Dell | Enterprise Systems

*INFO*Brief

Dell™ PowerEdge™ 850

The Dell PowerEdge 850 is an affordable, rack-dense web and infrastructure server for any size organization.

PowerEdge 850 Usage

The Dell™ PowerEdge™ 850 is an affordable rack-dense web and infrastructure server for any size organization. This server is the first PowerEdge rack-dense system designed to deliver greater processing power by using dual core technology and easily eclipses the performance of previous Dell single-socket rack-dense server models. In fact, a dual core processor on the 850 can deliver up to 79% greater compute-intensive performance and 26% web serving performance than the previous generation PowerEdge server.[1]

Key Points

More processor choices and memory capacity maximize flexibility across a variety of applications in rack dense environments.

- The PowerEdge 850 has multiple processor options based on business needs.
    - Pentium D- New Dual Core technology for best performance running multiple applications simultaneously.
        - Dual Core technology combines two processing cores into a single processor chip. The result can be dramatic increases in performance and power efficiency compared to single core processors especially when running multiple applications like:
            - Web server- caching, firewall
            - Infrastructure Server- domain controller
        - Dual Core technology can significantly enhance computation acceleration for multi-threaded tasks, often required for HPCC applications.
        - Compared to Pentium 4 on the same platform, Pentium D can provide up to 60% better performance in high performance computing environments and 24% better performance in web server applications.[2]
    - Pentium 4- Value, Price/Performance, single applications
    - Celeron D- Entry-level, price sensitive, simple file/print
- The PowerEdge 850 now comes with up to twice the memory of the previous generation. Up to 8GB of DDR-2 SDRAM dual channel memory helps improve system performance with more bandwidth especially when running 64 bit applications.

Offers scalability and headroom for future demands through next generation technologies

- New high-performance PCI Express architecture can deliver flexibility and investment protection
    - The PowerEdge 850 has a choice of two risers – one with x4 and x8 PCIe slots, a second with one x8 PCIe slot and one PCI-X 64/133 slot.
- Dual embedded Gigabit[3] NICs provide high bandwidth network connectivity with support for I/O traffic load balancing and fail-over
- SCSI and SATA RAID controllers provide flexibility and high data availability, allowing customers to match the performance and availability needed to their applications.
- The system has scalability to 1067 MHz FSB to support future processors

Comprehensive management tools help reduce hands-on maintenance and overall cost of ownership.

- Complete suite of systems management tools at no additional charge
    - Dell Server Assistant ships with every PowerEdge 850 as a bootable, stand-alone CD-ROM providing the tools to setup and configure the PowerEdge system components and software. It provides the following key functions and benefits:

        - Set-up and Configuration-Provides all the necessary tools for setting up and configuring new PowerEdge systems and software. Configures Dell-provided RAID controllers with a consistent interface
        - Streamlines Operating-System Installation – Helps to significantly reduce the time required for operating system installation.
        - Utilities, Drivers and Diagnostics - Provides a “System Tools” utility to view and create Dell software diskettes. Delivers Dell optimized and tested drivers, diagnostics and utilities
- Dell OpenManage™ Suite for easy server management and integration to Dell’s PowerEdge server line.
- Integrated features make remote server monitoring and management seamless and easy for remote offices or retail locations.
    - For advanced remote management, Dell Remote Access Card enables users to remotely access, monitor, troubleshoot, and repair/upgrade servers independent of the system status.
    - For basic remote monitoring, Dell’s IPMI 1.5 standard Integrated Baseboard Management Controller allows remote management when integrated with any industry standard management program.

Dell Services are designed for easy deployment and support at remote locations.

