



# Virtualization Solution Guide for midsize businesses

Virtualization technology can help your midsize business reduce costs, mitigate risks, and accelerate growth. HP can show you how.





## Let's talk about virtualization.

It's the technology on the lips and minds of almost every IT professional these days. If you aren't intimately familiar with it yet, here's a quick primer: Virtualization is a software layer that groups resources (such as servers and storage modules) logically rather than physically. This allows a single physical resource to function as multiple resources, or conversely, allows multiple physical resources to appear and behave as a single resource.

The classic example is that of the average server. Originally designed to run one operating system and one application, a server that has been virtualized can run several operating systems and several applications at once. And that changes everything. It means a server that was probably underutilized (10% is a fairly common utilization rate)—can now handle a lot more work—which allows the company using that server to increase its ROI, minimize unnecessary capital expenses, *and* expand its infrastructure capacity to support growth without increasing physical space

requirements. Plus, virtualization lowers the administrative burden by making server deployment and management easier, it helps bring power and cooling expenses under control, and it provides a very cost-effective way to set up a disaster recovery site.

### **So why haven't you virtualized?**

Now here's where the rubber hits the road. If you've known about virtualization but have yet to take the plunge, you're clearly either not convinced of its benefits or concerned about the implementation, or both. That's what we're here for today. Today we'll talk about the benefits that virtualization can deliver. Not intangible benefits, but concrete, hard-core, bottom-line, expressed-in-dollars benefits. And we'll talk about how HP is making virtualization easier for smaller and mid-sized companies to embrace. We've got a couple new technology offerings to talk about first, then we're going to take you through a few very specific (and common) sample scenarios to show you how the typical virtualization deployment plays out and how the companies embracing it are benefiting. Let's get started.

# Virtualization makes management easier and saves on power and cooling expenses to help you go green.

## **HP ProLiant iVirtualization—a fast and simple turnkey approach to virtualizing your environment**

VMware ESX Server 3i and Citrix XenServer are two of the most effective and respected virtualization solutions on the market. ESX Server 3i is a next-generation thin architecture, which provides an efficient foundation for building a dynamic, automated infrastructure. XenServer is a high-performance virtualization solution designed for efficient support of Windows® and Linux virtual machines. What HP has done is integrate both these solutions into ProLiant servers—along with powerful HP management software—to enable fast and straightforward deployment, proactive hardware monitoring, and consolidated lifecycle management with server firmware upgrades.

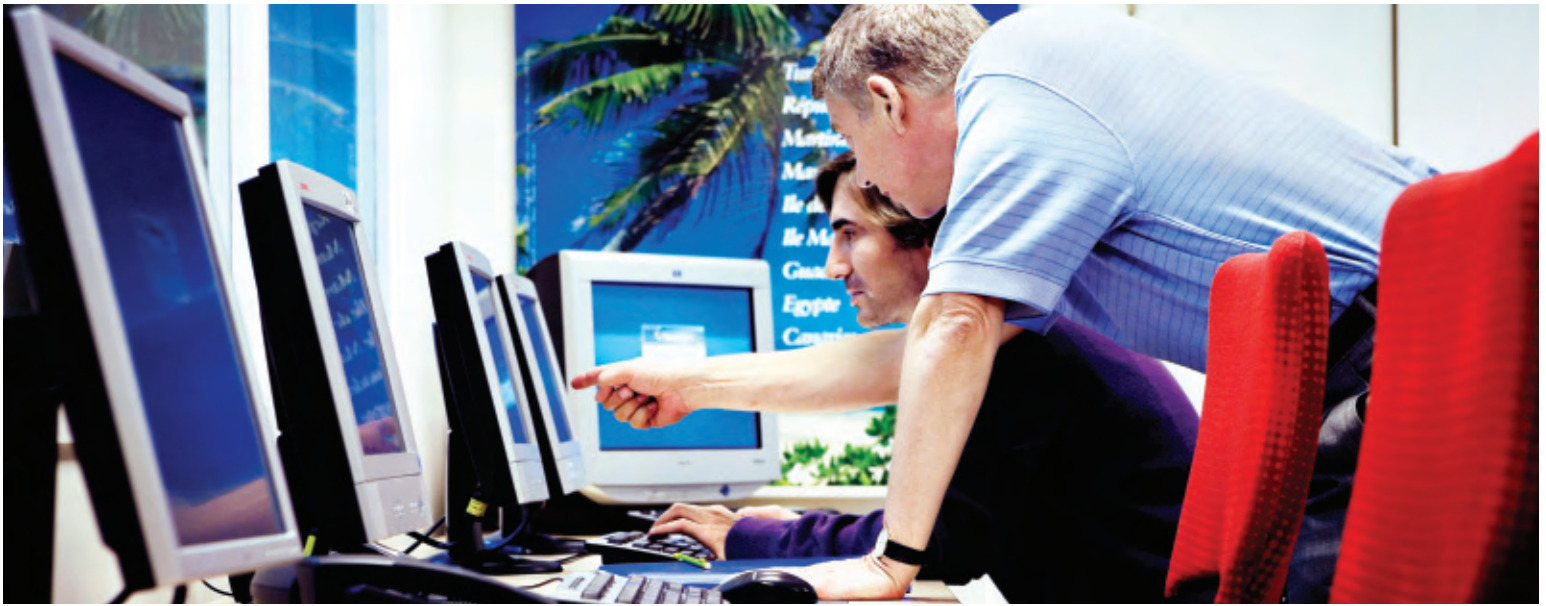
The way it works is that HP ships the software on a USB key, which is pre-installed in the internal USB port of the server. The system boots directly from the USB key, so the new servers are ready to run the virtualization application right out of the box. This revolutionary way of distributing virtualization technology removes time-consuming installation steps and simplifies host configuration.

