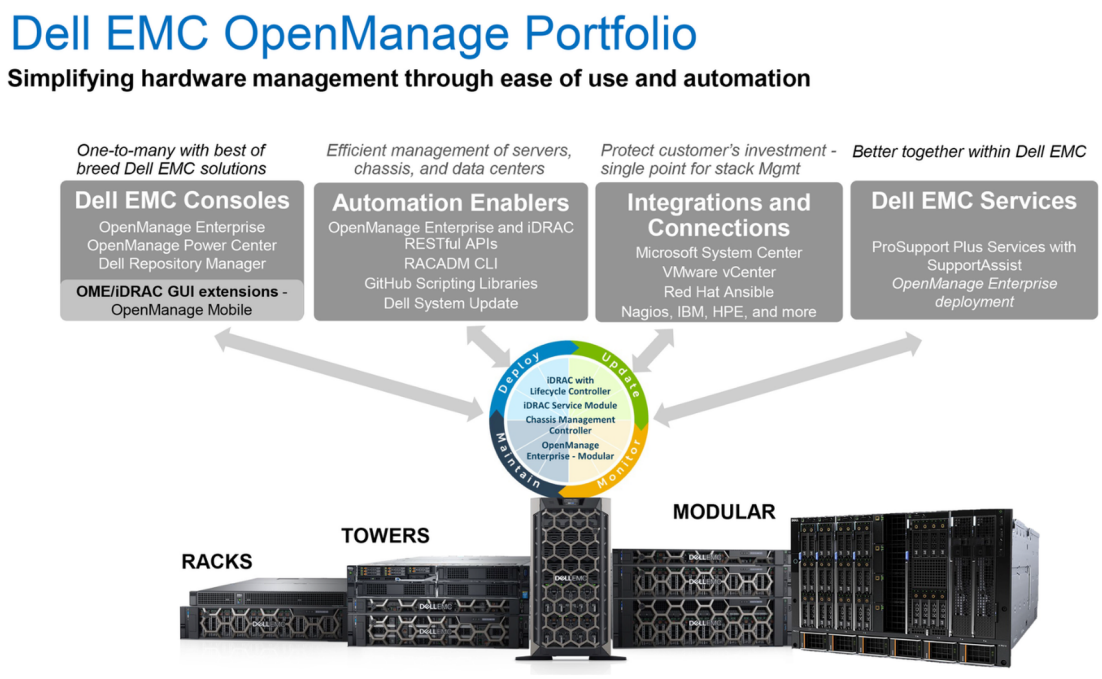

Figure 4. Dell EMC OpenManage Portfolio

Dell EMC delivers management solutions that help IT Administrators effectively deploy, update, monitor, and manage IT assets. OpenManage solutions and tools enable you to quickly respond to problems by helping them to manage Dell EMC servers effectively and efficiently; in physical, virtual, local, and remote environments, operating in-band, and out-of-band (agent-free). The OpenManage portfolio includes innovative embedded management tools such as the integrated Dell Remote Access Controller (iDRAC), Chassis Management Controller and Consoles like OpenManage Enterprise, OpenManage Power Manager plug in, and tools like Repository Manager.

Dell EMC has developed comprehensive systems management solutions based on open standards and has integrated with management consoles that can perform advanced management of Dell hardware. Dell EMC has connected or integrated the advanced management capabilities of Dell hardware into offerings from the industry's top systems management vendors and frameworks such as Ansible, thus making Dell EMC platforms easy to deploy, update, monitor, and manage.

The key tools for managing Dell EMC PowerEdge servers are iDRAC and the one-to-many OpenManage Enterprise console. OpenManage Enterprise helps the system administrators in complete lifecycle management of multiple generations of PowerEdge servers. Other tools such as Repository Manager, which enables simple yet comprehensive change management.

OpenManage tools integrate with systems management framework from other vendors such as VMware, Microsoft, Ansible, and ServiceNow. This enables you to use the skills of the IT staff to efficiently manage Dell EMC PowerEdge servers.

