PowerEdge C6220 II

Technical Guide

PowerEdge C6220 II

- Intel Xeon E5-2600 v2 processors: performance boosted by up to 40% over prior E5-2600 models

- Improved memory bandwidth with support for 1866MT/s DDR3 DIMMs

- Up to 4x faster task completion and improved device addressing for HPC with enhanced PCIe 3.0 connectivity

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1 System overview

The Dell™ PowerEdge™ C6220 II is an ultra-dense 2U server that can support up to four independent two-socket (2S) servers and is the direct successor to the PowerEdge C6220. The PowerEdge C6220 II has two sled configurations that are selected based on the number of nodes populated in the chassis:

- Two-node systems ship with 2U sleds
- Four-node systems ship with 1U sleds

Each independent server features single or dual Intel® Xeon® E5-2600 v2 series processors with up to 12 cores, C602 chipset for I/O connectivity, DDR3 memory, dual-port embedded Gigabit Ethernet (GbE) controllers and integrated IPMI 2.0 baseboard management controller (BMC) with a dedicated RJ45 connection.

The PowerEdge C6220 II server benefits from all the features of the Intel E5-2600 v2 product family as well as an extremely dense and energy-efficient shared infrastructure chassis. The combination of Intel's enhancements with the E5-2600 v2 processors and the C6000 shared infrastructure chassis provide performance, efficiency and flexibility in one dense package.

Key technologies

The Dell PowerEdge C6220 II leads the PowerEdge portfolio in key areas of differentiation, primarily:

- Ultra density: up to four independent 2S servers in a 2U form factor
- High-performance E5-2600 v2 series processors up to 130W TDP
- Up to 12 x 3.5-inch or 24 x 2.5-inch hot swap drives in a 2U form factor
- Flexible backplane enables customizable hard drives for interchangeable node assignments
- Enhanced serviceability over previous generations
- Redundant hot-plug power supply for limited configurations
- Serviceable nodes: ability to service one node while others are running
  (All four system boards are hot-pluggable.)
- Configure each server node differently to accomplish different workloads in one chassis
- Up to 512GB memory support with 16 DDR3 slots

Table 1 lists new technologies featured in the PowerEdge C6220 II server.

Table 1.   New technologies

New technologies	Detailed descriptions
Intel Xeon processor E5-2600 v2 product family	This family of Intel processors has embedded PCI Express® (PCIe) lanes for improved I/O performance. See the Processor section for details.
Intel C602 chipset	The Intel Platform Controller Hub (PCH) chip is implemented on the PowerEdge C6220 server.

New technologies	Detailed descriptions
1600MT/s DDR3 memory	Certain models of the Intel Xeon processor E5-2600 v2 product family support 1866MT/s memory. The PowerEdge C6220 II supports two DIMMs per channel at 1866MT/s with these processors. See the Memory section for details.
Advanced power management	The PowerEdge C6220 II 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.

Product comparison

The PowerEdge C6220 II is the successor to the C6200 system. Table 2 compares the features of the PowerEdge C6220 II to the C6220.

Table 2.   Comparison of PowerEdge C6220 and C6220 II

Specification	PowerEdge C6220	PowerEdge C6220 II
Chassis	2U rack	2U rack
Processors	Intel Xeon processor E5-2600 product family	Intel Xeon processor E5-2600 v2 product family
Cores	2, 4, 6 or 8 cores	2, 4, 6, 8, 10 or 12 cores
Cache	5MB, 10MB, 15MB or 20MB	10MB, 15MB, 20MB, 25MB or 30MB
Front side bus (FSB)	Intel QuickPath Interconnect (QPI)	Intel QPI
Memory[1]	16 x DDR3 RDIMM and UDIMM; up to 512GB	16 x DDR3 RDIMM and UDIMM; up to 512GB
Hard drive bays (hot plug)	4-node: up to 6 x 2.5" or 3 x 3.5" hard drives 2-node: up to 12 x 2.5" or 6 x 3.5" hard drives	4-node: up to 6 x 2.5" or 3 x 3.5" hard drives 2-node: up to 12 x 2.5" or 6 x 3.5" hard drives
Hard drive types	Default SATA and SSD Optional SAS via add-in controller	Default SATA and SSD Optional SAS via add-in controller
External drive bay	None	None
Embedded hard drive controller	Chipset-based SATA	Chipset-based SATA

