



HP virtualization with VMware

Enabling end-to-end virtualization of IT resources



No matter the size of your business, HP virtualization solutions with VMware deliver savings, simplification, and scalability across your environment.

The HP virtualization solutions with VMware

Enabling end-to-end virtualization

HP offers a comprehensive approach to virtualization that encompasses all aspects of your environment—from virtualization of mission-critical platforms, to client infrastructure, to management of your virtualized data center.

These offerings include industry-leading virtualization software from VMware, combined with HP infrastructure and tools for unified management of the virtual environment. In a unique advantage, our infrastructure management portfolio allows you to monitor, deploy, and control your HP ProLiant and HP BladeSystem servers and HP StorageWorks storage systems from almost anywhere.

And to bring it all together, our services organization and channel partners help you through the process of evaluating your needs, planning your solution, and deploying and operating your virtualized environment.

With HP, you gain an end-to-end, tightly integrated virtualization solution that incorporates everything you need: hardware, software, and services—including planning, deployment, and management. We deliver all the resources to put virtualization to work for your critical IT initiatives, including server consolidation, virtual desktop infrastructure, high availability, and continuity of operations, as well as development and test environments.

Whether you have ten servers, 100 servers, or 1,000 servers, HP virtualization solutions with HP servers, HP StorageWorks systems, HP services, and VMware software can deliver savings, simplification, and scalability across your environment.

The virtualization opportunity

Reducing costs and increasing agility

Around the world, forward-looking IT organizations are using virtualization to deliver better business outcomes and evolve their data centers from high-cost technology silos to low-cost, pooled assets. These organizations recognize that virtualization helps break down the silos that contribute to chronic under-utilization of IT resources and prevent applications from sharing infrastructure.

More than ever before, it's clear that virtualization makes good business sense. Virtualization enables a next-generation Adaptive Infrastructure that can meet the demands of changing business requirements. It can help an organization simultaneously reduce costs, increase energy efficiency, enhance availability and continuity, and increase agility. So for many companies, the question isn't, "Should we virtualize?" Instead, the question is, "How can we transition to a virtualized environment in a predictable, cost-effective manner?"

HP and VMware have the answer. HP and VMware offer a complete, mainstream virtualization solution that leverages VMware technology and HP platforms, management tools, and services. These proven solutions put your organization on a predictable path to the broad benefits of a virtualized IT environment.

The business benefits of virtualization

Save

- Save on hardware costs.
- Reduce overhead (power, cooling, space).
- Reduce administrative costs.

Simplify

- Gain integrated control of your physical and virtual machines.
- Consolidate management of servers, storage, and applications.
- Simplify procurement and support by working with one vendor.

Scale

- Increase efficiency and resource utilization.
- Automate IT service delivery with virtual desktop management.
- Deliver higher availability and disaster recovery capabilities.

Rethinking infrastructure barriers

HP with VMware offers a vast portfolio of solutions to help you put virtualization to work to overcome your infrastructure barriers, such as server sprawl, high energy costs, and security issues. These offerings include products for virtualization of servers, storage, and network connections; software for consolidated management of virtual and physical resources; and services to deploy virtualization strategies across your environment.

We engineer our solutions to enable your efforts to:

- Move virtual resources around the data center quickly and inexpensively
- Provision new capacity in minutes
- Improve the performance of business services
- Put unused capacity to work for the business

Ultimately, we can help you rethink the architecture of your entire data center using virtualization as a catalyst.

Core solution components

VMware technology

VMware provides core building blocks for a server virtualization solution for your organization. A global leader in virtual infrastructure software for industry-standard servers, VMware has more than 120,000 customers, and its software has been adopted by 95 percent of Fortune 1000 companies. Many of the world's largest enterprises use HP and VMware technology to fully leverage their existing computing investments and respond to fluctuating business demands.

HP virtualization solutions with VMware technology build on the capabilities of VMware ESX with complementary software products from HP and VMware to provide a scalable virtual machine environment. HP supports, certifies, and sells a wide range of VMware software products from the VMware Infrastructure 3 (VI3) portfolio of products.

VMware software offered by HP

In addition to the standard VI3 products, HP offers Virtual Desktop Infrastructure (VDI) products as well as a comprehensive list of upgrade a la carte VMware software options, including:

- VMware Virtual SMP
- VMware VMotion
- VMware VirtualCenter
- VMware Storage VMotion
- VMware DRS
- VMware HA
- VMware Consolidated Backup
- VMware Capacity Planner
- VMware Lab Manager

For detailed information on the individual components, visit www.hp.com/go/vmware.

