



VMware vSphere 4

The Best Platform for Building Cloud Infrastructures

Get the efficiency and low cost of cloud computing with uncompromising control over service levels and with the freedom of choice.

VMware vSphere™, the industry's first cloud operating system, leverages the power of virtualization to transform datacenters into dramatically simplified cloud computing infrastructures and enables IT organizations to deliver the next generation of flexible and reliable IT services, using internal and external resources, securely and with low risk.

Building on the proven power of the VMware® Infrastructure platform, used by more than 130,000 customers, VMware vSphere™ dramatically reduces capital and operating costs, and increases control over delivery of IT services while preserving the flexibility to choose between any type of OS, application and hardware, hosted in-house or using external resources.

With VMware vSphere™ providing the foundation for internal and external clouds, using federation and standards to bridge internal and external cloud infrastructures, organizations of all sizes can achieve the full benefits of cloud computing.

Key Benefits

VMware vSphere™ abstracts applications and information from the complexity of underlying infrastructure, creating internal cloud infrastructure so IT can focus on the support and enablement of business value. Benefits of VMware vSphere™ include:

- **Reduced costs and maximum IT efficiency:** VMware vSphere™ helps organizations deliver IT services more efficiently by eliminating unnecessary investments and reducing the cost and complexity of managing and maintaining IT infrastructure. By adopting VMware vSphere™, customers can achieve a 50 percent reduction in capital expenses and a reduction of more than 60 percent in operational expenses per application, dramatically lowering the total cost of owning and operating enterprise applications.

Organizations that use VMware vSphere™ can achieve consolidation ratios of well over 15:1, with automated management and dynamic allocation of resources to applications across internal and external cloud infrastructures. The result is a clean break from the



As the industry's first cloud operating system, VMware vSphere™ holistically manages hardware resources and provides built-in application service level controls, creating dramatically simplified cloud infrastructures

expensive model of application and information delivery that is tied to specific systems and architectures, and a seamless move to a self-managed, dynamically optimized IT environment for the most efficient delivery of business services.

- **Increased IT control through service level automation:** As businesses have become increasingly reliant on IT services, the effective delivery of applications can mean the difference between growth and decline, success and failure. Businesses depend on IT to fully control the quality-of-service for application delivery, without compromise. VMware vSphere™ 4 automates the delivery of service-level agreements (SLAs) covering availability, security and scalability shifting the paradigm of datacenter management from infrastructure to service delivery. Application owners who need to roll out new business services are shielded from the complexity of servers, storage and network infrastructure, leaving them to focus on the delivery of business value. The result is an automated, controlled environment that is resilient to failures and responsive to changing requirements without complexity or operational overhead.

- **Empowered IT departments with choice.** VMware vSphere™ future-proofs IT environments while delivering business services on demand, with the freedom to choose the right industry standard hardware, application architecture, operating system, in-house or external infrastructure for changing business requirements. With VMware vSphere™ 4, customers retain flexibility of choice, remaining independent of hardware, operating system, application stack, and service providers. This means customers can support their existing applications, and feel confident about future applications, while retaining the flexibility to deploy within internal or external cloud infrastructures.

How is VMware vSphere used in the enterprise?

Customers use VMware vSphere™ to:

Consolidate and continuously optimize server, storage and network hardware.

VMware vSphere™ eliminates server sprawl by running applications inside virtual machines on fewer servers and with more efficient use of storage and network resources. Organizations using VMware vSphere™ can achieve the highest consolidation ratios per server through its unique dynamic optimization and memory management capabilities. VMware vSphere™ reduces the complexity of hardware management through comprehensive virtualization of server, storage and networking hardware. VMware vSphere™ customers can slash capital expenses per application on the average by at least 50 percent, and operating (labor) costs by over 60 percent.

Improve business continuity through simple, cost effective high availability and disaster recovery

VMware vSphere™ helps create a secure, unbreakable infrastructure that keeps businesses running despite hardware failures or even entire datacenter outages. VMware vSphere™ not only eliminates application downtime due to planned server, storage or network maintenance activities, but also provides simple, cost effective high availability against unplanned downtime such as server failures. VMware vSphere™ also simplifies recovery from full datacenter outages, without the need for expensive redundant hardware.

Streamline IT operations

The VMware vSphere™ platform simplifies operational management of test, development and production environments, across many locations, remote and branch offices and including all types of applications and operating systems. VMware vSphere™ allows easy sharing and replacement of hardware resources and simplifies management through common sets of policies, operational procedures and automated management across disparate sets of applications and business users.

VMware vSphere™ simplifies the provisioning of business services and ensures a uniform assurance of service levels regardless of physical infrastructure or the actual location of the services. This not only reduces operational overhead, but also allows for the portability of applications across internal or external cloud infrastructures without losing service levels or requiring customization.

What are the key components of VMware vSphere?

VMware vSphere™ is the industry's first cloud operating system comprising of the following groups of components:

Infrastructure services – The set of components that comprehensively virtualize server, storage and network resources, aggregate them and allocate them precisely on demand to applications based on business priority.

Application services – The set of components that provide built-in service level controls to all applications running on VMware vSphere™, regardless of application type or operating system.

Administration of infrastructure and application services, automation of day-to-day operational tasks with deep visibility into every aspect of large and small VMware vSphere™ environments is provided by VMware vCenter™ Server¹.

Infrastructure Services: Virtualize and Aggregate Hardware Resources

VMware vSphere™ infrastructure services transform discrete hardware resources into a shared mainframe-like computing platform that is incredibly resilient and capable of running the most demanding applications with near-native performance. VMware vSphere™ provides the following types of infrastructure services:

VMware vCompute: Infrastructure services that efficiently virtualize server resources and aggregate them into logical pools that can precisely be allocated to applications.

