PowerEdge R820

Technical Guide

The PowerEdge R820, a four-socket, 2U rack server designed for dense virtualization and scalable database applications.

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1 System overview

Introduction

Designed to excel at running a wide range of applications and virtualization environments for both midsize and large enterprises, the Dell™ PowerEdge™ R820 rack server is a compute-intensive performance platform with highly scalable memory (up to 1.5TB) and impressive I/O capabilities to match. With four Intel® Xeon® E5-4600 processors and the ability to support dual RAID controllers, the R820 can readily handle very demanding, mission-critical workloads, like data warehousing, e-c ommerce, virtual desktop infrastructure (VDI), databases and data node high-performance computing (HPC).

Manage data overload

Keep pace with the explosion of data in the virtual age with the flexible, powerful I/O and storage capabilities of the R820. Up to 16 internal hard drives and integrated PCI Express® (PCIe) 3.0 enabled expansion slots greatly increase your capacity, while optional hot-plug, front-access Express Flash PCIe solid-state drives (SSD) (up to four) enable performance-enhancing, in-box storage tiering. Moreover, Dell Select Network Adapters, our flexible NIC technology, let you choose the right network fabric to match your needs without using up a valuable PCIe slot.

Accelerate the solution

Boost the performance of your HPC or 2D VDI environment by combining the PowerEdge R820's memory density with an optional graphics processing unit (GPU) accelerator. Choose from a range of GPU options for greater assisted performance.

Virtualize more with the R820

Maximize your data center's application capacity by expanding your virtual environment using the PowerEdge R820's large memory footprint, I/O options, flexible fabric choices and up to 32 cores in a four-processor configuration. Choose an industry-leading hypervisor and take advantage of our system management capability to manage both physical and virtual assets. The R820 can also help maximize your virtual machines' uptime using redundant failsafe hypervisors on its internal dual SD module. Dell OpenManage Integration with Microsoft System Center for Hyper-V and VMware vCenter for ESXi can help you easily manage complex virtual environments.

Simplified systems management, without compromise

The Dell OpenManage systems management portfolio includes Integrated Dell Remote Access Controller 7 (iDRAC7) with Lifecycle Controller. This embedded feature helps IT administrators manage Dell servers in physical, virtual, local and remote environments, operating in-band or out-of-band, with or without a systems management software agent installed.

OpenManage iDRAC with Lifecycle Controller integrates and connects to leading third-party systems management solutions (such as those from Microsoft, VMware and BMC Software), so users can maintain a single point of control and capitalize on an existing systems management investment. OpenManage simplifies the lifecycle of deploying, updating, monitoring and maintaining Dell PowerEdge servers.

Key technologies

Table 1 summarizes key technologies used in the Dell PowerEdge R820 rack server.

Table 1. Key technologies

New technologies	Detailed descriptions
Intel Xeon processor E5-4600 product family	This new family of Intel processors has embedded PCIe lanes for improved I/O performance. See the Processor section for details.
Intel C600 series chipset	The R820 server uses the Intel Platform Controller Hub (PCH) chip.
1600MT/s DDR3 memory	Certain models of the Intel Xeon processor E5-4600 product family support 1600MT/s memory. The R820 supports four DIMMs per channel at 1600MT/s with these processors. See the Memory section for details.
LRDIMM	This new memory option, load reduced DIMM (LRDIMM), is designed with a buffer chip (or chips) to replace the register to help minimize loading. LRDIMMs can increase overall server system memory capacity and speed. See the Memory section for details.
Flexible LOM	The Dell Select Network Adapter options allow you to customize your LAN port combinations from your choice of controller vendors. See the Networking and PCIe section for details.
Next-generation PERC options	The R820 supports the new PERC controller cards with improved functionality and faster performance. See the Storage section for details.
PERC S110 software RAID Solution	This new software RAID solution supports RAID 0, 1, 5 and 10; supports maximum of four hot-plug SATA hard drives or SATA SSDs. See the Storage section for details.
Express Flash drives	Dell Express Flash PCIe SSDs provide fast performance without requiring processor resources or capturing DRAM. The R820 supports up to four Express Flash drives. See the Storage section for details.
iDRAC7 with Lifecycle Controller	The new embedded system management solution for Dell servers features hardware and firmware inventory and alerting, in-depth memory alerting, faster performance, a dedicated gigabit port and many more features. See the Dell OpenManage systems management section for details.
Internal GPU support	The R820 supports internal graphics processing units (GPUs) for extreme computing power to solve HPC needs. See the Processor section for details.
DC power supply	A new 1100W DC power supply option is available for the R820. See the Power, thermal and acoustics section for details.
Advanced power management	The R820 supports advanced power monitoring and power capping tools that can help manage power consumption. See the Power, thermal and acoustics section for details.
Fresh Air cooling	Dell has tested and validated an integrated data center solution that enables you to operate at higher temperatures or even chiller-less. See the Power, thermal and acoustics section for details.
Failsafe hypervisors	The internal dual SD module enables Dell's unique Failsafe Virtualization architecture, ensuring uptime by providing failover capability for embedded hypervisors, such as VMware® vSphere® ESXi™.

2 System features

Compared to the previous generation of Dell PowerEdge servers, the R820 has more drive bay options, more PCIe slots, PCIe 3.0 support, more memory, a dual RAID controller option, optional Express Flash PCIe SSDs, internal GPU support and advanced system management.

Comparison of PowerEdge systems

The PowerEdge R820 is a direct replacement for the R810. Table 2 compares some of the features of the R820 to the R810. For the latest information on supported features, visit Dell.com/PowerEdge.

Table 2. Comparing the PowerEdge R810 to PowerEdge R820

Feature	PowerEdge R810	PowerEdge R820
Chassis	2U rack	2U rack
Processors	Intel Xeonprocessors 6500, 7500, E7-2800, E7-4800 and E7-8800 series	Intel Xeon processor E5-4600 product family
Internal interconnect	Intel QuickPath Interconnect	Intel QuickPath Interconnect
Memory[1]	32 x DDR3 RDIMM and UDIMM Up to 1TB	48 x DDR3 RDIMM, UDIMM and LRDIMM Up to 1.5TB
Hard drive bays (hot-plug)	6 x 2.5"	16 x2.5"
RAID controller	PERC H200, H700, H800	PERC H310, H710, H710P, H810 Dual PERC option
Express Flash drives	N/A	Up to 4 Flash Express drives
PCI slots	7 PCIe 2.0 slots	7 PCIe 3.0 slots
Embedded NICs	4 x 1GbE with optional TOE	Select Network Adapter: minimum configuration of 4 x 1GbE, 10GbE (optional)
Power supplies	Hot-plug, redundant 1100W AC	Hot-plug, redundant 750W AC, 1100W AC, 1100W DC
Dell OpenManage Systems Management	Dell OpenManage Lifecycle Controller 1.x iDRAC6 (Express or Enterprise) with Lifecycle Controller 1.x	OpenManage Essentials OMSA Agent OpenManage Power Center (requires iDRAC7 Enterprise with Lifecycle Controller) OpenManage Integrations and Connections iDRAC7 Express with Lifecycle Controller (standard option)
Support for internal GPU	No	Yes
Power efficiency	Gold	Titanium
Availability	Hot-plug drives Hot-plug redundant cooling Hot-plug redundant power supply units Internal dual SD modules	Hot-plug drives Hot-plug redundant cooling Hot-plug redundant power supply units Internal dual SD modules

[1]GB means 1 billion bytes and TB equals 1 trillion bytes; actual capacity varies with preloaded material and operating environment and will be less.

Specifications

Table 3 summarizes the specifications for each of the PowerEdge R820 features. For the latest information on supported features for the PowerEdge R820, visit Dell.com/PowerEdge.

Table 3. Technical specifications

Feature	PowerEdge R820 technical specification
Form factor	2U rack
Processors	Intel Xeon processor E5-4600 product family
Processor sockets	4 sockets
Internal interconnect	2 Intel QuickPath Interconnect (QPI) links: 6.4GT/s, 7.2GT/s, 8.0GT/s
Cache	2.5MB per core with core options of 4, 6 or 8
Chipset	Intel C602
Memory[1]	Up to 1.5TB (48 DIMM slots): 2GB/4GB/8GB/16GB/32GB DDR3 up to 1600MT/s
PCIe slots	**7 PCIe slots:** • 2 x16 full-height, half-length • 1 x8 full-height, half-length • 3 x8 half-height, half-length • 1 x8 full-height, half-length for the RAID controller
RAID controller	**Internal controllers:** PERC H310 PERC H710 PERC H710P **External HBAs (RAID):** PERC H810 **External HBAs (non-RAID):** 6Gbps SAS HBA
Hard drives (hot-plug)	**Drive bay options:** Up to 16 x 2.5-inch hot-plug SAS, SATA or SSD **Hard drive options:** 2.5-inch Express Flash, SAS SSD, SATA SSD, SAS (15K, 10K), nearline SAS (7.2K), SATA (7.2K); self-encrypting drives (SEDs) available
Embedded NIC	**Select Network Adapter options:** Broadcom® 5720 4x1Gb Base-T Intel I350 4x1Gb Base-T Intel X540 2x1Gb + 2x10Gb Base-T Broadcom 57800S 2x1Gb + 2x10Gb Base-T Broadcom 57800S 2x1Gb + 2x10Gb SFP+ Broadcom 57840S 4x10Gb SFP+ Mellanox® ConnectX®-3 Dual Port 40GbE QSFP+ ConnectX-3 Dual Port 10GbE DA/SFP+
Power supply	Titanium efficiency 750W AC power supply Platinum efficiency 750W or 1100W AC power supply (auto-ranging) 1100W DC power supply
Availability	High-efficiency, hot-plug redundant power supplies; hot-plug hard drives; TPM; dual internal SD support; hot-plug redundant fans; optional bezel; information tag; ECC memory; interactive LCD screen; extended thermal support; ENERGY STAR® compliant; switch independent partitioning

Feature	PowerEdge R820 technical specification
Dell OpenManage Systems Management (Agent-free or with OpenManage Server Administrator [OMSA] Agent)	• OpenManage Essentials • OMSA Agent • OpenManage Power Center (requires iDRAC7 Enterprise with Lifecycle Controller) • OpenManage Integrations and Connections: > OpenManage Integration Suite for Microsoft® System Center > OpenManage Integration for VMware vCenter™ > Connections for HP® Operations Manager, IBM® Tivoli® Netcool® and CA Network and Systems Management • iDRAC7 Express with Lifecycle Controller (standard option) > Upgrade to iDRAC7 Enterprise with Lifecycle Controller > Upgrade to 8GB vFlash media or 16GB vFlash media for iDRAC7 Enterprise with Lifecycle Controller > Trial evaluation available for IDRAC7 Enterprise with Lifecycle Controller
Rack support	ReadyRails™ sliding rails for tool-less mounting in 4-post racks with square or unthreaded round holes or tooled mounting in 4-post threaded hole racks, with support for optional tool-less cable management arm 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
Operating systems	Microsoft Windows Server® 2012 Microsoft Windows Server 2012 R2 (includes Hyper-V®) Microsoft Windows Server 2008 R2 SP1, x64 (includes Hyper-V) Novell® SUSE® Linux Enterprise Server Red Hat® Enterprise Linux® **Virtualization options:** Citrix® XenServer® VMware vSphere including ESXi™ Red Hat Enterprise Virtualization® For more information on the specific versions and additions, visit Dell.com/OSsupport.

