

# PowerEdge M710HD



## Technical Guide



Designed for enterprise database and virtualization deployments, the PowerEdge M710HD features tremendous I/O throughput, maximized memory density and robust processing power.



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# 1 Product Comparison

## 1.1 Overview

The Dell™ PowerEdge™ M710HD blade server helps you run business applications efficiently, reduce your data center footprint, ease data management and trim system maintenance time.

The M710HD is a data center virtualization-optimized blade that offers tremendous IO throughput, maximized memory density, and robust optional Intel® Xeon® 5600 processing power, all in an ultra-dense form factor with enterprise-class high availability. The M710HD is the first Dell M-Series server with a flexible network daughtercard (NDC) designed to allow for future integrated connectivity options.

### 1.1.1 Rack-Dense Performance

Unleash the power of massive IO throughput, core-rich Intel® Xeon® processors and an abundance of DD3 DIMMs on your toughest data center workloads. With massive I/O throughput, powerful multi-core processing and ultra-high-density memory options, the PowerEdge M710HD blade server can let you flex your data center muscles while taking on the toughest workloads. Flexible and robust IO deployment is achievable through multiple iSCSI, Ethernet, FibreChannel and InfiniBand options with additional future integrated network connectivity through the network daughtercard (NDC). Processing power from up to 12 Intel® Xeon® 5600 series cores and maximized RAM density with 18 DIMM slots allows for condensed full-height blade horsepower and cost-efficient DDR3 memory scaling in an ultra-dense form factor.

### 1.1.2 Efficiency without Compromise

Increase your capability to deploy virtualized solutions that can reduce power consumption while increasing performance capacity. The expanded addressable memory in the PowerEdge M710HD allows you to utilize more virtual machines from your existing hypervisor licensing, helping you save money and increase your virtualized deployments using existing resources. Optimized airflow design coupled with high-efficiency fans and power supplies enable the Dell M1000e blade enclosure to effectively power and cool PowerEdge M710HD servers while helping to reduce overall power draw. This allows you to reclaim power for use elsewhere in your data center, save on operational costs, and help the environment.

### 1.1.3 Enterprise-Class Reliability and Management

Spend more time on your business and less on maintaining your IT with embedded system management features on the PowerEdge M710HD and the Chassis Management Controller (CMC). The PowerEdge M710HD blade server is designed to ease your mind and reduce your operating costs delivering the closest thing to a worry-free data center. Optional failsafe embedded hypervisors and HDD fault tolerance through a hardware RAID controller offer protective redundancy that safeguards your organization's data from loss or corruption. Simplified systems management is achieved through automated discovery which automates configuration of new hardware and enables pre-provisioning of LAN/SAN resources.

In addition, one-to-many updating through the CMC and Virtual File Share simplifies the update process for BIOS, firmware and drivers without additional software. Proactive management provides immediate access to system status, issues and alerts through a single, easy-to-use interface that includes one-click key functions to help quickly resolve issues.

## 1.2 Comparison

The M710HD is an optimized blade solution for customers looking for a large capacity memory capabilities and IO scalability in a dense, easy-to-deploy half-height blade form factor. Table 1 compares the PowerEdge M710HD blade server to the PowerEdge M710, M610x, and M610 servers.

**Table 1. Product Comparison**

	M710HD	M710	M610x	M610
<b>Description</b>	General purpose Half-height 2S	General purpose Full-height 2S	Special purpose Full-height 2S	General purpose Half-height 2S
<b>Processor</b>	2 Socket Intel® Xeon® Processor 5500 or 5600 Series			
<b>Front Side Bus</b>	Two Intel QuickPath Interconnect (QPI)			
<b># Proc Sockets</b>	2			
<b>Max # Cores per Socket</b>	Up to 6			
<b>L2/L3 Cache</b>	8MB (5500 Series) or 12MB (5600 Series)			
<b>Chipset</b>	Intel 5520	Intel 5520	Intel 5500	Intel 5500
<b>DIMMs</b>	18 x DDR3 DIMMs (800/1066/1333MHz)	18 x DDR3 DIMMs (800/1066/1333MHz)	12 x DDR3 DIMMs (800/1066/1333MHz)	12 x DDR3 DIMMs (800/1066/1333MHz)
<b>Min/Max RAM</b>	1GB-192GB (16GB DIMMS)	1GB - 192GB (16GB DIMMS)	1GB - 192GB (16GB DIMMS)	1GB - 192GB (16GB DIMMS)
<b>Form Factor</b>	Half-Height Blade, Dual socket	Full-Height Blade, Dual Socket	Full-Height Blade, Dual Socket/Expansion module	Half-Height Blade, Dual Socket
<b>HDD Bays (2.5" only)</b>	SAS: Hot-Pluggable 2 x 2.5" SSD SATA: 2 x 2.5"	SAS: Hot-Pluggable 4 x 2.5" SSD SATA: 2 x 2.5"	SAS: Hot-Pluggable 2 x 2.5" SATA: 1 x 2.5"	SAS: Hot-Pluggable 2 x 2.5" SATA: 1 x 2.5"
<b>HDD Types</b>	SAS/SSD			
<b>HDD Controller</b>	Embedded H200	H200 SAS6/iR PERC6i with RAID battery	H200 H700	H200 Non-RAID SATA (1 HDD only) SAS6/iR PERC6i with RAID battery
<b>Optional HD Controller</b>	Embedded H200	SAS6/iR PERC6i with RAID battery	SAS6/iR PERC6i with RAID battery	SAS6/iR PERC6i with RAID battery
<b>Availability</b>	Hot-plug hard drives ECC memory			

	M710HD	M710	M610x	M610
	Single Device Data Correction (SDDC) Supports memory demand and patrol scrubbing High-availability failover cluster support			
<b>Server Management</b>	Integrated Dell Remote Access Controller iDRAC6 Express/Enterprise (both standard) w/ IPMI 2.0 +vMedia/vKVM, and CMC (on the PowerEdge M1000e chassis)			
<b>Mezz Slots</b>	2 x8 PCIe Mezzanine Cards	1 x4 and 3 x 8 PCIe Mezzanine Cards	2 x8 (PCI Gen 2); Fabric B limited to a small form factor (SFF) mezzanine card	2 x8 (PCI Gen 2); Fabric B limited to a small form factor (SFF) mezzanine card
<b>IO slots</b>	NA	NA	Two x16 PCIe Gen2 H800 / 6GB SAS nVidia M1060 and M2050-204	NA
<b>RAID</b>	0,1	0,1,5	0,1	0,1
<b>NIC/LOM</b>	4 x 1GbE dual Broadcom® BCM5709S 2 x 10GbE QLogic cLOM8214 (Future) 2 x 10GbE Broadcom BCM57712 (Future)	4 x TOE with optional iSCSI offload	2-port Broadcom® 5709S 1Gb w/ TOE plus optional iSCSI Accelerator	2-port Broadcom® 5709S 1Gb w/ TOE plus optional iSCSI Accelerator
<b>USB</b>	2 x external USB 2.0 ports at front bezel 1 x internal USB port	3 x external USB 2.0 ports at front bezel 1 x internal USB port	2 external, 1 internal	2 external, 1 internal
<b>SD Card</b>	2 x internal SD slot 1 for Persistent Storage 1 for Management (can also be configured as redundant SD cards for embedded hypervisor)	1 x internal SD slot 1 for Persistent Storage 1 for Management	2: 1 for Persistent Storage 1 for Management	2: 1 for Persistent Storage 1 for Management
<b>TPM</b>	Yes, except in China where TCM is the standard.			
<b>Video</b>	Matrox G200eW integrated into iDRAC chip			
<b>Power Supplies</b>	See the <a href="#">PowerEdge M1000e Technical Guide</a> .			
<b>Fans</b>	See the <a href="#">PowerEdge M1000e Technical Guide</a> .			
<b>Chassis</b>	See the <a href="#">PowerEdge M1000e Technical Guide</a> .			



