PowerEdge M620

Technical Guide

A feature-rich 2-socket blade server, the PowerEdge M620 is designed for maximum performance with extreme density.

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1 System overview

Introduction

Designed for your taxing workloads, such as email, database and virtual environments, the Dell PowerEdge M620 blade server is an ideal blend of density, performance, efficiency and scalability. The M620 delivers unprecedented memory density and superb performance with no compromise on enterprise-class features.

Accomplish more

Bring impressive new capabilities to your data center with the PowerEdge M620, which offers a memory capacity of up to 768GB of RAM (using 32GB DIMMS—available Q2 2012) along with scalable I/O capabilities. Powered by Intel® Xeon® E5 processors and Dell's unique Select Network Adapter, our flexible NIC technology, the M620 provides the performance you require and allows you to allocate your network throughput to match your application needs.

Designed for your hyper-dense environments

Your virtualization environments demand high memory capacity in order to maximize the number of virtual machines per server, and the PowerEdge M620 was designed with this in mind. If you are running high performance computing (HPC) application clusters, the M620 provides you with outstanding computational density and powerful processing capability in a compact form factor.

Improve operational efficiency

Help manage your servers using the Dell OpenManage™ portfolio, including Dell's exclusive Integrated Dell Remote Access Controller (iDRAC) with Lifecycle Controller. iDRAC, an embedded systems management feature, allows Dell servers to be managed in physical, virtual, local and remote environments, either in-band or out-of-band and with or without a systems management software agent. OpenManage also integrates and connects to leading third-party systems management solutions you may already use, allowing you to maintain a single point of control and capitalize on your existing investment. OpenManage simplifies the lifecycle of deploying, updating, monitoring and maintaining your Dell PowerEdge servers.

The PowerEdge M-series blade server line

Implement the right combination of features and performance scalability with the PowerEdge M-series blade servers, which can handle tough workloads in a data center of any size. In addition to the world-class management features provided in all PowerEdge servers, the M620 also takes advantage of the capabilities of the Dell PowerEdge M1000e chassis management controller (CMC). The CMC allows M-series blades to be managed individually or as groups, in single or multiple chassis, and within a data center or in multiple geographically dispersed locations around the globe without requiring a single agent or additional hardware. PowerEdge M-series blade servers use the redundant power, cooling, and networking infrastructure provided by the M1000e blade enclosure, which is exceptionally easy to deploy and manage and maximizes power and cooling efficiency.

New technologies

A number of new technologies are featured on the PowerEdge M620 system, as detailed in Table 1.

Table 1. New technologies

New technologies	Detailed descriptions
Intel Xeon processor E5-2600 product family	This new family of Intel processors has embedded PCI Express® (PCIe) lanes for improved I/O performance and additional new features. See the Processors section for details.
Intel C600 series chipset	The Intel Platform Controller Hub (PCH) chip is implemented on the M620.
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 more information.
Flexible LOM	Dell's Select Network Adapter options allow you choose the right network fabric without using up a valuable mezzanine card slot. See the Networking and mezzanine cards section for details.
Next-generation PERC options	The M620 supports new Dell 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 and 1. See the Storage section for details.
Express Flash drives[1]	Dell Express Flash PCIe SSD drives provide fast performance without requiring processor resources or capturing DRAM. The M620 supports up to two Express Flash PCIe SSD drives (available Q2 2012). 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 Systems management section for details.
Advanced power management	The M620 supports advanced power monitoring and power capping tools that can help manage power consumption in the data center.
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® ESXi™.
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.

[1]Available Q2 2012

2 System features

Compared to the previous generation of Dell™ PowerEdge™ blade servers, the M620 has more memory, processor cores, and networking options than ever before. Features include DDR3 memory, PCI Express 3.0, a network daughter card (NDC), dual internal SD module, and Dell's next-generation iDRAC solution known as iDRAC 7 Enterprise with Lifecycle Controller.

Specifications

Table 2 lists the technical specifications for the PowerEdge M620 blade server. For the latest information on supported features, visit Dell.com.

Table 2. Technical specifications

Feature	Technical specification
Form factor; enclosure	Half-height blade; Dell PowerEdge M1000e Blade Enclosure
Processors	Intel® Xeon® processor E5-2600 product family
Internal interconnect	Intel QuickPath Interconnect (QPI): 6.4 GT/s; 7.2 GT/s; 8.0 GT/s
Cache	2.5MB per core; core options: 2, 4, 6, 8
Memory[1]	Up to 768GB[2] (24 DIMM slots): 2GB/4GB/8GB/16GB/32GB DDR3 up to 1600MT/s
Chipset	Intel C600
Video	Integrated Matrox® G200
Primary storage[1]	**Hot-plug hard drive options**: Up to two 2.5" Express Flash PCIe SSD[3], SATA HDD/SSD, or SAS HDD/SSD **External storage:** For information about Dell external storage options, visit Dell.com/Storage
USB ports	2 front, 1 internal
I/O mezzanine card options	**Ethernet:** Intel 4x1Gb (1Gb) Broadcom® 57810S 2x10Gb KR (10Gb) Intel X520 2x10Gb XAUI/KR (10Gb) QLogic® QME8262 2x10Gb KR (10Gb) Brocade® BR1741M 2x10Gb KR (10Gb) **Fibre Channel:** QLogic QME2572 (8GB) Emulex® LPe1205-M (8GB) **Infiniband:** Mellanox® QDR IB CX-3 Mellanox FDR IB CX-3 VPI
I/O slots	Fully populated mezzanine card slots and switch modules yields 3 redundant I/O fabrics per blade
Dell Select Network Adapter (network daughter card)	2 x 10GbE KR Broadcom (BCM57810S bNDC) 2 x 10GbE KR QLogic bNDC 2 x 10GbE KR Intel i520 bNDC

Feature	Technical specification
RAID controller	**Internal controllers:** PERC S110 (software RAID) PERC H310 PERC H710 PERC H710P
Power supplies and fans	Supplied by M1000e blade enclosure
Remote management	iDRAC7 Enterprise with Lifecycle Controller or iDRAC7 Express for Blades with Lifecycle Controller
Systems management	Dell OpenManage™ Essentials and Dell Management Console Dell OpenManage Power Center Dell OpenManage Integration: • OpenManage Integration Suite for Microsoft® System Center • Dell Management Plug-in for VMware® vCenter™ • OpenManage Connections for HP Operations Manager, IBM Tivoli® Netcool®, and CA Network and Systems Management IPMI 2.0 compliant
Operating systems	Microsoft Windows Server® 2008 R2 SP1, x64 (includes Hyper-V™ v2) SUSE® Linux® Enterprise Server Red Hat® Enterprise Linux **Virtualization options:** Citrix® XenServer™ VMware® vSphere™ For more information on the specific versions and additions, visit Dell.com/OSsupport.
Embedded hypervisor	Two internal SD cards dedicated for hypervisor One dedicated for vFlash media support
For more information about the Dell blade solution, see the PowerEdge M1000e Technical Guide or the M1000e Blade Chassis Specification Sheet on Dell.com.	

