

BOOST SPEED AND MANAGEABILITY BY SHIFTING TO HYBRID MULTI-CLOUD INFRASTRUCTURE

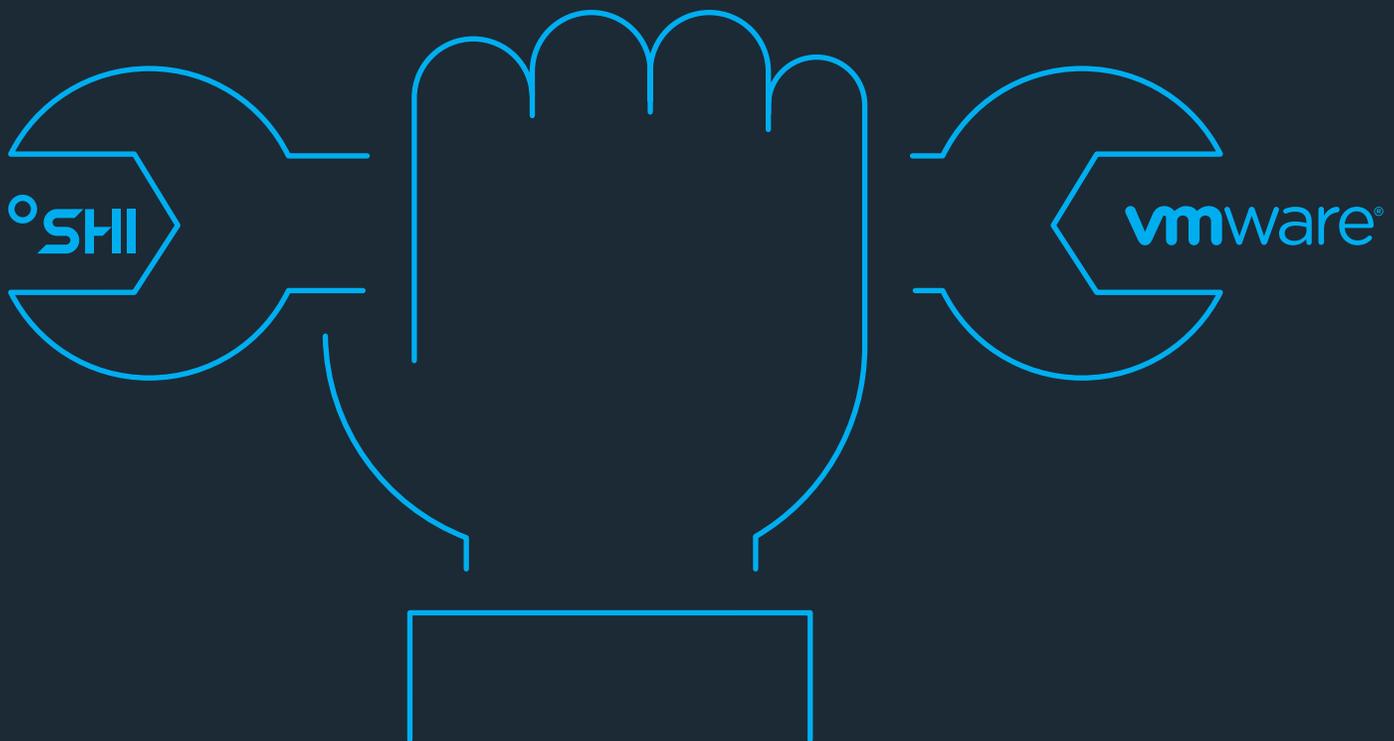


SOLUTION BRIEF

THIS IS INNOVATION AT WORK

POWER YOUR WORKLOADS, CLOUDS, AND DEVICES WITH THE SHI-VMWARE PARTNERSHIP

SHI and VMware have teamed up to offer you state-of-the-art technologies with expert strategy, deployment, integration, implementation, and management. With our technical expertise and guidance, you can speed up your business growth and realize your full potential.



Enterprises can dramatically improve data center performance and manageability by modernizing their data centers with VMware Cloud Foundation built on proven Intel® technology building blocks



Solution Ingredients

- VMware vSphere with Kubernetes
- VMware TKG Service for vSphere
- VMware vSAN
- VMware vRealize Suite
- VMware NSX-T Data Center
- VMware SDDC Manager
- VMware HCX

Optimized for:

- 2nd or 3rd Gen Intel® Xeon® Scalable processors
- Intel® Optane™ Persistent Memory
- Intel® Optane™ SSDs
- Intel® 3D NAND SSDs
- Intel® Ethernet products

Industry Strategic Challenges

The industry-wide shift to hybrid and multicloud infrastructures is accelerating for several compelling reasons. The hybrid model lets businesses scale quickly into the public cloud as needed while keeping certain strategic workloads on premises in a private cloud. More demanding loads, such as big data analytics, which are sensitive to CPU and memory I/O bottlenecks, may perform more efficiently on private cloud resources.¹ On the other hand, cost-effective storage may fare better in a public or divided-load hybrid model.² Moreover, different public clouds may excel in different workload types, which is why multicloud is quickly becoming a key subset of hybrid strategies.

