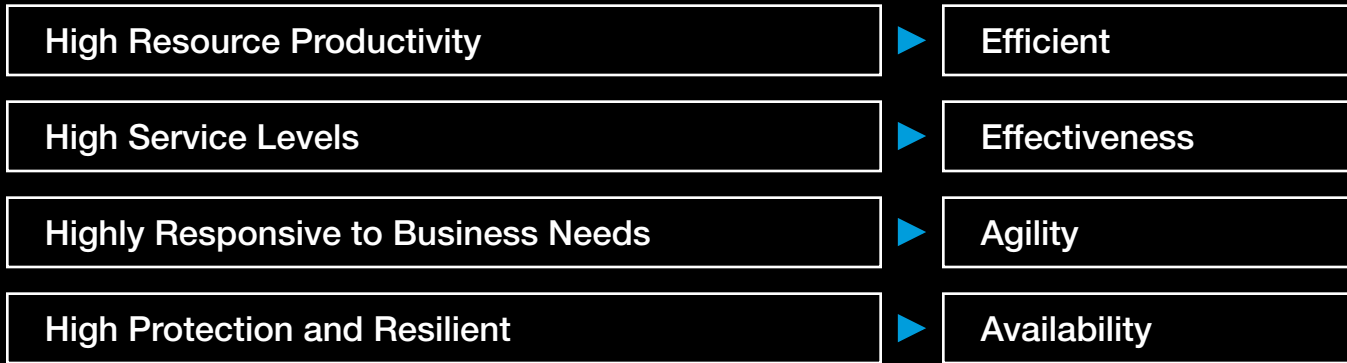


Building a
High-Performance Datacenter
with VMware



The global leader in virtualization solutions from the desktop to the datacenter

Four Measures of a High-Performance Datacenter



How does your datacenter score against the measurements of a high-performance datacenter? In today's economic times, efficiency is important. It means, for example, getting more for less, and adding services without adding servers. Fewer servers means less datacenter space, and lower power and cooling costs. Efficiency also means adding services without adding head count, improving the server-to-admin ratio and workload consolidation ratios. At the end of the day, efficiency determines how much money you can save by improving the productivity of existing resources.

Efficiency is not the whole story. Efficiency is not valuable if it reduces the effectiveness of the datacenter. Reducing costs should not impact the service provided to datacenter customers. Effectiveness measures your ability to meet service levels.

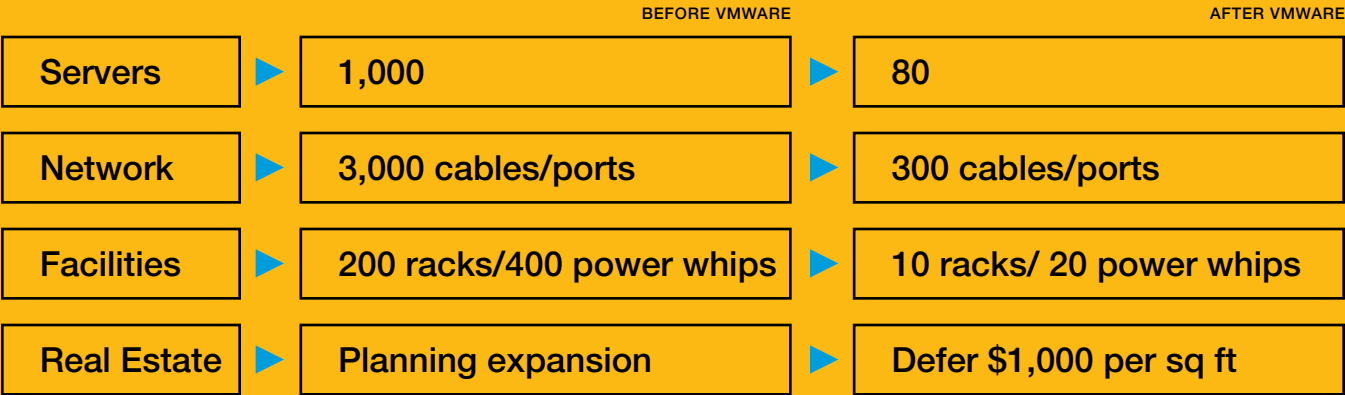
High-performance datacenters have the agility to respond quickly to business needs. Rapid response from IT can

help a business overcome unexpected changes in the business climate, keep ahead of the competition, or respond to government regulation changes. Agility measures your responsiveness to the business.

