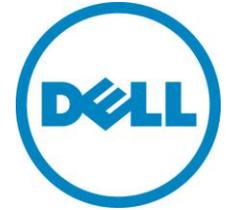


# PowerEdge M710

## Technical Guide



The PowerEdge M710 offers a robust and scalable enterprise platform that can help you simplify and save on IT expenses.

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# Contents

1	Product Comparison .....	6
1.1	Overview .....	6
1.2	Strong IT Foundation .....	6
1.3	Purposeful Design .....	6
1.4	Scalability for Growth .....	6
1.5	Smart Investment .....	6
1.6	Simplified Systems Management .....	7
1.7	Lifecycle Controller.....	7
1.8	Comparison .....	7
2	Key Technologies.....	9
2.1	Overview .....	9
2.2	Dual Intel Xeon Quad-Core and Six-Core Processors .....	9
2.3	DDR3 Memory .....	9
2.4	PCI Express Generation 2 .....	9
2.5	Redundant Internal SD Module .....	9
2.6	iDRAC6 Enterprise.....	9
3	System Information .....	10
3.1	Overview .....	10
3.2	Product Features Summary .....	10
4	Mechanical .....	12
4.1	Chassis Description.....	12
4.2	Dimensions and Weight.....	12
4.3	Exterior and Interior Views .....	13
4.3.1	Front View.....	13
4.3.2	Back View .....	13
4.3.3	Internal View .....	14
4.4	Security .....	14
4.5	Cover Latch .....	14
4.6	TPM (Trusted Platform Module) .....	14
4.7	Power Off Security .....	15
4.8	iDRAC6 Security Features .....	15
4.9	USB .....	15
4.10	Battery.....	15
4.11	Field Replaceable Units (FRU).....	15
4.12	User Accessible Jumpers, Sockets, and Connectors.....	15
5	Power, Thermal, Acoustic .....	16
5.1	Power Supplies .....	16
5.2	Power Efficiency .....	16
5.3	Thermal Operating and Storage Specifications .....	16
5.4	Acoustics .....	17
5.5	Thermal.....	17
6	Processors .....	19
6.1	Overview .....	19
6.2	Features .....	19
6.3	Supported Processors .....	20
6.4	Processor Installation.....	21
7	Memory .....	22

7.1	Overview .....	22
7.2	DIMMs Supported .....	22
7.3	Slots/Risers .....	23
7.4	Speed .....	24
8	Chipset .....	26
8.1	Overview .....	26
8.2	Intel 5520 I/O Hub .....	26
8.2.1	QuickPath Interconnect .....	26
8.2.2	PCI Express Generation 2 .....	26
8.2.3	Direct Media Interface (DMI) .....	26
8.3	Intel I/O Controller Hub 9 .....	26
9	BIOS .....	28
9.1	Overview .....	28
9.2	Supported ACPI States.....	28
10	Embedded LAN on Motherboard .....	29
11	I/O Mezzanine Cards.....	30
12	Storage .....	31
12.1	Drives .....	31
12.2	Hard Disk Drive Carrier.....	31
12.3	Empty Drive Bays.....	31
12.4	Diskless Configuration Support.....	31
12.5	RAID Configurations.....	31
12.6	RAID Controllers.....	33
12.7	Optical Drives.....	33
12.8	External Storage.....	33
13	Video.....	34
14	Rack Information.....	35
15	Operating Systems .....	36
16	Virtualization .....	37
16.1	Resources.....	37
16.2	Advanced Infrastructure Manager by Scalent .....	37
17	Systems Management.....	38
17.1	Overview .....	38
17.2	Server Management.....	38
17.3	Embedded Server Management .....	39
17.3.1	Dell Lifecycle Controller and Unified Server Configurator .....	39
17.3.2	Integrated Dell Remote Access Controller.....	40
17.3.3	Chassis Management Controller .....	42
18	USB Peripherals .....	43
Appendix A.	Statement of Volatility .....	44
Appendix B.	Certifications .....	49
B 1.	Regulatory Certifications .....	49
B 2.	Product Safety Certifications.....	49
B 3.	Electromagnetic Compatibility.....	49
B 4.	Ergonomics, Acoustics and Hygienics .....	50
Appendix C.	Industry Standards .....	51

## Tables

Table 1.	Product Comparison .....	7
Table 2.	Product Features Summary .....	10
Table 3.	Operating and Storage Specifications .....	16
Table 4.	Acoustical Performance of M1000e Chassis with Eight M710 Blades Installed.....	17
Table 5.	Comparison of Processor Technology .....	20
Table 6.	Supported Processors .....	20
Table 7.	Memory Populations and Maximum Frequency.....	24
Table 8.	Supported Hard Drives.....	31
Table 9.	RAID Configurations.....	32
Table 10.	Supported Video Modes .....	34
Table 11.	Server Management Documentation and Information.....	38
Table 12.	Unified Server Configurator Features and Description.....	39
Table 13.	Features List for Base Management Functionality, iDRAC, and vFlash Media .....	40
Table 14.	PowerEdge M710 Statement of Volatility .....	44
Table 15.	Product Safety Certifications.....	49
Table 16.	Electromagnetic Compatibility Certifications.....	50
Table 17.	Ergonomics, Acoustics and Hygienics.....	50
Table 18.	Industry Standards .....	51

## Figures

Figure 1.	PowerEdge M1000e .....	12
Figure 2.	Front View .....	13
Figure 3.	Back View .....	13
Figure 4.	Internal Module View .....	14
Figure 5.	Memory Slots and Risers.....	24
Figure 6.	2.5" HDD Carrier .....	31

# 1 Product Comparison

## 1.1 Overview

The Dell™ PowerEdge™ M710 is a full-height blade server featuring Intel® Xeon® processor 5500 and 5600 series architecture, including:

- Designed with large memory capacity and several I/O (input/output) options
- Great virtualization and database performance
- Designed for high energy efficiency

## 1.2 Strong IT Foundation

To build the most efficient data center solutions, Dell sought input from IT professionals. You asked for reliability, scalability, energy efficiency, and a lower total cost of ownership (TCO). Our M710 blade servers deliver, becoming the cornerstone of a high-performance data center capable of keeping pace with your changing business demands.

## 1.3 Purposeful Design

Today's data centers demand performance, high availability and redundancy. Designed with those needs in mind, the M710 blade server uses the Intel Xeon processor 5500 and 5600 series. These processors adapt to your software in real time, processing more tasks simultaneously. Using Intel Turbo Boost Technology, the M-Series blades can increase performance during peak usage periods. When demand decreases, Intel Intelligent Power Technology helps reduce operating costs and energy usage by proactively putting your server into lower power states.

Dell's innovative full-height M710 provides 18 DIMM slots and up to 288GB of total RAM, coupled with double the I/O capabilities of half-height blades and full-fabric redundancy on all three fabrics. The M710 blade server allows quick virtualization with software from leading industry vendors using an SD card or internal USB for embedded hypervisors.

## 1.4 Scalability for Growth

To keep pace with changing requirements, you can effectively scale I/O application bandwidth with end-to-end 10Gbe or Fibre Channel solutions. Use NPIV and Port Aggregator modes on a variety of switches to virtualize Ethernet or Fibre Channel ports for integration into heterogeneous fabrics. By harnessing Dell's FlexIO modular switches, you can cost-effectively scale your I/O needs, adding ports and functionality through expansion modules— including 10Gb uplinks and stacking ports— instead of needing to buy complete new switches. Dell provides a range of solutions for building on your investment to avoid costly “rip and replace” scenarios.

## 1.5 Smart Investment

The M710 is a foundational component of smart M-Series blade solutions that can help protect your infrastructure investments, simplify your IT environment, and drive real and sustainable savings in power efficiency and productivity. Features include:

- A future-ready, passive midplane capable of supporting multiple generations of blade servers and a full array of upcoming I/O technologies
- FlexIO eliminates “rip and replace” blade switch upgrades; modularity is built into the switches

- FlexAddress™ technology simplifies efforts and interactions between server and networking teams by providing slot-assigned, persistent WWN/iSCSI/MAC addresses for maintenance, without additional management tools or proprietary hardware
- Energy Smart Technologies, including ultra-efficient fans and power supplies for outstanding energy efficiency

With savings in time and money previously needed for maintenance, you free up resources that can be used for true innovation.

## 1.6 Simplified Systems Management

The next generation Dell™ OpenManage™ suite offers enhanced operations and standards-based commands designed to integrate with existing systems for effective control.

## 1.7 Lifecycle Controller

Lifecycle Controller is the engine for advanced systems management integrated on the server. Lifecycle Controller simplifies administrator tasks so you can perform a complete set of provisioning functions such as system deployment, system updates, hardware configuration and diagnostics from a single intuitive interface called Unified Server Configurator (USC) in a pre-OS environment. This eliminates the need to use and maintain multiple pieces of disparate CD/DVD media.

## 1.8 Comparison

Table 1 compares the PowerEdge M710 blade server to the PowerEdge M710HD, M610x, and M610 servers.

