Dell EMC PowerEdge C6520

Technical Guide

Part Number: E64S Series
Regulatory Type: E64S001
May 2021
Rev. A00

DELL Technologies

Notes, cautions, and warnings

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

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

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

Contents

1

System overview

Topics:

Key workloads

- Web scale applications/software as a service (SaaS)/infrastructure as a service (IaaS)
- High performance computing (HPC)
- Financial modeling and high frequency trading (HFT)
- Render nodes for visual effects rendering (VFX)
- Private cloud infrastructure
- High performance data analytics (HPDA)

New technologies

The following technologies are introduced or improved in the PowerEdge C6520.

Table 1. New Technologies

Technology	Detailed Description
Intel processor product family	Please refer the Processor section for specific SKU details. • Ultra path interconnect (up to 11.2 GT/s) • Peripheral controller hub (PCH): Intel® C620 series chipset • Core count (up to 40) • Max TDP: 270 W • Mismatched SKUs in a 2S configuration is not allowed.
3200 MT/s DDR4 memory	Select SKUs of the Intel processors support 3200 MT/s memory. The PowerEdge C6520 supports one DIMM per channel at 3200 MT/s with selected processors. Refer the Memory section for additional speed/population details. • 8 x DDR4 channels per socket, 1 DIMM per channel (1 DPC) • Up to 3200 MT/s (configuration-dependent) • RDIMMs up to 64 GB and LRDIMMs up to 128 GB supported
OCP 3.0 card	Supports standard OCP 3.0 connector with PCIe x16 bus.
M.2 card	Supports chipset M.2 SSD solution with SATA interface.
	Form factor: 22 x 80 mm
NVMe HDD	Supports two type of NVMe backplane chassis. • New 24 x 2.5-inch all NVMe backplane chassis (NVMe only, no SAS/SATA support) • 24 x 2.5-inch SAS/SATA backplane chassis with up to 8 NVMe drives (six drives per sled with up to two NVMe drives per sled)
iDRAC9 w/ Lifecycle Controller	Each PowerEdge C6520 compute node includes iDRAC9 consistent with 15G behaviors. The embedded systems management solution for Dell servers features hardware and firmware update, inventory

Table 1. New Technologies (continued)

Technology	Detailed Description
	and monitoring with in-depth memory alerting, faster performance, a dedicated gigabit port and many more features.

2

System features and generational comparison

The following table shows the comparison between the PowerEdge C6520 with the PowerEdge C6420.

Table 2. Features compared to previous version

Feature	PowerEdge C6520	PowerEdge C6420
Chassis	C6400 chassis	C6400 chassis
Processor	Up to two 3rd Generation Intel® Xeon® Processor Scalable family	Up to two 2nd Generation Intel® Xeon® Processor Scalable family
	Air and direct contact liquid cooling.	Air and direct contact liquid cooling.
	Configuration restrictions apply due to thermal or power limits.	Configuration restrictions apply due to thermal or power limits.
Memory	DDR4: 8 channels per processor	DDR4: 6 channels per processor
	Up to 16x RDIMMs and LRDIMMs	Up to 12x RDIMMs and LRDIMMS
	Speed: up to 3200 MT/s	Speed: 2900 MT/s
Storage	Backplanes: • 24 x 2.5-inch (direct and NVMe with two universal slots) • 24 x 2.5-inch all NVMe • 12 x 3.5-inch • No backplane	Backplanes: • 24 x 2.5-inch (direct, expander and NVMe with two universal slots) • 12 x 3.5-inch direct • No-backplane
	Internal: uSD card, M.2 SATA BOSS 1.5	Internal: uSD card, M.2 SATA BOSS 1.0
	No support for persistent memory	No support for persistent memory
Storage controllers	HW RAID: PERC 10: H345, HBA345, and H745	HW RAID: PERC 9 Mini (Mini H330, H730P, HBA330)
	Chipset: SATA	Chipset: SATA
	SW RAID: Yes, S150	SW RAID: Yes, S140
I/O slots	2 PCIe Gen4 HH/HL slots, x16 (network, storage, AIC)	1 PCIe Gen3 HH/HL slot, x16
	1 OCP3 Gen4 slot x16	1 x16 OCP Slot (network)
		1 MEZZ slot x8 (storage),
LOM	Single port 1 Gbe LOM (Broadcom)	Single port 1 Gbe LOM (Intel)
PSU	Support for 2 x 1600 W, 2000 W, 2400 W, and 2600 W	Support for 2 x 1600 W, 2000 W, and 2400 W
	Support 1+1 with FTR	Support 1+1 with FTR
Systems management	iDRAC9 with Lifecycle Controller	iDRAC9 with Lifecycle Controller
Accelerators	At least one GPU/FPGA/PAC (up to 75 W)	NA
CSIL	Tier-1 + CMT approved exception countries	Tier-1 + CMT approved exception countries

3

Chassis views and features

Topics:

- Chassis views

Chassis views

The PowerEdge C6400 chassis is a rack mount 2U chassis with static rails. It is leveraged from previous 14G generation and some new highlights are:

- New chassis option - 24 x 2.5-inch NVMe backplane configuration (optimized for use cases demanding higher IOPS such as cache tier
- New higher wattage power supply – 2600 W

The table provides a summary of different chassis options that will be available.

Table 3. PowerEdge C6400 available chassis options

Chassis type	Description	Liquid cooling	SAS	SATA	SSD	NVMe	Min HDD	Max HDD	Max NVMe
Diskless	No backplane	Yes	N/A	N/A	N/A	N/A	0	0	N/A
2.5 inches SAS/SATA	2.5 inches Direct Backplane	Yes	Yes	Yes	Yes	N/A	1	24	N/A
2.5 inches SAS/ SATA/ NVMe	2.5 inches NVMe Backplane	Yes	Yes	Yes	Yes	Yes	0*	24	2 NVMe drives or sled
2.5 inches NVMe	New 2.5 inches All NVMe Backplane (No SAS/SATA support)	Yes	No	No	Yes	Yes	1	24	6 NVMe drives or sled
3.5 inches	3.5 inches Direct Backplane	Yes	Yes	Yes	Yes	N/A	1	12	N/A

NOTE: * If configured with on-board SATA controller

The PowerEdge C6400 is a rack mount 2U chassis, it contains several elements:

- Chassis management board (CM Board)
- Power interposer board (PIB)
- Linking board
- Control panel with LED/LED board (ear board)
- Mid-plane board
- 24 x 2.5-inch SAS/SATA, with up to 8 x NVMe, or NVMe only
- 12 x 3.5-inch SAS/SATA
- Diskless, no backplane
- Thermal sensor board
- Power supply units (PSU)
- Fans

Front view of the system

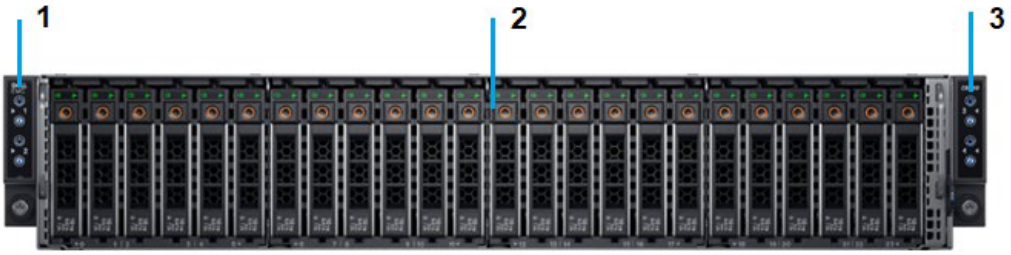


Figure 1. Front view of the C6400 Chassis

1. Left control panel
2. 2.5 inches drive bay
3. Right control panel

Rear view of the system

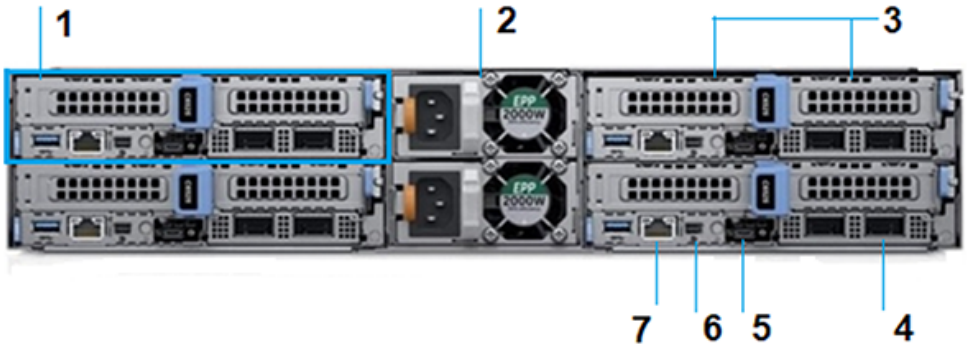


Figure 2. Rear view of the system

1. 1U half width compute sled
2. Power Supplies
3. PCIe Gen4 x16 slots
4. OCP 3.0 Gen4 x16 slot
5. Micro USB port for iDRAC Direct
6. Mini Display Port for video
7. 1 GbE (RJ45) port for systems mgmt. and/or host

