Dell EMC PowerEdge C4140

Technical Guide

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Regulatory Model: E53S Series
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DELL Technologies

Notes, cautions, and warnings

NOTE: A NOTE indicates important information that helps you make better use of your product.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

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System overview

Topics:

Introduction

PowerEdge C4140 is an incredibly dense purpose – built rack server designed to handle the most demanding technical computing workloads. With the 2nd Generation Intel® Xeon® Scalable processors and Nvidia® Volta® technologies, the C4140 fills a key gap as a leading GPU-accelerated platform in the PowerEdge server portfolio to enable a scalable business architecture in a heterogeneous data center environment.

With four double-width accelerators in just 1U of space, the C4140 delivers outstanding performance and maximum density while reducing your space, cost and management requirements.

Key capabilities offered:

- Fills a key gap as a leading GPU-accelerated platform in the PowerEdge server portfolio enable a scalable business architecture in a heterogeneous data center environment
- Maximum performance density with four GPU / accelerators in a 1U FF reducing the number of servers required to perform technical computing workloads
- Innovative platform design creates a superior thermal efficiency and high accelerator flexibility

New technologies

The following table shows the new technologies available for the PowerEdge C4140:

Table 1. New technologies

Technology	Detailed description
2nd Generation Intel® Xeon® Scalable Processor family	• 14 nm process technology • Intel® Ultra Path Interconnect (UPI) • Up to 24 cores per socket • Up to 2.4 GHz and 3.8 GHz • Max TDP: 150 W and 165 W For more information about supported processors, see the processor section.
Chipset	• Intel® Platform Controller Hub (PCH) For more information about supported processors, see the chipset section .
Memory	Support 2 DIMMs per channel (2DPC) at 2666 MT/s or 1DPC at 2933 MT/s with SKUs of the Second-Generation Intel® Xeon® Scalable processors. • 6x DDR4 Channels per socket, 2 DIMMs per channel • Up to 2666 MT/s (configuration-dependent) • RDIMMs up to 32 GB and LRDIMMs at 64 GB • Up to 24 total DIMMS with max capacity of 1.5 TB
Network Daughter Card	• Intel 10 GbE Quad Port (2+2) BT NDC

Table 1. New technologies (continued)

Technology	Detailed description
	• Intel 10 GbE Quad Port SFP+ (2+2) NDC • Intel x550 4-Port 10GBASE-T NDC For information about the additional supported cards, you can contact the sales representatives.
Storage	An Internal BOSS PCIe card with M.2 SD drives is the storage and boot device for the PowerEdge C4140. Either single or two matching M.2 SD drives available in 120 GB, 240 GB, or 480 GB. If more storage is required, the following options can be added : • Standard IDSDM and VFlash modules • NVMe/PCIE SSD AIC in rear PCIe Gen 3 LP slots • Hard drive bay in lieu of a PSU with two 2.5-inch SATA SSD drives in a non-raid configuration.
Power supply	• Dual 2400 W PSU in a redundant and non-redundant configuration is available. Single PSU option is available. • Dual 2000 W PSU in a redundant and non-redundant configuration is available. Single PSU configuration is available.
PCIe rear slots	Two Gen3 x16 on the rear PCIe slots.
iDRAC9 w/ Lifecycle Controller	The embedded systems management solution for Dell EMC servers features hardware and firmware inventory and alerting, in-depth memory alerting, faster performance, a dedicated Gb port, and many more features. For more information about supported processors, see the iDRAC section.

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System features

Topics:

Specifications

The following table shows the technical specifications of the PowerEdge C4140:

Table 2. Technical specifications

Feature	Specifications
Processor	Two 2nd Generation Intel® Xeon® Scalable processors. up to 24 cores per processor
Memory	• Up to 24 DDR4 DIMMs in total • Supports RDIMM/LRDIMM • Speeds up to 2933 MT/s • 1.5TB max ECC registered DDR4
Storage controllers	IDSDM or Internal M.2 Boot Module (2 x M.2) -120GB, 240GB or 480GB
Power supplies	2000W, 2400W hot-plug in either a redundant power supply unit (PSU) or single PSU option (available in certain configurations only)
Accelerators	NVIDIA® Tesla® P40, V100 16GB PCIe and NVLink GPUs, V100 32GB PCIe and NVLink GPUs

Network daughter cards and Optional adapters	• Support for the following Network Daughter Cards:
	  ○ Intel® X550 Quad Port 10GBASE-T (2+2)
	  ○ Intel® X550 Quad Port 10GBASE-T
	  ○ Intel® X710 Quad Port 10Gb SFP+ (2+2)
	• Support for the following PCIE network adapters:
	  ○ Intel® I350 Quad Port 1GbE PCIe LP
	  ○ Intel® X550 Dual Port 10GBASE-T PCIe LP
	  ○ Intel® X710 Dual Port 25GbE SFP28 PCIe LP
	  ○ Intel® X710 Dual Port 10GSFP+ PCIe LP
	  ○ Intel® X710 Dual Port 10GBASE-T PCIe LP
	  ○ Mellanox ConnectX-3 Pro Dual Port 10GbE SFP+ PCIe LP
	  ○ Mellanox ConnectX-3 Pro Dual Port 40GbE QSFP+ PCIe LP
	  ○ Mellanox ConnectX-4 LX Dual Port 10/25GbE SFP28 PCIe LP
	  ○ Mellanox ConnectX-4 Dual Port 100GbE QSFP28 PCIe LP
	  ○ Mellanox ConnectX-5 Dual Port 100GbE QSFP28 PCIe LP
	  ○ Intel® Omni-Path 1 x OPA 100Gb
	  ○ Mellanox ConnectX-3 Single Port FDR VPI PCIe LP

Table 2. Technical specifications (continued)

Feature	Specifications
	○ Mellanox ConnectX-5 1Port Infiniband EDR VPI PCIe LP ○ Solarflare 8522 Dual Port 10GbE SFP+ Onload PCIe LP ○ Solarflare 8522 Dual Port 10GbE SFP+ PCIe LP ● Optional adapters: Support for 2x NVMe/PCIE SSD AIC in rear slots.
Dimensions	Height: 4.28 cm (1.69 inch) Width: 43.4 cm (17.09 inch) Diameter: 92.62 cm (36.46 inch) Max weight: 24 kg (52.91 lb)
iDRAC	iDRAC9 with Lifecycle Controller
Consoles	● OpenManage Enterprise ● OpenManage Essentials ● OpenManage Server Administrator ● OpenManage Power Center
Security	● TPM 1.2/2.0 optional ● Cryptographically signed firmware ● Silicon Root of Trust ● Secure Boot ● System Lockdown ● System Erase
I/O ports	● Four (4) Double Wide accelerator Gen3 x16 PCIe slots ● Two (2) low profile Gen3 x16 PCIe slots ● Front ports: Power button, System ID / Status LED, Health Status LED ● Rear ports: 2 x USB 3.0 Port and iDRAC ethernet port
Supported OS	● Canonical® Ubuntu® Server LTS 16.04.3 ● Red Hat® Enterprise Linux 7.4 and 7.5 ● SUSE® Linux Enterprise Server 12 SP3® ● Windows Server 2016 ● VMWare ESXi 6.5 U2 and 6.7

Product comparison

Table 3. Product comparison

Feature	C4130	C4140
CPU	Up to 2x Intel Broadwell (Support up to 2x 145 W processors with ambient restrictions)	2x Intel Purley socket P (Support for up to 2x 150 W processor)
Front Side Bus	Intel QuickPath Interconnect (QPi)	Intel Ultra Path Interconnect (UPI, 11.2 GT/s)
Memory	DDR4 up to 16x RDIMMs (256 GB)	● DDR4 up to 24x RDIMMs ● RDIMM - 8 GB, 16 GB, 32 GB ● LRDIMM 64 GB
Storage controller	● Hardware RAID: PERC9 in a standard slot - select adapters ● Chipset SATA software RAID	● PCIe M.2 boot module ● Optional chipset SATA software RAID

Table 3. Product comparison (continued)

