VMware vSphere 8

The enterprise workload platform

Get Started

vmware®

The enterprise workload platform for traditional and next-gen applications

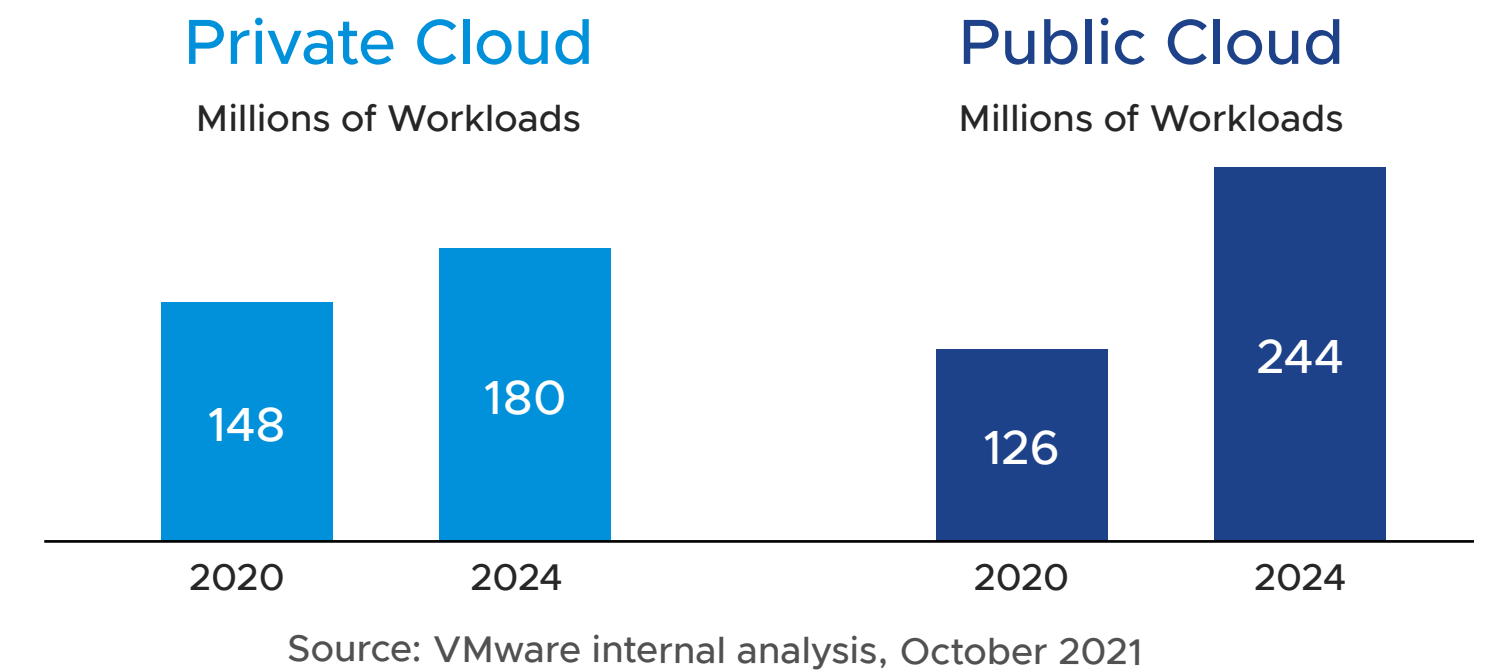## Workloads are growing everywhere as business priorities shift

Today, enterprises need to function under a different set of operating conditions. The rapid shift to a multi-cloud and subscription-based environment and the adoption of software-as-a-service (SaaS) operating and consumption models, is helping organizations realize new operational efficiencies, performance optimization and cost benefits.

While realizing these and other benefits, enterprises also continue to run many workloads in traditional, on-premises data centers for a variety of reasons, including cost management, network bandwidth and latency sensitivity; data privacy, security or sovereignty considerations; regulatory compliance; and the technical and migration risks and complexities of refactoring applications.

