HP virtualization with VMware

Enabling end-to-end virtualization of IT resources

vmware

hp invent

Whether you have 10 servers, 100 servers or 1,000 servers, HP virtualization solutions with VMware 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 delivering better business outcomes by turning rigid data-centers into agile, virtualized environments. Virtualization enables a next-generation Adaptive Infrastructure that can meet the demands of changing business requirements. These organizations recognize the opportunity to use virtualization to break down the silos that keep applications from sharing infrastructure and that contribute to chronic underutilization of IT resources.

More than ever before, it's clear that virtualization makes good business sense. It can help an organization simultaneously reduce costs, increase agility and make IT more responsive to the needs of the business. 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?"

Today, HP has the answer. HP offers a complete, mainstream virtualization solution that leverages VMware software and HP platforms, management tools and services. This proven solution puts your organization on a predictable path to the broad benefits of a virtualized IT environment.

The HP virtualization solution with VMware

Enabling end-to-end virtualization

The HP virtualization solution with VMware includes industry-leading server virtualization software from VMware and HP infrastructure and tools for unified management of the virtual environment. These software components run on HP ProLiant servers, the top-selling industry-standard server brand.

A unique HP advantage is the server and storage management portfolio, known as HP Essentials Management software. This integrated management software portfolio allows you to monitor, deploy and control your HP ProLiant and HP BladeSystem servers and HP StorageWorks storage from almost anywhere.

And to bring it all together, the HP Services organization and HP 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. HP delivers all the resources to put virtualization to work for your critical IT initiatives, including server consolidation, virtual desktop infrastructure, disaster recovery, and development and test.

Whether you have 10 servers, 100 servers or 1,000 servers, HP virtualization solutions with HP StorageWorks, HP Services and VMware can deliver savings, simplification and scalability across your environment.

Core solution components

VMware software

VMware provides core building blocks for an enterprise-class virtualization solution. A global leader in virtual infrastructure software for industry-standard servers, VMware has more than 20,000 customers, and its software has been adopted by 100 percent of Fortune 500 companies. Many of the world's largest enterprises use HP and VMware technology to simplify their IT infrastructures while fully leveraging their existing computing investments and responding to fluctuating business demands.

The HP virtualization solution with VMware builds on the capabilities of VMware ESX Server with complementary software products from HP and VMware to provide an enterprise-ready virtual machine environment.

Table 1. VMware software components offered by HP
The HP virtualization solution with VMware leverages multiple software products from VMware, including those summarized here.

VMware ESX Server	Provides virtual infrastructure software for partitioning, consolidating and managing servers Provides hardware-independent virtual machines, encapsulated in easy-to-manage files, to increase administration flexibility
ESX Server 3i	Next-generation thin hypervisor which can be integrated into ProLiant server hardware Server ships ready to boot up into a VMware hypervisor
VMware Virtual SMP	Allows a single virtual machine to span multiple physical processors Enables multiple processors to work in parallel while using only a single guest operating system image
VMware VirtualCenter	Provides a central point of control for your datacenter's virtual computing resources Allows you to manage hundreds of virtual servers from a single console
VMware VMotion	Lets you move live, running virtual machines from one host to another while maintaining ongoing service availability Enables intelligent workload management by allowing you to make dynamic changes without impacting users
VMware Storage VMotion	Extends the concept of VMotion to storage arrays and allows virtual machine disks to be moved from one datastore to another with no disruption or downtime.
VMware DRS	Dynamically allocates and balances computing capacity across collections of hardware resources aggregated into unified resource pools
VMware HA	Provides easy-to-use, cost-effective high availability capabilities for applications running in virtual machines
VMware Consolidated Backup	Provides a centralized facility for LAN-free backup of virtual machines Simplifies backup administration and reduces the load for ESX Servers
VMware Capacity Planner	Provides a web-enabled tool that delivers accelerated, more accurate and benchmarked capacity planning and server consolidation assessments
VMware Lab Manager	Streamlines development and test lab infrastructure and operations by pooling servers, networking, storage and other resources that can be shared across development and test teams

