

DELL™ POWEREDGE™ ENERGY SMART SERVERS



THE SMART CHOICE FOR OPTIMIZING YOUR DATA CENTER

LEADING THE CHARGE ON ENERGY OPTIMIZATION

IT organizations across the globe are working harder than ever to deliver greater data center performance and capacity for today's demanding applications and workloads. However, achieving these performance gains usually results in higher energy consumption and increased power and cooling costs. What's worse, data centers often surpass cooling capabilities before reaching their full compute capacity — an inefficient use of valuable IT resources. A problem that is compounded by rising energy costs, IT organizations are looking for more energy-efficient products that can lower their total cost of ownership.

That's where Dell comes in. Our end-to-end approach helps customers worldwide solve their power and cooling challenges and meet the demands of business growth with industry-standard solutions. We offer solutions you can deploy right now, as well as the right mix of tools, partnerships, and services to help you get the most from your existing infrastructure without the expense of retrofitting or expansion.

We have a long-standing commitment to promoting energy optimization throughout the industry. Not only were we the first company to introduce energy-optimized 1U and 2U industry-standard servers, we are a founding sponsor of The Green Grid, an association of technology vendors chartered to lower overall power consumption in global data centers. By working closely with standards organizations like the Standard Performance Evaluation Corporation (SPEC®) and leading technology partners, we are helping customers drive productivity — without driving up costs — like never before.

SERVERS DESIGNED FOR YOUR INFRASTRUCTURE

By lowering power consumption and complexity, Dell PowerEdge Energy Smart servers are designed to deliver what your IT infrastructure needs most: outstanding performance, reduced operational costs, and greater efficiency. No matter what your data center requirements, whether you run on AMD or Intel®, Dell Energy Smart servers have the right choice for you. Each one of our Energy Smart servers — the 1950 III, 2950 III, and 2970 — can help you save valuable space and resources, lower operating costs, and manage explosive business growth, all while working with your existing technologies.

SAVE OVER \$1 MILLION DOLLARS WITH DELL ENERGY SMART SERVERS

Every business needs to balance energy optimization with performance and price, and PowerEdge Energy Smart servers truly deliver. Consider the results: in industry testing, the latest generation of Dell PowerEdge Energy Smart servers use up to 14% less energy at peak performance over similarly configured standard Dell servers,¹ and for large data centers can help save in excess of \$1 million dollars in operational expenses over the lifecycle of the server.² Dell networked storage solutions, such as the Dell/EMC SAN arrays or PowerVault™ NAS servers, can further reduce power and cooling costs and improve capacity utilization by right-sizing application profiles with the appropriate system and storage medium.

No matter which Dell solution you choose, you get leading-edge technology that can save you more money with reduced power consumption and cooling costs while delivering the performance your business demands.



INNOVATION COMES FROM WORKING TOGETHER

Achieving tangible gains in energy optimization depends on improving technology — and the means to measure its results. To help customers better deploy and evaluate their power and cooling requirements, we work with SPEC and partner with companies like APC, Liebert, Sanmina-SCI, and Rittal to drive innovation that delivers real, measurable results.

YOU DON'T HAVE TO GO IT ALONE

If deploying hardware and managing your data center makes it difficult to balance your computing needs with space and power constraints, our services can help. Dell is singularly focused on making your business agile by offering a complete portfolio of Services capabilities and smartly designed tools to unlock the value of your IT environment.

- **Dell's Infrastructure Consulting Services.** Help drive efficiency and better performance throughout your IT infrastructure with our expert assistance in evaluation and design.
- **Dell Virtualization Services.** Help maximize your data center capacity and lower power consumption by reducing the number of physical servers in your infrastructure with Dell's expertise and best practices.
- **Dell Consolidation Services.** Can reduce server and storage sprawl and inefficiency by improving utilization and performance across your IT Infrastructure.
- **Dell Migration Services.** Gain the benefits of simplified IT and improved utilization with a complete hardware and software migration.
- **Dell Enterprise Support Services.** Dell offers "best-of-breed" Enterprise Support Services at varying levels to help you strike just the right balance between maximum uptime and its associated costs.
- **Dell Data Center Capacity Planner.** Make better hardware deployment decisions by estimating power, cooling, airflow, weight, and other top considerations for running an efficient data center.

VALUE THAT EXTENDS BEYOND TECHNOLOGY

When you choose Dell, you get the advantages of working directly with us — an end-to-end approach to data center optimization that can best meet your performance and capacity needs.

