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Top 10 Reasons

to deploy Intel® Optane™ technology with VMware Cloud Foundation.

VMware Cloud Foundation (VCF) is a hybrid cloud platform built on full-stack hyperconverged infrastructure (HCI) technology. VCF is a single, easy-to-deploy architecture that delivers consistent, secure infrastructure and operations across private and public cloud.

Here are 10 ways Intel Optane technology supercharges VMWare Cloud Foundation.

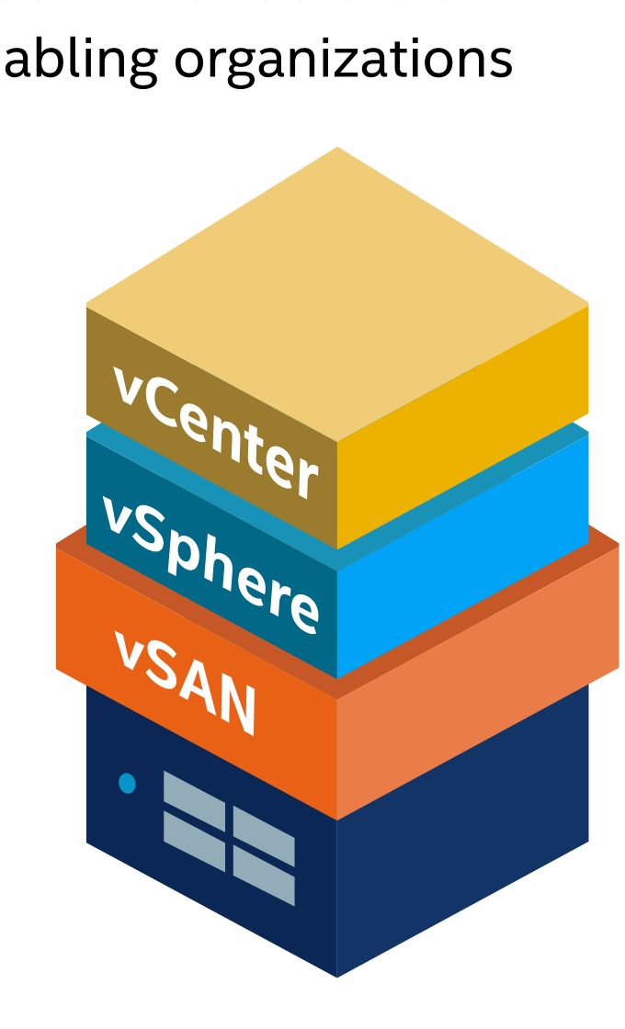
1

Accelerate All of Your HCI Solutions

Adding Intel® Optane™ technology to your hybrid cloud infrastructure can improve performance and data center efficiency—enabling organizations to move to the hybrid cloud with confidence.

Intel® Optane™ persistent memory (PMem) and solid state drive (SSD) storage solutions expand compute layer memory, and accelerate caching in the storage layer of vSan VMware's HCI family of products.

vCenter	vSphere	vSan
virtual infrastructure management	hypervisor for compute and memory virtualization	enterprise-class storage virtualization



2

Powerful Performance to Increase Revenue

Intel® Optane™ SSDs' more powerful database query response allows data center administrators (DCAs) to run workloads efficiently—and be confident in meeting demanding SLAs. This enables high performance more Transactions per Minute and New Orders per Minute vs SAS SSDs) to maximize productivity in mission critical vSAN workloads, leading to increased revenue.

UP TO **61%** **performance boost over traditional NVMe NAND flash cache**[1]

In addition, Intel Optane SSDs deliver significant performance boosts for database workloads versus all-flash NVME solutions, including 22% more IOPs and 59% lower latency at 100% CPU utlization.[1]

3

Save Power, Space and Money

Intel® Optane™ SSDs enable greater performance per VM, allowing you to reliably run fewer servers and reduce the operational footprint.

