

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 quad-core AMD, 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	<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</p> <p>Weight:</p> <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 <p>Dell offers a wide range of Power Distribution options for the M1000e with 20A, 30A, 60A single phase, or 30A three phase options</p>
Cooling Fans	<p>M1000e Chassis comes standard with 9 hot pluggable, redundant fan modules</p> <p>Based on Energy Smart Technologies, M1000e fans are a breakthrough in power and cooling efficiency</p> <ul style="list-style-type: none"> • 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	<p>Front Control Panel with interactive Graphical LCD</p> <ul style="list-style-type: none"> • Supports initial configuration wizard • Local server blade, enclosure, and module information and troubleshooting <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>
Enclosure I/O Modules	<p>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.</p> <p>FlexIO Technologies include:</p> <ul style="list-style-type: none"> • 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 <p>PowerConnect™ M6220 Ethernet Switch</p> <p>Includes 4 x fixed copper 10/100/1000Mb Ethernet uplinks standard plus 2 of the following optional modules:</p> <ul style="list-style-type: none"> • 48Gb (full duplex) Stacking module • 2 x 10Gb Optical (XFP-SR/LR) uplinks • 2 x 10Gb copper CX4 uplinks <p>Standard Features include:</p> <ul style="list-style-type: none"> • Layer 3 routing (OSPF, RIP, VRRP) • IPv6 support • Layer 2/3 QoS • Access Control Lists <p>Cisco® Catalyst Blade Switch M 3032</p> <p>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</p> <p>Standard features include:</p> <ul style="list-style-type: none"> • L2 switching • Base L3 routing (static routes, RIP) • Access Control Lists • L2/3 QoS

FEATURES	POWEREDGE M1000E MODULAR BLADE ENCLOSURE
<p>Enclosure I/O Modules, cont.</p>	<p>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:</p> <ul style="list-style-type: none"> • 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) <p>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:</p> <ul style="list-style-type: none"> • 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) <p>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</p> <p>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</p> <p>4Gb Fibre Channel Pass-Through Module 16 x FC 1/2/4Gb SFP ports</p> <p>Cisco M SFS7000 Infiniband Switch 8 copper or Optical external 4x Double Data Rate (DDR – 20Gb) Infiniband ports</p>
<p>Management</p>	<p>System Management <i>Dell OpenManage™ Systems Management</i></p> <ul style="list-style-type: none"> • 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 <p>Remote Management <i>1 (standard) or optional 2nd (redundant) Chassis Management Controller(s) (CMC) which provide:</i></p> <ul style="list-style-type: none"> • Single secure interface for inventory, configuration, monitoring, and alerting for the chassis and all components • Real Time Power/Thermal Monitoring and Management <ul style="list-style-type: none"> ▶ 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 <p>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</p> <ul style="list-style-type: none"> • 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 <p><i>Optional Integrated Avocent® keyboard, video and mouse (iKVM) switch</i></p> <ul style="list-style-type: none"> • 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.
<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 PowerVault NX1950 Unified Storage Solution</p>