As on-premises workloads continue to grow, organizations also continue to expand their public cloud footprint and expect the key benefits of public cloud to be available on-premises, including a flexible as-a-service consumption model, developer agility, and the ability to centrally manage infrastructure.

Key Trends in the IT Industry

Private Cloud		Public Cloud	
Millions of Workloads		Millions of Workloads	
148	180	126	244
2020	2024	2020	2024

Source: VMware internal analysis, October 2021

19% Year-over-year growth rate of Saas spending[1]

60% By 2025, the number of enterprises that will fund LOB and IT products through OpEx budgets[2]

90% By 2026, the number of global organizations running containerized apps in production[3]

Modernization challenges for on-premises infrastructure

Workload complexity and volume: Modern workloads are increasingly complex and high volume, creating higher demand for infrastructure services that provide key underlying functionality for these workloads. The increasing demand for software-defined infrastructure services places more strain on CPUs, leaving fewer compute cycles for workloads. This has resulted in a diverse mix of data center architectures based on accelerators, such as DPUs, field programmable gate arrays (FPGAs), and graphic processing units (GPUs), in addition to the mainstream architectures based on CPUs. Modern applications are also increasingly micro-services based and drive-up East-West network traffic within the data center.

With workloads and infrastructure services sharing a domain, the chances of malicious actors penetrating the network perimeter, persisting in the intranet, surveilling business activity, and causing damage/stealing data are higher.

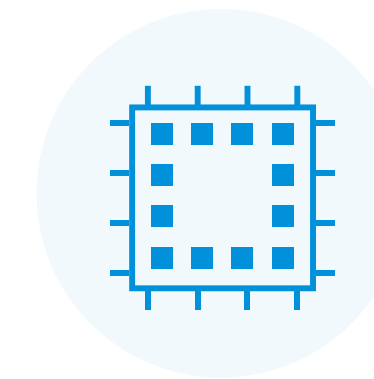Hence, traditional approaches to meet the needs of next-gen infrastructure are ineffective.

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Additional server capacity to meet the demand for infrastructure **drives up the cost**
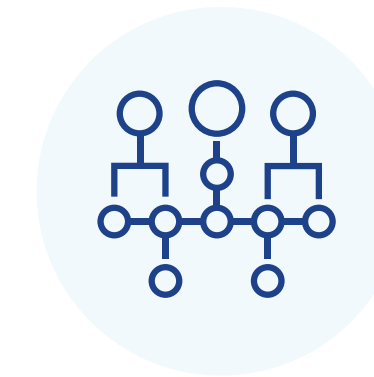
Specialized infrastructure silos increase **operational complexity**

CPU-centric security model needs additional defense against attacks

Up to 30%
of CPU capacity is consumed by networking and security services[4]

# Today's enterprise needs modern solutions

The volume and complexity of today's workloads and micro-services based architecture require a new approach that enables infrastructure transformation. These modern workloads require the following:

High-performing infrastructure to enhance workload performance, support new types of accelerators and simplify hardware lifecycle management
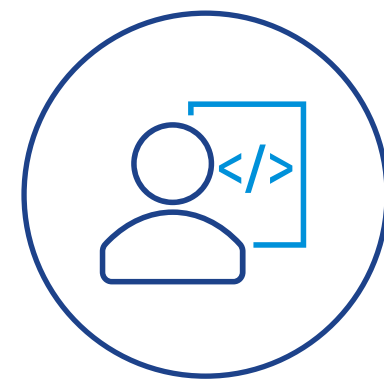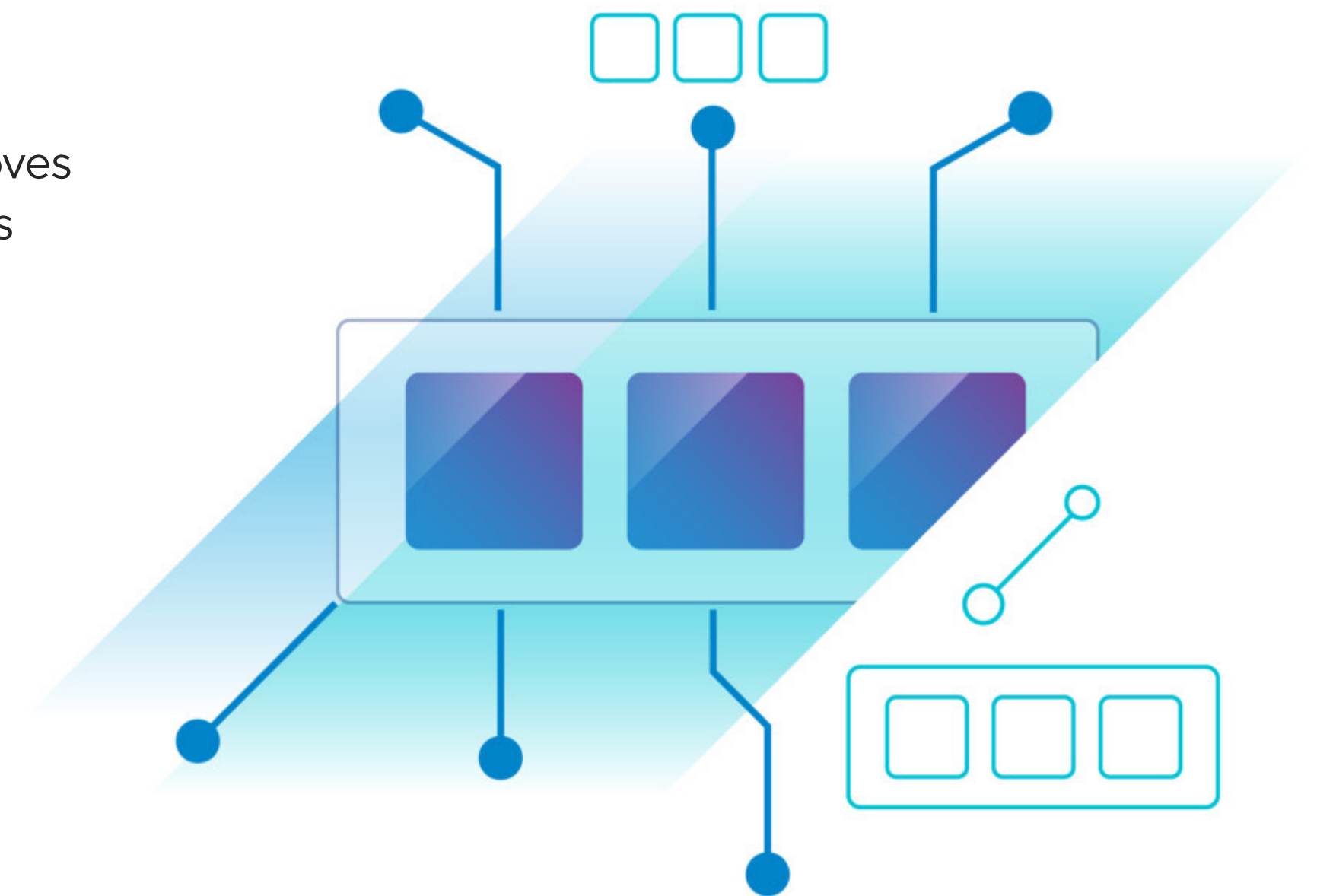
A developer-friendly platform that simplifies the discovery and deployment of DevOps services improves the resilience of containerized workloads and delivers greater flexibility to deploy Kubernetes clusters
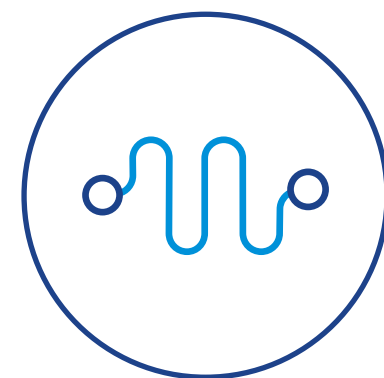
Flexible licensing that supports an OpEx and SaaS model that scales capacity on demand

