

# Micron® VMware vSAN™ All-Flash NVMe™ and SATA Reference Architecture



## Building an Optimally Balanced All-Flash Virtualization Node for vSAN 6.6 and Beyond

Data-intensive businesses that thrive in today's environment move quickly, and data platforms must move quickly with them. Technologies such as NVMe™ SSDs and advanced DRAM in conjunction with standard servers, multicore processors and state-of-the-art virtualization like VMware® vSAN™ are chasing application lethargy out of the data center.

Most vSAN deployments are all-flash today, proving the need for high performance nodes to enable dense, cost-effective virtualized application environments. Like the standard AF-6 all-flash VMware vSAN Ready Node™ definition, this reference architecture combines low-latency NVMe SSDs<sup>1</sup> in its cache tier with high-capacity, Enterprise-grade SATA SSDs in its capacity tier and advanced Micron® DRAM in standard 2-socket rack-mount servers to optimize compute, capacity, cost and performance with vSAN 6.6.

This reference architecture (developed by Micron engineers in collaboration with VMware and Supermicro) is optimized for best results and value. It provides predictably high performance that's easy to deploy and manage while enabling the key features and capabilities of vSAN 6.6.

## Key Features

### Balanced All-Flash Performance

This all-flash vSAN reference architecture with NVMe SSDs is optimized at the platform level for better results and better value.

**Cache tier NVMe SSDs** bring high speed, low latency and endurance to the vSAN cache tier. SSDs with NVMe bring data processing closer to the processor, minimizing latency and providing consistently fast throughput.

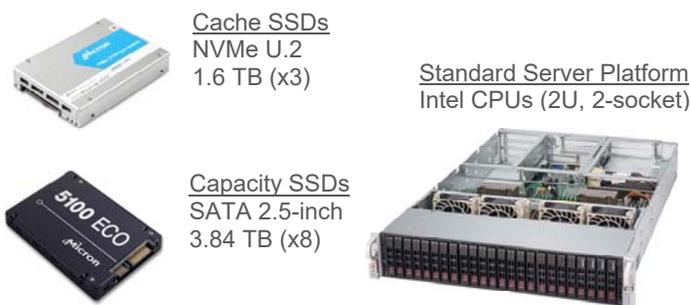
**Capacity tier SATA SSDs** disrupt the data deluge that can overwhelm the traditional IT infrastructure, and are tailored to meet the needs of read-intensive deployments.

### Flexibility and Choice

Micron lab-validated reference architectures enable you to build with confidence and enable faster time to deployment with predictable results.

### Easier Deployment

Micron Accelerated vSAN Reference Architecture helps free your deployment teams from the drudgery of experimentation, testing and reconfiguration, enabling them to focus on higher-value tasks — like rapid deployment, faster time to value and building your bottom line.



**Figure 1: Reference Architecture Major Components: Micron NVMe and SATA SSDs, Standard 2U, 2-socket Servers (with Micron DRAM)**

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## vSAN 6.6 Key Features and Capabilities

According to the VMware vSAN 6.6 data sheet, the following are achievable:<sup>2</sup>

**Flash-optimized:** vSAN 6.6 optimizations deliver up to 50% more IOPS than previously possible, deployed for over 50% less than the cost of competing hybrid hyper-converged solutions.

**Deduplication and Compression:** Software-based deduplication and compression optimizes all-flash storage capacity provides as much as 7x data reduction.<sup>3</sup>

**Data Protection (Erasure Coding):** Increases usable storage capacity by up to 100% while keeping data resiliency unchanged.

**vSAN Encryption:** Native to vSAN, vSAN Encryption provides data-at-rest security at the cluster level, built for compliance requirements and offers simple key management.

## Reference Configuration

Component	Details
Server platform	SYS-2029U-TR25M
Cache SSDs	Micron 9200 MAX (1.6TB, NVMe x3)
Capacity SSDs	Micron 5100 ECO (3.84TB, SATA x12)
OS Drive	Micron 240GB SATA SSD

## Micron Accelerated Storage Solution Reference Architecture Delivers

**Balanced CPUs, DRAM and Storage:** Engineered and lab-tested by Micron vSAN and platform experts to optimize each node for memory and IO-intensive applications, releasing the full potential of vSAN 6.6 in demanding mixed workload environments.

**A Complete, Deployable Reference Architecture:** The reference architecture linked below provides deployment and testing details for one of the most compelling vSAN configurations: a performance-optimized all-flash vSAN-enabled VMware vSphere® cluster using a combination of Micron SSDs (NVMe and SATA).

**Faster Time to Happy Applications:** Storage (SSDs and DRAM) can represent up to 70% of the value of today's advanced solutions. As a leading designer, manufacturer and supplier of advanced storage and memory technologies with extensive in-house software, application, workload and system design experience, reference architectures help you build and deploy faster with more confidence.

Component	Details
CPU	2x Xeon® 6142 (16-core, 2.60 GHz)
Memory	12x 32GB 2666 MHz ECC DDR4
Networking	Mellanox® ConnectX-4 (dual port)
Storage Controller (per node)	LSI 9300-8i (SAS/SATA, x3)

## Ready to Get Started With All-Flash vSAN 6.6?

An all-flash vSAN can bring amazing benefits. Download the Reference Architecture ([https://www.micron.com/~media/documents/products/other-documents/micron\\_nvme\\_sata\\_vsan\\_reference\\_architecture.pdf?la=en](https://www.micron.com/~media/documents/products/other-documents/micron_nvme_sata_vsan_reference_architecture.pdf?la=en)).

Visit Micron's NVMe SSD page ([https://www.micron.com/products/solid-state-storage/bus-interfaces/nvme-ssds#](https://www.micron.com/products/solid-state-storage/bus-interfaces/nvme-ssds#/)) to learn more about our latest NVMe SSDs and our Enterprise SATA SSD page ([https://www.micron.com/products/solid-state-storage/bus-interfaces/sata-ssds#](https://www.micron.com/products/solid-state-storage/bus-interfaces/sata-ssds#/)) for our most recent Enterprise SATA products.

VMware's vSAN page is loaded with details on vSAN 6.6 (<https://www.vmware.com/products/vsan.html>).

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1. NVMe (non-volatile memory, express) is an ultra-high bandwidth, ultra-low latency storage access protocol – see [www.nvmeexpress.org](http://www.nvmeexpress.org) for complete details

2. Source: <https://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/products/vsan/vmware-virtual-san-datasheet.pdf>

3. Assumes deployment enables 7X data reduction; actual data reduction is dependent on several external factors.

Products are warranted only to meet Micron's production data sheet specifications.

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