[1]GB means 1 billion bytes and TB equals 1 trillion bytes; actual capacity varies with preloaded material and operating environment and will be less.

3 Chassis views and features

The Dell PowerEdge R820 is a 2U, 4-socket rack server. For additional system views and features, see the *Dell PowerEdge R820 Owner's Manual* on Dell.com/Support/Manuals.

Chassis views

Figure 1 shows the features on the front of the R820 chassis including sixteen 2.5-inch hard drives, control panel, USB connectors, power button, system identification button, optical drive, information tag, video connector and vFlash media card slot.

Figure 1. Front view without bezel

Figure 2 shows the optional lockable bezel on the front of the R820 chassis.

Figure 2. Front view with bezel

Figure 3 shows the features on the back panel of the R820 including USB connectors, Ethernet connectors, serial connector, video connector, system identification button connector, iDRAC7 Enterprise port, PCIe slots and power supplies.

Figure 3. Back view

The chassis design of the R820 is optimized for easy access to components and for airflow for effective and efficient cooling. The R820 supports up to 48 DIMMs, four processors, hot-plug redundant fans, and many other components and features described in this guide.

Figure 4. Internal view

Chassis features

Table 4 lists the features on the R820 chassis. For additional information, see the *Dell PowerEdge R820 Owner's Manual* on Dell.com/Support/Manuals.

Table 4. Chassis features

Feature	Description
Power button	ACPI-compliant power button with an integrated green power LED
Front bezel	Covers the system's front-loading hard drives and locks for security
NMI button	Used to troubleshoot software and device driver errors; use only if directed to do so by qualified support personnel or by the operating system's documentation
System identification button	Buttons on the back and front of a system to help identify the unit in a data center environment
Hard drives	Up to 16 2.5-inch drives
USB connectors	Connects USB devices to the server
vFlash media reader	Activated when iDRAC Enterprise is enabled
Information tag	Slide-out label panel for recording system information
Video connector	Connects a monitor to the server
LCD panel and buttons	Displays system ID, status information and system error messages; two navigation buttons to scroll through the menu on the LCD and one select button
Optical drive	Optional slim DVD or DVD+RW drive
Tape drive	Optional external tape drive through the SAS 6Gbps HBA
Power supply units	Supplies power to the server
Power supply indicators	Indicates whether server has power
NIC indicators	Indicates network activity and status
PCIe slots	Connects PCIe expansion cards to the server
Ethernet connectors	Connects integrated 10/100/1000 NICs to the server
Serial connector	Connects a serial device to the server
iDRAC7 Enterprise port	Dedicated management port for optional iDRAC Ports card

Front control panel

The R820 control panel is located on the front of the chassis as shown in Figure 5. For more information about the LCD control panel, see the *Dell PowerEdge R820 Owner's Manual* on Dell.com/Support/Manuals.

Figure 5. LCD control panel

Quick Resource Locator

Dell PowerEdge 12th-generation servers include a Quick Resource Locator (QRL) — a model-specific Quick Response (QR) code that is located inside the R820 chassis cover (see Figure 6). Use your smartphone to access the Dell QRL app to learn more about the server.

Figure 6. QRL location

This QRL code allows you to:

- View step-by-step videos, including overviews of system internals and externals, as well as detailed, concise, task-oriented videos and installation wizards
- Locate reference materials, including searchable owner's manual content, LCD diagnostics and an electrical overview
- Look up your service tag so you can quickly gain access to your specific hardware configuration info and warranty information
- Contact Dell directly (by link) to get in touch with technical support and sales teams and provide feedback to Dell

These codes provide an easy way to retrieve the critical support information you need when you need it, making you more efficient and effective in managing your hardware.

Security features

The latest generation of PowerEdge servers has the features listed in Table 5 to help ensure the security of your data center.

Table 5. Security features

Security feature	Description
Cover latch	A tooled latch is integrated in the side cover to secure it to the rack chassis.
Bezel	An optional metal bezel is mounted to the chassis front to provide the Dell ID. A lock on the bezel is used to protect un-authorized access to hard drives. System status is viewable on the LCD screen when the bezel is installed.
TPM	The Trusted Platform Module (TPM) is used to generate/store keys, protect/authenticate passwords and create/store digital certificates. It also supports the Intel Xeon TXT functionality. TPM can also be used to enable the BitLocker™ hard drive encryption feature in Windows Server 2008. TPM 1.2 is supported. No TPM version is available for China or Russia.
Power-off security	BIOS has the ability to disable the power button function.
Intrusion alert	An internal switch is used to detect chassis intrusion.
Secure mode	BIOS has the ability to enter a secure boot mode through system setup. This mode includes the option to lock out the power and NMI switches on the control panel or set up a system password.

4 Processor

The Dell PowerEdge R820 features the Intel Xeon processor E5-4600 product family, which offers an ideal combination of performance, power efficiency and cost. These processors provide high performance no matter what your constraint is — floor space, power or budget — and on workloads that range from the most complicated scientific exploration to crucial web-serving and infrastructure applications. In addition to providing raw performance gains, improved I/O is also made possible with Intel Integrated I/O, which can reduce latency by adding more lanes and doubling bandwidth. This helps to reduce network and storage bottlenecks, unleashing the processor's performance capabilities.

Processor features

The new Intel Xeon processor E5-4600 product family adds the following new features:

- Four-socket processor design with power and dimensions optimized for density
- Up to eight execution cores per processor
- Intel Hyper-Threading technology enables up to 16 computational threads
- Micro-architecture on 32nm process for greater performance per watt
- Support for more memory — up to 48 DIMM slots and support for up to 32GB DIMMs, which increases memory capacity from 1TB to 1.5TB
- Integrated memory controller with four channels of DDR3 and 46-bit physical addressing facilitate greater memory capacity
- Intel Integrated I/O has support for up to 160 lanes of PCIe 3.0, which can reduce latency
- Faster connections throughout the system with support for DDR3 1600MT/s memory and 8.0GT/s QPI
- Intel Data Direct I/O (DDIO) allows I/O traffic to skip the main system memory and be directed straight to the processor cache, which can provide a significant reduction in latency as well as allowing memory to remain in a low-power state
- High bandwidth, low latency, bidirectional ring interconnect allows faster access to the 20MB multi-banked last level cache
- Intel Advanced Vector Extensions offer up to double the floating point operations per clock cycle by doubling the length of registers, which can be useful for addressing very complex problems or dealing with large-number calculations, which are integral to many technical, financial and scientific computing problems
- Intel Turbo Boost Technology 2.0, which allows processor cores to run faster than the base operating frequency if it's operating below power, current and temperature specification limits, delivers up to double the boost than the previous generation
- Continued improvements to both Intel TXT and AES-NI help to better protect systems and data

For more information on the Intel Xeon processor E5-4600 product family, visit Intel.com.

Supported processors

The R820 supports up to four processors with up to eight cores per processor. Table 6 lists the Intel Xeon processors supported by the PowerEdge R820. For the latest information on supported processors, visit Dell.com/PowerEdge.

Table 6. Supported processors

Model	Speed	TDP	Cache	Cores/Threads	QPI	Turbo threads	Maxmemory speed
XeonE5-4650	2.7GHz	130W	20MB	8/16	8.0GT/s	Yes	1600
XeonE5-4650L	2.6GHz	115W	20MB	8/16	8.0GT/s	Yes	1600
XeonE5-4640	2.4GHz	95W	20MB	8/16	8.0GT/s	Yes	1600
XeonE5-4620	2.2GHz	95W	16MB	8/16	7.2GT/s	Yes	1333
XeonE5-4617	2.9GHz	130W	15MB	6/6	7.2GT/s	Yes	1600
XeonE5-4610	2.4GHz	95W	15MB	6/12	7.2GT/s	Yes	1333
XeonE5-4607	2.2GHz	95W	12MB	6/12	6.4GT/s	NA	1066
XeonE5-4603	2.0GHz	95W	10MB	4/8	6.4GT/s	NA	1066

For information on processor installation and configuration, see the *Dell PowerEdge R820 Owner's Manual* on Dell.com/Support/Manuals.

Chipset

The PowerEdge R820 uses the Intel C602 chipset. For more information, visit Intel.com.

5 Memory

More memory options are available than ever before with the Dell PowerEdge R820 — greater capacities, higher frequencies and more flexibility. The R820 supports up to 1.5TB of memory (48 DIMM slots) and speeds of up to 1600MT/s, providing high performance in a variety of applications.

In addition to supporting existing unbuffered DIMMs (UDIMM) and registered DIMMs (RDIMM), the R820 supports load reduced DIMMs (LRDIMM), which use a buffer to reduce memory loading and provide greater density, allowing for the maximum platform memory capacity. High memory density provides a richer, no compromise virtualization environment. While the buffer in the LRDIMM reduces memory bus loading and allows 50% higher capacity in a system, the buffer does introduce additional latency, which will have a small impact on system performance.

Increase your uptime and reduce data loss with reliability, availability and serviceability (RAS) features like memory mirroring, sparing and many others. RAS aids in the rapid and accurate diagnosis of faults that require service, increasing your memory reliability.

Supported memory

The R820 supports the memory technologies shown in Table 7.

Table 7. Memory technologies supported

Feature	RDIMM	LRDIMM
Register	Yes	Yes
Buffer	No	Yes
Frequencies*	1333 or 1600MT/s	1333 or 1600MT/s
Ranks supported	1, 2 or 4	4
Capacity per DIMM	4, 8, 16 or 32GB	32GB
Maximum DIMMs per channel	3	3
DRAM technology	x4 or x8	x4
Temperature sensor	Yes	Yes
Error Correction Code (ECC)	Yes	Yes
Single Device Disable Code (SDDC)	Yes	Yes
Address parity	Yes	Yes

*Although the R820 supports DIMM speeds lower than 1333MT/s, you can only purchase this system with DIMM speeds of 1333MT/s and 1600MT/s on Dell.com/PowerEdge.

