

# DELL POWEREDGE BLADE SOLUTIONS



The Dell™ PowerEdge™ M-series blade solution is a breakthrough in enterprise server architecture. Built from the ground up using Dell's Energy Smart and FlexIO technologies, the M-series is designed to combat data center sprawl and IT complexity. The M-series delivers one of the most energy efficient, flexible, and manageable blade server products on the market.

## **POWEREDGE M605: ENERGY EFFICIENCY THAT CAN'T BE BEAT**

Dell blade servers deliver performance and efficiency without compromise. The PowerEdge M600 consumes up to 19% less power than HP BladeSystem c-Class, and delivers up to 25% better performance/watt than HP BladeSystem c-Class and IBM BladeCenter H. The PowerEdge M605 will support up to Six-Core AMD Opteron™ processors and offer 60% greater density than traditional 1U servers.

## **POWEREDGE M1000E: REVOLUTIONARY DESIGN**

The M605 is paired with the PowerEdge M1000e, the world's only modular blade enclosure providing snap-in scalability. The M1000e can help you increase capacity, lower operating costs, and deliver outstanding performance/watt. Built on Dell Energy Smart technology, Dell blades are designed to be the most power efficient x86 servers in the industry.

Energy Smart technologies include:

- Ultra-Efficient Power Supplies deliver high levels of efficiency (>91%) even at low utilization
- Dynamic Power Supply Engagement to provide maximum power utilization based on system demands
- Optimized airflow design with ultra-efficient fans in cooling zones help ensure that only the minimum amount of air required by the enclosure is consumed, improving data center efficiency
- Lead-free chassis, with lead-reduced I/O options

## **SERVER DEPLOYMENT & MANAGEMENT SIMPLIFIED**

Centralized management controllers, dynamic power management, real-time power reporting, and integrated KVM (Keyboard, Video, Mouse) all make server management quick and easy. Plus, every PowerEdge server is fully installed and tested at the factory, and ships in a minimum of boxes for fast deployment.



## EFFORTLESS SCALABILITY

Only Dell provides complete, scale on-demand switch designs. With additional I/O slots and switch options, you have the flexibility you need to meet increasing demands for I/O consumption. Plus, Dell's FlexIO modular switch technology lets you easily scale to provide additional uplink and stacking functionality — no need to waste your current investment with a “rip and replace” upgrade. FlexIO technologies include:

- Completely passive, highly available midplane that can deliver greater than 5Tbps of total I/O bandwidth
- Support for up to two ports of up to 40Gbps from each I/O Mezzanine card on the blade server
- Ethernet pass-through module which supports complete 10/100/1000Mb operation

## BUILT FOR GROWTH

Dell is committed to developing blade technology to grow with your needs. Our PowerEdge blades are designed to perform now and for many generations of blade servers to come. The enclosure is not dependent on specific server processor/chipset architecture, so upgrading is painless.

Dell PowerEdge blade solutions: Ready to streamline your data center today, easily scalable to tackle the challenges of tomorrow.

## ABOUT DELL GLOBAL SERVICES

Dell Services can help reduce IT complexity, lower costs, and eliminate inefficiencies by making IT and business solutions work harder for you. The Dell Services team takes a holistic view of your needs and designs solutions for your environment and business objectives while leveraging proven delivery methods, local talent, and in-depth domain knowledge for the lowest TCO.

