Dell EMC PowerEdge R340

The PowerEdge R340 delivers the right mix of performance, redundancy and value in a dense 1-socket, 1U chassis. Powered by the latest Intel® Xeon® processor family, it is ideal for small, medium and large enterprises looking to deploy multiple workloads including but not limited to: collaboration/sharing, file/print, mail/messaging and backup/recovery.

Contents

Product overview

Introduction

The PowerEdge R340 rack system consists of the Coffee Lake-S processor used in conjunction with the Cannon Lake-H PCH (C246) Platform Controller Hub (PCH). The PowerEdge R340 rack system is a two-chip platform (enabled by the chipset) when compared to the traditional three-chip platforms (Processor, Memory controller, and I/O controller). It also includes an integrated memory controller (IMC) and integrated I/O (IIO) (such as PCI Express and DMI3) on a single silicon die.

New technologies

The PowerEdge R340 is the ideal entry-level server for data centers & SMB to address small scale enterprise applications designed for productivity and data intensive applications for remote office/branch offices requiring maximum uptime. The PowerEdge R340 provides a choice of either 8x2.5" or 4x3.5" hot-plug drive configurations for added storage flexibility. 50% increase in core count significantly improves performance while a quiet, short-depth form factor is optimized for constrained spaces. R340 is perfect for web hosting, backup/recovery, file/print, mail/messaging, and collaboration/sharing.

The following table shows the list of new technologies offered by the PowerEdge R340:

New Technologies	Detailed Descriptions
Intel® C246 series chipset	Please refer to the chipset section for details
Intel® Xeon® processor E- 2100 Product Family	The Intel® Xeon® E-2100 processor has increased core count and embedded PCIe lanes that will improve the IO performance. Please refer processor section for additional details.
Next Generation SW RAID, PERC S140	The new 1-socket servers support the latest S140 software RAID along with H330 and H730P controller cards with improved functionality and faster performance. New SW RAID supports RAID 0, 1, 5 and 10. Please refer to storage section for additional details.
iDRAC 9	The new embedded system management solution for Dell EMC server features hardware and firmware inventory and alerting, in depth memory alerting, faster performance, dedicated gigabit port, email alerts, electronic licensing, editable user work notes log and more. Dedicated iDRAC Direct microUSB port improves at-the-box management. Please refer to section iDRAC section for additional details.

System features

Product comparison

The following table shows the comparison between the PowerEdge R330 and PowerEdge R340:

Table 1. Product comparison with predecessor

Feature	PowerEdge R330	PowerEdge R340
Processor	• Intel Xeon® E3-1200 v6 Processor family • Intel Pentium® • Intel Celeron® • Intel Core i3®	• Intel Xeon® E-2100 Processor family • Intel Pentium® • Intel Celeron® • Intel Core i3®
Number of processors	• 1	• 1
Number or cores	• Up to 4 cores	• Up to 6 cores
L2/L3 cache	• 2.0 MB per core • Up to 8 MB	• 2.0 MB per core • Up to 12 MB
Chipset	• Intel C236	• Intel C246
Memory Module	• DDR4: 4 UDIMMs with ECC • Speed: Up to 2400MT/s • Min RAM: 4 GB • Max RAM: 64 GB	• DDR4: 4 UDIMMs with ECC • Speed: Up to 2666MT/s • Min RAM: 8GB • Max RAM: 64 GB
Hard drive bays	• 4 x 3.5-inch cabled or hot plug • 8 x 2.5-inch hot plug • 2 x 1.8-inch cabled	• 4 x 3.5-inch hot plug • 8 x 2.5-inch hot plug
Hard drive types	• Default SATA. Optional SAS • Enterprise HDD • Entry HDD	• Default SATA. Optional SAS • Enterprise HDD • Entry HDD
External hard drive bays	• 1x slim ODD 9.5mm	• 1x slim ODD 9.5mm
RAID controllers	• Chipset based SATA, PERC S130 • PERC H330 • PERC H730 • PERC H830	• Chipset based SATA, PERC S140 • PERC H330 • PERC H730P
Host Bus Adapter (HBA)	• 12Gb SAS External HBA	• 12Gb SAS External HBA • HBA330 Internal adapter
Boot optimized storage subsytem	• Not supported	• 2x M.2 240GB (RAID 1 or No RAID) • 1x M.2 240GB (No RAID only)

Feature	PowerEdge R330	PowerEdge R340
Server management	• BMC • IPMI 2.0 compliant; Full Open Manage suite • Optional iDRAC8 Express • Optional iDRAC8 Enterprise • Vflash	• BMC • IPMI 2.0 compliant; Full Open Manage suite • Optional iDRAC9 Express • Optional iDRAC9 Enterprise • Vflash
I/O slots	• 1 x16 slot PCIe Gen3 for HL/FH from CPU1(x8 lanes) • 1 x 8 slot PCIe Gen3 for LP from CPU1(x4 lanes)	• 1 x16 slot PCIe Gen3 for HL/FH from CPU1(x8 lanes) • 1 x 8 slot PCIe Gen3 for LP from CPU1(x4 lanes)
NIC/LOM	• 2x GbE LOM	• 2x GbE LOM
USB	• 2 rear USB 3.0 • 2 front USB 2.0 • 1 internal USB 3.0	• 2 rear USB 3.0 • 1 front USB 2.0 • 1 internal USB 3.0
Power supplies	• Single or Dual Redundant hot-pluggable 350W (Platinum)	• Single or Dual Redundant hot-pluggable 350W (Platinum) or 550W (Platinum)
Fans	• 3 or 4 non-redundant, non-hot swappable fans	• 3 or 4 non-redundant, non-hot swappable fans
Form factor	• 1U rack	• 1U rack

Dimensions (HxWxD)	• 42.8 x 434.0 x 664 (mm) (w/o bezel)
	• 1.67" x 17.09" x 26.2"(in)
		• 4x 3.5" chassis:
		  – 42.8 x 434.0 x 596 (mm) (w/o bezel)
		  – 1.67" x 17.09" x 23.5"(in)
		• 8x 2.5" chassis:
		  – 42.8 x 434.0 x 545 (mm) (w/o bezel)
		  – 1.67" x 17.09" x 21.5"(in)

Weight	• Max 29.54 lb/13.4 Kg	• Max 29.98 lb/13.6 Kg

Product specifications

The following able list the technical specifications for the PowerEdge R340:

Table 2. Technical specifications

Features	Specifications
Form Factor	• 1U rack
Processors	• Intel® Xeon® processor E-2100 product family • Intel® Core™ i3 8100 processor • Intel® Pentium® G5500 processor • Intel® Celeron G4900 processor
Processor sockets	• 1
Front Side Bus or HyperTransport	• Intel DMI 3.0
Cache	• 2.0 MB per core • 8 MB or 12 MB

Features	Specifications
Chipset	• Intel C246 Chipset
Memory	• Up to 64GB (4 DIMM Slots) • 8GB/16GB 2666MT/s Unbuffered with ECC only • MIN/ MAX RAM: 8GB/64GB

I/O slots	• 2 GEN 3 PCIe slots:
	  – X16 slot FH (1x8 Gen3)
	  – X8 Slot LP (1X4 Gen3)

RAID controller	• S140 • PERC H330 • PERC H730P
Host Bus Adapter (HBA)	• 12Gb SAS External HBA • HBA330 Internal adapter
Drive bays	• Up to 8 x 2.5" Hot-Plug drives • Up to 4 x 3.5" Hot-Plug drives
Maximum internal storage	• 56.0TB for 4 x 3.5" HDD config • 19.2TB for 8 x 2.5" HDD config
Hard drives	• 2.5" SSD SATA 6Gb • 2.5" SATA 7.2K • 2.5" SAS 15K HDs • 2.5" Near Line SAS 7.2K • 2.5" SAS 10K HDDs • 3.5" Enterprise SATA 7.2K HDDs • 3.5" Near Line SAS 7.2K HDDs • Capacity: 14TB; 12TB; 10TB; 8TB; 6TB; 4TB; 2TB; 1TB
Embedded LOM/NIC	• Integrated BROADCOM BCM5720 Gigabit Ethernet Controller
Communications	Optional add-in cards: • 10GbE Intel (Dual) Sageville Sage Pond Dual port 10Gb Base-T adapter – FH or LP • 10GbE Intel (Dual) Fortville Eagle Fountain Dual port 10Gb SFP+ adapter – FH or LP • 1GbE Intel (Dual) Powerville Troi-Stony Dual port 1Gb Base-T adapter – FH or LP • 1GbE Intel (Quad) Powerville Lore-Stony Quad port 1Gb Base-T adapter – FH or LP • 1GbE Broadcom (Dual) 5720 Bashir Dual port 1Gb Base-T adapter – FH or LP • 1GbE Broadcom (Quad) 5719 Cardassia Quad port 1Gb Base-T adapter – FH or LP • FC8 Emulex (Dual) Saturn Wildfire Dual port FC8 SFP+ adapter – FH or LP
Power supply	• Single or dual 350W or 550W hot-plug redundant platinum power supplies (100–240 V AC)
Availability	• TPM/No TPM

