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WHITE PAPER

Confronting the VMware Licensing Shift: Modernizing Virtualization Infrastructure in an Era of Uncertainty

Strategies to Navigate VMware Licensing Changes and Future-proof Your Virtualized Environment

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Modernizing in an Era of Change

Broadcom's acquisition of VMware has sent shockwaves through IT organizations worldwide. With abrupt licensing changes, rising costs, and a shift to core-based subscription models, organizations that have long relied on VMware for their virtualized infrastructure are now facing an urgent dilemma: Stay the course and absorb escalating expenses, or pivot to a new virtualization strategy?

This white paper tackles that challenge head-on. Whether an organization chooses to optimize existing VMware deployments, migrate workloads to the public cloud, or explore alternative hypervisors, it needs a plan, and now.

NetApp's intelligent data infrastructure provides the flexibility to navigate this uncertain landscape with confidence. Drawing on decades of innovation across storage, virtualization, and cloud, NetApp supports whatever path an organization chooses, ensuring cost efficiency, performance, and control at every step.

IT leaders are used to dealing with change. It's always been an innate part of the industry, and for many organizations, embracing change has become a differentiator. But the pace of change seems to be accelerating; organizations are getting to grips with a number of new technology shifts. That, of course, drives multiple exciting opportunities but also carries challenges.

IT complexity is increasing: According to research by Enterprise Strategy Group, six in ten organizations said their IT environments have become more complex in the past two years. For one in five, the complexity increase has been substantial.[1]

Ask any IT leader what is driving that complexity, and it is likely that a few factors will rise to the surface (see Figure 1).[2] One is the increasingly complex cybersecurity landscape. Another is the organizational need to embrace new and emerging technologies—right now, a huge focus is on AI. Managing data overall is a prominent challenge as well, whether it involves meeting security and privacy mandates or dealing with higher data volumes and more data sources.

[1] Source: Enterprise Strategy Group Research Report, *2025 Technology Spending Intentions Survey*, December 2024.
[2] Ibid.

Figure 1. Biggest Drivers of Complexity in IT

Source: Enterprise Strategy Group, now part of Omdia

The virtualization landscape is in upheaval. Broadcom's acquisition of VMware has triggered radical changes to licensing models, pricing structures, and product packaging. Long-time VMware customers, who built their infrastructures on virtualization, are now facing unexpected and significant cost increases, along with a lack of predictability about future terms. In addition, there remains ongoing uncertainty around Broadcom's long-term commitment to features and the way the various capabilities are bundled.

This single seismic event has prompted many organizations to reconsider their virtualization strategies altogether. Some are accelerating plans to move workloads to the public cloud. Others are evaluating alternative hypervisors such as Red Hat OpenShift Virtualization, Microsoft Hyper-V, or variants of the KVM Open-Source tool.

But for every organization, the stakes are high. Virtual infrastructure underpins critical workloads, and shifting strategies comes with risks, costs, and complexity. That is why understanding the current environment—what you have, where it runs, how it's licensed, and how efficiently it operates—is the first step toward making informed decisions.

These industry events are resulting in some changes in pricing and packaging at the virtualization layer that are prompting many organizations to reevaluate their infrastructure strategy. Specifically, organizations are looking at virtualization in a way that is frankly probably long overdue (i.e., performing hygiene/efficiency reviews or even accelerating longer-term plans to transform). The rising cost of maintaining a VMware environment may, ironically, provide the very budgetary justification that IT teams need to explore and test alternative hypervisors.

Given the high level of investment in current virtual infrastructure, these are not trivial decisions. But the choice is stark: Stick with the current path, or switch strategy by embracing an alternative route such as moving more applications to the public cloud or even swapping hypervisors.

