

vmware®

Simplify and Automate Cloud Management





Managing in the Cloud Era

Greater efficiency. Increased agility. Improved compliance. Reduced costs. These are among the benefits that organizations moving to cloud computing can achieve when they properly consider both how they will build and how they will run their virtual and cloud infrastructure. The right architecture and the right management approach are equally important because the way infrastructure is built determines how it will be run. Similarly, the way the IT environment is managed greatly impacts how it will grow and develop with business demands.

Today, virtualization is the cornerstone of most IT initiatives, with many organizations leveraging their virtual infrastructure foundation to move to cloud computing. Yet, IT teams are challenged to effectively support new dynamic IT infrastructure using traditional management tools and approaches that were designed to support individual computing silos. IT organizations need a better way than legacy management solutions to maintain the performance, availability, quality of service, security and compliance requirements of infrastructure, applications and business services in the era of virtualization and cloud computing.

Increasing agility and driving innovation require a new IT management approach and tools that are as agile and flexible as virtual and cloud infrastructure. By adopting more-effective IT management, IT organizations can impose uniform governance, control and access over their heterogeneous environments. They can make the cost, quality and value of cloud services transparent to enable fact-based decisions. They can support greater visibility into the entire IT infrastructure and meet the demands of cloud computing—self-service, scale, velocity of change, shared service infrastructures—as well as the modern applications they support. Only then can they empower IT to move beyond being a service builder to being a broker that governs all IT services, becoming the single channel through which a business consumes cloud services.

VMware® delivers comprehensive IT management solutions that quickly adapt to changing conditions based on infrastructure performance, application needs and user demands. VMware Cloud Management solutions simplify and automate the operations of heterogeneous environments and hybrid clouds. With VMware solutions, organizations can streamline and accelerate the provisioning of infrastructure, application and desktop services. They can monitor and measure the health, compliance and efficiency of their virtual and cloud infrastructure and applications. Moreover, organizations can govern and manage cloud services as a critical element of running IT like a business.

“Management tools designed for physical environments (from provisioning through lifecycle and performance management operations) are not easily optimized for virtual workload management.”¹

The Taneja Group

Evolving the Datacenter

“Today’s IT requires organizations to take a holistic approach to planning, building and operating their infrastructure, especially as we move into this new era of cloud computing.”²

Don Henderson
Chief Technology Officer
NYSE Technologies

Software has become a source of differentiation and competitive advantage in almost every industry. But many organizations have rigid datacenter infrastructure that constrains IT and business agility. For most organizations, simplifying datacenter complexity requires automation, which works by decoupling the underlying resources from the hardware infrastructure and turning them into software assets.

Introduced by VMware, the software-defined datacenter removes computing silos by recasting all datacenter infrastructure layers—compute, memory, storage, network and security—as software services running across pools of industry-standard hardware. The architecture for implementing cloud computing, the software-defined datacenter is dynamically configured to meet the needs of all application workloads at peak efficiency levels.

After software services are defined, the entire datacenter fabric can be controlled, automated and managed by software. Self-programmable, it can be configured dynamically based on the demands of collective application workloads and predefined policies, ensuring maximum availability, throughput and efficiency.

VMware vCloud® Suite—the industry’s first complete cloud infrastructure suite—powers the software-defined datacenter. Within the suite, tightly integrated VMware Cloud Infrastructure and VMware Cloud Management solutions deliver on the promise of an extensible private cloud. VMware Cloud Management capabilities for the software-defined datacenter are unique in enabling enterprises to gain deep insight into their cloud infrastructure health, compliance and efficiency while accessing and provisioning services into any available cloud.