HP ProLiant iVirtualization is the only out-of-box offering that fully integrates industry-leading virtualization technology with core server management tools. It leverages core ProLiant technologies such as Integrated Lights-Out (iLO) management software, while supporting a broad range of industry-leading HP ProLiant servers.

## **What are HP's key differentiators?**

The following three HP differentiators apply to both Citrix and VMware solutions:

- **Active hardware management**—For active hardware management, HP Systems Insight Manager components are pre-installed on the USB key. These HP Common Information Model (CIM) components proactively surface hardware monitoring data in order to provide up-to-date information on the server state. This server state information is surfaced through HP Systems Insight Manager (HP SIM) by actively polling the server or through pre-failure alerts sent by the server to HP SIM.
- **Consolidated lifecycle management**—Future updates to integrated VMware or Citrix virtualization software can be made with the same tool used to update ProLiant system firmware. This simplifies lifecycle management by consolidating update processes using the same tool. In addition, the USB key is partitioned with redundant images, enabling a robust upgrade and recovery process.
- **Leverage existing investments**—Leverage existing investments to help contain data center costs. HP supports a broad range of servers for both VMware and Citrix products, allowing you to continue using existing server standards in your virtualized environment.



“It is very simple to turn on, get working and you get the benefits of virtualization, right out of the box,” stated Bowker, an analyst at the Enterprise Strategy Group. “Citrix’s goal is to make it as easy as possible. They do not see the need to learn new tools and get retrained.”

The following two HP features apply to Citrix solutions:

- **HP ProLiant Virtual Console**—For integrated Citrix XenServer, HP also includes HP ProLiant Virtual Console for straightforward single server host and virtual machine (VM) configuration and management; there is optional iLO remote access to host and VM consoles.
- **HP integrated Citrix XenServer HP Select Edition**— This value-priced virtualization option allows unlimited virtual machine creation with up to 32 GB memory per virtual machine. It is licensed by server, so the same license can be used on either a 2P or 4P server.

#### Two distinct virtualization choices

Which solution is right for you? That will depend on the unique challenges your company faces, the goals it hopes to achieve, and the current IT infrastructure you have in place.

HP integrated VMware ESXi 3.5 solutions are ideal for companies that are experienced with virtualization and require advanced management functionality. When attached to a shared SAN storage array like the HP StorageWorks Modular Smart Array (MSA) or Enterprise Virtual Array (EVA), they enable live migration, provide

workload balancing, allow clustering, and enhanced high availability.

HP Citrix integrated XenServer solutions, on the other hand, are great for new users of virtualization technology because they provide simple and secure virtual machine deployment and management at an entry-level price. Specifically, the XenServer HP Select Edition is a low cost yet powerful option for small virtualization installations, allowing unlimited virtual machines and featuring all-in-one management through the HP ProLiant Virtual Console (PVC).

