



SOLVE YOUR IT ENERGY CRISIS WITH AN ENERGY SMART SOLUTION FROM DELL



OVERCOME DATA CENTER ENERGY CHALLENGES

IT managers share a common and pressing problem: how to reduce energy consumption and cost without compromising IT performance. The solution: combine the right tools, the right services, and the right provider. And do it all at the right price. The solution begins with Dell™ PowerEdge™ Energy Smart servers.

RISING ENERGY CONCERNS REQUIRE PROMPT ACTION

Our customers tell us that improving data center efficiency is a top management priority. Globally, IT managers deal with similar issues:

Capacity is maxed out

The power utility is reluctant to supply another watt to your facility.

Physical limitations in the data center

A new server would require a new room.

Legacy limitations

Power overhead per rack used to be much lower.

Meet energy savings objectives

The objectives are clear: implement the most energy-efficient technologies available.

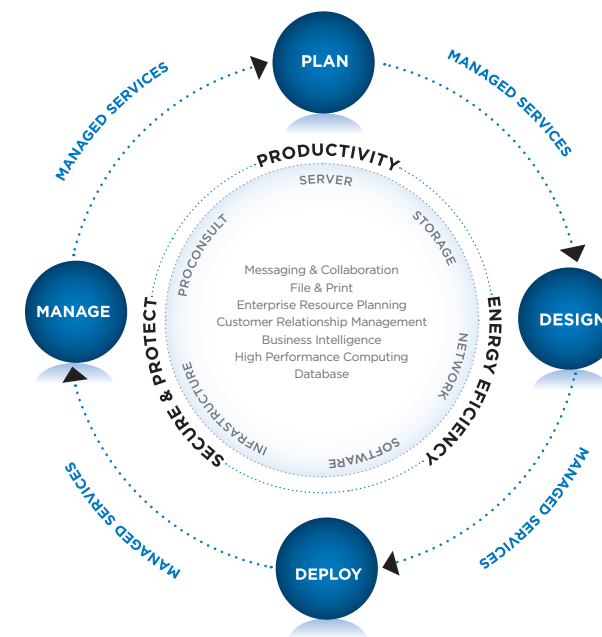
Moving forward, you must find new ways to help maximize energy efficiency while keeping pace with ongoing business demands. You need a total solution that helps balance server workloads and helps cut energy requirements.



THE DELL SOLUTION

What makes Dell the right choice is our ability to architect solutions that are right for you and are in sync with your unique requirements. Additionally, by offering technology, service, and support, we can help you throughout the process — from evaluation through implementation — in a cost-effective way.

Dell can help you right-size data center investments, improve productivity, and minimize power and cooling costs. Our Dell Energy Smart Data Center Assessment uses infrastructure and thermal analysis to help maximize data center efficiency. Whether you're changing platforms or creating a new IT environment, Dell's broad, customizable services portfolio can help simplify assessment, design, implementation, management, and support.



MEGA-SCALE DATA CENTER	Data Center Solutions (Cloud Computing)
LARGE-SCALE DATA CENTER	Dell ProConsult - Data Center Optimization Dell™ PowerEdge™ Servers with Energy Smart Technology Energy Smart Management Software PowerVault™ Network Attached Storage PowerVault Data Protection Physical Infrastructure (Power, Cooling & Racks) Dell EqualLogic™ Series SAN Arrays
SMALL-SCALE DATA CENTER	Dell ProConsult - Data Center Optimization PowerEdge Servers with Energy Smart Technology Energy Smart Management Software PowerVault Network Attached Storage Physical Infrastructure (Power, Cooling & Racks) Dell EqualLogic Series SAN Arrays
DATA ROOM / REMOTE BRANCH	Dell ProConsult - Remote Branch Office Solution PowerEdge Servers with Energy Smart Technology Energy Smart Management Software PowerVault Direct Attached Storage Physical Infrastructure (Power, Cooling & Racks) Dell ProManage - Managed Services for Small Business
DATA CLOSET / REMOTE BRANCH	PowerEdge Servers with Energy Smart Technology Disk Storage/Tape Backup Physical Infrastructure (Power, Cooling & Racks) Dell ProManage - Managed Services for Small Business

EXPECT DELL TO DELIVER:

Immediate, end-to-end solutions to help solve power and cooling challenges while meeting business growth demands with standards-based solutions.

