

# Dell EMC PowerEdge R340

## Technical Guide

## 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.

# Product overview

## Topics:

- [Introduction](#)
- [New technologies](#)

## Introduction

The PowerEdge R340 rack system consists of the Intel® Xeon® E-2200 processor family used in conjunction with the Intel® C246 series chipset 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. 100% 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
<b>Intel® C246 series chipset</b>	Please refer to the <a href="#">chipset section</a> for details
<b>Intel® Xeon® processor E- 2100 and E-2200 Product Family</b>	The Intel® Xeon® E-2100 and E-2200 processors have increased core count and embedded PCIe lanes that will improve the IO performance. Please refer <a href="#">processor section</a> for additional details.
<b>Next Generation SW RAID, PERC S140</b>	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 <a href="#">storage section</a> for additional details.
<b>iDRAC 9</b>	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.

## System features

### Topics:

- [Product comparison](#)
- [Product specifications](#)

## 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	<ul style="list-style-type: none"> <li>• Intel Xeon® E3-1200 v6 Processor family</li> <li>• Intel Pentium®</li> <li>• Intel Celeron®</li> <li>• Intel Core i3®</li> </ul>	<ul style="list-style-type: none"> <li>• Intel Xeon® E-2100 and E-2200 Processor family</li> <li>• Intel Pentium®</li> <li>• Intel Celeron®</li> <li>• Intel Core i3®</li> </ul>
Number of processors	<ul style="list-style-type: none"> <li>• 1</li> </ul>	<ul style="list-style-type: none"> <li>• 1</li> </ul>
Number of cores	<ul style="list-style-type: none"> <li>• Up to 4 cores</li> </ul>	<ul style="list-style-type: none"> <li>• Up to 8 cores</li> </ul>
L2/L3 cache	<ul style="list-style-type: none"> <li>• 2.0 MB per core</li> <li>• Up to 8 MB</li> </ul>	<ul style="list-style-type: none"> <li>• 2.0 MB per core</li> <li>• Up to 12 MB</li> </ul>
Chipset	<ul style="list-style-type: none"> <li>• Intel C236</li> </ul>	<ul style="list-style-type: none"> <li>• Intel C246</li> </ul>
Memory Module	<ul style="list-style-type: none"> <li>• DDR4: 4 UDIMMs with ECC</li> <li>• Speed: Up to 2400MT/s</li> <li>• Min RAM: 4 GB</li> <li>• Max RAM: 64 GB</li> </ul>	<ul style="list-style-type: none"> <li>• DDR4: 4 UDIMMs with ECC</li> <li>• Speed: Up to 2666MT/s</li> <li>• Min RAM: 8GB</li> <li>• Max RAM: 64 GB</li> </ul>
Hard drive bays	<ul style="list-style-type: none"> <li>• 4 x 3.5-inch cabled or hot plug</li> <li>• 8 x 2.5-inch hot plug</li> <li>• 2 x 1.8-inch cabled</li> </ul>	<ul style="list-style-type: none"> <li>• 4 x 3.5-inch hot plug</li> <li>• 8 x 2.5-inch hot plug</li> </ul>
Hard drive types	<ul style="list-style-type: none"> <li>• Default SATA. Optional SAS</li> <li>• Enterprise HDD</li> <li>• Entry HDD</li> </ul>	<ul style="list-style-type: none"> <li>• Default SATA. Optional SAS</li> <li>• Enterprise HDD</li> <li>• Entry HDD</li> </ul>
External hard drive bays	<ul style="list-style-type: none"> <li>• 1x slim ODD 9.5mm</li> </ul>	<ul style="list-style-type: none"> <li>• 1x slim ODD 9.5mm</li> </ul>
RAID controllers	<ul style="list-style-type: none"> <li>• Chipset based SATA, PERC S130</li> <li>• PERC H330</li> <li>• PERC H730</li> <li>• PERC H830</li> </ul>	<ul style="list-style-type: none"> <li>• Chipset based SATA, PERC S140</li> <li>• PERC H330</li> <li>• PERC H730P</li> </ul>
Host Bus Adapter (HBA)	<ul style="list-style-type: none"> <li>• 12Gb SAS External HBA</li> </ul>	<ul style="list-style-type: none"> <li>• 12Gb SAS External HBA</li> <li>• HBA330 Internal adapter</li> </ul>
Boot optimized storage subsystem	<ul style="list-style-type: none"> <li>• Not supported</li> </ul>	<ul style="list-style-type: none"> <li>• 2x M.2 240GB (RAID 1 or No RAID)</li> <li>• 1x M.2 240GB (No RAID only)</li> </ul>
Server management	<ul style="list-style-type: none"> <li>• BMC</li> </ul>	<ul style="list-style-type: none"> <li>• BMC</li> </ul>