Dell's approach to helping customers solve the power and cooling challenges through Industry-standard solutions allows you to be empowered with the right products, tools, partnerships, and services to balance energy consumption with performance across your computing environment. The following pages offer more technical information and system specifications to help you make the right choice.

DELL PARTNERSHIPS



**DELL POWEREDGE
ENERGY SMART 1950 III**

server delivers the data center performance and capacity you need with:

- Two-socket, Quad-Core Intel® Xeon® performance, 10th generation design commonalities and layout in a rack dense, 1U form factor
- Simple updates to BIOS, system drivers, firmware, operating systems, and applications from one easy-to copy template make it easy to manage remotely
- Ideal technology for edge-of-network, infrastructure, SAN front-end, thin client/server, and High Performance Computing Clusters (HPCC) applications

HELP INCREASE COMPUTE DENSITY IN YOUR EXISTING INFRASTRUCTURE. DEPLOY 11 DELL POWEREDGE ENERGY SMART SERVERS IN THE SAME ENERGY FOOTPRINT REQUIRED TO RUN 10 SIMILARLY CONFIGURED STANDARD DELL POWEREDGE SERVERS.³

FEATURES	DELL™ POWEREDGE™ ENERGY SMART 1950 III SERVER
Form Factor	1U rack height
Processors	Up to two Quad-Core or Dual-Core Intel® Xeon® low-volt processors
Front Side Bus	1333MHz Front Side Bus (FSB)
Cache	Up to 2x6MB
Chipset	Intel® 5000X
Memory	1GB/2GB Dual Ranked DIMMs in matched pairs; 667MHz; 8 sockets for support up to 16GB
I/O Slots	Two slots on separate PCI buses with PCI Express riser with two x8 lane slots
RAID Controller	Optional PERC 6/i integrated SAS/SATA II controller
Drive Bays	Four hard drive chassis with 4 x 2.5" SAS (10K) drives; Peripheral bays: 1 slim optical drive bay with choice of optional CD-ROM, optional DVD-ROM or combo CD-RW/DVD-ROM
Maximum Internal Storage	Up to 584GB: four 146GB hot-plug 2.5" SAS (10K RPM)
Hard Drives	2.5" SAS (10K RPM): 73GB, 146GB 2.5" SAS (15K RPM): 36GB , 73GB
External Storage	Dell PowerVault™ 22xS and Dell/EMC products
Tape Backup Options	Internal: none External: Dell PowerVault Storage Solutions
Network Interface Card	Dual embedded Broadcom® NetXtreme II™ 5708 Gigabit Ethernet NIC with fail-over and load balancing; TOE (TCPIP Offload Engine) supported on Microsoft® Windows Server® 2003, SP1 or higher with Scalable Networking Pack.
Power Supply	Energy Smart hot-plug redundant power (1+1)
Availability	Hot-plug hard drives; hot-plug redundant power; redundant cooling; ECC memory; Spare Row; Single Device Data Correction (SDDC); / PERC 6/i integrated daughter card; high availability failover cluster support; DRAC5
Video	Embedded ATI ES1000 with 16MB memory
Remote Management	Standard Baseboard Management Controller with IPMI 2.0 support; optional DRAC5 for advanced capabilities
Systems Management	Dell OpenManage™
Rack Support	4-post (Dell rack), 2-post and 3rd party Versa rails, sliding rails and Cable Management Arm
Operating Systems	Microsoft® Windows® Server 2008, Microsoft Windows Server 2003, SUSE Linux® Enterprise Server, Red Hat® Enterprise Linux, VMware VI 3.5, Citrix™ XenServer™

SIMPLIFY ENERGY EFFICIENCY AT DELL.COM/Energy/PowerEdge



**DELL POWEREDGE
ENERGY SMART 2950 III**

server delivers an excellent balance of outstanding performance, availability, and flexibility with:

- A 2U chassis for organizations that require space-conscious internal storage capacity rather than an external storage system
- Support for up to two of the latest Quad-Core Intel® Xeon® Low-Volt Processor
- As much as 32GB of fully buffered DIMM memory for exceptional memory throughput and capacity

