



WHITE PAPER

A Comprehensive Cloud Management Platform with Vblock™ Systems and Cisco® Intelligent Automation for Cloud

Abstract

Data center consolidation and virtualization have set the stage for cloud computing. While virtualization provides tremendous benefits, enabling IT organizations to consolidate physical servers and use resources more efficiently, the tremendous growth of virtual machines (VMs) in the data center has put renewed focus on the shortcomings of legacy infrastructure and provisioning processes that are often too complex, inefficient, and result in high operational overhead. As data center technology and processes have evolved, cloud computing has emerged with best practices that suggest that success lies in forming a comprehensive cloud management strategy. Such a strategy should look equally at the latest generations of hardware and software solutions.

Converged infrastructure solutions – where server, storage, and network technologies are integrated into a single set of infrastructure – establish a solid, purpose-built cloud computing foundation. Additionally, cloud management software solutions break down end user and technology silos with policy-based self-service, automation, and visibility across the entire cloud infrastructure. It is only through a comprehensive cloud solution that the new levels of agility, efficiency, and innovation promised by cloud computing can be realized. Above all, this type of complete cloud solution significantly lowers risk and accelerates time-to-market for new services.

This white paper defines the key, state-of-the-art attributes of a complete cloud environment and follows with a description of the converged infrastructure Vblock™ System from VCE™ and the Cisco® Intelligent Automation for Cloud (Cisco IAC) software solution that together represent one of the most comprehensive cloud platforms available today.

Challenge: Legacy Infrastructure and Management Solutions

A May 2012 report by Gartner found that after some hesitation in embracing cloud technology, 78% of companies surveyed said they would be pursuing a cloud strategy by 2014. Today's numbers suggest that the actual adoption of cloud computing has caught up to the abundant hype. Organizations see cloud computing as a way to keep pace with the rapid demands of today's business environment and to better use network, compute, and storage resources through virtualization. Yet deploying cloud-ready infrastructure and services still entails a lot of risk. Using commodity hardware or mixing different brands for network, compute, and storage tiers can result in highly complex environments.

In an earlier Gartner study, when asked what the single biggest challenge is for companies deploying cloud services, respondents cited management and operational processes at the top of the list rather than technical issues. However technical issues can arise as legacy infrastructure was not designed for the complexity of cloud models and the rapid setup and takedown of services among applications in physical and virtual resources. Most legacy management software and infrastructure solutions are mainly point products instead of end-to-end solutions and rely on manual processes and a high level of experience and specialized skill sets. The lack of integration and collective complexity impact operational efficiencies, slow business agility, and increase operational costs for IT environments.

Additionally, an automated, virtualized environment is not necessarily a cloud environment. The evolving definition of cloud also includes end-to-end orchestration, self-service, and the ability to flexibly assign and reassign resources and to isolate expenditures based on consumption for cost transparency. These features go a long way towards reducing risk and increasing flexibility and are typically provided by cloud management solutions that sit on top of the physical and virtual infrastructure.

A September 2012 report by Forrester Research defined six solution attributes of a state-of-the-art cloud computing environment based on what respondents said they required in an infrastructure-as-a-service (IaaS) solution. These foundational elements of cloud computing enable service providers and IT organizations to achieve greater speed, flexibility and agility as compared to the use of legacy management solutions and commodity hardware not designed for the cloud.

1. **Self-service access** through a portal or service catalog allows customers to order from a standardized list of service menus and provisioning templates and when connected to wide-scale automation, service requests can be significantly expedited.
2. **Highly standardized resources** that are managed through a centralized solution and pre-configured and pre-tested as a converged infrastructure stack dramatically reduces the complexity of today's environments with multiple point products and diverse support vendors.
3. **Automation of service delivery and operational processes** for physical and virtual resources simplifies operations, reduces costs, and enhances business flexibility.
4. **Shared resource pools** or logical containers across hypervisor, compute, network, and storage infrastructures allocated to specific or multiple VMs based on a user's order enables the use of shared resources for multiple users and customers for greater resource efficiency and cost effectiveness.
5. **Scale and elasticity** of cloud infrastructure are important benefits enabled by the dynamic adjustment of application and infrastructure resources according to real-time demand based on rules for when to scale up or scale down resources.
6. **Cost transparency** can be achieved with a holistic approach to management, from service request through decommissioning of the service, allowing for optimal utilization of resources.