**Table 1. Product Comparison**

Feature	M710	M710HD	M610x	M610
Description	General purpose Full-height 2S	General purpose Full-height 2S	Special purpose Full-height 2S	General purpose Half-height 2S
Processor	Intel Xeon Processor 5500 or 5600 Series			
Front Side Bus	Two Intel QuickPath Interconnect (QPI)			
Sockets	Two			
Cores	Up to six			
L2/L3 Cache	8MB (5500 Series) or 12MB (5600 Series)			
Chipset	Intel 5520	Intel 5520	Intel 5500	Intel 5500
DIMMs	18 x DDR3 DIMMs	18 x DDR3 DIMMs	12 x DDR3 DIMMs	12 x DDR3 DIMMs
Min/Max RAM	4GB/288GB	4GB/288GB	4GB/192GB	4GB/192GB
Hard Drive Bays	SAS: 4 x 2.5" (hot-plug) SSD SATA: 4 x 2.5"	SAS: 2 x 2.5" (hot-plug) SSD SATA: 2 x 2.5"	SAS: 2 x 2.5" (hot-plug) SATA: 1 x 2.5"	SAS: 2 x 2.5" (hot-plug) SATA: 1 x 2.5"
Hard Drive Types	SAS SSD, SATA SSD, SAS, nearline SAS	SAS/SSD	SAS SSD, SATA SSD, SAS, nearline SAS	SAS SSD, SATA SSD, SAS, nearline SAS
Hard Drive Controller	PERC H200 PERC H700 CERC 6/i	Embedded H200	PERC H200 PERC H700 PERC H800 SAS6/E	H200 Non-RAID SATA (one hard drive only)
Optional Hard	SAS6/iR		SAS6/iR	SAS6/iR

Feature	M710	M710HD	M610x	M610
Drive Controller	PERC6i with RAID battery		PERC6i with RAID battery	PERC6i with RAID battery
Availability	Hot-plug hard drives ECC memory Single Device Data Correction (SDDC) Supports memory demand and patrol scrubbing High-availability failover cluster support			
Systems Management	Dell™ OpenManage™ BMC, IPMI2.0 compliant Unified Server Configurator Lifecycle Controller iDRAC6 Enterprise with optional vFlash Remote Management: iDRAC6 Enterprise with option vFlash media Microsoft System Center Essential (SCE) 2010 v2	Dell™ OpenManage™ featuring Dell Management Console BMC, IPMI2.0 compliant Unified Server Configurator Lifecycle Controller iDRAC6 Enterprise with optional vFlash	Dell™ OpenManage™ featuring Dell Management Console BMC, IPMI2.0 compliant Unified Server Configurator Lifecycle Controller iDRAC6 Enterprise with optional vFlash	Dell™ OpenManage™ featuring Dell Management Console BMC, IPMI2.0 compliant Unified Server Configurator Lifecycle Controller iDRAC6 Enterprise with optional vFlash Remote Management: iDRAC6 Enterprise with option vFlash media
Mezz Slots	Four x8 PCIe Gen2	Two x8 PCIe Gen2	Two x8 PCIe Gen2	Two x8 PCIe Gen2
I/O slots	NA	NA	Two x16 PCIe Gen2 H800/6GB SAS nVidia M1060 and M2050-204	NA
RAID	0,1,5	0,1	0,1	0,1
NIC/LOM	Four TOE with optional iSCSI offload	Four 1GbE dual Broadcom® BCM5709S Two 10GbE QLogic cLOM8214 (Future) Two 10GbE Broadcom BCM57712 (Future)	2-port Broadcom® 5709S 1Gb w/ TOE plus optional iSCSI Accelerator	2-port Broadcom® 5709S 1Gb w/ TOE plus optional iSCSI Accelerator
USB	Three external USB 2.0 ports at front bezel One internal USB port	Two external USB 2.0 ports at front bezel One internal USB port		
SD Card	Two internal SD slots 1 x Persistent Storage 1 x Management	Two internal SD slots 1 x Persistent Storage 1 x Management / Redundant Persistent Storage	Two internal SD slots 1 x Persistent Storage 1 x Management	Two internal SD slots 1 x Persistent Storage 1 x Management
TPM	Yes, except in China where Trusted Computing Module (TCM) is the standard.			
Video	Matrox G200eW integrated into iDRAC chip			
Power Supplies	See the <a href="#">PowerEdge M1000e Technical Guide</a> .			
Fans	See the <a href="#">PowerEdge M1000e Technical Guide</a> .			
Chassis	See the <a href="#">PowerEdge M1000e Technical Guide</a> .			

## 2 Key Technologies

### 2.1 Overview

The Dell™ PowerEdge™ M710 is a full-height blade server with the following features:

- Dual quad-core or six-core Intel® Xeon® processors 5500 and 5600 series
- DDR3 memory
- PCI Express Generation 2 (PCIe Gen2)
- Optional redundant, mirrored SD cards
- iDRAC6 Enterprise with optional vFlash media

### 2.2 Dual Intel Xeon Quad-Core and Six-Core Processors

The Intel Xeon processor 5500 and 5600 series features quad-core and six-core processing to maximize performance and performance/watt for data center infrastructures and highly dense deployments. The Intel Xeon processor 5500 series 2S family of processor also features Intel Core™ micro-architecture and Intel 64 architecture for flexibility in 64-bit and 32-bit applications and operating systems.

### 2.3 DDR3 Memory

The M710 uses DDR3 memory which provides a high-performance, high-speed memory interface capable of low latency response and high throughput. The M710 supports registered ECC DDR3 DIMMs (RDIMMs).

The DDR3 memory interface consists of three channels, with up to three RDIMMs per channel for single/dual rank and up to two RDIMMs per channel for quad rank. The interface uses 2 GB, 4 GB, 8 GB, or 16GB RDIMMs. The memory mode is dependent on how the memory is populated in the system.

### 2.4 PCI Express Generation 2

PCIe is a serial point-to-point interconnect for I/O devices. PCIe Gen2 doubles the signaling bit rate of each lane from 2.5 Gb/s to 5 Gb/s. Each of the PCIe Gen2 ports is backwards-compatible with Gen1 transfer rates.

### 2.5 Redundant Internal SD Module

The Internal SD Module is dedicated for an SD Flash Card with embedded Hypervisor for virtualization. The SD Flash Card contains a bootable OS image for virtualized platforms. The persistent storage solution on the M710 allows for redundant SD cards.

### 2.6 iDRAC6 Enterprise

The iDRAC6 Enterprise feature set is a managed persistent storage space for server provisioning data. It consists of 1 GB flash and vFlash (an optional externally accessible SD card). vFlash offers the hot-plug portability and increased storage capacity benefits of SD while still being managed by the system.

## 3 System Information

### 3.1 Overview

The PowerEdge™ M710 is an optimized solution with large capacity memory capabilities and I/O scalability in a dense, easy-to-deploy blade form factor. Its key differentiators are superior memory scalability and granularity, new management capabilities with iDRAC/Life Cycle Controller, internal persistent storage, two internal hard drives, and trusted platform module (TPM) support. The M710 is a valuable asset in high-performance cloud computing (HPCC), messaging, database, and virtualization solutions.

### 3.2 Product Features Summary

Table 2 summarizes the product features for the PowerEdge M710. For the latest information on supported features for the PowerEdge M710, visit [Dell.com](http://Dell.com).

**Table 2. Product Features Summary**

Feature	Technical Specifications
Processors	Quad-core or six-core Intel® Xeon® processor 5500 and 5600 series
Chipset	Intel® 5520
Memory <sup>1</sup>	Up to 288GB (18 DIMM slots): 1GB/2GB/4GB/8GB/16GB ECC DDR3 up to 1333MT/s
Drive Bays	Four 2.5" SAS/SSD hot-plug drives
Storage <sup>1</sup>	<b>Internal Hot-Plug Hard Drives Options:</b> 2.5" SAS SSD, SATA SSD, SAS (10K, 15K) 2.5" nearline SAS (7.2K) <b>Maximum Internal Storage:</b> Up to 3.6TB per blade <b>External Storage:</b> For more information about Dell external storage solutions, visit <a href="http://Dell.com/Storage">Dell.com/Storage</a> .
RAID Controller Options	PERC H200 Modular (6Gb/s) PERC H700 Modular (6Gb/s) with 512MB battery-backed cache; 512MB, 1GB non-volatile battery-backed cache SAS 6/iR Modular CERC 6/i Modular PERC 6/i Modular with 256MB battery-backed cache

Feature	Technical Specifications
I/O Mezzanine Card Options	<p><b>1Gb and 10Gb Ethernet:</b>  Dual-Port Broadcom® Gb Ethernet w/ TOE (BCM-5709S)  Quad-Port Intel Gb Ethernet (82576)  Quad-Port Broadcom Gb Ethernet  Dual-Port Broadcom 10Gb Ethernet (BCM-57711)  Brocade® BR1741M-k Dual-Port Mezzanine CNA</p> <p><b>10Gb Enhanced Ethernet and Converged Network Adapters (CEE/DCB):</b>  Dual Port Intel 10GB Enhanced Ethernet Server Adapter X520-DA2 (FCoE Ready for Future Enablement)  Dual-Port QLogic® Converged Network Adapter (QME8142)—supports CEE/DCB 10GbE + FCoE  Dual-Port QLogic Converged Network Adapter (QME8242-k)—supports 10GbE + NPAR  Brocade® BR1741M-k Dual-Port Mezzanine CNA</p> <p><b>Fibre Channel:</b>  Dual-Port QLogic FC8 Fibre Channel Host Bus Adapter (HBA) (QME2572)  Dual-Port Emulex® FC8 Fibre Channel Host Bus Adapter (HBA) (LPe1205-M)  Emulex 8 or 4 Gb/s Fibre Channel Pass-Through Module</p> <p><b>InfiniBand:</b>  Dual-Port Mellanox® ConnectX® Quad Data Rate (QDR) InfiniBand  Dual-Port Mellanox ConnectX Dual Data Rate (DDR) InfiniBand</p>
Operating Systems	<p>Microsoft® Windows Server® 2012  Microsoft Windows Server 2008 SP2, x86/x64 (x64 includes Hyper-V®)  Microsoft Windows Server 2008 R2 SP1, x64 (includes Hyper-V v2)  Microsoft Windows HPC Server 2008  Novell® SUSE® Linux® Enterprise Server  Red Hat® Enterprise Linux®  Oracle® Solaris™</p> <p>For more information on the specific versions and additions, visit <a href="http://Dell.com/OSsupport">Dell.com/OSsupport</a>.</p> <p><b>Virtualization Options:</b>  Citrix® XenServer®  Microsoft Hyper-V through Microsoft Windows Server 2008  VMware® vSphere® including ESX™ and ESXi™  Red Hat Enterprise Virtualization®</p>
Power Supply	Supplied by Dell PowerEdge M1000e Blade Chassis
Video	Integrated Matrox® G200 with 8MB memory
Systems Management	<p>Dell™ OpenManage™  BMC, IPMI2.0 compliant  Dell OpenManage featuring Dell Management Console  Unified Server Configurator  Lifecycle Controller  iDRAC6 Enterprise with optional vFlash  Remote Management: iDRAC6 Enterprise with option vFlash media  Microsoft System Center Essential (SCE) 2010 v2</p>
Embedded Hypervisors	Optional embedded SD media
<p><sup>1</sup> GB means 1 billion bytes and TB equals 1 trillion bytes; actual capacity varies with preloaded material and</p>	

Feature	Technical Specifications
	operating environment and will be less.

