

SOLUTION BRIEF

Intel® Select Solutions
Virtual Desktop Infrastructure (VDI)
2nd Generation Intel® Xeon® Scalable Processors
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Intel Select Solutions for VMware Horizon VDI on vSAN

Support more remote workers without compromising security or user experience.



More employees than ever before are working remotely. In December 2019, video conferencing software company Zoom claimed 10 million daily meeting participants.¹ In April 2020, that figure jumped to more than 300 million.² This dramatic change is one of many indicators that more businesses are shifting to a remote workforce.

This sudden increase in the number of work-at-home employees and the demands of media-rich modern apps highlights the critical importance of having a scalable and flexible infrastructure to support that workforce. This is especially true for organizations that run virtual desktop infrastructures (VDIs), which host desktop environments in a data center that employees can access from anywhere. Many organizations are discovering that the increase in remote workers can seriously tax legacy systems, resulting in slow performance and frustrated users.

In addition, different types of employees—from knowledge users running less-demanding apps to power users running performance-hungry apps—place different demands on the infrastructure. As a result, it can be challenging to plan and deploy sufficient resources for the VDI platform to make sure that end-user needs are met, both now and into the future. This challenge becomes readily apparent as user demands grow and increasingly strain the underlying hardware, which in turn can slow desktop responsiveness and increase frustration for workers.

Expanding VDI with more servers, or overprovisioning new VDI deployments so that they can scale, might seem like the best or only options. However, simply expanding outdated infrastructure won't provide the cost-effective performance and scalability needed to support the ever-growing number of users. Also, overprovisioning can be costly and can result in poor utilization. Addressing all of these challenges requires careful evaluation of infrastructure options for your VDI needs, which can be a complex and time-consuming process.

Intel Select Solutions for VMware Horizon VDI on vSAN offer a faster, simpler path to a hyperconverged infrastructure (HCI) optimized for VDI, while helping to ensure outstanding performance and strong security for remote workers. The solutions feature VMware Horizon 7 and VMware vSAN 6.7 running on servers powered by 2nd Generation Intel Xeon Scalable processors, Intel® Optane™ technology, Intel 3D NAND solid state drives (SSDs) with NVMe Express (NVMe), and high-speed Intel Ethernet Adapters.

In addition, these solutions are optimized to meet the performance requirements of both knowledge users and power users today, with additional overhead to support growing user needs into the future.

Intel Select Solutions for VMware Horizon VDI on vSAN are ideal for organizations that want to:

- Support greater numbers of remote workers without compromising security, user experience, or productivity
- Scale VDI capacity or deploy new VDI solutions quickly and confidently
- Add flexibility and performance to support both knowledge and power users on the same VDI infrastructure
- Benefit from the simplicity, performance, and VDI user experience offered by VMware Horizon deployed on vSAN HCI infrastructure

VMware Horizon 7 software running on a VMware vSAN cluster

These Intel Select Solutions are optimized to run VMware Horizon 7 on a VMware vSAN cluster. VMware Horizon 7 simplifies the management and delivery of virtual desktops and apps on premises, in the cloud, or in a hybrid or multicloud configuration through a single platform. Because Horizon 7 is optimized for the software-defined data center (SDDC) and offers complete workspace environment management, it helps IT teams to control, manage, and protect all of the resources that end users need and want.

Why VMware Horizon on vSAN?

As organizations implement VDI for users who have more demanding workloads, the compute and memory requirements for each individual desktop increase. HCI merges compute, storage, and networking through software-defined infrastructure (SDI), thus streamlining deployment and scaling.

VMware vSAN is a software-defined enterprise storage solution that aggregates local or direct-attached data-storage devices to create a single storage pool shared across all hosts in a cluster. vSAN offers organizations high availability, security, and performance, and it seamlessly integrates with VMware vSphere as a native HCI solution for business-critical apps, consolidated VDI, mixed-workload infrastructures, and more. In addition, vSAN delivers a cloud-operational model to your data center, increasing IT agility through simplified workflows and automation while using existing tools and skillsets.

Intel Select Solutions for VMware Horizon VDI on vSAN

Intel Select Solutions for VMware Horizon VDI on vSAN can help simplify your VDI deployment. The configurations are performance-optimized specifically for VMware Horizon software running on VMware vSAN, so you can reduce the time required to evaluate, select, and purchase the necessary hardware components. As preconfigured, tested, and verified solutions, they also help minimize the time required to evaluate and deploy new VDI or to scale your existing environment with an excellent price/performance balance.

