2024-25 DCIG TOP 5

Enterprise VMware vSphere Alternatives // GLOBAL EDITION

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Enterprise VMware vSphere Alternatives // Global Edition

Table of Contents

Enterprise VMware vSphere Alternatives // Global Edition

Scale Computing Platform

Huawei Datacenter Virtualization Solution

Microsoft Azure Stack HCI

Nutanix Cloud Infrastructure

VergeIO VergeOS

**Products are listed with the licensee's product on top, followed by the other TOP 5 award recipients in alphabetical order.*

SOLUTIONS EVALUATED

1. Anchao Cloud Software ArcherOS
2. Harvester HCI
3. HiveIO Hive Fabric
4. Huawei Datacenter Virtualization Solution
5. iXsystems TrueNAS Scale
6. Maxta Hyperconvergence Software
7. Microsoft Azure Stack HCI
8. NodeWeaver
9. Nutanix Cloud Infrastructure
10. Oracle VM
11. oVirt
12. Oxide Cloud Computer
13. Proxmox Virtual Environment
14. Red Hat Hyperconverged Infrastructure
15. Sangfor Technologies HCI
16. Scale Computing Platform
17. SmartX HCI
18. SoftIron VMSquared
19. StorMagic SvHCI
20. Sunlight HyperConverged Edge Suite
21. VergeIO VergeOS
22. Virtuozzo Hybrid Infrastructure
23. Xen Orchestra XCP-ng
24. Zadara Edge Cloud

VMWARE VSPHERE ALTERNATIVE HYPERVISOR FEATURES EVALUATED

- Data protection and security
- Deployment options
- Licensing and pricing
- Management
- Software options
- Technical support

VMware by Broadcom Licensing Changes Prompting Enterprises to Reevaluate Their Choice of Hypervisor

Broadcom's formal announcement of the scope of the changes to VMware's software licensing in December 2023 sent shockwaves through many enterprises. Many enterprises expected Broadcom to fully adopt subscription-based software licensing once it completed its acquisition of VMware. However, few enterprises, if any, had insight into the breadth of these changes or how these changes might impact them.

What caught many enterprises off guard was Broadcom's decision to reduce the number of VMware software licensing options. Many software features that enterprises could once license individually they could now only obtain as part of a software bundle.

Enterprises that use many or all available VMware software features may well lower their overall software licensing costs. However, enterprises using one or a few VMware software features often report being quoted higher VMware software licensing costs.[1]

Other software licensing challenges have also emerged. Enterprises that utilize multiple VMware software features may find they must overbuy software licenses. For instance, enterprises may now only license VMware vSphere Standard for at least 16 CPU cores per server processor. This per-processor requirement applies even if the server has a processor or processors with fewer than 16 CPU cores.[2]

Conversely, enterprises licensing VMware Cloud Foundation (VCF) or VMware vSphere Foundation (VVF) may find VMware provides insufficient software licenses for some features.

For instance, both VCF and VVF include software licenses for vSAN. VCF includes one (1) tebibyte (TiB) of capacity per licensed core. VVF includes a 100 gibibyte (GiB) trial license per licensed core. Enterprises needing to manage more raw storage capacity than the vSAN licensing included with VCF or VVF must purchase additional vSAN licenses.[3]

These factors and others have prompted all size enterprises to reevaluate their virtualization platform. To make the best choice of a VMware vSphere Standard alternative solution, they must first quantify:

- The VMware software features they currently use.
- How broadly they use VMware and its features across their enterprise.
- How well competing hypervisors stack up.

The number of VMware software features an enterprise uses and how broadly it uses them factor into any decision. Alternative virtualization solutions vary in features, software licensing methods, and technical support options. These options and others all factor into selecting an appropriate VMware vSphere Standard alternative.

VMware vSphere Standard's Software License Features

This DCIG TOP 5 report seeks to help enterprises identify and create a short list of VMware vSphere Standard alternatives. DCIG did ***NOT*** attempt to quantify every feature that either VCF or VVF offers and identify viable alternatives to them. This report primarily focuses on alternatives to a subscription-based software license for VMware vSphere Standard.

