

PowerEdge C8000, C8220, C8220X and C8000XD



Technical Guide



The Dell PowerEdge C8000 series packs up to eight single-wide sleds, four double-wide sleds or a variety of combinations for the ideal mix.

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1 Series overview

The Dell™ PowerEdge™ C8000 series is a 4U shared infrastructure for mixing and matching compute, storage and graphics processing unit (GPU) sleds in one chassis. The C8000 chassis holds a combination of the following resources to optimize workload performance:

- Up to eight single-wide compute C8220 server sleds
- Up to four double-wide C8220X compute/GPU sleds or C8000XD storage sleds
- Up to two power sleds

PowerEdge C8000 chassis

The PowerEdge C8000 helps you speed up your most resource-intensive workloads by mixing and matching compute, storage or GPU sleds in the same rack chassis. With the C8000, you can pack more compute power in less space while saving energy. You get the cores, memory and I/O expansion you need for peak workload performance while keeping a dense footprint.

PowerEdge C8220 single-wide compute sled

The PowerEdge C8220 single-wide compute sled features the dual Intel® Xeon® processor E5-2600 or E5-2600 v2 product families with up to 12 cores each, 16 DIMM slots for up to 512GB of memory, 2.5-inch SATA/SAS/SSD drives for up to 2TB of storage, PCI Express® (PCIe) 3.0, and dual-port embedded Gigabit Ethernet (GbE) controllers.

PowerEdge C8220X double-wide compute/GPU sled

The PowerEdge C8220x double-wide compute/GPU sled has up to two GPUs, two Intel Xeon processor E5-2600 or E5-2600 v2 product family processors with up to 12 cores each, 16 DIMM slots, PCIe 3.0 and up to 8 x 2.5-inch or 4 x 3.5-inch hard drives.

With two of the fastest server processors available, and up to two of the most advanced GPUs available in one sled, you can speed processing by an order of magnitude to see results faster. With up to four additional cores, 10MB more cache, and a 17 percent increase in memory speeds, E5-2600 v2 processors may boost performance by up to 40 percent over previous-generation E5-2600 processors in Dell PowerEdge server platforms.

PowerEdge C8000XD double-wide storage sled

The PowerEdge C8000XD sled provides flexible, high-density local storage for big data, hosting and high-performance computing (HPC) environments. The PowerEdge C8000XD storage sled is available with up to 12 x 2.5-inch or 3.5-inch SAS/SATA, or up to 24 x 2.5-inch SSD hot-plug drives. Up to four storage sleds can be cascaded through mini SAS ports to deliver up to 192TB of storage capacity to capacity-hungry applications.

When populated with highly reliable SAS drives, the PowerEdge C8000XD is ideally suited for enterprise-level transactional applications such as modeling and simulation. With high capacity SATA drives, the PowerEdge C8000XD can be optimized for reference and high-bandwidth data applications such as disk-based backup, document imaging, and video surveillance. With high-speed SSDs, the PowerEdge C8000XD can be optimized to meet a high volume of real-time demands, such as online transaction processes, database queries, hosting and cloud services.



New technologies

Table 1 lists the new technologies for the PowerEdge C8000 series.

Table 1. New technologies

New technologies	Detailed descriptions
Intel Xeon processor E5-2600 and E5-2600 v2 product families	The processor E5-2600 and E5-2600 v2 product families have embedded PCIe lanes for improved I/O performance. See the Processor section for details.
Intel C602 series chipset	The Intel Platform Controller Hub (PCH) chip is implemented on the PowerEdge C8000 series.
1866MT/s DDR3 memory	Certain models of the Intel Xeon processor E5-2600 v2 product family support 1866MT/s memory. The PowerEdge C8000 series supports two DIMMs per channel at 1866MT/s with these processors. See the Memory section for details.
LRDIMM	This 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.
Internal GPU support	The PowerEdge C8220X supports internal GPUs. See the Processor section for details.
Advanced power management	The PowerEdge C8000 supports advanced power monitoring and power capping tools that can help manage power consumption. See the Power section for details.
Dell 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 section for details.



2 Series features

Run multiple workloads per rack or optimize workloads across racks. Shared chassis, power, and cooling can save on the total cost of ownership (TCO). Refresh individual sleds instead of replacing the whole chassis and extend the life of the hardware with less disruption.

- With up to four additional cores, 10MB more cache, and a 17 percent increase in memory speeds, Intel Xeon E5-2600 v2 processors may boost performance by up to 40 percent in Dell PowerEdge server platforms.
- NVIDIA® Tesla™ GPUs can speed high-performance applications by up to 10 times, with up to 665 gigaflops of double precision performance and one teraflop of single precision performance. See [Tesla™ M-Class GPU Computing Modules Accelerating Science](#).
- 2.5-inch or 3.5-inch SAS/SATA drives, or 2.5-inch SSDs can boost storage density up to 192TB per chassis
- 94 percent platinum-certified power supplies

Product comparison

Table 2 compares the features of the PowerEdge C8220, C8220X and C8000XD sleds.

Table 2. Comparison of PowerEdge C8220, C8220X and C8000XD

Specification	PowerEdge C8220	PowerEdge C8220X	PowerEdge C8000XD
Processors	Intel Xeon processor E5-2600 and E5-2600 v2 product families	Intel Xeon processor E5-2600 and E5-2600 v2 product families	N/A
Form factor	4U rack	4U rack	N/A
Front side bus	Intel QuickPath Interconnect	Intel QuickPath Interconnect	N/A
Sockets	2	2	N/A
Cores	4, 6, 8, 10 or 12 core	4, 6, 8, 10 or 12 core	N/A
L3 cache	10MB, 15MB, 20MB, 25MB or 30MB	10MB, 15MB, 20MB, 25MB or 30MB	N/A
Chipset	Intel C602	Intel C602	N/A
DIMMs	16 x DDR3 RDDR3, LV RDDR3; up to 1866MT/s	16 x DDR3 RDDR3, LV RDDR3; up to 1866MT/s	N/A
Min/Max RAM	4GB/512GB	4GB/512GB	N/A



Specification	PowerEdge C8220	PowerEdge C8220X	PowerEdge C8000XD
Hard drive bays	Up to 2 x 2.5" SATA/SSD (hot-plug)	Up to 2 x 2.5" SATA (hot-plug) Up to 8 x 2.5" SATA/SAS Up to 4 x 3.5" SATA/SAS	Up to 12 x 3.5" SATA/SAS (hot-plug) Up to 12 x 2.5" 15mm SATA/SAS (hot-plug) Up to 24 x 2.5" 9.5mm SATA/SAS
Hard drive types	Default SATA and SSD	Default SATA, SSD, NLSAS	Default SATA, SSD, NLSAS
External drive bay	None	None	None
Embedded hard-drive controller	Intel C602 integrated controller; optional LSI 2008 6Gb SAS mezz	C602 integrated controller; optional LSI 2008 6Gb SAS mezz	N/A
Optional storage controller	Optional add-in RAID: LSI 9211-8i LSI 9265-8i LSI 9280-8e LSI 9285CV-8e	Optional add-in RAID: LSI 9211-8i LSI 9265-8i LSI 9285CV-8e	N/A
Availability	N/A	N/A	N/A
Systems management	BMC, IPMI 2.0 compliant; iKVM, virtual media, Intel Node Manager 2.0 compliant	BMC, IPMI 2.0 compliant; iKVM, virtual media, Intel Node Manager 2.0 compliant	BMC, IPMI 2.0 compliant; iKVM, virtual media, Intel Node Manager 2.0 compliant
PCIe slots	1 x16 PCIe 3.0 low-profile riser slot 1 x8 PCIe 3.0 daughtercard mezzanine slot	Compute configuration 2 x8 PCIe 3.0 low-profile riser slots 1 x8 PCIe 3.0 daughtercard mezzanine slot GPU configuration 2 x16 PCIe 3.0 daughtercard slots	N/A
Embedded NIC	2x Intel I350 GbE	2x Intel I350 GbE	N/A
Power supplies	Provided by power sled: hot-plug, redundant, 1400W power supply (240V)	Provided by power sled: hot-plug, redundant, Platinum efficiency, 1400W power supply (240V)	Provided by power sled: hot-plug, redundant, Platinum efficiency, 1400W power supply (240V)
Power efficiency	Platinum	Platinum	Platinum
Fans	Provided by chassis fan cage: 6 x 120mm redundant, hot-pluggable fans	Provided by chassis fan cage: 6 x 120mm redundant, hot-pluggable fans	Provided by chassis fan cage: 6 x 120mm redundant, hot-pluggable fans