Table 1. Intel Select Solutions for VMware Horizon VDI on vSAN

COMPONENT	BASE CONFIGURATION	PLUS CONFIGURATION
CPU	Intel Xeon Gold 6230 processor (or higher)	Intel Xeon Gold 6258R processor (or higher)
MEMORY	DDR4 DRAM	Intel Optane persistent memory + DDR4 DRAM
STORAGE (BOOT)	Intel SSD DC S3520 Serial ATA (SATA)	Intel SSD DC S3520 SATA
STORAGE (CACHE)	Intel Optane SSD DC P4800X	Intel Optane SSD DC P4800X
STORAGE (CAPACITY)	Intel SSD DC P4510	Intel SSD DC P4510
NETWORK FABRIC	10Gb Intel Ethernet Adapter	25Gb Intel Ethernet Adapter
SOFTWARE (VMWARE)	VMware vSphere 6.7 U3, VMware vSAN 6.7 U3, VMware Horizon 7.12	VMware vSphere 6.7 U3, VMware vSAN 6.7 U3, VMware Horizon 7.12

If your organization is already reaping the benefits of HCI with vSphere and vSAN, you could improve your virtual desktop capabilities by choosing Intel Select Solutions for VMware Horizon VDI on vSAN. These solutions deliver all-flash performance, rapid provisioning and scaling, enterprise-grade data services, and consistent performance at scale—all while helping to reduce total cost of ownership (TCO). With the latest storage technologies, including Intel Optane SSDs, all-NVMe vSAN clusters offer great consolidation ratios, with up to 150K input/output operations per second (IOPS) per node, and up to 64 nodes per cluster.³

VMware vSAN ReadyNode certification

The VMware vSAN ReadyNode certification program provides assurance to data-center infrastructure buyers that their vSAN provider of choice has undergone VMware's rigorous certification process. Intel Select Solutions for VMware Horizon VDI on vSAN, which are offered by a variety of solution providers, are certified for vSAN ReadyNode, and are specified by Intel and VMware to deliver out-of-the-box high performance. With the additional verification of Intel Select Solutions for 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 vSAN software.

Base and Plus configurations

Intel Select Solutions for VMware Horizon VDI on vSAN are showcased in two reference configurations—"Base" and "Plus"—that have been verified to deliver high performance. These two configurations have been specially designed and pre-tested to demonstrate exceptional value, performance, security, and user experience. End customers can work with system builders, system integrators, or solution and service providers to customize these configurations to best fit their organizational needs and budgets.

The Base configuration provides an ideal price/performance balance that is optimized for the types of applications used by, and workloads encountered by, knowledge users. The Plus configuration uses a higher-level Intel Xeon Scalable processor than does the Base configuration, and it adds Intel Optane persistent memory (PMem). It can be further extended to support power users, who run more demanding

workloads with higher memory and compute requirements. Table 1 shows some details of these two configurations.

Hardware selections

Intel Select Solutions for VMware Horizon VDI on vSAN combine 2nd Generation Intel Xeon Scalable processors, Intel Optane PMem, Intel Optane SSDs, Intel 3D NAND SSDs, and 10/25/40 gigabit Ethernet (GbE) Intel Ethernet Converged Network Adapters. This combination helps your organization quickly deploy a reliable and scalable VDI built on a performance-optimized platform for demanding applications and workloads.

2nd Generation Intel Xeon Scalable processors

Intel Select Solutions feature the capabilities of 2nd Generation Intel Xeon Scalable processors, which provide outstanding performance across a broad range of use cases running in the data center, including VDI, in which virtual-machine (VM) density is top of mind. These processors also provide performance to support the processor-intensive data services provided by vSAN, such as deduplication, compression, and encryption. In addition, 2nd Generation Intel Xeon Scalable processors deliver advanced reliability and hardware-enhanced security that efficiently encrypts data and helps block malicious exploits while maintaining workload integrity and performance.

For the Base configuration, the Intel Xeon Gold 6230 processor provides an optimized balance of price and performance in a mainstream configuration. A higher-number processor can also be used.

The Plus configuration features the Intel Xeon Gold 6258R processor for optimal performance and scalability of both the VMs running on the cluster and the storage input/output (I/O) and data services. Both processors include built-in security features, such as the following, that help provide strong security for your VDI implementation:

- Intel AES New Instructions (Intel AES-NI) enables fast data encryption and decryption. Intel AES-NI is valuable for a wide range of cryptographic applications, such as applications that perform bulk encryption/decryption, authentication, random number generation, and authenticated encryption.
- Intel Trusted Execution Technology (Intel TXT) provides security capabilities such as measured launch and protected execution. It enables a verifiable installation, launch, and use of a hypervisor or operating system. It also helps ensure greater application, data, and VM isolation.