Table 2. Management software from HP

HP Systems Insight Manager	Discovers and identifies physical and virtual systems Provides a consolidated management console for physical and virtual resources
HP Storage Essentials	Discovers, manages and monitors heterogeneous network storage performance, automates tasks, simplifies procedures and processes, and helps lower costs
HP VMware Operations pack	Helps you virtualize IT operations and service management functions
HP VMware Change and Configuration pack	Enables IT change and configuration management functions and features
HP VMware Performance pack	Helps with planning the infrastructure for better performance by providing tools to load test your virtualized environment prior to deployment
Insight Control Portfolio	
HP Insight Power Manager	Power monitoring and management that provides centralized control of server power consumption and thermal output.
iLO Power Management pack	iLO2 Advanced is for ProLiant ML/DL, and iLO2 Select is for BladeSystem and Linux servers
HP ProLiant Essentials Virtual Machine Management pack	Provides central management and control of VMware and other virtual machines Enables physical host to virtual machine association Is part of HP ProLiant Essentials Virtualization Management software
HP ProLiant Essentials Server Migration pack	Automates the manual task of migrating servers between physical or virtual platform Enables conversions between virtualization layers for easy migration from one virtual machine type to another Is part of HP ProLiant Essentials Virtualization Management software
HP ProLiant Essentials Performance Management pack	Detects and analyzes hardware bottlenecks on HP ProLiant servers, select HP Integrity servers and MSA, All-in-One Storage System, EVA and XP shared storage devices Uses historic performance and utilization data to identify under-utilized servers that can be virtualized
HP ProLiant Essentials Rapid Deployment pack	Automates the deployment of physical systems, the VMware ESX virtualization layer and virtual machine guests in the ESX environment
HP ProLiant Essentials Vulnerability and Patch Management pack	Helps protect your virtual machines from the security vulnerabilities experienced by physical systems

HP servers certified for VMware

HP is one of the leading brand 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.

With HP, you have the added assurance that comes with hardware and software that have been 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 HP has tested key components within the virtualized stack. Today, HP has more certified platforms for VMware than any other vendor—39 HP ProLiant and BladeSystem server models have been certified for use with VMware ESX Server.*

By using HP BladeSystem servers, you can leverage the performance, density and low power and cooling requirements of server blades. A smaller solution footprint helps you make the most of the valuable space in your datacenter, and by attaching to a storage area network (SAN) you can benefit from significant additional cost savings and greater flexibility.

HP StorageWorks certified for VMware

Network storage is an essential component of a virtualization solution. Network storage allows you to take advantage of many of the 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.
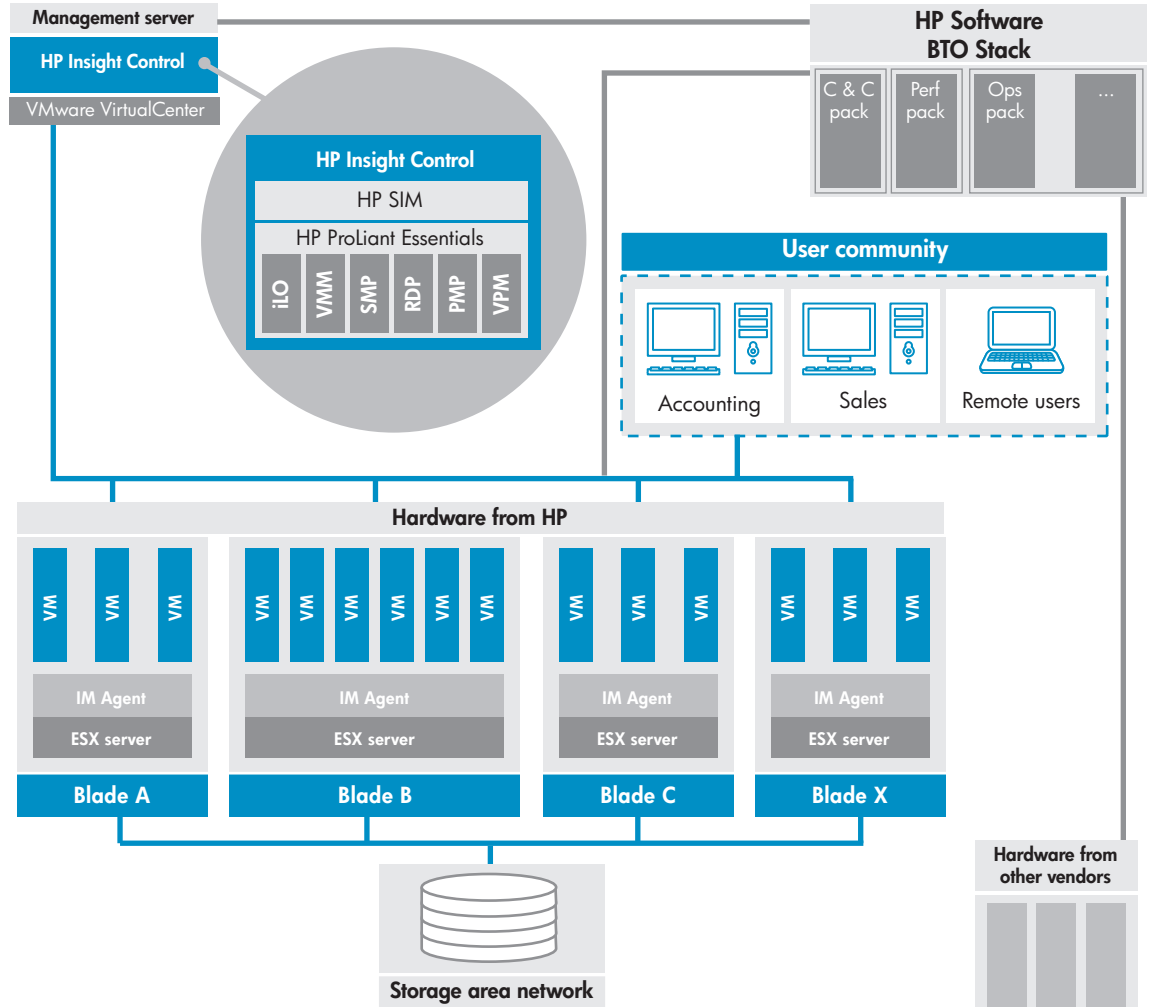
HP StorageWorks fibre channel storage arrays and iSCSI SANs provide an ideal storage platform for virtualization. The HP portfolio of storage products include the All-in-One Storage System (AiO), the MSA, EVA and XP disk array families. The HP StorageWorks storage arrays portfolio is tested and certified to perform in VMware environments.