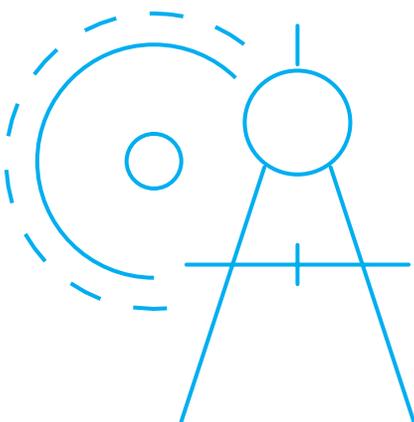
A recent survey of IT decision makers found that 85 percent of respondents reported hybrid cloud as their ideal IT operating model, citing security and flexibility as top priorities.³ Flexera's 2020 State of the Cloud Report revealed that "93 percent of enterprises have a multi-cloud strategy; 87 percent have a hybrid cloud strategy."⁴ However, Flexera adds that, despite companies averaging more than two each of public and private clouds (which tend to have siloed applications), "only 33 percent of all participating organizations use multi-cloud management tools."

Public cloud providers typically offer their own management tools. Some of these can be integrated with private management tools via an API, but often IT departments must juggle different management

platforms across multiple cloud services. This adds complexity and cost—in management hours and sometimes licensing—to the hybrid/multicloud solution.

Businesses adopting hybrid solutions need centralized, automated analysis of workloads and the ability to shift those workloads between clouds as dynamic factors dictate. Provisioning compute, memory and storage, and network resources should be automated, with a unified management interface and common feature set. Lifecycle management, including all the updates that go with it, becomes incrementally more difficult with each disparate cloud addition. Moreover, price-performance metrics should be perpetually examined so that applications, datasets, and services can be rebalanced across hybrid resources for maximum economic efficiency.

VMware Cloud Foundation addresses these challenges by providing a unified hybrid cloud platform that can accommodate multicloud deployments and integrate them into a single software-defined data center (SDDC) infrastructure. VMware Cloud Foundation delivers a single management plane for all workloads, OEM updates, and virtualized server resources under one hyperconverged infrastructure (HCI). Because VMware Cloud Foundation is built atop a range of Intel® compute, memory and storage, and networking technologies, the platform can help businesses address their many strategic cloud challenges and deploy a performant and highly manageable hybrid cloud solution that will scale easily over time.



Business Drivers and Desired Outcomes

Enterprises need an efficient approach to hybrid and multicloud operation. This depends on having a powerful platform that can manage many VMs and orchestrate many containers. Higher physical resource performance will yield greater platform efficiency, and may enable infrastructure consolidation, which can lead to lower total costs. Adopters of VMware Cloud Foundation can expect additional benefits:

- Consistent foundation across compute, memory and storage, and networking to help enable optimal workload placement.
- Simpler cross-cloud management to achieve optimized resource utilization, which can lead to fewer nodes, higher cluster density, and lower data center footprint, all of which can help reduce capital expenditures.
- Easy scaling of workloads and infrastructure without overprovisioning, so applications consume only the needed amount of resources, leaving more resources for other tasks.
- Greater deployment flexibility across both public and private clouds allows businesses to cost-optimize their cloud use, achieve high resilience, and avoid vendor lock-in.
- Ability to run more container workloads on less hardware, again yielding lower total costs while improving IT agility.



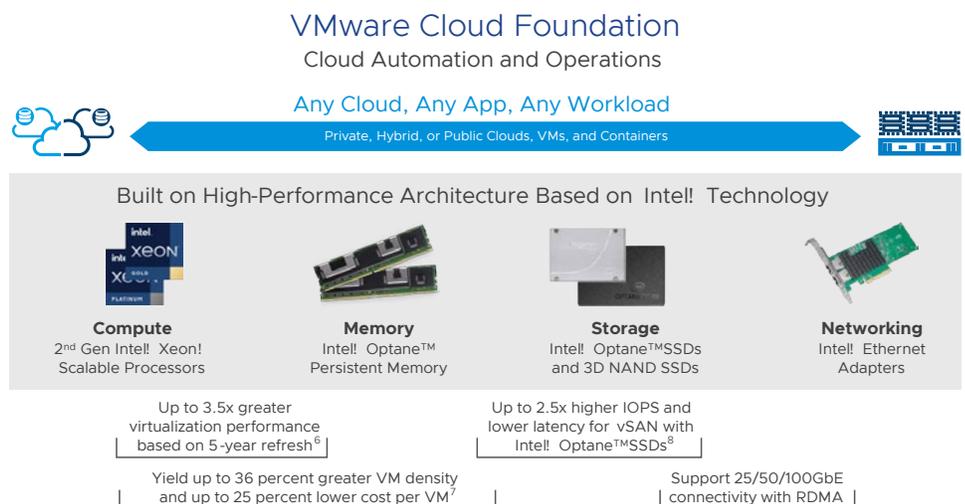
Digital Transformation and Business Innovation

Digital transformation focuses on the adoption of new, often-automated technologies. In the context of hybrid cloud operation and management, digital transformation's effectiveness directly relates to the hardware foundation

underlying the solution.

