Dell EMC VxFlex is a software-defined storage (SDS) solution that delivers an unmatched combination of performance, resiliency, flexibility and scalability while simplifying infrastructure management and operations.

In order to cope with constantly changing business needs, organizations are looking for software-defined approaches to building and managing their datacenters. However, it is important to ensure resiliency, high-performance and scalability as they modernize their infrastructure. VxFlex delivers the benefits of software-defined infrastructure while ensuring enterprise-class SLAs and scalability. VxFlex delivers storage services by combining its storage virtualization software, known as VxFlex OS, with Dell EMC PowerEdge servers to deliver flexible, scalable performance and capacity on demand. VxFlex Manager, a comprehensive IT Operations Management (ITOM) tool designed for VxFlex systems, automates deployment, expansion and lifecycle management of the system, including compute and storage resources, from BIOS and firmware through node, software and networking.

VxFlex aggregates local node resources to create a virtual pool of block storage with varying performance tiers. The architecture enables you to scale from as few as four nodes to several hundred nodes in a single deployment. In addition, it provides enterprise-grade features that include Six-9's resiliency, data protection, multi-tenant capabilities, quality of service (QoS), compression, thin provisioning, encryption and snapshots. VxFlex systems deliver the performance and time-to-value required to meet the demands of the modern business-critical enterprise datacenters.

HIGH PERFORMANCE APPLICATIONS AND DATABASES

VxFlex delivers the performance you need for high-performance database and application environments. VxFlex OS is the key enabling technology behind VxFlex systems, and it can deliver millions of IOPS at consistent sub-millisecond response times. Every node in the VxFlex cluster acts as a storage controller and is used in the processing of I/O operations. All the datasets are accessible to any application accessing the cluster over at least as many paths as there are contributing nodes. Such massive I/O parallelism eliminates performance bottlenecks and infrastructure silos. Throughput and IOPS scale in direct proportion to the number of nodes and disks added to the system, improving the cost/performance ratio as the scale grows.

High performance is a requirement for many databases and applications, but it is also a key factor when rebuilds and rebalances resulting from media and node failure are needed. With VxFlex, these activities 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 many businesses rely on VxFlex for their business-critical databases and applications.
VXFLEX DIFFERENTIATORS

Flexibility
- Flexible architecture allows support for multi-hypervisor as well as bare-metal and containerized deployments
- Deployment options include two-layer, HCI, storage only, or a mix

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
- Performance and resiliency improve with scale

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

LAB TESTING DEMONSTRATES HIGH PERFORMANCE
Dell EMC recently performed lab testing with six nodes VxFlex integrated rack system to assess VxFlex IO performance. The 6 node VxFlex integrated rack was able to support over 1 million IOPs with less than 1 millisecond latency using only six 1U nodes.*

MULTI-HYPERSISOR, BARE METAL AND CONTAINER SUPPORT
VxFlex systems offer VMware® vSphere, Red Hat Virtualization, and Windows/Hyper-V integration as an engineered system, alongside the ability to support other hypervisors and operating systems through bare metal configurations. VxFlex also supports cloud-native and container platforms including Kubernetes. This unique ability provides workload flexibility and gives organizations a choice to accommodate their architectural and application requirements without having to create infrastructure silos.

FLEXIBLE DEPLOYMENT OPTIONS
VxFlex can be deployed in a single-layer hyperconverged, two-layer server SAN architectures or as a storage-only solution. Customers can mix these architectures within a single deployment to best meet their needs.

- **Two-layer Server SAN architecture**: The two-layer architecture separates the nodes providing storage and compute resources, managing your storage and compute infrastructure independently and flexibly to address the exact scaling needs. With the two-layer deployment architecture, customers can optimize their infrastructure to meet the business needs while lowering the total infrastructure and licensing costs.

- **Single-layer HCI architecture**: An HCI model, where compute and storage resources are derived from the same nodes, creates a single-layer architecture and offers the best TCO savings while allowing you to modernize your data center with greater efficiency and simplicity.

- **Storage-only architecture**: A storage-only deployment provides additional flexibility to customers wanting to move to the software-defined paradigm, but who are taking an incremental approach. This option allows customers to start with a storage-only architecture to meet the storage needs while utilizing existing servers for compute resources.

* Based on 3rd-party testing (Apr 2019), using 8K block size in a 6-node (6RU) R640 cluster running VxFlex OS 2.6.1 on bare-metal Red Hat 7 in a hyperconverged deployment. Results may vary based on configurations.

START SMALL AND SCALE OUT

VxFlex enables flexible scale out capabilities for your data center. The system can be scaled by adding one or more nodes at a time, or by adding entire racks. VxFlex provides your infrastructure with unparalleled elasticity and scalability. Start with a small environment for your proof of concept or a new application and add nodes as needed when requirements evolve.