Feature	C4130	C4140
Storage	• Internal: IDSDM, Optional drive carrier instead of second power supply with up to 4x 2.5-inch drive. • Rear: 2x 1.8 inch SSD • Bandwidth: 12Gb/6Gbn SAS HP hard drive	• Internal: IDSDM or Internal M.2 boot module (2x M.2) for boot • Optional carrier instead of second PSU with up to 2 x 2.5 inch SSD
NDC/LOM	• No NDC is supported. • 2x 1Gbe LOM (Intel®)	Intel NDC: 10 GbE (2+2) BT or SFP+ (2+2) or x550 10GBASE-T
Max PCIe slots	2x PCIe Gen3 LP slots (mix of x8/x16 based on config)	Up to 2 Gen 3 slots, both are x16 and 1 Gen3 slot x4 (the M.2 BOSS module uses the x4 slot).
Accelerators or GPUs	• 4 x 300 W DW/FH/10.5 inch with custom brackets • SXM2 form factor with NVLINK interconnect	• 4 x 300 W DW/FH/10.5 inch PCIe with custom brackets • SXM2 form factor w/NVLINK interconnect
Internal 96-lane PCIe Gen3 Switch	• Configurations B, G, and K use PCIe switch. • Configurations C and M do not.	• Support for PCIe Configuration B, C, and G • Support for NVLink Configuration K and M
System Management	• Base: IDRAC 8 Express with Lifecycle configuration options • Upsell: Enterprise edition • No front USB or Dell Quick Sync 1.0 (NFC)	• iDRAC9 with Lifecycle Controller • Upsell: Enterprise edition • No front USB or Dell Quick Sync 2.0
Standard Rear ports	• Dedicated iDRAC • Serial port • Video port • 2 x USB 3.0 • 2 x 1G LOM	• Dedicated iDRAC • RJ45 • Serial port • Video port • 2 x USB 3.0
Dimensions	Height: 1U; Depth: 35 inches	Height: 1U; Depth: 35 inches

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Chassis views and features

Topics:

Front view and panel of the system

Figure 1. Front view of the system

1. Control panel

Rear view of the system

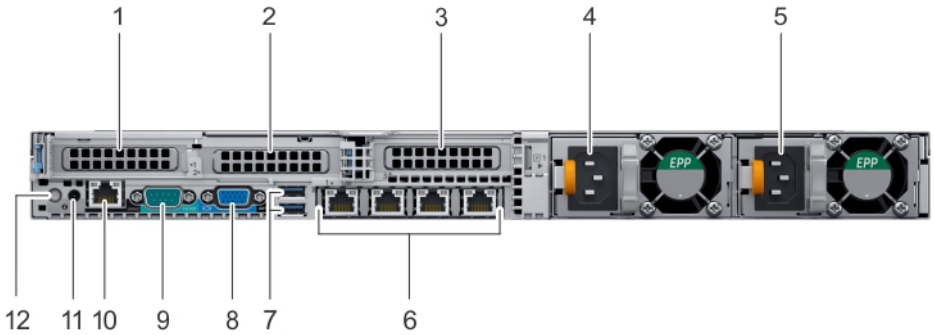

Figure 2. Rear view of the system

1. PCIe expansion card slot 1
2. PCIe expansion card slot 2

   NOTE: This slot is dedicated for BOSS card.
3. PCIe expansion card slot 3
4. Power supply unit (PSU 1)
5. Power supply unit (PSU 2)
6. Ethernet connectors (4)
7. USB connectors (2)
8. Video connector
9. Serial connector
10. iDRAC Enterprise port
11. NMI button
12. System identification button

Internal view of the system

The 2.5-inch drive cage is completely independent of the GPU configuration of the system and is supported on the switchboard, NVLink, or cabled configuration (B, C, G, K, and M).

The optional two 2.5-inch cabled SATA SSDs is installed only in PSU 2 bay.

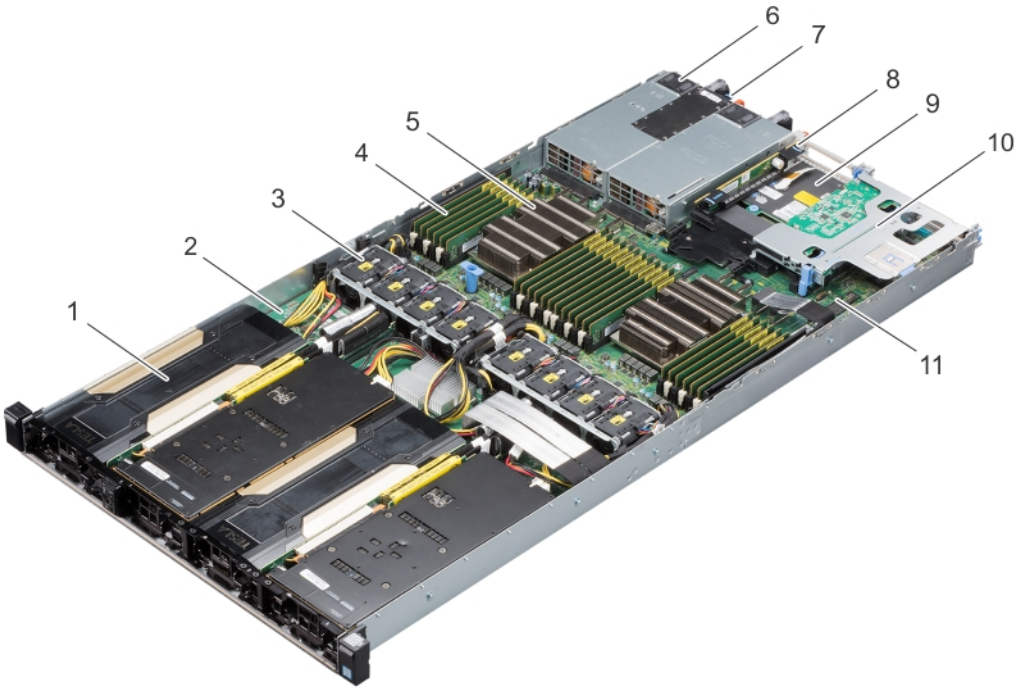

Figure 3. Configuration B, C, and G

1. PCIe GPU (4)
2. PCIe switch board
3. Cooling fan (8)
4. DIMMs (24)
5. Processor and heat sink (2)
6. PSU (2)
7. Information tag
8. Riser 2A (Low-profile PCIe expansion card: Slot 3)
9. Network daughter card (NDC)
10. Riser 1A (Low-profile PCIe expansion cards: Slots 1 and 2)
11. System board

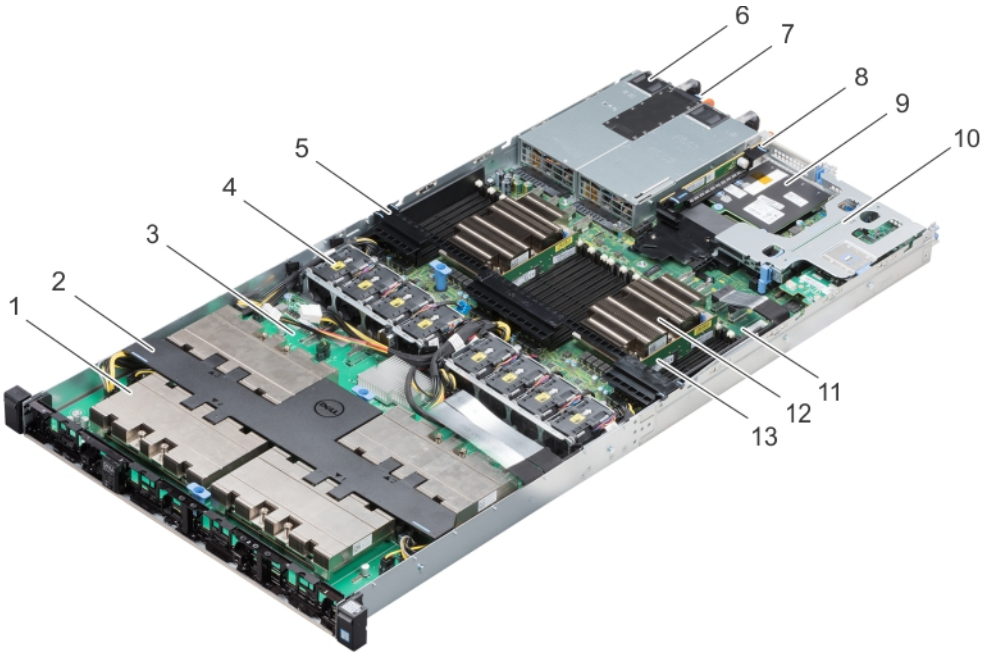

Figure 4. Configuration K

1. NVLink Heat sink and processor (4)
2. NVLink air shroud
3. NVLink board
4. Cooling fan (8)
5. Air shroud
6. PSU (2)
7. Information tag
8. Riser 2A (Low-profile PCIe expansion card: Slot 3)
9. Network daughter card (NDC)
10. Riser 1A (Low-profile PCIe expansion cards: Slots 1 and 2)
11. System board
12. Processor and heat sink (2)
13. DIMMs (24)