HP servers certified for VMware

HP is a market leader for x86 servers, storage, management software, services, and support. Building on this core strength, HP ProLiant and HP BladeSystem servers provide ideal platforms for virtualization on industry-standard hardware. Virtualized servers need more memory, more input-output (I/O) connections, and more network connections—in order to support many virtual machines (VMs) within a single physical server. Our servers were built with virtualization in mind.

You have the added assurance that comes with hardware and software certified for VMware. HP tests and qualifies many of its products with VMware. This includes drivers, management agents, installation software, and more. Certification allows you to run your business-critical applications with confidence, knowing we have tested key components within the virtualized stack. Today, HP has more certified ProLiant and BladeSystem server platforms for VMware than any other vendor – more than 50 servers. We continually add more platforms as new servers are released. Visit the www.hp.com/go/vmware/servermatrix for a complete list of certified server products.

By using HP BladeSystem servers, you can leverage the performance, density, and low power and cooling requirements of server blades. In the HP BladeSystem, 16 to 32 server blades share up to six power supplies and ten fans. Instead of assigning individual resources to each server blade, the system pools the resources and shares them among blades. A smaller solution footprint helps you make the most of the valuable space in your data center, and by attaching to a storage area network (SAN) you can benefit from significant additional cost savings and greater flexibility.

Virtualization is at the heart of our blade offerings. The HP ProLiant BL495c virtualization blade, the world's first server blade, was designed specifically to host virtual machines. The BL495c was built to remove the virtualization performance bottlenecks of memory, data storage, and network connections.

We make it easy to deploy blade-based systems. The HP BladeSystem c3000, for example, provides a versatile, all-in-one BladeSystem that allows smaller organizations, or those with remote sites, to consolidate server, storage, network, power, and management in an all-in-one infrastructure that is affordable and versatile.

In addition, HP has created HP BladeSystem Solution Blocks—proven application solution definitions that cut the time and effort needed to create, combine, and upgrade business solutions on a BladeSystem. Solution Blocks provide hassle-free ordering, configuring, and customizing of multiple applications. To view a list of Solution Blocks, visit www.hp.com/go/ bladesolutions.

HP StorageWorks certified for VMware

Network storage is an essential component of a virtualization solution. Network storage allows you to take advantage of the high-availability features of VMware, including the ability to quickly move virtual machines to different physical servers, while shielding the business from virtual machine hardware failures and protecting end users from service interruptions.

HP StorageWorks Fibre Channel and iSCSI storage provides an ideal platform for virtualization. The HP portfolio of storage products includes the All-in-One Storage System (AiO), Modular Smart Array (MSA), Enterprise Virtual Array (EVA), and XP disk array families. These storage arrays are tested and certified to deliver the performance you require in VMware environments.

Here are a few examples of how you can put these offerings to work in your virtualized environment:

- A combined HP BladeSystem and HP StorageWorks infrastructure provides an excellent platform for virtualization, offering an integrated, certified, easy-to-manage infrastructure that is fully certified with VMware.
- With its unique array-based virtualization capabilities, the HP EVA is optimized for simplified management and higher application availability. The ability to pool and centrally manage server and hardware resources results in a lower overall cost of IT and reduced requirements for power and cooling. The EVA integration with VMware Site Recovery Manager, meanwhile, delivers enhanced business continuity and application availability.
- The HP MSA 2000 is an excellent solution for organizations looking to transition from a direct-attach storage model to their first storage area network (SAN). With built-in features like snapshots and host-based replication software, the MSA 2000 offers a cost-effective entry-level solution. It's also ideal for larger organizations looking for a solution to meet their remote or branch office virtualization needs.

Ultimately, information is critical for the ongoing success of any business. You can increase the availability of your information by deploying virtualization—in particular deploying VMware in association with HP server and storage solutions. Combining replication and data protection software and technology from HP StorageWorks can significantly reduce the time required to recover from a disaster.

HP integrated virtualization management

While many companies can provide hardware that works with VMware, no other company offers our unique set of tightly integrated virtualization management

capabilities. We arm you with the tools you need to manage physical and virtual assets in the same way.

HP Insight Control suite

HP Insight software provides precise control to help you accomplish more in less time. Whether you are remote or onsite, HP Insight software gives you the ability to easily manage physical and virtual infrastructure throughout its lifecycle—from deployment to retirement—in a fraction of the time.