MANAGEMENT AND OPERATIONS

VxFlex Manager is a comprehensive ITOM software purpose-built for VxFlex appliance and integrated rack to automate and simplify implementation, expansion and lifecycle management of VxFlex environments. It 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. The automation and operational efficiencies enabled by VxFlex Manager allows IT staff and storage administrators to focus on higher value initiatives that drive business priorities.

Key tenets of the new VxFlex Manager include:

- System assurance: compliance and drift management with non-disruptive remediation
- Insights: monitoring, alerting, and health checks
- Simplified implementation: simplified and automated system deployment and workflows
- Serviceability: automation for node and disk replacement
- Ease of expansion: built-in template-based duplication

VxFlex Manager provides alerting and monitoring on VxFlex node hardware. 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 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 hypervisors in the deployment. With VxFlex Manager, it has never been easier to simplify and advance your software-defined datacenter strategy.
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.

VxFlex supports three PowerEdge server models. They include PowerEdge R640; PowerEdge R740XD and PowerEdge R840, all of which can be configured with solid state drives.

VXFLEX CONSUMPTION MODELS

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

- **VxFlex appliance** allows customers the flexibility and savings to 'bring their own' compatible networking*. With VxFlex appliance, customers benefit from a smaller starting point, with massive scale potential, without having to compromise performance, resiliency or manageability. VxFlex appliance offers complete SDS feature functionality VxFlex OS enables as well as comprehensive ITOM capabilities offered by VxFlex Manager.

- **VxFlex integrated rack** is a rack-scale engineered system with integrated networking. A white glove deployment service ensures a complete turnkey experience while the Release Certification Matrix (RCM) further simplifies upgrades, keeps systems stabilized and optimized, and removes the challenge of self-testing all firmware and software.

<table>
<thead>
<tr>
<th>Server</th>
<th>VxFlex appliance</th>
<th>VxFlex integrated rack</th>
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</thead>
<tbody>
<tr>
<td>Networking</td>
<td>Choice of Dell or Cisco switches*</td>
<td>Integrated Dell or Cisco switches</td>
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<tr>
<td>Software-defined storage</td>
<td>VxFlex OS</td>
<td>VxFlex OS</td>
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<tr>
<td>Management</td>
<td>VxFlex Manager; Alerting, monitoring, reporting</td>
<td>VxFlex Manager; Alerting, monitoring, reporting, RCM</td>
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<td>Lifecycle Management</td>
<td>VxFlex Manager</td>
<td>VxFlex Manager, RCM</td>
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<td>License</td>
<td>Capacity-based</td>
<td>Capacity-based</td>
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<td>Cluster Expansion</td>
<td>Per node (automated via VxFlex Manager)</td>
<td>Per node/rack (automated via VxFlex Manager)</td>
</tr>
<tr>
<td>Expansion</td>
<td>Add nodes</td>
<td>Add nodes/racks</td>
</tr>
<tr>
<td>Environmental</td>
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<td>Intuitive physical infrastructure consisting of</td>
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<td></td>
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<td>Cabinet 2.0—fully welded and dynamically load-rated</td>
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<td>Smart Power Deliver Units (PDU)</td>
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<td>HID reader and thermal sensors</td>
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<td>Hypervisor support</td>
<td>VMware vSphere, Red Hat Virtualization, Windows/Hyper-V</td>
<td>VMware vSphere, Red Hat Virtualization, Windows/Hyper-V</td>
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<tr>
<td>Bare metal support</td>
<td>Yes</td>
<td>Yes**</td>
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</table>

*must be supported by VxFlex Manager  
**Bare metal support requires preapproval
SUMMARY

VxFlex is a modern flexible SDS solution designed for consolidating workloads, modernizing business-critical databases and applications, and building agile private cloud environments. VxFlex helps organizations modernize their business-critical infrastructure while ensuring high-performance, market-leading resiliency, seamless scalability and operational simplicity. VxFlex systems can accommodate a broad set of requirements by supporting multiple deployment models to meet the architectural requirements. The solution can be deployed in single-layer Server SAN, two-layer HCI or storage-only architectures with support for a wide range of hypervisors, operating systems, as well as cloud-native containerized applications in a single manageable deployment. Further, VxFlex Manager takes the complexity out of the infrastructure by offering comprehensive ITOM and lifecycle-management capabilities.

DELL EMC EXPERIENCE

Dell EMC is a leading innovator of IT infrastructure solutions. Dell EMC systems are engineered to deliver the highest performance, operational simplicity, and scalability for the lowest TCO. Each system is engineered, manufactured, managed, supported, and sustained as one solution.

- Dell EMC systems utilize standardized architectures based on best-of-breed technologies.
- Dell EMC manufacturing completes integration, testing, and validation of every VxFlex system. This ensures that it is delivered within 60 days and is operational within hours of arrival. 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 solution, 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 lifecycle, 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.

To learn more visit dellemc.com/vxflex.