Specifications

Table 3 summarizes the product features for the PowerEdge C8000 chassis including the C8220 compute sled, the C8220X compute/GPU sled and the C8000XD storage sled. For the latest information on supported features for the PowerEdge C8000 chassis, visit Dell.com/PowerEdgeC.

Table 3. Technical specifications

Feature	PowerEdge C8000, C8220, C8220X and C8000XD technical specifications
Chassis	4U rack mount, holds up to 8 single-wide sleds, or 4 double-wide sleds with up to 2 power sleds (PowerEdge C8000)
Sled types	Single-wide compute sled (C8220) Double-wide compute/GPU sled (C8220X) Double-wide storage sled (C8000XD)
Servers/storage per chassis	Up to 8 (internal power) C8220 and up to 10 (external power) C8820 2-socket servers Up to 4 (internal power) C8220X and up to 5 (external power) C8820X 2-socket servers Up to 4 (internal power) C8000XD and up to 5 (external power) C8000XD storage expansion ¹
Processor	Intel Xeon processor E5-2600 and E5-2600 v2 product families
Processor sockets	2
Front side bus	Intel QuickPath Interconnect (QPI)
Number of cores	4, 6, 8, 10 or 12
L3 cache	10MB, 15MB, 20MB, 25MB or 30MB
Chipset	Intel C602
DIMMs	C8220 and C8220X hold up to 512GB (16 DIMM slots): 4GB/8GB/16GB/32GB DDR3 UDIMM (1333MT/s 1.35V), 4GB/8GB/16GB DDR3 RDIMM (1600MT/s 1.5V and 1.35V)
PCIe slots	C8220: <ul style="list-style-type: none"> • 1 x16 PCIe 3.0 low-profile riser slot • 1 x8 PCIe 3.0 daughtercard mezzanine slot C8220X: <ul style="list-style-type: none"> • Compute configuration <ul style="list-style-type: none"> 2 x8 PCIe 3.0 low-profile riser slots 1 x8 PCIe 3.0 daughtercard mezzanine slot • GPU configuration <ul style="list-style-type: none"> 2 x16 PCIe 3.0 daughtercard slots
Drive controller	C8220 and C8220X: Intel C602, SATA or SSD only
RAID controller	C8220 and C8220X: LSI 2008 mezzanine, LSI 9211-8i (optional), LSI 9265-8i (optional), LSI 9285CV-8e (optional)



Feature	PowerEdge C8000, C8220, C8220X and C8000XD technical specifications
Hard drive bays	<p>C8220: up to 2 x 2.5" SATA/SSD hot-plug drives</p> <p>C8220X: up to 2 x 2.5" SATA hot-plug plus up to 8 x 2.5" SATA/SAS non-hot-plug options; or up to 2 x 2.5" SATA/SAS non-hot-plug hard drives with GPUs; or 2 x 2.5" hot-plug hard drives + 4 x 3.5" hard drive options</p> <p>C8000XD: 24 x 2.5" or 12 x 3.5" SAS/SATA or 24 x 2.5" SSDs</p>
Hard drive types	<p>C8220: 2 x 2.5" hard drive options</p> <p>2.5" SATA SSD (eMLC): 100GB, 200GB, 400GB, 800GB</p> <p>2.5" SATA SSD (MLC): 120GB, 160GB, 240GB, 300GB, 480GB, 600GB, 800GB</p> <p>2.5" Enterprise SATA (7.2K RPM): 500GB, 1TB</p> <p>C8220X: 2 x 2.5" hot-plug hard drives + 8 x 2.5" or 4 x 3.5" non-hot-plug hard drive options; 2 x 2.5" non-hot-plug hard drives (GPUs)</p> <p>2.5" SAS 6Gb (10K): 300GB, 600GB, 900GB, 1.2TB</p> <p>2.5" SAS 6Gb (15K): 146GB, 300GB</p> <p>2.5" NL SAS 6Gb (7.2K): 500TB, 1TB</p> <p>2.5" SATA SSD (eMLC): 100GB, 200GB, 400GB, 800GB</p> <p>2.5" SATA SSD (MLC): 120GB, 160GB, 240GB, 300GB, 480GB, 600GB, 800GB</p> <p>2.5" Enterprise SATA (7.2K): 500GB, 1TB</p> <p>3.5" SAS 6Gb (15K): 300GB, 600GB</p> <p>3.5" NL SAS 6GB (7.2K): 1TB, 2TB, 3TB, 4TB</p> <p>3.5" Enterprise SATA (7.2K): 500GB, 1TB, 2TB, 3TB, 4TB</p> <p>C8000XD: 12 x 3.5" SATA/SAS HDDs hot-plug; 12 x 2.5" 15mm SATA/SAS HDDs or hot-plug; or 24 x 2.5" 9.5mm SATA/SAS HDDs non-hot-plug</p> <p>2.5" SAS 6Gb (10K): 300GB, 600GB, 900GB, 1.2TB</p> <p>2.5" SAS 6Gb (15K): 146GB, 300GB</p> <p>2.5" NL SAS 6Gb (7.2K): 500GB, 1TB</p> <p>2.5" SATA SSD (eMLC): 100GB, 200GB, 400GB, 800GB</p> <p>2.5" SATA SSD (MLC): 120GB, 160GB, 240GB, 300GB, 480GB, 600GB, 800GB</p> <p>2.5" Enterprise SATA (7.2K): 500GB, 1TB</p> <p>3.5" 6Gb SAS (15K): 300GB, 600GB</p> <p>3.5" NL 6GB SAS (7.2K): 2TB, 3TB, 4TB</p> <p>3.5" Enterprise SATA (7.2K): 500GB, 1TB, 2TB, 3TB, 4TB</p>
NIC/LOM	<p>2 x GbE: Intel i350</p> <p>1 x 100Mb Ethernet dedicated management port</p>
Power supply	<p>4 hot-plug 1400W power supplies through 2 single-wide power sleds</p>
Availability	<p>Hot-plug hard drives</p> <p>Hot-plug, redundant power through the power sled</p> <p>ECC memory</p> <p>Single device data correction (SDDC)</p>
Fans	<p>6 x 120mm, redundant, hot-plug fans through the chassis fan cage</p>
USB	<p>2 external</p>
Remote management	<p>Per sled or chassis: Embedded IPMI 2.0 BMC with 1X 10/100 Mbps RJ45 connector</p>