The final aspect of a high-performance datacenter is availability. Availability covers many facets of the datacenter, but in the simplest terms it means that services are always available to business customers. Downtime from system and application failure, security breaches, facility failures, natural and manmade disasters, and day-to-day maintenance should not impact the service levels that the business expects. Availability measures the security and resilience of your datacenter.

VMware vSphere™ can provide the technology to help you build a high-performance datacenter.

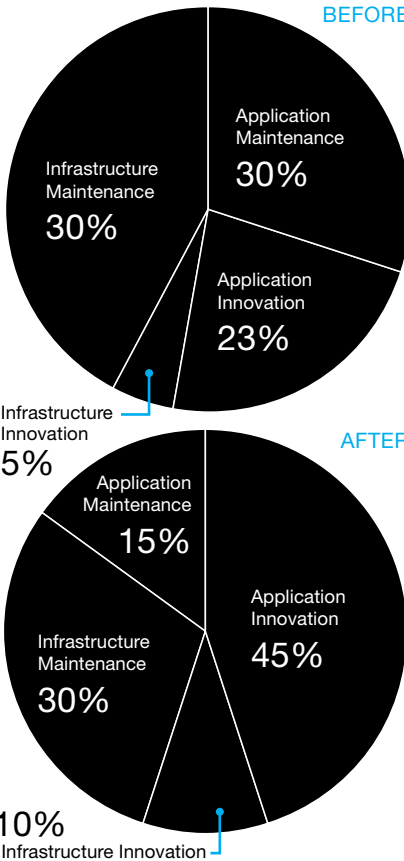
High-Performance Datacenters are Efficient



Efficiency in the datacenter is measured in terms of resource utilization – hardware assets, power, cooling, space, and human resources. The virtual datacenter OS can provide efficiencies in all these areas. VMware vSphere aggregates IT assets into a shared resource, or internal cloud. These assets are allocated to application services in a precise manner based on need. If the service needs more resource it is provided from the pool. If fewer resources are required, it is returned to the pool for use by other services. Since service peaks don't occur simultaneously, more resources are available to all services. VMware uniquely offers the highest consolidation ratios in the industry. Higher consolidation ratios allow more services to be run on fewer servers with fewer network ports, fewer power connections, and less space. CapEx savings can reach 80 percent. With less hardware comes lower power and cooling costs. Datacenter expansion is moved out years for cost savings of millions of dollars.

Automated load balancing and management of services improves administration efficiencies, as well. Mundane and error-prone tasks are reduced, so staff can be reduced or applied to projects that will enhance the services provided to the business. Customers have seen workload to admin ratios improve from 30 workloads per administrator in a physical environment to as high as 1,200 workloads per administrator in a virtual environment. Both hardware and human resource efficiencies are relative to the number of servers that are virtualized. Many customers have realized significant savings by adopting a "VMware First" policy. These customers always provide a virtual server unless specific reasons require a physical server. Customers have experienced cost savings of up to 70 percent per workload. The more workloads you move to virtual machines, the more money and time you can save.

VMware Innovates the Maintain Versus Innovate Economics





VMware helps CIOs and other technology executives answer their most pressing datacenter questions.

High-Performance Datacenters are Effective

How can I improve my Datacenter capabilities?

The journey to high-performance datacenter begins with an understanding of your long-term business or strategic goals. From there, IT can conduct a realistic assessment of where your datacenter capabilities stand in comparison to your requirements and virtualization industry standards and best practices.