FEATURES	POWEREDGE M1000e MODULAR BLADE ENCLOSURE
<b>Chassis Enclosure</b>	<p>Form Factor: 10U modular enclosure holds up to sixteen half-height blade servers            44.0cm (17.3") H x 44.7cm (17.6") W x 75.4cm (29.7") D            Weight:</p> <ul style="list-style-type: none"> <li>• Empty Chassis only — 98lbs</li> <li>• Chassis w/ all rear modules (IOMs, PSUs, CMCs, KVM) — 176lbs</li> <li>• Max Fully loaded w/ blades and rear modules — 394lbs</li> </ul>
<b>Power Supplies</b>	<p>3 (non-redundant) or 6 (redundant) 2360 watt hot plug power supplies</p> <ul style="list-style-type: none"> <li>• Based on Dell's Energy Smart Technologies, the M1000e Power Supplies deliver greater levels of efficiency (&gt;91%), even at very low levels of utilization</li> <li>• Redundant Power Supplies support 3+3 (AC redundancy), 3+1 (Power Supply Redundancy), or 3+0 (non-redundant) modes</li> <li>• System supports new Dynamic Power Supply Engagement functionality, which (if enabled) puts lightly loaded power supplies into standby mode, driving up the utilization and thus the efficiency on the active supplies</li> <li>• Power Supplies Require 200+ volt AC input; Dell offers a wide range of Power Distribution options for the M1000e with 20A, 30A, 60A single phase, or 30A three phase options</li> </ul>
<b>Cooling Fans</b>	<p>M1000e Chassis comes standard with 9 hot pluggable, redundant fan modules</p> <ul style="list-style-type: none"> <li>• Based on Energy Smart Technologies, M1000e fans are a breakthrough in power and cooling efficiency</li> <li>• The fans deliver low power consumption, but also use next generation low-flow technology to ensure the lowest possible amount of fresh air is consumed to cool the enclosure</li> </ul>
<b>Input Device</b>	<p>Front Control Panel with interactive Graphical LCD</p> <ul style="list-style-type: none"> <li>• Supports initial configuration wizard</li> <li>• Local server blade, enclosure, and module information and troubleshooting</li> </ul> <p>Two USB Keyboard/Mouse connections and one Video connection (requires the optional Avocent® iKVM switch to enable these ports) for local front “crash cart” console connections that can be switched between blades</p>

**FEATURES**

**POWEREDGE M1000e MODULAR BLADE ENCLOSURE**

Up to six total I/O modules for three redundant fabrics, featuring Ethernet FlexIO technology providing on demand stacking and uplink scalability. Dell's FlexIO technology delivers a level of I/O flexibility, bandwidth, investment protection, and capabilities unrivaled in the blade server market.

**FlexIO Technologies include:**

- Completely passive, highly available midplane that can deliver greater than 5Tbps of total I/O bandwidth
- Support for up to two ports of up to 40Gbps from each I/O Mezzanine card on the blade server
- The industry's only Ethernet pass-through module which supports full 10/100/1000Mb operation

**PowerConnect™ M6220 Ethernet Switch**

Includes 4 x fixed copper 10/100/1000Mb Ethernet uplinks standard plus 2 of the following optional modules:

- 48Gb (full duplex) Stacking module
- 2 x 10Gb Optical (XFP-SR/LR) uplinks
- 2 x 10Gb copper CX4 uplinks

**Standard Features include:**

- Layer 3 routing (OSPF, RIP, VRRP)
- IPv6 support
- Layer 2/3 QoS
- Access Control Lists

**PowerConnect M8024**

- 24 port 10GbE switch—16 internal server ports & up-to 8 external LAN ports
- Up to 2 flexible modular external port options for greater diverse connectivity:
- Up-to two 4x SFP+ modules (8 ports)
- Up-to two 2x 10GbaseT ports per module (4 ports) (available 1HCY09)
- Up-to two 3 CX4 modules (6 ports)
- New 10Gb Ethernet dual port mezzanine card usable on any mezzanine card slot
- Cisco® Catalyst Blade Switch M 3032
- Includes 4 x fixed copper 10/100/1000Mb Ethernet uplinks standard plus 2 optional module bays, each can support either
- 2 x 1Gb copper or optical SFPs

**Standard features include:**

- L2 switching
- Base L3 routing (static routes, RIP)
- Access Control
- L2/3 QoS