## 2 New Technologies

### 2.1 Overview

The M710HD is a new half-height blade with new features including:

- Dual Intel Xeon Quad-Core processors
- DDR3 memory
- PCI Express Generation 2
- Network daughtercard
- Redundant Internal SD Module
- Dell's next generation iDRAC solution, iDRAC6 Enterprise with integrated video controller

### 2.2 Detailed Information

#### 2.2.1 Dual Intel Xeon Quad-Core Processors

The Intel Xeon processor 5500 and 5600 series features quad-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.

#### 2.2.2 DDR3 Memory

The M710HD uses DDR3 memory which provides a high-performance, high-speed memory interface capable of low latency response and high throughput. The M710HD 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.

#### 2.2.3 PCI Express Generation 2

PCI Express 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.

#### 2.2.4 Network Daughtercard

The Network Daughter Card (NDC) is flexible LAN-on-motherboard networking solution with integration into embedded management and configuration subsystems.

#### 2.2.5 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 M710HD allows for redundant SD cards.

## 2.2.6 iDRAC6 Enterprise

The iDRAC6 Express 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-swap portability and increased storage capacity benefits of SD while still being managed by the system.

## 3 System Information

### 3.1 Overview

The M710HD is an optimized solution with large capacity memory capabilities and IO 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, 2 internal HDDs, and TPM support. The M710HD can be a valuable asset in high-performance cloud computing (HPCC), messaging, database, and virtualization solutions.

### 3.2 Product Features Summary

**Table 2. Product Features**

Feature	Technical Specifications
Processors	Intel® Xeon® processor 5500 and 5600 series Quad and Six-Core 60W, 80W, and 95W TDP options
Chipset	Intel® 5520
Memory <sup>1</sup>	1GB/2GB/4GB/8GB/16GB 1066 and 1333MHz DDR3 18 DIMM Slots with support for up to 192GBs using RDIMMs
Drive Bays	Two 2.5" SAS/Solid State hot-swappable drives
Storage <sup>1</sup>	<b>Internal Hot-Swappable Drives:</b> 2.5" SAS (10K rpm): 100GB, 146GB, 300GB or 600GB 2.5" SAS (15K rpm): 73GB or 146GB Solid State Drives (SSD): 50GB, 100GB, or 149GB <b>Maximum Internal Storage:</b> Up to 1.2TB per blade via two x 2.5" 600GB hot-plug SAS hard drive
RAID Controller Options	PERC H200 Integrated SAS Controller (6Gb/s)
I/O Mezzanine Card Options	Fully populated mezzanine card slots and switch modules will yield 3 redundant I/O fabrics per blade. <b>1Gb &amp; 10Gb Ethernet:</b> Dual-Port Broadcom® Gb Ethernet w/ TOE (BCM-5709S) Quad-Port Intel® Gb Ethernet Quad-Port Broadcom® Gb Ethernet (BCM-5709S) Dual-Port Intel® 10Gb Ethernet Dual-Port Broadcom® 10Gb Ethernet (BCM-57711) <b>10Gb Enhanced Ethernet &amp; Converged Network Adapters (CEE/DCB/FCoE):</b> Dual-Port Intel® 10Gb Enhanced Ethernet (FcoE Ready for Future Enablement) Dual-Port Emulex® Converged Network Adapter (OCM10102-F-M)—Supports CEE/DCB

	<p>10GbE + FCoE</p> <p>Dual-Port Qlogic® Converged Network Adapter (QME8142)—Supports CEE/DCB 10GbE + FCoE</p> <p><b>Fibre Channel:</b></p> <p>Dual-Port QLogic® FC8 Fibre Channel Host Bus Adapter (HBA) (QME2572)</p> <p>Dual-Port Emulex® FC8 Fibre Channel Host Bus Adapter (HBA) (LPe1205-M)</p> <p><b>Infiniband:</b></p> <p>Dual-Port Mellanox® ConnectX-2™ Dual Data Rate (DDR) and Quad Data Rate (QDR) InfiniBand</p>
<b>Communications</b>	<p>Two embedded Broadcom® NetXtreme II™ 5709 Gigabit Ethernet NICs with failover and load balancing.</p> <p>TOE (TCP/IP Offload Engine) supported on Microsoft® Windows Server® 2003 SP1 or higher with Scalable Networking Pack. iSCSI Offload supported on Windows Server® 2003 SP1 or higher, Red Hat® Enterprise Linux® 5, and SUSE® Linux® Enterprise Server 10. Scalable Networking Pack for Windows Server® 2003 is not required.</p> <p>Boot from SAN (iSCSI and FC) supported</p> <p>Optional add-in NICs: See I/O Mezzanine Card Options</p> <p>Optional add-in HBAs: See I/O Mezzanine Card Options</p>
<b>Communications Options</b>	<p>Four embedded Broadcom® 5709S Gigabit NIC with failover and load balancing.</p> <p>TOE (TCP/IP Offload Engine) supported on Microsoft® Windows Server® 2003 SP1 or higher with Scalable Networking Pack. iSCSI Offload supported on Windows Server® 2003 SP1 or higher, Red Hat® Enterprise Linux® 5, and SUSE® Linux® Enterprise Server 10. Scalable Networking Pack for Windows Server® 2003 is not required.</p> <p>Boot from SAN (iSCSI and FC) supported</p> <p>Optional add-in NICs: See I/O Mezzanine Card Options</p> <p>Optional add-in HBAs: See I/O Mezzanine Card Options</p>
<b>Operating Systems</b>	<p>Microsoft® Windows® Essential Business Server 2008, x64</p> <p>Microsoft® Windows Server® 2008 SP2, x86/x64 (x64 includes Hyper-V™)</p> <p>Microsoft® Windows Server® 2008 R2, x64 (includes Hyper-V™ v2)</p> <p>Novell® SUSE® Linux® Enterprise Server v11, x86/x64, SP1</p> <p>Red Hat® Enterprise Linux® Server v5.5, x86/64</p> <p>Red Hat® Enterprise Linux® AS/ES v4.8, x86/64</p> <p>For more information on the specific versions and additions, visit <a href="http://www.dell.com/OSsupport">www.dell.com/OSsupport</a>.</p>
<b>Virtualization OS Options</b>	<p>Citrix® XenServer™ v 5.6</p> <p>Microsoft® Windows Server® 2008, with Hyper-V™</p> <p>VMware® vSphere™ Version 4.1 (including ESX v4.1/ESXi™ v4.1)</p> <p><b>Optional Embedded Hypervisors:</b></p> <p>Citrix® XenServer™</p> <p>Microsoft® Windows Server® 2008, with Hyper-V™</p> <p>VMware® ESXi™ v 3.5</p>
<b>Management Options</b>	<p>Dell™ OpenManage™ software tools</p>