The HP Insight Control (ICE) suite provides a set of critical management and migration tools that integrate with your VMware virtualization solution, offering you the unique ability to detect pre-failure hardware alerts and use them to proactively move VMware virtual machines to other physical servers. ICE simplifies the management of HP ProLiant and BladeSystem environments, enabling total control of the server infrastructure—onsite or remotely. With a single, easy-to-use management console, you can proactively monitor server health and performance. You can also deploy new servers quickly and manage virtual machines—which means increased flexibility to quickly respond to your business. The savings are tangible—up to \$48,380 per 100 users.¹ Now with Dynamic Power Capping technology, ICE can potentially triple the capacity of your data center by reclaiming trapped power and cooling capacity. That equates to as much as a \$16 million capacity recovery for a typical 1 megawatt data center.²

Insight Dynamics – VSE suite (ID-VSE) for HP ProLiant

Providing advanced infrastructure management, HP Insight Dynamics – VSE suite (ID-VSE) for ProLiant servers helps you continuously analyze and optimize your adaptive infrastructure. This software is the world's first integrated solution that lets you visualize, plan, and change physical and virtual resources in the same way. It makes your infrastructure change-ready, with the freedom and flexibility of virtualization delivered across your physical infrastructure. The software helps you plan capacity and power continuously, balance physical and virtual resources, facilitate cost-effective availability, and provision infrastructure consistently. ID-VSE, which builds on HP Insight Control, gives you a powerful toolkit to accelerate complex IT projects and simplify daily operations. ID-VSE can generate savings of up to 40 percent for key data center tasks such as capacity planning, provisioning, and upgrades.

¹ IDC White Paper sponsored by HP, "Gaining Business Value and ROI with HP Insight Control," Document #210479, February 2008.

² "HP Performance Engineering Team, 2008 Benchmark." Percentage increase in server density compares the number of servers that can be deployed using Dynamic Power Capping with the number of servers that can be deployed using server faceplate values. Density improvements may vary based on how customers budget power and cooling resources.

HP expertise—for a one-stop solution

HP delivers one-stop shopping and support for your virtualization solution—including expert consulting and technical services from HP and partners as well as ongoing support from the worldwide HP support organization.

With our services expertise on your side, you're ideally positioned to rethink virtualization in business terms, and then apply best practices and innovative technology to achieve the promise of virtualization.

Our broad approach to virtualization addresses all aspects of your environment—people, processes, and technology. We start by pooling modular building blocks, including physical and virtual resources, into a shared infrastructure. Powerful, integrated management and automation tools then help you unleash the full power of virtualization. And we provide the professional services you need to align your IT resources to the needs of your business in powerful new ways.

HP has helped thousands of businesses achieve real benefits from virtualization. We use that experience to deliver solutions that help you gain more value from your virtualized environments. These efforts leverage the expertise of more than 200,000 HP services professionals worldwide. That means that as your needs change, HP has the services expertise to help you move forward.

HP Technology Services

Together with our channel partners, we offer a range of services for VMware solution deployment and ongoing support, including capacity assessment, analysis, consolidation, and migration. HP virtualization services help your business gain the most it can from virtualization—whether that means optimizing existing initiatives or deploying new solutions.

Our team of virtualization experts provides a consultative, practical approach to harnessing the extraordinary power of virtualization technology and driving success for all your important business objectives. Choose the level of service you want depending on your current level of in-house expertise and your plans for virtualization in the future.

HP virtualization services provide assistance throughout your virtualization lifecycle, from strategy and design through transition to ongoing operations and continual improvements. The HP Services organization can serve as a single point of contact for worldwide support for your virtualization solution, including proactive support to prevent problems and improve service levels to the business.

In these efforts, HP support personnel work closely with the VMware support organization. Add in the resources of HP worldwide network of certified value-added resellers, and you can be sure you have easy access to the expertise you need to design, deploy, operate, and support a high-performance, virtualized environment.

With the addition of EDS, HP has the industry's most comprehensive portfolio of IT solutions to help organizations like yours manage and transform their technology environments. Collectively, HP has helped thousands of companies implement successful virtualization solutions.

HP Services

HP Services provides the people and processes to help meet the availability and performance requirements of your business.

The HP Services portfolio offers:

Strategy and design services: translate business and technical needs into a solution that meets the necessary infrastructure needs

- **Deployment services:** risk-reducing installation, start-up, implementation, and integration
 - **HP Factory Express:** customized factory configurations and onsite deployment

- **Availability services:** reduce downtime and meet service-level commitments in business-critical environments
 - **HP Support Plus 24 Service:** integrated hardware and software support designed specifically for your technology
 - **HP Proactive 24 Service:** integrated hardware and software support, including proactive and reactive services to improve stability and availability
 - **HP Critical Service:** comprehensive support solution designed to help reduce the business impact of downtime for mission-critical applications

Education: classroom courses with self-paced curriculum and online instructor-led courses delivered off the shelf or customized to deliver an effective learning experience

For more information, please visit www.hp.com/services/virtualization.