## 4 Mechanical

### 4.1 Chassis Description

The Dell™ PowerEdge™ M710 is a full-height blade server that requires an M1000e chassis to operate.



Figure 1. PowerEdge M1000e

The M710 occupies two slots in the M1000e rack enclosure for a maximum of eight blades in one M1000e enclosure. The server can be mixed with other existing Dell blades of half-height form factors and is designed to mix with possible future half-height-double-wide and full-height-double-wide blades.

Refer to the [PowerEdge M1000e Technical Guide](#) for information on fans, power and power supply, racks, security, and other chassis information.

### 4.2 Dimensions and Weight

The PowerEdge M710 dimensions and weight are as follows:

- **Height:** 38.5 cm (15.2 in)
- **Width:** 5 cm (2 in)
- **Depth:** 48.6 cm (19.2 in)
- **Weight (maximum configuration):** 11.1 kg (24.5 lb)

## 4.3 Exterior and Interior Views

### 4.3.1 Front View



Figure 2. Front View

### 4.3.2 Back View



Figure 3. Back View

### 4.3.3 Internal View

A view of the internal module is shown in Figure 4. See *Opening and Closing the Blade* in the *Dell PowerEdge Modular Systems Hardware Owner's Manual* on [Support.Dell.com/Manuals](http://Support.Dell.com/Manuals) for more information.



Figure 4. Internal Module View

### 4.4 Security

Configurable client IP address range for clients connecting to iDRAC6.

### 4.5 Cover Latch

The blade module includes a latch for the cover. See *Opening and Closing the Blade* in the *Dell PowerEdge Modular Systems Hardware Owner's Manual* on [Support.Dell.com/Manuals](http://Support.Dell.com/Manuals) for more information.

### 4.6 TPM (Trusted Platform Module)

The TPM is used to generate/store keys, protect/authenticate passwords, and create/store digital certificates. TPM can also be used to enable the BitLocker™ hard drive encryption feature in Windows Server 2008.

TPM is enabled through a BIOS option and uses HMAC-SHA1-160 for binding. A Trusted Computing Module (TCM) version of the planar is available for use where TCM is the standard, for example, in China.

## 4.7 Power Off Security

Through the BIOS, the front blade server USB ports and power button can be disabled so as to not allow any control of the system from the front of the blade. The enclosure video can also be restricted.

The BIOS System Setup program's system security screen allows administrators to set the system password, control TPM activation and reporting, clear the TPM's memory, and disable the power button and USB ports.

## 4.8 iDRAC6 Security Features

The iDRAC6 modular solution offers many security features including:

- User authentication through Microsoft Active Directory, generic LDAP Directory Service, or locally administered user IDs and passwords
- Two-factor authentication provided by the Smart-Card logon feature; the two-factor authentication is based on what the users have (the Smart- Card) and what they know (the PIN)
- Role-based authorization, which enables an administrator to configure specific privileges for each user
- User ID and password configuration
- SM-CLP and Web interfaces that support 128-bit and 40-bit encryption (for countries where 128 bit is not acceptable), using the SSL 3.0 standard
- Session time-out configuration (in seconds)
- Configurable IP ports (where applicable)
- Secure Shell (SSH), which uses an encrypted transport layer for higher security
- Login failure limits per IP address, with login blocking from that IP address when the limit is exceeded

For greater security, access to iDRAC6 configuration through iDRAC6 Configuration Utility or the local RACADM CLI can be disabled by means of a RACADM command or from the GUI.

## 4.9 USB

The M710 supports the following USB devices:

- DVD (bootable; requires two USB ports)
- USB Key (bootable)
- Keyboard (only one USB keyboard is supported)
- Mouse (only one USB mouse is supported)

## 4.10 Battery

A replaceable coin cell CR2032 3V battery is mounted on the planar to provide backup power for the Real-Time Clock and CMOS RAM on the ICH9 chip.

## 4.11 Field Replaceable Units (FRU)

The planar contains a serial EEPROM to contain FRU information including Dell part number, part revision level, and serial number.

## 4.12 User Accessible Jumpers, Sockets, and Connectors

See System Board Information in the *Dell PowerEdge Modular Systems Hardware Owner's Manual* on [Support.Dell.com/Manuals](http://Support.Dell.com/Manuals) for more information.

## 5 Power, Thermal, Acoustic

### 5.1 Power Supplies

See the [PowerEdge M1000e Technical Guide](#) for information on power supplies and power supply specifications.

### 5.2 Power Efficiency

One of the main features of blade servers is enhanced power efficiency. The PowerEdge™ M710 achieves higher power efficiency by implementing the following features:

- User-configurable power options through the M1000e Chassis Management Controller (CMC) (see M1000e documentation on [Support.Dell.com](#) for further details)
- Improved power budgeting
- Voltage Regulator (VR) efficiency improvements
- Processor VR dynamic phase shedding
- Switching regulators instead of linear regulators
- Closed loop thermal throttling
- DDR3 and LV-DDR3 memory
- Memory VR static phase shedding
- BIOS Power/Performance options page
- Active Power Controller (BIOS-based processor P-state manager)
- Ability to power down or throttle memory
- Ability to disable a processor core
- Ability to turn off embedded NICs or PCIe lanes when not being used
- Option to run PCIe at Gen1 speeds instead of Gen2
- Energy Smart components at the M1000e chassis level to selectively enable more computing performance with less power consumption.

### 5.3 Thermal Operating and Storage Specifications

Thermal specifications for the PowerEdge M710 are detailed in Table 3 along with other important operating and storage information.

**Table 3. Operating and Storage Specifications**

Temperature	
Operating	10° to 35° C (50° to 95° F) with a maximum temperature gradation of 10° C per hour Note: For altitudes above 2950 feet, the maximum operating temperature is derated 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	8% to 85% (noncondensing) with a maximum humidity gradation of 10% per hour
Storage	5% to 95% (noncondensing) with a maximum humidity gradation of 10% per hour

Maximum vibration	
Operating	0.26 Grms at 10-350 Hz for 15 min
Storage	1.54 Grms at 10-250 Hz for 15 min
Maximum shock	
Operating	Half sine shock in all operational orientations of 31 G +/- 5% with a pulse duration of 2.6 ms +/-10%
Storage	Half sine shock on all six sides of 71 G +/- 5% with a pulse duration of 2 ms +/-10%
Altitude	
Operating	-16 to 3048 m (-50 to 10,000 ft) Note: For altitudes above 2950 feet, the maximum operating temperature is derated 1 °F/550 ft.
Storage	-16 to 10,600 m (-50 to 35,000 ft)
Airborne contaminant level	
Class G1 or lower as defined by ISA-S71.04-1985 (G1 maximum corrosive contaminant levels measured at ≤ 50% relative humidity)	

## 5.4 Acoustics

The acoustical design of the PowerEdge M710 reflects adherence to Dell's high sound quality standards. Sound quality is different from sound power level and sound pressure level in that it describes how humans respond to annoyances in sound, like whistles or hums. Definitions for acoustical performance data are as follows:

- **Idle:** Reference ISO7779 (2010) definition 3.1.7; system is running in its OS but no other specific activity.
- **LwA-UL:** The upper limit sound power level (LwA) calculated per section 4.4.2 of ISO 9296 (1988) and measured in accordance to ISO 7779 (2010).

Table 4 shows the acoustical performance for a typical configuration of the M1000e chassis with eight PowerEdge M710 blade servers installed. Acoustical performance varies with hardware configurations.

**Table 4. Acoustical Performance of M1000e Chassis with Eight M710 Blades Installed**

Typical Configuration (per blade) @ 23±2 °C Ambient in M1000e Chassis	
Operating Mode	LwA-UL (bels)
Idle	7.4

## 5.5 Thermal

The M710 thermal solution includes:

- Optimized airflow impedance for individual blade and chassis level airflow balancing
- Custom air baffling to direct air flow through the components to maintain proper cooling
- Custom-designed heat sinks that maintain CPU, DIMM, and board-level chip temperatures within thermal design targets
- Highly optimized fan control algorithm:

- Base fan speeds are a function of hardware configuration and ambient temperature to minimize airflow for a given environment.
- PID control algorithms are used for both CPU, DIMMs, and NDC to maintain appropriate thermal margin

## 6 Processors

### 6.1 Overview

The Intel® Xeon® processor 5500 and 5600 series are designed specifically for servers and workstation applications. These processors feature quad-core processing to maximize performance and performance/watt for data center infrastructures and highly dense deployments. They feature Intel Core™ micro-architecture and Intel 64 architecture for flexibility in 64-bit and 32-bit applications and operating systems and use a 1366-contact Flip-Chip Land Grid Array (FC-LGA) package that plugs into a surface-mount socket. The M710 provides support for up to two 2S processors.