Broadcom currently lists the following features as included with a subscription-based VMware vSphere Standard software license:[4]

Continued

Broadcom chose to consolidate and simplify VMware's software licensing and move solely to subscription-based software licensing. This decision has led competitors to differentiate themselves in how they make their software available and license it.

- Up to at least 16 Core licenses for each server Processor.
- VMware vCenter Server.
- VMware vSphere Hypervisor.
- vSphere API for Array Integration (VAAI)
- vSphere API for Storage Awareness (VASA)
- vSphere API for Third Party Multipathing.
- vSphere Data Protection.
- vSphere Replication.
- vSphere Storage Policy Based Management (SPBM).
- vSphere Virtual Volumes (VVOL).

The more VMware vSphere Standard features that an enterprise currently uses, the more critically it should examine alternatives. Enterprises using fewer VMware vSphere Standard features may find more vSphere alternatives that meet their needs.

Broadcom now licenses NSX, vSAN, and other VMware software features as part of VCF and VVF. Enterprises that use these VMware software features should separately validate how or if alternative solutions deliver comparable functionality.

The State of Enterprise VMware vSphere Standard Alternative Solutions

Globally, DCIG identified 24 different VMware vSphere Standard alternative solutions available in various configurations. Deployment options may include software for use on-premises, in the cloud, a preconfigured hardware appliance, or a combination of these.

Some providers also partner with hardware OEMs so that enterprises may order appliances from their preferred OEM. A few providers even make infrastructure-as-a-service (IaaS) available as an option. If electing to use IaaS, the provider manages the software after an enterprise deploys it.

Software Licensing

Software licensing has emerged as a hot-button topic. Broadcom chose to consolidate and simplify VMware's software licensing and move solely to subscription-based software licensing. This decision has led competitors to differentiate themselves in how they make their software available and license it.

For instance, Broadcom ended the availability of the VMware vSphere Hypervisor (free edition).[5] In response, some providers offer low- or no-cost software licensing to encourage enterprises to use their software. Optionally, some providers grant enterprises more time to test running existing enterprise applications on their VMware vSphere alternative.

Some providers do compete against Broadcom's subscription-based pricing with their own subscription-based pricing.[6] Alternatively, some offer only perpetual software licensing. A few give enterprises a choice between perpetual or subscription-based software licensing.

Support for Multiple Hypervisors

Moving to an alternative platform does not automatically mean an enterprise must abandon using VMware vSphere Standard in every instance. Some hyperconverged infrastructure (HCI) platforms support multiple hypervisors.

Supported hypervisors may include Microsoft Hyper-V, different versions of the Linux Kernel-based Virtual Machine (KVM), and VMware vSphere Standard, among others. An enterprise may even elect to run a different hypervisor on different deployments of the provider's HCI solution.

Some enterprises may find running multiple hypervisors their most affordable and practical option.

Some enterprises may find running multiple hypervisors their most affordable and practical option. Moving every application or workload off VMware vSphere may not work due to some advanced vSphere features those workloads utilize.

However, not all applications and workloads use advanced vSphere features. Enterprises may find they only need baseline vSphere features and can identify and use comparable features in an alternative hypervisor to host those applications and workloads.

Common Features across All Enterprise VMware vSphere Standard Alternative Solutions

DCIG evaluated 24 different VMware vSphere Standard alternatives in preparing this report. Across these 24 VMware vSphere Standard alternative solutions DCIG evaluated over 250 features on each one.

22 of the 24 solutions minimally offer the following seven (7) core features. DCIG believes the other two products also minimally support these seven features. However, DCIG could not authoritatively confirm their support of them prior to publication of this report.