[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

[2]Supported with 32GB DIMMS (available Q2 2012)

[3]Available Q2 2012

Comparison of PowerEdge systems

The PowerEdge M620 is a replacement for the predecessor M610 and M710HD systems, three systems that are compared in Table 3. For the latest information on supported features, visit Dell.com.

Table 3. Comparison of PowerEdge M610, M710HD, and M620

Feature	PowerEdge M610	PowerEdge M710HD	PowerEdge M620 (new)
Chassis; enclosure	Half-height blade; PowerEdge M1000e Blade Enclosure	Half-height blade; PowerEdge M1000e Blade Enclosure	Half-height blade; PowerEdge M1000e Blade Enclosure
Processors	Intel® Xeon® processors 5500 and 5600 series	Intel Xeon processors 5500 and 5600 series	Intel Xeon processor E5-2600 product family
Internal interconnect	Intel QuickPath Interconnect	Intel QuickPath Interconnect	Intel QuickPath Interconnect
Memory	12 x DDR3 RDIMM and UDIMM	18 x DDR3 RDIMM and UDIMM	24 x DDR3 RDIMM, UDIMM, and LRDIMM
Hard drive bays (hot plug)	2 x 2.5"	2 x 2.5"	2 x 2.5"
Express Flash drives[1]	Not supported	Not supported	Up to 2
I/O slots	2 PCIe 2.0 x8 mezzanine card slots	2 PCIe 2.0 x8 mezzanine card slots	2 x PCIe 3.0 x8 mezzanine card slots
Optional SD port	Yes	Yes	Yes (redundant hypervisor + vFlash media)
Systems management	Lifecycle Controller 1.x, OpenManage Server Administrator (OMSA), RACADM	Lifecycle Controller 1.x, OpenManage Server Administrator (OMSA), RACADM	Lifecycle Controller 2.x, Agent-Free, OpenManage Server Administrator (OMSA), RACADM
Remote management	iDRAC6 (Express or Enterprise) with Lifecycle Controller 1.x, Chassis Management Controller 3.x, Dell Management Console, IT Assistant, RACADM	iDRAC6 (Express or Enterprise) with Lifecycle Controller 1.x, Chassis Management Controller 3.x, Dell Management Console, IT Assistant, RACADM	iDRAC7 (Express for Blades or Enterprise) with Lifecycle Controller 2.x, Chassis Management Controller 4.x, OpenManage Essentials, Dell Management Console, IT Assistant, RACADM

[1]Available Q2 2012

3 Module views and features

The Dell™ PowerEdge™ M620 implements a new module design that supports up to 24 DIMMS and two processors. The M620 is a half-height blade server that requires a PowerEdge M1000e chassis to operate. It occupies one slot vertically in the M1000e for a maximum of 16 blade servers in one M1000e chassis. The M620 can be mixed with other existing Dell blades of half-height and full-height form factors.

The M620 is available in two module designs with different heat sinks and maximum number of supported DIMM slots, including the following:

- **57mm heatsink**: for 95W and under processors and maximum RAM expandability (up to 24 DIMMs)
- **77mm heatsink**: for 115W and 130W processors and RAM expandability up to 20 DIMMs
- **97mm heatsink**: for fresh air configurations supporting 95W and under processors and up to 16 DIMMs

The following sections provide external and internal views of the system and describe the module features. For more detailed information on features and descriptions for the M620, see the *Dell PowerEdge M620 Systems Owner's Manual* on Support.Dell.com/Manuals.

Module views

As shown in Figure 1, the M620 module supports up to two front-accessible, hot-plug hard drives and two USB ports.

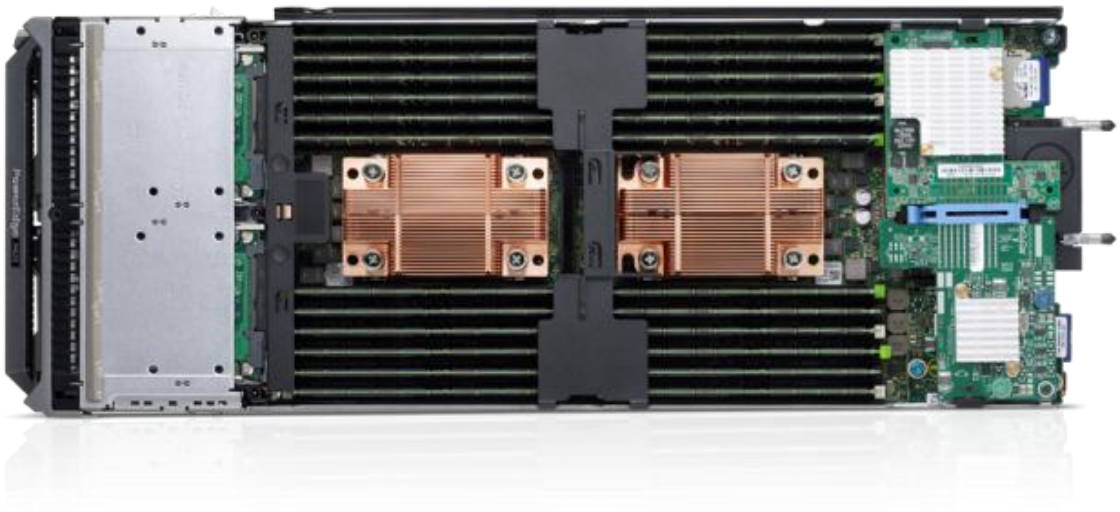
Figure 1. M620 front view

The chassis design of the M620 is optimized for easy access to components and for airflow for effective and efficient cooling. Figure 2 shows the M1000e chassis enclosure populated with M620 modules.

Figure 2. M1000e chassis enclosure with M620 blades

The M620 module shown in Figure 3 supports up to 24 DIMMS, two processors, and many other features that are described in this guide.

Figure 3. M620 internal module view



For additional system views, see the *Dell M620 Systems Owner's Manual* on Support.Dell.com/Manuals.

Module features

Table 4 lists the modules features for the M620 system. For additional information on these features, see the *Dell PowerEdge M620 Systems Owner's Manual* on Support.Dell.com/Manuals.