Features	Specifications
	• ECC memory, UDIMM
	• Hot-plug hard drives
	• Dual hot-plug redundant power supplies
Video	• Integrated Matrox G200 with iDRAC9
Remote management	• Lifecycle Controller 3.0
	• iDRAC9 Enterprise
	• VFlash (Optional)
Systems management	• Dell Open Manage featuring Dell Management Console
	• Lifecycle Controller 3.0
	• iDRAC9 Enterprise
	• VFlash (Optional)
Rack support	• ReadyRails™ static rails for tool-less mounting in 4-post racks with square or unthreaded round holes or tooled mounting in 4-post threaded and 2-post (Telco) racks
Featured database applications	• Microsoft® SQL Server® solutions

Chassis views and features

Front view of the system

Figure 1. Front view of the 8 x 2.5-inch rack system

Figure 2. Front view of the 4 x 3.5-inch rack system

Back view of the system
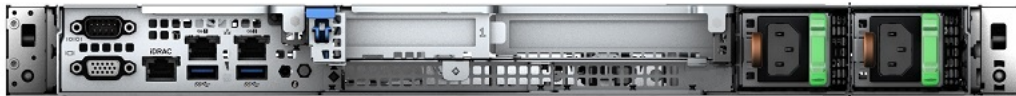
Figure 3. Back view of the systems

Internal view of the system
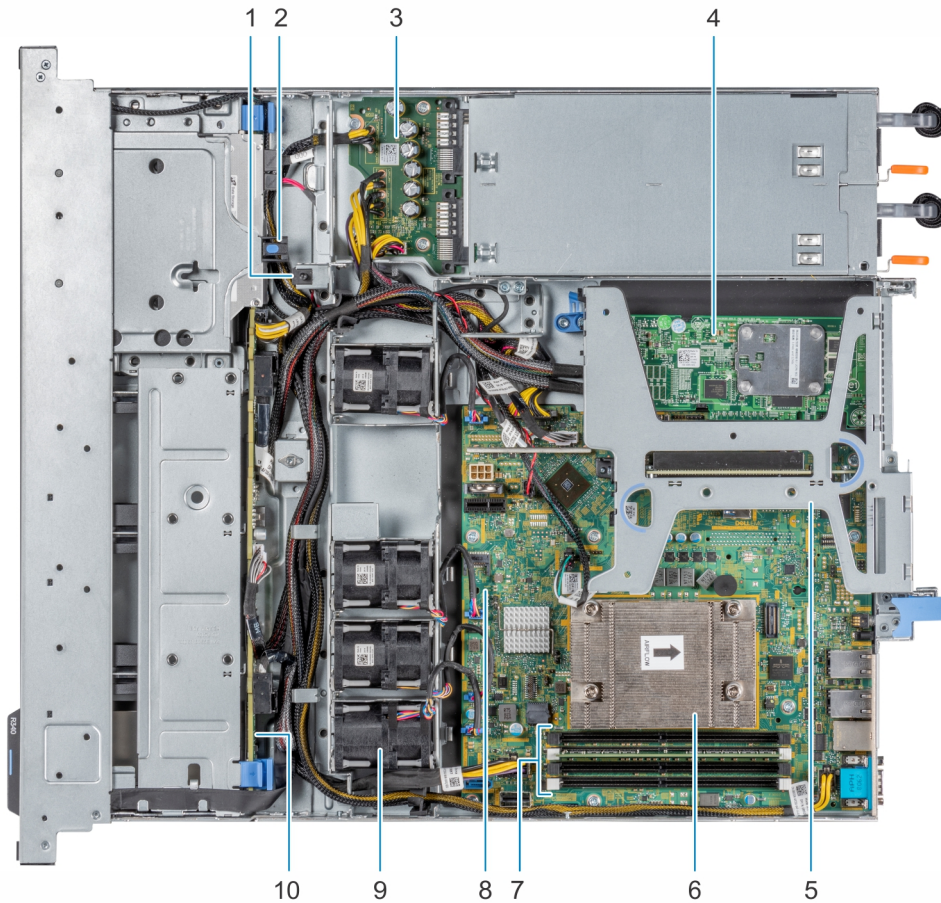
Figure 4. Inside the system

1.	Intrusion switch	2.	Optical drive
3.	Power distribution board	4.	PERC card
5.	Expansion card riser	6.	Heat sink
7.	Memory module sockets	8.	System board
9.	Cooling fans	10.	Drive backplane

Locating the information tag of your system

You can identify your system using the unique Express Service Code and Service Tag. Pull out the information tag in front of the system to view the Express Service Code and Service Tag. Alternatively, the information may be on a sticker on the back of the system chassis. The mini Enterprise Service Tag (EST) is found on the back of the system chassis. This information is used by Dell to route support calls to the appropriate personnel.
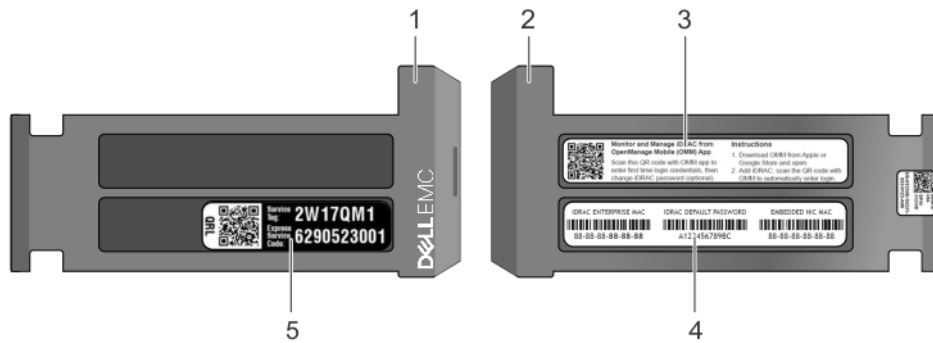
Figure 5. Locating the information tag of your system

1. Information tag (Top view)
2. Information tag (Bottom view)
3. OpenManage Mobile (OMM) label
4. iDRAC MAC address and iDRAC secure password label

   📝 NOTE: If you have opted for secure default access to iDRAC, the iDRAC secure default password is available on the back of the system Information tag. This label will be blank, if you have not opted for secure default access to iDRAC, then the default user name and password are root and calvin.

5. Service Tag

4

Processor

The PowerEdge R340 is single-socket rack server in a dense 1U form factor designed for productivity and data intensive applications for remote office/branch offices featuring the Intel® Xeon® E-2100 processor family.

Processor features

The following list highlights the features of the Intel® Xeon E-2100 processor family:

- Up to six execution cores per processor
- Four DMI3 lanes
- 16 PCIe Gen 3 links capable of 8.0 GT/s
- Socket H4, LGA package (LGA1151)
- Integrated 2 channel DDR4 memory controller
- Execute Disable Bit
- Support Turbo Boost Technology 2.0
- Increases CPU frequency if operating below thermal, power, and current limits
- Intel® Virtualization Technology (Intel® VT)

> NOTE: We do not support graphics with E-2100 processors, Graphics cannot be enabled on Dell servers using this processor due to technical restrictions.