In addition, 2nd Generation Intel Xeon Scalable processors benefit from generations of performance improvements to Intel Virtualization Technology (Intel VT). Intel VT helps eliminate performance overhead and helps improve security in virtualized environments, enabling users' VM experiences to faithfully mimic running natively on a dedicated CPU.

Intel Optane persistent memory (PMem)

Intel Optane PMem offers high density—up to 512 GB per DIMM module—for a lower cost per gigabyte of memory than that of traditional DRAM DIMMs. Organizations can use Intel Optane PMem for vSAN deployments, with VMware approval, to cost effectively expand the amount of memory available to support more or larger VMs or VDI sessions. Intel Optane

PMem can also be used to make higher quantities of “hot” data available for processing with in-memory databases, analytics, and other demanding workloads.

Intel Optane SSDs and Intel 3D NAND SSDs

VMware vSAN performs best when the cache tier is on fast SSDs that can provide low latency with high endurance. Workloads that require high performance can benefit from empowering the cache tier with the highest-performing SSDs, rather than mainstream Serial Attached SCSI (SAS) or SATA SSDs. Intel Optane SSDs are used to power the write-heavy cache tier in these Intel Select Solutions because these drives offer high IOPS per dollar with low latency, coupled with 30 drive-writes-per-day (DWPD) endurance.⁴ The capacity tier is served by Intel 3D NAND SSDs, which deliver optimized read performance with a combination of data integrity, performance consistency, and drive reliability.

Intel Ethernet 700 Series Network Adapters

The 10Gb and 25Gb Intel Ethernet 700 Series Network Adapters accelerate the performance of Intel Select Solutions for VMware Horizon VDI on vSAN. The Intel Ethernet 700 Series delivers validated performance ready to meet high-quality thresholds for data resiliency and service reliability with broad interoperability.⁵ In addition, Intel Ethernet 700 Series Network Adapters include integrated virtualization technologies that provide greater intelligence and performance for virtualized workloads and compatibility with vSphere quality-of-service (QoS) and teaming features.

Verified performance at a lower cost per desktop

Intel Select Solutions are verified to meet a specified minimum level of workload-optimized performance capabilities that helps ensure that businesses have the flexibility to support today's most common user profiles, while also building in sufficient headroom to support increasing memory and performance needs into the future.

To measure the performance of Intel Select Solutions for VMware Horizon VDI on vSAN, Intel and VMware chose two benchmarks: Login VSI to simulate knowledge users, and VMware View Planner 4.3 to simulate power users.

- Login VSI is a flexible, industry-standard tool used to evaluate VDI performance and consolidation capabilities. It can test a wide range of user types to help organizations correctly size their production environments and to help predict the impact of a change in VDI capacity and performance. Intel tested with the Login VSI knowledge-worker profile. This uses a balanced, intensive workload that stresses the system smoothly, resulting in relatively high CPU, memory, and I/O usage.
- VMware View Planner is a comprehensive test for comparing virtual desktop deployment platforms. It generates a realistic measure of client-side and server-side performance for all desktops being measured on a virtual desktop platform. Intel tested with the VMware View Planner high-memory test profile, which simulates a typical power-user scenario by logging on to the virtual desktop running Windows and launching several commonly used applications and multiple active browser sessions.

These benchmarks allowed Intel to test differing performance levels to identify optimal configurations for supporting both current and future needs of remote workforces. Tests show that, when configured with Intel Optane PMem, the Plus configuration of Intel Select Solutions for VMware Horizon VDI on vSAN can support up to 87 percent more users at lower cost per desktop than the Base configuration.⁶

These results show that you don't necessarily need to purchase additional servers to support larger numbers of remote users. You might be able to either consolidate your VDI infrastructure onto fewer servers than would have previously been required with older infrastructure or scale out the number of VMs or VDI sessions to support more users.

Fast-track your move to support more virtual desktops

By choosing Intel Select Solutions for VMware Horizon VDI on vSAN, you get a fast path to infrastructure transformation with virtual-desktop-optimized configurations verified for 2nd Generation Intel Xeon Scalable processors. You can also take advantage of the HCI benefits offered by VMware vSAN and support more remote workers wherever they are located—without the time and hassle required to tune the stack.

What are Intel Select Solutions?