Feature **PowerEdge C8000, C8220, C8220X and C8000XD technical specifications**

Operating systems

- Microsoft® Windows Server® 2012
- Microsoft Windows Server 2012 R2 (includes Hyper-V®)
- Microsoft Windows Server 2008 R2 Enterprise x64 SP1 (includes Hyper-V)
- Microsoft Windows® HPC Server 2008 R2 x64 SP1
- Novell® SUSE® Linux® Enterprise Server 11 SP1
- Red Hat® Enterprise Linux 6.0

Optional embedded hypervisors:

- Citrix® XenServer® 5.6 SP2
- Microsoft Hyper-V, a server role in Microsoft Windows Server operating systems
- VMware® vSphere® ESXi™ 5.5

Services

- Data Center Consulting Services
- Rack Integration (U.S. only, not available in China)
- Rack Design Verification
- Configuration Services/CFI
- Onsite Deployment
- Online Self Dispatch
- Basic Support
- ProSupport for IT
- ProSupport for Data Center
- 4-Hour Support
- Keep Your Hard Drive
- Enterprise Wide Contract
- IT Advisory Service
- Remote Advisory Service
- Certified Data Destruction
- Specialized Onsite Services



3 Chassis and sled views and features

The PowerEdge C8000 is a 4U rack-mounted chassis that supports the C8220, a single-width compute sled, the C8220X, a double-width compute sled, and the C8000XD, a double-width storage sled. The PowerEdge C8000 chassis is available in two versions: internal and external power.

The PowerEdge C8000 internal power configuration includes two internal power sleds that house up to two 1400W power supplies; power sleds are located in the middle of the chassis.

An external, 3U, half-length, power distribution unit (PDU) supports the PowerEdge C8000 external power configuration for up to four chassis.

PowerEdge C8000 chassis

A Dell PowerEdge C8000 system consists of the enclosure, fans with fan cage, and a variation of the C8220, C8220X and C8000XD sleds. Access to the sled bays is from the front of the PowerEdge C8000. The front also has the power and event indicator, chassis identification indicator, a thermal sensor that monitors the inlet ambient temperature, an Ethernet connector, and the NIC link/activity indicator.

Figure 1. PowerEdge C8000 chassis front view



On the back of the PowerEdge C8000 are a power and event indicator, a chassis identification indicator, chassis fans and their fault indicators.



Figure 2. PowerEdge C8000 chassis back view



Figure 3. PowerEdge C8000 chassis controller board



Table 4 lists the features on the PowerEdge C8000 chassis. For additional chassis-feature information, see the *Dell PowerEdge C8000 Hardware Owner's Manual* on Dell.com/Support/Manuals.

Table 4. PowerEdge C8000 features

Feature	Description
Sled bays	Holds up to 5 C8220X compute sleds, 10 C8220 compute sleds, 5 C8000XD sleds or 2 power sleds.
Power/event indicator	Indicates the power and health status of the system.



Feature	Description
Chassis identification indicator	Indicates when the chassis ID signal is generated.
Thermal sensor	Monitors the inlet ambient temperature.
NIC link/activity indicator	Indicate network activity and status.
Ethernet connectors	Embedded 10/100 Mbit NIC connector.
Fan fault indicators	Indicates when a fan is in normal operation or in failure.

PowerEdge C8220 single-wide compute sled

The front of the C8220 includes USB connectors, mezzanine card expansion slot, PCIe expansion slot, release latch, power button and indicator, video connector, serial connector, dedicated management port, Ethernet connectors and the sled ID indicator as shown in Figure 4.

Figure 4. PowerEdge C8220 sled front view



Figure 5 shows the back of the C8220 sled.

Figure 5. PowerEdge C8220 sled back view



Figure 6 is the side view of the C8220 sled.

Figure 6. PowerEdge C8220 sled side view

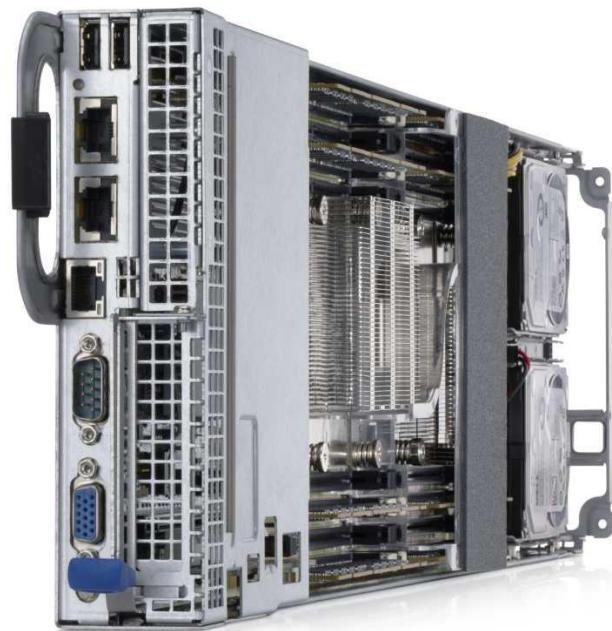


Figure 7 shows the inside of the C8220 sled.

Figure 7. PowerEdge C8220 sled interior view



PowerEdge C8220X double-wide compute/GPU sled

The front of the C8220X includes USB connectors, hard drive bays, mezzanine card expansion slot, PCIe expansion slot, release latch, power button and indicator, video connector, serial connector, dedicated management port, Ethernet connectors and the sled ID indicator as shown in Figure 8.



Figure 8. PowerEdge C8220X sled front closed view



Figure 9 shows how the C8220X sled can be opened.

Figure 9. PowerEdge C8220X sled front open view



Figure 10 shows the back view of the C8220X sled.

Figure 10. PowerEdge C8220X sled back closed view



The PowerEdge C8000 server enclosure includes three pairs of hot-pluggable fan modules that provide the system with redundant cooling source. Each fan module contains two separate cooling fans. All three fan modules must be installed at all times to ensure proper cooling. Figure 11 shows a fan cage from a Dell PowerEdge C8220X double-wide compute sled in vertical position, with one fan removed from the cage.

Figure 11. PowerEdge C8220X sled side closed view



The embedded server management logic in the system controls and monitors the speed of the fans. A fan failure or temperature that is too high in the system results in a notification from the BMC.



Figure 12 shows the interior view of the C8220X sled.

Figure 12. PowerEdge C8220X sled interior view



Figure 13 shows the top view of the C8220X sled.

Figure 13. PowerEdge C8220X top closed view



PowerEdge C8000XD double-wide storage sled

The front of the C8220XD includes external mini SAS connectors, hard drive bays, release latch and the power button and indicator, as shown in Figure 14.

Figure 14. PowerEdge C8000XD sled



4 Processor

The Intel Xeon processor E5-2600 and E5-2600 v2 product families are at the heart of a flexible and efficient data center to meet your diverse needs. The PowerEdge C8000 series is designed to deliver the best combination of performance, built-in capabilities, and cost effectiveness. From virtualization and cloud computing to design automation or real-time financial transactions, you'll be delighted by better than ever performance. I/O latency is dramatically reduced with Intel Integrated I/O, which helps you to eliminate data bottlenecks, streamline your operations and increase your agility.