A measure of Datacenter effectiveness is the ability to establish and meet SLAs. Many factors can effect the ability to meet SLAs and VMware vSphere provides the functionality to reduce the impact of those factors on SLA achievement. In a physical world where one application runs on one server the resources available to that application are limited by the capacity of that one server. To meet SLAs servers are sometimes sized for peak loads and are therefore underutilized. While providing the efficiencies of resource pools, VMware vSphere also provides effective resource allocation to ensure SLA's are met. Dynamic workload balancing is built-in and allocates resources to applications based on prescribed SLA measures. This process can be automated to monitor applications in real time and automatically adjust resources assigned to the application.

In addition to resource management, VMware vSphere provides availability and security services along with enhanced management services that reduce planned and unplanned downtime.

“We originally thought was we would run out of power in our primary datacenter in 2011 and we set out a goal to try to extend the life of that datacenter by two years, to get it out to 2013. The metrics I saw just yesterday say we can go to 2015. So we’ve added four years to the life of it. Now that wasn’t all virtualization but that was key. We had an overall optimization program to improve power and cooling in the datacenters and virtualization was a key part.”

Jeff Miggo
Nationwide Insurance

High-Performance Datacenters are Agile

From 20-40 Hours to Build a Server and Re-Load Application...



- Build and configure hardware
- Load operating system
- Load configuration tools (Backup, Resource Kit, Monitoring, etc...)
- Assign two IP addresses
- Build three network connections (copper or fiber)
- Turn over to applications team to re-load and re-configure software
- Test applications

...To 15-30 Minutes to Copy a Virtual Machine and Restart



333 Servers replaced
Per year = ~ 10,000 man hours saved

Agility is an important measure of datacenter performance. Being able to provide new services to the business quickly is key to success in a competitive landscape. When exception events occur the datacenter must be able to react quickly and positively to ensure the resilience of business services. VMware vSphere makes the datacenter agile by allowing services to be implemented and provisioned at the speed of business. Provisioning the average application requires from 20-40 hours if the server is on premise. If the server needs to be ordered the time can be measured in weeks. Creating a virtual service can be accomplished in 15-30 minutes. Most customers see their provisioning time cut from weeks to hours.

Here also, automated resource allocation allows immediate response to extraordinary workload demands and provides immediate business response. So efficiency is combined with agility.

The availability and disaster recovery features of VMware vSphere allow quick response to failure.

The business no longer has to wait for IT to deliver services to react to changing business climates.

High-Performance Datacenters are Available

Peet's Coffee & Tea is transforming its IT operations by leveraging VMware Infrastructure to minimize the possibility of application downtime to ensure uninterrupted availability for Peet's business users



The final measure of datacenter performance is availability. Availability is affected from system and application failure, security breaches, facility failures, natural and manmade disasters, and day-to-day maintenance. All of these failures can be mitigated by VMware vSphere. Application and system failures are handled by a restart of the failed service either on the original host or a new host. With VMware Fault Tolerance, a fault-tolerant synchronized copy of a virtual machine starts immediately executing on another host. The built-in security of VMware vSphere and the small attack surface of virtualized applications reduces the risk of security downtime. VMware recovery features provide the means to fail over an entire datacenter within minutes. Automated patching technology allows patches to be applied to applications and operating systems with no downtime.