The R820 supports the DIMMs listed in Table 8. For the latest information on supported memory, visit Dell.com/PowerEdge.

Table 8. DIMMs supported

Capacity (GB)	Speed (MT/s)	Type	Ranks per DIMM	Data width	SDDC support	Voltage
4	1600	RDIMM	1	x8	Advanced ECC	1.35
8	1600	RDIMM	1	x4	All modes	1.35
16	1600	RDIMM	2	x4	All modes	1.35
32	1333	RDIMM	4	x4	All modes	1.35
32	1333	LRDIMM	4	x4	All modes	1.35
32	1600	LRDIMM	4	x4	All modes	1.35

Memory configurations

The R820 server supports flexible memory configurations ranging from capacities of 4GB to 1.5TB. The R820 supports up to 12 DIMMs per processor (up to 48 DIMMs in a four-processor configuration). The R820 has four memory channels per processor, with each channel supporting up to three DIMMs.

The R820 supports a flexible memory configuration according to these basic rules:

- Speed: If DIMMs of different speeds are mixed, all channels across all processors operate at the slowest DIMM's common frequency.
- DIMM type: Only one type of DIMM is allowed per system. UDIMM, RDIMM and LRDIMM cannot be mixed.

The following additional memory population guidelines apply to the R820:

- Up to two quad-rank (QR) DIMMs and up to three dual-rank (DR) or single-rank (SR) DIMMs may be populated per channel. Although an LRDIMM is physically a QR DIMM, logic on the LRDIMM can make it appear as a DR DIMM to the system, allowing up to three LDRIMMs per channel.
- DIMMs must be installed in each channel, starting with the DIMM farthest from the processor.
- DIMMs should be installed with largest rank count to smallest. For example, if DR DIMMS are mixed with SR DIMMs, DR DIMMS should be placed in the lowest DIMM slots, followed by the SR DIMMs.

For more information on memory configuration, see the *Dell PowerEdge R820Owner's Manual* on Dell.com/Support/Manuals.

Memory speed

The R820 supports memory speeds of up to 1600MT/s, depending on the DIMM types installed and the configuration. All memory on all processors and channels run at the same speed and voltage. By default, the systems run at the highest speed for the channel with the lowest DIMM voltage and speed. The operating speed of the memory is also determined by the maximum speed supported by the processor, the speed settings in the BIOS and the operating voltage of the system.

Visit the PowerEdge memory page on Dell.com for the latest memory configuration and performance details for the R820 based on the population of the number and type of DIMMs per memory channel.

Memory RAS features

RAS features help keep the system online and operational without significant impact to performance, and can decrease data loss and crashing due to errors. RAS aids in rapid, accurate diagnosis of faults that require service. Table 9 describes the RAS features supported on the R820.

Table 9. Memory RAS features

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

For information on memory mirroring and sparing configurations, see the *Dell PowerEdge R820 Owner's Manual* on Dell.com/Support/Manuals.

6 Storage

The Dell PowerEdge R820 supports extensive internal and external storage options, internal and external storage controllers, and different chassis and backplane options for a varied number of drives.

Features such as Express Flash PCIe SSDs and CacheCade™ provide accelerated performance over previous technologies. Express Flash drives use PCIe lanes to connect directly to the processor and chipset and are easily accessible through the hot-plug drive bay. CacheCade uses Dell PERC storage controllers to accelerate performance over hard drives or traditional SSDs.

Internal storage

The R820 supports the following internal storage options:

- 8 x 2.5-inch drives
- 8 x 2.5-inch drives plus 4 x 2.5-inch Express Flash PCIe SSDs
- 8 + 8 x 2.5-inch drives
- 16 x 2.5-inch drives

Note: A system cannot be upgraded or reconfigured after point of purchase.

Supported hard drives

The R820 supports up to sixteen 2.5-inch hard drives or SSDs. Table 11 lists more information about these drives. For additional information, see Dell.com/PowerEdge.

Table 10. Supported hard drives

Form factor	Type	Speed (rpm)	Capacities
2.5”	SATA	7.2K	250GB, 500GB, 1TB
	Nearline SAS	7.2K	500GB, 1TB, 1TB SED
	SAS	10K	300GB, 600GB, 900GB, 900GB SED, 1.2TB
	SAS	15K	146GB, 300GB, 300GB SED
	SAS SSD	N/A	200GB, 400GB
	SATA SSD	N/A	100GB, 160GB, 200GB, 300GB, 400GB, 480GB, 800GB
	PCIe SSD	N/A	175GB, 350GB, 700GB, 1.2TB

Express Flash drives

Express Flash drives use PCIe and SSD technologies to provide performance, scalability and optimal serviceability. Accelerated performance with high IOPs is made possible without requiring processor resources or capturing DRAM. Also, Express Flash drives use a standardized 2.5-inch hot-plug form factor that saves critical PCIe slot space by moving drives from the back to the front of the system and allows a common management process for all drives.

The PowerEdge R820 has an option to support up to four 2.5-inch, hot-plug Express Flash drives with capacities of 175GB or 350GB.

External storage

External storage for the R820 is available through optional HBAs for SAS, iSCSI and Fibre Channel. For more information, see Dell.com/Storage.

Storage controllers

Dell provides highly capable RAID options for you to ensure that your data remains safe. Dell's RAID controller options offer impressive performance improvements, including the following features:

- FastPath™ I/O: This feature can help accelerate performance when operating on SSDs.
- Split mirror: This function allows you to break mirrored disk connection in order to quickly replace a drive.
- Physical disk power management (Dimmer Switch™): This feature allows for power control of spare or idle drives, which can save energy and operating expenses.

Supported RAID controllers

The newest line of PERC (PowerEdge RAID Controller) cards offer high I/O performance for database applications and streaming digital media environments. The internal RAID controllers have a dedicated connection to the motherboard. The R820 supports the new PERC 8 family of controllers with improved functionality and faster performance.

The default PERC for the R820 is a mini-type PERC. However, for a system with an internal GPU card or a card between half-length and ¾-length, use the adapter-type PERC. The R820 also supports the new software RAID solution that supports RAID 0, 1, 5 and 10.

The R820 supports the PERC cards listed in Table 11. For more information about the latest PERC offerings, see Dell.com/PERC.

Table 11. Supported RAID controllers

Controller	Description	Features	RAID modes supported	Form factor	Usage model
PERC H810 External	Eight-port, external and 6Gb/s PCIe RAID controller	Includes 1GB NV DDR3 cache, premium performance and feature set, security SED/EKMS, and SSD as cache	0, 1, 10, 5, 50, 6, 60	Adapter	Premium performance

Controller	Description	Features	RAID modes supported	Form factor	Usage model
PERC H710P Internal	Eight-port, internal 6Gb/s PCIe RAID controller that supports up to 32 SATA and SAS hard drives or SSDs	Includes 1GB NV DDR3 cache, premium performance and feature set, security SED/EKMS, and SSD as cache	0, 1, 10, 5, 50, 6, 60	Integrated mini-type and adapter-type[1]	Premium performance
PERC H710 Internal	Eight-port, internal 6Gb/s PCIe RAID controller that supports up to 32 SATA and SAS hard drives or SSDs	Includes 512MB DDR3 cache, advanced feature set, security SED/EKMS	0, 1, 10, 5, 50, 6, 60	Integrated mini-type and adapter-type[1]	Performance
PERC H310 Internal	Eight-port, internal 6Gb/s PCIe RAID that supports up to 32 SATA and SAS hard drives or SSDs	Supports hot-plug drives, expansion, pass-through	0, 1, 10, 5, 50	Integrated mini-type and adapter-type[1]	Value
PERC S110 Software RAID	3Gb/s SATA software RAID controller that supports up to 4 physical disks or 8 virtual disks	Supports up to 4 hot-plug SATA drives, no expansion, Microsoft Windows only	0, 1, 5, 10	System board-embedded SATA	Entry-level

[1]Adapter-type required with the two-PCIe slot chassis and required when configuring an internal GPU or ¾-length PCIe card

CacheCade

CacheCade is a technology that provides automated storage tiering on SSDs with the PERC H810 and H710P. It works by detecting the most often accessed data and copying it over time to the CacheCade SSD(s) where that cached data is accessed directly, instead of accessing the hard disk drives. This can dramatically increase how your applications respond when they are under peak traffic times and how they perform when response time is critical.

CacheCade provides cost-effective performance scaling for database-type applications that perform lots of random reads, and saves the cost of adding extra drives.

Optical drive

The R820 supports one slim, internal optical drive on the system board embedded SATA. The R820 supports DVD-ROM and DVD+/-RW.

Tape drive

The R820 does not support internal tape drives.

7 Networking and PCIe

The Dell PowerEdge R820 offers balanced, scalable I/O capabilities, including integrated PCIe 3.0 capable expansion slots. Dell Select Network Adapters, Dell's network daughter cards, let you choose the right network fabric without using up a valuable PCI slot. Pick the speed, technology, vendor and other options such as switch independent partitioning, which lets you share and manage bandwidth on 10GbE connections.

Select Network Adapter

The Select Network Adapter family includes flexible LAN on Motherboard (LOM) card options for the Dell PowerEdge 12th generation servers. The Select Network Adapter form factor delivers the value of LOM integration with the system, including BIOS integration and shared port for manageability while providing the flexibility of a modular card.

The R820 supports one custom rack network daughter card (NDC), as part of the Select Network Adapter family, to house the complete LOM subsystem. The NDC is a custom form factor card that contains a complete NIC subsystem. The NDC options supported on the R820 include a selection of 1GbE and 10GbE port cards, such as 1000 Base-T, 10Gb Base-T and 10Gb SFP+.

Figure 7. Rack network daughter card

Table 12 lists the available Select Network Adapter options and supported features for the R820.

Table 12. Supported Select Network Adapter options and features

Features	Broadcom 5720 Base-T (default)	Intel I350 Base-T	Broadcom 57800 SFP+[1]	Broadcom 57800 Base-T[1]	Broadcom 57840S SPF+	Intel X540 Base-T[1]
Ports x link speed	4 x 1Gb/s	4 x 1Gb/s	2 x 1Gb/s + 2 x 10Gb/s	2 x 1Gb/s + 2 x 10Gb/s	4 x 10Gb/s	2 x 1Gb/s + 2 x 10Gb/s
Supported speed	1Gb/s	1Gb/s	1Gb/s 10Gb/s	1Gb/s 10Gb/s	10Gb/s	1Gb/s 10Gb/s
SR-IOV	Not supported	Not supported	Not supported	Not supported	Supported	Supported (10Gb only)
ISCSI HBA	Not supported	Not supported	Supported[2]	Supported[2]	Supported[2]	Not supported
EEE	Supported	Supported	Not supported	Not supported	Not supported	Not supported
FCoE	Not supported	Not supported	Supported	Not supported[3]	Supported[3]	Supported[3]
Switch independent partitioning	Not supported	Not supported	Supported[4]	Supported[4]	Supported[4]	Not supported
DCB	Not supported	Not supported	Supported[5]	Supported[5]	Supported[5]	Supported[5]
iSCSI TLV	Not supported	Not supported	Supported[6]	Supported[6]	Supported[6]	Supported[6]

[1]These port cards have two chipsets that offer the choice of either 10GbE or 1GbE.

