



VBLOCK™ INFRASTRUCTURE PLATFORMS TECHNICAL OVERVIEW

Executive Summary

The potential of cloud computing is that of a flexible, shared pool of preconfigured and integrated computing resources that enables organizations to deliver better IT services faster, more reliably, and at a lower cost than with traditional data center models. The foundation for cloud computing is pervasive virtualization: the use of virtualized applications and operating systems throughout the enterprise and at every application tier.

Despite the well-understood benefits of virtualization, obstacles remain that slow or prevent implementation. Enterprise IT commonly comprises a large variety of devices and software from many vendors, built over time as requirements change. The result is a fragmented, complex network of underutilized and over-utilized resources. The IT components are costly and time consuming to configure, provision, and manage. Significant time and budget are spent getting the pieces to work together, tuning, devising workarounds, and planning upgrades and enhancements, rather than improving service delivery to end users.

The VCE Difference

VCE simplifies and accelerates deployment of cloud computing by integrating state-of-the art Cisco, EMC and VMware components into Vblock™ Infrastructure Platforms.

- Each Vblock platform is a standard, proven configuration of components that are thoroughly integrated and prequalified as a unit of converged Infrastructure. Each Vblock system is installed, configured, and managed as a single entity rather than a disparate group of components.
- Vblock platforms are optimized for the applications they support. They prioritize traffic, offload network processing, and increase indexing and system cycling while ensuring the accuracy of database structures.
- Each Vblock platform is designed with the future in mind. Each platform can be scaled as a cohesive system, to maintain balanced, measurable and consistent performance as needs change.
- VCE assembles all hardware into racks, and completes all cabling and powering. VCE performs rigorous testing to ensure that the completed assembly is working perfectly. Each rack arrives ready for installation and connection to the network and power grid.
- VCE handles all software release planning and configuration management, pre-testing upgrades and patches to minimize any impact to system uptime and robustness.
- VCE serves as the single go-to point for infrastructure support. Support engineers are experts on the entire infrastructure with direct escalation paths into engineering resources at Cisco, EMC, and VMware.

Vblock Platform Components

Vblock Infrastructure Platforms are scaled for customer technical and business requirements. Each of the components is carefully selected and tested, enabling the customer to run applications on a high performance, stable and supported configuration:

- Virtualization by VMware vSphere™ and VMware vCenter™ Server
- Networking by Cisco Nexus® switches
- Computing by Cisco Unified Computing System™ (UCS)

- Storage by EMC Symmetrix VMAX and EMC VNX
- Security by RSA enVision® (optional)
- Management by EMC Ionix™ Unified Infrastructure Manager
- Additional hardware required for racking, cabling, uninterruptible power supplies, etc.

Vblock Infrastructure Platforms are currently available in the configurations shown in Table 1.

