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 M600& 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 M600 features the latest Intel® Xeon™ Quad-Core processor, while the M605 will support up to Six-Core AMD Opteron processors, when available. Both offer 60% greater density than traditional 1U servers.

POWEREDGE M1000E: REVOLUTIONARY DESIGN

The M600 and M605 are 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 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, high 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.

FEATURES	POWEREDGE M1000e MODULAR BLADE ENCLOSURE
Chassis Enclosure	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: • Empty Chassis only — 98lbs • Chassis w/ all rear modules (IOMs, PSUs, CMCs, KVM) — 176lbs • Max Fully loaded w/ blades and rear modules — 394lbs
Power Supplies	3 (non-redundant) or 6 (redundant) 2360 watt hot plug power supplies • Based on Dell's Energy Smart Technologies, the M1000e Power Supplies deliver greater levels of efficiency (>91%), even at very low levels of utilization • Redundant Power Supplies support 3+3 (AC redundancy), 3+1 (Power Supply Redundancy), or 3+0 (non-redundant) modes • 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 • 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
Cooling Fans	M1000e Chassis comes standard with 9 hot pluggable, redundant fan modules • Based on Energy Smart Technologies, M1000e fans are a breakthrough in power and cooling efficiency • 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
Input Device	Front Control Panel with interactive Graphical LCD • Supports initial configuration wizard • Local server blade, enclosure, and module information and troubleshooting 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

FEATURES	POWEREDGE M1000e MODULAR BLADE ENCLOSURE
Enclosure I/O Modules	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, high 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, cont.	**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

Management	**System Management**
	Dell OpenManageTM Systems Management
	• Altiris Deployment Solution for Dell Blade Servers — reduce deployment time from hours to seconds
	• IT Assistant — manage multiple Dell servers from a single console
	• OpenManage Server Administrator — monitoring agents and 1:1 management utilities
	• Integration with 3rd party management solutions via Dell's Certified Partner Program
	Remote Management
	1 (standard) or optional 2nd (redundant) Chassis Management Controller(s) (CMC) which provide:
	• Single secure interface for inventory, configuration, monitoring, and alerting for the chassis and all components
	• Real Time Power/Thermal Monitoring and Management
	► Real Time System AC Power Consumption with reset-able peak and minimum values
	► System level power limiting and slot based power prioritization
	► Manages Dynamic Power Engagement functionality which can help to lower overall system power consumption by ensuring Power Supplies run at their optimal efficiency points
	► Manages fan speed control using Dell's enhanced "low flow" technology to ensure fans are delivering optimal cooling while minimizing power consumption and airflow
	Secure Web (SSL) and CLI (Telnet/SSH) interfaces
	Supports multiple levels of user roles and permissions, including integration into Microsoft Active Directory Services
	2 x 10/100/1000Mb Ethernet ports + 1 serial port
	• 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
	• 2nd Ethernet port supports daisy chaining of CMCs for improved cable management
	Optional Integrated Avocent® keyboard, video and mouse (iKVM) switch
	• Enables USB keyboard/mouse and video port on front control panel
	• iKVM module has 2 x USB, video, and Analog Console Interface (ACI) ports
	• ACI port allows connectivity and seamless tiering via cat5 cables to Dell or Avocent KVM switches with Analog Rack Interface (ARI) ports.
External storage Options	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
	PowerVault NX1950 Unified Storage Solution