This VMware Cloud Foundation solution recommends Intel® Xeon® Scalable processors, Intel® Optane™ persistent memory (PMem), Intel® Optane™ and Intel® 3D NAND storage, and Intel® Ethernet 800 Series network controllers.

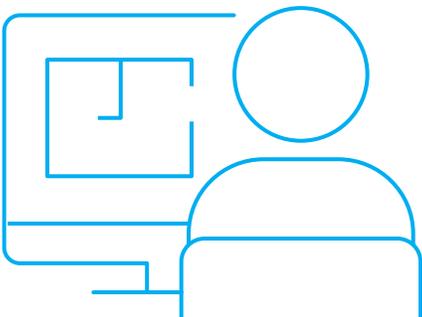
The majority of IT leaders say that digital transformation increases profitability and market share.⁵ An infrastructure based on Intel technologies can help facilitate a successful digital transformation by enabling easier migration of applications and data between clouds, helping enterprises reach their hybrid cloud goals.



Find the right solution for your organization. Contact your Intel representative or visit www.intel.com/vmware.

Enabling Transformation

With a single management interface and turnkey HCI solution, VMware Cloud Foundation, accompanied by Intel technologies, provides a fully capable platform that can administer all workloads concurrently across multiple public and private clouds. This end-to-end solution can help deliver consistently high performance, efficient operations, streamlined management, and a reduced data center footprint. In particular, Intel Optane PMem and SSD products can radically extend and accelerate the data pools linked to 2nd and later generation Intel Xeon Scalable processors, enabling a fast, agile infrastructure ready for demanding enterprise workloads. Adding Intel Ethernet 800 Series adapters expands benefits by enhancing cluster communications, lowering latency by more than 45 percent, and boosting throughput more than 30 percent.⁹ For enterprise SDDC work environments, this integration into a single architecture can protect IT investments while advancing performance, scalability, and management across a host of metrics.



- 1 Intel, "Optimal Workload Placement for Public, Hybrid and Private Clouds," <https://www.intel.com/content/dam/www/public/us/en/documents/white-papers/optimal-workload-placementfor-public-hybrid-and-private-clouds-white-paper.pdf>
- 2 Backblaze, "Confused About the Hybrid Cloud? You're Not Alone," <https://www.backblaze.com/blog/confused-about-the-hybrid-cloud-youre-not-alone>
- 3 Nutanix, "Enterprise Cloud Index," <https://www.nutanix.com/enterprise-cloud-index>
- 4 Flexera, "RightScale 2019 State of the Cloud Report from Flexera," <https://www.flexera.com/about-us/press-center/rightscale-2019-state-of-the-cloud-report-from-flexera-identifiescloud-adoption-trends.html>; Figure 1 chart used in accordance with Creative Commons Attribution 4.0 International License, as per the report's page 2
- 5 SAP, "4 Ways Leaders Set Themselves Apart," <https://www.sap.com/dmc/exp/4-ways-leaders-set-themselves-apart/index.html>
- 6 Up to 3.50X 5-Year Refresh Performance Improvement VM density compared to Intel® Xeon® E5-2600 processor v6: 1-node, 2x Intel Xeon E5-2697 processor v2 on Canon Pass with 256 GB (16 slots/16 GB/1600 MHz) total memory, ucode 0x42c on RHEL7.6, 3.10.0-957.el7.x86_65, 1x Intel® 400 GB SSD OS Drive, 2x Intel® DC SSD P4500 4 TB PCIe, 2*82599 dual-port Ethernet, Virtualization Benchmark, VM kernel 4.19, HT on, Turbo on, score: VM density=74, test by Intel on 1/15/2019. vs. 1-node, 2x Intel Xeon Platinum 8280 processor on Wolf Pass with 768 GB (24 slots/32 GB/2666 MHz) total memory, ucode 0x2000056 on RHEL7.6, 3.10.0-957.el7.x86_65, 1x Intel 400 GB SSD OS Drive, 2x Intel DC SSD P4500 4 TB PCIe, 2*82599 dual-port Ethernet, Virtualization Benchmark, VM kernel 4.19, HT on, Turbo on, score: VM density=21, test by Intel on 1/15/2019.
- 7 See footnote 8 in the tables at "Empowering Transformation in a Data-Centric Era," [intel.com/content/www/us/en/products/docs/processors/xeon/2nd-gen-xeon-scalable-processors-brief.html](https://www.intel.com/content/www/us/en/products/docs/processors/xeon/2nd-gen-xeon-scalable-processors-brief.html)
- 8 Intel, "vSAN Got a 2.5x Performance Increase," <https://itpeernetwork.intel.com/vsan-got-2-5x-performance-increase-thank-intel-optane/#qs.i5q9pp>
- 9 Intel, "Performance Testing Application Device Queues (ADQ) with Redis," <https://www.intel.com/content/dam/www/public/us/en/documents/solution-briefs/adq-solution-brief.pdf>





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