Inside the system

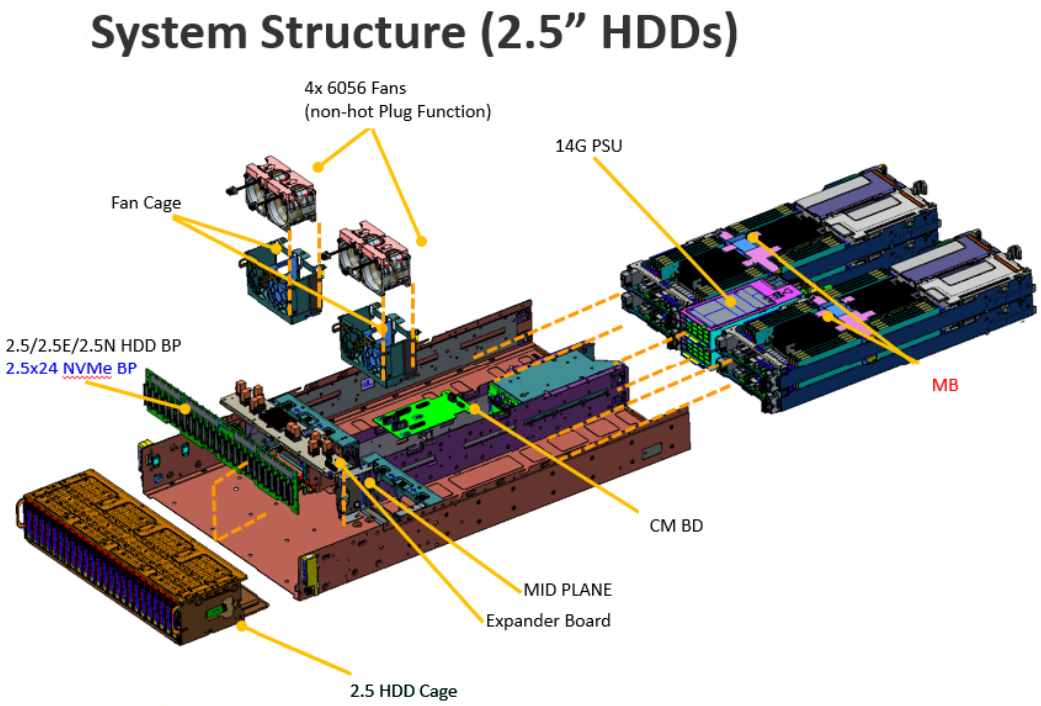


Figure 3. Inside the system C6400

Quick Resource Locator

Figure 4. Quick Resource Locator for C6520

4

Processor

Topics:

Processor features

The 3rd Generation Xeon Scalable Processors stack is next generation data center CPU offering with the latest features, increased performance, and incremental memory options. This latest generation Xeon Scalable processor will support usages from entry designs based on Intel Xeon Silver processors to advanced capabilities offered in new Intel Xeon Platinum processor.

The following lists the features and functions included in the upcoming 3rd Generation Intel Xeon Scalable Processor offering:

- Faster UPI with 3 Intel Ultra Path Interconnect (Intel UPI) at 11.2 GT/s (supported in gold and platinum options)
- More, Faster I/O with PCI Express 4 and up to 64 lanes (per socket) at 16 GT/s
- Enhanced Memory Performance with support for up to 3200 MT/s DIMMs (2 DPC)
- Increased Memory Capacity with up to 8 channels and up to 256 GB DDR4 DIMM support

Supported processors

Table 4. CPU BIN Stack

Proc	Clock Speed(GHz)	Cache (M)	UPI (GT/s)	Cores	Threads	Turbo	Memory Speed(MT/s)	Memory Capacity	Optane Memory Capable	TDP
8380	2.3	60	11.2	40	80	Turbo	3200	2 TB	Y	270W
8368Q	2.6	57	11.2	38	76	Turbo	3200	2 TB	Y	270W
8368	2.4	57	11.2	38	76	Turbo	3200	2 TB	Y	270W
8360Y	2.4	54	11.2	36	72	Turbo	3200	2 TB	Y	250W
8358	2.6	48	11.2	32	64	Turbo	3200	2 TB	Y	250W
8352Y	2.2	48	11.2	32	64	Turbo	3200	2 TB	Y	205W
8352V	2.1	54	11.2	36	72	Turbo	3200	2 TB	Y	195W
6354	3	39	11.2	18	36	Turbo	3200	2 TB	Y	205W
6348	2.6	42	11.2	28	56	Turbo	3200	2 TB	Y	235W
6346	3.1	36	11.2	16	32	Turbo	3200	2 TB	Y	205W
6342	2.8	36	11.2	24	48	Turbo	3200	2 TB	Y	230W
6338	2	36	11.2	32	64	Turbo	3200	2 TB	Y	205W
6336Y	2.4	36	11.2	24	48	Turbo	3200	2 TB	Y	185W
6334	3.6	18	11.2	8	16	Turbo	3200	2 TB	Y	165W
6330	2	42	11.2	28	56	Turbo	3200	2 TB	Y	205W
6326	2.9	24	11.2	16	32	Turbo	3200	2 TB	Y	185W

Table 4. CPU BIN Stack (continued)

Proc	Clock Speed(GHz)	Cache (M)	UPI (GT/s)	Cores	Threads	Turbo	Memory Speed(MT/s)	Memory Capacity	Optane Memory Capable	TDP
6314U	2.3	48	11.2	32	64	Turbo	3200	2 TB	Y	205W
6312U	2.4	36	11.2	24	48	Turbo	3200	2 TB	Y	185W
5320	2.2	39	11.2	26	52	Turbo	2933	2 TB	Y	185W
5318Y	2.1	36	11.2	24	48	Turbo	2933	2 TB	Y	165W
5317	3	18	11.2	12	24	Turbo	2933	2 TB	Y	150W
5315Y	3.2	12	11.2	8	16	Turbo	2933	2 TB	Y	140W
4316	2.3	30	10.4	20	40	Turbo	2666	2 TB	N	150W
4314	2.4	24	10.4	16	32	Turbo	2666	2 TB	Y	135W
4310	2.1	18	10.4	12	24	Turbo	2666	2 TB	N	120W
4309Y	2.8	12	10.4	8	16	Turbo	2666	2 TB	N	105W

5

Memory subsystem

The PowerEdge C6520 supports up to 16 DIMMs in a 2S configuration, with up to 2 TB of memory capacity and speeds of up to 3200 MT/s. The PowerEdge C6520 has eight DIMM channels per processor with one DIMM per channel (DPC).

The PowerEdge C6520 supports 16 GB/32 GB/64 GB (registered) RDIMMs. It supports 128 GB LRDIMMs and it will not support UDIMMs or persistent memory.

Topics:

Supported memory

The table below lists the memory technologies supported by the platform.

Table 5. Supported memory type

Feature	PowerEdge C6520 (DDR4)
DIMM type	RDIMM
	LRDIMM
Transfer speed	3200 MT/s
Voltage	1.2 V (DDR4)

The table below lists the supported DIMMs for the platform at launch. For information on memory configuration, see the *Dell EMC PowerEdge C6520 Installation and Service Manual* at www.dell.com/poweredgemanuals.