Table 4. Module features

Feature	Description
USB connectors	Two front-accessible USB connectors
Status indicator	Indicator for M620 power status
Hard drives	Two front-accessible, hot-plug, 2.5-inch hard drives; see the Storage section for details
Hard drive activity LEDs	Indicate the status and activity of the hard drives
Blade handle release button	Release button on the front handle of the blade server
USB key	Internal USB connector for a USB flash memory key that can be used as a boot device, security key, or mass storage device
Trusted Platform Module (TPM)	TPM is used to generate/store keys, protect/authenticate passwords, and create/store digital certificates; it also supports the Intel® Xeon® TXT functionality
Quick Resource Locator (QRL)	This code on the module can be scanned by a smartphone application to access information about the server

LCD control panel

The M1000e chassis enclosure LCD control panel is located on the front of the M1000e chassis to provide user access to buttons, display, and I/O interfaces. For more information on the M1000e LCD control panel, see the *Dell PowerEdge Modular Systems Hardware Owner's Manual* on Support.Dell.com/Manuals.

Quick Resource Locator

A useful feature included with Dell™ PowerEdge 12th generation servers is the Quick Resource Locator (QRL)—a model-specific Quick Response (QR) code (shown in Figure 4) that is located on the server. Just use your smartphone to access the Dell QRL application to learn more about the server.

Figure 4. QRL code located on module

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.

M1000e chassis enclosure features

For more information on the M1000e chassis enclosure features, see the *Dell PowerEdge Modular Systems Hardware Owner's Manual* on Support.Dell.com/Manuals.

4 Processors

The Dell™ PowerEdge™ M620 features the Intel® Xeon® processor E5-2600 product family, offering 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 E5-2600 product family not only adds new features, but also improves upon many features of the predecessor Intel Xeon processor 5600 series. A summary of what's new and improved includes the following:

- Up to two additional cores and up to 8MB more last level cache
- More memory—six more DIMMs than previous-generation of half-height blade servers with support for up to 32GB DIMMs, increasing memory capacity from 192GB (M610) or 288GB (M710HD) to 768GB (M620)
- Intel Integrated I/O has support for up to 80 lanes of PCIe 3.0, which can reduce latency
- Faster connections are provided throughout the system with support for DDR3 1600 MT/s memory and 8.0 GT/s QPI
- Intel 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
- 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 that are integral to many technical, financial, and scientific computing problems
- Intel Turbo Boost Technology 2.0 delivers up to double the boost than the previous-generation turbo technology
- Continued improvements to both Intel TXT and AES-NI help to better protect systems and data

For more information on the Intel® Xeon® processor E5-2600 product family, visit Intel.com.

Supported processors

The M620 supports up to two processors with up to eight cores per processor. Table 5 lists the Intel Xeon processors supported by the PowerEdge M620. For the latest information on supported processors, visit Dell.com.

Table 5. Supported processors

Model	Speed	Cache	QPI	Cores	Turbo	TDP
E5-2680	2.7Ghz	20M	8.0 GT/s	8	Yes	130W
E5-2670	2.6GHz	20M	8.0 GT/s	8	Yes	115W
E5-2667	2.9GHz	15M	8.0 GT/s	6	Yes	130W
E5-2665	2.4GHz	20M	8.0 GT/s	8	Yes	115W
E5-2660	2.2GHz	20M	8.0 GT/s	8	Yes	95W
E5-2650L	1.8GHz	20M	8.0 GT/s	8	Yes	70W
E5-2650	2.0GHz	20M	8.0 GT/s	8	Yes	95W
E5-2640	2.5GHz	15M	7.2 GT/s	6	Yes	95W
E5-2637	3.0GHz	5M	6.4 GT/s	2	Yes	80W
E5-2630	2.3GHz	15M	7.2 GT/s	6	Yes	95W
E5-2630L	2.0GHz	15M	7.2 GT/s	6	Yes	60W
E5-2620	2.0GHz	15M	7.2 GT/s	6	Yes	95W
E5-2609	2.4GHz	10M	6.4 GT/s	4	No	80W
E5-2603	1.8GHz	10M	6.4 GT/s	4	No	80W

For information on processor installation and configuration, see the *Dell PowerEdge M620 Systems Owner's Manual* on Support.Dell.com/Manuals.

Chipset

The Intel C600 chipset is implemented on the PowerEdge M620. For more information, visit Intel.com.

5 Memory

More memory options are available than ever before with the Dell™ PowerEdge™ M620—greater capacities, higher frequencies, and more flexibility. The M620 supports up to 768GB of memory (using 32 GB DIMMs—available Q2 2012) and speeds up to 1600 MT/s, providing high performance in a variety of applications. High memory density means there is no compromise when it comes to virtualization.

Increase your uptime and reduce data loss, due to Dell's focus on reliability, availability, and serviceability (RAS) features. RAS aids in the rapid and accurate diagnosis of faults that require service, increasing your memory reliability. System uptime is reinforced with RAS features like memory mirroring, sparing, and many others.

In addition to supporting existing UDIMM and RDIMM technologies, the M620 supports load reduced DIMMs (LRDIMMs), which use a buffer to reduce memory loading and allow for greater density, allowing for the maximum platform memory capacity.

Supported memory

Table 6 lists the memory technologies supported by the M620.

Table 6. Memory technologies supported

Feature	UDIMM	RDIMM	LRDIMM
Register	No	Yes	Yes
Buffer	No	No	Yes
Frequencies	800, 1066, 1333, or 1600MT/s	800, 1066, 1333, or 1600MT/s	1066 or 1333MT/s
Ranks supported	1 or 2	1, 2, or 4	4
Capacity per DIMM	2 or 4GB	2, 4, 8, 16, or 32GB	32GB[1]
Maximum DIMMS per channel	2	3	3
DRAM technology	x8	x4 or x8	x4
Temperature sensor	Yes	Yes	Yes
ECC	Yes	Yes	Yes
SDDC	Yes (with advanced ECC mode)	Yes	Yes
Address parity	Yes	Yes	Yes

[1]Available Q2 2012

Table 7 lists the DIMMs that are supported on the M620. For the latest information on supported memory, visit Dell.com.

Table 7. DIMMs supported

Capacity (GB)	Speed (MT/s)	Type	Ranks per DIMM	Data width	SDDC support	Voltage
2	1600	RDIMM	1	x8	Advanced ECC	1.5
2	1333	RDIMM	1	x8	Advanced ECC	1.35
2	1333	RDIMM	1	x8	Advanced ECC	1.35
2	1333	UDIMM	1	x8	Advanced ECC	1.35
2	1333	UDIMM	1	x8	Advanced ECC	1.35
4	1333	RDIMM	2	x8	Advanced ECC	1.35
4	1333	RDIMM	2	x8	Advanced ECC	1.35
4	1600	RDIMM	2	x8	Advanced ECC	1.5
4	1333	RDIMM	1	x4	All modes	1.35
4	1333	RDIMM	2	x8	Advanced ECC	1.35
4	1333	UDIMM	2	x8	Advanced ECC	1.35
4	1333	UDIMM	2	x8	Advanced ECC	1.35
8	1333	RDIMM	2	x4	All modes	1.35
8	1333	RDIMM	2	x4	All modes	1.35
8	1333	RDIMM	2	x4	All modes	1.35
8	1600	RDIMM	2	x4	All modes	1.5
16	1066	RDIMM	4	x4	All modes	1.35
16	1066	RDIMM	4	x4	All modes	1.35
16	1600	RDIMM	2	x4	All modes	1.5
16	1333	RDIMM	2	x4	All modes	1.35
32[1]	1333	LRDIMM	4	x4	All modes	1.35
32[1]	1333	RDIMM	4	x4	All modes	1.35

[1] 32GB DIMMS available Q2 2012

Memory configurations

Flexible memory configurations are supported on the M620, ranging from capacities of 2 GB to 768 GB (using 32 GB DIMMS—available Q2 2012). The M620 supports up to 12 DIMMs per processor (up to 24 DIMMs in a dual-processor configuration). Each processor has four memory channels, with each channel supporting up to three DIMMs.