Topics:

Server and Chassis Managers

- Integrated Dell Remote Access Controller (iDRAC)
- Dell EMC OpenManage Enterprise Modular (OME-M)
- iDRAC Service Module (iSM)

Dell EMC consoles

- Dell EMC OpenManage Enterprise
- Dell EMC Repository Manager (DRM)
- Dell EMC OpenManage Enterprise Power Manager plugin to OpenManage Enterprise
- Dell EMC OpenManage Mobile (OMM)

Automation Enablers

- OpenManage Ansible Modules
- iDRAC RESTful APIs (Redfish)
- Standards-based APIs (Python, PowerShell)
- RACADM Command Line Interface (CLI)
- GitHub Scripting Libraries

Integration with third-party consoles

- Dell EMC OpenManage Integrations with Microsoft System Center
- Dell EMC OpenManage Integration for VMware vCenter (OMIVV)
- Dell EMC OpenManage Ansible Modules
- Dell EMC OpenManage Integration with ServiceNow

Connections for third-party consoles

- Micro Focus and other HPE tools
- OpenManage Connection for IBM Tivoli
- OpenManage Plug-in for Nagios Core and XI

Dell EMC Update Utilities

- Dell System Update (DSU)
- Dell EMC Repository Manager (DRM)
- Dell EMC Update Packages (DUP)
- Dell EMC Server Update Utility (SUU)
- Dell EMC Platform Specific Bootable ISO (PSBI)

Dell resources

For additional information about white papers, videos, blogs, forums, technical material, tools, usage examples, and other information, go to the OpenManage page at www.dell.com/openmanagemanuals or the following product pages:

Table 16. Dell resources

Resource	Location
Integrated Dell Remote Access Controller (iDRAC)	www.dell.com/idracmanuals
iDRAC Service Module (iSM)	www.dell.com/support/article/sln310557
OpenManage Ansible Modules	www.dell.com/support/article/sln310720

Resource	Location
OpenManage Essentials (OME)	www.dell.com/support/article/sln310714
OpenManage Enterprise Modular	www.dell.com/OME-modular
OpenManage Mobile (OMM)	www.dell.com/support/article/sln310980
OpenManage Integration for VMware vCenter (OMIVV)	www.dell.com/support/article/sln311238
OpenManage Integration for Microsoft System Center (OMIMSSC)	www.dell.com/support/article/sln312177
Dell EMC Repository Manager (DRM)	www.dell.com/support/article/sln312652
Dell EMC System Update (DSU)	www.dell.com/support/article/sln310654
Dell EMC Platform Specific Bootable ISO (PSBI)	Dell.com/support/article/sln296511
OpenManage Connections for Partner Consoles	www.dell.com/support/article/sln312320
OpenManage Enterprise Power Manager	www.dellemc.com/solutions/openmanage/power-management.htm
OpenManage Integration with ServiceNow (OMISNOW)	Dell.com/support/article/sln317784

NOTE: Features may vary by server. Please refer to the product page on www.dell.com/manuals for details.

Appendix A. Additional specifications

Topics:

Dimensions and weight

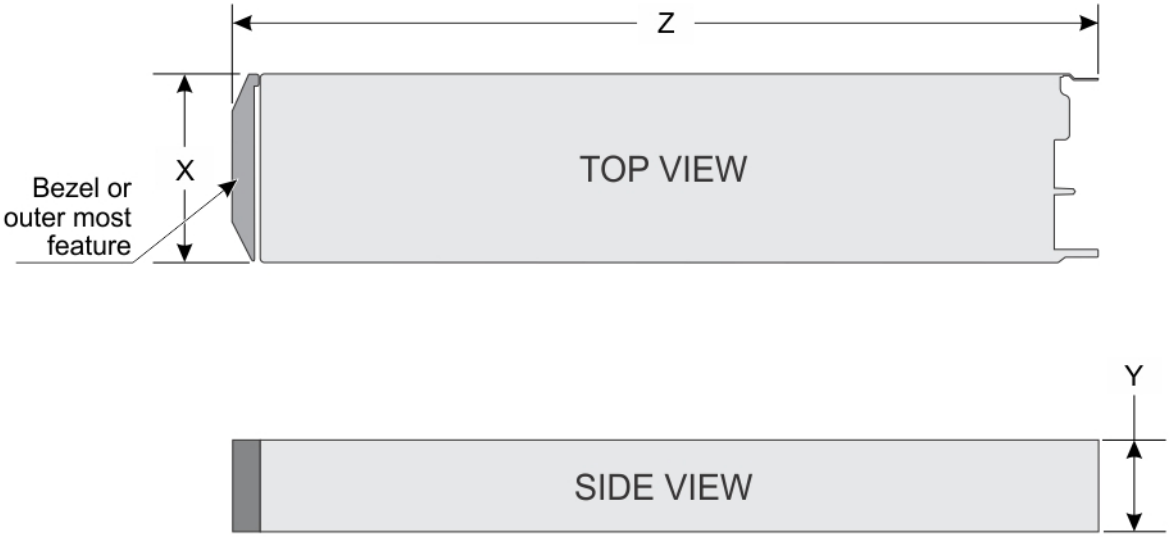

Figure 5. Dimensions and weight

Table 17. System dimensions of the PowerEdge MX740c

X	Y	Z (handle closed)	Max weight
250.2 mm (9.85 inches)	42.15 mm (1.65 inches)	620.35 mm (24.42 inches)	9.5 kg (20.94 lbs)

Environmental specifications

NOTE: For additional information about environmental certifications, please refer to the Product Environmental Datasheet located with the Manuals & Documents on www.dell.com/poweredgemanuals.

Table 18. Temperature specifications

Temperature	Specifications
Storage	–40°C to 65°C (–40°F to 149°F)
Continuous operation (for altitude less than 950 m or 3117 ft)	10°C to 35°C (50°F to 95°F) with no direct sunlight on the equipment.
Maximum temperature gradient (operating and storage)	20°C/h (68°F/h)

Table 19. Relative humidity specifications

Relative humidity	Specifications
Storage	5% to 95% RH with 33°C (91°F) maximum dew point. Atmosphere must be noncondensing always.
Operating	10% to 80% relative humidity with 29°C (84.2°F) maximum dew point.

Table 20. Maximum vibration specifications

Maximum vibration	Specifications
Operating	0.26 G_{rms} at 5 Hz to 350 Hz (all operation orientations).
Storage	1.87 G_{rms} at 10 Hz to 500 Hz for 15 min (all six sides tested).

Table 21. Maximum shock specifications

Maximum shock	Specifications
Operating	Six consecutively executed shock pulses in the positive and negative x, y, and z axes of 6 G for up to 11 ms.
Storage	Six consecutively executed shock pulses in the positive and negative x, y, and z axes (one pulse on each side of the system) of 71 G for up to 2 ms.

Table 22. Maximum altitude specifications

Maximum altitude	Specifications
Operating	3048 m (10,000 ft)
Storage	12,000 m (39,370 ft)

Table 23. Operating temperature derating specifications

Operating temperature derating	Specifications
Up to 35°C (95°F)	Maximum temperature is reduced by 1°C/300 m (1°F/547 ft) above 950 m (3,117 ft).
35°C to 40°C (95°F to 104°F)	Maximum temperature is reduced by 1°C/175 m (1°F/319 ft) above 950 m (3,117 ft).
40°C to 45°C (104°F to 113°F)	Maximum temperature is reduced by 1°C/125 m (1°F/228 ft) above 950 m (3,117 ft).