	<p>Dell Management Console</p> <p>Integration with 3rd party management solutions via the Dell Certified Partner Program</p> <p>Altiris™ Deployment Solution for Dell Blade Servers</p> <p>Designed to help reduce deployment time from hours to minutes</p> <p>Integrated Dell Remote Access Controller (iDRAC)</p> <p>Out-of-Band alerting, status, inventory, and troubleshooting via Secure Web GUI/CLI (telnet/SSH)</p> <p>Console Redirection</p> <p>vMedia (virtual media) - Map optical or hard drives to the blade from remote workstations over a network</p> <p>vKVM (virtual KVM) out-of-band remote console redirection—supports Java or ActiveX plug-ins</p> <p>IPMI 2.0 support</p>
<b>Power Supply</b>	Supplied by Dell™ PowerEdge™ M1000e Blade Chassis
<b>Video</b>	Integrated Matrox® G200 w/ 8MB memory
<b>Systems Management</b>	<p>BMC, IPMI2.0 compliant</p> <p>Dell™ OpenManage™ featuring Dell Management Console</p> <p>Unified Server Configurator</p> <p>Lifecycle Controller</p> <p>iDRAC6 Enterprise with optional vFlash</p>
<p><sup>1</sup> GB means 1 billion bytes and TB equals 1 trillion bytes; actual capacity varies with preloaded material and operating environment and will be less.</p>	

## 4 Mechanical

### 4.1 Chassis Description

The M710HD is a half-height blade server that requires an M1000e chassis to operate.



Figure 1. PowerEdge M1000e

It occupies 1 slot vertically in the M1000e rack chassis for a maximum of 16 blades in one M1000e chassis. It can be mixed with other existing Dell blades of half-height form factors and designed to mix with possible future half-height-double-wide and full-height-double-wide blades. Some highlights are:

- First Dell blade with support for network daughtercard
- Support for 18 DIMMs in a half-height form factor
- Support for persistent storage (internal USB connector and two external SD card slots)

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

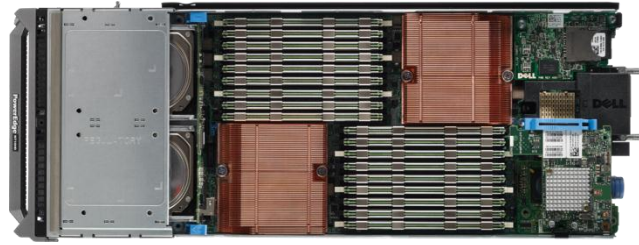
### 4.2 Dimensions and Weight

The PowerEdge M710HD dimensions and weight are as follows:

- **Height:** 18.9cm (7.4in)
- **Width:** 5cm (2in)
- **Depth:** 48.6cm (19.2in)
- **Weight (Maximum Configuration):** 7.4kg (16.3lb)

### 4.3 Internal Module

A view of the internal module is shown in Figure 2. See [Opening and Closing the Blade](#) in the *Dell PowerEdge Modular Systems Hardware Owner's Manual* for more information.



**Figure 2.** 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* 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. TCM is available 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 iDRAC 6 Security Features

The iDRAC 6 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 M710HD 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

For information, see [System Board Information](#) in the *Dell PowerEdge Modular Systems Hardware Owner's Manual*.



## 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. M710HD achieves higher power efficiency by implementing the following features:

- User-configurable power options via the M1000e Chassis Management Controller (CMC) (see M1000e documentation online at support.dell.com for further details)
- Improved power budgeting
- Voltage Regulator (VR) efficiency improvements
- CPU VR dynamic phase shedding
- Switching regulators instead of linear regulators
- Closed loop thermal throttling
- Use of DDR3 and LV-DDR3 memory
- Memory VR static phase shedding
- BIOS Power/Performance options page
- Active Power Controller (BIOS-based CPU P-state manager)
- Ability to power down or throttle memory
- Ability to disable a CPU core
- Ability to turn off embedded NICs or PCIe lanes when not being used
- Option to run PCIe at Gen-1 speeds instead of Gen-2
- 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 M710HD 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	20% to 80% (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 5-350 Hz in operational orientations
Storage	1.54 Grms at 10-250 Hz in all orientations
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% Square wave shock on all six sides of 27 G with velocity change @ 235 in/sec or greater
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)

## 5.4 Acoustics

### 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, hums, etc. One of the sound quality metrics in the Dell specification is prominence ratio of a tone, and this is listed in the table below.

### Acoustical Performance of Typical Configuration

When installed in the M1000e blade chassis, typical configuration<sup>1</sup> of M710HD blade results in the following idle acoustical performance in 23±2° C ambient: LwA-UL<sup>2</sup> = 7.5 bels and no prominent tones<sup>3</sup>. The typical configuration used in acoustical analysis on the M710HD is shown in Table 4.

<sup>1</sup> Typical configuration means projected average quantity, type, capacity, speed, etc., of components. Configuration for which data reported is listed in the following table.

<sup>2</sup> LwA - UL is the upper limit sound power level (LwA) calculated per section 4.4.2 of ISO 9296 (1988) and measured in accordance to ISO 7779 (1999).

<sup>3</sup> Prominent tone: Criteria of D.5 and D.8 of ECMA-74 9th ed. (2005) are followed to determine if discrete tones are prominent. The system is placed in a rack with its bottom at 75 cm from the floor. The acoustical transducer is at front bystander position, ref ISO7779 (1999) Section 8.6.2.

**Table 4. Typical Configuration for Acoustical Performance Analysis**

Chassis	Description	Quantity
Blade	M710HD	8
Slots populated	1, 2, 3, 4, 9, 10, 11, 12	
Power supply	2300-W	6
Blanks		8
System Fans	M1000e fan	9
Blade Internals	Description	Quantity
CPU	Intel Westmere-EP 2.4 GHz 80W	2
DIMM	4 GB Dual Rank	12
Mezz Cards	Dual port GbE FC	2
NDC	Qlogic-10G	1
HDD	SAS 2.5" 73 GB, 15 krpm	2

## 5.5 Thermal

The M710HD 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 M710HD 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
- 45 nm 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 6 MB shared	8 MB shared	12 MB shared
FSB (MHz) / Link Frequency (GT/s)	1333 MHz	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	>3 GHz	>3 GHz	>3 GHz
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	LGA 771	LGA1366	LGA1366

## 6.3 Supported Processors

Supported processors are detailed in Table 6.

