



Intel® Select Solutions for VMware vSAN*

Intel Select Solutions provide proven performance on verified infrastructure.



VMware vSAN* is a powerful platform that delivers hyper-converged infrastructure and serves as a critical building block for the software-defined data center. Organizations are deploying VMware vSAN—frequently on top of existing VMware vSphere* infrastructure—to take advantage of the solution's distinctive scalability, security, and performance features for today's most demanding, storage-intensive data center workloads.

The VMware vSAN ReadyNode* certification program provides assurance to data center buyers that their vSAN provider of choice has undergone VMware's rigorous certification process. Intel® Select Solutions for VMware vSAN, offered by a variety of solution providers, are certified for vSAN ReadyNode and tightly specified by Intel and VMware to deliver out-of-the-box high performance. With Intel Select Solutions for VMware vSAN, IT teams can rest assured that their solutions are already verified for balanced and optimized performance—from the hardware up through the firmware stack to the VMware vSAN software. IT teams can get right to work providing VMware vSAN services to customers rather than wading through multiple component options or conducting extensive, system-level testing.

Proven configurations are within reach with Intel Select Solutions for VMware vSAN, available from a wide variety of data center solution providers. Intel Select Solutions for VMware vSAN:

- Are performance-optimized specifically for VMware vSAN
- Reduce the time required to evaluate, select, and purchase the necessary hardware components
- Minimize the time required to deploy new infrastructure
- Deliver performance optimized to a specific threshold across compute, storage, and network on trusted Intel® architecture

What Are Intel® Select Solutions?

Intel Select Solutions are verified hardware and software stacks that are optimized for specific software workloads across compute, storage, and network. The solutions are developed from deep Intel experience with industry solution providers, in addition to extensive collaboration with the world's leading data center and service providers.

To qualify as an Intel Select Solution, solution providers must:

1. Follow the software and hardware stack requirements outlined by Intel
2. Replicate or exceed Intel's reference benchmark-performance threshold
3. Publish a detailed implementation guide to facilitate customer deployment

Solution providers can develop their own optimizations to add further value to the solutions.

Intel Select Solutions for VMware vSAN

VMware vSAN is an enterprise-class, software-defined storage (SDS) solution that powers highly scalable and high-performance hyper-converged infrastructure. Native to the VMware vSphere hypervisor, VMware vSAN uses solid-state drives (SSDs) for high capacity input/output (I/O) and low latency. Seamless integration with vSphere and the VMware ecosystem makes it an ideal storage platform for business-critical applications, cloud-native applications, remote office and branch office implementations, test and development environments, management clusters, security zones, and virtual desktop infrastructure (VDI).

Intel Select Solutions for VMware vSAN are available in two configurations, “Base” and “Plus,” as shown in Table 1. The configurations are designed to provide optimized balance and price performance for VMware vSAN across compute, storage, and networking components. The Plus configuration offers greater performance than the Base configuration, as measured by VMmark* 3.0 benchmark scores.¹

Compute: Intel Select Solutions for VMware vSAN utilize features and capabilities of the Intel® Xeon® Scalable processors. The Intel® Xeon® Gold 6130 processor

provides an optimized balance of price and performance in a mainstream configuration. The Intel Xeon Gold 6152 processor powers the Plus configuration, which is designed for high-density deployments or more demanding, latency-sensitive environments. Higher-number processors can also be used in either configuration.

Storage: VMware vSAN performs best when its hot-data tier—the cache tier—is on fast SSDs with very low latency. Workloads that require performance can benefit from empowering the cache tier with the highest-performing SSDs rather than mainstream Serial ATA (SATA) SSDs. Intel® Optane™ SSDs with Non-Volatile Memory Express* (NVMe*) are used to power the cache tier in Intel Select Solutions. Intel® Optane™ SSDs offer high I/O operations per second (IOPS) per dollar with low latency, and they are ideal for write-heavy cache functions. The capacity tier is served by Intel® 3D NAND SSDs with NVMe, delivering optimized read performance with a combination of data integrity, performance consistency, and drive reliability.