Rethinking applications and IT operations management

HP and VMware help you rethink applications and IT operations management to take into account both the physical and the virtual resources used to deliver business services. We help you exploit virtualization in order to deliver better services, in a better way, to the business.

The key is to dynamically link business services to the physical and virtual resources that deliver those services, and then manage the services in real time leveraging best practices for business service management, business service automation, and IT service management. These are among the benefits of HP Business Technology Optimization (BTO) solutions.

HP Business Technology Optimization solutions

Our BTO solutions integrate with VMware solutions to monitor, manage, and automate key management functions seamlessly across physical and virtual worlds—and that helps you reduce costs, risk, and complexity.

Here's a closer look at how these solutions help you put virtualization to work to achieve better business outcomes:

- **HP Business Service Management solutions** link business services to underlying physical and virtual infrastructures to help you avoid IT service failures and gain insight into their causes. By understanding these relationships, you can identify performance problems before end users are affected, optimize the performance of virtual infrastructures, and provide accurate decision support data for automating changes to the environment.
- **HP Business Service Automation solutions** automate provisioning and compliance tasks across physical and virtual service boundaries to remove redundant tasks and drive down administration overhead.
- **HP IT Service Management solutions** provide consistent processes for managing and enforcing license compliance across virtual and physical environments. These solutions also provide consolidated incident, problem, and change management for the distributed enterprise.

Together, these solutions enable your IT team to allocate technology spending and resources based on business priorities; automate key processes across IT strategy, applications, and operations; and measure technology effectiveness and efficiency from a business perspective.

Software and services bundles

HP has simplified the process of determining which tools and services you will need by creating management packs, or bundles of software and

services, to help you get started. The management tools and technologies used to create these packs are from HP, VMware, and our partners.

Implementation service providers add the service component to help you design an appropriate solution for your business.

- The **HP and VMware Operations pack** is the basic management pack, and the point where you can begin to build your virtualization solution. The Operations pack focuses on IT operations and service management functions.
- The **HP and VMware Change and Configuration pack** focuses on IT change and configuration management functions and features.
- The **HP and VMware Performance pack** focuses on planning the infrastructure for better performance by providing tools to load test your virtualized environment prior to deployment.

With HP, you gain an end-to-end, tightly integrated virtual infrastructure that is available, optimized for performance, and ready to deliver what you need to meet your service levels.

Rethinking client architectures

When it comes to virtual client technologies, one size does not fit all. You have to target the right solution to the right user group to gain the best performance at the best cost. That's why HP offers a full portfolio of remote client solutions—so you can find the approaches that best match the needs of different user groups.

This portfolio includes thin clients and workstations, virtual desktop infrastructure solutions and remote graphics software, which allows a user to access and share the desktop of a remote computer over a standard computer network.

The HP portfolio can help you to enhance client infrastructure manageability and security to:

- Decrease the cost and complexity of client management and support
- Improve end-user security and data protection
- Meet end-user client reliability, performance, and personalization demands
- Reduce environmental impact with lower energy and materials usage

In addition, to help you bring your client virtualization solutions together, we offer a variety of services to assist with strategy, planning and design, implementation, transition, and operations.

Virtualization scenarios

Enable IT consolidation.

Server consolidation with HP and VMware enables your organization to consolidate server resources to improve utilization, reduce data center floor space requirements, cut power and cooling costs, and simplify management.

HP has more VMware Certified Professionals (VCPs) than anyone except VMware.³

When you virtualize resources with HP ProLiant and BladeSystem servers, HP StorageWorks products, HP management software, and VMware technology, you can easily migrate from an under-utilized, over-provisioned physical environment to a virtual environment with fewer, more reliable systems. And with HP ProLiant Essentials Server Migration pack, you can speed the migration of your physical environments to a virtualized infrastructure.

Create a virtual desktop infrastructure environment.

HP and VMware can help you create a virtual desktop infrastructure (VDI) environment that consolidates many clients' systems onto a single server. You can then centrally host and manage your desktop environment from within your data center. Desktop virtualization gives you a cost-efficient alternative to physical desktops by enabling increased resource utilization and enhanced data security. HP VDI provides effective manageability, efficiency, and reliability through the use of HP ProLiant servers, HP StorageWorks, HP thin clients, and HP Remote Graphics software (our high-performance remote protocol for rich graphics and video) with VMware's virtualization software.

Enhance disaster recovery/high availability.