A 60% greater VM performance capability with Intel Optane SSDs as cache means that data center storage architects can reliably achieve similar VM performance capability using 1/3 fewer nodes.[2] Drop nodes—and still achieve better VM performance. The result is significant savings in server cost, footprint, and maintenance, including ongoing required maintenance.

up to **33%**

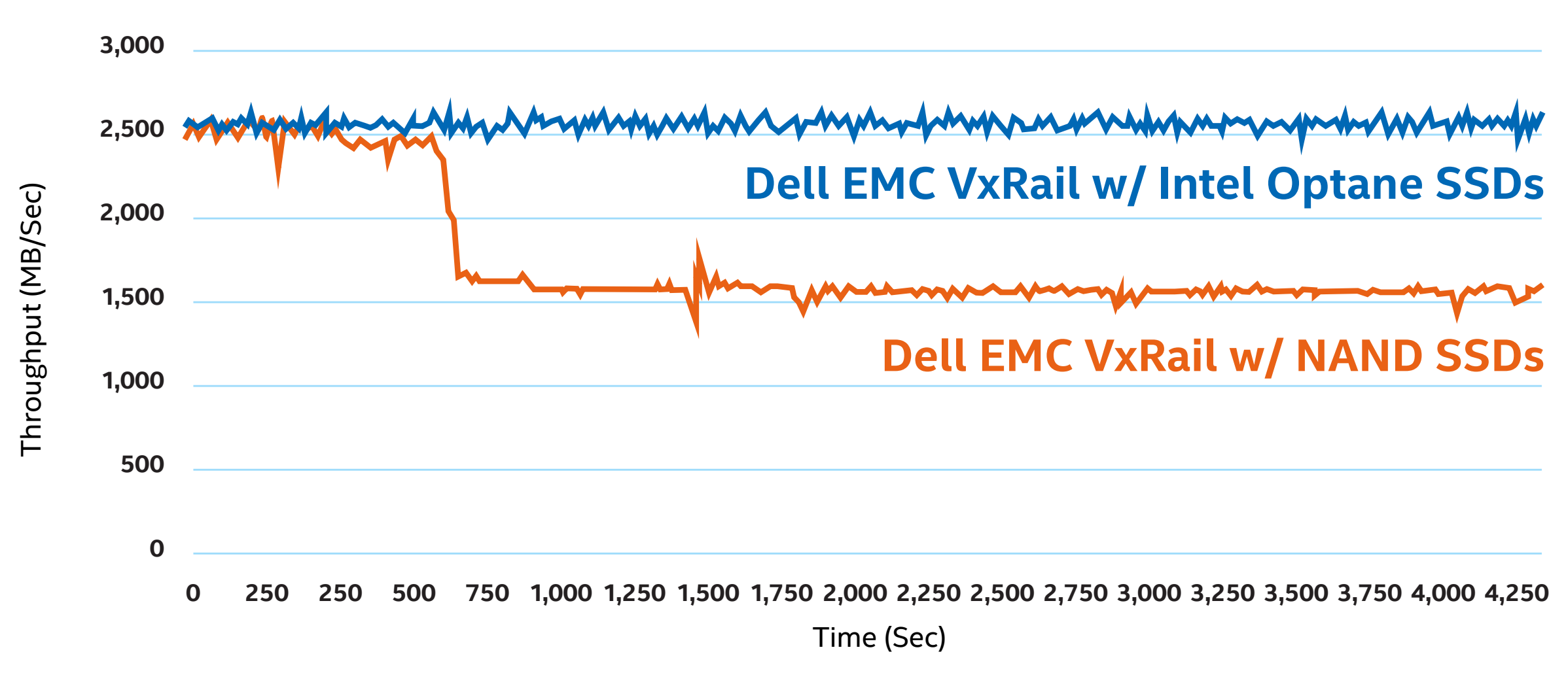
Greater node consolidation[2]

4

Consistent Performance For Heavy Workloads

Moving mission critical transactional databases to VCF HCI solutions requires best-in-class performance and consistency levels, in order to **increase OLTP — and revenue.** While NAND performances drops as you load, with Intel Optane SSDs you get powerful, repeated performance—exactly what you'd expect.

100% Sequential Write Throughput



Intel Optane SSD sustains consistent throughput with no drop in performance. SAS NAND SSD throughput drops by 39% once cache begins to aggressively destage.[1]

Support More VDI Users

5

Intel® Optane™ PMem for VMware Horizon VDI on vSAN simplifies 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.