- **VMware ESX™ and VMware ESXi** provide a robust, production-proven, high performance virtualization layer that abstracts server hardware resources and allow their sharing by multiple virtual machines. Unique memory management and advanced scheduling capabilities of VMware ESX and ESXi allow for the highest consolidation ratios and the best application performance, in many cases, even better than physical servers.
- **VMware Distributed Resource Scheduler (DRS)** aggregates compute resources across many clusters and dynamically allocates them to virtual machines based on business priorities, reducing management complexity through automation. **VMware Distributed Power Management (DPM)**, included with VMware DRS, automates energy efficiency in VMware DRS clusters by continuously optimizing server power consumption within each cluster.

¹ VMware vCenter Server is an essential requirement for management of VMware vSphere environments and is separately purchased.

VMware vStorage: Infrastructure services that abstract storage resources from the complexity of underlying hardware systems to enable the most efficient utilization of storage capacity in virtualized environments.

- **VMware vStorage Virtual Machine File System (VMFS)** is a high-performance cluster file system that allows efficient sharing and controls concurrent access to storage by virtualized servers.
- **VMware vStorage Thin Provisioning** provides dynamic allocation of storage capacity, allowing storage purchases to be deferred until they are really required, reducing storage spending by up to 50 percent.

VMware vNetwork: Infrastructure services that enable optimal administration and management of networking in virtual environments

- **VMware vNetwork Distributed Switch** simplifies and enhances the provisioning, administration and control of virtual machine networking in VMware vSphere™ environments. It also enables third-party distributed virtual switches such as the Cisco Nexus 1000v to be used in VMware vSphere™ environments, providing network administrators with familiar interfaces to control quality of service at the virtual machine level.

Application Services: Built-In Service Level Controls for Applications

VMware vSphere™ application services provide built-in controls over application service levels such as availability, security and scalability, and can be enabled simply and uniformly for any application running inside VMware virtual machines

Availability: Availability services allow IT to provide applications with varying levels of high availability depending on their priority and need, without the need for complex redundant hardware or clustering software.

- **VMware VMotion™** eliminates the need to schedule application downtime due to scheduled server maintenance through live migration of virtual machines across servers with no disruption to users or loss of service.
- **VMware Storage VMotion** eliminates the need to schedule application downtime due to planned storage maintenance or during storage migrations by enabling live migration of virtual machine disks with no disruption to users or loss of service.
- **VMware High Availability (HA)** provides cost effective, automated restart within minutes for all applications in the event of hardware or operating system failures.
- **VMware Fault Tolerance** provides continuous availability, without any data loss or downtime, to any application, in the event of hardware failures.

- **VMware Data Recovery** provides simple, cost effective, agentless backup and recovery for virtual machines, in smaller environments.

Security: Security services allow IT to provide applications with appropriate level of enforcement of security policies in an operationally efficient way.

- **VMware vShield Zones** simplifies application security by enforcing corporate security policies at the application level in a shared environment, while still maintaining trust and network segmentation of users and sensitive data.
- **VMware VMsafe™** enables the use of security products that work in conjunction with the virtualization layer to provide higher levels of security to virtual machines than even physical servers.

Scalability: Scalability services allow IT to deliver the right amount of resource to every application, based on its need, non disruptively.

- **VMware DRS** dynamically load balances server resources to deliver the right resource to the right application based on business priority; allowing applications to shrink and grow as needed
- **Hot add** enables CPU and memory to be added to virtual machines when needed without disruption or downtime.
- **Hot plug** enables virtual storage and network devices to be added to or removed from virtual machines without disruption or downtime.
- **Hot extend of virtual disks** allows virtual storage to be added to running virtual machines without disruption or downtime

vApps : Ensuring seamless application movement and choice between clouds

- VMware vSphere™ includes support for **vApp**, a logical entity comprising one or more virtual machines, which uses the industry standard Open Virtualization Format to specify and encapsulate all components of a multi-tier application as well as the operational policies and service levels associated with it.
- Just like the UPC bar code contains all information about a product, the vApp gives application owners a standard way to describe operational policies for an application which the cloud OS can automatically interpret and execute.
- vApps can comprise of any applications running on any OS, and provide a mechanism for customers to move their applications between internal clouds or external clouds with still the same service levels.

Find Out More

How Can I Purchase VMware vSphere?

VMware vSphere can be purchased in the following editions:

- **VMware vSphere Enterprise Plus** includes the full range of vSphere features for transforming datacenters into dramatically simplified cloud computing environments providing the next generation of flexible, reliable IT services.
- **VMware vSphere Enterprise** provides key features for minimizing downtime, protecting data, and automating resource management.
- **VMware vSphere Advanced** provides a strategic consolidation solution that protects all applications against planned and unplanned downtime to provide superior application availability.
- **VMware vSphere Standard** provides an entry level solution for basic consolidation of applications to slash hardware costs while accelerating application deployment.
- **VMware vSphere Essentials Plus** provides an all-in-one solution for small offices to virtualize three physical servers, reducing hardware costs while ensuring superior high application availability and data protection.
- **VMware vSphere Essentials** provides an all-in-one solution for small offices to virtualize three physical servers for consolidating and managing applications to reduce hardware and operating costs with a low up front investment

For more information on each of the editions and pricing refer to <http://www.vmware.com/go/vsphere/buy>.

Product Specifications and System Requirements

VMware vCenter Server is required for administration and control of VMware vSphere™ environments.

For information or to purchase VMware products, call 1-877-4VMWARE (outside of North America dial +1-650-427-5000), visit www.vmware.com/products, or search online for an authorized reseller. For detailed product specifications and systems requirements, please refer to the VMware vSphere install and configure guide.