DELL POWEREDGE ENERGY SMART 2950 III HAS 17% BETTER PERFORMANCE/WATT THAN HP PROLIANT DL380 G5 AND IBM SYSTEM x3650.⁴

FEATURES	DELL™ POWEREDGE™ ENERGY SMART 2950 III SERVER
Form Factor	2U rack height
Processors	Up to two Quad-Core or Dual-Core Intel® Xeon® low-volt processors
Front Side Bus	1333MHz Front Side Bus (FSB)
Cache	Up to 2x6MB
Chipset	Intel® 5000X
Memory	Up to 16GB (8 DIMM slots): 1GB/2GB/4GB Dual Ranked DIMMs in matched pairs, 667MHz
I/O Slots	Three PCI slots, PCIe riser with three PCI Express slots (one x4 (x8 connector) and two x8)
Drive Controller	4 port SAS 6/i integrated SAS controller (no RAID)
RAID Controller	Optional PERC 6/i integrated SAS daughtercard controller
Drive Bays	8 x 2.5" Hard Drive Option; 2.5" HD Option: up to 8 SAS HDs (10K); Peripheral bay options; Floppy Drive, DAT72 Tape Drive (not available with 6 x3.5" hard drive base); Slim optical drive bay with choice of CD-ROM, DVD-ROM or Combo CD-RW/DVD-ROM
Maximum Internal Storage	Up to 1.2TB; eight 146GB hot-plug SAS (10K RPM)
Hard Drives	2.5" SAS (10K RPM): 36GB, 73GB, 146GB
External Storage	SAS, SCSI and fibre channel storage systems
Tape Backup Options	External: Dell PowerVault™ Storage Solutions
Network Interface Card	Dual embedded Broadcom® NetXtreme II™ 5708 Gigabit Ethernet NIC with fail-over and load balancing. TOE (TCPIP Offload Engine) supported on Microsoft® Windows Server® 2003, SP1 or higher with Scalable Networking Pack
Power Supply	Energy Smart hot-plug redundant power (1+1)
Availability	SDDC, Spare Bank; hot-plug hard drives; hot-plug redundant power supplies; dual embedded NICs with failover and load balancing support; optional PERC6/i integrated daughtercard controller with battery-backed cache; hot-plug redundant cooling; tool-less chassis; fibre and SCSI cluster support; validated for Dell/EMC SAN
Video	Embedded ATI ES1000 with 16MB memory
Remote Management	Standard Baseboard Management Controller with IPMI 2.0 support; optional DRAC5 for advanced capabilities
Systems Management	Dell OpenManage™
Rack Support	4-post (Dell rack), 2-post and 3rd party Versa rails, sliding rails and Cable Management Arm
Operating Systems	Microsoft® Windows Server 2008, Microsoft® Windows Server 2003, SUSE® Linux® Enterprise Server, Red Hat® Enterprise Linux, VMware™ VI 3.5, Citrix™ XenServer™

SIMPLIFY ENERGY EFFICIENCY AT DELL.COM/Energy/PowerEdge



DELL POWEREDGE ENERGY SMART 2970

server offers outstanding performance, energy optimization, and value with:

- The performance of AMD Opteron™ processors within the same thermal envelope — delivering excellent performance without the need for additional data center capacity
- The right combination of hardware, software, and services to help you virtualize your IT environment
- Common behavioral specifications, layout and labeling conventions with the 10th generation of Dell PowerEdge servers

LARGE DATA CENTERS,
DEPLOYING POWEREDGE
ENERGY SMART SERVERS
CAN SAVE IN EXCESS OF \$1
MILLION DOLLARS OVER THE
LIFECYCLE OF THE SERVERS IN
OPERATIONAL EXPENSES.²