Table 6. Supported DIMMs

DIMM speed	DIMM type	DIMM capacity (GB)	Ranks per DIMM	Data width	Density	Technology
3200	RDIMM	16	2R	8	8 GB	SDP
3200	RDIMM	32	2R	4	8 GB	SDP
3200	RDIMM	64	2R	4	16 GB	SDP
3200	LRDIMM	128	8R	4	8 GB	3DS-4H
3200	LRDIMM	128	4R	4	16 GB	3DS-2H

Memory speed

The number of DIMMs per channel (DPC) does affect the operating memory bus speeds. Below is a table identifying the bus speeds for Intel Xeon Scalable processors:

Table 7. DIMM performance details

DIMM type	DIMM ranking	Capacity	DIMM rated voltage, speed	1 DPC
RDIMM	1R	8 GB	DDR4 (1.2 V), 3200	D:3200

Table 7. DIMM performance details (continued)

DIMM type	DIMM ranking	Capacity	DIMM rated voltage, speed	1 DPC
RDIMM	2R	16 GB, 32 GB, 64 GB	DDR4 (1.2 V), 3200	D:3200
LRDIMM	4R	128 GB	DDR4 (1.2 V), 3200	D:3200
LRDIMM	8R	128 GB	DDR4 (1.2 V), 3200	D:3200

6

Storage

Topics:

- Storage controllers
- Supported drives
- External Storage

Storage controllers

Table 8. PERC series controller offerings

Performance Level	Controller & Description
Entry Level	S150 (SATA, NVMe) SW RAID SATA, NVMe
Value	H345, HBA345
Value Performance	H745

Supported drives

The table shown below lists the internal drives supported by the PowerEdge C6520.

Table 9. Supported drives

Form factor	Type	Speed	Rotational speed	Capacities
2.5 inches	SATA	6 GB	SSD	120 GB, 200 GB, 240 GB, 400 GB, 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, 3.84 TB, 7.68 TB
2.5 inches	SATA	6 GB	7.2K	1 TB, 2 TB
2.5 inches	SAS	12 GB	7.2K	2 TB
2.5 inches	SAS	12 GB	SSD	400 GB, 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, 3.2 TB, 3.84 TB, 6.4 TB, 7.68 TB, 12.8 TB
2.5 inches	SAS	12 GB	10K	600 GB, 1.2 TB, 2.4 TB
2.5 inches	SAS	12 GB	15K	300 GB, 600 GB, 900 GB
M.2	SATA	6 GB	SSD	240 GB, 380 GB
U.2	NVMe	NA	SSD	960 GB, 1.6 TB, 1.92 TB, 3.2 TB, 3.84 TB,

Table 9. Supported drives (continued)

Form factor	Type	Speed	Rotational speed	Capacities
				6.4 TB, 7.68 TB, 12.8 TB
uSD	NA	NA	uSD	16 GB, 32 GB, 64 GB

External Storage

The C6520 does not support any external storage.

7

Networking

Topics:

Overview

PowerEdge offers a wide variety of options to get information moving to and from our servers. Industry best technologies are chosen, and systems management features are added by our partners to firmware to tie in with iDRAC and Lifecycle Controller. These adapters are rigorously validated for worry-free, fully supported use in our servers.

OCP 3.0 support

Supported OCP cards

OCP NIC 3.0 vs. Rack Network Daughter Card comparisons

Table 10. OCP 3.0, 2.0, and rNDC NIC Comparison

Form Factor	Dell rNDC	OCP 2.0 (LOM Mezz)	OCP 3.0	Note
PCIe Gen	Gen 3	Gen 3	Gen 4	Supported OCP3 are SFF (small form factor)
Max PCIe Lanes	x8	Up to x16	Up to x16	See server slot spec
Shared LOM	Yes	Yes	Yes	This is iDRAC port redirect
Aux Power	Yes	Yes	Yes	Used for Shared LOM

8

PCIe Subsystem

Topics:

- PCIe risers

PCIe risers

Riser 1A

Major components:

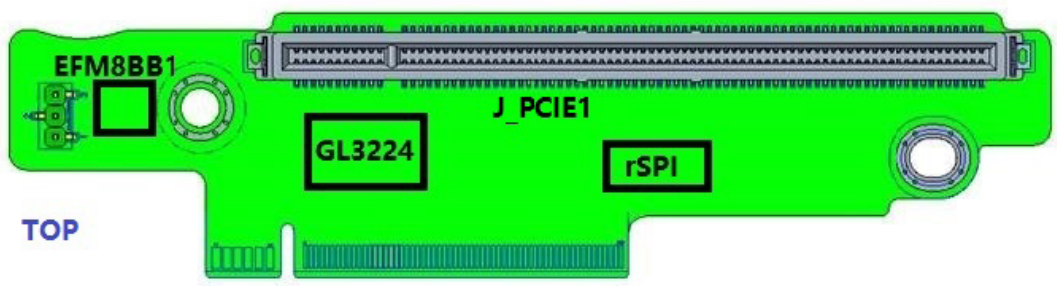
- Standard PCIe x16 connector, PCIe x16 source from processor 1.
- GL3224-OYI04 USB3.0 SD 3.0 Single LUN Memory Card Reader Controller. Supported MicroSD card capacities at RTS – 16 GB, 32 GB, and 64 GB.
- RSPI – This part is used during service operations in the field. When replaced by new sled, the PCIe riser move from old sled to new sled. Lifecycle controller has easy-restore feature that can restore the new sled to same configuration and firmware state as old sled. This operation also includes personality module used for liquid cooling.
- System API (SAPI) – The core of the Riser SAPI consists of the Silicon Labs EFM8BB1 micro controller, and the MCU will periodically transmits pertinent riser data over a 1-wire UART to the host system (CPLD and BIOS).
  - The payload between riser MCU and host system includes two information:
    - One is fixed riser information which is determined using a table structure that can be read through two MCU's ADC pin. Meanwhile, it is pre-programmed into the MCU code base. (e.g. riser type, slot width, slot source lanes, etc.).
    - The other is dynamic riser information which can be read in through the MCU's GPIO pins and serialized down to the host system. (e.g. adapter presence detect, WAKE#, etc.)

GL3224 and EFM8BB1 features:

- Support USB mass storage class bulk-only transport (BOT)
- Super speed USB or USB 2.0 transceiver macro (UTM), serial interface engine (SIE), and embedded power-on reset (POR)
- Support secure digital v1.0 / v1.1 / v2.0/ SDHC / SDXC (capacity up to 2 TB)
- Support serial peripheral interface (SPI) for firmware upgrade to SPI flash memory via USB interface

Riser 1A dimension

Board Size: 126.30x31.42 mm, 8 Layers



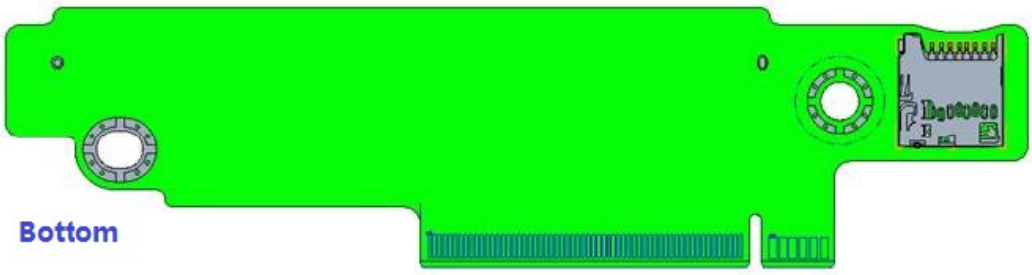


Figure 5. Riser 1A dimension

Riser 1B

Major components:

- Standard PCIe x16 connector, PCIe x16 source from processor 1 x8 and x8 from processor 2 by cable.
- RSPI - This part is used during service operations in the field. When replaced by new sled, the PCIe riser move from old sled to new sled. Lifecycle controller has easy-restore feature that can restore the new sled to same configuration and firmware state as old sled. This operation also includes personality module used for liquid cooling.
- System API (SAPI) – The core of the riser SAPI consists of the Silicon Labs EFM8BB1 microcontroller, and the MCU will periodically transmits pertinent riser data over a 1-wire UART to the host system (CPLD and BIOS).
  - The payload between riser MCU and host system includes two information:
    - One is fixed riser information which is determined using a table structure that can be read through two MCU's ADC pin. Meanwhile, it is pre-programmed into the MCU code base. (e.g. riser type, slot width, slot source lanes, etc.)
    - The other is dynamic riser information which can be read in through the MCU's GPIO pins and serialized down to the host system. (e.g. adapter presence detection, WAKE#, etc.)