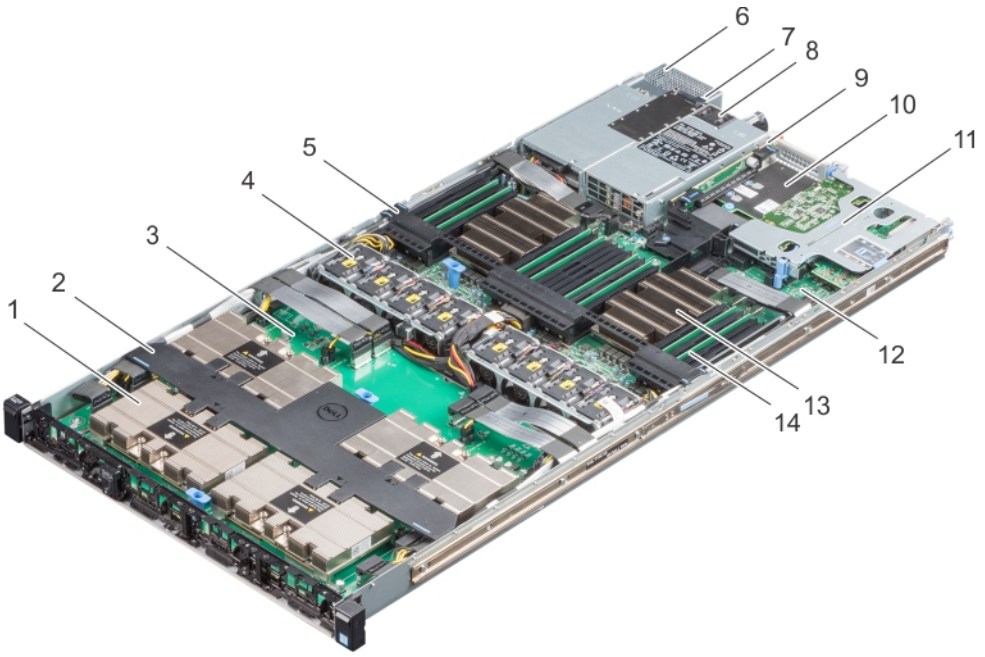

Figure 5. Configuration M

1. NVLink Heat sink and processor (4)
2. NVLink air shroud
3. NVLink board
4. Cooling fan (8)
5. Air shroud
6. Drive (2)

7. Information tag
8. PSU
9. Riser 2A (Low-profile PCIe expansion card: Slot 3)
10. Network daughter card (NDC)
11. Riser 1A (Low-profile PCIe expansion cards: Slots 1 and 2)
12. System board
13. Processor and heat sink (2)
14. DIMMs (24)

Locating Service Tag of your system

Your system is identified by a unique Express Service Code and Service Tag number. The Express Service Code is and Service Tag are found on the back of the system by pulling out the information tag. Alternatively, the information may be on a sticker on the chassis of the system. This information is used by Dell EMC to route support calls to the appropriate personnel.

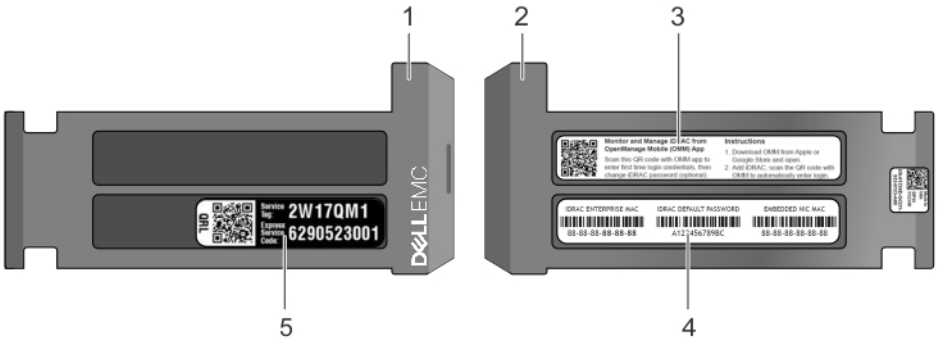

Figure 6. Locating Service Tag of your system

1. Information tag (top view)
2. Information tag (back view)
3. OpenManage Mobile (OMM) label
4. iDRAC MAC address and iDRAC secure password label
5. 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 microarchitecture 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 replace the existing 2-Socket E5-2600, 4-socket E5- 4600 & 4-socket E7-4800/8800 Processor Families, and will have named medal designations with different levels of features according to the medal designation below:

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

Topics:

Processor features

The following list is the supported features for the Second-Generation Intel® Xeon® Processor Scalable Family processor:

NOTE: The PowerEdge C4140 may not take advantage of all the listed features:

- Up to 28 cores with Intel® HT Technology (2 threads/core)
- Intel® Turbo Boost technology (excludes Bronze processors).
- Between 70W-205W TDP
- 768 GB memory capacity on all standard processors
- 1.5 TB memory capacity on select processors designated by "M"
- Socket P
- 14 nm process technology
- Rebalanced Cache Hierarchy: 1.375 MB for Skylake and 1.489 for Cascade lake level Cache: 35.75 MB / 24 Cores.
- 2S, 4S, 8S scalable (note: 4xxx (Silver) and 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 Channels DDR4 per CPU-RDIMM, LRDIMM
- 2133, 2400, 2666, 2933 speeds at 2 DIMMs per channel; no 3 DIMMs per channel support
- Memory Protection Extensions (MPX) 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.

Medal feature differences

The following table shows the processor features based on medal type:

Table 4. Medal features

81xx (Platinum)	61xx (Gold)	51xx (Gold)	41xx (Silver)	31xx (Bronze)
• 2S-2UPI • 2S-3UPI 1 • 4S-2UPI • 4S-3UPI • 8S-3UPI	• 2S-2UPI • 2S-3UPI • 4S-2UPI • 4S-3UPI	• 2S-2UPI • 4S-2UPI	• 2S-2UPI	• 2S-2UPI
• 6-ch DDR4 • 2666 MT/S	• 6-ch DDR4 • 2666 MT/S	• 6-ch DDR4 • 2400 MT/S	• 6-Ch DDR4 • 2400 MT/S	• 6-ch DDR4 • 2133 MT/S
3 UPI links @ 10.4GT/s	3 UPI links @ 10.4GT/s	2 UPI links @ 10.4GT/s	2 UPI links @ 9 . 6 G T/s	2 UPI links @ 9 . 6 G T/s
Intel® AVX-512 (2 x 512-bit FMAs)	Intel® AVX-512 (2 x 512-bit FMAs)	Intel® AVX-512 (1 x 512-bit FMAs)	Intel® AVX-512 (1 x 512-bit FMAs)	Intel® AVX-512 (1 x 512-bit FMAs)
48 lanes PCIe Gen3	48 lanes PCIe Gen3	48 lanes PCIe Gen3	48 lanes PCIe Gen3	48 lanes PCIe Gen3
Intel® Turbo Boost	Intel® Turbo Boost	Intel® Turbo Boost	Intel® Turbo Boost	N/A
Intel® Hyper- Threading	Intel® Hyper-Threading	Intel® Hyper-Threading	Intel® Hyper-Threading	N/A
Advanced RAS features	Advanced RAS features	Advanced RAS features	N/A	N/A
Node Controller Support	Node Controller Support	N/A	N/A	N/A

Supported processors

The following tables show the supported processors for the PowerEdge C4140:

Table 5. Supported processors (8xxx)