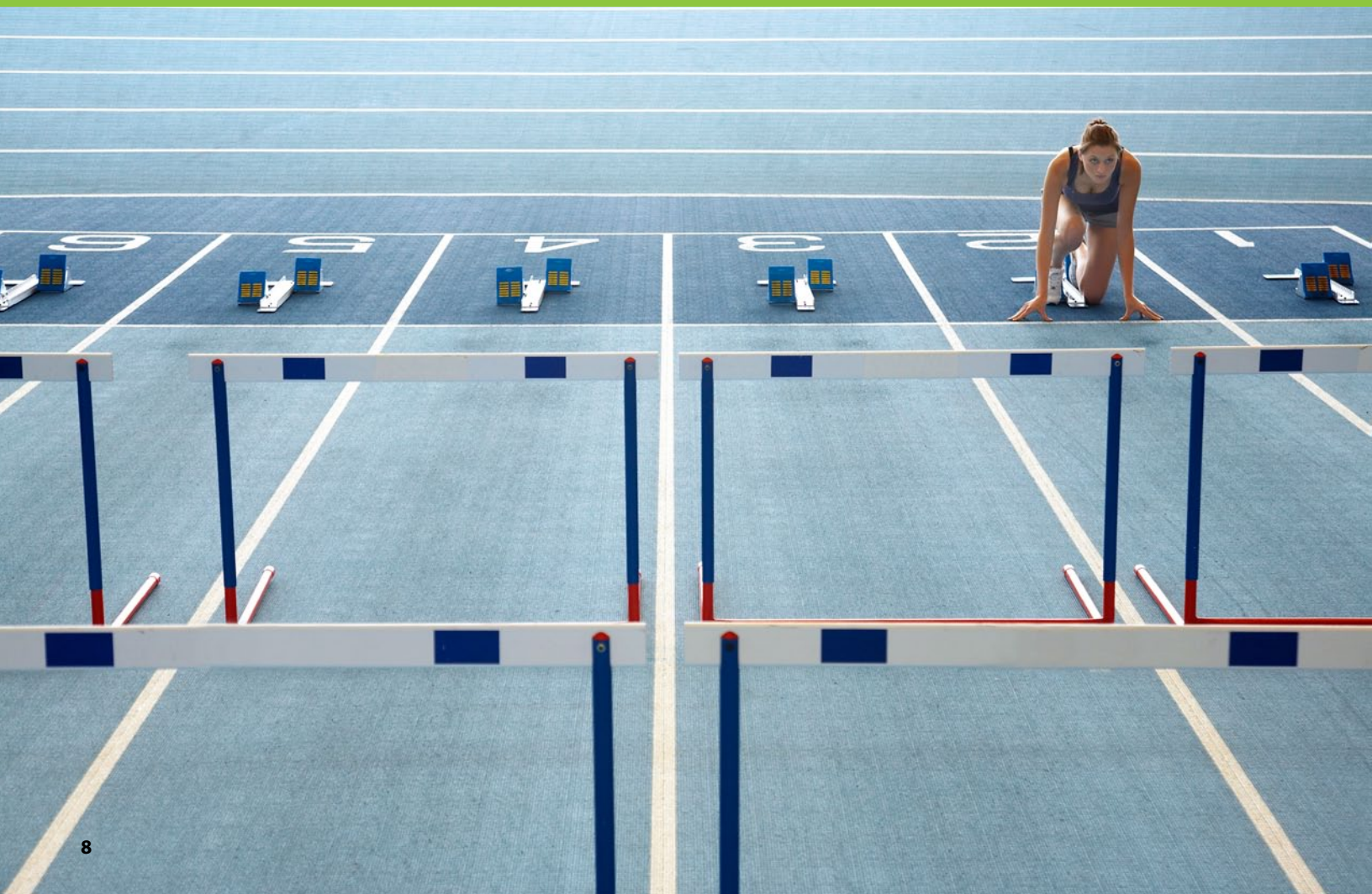
“As you look at overall distribution of resources and labor, I mean with the use of VMware and with virtualization less time is consumed in the overall system administration and the care and feeding of the physical infrastructure itself and so that I think allows us to shift resources to focusing on more system solution development, [...] we are able to be more efficient in providing the supporting services and that makes more budget available to support creating business solutions for our customers.

Siemens

Building a High-Performance Datacenter

10 Steps to Build a High-Performance Datacenter:

01. Establish Vision and Share ROI from First Project On
02. Appoint Change Agents to Commence
03. Certify and Train Change Agents on VMware
04. Assess Workloads for Virtualization, and Evaluate Current and Planned Projects
05. Build POC and Define Success Metrics for the POC
06. Measure POC Performance and Report Success to All Impacted Business Units
07. Transition Change Agents to a Permanent VMware Competency Team
08. Plan Expansion Initiatives - Treat VMware as an Architecture, Prioritize Applications, Build and Deploy Incrementally
09. Measure and Monitor Virtualized Environment
10. Continual Improvement of Operational IT processes with VMware



BEFORE VMWARE

AFTER VMWARE