**Table 6. Supported Processors**

Model	Speed	TDP Power	Cache	Cores	Usage Type	Max Memory Speed	QPI Link Speed	Turbo Mode Enabled	Hyper-threading
<a href="#">X5667</a>	3.06GHz	95W	12M	4	Advanced	1333MHz	6.4GT/s	Yes	Yes
<a href="#">X5670</a>	2.93GHz	95W	12M	6	Advanced	1333MHz	6.4GT/s	Yes	Yes
<a href="#">X5660</a>	2.80GHz	95W	12M	6	Advanced	1333MHz	6.4GT/s	Yes	Yes
<a href="#">X5650</a>	2.66GHz	95W	12M	6	Advanced	1333MHz	6.4GT/s	Yes	Yes
<a href="#">E5640</a>	2.66GHz	80W	12M	4	Standard	1066MHz	5.86GT/s	Yes	Yes
<a href="#">L5640</a>	2.26GHz	60W	12M	6	Low Voltage	1066MHz	5.86GT/s	Yes	Yes
<a href="#">E5630</a>	2.53GHz	80W	12M	4	Standard	1066MHz	5.86GT/s	Yes	Yes
<a href="#">E5620</a>	2.4GHz	80W	12M	4	Standard	1066MHz	5.86GT/s	Yes	Yes
<a href="#">L5609</a>	1.86GHz	40W	12M	4	Low Voltage	1066MHz	4.8GT/s	No	No
<a href="#">X5560</a>	2.80GHz	95W	8M	4	Advanced	1333MHz	6.4GT/s	Yes	Yes
<a href="#">E5530</a>	2.40GHz	80W	8M	4	Standard	1066MHz	5.86GT/s	Yes	Yes
<a href="#">L5520</a>	2.26GHz	60W	8M	4	Standard LV	1066MHz	5.86GT/s	Yes	Yes
<a href="#">E5507</a>	2.13GHz	80W	4M	4	Basic	800MHz	4.8GT/s	No	No
<a href="#">E5506</a>	2.13GHz	60W	4M	4	Basic LV	800MHz	4.8GT/s	No	No
<a href="#">E5503</a>	2.0GHz	80W	4M	2	Basic	800MHz	4.8GT/s	No	No

## 6.4 Processor Installation

See the [Processors](#) section in the *Dell PowerEdge Modular Systems Hardware Owner's Manual*.

## 7 Memory

### 7.1 Overview

The M710HD utilizes DDR3 memory providing a high performance, high-speed memory interface capable of low latency response and high throughput. The M710HD supports Registered ECC DDR3 DIMMs (RDIMM) as well as the low-voltage RDIMM's.

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 as detailed below:

- Three 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 is supported on M710HD.
  - Memory sparing requires that all the DIMMs are identically populated in all three channels. One channel will 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).
  - For 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.
  - Low Voltage DIMM's will run at the lower voltage for configurations with one or two DIMM's per channel.
  - Three DIMM per channel configuration of low-voltage DIMMs will run at normal power consumption.

The M710HD memory interface supports memory demand and patrol scrubbing, single-bit correction and multi-bit error detection. Correction of a x4 or x8 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.

- If DIMMs of different speeds are mixed, all channels will operate at the fastest common frequency.
- 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 380 mils (11.43 mm) or 400 mils apart, center-to-center.
- The M710HD memory system supports up to 18 DIMMs. DIMMs must be installed in each channel starting with the DIMM farthest from the processor. Population order will be identified by the silkscreen designator and the System Information Label (SIL) located on the chassis cover.

- Memory Optimized or Sparing: {1, 2, 3}, {4, 5, 6}, {7, 8, 9}
- Advanced ECC or Mirrored: {2, 3}, {5, 6}, {8, 9}

## 7.2 DIMMs Supported

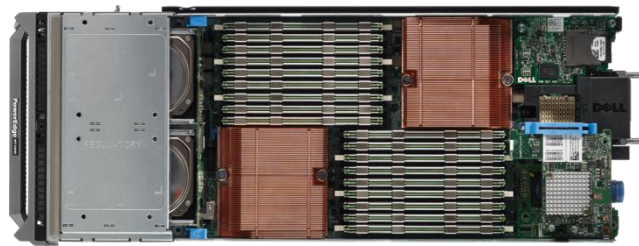
If DIMMs of different speeds are mixed, all channels operate at the fastest common frequency.

- UDIMMs are not supported.
- The first DIMM slot in each channel is color-coded with white ejection tabs for ease of identification.

The M710HD's DIMM sockets are placed 380 mils (11.43 mm) or 400 mils apart (spacing is increased in some areas to allow for more airflow); center-to-center in order to provide enough space for sufficient airflow to cool stacked DIMMs. DIMMs must be installed in each channel starting with the DIMM farthest from the processor (DIMM 1). Population order is identified by silkscreen and a label. The order is dependent on the memory configuration used. See Figure 3 for DIMM naming and population ordering.

## 7.3 Slots/Risers

Figure 3 illustrates memory slots and risers. For detailed information, see System Memory—PowerEdge M710 HD in the [System Memory](#) section of the *Dell PowerEdge Modular Systems Hardware Owner's Manual*.



**Figure 3.** 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

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

For Quad Rank DIMMs mixed with Single or Dual Rank DIMMs, the QR 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 ECC	800, 1066	QR only	
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 M710HD planar incorporates the Intel 5520 chipset for I/O and processor interfacing which was designed to support Intel Xeon Processor 5500 and 5600 Series, QuickPath Interconnect, and PCI Express Generation 2.

### 8.2 I/O Hub (IOH)

The M710HD system board uses the Intel 5520 chipset 36D IOH to provide a link between the processor(s) and I/O components. The main components of the IOH consist of two full-width QuickPath Interconnect links (one to each processor), 36 lanes of PCI Express Gen-2, and an x4 Direct Media Interface (DMI) and an integrated IOxAPIC.

### 8.3 QuickPath Interconnect (QPI)

The QuickPath Interconnect architecture consists of serial point-to-point interconnects for the processors and the IOH. The M710HD 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.

### 8.4 IOH PCI Express

PCI Express is a serial point-to-point interconnects for I/O devices. PCIe Generation 2 doubles the signaling bit rate of Generation 1 from 2.5 Gb/s to 5 Gb/s. Each of the PCIe Gen-2 ports are backwards-compatible with Gen-1 transfer rates.

The M710HD uses the Intel 5520 chipset 36D IOH which has one ESI port (port 0) as well as two PCI Express Gen2 ports (ports 1,2) and 8 PCI Express x4 ports (ports 3-10). Certain adjacent x4 ports can be combined into x8 ports (ports 7-8 and 9-10) the Network Daughter Card ports can also be combined into an x8 port as well

The M710HD blade planers have a dedicated connector for the Network Daughter Card (NDC). Physically, a PCIe -2 x8 connection is routed from IOH to the NDC connector. This connection is dedicated to the M710HD LOM solution. See 0.

