IT Efficiency Metrics for the Virtual Era:
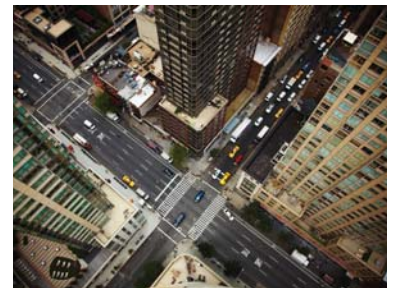
Survive, grow and thrive

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Dell Public and Large Enterprise

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The power to do more

Executive summary

As technology evolves and organizations adapt, the supporting IT infrastructure is expected to anticipate growth, increase agility and, through innovation, deliver a competitive advantage. Yet IT is saddled with fewer resources and an anchor of complex, often outdated hardware, software, skills and processes. The clear answer to this dilemma is increasing IT efficiency throughout the infrastructure, from the desktop to the data center. This white paper provides efficiency metric guidelines that have emerged as benchmarks of IT efficiency in the new virtual era. These metrics represent high-level measures in key categories that separate efficient organizations from ones that require improvement. More importantly, these measures are the ones that can have the greatest impact on IT's ability to meet the changing needs of their organization that provide greater agility and innovation.

Introduction

Efficiency in Information Technology has emerged as a major priority for nearly every organization, large or small, public or private. The emergence of technologies such as cloud computing and virtualization, coupled with the need for anytime, anywhere access to information on an endless array of new devices, has resulted in a new "virtual era" and with it greater expectations for IT agility and innovation.   But this era has also created critical new challenges to the IT infrastructure and those that have to manage it. To meet these challenges without overturning the cost structure of most organizations requires significantly greater efficiency in every aspect of IT – hardware, software, management, productivity and performance.

Most commercial organizations spend between 2.9% and 4.4% of total revenue on IT,[1] according to industry analysts. For public organizations that figure can be an even greater percent of the overall budget. So the question is a simple one: How can you get more out of every dollar you spend on IT? Significant increases in efficiency are the only answer. With this increased efficiency, organizations of all sizes and types can reinvest the savings and deliver competitive advantages, accomplish their mission more effectively, and serve their constituencies better.

Transforming an IT infrastructure to one that delivers greater efficiency and innovation is a simple concept, but is almost always difficult to attain. For the past few years, IT budgets and resources have remained relatively flat, yet needs of every organization are skyrocketing.

Consider data storage. It is expected that in the digital universe data will double every 18 months. Approximately 95% of that data is unstructured,[2] meaning it is difficult to control and manage because it comes from many different locations in many different forms and often incompatible formats. Worse yet, 90% of it is never used after it is created[3], so organizations pay for much more storage than they actually use.

Keeping up with data growth is mere table stakes. IT organizations face many more challenges in the virtual era. A more mobile workforce and the 'consumerization' of work and personal computing are issues that completely change the profile of what IT services an organization delivers to its workers. End users want one digital identity that follows them everywhere. Today 34 million people telecommute, and that will double in just five years.[4] IT organizations are struggling to provide the agility needed to support the explosion in personal and corporate device types – smart phones, tablets, Bluetooth, RFID tags, etc. – an average of four devices and third-party applications for each worker.[5] Workers are now expecting that these devices will be supported and employers are hearing the call: studies by the analyst firm Gartner show that 90% of organizations plan to support personal devices in the work environment by 2014. Without increased IT efficiency, how can IT afford to support multiple devices, operating systems and applications, while still protecting the organization's data and innovating to a competitive advantage?

To add to these issues, the complexity of IT is increasing in general. Technology innovation can add more silos to manage, more management tools to monitor, and more points of integration. This additional complexity is often supported by an IT workforce that is increasingly staffed with more generalists than specialists. This is why today, of the annual $1.8 trillion in estimated global IT infrastructure-related spending worldwide, approximately 80% of it is spent on maintenance—the day-to-day costs associated with "just keeping the lights on." This leaves only 1/5th of IT budgets available for the innovation that is essential to align IT with objectives of the organization and for the implementation of new technological advances.