Specification	PowerEdge C6220	PowerEdge C6220 II
Optional storage controller	Non-RAID: Intel C602 RAID: LSI 2008 Mezzanine, LSI 9210-8i, LSI 9265-8i (All at 3Gbps)	Non-RAID: Intel C602 RAID: LSI 2008 Mezzanine, LSI 9210-8i, LSI 9265-8i (All at 6Gbps)
PCIe slots	1U sled: 1 x16 PCIe 2.0 (half-height, half-length) + 1 x8 PCIe 3.0 (mezzanine) 2U sled: 2 x16 PCIe 2.0 (full height, full length) + 1 x8 PCIe 3.0 (mezzanine)	1U sled: 1 x16 PCIe 3.0 (half-height, half-length) + 1 x8 PCIe 3.0 (mezzanine) 2U sled: 1 x16 PCIe 3.0 full height, full length riser slot; 1 x16 PCIe 3.0 full height, half-length riser slot; and 1 x8 PCIe 3.0 (mezzanine)
Embedded NIC	2x Intel I350 GbE	2x Intel I350 GbE
Power supplies	Hot-plug, redundant power supply 1200W (80+ Platinum); auto-ranging (100V–240V) Redundant, 1400W (80+ Platinum) (240V)	Hot-plug, redundant power supply 1200W (80+ Platinum); auto-ranging (100V–240V) Redundant, 1400W (80+ Platinum) (240V)
Power efficiency	Platinum	Platinum
Fans	4 x 60 mm, non-redundant, not hot-pluggable	4 x 60 mm, non-redundant, not hot-pluggable
Systems management	BMC, IPMI 2,0 compliant; DMCI, iKVM, virtual media, Intel Node Manager 2.0 compliant	BMC, IPMI 2,0 compliant; DMCI, iKVM, virtual media, Intel Node Manager 2.0 compliant
Dimensions (HxWxD)	8.7 cm (3.4 in.) x 44.8 cm (17.6 in.) x 79.0 cm (31.1 in.)	8.7 cm (3.4 in.) x 44.8 cm (17.6 in.) x 79.0 cm (31.1 in.)
Weight	Max: 37 kg (81.6 lb)	Max: 37 kg (81.6 lb)

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

Specifications

Table 3 summarizes the product features for the PowerEdge C6220 II. For the latest information on supported features for the PowerEdge C6220 II, visit Dell.com/PowerEdgeC.

Table 3.   Technical specifications

Feature	PowerEdge C6220 II technical specification	
Form factor	2U rack mount chassis supporting 1 to 4 independent server nodes	
Sled types	1U or 2U PowerEdge C6220 II sleds Maximum of 4 1U or 2 2U PowerEdge C6220 II sleds in a chassis	
Processors	Intel Xeon processor E5-2600 v2 product family	
Processor sockets	2 sockets (up to 4x 2-socket servers)	
Internal interconnect	2 Intel QPI links: 6.4GT/s, 7.2GT/s, 8.0GT/s	
Cache	Up to 30MB with L3 cache; core options: 2, 4, 6, 8, 10 or 12 cores	
Chipset	Intel C602	
Memory[1]	**16 DIMM slots, up to 512GB per node:** 4GB/8GB/16GB (1.5V) DDR3 RDIMM (1866MT/s) 4GB/8GB/16GB LV (1.35V) DDR3 RDIMM (1600MT/s) 32GB LV DDR3 RDIMM (1333MT/s) 4GB LV DDR3 UDIMM (1600MT/s) 32GB LV DDR3 LRDIMM (1600MT/s)	
I/O slots	**1U sled:** 1 x16 PCIe 3.0 half-height (low profile), half-length riser slot 1 x8 PCIe 3.0 daughtercard (mezzanine) connector	**2U sled:** 1 x16 PCIe 3.0 full height, full length riser slot 1 x16 PCIe 3.0 full height, half-length riser slot 1 x8 PCIe 3.0 daughtercard (mezzanine) connector
Drive controller	Intel C602: SATA or SSDs only	
RAID controller	LSI 2008 6Gbps SAS mezzanine (optional) LSI 9210-8i 6Gbps SAS add-in controller (optional) LSI 9265-8i 6Gbps SAS add-in controller (optional)	
Hard drives (hot-plug)	**Drive bay options:** Up to 24 x 2.5" or up to 12 x 3.5" **Hard drive options:** 2.5" SAS (15K): 146GB, 300GB 2.5" SAS (10K): 600GB, 900GB, 1.2TB 2.5" SATA: 500GB, 1TB 2.5" NL SAS (7.2K): 1TB 2.5" SATA SSD (eMLC): 100GB, 200GB, 400GB, 800GB 2.5" SATA SSD (MLC): 120GB, 160GB, 240GB, 300GB, 480GB, 800GB	3.5" SATA (7.2K): 1TB, 2TB, 3TB, 4TB 3.5" SAS (15K): 600GB 3.5" NL SAS (7.2K): 1TB, 2TB, 3TB, 4TB
Embedded Network Adapter	Intel I350 2 x 1GbE	

Feature	PowerEdge C6220 II technical specification
I/O adapter options	**1GbE** Intel I350 quad-port 1Gb adapter Intel 82580 ET quad-port 1Gb mezzanine **10GbE** Intel 82599 dual-port 10Gb DA/SFP+ mezzanine Intel X520 dual-port 10Gb DA/SFP+ adapter **InfiniBand**® Mellanox® ConnectX®-2 QDR dual-port mezzanine Mellanox ConnectX-3 FDR single-port mezzanine Dell X410 HIC for connection to the C410x
Power supply	2 hot-plug redundant Platinum efficiency 1200W and 1400W power supplies
USB	2 external
Fans	Shared cooling with quick-disconnect 4 x 60 mm speed fans detectable with PWM control
Server management	Embedded BMC with IPMI 2.0 support with 1 x 10/100 Mbps RJ45 connector: Intel Node Manager 2.0 compliant — server management support for the PowerEdge C6220 II is delivered by third-party solutions only. No Dell OpenManage support is provided at this time. Systems management scripts and tools can be found at PowerEdgeC.Dell.com.
Rack support	ReadyRails™ static rails for tool-less mounting in 4-post racks with square or unthreaded round holes in a 19-inch EIA-310-E compliant rack including all Dell 42xx and 24xx racks. Note: APC racks are also supported.
Operating systems	Novell® SUSE® Linux® Enterprise Server 11 SP2 Red Hat® Enterprise Linux Microsoft® Windows Server® 2008 R2 x64 SP1 (includes Hyper-V®) Microsoft Windows® HPC Server 2008 R2 x64 SP1 Microsoft Windows Server 2012 Microsoft Windows Server 2012 R2 (includes Hyper-V) **Virtualization options:** Citrix® XenServer® Microsoft Hyper-V, a server role in Microsoft Windows Server operating systems VMware® ESXi™