Introducing vSphere 8: The enterprise workload platform

VMware vSphere® 8 is the enterprise workload platform that brings the benefits of the cloud to on-premises workloads. It combines industry-leading cloud infrastructure technology with DPU and GPU-based acceleration to boost workload performance. vSphere 8 centralizes management through the VMware Cloud Console to enhance operational efficiency and integrates with a growing catalog of add-on hybrid cloud services to expedite disaster recovery, ransomware protection, capacity optimization and planning, and more. vSphere 8 delivers an enterprise-ready self-service Kubernetes runtime with a multi-cloud management plane that simplifies the operations of Kubernetes clusters. With vSphere 8, IT and DevOps teams can easily build, run, manage, protect, and secure their traditional and next-gen applications. The vSphere 8 product line offers subscription options that provide more flexibility to meet financial management needs. In the following pages, we will walk you through each of the below elements in detail.
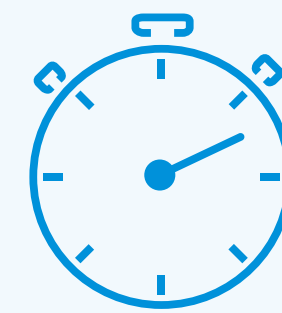
Get cloud benefits on-premises

Enhance existing on-site workloads in place with cloud services
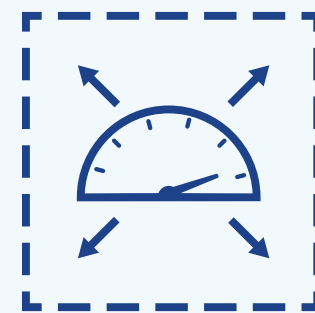
Supercharge workload performance

Meet the throughput and latency needs of modern distributed workloads

Enhance operational efficiency

Efficiently reduce IT maintenance windows

Accelerate innovation for DevOps

Easily discover, access and deploy developer services

Get cloud benefits on-premises

With vSphere 8, organizations can bring the benefits of the cloud to on-premises workloads. vSphere 8 combines industry-leading cloud infrastructure technology, an enterprise-ready Kubernetes environment, and high-value cloud services to transform existing on-premises deployments into SaaS-enabled infrastructure. vSphere 8 also helps IT admins deploy add-on cloud services:

1 **VMware Cloud Disaster Recovery (VCDR):** This capability protects on-premises mission-critical VMs by replicating them to the cloud and protecting them from both disasters and ransomware.

2 **VMware vRealize Operations** add-on service provides both capacity planning and optimization for infrastructure with the right size to fit both the current and future needs of workloads.
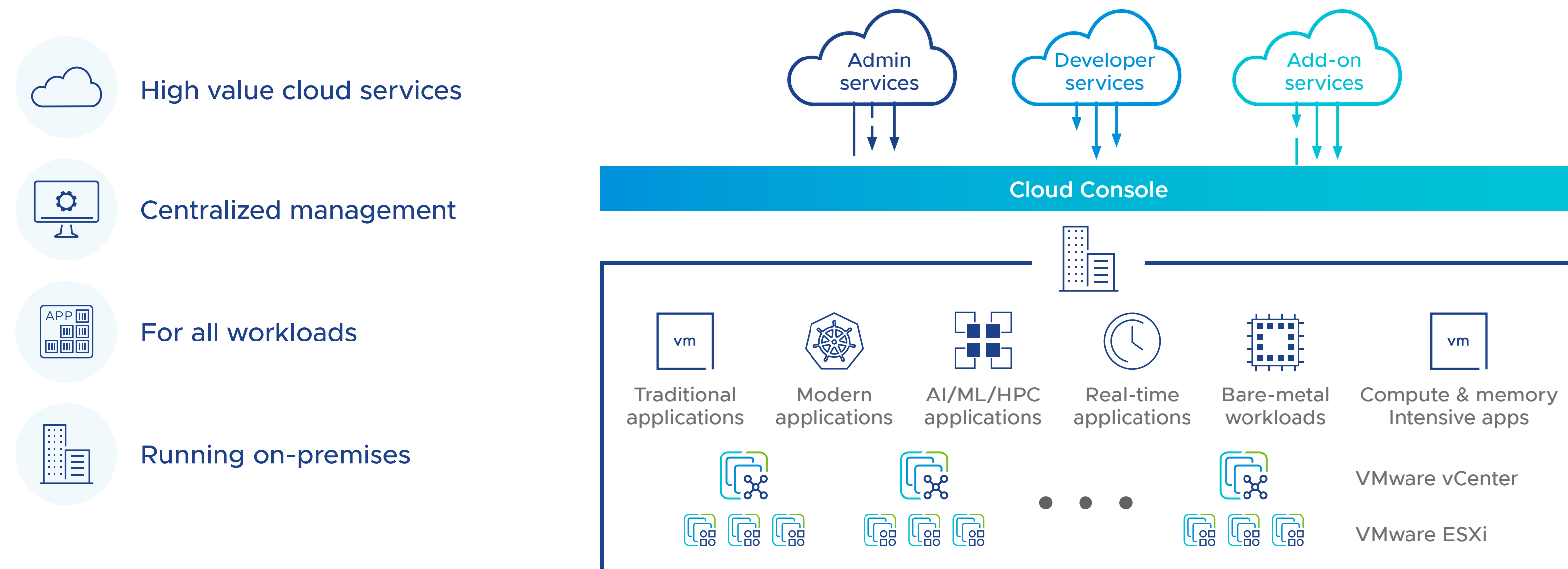
High value cloud services