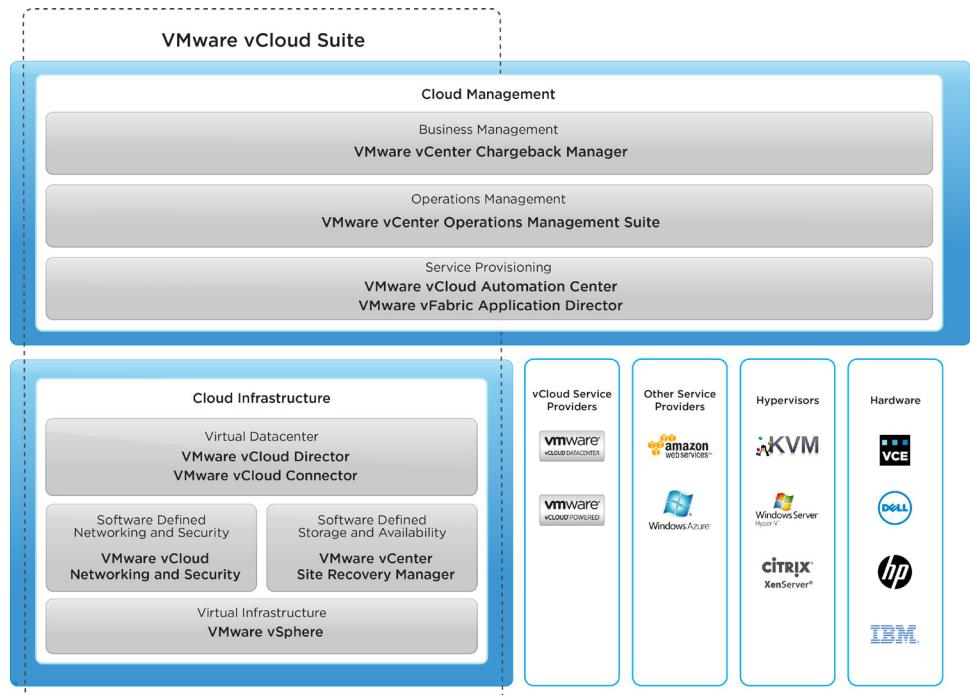


Figure 1. Within vCloud Suite, VMware Cloud Management solutions provide visibility into and control over the consumption and management of internal and external cloud resources and applications.

Empowering IT with VMware Cloud Management Solutions

Cloud computing helps organizations drive business innovation and agility and can lower overall IT costs. VMware supports the adoption of the cloud model that best meets your unique business needs while helping IT overcome key challenges to managing highly virtualized and dynamic cloud environments. One hundred percent of Fortune 500 companies have deployed VMware vSphere®, the industry's leading virtualization platform, as the optimal platform to increase agility and reduce costs. Now, these companies need additional flexibility and choice to support growing heterogeneous pools of infrastructure that have evolved from previous IT investment decisions, adoption of public clouds (e.g., Amazon Web Services) by developers and line-of-business owners, and mergers and acquisitions.

VMware Cloud Management solutions provide the flexibility and choice organizations require to effectively manage their diverse cloud environments. VMware solutions complement and leverage the management capabilities embedded in vSphere—including built-in intelligence with high availability, fault tolerance, dynamic resource scheduling and disaster-recovery capabilities that improve manageability, availability and business continuity. Moreover, they are an integral part of both the software-defined datacenter and vCloud Suite, which extend the benefits of vSphere virtualization to every domain in the datacenter—compute, storage, networking, and the associated availability and security services—by abstracting all hardware resources and pooling them into aggregate capacity, and enabling automation to safely and efficiently dole it out as needed for applications.

VMware Cloud Management solutions deliver comprehensive IT visibility and control. They also enable end users to access services that have been quickly and easily provisioned by IT into any available cloud. Using VMware Cloud Management solutions, IT organizations can streamline operations management and accelerate problem identification and remediation. They can improve service levels, reduce operational expenses and free IT staff from manual, repetitive tasks so they can focus on value-added activities.

Specifically designed for virtual and cloud environments, the VMware approach to managing hybrid and heterogeneous clouds addresses three critical areas:

- **Cloud service provisioning** – Automate the provisioning of infrastructure, applications and desktops across multiple clouds and platforms.
- **Cloud operations management** – Manage the health, risk, efficiency and compliance of infrastructure and applications.
- **Cloud business management** – Govern and manage cloud services as a critical element of running IT like a business.