Little hardware is actually required, as the Intel® Optane™ PMem supports significantly more VDI's per user— and Optane SSDs give those users increased performance.

The solution allows you to support **20% more VDI users per dollar.**

Compared to a baseline of 384GB DDR DRAM that supported 160 users, adding Intel Optane persistent memory **increased Horizon desktop users by 87%**[3]**, to 300 users, while lowering the TCO $/ VDI user by 16%.**[4]

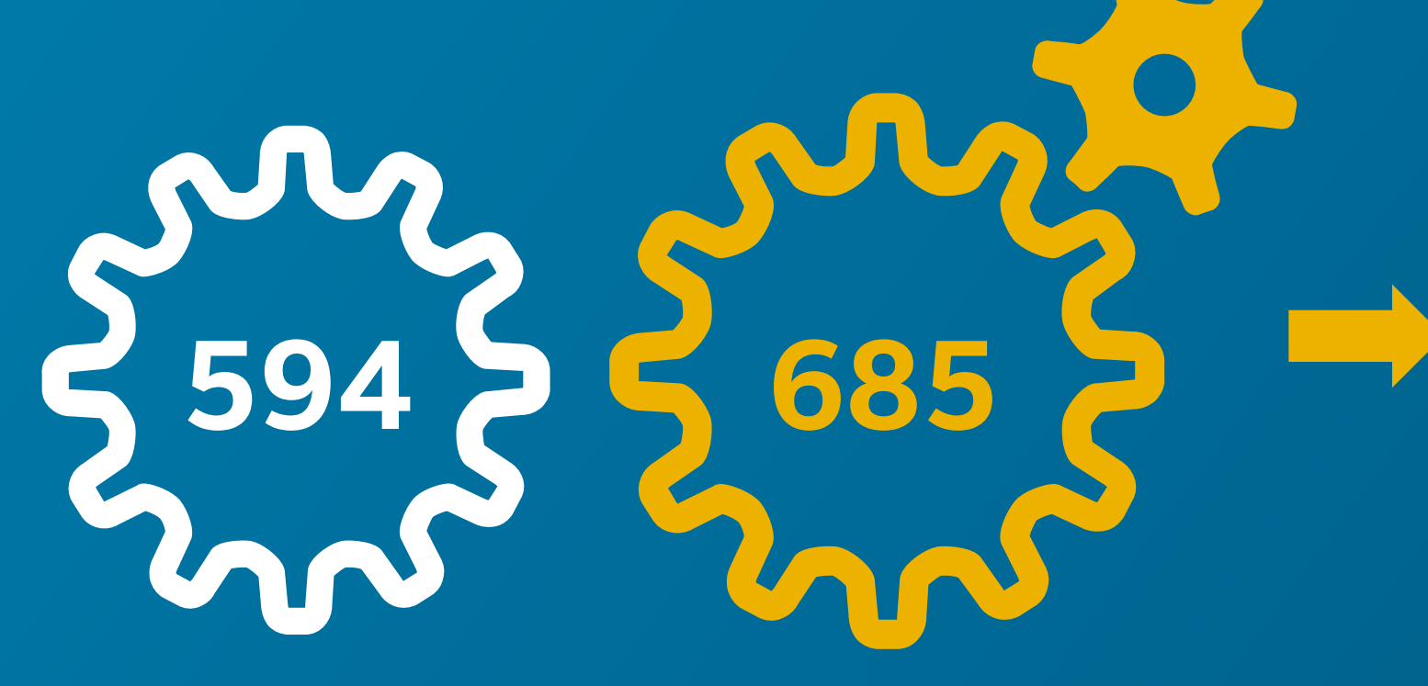
6

Better Day 2 Operations

Intel Optane SSDs enable speedier operations to deliver IT optimizations and savings:

- Maximize server productivity over server lifetime
- Optimize ongoing staff scheduling and utilization
- Minimize impact with faster return to 'normal' VM state

System administrators can now use vCenter operations tools to maintain efficient maintenance of their IT infrastructure, reducing OPx and Day 2 costs. Operations management is IO intensive, and typically done on off-hours, particularly backups. The quicker you get these actions done, the sooner you can return to a focus on mission critical application performance.



up to **15%**

Better operations performance[2]

Reduce HW/SW expenses or increase VM support.