Centralized management

For all workloads

Running on-premises

Figure 1: With vSphere 8, IT admins can deploy cloud services that protect workloads and optimize on-premises infrastructure.

Supercharge workload performance

## vSphere on DPUs Supercharges Workload Performance

VMware vSphere 8 enables you to meet the performance needs of modern distributed workloads, accelerating networking functions on the DPU (Data Processing Units, a.k.a SmartNICs) with the VMware vSphere Distributed Services Engine. With this capability now supported in vSphere 8, the era of heterogeneous computing, has truly started. This frees up CPU cycles to run workloads, results in higher workload consolidation, reduces latency and increases throughput so infrastructure services can run faster.

- Meet the performance needs of modern distributed workloads by accelerating networking functions on the DPU

- Reduce overhead of DPU lifecycle management with integrated vSphere workflows

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vSphere 8: Redis Performance Comparison

Up to
20%
cores saved[5]

Drive **higher workload consolidation** by utilizing saved cores, with similar or better performance

36%
Higher
TXN rate[5]
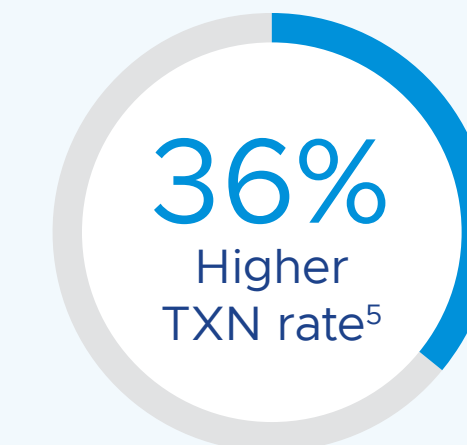
Supercharge performance by leveraging freed CPU cores and better cache locality to **drive more workload traffic**, while benefitting from vMotion and DRS
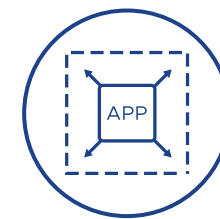
27%
Lower
latency[5]
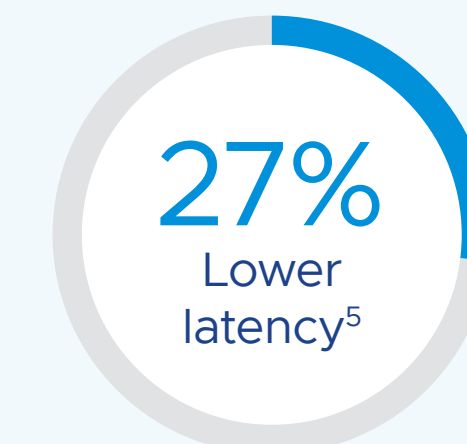
Supercharge workload performance