Table 1

Vblock™ Infrastructure Platforms

	Vblock Series 300				Vblock Series 700
	Vblock HX	Vblock GX	Vblock FX	Vblock EX	
Storage	EMC VNX 7500™ Drive types •• EFD •• SAS •• NL-SAS	EMC VNX 5700 Drive types •• EFD •• SAS •• NL-SAS	EMC VNX 5500 Drive types •• EFD •• SAS •• NL-SAS	EMC VNX 5300 Drive types •• EFD •• SAS •• NL-SAS	EMC Symmetrix VMAX™ Drive types •• EFD •• Fibre Channel •• SATA
Compute	<u>B200-M2 options</u> 3.33GHz w/ 96GB RAM 2.93GHz w/ 48GB RAM 2.66GHz w/ 96GB RAM	<u>B230-M1 options</u> 2.6 6GHz w/ 256GB RAM 2.00GHz w/ 128GB RAM	<u>B250-M2 options</u> 3.33GHz w/ 384GB RAM 2.93GHz w/ 192GB RAM	<u>B440-M1 options</u> 2.26GHz w/ 256GB RAM 2.00GHz w/ 128GB RAM	<u>UC blade option</u> B200-M2 2.66GHz w/ 48GB RAM
Fabric Interconnect	6140	6140	6140	6120	6140
Networking	Cisco Nexus 5548 Cisco MDS 9148				Cisco Nexus 5548 Cisco MDS 9148 Cisco MDS 9506 Cisco MDS 9513
Raid	Raid 5, 6, 10				
Virtualization	VMware® vSphere™ 4 Enterprise Plus suite; virtualization vSphere ESX 4, 4.1, or ESXi 4.1i				
Security	Individual component security tools and protocols RSA® enVision®, RSA SecurID® (both optional)				
Infrastructure Management	Ionix™ Unified Infrastructure Manager Advanced Management POD (AMP)				
Virtualization Enhancement Layer	vCenter™, Nexus 1000V with per-CPU license, PowerPath/VE for ESX				
Compute/Networking Management	Cisco UCS Manager/Cisco Fabric Manager				
Storage	EMC Unisphere™				EMC Symmetrix® Management Console

NOTES:

- 50% of the UCS blades can be bare metal (cannot run any other hypervisor).
- Nexus 7010 is optional for single Vblock system configurations and is required when aggregating multiple Vblock systems.
- This table shows the major components of Vblock systems. Additional options are available. For specific ordering information or to determine which Vblock is right for your applications, utilization, scale, and topology, please contact your VCE, VMware, Cisco, and/or EMC representative.

How Vblock Platforms Simplify and Accelerate Pervasive Virtualization

As preconfigured and pretested blocks of IT infrastructure, Vblock Infrastructure Platforms accelerate the move toward pervasive virtualization and cloud computing.

Vblock Infrastructure Platforms Simplify and Accelerate the Acquisition Process

Vblock Infrastructure Platforms are tested and validated units of infrastructure. That means that IT organizations no longer have to evaluate, purchase, and assemble separate components with varying support and license models. Instead, as an integrated offering from a single vendor, Vblock Infrastructure Platforms are easy to evaluate and purchase through VCE, its parent companies, or VCE-authorized resellers.

VCE creates services that are offered through parent companies and an extensive network of partners to help customers understand how to maximize value and accelerate deployment of pervasive virtualization and cloud solutions. Available service offerings include the following:

- Executive and architecture advisory services to help define an organization's cloud vision
- Strategy services to create a cloud strategy that aligns with business needs
- Design and implementation services to help IT plan an architecture and high-level design, and devise a roadmap to deployment

Vblock Infrastructure Platforms Simplify and Accelerate the Deployment Process

Vblock Infrastructure Platforms arrive as integrated units. All of the Vblock components are pre-tested, assembled, and configured to work together, resulting in a unit of IT infrastructure that is primed for virtualization and is production ready.

This integrated approach also helps to simplify data center architecture by reducing the planning and restructuring typically associated with changes in data center design. Vblock Infrastructure Platforms remove the architectural hurdles by providing all the necessary technologies in a single integrated system. And Vblock Infrastructure Platforms can scale easily as the business grows.


Designed to work with almost any application, Vblock Infrastructure Platforms have been tested and validated to work with many major applications, including:

- Microsoft Exchange
- Microsoft SharePoint
- Oracle RAC
- SAP
- VMware View

Because VCE has completed this compatibility and validation work up front, IT can focus on implementing virtualization more broadly throughout the organization.

Vblock Infrastructure Platforms Simplify and Accelerate Adoption and Management of Virtualization Technologies

Vblock Infrastructure Platforms allow IT organizations to focus their attention where it does the most good—delivering services to the business. IT administrators and CIOs understand the potential for dramatic cost savings that virtualization brings, but end users care only that their applications are available when they are needed and that they run as they should. As a result, concerns about consistency and performance of virtualized applications have been barriers to pervasive virtualization.