PVC removes complexity from virtualization installations by offering single server virtual machine management. It allows local virtual machine creation and management using the server’s keyboard/video/mouse. PVC features include:

- A first-time wizard-based setup that guides you through initial installation and configuration of host and virtual machines in ten minutes or less
- A GUI-based interface that provides ongoing virtual machine monitoring and management
- A multi-screen view of virtual machine consoles installed on the server, which simplifies the management process by allowing you to view multiple virtual machine consoles at once

Need greater functionality? Experienced users of virtualization technology will benefit from the Citrix XenServer HP Enterprise Edition, which enables resource pooling and live migration of virtual machines for optimum data center flexibility.

For more information about HP ProLiant iVirtualization solutions, visit [www.hp.com/go/easierdone](http://www.hp.com/go/easierdone)

## Scenario 1: Server Consolidation virtualization solution

In U.S. dollars

		Base Case				Virtualized Infrastructure				Savings			
		Year 1	Year 2	Year 3	Total Cost	Year 1	Year 2	Year 3	Total Cost	Year 1	Year 2	Year 3	Total Cost
Capital Costs	Servers***	20,174	20,174	17,292	57,640	8,522	8,522	8,522	25,566	11,652	11,652	8,770	32,074
	Virtualization Software					500	500	500	1,500	(500)	(500)	(500)	(1,500)
	<b>Total Capital Costs</b>	20,174	20,174	17,292	57,640	9,022	9,022	9,022	27,066	11,152	11,152	8,270	30,574
Operating Costs	Power and Cooling*	16,000	16,000	16,000	48,000	11,200	6,400	2,400	20,000	4,800	9,600	13,600	28,000
	Provisioning Costs**	2,800	2,800	2,400	8,000	280	280	240	800	2,520	2,520	2,160	7,200
	<b>Total Operating Costs</b>	18,800	18,800	18,400	56,000	11,480	6,680	2,640	20,800	7,320	12,120	15,760	35,200
<b>Total</b>		38,974	38,974	35,692	113,640	20,502	15,702	11,662	47,866	18,472	23,272	24,030	65,774

### Assumptions:

\* Approximate cost of powering and cooling based on \$800 cost per 1P server.

\*\* Assumes 10 hours to provision a non-virtual server and 1 hour for a virtual server, a 1/3rd per year replacement cycle, and a \$40/hour labor rate.

\*\*\* Servers in base case replaced by 7, 7, and 6 physical servers over three years. Virtualized scenario replaces 7, 7, and 6 physical machines with 1 new physical server running 7, 7, and 6 virtual machines over the three-year period.

### Scenarios<sup>1</sup>

Now let's take a look at a few different virtualization scenarios. We'll describe the drivers for each scenario, the HP integrated virtualization solution that would best address those drivers, and the cost savings you might expect to achieve by implementing the solution.

**Scenario 1: Server Consolidation**—Virtualization enables your organization to consolidate its server resources for improved utilization and tremendous cost savings. When you virtualize resources with HP integrated server solutions, you can easily migrate from an underutilized, over-provisioned physical environment to a virtual environment with fewer, more reliable systems. By doing this, you'll use less hardware, which means you'll reduce your real estate requirements (and expenses) as well as your power and cooling requirements and your management costs.

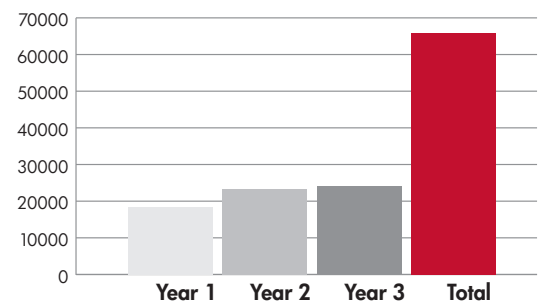
The table above compares the cost of maintaining an infrastructure of 20 physical servers to the cost of consolidating that same environment to three physical servers running 20 virtual machines.<sup>2</sup> Because real-world consolidation efforts typically do not take place in one fell swoop, we have dispersed costs for both scenarios across the space of three years.

As you can see, in the Base Case, where the environment is completely physical, \$57,640 is spent on acquiring new servers over three years. Provisioning these servers would cost \$8,000, and powering and cooling expenses for the entire environment would run around \$48,000. That puts the total expenditures for the non-virtualized environment at \$113,640 over three years.