Feature	PowerEdge C6220 II technical specification
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

2 Chassis views and features

The Dell PowerEdge C6220 II rack server is a 2U rack system that can support one to four independent server node options. The Power Edge C6220 II chassis is available in three versions:

- One supports 12 x 3.5-inch SAS/SATA drives
- Two support up to 24 x 2.5-inch SAS/SATA drives with a passive or expander backplane

A PowerEdge C6220 II system consists of the PowerEdge C6000 enclosure and an optional number of compute sleds.

Front panel

The front panel on the PowerEdge C6220 II chassis, as shown in Figure 1 and Figure 2, contains the power buttons and LEDs for each server node, and it contains the hard drive bays and LEDs.

Figure 1.   3.5-inch chassis

Figure 2.   2.5-inch chassis

Back panel

The fans, power supplies and connectors (USB, NIC, serial and Ethernet) are on the back panel of the PowerEdge C6220 II chassis, as shown in Figure 3.

Figure 3.   Back view with four server nodes

Chassis features

Table 4 lists the features on the PowerEdge C6220 II chassis. For additional information on PowerEdge C6220 II chassis features, see the *Dell PowerEdge C6220 II Systems Hardware Owner's Manual* on Dell.com/Support/Manuals.

Table 4.   Chassis features

Feature	Description
Power-on indicator and power button	ACPI-complaint power button with an integrated green power LED
System identification indicator/button	Buttons on the back and front of a system to help identify the unit in a data center environment
USB connectors	2 on the back panel
Hard drives	Up to 12 x 3.5-inch hot-plug hard drives Up to 24 x 2.5-inch hot-plug hard drives
Hard drive activity LEDs	Indicate the status and activity of the hard drives
Optical drive (optional)	Supports optional DVD drives; see the Storage section
Drive cover	Applicable for 2.5-inch hard drive systems only
Power supply units	Up to 2 back-accessible, hot-plug power supplies
Power supply indicators	Indicates whether system has power
NIC indicators	Indicates network activity and status
Ethernet connectors	Choice of network connectors through the Select Network Adapter family
Serial connector	Connects a serial device to the system

Compute sled options

The PowerEdge C6220 II has two different sled form factors — 1U and 2U.

- The 1U sled has a single x8 mezzanine slot and a single x16 PCIe slot. The x16 PCIe slot uses a 1U riser. This riser, which includes the microSD card reader and was default on every sled for the C6220 server, is optional for the C6220 II. This riser also has the microSD card reader.

- The 2U sled has a single x8 mezzanine slot and two x16 PCIe slots. Each x16 PCIe slot uses a different riser. One slot has the 1.5U riser for a full height, half-length add-in card. The other slot has a 2U riser for the full height, full length add-in card. Every 2U sled ships with both risers by default.

The PowerEdge C6220 II offers a cost-effective, flexible solution for ordering a system that is not fully loaded. This option is for customers who want to start with one or two nodes and add more as needed, and for customers who want to have a dedicated server for servicing tasks.

Figure 4.   1U sled — top view

Figure 5.   1U sled — back view

Figure 6.   2U sled — top view

Figure 7.   2U sled — side view
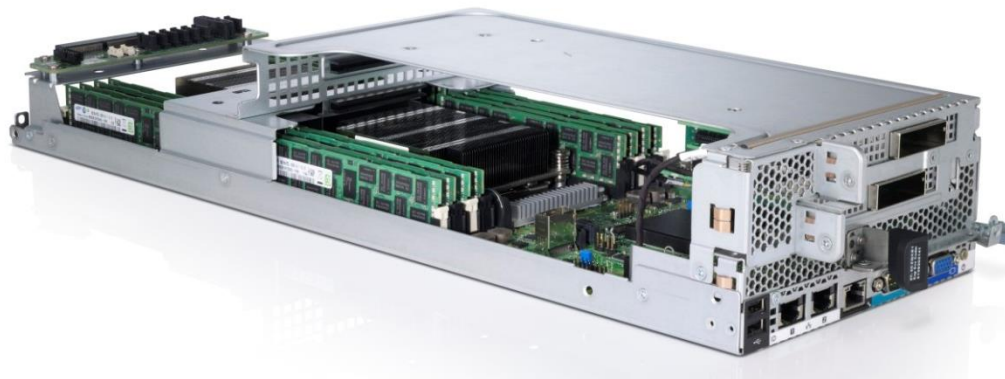
Figure 8.   2U sled — back view