Of course, such changes have real-world cost impacts. When Enterprise Strategy Group asked IT decision-makers which business initiatives would drive the most technology spending by their organizations over the next 12 months, the second most popular response (after strengthening cybersecurity) was reducing costs.[3]

Even the strategy of staying the course has organizational and cost implications that extend beyond the virtual compute layer to the entire infrastructure stack, including the data and storage layer. That is why data infrastructure vendors such as NetApp have placed such a priority on guiding organizations in making the right choices during this period. NetApp's emphasis on developing a comprehensive range of capabilities ensures that organizations are supported in this journey, regardless of which path they take.

Navigating a Path Forward

The First Step—Understanding What You Have

As organizations have placed digital technologies at the heart of their strategies in recent years, the tentacles of the associated IT systems have extended into every facet of operation. The "surface area" of IT has expanded beyond the core data center to a legion of on- and off-premises locations, to the extent that, today, most midsize organizations operate a multitude of on-premises data centers and edge locations, and they use myriad SaaS services and typically multiple hyperscale cloud providers. In a recent Enterprise Strategy Group research study, 68% of respondents said that the complexity of their organization's IT environment slows down IT operations and digital initiatives.[4]

Applications are running in all of these locations, and underpinning many of those applications is virtualization software. Of course, many organizations have already started on their modernization journey by turning to modern approaches such as containerization. Still, given how widespread hypervisors continue to be, the first task for any organization wishing to plot a path forward is to understand its current hypervisor usage. Indeed, the adage "you can't manage what you can't measure" is particularly apt in this context.

Unfortunately, getting an accurate picture is often easier said than done. Virtual machines (VMs) today extend across many locations, and the interdependencies between the VM and other infrastructure resources, including data and storage, can be opaque. At the application level, it's even more difficult to do dependency mapping. And despite, or perhaps because of, the rise in the number of observability tools in recent years, gaining a detailed understanding of the interdependencies across all resources can still be very difficult. Organizations also need to understand how efficiently they are utilizing compute resources and ascertaining which processes are running in which host vCPUs.

Why Does Storage Matter?

Storage has been critically important since the emergence of VMs 20 years ago, and the IT industry has invested substantially to create integrations to ensure that data storage environments are optimized to support VMs across multiple dimensions, including performance, backup, replication, data protection, and security.

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[3] Ibid.

[4] Source: Enterprise Strategy Group Research Report, *Navigating the Cloud and AI Revolution: The State of Enterprise Storage and HCI*, March 2024.

In an Evolving Licensing Environment, Architecture Becomes Key

One key decision point for organizations has centered on where to run some of those data management functions since they tend to be compute-, memory-, and storage-intensive tasks. Historically, they ran in an external storage system, but the emergence of hyperconverged infrastructure (HCI) approaches over the last decade has provided organizations with the option to run them at the server level, without requiring external storage.

Although the appeal of HCI is in its simplicity—the entire environment can run on special configurations of server-based hardware—there are trade-offs, some of which might be much more consequential in the light of industry shifts. HCI licensing isn't any cheaper, is fairly proprietary, and is yet another lock-in. Another trade-off with HCI is that storage and compute must be scaled in fixed increments. This could lead to resource underutilization if compute and data do not grow at comparable rates. Although there have been recent announcements of HCI vendors supporting external storage, there continue to be significant restrictions on the substantial scale required to be deployed before the use of this external storage is allowed. Additionally, organizations effectively have to buy all of their compute and storage hardware at the same time. At scale, this might be problematic from a Capex point of view.

Most notable are the implications from a licensing perspective. VMware has long offered subscription-based licensing as an option. However, under Broadcom, subscription licenses have become mandatory, and the previously popular Enterprise License Agreements and perpetual licenses are being phased out. This shift, combined with a move from per-socket to per-core licensing, has major implications for cost and planning, especially in environments running multi-core processors or infrastructure-heavy workloads like storage and backup within HCI deployments.