**Table 1. Product comparison with predecessor (continued)**

Feature	PowerEdge R330	PowerEdge R340
	<ul style="list-style-type: none"> <li>• IPMI 2.0 compliant; Full Open Manage suite</li> <li>• Optional iDRAC8 Express</li> <li>• Optional iDRAC8 Enterprise</li> <li>• Vflash</li> </ul>	<ul style="list-style-type: none"> <li>• IPMI 2.0 compliant; Full Open Manage suite</li> <li>• Optional iDRAC9 Express</li> <li>• Optional iDRAC9 Enterprise</li> <li>• Vflash</li> </ul>
I/O slots	<ul style="list-style-type: none"> <li>• 1 x16 slot PCIe Gen3 for HL/FH from CPU1(x8 lanes)</li> <li>• 1 x 8 slot PCIe Gen3 for LP from CPU1(x4 lanes)</li> </ul>	<ul style="list-style-type: none"> <li>• 1 x16 slot PCIe Gen3 for HL/FH from CPU1(x8 lanes)</li> <li>• 1 x 8 slot PCIe Gen3 for LP from CPU1(x4 lanes)</li> </ul>
NIC/LOM	<ul style="list-style-type: none"> <li>• 2x GbE LOM</li> </ul>	<ul style="list-style-type: none"> <li>• 2x GbE LOM</li> </ul>
USB	<ul style="list-style-type: none"> <li>• 2 rear USB 3.0</li> <li>• 2 front USB 2.0</li> <li>• 1 internal USB 3.0</li> </ul>	<ul style="list-style-type: none"> <li>• 2 rear USB 3.0</li> <li>• 1 front USB 2.0</li> <li>• 1 internal USB 3.0</li> </ul>
Power supplies	<ul style="list-style-type: none"> <li>• Single or Dual Redundant hot-pluggable 350W (Platinum)</li> </ul>	<ul style="list-style-type: none"> <li>• Single or Dual Redundant hot-pluggable 350W (Platinum) or 550W (Platinum)</li> </ul>
Fans	<ul style="list-style-type: none"> <li>• 3 or 4 non-redundant, non-hot swappable fans</li> </ul>	<ul style="list-style-type: none"> <li>• 3 or 4 non-redundant, non-hot swappable fans</li> </ul>
Form factor	<ul style="list-style-type: none"> <li>• 1U rack</li> </ul>	<ul style="list-style-type: none"> <li>• 1U rack</li> </ul>
Dimensions (HxWxD)	<ul style="list-style-type: none"> <li>• 42.8 x 434.0 x 664 (mm) (w/o bezel)</li> <li>• 1.67" x 17.09" x 26.2"(in)</li> </ul>	<ul style="list-style-type: none"> <li>• 4x 3.5" chassis: <ul style="list-style-type: none"> <li>○ 42.8 x 434.0 x 596 (mm) (w/o bezel)</li> <li>○ 1.67" x 17.09" x 23.5"(in)</li> </ul> </li> <li>• 8x 2.5" chassis: <ul style="list-style-type: none"> <li>○ 42.8 x 434.0 x 545 (mm) (w/o bezel)</li> <li>○ 1.67" x 17.09" x 21.5"(in)</li> </ul> </li> </ul>
Weight	<ul style="list-style-type: none"> <li>• Max 29.54 lb/13.4 Kg</li> </ul>	<ul style="list-style-type: none"> <li>• Max 29.98 lb/13.6 Kg</li> </ul>

## Product specifications

The following table lists the technical specifications for the PowerEdge R340:

**Table 2. Technical specifications**

Features	Specifications
<b>Form Factor</b>	<ul style="list-style-type: none"> <li>• 1U rack</li> </ul>
<b>Processors</b>	<ul style="list-style-type: none"> <li>• Intel® Xeon® processor E-2200 and E-2100 product family</li> <li>• Intel® Core™ i3</li> <li>• Intel® Pentium®</li> <li>• Intel® Celeron</li> </ul>
<b>Processor sockets</b>	<ul style="list-style-type: none"> <li>• 1</li> </ul>
<b>Front Side Bus or HyperTransport</b>	<ul style="list-style-type: none"> <li>• Intel DMI 3.0</li> </ul>
<b>Cache</b>	<ul style="list-style-type: none"> <li>• 2.0 MB per core</li> <li>• 8 MB or 12 MB</li> </ul>
<b>Chipset</b>	<ul style="list-style-type: none"> <li>• Intel C246 Chipset</li> </ul>
<b>Memory</b>	<ul style="list-style-type: none"> <li>• Up to 64GB (4 DIMM Slots)</li> <li>• 8GB/16GB 2666MT/s Unbuffered with ECC only</li> <li>• MIN/ MAX RAM: 8GB/64GB</li> </ul>

