

Enterprise-Grade: Dell EMC VxBlock 1000 with VMware Cloud Foundation

Silverton Consulting, Inc. StorInt™ Briefing



Executive Summary

Converged infrastructure like Dell EMC® VxBlock™ 1000 has taken a lot of the guesswork out of installing servers, storage and networking for the enterprise today. However, the benefits of VxBlock go far beyond installation. VxBlock 1000 is a purpose-built, validated system, engineered and manufactured specifically for VMware virtualization and cloud operations. It comes in a single-packaged offering, and it's guaranteed to deploy with automated workflows and single-point support, including lifecycle management and release certification.

Dell Technologies recently released support for VMware Cloud Foundation™ (VCF) 4.1 on VxBlock 1000. VxBlock 1000 with VCF can now execute a mix of traditional and cloud-native applications running in the core data center and offers second-to-none hybrid cloud functionality. VCF cloud operating model complements the existing VxBlock 1000 integrations with VMware vRealize Suite that customers take advantage of to deliver on-premise, private cloud outcomes.

Dell Technologies has tailored and modernized the VxBlock 1000 platform architecture for VCF. VxBlock 1000 now comes with VMware vSAN™ and NSX-T® options for easier management deployment with network flexibility, along with the proven, enterprise-class performance, resilience and economics of separate servers and external networked storage for data center infrastructure.

The value of VCF on Integrated Systems

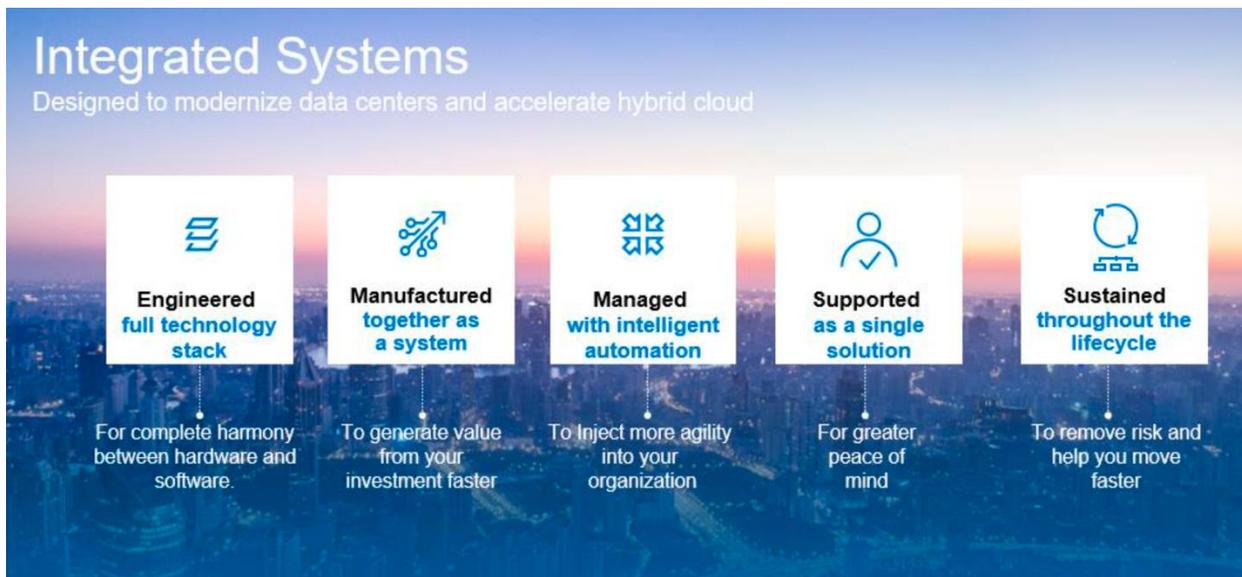
VCF delivers on the promise of the **cloud operating model** and the **hybrid cloud**. The cloud operating model shifts operations from configuring and provisioning workload infrastructure to a service model with network virtualization that creates self-service portals and resource pools to be consumed by both traditional and cloud-native applications with a highly adaptable network.