Global IT spending already totals in the trillions, and is predicted to rise another 5% in 2011.[6] The magnitude of even a 10% improvement in IT efficiency can deliver a transformative impact to an organization in two ways. First, it can transform how budgets are allocated, so that more resources can be spent on innovation that will actually improve the organization's ability to meet its objectives. Second, it can revolutionize how the IT infrastructure is able to meet the rising need for more computing resources and greater agility in a budget-constrained environment.

IT efficiency is not just a private sector priority. It also represents a fundamental challenge to public institutions (healthcare, education, governments, not for profits, and others) across the globe, in many cases hampering their ability to provide essential services to their constituencies. In the United States alone, for example, Dell estimates that by leveraging cost- and energy-saving technologies proven successful at driving IT efficiency in the private sector – such as data center consolidation, cloud computing, and teleworking – the government could save over $1 trillion by 2020.[7]

Key focus areas for IT efficiency transformation

Dell has embarked on an "Efficient IT" strategy to help not only our customers, but to improve its own IT environment, to take advantage of virtual era technology and return IT funds for reinvestment. Dell characterizes the defining inflection points of the virtual era as convergence, unprecedented data growth, virtualization, mobility and cloud. While there are literally tens of thousands of metrics available from the desktop to the data center, several have emerged as key goals or metrics that distinguish efficient IT in each of these categories.

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Welcome to the **Virtual Era**

Virtualization
Consolidation + abstraction

Cloud
Step-function increases in efficiency and flexibility.

Unprecedented Data Growth
Manage, optimize, and monetize data

Convergence
From network through systems management

Mobility
Billions of end-points

Convergence and unification of the infrastructure

Organizations want to manage fewer things – fewer technology silos and fewer points of management. Eight key characteristics or metrics are offered as measures of best-practice efficiency:

- **Mix of IT spend on maintenance vs. innovation:** In a typical organization, roughly 80% of IT budgets are spent on maintenance and only 20% on innovation. Organizations should strive for a balance of 50/50 so that a significant portion of the budget can be diverted back to the organization.   This measure shows how efficient, automated, and simplified your IT infrastructure is. (Dell's own mix is 48% maintenance and 52% innovation, using the same Efficient IT strategy.)

- **Servers managed per administrator:** Another efficiency measure is the number of servers a single administrator can manage. Servers per admin is an indication of how centralized and manageable the infrastructure is. Server administrators in hyperscale cloud-based companies can manage as many as 10,000 servers because they have homogenous environments. But even heterogeneous environments including physical and virtual resources can use new tools like Dell's Virtual Integrated System (VIS) to provide unified management yielding up to 3,000 servers per admin. This will vary widely by industry and type of IT environment, but the first step is always determining your current state and developing a plan to dramatically increase this figure.

- **Number of management tools & technology silos:** The more tools, processes and silos an organization has to manage, the more people it takes to manage them and the slower the response to changing organizational needs. Even smaller infrastructures can require 50 or more management dashboards. Virtual era tools can manage physical and virtual infrastructure in a common resource pool with a single management console. Start by determining where are you now and how can you reduce that number by at least 50%.

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- **Help desk costs as a percent of total IT costs:** High help desk costs are a sign of poor health. When things aren't working as they should, the help desk gets more calls. In truly efficient organizations, help desk costs as a percent of the overall IT budget should be less than 5%.[8]

- **Hardware metrics:** Consider your server refresh cycle. Starting in the fourth year of the life of a server, support costs increase dramatically: about 40% more in year four, 200% more in year five, 270% in year six and about 400% in year seven.[9] Best-of-breed organizations use a manageable refresh cycle of every four years (begin retiring at year four) and/or 20% hardware refresh per year (20% of the data center replaced each year). Dell's own IT uses the 20% per year, "constant refresh" strategy so that the benefits of new technology can be realized more quickly, and the oldest technology is retired in the most cost-effective and least disruptive way.