Supported processors

The following table lists the supported processors for the PowerEdge R340:

Model	Speed (GHz)	Power (Watts)	Cores	L3 Cache (MB)	Threads	Turbo	Max Memory Speed (MT/s)	Hyper-threading
E-2186G	3.8	95	6	12	12	Yes	2666	Yes
E-2176G	3.7	80	6	12	12	Yes	2666	Yes
E-2174G	3.8	71	4	8	8	Yes	2666	Yes
E-2146G	3.5	80	6	12	12	Yes	2666	Yes
E-2144G	3.6	71	4	8	8	Yes	2666	Yes
E-2136	3.3	80	6	12	12	Yes	2666	Yes
E-2134	3.5	71	4	8	8	Yes	2666	Yes
E-2126G	3.3	80	6	12	6	Yes	2666	No
E-2124	3.3	71	4	8	4	Yes	2666	No
Core i3 8100	3.6	65	4	6	4	No	2666	No
Pentium G5500	3.8	54	2	4	2	No	2666	No

Model	Speed (GHz)	Power (Watts)	Cores	L3 Cache (MB)	Threads	Turbo	Max Memory Speed (MT/s)	Hyper-threading
Celeron G4900	3.1	54	2	2	2	No	2666	No

Chipset

The following table shows the high level features supported by the C246 chipset implemented on the PowerEdge R340:

Chipset feature	C246	R340
TXT	Y	Y
Node Manager	Y	N
ECC	Y	Y
FlexIO - USB3.0 - 10 (means 6 is enough)	10	3
USB 2.0	4	4
FlexIO - 8 SATA ports	8	5
FlexIO - SATA Express	3	0
FlexIO - PCIE 3.0 ports - additional required	20	8
SPI (MB) FW image	7	UI
Intel vPRO/AMT11	Y	N
Rapid Strorage technology	Y	N
Rapid Strorage technology enterprise	Y	N
Data Center Graphics	N	N
supported displays	3	N
Int. Gbe MAC	Y	N
eSPI	Y	N
IO Flex - ability to change SATA/PCIE/USB	Y	N
Software Guard Extensions (SGX)	N	Y

The following table shows the features supported by the R340 chipset:

Feature	Description
DMI Interface	Direct Media Interface 3 (DMI3) connects the CPU1 to the PCH. DMI3 is similar to a four-lane PCI Express supporting a speed of 8 GT/s per lane.
PCI Express interface	PCI Express Generation 3 (PCIe Gen3) is capable of 8 GT/s bit rate (compared to PCIe Gen 2's 5 GT/s) per lane. Because PCIe Gen3 uses a "scrambling" encoding instead of PCIe Gen2's 8b/10b encoding, it is able to have double the bandwidth of PCIe Gen2. The PCIe Gen 3 will be fully compatible with prior

Feature	Description
	generations of this technology, from software to clocking architecture to mechanical interfaces.
AHCI	The SATA controller provides hardware support for Advanced Host Controller Interface (AHCI), a standardized programming interface for SATA host controllers developed through a joint industry effort. Platforms supporting AHCI may take advantage of performance features such as port independent DMA Engines—each device is treated as a master—and hardware-assisted native command queuing.
	AHCI defines transactions between the SATA controller and software and enables advanced performance and usability with SATA. Platforms supporting AHCI may take advantage of performance features such as no master/slave designation for SATA devices—each device is treated as a master— and hardware assisted native command queuing. AHCI also provides usability enhancements such as hot-plug and advanced power management. AHCI requires appropriate software support (such as, an AHCI driver) and for some features, hardware support in the SATA device or additional platform hardware. Visit the Intel web site for current information on the AHCI specification.
Low Pin Count Interface (LPC)	The Low Pin Count (LPC) Interface Specification for legacy I/O has facilitated the industry's transition toward ISA-less systems. The key enhancements to the 1.1 revision of the LPC Interface Specification is the inclusion of Firmware Memory cycles and addition of multibyte read capability.
	The LPC Interface allows the legacy I/O motherboard components, typically integrated in a Super I/O chip, to migrate from the ISA/X-bus to the LPC Interface, while retaining full software compatibility. The LPC Specification offers several key advantages over ISA/X-bus, such as reduced pin count for easier, more cost-effective design. The LPC Interface Specification is software transparent for I/O functions and compatible with existing peripheral devices and applications.
	The LPC Interface Specification describes memory, I/O and DMA transactions. Unlike ISA, which runs at 8MHz, it will use the PCI 33MHz clock and will be compatible with more advanced silicon processes. Mobile designers will also benefit from the reduced pin count because it uses less space and power and is more thermal efficient.
Serial Peripheral Interface (SPI)	The interface implements 3 Chip Select signals (CS#), allowing up to two flash devices and one TPM device to be connected to the PCH. The CS0# and CS1# are used for flash devices and CS2# is dedicated to TPM.
Advanced Programmable Interrupt Controller (APIC)	The chipset contains a Motorola MC146818B-compatible real-time clock with 256 bytes of battery-backed RAM. The Real-Time Clock (RTC) performs two key functions—keeping track of the time of day and storing system data, even when the system is powered down. The RTC operates on a 32.768-KHz crystal and a 3V battery.
GPIO	GPIO Serial Expander (GSX) is the capability provided by the chipset to expand the GPIOs on a platform that needs more

Feature	Description
	GPIOs than the ones provided by the PCH. The solution requires external shift register discrete components
System Management Bus (SMBus 2.0)	The chipset provides a System Management Bus (SMBus) 2.0 host controller as well as an SMBus Slave Interface. The chipset is also capable of operating in a mode in which it can communicate with I2C compatible devices. The host SMBus controller supports up to 100-KHz clock speed.
JTAG Boundary-Scan	This section contains information regarding the chipset testability signals that provides access to JTAG, run control, system control, and observation resources. PCH JTAG (TAP) ports are compatible with the IEEE Standard Test Access Port and Boundary Scan Architecture 1149.1 and 1149.6 Specification, as detailed per device in each BSDL file. JTAG Pin definitions are from IEEE Standard Test Access Port and Boundary-Scan.

Memory

The Integrated Memory Controller (IMC) supports DDR4/-RS protocols with two independent, 64-bit wide channels. The maximum system population at launch will be 64GB (4 DIMM slots x16 GB DDR4 U-DIMM).

Supported memory

DDR4 DIMM types include Un-buffered DIMMs (UDIMM ECC). Operational memory speeds of 2666MT/s, 2400MT/s, and 2133MT/s are supported but depends on DIMM capability. Standard DIMM voltage of 1.2v which supports speeds up to 2666MT/s at launch.

System is capable to support up to two DR or SR DIMMs per channel.

With UDIMM ECC, there is no buffering so each DRAM chip is 1 load, with a dual rank x2 UDIMM having 64 loads on address and command signals and 8 loads on the data signals.

The following table list the supported memory DIMMs for the PowerEdge R340:

📝 **NOTE: The R340 can support mixed DIMM configurations with two different DIMM capabilities.**

DIMM PN	MOD PN	DIMM Speed	DIMM Type	DIMM Capacity (GB)	Ranks per DIMM	Data Width	SDDC Support	DIMM Volts	Comments
D715X	1DV5N	2666	UDIMM	8	1	x8	Advanced ECC	1.2	
1T3YJ	JTVWT	2666	UDIMM	8	1	x8	Advanced ECC	1.2	BCC Version
VDFYD	TJKP0	2666	UDIMM	16	1	x8	Advanced ECC	1.2	
XY4YR	TH0V5	2666	UDIMM	16	1	x8	Advanced ECC	1.2	BCC Version
FPFP6	12YG7	2400	UDIMM	4	1	x8	Advanced ECC	1.2	
MT9MY	7YR44	2400	UDIMM	8	1	x8	Advanced ECC	1.2	
V7CCK	26YCJ	2400	UDIMM	8	1	x8	Advanced ECC	1.2	BCC Version
2TX5N	Y2RYH	2400	UDIMM	16	2	x8	Advanced ECC	1.2	
F6RWY	4F1W8	2400	UDIMM	16	2	x8	Advanced ECC	1.2	BCC Version
N8MT5	0WNKM	2133	UDIMM	4	1	x8	Advanced ECC	1.2	

DIMM PN	MOD PN	DIMM Speed	DIMM Type	DIMM Capacity (GB)	Ranks per DIMM	Data Width	SDDC Support	DIMM Volts	Comments
FD7GV	DM0YK	2133	UDIMM	4	1	x8	Advanced ECC	1.2	BCC Version
H5P71	K4KPT	2133	UDIMM	8	2	x8	Advanced ECC	1.2	
RXGPP	PKTX9	2133	UDIMM	8	1	x8	Advanced ECC	1.2	BCC Version
7XRW4	14FH6	2133	UDIMM	16	2	x8	Advanced ECC	1.2	
FXGXT	WTPK0	2133	UDIMM	16	2	x8	Advanced ECC	1.2	BCC Version

Memory speed

The system will run all memory on all CPUs and channels at the same speed and voltage. By default the system will run at the highest speed for the lowest voltage of the worst case channel DIMM configuration. Operating speed of the memory is determined by:

· Supported speed of the DIMMs
· DIMM configuration on any channel
· Max speed supported by the CPU
· Speed requested by user in BIOS setup screen
· Operating voltage of the system. Determined by:

– Voltages supported by the DIMMs.
– Voltages supported by the platform (R340 does not support 1.25V)
– Voltage requested by user in BIOS setup screen.