[2]Only 10GbE ports have iSCSI HBA support.

[3]Only 10GbE ports have FCoE support.

[4]Only 10GbE ports have switch independent partitioning support. The maximum number of partitions supported is four (two partitions per 10GbE port). 1GbE ports do not support switch independent partitioning.

[5]Only 10GbE ports have DCB support.

[6]Only 10GbE ports have ISCSI TLV support.

Table 13. Select Network Adapter selection for racks

Protocols	10Gb Ethernet	10Gb Converged			1Gb Ethernet	1Gb Converged
Running	Broadcom LAN 57800 2x1Gb+2x10	Broadcom LAN+ iSCSI 57800 2x1Gb+2x10	LAN+ FCoE	LAN+ISCSI+ FCoE	LAN	LAN+ISCSI
Racks	Gb SFP+	Gb SFP+	-	-	Broadcom 57204x1Gb BT	Broadcom 5720 4x1Gb BT
	Intel i540 2x1Gb+32x10Gb BT	Intel i540 2x1Gb+32x10Gb BT	-	-	Intel i350 4x1Gb BT	Intel i350 4x1Gb BT

System management integration

With R820, the job of deploying, updating, monitoring and maintaining the Select Network Adapters is fast and easy. System management integration features include the following:

- Pre-boot: Use the Dell Lifecycle Controller graphical user interface (GUI) to set configuration such as bandwidth allocation or firmware revision level
- Post-boot: Agent-free out-of-band or high-speed in-band connection over LOM through the Operating System/BMC pass-through feature for sensory information
- Automation of firmware and driver version deployment upon component replacement
- Automatic monitoring of NIC status and notification on SNMP traps
- Local or remote re-configuration of any NIC, physical or virtual
- PXE boot enabled on all LOM and NDCs for ease of use
- Boot from SAN (iSCSI, FCoE) configuration for networking devices through the Lifecycle Controller GUI

PCIe expansion

The R820 provides expanded PCIe slot capability over the previous servers. This is made possible by the 40 PCIe lanes available from each processor in the system. Dell designed the R820 to be PCIe 3.0-compliant in order to take full advantage of the processor capabilities.

PCIe slots

PCIe connectivity is integrated with the processor in that the number of processors in a system impacts the number of PCIe slots and the bandwidth of each PCIe slot.

- Slot 1: half-length, full-height, CPU2, PCIe 3.0 x16 (x16 connector), right riser 1
- Slot 2: half-length, full-height, CPU2, PCIe 3.0 x8 (x16 connector), right riser 1
- Slot 3: half-length, low-profile, CPU1, PCIe 3.0 x8 (x16 connector), center riser 2
- Slot 4: half-length, low-profile, CPU2, PCIe 3.0 x8 (x16 connector), center riser 2
- Slot 5: half-length, low-profile, CPU2, PCIe 3.0 x8 (x16 connector), center riser 2
- Slot 6: half-length, full-height, CPU1, PCIe 3.0 x16 (x16 connector), left riser 3
- Slot 7: half-length, full-height, CPU1, PCIe 3.0 x8 (x8 connector), left riser 3

PCIe expansion cards

The R820 supports a variety of PCIe expansion cards. Table 14 lists the supported add-in NICs and HBAs.

Table 14. Supported NICs and HBAs

Type	Adapter
1Gb/10Gb NIC	Broadcom 5720 2x1Gb Base-T
	Broadcom 5719 4x1Gb Base-T
	Intel I350 2x1Gb Base-T
	Intel I350 4x1Gb Base-T
	Broadcom 57810S 2x10Gb SFP+
	Broadcom 57810S 2x10Gb Base-T
	Intel X520 2x10Gb SFP+
	Intel X540 2x10Gb Base-T
	QLogic® QLE8262 2x10Gb SFP+
	Brocade® BR1020 2x10Gb SFP+
FC4/FC8/F16 HBA	QLogic QLE2460 4Gb
	QLogic QLE2462 4Gb
	QLogic QLE2560 8Gb
	QLogic QLE2562 8Gb
	QLogic QLE2660 16Gb
	QLogic QLE2662 16Gb
	Emulex LPe12000 8Gb
	Emulex LPe12002 8Gb
	Brocade BR815 8Gb
	Brocade BR825 8Gb

Table 15 lists additional supported PCIe expansion cards for the R820.

Table 15. Additional supported PCIe expansion cards

Type	Adapter
PCIe SSD	Fusion-io® ioDrive® 640GB V1
	Fusion-io PCIe SSD V2
PCIe bridge	PCIe bridge adapter for front-accessible, hot-plug Express Flash PCIe SSDs

For the latest information on all supported add-in PCIe expansion cards for the R820, visit Dell.com/PowerEdge.

8 Power, thermal and acoustics

Lower overall system-level power draw is a result of breakthrough system design. The Dell PowerEdge R820 server maximizes performance per watt through a combination of power and cooling, energy-efficient technologies and tools. Additionally, the PowerEdge R820 has an extensive collection of sensors that automatically track thermal activity, which helps regulate temperature thereby reducing server noise and power consumption.

Power consumption and energy efficiency

With the rise in the cost of energy coupled with increasing data center density, Dell provides tools and technologies to help you realize greater performance with less energy cost and waste. More efficient data center usage can reduce costs by slowing the need for additional center space. Table 16 lists the tools and technologies Dell offers to help you achieve your data center goals by lowering power consumption and increasing energy efficiency.

Table 16. Power tools and technologies

Feature	Description
Power supply units (PSU) portfolio	Dell's PSU portfolio includes intelligent features such as dynamically optimizing efficiency while maintaining availability and redundancy. Find additional information in the Power supply units section.
Tools for right-sizing	**Dell Energy Smart Solution Advisor (ESSA)** is a tool that helps you determine the most efficient configuration possible. With ESSA, you can calculate the power consumption of your hardware, power infrastructure and storage. ESSA can help you determine exactly how much power your server will use at a given workload, and the PSU Advisor can help you choose the best, most efficient PSU for your workload. Learn more at Dell.com/ESSA.
Industry compliance	Dell's servers are compliant with all relevant industry certifications and guidelines, including 80 PLUS, Climate Savers and ENERGY STAR.
Power monitoring accuracy	PSU power monitoring improvements include: • Dell's power monitoring accuracy is currently 1%, whereas the industry standard is 5% • More accurate reporting of power • Better performance under a power cap
Power capping	Use Dell's systems management to set the power cap limit for your systems to limit the output of a PSU and reduce system power consumption. Dell is the first hardware vendor to leverage Intel Node Manager for circuit-breaker fast capping.
Systems management	**iDRAC7 Enterprise** provides server-level management that monitors, reports and controls power consumption at the processor, memory and system level. **Dell OpenManage Power Center** delivers group power management at the rack, row and data center level for servers, power distribution units and uninterruptible power supplies.

Feature	Description
Active power management	**Intel Node Manager** is an embedded technology that provides individual server-level power reporting and power limiting functionality. Dell offers a complete power management solution comprised of Intel Node Manager accessed through Dell iDRAC7 Enterprise and OpenManage Power Center that allows policy-based management of power and thermals at the individual server, rack and data center level. **Hot spare** reduces power consumption of redundant power supplies. **Thermal control of fan speed** optimizes the thermal settings for your environment to reduce fan consumption and lower system power consumption. **Idle power** enables Dell servers to run as efficiently when idle as when at full workload.
Fresh Air cooling	With the thermal design and reliability of Dell products, certain configurations have the capability to operate at excursion-based temperatures beyond the industry standard of 35°C (95°F) up to 45°C (113°F) for excursionary periods of time and up to a 26°C dew point at 90% relative humidity; without impacting your availability model. Find additional information at Dell.com/FreshAir.
Rack infrastructure	Dell offers some of the industry's highest-efficiency power infrastructure solutions, including: • Power distribution units • Uninterruptible power supplies • Energy Smart containment rack enclosures Find additional information at content.dell.com/us/en/enterprise/power-and-cooling-technologies-components-rack-infrastructure.aspx.

Find additional information at Dell.com/PowerAndCooling and Power.com/PowerCenter.

Power supply units

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

The following power supply unit options are available for the R820:

- 750W AC
- 1100W AC
- 1100W DC

Figure 8 shows a 750W power supply unit extended from the R820 chassis.

Figure 8. 750W power supply unit

The PowerEdge R820 supports up to two AC-DC or DC-DC power supplies with 1 + 1 redundancy, auto-sensing and auto-switching capability.

Dell PSUs have achieved Platinum and Titanium efficiency levels as shown in Table 17.

Table 17. Power supply efficiency

Form factor	Output	Class	Efficiency targets by load			
			10%	20%	50%	100%
Redundant 60mm	750W AC	Platinum	82.0%	90.0%	94.0%	91.0%
	750W AC	Titanium	90.0%	94.0%	96.0%	91.0%
	1100W AC	Platinum	89.0%	93.0%	94.5%	92.0%
	1100W DC	N/A	80.0%	88.0%	91.0%	88.0%

Thermal and acoustics

Optimized thermal management makes the PowerEdge R820 cool and quiet. Benefiting from smart cooling fan speed control, the R820 can keep both high performance and good acoustics 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 Table 27). Operating environments for the R820 can vary from the data center to general-use spaces. In typical a configuration, the R820 is suitable for an open office environment.

Thermal design

The thermal design of the PowerEdge R820 reflects the following:

- **Multiple sensors are monitored for thermal feedback control:** The PowerEdge R820 dynamically controls system cooling fan speed based on responses from all component temperature sensors, including processors, hard disk drives, DIMMs, storage cards and the inlet ambient temperature. Thermal control detects and responds to hardware configuration. Thermal management adjusts cooling according to what the system really needs, and draws lower fan power draw and generates lower acoustical noise levels than servers without such controls.