- **Server density:** Increased compute density of servers is another key path to efficiency. Today's servers simply pack more performance per square inch. In just four years, performance has increased so dramatically that what once took 184 single-processor servers can now be done with just 21, and while at the same time reducing power consumption by 90%. Payback can be as few as 8 months just in performance and power savings alone. So the key metric is a simple one: Embrace greater density in your infrastructure.

- **Number of applications and operating systems:** Another source of cost and complexity is the software that IT must manage on a day-to-day basis. Consider how many versions of applications and operating systems you monitor, patch, update, and retire. These multiple versions of operating systems and redundant applications are often referred to as the "unknown shadow IT" and can represent as much as two times the cost of the "known" IT budget.[10] Dell's own IT launched an application reduction and rationalization project in the past two years. Of the more than 7,000 applications Dell used worldwide, more than 33% were either eliminated or standardized, saving millions of dollars in licensing and support. So two primary metrics are critical when it comes to applications. First, standardize as much as possible. A goal obtainable by many organizations consists of a target of 70% of all applications on standard software (non-customized or minimally customized), and only 30% custom.[11] Second, reduce application redundancy as much as possible. The goal should be to have only one application for each durable business process and business type. So an organization should strive for only one CRM system, one HR system, one financial system and so on. Not all businesses can achieve such a goal, but the lower the number of applications and versions the less redundancy, the lower the cost for licensing, and the lower the costs to support them.

- **Power efficiency:** Another key measurement is the efficiency of the power delivery to the data center hardware and how much is used. Not too long ago, the efficiency measures of power supply units were as low as 60% (e.g. 40% of the power delivered to the server was wasted or lost). Considering todays soaring energy costs, power efficiency of 80% or more is essential. More importantly, the ROI when replacing 60% efficient power supplies with more efficient ones can be as little as 18 months. Another key measure developed by the industry group the Green Grid www.thegreengrid.org is a standard for measuring overall power usage in a data center. The accepted measure, Power Usage Efficiency or PUE, was developed as a simple way to measure the effectiveness of the power going in to the data center and the ratio of what is actually used to deliver computing resources. A PUE of 2.0 is considered average, meaning that about 50% of the power is actually used to deliver computing resources and the other 50% is either wasted or used for non-compute resources such as cooling, lighting, and other devices. Dell recommends a PUE of 1.4 or less, meaning that for every 100 watts of power delivered to the data center, 60 watts are used for computing.

> After year 4 it is not that the hardware is faster or has more capacity – it is that support requirements increase substantially.[16]

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Key metrics: Convergence and Unification

50% maintenance

As many as 3000 servers per admin

Zero silos

<5% help desk cost as a % of IT

<4 year server refresh cycle

Dense server stacks as appropriate for your business

70% standard apps

One app per durable business process

>80% power supply efficiency

1.4 or less PUE

Data management:
The Achilles' heel of efficiency

Data storage is often the most complex part of IT transformation because it is growing so fast, is so mission critical, and usually exists in a loosely organized and haphazard structure. For these reasons, efficiency must be built throughout the entire storage network at every point – what is stored, how it is stored, where, when it is moved and what kind of storage device. It is no longer viable to simply add on another storage device. The virtual era requires that storage be virtualized too. There are dozens of metrics for storage, but five concepts emerge as the most common, high-level measures of storage efficiency:

- **The right technologies that enable storage efficiency:** As with any task, efficiency starts with having the right tools. First, in the virtual era, an Ethernet-enabled structure is essential. This provides the speed, ease of connectivity, and upgradability to 10G that will be necessary for scalable performance. Second, the structure needs to be standardized and modular, so that as more storage is needed, new modules can be easily and quickly added with no waste and no disruption of service. Build a storage architecture that is modular and avoids costly "forklift" upgrades. As you need more storage, simply plug in a new device that adds capacity and the ecosystem automatically senses it is there and provisions it instantly.