The following table shows the memory populations and the system speed frequencies:

Table 3. Memory populations and system speed

DIMM Type	DIMM Ranking	Capacity	DIMM Rated voltage	1 DIMM per channel	2 DIMMs per channel
UDIMM	1R/2R	8GB, and 16GB	DDR4 (1.2V)	2666	2666

Storage

The PowerEdge R340 provides various storage options which includes different drive types, internal and external storage controllers, and different chassis for different number of drive supports. The PowerEdge R340 supports the following drive-bay options:

- 4x 3.5" hot-plug drive option
- 8x 2.5" hot-plug drive option

Supported drives

The PowerEdge R340 system supports SAS, SATA, Nearline SAS drives/SSD drives.

Table 4. Supported Drives - SAS and SATA or SSD

Form Factor	Type	Speed	Rotational Speed	Capacities
2.5-inch	SATA	6 Gbps	7.2K	1TB, 2TB
	SAS	12 Gbps	7.2K	1TB, 2TB,
			10K	600GB, 1.2TB, 1.8TB, 2.4TB
			15K	300GB, 600GB, 900GB
	SSD	6 Gbps	512n	480GB, 960GB, 1.92TB, 3.84TB, 200GB, 240GB, 400GB, 800GB, 960GB, 1.92TB, 120GB, 240GB
3.5-inch	SATA	6 Gbps	7.2K	1TB, 2TB. 4TB, 8TB, 10TB, 12TB, 14TB
	SAS	12 gbps	7.2K	2TB, 4TB, 8TB, 10TB,12TB

Storage controller specifications

The PowerEdge R340 system supports:

- Internal storage controller cards: PERC H330, H730P, S140, HBA330 and Boot Optimized Storage Subsystem (BOSS) modules.
- External storage controller cards: 12 Gbps SAS HBA.

Optical drive

One ultra-slim type, 9.5mm, ODD is supported on the PowerEdge R340 via the system board embedded SATA. The R340 supports both the ultra-slim SATA DVD-ROM and DVD+/-RW.

If the drive is not ordered with the system, a blank should be installed in its place. ODD cable is 100% included in the chassis even if no ODD is ordered.

Tape drive

No internal tape drive support due to the dense rack form factor. External tape drive is supported via the 12 Gbps SAS HBA. The list below are the supported external tape drives for the PowerEdge R340:

- LTO-6 SAS
- LTO-7 SAS
- LTO-8 SAS

Internal Dual SD Module

The Internal Dual SD Module (IDSDM) is optional. The IDSDM contains two SD ports directly on the motherboard. The modules are redundant. Supported iDSDM microSD cards capacity are 8/16/32/64GB

The IDSDM card 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)

BOSS is offered as a means of booting the PowerEdge R340 servers to a full OS when:

- A solution such as IDSDM may be desired, but the target OS for BOSS is a full OS (not just a hypervisor)
- The user needs to maximize their number of drive bays

BOSS cards take up a PCIe slot and are not hot-plug capable. 1x or 2x 240GB modules are available. Dual (2x) module configs can be set up for either RAID 1 or No RAID. Single (1x) module configs can only be set up in a No RAID config.

Networking and PCIe

The following lists highlights the supported communication adapter cards:

- 10GbE Intel (Dual) Sageville Sage Pond Dual port 10Gb Base-T adapter – FH or LP
- 10GbE Intel (Dual) Fortville Eagle Fountain Dual port 10Gb SFP+ adapter – FH or LP
- 1GbE Intel (Dual) Powerville Troi-Stony Dual port 1Gb Base-T adapter – FH or LP
- 1GbE Intel (Quad) Powerville Lore-Stony Quad port 1Gb Base-T adapter – FH or LP
- 1GbE Broadcom (Dual) 5720 Bashir Dual port 1Gb Base-T adapter – FH or LP
- 1GbE Broadcom (Quad) 5719 Cardassia Quad port 1Gb Base-T adapter – FH or LP
- FC8 Emulex (Dual) Saturn Wildfire Dual port FC8 SFP+ adapter – FH or LP

PCIe slots

The PowerEdge R340 provides one riser PCIe expansion slot and one R/A PCIe internal storage slot:

- Slot 1 : One x8 PCIe Gen 3 for LP from CPU (x4 lanes)
- Slot 2 : One x16 PCIe Gen 3 for FH/HL from CPU (x8 lanes)
- Storage Slot: Dedicated PERC slot supports one PERC H330 or H730P or HBA330

PCI card dimensions and power support

The PCI card dimensions allowed in the PowerEdge R340 are:

Table 5. PCI card dimensions

Card type	Height	Length
Full Height / Half Length card	111.15 mm (4.376 inches) max	167.65 mm (6.600 inches) max
Low Profile (Half Height) card	68.90 mm (2.731 inches) max	167.65 mm (6.600 inches) max

Table 6. Power support

Electrical design	Physical slot	Bandwidth	Supported power
Slot 1	x8 Slot	PCIE_G3 x4	25W
Slot 2	x16 Slot	PCIE_G3 x8	25W

Power, thermal, and acoustics

Power supply units

The PowerEdge R340 power supply subsystem consists of one or two AC power supplies (1+1 redundant configuration only supports a 51.3mm PSU). The power supply provides +12V and +12Vaux for non-redundant and redundant design. There are several voltage regulators in the system to supply different voltage levels needed by different logic devices. The redundant power supplies are managed through a PMBus interface.

The following table shows the power efficiency of the power supply units:

Table 7. Power supply efficiency

Form factor	Output	Class	Efficiency targets by load			
			10%	20%	50%	100%
Redundant PSU	350W	Platinum	82.0%	90.0%	94.0%	91.0%

The following table shows the technical specifications of the power supply:

Table 8. Power supply specifications

PSU	Class	Heat dissipation (maximum)	Frequency	Voltage	AC		Current
					High line 100-240V	Low line 100-120V	
350 W AC	Platinum	1340 BTU/hr	50/60 Hz	100-240 V AC, autoranging	350 W	NA	4.8 A-2.4 A
550 W AC	Platinum	2107 BTU/hr	50/60 Hz	100-240 V AC, autoranging	550 W	NA	3.7 A-7.4 A

Thermal

The thermal design of the PowerEdge R340 reflects the following:

Feature	Description
Optimized thermal design	• The system layout is architected for optimum thermal design i.e. system component placement and layout are designed to provide maximum airflow coverage to critical components with minimum expense of fan power. • Custom heat sink designs for CPU, chipset for optimum component cooling.
Comprehensive thermal management	The power required to cool a server can contribute a significant amount to the overall system power. Thermal control is the active management of system cooling through fan speed and system power management to make sure that the system is reliable while minimizing system fan power consumption, airflow, and system acoustic output.

Feature	Description
	The PowerEdge R340 thermal control system regulates the fan speed based on several different responses from critical components' temperature sensors as well as inventory for system configurations. • Open and Closed loop fan speed control: – Open loop control uses system configuration information to determine fan speed based on system inlet temperature. – Closed loop control method uses component temperature feedback from various sub-systems to dynamically determine optimum fan speeds. – User configurable settings: ◦ With the understanding and realization that every customer has unique set of circumstances or expectations from the system, you can adjust the thermal control settings and optimize against the system performance and performance-per-Watt requirements. ◦ iDRAC Web interface, RACADM, or the iDRAC Settings Utility can be used for setting custom thermal settings. The settings are persistent, which means that once they are set and applied, they do not automatically change to the default setting during system reboot, power cycling, iDRAC, or BIOS updates. For more info on specifics of the user interfaces, please refer to the iDRAC User Guide.

Acoustics

The PowerEdge R340 is a rack-mount server appropriate for attended data center environment. However, lower acoustical output is attainable with proper hardware or software configurations. For example, the minimum configuration of R340 is quiet enough for typical office environment. The list below are the R340's acoustical dependencies:

- **Ambient Temperature**: For a similar workload fan speeds (and thus, acoustical noise) may increase as ambient temperature increases.
- **High Wattage CPU**: High-power (TDP) CPU parts may result in higher acoustical noise output.
- **Rear Drives**: When rear drives are installed in R340, fan speed may increase for cooling the drives, and hence both idle and operating acoustical outputs may be higher.
- **System Thermal Profile Selected in BIOS**: The default setting is "Power Optimized (DAPC)", which generally means lower fan speed and acoustics. If "Performance Optimized" is selected, fan speed and acoustical noise may increase.