Processor model	Clock speed (GHz)	Max turbo(GHz)	Cache (MB)	Cores-Threads	UPI speed (GT/s)	Number of UPI lanes	Hyper-Threading	Turbo	TDP (W)	DDR4 speed (MT/s)	Supported in C4140
8280 (Platinum)	2.70	4.00	38.50	28–56	10.4	Up to 3	Yes	Yes	205	2933	
8280M (Platinum)	2.70	4.00	38.50	28–56	10.4	Up to 3	Yes	Yes	205	2933	
8280L (Platinum)	2.70	4.00	38.50	28–56	10.4	Up to 3	Yes	Yes	205	2933	
8276 (Platinum)	2.20	4.00	38.50	28–56	10.4	Up to 3	Yes	Yes	165	2933	•
8276M (Platinum)	2.20	4.00	38.50	28–56	10.4	Up to 3	Yes	Yes	165	2933	
8276L (Platinum)	2.20	4.00	38.50	28–56	10.4	Up to 3	Yes	Yes	165	2933	
8270 (Platinum)	2.70	4.00	35.75	26–52	10.4	Up to 3	Yes	Yes	205	2933	

Table 5. Supported processors (8xxx) (continued)

Processor model	Clock speed (GHz)	Max turbo (GHz)	Cache (MB)	Cores-Threads	UPI speed (GT/s)	Number of UPI lanes	Hyper-Threading	Turbo	TDP (W)	DDR4 speed (MT/s)	Supported in C4140
8268 (Platinum)	2.90	3.90	35.75	24–48	10.4	Up to 3	Yes	Yes	205	2933	
8260 (Platinum)	2.40	3.90	35.75	24–48	10.4	Up to 3	Yes	Yes	165	2933	•
8260M (Platinum)	2.40	3.90	35.75	24–48	10.4	Up to 3	Yes	Yes	165	2933	
8260L (Platinum)	2.40	3.90	35.75	24–48	10.4	Up to 3	Yes	Yes	165	2933	
8256 (Platinum)	3.80	3.90	16.50	4–8	10.4	Up to 3	Yes	Yes	105	2933	
8253 (Platinum)	2.20	3.00	22.00	16–32	10.4	Up to 3	Yes	Yes	125	2933	Qual Only
8180M (Platinum)	2.50	3.80	38.50	28–56	10.4	Up to 3	Yes	Yes	205	2666	
8180 (Platinum)	2.50	3.80	38.50	28–56	10.4	Up to 3	Yes	Yes	205	2666	
8176M (Platinum)	2.10	3.80	38.50	28–56	10.4	Up to 3	Yes	Yes	165	2666	
8176 (Platinum)	2.10	3.80	38.50	28–56	10.4	Up to 3	Yes	Yes	165	2666	
8170M (Platinum)	2.10	3.70	35.75	26–52	10.4	Up to 3	Yes	Yes	165	2666	
8170 (Platinum)	2.10	3.70	35.75	26–52	10.4	Up to 3	Yes	Yes	165	2666	
8168 (Platinum)	2.70	3.70	33.00	24–48	10.4	Up to 3	Yes	Yes	205	2666	
8164 (Platinum)	2.00	3.70	35.75	26–52	10.4	Up to 3	Yes	Yes	150	2666	
8160M (Platinum)	2.10	3.70	33.00	24–48	10.4	Up to 3	Yes	Yes	150	2666	
8160 (Platinum)	2.10	3.70	33.00	24–48	10.4	Up to 3	Yes	Yes	150	2666	•
8158 (Platinum)	3.00	3.70	24.75	12–24	10.4	Up to 3	Yes	Yes	150	2666	
8156 (Platinum)	3.60	3.70	16.50	4–8	10.4	Up to 3	Yes	Yes	105	2666	
8153 (Platinum)	2.00	2.80	22.00	16–32	10.4	Up to 3	Yes	Yes	125	2666	

Table 6. Supported processors (6xxx)

Processor model	Clock speed (GHz)	Max turbo(GHz)	Cache (MB)	Cores-Threads	UPI speed (GT/s)	Number of UPI lanes	Hyper-Threading	Turbo	TDP (W)	DDR4 speed (MT/s)	Support
6254 (Gold)	3.10	4.00	24.75	18–36	10.4	Up to 3	Yes	Yes	200	2933	Qual Only
6252 (Gold)	2.10	3.70	35.75	24–48	10.4	Up to 3	Yes	Yes	150	2933	•
6248 (Gold)	2.50	3.90	27.50	20–40	10.4	Up to 3	Yes	Yes	150	2933	•
6246 (Gold)	3.30	4.20	24.75	12–24	10.4	Up to 3	Yes	Yes	165	2933	•
6244 (Gold)	3.60	4.40	24.75	8–16	10.4	Up to 3	Yes	Yes	150	2933	•
6242 (Gold)	2.80	3.90	22.00	16–32	10.4	Up to 3	Yes	Yes	150	2933	•
6240R (Gold)	2.40	4.0	35.75	24-48	10.4	Up to 2	Yes	Yes	165	2933	
6240 (Gold)	2.60	3.90	24.75	18–36	10.4	Up to 3	Yes	Yes	150	2933	•
6240M (Gold)	2.60	3.90	24.75	18–36	10.4	Up to 3	Yes	Yes	150	2933	•
6240L (Gold)	2.60	3.90	24.75	18–36	10.4	Up to 3	Yes	Yes	150	2933	
6238 (Gold)	2.10	3.70	30.25	22–44	10.4	Up to 3	Yes	Yes	140	2933	•
6238M (Gold)	2.10	3.70	30.25	22–44	10.4	Up to 3	Yes	Yes	140	2933	
6238L (Gold)	2.10	3.70	30.25	22–44	10.4	Up to 3	Yes	Yes	140	2933	
6234 (Gold)	3.30	4.00	24.75	8–16	10.4	Up to 3	Yes	Yes	130	2933	•
6230R (Gold)	2.10	4.00	35.75	26-52	10.4	Up to 2	Yes	Yes	150	2933	
6230 (Gold)	2.10	3.90	27.50	20–40	10.4	Up to 3	Yes	Yes	125	2933	•
6226 (Gold)	2.70	3.70	19.25	12–24	10.4	Up to 3	Yes	Yes	125	2933	•
6154 (Gold)	3.00	3.70	24.75	18–36	10.4	Up to 3	Yes	Yes	200	2666	
6152 (Gold)	2.10	3.70	30.25	22–44	10.4	Up to 3	Yes	Yes	140	2666	•
6150 (Gold)	2.70	3.70	24.75	18–36	10.4	Up to 3	Yes	Yes	165	2666	
6148 (Gold)	2.40	3.70	27.50	20–40	10.4	Up to 3	Yes	Yes	150	2666	•
6146 (Gold)	3.20	4.20	24.75	12–24	10.4	Up to 3	Yes	Yes	165	2666	•
6144 (Gold)	3.50	4.20	24.75	8–16	10.4	Up to 3	Yes	Yes	150	2666	•
6142M (Gold)	2.60	3.70	22.00	16–32	10.4	Up to 3	Yes	Yes	150	2666	
6142 (Gold)	2.60	3.70	22.00	16–32	10.4	Up to 3	Yes	Yes	150	2666	•
6140M (Gold)	2.30	3.70	24.75	18–36	10.4	Up to 3	Yes	Yes	140	2666	•
6140 (Gold)	2.30	3.70	24.75	18–36	10.4	Up to 3	Yes	Yes	140	2666	•
6138 (Gold)	2.00	3.70	27.50	20–40	10.4	Up to 3	Yes	Yes	125	2666	•
6136 (Gold)	3.00	3.70	24.75	12–2	10.4	Up to 3	Yes	Yes	150	2666	
6134M (Gold)	3.20	3.70	24.75	8–16	10.4	Up to 3	Yes	Yes	130	2666	•
6134 (Gold)	3.20	3.70	24.75	8–16	10.4	Up to 3	Yes	Yes	130	2666	•
6132 (Gold)	2.60	3.70	19.25	14–28	10.4	Up to 3	Yes	Yes	140	2666	•
6130 (Gold)	2.10	3.70	22.00	16–32	10.4	Up to 3	Yes	Yes	125	2666	•
6128 (Gold)	3.40	3.70	19.25	6–12	10.4	Up to 3	Yes	Yes	115	2666	
6126 (Gold)	2.60	3.70	19.25	12–24	10.4	Up to 3	Yes	Yes	125	2666	

