

Getting virtualization right: Five virtualization rules every organization must know

Rethink virtualization for better technology returns and better business outcomes

White paper



Table of contents

- Executive summary** 3
- Five virtualization rules** 3
 - Focus on connections 4
 - Manage one infrastructure 4
 - Automate to enable scalability. 5
 - Think beyond the data center 5
 - Be flexible. 6
- When you get virtualization right, you get real and measurable results** 7
 - Public sector 7
 - Health and life sciences 7
 - Media and entertainment 7
 - Telecom 7
 - Manufacturing. 8
- Get started** 8



Executive summary

The allure of virtualization is clear. For the business, it means faster time-to-market for new technology-enabled services and a strong foundation for new strategic initiatives, such as green technology and cloud computing. For technology organizations, virtualization promises faster server provisioning, increased hardware utilization, and lower costs for disaster recovery (DR). But there is a catch—organizations with multiple years of virtualization experience have found that initial gains from virtualization have led to cost increases elsewhere in the longer run. Here is why—virtualized environments are a great deal more complex and mobile than their physical counterparts. When these factors are not taken into account, it becomes much harder to discover, provision, monitor, manage, and enforce compliance in virtual environments.

To realize the full potential of virtualization and gain better business outcomes, organizations must take a broader, service-centric approach to virtualization. This top-down approach delivers real value from virtualization from the business perspective. Virtualization's true potential can only be realized this way, as opposed to an approach where costs are shifted from one technology area to the next.

HP has a long and proud tradition of partnering with technology leaders to help ensure success in both good economies and bad. This paper provides practical advice and insight into the rules these leaders followed to realize the full potential of virtualization.

Five virtualization rules

Technology organizations have one mission—to provide technology-enabled services to their businesses at lower cost and risk and with higher service levels. Few would argue that virtualization has a key role to play here. But the outcomes of virtualization are dependent on several key factors. From decades of experience working alongside businesses of every shape and size and in every economic climate imaginable, HP has identified five common virtualization rules, employed by organizations that have succeeded where others have not. While technology differs in complexity and scale from one business to the next, nearly every successful organization deployed the same five rules to realize the full potential of virtualization. Simply put, the rules are as follows:

1. Focus on connections
2. Manage one infrastructure
3. Automate to enable scalability
4. Think beyond the data center
5. Be flexible

In the following sections, we describe each of these rules and offer practical advice on how to enact them.

Focus on connections

The first rule is to focus on the connections between your applications, servers, storage, and network. In general, organizations initially take a technology-centric approach to virtualization—one that focuses on the server and the hypervisor. The “connections” rule requires some rethinking about how a virtualized server, with its greater mobility and speed, interacts with the rest of your hard-wired infrastructure. Just because a virtual machine can be provisioned or moved quickly does not mean that the connections to storage and network will automatically follow.

Most organizations ultimately find that unless a broader view of virtualization is taken—one that includes all the infrastructure elements of a service—any gains on the server side will be muted by overhead costs that spill over to the storage or networking side. With a focus on connections, mobility and speed of the entire service infrastructure is designed with virtualization in mind.

HP provides key technologies that enable you to transform your hard-wired infrastructure into a business-ready state. HP Virtual Connect technology provides a great example of how HP helps you realize the potential of virtualization. With Virtual Connect, HP did some rethinking of its own to remove interconnection bottlenecks. The solution virtualizes the physical connections between servers and storage as well as servers and networks. By virtualizing these connections, Virtual Connect allows server managers to wire everything once, and then add, replace, or recover servers without disrupting the network or storage topologies. The result is that new deployments or moves can be accomplished in minutes, rather than days.

Another advantage of Virtual Connect comes from the Flex-10 module, which flexibly allocates 10-GB Ethernet bandwidth across four NIC connections. This removes the need for additional costly NICs, switches, and cables, while increasing bandwidth flexibility. As a result, you can realize savings of up to 75 percent in network equipment costs.

Manage one infrastructure

The second rule acknowledges that with new technologies come new tools. It is all too common to find virtual infrastructures being managed with one set of tools and physical infrastructures being managed with another. This dual-infrastructure approach leads to multiple sets of operations tools, management data, and processes. If routine operational requirements, such as service availability, event management, problem isolation, and compliance reporting, were difficult before virtualization, imagine the cost and complexity increases that are possible in a virtual-physical divide.

Technology-enabled services will always be made up of physical and virtual components—applications, middleware, servers, storage, and networks. This makes monitoring and managing this mixed environment in a unified manner essential for technology providers to fulfill their mandate to the business. The key is holistic management of one infrastructure.