Memory capacity options

The M620 is available in the following memory capacity options:

- **24-DIMM capacity**: uses a 57 mm heatsink and is recommended for use with processors of 95W or less
- **20-DIMM capacity:** uses a 77 mm heatsink for cooling efficiency and is recommended for use with 115W and 130W processors

- **16-DIMM capacity:** uses a 97 mm heatsink to support the higher ambient temperatures of fresh air configurations

Flexible memory configuration

The M620 supports a flexible memory configuration, according to the following 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, or LRDIMM. These types cannot be mixed.

The following additional memory-population guidelines also apply to the M620:

- Up to two quad-rank (QR) DIMMs and up to three dual-rank (DR) or single-rank (SR) DIMMs may be populated 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 and population, see the *Dell PowerEdge M620 Systems Owner's Manual* on Support.Dell.com/Manuals.

Memory speed

Memory speeds of 1600 MT/s, 1333 MT/s, 1066 MT/s, and 800 MT/s are supported on the M620, 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 system runs 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.

Table 8 lists the memory configuration and performance details for the M620, based on the population of the number and type of DIMMs per memory channel.

Table 8. Memory speed capabilities

DIMM type	DIMM 0	DIMM 1	DIMM 2	# of DIMMs	Speed (MT/s)			
					800	1066	1333	1600
UDIMM	SR			1	•	•	•	
	DR			1	•	•	•	
	SR	SR		2	•	•	•	
	SR	DR		2	•	•	•	
	DR	DR		2	•	•	•	
RDIMM	SR			1	•	•	•	•
	DR			1	•	•	•	•
	QR			1	•	•		
	SR	SR		2	•	•	•	•
	SR	DR		2	•	•	•	
	DR	DR		2	•	•	•	•
	QR	SR		2	•			

DIMM type	DIMM 0	DIMM 1	DIMM 2	# of DIMMs	Speed (MT/s)			
					800	1066	1333	1600
	QR	DR		2	•			
	QR	QR		2	•			
	SR	SR	SR	3	•	•		
	SR	SR	DR	3	•	•		
	SR	DR	DR	3	•	•		
	DR	DR	DR	3	•	•		
LRDIMM	QR			1		•	•	
	QR	QR		2		•	•	
	QR	QR	QR	3		•		

Memory RAS features

Reliability, availability, and serviceability (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 which require service. Table 9 describes the memory RAS features supported on the M620.

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 (SDDC)	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, they are moved to the spare area while the operating system is running to prevent the errors 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 M620 Systems Owner's Manual* on Support.Dell.com/Manuals. Memory RAID is not supported.

6 Storage

The Dell™ PowerEdge™ M620 provides comprehensive internal storage options, including several drive types and storage controllers to choose from. The M620 supports up to 1.2TB of internal storage.

Express Flash PCIe SSDs (available Q2 2012) are a new option that can provide vastly accelerated performance over previous technologies. Dell Express Flash drives use PCIe lanes to connect directly to the processor and chipset and are easily accessible by hot-plug drive bay.

Internal storage

The M620 is available in three different hard-drive backplane options. Table 10 lists the options for backplanes, hard-drive controllers, and drive types for the M620.

Table 10. Hard-drive backplane options

Backplane	Controller	Drive types
SATA	Motherboard-embedded SATA	SATA SSD/HDD
SAS	PERC H310, H710, H710P	SAS SSD/HDD, SATA SSD/HDD
PCIe SSD	N/A	Express Flash PCIe SSD[1]

[1]Available Q2 2012

Supported hard drives

Table 11 lists the internal hard drives supported by the M620. For the latest information on supported hard drives, visit Dell.com.

Table 11. Supported hard drives

Form factor	Type	Speed (rpm)	Capacities
2.5"	SATA (3Gb)	7.2K	250GB, 500GB, 1TB
	Nearline SAS (6Gb)	7.2K	500GB, 1TB, 1TB (SED)
	SAS (6Gb)	10K	300GB, 600GB, 900GB, 900GB (SED)
	SAS (6Gb)	15K	146GB, 300GB, 300GB (SED)
	SAS SSD (SLC, 6Gb)	N/A	200GB, 400GB
	SATA SSD (MLC, 3Gb)	N/A	100GB, 200GB
	Express Flash PCIe SSD (SLC)[1]	N/A	175GB, 350GB

[1]Available Q2 2012

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, which allows a common management process for all drives.

The PowerEdge M620 has an option to support up to two Express Flash PCIe SSD drives (available Q2 2012) with the PCIe SSD backplane configuration. This backplane configuration may be selected at purchase, but may not be upgraded later.

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.

Supported RAID controllers

The newest line of PowerEdge RAID Controllers (PERCs) offers high I/O performance for a variety of uses, including database applications and streaming digital media environments.

PERC H710P

The PERC H710P is an eight-port, internal, 6Gb/s PCIe RAID controller (mini form factor) with 1 GB DDR3 non-volatile (NV) cache.

PERC H710

The PERC H710 is an eight-port, internal, 6Gb/s PCIe RAID controller (mini form factor) with 512 MB DDR3 NV cache.

PERC H310

The PERC H310 is an eight-port, internal, 6Gb/s PCIe RAID controller (mini form factor) that is a low-cost, entry-level RAID solution.

PERC S110

The PERC S110 is a 3Gb/s SATA software RAID controller that is a low-cost, entry-level RAID solution.

For more information about the latest PERC offerings, see Dell.com/PERC.

RAID controller feature support

Table 12 lists the features supported by the RAID controller options on the M620.