7

Enable Remote Workers

In today's environment, the **sudden increase in remote workers** has highlighted the need for scalable and flexible infrastructure that allows for a seamless experience in the virtual workplace.

VCF with Intel Optane Technology enables workers to come online in a very short time frame, and provides a rugged infrastructure to support continual additions. And Intel Optane technology for VMware Horizon VDI on vSAN simplify VDI deployments while delivering a best-in-class HCI experience.

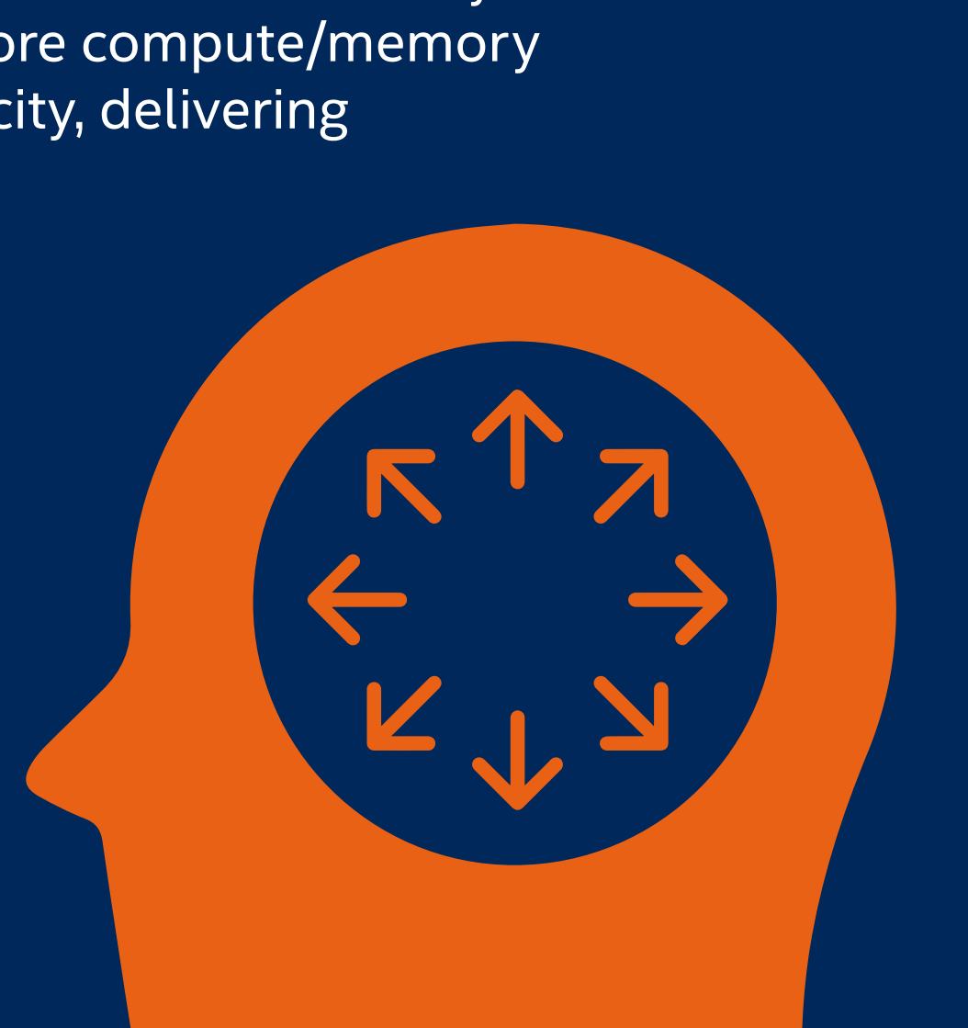
Achieve Affordable Memory Expansion

8

Intel Optane persistent memory is used in vSphere to dramatically expand virtualized memory cost—efficiently. More compute/memory virtualization results in larger VM memory capacity, delivering outstanding QoS for demanding HCI workloads.