Table 7. Supported processors (5xxx)

Processor model	Clock speed (GHz)	Max turbo(GHz)	Cache (MB)	Cores-Threads	UPI speed (GT/s)	Number of UPI lanes	Hyper-Threading	Turbo	TDP (W)	DDR4 speed (MT/s)	
5222 (Gold)	3.80	3.90	16.50	4–8	10.4	2 UPI	Yes	Yes	105	2933	Qual Only
5220 (Gold)	2.20	3.90	24.75	18–36	10.4	2 UPI	Yes	Yes	125	2666	•
5218R(gold)	2.10	4.0	27.5	20-40	10.4	2 UPI	Yes	yes	125	2666	
5218 (Gold)	2.30	3.90	22.00	16–32	10.4	2 UPI	Yes	Yes	125	2666	•
5217 (Gold)	3.00	3.70	11.00	8–16	10.4	2 UPI	Yes	Yes	115	2666	Qual Only
5215 (Gold)	2.50	3.40	13.75	10–20	10.4	2 UPI	Yes	Yes	85	2666	Qual Only
5215M (Gold)	2.50	3.40	13.75	10–20	10.4	2 UPI	Yes	Yes	85	2666	•
5215L (Gold)	2.50	3.40	13.75	10–20	10.4	2 UPI	Yes	Yes	85	2666	
5122 (Gold)	3.60	3.70	16.50	4–8	10.4	2 UPI	Yes	Yes	105	2666	
5120 (Gold)	2.20	3.20	19.25	14–28	10.4	2 UPI	Yes	Yes	105	2400	•
5118 (Gold)	2.30	3.20	16.50	12–24	10.4	2 UPI	Yes	Yes	105	2400	•
5117 (Gold)	2.00	2.80	19.25	14–28	10.4	2 UPI	Yes	Yes	105	2400	
5115 (Gold)	2.40	3.20	13.75	10–20	10.4	2 UPI	Yes	Yes	85	2400	

Table 8. Supported processors (4xxx)

Processor model	Clock speed (GHz)	Max turbo(GHz)	Cache (MB)	Cores-Threads	UPI speed (GT/s)	Number of UPI lanes	Hyper-Threading	Turbo	TDP (W)	DDR4 speed (MT/s)	
4216 (Silver)	2.10	3.20	22.00	16–32	9.6	2 UPI	Yes	Yes	100	2400	•
4215R(Silver)	3.20	4.0	11.00	8-16	9.6	2 UPI	Yes	Yes	130	2400	
4215 (Silver)	2.50	3.50	11.00	8–16	9.6	2 UPI	Yes	Yes	85	2400	Qual Only
4214R(Silver)	2.4	3.5	16.50	12-24	9.6	2UPI	Yes	Yes	100	2400	
4214 (Silver)	2.20	3.20	16.50	12–24	9.6	2 UPI	Yes	Yes	85	2400	•
4210 (Silver)	2.20	3.20	13.75	10–20	9.6	2 UPI	Yes	Yes	85	2400	
4208 (Silver)	2.10	3.20	11.00	8–16	9.6	2 UPI	Yes	Yes	85	2400	
4116 (Silver)	2.10	3.00	16.50	12–24	9.6	2 UPI	Yes	Yes	85	2400	•
4114 (Silver)	2.20	3.00	13.75	10–20	9.6	2 UPI	Yes	Yes	85	2400	•
4112 (Silver)	2.60	3.00	8.25	4–8	9.6	2 UPI	Yes	Yes	85	2400	
4110 (Silver)	2.10	3.00	11.00	8–16	9.6	2 UPI	Yes	Yes	85	2400	
4108 (Silver)	1.80	3.00	11.00	8–16	9.6	2 UPI	Yes	Yes	85	2400	

Table 9. Supported processors (3xxx)

Processor model	Clock speed (GHz)	Max turbo(GHz)	Cache (MB)	Cores-Threads	UPI speed (GT/s)	Number of UPI lanes	Hyper-Threading	Turbo	TDP (W)	DDR4 speed (MT/s)	
3204 (Bronze)	1.90	-	8.25	6–6	9.6	2 UPI	No	No	85	2133	
3106 (Bronze)	1.70	-	11.00	8–8	9.6	2 UPI	No	No	85	2133	
3104 (Bronze)	1.70	-	8.25	6–6	9.6	2 UPI	No	No	85	2133	

Chipset

The Dell EMC PowerEdge C4140 uses the Intel C621 chipset (PCH) that provides extensive I/O. Functions and capabilities include:

NOTE: The PowerEdge C4140 may not take advantage of all features that are listed below.

- 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

System memory

The system supports up to 24 DIMMs. Depending on the Intel® CPU, memory speeds of up to 2933 MT/s with 1 DIMM per channel and 2666 MT/s with 2 DIMMs per channel are available. It supports flexible memory configurations ranging from capacities of 16 GB minimum to 1.5 TB maximum. The C4140 supports registered (RDIMMs) and load reduced DIMMs (LRDIMMs) which use a buffer to reduce memory loading and provide greater density, allowing for the maximum platform memory capacity. Unbuffered DIMMs (UDIMMs) are not supported. No NVDIMM support is currently available on C4140.

Topics:

Supported memory

Supported DIMMs:

- RDIMMs: Registered memory modules
- LRDIMMs: Load Reduced memory modules

The following table lists the memory technologies supported by the PowerEdge C4140:

Table 10. Supported memory technologies

Feature	C4140 (DDR4)
DIMM Type	RDIMM, LRDIMM
Transfer speed	2666 MT/s, 2933 MT/s
Voltage	1.2V (DDR4)

The following table list the supported memory for the PowerEdge C4140 Intel® Xeon® Scalable processor family:

Table 11. Supported memory

DIMM PN	DIMM Speed	DIMM Type	DIMM Capacity (GB)	Ranks per DIMM	Data Width	SDDC Support	DIMM Volts
1VRGY	2666 MT/s	RDIMM	8	1	x8	Advanced ECC	1.2
VM51C	2666 MT/s	RDIMM	16	2	x8	Advanced ECC	1.2
TN78Y	2666 MT/s	RDIMM	32	2	x4	All Modes	1.2
4JMGM	2666 MT/s	LRDIMM	64	4	x4	All Modes	1.2

The following table list the supported memory for the PowerEdge C4140 with the 2nd Generation Intel® Xeon® Scalable processor family:

Table 12. Supported memory

DIMM PN	DIMM Speed	DIMM Type	DIMM Capacity (GB)	Ranks per DIMM	Data Width	SDDC Support	DIMM Volts
1VRGY	2666 - 2666 MT/s	RDIMM	8	1	x8	Advanced ECC	1.2

Table 12. Supported memory (continued)

DIMM PN	DIMM Speed	DIMM Type	DIMM Capacity (GB)	Ranks per DIMM	Data Width	SDDC Support	DIMM Volts
TFYHP	2933 - 2666 MT/s	RDIMM	16	2	x8	Advanced ECC	1.2
8WKDY	2933 - 2666 MT/s	RDIMM	32	2	x4	All Modes	1.2
W403Y	2933 - 2666 MT/s	RDIMM	64	2	x4	All Modes	1.2

Memory speed

The C4140 supports memory speeds of up-to 2933 MT/s, depending on the Intel® processor. All memory on all processors and channels run at the same speed and voltage. By default, this speed will be the highest speed supported by the CPU and the DIMMs. For example, both DIMMs and CPUs must be capable of running at 2933 MT/s in order for memory to run at 2933 MT/s (specific CPU / DIMM configuration required). The Intel® Xeon® Scalable Processor family CPU SKUs in the Platinum category support up to 2666 MT/s memory speed while CPU SKUs in Gold and Silver category support up to 2400 MT/s memory speed. The 2nd Generation Intel® Xeon® Scalable Processor family CPU SKUs in the Platinum and Gold category support up to 2933 MT/s memory speed while CPU SKUs in Silver category support up to 2400 MT/s memory speed. The operating speed of the memory is also determined by the maximum speed supported by the processor, the speed settings in the BIOS, and the operating voltage of the system.

Please see the tables in the supported memory section for performance details.