Table 12. RAID controller feature support

Feature	PERC option			
	S110	H310	H710	H710P
Software RAID stack	✓			
iMR firmware stack		✓		
MR firmware stack			✓	✓
SSD support	✓	✓	✓	✓

Feature	PERC option			
	S110	H310	H710	H710P
SATA backplane	✓			
SAS backplane		✓	✓	✓
SATA hard drives	✓	✓[1]	✓[1]	✓[1]
SAS hard drives		✓	✓	✓
Un-configured hard drive support (non-RAID)	✓	✓		
RAID 0	✓	✓	✓	✓
RAID 1	✓	✓	✓	✓
DDR3 cache (512MB)			✓	
DDR3 cache (512MB)				✓
Non-volatile cache option			✓	✓
Microsoft® Windows® support	✓	✓	✓	✓
Linux® support		✓	✓	✓
Virtualization support		✓	✓	✓
Mini form factor		✓	✓	✓
Embedded on motherboard	✓	N/A	N/A	N/A
PCIe 2.0		✓	✓	✓
Local support for self-encrypting disk (SED)		X		✓
UEFI browser	✓	✓	✓	✓
HII	✓	✓	✓	✓

[1]Supports SATA hard drives through the SAS backplane

7 Networking and mezzanine cards

The Dell™ PowerEdge™ M620 offers balanced, scalable I/O capabilities, including integrated PCIe 3.0 capable mezzanine card slots. Dell Select Network Adapters, Dell's network daughter cards, let you choose the right network fabric without using up a valuable mezzanine card slot. Pick the speed, technology, vendor, and other options such as switch independent partitioning, which let you share and manage bandwidth on 10GbE connections.

Installation of mezzanine cards requires an M1000e I/O module (IOM) of the same fabric technology to be installed in the corresponding fabric slot of the mezzanine to support data flow through that fabric or slot.

Select Network Adapters

The Select Network Adapter family is purpose-built and includes flexible LAN on motherboard (LOM) card options for 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 PowerEdge M620 supports one custom network daughter card (NDC), as part of Select Network Adapters family, to house the complete LOM subsystem. There are two form factors of Select Network Adapters—one for blade servers and one for rack servers. The blade network daughter card options supported on the M620 provide dual-port 10GbE interfaces.

Figure 5. Blade network daughter card (NDC)

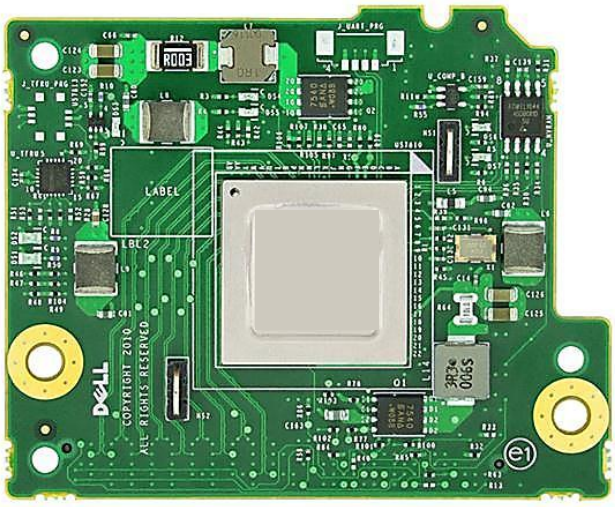


Table 13 lists the available Select Network Adapter options and their supported features for the M620.

Table 13. Supported Select Network Adapter options and features

Features	Broadcom® 57810S KR	Intel® X520 KR	QLogic® QMD8262 KR
Ports x link speed	2x10Gb	2x10Gb	2x10Gb
Supported speed	1Gb and 10Gb	1Gb and 10Gb	10Gb only
SR-IOV	Not supported	Supported	Not supported
ISCSI HBA	Supported[1]	Not supported	Supported[1]
FCoE	Not supported	Supported[2]	Supported[2]
Switch independent partitioning	Supported[3]	Not supported	Supported[3]
DCB	Not supported	Supported[4]	Supported[4]
DCB with iSCSI TLV	Not supported	Supported[5]	Supported[5]
Ports x link speed	2x10Gb	2x10Gb	2x10Gb

[1]Only 10GbE ports have iSCSI HBA support.
[2]Only 10GbE ports have FCoE support.
[3]Only 10GbE ports have switch independent partitioning support. The maximum number of partitions supported is eight (four partitions per 10GE port).
[4]Only 10GbE ports have DCB support.
[5]Only 10GbE ports have ISCSI TLV support.

System management integration

With M620, 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-thru 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 USC.

Mezzanine cards

The M620 provides two PCIe 3.0 mezzanine connectors for add-in cards. The M620 has been designed to be PCIe 3.0 compliant in order to take full advantage of the processor capabilities.

Table 14 lists the supported mezzanine cards for the M620.

Table 14. Supported mezzanine cards

Type	Adapter
1Gb/10Gb NICs	Intel 4x1Gb (1Gb)
	Broadcom 57810S 2x10Gb KR (10Gb)
	Intel X520 2x10Gb XAUI/KR (10Gb)
	QLogic QME8262 2x10Gb KR (10Gb)
	Brocade® BR1741M 2x10Gb KR (10Gb)
FC4/FC8 adapters	QLogic QME2572 (8GB)
	Emulex® LPe1205-M (8GB)
Infiniband	Mellanox® QDR IB CX-3
	Mellanox FDR IB CX-3 VPI

For the latest information on supported mezzanine cards for the M620, visit Dell.com.

8 Power, thermal, and acoustics

Lower overall system-level power draw is a result of Dell's breakthrough system design. The PowerEdge M620 blade server and M1000e chassis enclosure maximize performance per watt through a combination of power and cooling, energy efficient technologies, and tools. Additionally, the M620 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 data center space. Table 15 lists the tools and technologies Dell offers to help you achieve your data center goals by lowering power consumption and increasing energy efficiency.

Table 15. 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.
Tools for right-sizing	**Energy Smart Solution Advisor (ESSA)** is a tool that helps you determine the most efficient configuration possible. With Dell's 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/calc. **Energy Smart Data Center Assessment** is a Dell Services offering that uses infrastructure and thermal analysis to help maximize system efficiency. Learn more at Dell.com/EnergySmart.
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 iDRAC 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	With the thermal design and reliability of Dell products, you can have the capability to operate at excursion-based temperatures. This solution is comprised of servers, networking, storage, and infrastructure that run beyond the industry standard of 35°C (95°F) 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 (PDUs) • Uninterruptible power supplies (UPS's) • Energy Smart containment rack enclosures Find additional information at http://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

The M1000e chassis enclosure provides power and cooling for the M620 blade server. For information on the M1000e power supply units, see the *PowerEdge M1000e Technical Guide* on Dell.com.

Thermal and acoustics

Optimized thermal management keeps fan speeds in the PowerEdge M620 as low as possible, contributing to quiet operation and ensuring proper component cooling.

Thermal design

The thermal design of the PowerEdge M620 reflects the following:

- **Comprehensive thermal management:** The PowerEdge M620 dynamically controls system cooling fan speed, based on responses from critical sensors that monitor the temperature of several components, including:
  - Processors
  - DIMMs
  - System inlet ambient
  - Mezzanine card
  - Network daughter card (NDC)

Thermal control also 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 those without such controls.