Table 1. Hardware and firmware components for the Intel® Select Solutions for VMware vSAN* Base and Plus configurations

INGREDIENT	INTEL® SELECT SOLUTION FOR VMWARE VSAN* BASE CONFIGURATION	INTEL® SELECT SOLUTION FOR VMWARE VSAN PLUS CONFIGURATION
PROCESSOR	2 x Intel® Xeon® Gold 6130 processor, 2.10 GHz, 16 cores, or a higher number Intel Xeon Scalable processor	2 x Intel® Xeon® Gold 6152 processor, 2.10 GHz, 22 cores, or a higher number Intel Xeon Scalable processor
MEMORY	384 GB (12 x 32 GB 2,666 MHz DDR4 DIMM)	512 GB (16 x 32 GB 2,666 MHz DDR4 DIMM)
STORAGE	<p>Cache tier: 2 x 375 GB Intel® Optane™ SSD DC P4800X Series with NVMe*</p> <p>Capacity tier: 4 x 2 TB Intel® SSD DC P4500 Series with NVMe</p>	<p>Cache tier: 4 x 375 GB Intel® Optane™ SSD DC P4800X Series with NVMe</p> <p>Capacity tier: 4 x 2 TB Intel SSD DC P4500 Series with NVMe</p>
DATA NETWORK	<p>10 GbE Intel® Ethernet Converged Network Connection or Intel Ethernet Converged Network Adapter, such as 10 GbE Intel® Ethernet Connection X722, Intel Ethernet Connection OCP X527-DA2/DA4, or 10/40 GbE Intel® Ethernet Converged Network Adapter X710</p> <p>Management network: Integrated 1 GbE or better</p>	<p>10/25/40 GbE Intel Ethernet Converged Network Connection or Intel Ethernet Converged Network Adapter, such as 10 GbE Intel Ethernet Connection X722, Intel Ethernet Connection OCP X527-DA2/DA4, 10/40 GbE Intel Ethernet Converged Network Adapter X710, 25 GbE Intel Ethernet Converged Network Adapter XXV710, or 10/40 GbE Intel Ethernet Converged Network Adapter XL710</p> <p>Management network: Integrated 1 GbE or better</p>
TRUSTED PLATFORM MODULE (TPM)	TPM 1.2	TPM 1.2
FIRMWARE AND SOFTWARE OPTIMIZATIONS	<p>Intel® Volume Management Device (Intel® VMD)**</p> <p>Intel® Trusted Execution Technology (Intel® TXT) enabled</p> <p>Intel® Hyper-Threading Technology (Intel® HT Technology) enabled</p> <p>Intel® Turbo Boost Technology enabled</p> <p>Intel® Speed Shift Technology, Hardware P-states (HWP) native</p> <p>C-states disabled</p> <p>Power management settings optimized for performance</p>	<p>Intel VMD**</p> <p>Intel TXT enabled</p> <p>Intel HT Technology enabled</p> <p>Intel Turbo Boost Technology enabled</p> <p>Intel Speed Shift Technology, HWP native</p> <p>C-states disabled</p> <p>Power management settings optimized for performance</p>

**Recommended, not required

Intel® Xeon® Scalable Processors

Intel Xeon Scalable processors are the future-forward platform for cloud and software-defined infrastructure technologies, such as VMware vSAN. This processor family offers:

- High scalability to support a wide range of existing and emerging workloads for a modern hybrid cloud business strategy
- The efficiency and density required to deliver strong virtualized infrastructure performance gains
- Intelligence to deliver exceptional resource utilization and agility
- A foundation for more secure data center solutions, enabling improved data and workload integrity and supporting regulatory compliance



Networking: VMware vSAN requires 10 gigabit Ethernet (GbE), which is provided in the Base configuration by an Intel® Ethernet Connection X722, an Intel® Ethernet Converged Network Adapter X710, or an Intel® Ethernet Network Connection OCP X527-DA2/DA4. In the Plus configuration, additional options include a 25 GbE Intel Ethernet Converged Network Adapter XXV710 or a 40 GbE Intel Ethernet Converged Network Adapter XL710 to address the needs of VMware vSAN in more demanding workloads by providing rich features for virtualization and proven performance.

