

# DELL EMC VXFLEX

FOR MULTI-HYPERVISOR SUPPORT, TWO-LAYER ENVIRONMENTS, AND HIGH PERFORMANCE DATABASES AND APPLICATIONS

## VXFLEX INTEGRATED SYSTEMS

### VxFlex appliance

Simplified, economic form factor



### VxFlex integrated rack

Engineered system with integrated rack-scale network fabric



Dell EMC VxFlex is a hyperconverged system that delivers an unmatched combination of performance, resiliency and flexibility to address enterprise data center needs.

Organizations that want to accelerate their IT transformation with hyperconverged are often worried that they cannot get the same results that their legacy environment provides: resiliency, performance and scale. VxFlex is the answer to replicate the benefits of a legacy environment while also delivering on the advantages that hyperconverged promises.

VxFlex integrated systems create a server-based SAN by combining virtualization software, known as VxFlex OS, with Dell EMC PowerEdge servers to deliver flexible, scalable performance and capacity on demand. Local storage resources are combined to create a virtual pool of block storage with varying performance tiers. The architecture enables you to scale from a small environment to enterprise scale with over a thousand nodes. In addition, it provides enterprise-grade data protection, multi-tenant capabilities, and add-on enterprise features such as QoS, thin provisioning, and snapshots. VxFlex systems deliver the performance and time-to-value required to meet the demands of the modern enterprise data center.

## HIGH PERFORMANCE APPLICATIONS AND DATABASES

VxFlex delivers the performance you need for any high-performance database and application. VxFlex OS is the virtualization software that enables VxFlex systems and it can deliver millions of IOPS at consistent sub millisecond response times. Every node in the VxFlex cluster is used in the processing of I/O operations, making all I/O and throughput accessible to any application within the cluster. Such massive I/O parallelism eliminates performance bottlenecks. Throughput and IOPS scale in direct proportion to the number of nodes added to the system, improving cost/performance rates with growth. High performance is desired for databases and applications, but it is also a key factor when rebuilds and rebalances are needed. These all occur in the background with minimal to no impact to applications and users. The VxFlex system automatically manages and optimizes data layout, preventing performance hot spots. These unique VxFlex OS features are why the most discerning and competitive businesses rely on VxFlex for their mission critical databases and applications.

## VXFLEX DIFFERENTIATORS

### Flexibility

- Flexible architecture allows multi-hypervisor support for vSphere and Red Hat Virtualization
- Deployment options include two-layer or HCI, mix and match

### Linear scalability and elasticity

- Start small and grow incrementally with no bottlenecks or resiliency tradeoffs
- Scale compute and storage independently (or together) for minimum TCO
- Linear scalability delivers consistent performance and latency

### Predictable high performance and resiliency

- Reliable, repeatable, fast rebuilds deliver 6x9's Tier 1 resiliency
- Predictability even in mixed workloads with high variability
- Even better performance and resiliency as you scale

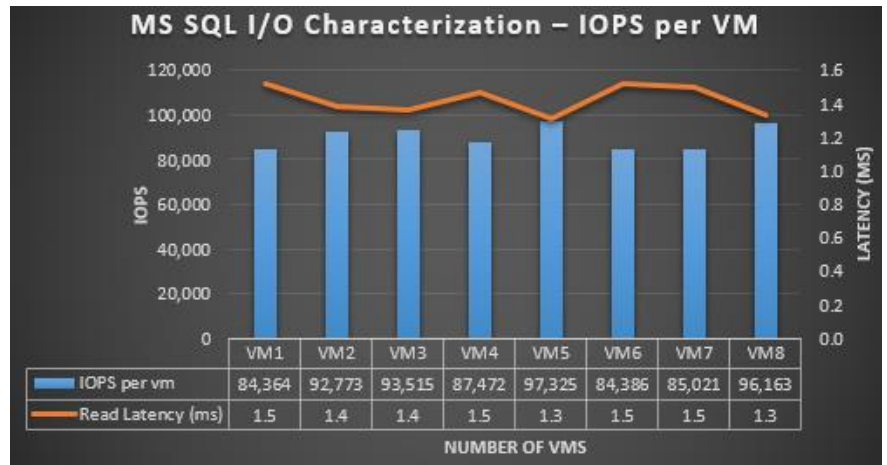
### Full stack architecture support

- Ability to take M&O to the network level
- Single source of support for both hardware and software



## Dell EMC lab testing results demonstrate VxFlex high performance:

VxFlex integrated rack can achieve up to 721,000 cumulative IOPs with less than or equal to 1.5 millisecond latency\*. Testing accomplished with eight nodes.



## MULTI-HYPERVISOR AND BARE METAL OPTIONS

VxFlex systems offers VMware® vSphere and Red Hat Virtualization integration as an engineered system, alongside the ability to support other hypervisors through bare metal configurations\*\*. This unique ability provides workload flexibility and gives organizations options with no future lock-in if requirements change as new projects and workloads arise.