1. ***Hypervisor.*** The hypervisor permits an enterprise to run one or more virtual machines (VMs) on a single computer. Each of these 24 solutions includes a hypervisor by default. Generally, enterprises should expect the solution to offer a Linux-based KVM or a variant based on KVM.
2. ***Management interface.*** The management interface facilitates the management of the VMs and other software features offered by the solution. Many include multiple management interfaces. These may include a CLI, a web-based GUI, REST APIs, and integration with third-party management platforms.
3. ***Software-defined networking (SDN).*** SDN, included in these 24 solutions, enables centralized control, programmability, and flexibility to adapt the network infrastructure to changing needs. This feature handles, directs, and prioritizes the communication between the different internal nodes and/or VMs in the solution.
4. ***Software-defined storage (SDS).*** SDS, also included in all 24 solutions, virtualizes physical hard disk and solid state drives. This solution will minimally virtualize the server's physical disk drives, though some include options to virtualize external storage arrays. Using SDS, the solution generally puts all the physical storage together into one central pool of storage. It then partitions this storage pool into smaller storage segments and assigns individual storage partitions to specific VMs.
5. ***Support Linux Guest Operating Systems.*** Enterprises increasingly use Linux as a guest operating system (OS) as an alternative to Windows. This trend has accelerated in recent years. Global tensions have resulted in some international providers to no longer formally support Windows as a guest OS. While over 85 percent still support the Windows guest OS, Linux variants now represent the only guest OS that all 24 products in this report formally support.

6. ***Web-based management GUI.*** All 24 products minimally provide enterprises with a web-based graphical user interface (GUI) to manage their solution. However, each solution's web-based management GUI may differ in terms of its capabilities. For instance, enterprises should verify if the GUI can access, visualize, and manage all installed instances of the solution in their environment. Some may achieve this feat. Other GUIs may require enterprises to enter the IP address of each installed solution to manage that instance.
7. ***Command-line interface (CLI).*** Enterprise administrators often need a CLI to facilitate scripting specific administrative tasks. Each of these 24 solutions offers a CLI to perform these tasks. However, the CLI commands that each solution supports may and likely do differ. If enterprise administrators plan to use the CLI, they should verify the solution's CLI includes the commands they need.

Each DCIG TOP 5 provider offers education and training to bring IT staff up to speed on its offering.

Similarities between the DCIG TOP 5 Enterprise VMware vSphere Alternative Solutions

In addition to supporting all the features listed above, all DCIG TOP 5 VMware vSphere alternative solutions also support the additional following features. These include:

- ***Education and training services.*** Switching to an alternative vSphere solution may look great from a cost perspective. However, enterprises need to have confidence their IT staff possesses the needed knowledge and skills to manage the solution. Each DCIG TOP 5 provider offers education and training to bring IT staff up to speed on its offering.
- ***Multiple data replication options.*** The flexibility to make copies of VMs and move them between cluster instances represents one of server virtualization's key benefits. Each DCIG TOP 5 solution gives enterprises the options to create VM clones, space-efficient snapshots, and asynchronously replicate VMs.
- ***Multiple features to deliver high availability (HA).*** Enterprises will expect these solutions to run without interruption. To meet these HA expectations, each of these solutions offers redundancy and failover options for multiple components. These components include disk drives, network connectivity, nodes in the cluster, individual VMs, storage volumes, and non-disruptive updates and upgrades.
- ***Multiple options to validate users and their roles.*** Ransomware has put cyber security at the forefront of enterprise requirements for any new solution. Protecting a data center's infrastructure must now start with validating the credentials of those individuals logging in to manage it. Each DCIG TOP 5 solution includes multi-factor authentication (MFA), role-based access controls (RBAC), and integration with Active Directory (AD).
- ***Multiple SDN implementation and management options.*** Each VMware vSphere alternative solution relies heavily upon its own networking features to run well. This reliance upon them makes it imperative each solution possesses robust features to effectively implement and manage its SDN. Each DCIG TOP 5 solution offers alerting, analysis and reporting, APIs for third-party integration, virtual switches, and VPN services for remote access.
- ***24x7x365 technical support with 4 hour or less response time.*** Enterprises need to have complete confidence that they can reach technical support anytime, day or night. Each DCIG TOP 5 VMware vSphere alternative solution provider offers this enterprise level of technical support. Enterprises may access each provider's technical support by phone or via its online knowledge base.