### 6.2 Features

Key features of the Intel Xeon processor 5500 series include:

- Up to four cores per processor
- Two point-to-point QuickPath Interconnect links at 6.4 GT/s
- 45nm process technology
- No termination required for non-populated CPUs (must populate CPU socket 1 first)
- Integrated QuickPath DDR3 memory controller
- 64-byte cache line size
- RISC/CISC hybrid architecture
- Compatible with existing x86 code base
- MMX™ support
- Execute Disable Bit
- Intel Wide Dynamic Execution
- Executes up to four instructions per clock cycle
- Simultaneous Multi-Threading (SMT) capability
- Support for CPU Turbo Mode (on certain SKUs)
- Increases CPU frequency if operating below thermal, power and current limits
- Streaming SIMD (Single Instruction, Multiple Data) Extensions 2, 3, and 4
- Intel 64 Technology
- Intel VT-x and VT-d Technology for virtualization support
- Enhanced Intel SpeedStep® Technology
- Demand-based switching for active CPU power management as well as support for ACPI P-States, C-States and T-States

The Intel Xeon processor 5600 series encompasses all the features of the 5500 series along with:

- New top BIN processors at 130W TDP
- Support for DDR3L, 1.35v DIMMs for even lower system power
- Support for memory sparing
- AES-NI (hardware encryption assist) for more efficient encryption for uses such as online transactions SSL
- Intel TXT (Trusted Execution Technology) provides hardware assisted protection against emerging software attacks

**Table 5. Comparison of Processor Technology**

Intel Xeon Processor	5400 Series	5500 Series	5600 Series
Cores	4	4	6
Last Level Cache	2 x 6MB shared	8MB shared	12MB shared
FSB (MT/s) / Link Frequency (GT/s)	1333 MT/s	Up to 6.4 GT/s	Up to 6.4 GT/s
Max TDP	120W	130W for WS 95W for Server	130W for WS and Server
Max Frequency	>3GHz	>3GHz	>3GHz
Memory Controller	Separate in chipset	Integrated 3-channel DDR3	Integrated 3-channel DDR3
Process Technology	45nm	45nm	32nm
Intel Trusted Execution Technology	No	No	Yes
Intel Advanced Encryption Security- New Instructions	No	No	Yes
Intel Virtualization Technology	Yes	Yes	Yes
Intel 64	Yes	Yes	Yes
Intel Hyper-Threading Technology	No	Yes	Yes
Socket	LGA771	LGA1366	LGA1366

### 6.3 Supported Processors

Supported processors are detailed in Table 6.

**Table 6. Supported Processors**

Model	Speed	TDP Power	Cache	Cores	Max Memory Speed	QPI Link Speed	Turbo Mode Enabled	Hyper-threading
X5690	3.46GHz	130W	12M	6	1333MT/s	6.4GT/s	Yes	Yes
X5680	3.33GHz	130W	12M	6	1333MT/s	6.4GT/s	Yes	Yes
X5675	3.06GHz	95W	12M	6	1333MT/s	6.4GT/s	Yes	Yes
X5670	2.93GHz	95W	12M	6	1333MT/s	6.4GT/s	Yes	Yes
X5660	2.8GHz	95W	12M	6	1333MT/s	6.4GT/s	Yes	Yes
X5650	2.66GHz	95W	12M	6	1333MT/s	6.4GT/s	Yes	Yes
E5645	2.4GHz	80W	12M	6	1333MT/s	5.86GT/s	Yes	Yes
E5649	2.53GHz	80W	12M	6	1333MT/s	5.86GT/s	Yes	Yes
L5640	2.26GHz	60W	12M	6	1066MT/s	5.86GT/s	Yes	Yes
X5687	3.6GHz	130W	12M	4	1333MT/s	6.4GT/s	Yes	Yes

Model	Speed	TDP Power	Cache	Cores	Max Memory Speed	QPI Link Speed	Turbo Mode Enabled	Hyper-threading
X5677	3.46GHz	130W	12M	4	1333MT/s	6.4GT/s	Yes	Yes
X5672	3.2GHz	95W	12M	4	1333MT/s	6.4GT/s	Yes	Yes
X5667	3.06GHz	95W	12M	4	1333MT/s	6.4GT/s	Yes	Yes
X5647	2.93GHz	130W	12M	4	1333MT/s	5.86GT/s	Yes	Yes
E5640	2.66GHz	80W	12M	4	1066MT/s	5.86GT/s	Yes	Yes
E5630	2.53GHz	80W	12M	4	1066MT/s	5.86GT/s	Yes	Yes
E5620	2.4GHz	80W	12M	4	1066MT/s	5.86GT/s	Yes	Yes
L5630	2.13GHz	40W	12M	4	1066MT/s	5.86GT/s	Yes	Yes
L5609	1.86GHz	40W	12M	4	800MT/s	4.8GT/s	No	No
E5607	2.26GHz	80W	8M	4	1066MT/s	4.8GT/s	Yes	Yes
E5606	2.13GHz	80W	8M	4	1066MT/s	4.8GT/s	Yes	Yes
E5603	1.6GHz	80W	4M	4	1066MT/s	4.8GT/s	Yes	Yes
X5560	2.80GHz	95W	8M	4	1333MT/s	6.4GT/s	Yes	Yes
E5530	2.4GHz	80W	8M	4	1066MT/s	5.86GT/s	Yes	Yes
L5520	2.26GHz	60W	8M	4	1066MT/s	5.86GT/s	Yes	Yes
E5506	2.13GHz	60W	4M	4	800MT/s	4.8GT/s	No	No
E5503	2.0GHz	80W	4M	2	800MT/s	4.8GT/s	No	No

## 6.4 Processor Installation

For instructions on installing a processor on the PowerEdge M710, see the Processors section in the *Dell PowerEdge Modular Systems Hardware Owner's Manual* on [Support.Dell.com/Manuals](http://Support.Dell.com/Manuals).

## 7 Memory

### 7.1 Overview

The PowerEdge™ M710 uses DDR3 memory providing a high performance, high-speed memory interface capable of low latency response and high throughput. The PowerEdge M710 supports registered ECC DDR3 DIMMs (RDIMM) or Unbuffered ECC DDR3 DIMMs (UDIMM).

Key features of the PowerEdge M710 memory system include:

- Registered (RDIMM) and Unbuffered (UDIMM) ECC DDR3 technology
- Each channel carries 64 data and eight ECC bits
- Support for up to 288 GB of RDIMM memory (with eighteen 16 GB RDIMMs)
- Support for up to 24 GB of UDIMM memory (with twelve 2 GB UDIMMs)
- Support for 800/1066/1333 MT/s single and dual rank DIMMs
- Support for 1066 MT/s quad rank DIMMs
- Support ODT (On Die Termination)
- Clock gating (CKE) to conserve power when DIMMs are not accessed
- DIMMs enter a low power self-refresh mode
- I<sup>2</sup>C access to SPD EEPROM for access to RDIMM thermal sensors
- Single Bit Error Correction
- SDDC (Single Device Data Correction)
- Support for Closed Loop Thermal Management on RDIMMs and UDIMMs Multi Bit Error Detection Support for Memory Optimized Mode
- Support for Advanced ECC mode
- Multi Bit Error Detection
- Support for Memory Optimized Mode
- Support for Memory Mirroring
- Support for memory sparing
- Support for both standard (1.5V) and low-voltage (1.35V) DIMM configurations, though the LV DIMMs require an Intel Xeon 5600 series processor

### 7.2 DIMMs Supported

The DDR3 memory interface consists of three channels with up to two RDIMMs or UDIMMs per channel for single/dual rank, and up to two RDIMMs per channel for quad rank. The interface uses 2 GB, 4 GB, 8 GB or 16GB RDIMMs. 1 GB or 2 GB UDIMMs are also supported. The memory mode is dependent on how the memory is populated in the system:

- **Lockstep:** two channels per CPU populated identically
  - Typically, the system will be set to run in Memory Optimized (Independent Channel) mode in this configuration. This mode offers the most DIMM population flexibility and system memory capacity, but offers the least number of RAS (reliability, availability, service) features.
  - All three channels must be populated identically.
- **Memory sparing:** users wanting memory sparing must also populate the DIMMs identically in all three channels, but one channel would be the spare and not accessible as system memory until brought online to replace a failing channel.
  - The first two channels per CPU populated identically with the third channel unused.

- Typically, two channels operate in Advanced ECC (Lockstep) mode with each other by having the cache line split across both channels. This mode provides improved RAS features (SDDC support for x8-based memory).
- **Memory mirroring:** two channels operate as mirrors of each other—writes go to both channels and reads alternate between the two channels.
  - One channel per CPU populated
  - This is a simple Memory Optimized mode. No mirroring or sparing is supported.

The PowerEdge M710 memory interface supports memory demand and patrol scrubbing, single-bit correction and multi-bit error detection. Correction of a device failure is also possible with SDDC in the Advanced ECC mode. Additionally, correction of an x4 device failure is possible in the Memory Optimized mode. RDIMMs and UDIMMs cannot be mixed.