Riser 1B dimension

Board size: 144.38 x 31.45 mm, 8 layers

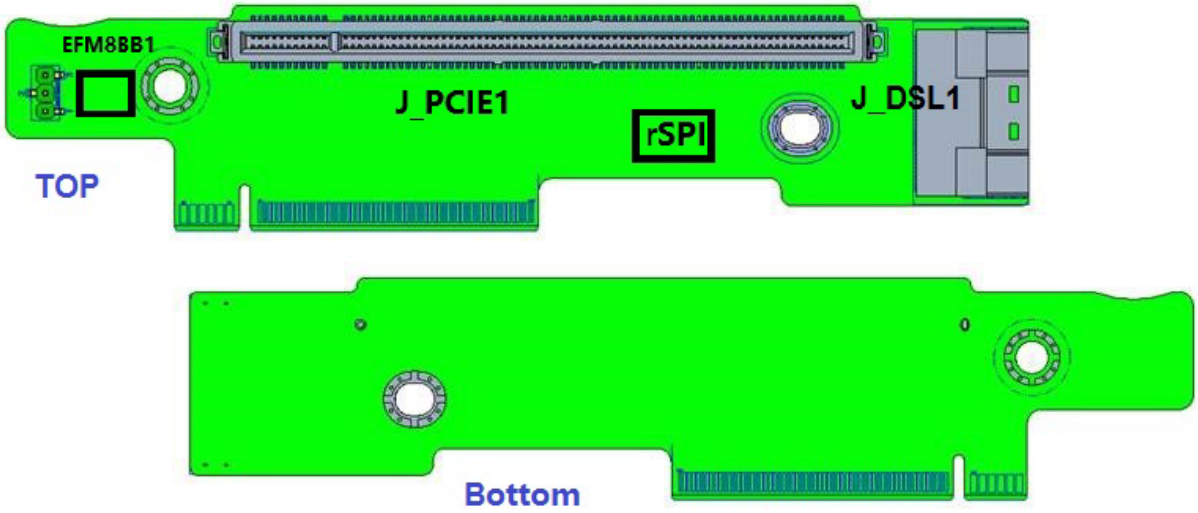


Figure 6. Riser 1B dimension

Riser 2B

Major components:

- Standard PCIe x16 connector, PCIe x16 source from processor 1.
- System API (SAPI) – The core of the riser SAPI consists of the Silicon Labs EFM8BB1 micro controller, and the MCU will periodically transmits pertinent riser data over a 1-wire UART to the host system (CPLD and BIOS).
  - The payload between riser MCU and host system includes two information:
    - One is fixed riser information which is determined using a table structure that can be read through two MCU's ADC pin. Meanwhile, it is pre-programmed into the MCU code base. (e.g. riser type, slot width, slot source lanes, etc.)
    - The other is dynamic riser information which can be read in through the MCU's GPIO pins and serialized down to the host system. (e.g. adapter presence detection, WAKE#, etc.)

Riser 2B dimension

Board size: 158.73 x 29.35 mm, 10 layers

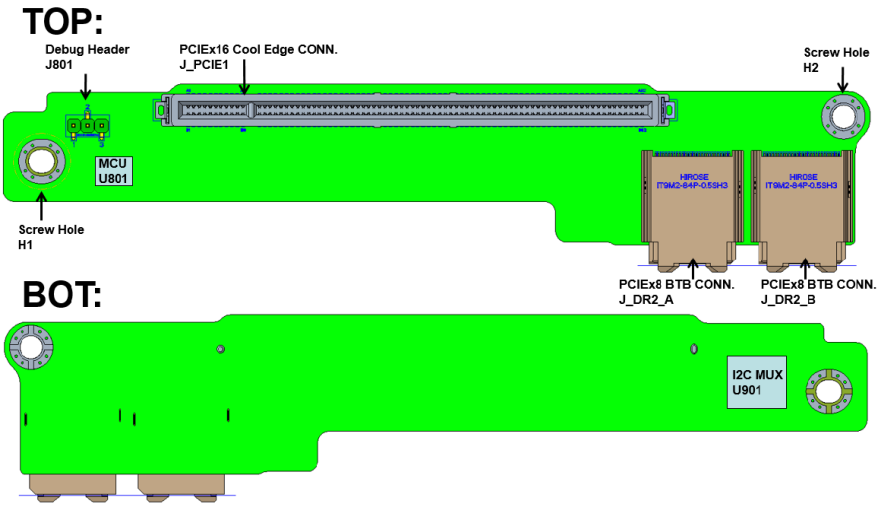


Figure 7. Riser 2B dimension

M.2 SATA Riser

The M.2 x16 Mezz SATA Riser can connect M.2 x16 module to J_M2 of main board. Only SATA0 port will be supported for internal boot purpose.

PCB Dimension:

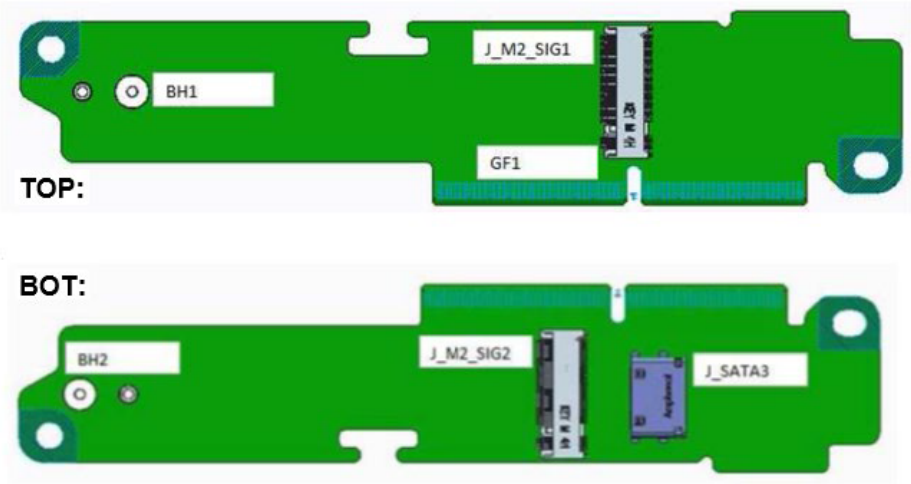


Figure 8. M.2 X 16 SATA Riser PCB Dimension

Table 11. PCIe Riser Slot CPU Orientation Matrix

Expansion Slots Mapping					
Riser	**Slot #**	**Form Factor**	**Controlling CPU**	**Slot's Electrical Bandwidth / Physical Connector**	**Power**
—	—	—	CPU	PCIe Gen4 x 16 (through Riser 1A)	75W
LP PCIe Slot (SLOT1)	1	Low profile	CPU1/2	PCIe Gen4 x8 from CPU1, x8 from CPU2 (through Riser 1B to support SNAPI card)	25W
LP PCIe Slot (SLOT2)	2	Low profile	CPU1	PCIe Gen4 x16 (through Riser 2B)	75W
OCP Slot	INT	Low profile	CPU1	PCIe Gen4 x 16	80W
M.2 BOSS slot	3	Proprietary	CPU2	PCIe Gen4 x 16	25W

9

Power, thermal, and acoustics

PowerEdge servers have an extensive collection of sensors that automatically track thermal activity, which helps regulate temperature thereby reducing server noise and power consumption. The table below lists the tools and technologies Dell offers to lower power consumption and increase energy efficiency.

Topics:

Power

Please refer to the “Power Supply Subsystem” topic.

Power Supply Subsystem

Power Supply Options Overview

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

For C6400 chassis, the power supply subsystem is formed with two AC-DC redundant power supplies. The power supply provides +12V and +12Vaux for redundant design. There are several voltage regulators in the system to supply different voltage levels needed by different logic devices.

NOTE: Unlike C6300 chassis where PSUs are resident on the left side of the chassis, C6400 chassis has PSUs in the center. Customers need to note this change to plan power cabling accordingly.

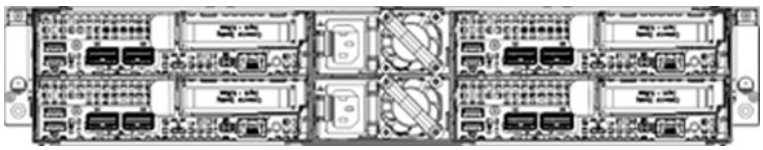


Figure 9. C6400 PSUs in the center of the chassis

The following Power Supply configuration options are available on C6400 chassis:

- Dual, Hot-plug Fault Tolerant Redundant Power Supply (1+1),1600W
- Dual, Hot-plug Fault Tolerant Redundant Power Supply (1+1), 2000W
- Dual, Hot-plug Fault Tolerant Redundant Power Supply (1+1), 2400W
- Dual, Hot-plug Fault Tolerant Redundant Power Supply (1+1), 2600W
- Dual, Hot-plug Non-Redundant Power Supply (2+0), 1600W
- Dual, Hot-plug Non-Redundant Power Supply (2+0), 2000W
- Dual, Hot-plug Non-Redundant Power Supply (2+0), 2400W
- Dual, Hot-plug Non-Redundant Power Supply (2+0), 2600W
- Dual, Hot-plug Fully Redundant Power Supply (1+1),1600W*
- Dual, Hot-plug Fully Redundant Power Supply (1+1), 2000W*
- Dual, Hot-plug Fully Redundant Power Supply (1+1), 2400W*

- Dual, Hot-plug Fully Redundant Power Supply (1+1), 2600W*

NOTE: Due to significant increase in power requirements for Intel Ice Lake processors, fully redundant (1+1) PSU setting is not possible for many configurations. Please consider going with Fault Tolerant Redundant PSU instead.