Table 5.   PowerEdge C6220 II 1U and 2U sled features and comparisons

Category	1U sled	2U sled
Height	1 rack unit (1.75 inches)	2 rack units (3.5 inches)
Number of system boards	1	1
Maximum number of sleds in a C6000 chassis	4	2
Custom mezzanine slots	1 x8 PCIe 3.0	1 x8 PCIe 3.0
PCIe slots	1 x16 PCIe 3.0, low profile, half length	1 x16 PCIe 3.0, full height, half length 1 x16 PCIe 3.0, full height, full length
Midplane connections	1 midplane connection: power, control, 6 SATA/SAS	2 midplane connections: bottom = power, control, 4 SATA/SAS top = 4 SATA/SAS

The PowerEdge C6220 II chassis is available with multiple drive size and backplane options. The base chassis remains the same, but installed backplanes determine drive size and capability. The number of drives per sled depends on the number of compute sleds installed as well as the backplane selected.

For additional information on PowerEdge C6220 II backplanes, see the *Dell PowerEdge C6220 II Systems Hardware Owner's Manual* on Dell.com/Support/Manuals.

3 Processor

The Dell PowerEdge C6220 II server features the exceptional performance, value and power efficiency of the Intel Xeon processor E5-2600 v2 product family. With up to 12 cores and 30MB cache, E5-2600 v2 processors have the capacity to deliver performance gains of up to 40 percent over previous-generation E5-2600 processors. No matter your constraint — floor space, power or budget — E5-2600 v2 processors can help you achieve more computational horsepower, in the same footprint, with better security and power efficiency.

Processor features

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

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

Supported processors

The PowerEdge C6220 II supports up to two processors with up to eight cores per processor. Table 6 lists the processors supported by the PowerEdge C6220 II. For the latest information on supported processors, visit Dell.com/PowerEdgeC.

Table 6.   Supported processors

Model	Clock speed	Maximum TDP	Cache	Cores	QPI speed	Maximum memory speed	Turbo
E5-2697 v2	2.7GHz	130W	30M	12	8.0GT/s	1866MT/s	Yes
E5-2695 v2	2.4GHz	115W	30M	12	8.0GT/s	1866MT/s	Yes
E5-2690 v2	3.0GHz	130W	25M	10	8.0GT/s	1866MT/s	Yes
E5-2680 v2	2.8GHz	115W	25M	10	8.0GT/s	1866MT/s	Yes
E5-2670 v2	2.5GHz	115W	25M	10	8.0GT/s	1866MT/s	Yes
E5-2667 v2	3.3GHz	130W	25M	8	8.0GT/s	1866MT/s	Yes
E5-2660 v2	2.2GHz	95W	25M	10	8.0GT/s	1866MT/s	Yes
E5-2650L v2	1.7GHz	60W	25M	10	8.0GT/s	1600MT/s	Yes
E5-2650 v2	2.6GHz	95W	20M	8	8.0GT/s	1866MT/s	Yes
E5-2643 v2	3.5GHz	130W	25M	6	8.0GT/s	1866MT/s	Yes
E5-2640 v2	2.0GHz	95W	20M	8	7.2GT/s	1600MT/s	Yes
E5-2637 v2	3.3GHz	130W	15M	4	8.0GT/s	1866MT/s	Yes
E5-2630L v2	2.4GHz	60W	15M	6	7.2GT/s	1600MT/s	Yes
E5-2630 v2	2.6GHz	80W	15M	6	7.2GT/s	1600MT/s	Yes
E5-2620 v2	2.1GHz	80W	15M	6	7.2GT/s	1600MT/s	Yes
E5-2609 v2	2.5GHz	80W	10M	4	6.4GT/s	1333MT/s	NA
E5-2603 v2	1.8GHz	80W	10M	4	6.4GT/s	1333MT/s	NA

For information on processor installation and configuration, see the *Dell PowerEdge C6220 II Systems Hardware Owner's Manual* on Dell.com/Support/Manuals.

GPU support

GPUs are supported in the PowerEdge C6220 II only through the PowerEdge C410x expansion chassis.

Supported GPU ratios

The PowerEdge C6220 II supports up to eight GPUs per server through the PowerEdge C410x.

Supported GPU configuration options

The PowerEdge C6220 II and the PowerEdge C410x support the following GPUs:

- Intel Phi 5110P
- NVIDIA K10*
- NVIDIA K20

*Not supported with Microsoft Windows Server 2012.

For more information, see the *PowerEdge C410x Technical Guide* at Dell.com/PowerEdgeC.

Chipset

The PowerEdge C6220 II incorporates the Intel C602 chipset. For more information, visit Intel.com.

4 Memory

The PowerEdge C6220 II uses DDR3 memory to provide a high-performance, high-speed memory interface capable of low-latency response and high throughput. The PowerEdge C6220 II supports registered ECC DDR3 DIMMs (RDIMMs), low-voltage DIMMs (LVDIMMs), unbuffered DIMMs (UDIMMs) and load-reduced DIMMs (LRDIMMs).

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

The DDR3 memory interface consists of four channels, with up to two RDIMMs, LVDIMMs, LRDIMMs or UDIMMs per channel. The system supports 4GB, 8GB, 16GB or 32GB RDIMMs and LVDIMMs, 4GB UDIMMs, and it supports 32GB and 64GB, 1600MT/s LRDIMMs. The memory mode depends on how the memory is populated in the system. The PowerEdge C6220 II does not support 1866MT/s in two DIMM per channel configurations.