By contrast, offloading these data management and storage-related tasks to an external storage system will likely result in a more efficient usage of vCPU, which might lower overall virtualization costs and will ensure that server CPUs are focused on processing essential workloads. Anything from 15%-25% of an HCI cluster's CPUs go to supporting the storage layer. In VMware's case, each of these need to be licensed too. That's up to one-third more CPUs to license to support the storage workload in an HCI environment.

Even long-time HCI vendors are reevaluating their architecture assumptions. Recent moves by Nutanix to support external storage underscore the growing recognition that tightly coupling compute and storage can lead to inefficiencies at scale.

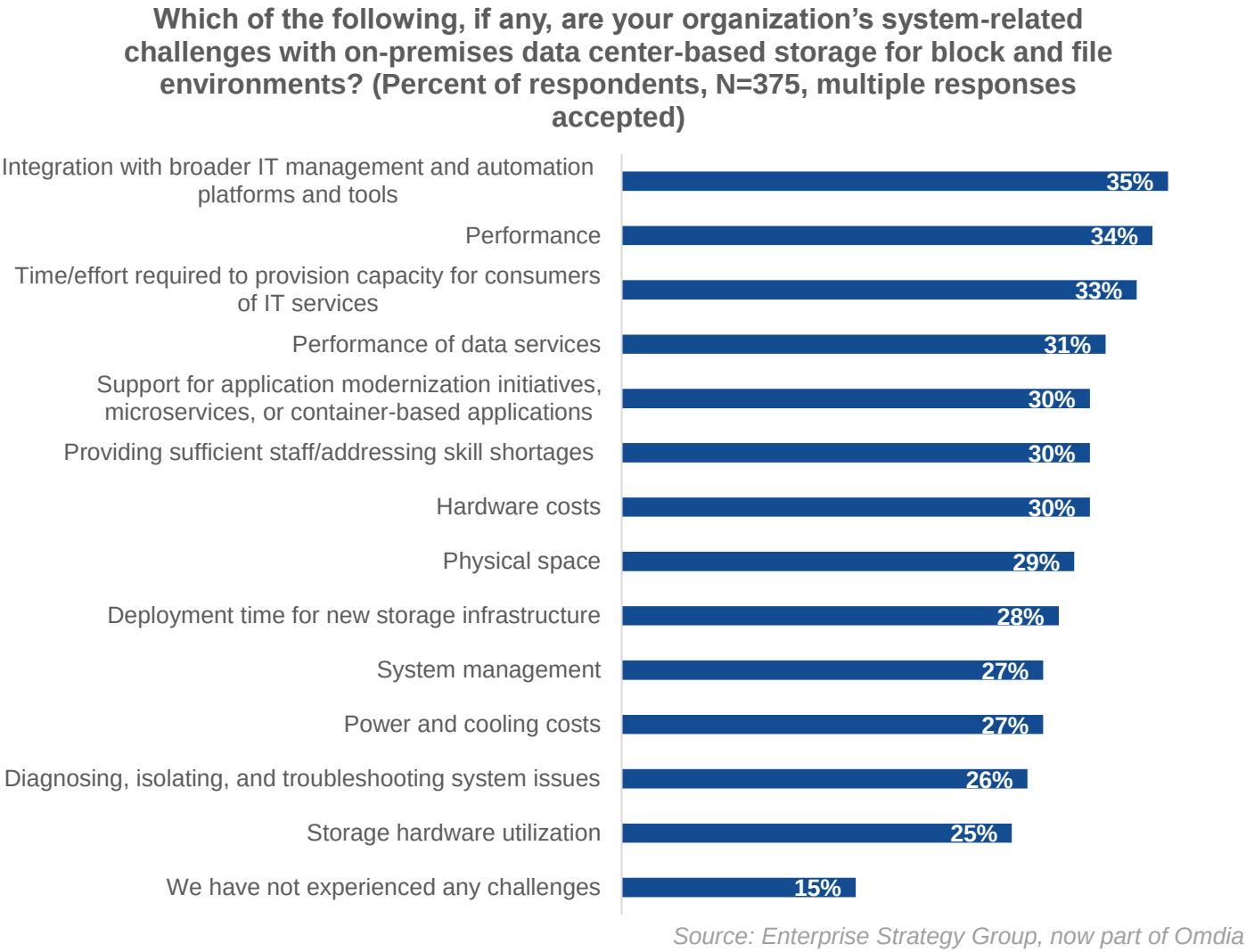
The Imperative to Modernize Storage

Meanwhile, organizations continue to grapple with a number of overall storage-related challenges. According to Enterprise Strategy Group research, these range from a lack of integration with the broader IT environment, to performance issues, provisioning issues, and a lack of support for application modernization initiatives, such as containers and microservices (see Figure 2).[5]

With the storage industry continuing to innovate across multiple dimensions, the capabilities of modern storage systems are improving—the performance of non-volatile memory express (NVMe)-based storage and NVMe-based protocols (/TCP and /FC) that improve network access/performance continue to grow substantially, for example. Falling costs are also bringing prices into a range that is increasingly viable for organizations. The potential for organizations to modernize their data and storage environment, and further optimize for their virtualization requirements, has never been stronger.

[5] Ibid.

Figure 2. Block-related Storage Challenges



Source: Enterprise Strategy Group, now part of Omdia

Further Embracing the Public Cloud

For some organizations, the option to move some, more, or all of their workloads, including virtualized applications, to public cloud providers might be an option. This could especially be the case if the cost of running their on-premises environments is likely to increase substantially. The popularity of public cloud environments remains as strong as ever. According to Enterprise Strategy Group research, 68% of organizations have a cloud-first policy when it comes to deploying net-new applications.[6]

Moreover, organizations, on average, reported that almost three quarters (74%) of their remaining/existing on-premises applications were either potential or strong candidates to move to public cloud environments over the next three years.[7]