**Enclosure I/O Modules**

**Cisco® Catalyst Blade Switch M 3130G**

Includes 4 x fixed copper 10/100/1000Mb Ethernet uplinks, 64Gb (full duplex) Stackwise Plus stacking ports standard plus 2 optional module bays, each can support either 2 x 1Gb copper or optical SFPs

**Standard Features include:**

- L2 switching
- Base L3 routing (static routes, RIP)
- Access Control Lists
- L2/3 QoS
- Optional software license key upgrades to IP Services (Advanced L3 protocol support) and Advanced IP Services (IPv6)

**Cisco® Catalyst Blade Switch M 3130X**

Includes 4 x fixed copper 10/100/1000Mb Ethernet uplinks, 64Gb full duplex Stackwise Plus stacking ports, and support for 2 x X2 modules for up to a total of two 10G CX4 or SR/LRM uplinks

**Standard Features include:**

- L2 switching
- Base L3 routing (static routes, RIP)
- Access Control Lists
- L2/3 QoS
- Optional software license key upgrades to IP Services (Advanced L3 protocol support) and Advanced IP Services (IPv6)

**Dell Ethernet Pass-Through Module**

Supports 16 x 10/100/1000Mb copper RJ45 connections

Only Ethernet Pass-through module on the market that supports full range of 10/100/1000Mb operation

**Brocade® M4424 SAN I/O Module**

Access Gateway Mode or FC Switch

- Access Gateway Mode enables NPIV functionality on external ports which delivers enhanced fabric interoperability,
- Simplified set up, and doesn't consume an FC domain
- 12 or 24 port versions with 4 or 8 x FC 1/2/4Gb SFPs respectively

**Brocade® M5424 - FC8 Switch**

up-to 24 8Gb/s ports - 16 internal server ports & 8 external SAN ports

New 24 port models for simplified deployment and powerful new Brocade enterprise software (available Nov 2008)

**4Gb Fibre Channel Pass-Through Module**

16 x FC 1/2/4Gb SFP ports

**Mellanox® M2401G - Dual Data Rate (DDR) InfiniBand Switch**

8 copper or Optical external 4x Double Data Rate (DDR - 20Gb) Infiniband ports

**PowerConnect™ M6348 Gigabit Ethernet Blade Switch**

FEATURES		POWEREDGE M1000E MODULAR BLADE ENCLOSURE
<b>Management</b>	<p><b>System Management</b></p> <p>Dell™ OpenManage™ Systems Management</p> <ul style="list-style-type: none"> <li>• Altiris™ Deployment Solution for Dell Blade Servers — reduce deployment time from hours to seconds</li> <li>• IT Assistant — manage multiple Dell servers from a single console</li> <li>• OpenManage™ Server Administrator — monitoring agents and 1:1 management utilities</li> <li>• Integration with 3rd party management solutions through Dell's Certified Partner Program</li> </ul> <p><b>Remote Management</b></p> <p>1 (standard) or optional 2nd (redundant) Chassis Management Controller(s) (CMC) which provide:</p> <ul style="list-style-type: none"> <li>• Single secure interface for inventory, configuration, monitoring, and alerting for the chassis and all components</li> <li>• Real Time Power/Thermal Monitoring and Management</li> <li>• Real Time System AC Power Consumption with resettable peak and minimum values</li> <li>• System-level power limiting and slot-based power prioritization</li> <li>• Manages Dynamic Power Engagement functionality which can help to lower overall system power consumption by ensuring Power Supplies run at their optimal efficiency points</li> <li>• Manages fan speed control using Dell's enhanced low-flow technology to ensure fans are delivering optimal cooling while minimizing power consumption and airflow</li> </ul> <p>Secure Web (SSL) and Command Line (Telnet/SSH) interfaces</p> <p>Supports multiple levels of user roles and permissions, including integration into Microsoft® Active Directory® Services</p> <p>2 x 10/100/1000Mb Ethernet ports + 1 serial port</p> <ul style="list-style-type: none"> <li>• Provides single point of connection from management network to iDRAC on each of the blades and the management interfaces on the integrated I/O Modules</li> <li>• 2nd Ethernet port supports daisy chaining of CMCs for improved cable management</li> <li>• Optional Integrated Avocent® keyboard, video and mouse (iKVM) switch</li> <li>• Enables USB keyboard/mouse and video port on front control panel</li> <li>• iKVM module has 2 x USB, video, and Analog Console Interface (ACI) ports</li> <li>• ACI port allows connectivity and seamless tiering via cat5 cables to Dell or Avocent KVM switches with Analog Rack</li> <li>• Interface (ARI) ports.</li> </ul>	
<b>External storage Options</b>	<p>Dell / EMC Fibre Channel and/or iSCSI external storage, including Dell/EMC AX150, AX150i, CX300, CX3-10c , CX3-20, CX3-40, and CX3-80, PowerVault™ MD3000i and PowerVault™ NX1950 Unified Storage Solution</p>	