A combined HP BladeSystem and Enterprise Virtual Array (EVA) 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 offering 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, reduced requirements for power and cooling, and enhanced business continuity and availability.

HP offers a full portfolio of certified storage ranging from our entry level iSCSI based All-in-One storage system, the HP MSA through to the highly scalable, highly reliable XP family of storage arrays.

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 server virtualization with replication and data protection software and technology from HP StorageWorks can significantly reduce the time required to recover from a disaster.

*As of August 29, 2007. For details, see www.vmware.com/pdf/vi3_systems_guide.pdf.

Virtual server architecture diagram showing Management server with HP Insight Control and VMware VirtualCenter, HP Software BTO Stack (C & C pack, Perf pack, Ops pack, ...), HP Insight Control detail (HP SIM, HP ProLiant Essentials: iLO, VMM, SMP, RDP, PMP, VPM), User community (Accounting, Sales, Remote users), Hardware from HP (Blade A, Blade B, Blade C, Blade X with VMs, IM Agent, ESX server), Storage area network, and Hardware from other vendors.

HP Services

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.

With HP virtualization services, you are provided with assistance for capacity planning, design, deployment and service management, including industry-leading mission-critical support. To enable an efficient virtualization journey, our services are designed with not only a single point of problem ownership and accountability but also proactive services to help you prevent problems and improve service levels to the business.

HP integrated virtualization management

Gain a single view of physical and virtual resources. While many companies can provide hardware that works with VMware, no other company offers the unique set of tightly integrated virtualization management capabilities HP does. HP arms you with the tools you need to unify the management of physical and virtual assets within the same environment.

Consolidated management is enabled by the HP Essentials Management software portfolio. It combines the capabilities of HP Systems Insight Manager (SIM), HP ProLiant Essentials and HP Storage Essentials software, which work in concert with a VMware environment. HP SIM discovers and identifies physical and virtual systems. Add in the capabilities of HP ProLiant and Storage Essentials software and you gain the ability to monitor both the health and the performance of physical and virtual server and storage resources.

Another unique HP ProLiant advantage is HP Insight Control. This integrated management software portfolio allows you to monitor, deploy and control your HP ProLiant and HP BladeSystem servers from almost anywhere. Delivered in a single package for easy deployment and installation, HP Insight Control makes IT staff more efficient and enables a cost-effective, stable and flexible IT infrastructure by delivering total control, increased flexibility and tangible savings.