- Purchase the operating system pre-installed and tested to save setup and installation time.
- Custom Factory Integration - In our ISO 9001-certified factory, we can add and test custom configured hardware and software to your new server prior to shipment.
- Server Installation Service - Go from factory to deployment with Dell server installation services. A Dell-certified technician will schedule delivery and get your new server up and running quickly.
- With the Enterprise Services suite, Dell becomes a partner to your organization working closely with you to resolve problems quickly and smoothly, no matter how large or small the incident. You receive immediate access to Dell's senior-level hardware and software experts and fast resolution times.
    - Platinum Enterprise Services - Comprehensive site-based support for complex production and operational environments.
    - Gold Enterprise Services - Rapid, expert support for key systems, such as production and operational servers.

Background

The PowerEdge 850 is a clear choice for users who have the need for a full-functionality single-socket rack-dense server specifically designed to run high performance server operating systems. For a variety of non-mission-critical applications, such as an edge-of-network web and remote location server support, the PowerEdge 850 offers standard server functionality at a very affordable cost and convenient form factor. For mission-critical applications, such as specific line-of-business and processor-intensive web applications, the PowerEdge 850 has features such as optional RAID hard drives, hardware monitoring, remote manageability, chassis intrusion detection, and external storage options that suit the needs of this demanding environment.

Product Description

The PowerEdge 850 is an affordable, single processor, general-purpose rack-dense server targeted to address the needs of price-sensitive users. While the PowerEdge 850 is in the lower-end price range of server systems, it offers many features found in higher-end servers:

1. Performance/Scalability

- Intel® Pentium® D 800MHz Front Side Bus dual core processor, Intel Pentium 4 800MHz FSB processor OR a low-cost 533MHz FSB Intel Celeron® D option.
- Choice of two I/O risers: A riser with two PCIe slots (x8 and x4) or, a riser with one 64-bit/133MHz PCI-X and one PCIe (x8) I/O slot
- Four ECC DDR-2 533/667MHz SDRAM DIMM sockets for up to 8 GB of memory
- Intel E7230 Server Chipset
- Internal hard drive cage supporting up to two 1-inch drives
- SATA or SCSI hard drives
- Optional RAID 0,1 SATA or SCSI controller cards
- One slim line media bay
  - One optional EIDE CD-ROM, DVD-ROM, CD-RW-DVD Combo
- Two embedded SATA channels for up to two SATA hard drives
- 2 SATA or SCSI hard drives with optional PCI controller and optional RAID
- Embedded dual Broadcom Gigabit[3] 5721J Ethernet Controllers frees up a slot and provides load balancing and fail over. The

controllers work from a separate I/O link and do not use any PCI bus bandwidth.

- Choice of optional server Operating Systems
  - Windows 2000 Server, Standard edition, (Service Pack 4)
  - Windows 2003 standard edition
  - Windows 2003 Web Server
  - Windows 2003 for 64 bits standard edition
  - RedHat Enterprise Linux (RHEL) ES version 3.
  - RedHat Enterprise Linux (RHEL) ES version 4. IA32
  - RedHat Enterprise Linux (RHEL) ES version 4 for EM64T.
  - Novell Netware version 6.5 Pack 3
  - SUSE Linux- SLES9 EM64T

2. Manageability

- Dell OpenManage IT Assistant
- Integrated BMC server management hardware
- Dell Server Assistant CD for easy start-up and OS installation
- DRAC 4p PCI card for remote manageability

Markets/Applications

Edge-of-network and infrastructure requirements

- The growth of the Internet continues to fuel the need for rack dense servers as service providers (ISPs/ASPs), small and medium businesses, enterprise customers, or any organization leveraging Internet technologies all struggle with the same fundamental issue – data center space.
- As data access becomes more immediate and businesses try to respond more in real time, the growth of networking services is increasing dramatically. Tiered architectures help customers better rationalize their data delivery. Deploying many fast "edge of network" servers helps move data more quickly in and out of the business, allowing them to more quickly react to changing conditions.
- Remote locations require rack-dense cost-effective servers for running remote applications that connect back to the corporate headquarters. Where an application in the data center may run dual processors and need to support hundreds of users that replicated application in a remote location may support only a few users, making a single processor server optimal.