Opportunity: Best-of-Breed Cloud Management

The industry-leading converged infrastructure architecture of the Vblock System from VCE can be tightly integrated with the Cisco Intelligent Automation for Cloud (IAC) unified cloud management solution to deliver a total cloud platform that enables IT organizations to control and manage cloud-based services more easily and transparently than ever before. Together they provide a highly integrated, unified cloud platform and management environment that breaks down legacy end user and technology silos across server, network, storage, and application stacks. It embodies a dynamic approach to service delivery that turns the cloud environment into an agile, on-demand service creation resource that is highly automated, resource efficient, and extremely flexible. Risk is greatly reduced with pre-configured and pre-tested cloud-ready converged infrastructure and end-to-end management of all aspects of service provisioning and resource management.

VCE Vblock Systems - The Leading Converged Infrastructure

A January 2013 report by Gartner named VCE the market share leader in the growing integrated infrastructure systems category, Figure 1 below, based on sales revenue. Customers have been drawn to Vblock Systems because these pre-packaged, pre-configured, and pre-tested converged infrastructure stacks are based on best-of-breed components from investor companies that are the industry leaders in compute, network, storage, and virtualization infrastructure – Cisco, EMC, VMware, and Intel, including:

- Blade servers and other components from the Cisco Unified Computing System™ (UCS™)
- Networking switches from Cisco
- Storage by EMC® Symmetrix® VMAX, EMC VNXe, and EMC VNX™ family
- Virtualization by VMware® vSphere™ and VMware vCenter™ Server

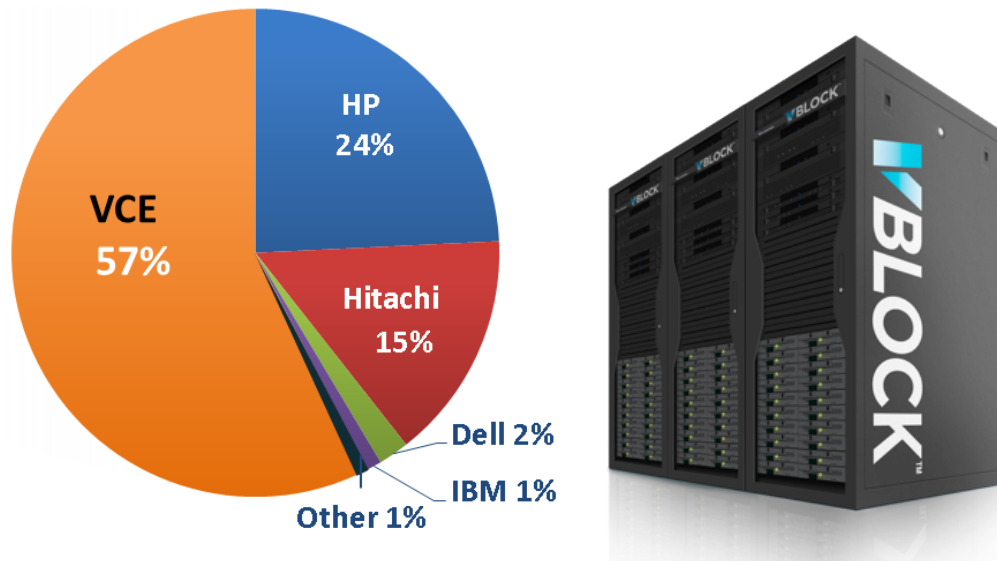


Figure 1. **Integrated Infrastructure Systems Market Share**

Source: Gartner – Market Share Analysis: Datacenter Hardware Integrated Systems, 1Q11-2Q12, 30 Nov 2012

VCE's engineering organization designs these leading technologies into Vblock Systems, which are fully engineered and then both physically assembled and logically built in state of the art factories. The result is a fully productized system that can be deployed into production fast with low risk. VCE is the first and only vendor to perform this level of engineering investment and manufacturing integration.

Because the Vblock System is a standardized product, data protection and workload mobility solutions are offered as factory-validated, integrated options, ensuring low risk and predictable deployments that ensure business continuity, backup, and disaster recovery. Data protection and workload mobility solutions are deployed in a consistent fashion, globally, in some of the world's most demanding environments.