**Table 2. Technical specifications (continued)**

Features	Specifications
<b>I/O slots</b>	<ul style="list-style-type: none"> <li>● 2 GEN 3 PCIe slots:               <ul style="list-style-type: none"> <li>○ X16 slot FH (1x8 Gen3)</li> <li>○ X8 Slot LP (1x4 Gen3)</li> </ul> </li> </ul>
<b>RAID controller</b>	<ul style="list-style-type: none"> <li>● S140</li> <li>● PERC H330</li> <li>● PERC H730P</li> </ul>
<b>Host Bus Adapter (HBA)</b>	<ul style="list-style-type: none"> <li>● 12Gb SAS External HBA</li> <li>● HBA330 Internal adapter</li> </ul>
<b>Drive bays</b>	<ul style="list-style-type: none"> <li>● Up to 8 x 2.5" Hot-Plug drives</li> <li>● Up to 4 x 3.5" Hot-Plug drives</li> </ul>
<b>Maximum internal storage</b>	<ul style="list-style-type: none"> <li>● 56.0TB for 4 x 3.5" HDD config</li> <li>● 19.2TB for 8 x 2.5" HDD config</li> </ul>
<b>Hard drives</b>	<ul style="list-style-type: none"> <li>● 2.5" SSD SATA 6Gb</li> <li>● 2.5" SATA 7.2K</li> <li>● 2.5" SAS 15K HDs</li> <li>● 2.5" Near Line SAS 7.2K</li> <li>● 2.5" SAS 10K HDDs</li> <li>● 3.5" Enterprise SATA 7.2K HDDs</li> <li>● 3.5" Near Line SAS 7.2K HDDs</li> <li>● 2.5-inch SAS SSDs</li> </ul> <p>HDDs capacities: 300GB, 600GB, 900GB, 1TB, 1.2TB, 1.8TB, 2TB, 2.4TB, 4TB, 6TB, 8TB, 10TB, 12TB, 14TB</p> <p>SSD capacities: 240GB, 480GB, 960GB, 1.2TB, 1.6TB, 1.92TB, 3.84TB, and 7.68TB</p>
<b>Embedded LOM/NIC</b>	<ul style="list-style-type: none"> <li>● Integrated BROADCOM BCM5720 Gigabit Ethernet Controller</li> </ul>
<b>Communications</b>	<p>Optional add-in cards:</p> <ul style="list-style-type: none"> <li>● 10GbE Intel (Dual) Sageville Sage Pond Dual port 10Gb Base-T adapter – FH or LP</li> <li>● 10GbE Intel (Dual) Fortville Eagle Fountain Dual port 10Gb SFP+ adapter – FH or LP</li> <li>● 1GbE Intel (Dual) Powerville Troi-Stony Dual port 1Gb Base-T adapter – FH or LP</li> <li>● 1GbE Intel (Quad) Powerville Lore-Stony Quad port 1Gb Base-T adapter – FH or LP</li> <li>● 1GbE Broadcom (Dual) 5720 Bashir Dual port 1Gb Base-T adapter – FH or LP</li> <li>● 1GbE Broadcom (Quad) 5719 Cardassia Quad port 1Gb Base-T adapter – FH or LP</li> <li>● FC8 Emulex (Dual) Saturn Wildfire Dual port FC8 SFP+ adapter – FH or LP</li> </ul>
<b>Power supply</b>	<ul style="list-style-type: none"> <li>● Single or dual 350W or 550W hot-plug redundant platinum power supplies (100–240 V AC)</li> </ul>
<b>Availability</b>	<ul style="list-style-type: none"> <li>● TPM/No TPM</li> <li>● ECC memory, UDIMM</li> <li>● Hot-plug hard drives</li> <li>● Dual hot-plug redundant power supplies</li> </ul>

**Table 2. Technical specifications (continued)**

<b>Features</b>	<b>Specifications</b>
<b>Video</b>	<ul style="list-style-type: none"><li>● Integrated Matrox G200 with iDRAC9</li></ul>
<b>Remote management</b>	<ul style="list-style-type: none"><li>● Lifecycle Controller 3.0</li><li>● iDRAC9 Enterprise</li><li>● VFlash (Optional)</li></ul>
<b>Systems management</b>	<ul style="list-style-type: none"><li>● Dell Open Manage featuring Dell Management Console</li><li>● Lifecycle Controller 3.0</li><li>● iDRAC9 Enterprise</li><li>● VFlash (Optional)</li></ul>
<b>Rack support</b>	<ul style="list-style-type: none"><li>● 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</li></ul>
<b>Featured database applications</b>	<ul style="list-style-type: none"><li>● Microsoft® SQL Server® solutions</li></ul>

# Chassis views and features

## Topics:

- Front view of the system
- Back view of the system
- Internal view of the system
- Locating the information tag of your system