HP can help. HP Universal Configuration Management Database (UCMDB) provides a consolidated repository of the physical and virtual infrastructures and services. HP Discovery and Dependency Mapping not only automates the population of the UCMDB, but it also maps the relationship of these logical elements to the overall business services they support. This data discovery and mapping is leveraged by HP Service Manager for incident management, by HP Operations Center for consolidated event and performance management, by HP Release Manager for impact analysis, and by HP Asset Manager for better financial management and license compliance. Using the native capabilities of HP UCMDB, you can proactively model the service impact of proposed changes and track configuration changes to all infrastructures, including virtual elements.

Automate to enable scalability

The third rule is about growing a virtualization footprint, reliably and cost-effectively. Automation allows technology organizations to scale services up or down quickly, without requiring corresponding investments in staffing costs. It also takes the element of human error out of complex manual tasks. For these reasons, wide-scale adoption and success of virtualization is dependent on automation. Automating routine, operational, and end-to-end processes is essential for driving out service costs, increasing quality, and maintaining compliance.

Automation can be deployed at several levels. At an infrastructure level, HP Data Center Automation Center can automate and orchestrate provisioning, updates, and compliance tasks across an entire hardware stack—including network, server, storage, and even client computing devices. Automation can also be

applied to daily maintenance tasks, such as backup and recovery. HP Data Protector software automates high-performance backup and recovery from disk or tape to provide 24x7 business continuity, while lowering the cost of doing so by up to 70 percent.

HP also enables automation of data collection, correlation, and analysis for availability and performance data—as virtual machines are put up, taken down, and moved from host to host. Without automated data collection, it becomes difficult to make simple decisions on what workloads are compatible and how many virtual machines can fit on a host. This can lead to incorrect configurations and a notably negative service impact. Having good decision support data makes automatic provisioning of servers more efficient and less error-prone, which leads to improved service levels.

Think beyond the data center

The fourth rule focuses on security, reliability, and leveraged investments through client virtualization. Virtualization does not end at the data center. Many of the investments made in the data center can be leveraged into virtualized desktops to reduce the risk of unsecured endpoints and data as well as improve employee productivity, while lowering the overall cost of services.

Extending virtualization to the desktop makes the business more secure, agile, and adaptable to your workforce at a lower total cost of ownership (TCO). Users become more productive through vastly increased flexibility with a more reliable local desktop experience from anywhere they may need to work. In addition, administrators can remotely support, troubleshoot, and manage hardware, operating systems, applications, and services for a broad number of users, without the need to crawl under desks or visit distributed desktop locations.

Client virtualization solutions can keep data in the data center securely. Using remote client virtualization solutions, the visual desktop experience is delivered from the data center to the user's thin client or access device. This can reduce the risk of data theft from end-user devices significantly and protect against unauthorized access, making it easier for your business to meet compliance requirements that address proprietary data or customer information.

Implementing client virtualization can also make it easier for you to meet both your organization's and your customers' environmental policies. The small footprint of thin clients requires significantly less component and packaging material usage. And the overall lower weight translates into less fuel consumption during delivery than a standard PC. Also, thin clients have no moving parts—no fans or hard disks—making them quieter, more reliable, and more energy-efficient than conventional PCs.

Think beyond the data center (cont'd)

Reducing ambient office noise can reduce fatigue and stress, making workers more productive. In addition, thin clients generate much less heat, so offices stay cooler with lower air-conditioning energy consumption, resulting in lower electricity bills and an overall reduction in CO₂ emissions.

The use of thin client technology, in parallel with the energy-efficiency measures in the data center, means that the carbon impact of the end-to-end infrastructure can be reduced—with overall improved efficiency due to a reduced service load. A thin client and Virtual Desktop Infrastructure (VDI) session generally uses below 30W of electricity combined—even under heavy load. A desktop may consume more than 150W under the same circumstances as a VDI session. Just add up the costs using 100, 1,000, or 5,000 desktops at your current electricity rates, and think about the potential cost savings. This kind of savings can affect a company's bottom line. HP has customers who use thin clients and save hundreds of dollars per day in reduced energy costs alone.

Experience shows that, in order to deliver the security, compliance, and cost benefits the business expects, the client environment must be flexible enough to match the computing needs of the employee base. These needs vary greatly by position, by department, and even by location, project, or time of the year. That is why we created the HP Client Virtualization portfolio—the industry's broadest range of client virtualization

solutions. HP Client Virtualization solutions help enhance the reliability and security of the end-user environment, while simplifying management.