[6] Source: Enterprise Strategy Group Complete Survey Results, *Understanding Workload, Application, and Data Deployment and Migration Decision-making*, July 2024.
[7] Ibid.

However, organizations must conduct a thorough evaluation of the steps, risks, and costs before deciding either way. Some considerations include:

- **How to move to the cloud.** Lift and shift the existing platform or re-platform to cloud-native virtualization? Move new versus existing applications? Lift and shift and then re-platform to cloud-native? Transform existing VM-based workloads as part of the move to the cloud to leverage a combination of IaaS, PaaS, and even SaaS?
- **Mapping application and infrastructure dependencies.** Many virtualized workloads are tightly coupled to specific databases, services, or hardware dependencies. Without a clear map of these relationships, migrations risk causing downtime or performance issues. Tools that can surface VM-to-storage, app-to-storage, and app-to-network dependencies are critical for planning cloud or hypervisor transitions with confidence.
- **Which applications to move.** Which ones can be moved quickly/easily, and which will be more complex? Do security/governance considerations exist? Sometimes even knowing what constitutes an application can be challenging.
- **Location.** Which cloud provider(s) and which cloud locations should be used?
- **Storage and data implications.** Which tool sets and storage capabilities are supported? How is data protected, backed up, secured, etc.?
- **Modernizing for the cloud-native future.** Migrating workloads off VMware or to the cloud is often just the first step. Once workloads are operating in a public cloud, many organizations pursue deeper modernization by transforming select applications into cloud-native architectures using PaaS or SaaS models. This not only boosts agility and scalability but also reduces long-term operational overhead. NetApp supports this evolution by offering integrated data management for Kubernetes, containerized environments, and platform services. Solutions such as Amazon FSx for NetApp ONTAP, Azure NetApp Files, Google Cloud NetApp Volumes, and NetApp Trident help protect organizations in transitioning smoothly from a VM-centric infrastructure to modern application delivery models without rearchitecting their entire data estates overnight.

These are not straightforward decisions. Organizations should aim to minimize the amount of complexity and decision points in the process to make the journey to the public cloud as smooth and consistent as possible.