- **User-configurable settings:** An R820 thermal control design target is to minimize the contribution of fan power to overall system power. However, with the understanding and realization that every customer has a unique set of circumstances or expectations of the system, in this generation of servers, we are introducing limited user-configurable settings in the iDRAC7 BIOS setup screen. For more information, see the *Dell PowerEdge R820 Owner's Manual* on Dell.com/Support/Manuals and "Advanced Thermal Control: Optimizing across Environments and Power Goals" on Dell.com.
- **Cooling redundancy:** The R820 allows continuous operation with a fan failure in the system.
- **Environmental specifications:** The optimized thermal management makes the R820 reliable under a wide range of operating environments as shown in the environmental specifications in Table 27. Many configurations are also compliant under expanded operating temperature environments, but a few are not.

Acoustical design

The acoustical design of the PowerEdge R820 reflects the following:

- **Versatility:** The PowerEdge R820 saves you power draw in the data center, but it also is quiet enough for the office environment in typical and minimum configurations.
- **Adherence to Dell's high sound quality standards:** Sound quality is different from sound power level and sound pressure level in that it describes how humans respond to annoyances in sound, like whistles and hums. One of the sound quality metrics in the Dell specification is prominence ratio of a tone, which is listed in Table 18.
- **Noise ramp and descent during bootup from power off:** Fan speeds and noise levels ramp during the boot process (from power off to power on) in order to add a layer of protection for component cooling in the case that the system were not to boot properly. To keep bootup as quiet as possible, the fan speed reached during bootup is limited to about half of full speed.
- **Noise level dependencies:** If acoustics is important to you, you may want to make the following configuration choices and settings for the PowerEdge R820 because they result in quieter operation:
  - iDRAC7 BIOS settings: Performance Per Watt (DAPC or OS) may be quieter than Performance or Dense Configuration (iDRAC Settings > Thermal > Max. Exhaust Temperature or Fan speed offset)
  - Hot spare feature of power supply unit: In system default setting, the Hot Spare Feature is disabled; acoustical output from the power supplies is lowest in this setting

  However, some components cause significant but not necessarily intuitive increases in loudness when they are installed in the R820. Contributors to acoustical output can include:
  - PCIe SSD cards (such as Fusion-io)
  - GPUs
  - Express Flash PCIe SSDs
  - 10Gb NIC
  - Dell Select Network Adapter
  - Dell PERC cards
  - Number of installed processors
  - Number of installed PCIe cards
  - Number of hard drives

Table 18 details the acoustical performance for the R820.

Table 18. Acoustical performance

Configuration (23 ± 2°C ambient)	CPUs	Hard drives	Power supply unit	Memory	PCI card/HDD controller	Operating mode	L_{WA}-UL[1] (bels)	L_{pA}[2] (dBA)	Prominent tones[3]
Typical	4	8 x 300GB SAS (10K)	2 x 1100W	32 x 8GB 1600Hz	2 x 1GbE NIC 2 x FC8 1 x PERC H710 1 x H810	Idle[4]	5.5	39	None
						Stress[5]	6.1	48	None
Feature rich	4	12 x 300GB SAS (10K)	2 x 1100W	32 x 8GB 1600Hz	2 x 1GbE NIC 2 x FC8 1 x PERC H710 1 x H810	Idle[4]	5.6	40	None
						Stress[5]	6.2	49	None

[1] L_{WA}-UL is the upper limit sound power levels (L_{WA}) calculated per section 4.4.1 of ISO 9296 (1988) and measured in accordance to ISO 7779 (2010).

[2] L_{pA} is A-weighted sound pressure level at front bystander position measured by binaural head in accordance with ISO7779 (2010) Section 8.6.2. The system is placed inside rack in 75 cm height.

[3] Prominent tone: Criteria of D.6 and D.11 of ECMA-74 11th ed. (2010) are followed to determine if discrete tones are prominent. The system is placed inside rack in 75 cm height and acoustic transducer, binaural head, is at front bystander position, ref ISO7779 (2010) Section 8.6.2.

[4] Idle: Reference ISO 7779 (2010) definition 3.1.7; system is running in its operating system but no other specific activity.

[5] Stressed processor: An operating mode per ISO 7779 (2010) definition 3.1.6. The software SPECPower at 50% is activated to stress the processors and DIMM.

For more information on Dell's acoustical design, see the Dell Enterprise Acoustics white paper.

9 Rack rails and cable management

The sliding and static rail systems for the Dell PowerEdge R820 provide tool-less support for four-post racks with square or unthreaded round mounting holes. Both rail systems also support tooled mounting in four-post threaded racks, and the static rails support tooled mounting in two-post (Telco) racks as well for added versatility.

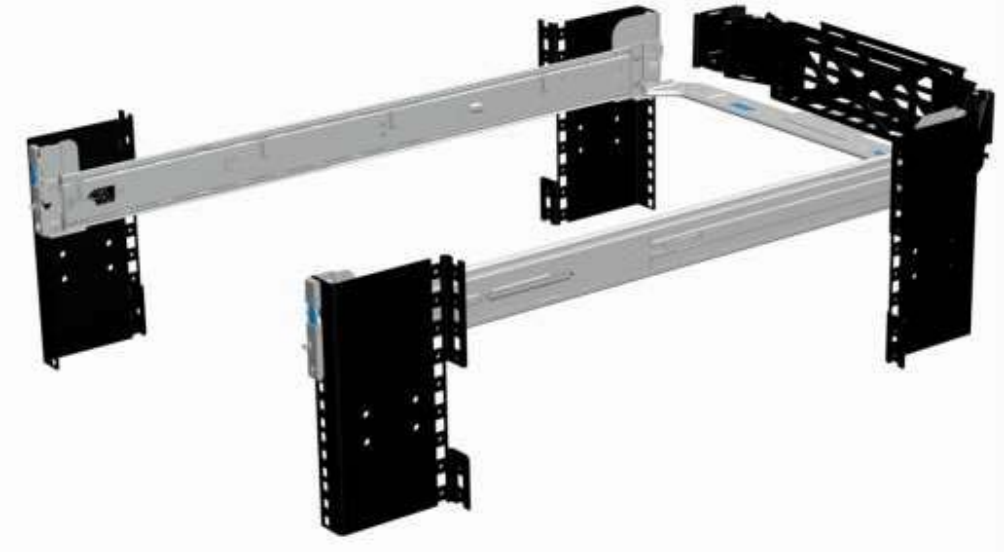
Compared to the R810 sliding rails that required the use of adapter brackets, the sliding rails for the R820 now offer support for threaded hole racks with the ReadyRails II mounting interface. The optional cable management arm (CMA) can be mounted on either the left or right side of the sliding rails without the use of tools for fast and easy deployment.

Sliding and static rail systems

The R820 supports both sliding rails and static rails. Both rails have a new slim rail design that supports the wide system chassis. The rails ship in the tool-less mounting configuration, but can be converted to the tooled configuration very quickly and easily.

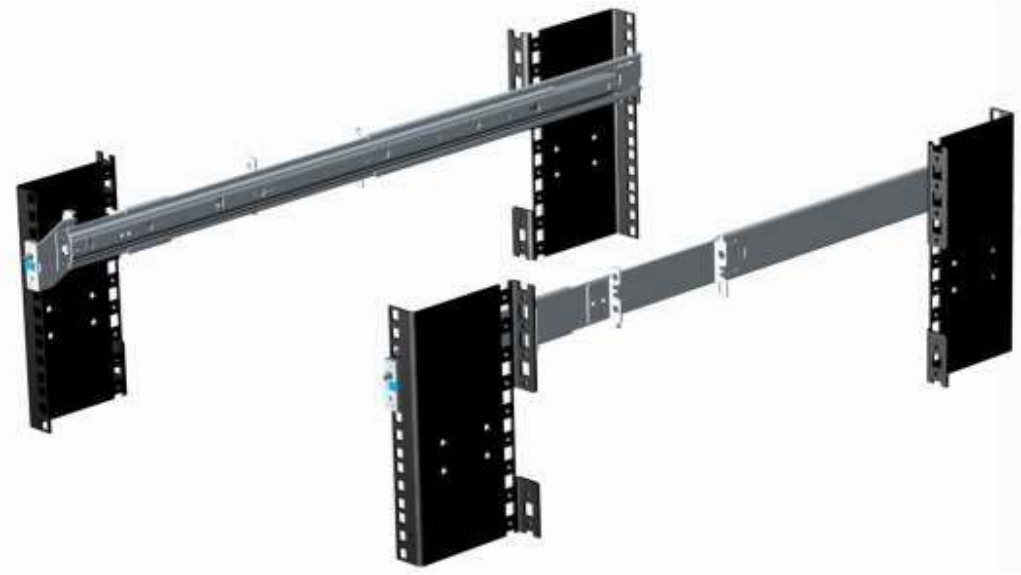
Sliding rails include a self-adjusting feature to allow the rails to be shared across multiple systems and accommodate various chassis depths. The sliding rail system allows you to fully extend the server out the rack for easy access for service. The sliding rails are available with or without the optional CMA. Figure 9 shows the sliding rails with the CMA.

Figure 9. Sliding rails with optional CMA



The static rails (shown in Figure 10) support a wider variety of racks than the sliding rails but do not support serviceability in the rack and are therefore are not compatible with the CMA.

Figure 10. Static rails



One key factor in selecting the proper rails is identifying the type of rack in which they will be installed. Both the sliding rails and the static rails support tool-less mounting in 19”-wide, EIA-310-E compliant square hole and unthreaded round hole four-post racks. Both also support tooled mounting in threaded hole four-post racks, but only the static rails, as the more universal solution, support mounting in two-post (Telco) racks.

Table 19 lists the rack types that the R820 supports. The R820 is not compatible with any other Dell rails or CMAs including previous generation rails.

Table 19. Supported rack types

Product	Rail identifier	Mounting interface	Rail type	Rack types supported				
				4-post			2-post	
				Square	Round	Thread	Flush	Center
R820	B6	ReadyRails II	Sliding	✓	✓	✓	X	X
	B4	ReadyRails	Static	✓	✓	✓	✓	✓

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 (PDUs), and the overall depth of the rack. Due to their reduced complexity and lack of need for CMA support, the static rails offer a greater adjustability range and a smaller overall mounting footprint than the sliding rails.

For detailed information about static and sliding rails, see the Rack rail specifications section in Appendix A. For more information on installing the R820 in a rack, see the *Rack Installation Instructions* on Dell.com/Support/Manuals.