FEATURES		POWEREDGE M605 BLADE SERVER
<b>Processors</b>	<p>Up to 2 Six-Core AMD Opteron™ 2000 Series processors</p> <p>2300 series Quad-Core processors up to 2.3GHz, 2MB cache (68W HE or 95W processor support)</p> <p>2200 series Dual-Core processors up to 3.0GHz, 2MB cache (68W HE or 95W processor support)</p>	
<b>Chipset</b>	NVIDIA® MCP55	
<b>Memory</b>	<p>Up to 8x DIMMs (DDR2) at 800MHz</p> <p>Up to 64GBI of memory with 8GB DIMMs</p>	
<b>Operating Systems</b>	<p>Microsoft® Windows® Essential Business Server 2008</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>Microsoft® Windows® HPC Server 2008</p> <p>Novell® SUSE® Linux® Enterprise Server</p> <p>Red Hat® Enterprise Linux®</p> <p>Sun® Solaris™</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>Storage</b>	<p>Up to two Hot-Swappable Internal Drives:</p> <p>2.5" SAS (10K rpm): 73GB, 146GB or 300GB</p> <p>2.5" SAS (15K rpm): 36GB or 73GB or 146GB</p> <p>2.5" SATA (7.2k rpm): 80GB, 160GB or 250GB</p> <p>25GB, 50GB Solid State Drive (SSD)</p> <p>Maximum Internal Storage:</p> <p>Up to 600GB per blade via two 2.5" 300GB hot-swappable SAS (10k rpm) hard drives</p> <p>External storage Options</p> <p>Dell/EMC Fibre Channel and/or iSCSI external storage, including Dell/EMC AX150, AX150i, CX300, CX3-10c , CX3-20, CX3-40, and CX3-80, PowerVault™ MD3000i and PowerVault™ NX1950 Unified Storage Solution</p>	
<b>Drive Bays</b>	Two 2.5" Hot-Swappable SAS/SATA/Solid State Drives	