Processor features

The Intel Xeon processor E5-2600 v2 product family has powerful new features and improves upon many of the capabilities of the predecessor Intel Xeon processor E5-2600 series:

- With up to four additional cores, 10MB more cache, and a 17 percent increase in memory speeds, E5-2600 v2 processors may boost performance by up to 40 percent in Dell PowerEdge server platforms.
- Support for DDR3 1866MT/s memory provides faster connections throughout the system.
- Up to 16 DIMM slots and support for up to 32GB DIMMs enable memory capacity of 512GB Dell's exclusive Fault Resilient Memory technology provides a protected memory zone for a hypervisor without consuming half of the total RAM in the system.
- In combination with Fault Resilient Memory, E5-2600 v2 processors offer Failsafe Virtualization for unsurpassed industry protection for virtual machines.
- Intel Secure Key and Intel OS Guard deliver faster and more secure encryption.
- Advanced Programmable Interrupt Controller virtualization (APICv) improves virtualization performance by reducing virtual machine (VM) exits, thereby reducing overhead required to service every APIC interrupt.
- Intel Integrated PCIe 3.0 provides up to 40 lanes per socket.
- Intel Turbo Boost Technology 2.0 delivers up to double the boost of the previous generation turbo technology.
- 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.
- 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 in the large-number calculations that are integral to many technical, financial and scientific computing problems.
- Dell Processor Acceleration Technology (DPAT), enabled through the BIOS, minimizes transition duration when the processor functions in turbo mode, thereby decreasing jitter and allowing for lesser latency.

For more information on the Intel Xeon processor E5-2600 and E5-2600 v2 product families, visit Intel.com.



Supported processors

The PowerEdge C8000 supports up to two processors with up to 12 cores per processor. Table 5 lists the processors supported by the PowerEdge C8000. For the latest information on supported processors, visit Dell.com/PowerEdgeC.

Table 5. Supported processors

Model	Clock speed	Maximum TDP	Cache	Cores	QPI speed	Maximum memory speed	Turbo
E5-2697v2	2.7GHz	130W	30M	12	8.0GT/s	1866MT/s	Yes
E5-2695v2	2.4GHz	115W	30M	12	8.0GT/s	1866MT/s	Yes
E5-2690	2.9GHz	135W	20M	8	8.0GT/s	1600MT/s	Yes
E5-2690v2	3.0Ghz	130W	25M	10	8.0GT/s	1866MT/s	Yes
E5-2680	2.7GHz	130W	20M	8	8.0GT/s	1600MT/s	Yes
E5-2680v2	2.8Ghz	115W	25M	10	8.0GT/s	1866MT/s	Yes
E5-2670	2.6GHz	115W	20M	8	8.0GT/s	1600MT/s	Yes
E5-2670v2	2.5GHz	115W	25M	10	8.0GT/s	1866MT/s	Yes
E5-2667v2	3.0GHz	130W	20M	8	8.0GT/s	1866MT/s	Yes
E5-2665	2.4GHz	115W	20M	8	8.0GT/s	1600MT/s	Yes
E5-2660	2.2GHz	95W	20M	8	8.0GT/s	1600MT/s	Yes
E5-2660v2	2.2GHz	95W	25M	10	8.0GT/s	1866MT/s	Yes
E5-2650L	1.8GHz	70W	20M	8	8.0GT/s	1600MT/s	Yes
E5-2650Lv2	1.7GHz	60W	25	10	8.0GT/s	1600MT/s	Yes
E5-2650	2.0GHz	95W	20M	8	8.0GT/s	1600MT/s	Yes
E5-2650v2	2.6GHz	95W	20M	8	8.0GT/s	1866MT/s	Yes
E5-2643	3.3GHz	130W	10M	4	6.4GT/s	1066MT/s	Yes
E5-2643v2	3.3GHz	130W	15MB	6	8.0GT/s	1866MT/s	Yes
E5-2640	2.5GHz	95W	15M	6	7.2GT/s	1333MT/s	Yes
E5-2640v2	2.0GHz	95W	20M	8	7.2GT/s	1600MT/s	Yes
E5-2637	3.0GHz	80W	5M	2	8.0GT/s	1333MT/s	Yes
E5-2637v2	3.5GHz	130W	10M	4	8.0GT/s	1866MT/s	Yes
E5-2630L	2.0GHz	60W	15M	6	7.2GT/s	1333MT/s	Yes
E5-2630Lv2	2.4GHz	60W	15M	6	7.2GT/s	1600MT/s	Yes
E5-2630	2.3GHz	95W	15M	6	7.2GT/s	1333MT/s	Yes
E5-2630v2	2.6GHz	80W	15M	6	7.2GT/s	1600MT/s	Yes



Model	Clock speed	Maximum TDP	Cache	Cores	QPI speed	Maximum memory speed	Turbo
E5-2620	2.0GHz	95W	15M	6	7.2GT/s	1333MT/s	Yes
E5-2620v2	2.1GHz	80W	15M	6	7.2GT/s	1600MT/s	Yes
E5-2609	2.4GHz	80W	10M	4	6.4GT/s	1066MT/s	NA
E5-2609v2	2.5GHz	80W	10M	4	6.4GT/s	1333MT/s	NA
E5-2603	1.8GHz	80W	10M	4	6.4GT/s	1066MT/s	NA
E5-2603v2	1.8GHz	80W	10M	4	6.4GT/s	1333MT/s	NA

Processor configurations

The PowerEdge C8220 and C8220X are available in single- or dual-processor configurations. Both processors must be matching in the dual-processor configuration.

Note: In single-processor configurations, the PCIe x8 mezzanine connector is inactive.

Processor installation

For information on processor installation, see the *Dell PowerEdge C8220 Hardware Owner's Manual* and the *Dell PowerEdge C8220X Hardware Owner's Manual* on Dell.com/Support/Manuals.

Chipset

The Intel C602 chipset is implemented on the PowerEdge C8000. For more information, visit Intel.com.

GPU support

The C8220X supports graphics processing unit (GPU) technology, which provides accelerated performance for a variety of applications including virtual desktop infrastructure (VDI) and HPC implementations. The PowerEdge C8220X supports the following GPUs and coprocessors.

- NVIDIA Tesla K10, K20 and NVIDIA GRID K2 GPU computing module
- Intel Xeon Phi™ coprocessor 5110P and Intel Xeon Phi coprocessor 7120P

The C8220X supports up to two NVIDIA Tesla K20 GPU computing modules. NVIDIA Tesla K20 GPUs are PCIe, double-wide, full-form factor computing modules. The K20 GPU supports up to 5GB of dedicated GDDR5 memory. Companion processors to the CPU in the server, Tesla GPUs accelerate parallel processing applications by up to 10 times, with up to 665 gigaflops of double-precision performance and 1 teraflop of single precision performance, ECC memory error protection, and L1 and L2 caches.



5 Memory

The PowerEdge C8220 and C8220X use DDR3 memory to provide a high-performance, high-speed memory interface capable of low latency response and high throughput. The PowerEdge C8220 and C8220X support low-voltage (LV) ECC DDR3 memory modules, registered DIMMs (RDIMM), and load-reduced DIMMs (LRDIMM).

