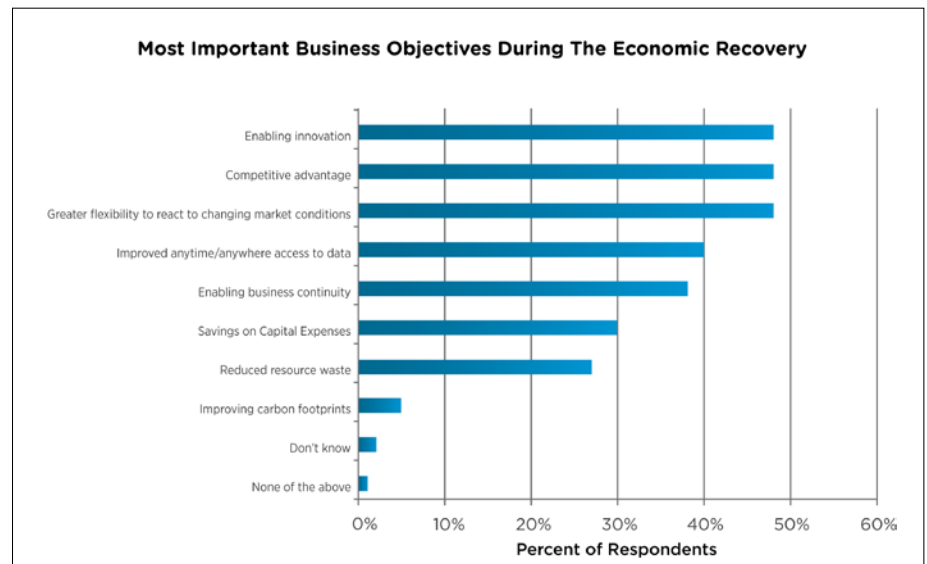


# Datacenter Agility, Extensibility, and Efficiency with VMware vCloud Solutions

## Datacenter Challenges Today

Virtualization provides a new level of cost-efficiency and agility in delivering IT services. Businesses have embraced the capabilities of virtualization to move beyond the highly manual and expensive delivery model of physical infrastructure. However, new challenges are emerging as businesses virtualize increasing portions of their datacenters. Virtual-machine sprawl and increased management overhead are creeping up on IT as end-user groups or organizations build out dedicated virtualized clusters. End users wait two to six weeks for virtual machines to be provisioned for their business needs. Increased management overhead and delayed responsiveness to end-user needs constrain an enterprise's ability to compete in today's fast-paced global economy. As a consequence, IT is increasingly under pressure from the business to become more cost-effective and agile. End users are starting to mutiny by opting for the services offered by proprietary public clouds, which can potentially be both insecure and difficult to migrate away from. Lines of business are increasingly sharing a common understanding that the best way to accelerate the business is to accelerate IT.



Source: CIO LinkedIn Market Pulse Survey, Oct 2010

## Promise of Cloud Infrastructure as a Service

The success of virtualization is the basis of a new model for the delivery of IT services—cloud computing. Cloud computing is an approach to computing that leverages the efficient pooling of an on-demand, self-managed virtual infrastructure, consumed as a service. This approach separates applications and information from the complexity of underlying infrastructure so that IT can focus entirely on the planning, governance and enablement of business value. Virtualization is the foundation on which cloud infrastructure is built. In addition to the standardization that comes with virtualization, cloud computing offers automation and self-service mechanisms that enable end users to consume infrastructure without the burden of manual configuration and provisioning. The combination of standardization, automation and self-service gives enterprises the agility they need to deliver IT services on virtual infrastructure.

## The Most Efficient, Agile and Extensible Cloud Infrastructure

The proven leader in virtualization, VMware® delivers unprecedented efficiency, agility and extensibility with its VMware vCloud™ solution. In Gartner, Inc.'s most recent evaluation of cloud service providers, four of the five top service providers ran on technologies based on VMware vCloud. Working with other industry leaders, VMware is helping enterprises gain the benefits of cloud computing while leveraging existing investments and retaining control.

The VMware vCloud solution introduces new abstractions, similar to those available with VMware vSphere®, to take virtualization to the datacenter level. By pooling resources among multiple VMware vSphere clusters, the VMware vCloud solution lowers the capital and operating costs of infrastructure. IT services are delivered as fully encapsulated and portable units—vApps—that can be manipulated through an open API and extended to deploy on any cloud compatible with VMware vCloud. End-user consumption is controlled through role-based access policies tied to organizational constructs and through virtual-networking technologies that can enable similar virtual-machine environments to be deployed concurrently.

VMware's policy-driven approach to abstraction enables capabilities that alternative cloud infrastructure approaches cannot deliver. Resource-management policies can improve utilization of shared infrastructure by allowing resources to be overcommitted beyond baseline reservations. Resource pooling and virtual distributed network configuration reduce the amount of hardware needed to deliver services, and they enable adaptive intelligence such as distributed resource scheduling and VMware vMotion. Software controls can enforce isolation that minimizes the chances of user-driven or system-driven faults. These unique capabilities allow VMware vCloud to deliver the most efficient, agile and extensible cloud infrastructure solution.