## 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

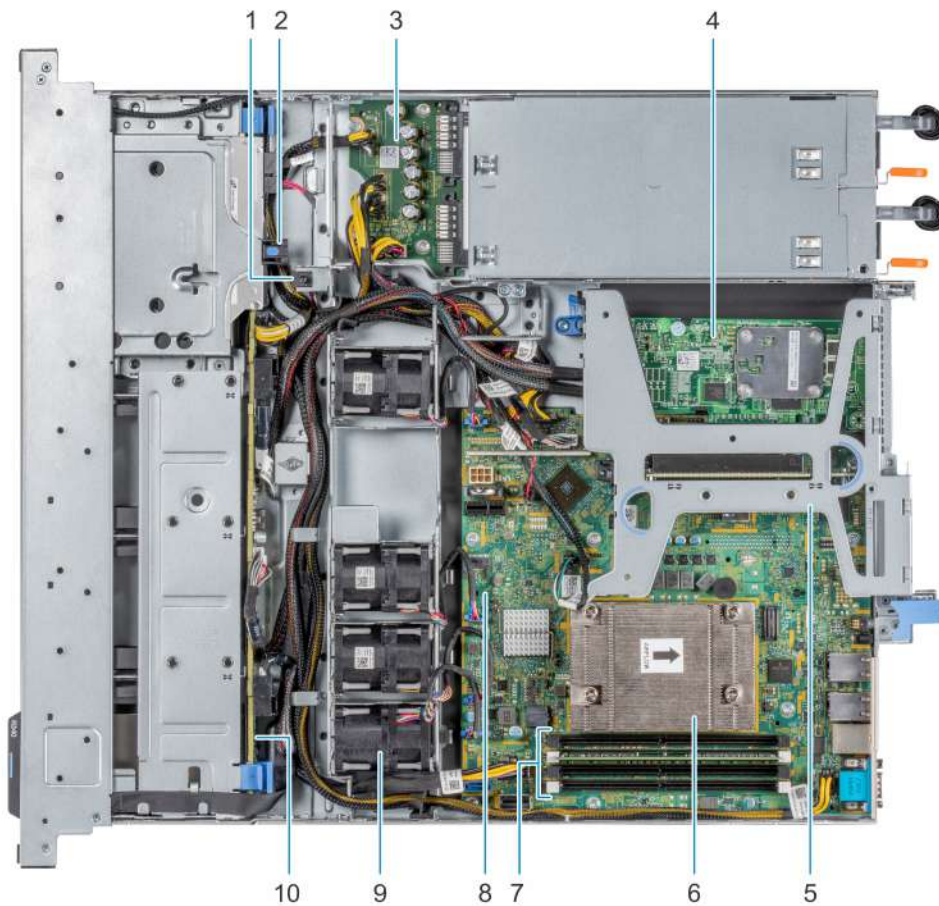
## Back view of the system



Figure 3. Back view of the systems



## Internal view of the system

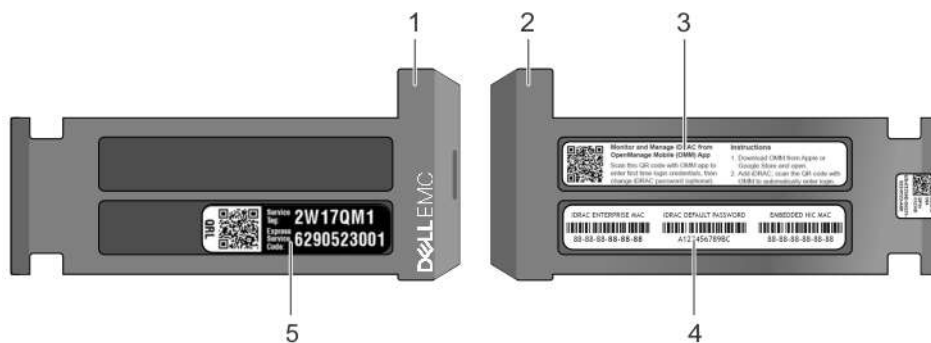


**Figure 4. Inside the system**

- |                             |                     |
|-----------------------------|---------------------|
| 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
  - i** **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

## 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 and E-2200 processor family.

### Topics:

- [Processor features](#)
- [Supported processors](#)
- [Chipset](#)

## Processor features

The following list highlights the features of the Intel® Xeon E-2100 and E-2200 processor family:

- Up to eight 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)

**i** **NOTE:** We do not support graphics with E-2100 and E-2200 processors, Graphics cannot be enabled on Dell servers using this processor due to technical restrictions.

**Software Guard Extensions (SGX):** Intel SGX functions are available on Coffee Lake Refresh SKUs: Xeon E-2274G, E-2276G, E-2286G, E-2288G processors and on these original Coffee Lake SKUs: Xeon E-2174G, E-2176G, E-2186G processors on PowerEdge R240. SGX option will be available in BIOS SETUP only if one of the supported processors are installed.

## Supported processors

**Table 3. Supported processors**

Coffee Lake Refresh Processors									
Model	Speed (GHz)	Power (Watts)	Cores	L3 Cache (MB)	Threads	Turbo	Max Memory Speed (MT/s)	Hyper-threading	SGX Support
E-2288G	3.7	95	8	16	16	Yes	2666	Yes	Y
E-2286G	4.0	95	6	12	12	Yes	2666	Yes	Y
E-2278G	3.4	80	8	12	16	Yes	2666	Yes	N
E-2276G	3.8	80	6	12	12	Yes	2666	Yes	Y
E-2274G	4.0	83	4	8	8	Yes	2666	Yes	Y
E-2246G	3.6	80	6	12	12	Yes	2666	Yes	N
E-2244G	3.8	71	4	8	8	Yes	2666	Yes	N
E-2236	3.4	80	6	12	12	Yes	2666	Yes	N

**Table 3. Supported processors (continued)**

Coffee Lake Refresh Processors									
Model	Speed (GHz)	Power (Watts)	Cores	L3 Cache (MB)	Threads	Turbo	Max Memory Speed (MT/s)	Hyper-threading	SGX Support
E-2234	3.6	71	4	8	8	Yes	666	Yes	N
E-2226G	3.4	80	6	12	6	Yes	2666	Yes	N
E-2224	3.4	71	4	8	4	Yes	2666	Yes	N
Core i3 9100	3.6	65	4	8	4	No	2666	No	N
Pentium G5420	3.8	58	2	4	4	No	2666	No	N
Celeron G4930	3.2	54	2	2	2	No	2666	No	N