Support higher complexity AI models

For AI and ML, vSphere 8 enables unparalleled levels of performance and scalability for the most demanding and complex models. Let's look at these expanded capabilities

Higher scalability for complex AI/ML models with eight vGPUs per VM: AI/ML development teams can now achieve higher scalability of available GPU resources with support for up to eight virtual GPUs (vGPUs) per VM – a 2x increase.
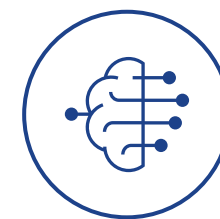
Development teams can speed up model training time with up to 32 passthrough devices per VM.
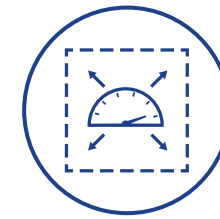
Improved performance with fractional vGPUs: Multi-vGPU support now includes fractional vGPU support with vSphere 8, ensuring demanding workloads have enough GPU resources.

Support for automated VMs placement by vSphere Distributed Resource Scheduler (DRS): VM placement on the GPU is greatly enhanced by the enablement of DRS awareness of PCIe topology. DRS automatically chooses NIC and GPU or multiple GPUs to improve performance.

Support for device group capability: Device groups enable the aggregation of PCIe devices paired with each other at the hardware level, either using NVLink or through a common PCIe switch.

Enhance operational efficiency

Upgrades, configuration, and maintenance are vital to the ongoing health of infrastructure yet can take valuable time and resources away from running business-critical applications. vSphere 8 helps reduce operational burdens and improve efficiencies. IT teams can not only return to regular operations faster but also track progress towards sustainability goals by monitoring energy consumed by workloads.

Enhanced workload placement by vSphere Distributed Resources Scheduler by factoring in memory (DRAM and PMEM) usage into bandwidth and latency.
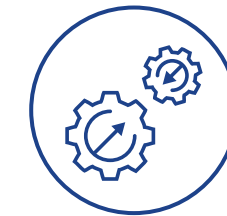
Optimize your IT maintenance window by pre-staging ESXi image downloads prior to maintenance and performing simultaneous upgrades on hosts.