FEATURES	POWEREDGE M600 BLADE SERVER	POWEREDGE M605 BLADE SERVER
Processors	**Up to 2 Dual-Core or Quad-Core Intel® Xeon® 5000 Sequence processors**	**Up to 2 Six-Core AMD Opteron 2000 Series processors**
	• 5400 series processors with up to two 3.33GHz, 1333MHz front-side bus, 2x6MB cache	• 2300 series Quad-Core processors up to 2.3GHz, 2MB cache (68W HE or 95W processor support)
	• 5200 series processors with up to 3.50GHz, 1333MHz front-side bus, 6MB cache	• 2200 series Dual-Core processors up to 3.0GHz, 2MB cache (68W HE or 95W processor support
	• Low voltage processors with up to 2.66GHz, 133MHz front-side bus, 2x6MB cache	
Chipset	Intel 5000P	NVIDIA MCP55
Memory	Supports up to 8 x Fully Buffered DIMMs (FBD) 667MHz	• Up to 8x DIMMs (DDR2) at 800MHz
	Support for up to 32GB (w/ 8 x 4GB DIMMs)	• Up to 64GB1 of memory with 8GB DIMMs
	• Up to 8x Fully Buffered DIMMs (FBD) at 667MHz	
	• Up to 64GB of memory with 8GB DIMMs	
Operating Systems	**Validated & Supported O/S:**	**Validated & Supported O/S:**
	Microsoft Windows® Server 2008 Datacenter Edition	Microsoft® Windows® Server 2003 R2 x64, Standard and Enterprise Edition
	Microsoft Windows® Server 2008 HPC Edition	Microsoft Windows Server 2008 x64 Small Business Server Standard Edition, Datacenter Edition, HPC Edition
	Microsoft Windows Server 2008 SP2	Red Hat Red Hat Enterprise Linux 5.2 x86_64
	Microsoft® Windows® Server 2003 R2 x64, Standard and Enterprise Edition	Red Hat Red Hat Enterprise Linux 5.2 x86
	Microsoft Windows Server 2008 x64 Small Business Server Standard Edition	Red Hat® Linux® Enterprise v4, WS, AS, ES, and ES x86-64
	Novell SUSE Linux Enterprise Server 11	Solaris 10 (Non-factory Installed)
	Novell SuSe Linux 10 SP2	SUSE Linux Enterprise Server 11
	Red Hat Linux Enterprise v5.3	VMware ESX 3.0
	Red Hat Red Hat Enterprise Linux 5.2 x86_64	
	Red Hat Red Hat Enterprise Linux 5.2 x86	
	Red Hat® Linux® Enterprise v4, WS, AS, ES, and ES x86-64	
	Solaris 10 (Non-factory Installed)	
	VMware ESX 3.0	

FEATURES	POWEREDGE M600 BLADE SERVER	POWEREDGE M605 BLADE SERVER
Storage	**Up to two Hot-Swappable Internal Drives:** 2.5″ SAS (10K rpm): 73GB[2], 146GB[2] or 300GB[2] 2.5″ SAS (15K rpm): 36GB[2] or 73GB[2] or 146GB[2] 2.5″ SATA (7.2k rpm): 80GB[2], 160GB[2] or 250GB[2] 25GB[2], 50GB[2] Solid State Drive (SSD) (limit 1 per blade) **Maximum Internal Storage:** Up to 600GB[2] per blade via two 2.5″ 300GB[2] hot swappable SAS (10k rpm) hard drives **External storage Options** 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 PowerVault NX1950 Unified Storage Solution	**Up to two Hot-Swappable Internal Drives:** 2.5″ SAS (10K rpm): 73GB[2], 146GB[2] or 300GB[2] 2.5″ SAS (15K rpm): 36GB[2] or 73GB[2] or 146GB[2] 2.5″ SATA (7.2k rpm): 80GB[2], 160GB[2] or 250GB[2] 25GB[2], 50GB[2] Solid State Drive (SSD) **Maximum Internal Storage:** Up to 600GB[2] per blade via two 2.5″ 300GB[2] hot-swappable SAS (10k rpm) hard drives **External storage Options** 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 PowerVault NX1950 Unified Storage Solution
Drive Bays	Two 2.5" Hot-Swappable SAS/SATA or one 2.5" Hot-Swappable Solid State Drive	Two 2.5" Hot-Swappable SAS/SATA/Solid State Drives
I/O Mezzanine Cards	**Two Optional PCIe x8 Mezzanine Card slots** Dual-Port Broadcom M5708t Gigabit Ethernet mezzanine card w/TCP/IP Offload and iSCSI boot capability Dual-Port Qlogic QME2472 4Gb Fibre Channel mezzanine card Dual-Port Emulex M Lpe1105 4Gb Fibre Channel mezzanine card Dual-Port Mellanox ConnectX-MDI 4xDDR Infiniband mezzanine card Dual Port Broadcom 5709 GbE Dual Port – TOE IPv6, iSCSI Boot, with iSCSI Offload blade server mezzanine Dual-Port Broadcom 57710 SFF 10Gb blade server mezzanine QLogic QME2572 8Gb Fibre Channel mezzanine card Emulex LPe1205-M 8Gb Fibre Channel mezzanine card	**Two Optional PCIe x8 Mezzanine Card slots** Dual-Port Broadcom M5708t Gigabit Ethernet mezzanine card w/ TCP/IP Offload and iSCSI boot capability Dual-Port Qlogic QME2472 4Gb Fibre Channel mezzanine card Dual-Port Emulex M Lpe1105 4Gb Fibre Channel mezzanine card Dual-Port Mellanox ConnectX-MDI 4xDDR Infiniband mezzanine card Dual-Port Broadcom 5709 GbE – TOE IPv6, iSCSI Boot, with iSCSI Offload blade server mezzanine Dual-Port Broadcom 57710 SFF 10Gb blade server mezzanine QLogic QME2572 8Gb Fibre Channel mezzanine card Emulex LPe1205-M 8Gb Fibre Channel mezzanine card
RAID Controllers	SAS 6/ir (H/W based) with RAID 0/1 support	SAS 6/ir (H/W based) with RAID 0/1 support
Communications	Dual embedded Broadcom® NetXtreme IITM 5708 Gigabit7 Ethernet NIC w/ TOE and iSCSI Firmware Boot	Dual embedded Broadcom® NetXtreme IITM 5708 Gigabit7 Ethernet NIC w/ TOE and iSCSI Firmware Boot
Management	**Dell OpenManageTM software tools** • Altiris Deployment Solution for Dell Blade Servers — reduce deployment time from hours to seconds • IT Assistant — manage multiple Dell servers from a single console • OpenManage Server Administrator- 1:1 monitoring agents • Integration with 3rd party management solutions via Dell's Certified Partner Program **Integrated Dell Remote Access Controller (iDRAC) with:** • Out of Band alerting, status, inventory, and troubleshooting via Secure Web GUI/CLI (telnet/SSH) • Remote Virtual Media (vMedia) and Virtual KVM ▸ vKVM blade ▸ vKVM- out of band remote console, supports Java or ActiveX plug-ins **IPMI 2.0 support**	**Dell OpenManageTM software tools** • Altiris Deployment Solution for Dell Blade Servers — reduce deployment time from hours to seconds • IT Assistant — manage multiple Dell servers from a single console • OpenManage Server Administrator- 1:1 monitoring agents Integration with 3rd party management solutions via Dell's Certified Partner Program **Integrated Dell Remote Access Controller (iDRAC) with:** • Out of Band alerting, status, inventory, and troubleshooting via Secure Web GUI/CLI (telnet/SSH) • Remote Virtual Media (vMedia) and Virtual KVM ▸ vKVM blade ▸ vKVM- out of band remote console, supports Java or ActiveX plug-ins **IPMI 2.0 support**