Automate first and tier to get the right data in the right place

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- **An "efficiency first" storage strategy:** Storage must be managed holistically and efficiently. First, there should be intelligent and automated tiering of data, to ensure that Tier 1 or 2 data necessary to run the business is readily available on the highest performing machines. Other data should be automatically moved to less expensive (and less available) media. Second, archiving and backup should be automated, to reduce risk and errors, and management costs.

- **Efficient utilization:** The overall cost of storage is expensive and growing. So storing as much as possible on the fewest number of devices is critical. One way to measure efficiency is the cost per stored gigabyte. Dell believes that total storage costs should be $5 per gigabyte or less.[12] This low cost is a byproduct of the automated tiering, backup and archiving processes above, but also a measure of the overall utilization of the entire system. Storage devices should approach 80% utilization, and the cost of the data network as a percent of total IT spend should be less that 8.89%.[13]

Key metrics: Data Management

> ### Ethernet-enabled
> ### Modular & scalable
> ### Automated: tiering, backup, archiving
> ### 80% utilization of storage
> ### 8.89% data network spend as a % of total IT spend

Virtualization:
Essential to consolidation & utilization

Virtualization defines the virtual era: simplifying management, consolidating hardware and software, and increasing utilization and performance. But the amount of virtualization an organization should have and the amount of virtualization it actually has are often dramatically different. Pervasive application of virtualization as a foundational strategy is a precursor to every aspect of IT transformation – to your strategy, to how you deliver IT services, and to your path to the cloud. If you don't get virtualization right, you won't be able to take full advantage of the cloud efficiencies. Seven key characteristics or metrics can be used to determine if this key enabling technology is being leveraged to its fullest:

- **Utilization rates of hardware:** Organizations want to get the most use out of every piece of hardware. But for most organizations the virtualization mission has NOT been accomplished. Consider that globally only about 16% of servers are virtualized, and that figure is only about 25% in the Global 500 firms.[14] Most organizations should strive to have at least 50% of their workloads virtualized and have servers run at 50% utilization or more. Once these levels are reached, the IT staff can start looking to improve the other non-virtualized 50%, either by applying additional layers of virtualization or by moving whole processes to the cloud.

- **Virtualization-ready hardware:**   Often a selective hardware refresh is needed to replace "unvirtualizable" servers with ones specifically made for the virtual era. Pre-configured virtualized server stacks, such as Dell's vStart, and next-generation servers with embedded hypervisors and considerable joint engineering with the leading virtualization providers, such as Dell's PowerEdge Servers, are great examples. Replace all hardware with virtual-ready hardware.

- **Adoption of a multi-hypervisor strategy:**   This is another binary decision: either you accept the fact that different hypervisors work best in certain situations or you lock yourself into a single-hypervisor strategy. A single hypervisor strategy might seem efficient in the short run. After all, one hypervisor means one management dashboard and one vendor. But in practice, some hypervisors simply deliver better performance – speed, integration, or cost – on certain workloads and applications. Dell's recommendation is to apply the right hypervisor to the right workload.

- **Unified management of both virtual and non-virtual resources:**   "Virtualization sprawl" is an inevitable byproduct of the incremental application of this technology. Each new workload adds another resource to manage, which is another reason why organizations keep hitting virtualization ceilings. Dell's recommendation is to address the issue more broadly by using a smaller set of tools to manage both virtual and non-virtual resources, from deployment and provisioning to self-service, from reporting and monitoring to the recapture of under- or un-used resources, and for the automation of the entire process. The Dell Virtual Integrated System (VIS) is one soluton that allows this kind of control www.dellcom/VIS. Regardless of vendor choice, strive to manage virtual and physical infrastructure with one tool.

- **Responsiveness:**   Once virtualization is running efficiently, it must deliver at expected and faster speeds. Two key metrics to consider are speed of deployment of new workloads and the speed of failover. Workload deployment speeds of less than one hour are needed, otherwise IT end users will be tempted to procure their own resources using cloud-based providers. Failover is another key metric. Recovery should be less than 15 minutes for most organizations.