Vblock Infrastructure Platforms elevate user confidence and satisfaction by delivering predictable performance and operational characteristics. For example, Vblock predetermined storage, memory, and compute capacity enable uniform distribution of workload as well as workload mobility. And deterministic fault and security isolation help ensure the level of business continuity needed for mission-critical applications. Because the platform components are pretested and preconfigured to work together at peak performance, the IT group can focus more on delivering services to end users and less on adjusting the infrastructure components.

Vblock Infrastructure Platforms not only remove obstacles to pervasive virtualization, but they also simplify management of the virtualized infrastructure. EMC Ionix Unified Infrastructure Manager (UIM) is included in every Vblock Infrastructure Platform to manage the configuration, provisioning, and compliance of aggregated Vblock Infrastructure Platforms. UIM simplifies deployment and integration into IT service catalogs and workflow engines, and dramatically simplifies Vblock platform deployment by abstracting the overall provisioning while offering granular access to individual components for troubleshooting and fault management.

In addition to the UIM, administrators can use component-specific management tools and interfaces to provide an extensible, open management framework that enables granular visibility into each system element. The individual element managers are:

- VMware vCenter Server
- Cisco UCS Manager
- EMC Symmetrix Management Console
- EMC Unisphere
- VCE Advanced Management Pod (AMP)

The open management framework also allows IT to use current management tools. The simplified design and the “containerized,” preconfigured and tested model means less work for IT staff.

Vblock Infrastructure Platforms are production ready, so IT can focus on migrating applications rather than on building and testing a virtualized environment to support them.

[Vblock Infrastructure Platforms Simplify and Accelerate Platform Support](#)

Getting help and support is easier with Vblock platforms than with the traditional approach to supporting IT infrastructure products. VCE provides one-stop customer service from Cisco, EMC, and VMware, which means greater levels of service with fewer headaches. VCE’s industry-leading support experience is delivered through support engineers who are experts on the entire infrastructure, utilize advanced collaboration capabilities, and have direct access into engineering resources at Cisco, EMC, and VMware. Additionally, VCE implements a unique approach to release and configuration management to further simplify IT operations. VCE makes available on formal release schedules validated and fully regressed software releases and firmware upgrades that cover the entire platform.

[Vblock Infrastructure Platforms Accelerate Return on Investment](#)

As prepackaged, tested, and validated units of IT infrastructure, Vblock Infrastructure Platforms lead to lower total costs and accelerate the return on investment (ROI). But the cost benefits of pervasive virtualization enabled by Vblock Infrastructure Platforms extend beyond reduced costs and rapid ROI. Pervasive virtualization allows IT to switch from a fixed cost model to a variable one, paying for IT services as they are consumed instead of merely depreciating underutilized infrastructure over time.

A Deeper Look Inside Vblock Infrastructure Platforms

Vblock platforms include products that provide all of the layers needed to achieve the benefits of pervasive virtualization. Each layer is composed of best-of-breed technologies that are pretested and preconfigured to work seamlessly together. These layers are:

- Compute
- Network
- Storage
- Virtualization software
- Management

The Compute Layer: Cisco Unified Computing System (UCS)

The computing power of Vblock platforms is provided by a Cisco Unified Computing System. Cisco UCS is a next generation data center platform that unites compute, network, and storage access. Optimized for virtualization, the platform is designed within open industry-standard technologies and reduces total cost of ownership (TCO) and increases business agility. Cisco UCS integrates a low-latency, lossless 10 Gb Ethernet unified network fabric with enterprise-class, x86-based servers (the Cisco B series). It is an integrated, scalable, multi-chassis platform in which all resources participate in a unified management domain.