The supporting infrastructure is key. Like Dell EMC VxRail® hyperconverged infrastructure (HCI), VxBlock 1000 converged infrastructure (CI) is not only “built for VMware” but is also an integrated system—meaning it's ready to

deploy and operate out of the box.

Dell Technologies integrated systems provide best-of-breed configuration options that have been engineered and tested to ensure interoperability, best availability and performance. This saves customers significant time and effort over build-your-own infrastructure, which involves selection, order, installation, cabling, configuration and validation—as well as the appreciable difficulties of multi-party monitoring, support and lifecycle management.





The VxBlock 1000 integrated system experience has five elements:

- **Engineering and validation of the system as a full technology stack**, including best-in-class Dell EMC networked storage, Dell EMC data protection, Cisco rack and blade servers, Cisco SAN, Cisco LAN hardware, and VMware software-defined networking software. This allows independent scaling of compute, storage or networking to meet any customer workload requirement—including hybrid cloud use cases with VCF and private cloud through vRealize.
- **Manufacturing of the system in the factory as one solution** with all the components cabled together. The solution is factory configured to the data center’s exact specifications and ready to be deployed as a single logical rack that can scale to multiple physical racks.
- **Workflow automation procedures and templates** used together with VMware software to help automate the management of VxBlock infrastructure for self-service operations.
- **World-class Dell Technologies’ support across the complete hardware-software stack** with one number to call if there’s a problem.
- **Lifecycle management** tools that work with VMware software to keep software and firmware updated throughout the stack.

Taking VMware cloud operations to next level

With VxBlock 1000, customers get the best of all worlds: infrastructure that works when deployed, automation for infrastructure configuration and provisioning, sophisticated infrastructure monitoring and management, and system software and hardware firmware lifecycle management—including VCF.

Key innovations and benefits include the following:

- **New management domain option:** A key innovation is the VMware vSAN-based management domain on VxBlock 1000. This vSAN AMP (Advanced Management Platform) expands beyond

the existing array-based, Unity XT option to enable customers to use VCF to automate hybrid and multi-cloud with the added security of NSX-T. It can be configured from 4 to 16 nodes to support any size VxBlock 1000 deployments.

- **Workload flexibility:** Because VxBlock 1000 is a CI solution, customers can select individual best-in-class networking, compute and storage systems for their three-tier infrastructure to meet workload requirements.
- **Deployment readiness:** For VxBlock 1000, customers and Dell technologists can work together to understand infrastructure needs and configuration requirements to ensure the VxBlock System is ready to be deployed in the data center once it arrives from factory.
- **Storage availability/performance options:** They can also benefit from mission-critical availability, performance and rich data services available in Dell EMC storage systems, like PowerMax, when used in VCF workload domains.
- **Investment protection:** Instead of “rip and replace”, VxBlock 1000 customers can easily move to using VMware Cloud, based on VCF. They can evolve into this new model using existing skillsets, without needing to rewrite existing applications or learn new cloud platforms. In addition, with VxBlock 1000, you can “split” workloads with a portion of VxBlock 1000 dedicated to hybrid cloud workloads on VCF and the rest dedicated to other workloads (such as SAP) that you may wish to run outside a hybrid model.

Dell EMC architecture for VCF on VxBlock 1000

A single, highly available VxBlock 1000 can support up to 1,000 blade/rack servers, 100 PB of storage and deployments across 15 VMware vCenter® workload domains. Managing 1000's of servers and 100 PB of storage is unprecedented and covers a substantial number of data centers that exist today and will for the foreseeable future.

Storage options and VMware vVols

VMware has introduced vVols (VMware Virtual Volumes), an integration and management framework in vSphere that virtualizes SAN/NAS arrays. vVols enable organizations that use Fibre-Channel (FC) storage to take advantage of storage policy-based management capabilities for modern application use-cases by attaching specific policy tiers to workloads backed by traditional storage.