- ***Remote monitoring and login/problem resolution.*** Many enterprises want to avoid calling technical support. Instead, they want the provider to tell them their infrastructure has an issue before it impacts operations. Each of these DCIG TOP 5 solution providers offer remote monitoring to help diagnose and troubleshoot issues on its respective solution.

Other features all these TOP 5 solutions also support include:

- ***Automated storage tiering.***
- ***Common task automation.***
- ***Deduplication.***
- ***REST API.***
- ***Thin provisioning.***

The differences between the DCIG TOP 5 VMware vSphere alternative solutions primarily surface in three broad areas: advanced cybersecurity features, advanced quality of service (QoS) functionality, and advanced SDN technical and management features.

Differences between the TOP 5 Enterprise VMware vSphere Alternative Solutions

Despite the many similarities between the DCIG TOP 5 VMware vSphere alternative solutions, they also differ significantly in supported features. Since their differences outnumber their similarities, enterprises should identify specific features the solution should possess to meet their requirements.

The differences between the DCIG TOP 5 VMware vSphere alternative solutions primarily surface in three broad areas: advanced cybersecurity features, advanced quality of service (QoS) functionality, and advanced SDN technical and management features. While each DCIG TOP 5 solution supports these three functions in some capacity, each implements them differently, and some to a greater extent than others. Consider:

- ***Advanced cyber security features.*** All enterprises now routinely deal with ransomware events and bad actors both inside and outside their company. This frequent occurrence has made it imperative that any vSphere alternative solution prepares them to ward off these attacks.

  Each TOP 5 solution possesses some core features that equip enterprises to secure their environment. However, repelling more sophisticated cyberattacks often requires a solution possess more advanced cyber security features.

  The differences between available solutions show up in multiple ways. For instance, enterprises may want the solution to encrypt data in-flight or at-rest. Only four of the solutions indicate either in-flight or at-rest encryption as an option.

  Other enterprises may want to ensure that a second individual reviews certain management tasks before they are completed.

  Still others may want to impede a ransomware attack by storing data in an immutable format. This requires the vSphere alternative to either write data in a WORM file form or on immutable object storage. Only one solution, respectively, currently supports these features.

  Many enterprises also want to better monitor their environment for suspicious events. To facilitate this activity, two integrate with Security Information and Event Management (SIEM) platforms that centralize monitoring and analysis of suspicious activities.
- ***Advanced QoS functionality.*** Performance issues may arise when administrators place VMs or workloads on a specific physical host or cluster. Identifying which VM or workload caused the issue, when it caused the issue, why it is causing the issue, and how to best resolve the issue quickly gets complicated.

Identifying which VM or workload caused a performance issue, when it caused the issue, why it is causing the issue, and how to best resolve the issue quickly gets complicated.

Here again, each DCIG TOP 5 vSphere alternative offers some features to help measure, manage, and allocate performance on its platform. However, enterprises that run critical workloads and VMs in their virtualized environments may need more sophisticated QoS features. In this area, enterprises will find distinct differences between available solutions.

For instance, enterprises may run workloads or VMs that must maintain minimum levels of performance. In these cases, they will find only a few solutions that currently offer this more advanced QoS functionality.

- ***Advanced SDN technical and management features.*** Robust SDN technical and management features become increasingly important when enterprises host VMware vSphere alternatives on a cluster of nodes. Enterprises will need features with the appropriate settings that they may tweak to set up networking between the nodes. Once configured, features that control, monitor, and prioritize networking traffic come into play to provide ongoing management.

  While each DCIG TOP 5 solution offers some core SDN functions, enterprises may need advanced features. For instance, enterprises that need connectivity to a specific general-purpose cloud will want an SDN solution that integrates with that cloud. Enterprises running multiple workloads with varying priorities may need load balancing and network QoS functionality. Still others may require more advanced networking services such as microsegmentation and virtual routing.

  Enterprises will find each of these and other advanced SDN features within some DCIG TOP 5 solutions. However, enterprises will not find all advanced SDN features in all five of these solutions.