Enabling different nodes to run different hypervisors, all while sharing the same storage pool, allows independent upgrades and shifting to different virtual environments as needed.

## FLEXIBLE DEPLOYMENT OPTIONS

The VxFlex storage environment can be designed to resemble hyperconverged or a traditional two-layer SAN architecture. Hyperconverged combines compute and storage together on the same node while a two-layer model separates them.

- **HCI/single-layer architecture:** An HCI model, where compute and storage reside within the same server, creates a single-layer architecture and offers the best TCO savings while allowing you to modernize your data center with greater efficiency.
- **Two-layer model:** Maintain your storage environment using a two-layer model to resemble a traditional SAN architecture with compute and storage on separate nodes. A two-layer model provides efficient parallelism and no single points of failure. Additionally, storage and compute nodes remain separate operationally, giving teams the flexibility to manage each infrastructure component independently. And if an organization is compute-heavy or storage-heavy, a two-layer model allows them to scale each component independently, preventing the worry of unused resources.

\* Based on internal Dell EMC testing, January 2019, using 100% reads & 4K block size in an 8-node (8RU) R640 cluster with two protection domains that each consisted of four nodes and VxFlex OS 2.6.1. Results based on Microsoft DISKSPD using ESXi 6.5. Results may vary based on configurations AD#19000008

\*\*Other hypervisors supported through bare-metal and require preapproval

## START SMALL AND SCALE OUT

VxFlex enables flexible scale out capabilities for your data center. As compute and storage resources are consumed, add nodes one by one, or scale by adding entire racks. VxFlex provides your infrastructure with unparalleled elasticity and scalability. Start with a small environment for your proof of concept or new application and add nodes as needed when requirements evolve – even to web-scale size.

## DELL EMC POWEREDGE SERVERS

VxFlex, built on Dell EMC PowerEdge servers, provides better all-flash economics, improved performance, and workload flexibility to address new customer use cases for both traditional and cloud-native workloads running in mixed environments.

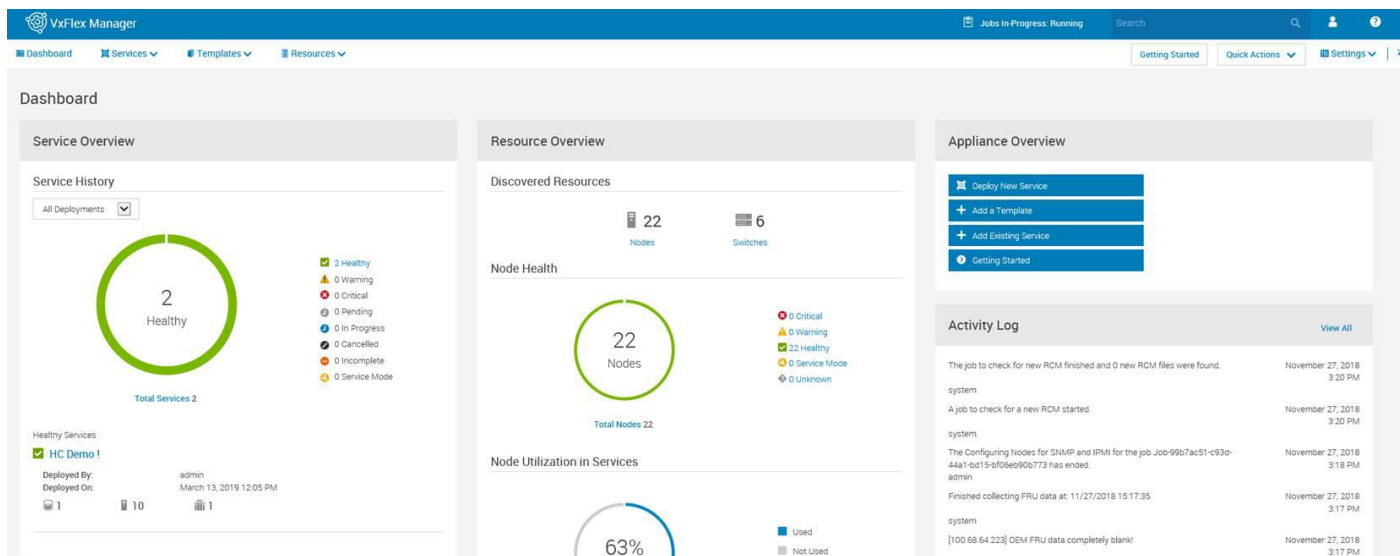
For VxFlex, three PowerEdge-based options are available (1U/1N based on PowerEdge R640; 2U/1N based on PowerEdge R740XD and R840), all of which can be configured with SSD (all-flash) options.

## MANAGEMENT AND OPERATIONS

VxFlex Manager is a comprehensive IT Operations Management (ITOM) software purpose-built for VxFlex appliance and integrated rack to automate and simplify implementation, expansion and lifecycle management.