R340 acoustical performance is characterized for two configurations: Typical and Feature Rich. The following tables summarizes the configuration and acoustical performance of the R340. Each configuration has been tested according to Dell EMC acoustical standards for rack mounted servers

Configuration	Typical	Feature rich
CPU Type	Intel E-2124	Intel E-2126G
CPU TDP	71 W	80 W
CPU Quantity	1	1
Memory Type	16GB UDIMM	32GB UDIMM
DIMM Quantity	2	4
Backplane Type	4X 3.5" Hot-plug	8x 2.5" hot swap

Configuration	Typical	Feature rich
Fan Quantity	4 x 4056	4 x 4056
HDD Type	3.5" SATA 2-TB	2.5" SAS 300 GB 15k
HDD Quantity	2	8
PSU Type	350 W	350 W
PSU Quantity	2	2
PCI 1	2x 1GbE Broadcom	2x 1GbE Broadcom
PCI 2	PERC H330	PERC H730
PCI 3		

Table 9. Acoustical performance: Idle/operating at 25°C ambient

Configuration		Typical	Feature rich
L_{wA-UL}^2 (Bels)	Idle	4.9	5.2
	Operating	4.9	5.3
L_{pA}^3 (dBA)	Idle	38	42
	Operating	38	42
Prominent tones		No prominent tones in Idle and Operating	

Table 10. Acoustical performance: Idle/operating at 28°C ambient

Configuration	Typical	Feature rich
L_{wA-UL}^2 (Bels)	5.2	5.5
L_{pA}^3 (dBA)	37	38

Table 11. Acoustical performance: Max loading at 35°C ambient

Configuration	Typical	Feature rich
L_{wA-UL}^2 (Bels)	8.4	8.4
L_{pA}^3 (dBA)	67	67

Supported operating systems

The following lists the supported operating systems for the PowerEdge R340

- Windows 2019 with Hyper-V Standard
- Windows 2019 Essentials
- Windows 2016 with Hyper-V Standard
- Windows 2016 Essentials
- Windows 2012 R2 Essentials
- Windows 2012 R2 Standard
- RHEL 7.5
- SLES 15
- Ubuntu server 18.04.1
- Citrix XenServer 7.1
- VMWare ESXi 6.7
- VMWare ESXi 6.5

Dell EMC OpenManage systems management

Whether your IT environment consists of a few servers or a few thousand servers, Dell EMC OpenManage systems management solutions provide comprehensive management for evolving IT environments. OpenManage is based on open standards and provides agent-based and agent-free server lifecycle management functionality for Dell EMC PowerEdge servers. OpenManage solutions help you automate and streamline essential hardware management tasks.

Start with a firm foundation for efficient hardware management using OpenManage tools, utilities and management consoles. OpenManage systems management solutions consist of a combination of embedded management features and software products that help you automate and simplify the entire server lifecycle: deploy, update, monitor and maintain. OpenManage solutions are innovatively designed for simplicity and ease of use to help you reduce complexity, save time, achieve efficiency, control costs and empower productivity. OpenManage centers around efficient management of server lifecycle.

The Dell EMC OpenManage Portfolio

Simplifying hardware management through ease of use, intelligent automation and integrated security

One-to-many consoles	One size doesn't size fit all – use the best tool for the job	Protect your investments	Work better together
Consoles • OpenManage Enterprise • OpenManage Essentials • OpenManage PowerCenter	**Tools** • OpenManage Mobile • Repository Manager • Standards-based APIs • RACADM CLI	**Integrations and Connections** • MS System Center • VMware vCenter • Red Hat Ansible • Nagios, IBM, HPE etc.	**Dell Services** • ProSupport Plus Services with SupportAssist • OME deployment

Server Element Managers

Discover/Inventory Configure/Deploy Update Monitor Maintain

Enabled by iDRAC with Lifecycle Controller, iDRAC Service Module (iSM)

Chassis Management Controller (CMC)

RACK TOWER MODULAR

Figure 6. Server lifecycle management operations

iDRAC with Lifecycle controller

The integrated Dell Remote Access Controller 9 (iDRAC9) with Lifecycle Controller is embedded within every Dell EMC PowerEdge server and provides functionality that helps IT administrators deploy, update, monitor, and maintain servers with no need for any additional software to be installed. iDRAC functions regardless of operating system or hypervisor presence because from a pre-OS or bare-metal state, iDRAC is ready to work because it is embedded within each server from the factory.

iDRAC features and comparison

The PowerEdge R340 supports the following iDRAC licenses – Basic (default), Express (upgrade) and Enterprise (upgrade).

NOTE: The features listed in bold in the below table are new for iDRAC9.

Table 12. iDRAC feature comparison

Features	iDRAC8 Basic	iDRAC9 Basic	iDRAC8 Express	iDRAC9 Express	iDRAC8 Express for Blades	iDRAC9 Express for Blades	iDRAC8 Enterprise	iDRAC9 Enterprise
Interface/Standards								
Redfish	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IPMI 2.0	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DCMI 1.5	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Web-based GUI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Racadm command line—local/remote	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SMASH-CLP—SSH-only	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Telnet	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SSH	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Serial redirection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
WSMAN	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Network Time Protocol	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Connectivity								
Shared NIC	Yes	Yes	Yes	Yes	N/A	N/A	Yes	Yes
Dedicated NIC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VLAN tagging	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IPv4	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IPv6	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DHCP (new default; no static IP)	Yes	**Yes**	Yes	**Yes**	Yes	**Yes**	Yes	**Yes**
DHCP with Zero Touch	No	No	No	No	No	No	No	**Yes**
Dynamic DNS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OS pass-through	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
iDRAC Direct-Front panel USB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Connection View	No	**Yes**	No	**Yes**	No	**Yes**	No	**Yes**
NFS v4	No	**Yes**	No	**Yes**	No	**Yes**	No	**Yes**
NTLM v1 and NTLM v2	No	**Yes**	No	**Yes**	No	**Yes**	No	**Yes**
Security								

Features	iDRAC8 Basic	iDRAC9 Basic	iDRAC8 Express	iDRAC9 Express	iDRAC8 Express for Blades	iDRAC9 Express for Blades	iDRAC8 Enterprise	iDRAC9 Enterprise
Role-based authority	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Local users	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SSL encryption	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IP blocking	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Directory services—AD, LDAP	No	No	No	No	No	No	Yes	Yes
Two-factor authentication	No	No	No	No	No	No	Yes	Yes
Single sign-on	No	No	No	No	No	No	Yes	Yes
PK authentication	No	No	Yes	Yes	Yes	Yes	Yes	Yes
FIPS 140-2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Secure UEFI boot-certificate management	No	**Yes**	No	**Yes**	No	**Yes**	No	**Yes**
Lock down mode	No		No	No	No	No	No	**Yes**
Unique iDRAC default password	No	**Yes**	No	**Yes**	No	**Yes**	No	**Yes**
Customizable Security Policy Banner-login page	No	**Yes**	No	**Yes**	No	**Yes**	No	**Yes**
Remote Presence								
Power control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Boot control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Serial-over-LAN	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Virtual Media	No	No	No	No	Yes	Yes	Yes	Yes
Virtual Folders	No	No	No	No	No	No	Yes	Yes
Remote File Share	No	No	No	No	No	No	Yes	Yes
Virtual Console	No	No	No	No	Yes	Yes	Yes	Yes
HTML5 access to virtual console	No	No	No	No	Yes	Yes	Yes	Yes
VNC connection to OS	No	No	No	No	No	No	Yes	Yes
Quality/bandwidth control	No	No	No	No	No	No	Yes	Yes
Virtual Console collaboration—6 users	No	No	No	No	No	No	Yes	Yes
Virtual Console chat	No	No	No	No	No	No	Yes	Yes
Virtual Flash partitions	No	No	No	No	No	No	Yes	Yes
Group manager	No	No	No	No	No	No	No	**Yes**
HTTP/HTTPS support along with NFS/CIFS	No	**Yes**	No	**Yes**	No	**Yes**	No	Yes
Power and Thermal								

Features	iDRAC8 Basic	iDRAC9 Basic	iDRAC8 Express	iDRAC9 Express	iDRAC8 Express for Blades	iDRAC9 Express for Blades	iDRAC8 Enterprise	iDRAC9 Enterprise
Real-time power meter	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Power thresholds & alerts	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Real-time power graphing	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Historical power counters	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Power capping	No	No	No	No	No	No	No	No
Power Center integration	No	No	No	No	No	No	Yes	Yes
Temperature monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Temperature graphing	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Health Monitoring								
Predictive failure monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SNMPv1, v2 and v3—traps and gets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Email alerting	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Configurable thresholds	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fan monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Power Supply monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Memory monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CPU monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RAID monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NIC monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HD monitoring—enclosure	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Out of Band Performance Monitoring	No	No	No	No	No	No	Yes	Yes
Alerts for excessive SSD wear	No	**Yes**	No	**Yes**	No	**Yes**	No	**Yes**
Customizable settings for Exhaust Temperature	No	**Yes**	No	**Yes**	No	**Yes**	No	**Yes**
Update								
Remote agent-free update	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Embedded update tools	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sync with repository— scheduled updates	No	No	No	No	No	No	Yes	Yes
Auto update	No	No	No	No	No	No	Yes	Yes
Improved PSU firmware updates	No	**Yes**	No	**Yes**	No	**Yes**	No	**Yes**
Deployment and Configuration								