- **Environmental specifications:** The optimized thermal management makes the PowerEdge M620 reliable under a wide range of operating environments as shown in Table 23. When operating above 30°C ambient, performance impacts may be seen. For more information see the *Dell PowerEdge M620 Systems Owner's Manual* on Support.Dell.com/Manuals.

Acoustical performance

The acoustical performance of the PowerEdge M620 is reflected in Table 16. The addition of some components can cause an increase in fan speed and acoustical output. Contributors to acoustical output can include:

- The system thermal profile selected in BIOS (for example, Power optimized DAPC or Performance optimized)
- Express Flash PCIe SSDs
- NDC
- Number of installed processors
- Population of modular, non-homogenous modular deployment
- Impedance of blanks

Table 16. M620 acoustical performance

Configuration (23 ± 2°C ambient)	CPUs	Hard drives	DIMMs	HDD controller	NDC	PCI cards	Operating mode	L_{WA}-UL[1] (bels)	L_{pA}[2] (dBA)
Minimum	1 x 80W (4 core)	1 x SATA (7.2K)	4 x 4GB	Onboard SATA	None	Any mezz. card	Standby[3]	6.8	54
							Idle[4]	7.4	59
Typical	2 x 95W (8 core)	2 x SAS (10K)	16 x 8GB	PERC H310 (mini)	1Gb	Any mezz. card	Standby[3]	6.7	53
							Idle[4]	7.8	62

[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 the average A-weighted sound pressure level from the four bystander positions calculated per section 4.3 of ISO 9296 (1988) and measured in accordance with ISO 7779 (2010). The system is placed in a half rack enclosure (base of system is 25 cm above reflective floor).

[3] Standby: AC Power is connected to power supply units but the system is not turned on.

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

9 Operating systems and virtualization

The Dell™ PowerEdge™ M620 supports a wide range of industry-standard operating systems and virtualization software.

Supported operating systems

Table 17 lists the operating systems supported on the M620. For the latest information on supported operating systems, see Dell.com/OSsupport.

Table 17. Primary operating system support

Operating System	Platform	Edition
Red Hat® Enterprise Linux® 5.7	x32 x64	N/A
Red Hat Enterprise Linux 6.1	x64	N/A
Red Hat Enterprise Linux for HPC Compute Node	x64	N/A
SUSE® Linux Enterprise Server 11 SP2	x64	N/A
SUSE Linux Enterprise Server 10 SP4	x64	N/A
Microsoft® Windows Server® 2008 with SP2	x86	Standard Enterprise
	x64 (with Microsoft Hyper-V™ role enabled)	Standard Enterprise Datacenter
Microsoft Windows Server 2008 R2 with SP1	x64 (with Microsoft Hyper-V role enabled)	Standard Enterprise Datacenter HPC

Support of the operating systems listed in Table 18 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 18. 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 Datacenter

Supported virtualization

One of the key features for virtualization on the M620 is the support for a fail-safe hypervisor. By running the 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 19 highlights the virtualization support for the M620.

Table 19. Virtualization support

Operating systems		Version	Options
VMware®[1]	vSphere® v4.1 U2	ESX® Classic	DIB
	vSphere v4.1 U2	ESXi® Installable	DIB
	vSphere v4.1 U2	ESXi Embedded	FI
	vSphere v5.0	ESXi (one version)	DIB
	vSphere v5.0 U1*[2]	ESXi (one version)	FI/DIB
Citrix®	XenServer® v6.0	—	DIB

FI = factory install; DIB = drop in box
[1]vSphere Fault Tolerance is supported with these versions
[2]Available Q2 2012

10 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 6, Dell systems management solutions are centered around OpenManage server management, featuring iDRAC with Lifecycle Controller.

Figure 6. 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 the 2nd 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 20 describes the functions and benefits of iDRAC7 with Lifecycle Controller.

Table 20. iDRAC7 with Lifecycle Controller functions and benefits

Feature	Function	Benefit
Out of band (OOB)	iDRAC7 offers real-time, agent-free OOB monitoring, inventory, and alerting for servers, direct-attach storage, and network cards	Receive hardware notifications and email alerts, independent of the OS or hypervisor type or status—even if an OS or hypervisor 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	Explicit, detailed information allows IT administrators to be more efficient in diagnosing and remediating an issue; an embedded URL in e-mail alert notifications enables launch to iDRAC7 GUI or virtual console
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 usage and report on historical power usage by rack, row or room using OpenManage Power Center
Electronic licensing	To obtain a software license key for iDRAC7 Express for Blades or iDRAC7 Enterprise after server purchase, submit a request to purchase a software license key through the Dell Licensing Portal or with a Dell sales representative	New systems come with digital license installed in the factory; free 30-day trial versions are available; uses a license management portal versus paper-based licenses to simplify license management

iDRAC7 Enterprise is available for the PowerEdge M620, and Dell also offers an option of iDRAC7 Express for Blades. A detailed feature comparison for iDRAC7 Enterprise and iDRAC7 Express for Blades is shown in Table 21.

Table 21. Feature comparison for iDRAC7 Enterprise and iDRAC7 Express for Blades

Feature (function)	iDRAC7 Enterprise	iDRAC7 Express for Blades
Local configuration with USC	•	•
IPMI 2.0	•	•
Embedded diagnostics	•	•
Local OS install	•	•
Local updates	•	•
Driver pack	•	•
Encryption	•	•
Dedicated NIC 1Gbps (100MB in iDRAC6)	•[1]	•[1]
IPv6	•	•
Auto-discovery	•	•
Auto-recovery	•	•
Web GUI	•	•
Remote CLI	•	•
Local/SSH CLI	•	•
Serial redirection	•	•
Remote configuration	•	•
Remote update	•	•
Email alerts	•	•
SNMP alerts	•	•
Comprehensive monitoring	•	•
Virtual console (4 user)	•	•[2]
Virtual media	•	•
Crash screen capture[3]	•	•
Power control	•	•
Power monitoring	•	•
Virtual console chat	•	
Support for customer-supplied SD cards for	•	
Virtual flash partitions	•	
Virtual folders	•	
Remote file share	•	

Feature (function)	iDRAC7 Enterprise	iDRAC7 Express for Blades
Crash video playback	•	
Boot record/playback	•	
Part replacement	•	
Backup and restore configurations	•	
Power capping	•	
Enterprise group power management	•	
Directory services (AD, LDAP)	•	
PK authentication	•	
Two-factor authentication[4]	•	

[1]Blade-to-chassis internal connection is 100MB; [2]Single user; [3]Requires OMSA agent on target server; [4]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 (1:1) 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.

Chassis Management Controller console for blade systems

The Dell Chassis Management Controller (CMC) is a systems management hardware and software solution for managing multiple Dell blade chassis. The CMC is a hot-pluggable module inserted in the back of a Dell blade chassis. It provides a secure interface that enables an administrator to inventory, perform configuration and monitoring tasks, remote power on/off blades, and enable alerts for events on servers and components in the blade chassis.