FEATURES	POWEREDGE M600 BLADE SERVER	POWEREDGE M605 BLADE SERVER
Standard Interfaces	Two USB 2.0 bootable ports on front panel for floppy, CD/DVD, memory key, keyboard/mouse	Two bootable USB 2.0 ports on front panel for floppy, CD/DVD, memory key, keyboard/mouse
Video	Embedded ATI RN50 video controller with 32MB memory	Embedded ATI RN50 video controller with 32MB memory

Environmental and Regulatory

Operating Temperature	10º C to 35º C (50º F to 95º F)1	10º C to 35º C (50º F to 95º F)
Storage Temperature	-40º C to 65º C (-40º F to 149º F)	-40º C to 65º C (-40º F to 149º F)
Operating Relative Humidity (non-condensing twmax=29C)	8% to 80% non-condensing	8% to 80% non-condensing
Maximum humidity gradient	10% per hour, operational and non-operational conditions	10% per hour, operational and non-operational conditions.
Storage Relative Humidity	5% to 95% non-condensing (twmax=38C)	5% to 95% non-condensing (twmax=38C)
Operating Vibration	0.26Grms at 10Hz to 350Hz for 15 minutes	0.26Grms at 10Hz to 350Hz for 15 minutes
Storage Vibration	1.54Grms Random Vibration at 10Hz to 250Hz for 15 minutes	1.54Grms Random Vibration at 10Hz to 250Hz for 15 minutes
Operating Shock	1 shock pulse of 41G for up to 2ms	1 shock pulse of 41G for up to 2ms
Storage Shock	6 shock pulses of 71G for up to 2ms	6 shock pulses of 71G for up to 2ms
Operating Altitude	-16 to 3,048m (-50 ft to 10,000 ft)	-16 to 3,048m (-50 ft to 10,000 ft)
Storage Altitude	-16m to 10,600m (-50 ft to 35,000 ft)	-16m to 10,600m (-50 ft to 35,000 ft)
Regulatory	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 1 For altitudes above 2950 feet, the maximum operating temperature is derated 1ºF/550 ft.	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 1 For altitudes above 2950 feet, the maximum operating temperature is derated 1ºF/550 ft.

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