Supported memory

Table 7 lists the DIMMs supported by the PowerEdge C6220 II. For the latest information on supported memory, visit Dell.com/PowerEdgeC.

Table 7.   DIMMs supported

Capacity (GB)	Speed (MT/s)	Type	Ranks per DIMM	Data width	SDDC support	Voltage
4	1600	UDIMM	1	x8	Advanced ECC	1.5
4	1333	UDIMM	1	x8	Advanced ECC	1.35
4	1866	RDIMM	1	x8	Advanced ECC	1.5
4	1600	RDIMM	1	x8	Advanced ECC	1.35
8	1866	RDIMM	1	X4	All modes	1.5
8	1600	RDIMM	1	X4	All modes	1.35
8	1333	RDIMM	2	X8	All modes	1.35
8	1600	RDIMM	2	X8	All modes	1.5
16	1866	RDIMM	2	x4	All modes	1.5
16	1600	RDIMM	2	x4	All modes	1.35
32	1333	RDIMM	4	x4	All modes	1.35
32	1600	LRDIMM	4	X4	All modes	1.35

Memory configurations

For information on memory configuration, see the *Dell PowerEdge C6220 II Systems Hardware Owner's Manual* on Dell.com/Support/Manuals.

Memory speed

The PowerEdge C6220 II supports memory speeds up to 1866MT/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.

5 Storage

The direct backplanes can be used in configurations of up to four nodes. The expander can support one to four nodes, but it cannot be ordered or shipped from the factory in less-than-full-chassis configurations. By default the hard drive slots are divided equally across server nodes, but the 2.5-inch chassis with expander allows the user to define how the drives are split. All drive slots are hot-swap capable, and each SAS or SATA slot has two LED indicators to indicate drive status and health.

In addition, the PowerEdge C6220 II has a MicroSD slot located on the PCIe riser for loading an embedded hypervisor. This riser is optional in the 1U nodes and default in the 2U nodes.

PowerEdge C6220 II MicroSD card reader

The PCIe risers on the PowerEdge C6220 II include a MicroSD card reader slot. Cards installed in this slot can be used for storing an embedded hypervisor.

PowerEdge C6220 II hard drive cable routing

The SAS/SATA signals in the PowerEdge C6220 II are routed via a thin, flexible cable. Hard drive controller connectors are provided near the expansion slots to facilitate easier connection between the controller and system board. The advantages of this design are:

- The best possible signal integrity
- Support for six 3.5-inch drives per 2U node

Half of the HDD signals for 2U sled configurations are routed through the upper midplane to provide additional bandwidth.

Internal storage

The PowerEdge C6220 II supports up to 24 hard drives per server node depending on the number of installed nodes and the backplane type (2.5-inch direct, 2.5-inch expander or 3.5-inch expander).

- 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 drives
- Use of the PowerEdge C6220 II-specific drive carrier

  Note: The C6220 II shares this drive carrier with any other PowerEdge C platform, such as C6100, C6105, C6145 and C6220.

Supported hard drives

Table 8 lists PowerEdge C6220 II hard drive options. For additional information, see Dell.com/PowerEdgeC.

Table 8.   Supported hard drives

Form factor	Type	Speed (rpm)	Capacities
3.5″	SATA (3Gb)	7.2K	1TB, 2TB, 3TB, 4TB
	SAS (6Gb)	15K	600GB

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

RAID configurations

The PowerEdge C6220 II supports RAID configurations, but only as a user-configurable option. See the available RAID options listed in Table 9.

Table 9.   RAID support

Controller	Supported RAID levels
Embedded Intel C602 chipset-based SATA	RAID 0, 1, 10, 5
LSI 2008 mezzanine at 6Gbps	RAID 0, 1, 10, JBOD
LSI MegaRAID SAS 9265-8i at 6Gbps	RAID 0, 1, 5, 6, 10, 50, 60
LSI SAS 9210-8i at 6Gbps	RAID 0, 1, 1E, 10, JBOD
Dell MegaRAID SAS 9285-8e (only available via customer kit)	RAID 0, 1, 5, 6, 10, 50, 60

Storage controllers

Onboard controller

The Intel C602 chipset includes the embedded. The PowerEdge C6220 II uses the −J variant of the C602. For more information, visit Intel.com.

- 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 via cable
- Interfaces transfer rate: Up to 6Gbps on two ports and 3Gbps on four ports

LSI 2008 mezzanine card

The LSI 2008 mezzanine card is a custom SAS HBA mezzanine card for the PowerEdge C6220 II. 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, JBOD
- RAID spans: 10
- Device Type: PCIe mezzanine card
- PCI Interface: PCIe 2.0 x8 lanes
- Ports: 8
- Interface type: 2 MiniSAS SFF-8087 x4 connectors
- Interfaces transfer rate: Up to 6Gbps per port

LSI 9210-8i PCIe card

The LSI 9210-8i provides higher performance SAS HBA cards and higher RAID levels with battery-backed cache.