FEATURES	DELL™ POWEREDGE™ ENERGY SMART 2970 SERVER
Form Factor	2U rack height
Processors	Up to two quad-core Low Power AMD Opteron™ 2300 HE series processors
HyperTransport	1GHz AMD HyperTransport™ Technology
Cache	Up to 2x1 MB L2 Cache
Chipset	Broadcom HT-2100 and HT-1000 server I/O controllers
Memory	Up to 16GB (8 DIMM slots): 1GB/2GB Dual Ranked DIMMs in matched pairs, 667MHz
I/O Slots	Three PCIe slots, (one x4 with x8 connector and two x8)
Drive Controller	SAS 6/iR, SAS 5/i
RAID Controller	Optional integrated PERC 6/i, PERC 5/i, SAS 6/iR, or SAS 5/i
Drive Bays	8 x 2.5" Hard Drive Option; Peripheral bay options; Floppy Drive, PowerVault 100T Tape Drive, RD1000 removable disk drive backup device; Slim optical drive bay with choice of CD-ROM, DVD-ROM or Combo CD-RW/DVD-ROM
Maximum Internal Storage	Up to 1,168GB: eight 146GB hot-plug SAS (10 K RPM)
Hard Drives	2.5" SAS (10K RPM) 73GB, 146GB, and 2.5" SATA (7.2K RPM) 80GB, 120GB
External Storage	SAS, SCSI and fibre channel storage systems
Tape Backup Options	Dell PowerVault™ Storage Solutions
Network Interface Card	Dual embedded Broadcom® NetXtreme II™ 5708 Gigabit Ethernet NIC with fail-over and load balancing. TOE (TCPIP Offload Engine) supported on Microsoft Windows Server 2003, SP1 or higher with Scalable Networking Pack. Optional iSCSI offload enablement
Power Supply	Energy Smart hot plug power supply
Availability	ECC DDR2 SDRAM, SDDC, Spare Bank; hot-plug hard drives; optional hot-plug redundant power supplies; dual embedded NICs with failover and load balancing support; optional PERC6/i integrated daughtercard controller with battery-backed cache; hot-plug redundant cooling; tool-less chassis; fibre and SAS cluster support; validated for Dell/EMC SAN
Video	Embedded ATI ES1000 with 16MB memory
Remote Management	Standard Baseboard Management Controller with IPMI 2.0 support; optional DRAC5 for advanced capabilities
Systems Management	Dell OpenManage™
Rack Support	4-post (Dell rack), 3rd party Versa rails, sliding rails and Cable Management Arm
Operating Systems	Microsoft® Windows Server 2008, Microsoft Windows Server 2003; Red Hat® Linux® Enterprise v5; SUSE Linux Enterprise Server 10 x86-64, Solaris™ 10

SIMPLIFY ENERGY EFFICIENCY AT DELL.COM/Energy/PowerEdge

¹ Performance per watt claims based on SPECpower_ssj2008 benchmark testing performed by Dell in May 2008 comparing a Dell PowerEdge 2950 III to a Dell PowerEdge 2950 III Energy Smart each with two Quad-Core Intel Xeon 5420 (E and L, respectively), 2.50 GHz processor, 8GB/667 MHz of Memory, and a 73.4GB SAS (15K and 10K RPM, respectively) hard drive with system power management policy always on.

² Energy cost was obtained from the International Energy Agency and represents a worldwide average of \$.085 per kWh based on 2006 global average cost of energy. Assumes server operation 24 hours a day, 365 days a year; "large" data centers are those deploying 5000 or more 1U servers. Actual AC power measurements were obtained using an Extech 380803 Power Analyzer taken during the peak load of the SPECpower_ssj2008 benchmark test performed by Dell Labs in May 2008. The PE1950 III Energy Smart configuration consisted of two dual-core Intel Xeon L5420 (2.50 GHz LV) processors, 8x1GB 667MHz FBDIMMs, and 2x73GB 10K 2.5" SAS drives running Windows Server 2003 x64 Enterprise Edition, compared to a PE1950 III standard configuration of two dual-core Intel Xeon E5420 (2.50GHz) processors, 8x1GB 667MHz FBDIMMs, and 2x73GB 15K 3.5" SAS drives running Windows Server 2003 x64 Enterprise Edition. Actual performance and power consumption will vary based on configuration, usage and manufacturing variability.

³ Energy efficiency claims based on SPECpower_ssj2008 benchmark testing performed by Dell in May 2008 comparing a Dell PowerEdge 2950 III to a Dell PowerEdge 2950 III Energy Smart each with two Quad-Core Intel Xeon 5420 (E and L, respectively), 2.50 GHz processor, 8GB/667 MHz of Memory, and a 73GB SAS (15k and 10K RPM, respectively) hard drive with system power management policy always on. Testing showed average power measurement of 277 watts for the Dell PowerEdge 2950 III and 242 watts for the Dell PowerEdge 2950 III Energy Smart server. Actual performance and power consumption will vary based on configuration, usage and manufacturing variability.

⁴ Based on internal Dell testing in August 2008 using SPECpower_ssj2008. Each server was configured with 2 x Intel® Xeon® L5420 (2.50 GHz/50W TDP) processors, 8x1GB DDR2-667 FBDIMM, 2x73GB 10K drives (1U) and 4x73GB 10K drives (2U), 1 DVD-ROM drive, 2 power supplies, and Windows Server 2003 R2 x64 Enterprise Edition running Oracle JRockit P27.5.0-5-97156. Power saving mode was enabled in the BIOS and in the operating system for each server.