VCE tests a range of customer applications so that Vblock Systems, configured according to best practices, can deliver the optimum application performance predictably and easily. All of the different components in every Vblock System are supported by one company, VCE. Customers can focus on business innovation from Day 1 instead of having to integrate and validate components from several companies or locking themselves into converged infrastructure with components from the same vendor.

Improve IT Agility with Cisco's Cloud Management Solution

Together, the Vblock System and Cisco IAC are raising the bar on the ease of management, accelerated time-to-market, workload agility, and cost-effectiveness that customers should expect from a unified cloud management environment. With this level of integration, the Vblock System and Cisco

IAC further transform the experience of deploying and managing cloud-based services with a self-service Web portal, highly automated workflows, and comprehensive service orchestration.

- **Web-based self-service portal and service catalog** — Cisco IAC's Web-based self-service portal enables users to browse from a catalog of standard service options defined by IT. Once service orders are placed, users can track order status, modify and manage completed orders, and view usage, consumption and costs for all of their orders. This self-service process enables users to order services without IT intervention reducing IT time and costs.
- **Service delivery automation** — Automation of the cloud environment simplifies operations, reduces costs, and promotes business flexibility. Cisco IAC provides automated workflows that orchestrate the end-to-end user requests across the Vblock System components, operating systems, applications, and optional external systems. Updates to configuration management databases (CMDBs) and system management tools can be incorporated to ensure that configuration-related information used by incident, change, and release management systems are up-to-date.
- **Resource management** — Resource management in large-scale cloud models requires performance isolation and the efficient use of the converged infrastructure. The Vblock System and Cisco IAC combine to use the concept of resource pools or logical containers across hypervisor, compute, network, and storage infrastructures allocated to specific or multiple VMs based on each user's order. Allocating resources into logical containers provides isolation from noisy neighbors and the ability to share resources across multiple users. The Vblock System and Cisco IAC complement the Cisco UCS and Cisco Nexus switching components and allows for the integration of other third-party solutions, including service management tools and operational processes.
- **Virtual data centers** — The Vblock System and Cisco IAC can manage a wide range of IaaS use cases, from simple ordering of VMs from a shared pool of resources to more advanced virtual data centers (VDCs) with dedicated resource pools for project teams, departments, or entire organizations. Within Cisco IAC, VDCs represent logical containers of cloud resources and are perfect for organizational units where a range of sizes (e.g., small, medium, large) can be defined by IT for consumption. To guard against unrestrained resource reservations, approval and oversight can be managed by the cloud administrator through the Cisco IAC portal.
- **Lifecycle management** — The lifecycle management of a cloud service spans from service request through decommissioning of the service and allows for optimal utilization of resources — whether human, virtual or physical. The Vblock System and Cisco IAC facilitate tracking of all aspects of individual services, including project and business information captured during the initial order and data about the various elements being provisioned to support the service from initiation to retirement. Decommissioning of resources ensures optimal utilization of the converged infrastructure components.

- **Cloud infrastructure synchronization** — Cisco IAC includes a feature unique to cloud computing called Cloud Sync, that provides infrastructure discovery for visibility into cloud infrastructure elements and the management systems connected to them. Cloud infrastructure discovery can be completed on-demand or scheduled as specified by the administrator. Cloud Sync keeps IT in control with the ability to register or ignore discovered infrastructure elements, as some infrastructure elements may be designated for use outside of the cloud environment. For example, an administrator may ignore a particular UCS blade that is already in use, so that it will never be considered as spare cloud capacity.