Video specifications

Table 24. Video specifications

Type	Description
Video type	Matrox G200 graphics controller integrated with iDRAC
Video memory	4 Gb DDR4 shared with iDRAC application memory

USB ports

The Dell EMC PowerEdge MX740c system supports:

- One USB 3.0-compliant port on the front of the system
- One micro USB/iDRAC Direct USB 2.0-compliant port on the front of the system
- One USB 3.0-compliant internal port

NOTE: The micro USB 2.0-compliant port on the front of the system can only be used as an iDRAC Direct management port.

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Appendix B. Standards compliance

Table 25. Industry standard documents

Standard	URL for information and specifications
ACPI Advance Configuration and Power Interface Specification, v2.0c	acpi.info
Ethernet IEEE 802.3-2005	standards.ieee.org/getieee802/802.3.html
HDG Hardware Design Guide Version 3.0 for Microsoft Windows Server	microsoft.com/whdc/system/platform/pcdesign/desguide/serverdg.mspx
IPMI Intelligent Platform Management Interface, v2.0	intel.com/design/servers/ipmi
DDR4 Memory DDR4 SDRAM Specification	jedec.org/standards-documents/docs/jesd79-4.pdf
PCI Express PCI Express Base Specification Rev. 2.0 and 3.0	pcisig.com/specifications/pciexpress
PMBus Power System Management Protocol Specification, v1.2	pmbus.info/specs.html
SAS Serial Attached SCSI, v1.1	t10.org
SATA Serial ATA Rev. 2.6; SATA II, SATA 1.0a Extensions, Rev. 1.2	sata-io.org
SMBIOS System Management BIOS Reference Specification, v2.7	dmtf.org/standards/smbios
TPM Trusted Platform Module Specification, v1.2 and v2.0	trustedcomputinggroup.org
UEFI Unified Extensible Firmware Interface Specification, v2.1	uefi.org/specifications
USB Universal Serial Bus Specification, Rev. 2.0	usb.org/developers/docs

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Appendix C: Additional resources

Table 26. Additional resources

Resource	Description of contents	Location
Installation and Service Manual	This manual, available in PDF format, provides the following information: • Chassis features • System Setup program • System messages • System codes and indicators • System BIOS • Remove and replace procedures • Troubleshooting • Diagnostics • Jumpers and connectors	Dell.com/Support/Manuals
Getting Started Guide	This guide ships with the system, and is also available in PDF format. This guide provides the following information: • Initial setup steps • Key system features • Technical specifications	Dell.com/Support/Manuals
Information Update	This document ships with the system, is also available in PDF format online, and provides information on system updates.	Dell.com/Support/Manuals
System Information Label	The system information label documents the system board layout and system jumper settings. Text is minimized due to space limitations and translation considerations. The label size is standardized across platforms.	Outside the system chassis cover
Quick Resource Locator (QRL)	This code on the chassis can be scanned by a phone application to access additional information and resources for the server, including videos, reference materials, service tag information, and Dell EMC contact information.	Outside the system chassis cover
Enterprise Infrastructure Planning Tool (EPIT)	The Dell EMC online EPIT enables easier and more meaningful estimates to help you determine the most efficient configuration possible. Use EPIT to calculate the power consumption of your hardware, power infrastructure, and storage.	Dell.com/calc

Appendix D. Support and deployment services

ProDeploy Enterprise Suite and Residency Services

ProDeploy Enterprise Suite gets your server out of the box and into optimized production—fast. Our elite deployment engineers with broad and deep experience utilizing best-in-class processes along with our established global scale can help you around the clock and around the globe. From simple to the most complex server installations and software integration, we take the guess work and risk out of deploying your new server technology.

		Basic Deployment	ProDeploy	ProDeploy Plus
Pre-deployment	Single point of contact for project management		●	In-region
	Site readiness review		●	●
	Implementation planning		●	●
	Technology Service Manager (TSM) engagement for ProSupport Plus entitled devices			●
Deployment	Deployment service hours	Business hours	24x7	24x7
	Onsite hardware installation*	●	●	●
	Packaging materials disposal	●	●	●
	Install and configure system software		●	Onsite
	Project documentation with knowledge transfer		●	●
Post-deployment	Deployment verification		●	●
	Configuration data transfer to Dell EMC technical support		●	●
	30-days of post-deployment configuration assistance			●
	Training credits for Dell EMC Education Services			●

Figure 6. ProDeploy Enterprise Suite capabilities

NOTE: Hardware installation not applicable on selected software products.