The CMC utilizes iDRAC with Lifecycle Controller to perform management functions, such as opening a remote console session from the CMC interface.

Dell consoles

The central console in a systems management solution is often referred to as the one-to-many (1:M) 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 recently released 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 PowerConnect™ 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 Dell KACE™ K1000 service desk. OpenManage Essentials is available as a no-charge software download from Support.Dell.com.
- **Dell Management Console**—Dell Management Console (DMC) offers sophisticated data-center management capabilities with comprehensive reporting features. DMC can perform basic hardware management and can manage operating systems and applications using various plug-ins from Symantec.
- **Dell IT Assistant**—Dell IT Assistant (ITA) is a console for managing Dell servers, storage arrays, and other components distributed throughout a network. Dell IT Assistant allows for easy identification of system issues through alerts, helping to reduce system downtime. Systems administrators can easily monitor systems anywhere within their network using ITA. ITA is supported on the R720 and R720xd, however, enhanced functionality is now available with OpenManage Essentials.

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.
- **Dell Management Plug-in 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 Connections with third-party consoles

Dell OpenManage provides 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 (CA NSM) 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 7 illustrates the various operations that can be performed during the server's lifecycle.

Figure 7. Systems management server lifecycle

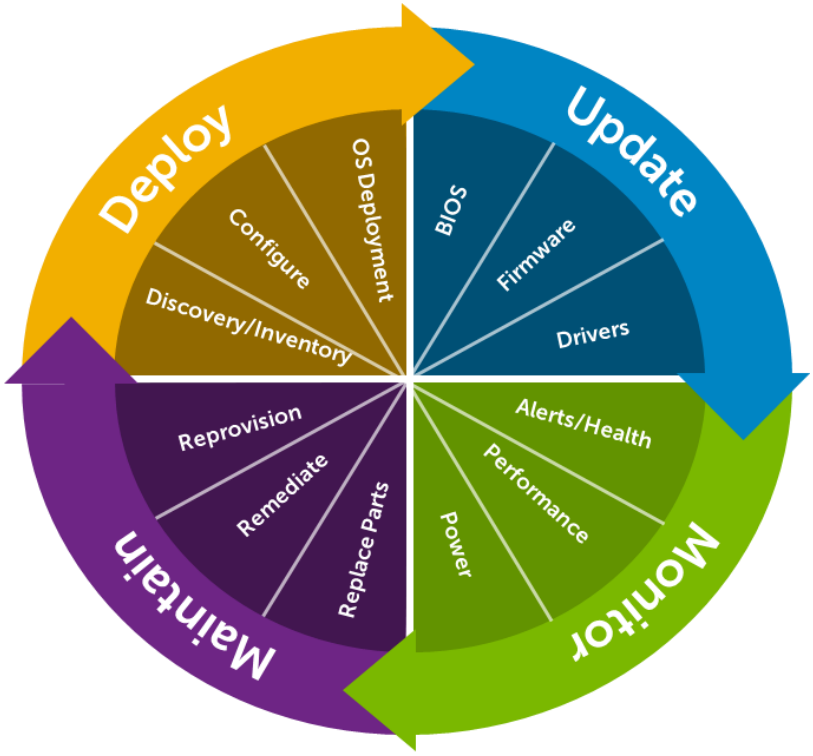


Table 22 lists the products that are available for one-to-one and one-to-many operations, and when they are used in the server's lifecycle:

Table 22. One-to-one and one-to-many operations

Operation	One-to-one	One-to-many	
Deploy	• Lifecycle Controller GUI • DTK • SBUU	• Symantec Deployment Server • Dell Management Plug-in 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 • Lifecycle Controller GUI • Repository Manager • DUP • SUU • SBUU • Dell Management Plug-in for VMware vCenter	• Dell OpenManage Essentials • Dell OpenManage ITA • Dell Management Console • 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 • OMSA	• Dell OpenManage Essentials • Dell OpenManage ITA • BMC ProactiveNet Performance Management • Dell OpenManage Power Center • Dell Management Console	• Dell Management Plug-in for VMware vCenter • BMC ProactiveNet • Dell Server Management Pack Suite for Microsoft System Center Operations Manager (SCOM)
Maintain	• IPMI • iDRAC7 • 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

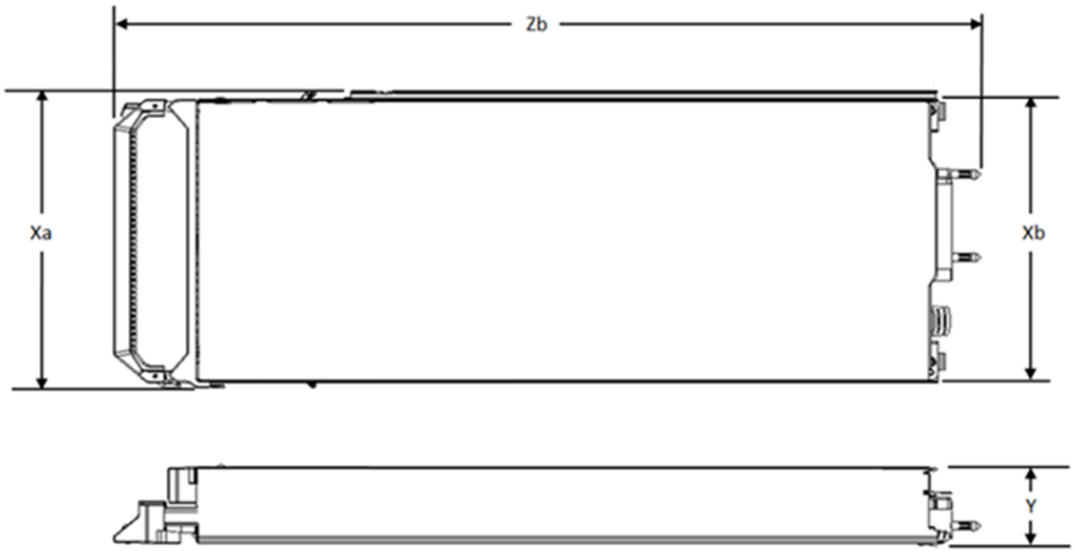
For additional detailed information on Dell's systems management portfolio, see the *Dell Systems Management Overview Guide* on Support.Dell.com/Manuals.

Appendix A. Additional specifications

Module dimensions and weight

Figure 8 details the dimensions of the M620 module.

Figure 8. Module dimensions



Xa	Xb	Y	Zb (handle closed)	Zb (handle open)
197.92mm	192.3mm	50.35mm	544.32mm	564.9mm

The weight of a maximum-configured M620 blade server is 7.0 kg (15.4 lb).

Environmental specifications

For the most up-to-date information on the M620 environmental specifications, see the *Dell PowerEdge M620 System Owner's Manual* and the *Dell PowerEdge M620 Getting Started Guide* on Support.Dell.com/Manuals. additional information about environmental measurements for specific system configurations, see Dell.com/environmental_datasheets.