The system contains 16 memory sockets split into two sets of eight sockets, one set per each processor. Each eight-socket set is organized into four channels with two memory sockets per channel.

Supported memory

The DDR3 memory interface consists of four channels, with up to two DIMMs per channel. The system supports 4GB, 8GB or 16GB RDIMMs and 32GB LRDIMMs. The memory mode depends on how the memory is populated in the system.

The PowerEdge C8220 and PowerEdge C8220X support the DIMMs listed in Table 6. For the latest information on supported memory, visit Dell.com/PowerEdgeC.

Table 6. DIMMs supported

Capacity (GB)	Speed (MT/s)	Type	Ranks per DIMM	Data width	SDDC support	Voltage
4	1333	UDIMM	2	x8	Advanced ECC	1.35
4	1333	RDIMM	2	x8	Advanced ECC	1.35
4	1600	RDIMM	2	x8	Advanced ECC	1.35
4	1600	RDIMM	2	x8	Advanced ECC	1.5
4	1866	RDIMM	1	x8	Advanced ECC	1.5
8	1333	RDIMM	2	x4	All modes	1.35
8	1600	RDIMM	2	x4	All modes	1.5
8	1600	RDIMM	1	x4	All modes	1.35
8	1866	RDIMM	1	x4	All modes	1.5
16	1066	RDIMM	4	x4	All modes	1.35
16	1333	RDIMM	2	x4	All modes	1.35
16	1600	RDIMM	2	x4	All modes	1.5
16	1600	RDIMM	2	x4	All modes	1.35
16	1866	RDIMM	2	x4	All modes	1.5
32	1333	RDIMM	4	x4	All modes	1.35

Memory configurations

For more information on memory configuration, see the *Dell PowerEdge C8220 Hardware Owner's Manual* and the *Dell PowerEdge C8220X Hardware Owner's Manual* on Dell.com/Support/Manuals.



Memory speed

The PowerEdge C8220 and C8220X support memory speeds of 1866MT/s, 1600MT/s, 1333MT/s, and 1066MT/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.

Table 7 lists memory configuration and performance details based on the population of the number and type of DIMMs per memory channel.

Table 7. Memory speed capabilities

DIMM type	DIMM 1	DIMM 2	Maximum GB/ channel	Maximum speed (MT/s)	
				1.5V DIMMs	1.35V DIMMs
UDIMM	SR	Empty	4GB	1866	1333
	SR	SR	8GB	1600	1333
	SR or DR	Empty	16GB	1866	1333
RDIMM	SR	SR	16GB	1600	1333
	SR or DR	DR	32GB	1600	1333
	QR	Empty	32GB	1066*	800*
	QR	SR, DR, or QR	64GB	800*	800*
LRDIMM	QR	Empty	32GB	1866	1600
	QR	QR	64GB	1600	1600

*Although the C8220 and C8220X support DIMM speeds of 800MT/s and 1066MT/s, you can only purchase these systems with DIMM speeds of 1333MT/s, 1600MT/s and 1866MT/s on Dell.com/PowerEdgeC.

For information on memory mirroring and sparing configurations, see the *Dell PowerEdge C8220 Hardware Owner's Manual* and the *Dell PowerEdge C8220X Hardware Owner's Manual* on Dell.com/Support/Manuals.



6 Storage

To accommodate various drive options, the PowerEdge C8220, C8220X, and C8000XD support a variety of optional drives and drive types. The C8220 supports up to 2 x 2.5-inch SATA/SSD non-hot-plug drives located in the back of the sled. The C8220X has more flexibility and accommodates 2 x 2.5-inch SATA/SSD/SAS hot-plug drives, plus 2 x 2.5-inch SATA/SSD non-hot-plug drives located in the back of the sled, and 8 x 2.5-inch or 4 x 3.5-inch drives located on the top of the sled.

The C8000XD storage sled accommodates up to 12 x 2.5-inch SATA/SSD/SAS SSD hot-plug, 12 x 3.5-inch SATA/SAS/SSD hot-plug, or 24 x 2.5-inch SSD non-hot-plug drives.

In addition, the PowerEdge C8220 and C8220X have a MicroSD slot located on the PCIe riser for loading an embedded hypervisor.

PowerEdge C8220 and C8220X MicroSD card reader

The PCIe risers on the PowerEdge C8220 and C8220X include a MicroSD card reader slot. Cards installed in this slot can be used for storing an embedded hypervisor.

PowerEdge C8220 and C8220X hard drive cable routing

To facilitate easier and cleaner cable routing, the SAS/SATA signals in the C8220 and C8220X are routed through each sled to the chassis midplane. Configurations that use the onboard controller are cable-less to avoid clutter and additional cost. Hard drive controller connectors are provided near the expansion slots to facilitate easier connection between the controller and system board.

Internal storage

The PowerEdge C8220, C8220X and C8000XD system supports a variety of drive types, capacities, and quantities depending on the number of sleds installed.

- Support for 7.2K, 10K, and 15K RPM 2.5-inch and 3.5-inch SAS drives
- Support for 7.2K RPM Enterprise 2.5-inch and 3.5-inch SATA
- Hard drives must use the specific drive carrier for the PowerEdge C8220, C8220X, and C8000XD

Supported hard drives

Table 8, Table 9, and Table 10 list the hard drive options for the C8220, C8220X and C8000XD. For additional information, see Dell.com/PowerEdgeC.

Table 8. Supported hard drives on the C8220

Form factor	Type	Speed (rpm)	Capacities
2.5"	Enterprise SATA	7.2K	500GB, 1TB
	SATA SSD (MLC)	NA	120GB, 160GB, 240GB, 300GB, 480GB, 600GB, 800GB
	SSD (eMLC)	NA	100GB, 200GB, 400GB, 800GB



Table 9. Supported hard drives on the C8220X

Form factor	Type	Speed (rpm)	Capacities
3.5"	Enterprise SATA	7.2K	500GB, 1TB, 2TB, 3TB, 4TB
	Nearline SAS (6Gb)	7.2K	1TB, 2TB, 3TB, 4TB
	SAS (6Gb)	15K	300GB, 600GB
2.5"	Enterprise SATA	7.2K	500GB, 1TB
	Nearline SAS (6Gb)	7.2K	500GB, 1TB
	SAS (6Gb)	10K	300GB, 600GB, 900GB, 1.2TB
	SAS (6Gb)	15K	146GB, 300GB
	SSD (eMLC)	NA	100GB, 200GB, 400GB, 800GB
	SSD (MLC)	NA	120GB, 160GB, 240GB, 300GB, 480GB, 800GB

Note: Only two 2.5-inch SATA or SSD non-hot-plug hard drives with GPUs.

Table 10. Supported hard drives on the C8000XD

Form factor	Type	Speed (rpm)	Capacities
3.5"	Enterprise SATA	7.2K	500GB, 1TB, 2TB, 3TB, 4TB
	Nearline SAS (6Gb)	7.2K	2TB, 3TB, 4TB
	SAS (6Gb)	15K	300GB, 600GB
2.5"	Enterprise SATA	7.2K	500GB, 1TB
	Nearline SAS (6Gb)	7.2K	500GB, 1TB
	SAS (6Gb)	10K	300GB, 600GB, 900GB, 1.2TB
	SAS (6Gb)	15K	146GB, 300GB
	SSD (eMLC)	NA	100GB, 200GB, 400GB, 800GB
	SSD (MLC)	NA	120GB, 160GB, 240GB, 300GB, 480GB, 600GB, 800GB



RAID configurations

The PowerEdge C8220 and C8220XD support RAID configurations, but only as a user-configurable option. See the available RAID options in Table 11.