The right mix of tools, partnerships, and services can help you get more out of your infrastructure without the cost and hassle of retrofitting or expanding your data center.

HOW ENERGY SMART CAN HELP YOU REACH EFFICIENCY GOALS



DELL ENERGY SMART TECHNOLOGIES — DESIGNED TO HELP MAXIMIZE PERFORMANCE PER WATT

Dell is intensely focused on driving energy efficiency into our latest generation of servers, storage, and infrastructure products. For example, based on customer input and our corporate Green IT initiative (DELL.COM/Green), we challenged our engineers to raise the bar on energy efficiency. They delivered.

The result: From servers to storage devices, consulting to services, Dell can deliver a holistic solution to help maximize IT productivity while significantly reducing energy consumption.

Dell delivers exceptional performance per watt

Our technologies are designed to help IT departments balance performance and consumption without armies of consultants and costly retooling.



“The power monitoring capabilities of the Dell™ PowerEdge™ R710 servers provide tremendous benefits ... we can optimize energy efficiency for our current data centers and produce more accurate power forecasts for new data centers.”

Tony Villa
Server Hardware Product Manager
Pacific Gas & Electric Co., March 2009



Dell's goal is to become the greenest technology company on the planet. We believe it's important to consider the environmental impact at every stage in the product life cycle. Dell is redefining the Green Data Center as part of our commitment to helping our customers compute more while consuming less. Our holistic approach to Data Center Productivity enables our customers to meet growing computing needs while also helping to drive down costs and support their environmental responsibility goals. Dell is committed to helping you utilize resources more effectively and realize greater performance with less energy and cost.

DELL POWEREDGE SERVERS DIRECTLY ADDRESS YOUR ENERGY NEEDS

Our latest line of PowerEdge servers includes new components designed to help drive energy efficiency as a design standard while helping to deliver the performance your business requires to meet your own environmental and cost goals.

DELL POWEREDGE SERVERS DELIVER:

Dell Energy Smart Power Supplies

Energy Smart Power Supply Units (PSUs) are engineered to achieve some of the highest efficiencies in the industry. They include options for right-sized or dynamically provisioned power supplies in the case of blades. “Right-sizing” means taking unneeded overhead out of the server power envelope.

Dell Energy Smart System Design

Dell delivers breakthrough system design to help lower the overall system-level power draw of PowerEdge blade, rack, and tower servers. Leveraging high-efficiency voltage regulators, greater venting and airflow, Dell's “low-flow” fan technology, and advanced resource management, our latest generation of PowerEdge servers come ready to help maximize performance per watt.

In addition, all 11th generation PowerEdge servers come with an extensive collection of sensors that can automatically track thermal activity helping regulate temperatures and reduce energy consumption. These sensors (consider that the R610 comes with 44 sensors, the R710 with 35 sensors, and the T610 with 25 sensors) are designed to automatically make adjustments to help reduce energy usage.

Dell Active Power Controller (DAPC)

Our operating system-agnostic power-management capability can save you money by lowering the system-level power draw at times of low utilization. A Dell exclusive, PowerEdge servers with DAPC can outperform other OS-based power management solutions head-to-head in PowerEdge servers with the widely used SpecPower benchmark.¹

Dell Energy Smart Management

Incorporating a significant increase in functionality over previous generations, Dell Energy Smart Management features include power capping, advanced power policies, power scheduling, and device disablement.

High-Efficiency Processors and Memory

Dell incorporates some of the latest processor and memory technologies to target the highest performance per watt for standards-based servers.

DELL ENERGY SMART: BUILT TO LOWER ENERGY COSTS

Dell Active Power Controller = Up to 15.7% energy savings²

Dell Energy Smart Power Supplies = Up to 8.4% energy savings³

Dell Energy Smart System Design = Up to 16% energy savings⁴

High-Efficiency Processors = Intel® Xeon® 5500 series can deliver computing performance up to 2.25x over existing Intel Xeon 5400 series⁵

Help increase energy efficiency by enabling Dell Energy Smart Management

A BETTER TCO FOR GOING GREEN

With low power consumption and complexity, Dell™ PowerEdge™ servers can help deliver what your IT infrastructure needs most: outstanding performance, low operational costs, and exceptional efficiency.