For most organizations, when it comes to virtual client technologies, one size does not fit all. Targeting the right solution for the right user group or environment allows the best performance at the best cost. For this reason, many enterprise businesses have deployed, and will continue to deploy, multiple client virtualization technologies for their user environments.

In the market today, HP is the only technology vendor with the ability to offer a full portfolio of interoperable virtualization technologies under one roof. The HP Client Virtualization portfolio includes solutions for server-based computing, server-hosted desktops (VDI), dedicated remote desktops (blade PCs and blade workstations), and local virtual machines.

HP, together with key industry partners, such as Citrix, VMware, and Microsoft, offers end-to-end client virtualization solutions for the entire population of enterprise users, from entry-level task-oriented workers up through engineers and traders who need significant compute and/or graphics performance. HP can drive both hardware and application commonality from the thin client access device through partners' virtualization software stacks, the connection protocol, broker, management tools, and back into the data center hardware.

Be flexible

The last rule concerns how you source the skilled resources needed to put the other four rules into play. In the face of budgetary constraints, successful organizations have shown that getting creative with sourcing models is one way to fill in the skill gaps that often prevent broader adoption of virtualization.

Each organization's ability to realize the full potential of virtualization is based on its specific needs and resources and its familiarity with all facets of virtualization. The good news is that HP provides flexible service options designed to help each organization develop and execute a service-centric virtualization strategy, tailored to its needs.

HP services can help you assess, design, transition, operate, and improve your infrastructures, applications, operations, and client architectures continually. Alternatively, HP also provides virtualization outsourcing services that can help you plan, build, and run an outsourced virtual environment, designed to meet your organization's goals.

Partnering with HP has many advantages. As one of the largest technology companies in the world, HP has experience from the desktop to the data center and can provide solutions that are flexible enough to meet your business needs.

When you get virtualization right, you get real and measurable results

Public sector

Challenge: Wageningen UR, which comprises a university and several dedicated research institutes, generates an enormous amount of important scientific and commercially sensitive data. The establishment had several data centers, each located in separate buildings and running various applications and detached email systems. There were diverse server environments, poor data storage and back-up facilities, and too many people managing a distributed SAN. In addition, the disparate email systems hindered effective communications. The solution was to centralize, consolidate, and optimize the data center architecture.

Deployment: HP ProLiant DL380 Servers, HP ProLiant BL20p Server Blades, HP ProLiant BL480c Server Blades, HP StorageWorks Enterprise Virtual Array (EVA), HP StorageWorks Enterprise Modular Library (EML) E-series, HP Modular Cooling System (MCS) Primary software, HP Data Protector software, VMware virtualization software, and HP Consulting and Integration services.

Results: Reduced the time spent on managing the email environment by 60 percent, TCO by up to 30 percent, and the staff required to manage the server environment by 35 percent¹.

Health and life sciences

Challenge: Keeping up with growing desktop demands, Pacific Hospital of Long Beach, California, is a full-service, for-profit, and teaching hospital with 184 licensed acute care beds. Including physician practices and other facilities that partner with the hospital, the staff supports 1,300 users in 20 locations. In this scenario, deploying and maintaining traditional desktops was crippling the technology department.

Deployment: 150 HP Compaq t5730 Thin Clients with 1GB of RAM and 1GB of flash memory and Microsoft® Windows® XP Embedded, six HP ProLiant DL360 Servers in the central data center running Citrix software for remote access, and a centralized storage area network for all application files.

Results: Faster hardware and software deployment; time and cost reductions through remote, centralized management that removed the need for field

technicians to travel throughout Southern California; and total cost saving estimates ranging from 22 to 48 percent per year over the first three years, with roughly 80 percent power usage savings at the desktop because of the thin client deployment².

Media and entertainment

Challenge: MICROS-Fidelio provides enterprise-wide technologies to all segments of the hotel industry—from budget hotels to about 70 percent of the world's five-star hotels. The company needed to keep service levels high and raise them higher to keep winning the business of the most demanding hotels and hotel guests in the world. As the business grew, space demands in its data centers grew by 50 percent annually. In the past three years, application hosting has grown fivefold, while data center energy costs have doubled. To manage the growth, the company decided to standardize on common hardware for all its clients.

Deployment: HP ProLiant BL465c G5 Server Blades, HP ProLiant BL685c G5 Server Blades, HP BladeSystem c7000 Enclosure, HP Virtual Connect technology, HP StorageWorks Enterprise Virtual Array (EVA), HP Insight Dynamics – VSE, HP Virtual Connect Enterprise Manager, HP StorageWorks Continuous Access software, and VMware Infrastructure 3.