- If DIMMs of different speeds are mixed, all channels will operate at the fastest common frequency.
- RDIMMs and UDIMMs cannot be mixed.
- If memory mirroring is enabled, identical DIMMs must be installed in the same slots across both channels. The third channel of each processor is unavailable for memory mirroring.
- The first DIMM slot in each channel is color-coded with white ejection tabs for ease of installation.
- The DIMM sockets are placed 450 mils (11.43 mm) apart, center-to-center in order to provide enough space for sufficient airflow to cool stacked DIMMs.
- The PE M710 supports up to 18 DIMMs. DIMMs must be installed in each channel starting with the DIMM farthest from the processor. Population order is identified by the silkscreen designator and the System Information Label (SIL) located on the chassis cover.
- Memory Optimized: {1, 2, 3}, {4, 5, 6}, {7, 8, 9}
- Advanced ECC or Mirrored: {2, 3}, {5, 6}, {8, 9}
- Quad Rank or UDIMM: {1, 2, 3}, {4, 5, 6}, {7, 8, 9}

While 800 MT/s DIMMs are not supported, the installation of two quad rank 1066MT/s or three single- or dual-rank 1333MT/s DIMMs will operate at 800MT/s.

For detailed information, see the System Memory section of the *Dell PowerEdge Modular Systems Hardware Owner's Manual* on [Support.Dell.com/Manuals](http://Support.Dell.com/Manuals).

### 7.3 Slots/Risers

Figure 5 illustrates memory slots and risers. For detailed information, see the System Memory section of the *Dell PowerEdge Modular Systems Hardware Owner's Manual* on [Support.Dell.com/Manuals](http://Support.Dell.com/Manuals).



**Figure 5. Memory Slots and Risers**

## 7.4 Speed

The memory frequency is determined by a variety of inputs:

- Speed of the DIMMs
- Speed supported by the CPU
- Configuration of the DIMMs

Table 7 shows the memory populations and the maximum frequency achievable for that configuration.

For quad-rank DIMMs mixed with single- or dual-rank DIMMs, the quad-rank DIMM needs to be in the slot with the white ejection tabs (the first DIMM slot in each channel). There is no requirement for the order of SR and DR DIMMs.

**Table 7. Memory Populations and Maximum Frequency**

DIMM Slots per Channel	DIMMs Populated per Channel	DIMM Type	POR Speeds	Ranks per DIMM (any combination)	Population Rules
2	1	Reg. DDR3 ECC	800, 1066, 1333	SR or DR	Any combination of x4 and x8 RDIMMs, with 1Gb, 2Gb, or 4Gb DRAM density  Populate DIMMs starting with slot 0, furthest from the CPU
2	1	Reg. DDR3 ECC	800, 1066	QR only	
2	2	Reg. DDR3 ECC	800, 1066, 1333	Mixing SR, DR	
2	2	Reg. DDR3 ECC	800	Mixing SR, DR, QR	
3	1	Reg. DDR3 ECC	800, 1066, 1333	SR or DR	
3	1	Reg. DDR3	800, 1066	QR only	

DIMM Slots per Channel	DIMMs Populated per Channel	DIMM Type	POR Speeds	Ranks per DIMM (any combination)	Population Rules
		ECC			
3	2	Reg. DDR3 ECC	800, 1066, 1333	Mixing SR, DR	
3	2	Reg. DDR3 ECC	800	Mixing SR, DR, QR	
3	3	Reg. DDR3 ECC	800	Mixing SR, DR	

## 8 Chipset

### 8.1 Overview

The PowerEdge™ M710 planar incorporates the Intel® 5520 chipset for I/O and processor interfacing that was designed to support Intel Xeon® Processor 5500 and 5600 series, QuickPath Interconnect, and PCIe Gen2.

### 8.2 Intel 5520 I/O Hub

The PowerEdge M710 system board incorporates the Intel 5520 chipset 36D I/O Hub (IOH) to provide a link between the processors and the I/O components. The main components of the IOH consist of two full-width QuickPath Interconnect links (one to each processor), 36 lanes of PCIe Gen2, and a x4 Direct Media Interface (DMI) and an integrated IOxAPIC.

#### 8.2.1 QuickPath Interconnect

The QuickPath Interconnect (QPI) architecture consists of serial point-to-point interconnects for the processors and the IOH. The M710 has a total of three QPI links: one link connecting the processors and links connecting both processors with the IOH. Each link consists of 20 lanes (full-width) in each direction with a link speed maximum of 6.4 GT/s. An additional lane is reserved for a forwarded clock. Data is sent over the QPI links as packets.

The QuickPath Architecture implemented in the IOH and CPUs features four layers. The physical layer consists of the actual connection between components. It supports Polarity Inversion and Lane Reversal for optimizing component placement and routing. The Link layer is responsible for flow control and the reliable transmission of data. The Routing layer is responsible for the routing of QPI data packets. Finally, the Protocol layer is responsible for high-level protocol communications, including the implementation of a MESIF (Modify, Exclusive, Shared, Invalid, Forward) cache coherence protocol.

#### 8.2.2 PCI Express Generation 2

PCI Express (PCIe) is a serial point-to-point interconnect for I/O devices. PCIe Generation 2 (Gen2) doubles the signaling bit rate of each lane from 2.5 Gb/s to 5 Gb/s. Each of the PCIe Gen2 ports is backward-compatible with Gen1 transfer rates.

#### 8.2.3 Direct Media Interface (DMI)

The DMI (previously called the Enterprise Southbridge Interface) connects the Intel 7500 Legacy IOH with the Intel I/O Controller Hub (ICH). The DMI is equivalent to an x4 PCIe Gen1 link with a transfer rate of 1 GB/s in each direction.

### 8.3 Intel I/O Controller Hub 9

The Intel I/O Controller Hub 9 (ICH9) is a highly integrated I/O controller supporting the following functions:

- PCI Bus 32-bit Interface Rev 2.3 running at 33 MT/s
- Serial ATA (SATA) ports with transfer rates up to 300 MB/s
- Six UHCI and two EHCI (high-speed 2.0) USB host controllers
- Power management interface (ACPI 3.0b compliant)
- Platform Environmental Control Interface (PECI)
- I/O interrupt controller

- SMBus 2.0 controller
- Low Pin Count (LPC) interface to Trusted Platform Module (TPM)
- Serial Peripheral Interface (SPI) support for up to two devices
- The M710's BIOS is connected to the ICH9 using SPI

## 9 BIOS

### 9.1 Overview

The PowerEdge™ M710 BIOS is based on the Dell BIOS core, and supports the following features:

- Intel Xeon processor 5500 and 5600 series 2S support
- Simultaneous Multi-Threading (SMT) support
- Processor Turbo Mode support
- PCI 2.3 compliant
- Plug n' Play 1.0a compliant
- MP (Multiprocessor) 1.4 compliant
- Boot from hard drive, optical drive, iSCSI drive, USB key, and SD card
- ACPI support
- Direct Media Interface (DMI) support
- PXE, iSCSI, and WOL support for on-board NIC
- Memory mirroring
- SETUP access through F2 key at end of POST
- USB 2.0 (USB boot code is 1.1 compliant)
- F1/F2 error logging in CMOS
- Virtual KVM, CD, and floppy support
- Unified Server Configurator (UEFI 2.1) support
- Power management support including DBS, Power Inventory and multiple Power Profiles

The M710 BIOS does not support the following:

- Embedded Diagnostics (embedded in the Lifecycle Controller)
- BIOS language localization
- BIOS recovery after bad flash (but can be recovered from iDRAC6 Express)

### 9.2 Supported ACPI States

The M710 supports the standard Advanced Configuration and Power Interface (ACPI) states. To learn more see [www.acpi.info](http://www.acpi.info).

## 10 Embedded LAN on Motherboard

The PowerEdge™ M710 supports four embedded Broadcom 5709S dual-port LAN controllers as independent Gigabit Ethernet interface devices. The following information details the features of the LAN devices.

- x4 PCIe Gen2 capable interface
- Controller operated at Gen1 speed
- Integrated MAC and PHY
- 3072x18 Byte context memory
- 64 KB receive buffer
- TOE (TCP Offload Engine)
- RDMA controller (RNIC) (enabled post-RTS through an optional hardware key)
- NC-SI (Network Controller-Sideband Interface) connection for manageability
- Wake-On-LAN (WOL)
- PXE 2.0 remote boot
- iSCSI boot
- IPv4 and IPv6 support
- Bare metal deployment support
- iSCSI offload Accelerator - Used for offloading iSCSI traffic as an iSCSI accelerator/HBA - Optionally enabled through a hardware key

## 11 I/O Mezzanine Cards

The PowerEdge™ M710 contains four PCIe Gen2 mezzanine slots. Installation of mezzanine cards requires an M1000e I/O module (IOM) of the same fabric technology to be installed in the corresponding fabric slot of the mezzanine to support data flow through that fabric slot. See the [PowerEdge M1000e Technical Guide](#) for information on IOM options.

The following are the available options for mezzanine cards:

- Broadcom® Dual-Port 5709
- Intel® Gb ET Quad-Port
- Broadcom Dual-Port 57711
- Intel Ethernet X520 10GbE x/k
- Emulex® CNA OCM10102FM
- QLogic QME8142
- QLogic QME2572 (FC8)
- Emulex LPe1205 (FC8)
- Mellanox® ConnectX®-2 DDR IB VPI
- Mellanox ConnectX-2 QDR IB VPI
- Brocade BR174M-k 10GbE
- QLogic QME8242-k 10Gb CNA

## 12 Storage

### 12.1 Drives

The PowerEdge™ M710 supports up to four hot-pluggable 2.5” SAS SSD, SATA SSD, SAS, or nearline SAS hard disk drives. See Table 8 for information on supported hard drives. For the most up-to-date information on supported hard drives, visit [Dell.com](http://Dell.com).

**Table 8. Supported Hard Drives**

Form Factor	Capacity	Speed	Type
2.5”	149GB	N/A	SAS SSD
2.5”	50GB, 100GB	N/A	SATA SSD
2.5”	73GB, 146GB	15K	SAS
2.5”	146GB, 300GB, 600GB, 900GB	10K	SAS
2.5”	500GB	7.2K	nearline SAS

### 12.2 Hard Disk Drive Carrier

The PowerEdge M710 supports the Dell eleventh-generation 2.5” hard drive carrier.



