Dell EMC VxFlex Ready Nodes

Scalable, reliable and easy-to-deploy building blocks for hyper-converged or server SAN architecture, multi-hypervisor or bare metal environments, and high performance databases

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**Quick and easy deployment**

**Enterprise-grade resilience**

**Scalable performance**

**A solution built for modern storage demands**

Enterprises are producing, ingesting and storing more data than ever before. Traditional SAN storage offers the high performance and high availability required to support business applications, hypervisors, file systems and databases. But a SAN doesn’t provide the massive scalability, linear performance gains and resilience required by modern enterprise data centers.

Dell EMC VxFlex Ready Nodes converge storage and compute resources, aggregating capacity and performance with simplified management capable of starting small and scaling in discrete increments. Dell EMC VxFlex Ready Nodes bring together Dell EMC PowerEdge servers with Dell EMC VxFlex OS software in scalable, reliable and easy-to-deploy building blocks for hyper-converged or server SAN architecture, multi-hypervisor or bare metal environments, and high performance databases.

VxFlex Ready Nodes offers flexibility in deployment options:

**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:** Redesign your storage environment using a traditional two-layer model to resemble a traditional SAN architecture. 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 independently.

Either option fits within your existing infrastructure and provides massive scalability with linear performance gains and enterprise-grade, no-compromise resilience — in a validated, configured and supported building block that’s quick and easy-to-deploy.

**Quick and easy deployment**

Dell EMC VxFlex Ready Nodes reduce the time IT spends planning and deploying new architectures. Dell EMC VxFlex Ready Nodes are:

- Configured, tuned and optimized to simplify VxFlex OS deployment and ease scaling projects
- Delivered with the complex configuration steps completed and tested in a known good configuration — including hardware compatibility list (HCL) lookup, HCL driver downloads and driver installs
- Easy-to-deploy, operate and manage with transformative Automated Management Services built into VxFlex OS
- Supported by a single vendor — Dell EMC — for streamlined, collaborative support from the first call

**Enterprise-grade resilience**

Dell EMC VxFlex Ready Nodes provide enterprise-grade resilience by running the storage software directly on application servers. Designed for extensive fault tolerance and availability, the solution effectively handles failures of media, connectivity and nodes, software interruptions more so that no single point of failure can interrupt the input/output (I/O) service. Dell EMC PowerEdge R640 and R740xd Servers are a perfect foundation, with high-availability features such as hot-pluggable and hot-swappable power supply units (PSUs), hard disk drives (HDDs) and fans, and a dual SD card option for fail-safe hypervisors. In addition, Dell EMC VxFlex Ready Nodes support and integrate with Dell EMC data protection services, enabling ERP admins and DBAs to manage, control and protect their growing physical and virtual systems and database environments effectively using tools from the Dell EMC Data Protection Suite, such as Data Domain (DD) with DD Boost, Networker and RecoverPoint.
Scalable performance
Dell EMC VxFlex Ready Nodes are designed to scale massively. Unlike most traditional storage systems, as the number of storage devices grows, so does throughput and IOPS. The scalability of performance is linear with regard to the growth of the deployment. You can add servers and storage modularly so resources can grow individually or together to maintain balance. Every server in the cluster is used in the processing of I/O operations, making I/O and throughput accessible to any application within the cluster. Throughput and IOPS scale in direct proportion to the number of servers and local storage devices added, improving cost/performance rates with growth. Plus, Dell EMC VxFlex Ready Nodes are based on Dell EMC PowerEdge servers, which deliver higher core counts for I/O intensive applications, reducing bottlenecks and further improving performance.

How will you use Dell EMC VxFlex Ready Nodes?
Workloads come in various shapes and sizes, and mission-critical applications require a flexible infrastructure to handle the independent needs of each implementation, while delivering enterprise-class levels of performance and resilience.

Server SAN or 2-layer storage architecture
Dell EMC VxFlex Ready Nodes abstract the direct-attached storage of Dell EMC PowerEdge servers into a pool of shared block storage. By converging the storage and compute on the same physical servers, this single- and/or two-layer architecture helps simplify management and optimize storage efficiency as the infrastructure grows from three nodes to thousands. Whether using HDDs, solid disk drives (SDDs), or even NVMe or PCIe flash, storage is combined into block-storage pools with varying performance tiers. Combined with quality of service (QoS), snapshots, caching, fault sets and protection domains, and data-at-rest encryption, Dell EMC VxFlex Ready Nodes deliver an enterprise-grade hyper-converged solution. You can break free of the large initial investments and high operational costs commonly associated with traditional SANs, and lower the costs and risks associated with refreshes and data migrations.