Coffee Lake Refresh Processors									
Model	Speed (GHz)	Power (Watts)	Cores	L3 Cache (MB)	Threads	Turbo	Max Memory Speed (MT/s)	Hyper-threading	SGX Support
E-2186G	3.8	95	6	12	12	Yes	2666	Yes	Y
E-2176G	3.7	80	6	12	12	Yes	2666	Yes	Y
E-2174G	3.8	71	4	8	8	Yes	2666	Yes	Y
E-2146G	3.5	80	6	12	12	Yes	2666	Yes	N
E-2144G	3.6	71	4	8	8	Yes	2666	Yes	N
E-2136	3.3	80	6	12	12	Yes	2666	Yes	N
E-2134	3.5	71	4	8	8	Yes	2666	Yes	N
E-2126G	3.3	80	6	12	6	Yes	2666	No	N
E-2124 *	3.3	71	4	8	4	Yes	2666	No	N
Core i3 8100	3.6	65	4	6	4	No	2666	No	N
Pentium G5500	3.8	54	2	4	2	No	2666	No	N
Celeron G4900	3.1	54	2	2	2	No	2666	No	N

## 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

Chipset feature	C246	R340
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
<b>DMI Interface</b>	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.
<b>PCI Express interface</b>	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 generations of this technology, from software to clocking architecture to mechanical interfaces.
<b>AHCI</b>	<p>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.</p> <p>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</p>

Feature	Description
	platform hardware. Visit the Intel web site for current information on the AHCI specification.
<b>Low Pin Count Interface (LPC)</b>	<p>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.</p> <p>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.</p> <p>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.</p>
<b>Serial Peripheral Interface (SPI)</b>	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.
<b>Advanced Programmable Interrupt Controller (APIC)</b>	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.
<b>GPIO</b>	GPIO Serial Expander (GSX) is the capability provided by the chipset to expand the GPIOs on a platform that needs more GPIOs than the ones provided by the PCH. The solution requires external shift register discrete components
<b>System Management Bus (SMBus 2.0)</b>	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.
<b>JTAG Boundary-Scan</b>	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 BSD 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

DDR 4 DIMM types include Un-buffered DIMMs (UDIMM ECC). Operational memory speeds of 2666 MT/s, 2400 MT/s, and 2133 MT/s are supported but depends on DIMM capability. Standard DIMM voltage of 1.2v which supports speeds up to 2666 MT/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 Speed	DIMM type	DIMM capacity (GB)	Ranks per DIMM	Data width	SDDC support	DIMM volts	Comments
2666	UDIMM	8	1	x8	Advanced ECC	1.2	
2666	UDIMM	8	1	x8	Advanced ECC	1.2	BCC Version
2666	UDIMM	16	1	x8	Advanced ECC	1.2	
2666	UDIMM	16	1	x8	Advanced ECC	1.2	BCC Version
2400	UDIMM	4	1	x8	Advanced ECC	1.2	
2400	UDIMM	8	1	x8	Advanced ECC	1.2	
2400	UDIMM	8	1	x8	Advanced ECC	1.2	BCC Version
2400	UDIMM	16	2	x8	Advanced ECC	1.2	
2400	UDIMM	16	2	x8	Advanced ECC	1.2	BCC Version
2133	UDIMM	4	1	x8	Advanced ECC	1.2	
2133	UDIMM	4	1	x8	Advanced ECC	1.2	BCC Version
2133	UDIMM	8	2	x8	Advanced ECC	1.2	
2133	UDIMM	8	1	x8	Advanced ECC	1.2	BCC Version

DIMM Speed	DIMM type	DIMM capacity (GB)	Ranks per DIMM	Data width	SDDC support	DIMM volts	Comments
2133	UDIMM	16	2	x8	Advanced ECC	1.2	
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 4. Memory population 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

### Topics:

- [Supported drives](#)
- [Storage controller specifications](#)
- [Optical drive](#)
- [Tape drive](#)
- [Internal Dual SD Module](#)

## Supported drives

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

**Table 5. 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 (IDSMD) is optional. The IDSMD contains two SD ports directly on the motherboard. The modules are redundant. Supported iDSMD microSD cards capacity are 8/16/32/64GB

The IDSMD 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 IDSMD 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:

- Intel Ethernet I350 DP 1Gb server adapter – FH or LP
- Intel X550 Dual Port 10G Base-T adapter – FH or LP
- Intel Ethernet I350 QP 1Gb server adapter – FH or LP
- Intel X710 Dual Port 10Gb Direct Attach, SFP+, Converged Network adapter – FH or LP
- Broadcom 5720 DP 1Gb Network Interface Card – FH or LP
- Broadcom 5719 QP 1Gb Network Interface Card – FH or LP
- Emulex LPE 12002, Dual Port 8Gb Fibre Channel HBA – 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 6. 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 7. 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