**Figure 6. 2.5” HDD Carrier**

### 12.3 Empty Drive Bays

For the slots that are not occupied by drives, a carrier blank is provided to maintain proper cooling, maintain a uniform appearance to the unit, and provide EMI shielding.

### 12.4 Diskless Configuration Support

The system supports diskless configuration with no storage controller (H200/PERC 7i) installed in the system. A 2.5” HDD backplane is installed in this configuration.

### 12.5 RAID Configurations

Table 9 lists the factory-installed RAID configurations for the PowerEdge M710.

**Table 9. RAID Configurations**

Hot- Plug?	Min. hard drives	Max. hard drives	Description
No	0	0	Diskless Configuration, No controller
No	2	4	SAS HDD using SAS6/IR controller or SAS HDD/SAS SSD/SATA SSD using H200 controller card with no RAID
No	2	4	SAS HDD using the SAS6/IR controller or SAS HDD/SAS SSD/SATA SSD using H200 controller card with drives in a RAID 0 stripe
Yes	2	2	SAS HDD using the SAS6/IR controller or SAS HDD/SAS SSD/SATA SSD using H200 controller card with drives in a RAID 1 mirror
No	1	2	SAS HDD using the CERC6 controller card with drives in a RAID 0 stripe
Yes	2	2	SAS HDD using the CERC6 controller card with drives in a RAID 1 mirror
Yes	3	4	SAS HDD using the CERC6 controller card with drives in a RAID 5
Yes	4	4	SAS HDD using the CERC6 controller card with drives in a RAID 10
Yes	4	4	SAS HDD using the CERC6 controller card with 2 separate RAID 1 mirrors
No	1	2	SAS HDD or SSD using the PERC6 controller (w/ battery) or PERC H700 controller card with drives in a RAID 0 Stripe
Yes	2	2	SAS HDD or SSD using the PERC6 controller (w/ battery) or PERC H700 controller card with drives in a RAID 1 mirror
Yes	3	4	SAS HDD or SSD using the PERC6 controller (w/ battery) or PERC H700 controller card with drives in a RAID 5

Yes	4	4	SAS HDD or SSD using the PERC6 controller (w/ battery) or PERC H700 controller card with drives in a RAID 10
Yes	4	4	SAS HDD or SSD using the PERC6 controller (w/ battery) or PERC H700 controller card with 2 separate RAID 1 mirrors

## 12.6 RAID Controllers

The M710 supports a variety of internal RAID cards through a dedicated PCIe Gen1 x4 slot. For more PowerEdge RAID controller (PERC) information, see [Dell.com/PERC](http://Dell.com/PERC).

- PERC H200 Modular (6Gb/s)
- PERC H700 Modular (6Gb/s) with 512MB battery-backed cache; 512MB, 1GB non-volatile battery-backed cache
- SAS 6/iR Modular
- CERC 6/i Modular
- PERC 6/i Modular with 256MB battery-backed cache

## 12.7 Optical Drives

Optical drives are optional in all M710 systems and connect to the blade through the front USB interface.

## 12.8 External Storage

A number of external storage options are available using the appropriate IOMs in the M1000e chassis and mezzanine card(s) in the M710 blade. See [Dell.com/Storage](http://Dell.com/Storage) for more information.

## 13 Video

The M710 integrated Dell Remote Access Controller 6 (iDRAC6) incorporates an integrated video subsystem, connected to the 32-bit PCI interface of the ICH9. This logic is based on the Matrox® G200. The device only supports 2D graphics.

The integrated video card shares its video memory with the iDRAC6's 128 MB DDR2 application space memory. This memory is also used for the KVM buffer.

The M710 system supports the 2D graphics video modes shown in Table 10.

**Table 10. 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

## 14 Rack Information

For information on rack and cable accessories for the M710, see the [PowerEdge M1000e Technical Guide](#).

## 15 Operating Systems

The M710 is designed to meet the MSFT WinLogo 3.0 design specifications. For the most up-to-date information, see the [Operating System Support Matrix for Dell PowerEdge Systems](#) on Dell.com.

## 16 Virtualization

### 16.1 Resources

For the most up-to-date information, visit the following Websites:

- [Operating System Support Matrix for Dell PowerEdge Systems](#) on Dell.com
- [VMware](#) for a compatibility list
- [Support.dell.com](#) offers extensive information designed to help customers configure virtualization software with PowerEdge servers and blade-related virtualization documents
- [Dell Virtualization Solution Advisor on dell.com](#) on Dell.com offers virtualization configuration solutions
- [Virtualization platforms supported by OpenManage](#)

### 16.2 Advanced Infrastructure Manager by Scalent

Dell Advanced Infrastructure Manager (AIM) allows IT organizations to manage networking, storage, and servers (as well as server workloads) that can be dynamically reconfigured and deployed to meet the changing needs of today's data center environment. Specifically, AIM provides IT professionals the ability to:

- Combine new and existing networking, storage devices, and servers into a holistic computing solution that enables dynamic allocation of resources to meet application workload requirements.
- Manage physical and virtual resources with a single solution that includes the ability to move workloads seamlessly across hardware platforms for increased availability and scalability.
- Provide virtualization-like functionality to non-virtual (physical) servers, including automated failover, dynamic load balancing, and business continuity.
- Integrate existing infrastructure (networking, storage devices, and servers) into an AIM solution to provide investment protection and extend the useful life of existing data center assets.
- Significantly decrease the amount of time and people required to deploy hardware and get applications up and running by providing a repeatable, scalable framework for hardware implementation using AIM.

More information can be found at [Dell.com/AIM](#).

# 17 Systems Management

## 17.1 Overview

Dell delivers open, comprehensive, and integrated solutions that help you reduce the complexity of managing disparate IT assets. Combining Dell™ PowerEdge™ servers with a wide selection of Dell developed systems management solutions gives you choice and flexibility, so you can simplify and save in IT environments of any size. To help you meet your server management demands, Dell offers Dell OpenManage™ systems management solutions for:

- Deployment of one or many servers from a single console
- Monitoring of server and storage health and maintenance
- Update of system, operating system, and application software

Dell offers IT management solutions for organizations of all sizes—priced and sized appropriately, and supported comprehensively.

## 17.2 Server Management

A Dell Systems Management and Documentation DVD, Dell Management Console DVD, and ISO images are included with the product. See Table 11 for a description of the available content.

**Table 11. Server Management Documentation and Information**

Title	Description
Dell Systems Build and Update Utility (SBUU)	Assists in OS install and pre-OS hardware configuration and updates.
Server Update Utility (SUU)	Provides an inventory tool for managing updates to firmware, BIOS, and drivers for either Linux or Windows varieties.
OpenManage Server Administrator (OMSA)	Provides a comprehensive, one-to-one (one console to one server) systems management solution, designed for system administrators to manage systems locally and remotely over a network. OMSA allows system administrators to focus on managing their entire network by providing comprehensive one-to-one systems management.
Management Console	Dell IT Assistant (ITA) is also included, as well as tools to allow access to our remote management products. These tools are Remote Access Service for iDRAC and the Baseboard Management Controller (BMC) Utility.
Active Directory Snap-in Utility	Provides an extension snap-in to the Microsoft Active Directory. This allows you to manage Dell specific Active Directory objects. The Dell-specific schema class definitions and their installation are also included on the DVD.
Dell Systems Service Diagnostics Tools	Deliver the latest Dell optimized drivers, utilities, and operating system-based diagnostics that you can use to update your system.
eDocs	Includes PDF files for PowerEdge systems, storage peripherals, and Dell OpenManage™ software.

Dell Management Console (DMC)	Provides a systems management console that enables systems administrators to discover and inventory devices on your network. It provides functions such as health and performance monitoring of networked devices and patch management capabilities for Dell systems. DMC differs from the IT Assistant management console (described above) in that with DMC, value-add plug-ins that enable advanced functionality can be purchased and added to the base DMC product.
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## 17.3 Embedded Server Management

The PowerEdge M710 implements circuitry for the next generation of Embedded Server Management. It is Intelligent Platform Management Interface (IPMI) v2.0 compliant. The iDRAC (Integrated Dell Remote Access Controller) is responsible for acting as an interface between the host system and its management software and the peripheral devices.

iDRAC6 provides features for managing the server remotely or in data center lights-out environments. Advanced iDRAC features require the installation of the optional iDRAC6 Enterprise card.

For more information on iDRAC, see [Support.Dell.com/Manuals](http://Support.Dell.com/Manuals).

### 17.3.1 Dell Lifecycle Controller and Unified Server Configurator

Embedded management is comprised of interdependent pieces:

- Dell Lifecycle Controller
- Unified Server Configurator
- iDRAC6

Dell Lifecycle Controller powers the embedded management features. It includes integrated and tamper-proof storage for system-management tools and enablement utilities (firmware, drivers, etc.). Lifecycle Controller enables pre-OS server deployment, OS installation, platform updates, platform configuration, and diagnostics capabilities.

Dell Unified Server Configurator (USC) is a graphical user interface (GUI) that aids in local server provisioning in a pre-OS environment. To access the Unified Server Configurator, press the <F10> key within 10 seconds of the Dell logo appearance during the system boot process. Table 12 details current functionality enabled by the USC.