**Table 8. M710HD PCIe Assignments**

	Port Number	M710HD
IOH	Port 0	ESI
	Port 1-2	H200
	Port 3	NDC connection
	Port 4	
	Port 5-6	Not Used
	Port 7-8	FAB B
	Port 9-10	FAB C
ICH9	x4 Port 1-4	Unused
	x1 Port 5	Unused
	x1 Port 6	Unused

## 8.5 Intel I/O Controller Hub 9 (ICH9)

ICH9 is a highly integrated I/O controller, supporting the following functions:

- Six x1 PCI Express Gen-1 ports, with the capability of combining ports 1-4 as a x4 link
- PCI Bus 32-bit Interface Rev 2.3 running at 33 MHz
- Serial ATA (SATA) ports with transfer rates up to 300 MB/s (The M710HD does not support SATA.)
- Six UHCI and two EHCI (high-speed 2.0) USB host controllers with up to 12 USB ports (M710HD uses three of these ports for internal and external use.)
- 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), and SPI-VU
- Serial Peripheral Interface (SPI) support for up to two devices

## 8.6 PCI Express Generation 2

PCI Express is a serial point-to-point interconnects 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.

## 8.7 Direct Media Interface (DMI)

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

## 8.8 PCI Express Mezzanine Connectors

The M710HD supports two x8 PCI Express Gen-2 mezzanine connectors.

## 9 BIOS

### 9.1 Overview

The M710HD 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
- CPU 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

### 9.2 Supported ACPI States

The M710HD supports the standard Advanced Configuration and Power Interface (ACPI) states. To learn more see <http://www.acpi.info/>.

## 10 Embedded Gigabit Ethernet Controllers on Motherboard (LOM)

### 10.1 Overview

The M710HD is designed to support the following three different PCI Express Network Daughter Cards:

- 4 x 1GbE Dual Broadcom® BCM5709S (currently available)
- 2 x 10GbE QLogic® cLOM8214 (available early in 2011)
- 2 x 10GbE Broadcom BCM57712 (available early in 2011)

### 10.2 Broadcom BCM5709S

The Broadcom Quad-Port Gigabit Ethernet Daughter cards with TCP Offload Engine (TOE) and iSCSI Offload Engine (iSOE) support is available on the M710HD. Two embedded Broadcom BCM5709S dual-port LAN controllers are on the M710HD Network daughter card as independent Gigabit Ethernet interface devices. The following information details the features of the LAN devices:

- x4 PCI Express Gen-2 capable interface
- Integrated MAC and PHY
- 3072x18 Byte context memory
- 64 KB receive buffer
- TOE (TCP Offload Engine - licensed by default)
- iSCSI offload controller (licensed by default)
- NC-SI (Network Controller-Sideband Interface) connection for Flex Addressing
- Wake-On-LAN (WOL)
- PXE 2.0 remote boot
- iSCSI boot
- IPv4 and IPv6 support
- Bare metal deployment support

### 10.3 QLogic cLOM8214

Once available, the QLogic cLOM8214 (P3+) will power the QLogic 2x10GbE Network Daughter card with TOE, iSCSI, and FCoE on the M710HD. The following features will be supported:

- X8 PCI Express Gen-2 host interface
- Two AMCC2025 KR PHYs for 10GbE and GbE connectivity
- TOE
- iSCSI offload controller
- FCoE offload
- DCB support
- NC-SI (Network Controller-Sideband Interface) connection for Flex Addressing
- Wake-On-LAN (WOL)
- PXE 2.1 remote boot
- iSCSI boot
- FCoE boot
- IPv4 and IPv6 support
- Bare metal deployment support
- Optional PCI Partitioning providing 8 PFs
- SR-IOV

## 10.4 Broadcom BCM57712S

Once available the Broadcom 57712S C-NIC will power the Broadcom Dual-Port 10 Gigabit Ethernet daughter cards with TOE, iSCSI, and FCoE. The following features will be supported:

- X8 PCI Express Gen-2 host interface
- Broadcom BCM8073 KR PHY for 10GbE and GbE connectivity
- TOE
- iSCSI offload controller
- FCoE offload
- DCB support
- NC-SI (Network Controller-Sideband Interface) connection for Flex Addressing
- Wake-On-LAN (WOL)
- PXE 2.1 remote boot
- iSCSI boot
- FCoE boot
- IPv4 and IPv6 support
- Bare metal deployment support
- Optional PCI Partitioning providing 8 PFs
- SR-IOV
- Energy-efficient Ethernet support

## 11 I/O Slots (I/O Mezzanine Card Options for M1000e)

### 11.1 Overview

The M710HD contains two PCIe x8 Gen-2 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

### 11.2 Options

Available options for slots include:

- Broadcom® Dual-Port 5709
- Broadcom® Quad-Port 5709
- Intel® ET Quad-Port 82576
- Broadcom® Dual-Port 57711
- Intel® Ethernet X520 10GbE x/k
- QLogic® CNA QME8142
- Emulex® CNA OCM10102FM
- QLogic® QME2572 (FC8)
- Emulex® LPe1205 (FC8)
- Mellanox® ConnectX™-2 DDR IB (SFF)
- Mellanox® ConnectX™-2 QDR IB (SFF)



## 12 Storage

### 12.1 Drives

All enterprise-class 2.5” storage drives sold by Dell are qualified, including those that offer Self-Encrypting Drive functionality as well as the 6Gb SAS drives. All storage drives used with the PERC H700 must be purchased from Dell.

### 12.2 Hard Disk Drive Carrier

The M710HD supports the 11G 2.5” hard drive carrier.



**Figure 4.** 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 storage controller (H200/PERC 7i) installed in the system. A 2.5” HDD backplane is still installed in this configuration

## 12.5 Storage Controllers

**Table 9. M710HD RAID Support**

	SKU Product	Usage	M710HD Support	Slot	PCIe Con	PCI Bracket	I/O Con	RAID	BBU
SAS HBA SAS/SATA	PERC H200 Integrated	Internal Backplane Storage	Yes - Max 1	Embedded		No	x4 mini-SAS int	0, 1	No

## 12.6 H200

The M710HD internal H200 HBA incorporates two four-channel SAS IOCs for connection to up to two SAS or SATA SSD hard disk drives. PERC H200 is based on LSI SAS2008e SAS IOC which is SAS 2.0 compliant and has 6Gbps throughput.

The M710HD embedded PERC H200 solution supports the following features:

- PCIe - 2
- SAS Hard Drive up to 6Gb/s and Solid State Drive (SSD)
- RAID 0 and 1
- Array Management via BIOS Configuration Utility (CTRL+C) and OMSS
- Selection of Preferred Boot Device
- Background Initialization (BGI)
- Consistency Check (CC)
- Check-pointing for Rebuild, BGI and CC
- Reporting of unsupported drives (no blocking)
- Reporting of Negotiated Link Speed
- HDD BP SEP/Status LED support
- Enhanced UEFI/Maser Support

### 12.6.1 Selection of Preferred Boot Device in H200 controller

The M710HD H200 controller offers the ability to specify any un-configured Physical Disk or Virtual Disk as a Boot Device regardless of its slot location in the system.