6

Storage

An optional 2.5 -inch hard drive bay is available for additional storage. This option goes in the redundant PSU slot and can hold two matching SATA SSDs in a non-raid configuration. Option to configure Raid 1 by the customer only.

Topics:

Supported drives

For information about the latest supported drives, you can contact the sales representatives.

External storage

External storage support is available through the following options:

- 12Gbps SAS HBA
- PERC H840

For the most up-to-date and detailed information on the above external storage options, please refer to www.dell.com/perc

Internal Dual SD Module

The design for the PowerEdge C4140 combines the IDSDM and/or vFlash into a single card. The Vflash card is no longer accessible from outside of the chassis. There are two SKUs:

- vFlash only
- vFlash + IDSDM

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, in particular, should be minimized as the SD media can wear out.

The IDSDM module provides the following functions:

- Dual SD interface is maintained in a mirrored configuration (primary and secondary SD)
- Provides full RAID1 functionality
- Dual SD cards are not required; the module can operate with only one card but will provide no redundancy
- Enables support for Secure Digital eXtended Capacity (SDXC) cards
- USB interface to host system
- I2C interface to host system and onboard EEPROM for out-of-band status reporting
- Onboard LEDs show status of each SD card
- A BIOS Setup Redundancy setting supports Mirror Mode or Disabled

Boot Optimized Storage Subsystem (BOSS)

An Internal BOSS PCIe card with M.2 SD drives is required. This Boss solution will be the boot device for the PowerEdge C4140. Either single or two matching M.2 SD drives available in 120GB, 240GB or 480G are set in either a mirrored or non-raid configuration. A non-raid configuration can be later set up by the customer if necessary.

BOSS drives and cards are not hot-plug capable.

7

GPU and FPGA support

The PowerEdge C4140 supports up to 4 double wide GPUs, up to 300W each. Below are the requirements for GPU usage:

- Must have 2 CPUs installed
- GPUs must be identical
- CPU TDPs of 85W and up to 165W

The PowerEdge C4140 supports up to four double wide GPUs, with up to 300W each. The list below are the supported GPUs for the C4140:

- NVIDIA® Tesla® P40
- NVIDIA Tesla P100 12GB PCIe
- NVIDIA Tesla P100 16GB PCIe and NVLink
- NVIDIA® Tesla® V100 16GB PCIe and NVLink
- NVIDIA® Tesla® V100 32GB PCIe and NVLink

FPGAs are available through OEM only:

- Nallatech 510T
- Nallatech 520C
- Nallatech 520N

Topics:

Configurations and options

The PowerEdge C4140 offers the configurations listed below:

- Configuration B – 2 CPUs with 4 GPUs switched
- Configuration C - 2 CPUs with 4 GPUs direct
- Configuration G – 2 CPUs with 4 GPUs virtual switched
- Configuration K – 2 CPUs with 4 GPUs NVLINK2
- Configuration M – 2 CPUs with 4 GPUs direct NVLINK2

8

Power, thermal and acoustics

Topics:

Power supply units

Energy Smart power supplies have intelligent features, such as the ability to dynamically optimize efficiency while maintaining availability and redundancy. Also featured are enhanced power- consumption reduction technologies, such as high- efficiency power conversion and advanced thermal- management techniques, and embedded power- management features, including high accuracy power monitoring.

The following power supply unit options are available for the PowerEdge C4140:

- 2400W AC
- 2000W AC

The C4140 supports dual redundant AC power supplies and requires 220V.

The following table shows the power efficiency of the power supplies:

Table 13. Power supply efficiency

Form factor	Output	Class	Efficiency target by loads			
			10%	20%	50%	100%
Redundant PSU	2000W	Platinum	89%	93%	94%	91%
	2400W	Platinum	89%	93%	94%	91.5%

The following table shows the power efficiency of the power supplies:

Table 14. Power supply specifications

Wattage	Frequency	Voltage	Class	Heat dissipation
2000W	50/60Hz	100-240Vac/11.5A	Platinum	7500 BTU/hr
2400W	50/60Hz	100-240Vac/11.5A	Platinum	9000 BTU/hr

Thermal

The PowerEdge C4140 was designed to provide ambient air to minimize GPU temperatures and maximize performance. The spread layout for GPU's and CPUs provides even and predictable thermal characteristics and performance behaviors. This layout, when used in supported ambient ranges, can prevent any GPU throttling that could be seen in shadow type designs where the GPU is exposed to higher air temperatures. GPU reliability and leakage currents can also be improved by operating at lower temperatures.

Due to the density in high TDP configurations (CPU and GPU), certain workloads with high concurrent GPU/CPU usage and high TDP parts may require ambient environments below 25°C to assure desired CPU performance. The information below is to provide the configuration and workload guidance to assess the ambient temperature required to achieve a given performance level. Also of note, there are some configurations that are capable of full performance support up to 30°C.

Architectural configurations

There are five architectural configurations supported:

- Configuration B – 2 CPUs with 4 GPUs switched, (1) x16 LP PCIe
- Configuration C - 2 CPUs with 4 GPUs direct, (2) x16 LP PCIe
- Configuration G – 2 CPUs with 4 GPUs virtual switched, (2) x16 LP PCIe
- Configuration K – 2 CPUs with 4 GPUs NVLINK2, (2) x16 LP PCIe
- Configuration M – 2 CPUs with 4 GPUs direct NVLINK2, (2) x16 LP PCIe

The following tables show the thermal details for both architectural configurations:

NOTE: Certain system hardware configurations may require operating temperatures to be less than 25°C

Table 15. Configuration B: Ambient requirements for 100% GPU power (concurrent), dual CPU and 94CFM

GPU power (x4)	CPU power dissipation							
	2 x 70W	2 x 85W	2 x 105W	2 x 125W	2 x 130W	2 x 140W	2 x 150W	2 x 165W
325W	21°C	21°C	20°C	19°C	19°C	18°C	17°C	15°C
300W	23°C	23°C	22°C	21°C	21°C	20°C	19°C	17°C
275W	25°C	25°C	24°C	23°C	23°C	22°C	21°C	19°C
250W	27°C	26°C	26°C	25°C	25°C	24°C	23°C	22°C
225W	29°C	28°C	28°C	27°C	27°C	26°C	25°C	24°C
200W	30°C	30°C	30°C	30°C	29°C	28°C	27°C	26°C

Table 16. Configuration C: Ambient requirements for 100% CPU and 100% GPU power (concurrent), dual CPU and 94CFM

NVLink SMX2	CPU power dissipation							
	2 x 70W	2 x 85W	2 x 105W	2 x 125W	2 x 130W	2 x 140W	2 x 150W	2 x 165W
325W	24°C	23°C	22°C	21°C	20°C	20°C	19°C	17°C
300W	28°C	26°C	24°C	23°C	23°C	23°C	22°C	20°C
275W	28°C	27°C	26°C	25°C	25°C	24°C	23°C	21°C
250W	29°C	29°C	28°C	27°C	26°C	26°C	25°C	23°C
225W	30°C	30°C	30°C	29°C	28°C	28°C	28°C	26°C
200W	30°C	30°C	30°C	30°C	30°C	30°C	30°C	28°C

Table 17. Configuration G: Ambient requirements for 100% CPU and 100% GPU power (concurrent), dual CPU and 94CFM

NVLink SMX2	CPU power dissipation							
	2 x 70W	2 x 85W	2 x 105W	2 x 125W	2 x 130W	2 x 140W	2 x 150W	2 x 165W
325W	23°C	22°C	20°C	19°C	18°C	18°C	18°C	17°C
300W	25°C	24°C	22°C	21°C	21°C	20°C	19°C	18°C
275W	27°C	26°C	23°C	23°C	23°C	22°C	21°C	20°C
250W	28°C	27°C	25°C	25°C	25°C	24°C	23°C	22°C
225W	30°C	29°C	27°C	27°C	27°C	26°C	25°C	24°C
200W	30°C	30°C	29°C	29°C	29°C	28°C	27°C	26°C

Table 18. Configuration K: Ambient requirements for 100% CPU and 100% GPU power (concurrent), dual CPU and 94CFM

NVLink SMX2	CPU power dissipation							
	2 x 70W	2 x 85W	2 x 105W	2 x 125W	2 x 130W	2 x 140W	2 x 150W	2 x 165W
300W	25°C	24°C	22°C	21°C	20°C	19°C	18°C	18°C

Table 19. Configuration M: Ambient requirements for 100% CPU and 100% GPU power (concurrent), dual CPU and 94CFM

NVLink SMX2	CPU power dissipation							
	2 x 70W	2 x 85W	2 x 105W	2 x 125W	2 x 130W	2 x 140W	2 x 150W	2 x 165W
300W	24°C	24°C	23°C	23°C	22°C	22°C	20°C	20°C

Acoustics

Dell EMC focuses on sound quality in addition to sound power level and sound pressure level. Sound quality describes how disturbing or pleasing a sound is interpreted, and Dell EMC references a number of psych acoustical metrics and thresholds in delivering to it. Tone prominence is one such metric. Sound power and sound pressure levels increase with greater populations or higher utilization, while sound quality remains good even as the frequency content changes.