With VxBlock with VCF 4.1, vVols are also now supported as primary storage. VxBlock 1000 currently offers vVols on PowerMax and will offer them in a future release on PowerStore.

Dell EMC storage arrays available in VxBlock 1000 and supported with VCF 4.1 are as follows:

- **Dell EMC PowerMax storage** for the highest availability performance scale-up/scale-out file and block primary storage available on the market today (PowerMax supports end-to-end NVMe block storage or VMware vVols for cloud-native and traditional mission-critical virtualized workloads).



- **Dell EMC PowerStore or Unity XT storage** for mid-tier, scale-up file and block primary storage for traditional virtualized workloads.
- **Dell EMC PowerScale/Isilon storage** for scale-out file and object supplemental storage for AI/ML and next-gen workloads that require massive data repositories for training, inferencing and data analytics.

For **multi-region and multi-cloud** capabilities, customers can order VxBlock 1000 with **Dell EMC VPLEX™**, which offers continuous availability and data mobility for PowerMax, PowerStore and Unity XT storage. Customers using VPLEX can have full data replication and mobility between sites within metropolitan areas. Organizations with PowerMax in VxBlock 1000 can also use Dell EMC SRDF for CA/DR.

With the initial release of VCF on VxBlock 1000, PowerMax vVols supports the following capabilities:

- **VMware VASA 3.0 and vVols 2.0** level functionality that are defined within storage containers. Storage containers can support multiple PowerMax service and performance levels, including Diamond, Platinum, Gold, Silver and Bronze. Storage containers can also specify whether data reduction (deduplication/compression) is enabled.
- **VASA Replication Groups (VRGs)** using PowerMax SRDF/A. Customers can specify a VRG between two PowerMax arrays to automatically replicate vVols between them.

Networking strategy and options

VCF on VxBlock 1000 leverages VMware NSX-T™ Data Center to deliver software defined networking and security to meet the needs of private and hybrid cloud. The platform provides an engineered underlay leveraging the Cisco Nexus switches in both the Management and Workload domains, over which VMware NSX-T Data Center delivers a scalable software defined overlay transport. Together, this engineered underlay/overlay supplies VMware's Application Virtual Networks (AVN) that can deliver outcomes such as the following:

- **Immense scale** that allows underlay/overlay networks to scale L2/L3 to thousands of devices. These AVN networks can co-exist with more traditional L2 network constructs such as VLANs.
- **Pervasive security** that leverages centralized security, load balancing and east-west micro segmentation across the Management and Workload domains.
- **Cloud-native VCF Tanzu container-based workload** support that take advantage of the flexibility and scalability of AVN software-defined networking.
- **Deep network API integration** that supplies developer extensibility that allows for IaaS (Infrastructure as Code) based use-cases.
- **Public cloud** support that uses the flexible software defined networking and security policies to extend the data center into the public cloud – e.g. vSphere on AWS.
- **Multi-region and multi availability-zone** support that enables high availability for the Software Defined Data Center (SDDC).

VxBlock 1000 customers that do not choose to implement the above features have the option to deploy VMware Cloud Foundation with a subset of NSX-T Data Center functionality based on VLAN (Virtual LAN) capabilities only, deferring the benefit of Application Virtual Networks to some later date.

The NSX-T Edge cluster is a set of virtual and hardware devices that provide centralized security and on-ramp/off-ramp connectivity to the Management and Workload domains, as is required for AVN support. For VxBlock 1000 customers choosing the non-AVN option, NSX-T will still be deployed and licensed on the platform, but the physical NSX-T Edge cluster will be absent.

Data Protection options

VxBlock also comes with a number of data protection options depending on data center requirements:

- **Dell EMC PowerProtect Data Manager with Data Domain storage** provides the rich functionality of full-featured data protection solutions along with state-of-the-art backup storage that has been in use for over a decade in thousands of deployments.
- **Dell EMC RecoverPoint** supplies a continuous data protection solution for any-point-in-time data recovery.
- **Dell EMC RecoverPoint for VM (RP4VM)** provides continuous data protection at the VM level for virtualized environments.