VxFlex Manager brings together multiple management consoles, workflow automation and an intuitive interface that allows customers to monitor, manage, deploy and maintain physical and virtual resources with the click of a button. Key tenets of the new VxFlex Manager architecture include:

- System assurance: RCM updates and non-disruptive remediation (integrated rack)
- Insights: Monitoring, alerting, and health checks
- Simplified implementation: Simplified and automated system deployment and workflows
- Deploy and scale two-layer deployments on RHEL based storage nodes
- Node serviceability: Automation for node and disk replacement



VxFlex Manager provides alerting and monitoring on node hardware (Dell EMC PowerEdge servers). These monitoring capabilities proactively detect errors and when connected to Dell EMC Secure Remote Support (SRS), provide remote alerting and protection for system nodes. Remote monitoring enables you to easily establish a stateless compute environment, so you can achieve greater agility and control of your server node resources. When node maintenance operations are required, or in the case of a disaster recovery incident, failures are quickly identified, and Dell EMC Support is informed immediately for speedy resolutions. This proactive alerting and automated technical support means less time is spent troubleshooting so more time can be spent addressing business priorities.

By leveraging a powerful reporting engine, customized reports are also available and provide easy access to specific node information as needed.

The VxFlex Manager architecture delivers a wide range of services to support VxFlex including nodes, switches, VxFlex OS, and other hypervisors. It also supports the latest 14th generation node configurations. With VxFlex and VxFlex Manager, it has never been easier to simplify and advance your HCI strategy.

## VXFLEX CONSUMPTION MODELS

Dell EMC strongly believes that one size does not fit all when it comes to HCI. That's why for VxFlex integrated systems, you have choice and flexibility in how you choose to consume the VxFlex architecture:

- **VxFlex appliance** allows customers the flexibility and savings to 'bring their own' networking. \* With VxFlex appliance, customers benefit from a smaller starting point, with massive scale potential, without having to compromise on performance and resiliency.
- **VxFlex integrated rack** is a rack-scale engineered system with integrated networking for easy scale-out. A white glove deployment service ensures a complete turnkey experience while the Release Certification Matrix (RCM) further simplifies upgrades and keep systems stabilized and optimized and removes the challenge of self-testing all firmware and software.

	VxFlex appliance	VxFlex integrated rack
Server	Dell EMC PowerEdge servers, R640, R740XD, R840	Dell EMC PowerEdge servers, R640, R740XD, R840
Networking	Choice of Dell or Cisco switches*	Integrated
Software-defined storage	VxFlex OS	VxFlex OS
Management	VxFlex Manager: Alerting, monitoring, reporting	VxFlex Manager: Alerting, monitoring, reporting, RCM
Lifecycle Management	VxFlex Manager	VxFlex Manager, RCM
License	Capacity-based	Capacity-based
Cluster Expansion	Per node (automated via VxFlex Manager)	Per node/rack (automated via VxFlex Manager)
Expansion	Add nodes	Add nodes/racks
Environmental	n/a	Intelligent physical infrastructure consisting of Cabinet 2.0— fully welded and dynamically load-rated Smart Power Deliver Units (PDU) HID reader and thermal sensors
Hypervisor support	VMware vSphere, Red Hat Virtualization	VMware vSphere, Red Hat Virtualization
Bare metal support	Yes	Yes**

\*must be supported by VxFlex Manager

\*\*Bare metal support requires preapproval

## SUMMARY

VxFlex is an HCI offering that can replace an enterprise grade SAN using Dell EMC PowerEdge servers and intelligent software. VxFlex appliance and integrated rack exhibit balanced and predictable behavior, allows for varying performance and capacity ratios, decouples the scalability of compute and storage resources, and can scale enormously and non-disruptively.

VxFlex provides a completely distributed pool of storage capacity and performance. It delivers consistent IOPS and low latency, eliminating hotspots—no matter the workload.

## DELL EMC EXPERIENCE

Dell EMC is a leading innovator of intelligent converged and hyper-converged infrastructure systems. Dell EMC Systems are engineered to deliver the highest performance, operational simplicity, and scalability for the lowest TCO. Every system is a true converged infrastructure—each is engineered, manufactured, managed, supported, and sustained as one product.

- Dell EMC systems are standardized architectures based on best-in-breed technologies.
- Dell EMC manufacturing completes integration, testing, and validation of every Dell EMC VxFlex. This ensures that it is delivered within 60 days and is operational within hours of arrival.
- Dell EMC uses a process known as the Logical Configuration Survey (LCS) to customize integration and deployment. All system elements are pre-integrated, pre-configured, then tested and validated before shipping. Turnkey integration allows you to operate and manage your system as a single engineered product, rather than as individual, siloed components. Ongoing, component-level testing, and qualification result in a drastically simplified update process. The result is significant time and resource savings throughout the system life cycle, allowing you to focus your resources on business innovation.
- Every VxFlex integrated rack is sustained by a Release Certification Matrix (RCM), a documented set of firmware and software releases for all integrated rack components that are pre-tested and certified for interoperability, and regularly delivered to customers to simplify upgrades and keep systems stabilized and optimized.



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