The Cisco UCS includes:

- Cisco UCS 6100 Series Fabric Interconnects
- Cisco UCS 5100 Series Blade Server Chassis
- Cisco UCS 2100 Series Fabric Extenders
- Cisco UCS B-Series Blade Servers
- Cisco UCS B-Series Network Adapters
- Cisco UCS Manager

These components help provide uniform access to both networks and storage, eliminating the barriers to deploying a fully virtualized environment. Through the UCS, Vblock platforms accelerate the delivery of new services simply, reliably, and securely through end-to-end provisioning and migration support for both virtualized and non-virtualized systems. They provide predictable performance, with the components carefully selected to balance performance with reliability. Vblock Infrastructure Platforms powered by Cisco UCS also feature:

- Built-in redundancy for high availability
- Hot swappable components for serviceability
- Fewer physical components than in a comparable platform built piece-by-piece
- Reduced cabling
- Improved energy efficiency over traditional blade server chassis

The Network Layer: Cisco Nexus 1000V

The Cisco Nexus 1000V is a software switch on a server that delivers Cisco VN-Link services to VMs hosted on that server. VN-Link services bridge the server, storage, and network management domains in Vblock platforms to help ensure that changes in one environment are communicated to the others. The Nexus 1000V takes advantage of the VMware vSphere framework to offer tight integration between server and network environments.

The Nexus 1000V helps ensure consistent, policy-based network capabilities to all servers in the data center. It allows policies to move with a VM during live migration, which ensures persistent network, security, and storage compliance for improved business continuity and performance management. The Nexus 1000V also aligns management of the operational environment for VMs within the Vblock Infrastructure Platforms, reducing the TCO by providing operational consistency and visibility.

The Storage Layer: Best-of-Breed Technologies from EMC and Cisco

Components that compose the storage layer vary based on the Vblock Infrastructure Platform:

EMC Symmetrix VMAX

The EMC Symmetrix VMAX is a high-end storage system that is purpose built for pervasive virtualization. It brings extensive capability to the Vblock Series 700 model MX, such as unmatched reliability through non-disruptive operations and upgrades that can be performed without storage or application downtime. Built for availability and scalability, Symmetrix VMAX uses specialized engines that provide full redundancy to ensure that access to critical information is never in doubt and that service levels are never compromised. With its speed, capacity, efficiency, and ability to deliver performance on demand, the Symmetrix VMAX can help transparently optimize service levels while lowering TCO.

The EMC Symmetrix VMAX system integrates seamlessly with other Vblock Series 700 model MX components to accelerate and simplify provisioning and deployment. For example, EMC's new PowerPath®/VE support for vSphere optimizes usage on all available paths between VMs and the storage they are using. It also provides proactive failover management.

In addition, the Vblock Series 700MX powered by Symmetrix VMAX, enables massive consolidation and incremental scalability to deliver the benefits of tiered storage on one platform, while providing the flexibility to rapidly address the changing needs of the business.

EMC VNX

The EMC VNX unified storage family delivers industry-leading innovation and enterprise capabilities to the Vblock Series 300. Customers have a choice of file, block and object in a unified scalable, easy-to-use system. This next-generation storage platform combines powerful and flexible hardware with advanced efficiency, management, and protection software to meet the demanding needs of today's enterprises. Vblock Series 300 offers a range of models from entry-point to high-performance petabyte-capacity configurations servicing the most demanding application requirements. This robust platform for consolidation of legacy block storage, file servers and direct attached application storage, cost effectively manages multi-protocol file systems and multiprotocol block storage access. By utilizing a 6-Gb/s SAS drive backend, applications and system performance is significantly improved.

High-Performance SAN: Cisco MDS 9000 Series

The Vblock Series 300 and Vblock Series 700 provide an integrated high-performance SAN solution provided by two Cisco MDS 9148 Multilayer Directors. The MDS 9000 series adds a rich set of features to a high-performance, protocol-independent switch fabric. Integrated with the other layers of the Vblock platforms, the MDS 9148 helps

Data Centers Before and After Vblock Infrastructure Platforms

Vblock Infrastructure Platforms help IT realize the benefits of cloud computing.