Cable management arm

The optional CMA organizes and secures the cords and cables exiting the back of the server and unfolds to allow the server to extend out of the rack without having to detach the cables. Some key features of the R820 CMA include:

- Large U-shaped baskets to support dense cable loads
- Open vent pattern for optimal airflow
- Ability to be mounted on either side
- Use of hook-and-loop straps rather than plastic tie wraps to eliminate the risk of cable damage during cycling
- Low-profile fixed tray to both support and retain the CMA in its fully closed position
- Ability to mount the CMA and tray without the use of tools, due to snap-in designs

10 Operating systems and virtualization

The Dell PowerEdge R820 supports a wide range of industry-standard operating systems and virtualization software.

Supported operating systems

Table 20 lists the primary operating systems supported on the R820. For the latest information on supported operating systems, see Dell.com/OSsupport.

Table 20. Primary operating system support

Operating System	Platform	Edition
Red Hat Enterprise Linux 5.8[1]	x32 x64	N/A
Red Hat Enterprise Linux 6.3[2]	x64	N/A
Red Hat Enterprise Linux 6.2 for HPC	x64	N/A
SUSE Linux Enterprise Server 11 SP3	x64	N/A
SUSE Linux Enterprise Server 10 SP4	x64	N/A
Microsoft Windows Server 2012	x64	Standard Data center
Microsoft Windows Server 2012 R2	x64 (with Hyper-V role enabled)	Standard Data center
Microsoft Windows Server 2008 SP2	x86	Web Standard Enterprise
	x64 (with Hyper-V role enabled)	Web Standard Enterprise Data center
Microsoft Windows Server 2008 R2 with SP1	x64 (with Hyper-V role enabled)	Web Standard Enterprise Data center HPC Foundation

[1] RHEL 5.7 is the minimum supported version. Current drop in box option is RHEL 5.8.

[2] RHEL 6.1 is the minimum supported version. Current factory install is RHEL 6.3.

Support of the operating systems listed in Table 21 is limited to a virtual environment as a guest operating system. Please contact the software vendor for additional support or questions about running the operating system in a virtualized environment.

Table 21. Virtual guest operating system support

Operating System	Platform	Edition
Microsoft Windows 2003	x86	Web
Microsoft Windows 2003 R2 with SP2	x86	Standard Enterprise
	x64	Standard Enterprise Data center

Supported virtualization

One of the key features for virtualization on the PowerEdge R820 is the support for a fail-safe hypervisor. By running a hypervisor on an optional SD card and installing a backup copy on the other mirrored SD card, you can protect against hardware failure and maximize virtualization uptime.

Table 22 highlights the virtualization support for the R820.

Table 22. Virtualization support

Operating systems		Install version	Factory options	Internal dual SD module install support
VMware	vSphere v5.0	ESXi	DIB	Yes
	vSphere v5.0 U1	ESXi	DIB	Yes
	vSphere v5.1 U1	ESXi	DIB	Yes
	vSphere v5.1	ESXi	DIB	Yes
	vSphere v5.5	ESXi	DIB	Yes
Citrix	XenServer 6.1	N/A	DIB	Yes
Red Hat[1]	Enterprise Virtualization 3.1	N/A	DIB	No

FI = factory install; DIB = drop in box

[1]No OpenManage support; drop-in-box license registration card only

11 Dell OpenManage systems management

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

The advanced management capabilities of Dell OpenManage also integrates into offerings from other popular systems management solutions that you may already use, making Dell platforms easy to manage and deploy in any IT environment. This ensures your IT services are available when your business needs them. If you have already standardized on offerings from industry leaders, such as BMC Software, Microsoft, Symantec™, VMware, or other vendors, you can leverage OpenManage integration and connections developed for use with your existing systems management framework to efficiently manage Dell servers, storage, business-client PCs and network devices.

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

Systems management solutions

Dell systems management solutions include a wide variety of tools, products, and services that enable you to leverage an existing systems management framework. As shown in Figure 11, Dell systems management solutions are centered around OpenManage server management, featuring iDRAC with Lifecycle Controller.

Figure 11. Dell systems management solutions

OpenManage systems management

The Dell OpenManage systems management portfolio includes powerful hardware and software management tools and consoles. OpenManage simplifies the lifecycle of deploying, updating, monitoring and maintaining your Dell PowerEdge servers.

iDRAC7 with Lifecycle Controller

The Integrated Dell Remote Access Controller 7 (iDRAC7) with Lifecycle Controller is the heart of Dell's second generation of Dell PowerEdge server embedded management functionality. In addition to enabling agent-free management, iDRAC7 with Lifecycle Controller provides remote access to the system — whether or not there is a functioning operating system running on the server. These embedded features improve all aspects of a typical server lifecycle. Table 23 describes the functions and benefits of iDRAC7 with Lifecycle Controller.

Table 23. iDRAC7 with Lifecycle Controller functions and benefits

Feature	Function	Benefit
Out of band (OOB)	iDRAC7 offers real-time OOB discovery, inventory, deployment monitoring, alerting and updates for servers and internal storage	Manage servers independent of the OS type or status — even if an OS is not installed
Single code base	All server types have the same embedded management hardware and firmware	Simplified and consistent maintenance across server platforms
Dedicated GigE port (PowerEdge rack and tower systems)	Gigabit Ethernet replaces 10/100 on predecessor iDRAC6	Fast throughput for better performance; compatibility with setup for switches
Email alerts	Simplified, more informative, and expanded coverage than previous versions of iDRAC	More detail allows IT administrators to be more efficient in diagnosing and remediating an issue; alerts include a direct, embedded URL in the email notification to further speed resolution
vFlash media	Enabled with iDRAC7 Enterprise	Allows for use of a non-Dell SD card
Enhanced power management	Integration with Intel Node Manager provides data center level power monitoring and capping (requires iDRAC7 Enterprise)	Fine tune data center power policies, capping, and usage; report on historical power usage by rack, row or room using Power Center Manager (new)

Feature	Function	Benefit
Electronic licensing	Upgrades to iDRAC7 Express or iDRAC7 Enterprise by software licensing key and license portal (may require installation of hardware option for 300-500 series servers)	Digital license installed in factory; free 30-day trial versions are available; uses a license management portal versus paper-based licenses and simplifies license management. For most server models, embedded server management and electronic licensing enables feature enhancements that do not require installation of additional hardware or system downtime.

iDRAC7 feature comparison

iDRAC7 Enterprise is available for the PowerEdge R820, and Dell also offers an option of iDRAC7 Express. A detailed feature comparison for iDRAC7 Enterprise and iDRAC7 Express is shown in Table 24.

Table 24. Feature comparison for iDRAC7 Express and Enterprise

Feature (function)	iDRAC7 Enterprise	iDRAC7 Express
Local configuration with Lifecycle Controller GUI	∞	∞
IPMI 2.0	∞	∞
Embedded diagnostics	∞	∞
Local OS install	∞	∞
Local updates	∞	∞
Driver pack	∞	∞
Shared NIC (LOM)	∞	∞
Remote update	∞	∞
Power control	∞	∞
Encryption	∞	∞
Crash screen capture[1]	∞	∞
IPv6	∞	∞
Auto-discovery	∞	∞
Auto-recovery	∞	∞
Web GUI	∞	∞
Remote CLI	∞	∞
Local/SSH CLI	∞	∞
Serial redirection	∞	∞
Remote configuration	∞	∞
Email alerts	∞	∞
SNMP alerts	∞	∞

Feature (function)	iDRAC7 Enterprise	iDRAC7 Express
Power monitoring	∞	∞
Comprehensive monitoring	∞	∞
Dedicated NIC 1Gbps (100MB in iDRAC6)	∞	
Part replacement	∞	
Backup and restore configurations	∞	
Virtual console (4 user)	∞	
Virtual console chat	∞	
Support for customer-supplied SD cards for vFlash media	∞	
Virtual flash partitions	∞	
Virtual media	∞	
Virtual folders	∞	
Remote file share	∞	
Crash video playback	∞	
Boot record/playback	∞	
Power capping	∞	
Enterprise group power management	∞	
Directory services (AD, LDAP)	∞	
PK authentication	∞	
Two-factor authentication[2]	∞	

[1]Requires OMSA agent on target server
[2]Uses Microsoft ActiveX® on Internet Explorer® only

Agent-based management

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

OpenManage Server Administrator

The Dell OpenManage Server Administrator (OMSA) agent gives you a comprehensive, one-to-one systems management solution for both local and remote servers and their storage. OMSA can help simplify single-server monitoring with a secure command-line interface (CLI) or Web-based management graphical user interface (GUI). It can also be used to view system configuration, inventory, health and performance.

Agent-free management

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

Dell consoles

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

- **Dell OpenManage Essentials:** OpenManage Essentials (OME) is a systems management console that provides a comprehensive view of Dell systems, devices and components in an enterprise network. It is used to monitor Dell PowerEdge servers, EqualLogic™ and PowerVault™ storage and Dell Networking switches; to update and configure Dell servers; and to create asset reports. OpenManage Essentials also communicates health status alerts for Dell servers, storage, and network devices to the KACE™ K1000 service desk. OpenManage Essentials is available as a no-charge software download from Dell.com/Support.

OpenManage systems management tools and utilities

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

- **Dell Repository Manager:** The Dell Repository Manager (RM) is a standalone GUI-based productivity tool that helps simplify the process of managing downloads and baseline BIOS, firmware, and driver updates. Repository Manager can create deployment disks as well as create and manage customized repositories.
- **Dell OpenManage Server Update Utility:** The Dell Server Update Utility (SUU) is a DVD-based application for identifying and applying BIOS and firmware updates to your Dell PowerEdge servers.
- **Dell OpenManage Systems Build and Update Utility:** The Dell System Build and Update Utility (SBUU) provides one-to-one and one-to-many deployment and single-server update capabilities in the pre-operating system environment.
- **Dell Update Packages:** The Dell Update Packages (DUP) is a self-contained executable in a standard package format that updates a software element on a Dell server such as the BIOS, a driver, firmware and other software updates.
- **Dell OpenManage Deployment Toolkit:** The Dell OpenManage Deployment Toolkit (DTK) is a CLI-based tool that includes a set of utilities for configuring and deploying Dell PowerEdge systems, and can be used to build scripted, unattended OS installations to deploy large numbers of servers in a reliable fashion.
- **RACADM:** The RACADM command-line utility provides a scriptable interface that allows you to locally or remotely configure iDRAC7.
- **IPMITool:** IPMITool includes scriptable console application programs used to control and manage remote systems using the IPMI version 1.5 and later protocol.

Integration with third-party consoles

Dell OpenManage easily integrates with several leading third-party consoles, including:

- **Dell Server Management Pack Suite for Microsoft System Center Operations Manager (SCOM):** This suite of server management packs enables several functions through System Center Operations Manager, including in-band discovery and monitoring of racks and

towers, out-of-band discovery and monitoring through iDRAC with Lifecycle Controller, as well as performance and advanced monitoring.