In the SAS Topology screen accessed using CTRL+C, a user can scroll down to either select the desired Physical Disk or Virtual Disk and assign that device as their Preferred Boot Device by pressing ALT+B. The Preferred Boot Device will then be marked as “Boot” under Device Information. ALT+B can be used to deselect a previously selected Preferred Boot Device as well.

If no Boot Device is selected, the controller will boot to the first device discovered or its associated RAID volume.

### 12.6.2 M710HD H200 SAS 6Gb/s Throughput, Max Link Speed and Negotiated Link Speed

The M710HD H200 6Gbps SAS controller complies with SAS 2.0 and provides up to 6 Gb/s throughput.

For maximum supported throughput, ensure that the correct hardware is used. This includes hard drives, backplanes, enclosures, etc.

### 12.6.3 M710HD H200 Solid State Drive (SSD) Support

In addition to SAS Hard Disk Drive (HDD) support, the M710HD PERC H200 also offers support for SSDs. The M710HD H200 controller does not support the mixing of SSDs and SAS HDDs in a RAID volume.

## 12.7 RAID Configurations

**Table 10. RAID Configurations**

	Hot Plug	Min HDs	Max HDs	Configs	Description	Factory
0	N	0	0	ZERO	Diskless Configuration, No modular	√
1	N	1	2	MSSN	SATA HDD/SAS drives using SATA/SAS HDD/SSD drives using H200 Modular with no RAID	√
2	Y	2	2	MSSR1	SATA/SAS drives using SATA/SAS HDD/SSD drives using H200 Modular with drives in a RAID 1 mirror	√
3	N	2	2	MSSR0	SATA/SAS drives using SATA/SAS HDD/SSD drives using H200 Modular with drives in a RAID 0 stripe	√

## 12.8 LED Indicators

Each disk drive carrier has two LED indicators visible from the front of the system. One is a green LED for disk activity and the other is a bicolor (Green/Amber) LED for status information. The activity LED is driven by the disk drive during normal operation. The bicolor LED is controlled by the SEP device on the backplane. Both LEDs are used to indicate certain conditions under direction of a storage controller.

## 12.9 Optical Drives

Optical drives are optional in all M710HD systems and connect to the blade through the front USB interface. The following internal slim-line drives are available on M710HD: DVD-ROM and DVD+RW. PATA (IDE) optical drives are not supported.

## 12.10 I/O Mezzanine Card Options

The M710HD contains two PCIe x8 Gen-2 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.

## 13 Video (PCI Video)

The M710HD 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 M710HD system supports the 2D graphics video modes shown in Table 11.

**Table 11. 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 M910, see the [PowerEdge M1000e Technical Guide](#) and the [M1000e Rack and Cable Advisor Tool](#).

## 15 Operating Systems

The M710HD 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, see the [Operating System Support Matrix for Dell PowerEdge Systems](#) on Dell.com or the compatibility list maintained by [VMware](#).

[Support.dell.com](#) has extensive information designed to help customers configure virtualization software with PowerEdge servers.

To configure a complete virtualization solution, another resource is the [Dell Virtualization Solution Advisor on dell.com](#). [Support.dell.com](#) also has many blade-related virtualization documents, as well as a [detailed list of the virtualization platforms that are 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 [www.dell.com/aim](http://www.dell.com/aim) .

## 16.3 Vizioncore

Vizioncore's easy-to-use virtualization software products support business continuity and disaster recovery, high availability, monitoring, automation, P2V and optimization. The software is agent-less and can co-exist with other leading backup software vendors, or be used as a standalone solution.

- vRanger™ Pro is a backup and restore solution for virtualized environments.
- vFoglight™ Standard and Professional editions help organizations monitor, understand and analyze their virtual infrastructure by managing the relationships and interaction between all the components in the virtual environment.
- vConverter™ helps convert servers to the VMware, Microsoft, XenServer or Virtual Iron platforms.
- vReplicator is a host-level software-based replication solution for VMware infrastructure which enables companies to leverage virtualization to support High Availability (HA) and Disaster Recovery (DR) strategies.
- Vizioncore™ vOptimizer Pro helps administrators understand storage utilization so they can make real-time adjustments in allocations. It presents the financial impact of reclaimed storage per virtual machine (VM), per host, and cumulative cost savings across the enterprise through historical detailed reports.
- vControl is a VM management solution that provides self-service provisioning, multi-VM control and task-based automation. vControl lets VM consumers build and deploy VMs for themselves, while providing administrators a single interface for task-based administration of VMs.
- Vizioncore vEssentials™ is a software bundle of vFoglight Pro, vRanger Pro and vReplicator.

More information can be found at <http://vizioncore.com/asg/>.



## 17 Systems Management

### 17.1 Overview

Dell aims on delivering open, flexible, and integrated solutions that help you reduce the complexity of managing disparate IT assets by building comprehensive IT management solutions. Combining Dell PowerEdge Servers with a wide selection of Dell-developed management solutions gives you choice and flexibility, so you can simplify and save in environments of any size. To help you meet your server performance 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, sized, and supported right.

### 17.2 Server Management

A Dell Systems Management and Documentation DVD and a Dell Management Console DVD are included with the product. ISO images are also available. A brief description of available content:

- **Dell Systems Build and Update Utility:** Dell Systems Build and Update Utility assists in OS install and pre-OS hardware configuration and updates.
- **OpenManage Server Administrator:** The OpenManage Server Administrator (OMSA) tool provides a comprehensive, one-to-one systems management solution, designed for system administrators to manage systems locally and remotely on a network. OMSA allows system administrators to focus on managing their entire network by providing comprehensive one-to-one systems management.
- **Management Console:** Our legacy IT Assistant console 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 BMC Management Utility.
- **Active Directory Snap-in Utility:** The 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:** Dell Systems Service and Diagnostics tools deliver the latest Dell optimized drivers, utilities, and operating system-based diagnostics that you can use to update your system.
- **eDocs:** The section includes files for PowerEdge systems, storage peripheral, and OpenManage software.
- **Dell Management Console DVD:** The Dell Management Console is a Web-based systems management software that enables you to discover and inventory devices on your network. It also provides advanced functions, such as health and performance monitoring of networked devices and patch management capabilities for Dell systems.
- **Server Update Utility:** In addition to the Systems Management Tools and Documentation and Dell Management Console DVDs, customers have the option to obtain Server Update Utility DVD. This DVD has an inventory tool for managing updates to firmware, BIOS and drivers for either Linux or Windows varieties.

## 17.3 Embedded Server Management

The PowerEdge M710HD implements circuitry for the next generation of Embedded Server Management. It is Intelligent Platform Management Interface (IPMI) v2.0 compliant. The optional iDRAC (Integrated Dell Remote Access Controller) is responsible for acting as an interface between the host system and its management software and the periphery devices.