Before:

- Not ready for pervasive virtualization
- Complex and costly
- Hybridized infrastructure
- Time consuming to manage
- Slow delivery of IT services

After:

- Pervasive virtualization
- Flexible infrastructure
- Simple management
- One stop for support
- Faster delivery of IT services

deliver uncompromising high availability, security, scalability, and ease of management. It also supports:

- 48 ports, 1/2/4/8 Gbps Fibre Channel
- Intelligent network services, such as VSAN technology, access control lists for hardware-based intelligent frame processing, and advanced traffic management features
- Intelligent diagnostics, protocol decoding, and network analysis tools for added reliability, faster problem resolution, and reduced service costs

The Virtualization Layer: VMware vSphere

The virtualization layer of Vblock platforms is provided by VMware vSphere Enterprise, the industry's most reliable platform for data center virtualization. vSphere:

- Virtualizes all application servers
- Provides VMware High Availability and Dynamic Resource Scheduling
- Simplifies and accelerates VM provisioning with customizable templates
- Simplifies management of workloads

Centralized, proactive VM management is provided by VMware vCenter Server, which is a scalable and extensible management platform that gives centralized control and visibility at every level of virtual infrastructure.

The Management Layer

IT can manage Vblock Infrastructure Platforms using standard management tools. The tools at each layer allow views of that layer's configurations, resources, and usage. For an added cost, organizations can take advantage of a unified management tool—EMC Ionix Unified Infrastructure Manager (UIM).

UIM manages the configuration, provisioning, and compliance of a single Vblock and pools of aggregated Vblock Infrastructure Platforms, simplifying deployment and integration into IT service catalogs and workflow engines. It thus can dramatically simplify Vblock platform deployment by abstracting the overall provisioning of the Vblock system while offering granular access to individual components for troubleshooting and fault management. In addition, Vblock Infrastructure Platforms have an open management framework that allows organizations to integrate them with their current management tools if they prefer.

Managing the workloads that run on the Vblock Infrastructure Platforms is easy, too, with VMware vCenter Server. From a single console, vCenter Server provides unified management of all the hosts and VMs in the Vblock Infrastructure Platforms with aggregate performance monitoring. And vCenter Server provides:

- Centralized control and deep visibility into virtual infrastructure
- Proactive management of VMware vSphere
- A scalable and extensible management platform
- Distributed resource optimization
- High availability
- Security

vCenter Server provides a simple and efficient way to manage VMware vSphere, in environments scaling from ten VMs to thousands.



Summary

The use of pervasive virtualization and cloud computing can bring significant advantages to the business, including lower costs, greater data center agility, and reduced complexity. Despite these benefits, many organizations have delayed their progress because of architectural obstacles. Data centers often include nonintegrated applications and hardware from many different vendors, which complicates the adoption of pervasive virtualization and cloud computing.

With solutions that integrate individual components, enterprise IT can minimize complexity, reduce risk, and deliver reduced cost of ownership. Vblock Infrastructure Platforms from VCE accelerate the move towards pervasive virtualization by combining best-of breed networking, computing, storage, security, and management technologies with end-to-end vendor accountability.

Next Steps

Learn more about how to quickly realize the benefits of pervasive virtualization and cloud technology with Vblock Infrastructure Platforms.

Visit www.vce.com or contact an authorized VCE reseller.

ABOUT VCE

VCE, the Virtual Computing Environment Company formed by Cisco and EMC with investments from VMware and Intel, accelerates the adoption of converged infrastructure and cloud-based computing models that dramatically reduce the cost of IT while improving time to market for our customers. VCE, through the Vblock platform, delivers the industry's first completely integrated IT offering with end-to-end vendor accountability. VCE's prepackaged solutions are available through an extensive partner network, and cover horizontal applications, vertical industry offerings, and application development environments, allowing customers to focus on business innovation instead of integrating, validating and managing IT infrastructure.

For more information, go to www.vce.com.



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