Track your progress towards sustainability goals by monitoring energy consumed by workloads.
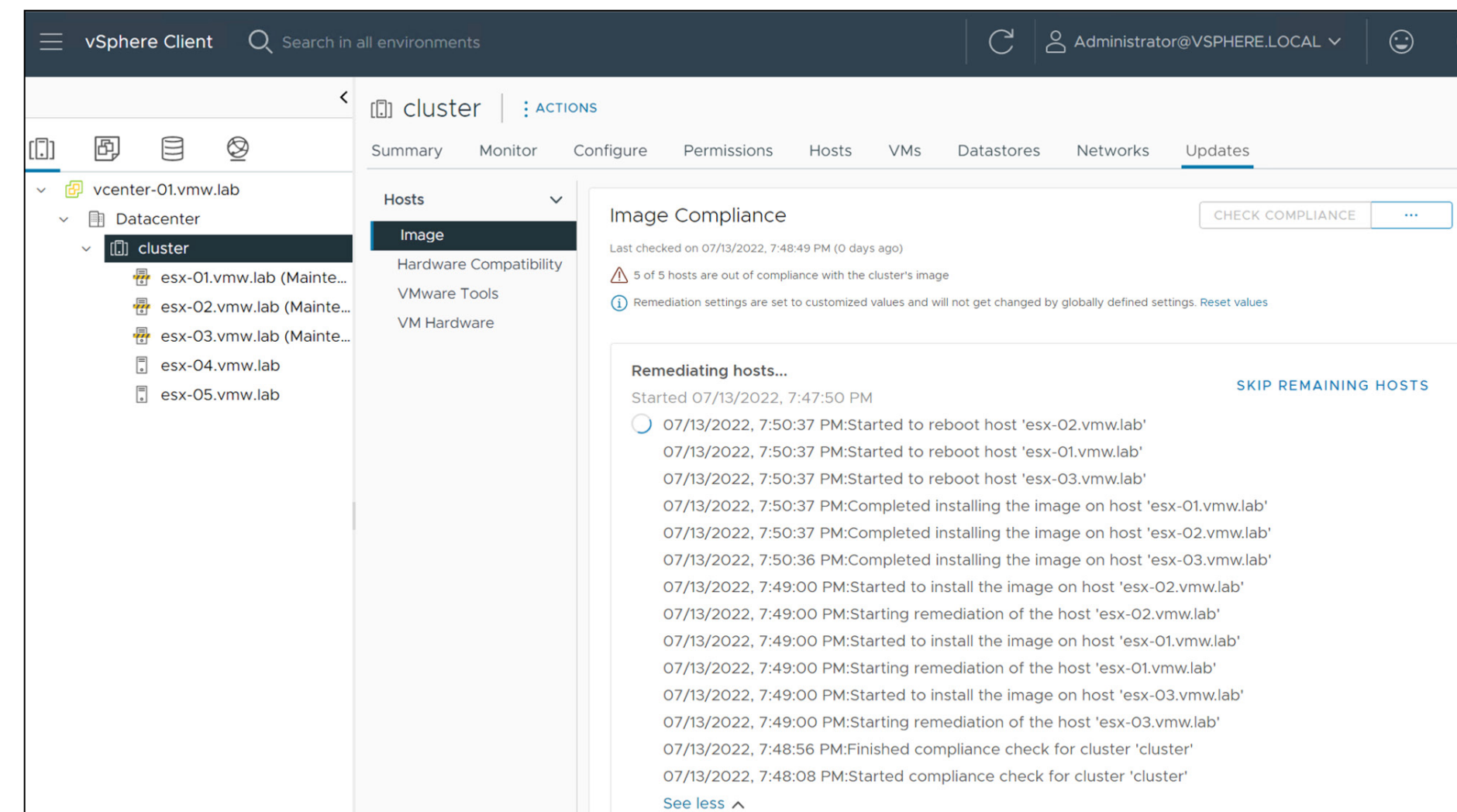

Figure 2: vSphere Lifecycle Manager can remediate multiple hosts in parallel, dramatically reducing the overall time needed to remediate an entire cluster.

Accelerate innovation for DevOps

With VMware vSphere 8, DevOps teams can now access IaaS services (ex. provisioning VMs, networking, setting up Tanzu Kubernetes Grid clusters) easily from the **Cloud Consumption Interface**, simplifying infrastructure setup across the vSphere estate through intuitive UIs and developer-friendly APIs and freeing developers to focus on development efforts vSphere 8 enables this with below.

Gain self-service access to IaaS services across vSphere cloud infrastructure from an intuitive cloud console.