Table 23 details the environmental specifications for the M620.

Table 23. Environmental specifications

Temperature and humidity	
Continuous operation	10°C to 35°C at 10% to 80% relative humidity (RH), with 26°C max dew point. De-rate maximum allowable dry bulb temperature at 1°C per 300m above 900m (1°F per 550 ft). When using the PowerEdge M620 with internal GPU card(s), the continuous operation range is 10°C to 30°C at 10% to 80% RH, with 26 °C max dew point.

Temperature and humidity	
Expanded operation	When operating in the expanded temperature range, system performance may be impacted. When operating in the expanded temperature range, ambient temperature warnings may be reported on the LCD and in the System Event Log. **< 10% of annual operating hours:** 5°C to 40°C at 5% to 85% RH with 26°C dew point. 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, de-rate maximum allowable dry bulb temperature by 1°C per 175 m above 950m (1°F per 319 ft). **< 1% of annual operating hours:** –5°C to 45°C at 5% to 90% RH with 26°C dew point. 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, de-rate maximum allowable dry bulb temperature by 1°C per 125m above 950m (1°F per 228ft). **Expanded operating temperature restrictions:** • Maximum 95W processor is supported. • Dell PERC H710 and H710P cards are not supported in dual-processor configurations. • When populating the blade slots in the enclosure with only PowerEdge M620 blades: – Dual-processor blade servers with PERC H310 cards cannot be mixed with single-processor blades. – To support a PERC H310 card in a dual-processor configuration, the blade slots in the M1000e enclosure must be installed with M620 blades or a combination of blade blanks and M620 blades. The PowerEdge M620 blades must be installed with 97 mm wide heat sinks. Non Dell qualified peripheral cards and/or peripheral cards greater than 25W are not supported.
Storage	–40 °C to 65 °C (-40 ° to 149 °F) with a maximum temperature gradation of 20 °C per hour

Video specifications

The Dell PowerEdge M620 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 M620 system supports the 2D graphics video modes in Table 24.

Table 24. 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

Resolution	Refresh Rate (Hz)	Color Depth (bit)
1152 x 864	60, 75, 85	8, 16, 32
1280 x 1024 (not available for UEFI)	60, 75	8, 16, 32

USB peripherals

USB peripherals are supported through the front USB ports. They are USB 2.0 compliant.

Appendix B. Standards compliance

The M620 system conforms to the industry standards in Table 25.

Table 25. Industry standard documents

Standard	URL for information and specifications
ACPI Advance Configuration and Power Interface Specification, v2.0c	http://www.acpi.info/
Ethernet IEEE 802.3-2005	http://standards.ieee.org/getieee802/802.3.html
HDG Hardware Design Guide Version 3.0 for Microsoft Windows Server	http://www.microsoft.com/whdc/system/platform/pcdesign/desguide/serverdg.mspx
IPMI Intelligent Platform Management Interface, v2.0	http://www.intel.com/design/servers/ipmi/
DDR3 Memory DDR3 SDRAM Specification, Rev. 3A	http://www.jedec.org/download/search/JESD79-3C.pdf
LPC Low Pin Count Interface Specification, Rev. 1.1	http://developer.intel.com/design/chipsets/industry/lpc.htm
PCI Express PCI Express Base Specification Rev. 2.0 and 3.0	http://www.pcisig.com/specifications/pciexpress/
PMBus Power System Management Protocol Specification, v1.2	http://pmbus.info/specs.html
SAS Serial Attached SCSI, v1.1	http://www.t10.org/ftp/t10/drafts/sas1/sas1r10.pdf
SATA Serial ATA Rev. 2.6; SATA II, SATA 1.0a Extensions, Rev. 1.2	https://www.sata-io.org/secure/spec_download.asp http://www.sata-io.org/docs/S2Ext_1_2_Gold.pdf
SMBIOS System Management BIOS Reference Specification, v2.7	http://www.dmtf.org/standards/smbios/
TPM Trusted Platform Module Specification, v1.2	https://www.trustedcomputinggroup.org/downloads/specifications/tpm/tpm
UEFI Unified Extensible Firmware Interface Specification, v2.1	http://www.uefi.org/specs/
USB Universal Serial Bus Specification, Rev. 2.0	http://www.usb.org/developers/docs/
Windows Logo Windows Logo Program System and Device Requirements, v3.10	http://www.microsoft.com/whdc/winlogo/hwrequirements.mspx

Appendix C. Additional resources

Table 26 provides a list of documents and websites that provide for more information on the Dell™ PowerEdge™ M620.

Table 26. Additional resources

Resource	Description of contents	Location
PowerEdge M620 System Owner's Manual	This manual is provided in HTML format on the CD provided with the M620 system, and also in HTML and PDF format at the Dell support site. A printed version is available in Asian languages as a customer-orderable option. This manual provides information on the following: • Chassis features • System Setup program • System messages • System codes and indicators • System BIOS • Remove and replace procedures • Troubleshooting • Diagnostics • Jumpers and connectors	Support.Dell.com/Manuals
PowerEdge Modular Systems Hardware Owner's Manual	This manual provides information on the PowerEdge M1000e chassis enclosure and its supported blade server modules.	Support.Dell.com/Manuals
Dell PowerEdge M1000e, M915, M910, M710HD, M710, M620, M610x, and M610 Getting Started Guide	This guide is printed and shipped with the system, and is also available in PDF format on the Dell support site. This guide provides information on the following: • Initial setup steps • Key system features • Technical specifications	Support.Dell.com/Manuals
System Information Label	The system information label documents the system board layout and system jumper settings.	On the module
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.	On the module
Information Update	This document is printed and shipped with the system, and is also available in PDF format on the Dell support site. This guide provides system update information.	Support.Dell.com/Manuals
PowerEdge M1000e Technical Guide	This guide provides detailed technical information on the M1000e chassis enclosure and its supported features.	Dell.com
Dell Energy Smart Data Center Assessment	uses infrastructure and thermal analysis to help maximize system efficiency	Dell.com/EnergySmart

Resource	Description of contents	Location
Energy Smart Solution Advisor (ESSA)	The Dell online advisor console enables easier and more meaningful estimates to help you determine the most efficient configuration possible. With Dell's, you can calculate the power consumption of your hardware, power infrastructure, and storage.	Dell.com/ESSA
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 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 R620 processors and chipset.	Intel.com
Dell PowerEdge RAID controllers	Provides more information on Dell PowerEdge RAID controllers (PERC).	Dell.com/PERC
Power distribution unit (PDU)	Provides help selecting a power distribution unit (PDU).	DellPDU.com
Uninterruptible power supply (UPS)	Provides help selecting an uninterruptible power supply (UPS) model.	DellUPS.com
Volatility information	Contact your Dell Sales Representative.	