ProDeploy Plus

From beginning to end, ProDeploy Plus provides the skill and scale needed to successfully execute demanding deployments in today's complex IT environments. Certified Dell EMC experts start with extensive environmental assessments and detailed migration planning and recommendations. Software installation includes set up of most versions of Dell EMC SupportAssist and OpenManage system management utilities. Post-deployment configuration assistance, testing, and product orientation services are also available.

ProDeploy

ProDeploy provides full service installation and configuration of both server hardware and system software by certified deployment engineers including set up of leading operating systems and hypervisors as well as most versions of Dell EMC SupportAssist and OpenManage system management utilities. To prepare for the deployment, we conduct a site readiness review and implementation planning exercise. System testing, validation, and full project documentation with knowledge transfer complete the process.

Basic Deployment

Basic Deployment delivers worry-free professional installation by experienced technicians who know Dell EMC servers inside and out.

Residency Services

Residency Services helps customers transition to new capabilities quickly with the assistance of on-site or remote Dell EMC experts whose priorities and time you control. Residency experts can provide post implementation management and knowledge transfer related to a new technology acquisition or day-to-day operational management of the IT infrastructure.

Deployment services

Deployment services details and exceptions can be found in service description documents at the Enterprise Configuration and Deployment pageon Dell.com.

Remote Consulting Services

When you are in the final stages of your PowerEdge server implementation, you can rely on Dell EMC Remote Consulting Services, and our certified technical experts to help you optimize your configuration with best practices for your software, virtualization, server, storage, networking, and systems management.

Data Migration Service

Protect your business and data with our single point of contact to manage your data migration project. Your project manager will work with our experienced team of experts to create a plan using industry-leading tools and proven processes based on global best practices to migrate your existing files and data so your business system get up and running quickly and smoothly.

ProSupport Enterprise Suite

With Dell EMC ProSupport Services, we can help you keep your operation running smoothly, so you can focus on running your business. We will help you maintain peak performance and availability of your most essential workloads. Dell EMC ProSupport is a suite of support services that enable you to build the solution that is right for your organization. Choose support models based on how you use technology and where you want to allocate resources. From the desktop to the data center, address everyday IT challenges, such as unplanned downtime, mission-critical needs, data and asset protection, support planning, resource allocation, software application management and more. Optimize your IT resources by choosing the right support model.