Virtualization can help you maintain the availability of critical applications, reduce the risk of data loss and business interruption, and recover more quickly from disruptive events. HP ProLiant servers, HP StorageWorks systems, HP BTO software, and VMware software deliver greater system reliability along with the ability to move, duplicate, and restore critical information with little or no disruption to your business. HP replication software—including HP Continuous Access, Business Copy, and Storage Mirroring software—works together with HP Data Protector, VMware Site Recovery Manager, and VMware HA software.

Together, HP and VMware provide a level of automation and high availability solutions for enhanced business continuity and data protection that deliver on your recovery point and recovery time objectives. To enable these gains, HP Operations Orchestration software automates and orchestrates workflows across physical and virtual server environments to improve management and maintain availability of the business services.

Virtualizing your server and storage infrastructure overcomes what has been one of most significant inhibitors to deploying effective disaster recovery and high-availability solutions, namely cost.

Virtualization can help you increase infrastructure utilization, application uptime, and service levels, while at the same time lowering operational cost and reducing management complexity. Virtualization also makes it easier to manage changing demands in application workloads by creating virtual machines and application instances that can be automatically migrated and balanced across virtual machines.

Bring virtualization to development and test environments.

Using VMware's Lab Manager, HP and VMware can assist with the automation of test and development processes. A single physical server can host dozens of virtualized development environments. VMware Lab Manager streamlines development and test lab infrastructure and operations by pooling servers, network, storage, and other resources. This allows you to reduce the number of physical servers necessary to test and qualify new software development projects, and can also reduce project schedules and resource costs by developing a reusable library of virtual resources.

In addition, the HP Insight Dynamics – VSE software suite can help you create a dynamic test and development environment through the use of logical servers. A logical server is a server profile that is easily created and freely moved across physical or virtual machines. This capability can be used to rapidly activate, move, and deactivate test and development environments, using both physical and virtual servers, to enable the sharing of hardware between test and development teams, and to make it easy to save environments for reuse.

³ Source: VMware.

Other usage models

Virtualization has a wide range of applications. Other usage models include:

- **Workload optimization**—With virtualized server resources, you can respond faster to business change and increase the efficiency of your operations. The integrated virtualization management capability of HP Insight Control Environment and VMware VirtualCenter provides dynamic control to help you manage resource utilization and balance workloads to deliver on service-level agreements and respond to variable business demands effectively.
- **Legacy application and operating system support**—The HP and VMware virtualization solution allows your company to upgrade to a new hardware platform while continuing to run legacy applications without modification when running inside a virtual machine.

Getting started

Putting best practices to work

Ready to get started? Every organization is unique—with different business goals and objectives. Through our HP Data Center Virtualization Services, we help you architect, build, and deploy a virtualization strategy that is just right for your organization.

Based upon our experience and expertise, we suggest you consider the following starting points for your virtualization journey:

- **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.

- **Assess your current state.** Virtualization impacts people, processes, and technology. Through targeted service offerings—including the HP Adaptive Infrastructure Maturity Model, HP Virtualization Assessment Services, and HP Data Center Services—we help you assess your current state to provide a starting point for your virtualization journey.
- **Build your virtualization plan.** Through our HP Data Center Virtualization Services and our HP Adaptive Infrastructure experts, we enable you to build a prioritized list of projects and activities that increase the business outcomes of your virtualization.

Evaluating your needs and opportunities

To help you evaluate your virtualization needs and opportunities, we offer a wide variety of free online resources. To access these resources—including online planning tools and downloadable white papers—visit www.hp.com/go/vmware.

To learn more about the HP and VMware virtualization solutions, and how they can help your organization reduce costs and increase business agility, contact your HP sales representative or HP channel partner, or visit www.hp.com/go/vmware.

To learn more about HP and VMware management solutions, visit www.hp.com/go/vmware/management.

To learn more about HP and VMware storage solutions, visit www.hp.com/go/vmware/storage.

To learn more about the HP and VMware VDI solution, visit www.hp.com/go/vmware/vdi.

“VMware and HP are solving some of the biggest IT problems our customers face. Together, we’re developing a framework to run data centers in a new way that lets customers do more with less and run future application loads with much more agility. Our solutions help companies be more productive, more flexible, and more resilient with leaner IT operations that require less money, less power, and less hardware.”

Paul Maritz, President and CEO, VMware

Technology for better business outcomes

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

Virtualization licensing requirements: Virtualization requires that you have the appropriate number of software licenses for the applicable number of virtualized environments. It is your responsibility to verify that you work with your software provider and obtain the appropriate number of licenses to all third-party software to be used in virtualized environments.

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