Application Development, Compute-intensive, and multitasking requirements

- Because of cost constraints, application development is often done on more cost-effective single processor servers with lower performance and availability than the final production servers. Developers who

created multi-threaded applications often did not have a good representation of how they would perform on multi-processor systems until after deployment, but now can use a system with dual core processors as a test-bed for those applications.

- Multithreading can enable running specialized applications faster. Since many HPCC applications are multi-threaded, allowing separate threads or tasks to be split across the two processors will result in tasks being run concurrently to help complete the job faster.
- Multitasking provides the ability for running multiple applications faster and helping improve performance/throughput in complex application environments (i.e., complete more work per unit of time).

Feature Comparison

A feature comparison of the single processor PowerEdge 850 rack-dense and PowerEdge 1850 rack-dense server systems is shown in Table 1.

Table 1
Feature Comparison of PowerEdge 850 and PowerEdge 1850 Rack Servers

Features	PowerEdge 850	PowerEdge 1850
Processors	Single Intel Pentium 4 processor (up to 3.8GHz) or single Intel Celeron processor (2.53GHz) or single Pentium D dual-core processor (up to 3.2 GHz)	Up to two Intel Xeon processors Up to 3.6GHz 2MB L2 cache
L2 cache	2MB for P4 Prescott 256K for Celeron 2x1MB for PD dual core Smithfield	Up to 2MB
Chipset	Intel E7230	Intel E7520
Front Side Bus	800MHz for P4 & PD, 533MHz for Celeron	800MHz
I/O Channels	4 total: 2 x Gigabit embedded NICs plus one of two risers: Riser 1: 1 x 64- bit/133MHz PCI-X slot, 1 PCI Express x8 slot Riser 2: 1 PCI Express x8 slot, 1 PCI Express x4 slot	5 total: 2 slots on separate PCI buses: either PCI-X riser with 1 x 64-bit/133MHz and 1 x 64-bit/100MHz OR Express riser with one x4 and one x8 lane slots 2 x embedded Gigabit NICs, Management port for DRAC 4/I (optional)
Starting/ Maximum	256MB/8GB DDR-2 533/667 SDRAM Support for dual channel memory	256MB/12GB (16GB with availability of 4GB dual

Features	PowerEdge 850	PowerEdge 1850
Memory	architecture	rank DIMMS) 400MHz DDR2 SDRAM
Availability	ECC memory Optional SATA and SCSI RAID solutions; Tool-less chassis DRAC 4/p for accessing the system independent of the OS status	Hot-plug hard drives Hot-plug, redundant power Redundant cooling Memory: ECC, Spare Row, Spare Bank SDDC (Single Device Data Correction), Mirroring ROMB w/ battery backed 256MB DDR2 cache HA failover cluster support DRAC 4/I for accessing the system independent of the OS status
Internal Storage Scalability	2 x 3.5" SATA or U320 SCSI drives	2 x 3.5″ U320 SCSI drives
Internal Storage Performance	10K and 15K RPM U320 SCSI drives; 7200 RPM SATA drives	10K and 15K RPM U320 SCSI drives
External Hard Drive Storage	PowerVault™ 22XS	PowerVault 22XS Dell/EMC
Embedded SCSI	N/A	Single channel U320 SCSI
RAID support	Optional CERC SATA 1.5Gb/6 Ch. for SATA hard drives; PERC 4/SC and PERC 4e/DC for SCSI hard drives	Optional single channel ROMB Optional PERC 4/DC, PERC 4/SC and PERC 4e/DC
Tape Support	External: PowerVault 124T and 114T 1U AutoLoader, PowerVault 122T 2U AutoLoader	Internal: N/A External: PowerVault 132T, PV 136T, PV 122T (2U), PV112T (1U) and PV114T (1U)
Video	XGI GX20 on motherboard with 16MB memory	Embedded ATI Radeon 7000-M with 16MB memory
Networking	Dual embedded Gigabit NICs – Broadcom Dual 5721J; single and dual port Intel PRO/1000 MT Gigabit Adapter (copper); single port, Intel PRO/100S; single and dual port Intel PRO/1000 PT	Dual embedded Intel Gigabit NICs, single and dual port Intel PRO/1000 MT™ adapters (copper), Intel PRO/1000 MF (optical); Intel PRO/100S (test