- **Dell Lifecycle Controller Integration (DLCI) for Microsoft System Center Configuration Manager (SCCM):** This pack contains Dell Lifecycle Controller Integration (DLCI), which integrates OpenManage functions in SCCM to manage the Dell PowerEdge servers, including auto-discovery, operating system deployment and configuration of hardware elements, (RAID, NIC, BIOS, iDRAC), OS and hypervisor agnostic updates, firmware management and system viewer utilities.
- **Dell Server PRO Management Pack for Microsoft System Center Virtual Machine Manager (SCVMM):** This pack manages Dell physical servers and hosts of virtual machines (VMs) by using Microsoft System Center Operations Manager/System Center Essentials (SCOM/SCE) and System Center Virtual Machine Manager (SCVMM). It provides guidance for remedial actions based on alerts to best manage virtual machines and handle the impacts appropriately.
- **OpenManage Integration for VMware vCenter:** This plug-in allows IT administrators to monitor, provision, and manage the physical PowerEdge server hardware and firmware from a dedicated Dell menu accessed through the VMware vCenter console using the same role-based access control model as vCenter, combining physical server management.
- **BMC Software:** Dell and BMC Software work together to simplify IT by ensuring tight integration between Dell server, storage, and network management functionality and the BMC Software process and data center automation products.

OpenManage integration and connections with third-party consoles

Dell OpenManage provides integrations and connections with many third-party consoles, including:

- **Dell OpenManage Connection for Computer Associates Network and Systems Management:** This connection allows you to monitor PowerEdge servers and PowerVault storage arrays from within the Computer Associates Network and Systems Management (CANSM) console.
- **Dell OpenManage Connection for HP Operations Manager:** This connection enables several functions through HP Operations Manager, including auto-grouping, SNMP trap reception, global health monitoring and a context-sensitive launch of OpenManage Server Administrator.
- **Dell OpenManage Connection for IBM Tivoli Netcool/OMNIBus:** This connection provides event monitoring capabilities to monitor Dell PowerEdge servers and Dell EqualLogic systems. It allows event monitoring, automatic event correlation and launching device consoles from the Netcool/OMNIbus console.

Dell server management operations

Dell OpenManage systems management is centered on automating the server management lifecycle — Deploy, Update, Monitor and Maintain. To manage an infrastructure properly and efficiently, you must perform all of these functions easily and quickly. iDRAC7 with Lifecycle Controller technology provides you with these intelligent capabilities embedded within the server infrastructure. This allows you to invest more time and energy on business improvements and less on maintenance. Figure 12 illustrates the various operations that can be performed during the server's lifecycle.

Figure 12. Systems management server lifecycle

Table 25 lists the products that are available for one-to-one and one-to-many operations, and when they are used in the server's lifecycle.

Table 25. One-to-one and one-to-many operations

Operation	One-to-one	One-to-many	
Deploy	• Lifecycle Controller GUI • DTK • SBUU	• Symantec Deployment Server • OpenManage Integration for VMware vCenter • KACE K1000 Appliance • Lifecycle Controller Remote Services • BMC BladeLogic integration with Lifecycle Controller	• Dell Server Deployment Pack (DSDP) for Microsoft System Center Configuration Manager and Dell Lifecycle Controller Integration (DLCI) for Microsoft System Center Configuration Manager
Update	• iDRAC7 with LifeCycle Controller GUI • Repository Manager • DUP • SUU • SBUU • OpenManage Integration for VMware vCenter	• Dell OpenManage Essentials • Lifecycle Controller Remote Services	• Dell Update Catalogs for Microsoft System Center Configuration Manager • Dell Lifecycle Controller Integration (DLCI) for Microsoft System Center Configuration Manager

Operation	One-to-one	One-to-many	
Monitor	• iDRAC7 with LifeCycle Controller • OMSA	• Dell OpenManage Essentials • BMC ProactiveNet Performance Management Integration with Lifecycle Controller • Dell OpenManage Power Center	• OpenManage Integration for VMware vCenter • BMC ProactiveNet Performance Management Integration with Lifecycle Controller • Dell Server Management Pack Suite for Microsoft System Center Operations Manager (SCOM)
Maintain	• iDRAC7 with Lifecycle Controller GUI	• Lifecycle Controller Remote Services	Remediate: • Dell Server PRO Management Pack for Microsoft System Center Virtual Machine Manager (SCVMM) Replace parts: • Dell Lifecycle Controller Integration (DLCI) for Microsoft System Center Configuration Manager

For additional detailed information on Dell's systems management portfolio, see the *Dell OpenManage Systems Management Overview Guide* on Dell.com/Support/Manuals.

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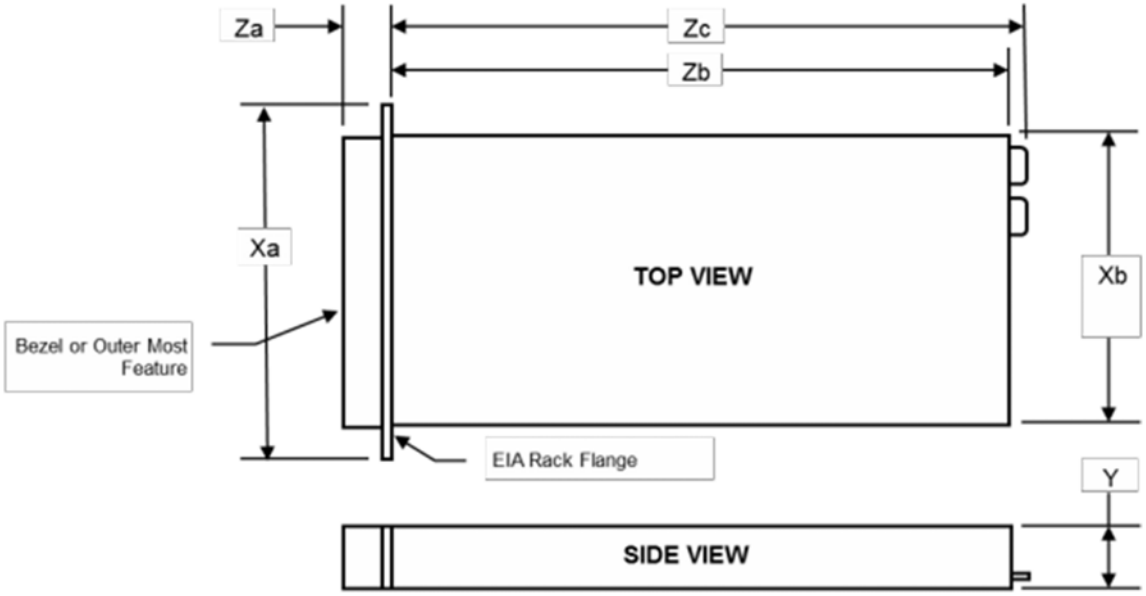
Appendix A. Additional specifications

Chassis dimensions

Figure 13 details the dimensions of the Dell PowerEdge R820 chassis.

Figure 13. System dimensions



Xa	Xb	Y	Za with bezel	Za without bezel	Zb	Zc
482.4mm	434.0mm	86.8mm	35.7mm	20.4mm	740.6mm	777.6mm

Chassis weight

The R820 chassis at maximum configuration is 29.5 kg (65 lb).

Video specifications

The Dell PowerEdge R820 iDRAC incorporates an integrated video subsystem. The graphics controller is the 2D Matrox® G200. The video frame buffer (16MB) is contained within the iDRAC RAM (256MB) device.

The R820 system supports the 2D graphics video modes listed in Table 26.

Table 26. Supported video modes

Resolution	Refresh Rate (Hz)	Color Depth (bit)
640 x 480	60, 70	8, 16, 32
800 x 600	60, 75, 85	8, 16, 32
1024 x 768	60, 75, 85	8, 16, 32
1152 x 864	60, 75, 85	8, 16, 32
1280 x 1024	60, 75	8, 16, 32

Environmental specifications

Table 27 details the environmental specifications for the R820. For additional information about environmental measurements for specific system configurations, see Dell.com/environmental_datasheets.

Table 27. Environmental specifications

Fresh Air: temperature, humidity, altitude de-rating	
Continuous operation	10°C to 35°C (50°F to 95°F) at 10% to 80% relative humidity with 26°C (78.8°F) maximum dew point (maximum wet bulb temperature). De-rate maximum allowable dry bulb temperature at 1°C per 300m above 950m (1°F per 547 ft above 3117 ft).
Expanded operation	When operating in the expanded temperature range, system performance may be impacted, and ambient temperature warnings may be reported on the LCD and in the System Event Log. **≤ 10% of annual operating hours:** 5°C to 10°C and 35°C to 40°C (with no direct sunlight on the equipment) at 5% to 85% relative humidity with 26°C dew point (maximum wet bulb temperature). Outside the standard operating temperature (10°C to 35°C), the system can operate down to 5°C or up to 40°C for a maximum of 10% of its annual operating hours. For temperatures between 35°C and 40°C (95°F to 104°F), de-rate maximum allowable dry bulb temperature by 1°C per 175m above 950m (1°F per 319 ft above 3117 ft). **≤ 1% of annual operating hours:** –5°C to 5°C and 40°C to 45°C (with no direct sunlight on the equipment) at 5% to 90% relative humidity with 26°C dew point (maximum wet bulb temperature). Outside the standard operating temperature (10°C to 35°C), the system can operate down to –5°C or up to 45°C for a maximum of 1% of its annual operating hours. For temperatures between 40°C and 45°C (104°F to 113°F), de-rate maximum allowable dry bulb temperature by 1°C per 125m above 950m (1°F per 228 ft above 3117 ft). **Expanded operation restrictions:** • No cold startup below 5°C • Maximum 95W processors (two or four processors) • Maximum 8 hard drives (no dual PERC) • Maximum altitude for the operating temperature must be 3050m (10,000ft) • x8 backplane only (restrict 2nd x8, x16 or x4 backplanes) • Requires two redundant power supplies, either 750W or 1100W • PCIe slot 1 and slot 2 cannot be populated • Not supported: - GPU - LRDIMM
Temperature	
Operating	See Fresh Air for temperature information
Storage	–40°C to 65°C (-40°F to 149°F) with a maximum temperature gradation of 20°C per hour

Relative humidity	
Operating	See Fresh Air for relative humidity information
Storage	5% to 95% at a maximum wet bulb temperature of 33°C (91°F); atmosphere must be non-condensing at all times
Maximum vibration	
Operating	0.26 Grms at 5Hz to 350Hz in all orientations
Storage	1.87 Grms at 10Hz to 500Hz for 15 minutes (all six sides tested)
Maximum shock	
Operating	Half sine shock in all operational orientations of 31G +/– 5% with a pulse duration of 2.6ms +/– 10%
Storage	Half sine shock on all six sides of 71G +/– 5% with a pulse duration of 2ms +/–10%; square wave shock on all six sides of 27G with velocity change at 235 in/sec or greater
Altitude	
Operating	–15.2m to 3048m (–50 ft to 10,000 ft)
Storage	–15.2m to 12,000m (–50 ft to 39,370 ft)
Airborne contaminant level	
Class G1 or lower as defined by ISA-S71.04-1985	

Power supply specifications

Table 28 lists power supply specifications for the PowerEdge R820.