## Topics:

- Power supply units
- Thermal
- 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 8. 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 9. 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
<b>Optimized thermal design</b>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Custom heat sink designs for CPU, chipset for optimum component cooling.</li> </ul>
<b>Comprehensive thermal management</b>	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

Feature	Description	
	<p>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.</p> <p>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.</p> <ul style="list-style-type: none"> <li>● Open and Closed loop fan speed control: <ul style="list-style-type: none"> <li>○ Open loop control uses system configuration information to determine fan speed based on system inlet temperature.</li> <li>○ Closed loop control method uses component temperature feedback from various sub-systems to dynamically determine optimum fan speeds.</li> <li>○ User configurable settings: <ul style="list-style-type: none"> <li>■ 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.</li> <li>■ 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.</li> </ul> </li> </ul> </li> </ul>	

## 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

Configuration	Typical	Feature rich
Backplane Type	4X 3.5" Hot-plug	8x 2.5" hot swap
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 10. Acoustical performance: Idle/operating at 25°C ambient**

Configuration	Typical	Feature rich	
LwA-UL <sup>2</sup> (Bels)	Idle	4.9	5.2
	Operating	4.9	5.3
LpA <sup>3</sup> (dBA)	Idle	38	42
	Operating	38	42
Prominent tones	No prominent tones in Idle and Operating		

**Table 11. Acoustical performance: Idle/operating at 28°C ambient**

Configuration	Typical	Feature rich
LwA-UL <sup>2</sup> (Bels)	5.2	5.5
LpA <sup>3</sup> (dBA)	37	38


**Table 12. Acoustical performance: Max loading at 35°C ambient**

Configuration	Typical	Feature rich
LwA-UL <sup>2</sup> (Bels)	8.4	8.4
LpA <sup>3</sup> (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

 **NOTE:** Windows 2012 R2 is not supported with E-2200 processor configurations.

- 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

## Dell EMC OpenManage Portfolio

Simplifying hardware management through ease of use and automation

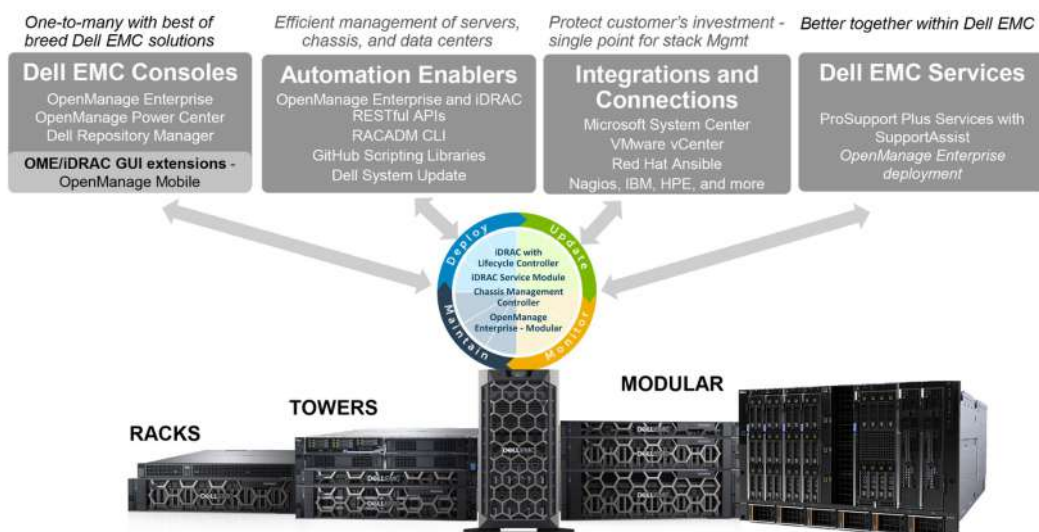


Figure 6. Dell EMC OpenManage Portfolio

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](#)
- [Dell EMC consoles](#)
- [Automation Enablers](#)
- [Integration with third-party consoles](#)
- [Connections for third-party consoles](#)
- [Dell EMC Update Utilities](#)
- [Dell resources](#)