Features	PowerEdge 850	PowerEdge 1850
	(PCI Express)	only); single and dual port Intel PRO/1000 PT (Express) (RTS+)
High Availability Clustering	No	Yes, SCSI and FC
Chassis	1U, Tool-less access	1U, Tool-less rack only
Power Supply	1 x 345W non-redundant	2 X 550W redundant (optional)
Remote Management	Standard BMC with IMPI 1.5 support Optional DRAC 4/p for advanced capabilities	Standard BMC with IMPI 1.5 support Optional DRAC 4/I for advanced capabilities
Systems Management	Dell OpenManage	OpenManage support
Rack Support	**4-post (Dell rack), 2-post and 3rd party Versa rails** (sliding) Cable Management Arm (CMA).	**4-post (Dell rack)**

Features and Key Customer Benefits

The features and benefits of the PowerEdge 850 are shown in Table 3.

Table 3
Features and Benefits of the PowerEdge 850

Feature	Benefit
Performance	
Single Pentium 4 Prescott processor at 2.8GHz, 3.2GHz, 3.6GHz and 3.8GHz with 800MHz front side bus (FSB); or P4 Prescott Celeron at 2.53 GHz; or PD dual core at 3.0 and 3.2 GHz.	Enhanced Intel® Pentium® 4 Processor ("Prescott") provides high clock speeds (up to 3.8GHz), double cache size compared to previous generation (2MB L2 cache) and EM64T 64-bit capability. The system has expandability to 1067 MHz FSB when Intel introduces mainstream processor running at that speed.
Intel E7230 (Mukilteo) chipset	The E7230 (Mukilteo) chipset is the next generation server chipset technology, optimized for the Intel P4 Prescott Socket-T processors and is designed to support new DDR2 533/667 Memory technology, the advanced PCIe system I/O bus, dual core processors and 1067 MHz FSB speeds. The E7230 can deliver maximized system bus, memory, and I/O bandwidth to enhance performance, scalability, and end-user productivity.
PCI Express I/O technology	PCI Express is compatible with existing PCI drivers, applications, and operating systems and designed from the ground up for 10 Gigabit and beyond network bandwidth. The new bus technology is expected to allow the PCI Express transmission rates to keep pace with processor and I/O advances for the next 10 years or more. This technology has the ability to scale speeds by forming multiple lanes- x1, x4, x8, x16 and in the future x32 lane widths Being point-to-point connection architecture, PCI Express allows each device to have a dedicated connection without sharing network bandwidth. PCI Express provides higher bandwidth per pin than PCI-X I/O technology. PCI Express provides advanced error checking features and built-in Quality of Service (QoS) capabilities. Low Cost - PCI Express is serial, point to point connection architecture for easy electrical routing, and it requires fewer parts (bridges and ASICs), smaller connectors and fewer board layers compared to a PCI-based system design.
Availability:	
SCSI hard drives	Provides high speed and reliable SCSI drives.
ECC memory	This feature allows the system to tolerate single-bit memory errors of a memory chip on a DIMM.
Expandability:	
Up to 8GB of DDR2 SDRAM	The system supports a minimum of 256MB up to 8GB of DDR2 533/667 SDRAM via dual memory channels, which helps to improve system performance in some applications. 8GB of memory also provides more flexibility for 64-bit applications that can address more than 4GB of flexible memory when a 64-bit operating system is used.

Service and Support

Please note: Dell services vary by region. The services listed below are available in the United States; please contact your local representative for more information, or visit http://www.support.dell.com/home.aspx.

Dell Enterprise Services

Dell offers a broad portfolio of Enterprise services that help optimize the use of IT technologies, rapidly deploy systems, educate IT professionals and maximize system uptime. Dell provides expert advice and technical assistance and a single point of contact, and helps reduce overall total cost of ownership (TCO).