Features	iDRAC8 Basic	iDRAC9 Basic	iDRAC8 Express	iDRAC9 Express	iDRAC8 Express for Blades	iDRAC9 Express for Blades	iDRAC8 Enterprise	iDRAC9 Enterprise
Local configuration via F10	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Embedded OS deployment tools	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Embedded configuration tools	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AutoDiscovery	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Remote OS deployment	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Embedded driver pack	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Full configuration inventory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Inventory export	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Remote configuration	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zerotouch configuration	No	No	No	No	No	No	Yes	Yes
System Retire/Repurpose	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Server Configuration Profile in GUI	No	**Yes**	No	**Yes**	No	**Yes**	No	**Yes**
Diagnostics, Service and Logging								
Embedded diagnostic tools	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Part Replacement	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Server Configuration Backup	No	No	No	No	No	No	Yes	Yes
Server Configuration Restore	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Easy Restore—system configuration	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Easy Restore Auto Timeout	No	**Yes**	No	**Yes**	No	**Yes**	No	**Yes**
LED health status indicator	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
iDRAC Direct—front USB mgmt port	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
iDRAC Service Module (iSM) embedded	No	**Yes**	No	**Yes**	No	**Yes**	No	**Yes**
iSM to inband alert forwarding to consoles	No	**Yes**	No	**Yes**	No	**Yes**	No	**Yes**
Crash screen capture	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Crash video capture	No	No	No	No	No	No	Yes	Yes
Boot capture	No	No	No	No	No	No	Yes	Yes
Manual reset for iDRAC—LCD ID button	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Features	iDRAC8 Basic	iDRAC9 Basic	iDRAC8 Express	iDRAC9 Express	iDRAC8 Express for Blades	iDRAC9 Express for Blades	iDRAC8 Enterprise	iDRAC9 Enterprise
Remote reset for iDRAC—requires iSM	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Virtual NMI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OS watchdog	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SupportAssist Report—embedded	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
System Event Log	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lifecycle Log	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced logging in the Lifecycle controller log	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Work notes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Remote Syslog	No	No	No	No	No	No	Yes	Yes
License management	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Improved customer experience								
iDRAC -Faster processor, more memory	No	**Yes**	No	**Yes**	No	**Yes**	No	**Yes**
GUI rendered in HTML5	No	**Yes**	No	**Yes**	No	**Yes**	No	**Yes**
Add BIOS configuration to iDRAC GUI	No	**Yes**	No	**Yes**	No	**Yes**	No	**Yes**
iDRAC support for SW RAID licensing	No	**Yes**	No	**Yes**	No	**Yes**	No	**Yes**

Agent-free management

As Dell EMC PowerEdge servers have embedded server lifecycle management, in many cases, there is no need to install an OpenManage systems management software agent into the operating system of a Dell EMC PowerEdge server. This greatly simplifies and streamlines the management footprint.

Agent-based management

Most systems management solutions require pieces of software, called agents, to be installed on each node in order to be managed within the IT environment. Additionally, the same agent is often used as a local interface into the hardware health and may be accessed remotely as a management interface, typically referred to as a one-to-one interface. For customers that continue to use agent-based solutions, Dell EMC provides OpenManage Server Administrator.

Dell EMC consoles

The central console in a systems management solution is often referred to as the one-to-many console. The central console provides a rapid view and insight into the overall health of all systems in the IT environment. The Dell EMC systems management portfolio includes several powerful consoles, depending upon your needs, including the following:

Dell EMC OpenManage Essentials

OpenManage Essentials is the one-to-many management console for monitoring Dell HW infrastructure including server, storage and networking, as well as for lifecycle management of PowerEdge servers. It support Windows, Linux, VMware, and HyperV environments. OME provides a simple and easy interface for system administrators to maximize the uptime and health of Dell systems. It helps to

- Monitor health status and events for PowerEdge servers, EqualLogic or MD series storage, and PowerConnect and Force 10 switches.
- Provide hardware-level control and management for PowerEdge server, blade system, and internal storage arrays.
- Link and Launch element management interfaces, such as, iDRAC, CMC, EQL group manager etc
- Integrate with the following Dell solutions:

  – Dell Repository Manager : Builds customized server update baselines that OpenManage Essentials can use.
  – OpenManage Power Center : Optimize power consumption in the servers.
  – SupportAssist : Enables automatic hardware failure notification to be sent securely to Dell EMC technical support for intelligent analysis and diagnosis to optimize availability and reduce manual intervention. This solution is available as part of Basic Hardware Warranty, ProSupport and ProSupport Plus at no additional cost. Download SupportAssist Enterprise from Dell.com/SupportAssist.
- Provide REST interface API support for 3rd Party Integration.
- Manage Server Configuration - it is a fee-based license available on Dell's 14th generation of PowerEdge servers with iDRAC Enterprise or iDRAC Express licenses. The key features include the following:

  – Configure a server or chassis using a template and deploying an operating system on the PowerEdge bare metal servers.
  – During a server operation, automatically detect and notify any server or chassis drift from a customer-defined baseline configuration.
  – Boot a system from a network-mounted ISO using iDRAC.
  – Support VLAN Management for FN-IOM and M-IOA.
- For more information, see delltechcenter.com/OME

OpenManage Mobile

OpenManage Mobile(OMM) is a software application that enables easy, convenient, and secure monitoring and management of PowerEdge servers remotely, or at-the-server. With OpenManage Mobile, IT Administrators can securely perform several data center monitoring and remediation tasks using an Android or iOS mobile device. The OpenManage Mobile app is available as a free software download from the Apple Store and the Google Play Store.

OMM can also monitor and manage PowerEdge servers through a OpenManage Essentials console or by directly accessing the server's iDRAC.

The OpenManage Essentials console can be accessed through OpenManage Mobile over a secure IP network. This allows you to monitor all devices managed by OpenManage Essentials such as Dell EMC servers, storage, networking, firewall, and supported third party devices.

If you are remote, you can access iDRAC over a secure IP network.

Key Features of OpenManage Mobile (When connected through OpenManage Essentials console):

- Connect to multiple servers which have OME installed, from a single mobile device.
- Connect to multiple servers individually through the iDRAC interface.
- Receive critical alert notification on your mobile device as they arrive into your OpenManage Essentials management console.
- Acknowledge, forward, and delete alerts from your mobile device.
- Browse through device details, firmware inventory, and event logs of individual systems.
- Perform several server management functions such as power-on, power cycle, reboot, and shutdown from the mobile application.

Key Features of OpenManage Mobile (When connected through iDRAC):

- Connect to any 14th gen, 13th gen, or 12th gen server remotely

- Assign IP address, change credentials, and update common BIOS attributes for Bare Metal Configuration
- Configure one server manually, or multiple servers simultaneously through a template.
- Browse server details, health status, hardware & firmware inventory, networking details, and System Event or LC logs. Share this information easily with other IT Administrators.
- Access SupportAssist reports, Last Crash screen and video (PowerEdge 14th gen servers)
- Access Virtual Console (and reduce the need for crash carts).
- Power On, Shut down, or Reboot your server from anywhere.
- Run any RACADM command

OpenManage Power Center

OpenManage Power Center is a one-to-many application that can read power usage and thermal readings information from Dell EMC servers, Power Distribution Units (PDU), and Uninterruptible Power Supplies (UPS). It can aggregate this information into rack, row, and room-level views.

For more information, see OpenManage Power Center User's Guide available at **Dell.com/openmanagemanuals**.

Dell EMC OpenManage systems management tools, utilities and protocols

Dell EMC OpenManage systems management tools and utilities consist of the following:

Dell EMC Repository Manager:

Dell EMC Repository Manager (DRM) is an application that helps you to:

- Identify the updates that are relevant to the systems in your data center.
- Identify and notify when updates are available.
- Package the updates into different deployment format.

To automate the creation of baseline repositories, DRM provides advanced integration capabilities with iDRAC/LC, OpenManage Essentials, Chassis Management Controller, OpenManage Integration for VMware vCenter and OpenManage Integration for Microsoft System Center (OMIMSSC). Also, DRM packages updates into custom catalogs that can be used for deployment.