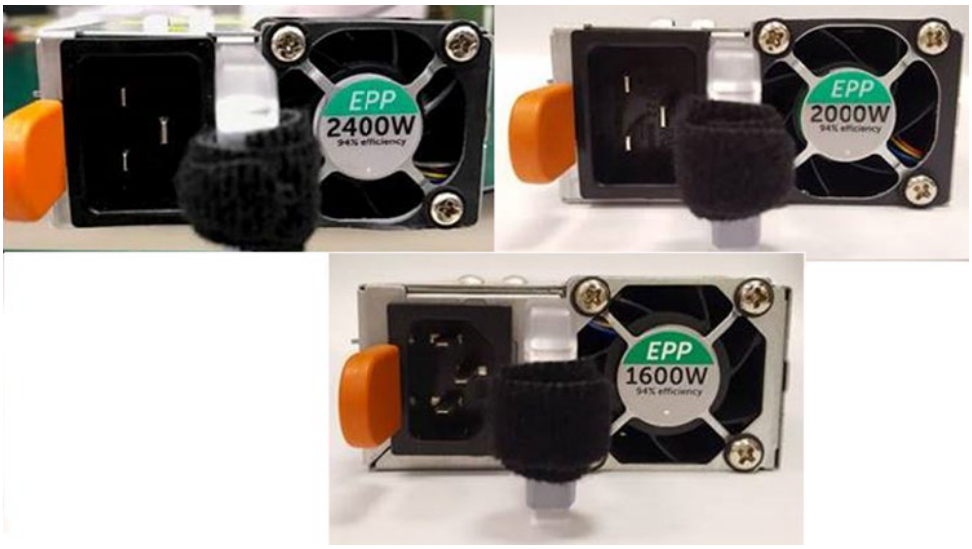


Figure 10. C6400 PSU Options

NOTE: Please refer below PSU AC side where the cables plug:

- 1600W/800W: IEC-C14
- 2000W/1000W: IEC-C20
- 2400W/1400W: IEC-C20
- 2600W/1400W: IEC-C20

Below illustration shows both power cord (outlet) and power supply side (inlet) for reference.

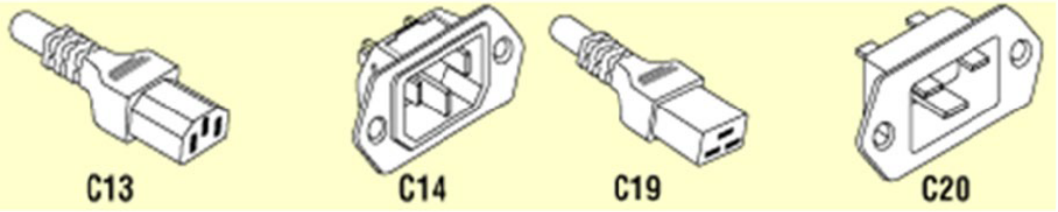


Figure 11. Sample illustration of inlet/outlet connectors

Below table lists the power capacity of all three PSUs in High/Low line operation mode.

Table 12. C6400 PSU Rating

Operation model\ PSU type	2600W	2400W	2000W	1600W	2000W - 240VDC
For High Line Operation(200-240)	2600W	2400W	2000W	1600W	2000W
For Low Line Operation(100-120)	1400W	1400W	1000W	800W	1000W
192VDC-288VDC	***	***	***	***	2000W

LED Indicator behavior of Power Supplies

AC Power Supply Indicator is now integrated into the transparent handle making it easier to see in dense racks. The handle will light-up when powered on and color will provide status. The LED indicator behavior is as below:

Table 13. PSU LED Indicator Behavior

	Indication	LED and State
1	Input Fail / System is Off	Off
2	Input Ok / System is On	Solid Green
3	DC output Ok	Solid Green
4	PSU Failsafe Failure	Blinking Amber
5	PSU Firmware Updating	Blinking Green
6	PSU Firmware Update Failed	Blinking Amber
7	PSU Mismatch	Blinking Green and Off

Thermal

Thermal design

Thermal management of the platform helps deliver high performance with the right amount of cooling to components, while maintaining the lowest fan speeds possible. This is done across a wide range of ambient temperatures from 10°C to 35°C (50°F to 95°F) and to extended ambient temperature ranges (see Environmental Specifications).

Acoustics

Acoustical performance

Acoustical configuration details are provided in Acoustical configurations of C6520 and acoustical performance data for the configurations is included in Acoustics Performance of the C6520 acoustical configurations. Each configuration has been tested according to Dell EMC acoustical standards.

Table 14. Acoustical configurations of C6520

Configuration	HPC	Webtech
CPU Type	Intel	Intel
CPU TDP / Cores	205W / 32C	185W / 32C
CPU Quantity	2	2
RDIMM Memory	32GB DDR4 RDIMM	16GB DDR4 RDIMM
Memory Quantity	16	12
Backplane Type	X	24*2.5 inches
HDD Type	X	2.5 inches NVMe
HDD Quantity	X	3pcs/blade
PSU Type	2000W	2000W

Table 14. Acoustical configurations of C6520 (continued)

Configuration	HPC	Webtech
PSU Quantity	2	2
OCP	1x 1GbE	X
PCI 1	Mellanox Connect X-4 Single Port VPI QSFP28 EDR 100 GbE	Intel® 25GbE 2P XXV710
PCI 2	X	Intel® 25GbE 2P XXV710
BOSS	Yes	Yes
Others	X	X

Table 15. Acoustics Performance of the C6520 acoustical configurations

Configuration		HPC	Webtech
Acoustical Performance: Idle/ Operating @ 25 °C Ambient			
L wA,m (B)	Idle Operating	7.1 7.7	6.8 7.5
K v (B)	Idle Operating	0.4 0.4	0.4 0.4
L pA,m (dB)	Idle Operating	54 60	51 58
Prominent Tones (dB)	Idle Operating	13 12	11 11
Prominent tones No prominent tones in Idle and Operating			
Acoustical Performance: Idle @ 28 °C Ambient			
L wA,m (B) K v (B) L pA,m (dB)		7.4 0.4 58	7.1 0.4 54
Acoustical Performance: Max. Loading @ 35 °C Ambient			
L wA,m (B) K v (B) L pA,m (dB)		8.5 0.4 67	8.6 0.4 69

- LwA,m: The declared mean A-weighted sound power level (LwA) is calculated per section 5.2 of ISO 9296 (2017) with data collected using the methods described in ISO 7779 (2010). Data presented here may not be fully compliant with ISO 7779.
- LpA,m: The declared mean A-weighted emission sound pressure level is at the bystander position per section 5.3 of ISO 9296 (2017) and measured using methods described in ISO 7779 (2010). The system is placed in a 24U rack enclosure, 25cm above a reflective floor. Data presented here may not be fully compliant with ISO 7779.
- Prominent tones: Criteria of D.6 and D.11 of ECMA-74 (17 th ed., Dec. 2019) are followed to determine if discrete tones are prominent and to report them, if so.
- Idle mode: The steady-state condition in which the server is energized but not operating any intended function.
- Operating mode: The maximum of the steady state acoustical output at 50% of CPU TDP or active HDDs per C.9.3.2 in ECMA-74 (17 th ed., Dec. 2019).

Dell typically categorizes servers in 5 categories of acoustically acceptable usage:

- Category 1: Table-top in Office Environment
- Category 2: Floor-standing in Office Environment
- Category 3: General Use Space
- Category 4: Attended Data Center
- Category 5: Unattended Data Center

The C6520 server is approved for use in category 5 Unattended Data Center. Details and acoustical specification category table coming soon.

10

Rack, rails, and cable management

Key factors in selecting the proper rails include:

- Identifying the type of rack in which they will be installed
- The spacing between the front and rear mounting flanges of the rack
- The type and location of any equipment mounted in the back of the rack such as power distribution units (PDUs), and the overall depth of the rack

Reference the DellEMC Enterprise Systems Rail Sizing and Rack Compatibility Matrix link for the following information

- Specific details about rail types and their functionalities
- Rail adjustability ranges for various rack mounting flange types
- Rail depth with and without cable management accessories

Rack types supported for various rack mounting flange types

Topics:

Rails information

The rack rail system for C6400 server provides tool-less support for 4-post racks with square or unthreaded round holes. There is no support for a cable management arm (CMA) or a strain relief bar (SRB). The static rails support a wide variety of racks.