## 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 13. Dell resources**

<b>Resource</b>	<b>Location</b>
Integrated Dell Remote Access Controller (iDRAC)	<a href="https://www.dell.com/idracmanuals">https://www.dell.com/idracmanuals</a>
iDRAC Service Module (iSM)	<a href="https://www.dell.com/support/article/sln310557">https://www.dell.com/support/article/sln310557</a>
OpenManage Ansible Modules	<a href="https://www.dell.com/support/article/sln310720">https://www.dell.com/support/article/sln310720</a>
OpenManage Essentials (OME)	<a href="https://www.dell.com/support/article/sln310714">https://www.dell.com/support/article/sln310714</a>
OpenManage Enterprise Modular	<a href="https://www.dell.com/OME-modular">https://www.dell.com/OME-modular</a>
OpenManage Mobile (OMM)	<a href="https://www.dell.com/support/article/sln310980">https://www.dell.com/support/article/sln310980</a>
OpenManage Integration for VMware vCenter (OMIVV)	<a href="https://www.dell.com/support/article/sln311238">https://www.dell.com/support/article/sln311238</a>
OpenManage Integration for Microsoft System Center (OMIMSSC)	<a href="https://www.dell.com/support/article/sln312177">https://www.dell.com/support/article/sln312177</a>
Dell EMC Repository Manager (DRM)	<a href="https://www.dell.com/support/article/sln312652">https://www.dell.com/support/article/sln312652</a>
Dell EMC System Update (DSU)	<a href="https://www.dell.com/support/article/sln310654">https://www.dell.com/support/article/sln310654</a>
Dell EMC Platform Specific Bootable ISO (PSBI)	<a href="https://www.dell.com/support/article/sln296511">Dell.com/support/article/sln296511</a>
Dell EMC Chassis Management Controller (CMC)	<a href="https://www.dell.com/support/article/sln311283">www.dell.com/support/article/sln311283</a>
OpenManage Connections for Partner Consoles	<a href="https://www.dell.com/support/article/sln312320">https://www.dell.com/support/article/sln312320</a>
OpenManage Enterprise Power Manager	<a href="https://www.dell.com/solutions/openmanage/power-management.htm">https://www.dell.com/solutions/openmanage/power-management.htm</a>
OpenManage Integration with ServiceNow (OMISNOW)	<a href="https://www.dell.com/support/article/sln317784">Dell.com/support/article/sln317784</a>

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

# Appendix A. Additional specifications

## Topics:

- Chassis dimensions
- Chassis weight
- Video
- USB ports
- Drives
- NIC ports
- Environmental specifications

## Chassis dimensions

This section describes the physical dimensions of the system.

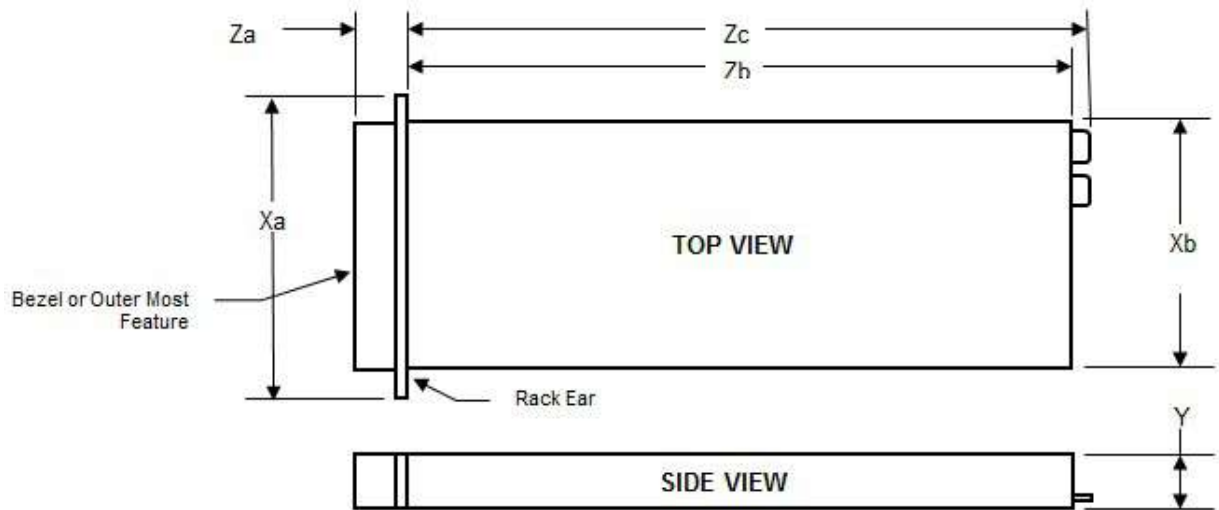


Figure 7. Chassis dimensions of the PowerEdge R340 system

Table 14. 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 15. 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 16. USB specifications**

<b>System</b>	PowerEdge R340
<b>Front panel</b>	One USB 2.0-compliant port, One Micro USB iDRAC-compliant port
<b>Back panel</b>	Two USB 3.0-compliant port
<b>Internal</b>	One USB 3.0-compliant port

# Drives

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

Drives	Specification
<b>Eight drive system</b>	Up to eight 2.5-inch, hot swappable SAS, SATA, or SATA SSD drives.
<b>Four drive system</b>	<ul style="list-style-type: none"><li>Up to four 3.5-inch cabled drives, or</li><li>Up to four 3.5-inch hot swappable SAS, SATA, or SATA SSD drives</li><li>Up to four 2.5-inch hot swappable SAS, SATA, or SATA SSD drives in 3.5-inch adapters</li></ul>

# 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](https://www.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<sub>rms</sub> at 5 Hz to 350 Hz (operation orientation).

**Storage** 1.88 G<sub>rms</sub> 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** 30482000 m (10,0006560 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.

**i** **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.

**i** **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.

**i** **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.

**i** **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.

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

## Appendix B. Standards compliance

The system conforms to the following industry standards.