Cisco Intelligent Automation for Cloud 3.1.1 [cpta01 cpta01] Profile | Logout My Workspace

System Health | Order Cloud Services | System Resource Usage | System Setup | Cloud Service Errors | My Servers | Cloud Infrastructure

Edit Page | Edit Passwords | Set as Homepage | Refresh Portlets | Orders | Approvals

vCenter, CSP and UCS | Amazon EC2 | OpenStack Nova Compute | VMware vCloud Director | Cisco Cloupia

Discover Datastores | Discover All

VMware vCenter: 2 Data Centers, 3 Clusters, 4 Hosts, 14 Datastores, 30 Resource Pools, 57 Portgroups, 10 VM Templates

Cisco SP: 0 OS Templates

Cisco UCS Manager: 10 UCS Blades, 39 UCS VLANs, 22 Service Profile Templates

Datastore Name	Status	Datastore Cluster	vCenter Name	Datacenter	Datastore Path	First Discov...	Last Status ...
NetApp1-Vol1	Registered	No	10.93.234.90	LKO-CIAC	LKO-CIAC/NetApp1-Vol1		06/05/13 1...
NetApp-CIAC	Discovered	No	10.93.234.90	LKO-CIAC	LKO-CIAC/NetApp-CIAC	02/25/13 0...	06/05/13 1...
NetApp-CIAC2	Discovered	No	10.93.234.90	LKO-CIAC	LKO-CIAC/NetApp-CIAC2	02/25/13 0...	06/05/13 1...
NetApp-Cloupia	Not Found	No	10.93.234.90	LKO-CIAC	LKO-CIAC/NetApp-Cloupia	02/25/13 0...	03/06/13 1...
datastore1	Discovered	No	10.93.234.90	LKO-CIAC	LKO-CIAC/datastore1	02/25/13 0...	06/05/13 1...
CIAC ESXi 01 Boot	Ignored	No	10.93.234.90	LKO-CIAC	LKO-CIAC/CIAC ESXi 01 Boot	02/25/13 0...	06/05/13 1...
NetApp2-CIAC3	Discovered	No	10.93.234.90	LKO-CIAC	LKO-CIAC/NetApp2-CIAC3	03/08/13 1...	06/05/13 1...

Vblock System and Cisco IAC Features and Benefits

- Single, highly integrated cloud services environment breaks down end user and technology silos to realize greater agility, efficiency, and innovation
- Pre-integrated, pre-tested, converged infrastructure is operational in minutes
- Converged compute, network, storage, virtualization, and management infrastructure based on world-famous components from industry leaders Cisco, EMC, and VMware reduce risk
- End-to-end intelligence on the state of every component provides real-time data for effective resource management and service assurance
- Web-based self-service portal simplifies service ordering and governance
- Automated workflows and comprehensive service orchestration standardize complex tasks and speed service delivery to improve user satisfaction and reduce operational costs

- VCE support for the entire Vblock System alleviates the time and challenge of multiple vendors providing support

Summary

Converged infrastructure tightly integrates compute, network, storage, and virtualization components into a single, more easily managed solution stack. Add to this centralized management intelligence, automated workflows, service orchestration, and a Web self-service interface and the cloud services environment is dramatically transformed into an agile, dynamic business asset that accelerates time-to-market and significantly reduces risk. This is the value of the Vblock System and Cisco IAC. With best-of-breed components and technologies from industry pioneers Cisco, EMC, and VMware, it is an all-inclusive cloud environment in a box that lowers operational complexity and cost, accelerates time-to-market for new services, and brings peace of mind to overwhelmed IT departments.

About VCE

VCE is a leading innovator of intelligent converged infrastructure systems. Customers rely on VCE for the fastest deployment of infrastructure and applications, the highest application performance and availability, and the lowest TCO. Formed by Cisco and EMC with investments from VMware and Intel, VCE accelerates the adoption of converged infrastructure and cloud-based computing models that dramatically reduce the cost of IT while improving time to market for customers. VCE, through the Vblock Systems platform, delivers the industry's first completely integrated IT offering with end-to-end vendor accountability..

Ten of the world's top 15 telecommunications companies use VCE Vblock Systems as part of their cloud offerings, and VCE has significant penetration into Fortune 500 accounts.

For more information, go to <http://www.vce.com>

About Cisco

Cisco is the global networking leader and a key investor and partner in VCE. Cisco UCS continues Cisco's long history of innovation in delivering integrated systems for improved business results based on industry standards and using the network as the platform. Cisco UCS is a critical component of VCE Vblock Systems, a complete converged infrastructure platform for cloud and traditional workloads. Cisco IAC adds a premier software toolset for designing, deploying, and operating a cloud infrastructure using Vblock Systems in private, public, or hybrid cloud models for many different as-a-service use cases.

For more information, go to <http://www.cisco.com/go/iacloud>