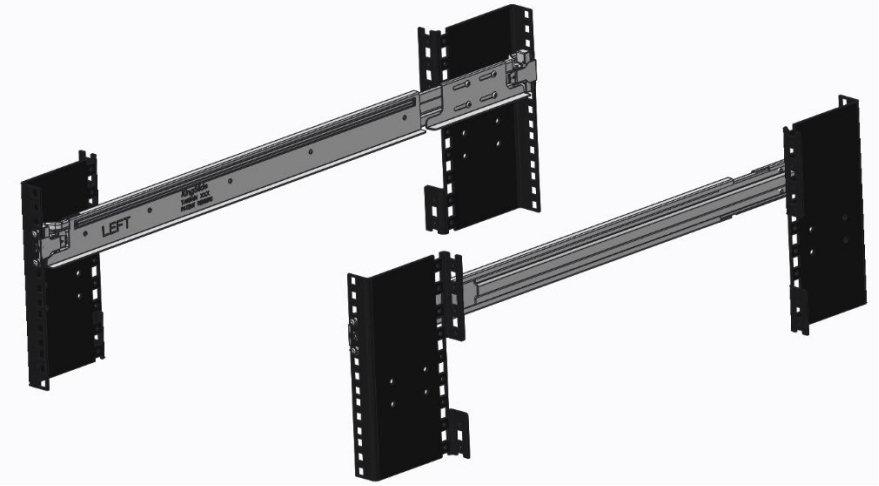


Figure 12. Static Rail

The key factor in selecting the proper rails is identifying the type of rack in which they are installed. The static rail supports tool-less mounting in 19 inches-wide, EIA-310-E compliant square-hole and unthreaded round-hole 4- post racks. The static rail does not support mounting in threaded-hole racks.

NOTE: APC racks are also supported

Table 16. Rail adjustability range

Rail Adjustability range (mm)							
				Square		Round	
Product	**Rail Identifier**	**Mounting Interface**	**Rail Type**	**Min**	**Max**	**Min**	**Max**
C6400	N/A	Tool-less	Static	603 mma	917 mm	603 mma	917 mm

NOTE: a – minor conversion required

Other key factors governing proper rail selection include the spacing between the front and rear mounting flanges of the rack, the type and location of any equipment mounted in the back of the rack, such as power distribution units, and the overall depth of the rack. Due to their reduced complexity and lack of CMA and SRB support, the static rails offer a greater adjustability range and a smaller overall mounting footprint than sliding rails.

For information about installing the system in a rack, see the Dell PowerEdge Rack Installation Guide on Dell.com/Support/Manuals.

11

Supported Operating Systems

The following lists the supported operating systems for the C6520:

- Citrix(R) Hypervisor (R)
- Microsoft(R) Windows Server(R) with Hyper-V
- Red Hat(R) Enterprise Linux
- SUSE(R) Linux Enterprise server
- VMware(R) ESXi(R)

The link to the specific OS versions and editions, certification matrices, Hardware Compatibility Lists (HCL) portal, and Hypervisor support can be found at Dell EMC Enterprise Operating Systems.

12

Dell EMC OpenManage systems management

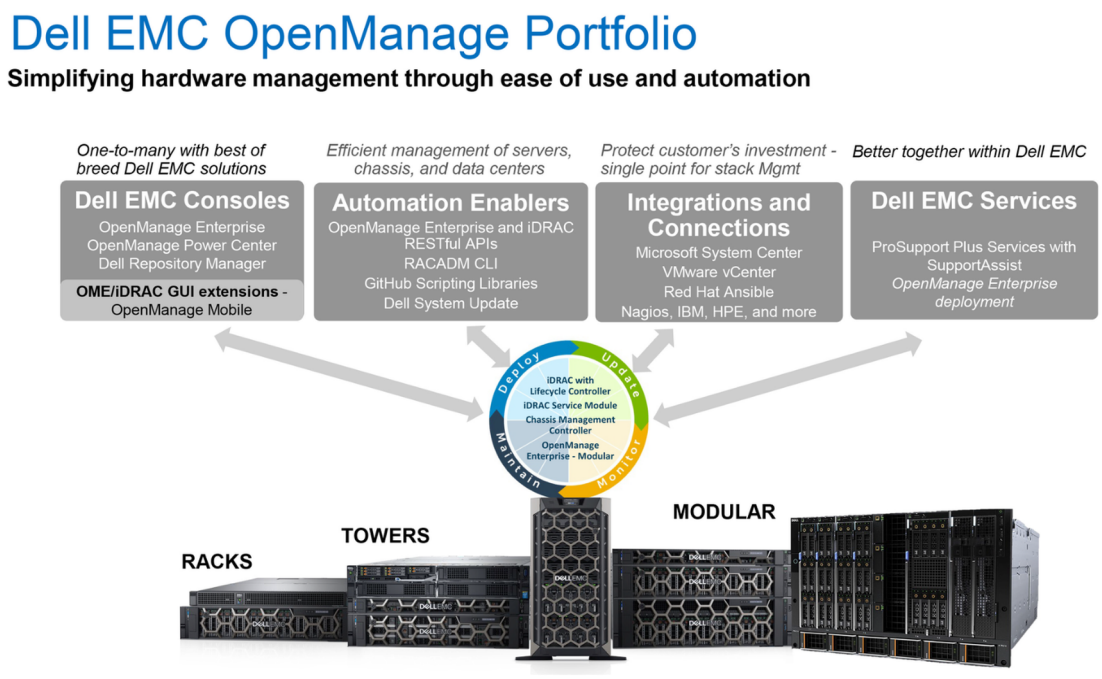


Figure 13. Dell EMC OpenManage Portfolio

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

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

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

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

Topics:

Server and Chassis Managers

- Integrated Dell Remote Access Controller (iDRAC)
- 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 17. Dell resources

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

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

13

Dell Technologies Services

Dell Technologies Services include a wide, customizable range of service choices to simplify the assessment, design, implementation, management and maintenance of IT environments and to help you transition from platform to platform. Depending on your current business requirements and the level of service right for you, we provide factory, on-site, remote, modular, and specialized services that fit your needs and budget. We'll help with a little or a lot—your choice—and provide access to our global resources.

For more information, see DellEMC.com/Services.

Topics:

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
Pre-deployment	Single point of contact for project management	-	●	In-region
	Site readiness review	-	●	●
	Implementation planning	-	●	●
	SAM engagement for ProSupport Plus entitled devices	-	-	●
Deployment	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	-	●	●
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 14. 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.

Basic Deployment

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

Dell EMC Server Configuration Services

With Dell EMC Rack Integration and other Dell EMC PowerEdge Server Configuration Services, you save time by receiving your systems racked, cabled, tested, and ready to integrate into the data center. Dell EMC staff pre-configure RAID, BIOS and iDRAC settings, install system images, and even install third-party hardware and software.

For more information, see Server Configuration Services.

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.

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.

Dell EMC ProSupport Enterprise Suite

With the ProSupport Enterprise Suite, we help keep your IT systems running smoothly, so you can focus on running your business. We will help 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 IT resources by choosing the right support model.

Figure 15. Dell EMC ProSupport Enterprise Suite

Dell EMC ProSupport Plus for Enterprise

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

- An assigned Services Account Manager who knows your business and your environment
- Immediate advanced troubleshooting from an engineer who understands your PowerEdge server
- Personalized, preventive recommendations based on analysis of support trends and best practices from across the Dell Technologies infrastructure solutions 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

Dell EMC ProSupport for Enterprise

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

- 24x7 support through phone, chat and online
- Predictive, automated tools and innovative technology
- A central point of accountability for all hardware and software issues
- Collaborative 3rd party support
- Hypervisor, operating system and application support
- Consistent experience regardless of where you are located or what language you speak
- Optional onsite parts and labor response options including next business day or four-hour mission critical

NOTE: Subject to service offer country availability.

Enterprise Support Services
Feature Comparison

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

Availability and terms of Dell Technologies services vary by region and by product. For more information, please view our Service Descriptions available on Dell.com

Figure 16. Dell EMC Enterprise Support model

Dell EMC 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, this service option offers a truly unique solution for Dell Technologies largest customers with the most complex environments.