Results: Reduced missed application-level service-level agreements (SLAs) by 45 percent, allocation and management time by 50 percent, power requirements by 80 percent, recovery time by 25 percent, and rollbacks of upgrades by 25 percent; achieved 50 percent annual data center growth with just 25 percent increase in staff; and doubled server utilization³.

Telecom

Challenge: Mitel is a leading provider of communication solutions that deliver Internet Protocol (IP) or IP-based voice, video, and data services over a single broadband network. Being a fast-changing business with highly variable transaction volumes, the firm has a constant need to rapidly roll out innovations and improve their service levels, well within budget constraints, to stay ahead of the competition. The company wanted to consolidate and virtualize its technology infrastructure, so that it had an engine room capable of sustaining its business growth.

¹ "HP partners Wageningen UR in a constant drive for infrastructure optimisation", March 2009
http://wpcfs.corp.hp.com/TSGWW2_WPC/Al/Wageningen.pdf

² "Hospital slashes desktop costs, improves services with HP thin clients", March 2009
<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA2-4823ENW.pdf>

³ "Meeting SLAs for the world's most demanding customers with HP Insight Dynamics – VSE", January 2009
<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-4044ENW.pdf>

Deployment: Two clustered HP 9000 rp8420 32 Servers, HP-UX 11i v2-based HP Virtual Server Environment, nPars and vPars, HP Serviceguard, HP-UX Workload Manager, HP ProLiant BL20p G2 and G3 Blade servers, NAS cluster of HP StorageWorks EVA with HP Data Protector software and dual HP StorageWorks MSL tape libraries; HP Services including consulting and project management for planning, design, installation, and configuration services including transfer to new platform and ongoing Business Continuity Support; and HP Financial Services leasing solution.

Results: Reduced data center operating costs by CDN\$300,000 per year and resource allocation below 30 minutes, as opposed to weeks, by deploying partitions rather than servers⁴.

Manufacturing

Challenge: Jabil is a global electronic product solutions provider with three data centers and server rooms in 12 different locations. The company needed to reduce data center footprint and management requirements to maintain a competitive edge and increase profitability. In addition, it wanted to provide greater flexibility and speed in delivering technology services.

Deployment: HP ProLiant BL465c Server Blades, HP ProLiant BL685c Server Blades, HP Integrity BL860c Server Blades, HP BladeSystem c7000 Enclosure, HP Insight Control Environment for BladeSystem, HP ProLiant Essentials Virtual Machine Management Pack 3.5, VMware Infrastructure 3, VMware ESX Server 3.5, and HP service and support.

Results: Reduced time to value for new servers by 95 percent (10 minutes versus 3 hours) and on-call time from 24x7 shifts to 12x5 shifts; increased server count by 50 percent without increasing administration headcount; and achieved 30 to 50 percent reduction in server footprint and \$15,000 annual savings from reduced staff time due to automated spare parts replacement⁵.

Get started

HP suggests that you consider the following steps to begin your virtualization journey:

Assess your current state: Virtualization impacts people, processes, and technology. Through our offerings, which include HP Adaptive Infrastructure Maturity Model, HP Virtualization Assessment Services, and HP Data Center Services, HP can help you assess your current state to determine a starting point.

Develop your virtualization strategy: This strategy should be based on your business strategy and goals. HP Data Center Virtualization Services can help you build the virtualization strategy that is right for your business.

Build your virtualization plan: Through HP Data Center Virtualization Services and HP Adaptive Infrastructure experts, HP can help you build a prioritized list of projects and activities that can help you improve the business outcomes of your virtualization initiative.

To learn more about how HP can help you build virtualization with a future into your business, visit: www.hp.com/go/virtualization. Get in touch with an HP representative to schedule an assessment and build a virtualization plan, based on your business goals and your current state of technology, and start getting more from virtualization for your business.

⁴ "Leading telecom turns virtual IT infrastructure into real competitive advantage", January 2006
http://www.hp.com/canada/portal/enterprise/success_stories/Mitel.pdf

⁵ "The more we grow, the smaller we get: Jabil uses HP BladeSystem, virtualization, and integrated server management tools to shrink its IT footprint even as the company grows", January 2009
<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-4381ENW.pdf>



Get connected

www.hp.com/go/getconnected

Get the insider view on tech trends, alerts and HP solutions for better business outcomes

Technology for better business outcomes

To learn more, visit www.hp.com/go/virtualization

© Copyright 2009 Hewlett-Packard Development Company, L.P. The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

Microsoft and Windows are U.S. registered trademarks of Microsoft Corporation.

4AA2-7209ENW, August 2009