Table 11. RAID support

Controller	Supported RAID levels
Embedded Intel C602 chipset based SATA	RAID 0, 1, 10, 5
LSI 2008 mezzanine	RAID 0,1, 10
LSI 9211-8i PCIe Card	RAID 0, 1, 10
LSI MegaRAID SAS 9265-8i SGL PCIe card	RAID 0, 1, 5, 6, 10, 50, 60

Storage controllers

The C8220 and C8220X support an external RAID controller that connects to the C8000XD.

Table 12. External RAID support

Controller	Supported RAID levels
LSI 9280-8e SGL PCIe card (external ports for DWS connection)	RAID 0, 1, 5, 6, 10, 50, 60
LSI 9285CV-8e	RAID 0, 1, 5, 6, 10, 50, 60

Onboard controller

The embedded controller is included in the Intel C602 chipset.

- Storage controller: Intel AHCI SATA
- Supported protocols: SATA only
- Cache: None
- Battery: None
- RAID level: RAID 0, 1, 5
- RAID spans: 10
- Device Type: Onboard controller
- PCI Interface: x4 DMI
- Ports: 6
- Interface type: Routed through motherboard to midplane
- Interfaces transfer rate: Up to 6Gbps on first two ports. Up to 3Gbps on remaining four ports.

LSI 9265-8i PCIe card

The LSI 9265-8i provides higher performance SAS drives and higher RAID levels with battery-backed cache.

- Storage controller: LSI MegaRAID SAS 9265-8i
- Supported protocols: SATA and SAS
- Cache: 1Gb DDR3 1333MT/s



- Battery: LSI iBBU09
- RAID level: RAID 0, 1, 5, and 6
- RAID spans: 10, 50, and 60
- Device type: PCIe add-in controller
- PCI interface: PCIe 2.0 x8 lanes
- Ports: 8
- Interface type: Two x4 SFF8087 Mini-SAS connectors
- Interfaces transfer rate: Up to 6Gbps per port

LSI 2008 mezzanine card

The LSI 2008 mezzanine card is a custom SAS host bus adapter (HBA) mezzanine card for the PowerEdge C8000. This card provides higher performance SAS drives without higher RAID levels and battery-backed cache.

- Storage controller: LSI SAS 2008
- Supported protocols: SATA and SAS
- RAID level: RAID 0, 1
- RAID spans: 10
- Device type: PCIe mezzanine card
- PCI interface: PCIe 2.0 x8 lanes
- Ports: 8
- Interface type: Two x4 SFF8087 Mini-SAS connectors
- Interfaces transfer rate: Up to 6Gbps per port

Table 13 lists the supported add-in cards for the PowerEdge C8000 series.

Table 13. Add-in cards supported by drive controller

Factory hard drive controller configuration	Card type	C8220	C8220X	C8220X +GPU
LSI 2008 8-port SAS	Mezz	No	Yes	No
LSI 9265-8i	PCIe	Yes	Yes	No
LSI 9202 SAS HBA	PCIe	Yes	Yes	No
LSI 9211-8i SAS HBA	PCIe	Yes	Yes	No
LSI 9280-8e	PCIe	Yes	Yes	No
Mellanox[®] ConnectX[®]-2 dual-port QDR IB	Mezz	Yes	Yes	Yes
Mellanox ConnectX-3 single-port FDR IB	Mezz	Yes	Yes	Yes
QLogic[®] single-port QDR IB QLE7340	PCIe	Yes	Yes	No

Optical drive

The PowerEdge C8000 chassis does not support optical drives. If needed, any external USB 2.0 compliant drive can be used, although no specific vendors have been qualified.



Tape drive

The PowerEdge C8000 chassis does not support an internal tape drive. External storage peripherals are not directly validated with PowerEdge C8000, but customers can use any supported network-based storage options validated with our network and fabric card matrix.



7 Networking and PCIe

Embedded NICs/LAN on Motherboard (LOM)

One Intel I350 dual-port GbE controller is installed on the system board as an independent Ethernet interface device. From a board perspective, the LOM refers to this controller.

The Intel Ethernet Controller I350 family builds on Intel's history of delivering Ethernet products with flexible design and in-box driver support. Run up to four 1Gb ports with enhanced power-saving and market-leading flexible I/O virtualization including VMDq and SR-IOV. Intel's software drivers and support are unmatched for virtual or non-virtualized environments.

- x4 PCIe 2.0 capable interface
- Power 1W (max) with DMA coalescing, Smart Power Down (SPD), and Active State Power Management (ASPM)
- I/O virtualization
 - Eight transmit and receive queue pairs per port
 - Flexible port partitioning
 - SR-IOV support
- Stateless offloads
 - TCP/UDP IPv4 checksum offloads
 - IPv6 support for IP/TCP and IP/UDP receive checksum offload
 - Tx TCP segmentation offload
 - Jumbo Frame support up to 9.5KB
 - Low latency Interrupts
- Remote boot
 - PXE 2.1 remote boot
 - iSCSI boot
- Wake-up support
 - Wake-On-LAN (WOL)
 - ACPI specification v2.0c
 - Magic Packet wake-up enable with unique MAC address
- IPv4 and IPv6 support
- Supports teaming

PCIe support

The PowerEdge C8220 and C8220X support various PCIe expansion options:

- C8820 sled
 - 1 x16 PCIe 3.0 low-profile riser slot
 - 1 x8 PCIe 3.0 daughtercard mezzanine slot
- C8220X sled
 - Hot-plug configuration
 - > 2 x8 PCIe 3.0 low-profile riser slots
 - > 1 x8 PCIe 3.0 daughtercard mezzanine slot



- GPU configuration
 - > 2 x16 PCIe 3.0 daughtercard slots

For information on card installation, requirements, and slot priorities, see the *PowerEdge C8220 Hardware Owner's Manual* and the *PowerEdge C8220X Hardware Owner's Manual* on Dell.com/Support/Manuals.

NIC cards

Table 14 lists the supported add-in NIC cards.

Table 14. Supported add-in NIC cards

Card type	Interface
Intel 82559 dual-port 10GbE (SFP+)	PCIe 8x mezzanine slot
Mellanox ConnectX-2 dual-port QDR InfiniBand®	Mezzanine
Mellanox ConnectX-3 dual-port FDR InfiniBand	Mezzanine
Intel X520-DA dual-port 10GbE (SFP+)	Riser slot
Intel I350 quad-port 1GB low profile NIC	Riser slot

For the latest information on C8220 and C8220X supported PCIe expansion cards, visit Dell.com/PowerEdgeC.



8 Power

Lower overall system-level power draw is a result of Dell's breakthrough system design. PowerEdge servers maximize performance per watt through a combination of power and cooling, energy efficient technologies, and tools. Additionally, PowerEdge servers have 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
Tools for right-sizing	Energy Smart Solution Advisor (ESSA) is a tool that can help 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/ESSA .
Industry compliance	The PowerEdge C8000 series is compliant with 80 PLUS certification.
Power monitoring accuracy	PSU power monitoring improvements include: <ul style="list-style-type: none">• 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.
Active power management	Intel Node Manager is an embedded technology that provides individual server-level power reporting and power limiting functionality. 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.