Only VMware and the extensive VMware partner network deliver a complete portfolio of intelligent and policy-driven IT management solutions that extend the benefits of vSphere. VMware solutions automate and simplify IT management while empowering IT to govern services across heterogeneous and hybrid clouds. With VMware management solutions, IT can finally operate at cloud scale and begin to act as a broker of IT services to the business.

"The flexibility and scalability enabled by our VMware powered private cloud helps us address business needs by accelerating the delivery of business-critical applications and services. Our investment in VMware Cloud Management helps us simplify and automate the management of our cloud. This powerful combination means that Columbia Sportswear is able to respond to business and market opportunities faster than ever before."³

Fred Pond
Vice President and CIO
Columbia Sportswear

"The traditional enterprise automation solutions just don't work well with virtualization and the cloud. They are mired in the operating models of the past.... The vFabric Application Management Suite makes everything easier for our clients to manage their virtual and cloud environments."⁴

European High Technology Company

Cloud Service Provisioning

Today's IT environments often feature heterogeneous pools of infrastructure—physical, virtual, multihypervisor and hybrid cloud. These complex environments are challenging IT to impose uniform governance, control, access and self-service. To help accelerate service delivery while increasing compliance and IT efficiency, organizations are deploying VMware Cloud Management solutions that automate the governance, sourcing and provisioning of infrastructure, applications and desktop services across clouds.

Multiplatform, Multicloud Service Governance

Acting as a service governor, VMware vCloud® Automation Center™ enables the policy-based provisioning of infrastructure on multiple platforms and clouds, including VMware enabled private and public clouds, other hypervisor platforms, public clouds such as Amazon Elastic Compute Cloud (Amazon EC2), and physical infrastructures. vCloud Automation Center helps to ensure that the right people get access to the right services and that those services are provisioned on the right infrastructure—for example, a production workload onsite and a development/test environment in the public cloud. Its capabilities extend to the virtual desktop to provide unified cloud management for desktops and servers. By evolving existing infrastructure into scalable cloud services in days, enterprises can realize fast time-to-cloud value, and quickly and economically respond to business demand by provisioning IT services in just minutes.

Infrastructure Provisioning

Through a self-service portal—essentially a cross-cloud storefront—vCloud Automation Center enables authorized administrators, developers and business users to request new IT

services or manage existing resources. With policy-aware governance and control, users can apply business rules to the cloud without changing organizational processes or policies. Concurrently, enterprises have the flexibility to offer different service levels, policies and automation processes, based on users' needs. Moreover, VMware supports end-to-end lifecycle management of existing and newly provisioned cloud-computing resources and intelligent resource management. These capabilities also extend to virtual desktop environments, boosting IT efficiency and empowering users with personalized, instantly available services.

Application Provisioning and Management

VMware recognizes that a new operating model is needed for cloud computing—one that separates application and infrastructure management so enterprises can better support increasingly Web-oriented, dynamic, data-intensive, real-time and virtualized applications. This split increases agility, flexibility, control and performance and enables unprecedented collaboration between application development, build, release and support teams. VMware vFabric™ Application Management Suite supports the deployment of multilayer applications to cloud environments and fosters collaboration between emerging DevOps teams. Using vFabric, enterprises can model and automate the deployment of applications to any registered vCloud instance, as well as Amazon EC2, using blueprints and standardized application components and settings. At the same time, developers have flexibility in choosing from traditional or modern development frameworks and languages. VMware helps enterprises simplify and accelerate application release management, including ongoing application

maintenance, upgrade and retirement processes; respond to changing business needs faster using a closed-loop system for autoscaling applications to support a sudden increase in user volume or maintain service-level agreements (SLAs) in case of performance degradation; and facilitate application development-to-production handoffs by building monitoring policies into the deployment process.

Desktops as a Service

vCloud Automation Center delivers a personalized, self-service portal and end-to-end automation that transforms virtual desktop infrastructure into a virtual desktop cloud. This highly automated process rapidly creates desktops that meet exact business and user specifications. Organizations also gain full life-cycle management of their virtual desktops, including deprovisioning and intelligent reclamation of inactive or orphaned virtual machines.