**Table 12. Unified Server Configurator Features and Description**

Feature	Description
Faster O/S Installation	Drivers and the installation utility are embedded on system, so no need to scour Dell.com.
Faster System Updates	Integration with Dell support automatically directed to latest versions of the Unified Server Configurator, iDRAC, RAID, BIOS, NIC, and power supply.
Update Rollback	Ability to recover to previous “known good state” for all updatable components.
More Comprehensive Diagnostics	Diagnostic utilities are embedded on system.
Simplified Hardware Configuration	Detects RAID controller and allows user to configure virtual disk and choose virtual disk as boot device, eliminating the need to launch a separate utility. Also provides configuration for iDRAC, BIOS, and NIC/LOM.

For more information on Dell Lifecycle Controller, see [Support.Dell.com/Manuals](http://Support.Dell.com/Manuals).

## 17.3.2 Integrated Dell Remote Access Controller

The integrated Dell Remote Access Controller (iDRAC6) provides IT Administrators comprehensive yet straightforward management of remote servers, by delivering “as if you are there” presence and control. iDRAC6 helps users to save time and money by eliminating travel to the remote server(s), whether that server is located in a different room, a different building, a different city, or in a different country.

iDRAC6 Enterprise is a standard feature on the M710, and Virtual Flash (vFlash) media is a purchasable option.

### 17.3.2.1 iDRAC6 Enterprise

The iDRAC6 Enterprise card provides access to advanced iDRAC6 features. The iDRAC6 Enterprise connects directly to the M915 planar and is mounted parallel to the planar with stand-offs.

Key features for the iDRAC6 Enterprise include:

- Scripting capability with Dell’s Racadm command-line
- Remote video, keyboard, and mouse control with Virtual Console
- Remote media access with Virtual Media
- Dedicated network interface

### 17.3.2.2 iDRAC6 Enterprise with Virtual Flash Media

The iDRAC6 Enterprise can be upgraded by adding the virtual flash (vFlash) media card. This is an 8 GB Dell-branded SD card that enables a persistent 256 MB virtual flash partition. The vFlash media delivers the following key features:

- Support for 8 GB SD storage media
- Can be used as a repository for a pre-OS image, eliminating the need to maintain a network infrastructure for OS deployment
- Can also be used for permanent diagnostics image for use after system failures, or permanent failsafe image for periodic configuration changes

A more detailed feature list for base management functionality, iDRAC6 Enterprise, and vFlash media is shown in Table 13.

**Table 13. Features List for Base Management Functionality, iDRAC, and vFlash Media**

Feature	Base Management Functionality	iDRAC6 Enterprise	vFlash Media
<b>Interface and Standards Support</b>			
IPMI 2.0	✓	✓	✓
Web-based GUI		✓	✓
SNMP		✓	✓
WSMAN		✓	✓
SMASH-CLP		✓	✓
Racadm command-line		✓	✓

Feature	Base Management Functionality	iDRAC6 Enterprise	vFlash Media
<b>Conductivity</b>			
Shared/Failover Network Modes	✓	✓	✓
IPv4	✓	✓	✓
VLAN Tagging	✓	✓	✓
IPv6		✓	✓
Dynamic DNS		✓	✓
Dedicated NIC		✓	✓
<b>Security and Authentication</b>			
Role-based Authority	✓	✓	✓
Local Users	✓	✓	✓
Active Directory		✓	✓
SSL Encryption		✓	✓
<b>Remote Management and Remediation</b>			
Remote Firmware Update	✓	✓	✓
Server power control	✓	✓	✓
Serial-over-LAN (with proxy)	✓	✓	✓
Serial-over-LAN (no proxy)		✓	✓
Power capping		✓	✓
Last crash screen capture		✓	✓
Boot capture		✓	✓
Serial-over-LAN		✓	✓
Virtual media		✓	✓
Virtual console		✓	✓
Virtual console sharing		✓	✓
Virtual flash			✓
<b>Monitoring</b>			
Sensor Monitoring and Alerting	✓	✓	✓
Real-time Power Monitoring		✓	✓
Real-time Power Graphing		✓	✓
Historical Power Counters		✓	✓
<b>Logging Features</b>			

Feature	Base Management Functionality	iDRAC6 Enterprise	vFlash Media
System Event Log	✓	✓	✓
RAC Log		✓	✓
Trace Log		✓	✓

### 17.3.3 Chassis Management Controller

For more information about the chassis management controller (CMC) for the PowerEdge M710, see the [PowerEdge M1000e Technical Guide](#).

## 18 USB Peripherals

The PowerEdge™ M710 supports the following USB devices with its three externally accessible USB ports:

- DVD (bootable; requires two USB ports)
- USB key (can be used as a boot device, security key, or mass storage device)
- Keyboard (only one USB keyboard is supported)
- Mouse (only one USB mouse is supported)

## Appendix A. Statement of Volatility

The PowerEdge™ M710 blade and its configurable modules contain both volatile and non-volatile (NV) components. Volatile components lose their data immediately upon removal of power from the component. Non-volatile components continue to retain their data even after the power has been removed from the component. Dell PowerEdge blades may contain hard disk drives that retain customer data after the system is powered off. Data should be removed from these hard disk drives using locally approved methods before they are removed from a secured environment.

**Table 14. PowerEdge M710 Statement of Volatility**

Server BIOS Memory	Details
Size	4MB
Type	SPI Flash
Purpose	There is boot code and application code. The code is vital to the system booting to the OS. Contains the BIOS code.
Can user programs or operating system write data to it during normal operation?	No
How is data input to this memory?	Flashed in the factory or using Dell flash utility
How is this memory write protected?	Software write protected
System FRU	Details
Size	256Kb
Type	Serial I2C EEPROM, nonvolatile
Purpose	This chip stores some system configuration information (system type, board PPID information, etc.)
Can user programs or operating system write data to it during normal operation?	Yes; a user can enter a username and password which will be stored in the chip
How is data input to this memory?	I2C bus from the iDRAC6
How is this memory write protected?	Only the iDRAC6 can write to the chip
Server CMOS (Complementary Metal-Oxide Semiconductor) Memory	Details
Size	256 bytes
Type	CMOS
Purpose	BIOS configurations
Can user programs or operating system write data to it during normal operation?	Using BIOS setup
How is data input to this memory?	BIOS defaults, BIOS setup
How is this memory write protected?	NA
Remarks	RTC is inside ICH9; jumper on motherboard can be used to reset to factory default settings
Server LOM Memory	Details
Size	4Mb (1MB)
Type	Flash

Purpose	Contains LOM boot code and config data
Can user programs or operating system write data to it during normal operation?	Yes, under software control
How is data input to this memory?	Requires vendor provided firmware file and loader program used during factory assembly or possible field update; a system loaded with arbitrary data in firmware memory would not operate
How is this memory write protected?	Software control
<b>Broadcom Integrated LOM Hardware License Key (optional)</b>	<b>Details</b>
Size	512 bytes
Type	Serial flash
Purpose	TOE = iSCSI offload liscensing
Can user programs or operating system write data to it during normal operation?	No
Does it retain data when powered off?	Yes
How is data input to this memory?	Serial write-through external interface during factory processes
How is this memory write protected?	NA
<b>Server Video Memory</b>	<b>Details</b>
Size	64M x16
Type	DDR2 SDRAM
Purpose	Graphics Buffer
Can user programs or operating system write data to it during normal operation?	Yes
How is data input to this memory?	Normal Operation
How is this memory write protected?	No
<b>CPLD</b>	<b>Details</b>
Size	2280 logic elements; 7.5Kbits RAM; 27.6Kbits EBR SRAM
Type	Programmable Logic Device
Purpose	Provide blade power sequencing and other blade control logic
Can user programs or operating system write data to it during normal operation?	Yes (customer can use DOS program to update CPLD image)
How is data input to this memory?	By way of specialized programming utilities used in the factory and possibly for field updates
How is this memory write protected?	Software control
<b>Hard Drive Backplane Firmware (SEP) Memory</b>	<b>Details</b>
Size	32KB
Type	Flash
Purpose	Interface between the RAID controller and the hard drives as well as a controller for the hard drive status LED.
Can user programs or operating system write	No. A special (not available to customers) DOS

data to it during normal operation?	utility is needed to flash the application code, and the boot block is cable flashed only.
How is data input to this memory?	Cable flash to flash entire chip or a special utility (not available to customers) to flash in DOS.
How is this memory write protected?	Software write protected. No hardware protection pin.
<b>iDRAC6 Enterprise SPI Flash</b>	<b>Details</b>
Size	2MB
Type	SPI Flash
Purpose	There is boot code that is used by the iDRAC6 Enterprise management controller. Also contains the Life Cycle Log which contains server management data unique to the run-time events of the server itself.
Can user programs or operating system write data to it during normal operation?	No
How is data input to this memory?	Flashed in the factory or using Dell flash utility. Also written to by the iDRAC6 Enterprise controller to make Life Cycle Log (LCL) entries.
How is this memory write protected?	Software write protected
<b>TPM (for boards shipped outside of China)</b>	<b>Details</b>
Size	Unspecified size of user ROM, RAM, EEPROM; 128 bytes of OTP memory included
Type	ROM, RAM, EEPROM
Purpose	Trusted Platform Module NV storage. May be used to securely store user data.
Can user programs or operating system write data to it during normal operation?	Yes, OSes and applications that conform to the TCG standard can write data to the TPM during normal operation. Access to the NV Storage is controlled by the TPM owner.
How is data input to this memory?	TCG TPM Specification defined command interface.
How is this memory write protected?	As defined by the TCG TPM Specification, protection of this NV memory area is configurable by the TPM owner.
<b>iDRAC6 Enterprise Card FRU</b>	<b>Details</b>
Size	2Kb
Type	Serial I2C EEPROM, nonvolatile
Purpose	This chip stores some system configuration information (system type, board PPID information, etc.)
Can user programs or operating system write data to it during normal operation?	No. A special (not available to customers) DOS utility is needed to flash the application code.
How is data input to this memory?	I2C bus from iDRAC
How is this memory write protected?	Only the iDRAC can write to the chip
<b>iDRAC6 Enterprise Card eMMC</b>	<b>Details</b>
Size	1GB