Today, many customers are looking for ways to expand the productive capacity of their data centers while reducing energy consumption. By refreshing existing hardware platforms and adopting more effective energy policies driven by business requirements, opportunities for savings exist. In extreme cases, a “fork lift” upgrade will be required, while in other cases, less dramatic action is required. As a result, Dell now provides a tool that can help model the financial and physical impact of moving to a virtualization or high-density environment.

Below is an energy TCO hypothetical that outlines the potential savings around the areas of direct and indirect power, real estate, adaptive usage, and existing system maintenance that come with migration from legacy server platforms to Dell’s new PowerEdge Servers with virtualization capabilities.

CURRENT ENVIRONMENT

Current Servers 300
HP DL 380 G4 3.0GHz (2GB RAM)

% of Servers Virtualized 0

Rack Count 17

Electric Bill (Annual) **\$240,929**

Real Estate Cost (Annual) **\$459,000**

ENVIRONMENT AFTER REFRESH

Target Servers 94
Dell M610 (E5530 w/24GB RAM)

% of Servers Virtualized 75

Target Rack Count 5

Target Electric Bill (Annual) **\$61,078**

Real Estate Cost (Annual) **\$135,000**

Bottom Line Savings = **\$179,850**/year in Energy Savings (Projected) = **74.6% SAVINGS**
\$324,000/year in Real Estate Savings (Projected) = **70.6% SAVINGS**
DATA CENTER PHYSICAL FOOTPRINT REDUCED BY 70%

Assumptions: Cost of Electricity at \$0.10/kW hr; 5kW/rack; PUE of 2.8 used in electricity calculations; \$1,000/sq ft annual real estate cost; 12vms/1 new physical server.

INNOVATION COMES FROM WORKING TOGETHER

Achieving tangible gains in energy optimization depends on improving technology — and the means to measure its results. To help you better evaluate, deploy, and manage power and cooling requirements, Dell works with world-class partners throughout the technology life cycle to drive innovation that delivers real, measurable results.

Dell has a long-standing commitment to promoting energy optimization throughout the industry. We are the first company to introduce energy-optimized 1U and 2U industry-standard servers, and Dell is a sponsor of The Green Grid, an association of technology vendors chartered to help lower overall power consumption in global data centers.



By working closely with organizations like the Standard Performance Evaluation Corporation (SPEC®) and other leading technology partners, we are helping customers drive productivity — without driving up costs — like never before.



“The Dell PowerEdge R610 server and PowerEdge M610 blade server will help us reduce overall power consumption... These systems give us five times the processing capacity for the same amount of power as servers we acquired only three years ago.”

Gary Jung, Manager
 Scientific Cluster Support Project
 Lawrence Berkeley National Laboratory, University of California, March 2009



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¹ Based on SPECpower_ssj2008 benchmark testing performed by Dell Labs in February 2009 comparing the Dell PowerEdge R710 running Microsoft Windows 2008 Server Ed. SP1 with Dell Active Power Controller enabled versus Windows Balanced power management enabled.

² Actual performance and power consumption will vary based on configuration, usage and manufacturing variability.

³ Based on Dell Labs testing in November 2008 comparing total AC load results for the Dell PowerEdge 1950 III power supply to the Dell PowerEdge R610 Energy Smart power supply using redundant configurations and fixed total DC load of 75W. Actual performance and power consumption will vary based on configuration, usage, and manufacturing variability.

⁴ Based on power measurements using an Extech 380803 Power Analyzer by Dell Labs in July 2008 comparing the PowerEdge R610 with dual quad-core Intel Xeon x5570 processors and 6 SAS drives to the PowerEdge 1950 III with dual quad-core Intel Xeon processors and 2 SAS drives. Actual performance will vary based on configuration, usage and manufacturing variability.

⁵ SOURCE: Intel internal measurement. (Feb 2009). For more information, see <http://www.intel.com/Assets/PDF/prodbrief/321579.pdf>

Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance. Buyers should consult other sources of information to evaluate the performance of systems or components they are considering purchasing. For more information on performance tests and on the performance of Intel products, visit <http://www.intel.com/performance/resources/limits.htm>

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