**Table 17. Industry standard documents**

Standard	URL for information and specifications
<b>ACPI</b> Advance Configuration and Power Interface Specification, v2.0c	<a href="https://uefi.org/specsandtesttools">https://uefi.org/specsandtesttools</a>
<b>Ethernet</b> IEEE 802.3-2005	<a href="https://standards.ieee.org/">https://standards.ieee.org/</a>
<b>HDG</b> Hardware Design Guide Version 3.0 for Microsoft Windows Server	<a href="https://microsoft.com/whdc/system/platform/pcdesign/desguide/serverdg.msp">microsoft.com/whdc/system/platform/pcdesign/desguide/serverdg.msp</a>
<b>IPMI</b> Intelligent Platform Management Interface, v2.0	<a href="https://intel.com/design/servers/ipmi">intel.com/design/servers/ipmi</a>
<b>DDR4 Memory</b> DDR4 SDRAM Specification	<a href="https://jedec.org/standards-documents/docs/jesd79-4.pdf">jedec.org/standards-documents/docs/jesd79-4.pdf</a>
<b>PCI Express</b> PCI Express Base Specification Rev. 2.0 and 3.0	<a href="https://pcisig.com/specifications/pciexpress">pcisig.com/specifications/pciexpress</a>
<b>PMBus</b> Power System Management Protocol Specification, v1.2	<a href="http://pmbus.org/Assets/PDFS/Public/PMBus_Specification_Part_1_Rev_1-1_20070205.pdf">http://pmbus.org/Assets/PDFS/Public/PMBus_Specification_Part_1_Rev_1-1_20070205.pdf</a>
<b>SAS</b> Serial Attached SCSI, v1.1	<a href="http://www.t10.org/">http://www.t10.org/</a>
<b>SATA</b> Serial ATA Rev. 2.6; SATA II, SATA 1.0a Extensions, Rev. 1.2	<a href="https://sata-io.org">sata-io.org</a>
<b>SMBIOS</b> System Management BIOS Reference Specification, v2.7	<a href="https://dmtf.org/standards/smbios">dmtf.org/standards/smbios</a>
<b>TPM</b> Trusted Platform Module Specification, v1.2 and v2.0	<a href="https://trustedcomputinggroup.org">trustedcomputinggroup.org</a>
<b>UEFI</b> Unified Extensible Firmware Interface Specification, v2.1	<a href="https://uefi.org/specifications">uefi.org/specifications</a>
<b>USB</b> Universal Serial Bus Specification, Rev. 2.0	<a href="https://usb.org/developers/docs">usb.org/developers/docs</a>

## Appendix C Additional resources

**Table 18. Additional resources**

Resource	Description of contents	Location
Installation and Service Manual	This manual, available in PDF format, provides the following information: <ul style="list-style-type: none"> <li>• Chassis features</li> <li>• System Setup program</li> <li>• System messages</li> <li>• System codes and indicators</li> <li>• System BIOS</li> <li>• Remove and replace procedures</li> <li>• Troubleshooting</li> <li>• Diagnostics</li> <li>• Jumpers and connectors</li> </ul>	<a href="http://Dell.com/Support/Manuals">Dell.com/Support/Manuals</a>
Getting Started Guide	This guide ships with the system, and is also available in PDF format. This guide provides the following information: <ul style="list-style-type: none"> <li>• Initial setup steps</li> <li>• Key system features</li> <li>• Technical specifications</li> </ul>	<a href="http://Dell.com/Support/Manuals">Dell.com/Support/Manuals</a>
Rack Installation Instructions	This document ships with the rack kits, and provides instructions for installing a server in a rack.	<a href="http://Dell.com/Support/Manuals">Dell.com/Support/Manuals</a>
Information Update	This document ships with the system, is also available in PDF format online, and provides information on system updates.	<a href="http://Dell.com/Support/Manuals">Dell.com/Support/Manuals</a>
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.	<a href="http://Dell.com/calc">Dell.com/calc</a>



## Appendix D. Support and deployment services

### Topics:


- Dell EMC ProDeploy Enterprise Suite
- Deployment services
- Dell EMC Remote Consulting Services
- Dell EMC Data Migration Service
- ProSupport Enterprise Suite
- ProSupport Plus
- ProSupport
- ProSupport One for Data Center
- ProSupport One for Data Center
- Support Technologies
- Additional professional services
- Dell Education Services
- Dell EMC Global Infrastructure Consulting Services
- Dell EMC Managed Services

## Dell EMC ProDeploy Enterprise Suite

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

		Basic Deployment	ProDeploy	ProDeploy Plus
<b>Pre-deployment</b>	Single point of contact for project management	-	●	In-region
	Site readiness review	-	●	●
	Implementation planning	-	●	●
	SAM engagement for ProSupport Plus entitled devices	-	-	●
<b>Deployment</b>	Deployment service hours	Business hours	24x7	24x7
	Remote guidance for hardware installation or Onsite hardware installation and packaging material removal	Onsite	Remote or Onsite	Onsite
	Install and configure system software	-	Remote	Onsite
	Install support software and connect with Dell Technologies	-	●	●
	Project documentation with knowledge transfer	-	●	●
<b>Post-deployment</b>	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.

## Dell EMC ProDeploy Plus

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

## 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 page on [Dell.com](http://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 9. 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

## ProSupport

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

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

# ProSupport One for Data Center

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

- Team of assigned 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

## 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.

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- 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. 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](http://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](http://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](http://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.