- Storage Controller: LSI SAS 2008
- Supported protocols: SATA and SAS
- RAID level: RAID 0, 1, 1E, 5, JBOD
- RAID spans: 10
- Device Type: PCIe mezzanine card
- PCI Interface: PCIe 2.0 x8 lanes
- Ports: 8
- Interface type: 2 MiniSAS SFF-8087 x4 connectors
- Interfaces transfer rate: Up to 6Gbps per port

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 SAS2208 dual-core ROC
- 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 MiniSAS SFF-8087 x4 connectors
- Interfaces transfer rate: Up to 6Gbps per port

Table 10 lists the supported add-in cards for the PowerEdge C6220 II server.

Table 10.   PCIe slot configuration by drive controller

Factory hard drive controller configuration	Card type	LP x16 slot — 1U	FH x16 slot 1 (lower) — 2U	FH x16 slot 2 (upper) — 2U
1U diskless	Mezzanine available	LP available	N/A	N/A
1U onboard	Mezzanine available	LP available	N/A	N/A
1U LSI 2008	LSI 2008	LP available	N/A	N/A
1U LSI 9210-8i	Mezzanine available	LSI 9210-8i LP	N/A	N/A
1U LSI 9265-8i	Mezzanine available	LSI 9265-8i LP	N/A	N/A
2U onboard	Mezzanine available	N/A	FH available	FH available
2U LSI 2008	LSI 2008	N/A	FH available	FH available
2U LSI 9210-8i	Mezzanine available	N/A	LSI 9210-8i FH	FH available
2U LSI 9265-8i	Mezzanine available	N/A	LSI 9265-8i FH	FH available

LED indicators

For more information on LED indicators, see the *Dell PowerEdge C6220 II Systems Hardware Owner's Manual* on Dell.com/Support/Manuals.

Optical drive

The PowerEdge C6000 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 C6220 II does not support an internal tape drive. External storage peripherals are not directly validated with PowerEdge C6220 II, but customers can use any supported network-based storage options validated with our network and fabric-card matrix.

6 Networking and I/O

For the latest information on PowerEdge C6220 II-supported cards, visit Dell.com/PowerEdgeC.

Embedded NIC/LAN on motherboard (LOM)

The PowerEdge C6220 II has a single Intel i350 dual-port GbE controller installed on the system board as an independent Ethernet interface device. From a board perspective, the LOM refers to this controller. Other features include:

- 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

I/O slots

The PowerEdge C6220 II supports two PCIe expansion options:

- One PCIe riser with a single x16 PCIe 3.0 slot (1U sled)
  - Support for half-height, half-length (6.6" maximum length) PCIe cards
- One PCIe Riser set with a dual x16 PCIe 3.0 slot (2U sled)
  - Support for one full height, full length PCIe card and one full height, half-length PCIe card
- One x8 PCIe 3.0 mezzanine network daughter card slot for RAID, networking or fabric options

  Note: The x8 mezzanine is not available in single-processor configurations. Both processor sockets must be populated to access the mezzanine.

The PowerEdge C6220 II does not support hot-pluggable PCIe cards.

Table 11 lists the supported mezzanine and add-in cards.

Table 11. Supported mezzanine and add-in cards

Card type	Interface
LSI 2008 8-port SAS	Mezzanine slot
Mellanox ConnectX-2 dual-port QDR InfiniBand	Mezzanine slot
Mellanox ConnectX-3 single-port FDR InfiniBand	Mezzanine slot
Intel 82599 dual-port 10GbE (SFP+)	Mezzanine slot
Intel 82580 quad-port 1GbE	Mezzanine slot
LSI 9265-8i (supported only at 6Gbps)	Riser slot
LSI 9210-8i (supported only at 6Gbps)	Riser slot
LSI 9285-8e	Riser slot (available via customer kit only)
Intel i350 quad-port 1Gb	Riser slot
Dell X410 HIC card	Riser slot
Intel X520-DA dual-port 10GbE (SFP+)	Riser slot
Intel X540 dual-port 10GbE Base-T	Riser slot (available via customer kit or S&P

NIC cards

Table 12 lists the supported NIC add-in cards.

Table 12. Supported NIC add-in cards

Card type	Interface
Intel 82559 dual-port 10GbE (SFP+)	PCIe x8 mezzanine slot
Intel 82580 quad-port 1GbE	PCIe x8 mezzanine slot
Mellanox ConnectX-2 dual-port QDR IB	PCIe x8 mezzanine slot
Mellanox ConnectX-3 single-port FDR IB	PCIe x8 mezzanine slot
Intel i350 1Gb quad-port	Riser slot
Intel X520-DA dual-port 10GbE (SFP+)	Riser slot
Intel X540 dual-port 10GbE Base-T	Riser slot (available via customer kit or S&P)

For the latest information on PowerEdge C6220 II-supported PCIe expansion cards, visit
Dell.com/PowerEdgeC.

7 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 13 lists the tools and technologies Dell offers to help you achieve your data center goals by lowering power consumption and increasing energy efficiency.

Table 13.   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 power supply Advisor can help you choose the best, most efficient power supply for your workload. Learn more at Dell.com/ESSA.
Industry compliance	The PowerEdge C6220 II server is compliant with all relevant industry certifications and guidelines, including 80 PLUS.
Power monitoring accuracy	Power supply power monitoring improvements include: • Dell 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 power supply and reduce system power consumption. Dell is the first hardware vendor to leverage Intel Node Manager for circuit-breaker fast capping.
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.