Intel Optane provides affordable memory expansion for:

- ✓ Efficient compute/memory virtualization
- ✓ Large VM memory capacity



9

Enable Workload Consolidation

Improved VM performance capability means you can meet SLAs with fewer nodes—saving on server costs. The 60% greater VM performance capability with Intel Optane SSDs as cache means data center storage architects can reliably achieve similar VM performance capability using a third of the nodes.[2]

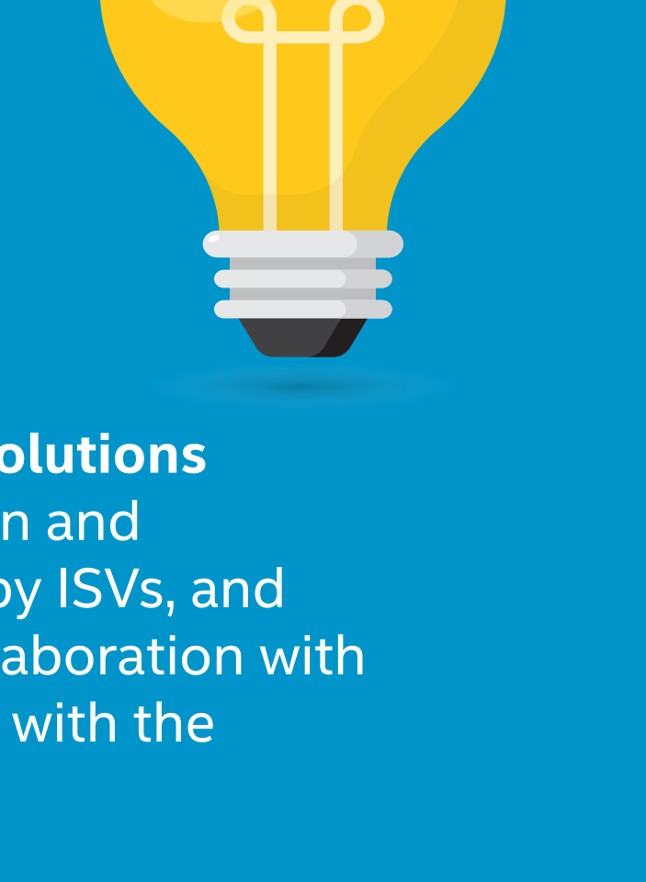
Bottom line: Better VM performance with real savings in server cost, footprint, and ongoing maintenance.

33% **greater storage consolidation**[2]

10

The Intel Difference

With over 50 years of experience, Intel is redesigning the fabric of how new systems are architected, building storage directly into the DNA of new system designs.



The combination of Intel Optane persistent memory with the performance-optimized Intel Optane SSDs and next-generation cost-optimized Intel® 3D NAND SSDs is defining the future of storage—a future driven by Intel.

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.

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[1] Tests commissioned by Dell and performed by Enterprise Strategy Group, test publication date August 26, 2019. Source report with test configurations available at esg-global.com/validation/esg-technical-validation-dell-emc-vxrail-with-intel-xeon-scalable-processors-and-intel-optane-ssds. Intel does not control or audit third-party data. You should consult other sources to evaluate accuracy.

[2] Tests by The Evaluator Group and commissioned by Intel. Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Configuration details available from The Evaluator Group at https://www.evaluatorgroup.com/document/lab-insight-latest-intel-technologies-power-new-performance-levels-vmware-vsan-2018-update/. See Appendix B for server cost estimate details and assumptions.

[3] Krass, Peter. "Intel Optane Technology: Memory or Storage? The Answer is Both." TechProviderZone.com. June 25, 2020. https://www.techproviderzone.com/cloud-and-data-centers/intel-optane-technology-memory-or-storage-the-answer-is-both-0.

[4] VMware. "Virtual Desktop Infrastructure (VDI): How to Scale and Optimize for Today's Realities." June 2020.

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Performance results are based on testing as of dates shown in the configurations and may not reflect all publicly available security updates. See backup for configuration details. No product or component can be absolutely secure.

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.

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