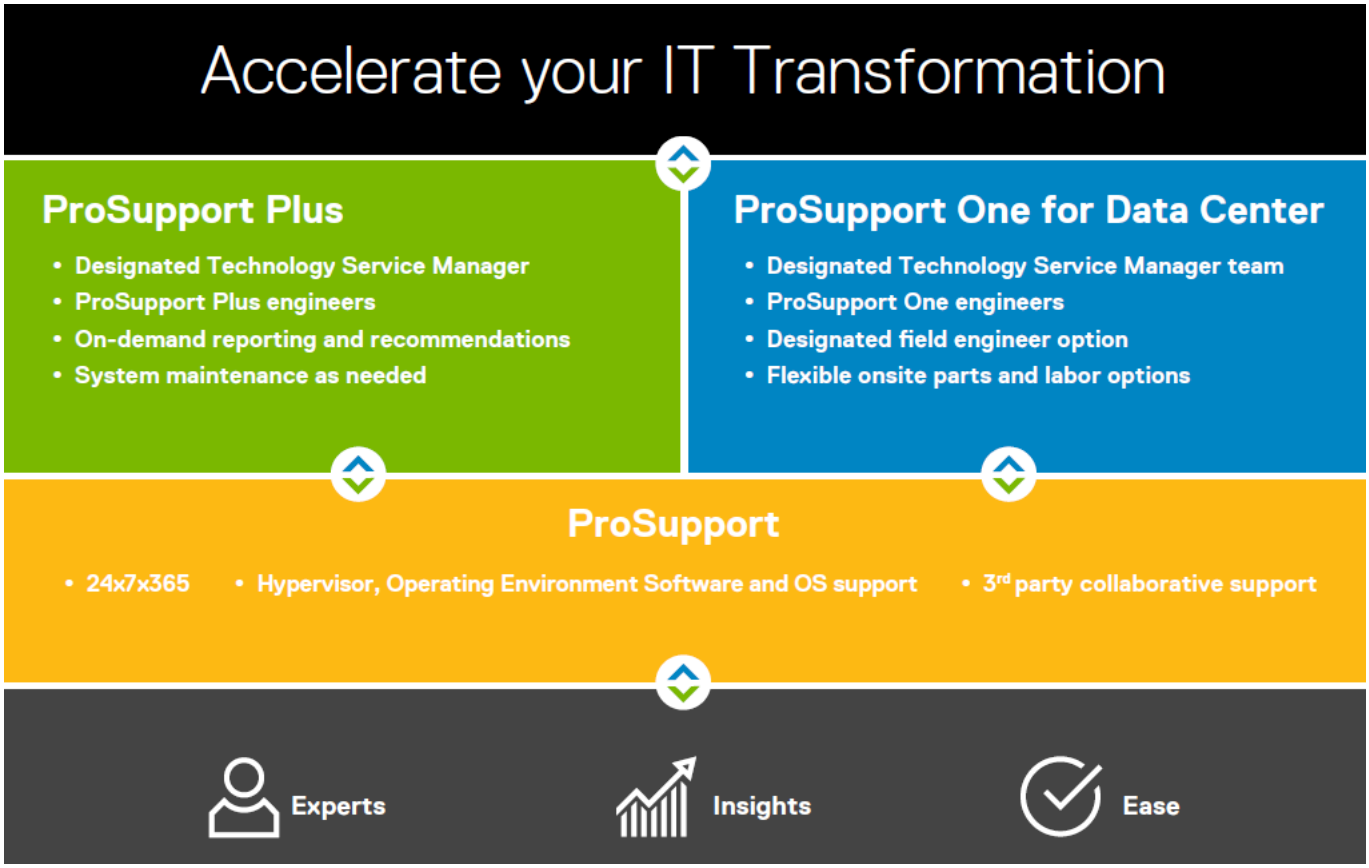

Figure 7. ProSupport Enterprise Suite

ProSupport Plus

When you purchase PowerEdge servers, we recommend ProSupport Plus, our proactive and preventative support, for business-critical systems. ProSupport Plus provides all the benefits of ProSupport, plus the following:

- An assigned Technology Service Manager who knows your business and your environment
- Access to senior ProSupport engineers for faster issue resolution
- Personalized, preventive recommendations based on analysis of support trends and best practices from across the Dell EMC customer base to reduce support issues and improve performance
- Predictive analysis for issue prevention and optimization enabled by SupportAssist
- Proactive monitoring, issue detection, notification and automated case creation for accelerated issue resolution enabled by SupportAssist
- On-demand reporting and analytics-based recommendations enabled by SupportAssist and TechDirect

ProSupport

Our ProSupport service offers highly trained experts around the clock and around the globe to address your IT needs. We will help you minimize disruptions and maximize availability of your PowerEdge server workloads with:

- 24x7x365 access to certified hardware and software experts
- Collaborative 3rd party support
- Hypervisor and OS support
- Consistent level of support available for Dell EMC hardware, software and solutions
- Onsite parts and labor response options including next business day or four-hour mission critical

ProSupport One for Data Center

ProSupport One for Data Center offers flexible site-wide support for large and distributed data centers with more than 1,000 assets. This offering is built on standard ProSupport components that leverage our global scale but are tailored to your company's needs. While not for everyone, it offers a truly unique solution for Dell EMC's largest customers with the most complex environments.