Feature	Description
Rack infrastructure	Dell offers some of the industry's highest efficiency power infrastructure solutions, including: • Power distribution units • Uninterruptible power supplies • Energy Smart containment rack enclosures Find additional information at Dell.com/RackInfrastructure.

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

Power supply units

The base redundant system consists of two hot-plug power supplies in a 1+1 configuration available at 1200W and 1400W. The PowerEdge C6220 II supports two configurations based on the number of system boards, as shown in Table 14.

Table 14.   Supported configurations for power supply redundancy

Power supply	Two system boards	Four systems boards
1400W	Up to 2x 130W processors/MLB (main logic board) 3x hard drives/MLB 8x memory modules/MLB	1x 130W processor/MLB 2x hard drives/MLB 2x memory modules/MLB
1200W	Up to 2x 130W processors/MLB 3x hard drives/MLB 4x memory modules/MLB	1x 95W processor/MLB 1x hard drive/MLB 3x memory modules/MLB

Dell power supplies have achieved Platinum efficiency levels as shown in Table 15.

Table 15.   Power supply efficiency

Form factor	Output	Class	Efficiency targets by load			
			10%	20%	50%	100%
Redundant 86 mm	1400W AC	Platinum+	89.0%	93.0%	94.5%	92.0%
	1200W AC	Platinum	89.0%	93.0%	94.5%	92.0%

System power supply throttling feature

The PowerEdge C6220 II supports a power supply throttling feature that protects the system if power consumption exceeds the maximum for the supply (either 1400W or 1200W). In configurations where power consumption is greater than the maximum, redundancy is lost, and the PowerEdge C6220 II throttles power consumption of the two or four independent nodes to stay within the power budget. Performance is degraded in this mode, but the system continues to operate. After you replace the failed power supply, redundancy is restored and all nodes resume normal operation.

8 Rack information

The PowerEdge C6220 II rack kit provides rack installation components such as rails. The components consist of a static rail system; there is no support for a cable management arm.

Static rails

The static rails allow for tool-less installation in 19-inch EIA-310-E compliant square or unthreaded round hole four-post racks. (Note: APC racks are also supported.) Other specifications include:

- Rail depth: 602 mm
- Square-hole and round-hole rack adjustment range: 582 mm–822 mm

9 Operating systems and virtualization

The Dell PowerEdge C6220 II rack server supports a wide range of industry standard operating systems and virtualization software.

Supported operating systems

The PowerEdge C6220 II supports the following operating systems:

- Microsoft Windows Server 2012
- Microsoft Windows Server 2012 R2 (includes Hyper-V)
- Microsoft Windows HPC Server 2008 R2 (64-bit) SP1
- Microsoft Windows Server 2008 R2 Enterprise (64-bit) SP1 (includes Hyper-V)
- Red Hat Enterprise Linux 6.4
- Novell SUSE Linux Enterprise Server 11 SP3

Supported virtualization

The PowerEdge C6220 II supports the following virtualization hypervisors:

- VMware ESXi 5.5
- Citrix XenServer 6.1
- Microsoft Hyper-V, a server role in Microsoft Windows Server operating systems

10 Systems management

Systems management for the PowerEdge C6220 II is through third-party solutions only. There is no Dell OpenManage support for server management at this time.

Embedded server management

The PowerEdge C6220 II supports BMCs that comply with IPMI v2.0. The PowerEdge C6220 II BMC provides the following features for managing the server remotely or in data center lights-out environments:

- Views of hardware sensors (such as temperature, voltage, presence and error)
- Error alerts (server reset, critical sensor values and others) using email traps, paging and more
- Option to share embedded NIC Ethernet ports
- IPMI 2.0 monitoring and management functionality
- Server reset, reboot and 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 16 and Figure 9 details the dimensions of the PowerEdge C6220 II.
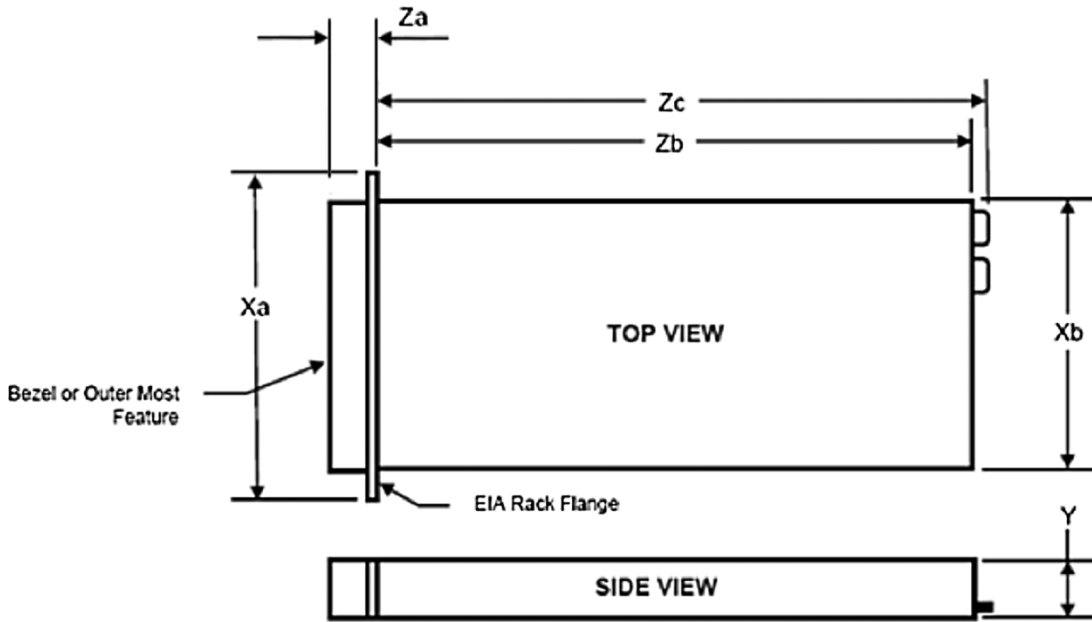
Figure 9.   PowerEdge C6220 II chassis dimensions