## Delivering Infrastructure as a Service with Security

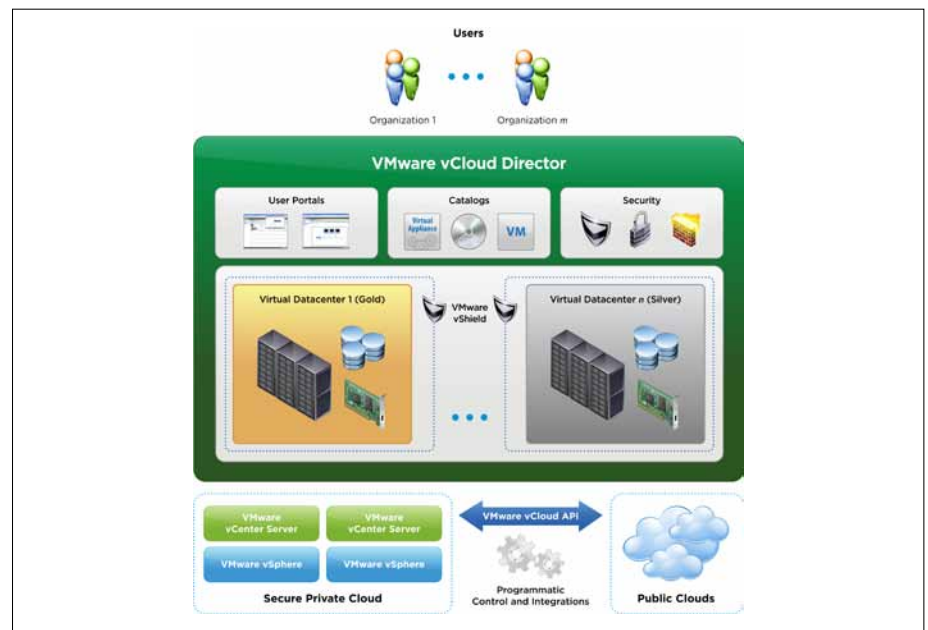
VMware vCloud Director pools infrastructure resources among multiple clusters into policy-based virtual datacenters. VMware vCloud Director integrates with existing VMware vSphere deployments and extends capabilities such as VMware Distributed Resource Scheduler (DRS) and VMware vNetwork Distributed Switch to provide elastic compute, storage and networking interfaces across multiple clusters. These elastic and tiered virtual datacenters enable resources to be provisioned to IT services without repeated configuration. By logically pooling infrastructure capacity into virtual datacenters, IT organizations can manage resources more efficiently with complete abstraction between the delivery of infrastructure and the underlying hardware that supports it.

With VMware solutions, the virtual infrastructure can be secured and continuously monitored for compliance drift. VMware vShield App enables security-trust-zone policies to be applied on the VMware vCenter clusters backing VMware vCloud to protect and control traffic to IT-governed groups of virtual machines. VMware vCenter Configuration Manager also enables continuous monitoring of the virtual environment to detect potential incidents and failures that can take the environment out of compliance.

## Enabling Portability of Services with Hybrid Cloud

VMware vCloud Director leverages open standards, including the VMware vCloud API and Open Virtualization Format (OVF), to enable packaging and migration of workloads across clouds. By encapsulating multi-virtual-machine services and the associated networking policies into vApps, VMware vCloud Director lets end users of one cloud easily share services with one another—and IT can easily migrate services between clouds. This unique ability to migrate vApps between internal private clouds as well as between private and public allows businesses to realize the unified benefits of a hybrid cloud.

Custom messages allow outbound notifications to be sent from VMware vCloud Director to other systems—such as request-approval workflow—so that existing systems in the datacenter can trigger vApp operations. All of these functions enable a business to customize its cloud infrastructure to its unique business requirements, providing the freedom of choice to deploy IT services in an enterprise hybrid cloud.



VMware Hybrid Cloud Solution

## Consuming Infrastructure as a Service with Agility

VMware vCloud Director leverages pooling of infrastructure and portability of services to enable uniquely agile access to IT services. VMware vCloud Director enables end users to deploy services and consume resources on demand through both a Web portal and a programmatic interface. End users store their most frequently used vApp configurations in catalogs that enable sharing and collaboration among users in an organization. At deployment time, VMware vCloud Director can automatically detect provisioning of a vApp template that has already been deployed and rapidly provision a clone using unique VMware linked clone technology. VMware vShield Edge technology, built into VMware vCloud Director, delivers advanced routing functionality—including DHCP and network address translation (NAT)—that enables multiple end users to deploy identical vApp configurations connected to the external network without network collisions.

IT teams can also leverage multiple resource-allocation models to govern consumption, ranging from pay-as-you-go to a fixed-reserve models. Service deployment in VMware vCloud Director can be metered and monitored with VMware vCenter Chargeback, ensuring accountability for resource usage. Ultimately, IT organizations maintain control with permissions, quotas and leases governed by role-based access controls that leverage existing Lightweight Directory Access Protocol (LDAP) directory services.

## Summary

Hardware and simple orchestration solutions alone cannot deliver the level of efficiency and agility needed for enterprises to truly accelerate IT. VMware cloud infrastructure solutions enable IT to move from a model of manual management of virtual-machine sprawl, custom service design and manual provisioning to a new model of automated delivery, portable service design and automated consumption.

Only VMware enables you to build **your cloud** without compromise. Using the VMware vCloud solution, enterprises can implement a hybrid cloud quickly, leveraging existing investments in hardware, software and skills. They can deliver the efficiency and agility of cloud computing without sacrificing flexibility or control. VMware vCloud solutions accelerate IT so that IT can accelerate the business.