Intel Select Solutions are pre-defined, workload-optimized solutions designed to minimize the challenges of infrastructure evaluation and deployment. Solutions are validated by OEMs/ODMs, certified by ISVs, and verified by Intel. Intel develops these solutions in extensive collaboration with hardware, software, and operating system vendor partners and with the world's leading data center and service providers. Every Intel Select Solution is a tailored combination of Intel data center compute, memory, storage, and network technologies that delivers predictable, trusted, and compelling performance.

To refer to a solution as an Intel Select Solution, a vendor must:

1. Meet the software and hardware stack requirements outlined by the solution's reference-design specifications
2. Replicate or exceed established reference-benchmark test results
3. Publish solution content to facilitate customer deployment

Solution providers can also develop their own optimizations in order to give end customers a simpler, more consistent deployment experience.

Learn more

Intel Select Solutions: intel.com/selectsolutions

Intel Xeon Scalable processors: intel.com/xeonscalable

Intel Optane technology: intel.com/optane

VMware Horizon: vmware.com/products/horizon.html

VMware vSAN: vmware.com/products/vsan.html

Where to buy: intel.com/content/www/us/en/products/docs/select-solutions/where-to-buy.html



¹ Zoom. "A Message to Our Users." April 2020. <https://blog.zoom.us/wordpress/2020/04/01/a-message-to-our-users/>.

² Zoom. "90-Day Security Plan Progress Report: April 22." April 2020. <https://blog.zoom.us/wordpress/2020/04/22/90-day-security-plan-progress-report-april-22/>.

³ As measured by VMware: VMware. "vSAN for Horizon." vmware.com/products/horizon/horizon-vsan.html.

⁴ Based on internal Intel testing. Source: Intel. "Breakthrough Performance Expands Datasets, Eliminates Bottlenecks." January 2019. intel.com/content/www/us/en/solid-state-drives/optane-ssd-dc-p4800x-brief.html.

⁵ The Intel Ethernet 700 Series includes extensively tested network adapters, accessories (optics and cables), hardware, and software, in addition to broad operating system support. A full list of the product portfolio's solutions is available at intel.com/ethernet. Hardware and software are thoroughly validated across Intel Xeon Scalable processors and the networking ecosystem. The products are optimized for Intel architecture and a broad operating system ecosystem: Windows, Linux kernel, FreeBSD, Red Hat Enterprise Linux (RHEL), SUSE, Ubuntu, Oracle Solaris, and VMware ESXi. Supported connections and media types for the Intel Ethernet 700 Series are: direct-attach copper and fiber SR/LR (QSFP+, SFP+, SFP28, XLPP1/CR4, 25G-CA/25G-SR/25G-LR), twisted-pair copper (1000BASE-T/10GBASE-T), and backplane (XLAUI/XAUI/SFI/KR/KR4/KX/SGMII). Note that Intel is the only vendor offering the QSFP+ media type. The Intel Ethernet 700 Series supported speeds include 10GbE, 25GbE, 40GbE.

⁶ Performance results are based on testing performed by Principled Technologies on February 26, 2020, and commissioned by Intel. Configuration: Four nodes containing 2 x 2nd Generation Intel Xeon Gold 6258R processors with four different memory configurations: (1) 384 GB total memory (12 x 32 GB 2,667 MHz DDR4 DRAM); (2) 608 GB total memory (4 x 128 GB Intel Optane persistent memory, 12 x 8 GB 2,667 MHz DDR4 DRAM); (3) 704 GB total memory (4 x 128 GB Intel Optane persistent memory, 12 x 16 GB 2,667 MHz DDR4 DRAM); (4) 1,216 GB total memory (8 x 128 GB Intel Optane persistent memory, 12 x 16 GB DDR4 DRAM). One Intel SSD DC S3520 (boot drive), 2 x 960 GB Intel Optane SSD DC P4800X drives (VMware vSAN cache tier), 6 x 2 TB Intel SSD DC P4510 drives (VMware vSAN capacity tier), 25Gb Intel Ethernet Network Adapter XXV710, VMware ESXi 6.7.0 U1 build 10302608. For full testing details and configuration information, see: Principled Technologies. "Support more users on VMware Horizon virtual desktops with new Intel Xeon Gold 6258R processor-based servers and Intel Optane Persistent Memory." April 2020. principledtechnologies.com/VMware/VMware-HCI-Intel-Optane-VDI-0420.pdf.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors.

Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more complete information visit www.intel.com/benchmarks.

Performance results are based on testing as of dates shown in configurations and may not reflect all publicly available updates. **No product or component can be absolutely secure.**

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