Cloud Operations Management

As operations management disciplines converge in the cloud, enterprises need a real-time understanding of

how to manage health, capacity and configuration issues and risks. VMware Cloud Management solutions support collaboration between IT infrastructure, applications and operations teams and help enable organizations to proactively ensure quality of service, operational efficiency and continuous compliance.

Embedded, Integrated and Converged Management

VMware enhances the management capabilities already built into vSphere with integrated, automated performance management capabilities from VMware vCenter™ Operations Manager™ Foundation. These new capabilities add health monitoring, self-learning performance analytics, and root-cause analysis and recommendations, as well as proactive smart alerts, to vSphere. They also provide an easy on-ramp to VMware vCenter™ Operations Management Suite™. Leveraging a converged approach to managing performance, capacity and configuration in highly virtualized and cloud environments, vCenter Operations Management Suite delivers automated operations management for hybrid clouds that can nearly double the cost savings customers receive from vSphere.⁵

"The next step in our journey to cloud computing is to streamline and automate the operations of our cloud infrastructure. The VMware vCenter Operations Management Suite gives us better visibility into key performance, health and efficiency indicators across the operational and infrastructure environments and allows us to achieve higher service levels of our business-critical applications from a single management console."⁶

Matthew Cunningham
Senior Vice President of IT
CareCore National

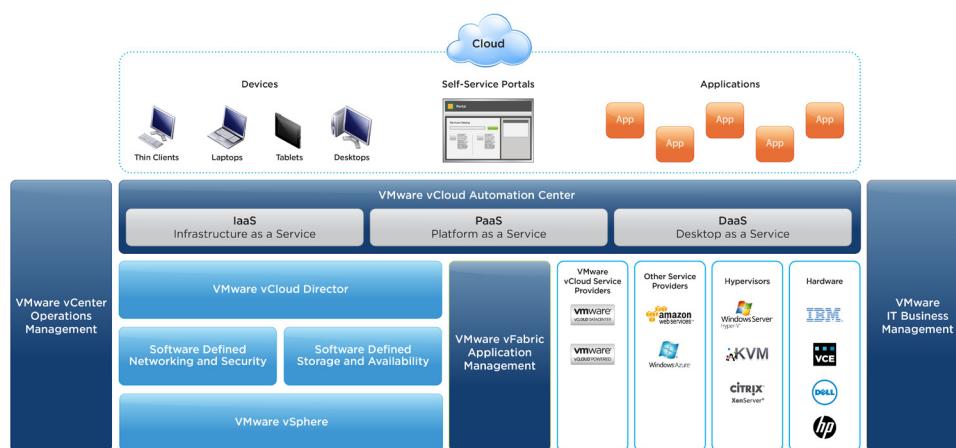


Figure 2. VMware Cloud Management empowers IT to provision and manage services across platforms and providers.

*"vCenter Operations Management has cut the time to resolve issues in half.... With vCenter Operations Management, our remote local teams can monitor, manage and resolve most local virtual-based issues. That is a huge benefit. It means better uptime and better response to the business."*⁷

Global Pharmaceutical Company

Analytics-Based Health Management

vCenter Operations Management Suite features patented analytics and a highly automated and integrated approach to performance, capacity and configuration management for a comprehensive view of heterogeneous and hybrid cloud environments. Organizations can aggregate data from VMware and third-party monitoring systems to improve quality of service and reduce both operational and capital expenses. As enterprises leverage the hybrid cloud, a single "cloud console" dashboard provides complete visibility into the health of workloads running across multiple clouds. A self-learning system, vCenter Operations Management Suite leverages dynamic thresholds and proactive smart alerts to notify IT teams about impending performance degradation and other issues so that IT can act before end users are affected. With automated configuration management and auditing of virtual infrastructure and operating systems, organizations can deliver continuous compliance with best practices, security guidelines and regulatory requirements. Additionally, by right-sizing infrastructure resources using automated capacity analysis and "what-if" capacity modeling, IT can ensure optimal resource utilization.