Dell Professional Services Offerings

- Migration and Consolidation
- Messaging and Collaboration
- High Availability and Infrastructure Performance
- Internet Business
- Industry Specialization

Dell Deployment Services Offerings

- Custom Factory Integration (CFI) Services provide high-quality, one-touch integration of enterprise hardware and software
- Asset Discovery
- Customized delivery helps ensure timely response when and where required
- On-site installation, de-installation, moves, and upgrades by trained and experienced technicians
- Asset Recovery Services offers efficient and environmentally friendly disposal for non-functional or older equipment designed to comply with EPA standards.

Training and Certification Services

Dell Enterprise Courses - Enterprise training to help you prepare for Dell certifications and help increase your productivity on Dell Enterprise systems.

Dell Certifications - Get trained and certified on Dell Enterprise systems.

Dell K-12 Professional Development - Improve your staff's technology proficiency. Assessments, training, and classroom technology integration.

Online Training & Certification - Over 1,200 courses ranging from home technology and productivity to business and education skills and IT certifications.

Dell Hardware Maintenance Courses - Online and instructor-led training for self-maintainers. Service technicians get lab experience troubleshooting Servers, Desktops, and Portables.

Red Hat® Linux® Certifications - Customer-site courses for Linux. Linux Workstation Management, Linux Professional Enterprise Administration, and more.

2003 Microsoft Courses - All new courses for Microsoft Windows XP Professional, .NET and Active Directory.

2000 Microsoft Courses - Customer-site courses for Microsoft Windows XP, Exchange, SQL Server, and more.

Support Services

- Platinum Enterprise Support Services = Comprehensive site-based support for complex production and operational environments.
- Gold Enterprise Support Services = Rapid, expert support for key systems, such as production and operational servers.
- Silver Enterprise Support Services = Enhanced, prompt hardware and software support for non-critical systems, such as departmental or development servers.
- Basic Enterprise Support Services = Basic hardware support for simple systems, such as file or print servers, with Next Business Day on-site[3] response.[I think the name Bronze is gone, isn't it? Don't we call it Basic Enterprise Support now? See attached e-mail from Dell Services counsel.]
- Software support for enterprise software including Windows, Novell, and Linux
- Limited warranty[5] and Service and Support are provided with all Dell servers including 30 Day Getting Started Phone Support, 7x24 lifetime technical phone support, E-support, and NBD on-site[4] response
- Service Upgrades to enable rapid resolution through same day on-site[4] services
- OpenManage Subscription Services to keep customers informed of the latest BIOS, drivers, and utilities to help better manage the Dell solution.

Dell cannot be responsible for errors in typography and photography.

[1] Based on the Specint_rate2000 benchmark and WebBench 6.0 tests performed by Dell Labs in June 2005 comparing the PowerEdge 850 with a Pentium D 3.0 GHz processor with the PowerEdge 750 with a 3.0GHz Pentium 4 processor. All other relevant configs of the two systems were identical. Actual performance will vary based on configuration, usage and manufacturing variability.

[2] Based on the Specint_rate2000 and WebBench 6.0 benchmark tests performed by Dell Labs in June 2005 comparing a PowerEdge 850 with a Pentium D 3.0 GHz processor with the same system using a 3.0GHz Pentium 4 processor. All other relevant configs of the two systems were identical. Actual performance will vary based on configuration, usage and manufacturing variability.

[3] This term does not connote an actual operating speed of 1 Gb/sec. For high speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

[4] Service may be provided by third-party. Technician will be dispatched if necessary following phone-based troubleshooting. Subject to parts availability and geographical restrictions. Service timing dependent upon time of day call placed to Dell. Subject to terms of service contract. U.S. only.

[5] For a complete copy of our guarantees or limited warranties, please visit http://www.dell.com/us/en/gen/services/service_service_contracts.htm or write to Dell USA L.P., One Dell Way, Round Rock, Texas 78682, Attn: Warranties.

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