> Manage everything – virtual and physical as a single pool of resources

Key metrics: Virtualization

50% server utilization

50% virtualized workloads

"Virtualize-first, Virtualization-ready" hardware

Multi-hypervisor strategy

One management tool for virtual and physical

<1 hour deployment of new workloads

<15 minutes recovery

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Enabling end-user computing

End-user computing decisions begin with the basic considerations of the cost to buy, deploy and support the devices that are used by the workforce. But the consumerization of end-user computing has added a new wrinkle that is completely changing how IT supports a more mobile and "tech-savvy" workforce. Will the CIO allow the workforce to use personal devices at all and if so what kinds of devices and platforms will be allowed with what security measures? It is also critical to have a security strategy that addresses how to protect access to the devices, the data on the devices (especially sensitive organizational information), and how to insulate the organization from potential threats coming from these devices.

Eight characteristics or metrics emerge as key indicators of end-user computing efficiency:

- **Total cost of ownership:** The cost of end-user computing devices has dropped dramatically over the past few years, and consumer devices are nearly as powerful as those used by business. The cost to buy, deploy, patch and update these devices are key measures that indicate how standardized the environment is, how devices are provided to the users and how they are supported. First, organizations often start with the total cost of ownership, or TCO. Today, the average cost to maintain a new PC to an employee is $615[15] (not including the cost of the device itself). The industry, including Dell, sees best-of-breed companies with TCOs as low as $277 per year, or 55% less. Organizations should also look to best practices for PC deployment. The best organizations strive for deployment costs from $373 to $583, versus the typical cost of $795 (a reduction of 30% to 50%). Speed of deployment is another factor. Today it takes an average 2.9 hours to deploy a single PC in most organizations. The best organizations should look to reduce that by as much as 70% to a range of 0.7 to 1.29 hours, but deployment of less than 15 minutes is not only possible, but available.

- **Improve and simplify device management:** Once a PC is deployed, the largest part of the cost is not the PC itself but the cost to manage it. The most efficient organizations offload 100% of the configuration, deployment and support to a third-party vendor. After all, the core competency of IT in most organizations is not desktop or laptop break/fix, patching or updating. For those that do some or all of their own support, two characteristics exemplify the gold standard of efficiency: the use of only one deployment tool and one systems management tool. Dell's own IT is an excellent example. With more than 100,000 end users around the globe, Dell manages most all of these devices centrally with a single tool.

- **Application simplification and management:** The number, variety and versions of applications can add tremendous inefficiency, and increases the costs of licensing and support. Two goals are clear: have as few desktop/laptop images to manage as possible and reduce the number of operating systems supported. Best practices are that organizations have one of each – one system image and one operating system. Dell has standardized on Windows 7 and centrally manages only one client image worldwide.

- **Virtualize desktops where possible:** Desktop virtualization is an efficiency technology that provides the greatest organizational control for the least cost. Today only about 5% of desktops are virtualized, but this is expected to grow to 10% by 2014.[14] In certain industries, such as government, health care and others, this has emerged as a credible and cost-effective alternative to traditional computing and provides security benefits that are difficult to achieve with traditional systems. Assess the impact of virtualization and know where in your organization desktop virtualization is viable.

Deal with the consumerization of end-user computing

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Key metrics: End-user computing

$277 per year total cost per ownership

$373 to $583 PC deployment cost

15 minutes to deploy a new system

One deployment and management tool

100% offloading of support

One system image

One operating system (Windows 7)

Desktop virtualization plan where it makes sense

Leveraging cloud efficiencies

Cloud computing is the most talked about and probably most misunderstood technology that can have a dramatic change on IT infrastructure. The concept is simple – move applications to a cloud delivery model and literally unplug large parts of the IT infrastructure. But getting there can be a complicated issue. Moving to a cloud model means changing processes that are ingrained in the organization – it is a completely different way to deliver IT services. The CIO and the IT organization must transition from the concept of managing boxes to dynamically delivering workloads, or the idea of IT-as-a-service (ITaaS). The transformation includes a change in mission and workflow, from keeping hardware and software running to completely disconnecting the infrastructure from the workload and focusing only on delivering the service.