Improved IT Infrastructure and Operations Team Collaboration

In dynamic IT environments, multiple teams must share data, processes and tools, and management disciplines must be better aligned. VMware helps enterprises improve the effectiveness and efficiency of disparate IT teams and processes. VMware Cloud Management solutions enable IT to gain a holistic view of all infrastructure, increasing collaboration among IT teams with a real-time understanding of how to manage health, capacity and configuration issues and risks. By dramatically simplifying and automating management across the environment,

IT teams can be more proactive as they ensure optimal system performance.

Application Management

Increased cloud adoption and the use of modern application frameworks and methodologies is causing application operations teams to think differently about managing application performance. vFabric Application Management Suite enables enterprises to simplify performance monitoring and management of Web and custom applications in heterogeneous, hybrid cloud environments. It provides a single pane of glass through which organizations can visualize infrastructure health in the context of applications and correlate infrastructure events to application performance, as well as see overall application health across cloud deployments—and from the business perspective. With vFabric Application Management Suite, application owners gain the real-time visibility and control they need to manage their SLAs. Its integrated resource, transaction and code monitoring approach simplifies performance management while providing unprecedented visibility and control of application performance in the cloud.

Cloud Business Management

As the strategic importance of cloud computing grows, IT needs solutions for managing the business of cloud as the most effective and efficient IT service-delivery mechanism. IT needs to be able to measure performance and cost across all cloud services—from infrastructure to applications to desktops as a service. VMware IT Business Management Suite makes the cost, quality and value of cloud services transparent to organizations. It provides a business context for IT activities and enables fact-based decisions aligned with business goals, which ultimately transition IT from being a builder to being a broker of IT services.

Running IT Like a Business

VMware offers automated solutions for IT financial management, IT benchmarking, supporting service-quality management and building a services portfolio. With VMware, organizations can gain complete, consolidated views into IT capital, operating and service expenses across a broad range of financial data sources. They can collect and abstract information, model it and publish service, cost and governance models. They can even run “what-if” scenarios against current states to understand the impact of proposed IT and business decisions. To evaluate competitiveness, VMware delivers extensive industry, peer and functional benchmarking capabilities across 18 IT domains, with more than 3,500 detailed metrics.

IT Cost Transparency with 360-Degree Visibility

While many IT teams struggle to communicate the value they provide to their business stakeholders, enterprises using VMware IT Business Management Suite can provide meaningful measurements and reports—including a bill of IT services, chargeback, service performance reports and vendor scorecards—to communicate costs, quality and value for cloud services and any IT service offered. VMware visualization capabilities enable organizations to

share this critical information in role-based dashboards and reports. With VMware IT Business Management solutions, organizations can automate the collection, aggregation and analysis of all IT costs—including physical infrastructure, facilities, networking, labor, software and other costs—with virtual and cloud resource metering. This delivers comprehensive insight into all IT costs for 360-degree transparency and fact-based decision making.

IT as a Services Broker

VMware enables IT to act as the single point of contact for all sourcing, provisioning and cloud service-related information. In this way, IT becomes the channel through which the business consumes cloud services, whether the services are direct cloud services or cloud services used to deliver parts of larger IT services spanning multiple departments and vendors. By providing line-of-business stakeholders with a range of service and pricing options tied to SLAs, IT can greatly reduce the incidence of shadow IT and its accompanying business risks and inefficiencies. IT also can negotiate with cloud providers based on internal needs using peer and industry benchmarks as data points for informed discussions and effective decision making.

“Finally, we have the cost visibility we need to make fact-based, and not gut-feel, business decisions. We’re working together now to truly align IT with the business.”⁸

UK-Based Healthcare Technology Provider

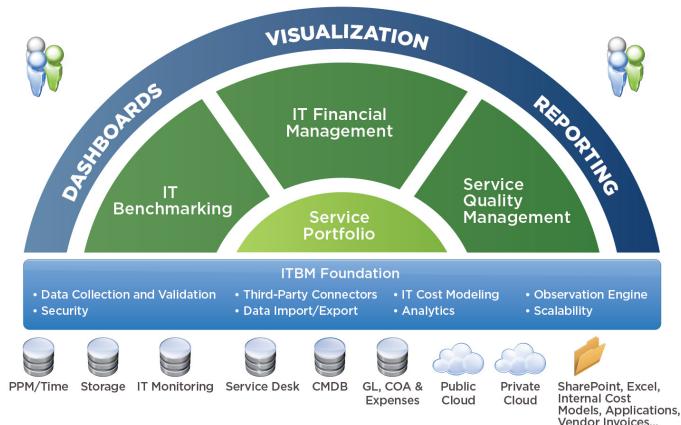


Figure 3. VMware enables IT to measure cost, quality and value across all cloud services.