Embrace Another Hypervisor Altogether

Another option is for organizations to move some or all workloads to a different hypervisor. According to Enterprise Strategy Group research, more than one-third (37%) of organizations plan to change their primary hypervisor.[8] Although this might appear to be the "nuclear option" that carries way more risk, effort, and cost—at least during the initial transition—there are a number of ways to make it more palatable. For example, despite VMware's dominance in the hypervisor industry, well-established alternatives exist, including Red Hat OpenShift Virtualization, Microsoft Hyper-V, and multiple variants of the KVM Open-Source tool, as well as Oracle and some emerging options such as Proxmox. Organizations should explore solutions that offer robust and comprehensive integration with such platforms, thus reducing risk and minimizing complexity.

Many organizations might already be on this path, as they are embracing cloud-native technologies such as containers and Kubernetes for their newer applications, especially those that run in the public cloud. There might be an opportunity to leverage some of those capabilities and skill sets to accelerate and extend the effort to workloads that currently run on virtual infrastructure. Ultimately, there will inevitably be more testing and retraining involved in

[8] Source: Enterprise Strategy Group Research Report, *Navigating the Cloud and AI Revolution: The State of Enterprise Storage and HCI*, March 2024.

taking this route, though the payoff could be significant for organizations with the skills, resources, and time to take this option.

Taking Control With NetApp

NetApp is approaching this issue with a broad, strategic vision and comprehensive set of capabilities. Regardless of organizations' strategies for evolving their virtualization infrastructure, NetApp has them covered. A VMware partner for 20-plus years, NetApp was a pioneer in creating innovative integrations with VMware that are built around an intelligent data infrastructure that can look after data, wherever it resides. Today, 20,000 organizations worldwide run VMware on NetApp because of its flexibility and its ability to lower risks.

Understanding What You Have—Data Infrastructure Insights (DII)

NetApp Data Infrastructure Insights (DII) is resource management software designed to optimize and right-size a virtualized compute and storage environment to save costs and improve performance. The software assists IT teams in identifying idle or wasted resources, reclaiming cloud costs, and deferring on-premises spending. With it, organizations can reduce waste continuously, while maximizing resource utilization across the hybrid cloud environment. DII also helps organizations prepare for future cloud migrations and operate at scale post migration. It offers:

- Monitoring of the entire heterogenous IT landscape (e.g., VMs, storage, and containers) with a user-friendly data model.
- Support for cross-infrastructure dependency mapping, making it easier to visualize and optimize VM, application, and storage interrelationships.
- Displays of which workloads are using which specific compute or storage resources and who owns those workloads.
- Alignment of physical and cloud infrastructure allocations to avoid unnecessary license expenses and to reclaim unused resources.
- Facilitated operations at scale for continued data migrations.

NetApp Is Optimized for VMware on Premises

NetApp storage is designed to deliver performance and scalability for VMware environments, offloading all important data management tasks related to backup, replication, protection, and security. A combination of capabilities can optimize the cost of VMware subscriptions via:

- Modern, all-flash architectures, supporting the latest NVMe capabilities. CPUs are offloaded to gain the highest performance and lowest response times to keep workloads running on VMware vCPUs as efficiently as possible.
- Simplified manageability and integration. NetApp integrates natively with VMware vSphere through ONTAP Tools for VMware, enabling policy-based provisioning, automation, and VM-level data management directly within the vSphere UI. It also supports VAAI primitives to offload common storage tasks for efficiency and integrates with SnapCenter for application-consistent backup and restore workflows across VMware environments.
- Advanced data management for virtual servers, desktops, databases, and containerized workloads.
- NetApp Snapshot copies for backup, replication, and data protection.