In the virtualized environment, however, the physical servers are gradually replaced (seven the first year, seven the second year, and six the third year), by HP ProLiant iVirtualization servers running virtual machines. At the end of three years, this customer will have spent \$25,566 on the new virtualized servers, \$1,500 on virtualization software, \$800 on provisioning, and \$20,000 on power and cooling expenses, for a total expenditure of \$47,866 over three years. He will have eliminated 17 physical servers, and—compared with his counterpart with the all-physical environment—he will be enjoying annual power and cooling expenses that are more than \$13,000 lower. Overall, the customer going with a virtualized environment will have saved himself an amazing \$65,744 over three years compared to the company that decided against virtualization.

### Total cost savings with HP ProLiant iVirtualization servers running virtual machines

#### \$ Savings



<b>Year 1 savings:</b>	<b>\$18,472</b>
<b>Year 2 savings:</b>	<b>\$23,272</b>
<b>Year 3 savings:</b>	<b>\$24,030</b>
<b>Total:</b>	<b>\$65,774</b>

**Scenario 2: Business Continuity/Disaster Recovery virtualization solution**  
In U.S. dollars

		DR—Base Case				DR—Virtualized Infrastructure				Savings			
		Year 1	Year 2	Year 3	Total Cost	Year 1	Year 2	Year 3	Total Cost	Year 1	Year 2	Year 3	Total Cost
<b>Capital Costs</b>	<b>Servers***</b>	57,640			57,640	25,566			25,566	32,074			32,074
	<b>Virtualization Software</b>					1,500			1,500	(1,500)			(1,500)
	<b>HP StorageWorks Storage Mirroring software</b>	104,424			104,424	38,320			38,320	66,104			66,104
	<b>Total Capital Costs</b>	162,064			162,064	65,386			65,386	96,678			96,678
<b>Operating Costs</b>	<b>Power and Cooling*</b>	16,000	16,000	16,000	48,000	2,400	2,400	2,400	7,200	13,600	13,600	13,600	40,800
	<b>Provisioning Costs**</b>	8,000			8,000	800			800	7,200			7,200
	<b>Total Operating Costs</b>	24,000	16,000	16,000	56,000	3,200	2,400	2,400	8,000	20,800	13,600	13,600	48,000
	<b>Total</b>	186,064	16,000	16,000	218,064	68,586	2,400	2,400	73,386	117,478	13,600	13,600	144,678

Assumptions:

\* Approximate cost of powering and cooling based on \$800 cost per 1P server.

\*\* Assumes 10 hours to provision a non-virtual server and 1 hour for a virtual server, a 1/3rd per year replacement cycle, and a \$40/hour labor rate.

\*\*\* Base case assumes 20 servers purchased in year 1 for DR site. Virtualized case assumes 6.67:1 ratio for virtual machines to physical servers, with 3 servers being purchased to run 20 virtual machines.

**Scenario 2: Business Continuity/Disaster Recovery—**

You need to protect your data from a multitude of threats, ranging from software glitches and hardware failures to human errors and natural disasters. HP integrated virtualization solutions provide cost-effective options to traditional business continuity solutions.

The table above compares the cost of establishing a traditional disaster recovery (DR) site with the cost of establishing a DR site that uses virtualization technology.<sup>3</sup>

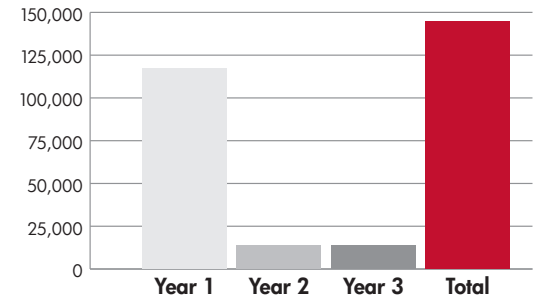
Unlike a consolidation effort, which is likely to take place across several years, the creation of a DR facility is likely to happen all at once. However, power and cooling savings will continue to accrue over time, so this chart, like our first, will cover total cost savings over the space of three years.

As you can see, in the Base Case, the capital expenditures are tremendous. The company using this strategy would spend \$57,640 on 20 new servers and \$104,424 on HP StorageWorks Storage Mirroring software. On top of that, they'd spend \$56,064 on operating costs, including \$48,000 for power and cooling, and \$8,000 on provisioning. Total cost for this customer to create a DR site and run it for three years: \$218,064.