In addition, HP ProLiant Essentials Virtualization Management software provides critical management and migration tools for your VMware virtualization solution. This software, included with select VMware products and solutions from HP, complements both HP Systems Insight Manager and VMware VirtualCenter.

For a broader solution from an enterprise management perspective, the HP Software organization offers additional software to address your IT Service Management (ITSM) processes and the automation and technology support you need to deliver the agility provided by virtualization. Combining HP management software and VMware's technology suite with specialized Smart Plug-ins, our IT virtualization management solution gives your IT managers and chief information officer (CIO) a holistic framework for managing the complexities of a virtualized infrastructure.

HP Software 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 and help 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.

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.

HP Services and HP channel partners offer a range of services for VMware solution deployments, including capacity assessment, analysis, consolidation and migration. HP professionals can help you identify your needs and develop a clear virtualization strategy.

You can also look to the HP Services organization as a single point of contact for worldwide support for your virtualization solution. 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 deploy, operate and support a high performance, virtualized environment.

Virtualization scenarios

Enable IT consolidation.

The HP virtualization solution with VMware enables your organization to consolidate server resources to improve utilization, reduce datacenter floor space requirements, cut power and cooling costs, and simplify management. When you virtualize resources with HP ProLiant servers, HP StorageWorks products and VMware software, you can easily migrate from an under-utilized, over-provisioned physical environment to a virtual environment with fewer, more reliable systems. With HP ProLiant Essentials Server Migration pack, you can speed the migration of these environments to a virtualized environment.

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 datacenter. Desktop virtualization gives you a cost-efficient alternative to physical desktops by enabling increased resource utilization and enhanced security. HP VDI provides effective manageability, efficiency and reliability through the use of HP ProLiant servers, HP thin clients, and HP Remote Graphics software (HP high-performance remote protocol) 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 products and VMware software deliver 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 VMware DRS and VMware HA software. Together, HP and VMware provide a level of automation and high availability solutions for enhanced business continuity that deliver on your recovery point and recovery time objectives.

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 across virtual machines.

Bring virtualization to development and test environments.

Using VMware's Lab Manager product, this HP and VMware solution can assist with the automation of test and development processes. A single physical server can host dozens of virtualized development environments. This allows you to reduce the number of physical servers that are needed in order to test and qualify new software development projects. Lab Manager can also reduce project schedules and resource costs by developing a re-usable library of virtual resources.

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 ProLiant Essentials Virtual Machine Management pack 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.

Implementing virtualization

Putting best practices to work

HP and channel partners offer proven processes for implementing virtualization solutions. These processes draw on best practices and established methodologies to guide you through the three key stages of a virtualization initiative: planning, deployment and migration, and operation.

Phase 1: Planning

The HP step-by-step approach to virtualization begins with careful planning. In this phase, our consultants and channel partners work with your team to identify candidate servers for virtualization. A key step here is to gather inventory and performance data for your current environment.

This process identifies the appropriate hardware for your virtualization solution, including server types, storage and networking gear. Armed with this information, you can determine the applications that are a best fit for running in a virtual machine.

Tools used in this phase include HP online planning resources and the VMware Capacity Planner, which creates capacity profiles for large environments. Other tools include HP Systems Insight Manager, HP Storage Essentials and HP ProLiant Essentials Performance Management pack, which provide capabilities for discovering your environment and identifying servers and storage with bottlenecks or excess capacity.

Phase 2: Deployment and migration

Sound planning creates a foundation for deployment and migration work. In this phase, you begin by deploying servers, networking and storage.

Now you're ready to begin putting the virtualization tools into place. HP professionals and HP channel partners work with your team to deploy VMware virtualization technology onto each physical server, install agents to manage physical servers, storage and migration of existing applications from physical servers to virtual machines.

HP ProLiant Essentials Server Migration pack, part of the HP ProLiant Essentials Virtualization Management software, streamlines migration of existing server environments to HP ProLiant servers running VMware software. Server Migration pack enables migration from physical servers or from virtual machines running on other platforms.

Phase 3: Operation

Once your virtualized environment is in place, management tools become the key to a successful project. With HP Systems Insight Manager, HP Storage Essentials and ProLiant Essentials Virtual Machine Management pack, you can monitor both physical servers, storage and virtual machines from a single console. You can also easily migrate virtual machines to other VMware servers. And HP Services can help you proactively manage your virtualized environment and improve service levels to end users and the business.

Let's get started

HP offers a wide variety of free online resources to help you evaluate your virtualization needs and opportunities. 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.

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

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.

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