Dell EMC Repository Manager can create the following deployment tools:

- Custom catalogs
- Lightweight deployment pack
- Bootable Linux ISO
- Custom Server Update Utility (SUU)

For more information, see Dell EMC Repository Manager User's Guide available at **Dell.com/support/manuals**.

Dell Update Packages

Dell Update Packages (DUP) is a self-contained executable supported by Microsoft Windows or Linux that updates a component on a server and applications like OMSA, iSM, and DSET.

DUPs can be executed in GUI or in CLI mode.

For more information, see Dell EMC Update Packages User's Guide available at www.delltechcenter.com/DSU.

Dell Remote Access Controller Administration (RACADM) CLI

The RACADM command-line utility provides a scriptable interface to perform inventory, configuration, update, and health status check of PowerEdge servers. RACADM operates in multiple modes:·

- Local — supports running RACADM commands from the managed server's operating system.
- SSH or Telnet — known as Firmware RACADM; is accessible by logging in to iDRAC using SSH or Telnet
- Remote — supports running RACADM commands from a remote management station such as a laptop or desktop.

RACADM is supported by the iDRAC with Lifecycle Controller and by the Chassis Management Controller of the M1000e, VRTX and FX2 modular systems. Local and Remote RACADM is supported on Windows Server, Windows clients, and on Red Hat, SuSe and Ubuntu Linux.

For more information, see the RACADM Command Line Reference Guide for iDRAC and CMC available at **Dell.com/support/ manuals**.

iDRAC with Lifecycle Controller Embedded Management APIs

iDRAC with Lifecycle Controller provides a range of standards-based applications programming interfaces (APIs) that enable scalable and automated management of PowerEdge servers. Standard systems management APIs have been developed by organizations such as the Institute of Electrical and Electronics Engineers (IEEE) and Distributed Management Task Force (DMTF). These APIs are widely used by commercial systems management products and by custom programs and scripts developed by IT staff to automate management functions such as discovery, inventory, health status checking, configuration, update, and power management. The APIs supported by iDRAC with Lifecycle Controller include:

- **Redfish** - In 2015, the DMTF Scalable Platforms Management Forum published Redfish, an open industry-standard specification and schema designed to meet the needs of IT administrators for simple, modern, and secure management of scalable platform hardware. Dell is a key contributor to the Redfish standard, acting as co-chair of the SPMF, promoting the benefits of Redfish, and working to deliver those benefits within industry-leading systems management solutions. Redfish is a next generation management standard using a data model representation inside a hypermedia RESTful interface. The data model is defined in terms of a standard, machine-readable schema, with the payload of the messages expressed in JSON and the OData v4 protocol.
- **WSMan** -The Web Services For Management (WSMan) API, first published by the DMTF in 2008, is the most mature and robust API provided by iDRAC with Lifecycle Controller. WSMan uses a Simple Object Access Protocol (SOAP) with data modeled using the Common Information Model. WSMan provides interoperability between management applications and managed resources, and identifies a core set of web service specifications and usage requirements that expose a common set of operations central to all systems management.
- **IPMI** - The Intelligent Platform Management Interface (IPMI) is a message-based, hardware-level interface specification that can operate over both LAN and serial interfaces. IPMI is supported broadly by server vendors, systems management solutions, and open source software.
- **SNMP** - The Simple Network Management Protocol (SNMP) helps in standardizing the management of network devices. SNMP allows commercial management consoles created for monitoring network switches and routers to also monitor X86 severs. SNMP is primarily used to deliver event messages to alert administrators of problems on their systems but can also be used to discover, inventory and configure servers.

To assist automating system management tasks and simplify API integration, Dell provides PowerShell and Python libraries and script examples utilizing the WSMan interface. The iDRAC with LC pages of Dell Techcenter offer a library of technical white papers detailing the use of the embedded management APIs. For more information, see delltechcenter.com/iDRAC and delltechcenter.com/LC.

Integration with third-party consoles

Dell EMC OpenManage provides integration with several leading third-party consoles, including:

OpenManage Integration Suite for Microsoft System Center

The combination of Dell OpenManage Integration Suite and Microsoft System Center simplifies and enhances deployment, configuration, monitoring and updating of Dell servers and storage in physical and virtual environments. Our agent-free and agent-based plug-ins deliver a unique level of integration and efficiency when managing Dell hardware within a System Center environment.

The OpenManage Integration Suite for Microsoft System Center includes: Dell Server and Storage Management Packs for System Center Operations Manager (SCOM); Dell Server Deployment Packs and Update Catalogs for System Center Configuration

Manager (SCCM); and tools for optimizing management of Dell PowerEdge servers in virtual environments using System Center Virtual Machine Manager (SCVMM).

OpenManage Integration for VMware vCenter

The OpenManage Integration for VMware vCenter allows you to monitor, provision, and manage PowerEdge server hardware and firmware. You can perform these tasks through a dedicated Dell menu that can be accessed directly through the VMware vCenter console. OMIVV also allows granular control and reporting for the hardware environment using the same role-based access control model as vCenter. The OpenManage Management Pack for vRealize Operations Manager is available with OMIVV v4.0 onwards. This helps in checking hardware health and alerting into vRealize operations, which also includes dashboard and reporting on the server environment.

You can manage and monitor Dell hardware within the virtualized environment

- Alerting and monitoring environment for servers and chassis
- Monitoring and reporting for servers and chassis
- Updating firmware on servers
- Deploying enhanced options

For more information, see delltechcenter.com/omivv

NOTE: The Dell EMC Repository Manager integrates with OpenManage Integration for VMware vCenter. The Dell EMC Repository Manager provides advanced functionality, simplifies the discovery, and deployment of new updates.

BMC Software

Dell EMC and BMC Software work together to simplify IT by ensuring tight integration between Dell EMC server, storage, and network management functionality and the BMC Software process and data center automation products.

OpenManage connections with third-party consoles

Dell EMC OpenManage Connections gives you an easy path to adding support for third-party devices, so you can continue to use your existing management tools while easily adding Dell EMC server systems to your existing IT environment. Integrate new systems at your own pace. Manage new Dell EMC servers and storage with your legacy management tools, while extending the useful life of your existing resources. With OpenManage Connections you can add monitoring and troubleshooting of Dell EMC assets to your IT infrastructure.

- OpenManage Connection for Nagios Core and Nagios XI
- OpenManage Connection for HPE Operations Manager i (OMi)

For more information on these OpenManage Connections, visit **Dell.com/openmanage**.

Appendix A. Additional specifications

Chassis dimensions

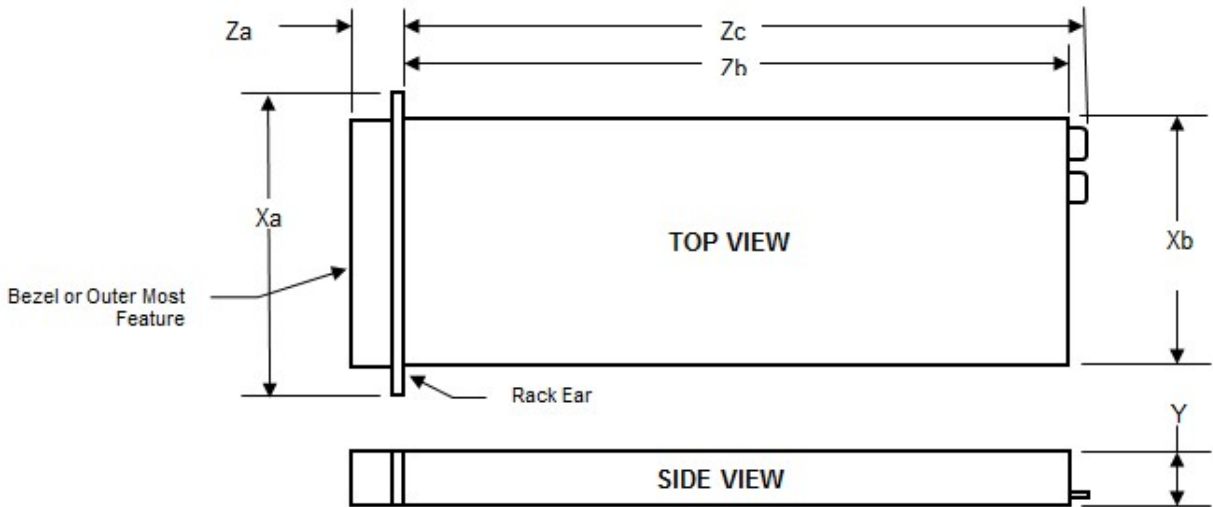This section describes the physical dimensions of the system.