Fundamental Intel® Technologies

In addition to the Intel hardware foundation, related Intel technologies play a fundamental role in Intel Select Solutions. The following technologies help enhance security and performance in Intel Select Solutions for VMware vSAN:

- **Intel® Volume Management Device (Intel® VMD):** Enables hot swap replacement of NVMe SSDs from the Peripheral Component Interconnect Express* (PCIe*) bus without shutting down the system, while standardized LED management helps provide much faster identification of SSD status. This standardization brings enterprise reliability, availability, and serviceability (RAS) features to NVMe SSDs, enabling you to deploy next-generation storage with confidence. IT professionals can now service

these drives online without an outage, which minimizes interruptions and improves uptime and serviceability. The unique value of Intel VMD is that Intel is sharing this technology across the ecosystem for broad enablement.

- **Intel® Trusted Execution Technology (Intel® TXT):** Provides the foundation for highly scalable platform security in physical and virtual infrastructures. It helps harden servers at the lowest level against threats of hypervisor, BIOS, or other firmware attacks, malicious rootkit installations, and other types of attacks or misconfiguration to firmware and operating systems.
- **Trusted Platform Module (TPM) 1.2:** Protects the system start-up process by ensuring it is tamper-free before releasing system control to the operating system. TPM 1.2 also provides secured storage for sensitive data, such as security keys and passwords, and performs encryption and hash functions. Intel TXT utilizes this technology.
- **Intel® Turbo Boost Technology:** Accelerates processor and graphics performance for peak loads, automatically allowing processor cores to run faster than the rated operating frequency if they're operating below power, current, and temperature specification limits.
- **Intel® Hyper-Threading Technology (Intel® HT Technology):** Enables multiple threads to run on each core, which ensures that systems use processor resources more efficiently. Intel HT Technology also increases processor throughput, improving overall performance on threaded software.
- **Intel® Speed Shift Technology:** Allows the processor to quickly select its best operating frequency and voltage for optimal performance and power efficiency without intervention from the operating system.

A Verified Foundation for Hyper-Converged Infrastructure with Intel Select Solutions for VMware vSAN

Intel Select Solutions are a fast path to data center transformation with workload-optimized configurations verified for Intel Xeon Scalable processors. When organizations choose Intel Select Solutions for VMware vSAN, they get the optimized performance that hyper-converged infrastructures need and demand—without the time and hassle required to tune the stack. Visit intel.com/selectsolutions for more information on Intel Select Solutions.

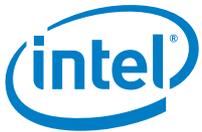
Learn More

Intel Select Solutions web page: intel.com/selectsolutions

Intel Xeon Scalable processors: intel.com/xeonscalable

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VMware vSAN: vmware.com/vsan



¹ VMmark 3.0 generates a realistic measure of platform performance by incorporating a variety of platform-level workloads such as shared-nothing migration, virtual machine migration, clone and deploy, snapshotting, and storage migration operations, in addition to traditional application-level workloads. To learn more about the benchmark, visit vmware.com/products/vmmark.html.

Tests document performance of components on a particular test, in specific systems. Differences in hardware, software, or configuration will affect actual performance. Consult other sources of information to evaluate performance as you consider your purchase. For more complete information about performance and benchmark results, visit intel.com/benchmarks.

Cost reduction scenarios described are intended as examples of how a given Intel- based product, in the specified circumstances and configurations, may affect future costs and provide cost savings. Circumstances will vary. Intel does not guarantee any costs or cost reduction.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at intel.com.

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