- NetApp SnapCenter that integrates tightly with VMware environments to provide unified backup and recovery for applications such as Oracle, SQL Server, and SAP.
- Industry-leading guarantees for flash data efficiency (compression, dedupe, and compaction).
- The new ASA, a block-only family of systems highly optimized for VMware, offering a state-of-the-art combination of ease of use/simplicity, performance, and low cost. Especially for organizations or departments that haven't used NetApp ONTAP in the past, ASA is radically simplified and focused on block with differentiated capabilities compared with NetApp's unified platforms.
- The granular VM management provided by NetApp's NFS-based storage solutions (AFF). NetApp's longstanding integration with VMware allows administrators to manage VMs at the file level, simplifying operations like snapshotting, cloning, and recovery. This is particularly valuable for customers seeking simplicity and flexibility in the face of platform shifts.

NetApp Is Optimized for Public Cloud

NetApp was the only storage supplier to put public cloud at the heart of its strategy almost a decade ago. Those long-term investments are now paying off. NetApp ONTAP is the only external, fully managed public cloud storage service certified and supported across VMware-powered services at AWS, Azure, and Google.

The key point is that, regardless of whether organizations want to run VMware in the cloud or move to cloud-native virtualization, NetApp can uniquely deliver the same experience and capabilities in the cloud of their choice. Moving to the cloud with NetApp provides flexibility with a familiar tool set. And, when combined with VMware in the cloud with ONTAP, it can save up to 50% on storage-heavy workloads, according to NetApp.

NetApp Is Optimized for Additional Hypervisors and More

NetApp is investing in the hypervisor and container/cloud-native ecosystem beyond VMware to ensure that organizations that want to look into another route have full support from NetApp, including help in reducing risk, complexity, and implementation time, thereby boosting ROI.

NetApp and Red Hat have been strategic partners for more than 20 years investing in joint solutions, and the partnership has never been stronger. They work together to offer a consistent data platform for workloads across all major cloud providers and from the core data center to the edge, delivering cost optimization and reduced complexity for their joint customers.

NetApp has worked closely with Red Hat to build hybrid cloud solutions that give its customers a modern, common control plane for managing both their virtual machines and containers using OpenShift and OpenShift Virtualization, all backed by NetApp storage and ONTAP. They address all data protection needs such as backup and disaster recovery using NetApp Trident and Trident protect, giving organizations coming from VMware the SRM-like capability that they require. They also have tools such as NetApp Shift to assist with VM format conversion, accelerating large-scale transition projects by enabling compatibility across virtualization platforms. Ultimately, this gives organizations a complete choice regarding whether the workload requires a virtual machine or container and whether it needs to run on premises, in the cloud, or both.

NetApp also supports Microsoft Hyper-V environments, offering integrations for backup, replication, and data protection through tools like SnapManager for Hyper-V. Additionally, NetApp's SMI-S Provider enables tight integration with System Center Virtual Machine Manager, enabling IT teams to manage storage directly within their existing Microsoft toolchains. Combined with performance optimizations, this support enables enterprise-grade virtualization and data services across a variety of virtualized workloads.

NetApp enables its customers to deploy many different options, whether they are ready to modernize now or later. Choosing NetApp won't restrict them.

Conclusion

NetApp customers are able to make an informed decision by starting with a DII, which provides detailed usage, utilization, and ownership information on their current VMware environment. Armed with this information, IT decision-makers can then embrace a path that makes the most sense for them individually, and they can do so with confidence, knowing that NetApp has their back.

NetApp did a phenomenal job in supporting organizations through the process of optimizing their VMware environments years ago. Now, years later, organizations are wondering where they should go next. NetApp is a trusted authority for helping those organizations through this important decision-making process at this transformative time.

Organizations have a choice. If they're looking into a reset of their VMware environment, whether it is on premises or in the cloud, or they are considering moving to other vendors such as Microsoft for Hyper V or Red Hat for OpenShift and OpenShift Virtualization, NetApp provides the most flexibility, efficiency, ease of use, and—having done this so many times before—the experience to really help.

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