- Team of assigned Technology Services Managers with remote, on-site options
- Assigned ProSupport One technical and field engineers who are trained on your environment and configurations
- On-demand reporting and analytics-based recommendations enabled by SupportAssist and TechDirect
- Flexible on-site support and parts options that fit your operational model
- A tailored support plan and training for your operations staff

	ProSupport	ProSupport Plus	ProSupport One for Data Center
Remote technical support	24x7	24x7	24x7
Parts and labor response options	Next business day or Mission Critical	Next business day or Mission Critical	Flexible
Automated issue detection and case creation	●	●	●
Self-service case initiation and management	●	●	●
Hypervisor and OS support.	●	●	●
Priority access to specialized support experts		●	●
Designated Technology Service Manager		●	●
Personalized assessments and recommendations		●	●
On-demand support and utilization reports		●	●
Systems Maintenance guidance		Semiannual	Optional
Designated technical and field support teams			●

Figure 8. Enterprise Support feature comparison

Support Technologies

Powering your support experience with predictive, data-driven technologies.

SupportAssist

The best time to solve a problem is before it happens. The automated proactive and predictive technology SupportAssist* helps reduce steps and time to resolution, often detecting issues before they become a crisis. Benefits include:

- Value - SupportAssist is available to all customers at no additional charge.
- Improve productivity - replace manual, high-effort routines with automated support.
- Accelerate time to resolution - receive issue alerts, automatic case creation and proactive contact from Dell EMC experts.
- Gain insight and control - optimize enterprise devices with on-demand ProSupport Plus reporting in TechDirect and get predictive issue detection before the problem starts.

SupportAssist is included with all support plans but features vary based on service level agreement.

	Basic Hardware Warranty	ProSupport	ProSupport Plus
Automated issue detection and system state information collection	●	●	●
Proactive, automated case creation and notification		●	●
Predictive issue detection for failure prevention			●
Recommendation reporting available on-demand in TechDirect			●

Figure 9. SupportAssist model

Get started at Dell.com/SupportAssist

TechDirect

Boost your IT teams productivity when supporting Dell EMC systems. With over 1.4 million self-dispatches processed each year, TechDirect has proven its effectiveness as a support tool. You can:

- Self-dispatch replacement parts
- Request technical support
- Integrate APIs into your help desk

Or, access all your Dell EMC certification and authorization needs. Train your staff on Dell EMC products as TechDirect allows you to:

- Download study guides
- Schedule certification and authorization exams
- View transcripts of completed courses and exams

Register at techdirect.dell.com

Additional professional services

Dell Education Services

Dell Education Services offers the PowerEdge server training courses designed to help you achieve more with your hardware investment. The curriculum is designed in conjunction with the server development team, as well as Dell EMC's technical support team, to ensure that the training delivers the information and practical, hands-on skills you and your team need to confidently manage and maintain your Dell EMC server solution. To learn more or register for a class today, visit LearnDell.com/Server.

Dell EMC Global Infrastructure Consulting Services

Dell EMC Global Infrastructure Consulting Services use skilled solution architects, innovative tools, automated analysis and Dell EMC's intellectual property to give rapid insight into the root causes of unnecessary complexity. We seek better answers than traditional service models, and our strategy is to help quickly identify high-impact, short-duration projects that deliver return on investment (ROI) and free up resources. The results are practical, action-oriented plans with specific, predictable, measurable outcomes. From data center optimization to server virtualization to systems management, our consulting services can help build a more efficient enterprise.

Dell EMC Managed Services

Dell EMC Managed Services are a modular set of lifecycle services designed to help you automate and centrally configure, deploy, and manage your day-to-day data center operations. These services extend your existing on-premise IT infrastructure with off-premise cloud services designed to better address challenges with mobility, highly distributed organizations, security, compliance, business continuity, and disaster preparedness.