Figure 7. Chassis dimensions of the PowerEdge R340 system

Table 13. Dimensions of the Dell PowerEdge R340 system

Description	R340 with 8 x 2.5- inch dimension	R340 with 4 x 3.5- inch dimension
Xa	482.0	482.0
Xb	434.0	434.0
Y	42.8	42.8
Za with bezel	35.6	35.6
Za without bezel	22.0	22.0
Zb	483.72	534.49
Zc	522.82	573.59
Max system weight (Kg)	12.0	13.2

Chassis weight

This section describes the weight of the system.

Table 14. Chassis weight

System	Maximum weight (with all hard drives/SSDs)
PowerEdge R340	Max 29.98 lb/13.6 Kg

Video

The PowerEdge R340 system Integrated Dell Remote Access Controller (iDRAC) incorporates an integrated video subsystem, connected to the chipset via PCI express and internal PCIe switch and PCIe to PCI-bridge. The graphics controller is the 2D Matrox G200. The video frame buffer (16MB) is contained within the iDRAC RAM (256MB) device.

The R340 supports the following 2D graphics video modes:

Resolution	Refresh Rate (Hz)	Color Depth (bit)
640 x 480	60, 72	8, 16, 24
800 x 600	60, 75, 85	8, 16, 24
1024 x 768	60, 75, 85	8, 16, 24
1152x864	60, 75, 85	8, 16, 24
1280 x 1024	60, 75	8, 16, 24

USB ports

The PowerEdge R340 system supports the USB ports mentioned below:

Table 15. USB specifications

System	PowerEdge R340
Front panel	One USB 2.0-compliant port, One Micro USB iDARC-compliant port
Back panel	Two USB 3.0-compliant port
Internal	One USB 3.0-compliant port

Drives

The PowerEdge R340 rack system supports SAS, SATA drives and Solid State Drives (SSDs).

Drives	Specification
Eight drive system	Up to eight 2.5-inch, hot swappable SAS, SATA, or SATA SSD drives.
Four drive system	Up to four 3.5-inch cabled drives, or
	Up to four 3.5-inch hot swappable SAS, SATA, or SATA SSD drives
	Up to four 2.5-inch hot swappable SAS, SATA, or SATA SSD drives in 3.5-inch adapters

NIC ports

The PowerEdge R340 system supports two 10/100/1000 Mbps Network Interface Controller (NIC) ports on the back panel.

Environmental specifications

NOTE: For additional information about environmental measurements for specific system configurations, see Dell.com/environmental_datasheets.

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.
Fresh air	For information on fresh air, see Expanded Operating Temperature section.
Maximum temperature gradient (operating and storage)	20°C/h (36°F/h)

Relative humidity	Specifications
Storage	5% to 95% RH with 33°C (91°F) maximum dew point. Atmosphere must be non-condensing at all times.
Operating	10% to 80% Relative Humidity with 29°C (84.2°F) maximum dew point.

Maximum vibration	Specifications
Operating	0.26 G_{rms} at 5 Hz to 350 Hz (operation orientation).
Storage	1.88 G_{rms} at 10 Hz to 500 Hz for 15 min (all six sides tested).

Maximum shock	Specifications
Operating	One pulse on each side of the system of 71 G for up to 2 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.

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

Operating temperature de-rating	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)

The following section defines the limits to help avoid IT equipment damage and/or failure from particulates and gaseous contamination. If the levels of particulates or gaseous pollution are beyond the specified limits and cause equipment damage or failure, you may need to rectify the environmental conditions. Remediation of environmental conditions is the responsibility of the customer.

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.

Particulate contamination	Specifications

> **NOTE:** 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:** 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.

> **NOTE:** Applies to data center and non-data center environments.

Gaseous contamination	Specifications
Copper coupon corrosion rate	<300 Å/month per Class G1 as defined by ANSI/ISA71.04-1985.
Silver coupon corrosion rate	<200 Å/month as defined by AHSRAE TC9.9.

> **NOTE:** Maximum corrosive contaminant levels measured at ≤50% relative humidity.

Appendix B. Standards compliance

The system conforms to the following industry standards.

Table 16. 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

Appendix C Additional resources

Table 17. 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 EMC contact information.	Inside the system chassis cover
Energy Smart Solution Advisor (ESSA)	The Dell EMC 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

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. 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 8. 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 help you rest easy knowing your systems have been deployed and integrated by the best.

ProDeploy

ProDeploy provides full service installation and configuration of both server hardware and system software by certified deployment engineers including set up of 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. System testing, validation and full project documentation with knowledge transfer complete the process. We focus on getting you up and running so you can focus on your business and prepare for whatever comes next.

Basic Deployment

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

Residency Services

Residency helps customers transition to new capabilities quickly through 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 Remote Consulting 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 gets 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.

ProSupport Plus

Optimize your critical systems and free up staff to innovate the business. ProSupport Plus provides an assigned Technology Service Manager and access to senior technical engineers that quickly diagnose issues and provide personalized guidance to avoid problems before they ever impact your business.

ProSupport

Keep your hardware and software running smoothly with 24x7 access to technology engineers as well as proactive and preventive technologies to help you get ahead of issues.

ProSupport One for Data Center

Get a tailored, personalized support experience for your large IT environment, including an assigned service account management expert as well as flexible parts and labor options.
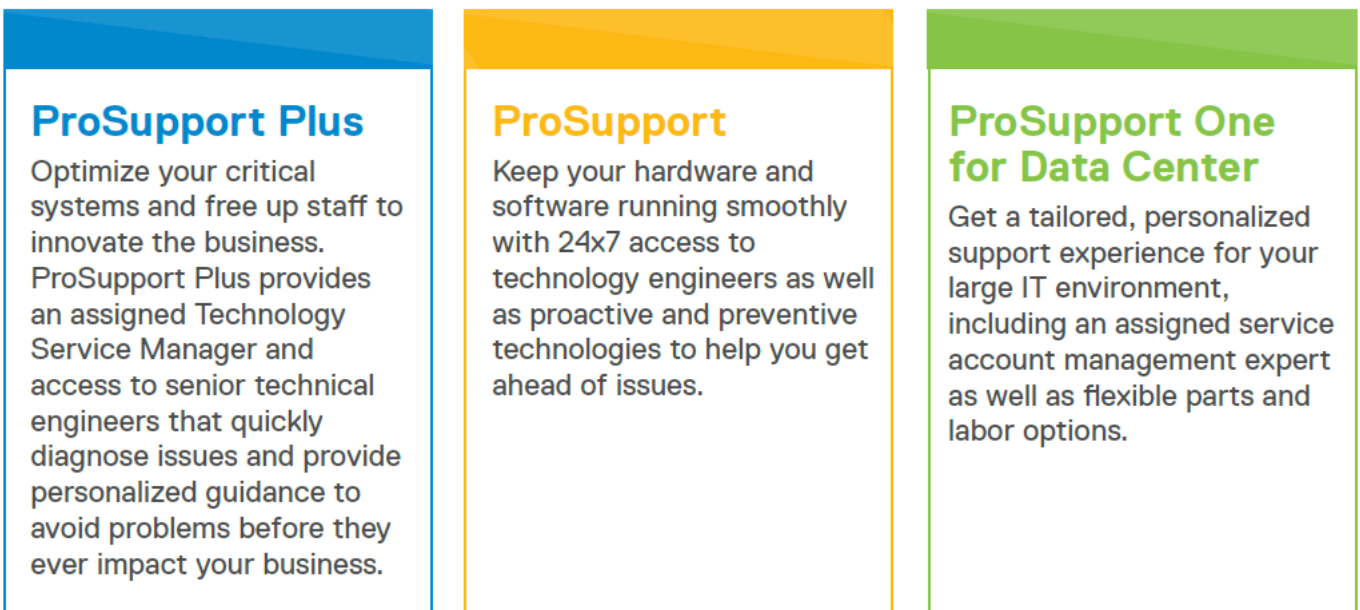
Figure 9. ProSupport Enterprise Suite

ProSupport Plus

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

- A designated 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 designated Technology Services Managers with remote, on-site options
- Designated 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

Enterprise Support Services
Feature Comparison

	ProSupport	ProSupport Plus	ProSupport One for Data Center
Remote technical support	24x7	24x7	24x7
Onsite support	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, Operating Environment Software 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 10. ProSupport One for Data Center model

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 designated Technology Services Managers with remote, on-site options
- Designated 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 11. ProSupport One for Data Center model

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 your steps and time to resolution, often detecting issues before they become a crisis. Benefits include:

- Value - SupportAssist is available to all customer 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 you rapid insight into the root causes of unnecessary complexity. We seek better answers than traditional service models, and our strategy is to help you 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 you 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.