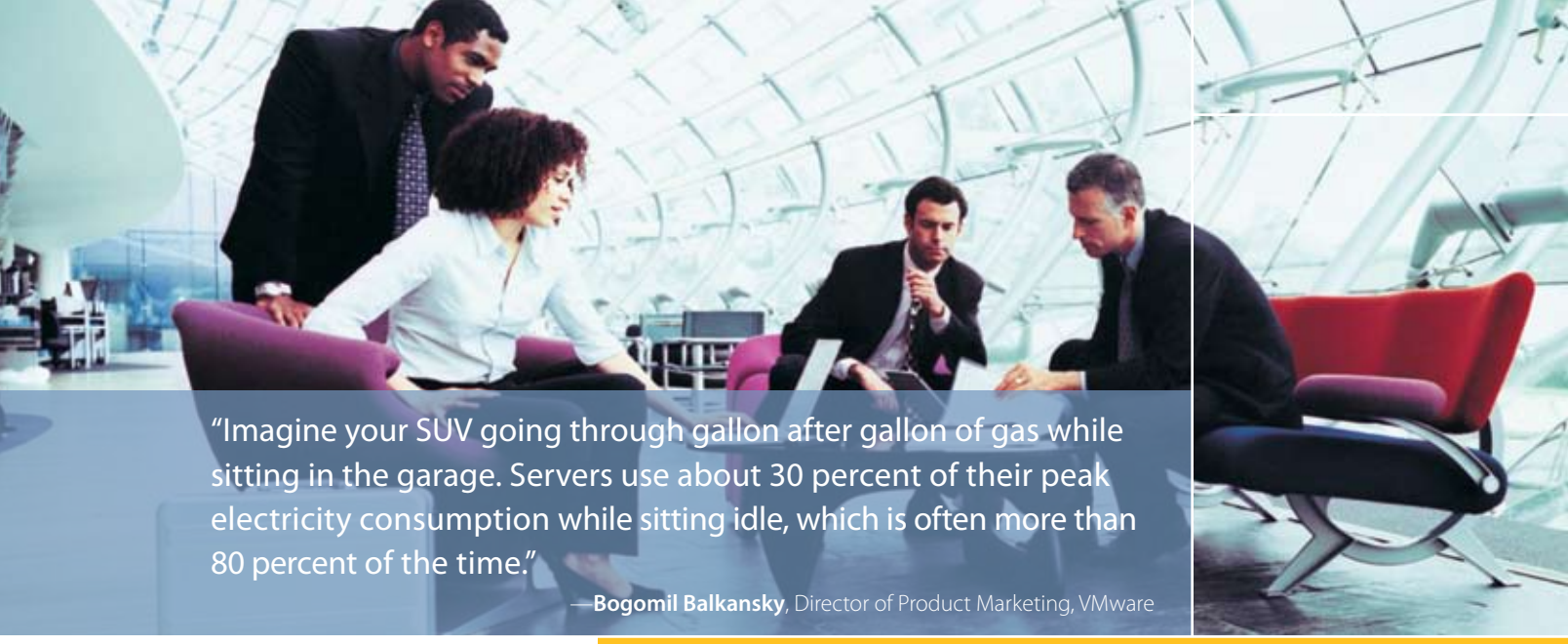
vmware™

The Tangible Value of Virtualization

DELL

intel



"Imagine your SUV going through gallon after gallon of gas while sitting in the garage. Servers use about 30 percent of their peak electricity consumption while sitting idle, which is often more than 80 percent of the time."

—**Bogomil Balkansky**, Director of Product Marketing, VMware

Once upon a time, CIOs could solve IT problems simply by adding new servers to handle additional workloads. Today, the legacy left by this strategy haunts enterprises everywhere. Server proliferation has become a serious challenge. However, virtualization is more than just a concept—it is a concrete business strategy that can provide tangible value for companies in virtually any industry.

The high cost of inefficient data centers

In today's environment, the top concerns of managing IT systems have turned from the simple mathematics of hardware procurement, systems administration, and programmers to the modern day data center concerns of energy efficiencies—power and cooling requirements and costs, rising real-estate costs, business continuance policies to meet regulatory governance, and increasing server hardware sprawl. IDC's recent Directions presentation, "Enterprise Class Virtualization 2.0,"[1] provides facts around operational costs that vex organizations tasked to manage and fund IT infrastructures:

- $8 is spent maintaining legacy IT for every $1 invested in new IT infrastructure; this severely limits business innovation
- 50¢ is spent to power and cool servers for every $1 in server spending today; this may increase to 70¢ by 2010
- Constructing a new data center costs approximately $1,000 per square foot; this is $40,000 per rack or $2,400 for a typical server

As operational costs for IT infrastructure and data centers continue to increase, enterprises, agencies, and institutions around the world are turning to virtual infrastructures as an answer to mitigating costs, driving optimization, and gaining efficiencies from their IT environments. IDC reports that "virtualization impacts more than servers—storage, networks, clients, management, security, etc." and "server virtualization is now considered a mainstream technology among IT buyers."[2]

Virtualization: A smarter way to allocate resources

Adding even more servers to already overbuilt, underutilized networks is not the answer for companies trying to focus on strategic IT projects. Instead, businesses need consolidated IT environments that require less maintenance and fewer power and cooling resources.

By making resources available when and where they are needed, virtualization eliminates unused headroom, allowing companies to handle their workloads using fewer servers. And fewer servers mean less maintenance, power, and cooling, which translates into significant reductions in

[1] IDC, "Enterprise Class Virtualization 2.0—Application Mobility, Recovery, and Management," Document #DR2007_5MEW, February 2007

[2] IDC, "Enterprise Class Virtualization 2.0—Application Mobility, Recovery, and Management," Document #DR2007_5MEW, February 2007

Virtualization in the Real World

Virtualization is more than just a concept—it is a concrete business strategy that can provide tangible value. For example, when Data Guard Systems—a hosted point-of-sale provider for cell phone retailers—found itself facing a million-dollar price tag to add power capacity to its data center, the company chose instead to facilitate growth by finding ways to reduce its per-server power consumption.