TOP 5 Enterprise VMware vSphere Alternative Solution Profiles

Each of the following DCIG TOP 5 Enterprise VMware vSphere alternative solution profiles highlight at least three ways they differentiate themselves from one another. These differentiators represent some of the primary reasons that an enterprise may want to consider one solution over another as an enterprise VMware vSphere alternative. Within each solution, an enterprise may find features that better meet its specific needs.

Enterprises may start with one SC//Platform appliance and then increase that deployment up to eight nodes in a cluster. The SC//Platform also gives enterprises the flexibility to mix dissimiliar hardware appliances in a cluster.

Scale Computing Platform

The Scale Computing Platform (SC//Platform) distinguishes itself by providing an all-in-one hardware and software HCI solution that includes all software licenses. Software features it offers at no additional charge include HA clustering, built-in DR, replication, and software-defined storage (SDS), among others.

The SC//HyperCore hypervisor serves as the foundation for the SC//Platform. Based on components of the Linux KVM hypervisor, SC//HyperCore leverages the virtualization offload capabilities available in modern CPU architectures.

The SC//Platform embeds storage with SC//HyperCore and pools it across the entire cluster automatically adding storage from new nodes. This design enables direct data flows from the SC//HyperCore hypervisor to its virtual storage device (VSD) virtual disks. Faster communication between the hypervisor and storage layers occurs thereby improving the SC//Platform's overall performance.

Additional features the SC//Platform offers that further help differentiate it from other TOP 5 VMware vSphere alternative solutions include:

- ***Scale Computing Move automates migrations and minimizes downtime.*** Successfully moving existing VMware vSphere VMs into an alternative hypervisor represents an initial concern every enterprise faces. Scale Computing Move addresses this concern. It equips enterprises to migrate physical, virtual, or cloud workloads to the SC//Platform.

  Available for both Linux and Windows guest OSes, enterprises may configure Scale Computing Move to automatically replicate data. Enterprises may schedule the migration through Scale Computing's central console, scripting, or third-party tools. Before switching over, enterprises may test the target server at any time and fail back to the original system if needed.

- ***Centrally manage all SC/HyperCore through SC//Fleet Management.*** Centralized management of all HCI clusters regardless of their location often emerges as an enterprise prerequisite. Scale Computing addresses this enterprise expectation with SC//Fleet Management, its cloud-host monitoring and management tool.

  Able to monitor and manage up to 50,000 clusters, it facilitates advanced management capabilities. These include automatic cluster provisioning, SC//HyperCore firmware upgrades, and access to any specific SC//HyperCore cluster through the HyperCore user interface (UI) for in-depth management.

- ***Mix and match different size nodes in a cluster.*** An HCI provider may require all nodes in a single cluster to originate from the same hardware provider. This may extend to requiring all nodes in the cluster to possess the exact same hardware specifications. Scale Computing does not impose this requirement.

  Scale Computing gives enterprises the flexibility to mix dissimiliar hardware appliances in a cluster. These different size nodes may then coexist together in the cluster. Further, each appliance node in the cluster may possess dissimilar storage such as all HDDs, hybrid HDD/SSD, or all SSDs.

  Despite potentially different storage capacities in each appliance, each appliance's storage capacity gets added to the overall cluster storage pool. The Scale Computing Reliable Independent Block Engine (SCRIBE) combines the SC//HyperCore storage drives into a single storage pool. Enterprises may start with one appliance of any size and then increase that deployment up to eight in a cluster.

Huawei DCS distinguishes itself by building upon and capitalizing on the multiple enterprise datacenter technologies available from Huawei.

Huawei Datacenter Virtualization Solution

The Huawei Datacenter Virtualization Solution (DCS) distinguishes itself by building upon the multiple enterprise datacenter technologies available from Huawei. Huawei also offers enterprise datacenter computing, networking, and storage technologies as well as the Huawei Cloud. The Huawei DCS capitalizes upon these technologies to enable enterprises to create a virtual datacenter that meets their needs.