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

ProSupport for HPC

The ProSupport for HPC provides solution-aware support including:

- Access to senior HPC experts
- Advanced HPC cluster assistance: performance, interoperability & configuration
- Enhanced HPC solution level end-to-end support
- Remote pre-support engagement with HPC Specialists during ProDeploy implementation

Learn more at DellEMC.com/HPC-Services.

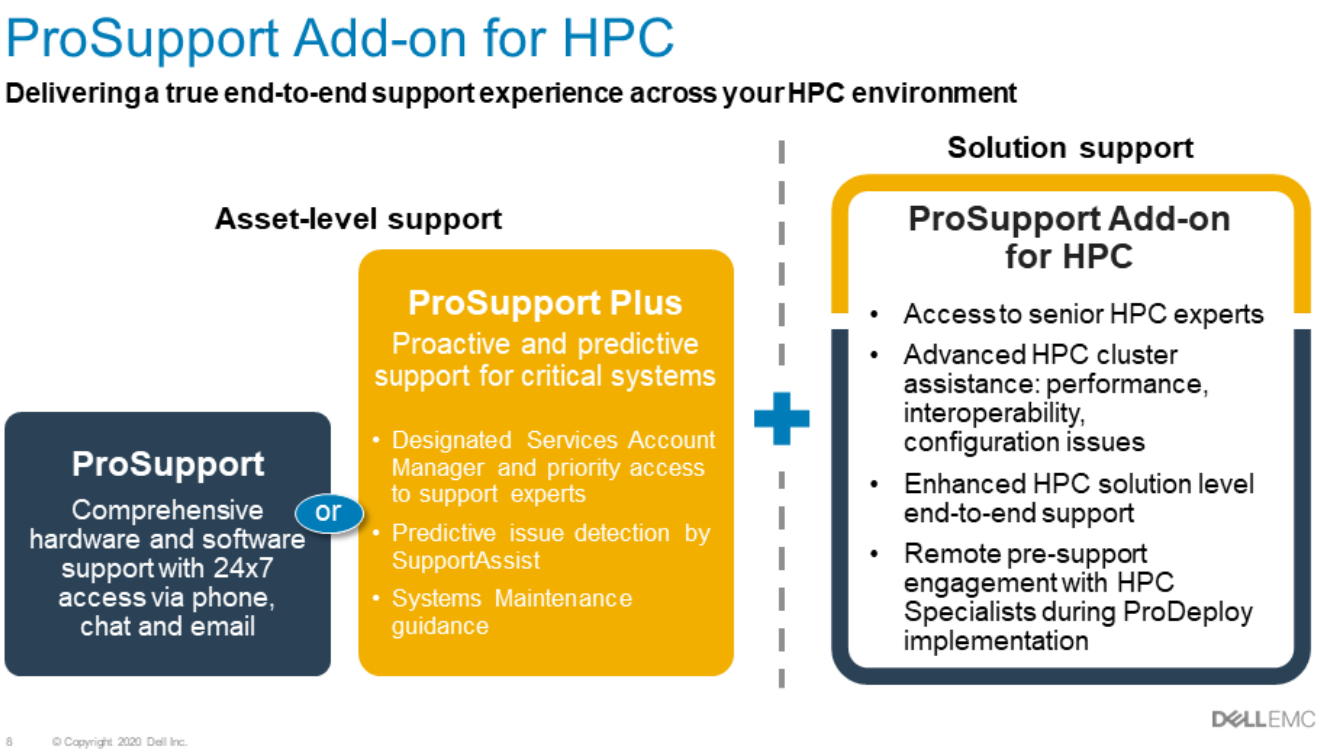


Figure 17. ProSupport for HPC

Support Technologies

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

Dell EMC 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

NOTE: 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 18. SupportAssist model

Get started at Dell.com/SupportAssist

Dell EMC TechDirect

Boost IT team 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 requirements. 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.

Dell Technologies Education Services

Build the IT skills required to influence the transformational outcomes of the business. Enable talent and empower teams with the right skills to lead and execute transformational strategy that drives competitive advantage. Leverage the training and certification required for real transformation.

Dell Technologies Education Services offers PowerEdge server training and certifications designed to help you achieve more from your hardware investment. The curriculum delivers the information and the practical, hands-on skills that you and your team need to confidently install, configure, manage, and troubleshoot your Dell EMC servers. To learn more or register for a class today, see LearnDell.com/Server.

Dell Technologies Consulting Services

Our expert consultants help you transform faster, and quickly achieve business outcomes for the high value workloads Dell EMC PowerEdge systems can handle.

From strategy to full-scale implementation, Dell Technologies Consulting can help you determine how to execute your IT, workforce, or application transformation.

We use prescriptive approaches and proven methodologies combined with Dell Technologies' portfolio and partner ecosystem to help you achieve real business outcomes. From multi-cloud, applications, DevOps, and infrastructure transformations, to business resiliency, data center modernization, analytics, workforce collaboration, and user experiences—we're here to help.

Dell EMC Managed Services

Reduce the cost, complexity, and risk of managing IT. Focus your resources on digital innovation and transformation while our experts help optimize your IT operations and investment with managed services backed by guaranteed service levels.

14

Appendix A. Additional specifications

Topics:

Chassis dimension

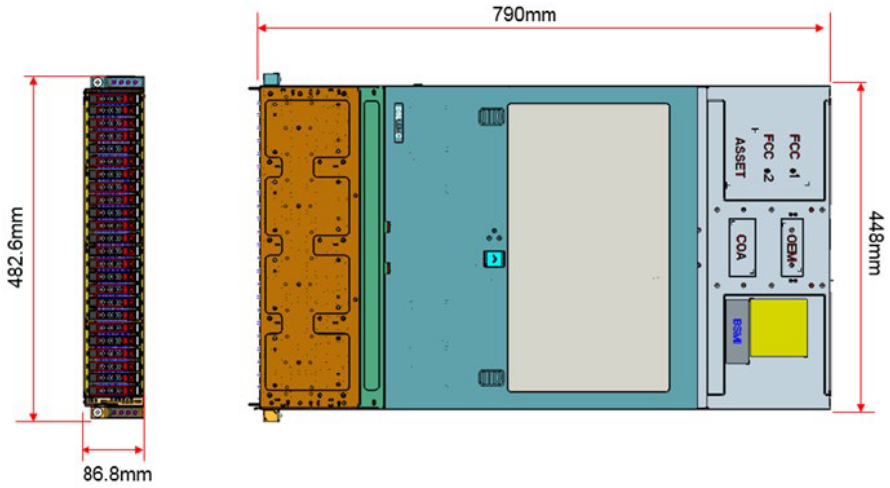


Figure 19. Chassis Dimensions Reference Diagram

Chassis weight

Table 18. Weight specifications

Weight	
Depth x Height x Width	(D) 790 mm x (H) 86.8 mm x (W) 448 mm
Weight (maximum configuration)	3.5 inches direct backplane chassis: 43.62 Kg
	2.5 inches Direct or NVMe backplane chassis: 41.46 Kg
	No backplane chassis: 34.56 Kg
Weight (empty)	Chassis – 5.58 Kg/12.31 lbs

Video specifications

The PowerEdge C6520 supports Matrox G200 controller and video from mini-DP display port.

Table 19. Video specifications for PowerEdge C6520

Resolution	Refresh rate (Hz)	Color depth (bits)
1024 x 768	60	8, 16, 32
1280 x 800	60	8, 16, 32
1280 x 1024	60	8, 16, 32
1360 x 768	60	8, 16, 32
1440 x 900	60	8, 16, 32
1600 x 900	60	8, 16, 32
1600 x 1200	60	8, 16, 32
1680 x 1050	60	8, 16, 32
1920 x 1080	60	8, 16, 32
1920 x 1200	60	8, 16, 32

Power supply specifications

1600 W PSU specifications

Table 20. 1600 W PSU specification

Attribute	Value
Configuration options	1+1 fault tolerant redundant (from factory)
	2+0 non redundant (customer configurable)
80 plus	Platinum
Power factor correction	Active
FCC classification	Class A
Max output current	131.15 A (180-264 V AC) 65.57 A (90-140 V AC)
Input voltage range	90-264 V AC, 47-63 Hz
Iin 100 - 240 V AC for rating on safety label	10.0 Amps
Initial inrush current	25 Amps (peak)
Secondary inrush current	25 Amps (peak)

Table 21. 1600 W PSU efficiency

	10% Load	20% Load	50% Load	100% Load
Power Supply efficiency at 115 V AC	N/A	85%	88%	90%
Power Supply efficiency at 230 V AC	87%	90%	94%	91%