As new as this model is, there are 6 metrics or goals that are already being attained by innovators:

- **Start transitioning to the cloud now:** For most organizations, the path to the cloud is a transitional one rather than a jump. Two models have emerged. One leverages existing virtualization and moves pre-virtualized applications to a cloud-based delivery model. The rationale here is that the platform and strategy for ITaaS is already in place, so the movement is a natural one. The other model is to move non-virtualized or hard-to-virtualize workloads to a cloud model, such as databases, ERP apps, or email. The rationale here is that some applications are simply too complex to transition, so using a proven cloud-based platform allows for offline development and less risky cut over. In either strategy the goal for most organizations should be to begin by moving 20% of your applications to a cloud delivery model.

- **Connect your data to cloud-based applications:** As more applications move to the cloud, there is an increasing need for the integration of data from on-premise and off-premise (cloud) applications. Moving to the cloud is essentially meaningless unless the data is connected. For success, organizations need to get the tools (or hire them) to integrate on-premise apps and data with these new cloud-based apps. As such, one key metric is to have a tool or service that integrates data from HR, financial, ERP, inventory, sales management and CRM systems in a simple, seamless way. Dell Boomi is just such a tool www.dell.com/boomi.

- **Meet cloud performance expectations:** Cloud computing is still in the early stages of maturity, or as some call it, the "point of inflated expectations." Several expectations emerge as critical. Resiliency (the ability to recover from component failure) is expected to be 100% and the system should be designed to deliver "always available" reliability. Speed and agility are expected to be transformed so that new workloads can be delivered in as little as one hour, rather than days or weeks. And self-service is a critical component. End users expect to be able to deploy and manage their own resources so that the delivery of IT resources is "frictionless."

Key metrics: Cloud computing

20% of applications delivered by the cloud

Integrated tool to connect on-premise and off-premise apps and data

100% reliability

100% resiliency

1 hour workload deployment

**"Frictionless"** self-service IT

How Dell approaches efficiency

The transformation of IT is often framed as technology discussion. But the issue is much greater than whether an organization can implement the next generation of faster servers or install the next generation software. While IT efficiency transformation encompasses technology, the greatest gains will come from addressing the people and processes that run the technology. If fewer people can manage more of the infrastructure in a less complex environment, efficiency gains can be much greater than improvements offered by technology solutions alone. If there are fewer touch points, fewer steps, and fewer islands of IT to manage, then costs, agility and innovation can be transformed.