Now available for almost ten years, enterprises may deploy the Huawei DCS in environments of almost any size. Enterprises may use it in environments that require as few as two nodes. Alternatively, Huawei DCS may scale up to 256 nodes to meet the capacity and performance demands of very large datacenters.

Additional features the Huawei DCS offers that further helps differentiate it from other TOP 5 VMware vSphere alternative solutions include:

- ***Centralized management console that automates and simplifies provisioning and problem resolution.*** All providers of VMware vSphere alternative solutions provide a centralized management console. However, the capabilities of these centralized consoled can and do vary between solutions. Further, only the best ones monitor clusters or individual nodes and facilitate informed troubleshooting.

  The Huawei DCS offers such functionality. By default, Huawei DCS includes four preset dashboards that include a data center overview and more than 30 customizable widgets. Behind the scenes, Huawei DCS console performs end-to-end topology and workload analysis.

  On a daily basis, this analysis contributes to improves to facilitating one-step provisioning for VMs. It allocates the most appropriate, available computing, network, and storage resources to each VM. This analysis also then helps identify issues as they occur by isolating their root cause and expeditating their resolution.

- ***Hardware passthrough positions Huawei DCS to achieve higher levels of performance.*** Server, network, and storage virtualization technolgoies found in hypervisors each equip enterprises to achieve higher levels of hardware efficiency. However, sometimes in order to achieve these higher hardware utilization rates, enterprises must compromise on performance.

  The hardware passthrough feature available in the Huawei DCS helps compensate for this typical hypervisor drawback. Its Data Plane Development Kit (DPDK) significantly shortens the forwarding path on the network that connects the DCS nodes. This technology helps substantiate Huawei's claims the Huawei DCS achieves performance metrics comparable to physical devices.

- ***Positions enterprises to achieve near-zero downtime, recoveries, and failovers.*** Enterprises often must achieve high levels of availability and fast failovers be it onsite, a second site, or the cloud. Huawei DCS offers multiple replication technologies that enterprises may need to achieve competing objectives or overcome specific limitations.

  For instance, Huawei DCS offers asynchronous and synchronous replication, asynchronous and synchronous mirroring, and continuous snapshots that enterprises may choose to implement. These multiple replication options give enterprises flexibility to meet specific recovery or uptime requirements or budget or technical constraints.

Supporting GPUs and GPU partitioning between VMs may emerge as prerequisites for enterprises seeking an alternative VMware vSphere solution. Microsoft Azure Stack HCI checks these two boxes.

Microsoft Azure Stack HCI

Microsoft distinguishes Azure Stack HCI by delivering it as a hybrid service. Using this design methodology, Microsoft introduces the benefits of Microsoft Azure into Azure Stack HCI. For instance, using Microsoft Azure Update Manager, an enterprise may manage and update its on-premises Azure Stack HCI deployment(s). Azure Stack HCI deployments also gain unrestricted access to Microsoft Hyper-V and its features.

To implement Azure Stack HCI on-premises, an enterprise may choose from two approaches.[8] The integrated system option delivers Azure Stack HCI in a hardware-as-a-service model. This choice delivers the hardware and software preinstalled from the hardware provider.

Alternatively, an enterprise may choose to buy validated nodes. If pursuing this option, an enterprise assumes the responsibility for acquiring, sizing, and building out the underlying hard-ware. This involves using the Azure Stack HCI sizing tool to estimate hardware requirements.

Additional features Microsoft Azure Stack HCI offers that help differentiate it from other TOP 5 VMware vSphere alternative solutions include:

- ***Azure Migrate can discover, assess, and migrate VMware VMs to Azure Stack HCI.*** Finding a suitable replacement for VMware vSphere represents only part of the challenge of adopting an alternative VMware vSphere solution. Migrating existing VMware VMs to the alternative solution represents an equally great challenge.