By consolidating 45 backup database servers onto four Dell™ PowerEdge™ servers with dual-core Intel® Xeon® processors running VMware® Infrastructure 3 data center optimization and management software, Data Guard was able to reduce its power costs by as much as $10,000 per month and pay back the cost of the new infrastructure within one year. The virtual infrastructure, created with the assistance of Dell assessment, design, and implementation services, also made disaster recovery more cost-effective and reliable with built-in business continuity features provided by VMware technology.

operations costs—and more money for strategic initiatives.

Dell has developed adaptive power management and worked with VMware to develop ways to autonomically and proactively power-down underutilized systems during off-peak times. Ultimately this drives down costs of power and cooling for unused systems during nights and weekends.

What's at stake for your budget—and the environment

New initiatives chartered to solve problems around energy and conservation have emerged. Dell Earth and the Green Grid initiative are examples where Dell, Intel, and VMware are collaborating to refine information technology that conserves energy and resources. Here are some of the glaring facts that are advancing these new efforts toward energy efficiency and conservation: according to Gartner Research, energy costs may increase from 10 percent of the typical IT budget today to more than 50 percent in the next few years.[3] Current IT infrastructures are very inefficient due to underutilization, especially with x86/x64 servers. Gartner states that during a 24-hour period, less than 10 percent of the available computing power of these servers is being used. The picture is slightly better for RSC/UNIX machines (at 20 percent during a 24-hour period), whereas a typical mainframe environment can achieve between 70 percent and 80 percent. Because most of the power and cooling problem is caused by high-density x86 servers, this low level of use is a major contributor to the overall energy problem.[4] IDC found that the cost of power for servers may exceed the cost of the servers themselves by 2008. What's more, IDC calculates that the total power and cooling bill for servers worldwide is almost $30 billion for 2006—and if current trends persist, that number will rise to $45 billion by the end of the decade.[5]

Virtual infrastructures offset these mounting operational costs by matching IT infrastructure to business requirements and needs. Virtualization enables multiple applications and workloads to operate on individual servers, thus driving higher utilization and computing power for every unit of energy expended to run each server. For example, in a company running 1,000 mainstream servers in a 12:1 consolidation ratio over a period of three years, virtualization can facilitate major cost savings. VMware studies[6] indicate that this company could save approximately $759,000 on power costs alone over three years—in addition to $949,000 on cooling and $416,000 on space costs. The company could save $5.8 million on hardware, as well as $586,000 on networking and storage equipment.

Consolidated, virtualized data centers extend another important benefit: environmental stewardship. For every workload moved from physical to virtual, an organization can save $250 per year in electricity costs and $310 in cooling costs. That means for every one million workloads running on VMware virtual machines, companies realize $560 million in total savings.

This scenario also represents 8 billion kilowatts saved—which exceeds the total energy needed for heating, ventilation, and cooling in New England in a year. By cutting power and cooling requirements, virtualization helps industry leaders do their part to promote "green" policies and prevent climate change.

Dell, Intel, and VMware: The power of virtualization

VMware® Infrastructure 3 Data Center Management and Optimization Suite running on Dell™ PowerEdge™ servers featuring quad-core Intel® Xeon® 5300 series processors

[3] Gartner, "A Message From Data Center Managers to CIOs: Wake Up to Our Energy Crisis," Page 4, August 2006

[4] Gartner, "Data Center Power and Cooling Scenario: Options for the Road Ahead," Pages 2–3, April 2007

[5] IDC, "Worldwide Server Power and Cooling Expense 2006–2010 Forecast," Document #203598, September 2006

[6] VMware Market Opportunity Study, Server and Infrastructure Virtualization, January 2007. Data in example enterprise scenario based on usage reported by VMware customers.

provides an outstanding platform to deliver the value of virtualization. Together, Dell, Intel, and VMware provide production-proven, mainframe-class infrastructure that is always on, offers capacity on demand, and provides policy-based automation.

The combined strength of Dell, Intel, and VMware can deliver significant benefits for small, medium, and large organizations across all industries and sectors:

- ***Realize transformative cost savings*** through low TCO from virtualized IT infrastructures that enable effective use of budget resources and help decrease operational costs
- ***Increase operational flexibility and efficiency*** through quick deployment of software applications and services for fast time to productivity
- ***Minimize risk and enhance IT service levels*** through zero-downtime maintenance capabilities and rapid recovery times for high availability and streamlined disaster recovery scenarios across the data center
- ***Optimize IT environments*** through VMware virtual infrastructures that can help optimize and manage the enterprise—from Dell PowerEdge servers to Dell OptiPlex™ desktops and Dell Latitude™ notebook PCs

In addition, the quad-core Intel Xeon 5300 series processors incorporated in Dell PowerEdge servers enable a new level of consolidation, improving server efficiency across various criteria including price/performance, performance per watt, and performance per square foot of data center space.

Savings beyond power and cooling

Power, cooling, and space savings are just some of many ways that Dell and VMware virtual infrastructure solutions can dramatically reduce operation costs in the IT environment—these are savings that a business or organization can take back to its bottom line. To understand the total impact of virtualization on your organization—try our online ROI calculator and see the dramatic savings instantly.

To learn more, visit www.vmware.com/dell or www.intel.com/business/technologies/virtualization.htm. Calculate your cost savings today at www.vmware.com/go/calculator.