2000 W PSU specifications

Table 22. 2000 W PSU specifications

Attribute	Value
Configuration options	1+1 fault tolerant redundant
80 plus	Platinum
Power factor correction	Active
FCC classification	Class A
Max output current	163.93 A (180-264 V AC) 81.97 A (90-140 V AC)
Input voltage range	90-264 V AC, 47-63 Hz
Iin 100 - 240 V AC for rating on safety label	11.5 Amps
Initial Inrush Current	25 Amps (peak)
Secondary Inrush Current	45 Amps (peak)

Table 23. 2000 W PSU efficiency

	10% Load	20% Load	50% Load	100% Load
Power Supply efficiency at 115 V AC	N/A	88%	92%	91%
Power Supply efficiency at 230 V AC	89%	93%	94%	91%

2400 W PSU specifications

Table 24. 2400 W PSU specifications

Attribute	Value
Configuration options	1+1 fault tolerant redundant
80 plus	Platinum
Power factor correction	Active
FCC classification	Class A
Max output current	196.72 A (180-264 V AC)
	114.75 A (90-140 V AC)
Input voltage range	90-264 V AC, 47-63 Hz
Iin 100 - 240 V AC for rating on safety label	16.0 Amps
Initial inrush current	35 Amps (peak)
Secondary inrush current	45 Amps (peak)

Table 25. 2400 W PSU efficiency

	10% Load	20% Load	50% Load	100% Load
Power Supply efficiency at 115 V AC	82%	88%	92%	91%

Table 25. 2400 W PSU efficiency (continued)

	10% Load	20% Load	50% Load	100% Load
Power Supply efficiency at 230 V AC	89%	93%	94%	91.50%

Table 26. 2600 W PSU specifications

Attribute	Value
Configuration Options	1+1 Fault Tolerant Redundant
80 Plus	Platinum
Power Factor Correction	Active
FCC Classification	Class A
Max Output Current	213.11A (180-264Vac) 114.75A (90-140Vac)
Input Voltage Range	90-264V AC, 47-63Hz
Iin 100 - 240VAC for rating on safety label	13.5 - 16.0 Amps
Initial Inrush Current	35 Amps (peak)
Secondary Inrush Current	45 Amps (peak)

Table 27. 2600W PSU efficiency

	10% Load	20% Load	50% Load	100% Load
Power Supply efficiency at 115Vac	82%	88%	92%	91%
Power Supply efficiency at 230Vac	89%	93%	94%	91%

Power consumption testing

Power Budget Estimation guidance is available in the Dell Enterprise Infrastructure Planning Tool www.dell.com/calc. For any configuration, please use the EIPT tool to size PSU. The Dell ordering tools do not have validation rules to check PSU sizing, hence it's critical to use the EIPT tool to ensure the PSU is chosen correctly for the configuration being quoted.

For quick reference, recommended PSU for common configurations below provides recommended PSU based on some common configurations.

Table 28. Recommended PSU for common configurations

1+1 mode: FTR enabled				
2Processors, PSU 1+1	**4 Sleds**	**3 Sleds**	**2 Sleds**	**1 Sled**
1600W	Not Supported	> 195W is restricted	Valid	Valid
2000W	> 195W is restricted	Valid	Valid	Valid
2400W	Valid	Valid	Valid	Valid
2600W	Valid	Valid	Valid	Valid

1 Processor, PSU 1+1	4 Sleds	3 Sleds	2 Sleds	1 Sled
1600W	Valid	Valid	Valid	Valid
2000W	Valid	Valid	Valid	Valid
2400W	Valid	Valid	Valid	Valid

1 Processor, PSU 1+1	4 Sleds	3 Sleds	2 Sleds	1 Sled
2600W	Valid	Valid	Valid	Valid

2+0 mode: FTR disabled				
2Processors, PSU 2+0	**4 Sleds**	**3 Sleds**	**2 Sleds**	**1 Sled**
1600W	Not supported	> 165W is restricted	Valid	Valid
2000W	> 165W is restricted	Valid	Valid	Valid
2400W	> 205W is restricted	Valid	Valid	Valid
2600W	Valid	Valid	Valid	Valid

1Processor, PSU 2+0	4 Sleds	3 Sleds	2 Sleds	1 Sled
1600W	Valid	Valid	Valid	Valid
2000W	Valid	Valid	Valid	Valid
2400W	Valid	Valid	Valid	Valid
2600W	Valid	Valid	Valid	Valid

PSU redundancy options and sizing

As noted earlier, the following power supply configurations are available on the PowerEdge C6400 chassis:

1. Dual, hot-plug fault tolerant redundant power supply (1+1),1600 W
2. Dual, hot-plug fault tolerant redundant power supply (1+1), 2000 W
3. Dual, hot-plug fault tolerant redundant power supply (1+1), 2400 W
4. Dual, hot-plug fully redundant power supply (1+1),2600 W
5. Dual, hot-plug fully redundant power supply (2+0),1600 W
6. Dual, hot-plug fully redundant power supply (2+0), 2000 W
7. Dual, hot-plug fault tolerant redundant power supply (2+0), 2400 W
8. Dual, hot-plug fully redundant power supply (2+0), 2600 W
9. Dual, hot-plug fully redundant power supply (1+1),1600W*
10. Dual, hot-plug fully redundant power supply (1+1), 2000W*
11. Dual, hot-plug fully redundant power supply (1+1), 2400W*
12. Dual, hot-plug fully redundant power supply (1+1), 2600W*

NOTE: Due to significant increase in power requirements for Intel Xeon Scalable processors, fully redundant (1+1) PSU setting is not possible for many configurations. Please consider going with Fault Tolerant Redundant PSU instead.

By default, the PowerEdge C6520 supports fault tolerant redundancy (FTR) which means that when a power supply fails, during the failed state, the system is expected to throttle the processor performance to keep the peak power consumption within the system limits and prevent OCP shutdown.

In order to avoid system throttling in case of PSU failure, the PSU option with full redundancy can be chosen which will configure the system in the factory to not throttle processors in case a PSU fails. Note that careful planning is needed in order to configure a system with fully redundant PSUs – the EIPT tool available at http://www.dell.com/calc provides guidance on which configuration can be used with a fully redundant PSU settings.

Also note that the PSU configuration of fully redundant or fault tolerant is not a setting on the PSU, but a setting on the PowerEdge C6400 chassis manager that modifies the system behavior to throttle or not throttle if a PSU failure is detected.

CAUTION: If a system configuration is chosen with fully redundant PSU option, however a single PSU does not have the capacity to supply adequate power, the sleds can shut down due to OCP protection. Hence, the EIPT tool must be used to configure the right PSU option for the desired configuration.

Unlike other 14G platforms, C6520 does not have any order validation rules for PSU sizing. PSU sizing is available in the Enterprise Power Infrastructure Tool (EIPT) and it is required to use the tool to size the correct PSU for the configuration being considered.

Setting PSU to 2+0

The PSU are supported in both 1+1 and 2+0 redundancy mode. Customers can select 1+1 (FTR) or 2+0 when ordering the system and later can change the mode by themselves or by technical support using the instructions below:

IPMI command to set to 2+0 non-redundant mode:

```
Ipmitool -I wmi 0x30 0xC7 0x30 0x2 0x0
```

The redundancy option will apply after resetting the chassis manager using:

```
Ipmitool -I wmi 0x6 0x34 0x45 0x70 0x18 0xc8 0x20 0x0 0x2 0xd8
```

IPMI command to set redundancy back to 1+1 redundant mode:

```
Ipmitool -I wmi 0x30 0xC7 0x30 0x1 0x1
```

Environmental specifications

The table below details the environmental specifications for the platform. For additional information about environmental measurements for specific system configurations, see Product Safety, EMC and Environmental datasheets.

15

Appendix B. Standards compliance

The system conforms to the following industry standards.

Table 29. Industry standard documents

Standard	URL for information and specifications
ACPIAdvance Configuration and Power Interface Specification, v2.0c	https://uefi.org/specsandtesttools
Ethernet IEEE 802.3-2005	https://standards.ieee.org/
HDGHardware 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	http://pmbus.org/Assets/PDFS/Public/PMBus_Specification_Part_I_Rev_1-1_20070205.pdf
SAS Serial Attached SCSI, v1.1	http://www.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 30. 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 indicator codes • System BIOS • Remove and replace procedures • 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	Dell.com/Support/Manuals
Rack Installation Guide	This document ships with the rack kits, and provides instructions for installing a server in a rack.	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