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The Efficient Enterprise **Path to Efficiency**
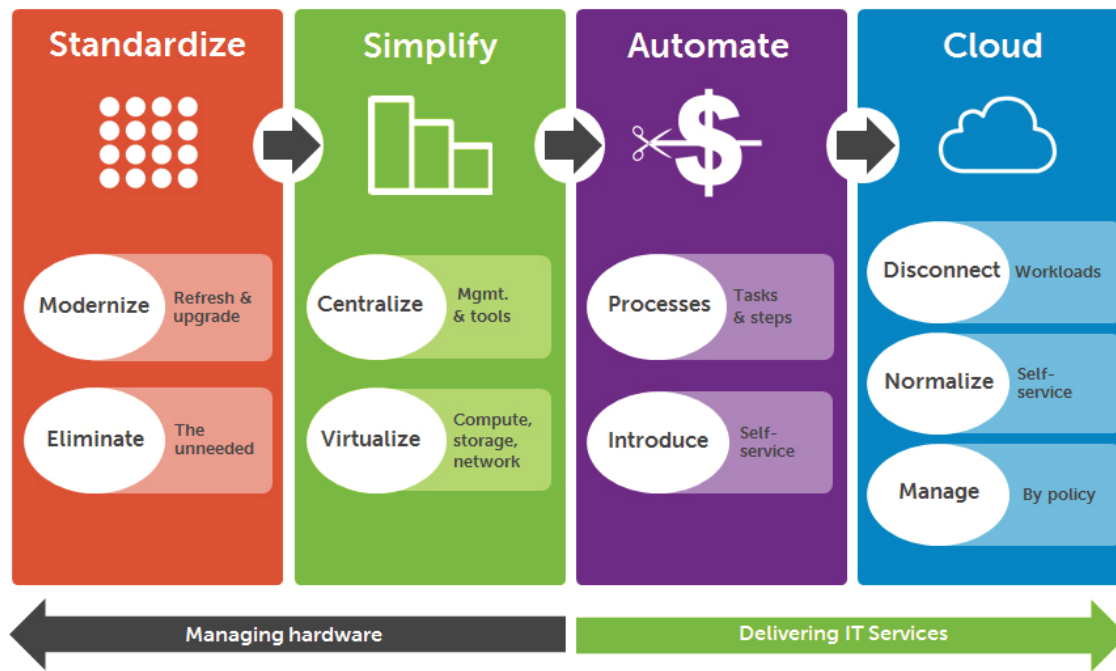
At the heart of Dell's Efficient IT strategy is a focus on always addressing not only the technology, but the people and processes that are used to manage the technology. With this in mind, the process steps for addressing efficiency gains, whether for our internal use or for our customers, is straightforward: standardize, simplify, automate and move to the cloud:

Standardize: Disparate, proprietary, and legacy systems can bog down efforts to operate efficiently. By migrating them to standards-based components, common platforms, open tools, and a unified fabric, organizations can reduce complexity and optimize the data center infrastructure they already own.

Simplify: Through pragmatic solutions like virtualization and storage consolidation, redundancies can either be consolidated or eliminated to ensure the organization is getting the most out of its infrastructure. Further, when a company rationalizes and reduces their applications, they have the flexibility to easily remove and repurpose resources for other uses.

Automation: When a uniform environment with fewer touch points has been created, greater levels of automation are now possible. The right tools and best operational practices can be implemented to reduce manual intervention and boost productivity. Having rationalized their infrastructure, organizations are now in the position to determine where in their environment they can best leverage new and improved IT services.

Move to the cloud: The cloud offers the possibility of managing workloads not infrastructure. Organizations should address which applications or workloads can or should be moved to the cloud today from a cost, work flow and resiliency perspective.

We've done this already at Dell. By **standardizing, simplifying** and **automating** alone we have successfully managed to allocate 52% of Dell's IT budget toward innovation. Servers have been consolidated up to 30:1; 7,000+ servers have been virtualized; and 6,000 servers have been eliminated. Implementing the Efficient Enterprise framework at Dell has resulted in more than $100 million in savings over just two years.

At Dell, we believe that there is $200 billion in efficiency-led savings that can be accessed by addressing the people, process and technology that make IT function and we are committed to helping you get your share.

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How you get there matters

The strategy an organization uses to get to the next level of efficiency is a critical decision, and one that has far-reaching ramifications on costs, the ability to virtualize/converge/unify, moving to the cloud, and the ability to affordably manage the infrastructure. Employing an Efficient IT strategy should not – and does not – mean that an organization must destroy what it already has. It does, however, require a different strategic mindset. A technology solution that is closed and proprietary, vertically integrated, with built-in boundaries (limitations on size, scalability, management tools, etc.) are intended to lock and organization to a particular vendor or path. Taking this path is a gamble that one particular vendor or technology will out-innovate the market.

Dell's approach is, and has been, dramatically different from the rest of the industry. The value is summed up in three words: **Open, affordable** and **capable**. Open and industry standard technology and platforms provide marketplace-tested and validated value, as well as best practices. Virtual integration means that the technology works with more brands and platforms, making it more capable and more affordable in the short term and long run. Most importantly, this approach provides the scalability to meet the increasing needs of the organization, so you can easily snap on another module as needed, rather than rip and replace to get to the next level of functionality. In the end, an open approach always gives an organization the tools and flexibility to choose the technologies that meet its needs rather than a strategy imposed by a vendor.