Feature	Description
Dell Fresh Air cooling	With the thermal design and reliability of Dell products, you can have the capability to operate at excursion-based temperatures beyond the industry standard of 35°C (95°F) without impacting your availability model. This solution takes into account servers, networking, storage and other infrastructure. Find additional information at Dell.com/FreshAir .

Find additional information at Dell.com/PowerAndCooling.

Power sleds and power supplies

The base redundant system consists of two power sleds with up to two 1400W power supplies in a 1+1 configuration. Each power sled installs up to two 1400W power supply modules capable of delivering 2800W of power to the server enclosure at an input range of 200–240V.

Figure 15. PowerEdge C8000 power sled



Dell power supplies have achieved Platinum efficiency levels as shown in Table 16.

Table 16. Power supply efficiency

Form factor	Output	Class	Efficiency targets by load			
			10%	20%	50%	100%
Redundant 86 mm	1400W	Platinum+	89.0%	93.0%	94.5%	92.0%



System power supply throttling feature

The PowerEdge C8000 supports a power supply throttling feature that protects the system if power consumption exceeds the maximum for the supply (1400W). In configurations where power consumption is greater than the maximum, redundancy is lost and the PowerEdge C8000 throttles power consumption of the sleds to stay within the power budget. Performance is degraded in this mode, but the system continues to operate. For example, if a power supply fails or is removed from the enclosure so that the number of power supplies is less than the required number of power supplies, the PowerEdge C8000 throttles all sleds in the enclosure until the failed power-supply module is replaced. If three power-supply modules fail in a 2+2 configuration, the PowerEdge C8000 throttles all the sleds in the enclosure. When the failed power-supply modules are replaced, redundancy is restored, the enclosure exits power-throttling mode, and all sleds resume normal operation.

Table 17. PowerEdge C8000 power throttling

Config	Max power output	Chassis power limit	Single PSU NG	Single sled service	Min sled output	Qty	Max total	Throttle	Action in case of 1 PSU failure	Action in case of servicing 1 power sled
1+1 (2 power sleds + 1 PSU)	1400	1400	1400	1400	450	4	1800	1400	Process the event and execute the policy for emergency throttling	Process the event but do not execute throttling
2+0 (1 power sled + 2 PSUs)	2800	2000	1400	N/A	450	4	1800	1400	Process the event and execute the policy for emergency throttling	N/A
2+2 (2 power sleds + 2 PSUs)	2800	2800	2800	2800	750	4	3000	2600	Process the event and execute the policy for emergency throttling	Process the event but do not execute throttling
4+0 (2 power sleds + 4 PSUs)	5600	4000	4200	2800	750	4	3000	2600	Process the event and execute the policy for emergency throttling	Process the event and execute the policy for emergency throttling



9 Rack information

Rack installation components such as rails are provided with the PowerEdge C8000 rack kit. The kit components consist of a static rail system. A cable lacing bar can be used at the front of the system.

Static rails

Static rails for four-post racks include:

- Support for tool-less installation in 19-inch EIA-310-E compliant square or unthreaded round hole four-post racks including all Dell 42xx and 24xx racks (APC racks are also supported)
- Rail depth: 602 mm
- Square-hole and round-hole rack adjustment range: 582 mm–822 mm



10 Operating systems and virtualization

The Dell PowerEdge C8220 and C8220X support a wide range of industry standard operating systems and virtualization software.

Supported operating systems

The PowerEdge C8220 and C8220X support the following operating systems:

- Microsoft Windows Server 2012
- Microsoft Windows Server 2012 R2 (includes Hyper-V)
- Microsoft Windows Server 2008 R2 Enterprise x64 SP1 (includes Hyper-V)
- Microsoft Windows HPC Server 2008 R2 x64 SP1
- Novell SUSE Linux Enterprise Server 11 SP1
- Red Hat Enterprise Linux 6.0

Additional operating systems tested but not officially supported

The following operating systems have been tested on the PowerEdge C8220 and C8220X, but are not officially supported:

- CentOS 6 64-bit
- Free BSD 8.2 64-bit
- Ubuntu 11.4 64-bit

Supported virtualization

The PowerEdge C8220 and C8220X support the following virtualization hypervisors:

- Citrix XenServer 5.6 SP2
- Microsoft Hyper-V, a server role in Microsoft Windows Server operating systems
- VMware vSphere ESXi 5.5



11 Systems management

Systems management support for the PowerEdge C8220, and C8220X, and C8000XD is provided by third-party solutions only. No Dell OpenManage™ support is provided at this time.

Server management

Server management support for the PowerEdge C8220, and C8220X, and C8000XD is provided by third-party solutions only. No Dell OpenManage support is provided at this time.

Embedded server management

The PowerEdge C8220 and C8220X support baseboard management controllers (BMC) that comply with Intelligent Platform Management Interface (IPMI) v2.0.

The PowerEdge C8220 and C8220X BMC provide features for managing the server remotely or in data center lights-out environments, including:

- Ability to view hardware sensors (temperature, voltage, presence, error sensors)
- Error alerts (server reset, critical sensor values) using email traps, paging, and more
- Option to share embedded NIC Ethernet ports
- IPMI 2.0 monitoring and management functionality
- Server reset, reboot, power-on/off/cycle
- Remote KVM-over-IP console support for up to three simultaneous users