  Adopting Azure Stack HCI gives an enterprise access to its Azure Migrate tool. An enterprise may first use Azure Migrate to discover and assess VMs running in its current VMware environment.[9] Once Azure Migrate completes its assessment, an enterprise may then use it to migrate VMware VMs to Azure Stack HCI.[10]
- ***Run applications, VMs, or container-based workloads anywhere—on-premises or in the cloud.*** VMware vSphere's hybrid cloud functionality appealed to many enterprises. This feature offered them the flexibility to run applications, VMs, or container-based workloads both on-premises and in multiple general-purpose clouds. Microsoft Azure Stack HCI provides similar functionality. Using Azure Stack HCI, an enterprise may run applications, VMs, or container-based workloads either on-premises or in Microsoft Azure. They may then manage both the on-premises and cloud workloads from the Azure Portal.
- ***Supports GPU partitioning.*** Enterprises continue to deploy Nvidia GPUs in their enterprise servers to accelerate the performance of their hosted VMs. As such, supporting GPUs and GPU partitioning between VMs may emerge as prerequisites for enterprises seeking an alternative VMware vSphere solution. Microsoft Azure Stack HCI checks these two boxes. Using Azure Stack HCI's GPU partitioning, each VM gets a dedicated fraction of the GPU. This feature uses Single Root IO Virtualization that creates a hardware-backed security boundary with predictable performance for each VM.[11]

NCI's support of three different hypervisors gives enterprises more time to choose an alternative to VMware vSphere. An enterprise may even opt to continue running vSphere Standard on NCI if needed or desired.

Nutanix Cloud Infrastructure

Nutanix Cloud Infrastructure (NCI) distinguishes itself by providing a hyperconverged infrastructure (HCI) solution that supports three different hypervisors. These include Microsoft Hyper-V, VMware vSphere, and the Nutanix Acropolis Hypervisor (AHV). NCI's support of three different hypervisors gives enterprises more time to choose an appropriate alternative to VMware vSphere. An enterprise may even opt to continue running vSphere Standard with a subscription on NCI if needed or desired.

NCI delivers storage services by running a Nutanix Controller VM (CVM) on every Nutanix node in a cluster. All CVMs work as one to create an aggregated, global storage pool with a distributed, shared-nothing infrastructure. Any guest VM hosted on the NCI may access and consume any storage resources in this storage pool. Nutanix includes such features as compression, deduplication, HA replication, and snapshots among its many storage services.

Additional features NCI offers that help differentiate it from other TOP 5 VMware vSphere alternative solutions include:

- ***Three NCI editions to meet specific enterprise needs.*** Every enterprise has applications, business units, and/or workloads with specific needs. To accommodate these differing requirements, Nutanix offers three NCI editions. These include:
  - **NCI Starter.** Nutanix targets Starter for small-scale, on-premises deployments with a limited number of workloads. It contains a core set of software functionality that an enterprise might expect. These include its AHV hypervisor, application-consistent snapshots, asynchronous replication, and VM-centric snapshots and clones, among others.
  - **NCI Pro**. Pro contains many additional features that enterprises operating both on-premises and in the cloud need. It contains all the features found in Starter plus introduces more data services, higher resilience, and better management. It offers VM Centric Storage quality of service (QoS), multiple site DR, and vGPU and GPU Passthrough, among others, to deliver on these functions.
  - **NCI Ultimate.** Ultimate contains all the features of Starter and Pro plus additional ones to address more complex infrastructure challenges. Enterprises that need to deploy NCI in multiple sites and that possess advanced security requirements will find Ultimate most appropriate. To deliver these capabilities it includes Metro Availability, synchronous replication, and encryption for data at rest, among others.
- ***Database certification with SAP HANA and Oracle RAC.*** Enterprises running high performance databases on VMs often rely upon external storage arrays to meet these performance demands. To address these concerns, Nutanix has certified NCI's storage with SAP HANA and Oracle RAC to demonstrate its performance capabilities. Nutanix has found NCI's application I/O performance, latency, transactions per second, and data services now match typical SAN metrics.
- ***Free and third-party software tools available to migrate ESXi VMs to Nutanix AHV.*** Nutanix includes its own software tools to help enterprises migrate ESXi VMs to Nutanix AHV. The Nutanix Image Service imports any images (ISO files or disk images) supported in ESXi directly into AHV. It can also perform test VM migrations as well as small-scale or staged migrations to AHV. However, Nutanix Image Service only supports manual migration. To address this drawback, Nutanix partners with third parties that can help simplify and automate VM migrations to AHV.