Table 16.   PowerEdge C6220 II chassis dimensions

Xa	Xb	Xa without bezel	Y	Zb	Zc
48.23 cm	44.8 cm	4.2 cm	8.76 cm	75.01 cm	76.2 cm

System weight

Table 17 lists the weight of the PowerEdge C6220 II rack server at minimum and maximum configuration.

Table 17.   System weight

Maximum configuration	Minimum configuration
37 kg (81.571 lb)	17.14 kg (37.79 lb)

Environmental specifications

Table 18 details the environmental specifications for the PowerEdge C6220 II. For the most up-to-date information, see the *Dell PowerEdge C6220 II Getting Started Guide* on Dell.com/Support/Manuals. For additional information about environmental measurements for specific system configurations, see Dell.com/environmental_datasheets.

Table 18.   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 ft
Storage	−40° to 65°C (−40° 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	−40°C to 65°C (−40°F to 149°F) with a maximum temperature gradation of 20°C 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)
Altitude	
Operating	−15.2 m to 3048 m (−50 ft to 10,000 ft) Note: For altitudes above 2950 feet, the maximum operating temperature is de-rated 1°F/550 ft
Storage	−15.2 m to 10,668 m (−50 ft to 35,000 ft) Note: For altitudes above 2950 feet, the maximum operating temperature is de-rated 1°F/550 ft
Airborne contaminant level	
Class G1 or lower as defined by ISA-S71.04-1985	

Video specifications

The BMC for the PowerEdge C6220 II incorporates an integrated video subsystem that is connected to the 32-bit PCIe interface of the C602 chipset. The logic is based on the ATS2050 and supports 2D graphics only. The video device output is available only as a rear video port. The integrated video core shares its video memory with the BMC 32MB DDR2 application space memory. This memory is also used for the KVM buffer. The PowerEdge C6220 II system supports the 2D graphics video modes listed in Table 19.

Table 19.   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 20 lists power supply specifications for the PowerEdge C6220 II.

Table 20.   Power supply specifications

Specification	1400W AC power supply	1200W AC power supply
Current consumption	9.0A	12.0−8.0A
Supply voltage	200−240V AC	100−240V AC (auto ranging)
Frequency	50/60Hz	50/60Hz
Heat dissipation	6024 BTU/hour maximum	4016 BTU/hour maximum
Maximum inrush current	Initial in-rush current cannot exceed 55A (peak). Secondary inrush current cannot exceed 55A (peak).	Initial in-rush current cannot exceed 55A (peak). Secondary inrush current cannot exceed 35A (peak).

USB peripherals

The PowerEdge C6220 II supports the following USB 2.0 compliant devices through the two rear 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 C6220 II conforms to the industry standards listed in Table 21.

Table 21.   Industry standard documents

Standard	URL for information and specifications
ACPI Advance Configuration and Power Interface Specification, v2.0c	acpi.info
Ethernet IEEE 802.3-2005	standards.ieee.org/getieee802/802.3.html
HDG Hardware Design Guide Version 3.0 for Microsoft Windows Server	microsoft.com/whdc/system/platform/pcdesign/desguide/serverdg.mspx
DDR3 Memory DDR3 SDRAM Specification, Rev. 3A	jedec.org/download/search/JESD79-3C.pdf
PCI Express PCI Express Base Specification	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
UEFI Unified Extensible Firmware Interface Specification, v2.1	uefi.org/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.mspx

Appendix C. Additional resources

Table 22 provides a list of documents and websites that provide for more information on the Dell PowerEdge C6220 II rack server.

Table 22.   Additional resources

Resource	Description of contents	Location
PowerEdge C6220 II Systems Hardware Owner's Manual	This manual is provided in PDF format and 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	Dell.com/Support/Manuals
PowerEdge C6220 II 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	Dell.com/Support/Manuals
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
Rack 2420, 4220 and 4820 Rack Enclosures Technical Guide	This guide describes the expanded portfolio of rack enclosures and components.	Dell.com/us/Enterprise
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

Resource	Description of contents	Location
Power and cooling technologies	Provides details for improving energy efficiency in the data center.	Dell.com/PNC
Energy management	Provides information on Dell's Fresh Air cooling solutions.	Dell.com/FreshAir
Processor and chipset	Provides more information about the PowerEdge C6220 II processor 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.	