The optional upgrade to 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.

## 17.4 Lifecycle Controller and Unified Server Configurator

Embedded management is comprised of several interdependent pieces:

- Lifecycle Controller
- Unified Server Configurator
- iDRAC6
- vFlash

Lifecycle controller powers the embedded management features. It is integrated and tamperproof storage for system-management tools and enablement utilities (firmware, drivers, etc.). It is flash partitioned to support multiple, future-use cases.

Dell Unified Server Configurator (USC) is a local 1:1 graphical user interface embedded on Lifecycle Controller that aids in local server provisioning in a pre-OS environment. For servers with iDRAC Express, the Lifecycle Controller offers OS install, platform updates, platform configuration, and diagnostics capabilities. For servers without iDRAC Express, this utility has limited functionality and offers OS install and diagnostics capabilities only.

To access the Unified Server Configurator, press the <F10> key within 10 seconds of the Dell logo's appearance during the system boot process. Current functionality enabled by the Unified Server Configurator includes:

**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.

## 17.5 The iDRAC6 Enterprise

In addition to upgrading the system with a Lifecycle Controller, the iDRAC6 offers the following key features:

- Graphical web interface
- Standard-based interfaces
- Server Sensor monitoring and fault alerting
- Secure operation of remote access functions including authentication, authorization, and encryption
- Power control and management with the ability to limit server power consumption and remotely control server power states
- Advanced troubleshooting capabilities
- Scripting capability with Dell's Racadm command-line
- Remote video, keyboard, and mouse (KVM) control with Virtual Console
- Remote media access with Virtual Media
- Dedicated network interface

Additionally, the iDRAC6 can be upgraded by adding the vFlash Media card. This is a 1 GB Dell branded SD card that enables a persistent 256 MB virtual flash partition.

A more detailed feature list for iDRAC6 and vFlash is included in the table below.

**Table 13. Features List for BMC, iDrac, and vFlash**

Feature	BMC	iDRAC6 Enterprise	vFlash Media
IPMI 2.0	✓	✓	✓
Web-based GUI		✓	✓
SNMP		✓	✓
WSMAN		✓	✓
SMASH-CLP		✓	✓
Racadm command-line		✓	✓
Shared/Failover Network Modes	✓	✓	✓
IPv4	✓	✓	✓
VLAN Tagging	✓	✓	✓
IPv6		✓	✓
Dynamic DNS		✓	✓
Dedicated NIC		✓	✓
Role-based Authority	✓	✓	✓
Local Users	✓	✓	✓
Active Directory		✓	✓
SSL Encryption		✓	✓
Remote Firmware Update	✓	✓	✓

Feature	BMC	iDRAC6 Enterprise	vFlash Media
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			✓
Sensor Monitoring and Alerting	✓	✓	✓
Real-time Power Monitoring		✓	✓
Real-time Power Graphing		✓	✓
Historical Power Counters		✓	✓
System Event Log	✓	✓	✓
RAC Log		✓	✓
Trace Log		✓	✓

## 17.6 Chassis Management Controller (CMC)

See the [PowerEdge M1000e Technical Guide](#).

## 18 Peripherals

### 18.1.1 USB peripherals

The M710HD provide an internal USB connector for a USB flash memory key. The USB memory key can be used as a boot device, security key, or mass storage device.

### 18.1.2 External Storage

By use of the appropriate IOMs in the M1000e chassis and mezzanine card(s) in the M710HD blade, the following external storage options are available:

- Disk Storage Options:
  - Dell EqualLogic™ PS5000 Series
  - PowerVault™ NX1950 Unified Storage Solution
  - PowerVault MD3000i
  
- Dell/EMC fibre channel and/or iSCSI external storage, including:
  - CX300
  - CX3-10c
  - CX3-20
  - CX3-40
  - CX3-80
  - CX4-120
  - CX4-240
  - CX4-480
  - CX4-960

## Appendix A. Standards Compliance

The PowerEdge M610x system conforms to the industry standards shown in Table 14.

**Table 14. Standards Compliance and Specifications**

Standard	URL for information and specifications
ACPI Advance Configuration and Power Interface Specification, v2.0c	<a href="http://www.acpi.info/">http://www.acpi.info/</a>
Ethernet IEEE 802.3-2005	<a href="http://standards.ieee.org/getieee802/802.3.html">http://standards.ieee.org/getieee802/802.3.html</a>
IPMI Intelligent Platform Management Interface, v2.0	<a href="http://www.intel.com/design/servers/ipmi/">http://www.intel.com/design/servers/ipmi/</a>
DDR3 Memory 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>
LPC 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>
PCI Express PCI Express Base Specification Rev. 2.0	<a href="http://www.pcisig.com/specifications/pciexpress/">http://www.pcisig.com/specifications/pciexpress/</a>
PMBus Power System Management Protocol Specification, v1.1	<a href="http://pmbus.info/specs.html">http://pmbus.info/specs.html</a>
SAS Serial Attached SCSI, v1.1	<a href="http://www.t10.org/ftp/t10/drafts/sas1/sas1r10.pdf">http://www.t10.org/ftp/t10/drafts/sas1/sas1r10.pdf</a>
SATA Serial ATA Rev. 2.6; SATA II, Extensions to SATA 1.0a, Rev. 1.2	<a href="https://www.sata-io.org/secure/spec_download.asp">https://www.sata-io.org/secure/spec_download.asp</a> <a href="http://www.sata-io.org/docs/S2Ext_1_2_Gold.pdf">http://www.sata-io.org/docs/S2Ext_1_2_Gold.pdf</a>
SMBIOS System Management BIOS Reference Specification, v2.6	<a href="http://www.dmtf.org/standards/smbios/">http://www.dmtf.org/standards/smbios/</a>
TPM Trusted Platform Module Specification, v1.2	<a href="https://www.trustedcomputinggroup.org/downloads/specifications/tpm/tpm">https://www.trustedcomputinggroup.org/downloads/specifications/tpm/tpm</a>
UEFI Unified Extensible Firmware Interface Specification, v2.1	<a href="http://www.uefi.org/specs/">http://www.uefi.org/specs/</a>

Standard	URL for information and specifications
USB Universal Serial Bus Specification, Rev. 2.0	<a href="http://www.usb.org/developers/docs/">http://www.usb.org/developers/docs/</a>
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>

## Appendix B. Regulatory Certifications

Please see the external Product Safety, EMC, and Environmental Datasheets on dell.com at:  
[http://www.dell.com/regulatory\\_compliance\\_datasheets](http://www.dell.com/regulatory_compliance_datasheets)