Summary

How an organization takes the next step depends largely on where it is at the moment. Dell's Efficient IT strategy focuses on core solutions that improve not only technology but the productivity of the people and processes that manage the technology. One of the first ways to get started is by assessing the your current efficiency state using the Dell Efficiency Model. The model uses a powerful calculator to generate assessments across a range of criteria to create an overall IT efficiency score. The calculator is free to use, so you can find out how efficient your organization is by visiting: http://marketing.dell.com/item-tool-pcq1

Dell is ready to help you with your "Efficient IT transition," starting with a few simple tools and services that can shorten the path, and cost, to improve your organization's IT agility – to help you do more, faster. Call your Dell Executive and let's get to work. Below are some of the services and products Dell offer's to help you implement the Efficient IT strategy:

To improve efficiency of your data center

- Data Center Strategy – Capacity Planning Service
- Data Center Implementation, Consolidation and Migration
- Data Center Operations Services

To create intelligent data management

- Backup and Recovery Service
- Disaster Recovery Service
- Data Migration Service
- Data Management and Storage Technology Service
- Data Center Backup Service Management Service
- Tiered Storage Service
- Storage for Server Virtualization
- Service improving networking performance

Virtualization Services and Solutions

- vStart
- Virtualization Health Check
- Dell Virtualization Discovery Workshop
- Streamlined Optimization Service or Transformation Manager and vPODs

Improving infrastructure Management

- vStart
- Dell Efficient Architecture Workshop
- VIS/AIM Technology introduction and proof of concept
- VIS/AIM Accelerator

Network Efficiency Services

- Dell PowerConnect Network Services: Basic Next Business Day Support

Optional Dell PowerConnect Network Services

- Asset Recovery
- Custom Factory Integration
- Asset Tagging Services
- Installation Services
- Dell ProSupport
- High Performance/Availability
- Backup & Recovery
- Training and Certification
- Migration & Consolidation

Cloud Services

- Dell Cloud Workshop
- Virtual Data Center
- X-as-a-Service: ItaaS, PaaS, SaaS, etc.

Learn more about Dell's Efficient IT strategy by visiting:
www.dell.com/efficiententerprise

Footnotes:
1. Gartner Worldwide IT Benchmark Report 2006: Volume 1: IT Spending & Staffing Analysis: Key Spending Measures
2. Data Center White Paper sponsored by EMC, "As the Economy Contracts, the Digital Universe Expands," May 2009
3. "Measurement & Analysis of Large-Scale Network File System Workloads," University of California, Santa Cruz
4. Dell research
5. Morgan Stanley Research. Data and Estimates as of 11/10 Note: Notebook PCs include Netbooks
6. Gartner: http://seekingalpha.com/article/245229-gartner-2011-it-spending-forecast-to-increase-5-to-3-6-trillion
7. Dell research
8. Gartner Worldwide IT Benchmark Report 2006: Volume 3: Key Infrastructure Metrics: Help Desk
9. IDC: Managing IT Infrastructure Renewal: A Business Framework to Reduce Server and Storage Costs: September 2010
10. Dell research
11. Booz&Co.: "High-performance IT: Achieving sustainable returns on IT investment" http://www.booz.com/media/uploads/IT_Benchmarking-2.pdf)
12. Dell research
13. Gartner Worldwide IT Benchmark Report 2006: Volume 3: Key Infrastructure Metrics: Data Network
14. "Virtualization With VMware or Hyper-V: What You Need To Know, Tom Bittman Gartner Webinar 26 August, 2009" and Gartner "Dataquest Insight: Alternative Delivery Models and Revised
     Professional Client Device Forecasts", January, 2009
15. IDC "Dell PC Optimized Deployment Model" June 2010
16. IDC "Managing IT Infrastructure Renewal: A Business Framework to Reduce Server and Storage Costs" September 2010

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