FEATURES		POWEREDGE M605 BLADE SERVER			
<b>I/O Mezzanine Cards</b>	<p><b>1Gb &amp; 10Gb Ethernet:</b>            Dual-Port Broadcom® Gb Ethernet w/ TOE (BCM-5709S)            Quad-Port Intel® Gb Ethernet (BCM-82576)            Quad-Port Broadcom® Gb Ethernet (BCM-5709S)            Dual-Port Broadcom® 10Gb Ethernet (BCM-57711)</p> <p><b>10Gb Enhanced Ethernet &amp; Converged Network Adapters (CEE/DCB):</b>            Dual-Port QLogic® Converged Network Adapter (QME8142) - Supports CEE/DCB 10GbE + FCoE</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) (LPel205-M)</p> <p><b>Infiniband:</b>            Dual-Port Mellanox® ConnectX Quad Data Rate (QDR) InfiniBand            Dual-Port Mellanox® ConnectX Dual Data Rate (DDR) InfiniBand</p>				
<b>RAID Controllers</b>	SAS 6/ir (H/W based) with RAID 0/1 support				
<b>Communications</b>	Dual embedded Broadcom® NetXtreme II™ 5708 Gigabit7 Ethernet NIC w/ TOE and iSCSI Firmware Boot Dual Port 10GB Enhanced Intel Ethernet Server Adapter X520-DA2 (FcoE Ready for Future Enablement)				
<b>Management</b>	<p><b>Dell OpenManage™ software tools</b></p> <ul style="list-style-type: none"> <li>• Altiris™ Deployment Solution for Dell Blade Servers – reduce deployment time from hours to seconds</li> <li>• IT Assistant – manage multiple Dell servers from a single console</li> <li>• OpenManage Server Administrator—1:1 monitoring agents Integration with 3rd party management solutions via Dell's Certified Partner Program</li> </ul> <p><b>Integrated Dell Remote Access Controller (iDRAC) with:</b></p> <ul style="list-style-type: none"> <li>• Out-of-Band alerting, status, inventory, and troubleshooting via Secure Web GUI/CLI (telnet/SSH)</li> <li>• Remote Virtual Media (vMedia) and Virtual KVM               <ul style="list-style-type: none"> <li>• vKVM blade</li> <li>• vKVM- out of band remote console, supports Java or ActiveX plug-ins</li> </ul> </li> </ul> IPMI 2.0 support				
<b>Standard Interfaces</b>	Two bootable USB 2.0 ports on front panel for floppy, CD/DVD, memory key, and keyboard/mouse				
<b>Video</b>	Embedded ATI™ RN50 video controller with 32MB memory				
Environmental and Regulatory					
<b>Operating Temperature</b>	10° C to 35° C (50° F to 95° F) <sup>1</sup>				
<b>Storage Temperature</b>	-40° C to 65° C (-40° F to 149° F)				
<b>Operating Relative Humidity (non-condensing twmax=29C)</b>	8% to 80% non-condensing				
<b>Maximum humidity gradient</b>	10% per hour, operational and non-operational conditions.				
<b>Storage Relative Humidity</b>	5% to 95% non-condensing (twmax=38C)				
<b>Operating Vibration</b>	0.26Grms at 10Hz to 350Hz for 15 minutes				
<b>Storage Vibration</b>	1.54Grms Random Vibration at 10Hz to 250Hz for 15 minutes				
<b>Operating Shock</b>	1 shock pulse of 41G for up to 2ms				
<b>Storage Shock</b>	6 shock pulses of 71G for up to 2ms				
<b>Operating Altitude</b>	-16 to 3,048m (-50 ft to 10,000 ft)				
<b>Storage Altitude</b>	-16m to 10,600m (-50 ft to 35,000 ft)				
<b>Regulatory</b>	<table border="0"> <tr> <td style="vertical-align: top;">           FCC (U.S. only) Class A            ICES (Canada) Class A            CE Mark (EN 55022 Class A, EN55024, EN61000-3-2, EN61000-3-3)            VCCI (Japan) Class A            BSMI (Taiwan) Class A            C-Tick (Australia/New Zealand) Class A         </td> <td style="vertical-align: top; padding-left: 20px;">           SABS (South Africa) Class A            CCC (China) Class A            MIC (Korea) Class A            UL 60950-1            CAN/CSA C22.2 No. 60950-1            EN 60950-1            IEC 60950-1         </td> </tr> </table>			FCC (U.S. only) Class A ICES (Canada) Class A CE Mark (EN 55022 Class A, EN55024, EN61000-3-2, EN61000-3-3) VCCI (Japan) Class A BSMI (Taiwan) Class A C-Tick (Australia/New Zealand) Class A	SABS (South Africa) Class A CCC (China) Class A MIC (Korea) Class A UL 60950-1 CAN/CSA C22.2 No. 60950-1 EN 60950-1 IEC 60950-1
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<sup>1</sup> For altitudes above 2,500 feet, the maximum operating temperature is derated 1° F/550 ft.

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