## Appendix C. Additional Technical Specifications

**Table 15. Technical Specifications**

Processor	
Processor Type	2 Socket Intel® Xeon® Processor 5500 or 5600 Series
Expansion Bus	
Bus Type	PCI Express Generation 2
Mezzanine Slots	Two mezzanine PCIe x8 Gen-2
Network Daughtercard	4 x 1GbE dual Broadcom BCM5709S 2 x 10GbE QLogic cLOM8214 2 x 10GbE Broadcom BCM57712
Memory	
Architecture	1066 or 1333 MHz DDR3 and LV-DDR3 RDIMMs. Support for Advanced ECC or Memory Optimized operation.
Memory Module Sockets	Eighteen 240-pin
Memory Module Capacities	1 GB, 2 GB, 4 GB , 8 GB, or 16GB RDIMMs (single-, dual-, quad-rank dependent on capacity)
Minimum RAM	1 GB with a single CPU
Maximum RAM	192 GB (with 16 GB RDIMMs)
Drives	
Hard drives	Up to two 2.5-inch, hot-pluggable SAS hard drives or SATA SSD hard drives
Diskette drive	External optional USB 1.44-MB
Optical drive	External optional USB DVD Note: DVD devices are data only
Flash drive	Internal optional USB Internal optional SD Card Optional VFlash Card (with integrated iDRAC6 Enterprise)
Connectors	
Front	
USB	Two 4-pin, USB 2.0-compliant
Internal	
USB	One 4-pin, USB 2.0-compliant
Back	
SD	One internal SD card dedicated for Hypervisor One dedicated for future VFlash support
Video	

Video Type	Integrated Matrox G200 with iDRAC6
Video Memory	8 MB shared with iDRAC application memory
<b>Power</b>	
Batteries	
System battery	CR 2032 3.0-V lithium coin cell
<b>Physical</b>	
Blade	
Height	18.9cm (7.4in)
Width	5cm (2in)
Depth	48.6cm (19.2in)
Weight (maximum configuration)	7.4kg (16.3lb)

## Appendix D. Statement of Volatility

The Dell PowerEdge™ M710HD 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 16. PowerEdge M710HD Statement of Volatility**

Server BIOS Memory	Details
Size:	4MB
Type: [e.g., Flash PROM, EEPROM]:	SPI Flash
Can user programs or operating system write data to it during normal operation?	No
Purpose? [e.g., boot code]	There is boot code and application code. The code is vital to the system booting to the OS. Contains the BIOS code.
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: [e.g., Flash PROM, EEPROM]:	Serial I2C EEPROM, nonvolatile
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.
Purpose? [e.g., boot code]	This chip stores some system configuration information (system type, board PPID information, etc)
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: [e.g., Flash PROM, EEPROM]:	CMOS
Can user programs or operating system write data to it during normal operation?	Using BIOS setup
Purpose? [e.g., boot code]	BIOS configurations
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.
<b>Network Daughter Card LOM Memory</b>	<b>Details</b>
Size:	4Mb
Type: [e.g., Flash PROM, EEPROM]:	Flash
Can user programs or operating system write data to it during normal operation?	Yes, under software control.
Purpose? [e.g., boot code]	Contains LOM boot code and config data
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>Network Daughtercard FRU and Temperature Sensor</b>	<b>Details</b>
Size:	512bytes
Type: [e.g., Flash PROM, EEPROM]:	EEPROM
Can user programs or operating system write data to it during normal operation?	No
Purpose? [e.g., boot code]	Contains firmware for FRU and temperature sensor processing
How is data input to this memory?	Boot block is cable flashed only, FRU and temperature registers are accessed via iDRAC6 I2C.
How is this memory write protected?	Software control.
<b>H200 SRAM</b>	<b>Details</b>
Size:	128K Bytes
Type: [e.g., Flash PROM, EEPROM]:	Serial RAM
Can user programs or operating system write data to it during normal operation?	No
Does it retain data when powered off?	Yes
Purpose? [e.g., boot code]	Storage configuration data
How is data input to this memory?	Host controller through SDRAM bus
How is this memory write protected?	Software write protected
<b>H200 Flash</b>	<b>Details</b>
Size:	64Mb
Type: [e.g., Flash PROM, EEPROM]:	Flash
Can user programs or operating system write data to it during normal operation?	No

Does it retain data when powered off?	Yes
Purpose? [e.g., boot code]	H200 Firmware
How is data input to this memory?	Host controller
How is this memory write protected?	Software write protected
Remarks	
<b>M710HD H200 EEPROM</b>	<b>Details</b>
Size:	64KB
Type: [e.g., Flash PROM, EEPROM]:	EEPROM
Can user programs or operating system write data to it during normal operation?	Yes
Does it retain data when powered off?	Yes
Purpose? [e.g., boot code]	Store board manufacture information
How is data input to this memory?	I2C bus from iDRAC6
How is this memory write protected?	Only the iDRAC 6 can write to the chip
Remarks	
<b>M710HD EDID EEPROM</b>	<b>Details</b>
Size:	2K
Type: [e.g., Flash PROM, EEPROM]:	EEPROM
Can user programs or operating system write data to it during normal operation?	no
Does it retain data when powered off?	Yes
Purpose? [e.g., boot code]	Stores current monitor information
How is data input to this memory?	I2C bus from iDRAC6
How is this memory write protected?	no
<b>Server Video Memory</b>	<b>Details</b>
Size:	64M x16
Type: [e.g., Flash PROM, EEPROM]:	DDR2 SDRAM
Can user programs or operating system write data to it during normal operation?	Yes
Purpose? [e.g., boot code]	Graphics Buffer
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: [e.g., Flash PROM, EEPROM]:	Programmable Logic Device
Can user programs or operating system write data to it during normal operation?	Yes (Customer can use DOS program to update CPLD image)
Purpose? [e.g., boot code]	Provide blade power sequencing and other blade control logic.
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>HDD Backplane Firmware (SEP) Memory</b>	<b>Details</b>
Size:	32KB
Type: [e.g., Flash PROM, EEPROM]:	Flash
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.
Purpose? [e.g., boot code]	Interface between the RAID controller and the hard drives as well as a controller for the HDD status LED.
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: [e.g., Flash PROM, EEPROM]:	SPI Flash
Can user programs or operating system write data to it during normal operation?	No
Purpose? [e.g., boot code]	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.
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: [e.g., Flash PROM, EEPROM]:	ROM, RAM, EEPROM
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.
Purpose? [e.g., boot code]	Trusted Platform Module NV storage. May be used to securely store user data.
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: [e.g., Flash PROM, EEPROM]:	Serial I2C EEPROM, nonvolatile
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.
Purpose? [e.g., boot code]	This chip stores some system configuration information (system type, board PPIID information, etc)
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: [e.g., Flash PROM, EEPROM]:	NAND Flash
Can user programs or operating system write data to it during normal operation?	Yes. Under software control.
Purpose? [e.g., boot code]	This device stores the iDRAC6 kernel and other data for system management.
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: [e.g., Flash PROM, EEPROM]:	Flash
Can user programs or operating system write data to it during normal operation?	Yes
Purpose? [e.g., boot code]	RIPS FW
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: [e.g., Flash PROM, EEPROM]:	SPI Flash
Can user programs or operating system write	No

data to it during normal operation?	
Purpose? [e.g., boot code]	SD RAID write log
How is data input to this memory?	SPI interface from MCU
How is this memory write protected?	None