VxBlock customers can elect to combine these data protection capabilities with the multi-cloud/multi-region storage capabilities mentioned earlier to provide a more resilient BC/DR environment for mission-critical workloads.

Leveraging VMware VCF 4.1 with VxBlock 1000

VMware has introduced some new capabilities in VCF 4.1 and later versions of vSphere which can take advantage of VxBlock 1000 infrastructure.

VCF 4.1 SDDC enhancements

VCF 4.1 has introduced new backup workflow automation and improved APIs, including better data protection management for scheduling backups, changing retention policies, invoking on-demand backups and automating backup retries. VCF 4.1 has also added public APIs for Dell PowerProtect and other data protection software.

VMware Tanzu for cloud-native applications

VCF 4.0 added **VCF with Tanzu**, an enterprise-grade platform to run Kubernetes, cloud-native, containerized applications under VCF. Late in 2020, VMware also introduced **vSphere with Tanzu** as a simpler and easier path to run Kubernetes-based applications. With Tanzu, customers can run their cloud-native applications in pods running as VMs under VMware virtualization.

installed with bring-your-own VMware ELA, Tanzu with VCF or Tanzu with vSphere may be already available in your data centers. For these customers, cloud-native containerized and traditional virtualized workloads can easily be run on VxBlock 1000 infrastructure.

Federated VCF/multi-instance management

With VxBlock 1000 and VCF 4.1, customers can use **Federated VCF** environments. This means gaining the maximum configuration flexibility across more than one Dell Technologies platform by using HCI for

general-purpose workloads and three-tier VxBlock 1000 VCF instances for mission-critical production workloads. VCF federations can operate under a **multi-instance controller** to manage up to 20 separate VCF instances.

VCF on VxBlock for next-generation cloud operations

With VCF 4.1 on VxBlock 1000 infrastructure, customers can enjoy a comprehensive cloud operating model, including the following:

- For **business-critical** workloads, VxBlock 1000 infrastructure can be configured with the highest availability/highest performing Dell EMC storage, Cisco MDS SAN and high-end Cisco UCS B- and C-Series servers, Cisco Nexus LAN with VMware NSX networking, as well as VMware software to run critical production applications.
- For **general-purpose workloads**, VxBlock 1000 infrastructure can be configured with mid-tier Dell EMC storage options and Cisco MDS SAN, as well as mid-tier Cisco UCS B- and C-series servers, and Cisco Nexus LAN with VMware NSX networking and VMware software.
- For **next-gen AI/ML/DL and data science workloads** using specialized GPU hardware and large data repositories with compute- and data-intensive workloads, VxBlock 1000 infrastructure can be configured with Dell EMC primary and supplemental storage, Cisco MDS SAN and high-end Cisco B-Series UCS servers with NVIDIA Tesla GPUs, as well as Cisco Nexus LAN with VMware NSX networking.

Summary

Dell EMC VxBlock 1000 offers a fast path to build your data center infrastructure one logical rack at a time. With VxBlock 1000, you can tailor a three-tier system to gain best-in-class performance, availability and scalability to match workload requirements. At the same time, you can use engineered and validated infrastructure that comes cabled and ready for VMware software deployment. This sort of tailor-made, rapid-deployment infrastructure is hard to find outside of VxBlock 1000.

Dell EMC VxBlock 1000 with VCF 4.1 provides a significant opportunity for data centers today. VCF software on VxBlock 1000 can provide all the tools needed to evolve your data center to a cloud service model. Further, with VxBlock 1000 on-prem and cloud-based VCF solutions available, you can enjoy the hybrid-cloud flexibility needed to run workloads wherever it makes the most sense. In fact, with VxBlock 1000 and VCF, you can deploy infrastructure flexible enough to support current traditional, cloud-native and next-gen work as well as take advantage of a data center framework that can expand to any size necessary for workloads yet to be imagined.

Silverton Consulting, Inc., is a U.S.-based Storage, Strategy & Systems consulting firm offering products and services to the data storage community.