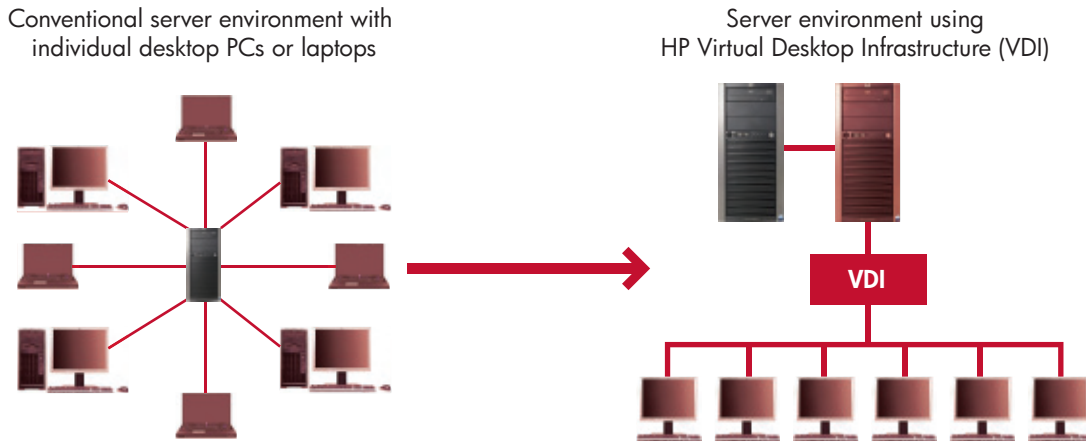
By comparison, the company creating a DR site with a virtualized infrastructure would spend a mere \$25,566 on three new HP ProLiant iVirtualization servers, \$1,500 on virtualization software, and \$38,320 on HP StorageWorks Storage Mirroring software. Add to that the \$7,200 they would spend on power and cooling, and the \$800 they'd spend on provisioning, and you can see this company comes out way ahead, spending only \$73,386 to set up their new DR site—a savings of \$144,678.

**Total cost savings with establishing a Disaster Recovery site that uses virtualization technology**

**\$ Savings**



<b>Year 1 savings:</b>	<b>\$117,478</b>
<b>Year 2 savings:</b>	<b>\$13,600</b>
<b>Year 3 savings:</b>	<b>\$13,600</b>
<b>Total:</b>	<b>\$144,678</b>



**Scenario 3: PC Virtualization**—As you are probably aware, the traditional one-PC-per-user desktop environment creates formidable management challenges. Heterogeneous desktop hardware requires multiple PC images, labor-intensive technical support keeps maintenance costs high, and valuable IT personnel spend too much time on repetitive tasks such as resetting passwords or maintaining hardware.

In addition to these inherent challenges, recent press headlines about stolen laptops with sensitive data files have highlighted a persistent security issue associated with the traditional desktop environment: It's hard to protect these devices and the sensitive information they contain. Maintaining security is made more complicated by the need for constant upgrades and patches. Backing up desktops is also a challenge—if it gets done at all. And all the while, many organizations are paying steep power and cooling costs for hundreds of underutilized PCs.

The HP Virtual Desktop Infrastructure (VDI) is designed to help you respond to these challenges. As you can see in the graphic above, it delivers immediate cost savings versus outfitting your staff with desktop PCs; but the true value of VDI lies in its innovative approach to managing and controlling today's desktop environment.

VDI enables your organization to host desktops inside virtual machines running on centralized servers. Users access their virtual desktops remotely from a thin client, repurposed computer, or even a handheld device. Security is enhanced because VDI enables

organizations to move sensitive data usually stored on desktop or notebook drives into a centrally managed storage environment in the corporate IT infrastructure. Support is streamlined because configuration, patch management, and image management can be performed through centralized resources. And compatibility issues are reduced by running desktop applications on top of desktop operating systems.

#### **HP Server Migration Pack—Universal Edition**

When you're ready to virtualize your existing infrastructure, HP is ready to help. The HP Server Migration Pack—Universal Edition (SMP Universal) provides an automated, accurate, and affordable way to migrate existing servers and their content to the latest HP BladeSystem or ProLiant server technologies or the latest virtualization platforms from VMware, Microsoft®, and Citrix. SMP Universal supports P2ProLiant, V2ProLiant, P2V, and V2V migrations; and it can run standalone or integrate with HP Systems Insight Manager. Physical or virtual, the fastest and easiest way to migrate your servers is with HP Server Migration Pack—Universal Edition.