Heterogenous or bare-metal hypervisor environments
SAN-driven storage comes with numerous limitations in a virtual environment. Dell EMC VxFlex Ready Nodes optimize traditional virtualized infrastructures by providing highly scalable server-based storage for heterogeneous platforms, including support for multiple hypervisors, operating systems and bare-metal configurations. The solution allows for independent scaling of compute and storage, reducing stranded resources and bringing flexibility to virtualized infrastructures that traditional SAN can’t provide. Scaling now becomes significantly easier with the ability to optimally distribute resources based on application and workload needs.

High-performance databases
For databases — such as Microsoft® SQL Server®, SAP® and Oracle® Database — the ability to satisfy various sets of business requirements and service level agreements (SLAs) on the same infrastructure without impacting other applications or workloads is imperative to a successful deployment. Every node in a Dell EMC VxFlex Ready Node cluster is used in the processing of I/O operations, making throughput accessible to any application within the cluster. Such massive I/O parallelism eliminates performance bottlenecks, while throughput and IOPS scale in direct proportion to the number of nodes added to the system, improving cost/performance as the environment grows. Performance optimization is automatic, and whenever rebuilds and rebalances are needed, they occur in the background with minimal or no impact to applications. For optimal utilization, the solution also enables independent scaling of compute and storage, eliminating stranded resources.
Are you facing any of these challenges?

"We can’t support the high performance requirements of our applications and databases."

Every VxFlex Ready Node within a 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. Performance optimization is automatic. Whenever rebuilds and rebalances are needed, they occur in the background with minimal or no impact to applications and users.

"We need to plan for future growth and avoid lock-in."

VxFlex Ready Nodes provides support for multi-hypervisors and even bare-metal configurations. This unique ability provides workload flexibility and gives groups within the organization the ability to change requirements as needed if new projects and workloads arise without lock-in.

"We’re running out of capacity."

Data growth is a key driver of storage evolution. Enterprises are producing, ingesting and storing more data than ever before. Traditional SAN arrays are flexible but have a limit on available space and performance. Increasingly, many organizations are finding that their SAN, which they originally forecast would support their operations for five or more years, is already struggling after only two or three. Dell EMC VxFlex Ready Nodes scale from three nodes up to thousands while providing one large pool of storage and eliminating “islands of SANs.” They also optimize storage and compute resources to reduce capacity planning and enable a “pay as you grow” model.

"We need to guard against failures or data loss."

With today’s consumers and employees expecting around-the-clock access to applications and information, there’s no time for downtime. But data protection becomes increasingly difficult as applications leverage a heterogeneous mix of infrastructure components. Specifically, for databases, it’s not just about protecting the production environment. The same copy of the production database is used across various business units within an organization, such as test/dev, QA and analytics. This puts enormous pressure on IT to minimize backup windows and reduce the costs associated with storing, copying and protecting mission-critical databases, whether in production or nonproduction, copies being used by different business units.

"It takes too long to plan and deploy storage architecture."

With budgets and staffing tight, it can be hard to dedicate resources to essential core projects like expanding storage capacity. At the same time, getting the configuration, settings and firmware compatibility just right is critical for performance and availability, but can take up a lot of time. Dell EMC VxFlex Ready Nodes take the guesswork out of the equation and speed deployment with configured, tested and optimized building blocks.
Dell EMC VxFlex Ready Nodes

Each Dell EMC VxFlex Ready Node consists of:

- VxFlex OS software.
- Optimized PowerEdge R640 and/or R740xd Servers.
- ProDeploy, ProSupport, ProSupport Plus (recommended) or custom services (optional). With ProDeploy, Dell EMC can install and configure VxFlex OS during deployment, regardless of whether the license is preexisting or purchased with the order.
- Dell Financing (optional).

Dell EMC VxFlex Ready Node implementations have a minimum of three nodes per cluster. Customers can increase in one-node increments up to a maximum of 1,024 nodes per cluster.

Configuration options

- Hyper-converged nodes are designed to balance compute and storage and are highly scalable in both areas.
- Storage-only nodes are designed to focus on storage density and performance.
- Compute-only nodes are designed for compute capacity increase only, with no increase in storage or performance.
- The Automated Management Server discovers, deploys and manages a Dell EMC VxFlex Ready Node cluster.

You can mix and match compute and storage in any node, and each node can be a unique configuration within the cluster. In addition, Red Hat® Enterprise Linux®, KVM, Microsoft® Hyper-V® and VMware ESXi™ work in any combination within the cluster.