The PowerEdge C4140 is designed, acoustically, suitable for usage in “unattended data center” environment. The phrase “unattended data center” is used to mean a space in which many (from tens to 1000s) of Enterprise products are deployed together, its own heating and cooling systems condition the space, and operators or engineers of equipment enter generally only to deploy, service, or decommission equipment. Hearing protection or hearing monitoring programs may be expected (per government or company guidelines) in these areas.

Acoustical dependencies

- **System thermal profile selected in BIOS:** The system default setting is “Power Optimized (DAPC)”,which is in general lower fan speed and acoustics. If “Performance optimized” is selected, fan speed and acoustics will become higher.
- **Ambient Temperature:** The fan speed increases when system is located in a higher ambient temperature environment, and hence higher acoustics.
- **Types of CPU And GPGPU Cards:** High-power CPU/ GPGPU cards will result in higher acoustics.
- **Operating condition:** The system acoustics is highly depending on the work loading of GPGPU.

9

Supported operating systems

The following lists the supported operating systems for the PowerEdge C4140:

- Canonical Ubuntu LTS
- Citrix XenServer
- Microsoft Windows Server
- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server
- VMware ESXi

10

Dell EMC OpenManage systems management

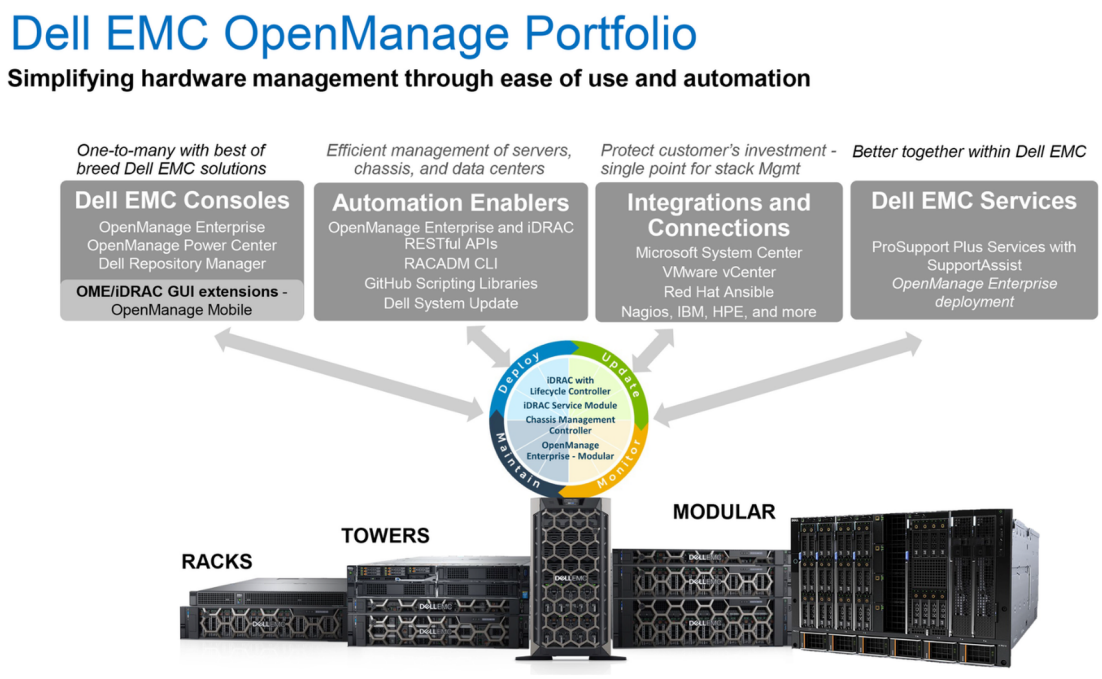

Figure 7. Dell EMC OpenManage Portfolio

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)
- Chassis Management Controller (CMC)
- 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 https://www.dell.com/openmanagemanuals or the following product pages:

Table 20. Dell resources

Resource	Location
Integrated Dell Remote Access Controller (iDRAC)	https://www.dell.com/idracmanuals
iDRAC Service Module (iSM)	https://www.dell.com/support/article/sln310557
OpenManage Ansible Modules	https://www.dell.com/support/article/sln310720
OpenManage Essentials (OME)	https://www.dell.com/support/article/sln310714
OpenManage Enterprise Modular	https://www.dell.com/OME-modular
OpenManage Mobile (OMM)	https://www.dell.com/support/article/sln310980
OpenManage Integration for VMware vCenter (OMIVV)	https://www.dell.com/support/article/sln311238
OpenManage Integration for Microsoft System Center (OMIMSSC)	https://www.dell.com/support/article/sln312177
Dell EMC Repository Manager (DRM)	https://www.dell.com/support/article/sln312652
Dell EMC System Update (DSU)	https://www.dell.com/support/article/sln310654
Dell EMC Platform Specific Bootable ISO (PSBI)	Dell.com/support/article/sln296511
Dell EMC Chassis Management Controller (CMC)	www.dell.com/support/article/sln311283
OpenManage Connections for Partner Consoles	https://www.dell.com/support/article/sln312320
OpenManage Enterprise Power Manager	https://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 https://www.dell.com/manuals for details.

11

Additional specifications

Topics:

Chassis dimensions

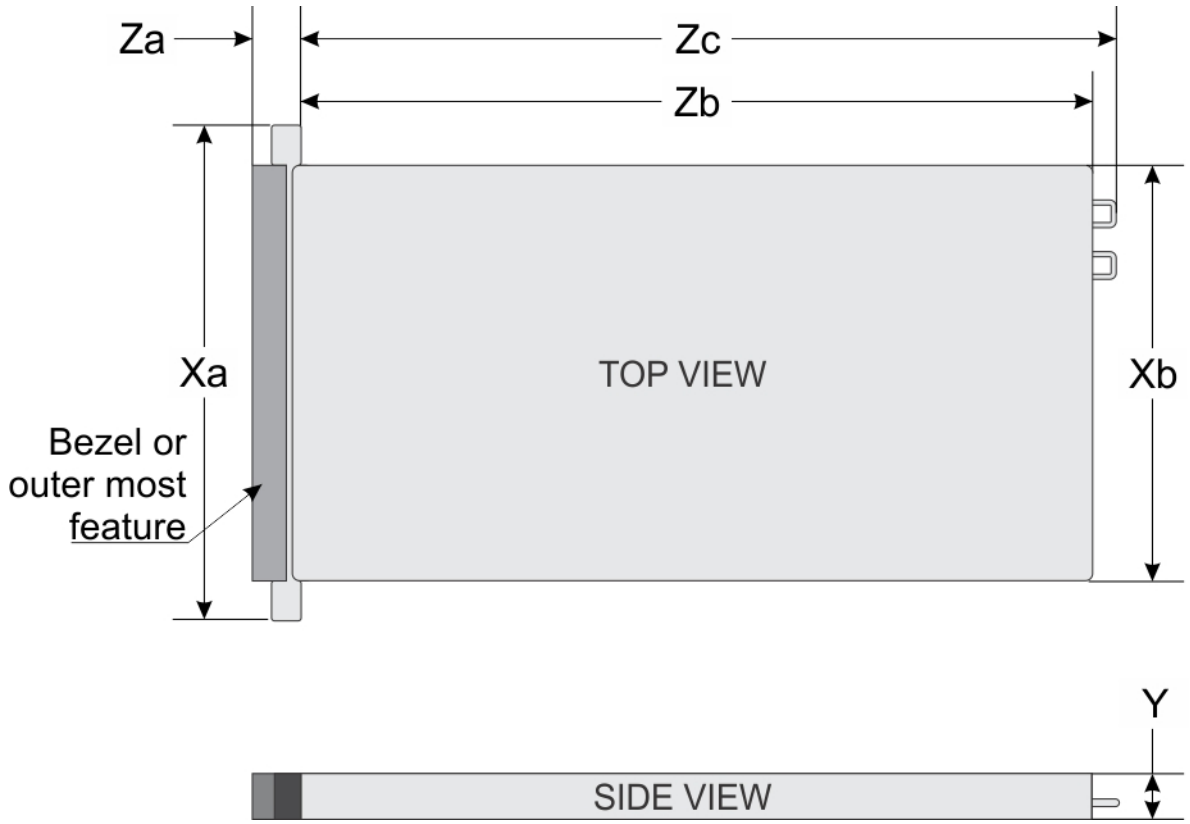

Figure 8. Details the dimensions of PowerEdge C4140 system

Table 21. The dimensions of PowerEdge C4140 system

Xa	Xb	Y	Za with bezel	Za without bezel	Zb	Zc	Max system weight
482.4 mm (18.99 inches)	434 mm (17.08 inches)	43.1 mm (1.69 inches)	18.0 mm (0.70 inches)	18.0 mm (0.70 inches)	886.4 mm (34.89 inches)	923.8 mm (36.37 inches)	24kg

System weight

Table 22. System weight

System	Maximum weight
PowerEdge C4140 (Configuration B - with PCIe GPUs)	22.1 kg (48.7 lb)
PowerEdge C4140 (Configuration K - with SXM2 GPUs)	24 kg (52.91 lb)

Video specifications

The PowerEdge C4140 supports the Matrox G200eW3 graphics card.

The following table shows the video resolution and refresh rate:

Table 23. Video resolution and refresh rate

Resolution	Refresh Rate	Horizontal Freq.	Pixel Clock	Rear Panel	Front Panel
1024 x 768	60 Hz	48.4 kHz	65.0 MHz	Yes	Yes
1280 x 800	60 Hz	49.7 kHz	83.5 MHz	Yes	Yes
1280 x 1024	60 Hz	64.0 kHz	108.0 MHz	Yes	TBD
1360 x 768	60 Hz	47.71 kHz	85.5 MHz	Yes	Yes
1440 x 900	60 Hz	55.9 kHz	106.5 MHz	Yes	TBD
1600 x 900	60 Hz (RB)	55.54 kHz	97.75 MHz	Yes	Yes
1600 x 1200	60 Hz	75.0 kHz	162.0 MHz	TBD	TBD
1680 x 1050	60 Hz (RB)	64.7 kHz	119.0 MHz	Yes	TBD
1920 x 1080	60 Hz	67.158 kHz	173.0 MHz	TBD	No
1920 x 1200	60 Hz	74.556 kHz	193.25 MHz	TBD	No

USB specifications

The PowerEdge C4140 system supports:

- Two USB 3.0-compliant ports on the back panel
- One internal USB 3.0-compliant port

NIC ports

The PowerEdge C4140 system supports four 10/100/1000 Mbps Network Interface Controller (NIC) ports.

Environmental specifications

The tables below list the environmental specifications for the PowerEdge C4140:

Table 24. Relative humidity specifications

Relative Humidity	Specifications
Storage	5% to 95% RH with 33°C (91°F) maximum dew point. Atmosphere must be non-condensing at all times.

Table 24. Relative humidity specifications (continued)

Relative Humidity	Specifications
Operating	10% to 80% relative humidity with 29°C (84.2°F) maximum dew point.

Table 25. Maximum vibration specifications

Maximum vibration	Specifications
Operating	1. 26Grms at 5Hz to 350Hz (x, y, and z axes)
Storage	1. 88Grms at 10Hz to 500Hz for 15min (all six sides tested)

Table 26. Maximum shock specifications

Maximum shock	Specifications
Operating	Six consecutively executed shock pulses in the positive and negative x, y, and z axes of 6G for up to 11ms
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 27. Maximum altitude specifications

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

Table 28. Operating temperature de-rating specifications

Operating temperature de-rating	Specifications
Up to 30°C (86°F)	Maximum temperature is reduced by 1°C/300 m (1°F/547 ft) above 950 m (3,117 ft).

Table 29. Standard operating temperature specifications

Standard operating temperature	Specifications
Continuous operation (for altitude less than 950m or 3117ft)	10°C to 35°C (50°F to 95°F) with no direct sunlight on the equipment.

Table 30. Particulate contamination specifications

Particulate contamination	Specifications
Air filtration	Data center air filtration as defined by ISO Class 8 per ISO 14644-1 with a 95% upper confidence limit. NOTE: This condition applies to data center environments only. Air filtration requirements do not apply to IT equipment designed to be used outside a data center, in environments such as an office or factory floor. NOTE: Air entering the data center must have MERV11 or MERV13 filtration.
Conductive dust	Air must be free of conductive dust zinc whiskers, or other conductive particles. NOTE: This condition applies to data center and non-data center environments.
Corrosive dust	• Air must be free of corrosive dust. • Residual dust present in the air must have a deliquescent point less than 60% relative humidity.

Table 30. Particulate contamination specifications (continued)

Particulate contamination	Specifications
	NOTE: This condition applies to data center and non-data center environments.

Table 31. Gaseous contamination specifications

Gaseous contamination	Specification
Copper coupon corrosion rate	<300A/month per class G1 as defines by ANSI/ISA71.04-1985
Silver coupon corrosion rate	<200A/month as defined by ASHRAE TC9.9

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Appendix B. Standards compliance

Table 32. 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 33. 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
Rack Installation Instructions	This document ships with the rack kits, and provides instructions for installing a server in a rack.	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.	Inside 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 contact information.	Inside the system chassis cover
Energy Smart Solution Advisor (ESSA)	The Dell online ESSA enables easier and more meaningful estimates to help you determine the most efficient configuration possible. Use ESSA to calculate the power consumption of your hardware, power infrastructure, and storage.	Dell.com/calc

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Appendix D. Support and deployment services

Dell EMC Global Services include a wide, customizable range of service choices to simplify the assessment, design, implementation, management and maintenance of IT environments and to help you transition from platform to platform. For High Performance Computing (HPC) clusters, Dell EMC offers a comprehensive services portfolio from design and implementation to support and systems management, including on-premise and managed systems, as well as those in the cloud.

Depending on your current business requirements and the level of service they want, we can provide factory, on-site, remote, modular and specialized services that fit your needs and budget. We'll help with a little or a lot - your choice - and provide access to our global resources.

Topics:

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. For HPC, Dell EMC's deployment model provides comprehensive, proven cluster implementation at the right price, that scales regardless of cluster size. From simple to the most complex server installations and software integration, we take the guess work and risk out of deploying new server technology. Who's better suited to implement the latest Dell EMC servers than the Dell EMC elite deployment engineers who do it every day?

		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 9. 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 leading operating systems and hypervisors as well as most versions of Dell EMC SupportAssist and OpenManage system management utilities. Post-deployment configuration assistance, testing, and product orientation help you rest easy knowing your systems have been deployed and integrated by the best.

Dell EMC 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.

Dell EMC Basic Deployment

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

Dell EMC 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.

Dell EMC 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.

Dell EMC 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 the ProSupport Enterprise Suite, 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. ProSupport Enterprise Suite 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 10. 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 Services Account Manager (SAM) 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
- A single point of accountability for any eligible 3rd party software

ProSupport

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

- 24x7x365 access to certified hardware and software experts
- 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 Services Account Managers (SAM) 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

	Basic	ProSupport	ProSupport Plus
Remote technical support	9x5	24x7	24x7
Covered products	Hardware	Hardware Software	Hardware Software
Onsite hardware support	Next business day	Next business day or 4hr mission critical	Next business day or 4 hr mission critical
Automated issue detection & proactive case creation		●	●
Self-service case initiation and management		●	●
Access to software updates		●	●
Priority access to specialized support experts			●
3rd party software support			●
Assigned Technology Service Manager			●
Personalized assessments and recommendations			●
Semiannual systems maintenance			●

Figure 11. 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 12. 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.