[www.hp.com/go/smp](http://www.hp.com/go/smp)

#### **HP StorageWorks**

While data storage has become a challenge for companies of all sizes, there is no question that it can be a disproportionate burden on small and midsized businesses. We understand that you need comprehensive, yet easy-to-implement solutions that bridge the gap between your data storage requirements and the capabilities of your IT

infrastructure. HP ProLiant iVirtualization is making it easy to improve the efficiency of your IT infrastructure. Consolidating your data storage is another easy way to improve efficiency, and is a natural fit to create highly available virtualized server environments.

HP Simply StorageWorks brings together all of the resources you need to make the most of your technology investments, and shorten the route to business outcomes. HP and our channel partners provide personal attention, convenient tools, and reliable services to help you improve the efficiency of your data storage and protect your data assets so you can focus on your business. As your trusted partner, we deliver cost-effective and change-ready solutions to support growth, save costs, and reduce your risk. HP Simply StorageWorks solutions include consolidated SAN storage arrays, optimized NAS file/print serving solutions, and multi-tier backup using disk and tape. For more information, visit [www.hp.com/go/storage](http://www.hp.com/go/storage)

## HP Financial Services

Don't forget that HP provides financial solutions for managing total cost of ownership, from planning and acquiring business technology all the way to replacing and retiring it. It's just one more tool HP offers to help you get to where you want to be—sooner and easier. For more information, visit [www.hp.com/hpfinancialservices](http://www.hp.com/hpfinancialservices)

## HP Services

HP Virtualization Support Services help your business gain the most it can from virtualization, helping deliver total care for your IT infrastructure—whether that means optimizing previous initiatives or deploying new solutions. With new services introduced for virtualization software such as Citrix XenServer and VMware ESX Server 3i plus an extensive portfolio of deployment and support offerings for HP ProLiant servers and management software, HP can help you show a faster return on your IT investment. Services from HP help customers integrate servers, operating systems such as Microsoft Windows, and virtualization software to create a flexible, virtualized environment. Not only can we help you improve capacity utilization, but HP Services can help you concentrate skills and resources where they are needed most, helping your organization keep pace with changing business needs.

XenServer Enterprise Edition and VMware Server 3i Enterprise options from HP come with 1-year 9x5 unlimited incidents support and subscription update services. Further productivity-enhancing support-level upgrade options are available.

For those products that do not come with 1-year 9x5 unlimited incidents software support and subscription updates included, an equivalent HP Care Pack is available.

For all products, the following HP Care Pack upgrades are available: 3-year 9x5, 1-year 24x7, and the HP recommended service level of 3-year 24x7 unlimited incidents software support and subscription updates. HP Virtualization Support Services help your organization:

- Gain greater performance from your system investments
- Increase server utilization rates
- Improve productivity

To learn more about HP Virtualization Support Services, visit [www.hp.com/services/Virtualization](http://www.hp.com/services/Virtualization)

<sup>1</sup> These scenarios are examples for illustration only. Actual implementation and associated savings may vary.

<sup>2</sup> Assumptions: approximate cost of powering and cooling based on \$800 cost per 1P server; assumes 10 hours to provision a non-virtual server and 2 hours for a virtual server, a 1/3rd per year replacement cycle, and a \$40/hour labor rate; servers in base case replaced at a rate of 7 the first year, 7 the second year, and 6 the third year over three years. The virtualized scenario replaces 7 servers with one physical server and seven virtual machines the first year; another 7 servers with one physical server and seven virtual machines the second year; and 6 servers with one physical server the third year. The servers used in the Base Case are HP ProLiant ML310 Servers. The virtualized environment uses ProLiant ML370 Servers.

<sup>3</sup> Approximate cost of powering and cooling based on \$800 cost per 1P server; assumes 10 hours to provision a non-virtual server and 2 hours for a virtual server, a 1/3rd per year replacement cycle, and a \$40/hour labor rate; Base Case assumes 20 servers purchased in year 1 for DR. Virtualized case assumes 6.67:1 ratio, with 3 servers being purchased.

To learn more, visit [www.hp.com/go/easierdone](http://www.hp.com/go/easierdone)

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