FEATURES	POWEREDGE M600 BLADE SERVER	POWEREDGE M605 BLADE SERVER
Processors	<p>Up to 2 Dual-Core or Quad-Core Intel® Xeon® 5000 Sequence processors</p> <ul style="list-style-type: none"> • 5400 series processors up to 3.16GHz, 1333MHz front side bus, 2x6MB cache • 5300 series processors up to 2.33GHz, 1066MHz or 1333MHz front side bus, 2x4MB cache • L5335 low volt processor up to 2.0Ghz, 1333Mhz front side bus, 2x4MB cache • 5200 series processors up to 3.33GHz, 1066MHz or 1333MHz front side bus, 2x3MB cache • 5130 processor @ 2.0GHz, 1333MHz front side bus, 2x2MB cache • 5148 low volt processor @ 2.33GHz, 1333MHz front side bus, 2x2MB cache 	<p>Up to 2 Dual-Core AMD Opteron 2000 Series processors, or quad-core AMD (when available)</p> <ul style="list-style-type: none"> • 2300 series Quad-Core processors up to 2.3GHz, 2MB cache (68W HE or 95W processor support) • 2200 series Dual-Core processors up to 3.0GHz, 2MB cache (68W HE or 95W processor support)
Chipset	Intel 5000P	NVIDIA MCP55
Memory	<p>Supports up to 8 x Fully Buffered DIMMs (FBD) 667MHz Support for up to 32GB (w/ 8 x 4GB DIMMs)</p> <ul style="list-style-type: none"> • 512MB/1GB/2GB/4GB FBD DIMMs 667MHz <p>64GB support will be offered with 8GB DIMMs</p>	<p>Supports up to 8 x DDR2 667/800Mhz DIMMs Support for up to 32GB (w/ 8 x 4GB DIMMs)</p> <ul style="list-style-type: none"> • 512MB/1GB/2GB/4GB DDR2 (667/800MHz) <p>64GB support will be offered with 8GB DIMMs</p>
Operating Systems	<p>Validated & Supported O/S: Microsoft® Windows® Server 2003 R2, Standard and Enterprise Edition Microsoft® Windows® Server 2003 R2 x64, Standard and Enterprise Edition Red Hat® Linux® Enterprise v5 Red Hat® Linux® Enterprise v4, WS, AS, ES, and ES x86-64 SUSE Linux Enterprise Server 10, x86-64 SUSE Linux Enterprise Server 9 VMware ESX 3.5 VMware ESX 3.0</p>	<p>Validated & Supported O/S: Microsoft® Windows® Server 2003 R2, Standard and Enterprise Edition Microsoft® Windows® Server 2003 R2 x64, Standard and Enterprise Edition Red Hat® Linux® Enterprise v5 Red Hat® Linux® Enterprise v4, WS, AS, ES, and ES x86-64 SUSE Linux Enterprise Server 10, x86-64 SUSE Linux Enterprise Server 9 VMware ESX 3.5 VMware ESX 3.0</p>
Storage	<p>Hard Drives⁶ 2.5" SAS (10k rpm): 36GB, 73GB, or 146GB 2.5" SAS (15k rpm): 36GB or 73GB 2.5" SATA (7.2k rpm): 80GB, 120GB</p> <p>Maximum Internal Storage Up to 300GB: two 146GB hot-plug SAS (10k rpm)</p> <p>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</p>	<p>Hard Drives⁶ 2.5" SAS (10k rpm): 36GB, 73GB, or 146GB 2.5" SAS (15k rpm): 36GB or 73GB 2.5" SATA (7.2k rpm): 80GB, 120GB</p> <p>Maximum Internal Storage Up to 300GB: two 146GB hot-plug SAS (10k rpm)</p> <p>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</p>
Drive Bays	Two 2.5" Hot Plug SAS/SATA drives	Two 2.5" Hot Plug SAS/SATA drives
I/O Mezzanine Cards	<p>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</p>	<p>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</p>
RAID Controllers	SAS6/ir (H/W based) with RAID 0/1 support	SAS6/ir (H/W based) with RAID 0/1 support
Communications	Dual embedded Broadcom® NetXtreme IITM 5708 Gigabit ⁷ Ethernet NIC w/ TOE and iSCSI Firmware Boot	Dual embedded Broadcom® NetXtreme IITM 5708 Gigabit ⁷ Ethernet NIC w/ TOE and iSCSI Firmware Boot
Management	<p>Dell OpenManage™ software tools</p> <ul style="list-style-type: none"> • 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 <p>Integrated Dell Remote Access Controller (iDRAC) with:</p> <ul style="list-style-type: none"> • Out of Band alerting, status, inventory, and troubleshooting via Secure Web GUI/CLI (telnet/SSH) • Remote Virtual Media (vMedia) and Virtual KVM (vKVM) <ul style="list-style-type: none"> ▶ vMedia- Map media from remote workstation/network to the blade ▶ vKVM- out of band remote console, supports Java or ActiveX plug-ins <p>IPMI 2.0 support</p>	<p>Dell OpenManage™ software tools</p> <ul style="list-style-type: none"> • 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 <p>Integrated Dell Remote Access Controller (iDRAC) with:</p> <ul style="list-style-type: none"> • Out of Band alerting, status, inventory, and troubleshooting via Secure Web GUI/CLI (telnet/SSH) • Remote Virtual Media (vMedia) and Virtual KVM (vKVM) <ul style="list-style-type: none"> ▶ vMedia- Map media from remote workstation/network to the blade ▶ vKVM- out of band remote console, supports Java or ActiveX plug-ins <p>IPMI 2.0 support</p>