Table 28. Power supply specifications

Specification	1100W DC	1100W AC	750W AC Titanium	750W AC Platinum
Current consumption	32A	12–6.5A	10–5A	10–5A
Supply voltage	-48V to -60V DC	100–240VAC[1]	200–240VAC	100–240VAC[1]
Frequency	N/A	50/60Hz	50/60Hz	50/60Hz
Heat dissipation (BTU/hr max)	4416	4100	2843	2891
Maximum inrush current[2]	55A	55A	55A	55A

[1]Auto-ranging

[2]Under typical line conditions and over the entire system ambient operating range, the inrush current may reach 55A per power supply for 10ms or less.

Rack rail specifications

Table 29 lists the spacing dimensions for the R820 sliding and static rails.

Table 29. Rail adjustability range

Product	Rail identifier	Rail type	Rail adjustability range (mm)						Rail depth (mm)	
			Square		Round		Threaded		without CMA	with CMA
			Min	Max	Min	Max	Min	Max		
R820	B6	Sliding	676	868	662	861	676	883	714	845
	B4	Static	608	879	594	872	604	890	622	—

The adjustment range of the rails is a function of the type of rack in which they are being mounted. The min-max values listed above represent the allowable distance between the front and rear mounting flanges in the rack. Rail depth without the CMA represents the minimum depth of the rails with the outer CMA brackets removed (if applicable) as measured from the front mounting flanges of the rack.

USB peripherals

USB peripherals are supported through the front and back USB ports on the R820. These ports are USB 2.0 compliant.

Appendix B. Standards compliance

The Dell PowerEdge R820 conforms to the industry standards listed in Table 30.

Table 30. Industry standard documents

Standard	URL for information and specifications
ACPI Advance Configuration and Power Interface Specification, v2.0c	acpi.info
Ethernet IEEE 802.3-2005	standards.ieee.org/getieee802/802.3.html
HDG Hardware Design Guide Version 3.0 for Microsoft Windows Server	microsoft.com/whdc/system/platform/pcdesign/desguide/serverdg.mspx
IPMI Intelligent Platform Management Interface, v2.0	intel.com/design/servers/ipmi
DDR3 Memory DDR3 SDRAM Specification, Rev. 3A	jedec.org/download/search/JESD79-3C.pdf
LPC Low Pin Count Interface Specification, Rev. 1.1	developer.intel.com/design/chipsets/industry/lpc.htm
PCI Express PCI Express Base Specification Rev. 2.0 and 3.0	pcisig.com/specifications/pciexpress
PMBus Power System Management Protocol Specification, v1.2	pmbus.info/specs.html
SAS Serial Attached SCSI, v1.1	t10.org
SATA Serial ATA Rev. 2.6; SATA II, SATA 1.0a Extensions, Rev. 1.2	sata-io.org
SMBIOS System Management BIOS Reference Specification, v2.7	dmtf.org/standards/smbios
TPM Trusted Platform Module Specification, v1.2	trustedcomputinggroup.org
UEFI Unified Extensible Firmware Interface Specification, v2.1	uefi.org/specs
USB Universal Serial Bus Specification, Rev. 2.0	usb.org/developers/docs
Windows Logo Windows Logo Program System and Device Requirements, v3.10	microsoft.com/whdc/winlogo/hwrequirements.mspx

7 Additional resources

Table 31 provides a list of documents and websites that provide for more information on the Dell PowerEdge R820.

Table 31. Additional resources

Resource	Description of contents	Location
PowerEdge R820 Systems Owner's Manual	This manual, available PDF format, provides the following information: Chassis features System Setup program System messages System codes and indicators System BIOS Remove and replace procedures Troubleshooting Diagnostics Jumpers and connectors	Dell.com/Support/Manuals
PowerEdge R820 Getting Started Guide	This guide ships with the system, and is also available in PDF format on the Dell support site. This guide provides the following information: Initial setup steps Key system features Technical specifications	Dell.com/Support/Manuals
Rack Installation Instructions	This document ships with the rack kits, and provides instructions for installing a server in a rack.	Dell.com/Support/Manuals
Cable Management Arm Installation Instructions	This document ships with the CMA kits, and provides instructions for installing the cable management arm on the rails.	Dell.com/Support/Manuals
Information Update	This document ships with the system, and is also available in PDF format on the Dell support site. This document provides information on system updates.	Dell.com/Support/Manuals
System Information Label	The system information label documents the system board layout and system jumper settings. Text is minimized due to space limitations and translation considerations. The label size is standardized across platforms.	Inside the system chassis cover
Quick Resource Locator (QRL)	This code on the chassis can be scanned by a phone application to access additional information and resources for the server, including videos, reference materials, service tag information and Dell contact information.	Inside the system chassis cover
Energy Smart Solution Advisor	The Dell Energy Smart Solution Advisor (ESSA) enables easier and more meaningful estimates to help you determine the most efficient configuration possible. Use	Dell.com/ESSA

Resource	Description of contents	Location
	ESSA to calculate the power consumption of your hardware, power infrastructure and storage.	
Power and cooling technologies	Provides details for improving energy efficiency in the data center.	Dell.com/PNC
Energy management	Provides information on Dell's Fresh Air cooling solutions.	Dell.com/FreshAir
Operating system matrix for Dell PowerEdge systems	Provides updated information on which operating systems are available on which PowerEdge systems.	Dell.com/OSsupport
Processor and chipset	Provides more information about the R820 processors and chipset.	Intel.com
Dell PowerEdge RAID controllers	Provides more information about Dell PERCs.	Dell.com/PERC
Power distribution unit	Provides help selecting a rack-based power distribution unit.	DellPDU.com
Uninterruptible power supply	Provides help selecting an uninterruptible power supply model.	DellUPS.com
Volatility information	Contct your Dell sales representative	Dell.com
Dell Enterprise Acoustics	White paper that explores the mechanisms of, people's reaction to, language of, and Dell's work to control noise from Enterprise products.	dell.com/downloads/global/products/pedge/en/acoustical-education-dell-enterprise-white-paper.pdf

Appendix C. System board block diagram

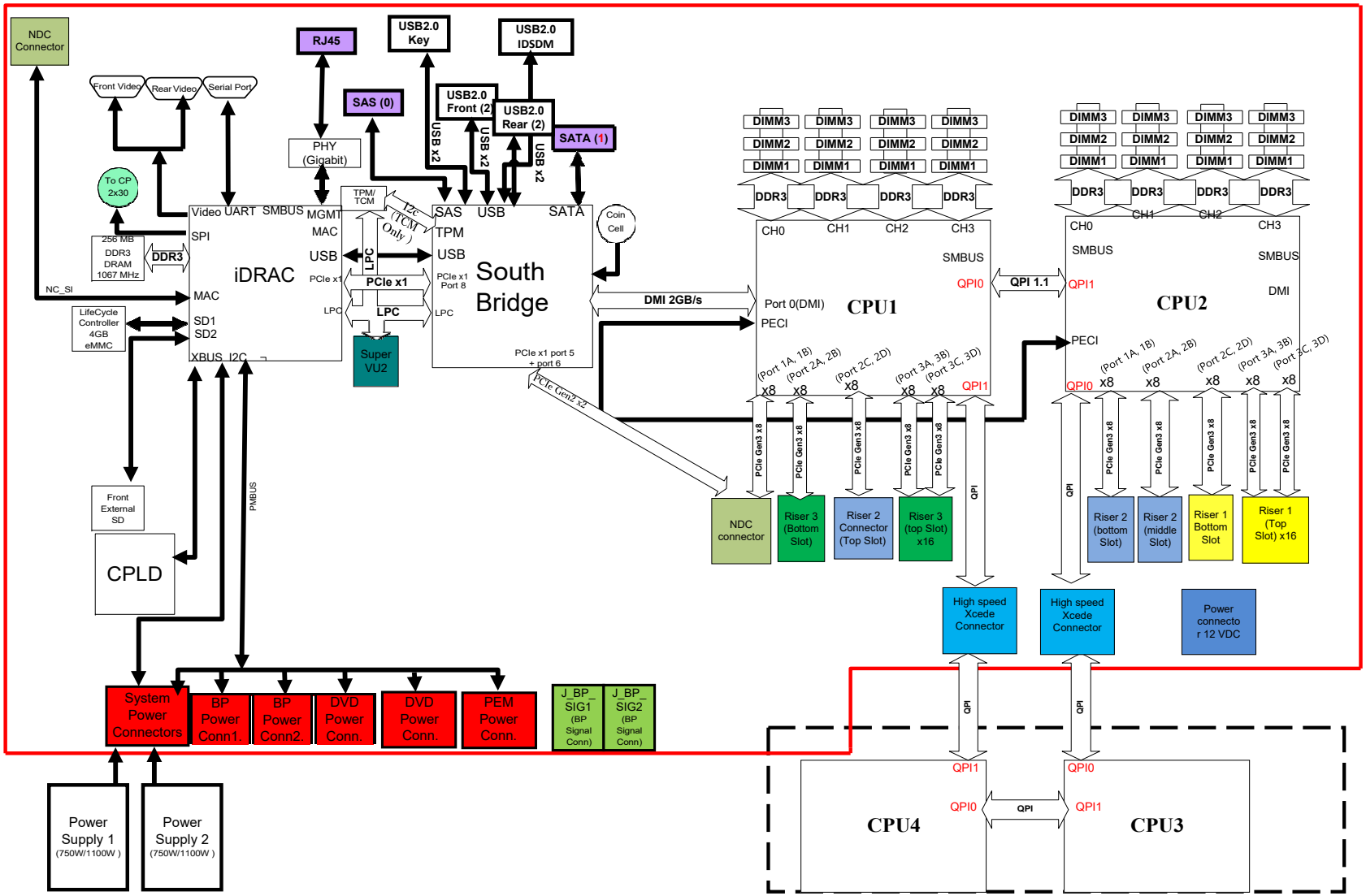



Figure 14. R820 system board block diagram