Support Apps at the Edge with vSAN 8 with Express Storage Architecture

Edge computing defined

VMware defines edge computing as distributed digital infrastructure for running workloads across a multitude of locations, placed close to users and devices that produce data.

In today's technology-driven environment, businesses of all sizes, across every vertical, operate under a digital-first strategy. To meet the goals of the modern business and automate business-critical processes, workloads are increasingly being hosted at the edge to ensure high performance and low latency. To support the compute and storage needs for these local applications, the use of decentralized infrastructure has exploded, with no signs of slowing. IDC estimates that IT spending on the edge is expected to grow by an 18.7 percent compound annual growth rate (CAGR) through 2025.[1]

The challenge: Balancing resources for edge deployments

While edge deployments equip organizations with the real-time processing power needed to support local applications, implementation may surface some challenges:

- Physical limitations – The physical data center footprint should always be strategically planned, but with many edge deployments, it is done with a shorter runway or limited resources. IT teams are often constrained to existing spaces that offer substandard environments for servers and storage solutions.
- Budget constraints – At organizations of all sizes, competing business and IT priorities lead to financial compromise. Because edge deployments are typically purpose-driven, budget for edge infrastructure is often not substantial.
- Resource allocation – With budget limitation comes lean IT teams. Most edge sites lack a dedicated IT resource to manage hardware and software lifecycles, creating support and troubleshooting challenges.
- Security considerations – Though every IT leader understands the importance of securing their data, physical security at edge sites often falls short of the robust measures taken in core data centers.

1. IDC Directions. "Edge as the Runway for Digital First Operations." DR2022_T1_JC. March 2022.

Edge use cases

HCI supports edge deployments across a diverse set of use cases, including the following.

Financial services and insurance

- Account management
- Fraud detection
- Transaction processing

Healthcare

- Electronic health record management
- Telemed care

Retail

- Inventory management
- Market analytics and AI/machine learning (ML)

Remote office/branch office

- Collaboration and email
- Last-mile connection
- Business-critical applications

Manufacturing

- Quality assurance
- Robotic assembly and fulfilment
- Warehouse management

- Unique workload requirements – The applications hosted at edge locations vary greatly in terms of their performance, storage and availability needs. To achieve flexibility for these varying requirements, workloads at the edge need access to block storage and file shares.

The solution: Hyperconverged infrastructure at the edge

Hyperconverged infrastructure (HCI) use at the edge is growing rapidly, supporting an increasing list of use cases at a lower cost and smaller footprint than traditional storage solutions. Whether running mission-critical applications in hospitals or back-office apps in a regional office, organizations of all sizes are finding unparalleled value in HCI at the edge through:

- Scalability – HCI can scale down to as little as two nodes plus a witness.
- Enhanced performance – HCI provides high levels of performance across a variety of solutions, from storage-dense drives to high-performance NVMe to support the most demanding applications.
- Flexibility – HCI can support a wide variety of workloads, all from one infrastructure stack. Administrators can expect simplified management of their storage requirements.
- Data services – HCI enables many of the desired data services needed for edge deployments, all in a small footprint. This includes, but is not limited to, native block and file storage, quality of service, and encryption.
- Centralized management – HCI offers unmatched operational simplicity. It can be managed virtually from a central location, greatly reducing the need for onsite IT staff at edge locations.

The VMware vSAN difference

VMware vSAN™ is the only HCI solution native to VMware vSphere®, bringing the power of cloud to your storage with consistent application performance and high consolidation ratios. vSAN 8 with Express Storage Architecture™ offers unprecedented levels of performance and availability for application deployment at the edge.

Some of the leading benefits and capabilities of running edge deployments on vSAN 8 with Express Storage Architecture include:

- Unparalleled performance without trade-off – Achieve RAID1 performance regardless of RAID configuration. Express Storage Architecture users can expect up to 4x higher performance while maintaining the highest levels of data protection and space efficiency.
- Availability of your applications at the edge – Enable rapid data protection with up to 100x faster operations via native snapshots within vSAN Express Storage Architecture. Seamlessly connect to third-party backup solutions via an API for an easy-to-use experience to enhance data protection and backup

management of applications at the edge. Adaptive RAID5 erasure coding with as few as three hosts further improves data reliance and management while using less capacity for data storage.

- Integrated file services – Easily provision a file share with a single workflow, and use vSAN as a unified storage control plane for both block and file storage. vSAN file services integrate Active Directory and support Kerberos network authentication and the most common protocols. vSAN file services can be used in two-node deployments and stretched cluster deployments.
- Simplified storage operations – Seamlessly consume storage with minimal effort by choosing policy-driven storage and automatically mounting the volume. vSAN cloud native storage supports all key storage API objects within Kubernetes, and powers both block-centric and file-centric microservice-based applications. vSAN provides admins with a comprehensive, single UI view to manage storage used by containers across multiple orchestrators.
- Lower storage costs with supreme resource and space efficiency – Deliver up to 4x better compression ratios and up to 70 percent extra usable capacity with optimized compression methods, further improving space savings and efficiency. A single-tier architecture enhances the overall efficiency of storage as all storage devices contribute to capacity.
- Enhanced visibility – Get global visibility into the entire vSAN estate, including edge deployments, with VMware vSAN+™. Cloud-connected HCI provides users with a single management plane that delivers alerts and health status to a single location, making it easier for admins to identify and remediate issues quickly.

Learn more

Visit Tech Zone to take a technical deep dive into vSAN 8 with Express Storage Architecture.

Read customer stories to learn how others are using vSAN.

Try vSAN online for free with VMware Hands-on Labs.

Request a free vSAN assessment for mission-critical applications in your data center.

For more information or to purchase VMware products, call 877-4-VMWARE (outside North America, +1-650-427- 5000), visit vmware.com/products, or search online for an authorized reseller.

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