Improve the resilience of containerized workloads through availability zones.
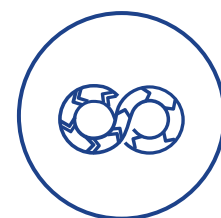
Simplify TKG cluster lifecycle and package management with API-driven Cluster Classes and Carvel to build on Kubernetes with confidence.
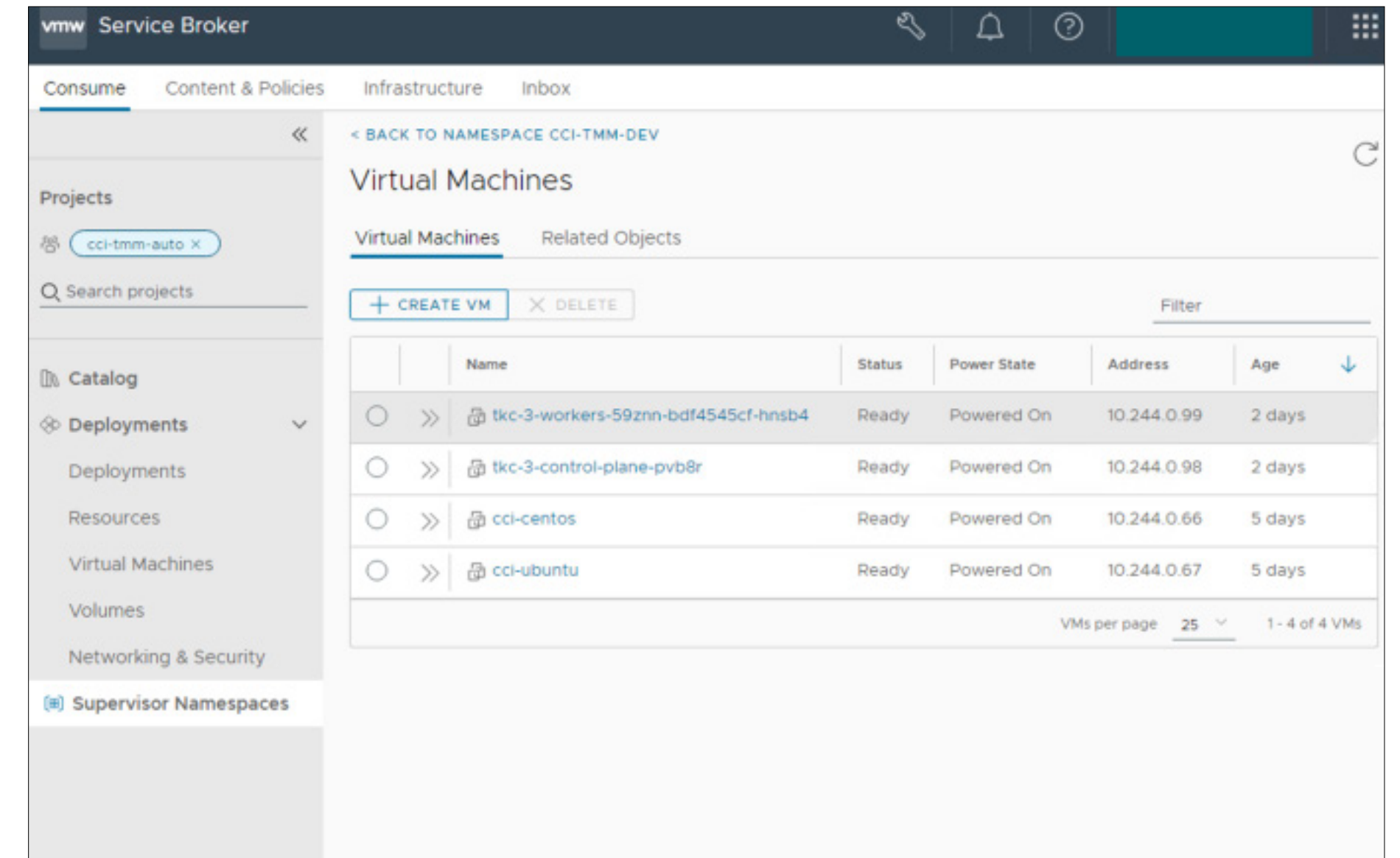

Figure 3: Provisioning infrastructure through Cloud Consumption Interface

Putting it all together

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1. Gartner, Inc. "Why are you wasting your SaaS Expenditure." Jaswant Kalav, Luke Ellery, Oct 2021.

2. IDC. "IDC FutureScape: Worldwide Future of Digital Infrastructure 2022 Predictions." Oct 2021. Doc # US47441321.

3. Gartner, Inc. "The Innovation Leader's Guide to Navigating the Cloud-Native Container Ecosystem." Arun Chandrasekaran, Wataru Katsurashima, August 2021.

4. Gartner, Your Server Is Eating Your Network – Time to Rethink Data Center Network Architectures, Joe Skorupa, Andrew Lerner, April 2021

5. Internal VMware performance testing , August 2022. DPU vs. Perf NIC (25G NICs with NSX overlay enabled)

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