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### Server

#### PowerEdge R740xd
- **2U high-capacity form factor**

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#### PowerEdge R640
- **1U high-density form factor**

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### CPU
- Intel Xeon Scalable processors, up to 26 cores

### Memory
- **NVDIMM**
  - 224–736GB
  - Without NVDIMM
    - 192GB–3TB

### GPU
- NVIDIA® Tesla® M10, M60

### BOSS
- BOSS controller card with 2x 120GB M.2 SATA drives creates single RAID1

### Storage
- **Controllers**
  - RAID: PERC H730p SAS: HBA330, all SSD
  - Drive capacities, max 32 drives
    - SAS SSD 2.5" — 800GB, 960GB, 1.6TB, 1.92TB, 3.84TB
    - SATA SSD 2.5" — 1.6TB, 1.92TB, 3.84TB
    - SAS HDD 2.5" 10K RPM — 1.2TB, 2.4TB
    - NVMe 2.5" SSD — 800GB, 1.6TB, 3.2TB, 6.4TB

- **Controller Configuration**
  - 1 CPU configuration
    - 1 onboard rNDC + 1 PCIe 4x 10/25GbE
  - 2 CPU configuration
    - 1 onboard rNDC + 2 PCIe 4x 10/25GbE
  - Supported NICs: Intel X550, Mellanox ConnectX-4 Lx

### Network
- **1–2 CPU, 0–2 GPU configuration**
  - 1 onboard rNDC + 2 PCIe 2x 10GbE + 2x 1GbE + 4x 10/25GbE
  
- **2 CPU, 3 GPU configuration**
  - 1 onboard rNDC only 2x 10/25GbE
  - Supported NICs: Intel X550, Mellanox ConnectX-4 Lx

### Automated Management Services

VxFlex OS differentiation includes Automated Management Services for monitoring, automated provisioning and lifecycle management. For customers deploying hyper-converged Dell EMC VxFlex Ready Nodes with VMware ESXi, hyper-converged RHEL or RHEL storage-only, Automated Management Services can automatically discover the hardware and configure the network. It also enables administrators to create entities such as compute clusters, virtual machines, data stores and application networks from a single management console.

Automated Management Services help simplify the lifecycle management of Dell EMC VxFlex Ready Nodes by selecting components, then identifying and applying the required operating system patches and firmware upgrades. The end-to-end monitoring and management means data centers can experience greater operational efficiency while reducing risks and administration overhead associated with manual configuration tasks.

Read more
Solution Overview

Why Dell EMC?

The combination of Dell and EMC brings together two industry-leading companies with strong reputations for value and innovation. Dell EMC holds leadership positions in some of the biggest and largest-growth categories in the IT infrastructure business, and that means you can confidently source your IT needs from one provider — Dell EMC.

- #1 converged infrastructure¹
- #1 hyper-converged infrastructure¹
- #1 in traditional and all-flash storage²
- #1 virtualized data center infrastructure³
- #1 cloud IT infrastructure⁴
- #1 server virtualization and cloud systems management software (VMware)⁵
- #1 in data protection⁵

Services and financing

Dell EMC Support and Deployment Services

Solutions customized for your needs

Leverage on-site integration or application implementation with Dell EMC Professional Services.

Deployment assistance when you need it

You can trust Dell EMC to deploy Ready Nodes and more, including operating system, firmware and hypervisor with Dell EMC ProDeploy.

Support is always on for you

Enjoy unlimited access to 24x7 chat, email and phone support services with how-to assistance and disaster recovery from Dell EMC ProSupport. Dell EMC recommends ProSupport Plus with priority access to engineers, and a designated Technology Service Manager to manage and report on collaborative support across hardware and software.

Dell Financial Services

Let the wealth of leasing and financing options from Dell Financial Services help you find opportunities when your organization faces decisions regarding capital expenditures, operating expenditures and cash flow.

- Leasing and financing solutions are available throughout the U.S., Canada and Europe.
- Dell EMC Financial Services can finance your technology solution.
- Electronic quoting and online contracts offer an efficient purchase experience.

Learn more about Dell Financial Services.

¹ IDC WW Quarterly Converged Systems Tracker, Q4 2017, April 2018, Vendor Revenue.
³ Dell EMC Annual Report, 2015.
⁴ IDC WW Quarterly Cloud IT Infrastructure Tracker, April 2017, Vendor Revenue — EMC Q4 2016.
Dell EMC Customer Solution Centers

Experience Dell EMC solutions in our global network of 21 dedicated facilities. The Dell EMC Customer Solution Centers are trusted environments where world-class IT experts collaborate with you to share best practices, facilitate in-depth discussions of effective business strategies using briefings, workshops, or proofs-of-concept and help you become more successful and competitive. Dell EMC Customer Solution Centers reduce the risk associated with new technology investments and can help improve speed of implementation.

Find out more

Don't wait to find out more about this building block for server SAN and hyper-converged infrastructure that can achieve massive scaling with linear performance gains and enterprise-grade resilience — in a reliable solution that's quick and easy-to-deploy. Contact your Dell EMC sales representative, right away.