Type	NAND Flash
Purpose	This device stores the iDRAC6 kernel and other data for system management.
Can user programs or operating system write data to it during normal operation?	Yes. Under software control.
How is data input to this memory?	I2C bus from iDRAC
How is this memory write protected?	Only the iDRAC can write to the chip
<b>HDD Backplane Firmware (SEP) Memory</b>	<b>Details</b>
Size	32KB
Type	Flash
Purpose	Interface between the RAID controller and the hard drives as well as a controller for the HDD status LED
Can user programs or operating system write data to it during normal operation?	No; a special (not available to customers) DOS utility is needed to flash the application code, and the boot block is cable flashed only
How is data input to this memory?	Cable flash to flash entire chip or a special utility (not available to customers) to flash in DOS
How is this memory write protected?	Software write protected; no hardware protection pin
<b>iDRAC6 Enterprise SPI Flash</b>	<b>Details</b>
Size	2MB
Type	SPI Flash
Purpose	There is boot code that is used by the iDRAC6 Enterprise management controller. Also contains the Life Cycle Log which contains server management data unique to the run-time events of the server itself.
Can user programs or operating system write data to it during normal operation?	No
How is data input to this memory?	Flashed in the factory or using Dell flash utility. Also written to by the iDRAC6 Enterprise controller to make Life Cycle Log (LCL) entries.
How is this memory write protected?	Software write protected
<b>TPM (for boards shipped outside of China)</b>	<b>Details</b>
Size	Unspecified size of user ROM, RAM, EEPROM; 128 bytes of OTP memory included
Type	ROM, RAM, EEPROM
Purpose	Trusted Platform Module NV storage. May be used to securely store user data.
Can user programs or operating system write data to it during normal operation?	Yes, OSEs and applications that conform to the TCG standard can write data to the TPM during normal operation. Access to the NV Storage is controlled by the TPM owner.
How is data input to this memory?	TCG TPM Specification defined command interface.
How is this memory write protected?	As defined by the TCG TPM Specification,

	protection of this NV memory area is configurable by the TPM owner.
<b>iDRAC6 Enterprise Card FRU</b>	<b>Details</b>
Size	2Kb (256 bytes)
Type	Serial I2C EEPROM, nonvolatile
Purpose	This chip stores some system configuration information (system type, board PPID information, etc.)
Can user programs or operating system write data to it during normal operation?	No. A special (not available to customers) DOS utility is needed to flash the application code.
How is data input to this memory?	I2C bus from the iDRAC
How is this memory write protected?	Only the iDRAC can write to the chip
<b>iDRAC6 Enterprise Card eMMC</b>	<b>Details</b>
Size	1GB
Type	NAND Flash
Purpose	Stores the iDRAC6 kernel and other data for system management
Can user programs or operating system write data to it during normal operation?	Yes, under software control
How is data input to this memory?	I2C bus from the iDRAC
How is this memory write protected?	Only the iDRAC can write to the chip
<b>iDRAC6 Enterprise Card MCU</b>	<b>Details</b>
Size	256Kbytes
Type	Flash
Purpose	RIPS FW
Can user programs or operating system write data to it during normal operation?	Yes
How is data input to this memory?	USB: Special Dell utility required for programming
How is this memory write protected?	Software protected
<b>iDRAC6 Enterprise Card SPI Flash</b>	<b>Details</b>
Size	64Mb
Type	SPI Flash
Purpose	SD RAID write log
Can user programs or operating system write data to it during normal operation?	No
How is data input to this memory?	SPI interface from MCU
How is this memory write protected?	None

## Appendix B. Certifications

### B 1. Regulatory Certifications

Regulatory compliance certificates can be located at the following sites:

- [http://www.dell.com/content/topics/global.aspx/about\\_dell/values/regulatory\\_compliance/dec\\_conform?c=us&l=en&s=corp](http://www.dell.com/content/topics/global.aspx/about_dell/values/regulatory_compliance/dec_conform?c=us&l=en&s=corp)

### B 2. Product Safety Certifications

The product has been certified and bears the Mark, as applicable, of the Product Safety authorities as indicated in Table 15.

**Table 15. Product Safety Certifications**

Country/Region	Authority or Mark
Argentina	IRAM
Belarus	BELLIS
Canada	SCC
China	CNCA or CCC
Croatia	KONCAR
European Union	CE
Germany	TUV
IECEE	IECEE CB
Israel	SII
Kazakhstan	OTAN - CKT
Kenya	KEBS
Kuwait	KUCAS
Mexico	NYCE or NOM
Moldova	INSM
Nigeria	SONCAP
Norway	NEMKO
Russia	GOST
Saudi Arabia	KSA ICCP
South Africa	NRCS
Taiwan	BSMI
Ukraine	UKRTEST or UKRSERTCOMPUTER
United States	NRTL
Uzbekistan	STZ

### B 3. Electromagnetic Compatibility

The product has been certified and bears the Mark, as applicable, of the EMC authorities as indicated in Table 16.

**Table 16. Electromagnetic Compatibility Certifications**

Country/Region	Authority or Mark	Class
Australia/New Zealand	ACMA or C-Tick	Class A
Belarus	BELLIS	Class A
Bosnia & Herzegovina, Montenegro, Serbia	KVALITET	Class A
Canada	ICES	Class A
China	CNCA or CCC	Class A
Croatia	KONCAR	Class A
European Union	CE	Class A
Israel	SII	Class A
Japan	VCCI	Class A
Kazakhstan	OTAN - CKT	Class A
Moldova	INSM	Class A
Norway	NEMKO	Class A
Russia	GOST	Class A
South Africa	SABS	Class A
South Korea	KCC	Class A
Taiwan	BSMI	Class A
Ukraine	UKRTEST or UKRSERTCOMPUTER	Class A
United States	FCC	Class A
Uzbekistan	STZ	Class A
Vietnam	ICT	Class A

#### B 4. Ergonomics, Acoustics and Hygienics

The product has been certified and bears the Mark, as applicable, of the Ergonomics, Acoustics and Hygienics authorities as indicated in Table 17.

**Table 17. Ergonomics, Acoustics and Hygienics**

Country/Region	Authority or Mark
Belarus	BELLIS
Germany	GS
Russia	GOST

## Appendix C. Industry Standards

The PowerEdge™ M710 conforms to the industry standards shown in Table 18.

**Table 18. Industry Standards**

Standard	URL for Information and Specifications
<b>ACPI</b> Advance Configuration and Power Interface Specification, v2.0c	<a href="http://www.acpi.info/">http://www.acpi.info/</a>
<b>Energy Star</b> EPA Version 1.0 of the Computer Server specification	<a href="http://www.energystar.gov/index.cfm?c=archives.enterprise_servers">http://www.energystar.gov/index.cfm?c=archives.enterprise_servers</a>
<b>Ethernet</b> IEEE 802.3-2005	<a href="http://standards.ieee.org/getieee802/802.3.html">http://standards.ieee.org/getieee802/802.3.html</a>
<b>IPMI</b> Intelligent Platform Management Interface, v2.0	<a href="http://www.intel.com/design/servers/ipmi/">http://www.intel.com/design/servers/ipmi/</a>
<b>DDR3 Memory</b> DDR3 SDRAM Specification, Rev. 3A	<a href="http://www.jedec.org/download/search/JESD79-3A.pdf">http://www.jedec.org/download/search/JESD79-3A.pdf</a>
<b>LPC</b> Low Pin Count Interface Specification, Rev. 1.1	<a href="http://developer.intel.com/design/chipsets/industry/lpc.htm">http://developer.intel.com/design/chipsets/industry/lpc.htm</a>
<b>PCI Express</b> PCI Express Base Specification Rev. 2.0	<a href="http://www.pcisig.com/specifications/pciexpress/">http://www.pcisig.com/specifications/pciexpress/</a>
<b>PMBus</b> Power System Management Protocol Specification, v1.1	<a href="http://pmbus.info/specs.html">http://pmbus.info/specs.html</a>
<b>SAS</b> Serial Attached SCSI, v1.1	<a href="http://www.t10.org/cgi-bin/ac.pl?t=f&amp;f=sas1r10.pdf">http://www.t10.org/cgi-bin/ac.pl?t=f&amp;f=sas1r10.pdf</a>
<b>SATA</b> Serial ATA Rev. 2.6; SATA II, Extensions to SATA 1.0a, Rev. 1.2	<a href="http://sata-io.org/">http://sata-io.org/</a>
<b>SMBIOS</b> System Management BIOS Reference Specification, v2.6	<a href="http://www.dmtf.org/standards/smbios/">http://www.dmtf.org/standards/smbios/</a>
<b>TPM</b> Trusted Platform Module Specification, v1.2	<a href="http://www.trustedcomputinggroup.org/resources/tpm_main_specification">http://www.trustedcomputinggroup.org/resources/tpm_main_specification</a>
<b>UEFI</b> Unified Extensible Firmware Interface Specification, v2.1	<a href="http://www.uefi.org/specs/">http://www.uefi.org/specs/</a>
<b>USB</b> Universal Serial Bus Specification, Rev. 2.0	<a href="http://www.usb.org/developers/docs/">http://www.usb.org/developers/docs/</a>

Standard	URL for Information and Specifications
Microsoft® Windows® Logo Windows Logo Program System and Device Requirements, v3.10	<a href="http://www.microsoft.com/whdc/winlogo/hwrequirements.msp">http://www.microsoft.com/whdc/winlogo/hwrequirements.msp</a>