Furthering IT Innovation with VMware

VMWARE CLOUD MANAGEMENT SOLUTIONS

VMware vCloud Suite is a complete, integrated cloud solution that delivers on the vision of the software-defined datacenter.

VMware vCenter Operations Management Suite solutions deliver quality of service, operational efficiency and continuous compliance for dynamic hybrid cloud infrastructure and business-critical applications.

VMware vFabric Application Management Suite solutions streamline and improve application provisioning, monitoring and optimization.

VMware IT Business Management Suite solutions provide transparency and control over costs, services and quality to run IT like a business.

VMware Professional Services includes VMware Accelerate™ Advisory Services, Cloud Operations Services, Technology Consulting Services, Technical Account Manager Services, and Education Services and Certification Programs.

VMware management solutions support how IT both architects and manages hybrid cloud environments, enabling more organizations to benefit from cloud computing. With VMware, enterprises gain an agile, flexible and dynamic management approach that measures, manages and improves IT services across multiple clouds and platforms.

In the cloud era—in which services can be delivered internally or by external service providers—VMware helps IT teams stay in control. Specifically designed for rapidly changing virtual and cloud environments, VMware Cloud Management solutions are intelligent and driven by business and IT policies. They simplify and automate cloud service provisioning, cloud operations management and cloud business management, giving IT the opportunity to become a broker of services instead of being solely a builder of them. In this new role, IT also has the opportunity to help increase IT agility and innovation, and to serve as a strategic partner to the business.

Using VMware Cloud Management solutions, organizations can effectively provision and govern infrastructure, applications and desktops as a service based on predefined policies. They can proactively help ensure the health, compliance and efficiency of cloud infrastructure. They can govern and manage cloud services, benchmarking against industry peers, and metering

and modeling environments to be sure they are delivering the right service quality at the right price.

VMware Cloud Management solutions are backed by VMware Professional Services, which turns IT possibilities into business outcomes. VMware Professional Services uncovers and exploits the unique opportunities made possible by VMware technology. Drawing on unparalleled product expertise and customer experience, VMware collaborates with teams to address the technical, people, process and financial considerations for IT acceleration to deliver results that are positive, tangible and material to IT and the business.

As the global leader in virtualization and cloud infrastructure—with more than 400,000 customers and 55,000 partners—VMware is enabling organizations to continually enhance the value, quality and delivery of their IT services. VMware Cloud Management solutions support IT organizations as they successfully shift from maintaining a single environment to brokering IT services across heterogeneous and hybrid clouds. With VMware, organizations can increase innovation and agility—two essential requirements to keeping up with the growing demands of business.

Learn more. Contact VMware today at 877-4-VMWARE or visit <http://www.vmware.com>.

1 The Taneja Group. "An Overview of the Cloud Market Vendor Landscape." August 2011.

2 VMware Press Release. "VMware Unveils Industry's Most Comprehensive Cloud Infrastructure and Management Solution." August 27, 2012.

3 VMware Press Release. "VMware Extends Cloud Management Capabilities with vCloud Suite Updates." October 9, 2012.

4 VMware Web Site. "Cloud Management Diaries." Pages 21-22. October 2012.

5 Management Insight Technologies. "The Benefits of VMware's vCenter Operations Management Suite: Quantifying the Incremental Value of vCenter Operations Management Suite for vSphere Customers." Sonia Sheffield and Jack Mandelbaum. September 2012.

6 VMware Press Release. "VMware Delivers VMware vCenter Operations Management Suite." January 25, 2012.

7 VMware Web Site. "Cloud Management Diaries." Page 28. October 2012.

8 VMware Web Site. "Cloud Management Diaries." Page 35. October 2012.





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