Appendix A. Additional specifications and options

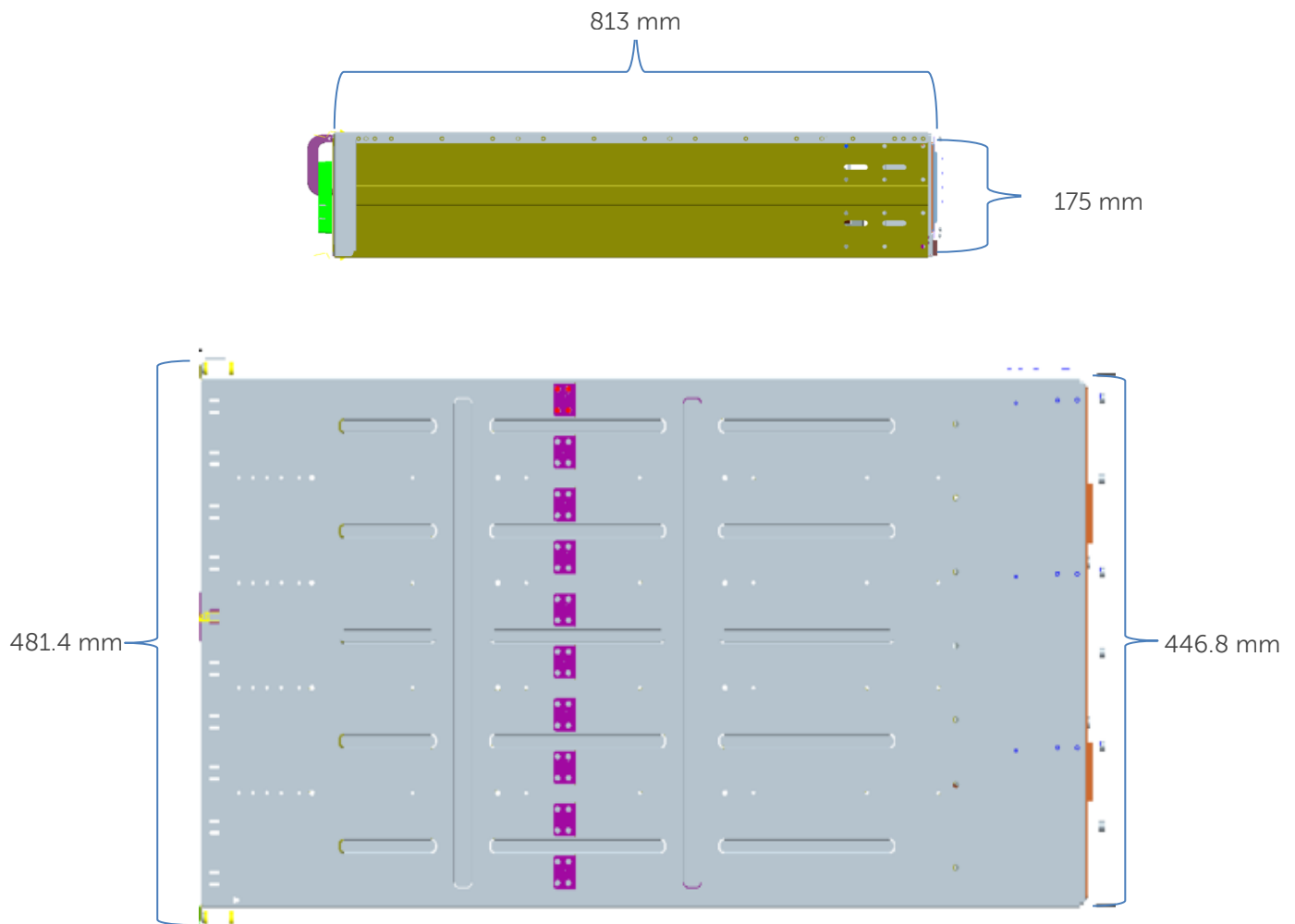
System dimensions

Table 18 and Figure 16 detail the dimensions of the PowerEdge C8000.

Table 18. PowerEdge C8000 chassis dimensions

Dimensions	
Depth	813 mm (31.9 in)
Height	175 mm (6.9 in)
Width	Front: 481.4 mm (18.95 in), Back: 446.8 mm (17.6 in)

Figure 16. PowerEdge C8000 chassis dimensions



System weight

Table 19 lists the weight of the C8000 chassis at maximum configuration as well as empty of any hardware.

Table 19. System weight

Maximum configuration	Empty chassis
102 kg (225 lb)	45 kg (100 lb)

Environmental specifications

Table 20 details the environmental specifications for the C8000 series. For the most up-to-date information, see *Dell PowerEdge C8000, C8220, C8220X, and C8000XD Getting Started with Your System* on Dell.com/Support/Manuals. For additional information about environmental measurements for specific system configurations, see Dell.com/environmental_datasheets.

Table 20. Environmental specifications

Temperature	
Operating	10°C to 35°C (50°F to 95°F) with a maximum temperature gradation of 10°C per hour. Note: For altitudes above 2950 feet, the maximum operating temperature is de-rated 1°F/550 feet.
Storage	-40°C to 65°C (-40°F to 149°F) with a maximum temperature gradation of 20°C per hour
Relative humidity	
Operating	20% to 80% (non-condensing) with a maximum humidity gradation of 10% per hour
Storage	5% to 90% (non-condensing) with a maximum humidity gradation of 10% per hour
Maximum vibration	
Operating	0.26 Grms at 5Hz to 350Hz for 5 minutes in operational orientations
Storage	1.88 Grms at 10Hz to 500Hz for 15 minutes in all orientations
Maximum shock	
Operating	One shock pulse in the positive z-axis (one pulse on each side of the system) of 31G for 2.6 ms in the operational orientation
Storage	Six consecutively executed shock pulses in the positive and negative x, y, and z axes (one pulse on each side of the system) of 71G for up to 2 ms. Six consecutively executed shock pulses in the positive and negative x, y, and z axes (one pulse on each of the system) of 22G faired square wave pulse with velocity change at 200 in/second (508 cm/second)

Video specifications

The integrated baseboard management controller in the PowerEdge C8220 and C8220X incorporates an integrated video subsystem connected to the PCIe interface of the C602 chipset. This ATS2300-based logic supports only 2D graphics. The video device output is available as a rear video port only. The integrated video core shares its video memory with the BMC 32 MB DDR2 application space memory. Table 21 lists the 2D graphics video modes supported by the C8000 system.



Table 21. Supported video modes

Resolution	Refresh Rate (Hz)	Color Depth (bit)
640 x 480	60, 72, 75, 85	8, 16, 32
800 x 600	56, 60, 72, 75, 85	8, 16, 32
1024 x 768	60, 72, 75, 85	8, 16, 32
1152 x 864	75	8, 16, 32
1280 x 1024	60, 75, 85	8, 16
1280 x 1024	60	32
1600 x 1200	60	32

Power supply specifications

Table 22 lists power supply specifications for the PowerEdge C8000.

Table 22. Power supply specifications

Specification	1400W AC power supply
Current consumption	9.0A
Supply voltage	200–240VAC
Frequency	50/60Hz
Heat dissipation	6024.376 BTU/hour maximum
Maximum inrush current	Initial inrush current cannot exceed 55A (peak). Secondary inrush current cannot exceed 25A (peak).

USB peripherals

The PowerEdge C8220 and C8220X support the following USB 2.0 compliant devices through the two front ports:

- DVD (bootable)
- USB key (bootable)
- Keyboard (only one USB keyboard is supported)
- Mouse (only one USB mouse is supported)



Appendix B. Standards compliance

The PowerEdge C8000 series conforms to the industry standards listed in Table 23.

Table 23. 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.msp
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



Standard	URL for information and specifications
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.msp



Appendix C. Additional resources

Table 24 provides a list of documents and websites that provide for more information on the Dell PowerEdge C8000 series.

Table 24. Additional resources

Resource	Description of contents	Location
Dell PowerEdge C8000 Hardware Owner's Manual, Dell PowerEdge C8000XD Hardware Owner's Manual, Dell PowerEdge C8220 Hardware Owner's Manual, Dell PowerEdge C8220X Hardware Owner's Manual	<p>This manual, available in PDF format, provides the following information:</p> <ul style="list-style-type: none"> • 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
Dell PowerEdge C8000, C8220, C8220X, and C8000XD Getting Started With Your System	<p>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:</p> <ul style="list-style-type: none"> • Initial setup steps • Key system features • Technical specifications 	Dell.com/Support/Manuals
Dell PowerEdge 2420, 4220, and 4820 Rack Enclosures Technical Guide	This document provides details about the PowerEdge rack enclosures.	Dell.com/Rack Guide
Rack Installation Instructions	This printed document is provided with the rack kits. The document provides the instructions for installing the server in a rack.	Dell.com/Support/Manuals
Using the Baseboard Management Controller	This document is available in PDF format on the Dell support site. This document provides information on the BMC.	Dell.com/Support/Manuals
Information Update	This document is printed and shipped 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
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 ESSA to 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



Resource	Description of contents	Location
Energy management	Provides information on Dell Fresh Air cooling solutions.	Dell.com/FreshAir
Processor and chipset	Provides more information about the processors and chipset.	Intel.com
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	Contact your Dell sales representative.	