VergeOS implements multi-tenancy by creating multiple virtual data centers (VDCs). Enterprises may then manage and use each VergeOS VDC like they manage and use the VPCs available in general-purpose public clouds.

VergeIO VergeOS

VergeIO distinguishes VergeOS by delivering its self-described next iteration of the hyper-converged infrastructure: the ultraconverged infrastructure (UCI). Rather than simply virtualizing the normal server stack (compute, networking, and storage), VergeOS tackles virtualizing the entire data center.

VergeIO starts by installing VergeOS on bare metal servers. It then brings the servers' hardware resources under its management, catalogs these resources, and makes them available to VMs. By the VergeOS directly accessing and managing the server's hardware resources, it optimizes those resources in ways other hypervisors often cannot.

For instance, VergeOS's deduplication feature globally deduplicates all data stored across all the storage resources it manages. While deduplication provides the expected data reduction benefits, it also positions enterprises to more effectively and efficiently perform other tasks. These include taking and replicating space-efficient VM clones and snapshots to other clusters. It also well-positions VergeOS to operate in edge environments with fewer resources.

Other features that the VergeIO VergeOS offers that help differentiate it from other TOP 5 VMware vSphere alternative solutions include:

- ***Delivers multi-tenancy by creating multiple virtual data centers.*** Multi-tenancy often gets deployed by only logically grouping certain resources and users together. VergeOS implements multi-tenancy by creating a virtual data center (VDC).

  This new VDC has its own compute, network, storage, management US, and even its own mini-VergeOS instance assigned to it. Enterprises may then manage and use each VergeOS VDC much like they manage and use the virtual private clouds (VPCs) offered by general-purpose public cloud providers.

- ***Offers a VMware service within a VDC to facilitate VMware vSphere migrations.*** VergeOS offers its own VMware service that enterprises may leverage to facilitate migrating existing vSphere VMs onto a VergeOS VDC. Once an enterprise creates a VDC, an administrator points the VergeOS VDC VMware service to an existing VMware vSphere instance.

  The administrator enters the vSphere instance's username and password to gain access to vSphere. The VergeOS VDC VMware service then displays all the VMs in that vSphere environment.

  The administrator then needs to select the VMs that it wants to migrate to VergeOS and click "Import" to start the migration. As VergeOS imports the vSphere VMs, an enterprise may start using the VMs immediately. Alternatively, the enterprise may test the imported VMs to ensure they work in the VDC environment while the source VMs continue to run in production.

- ***Uses per physical machine all-inclusive software licensing.*** VergeIO licenses VergeOS by each physical machine, or node, in a VergeOS cluster. VergeIO uses an all-inclusive software licensing model for VergeOS. Each software license includes VergeOS' full complement of server virtualization, networking, and storage capabilities.

  Further, VergeIO does not require enterprises to adhere to a hardware compatibility list (HCL) or certified vendor list when selecting server hardware.[12] While VergeIO does have minimum physical server hardware guidelines, enterprises may find they can re-use available existing servers to host VergeOS.[13]

VMware vSphere Alternative Solution Inclusion Criteria

In considering solutions for inclusion in this report, a VMware vSphere Alternative solution must meet the following criteria:

- Offers a virtualization solution for compute, networking and storage with a hypervisor.
- Intended for use by enterprises that reside anywhere globally.
- May be software-only that runs on standard x86 hardware or select OEM server platforms.
- May be pre-integrated appliance that includes all needed hardware and software.
- Shipping and available by June 1, 2024.
- Sufficient information available for DCIG to make an informed, defensible decision.

DCIG Disclosures

Providers of some of the VMware vSphere alternative solutions covered in this DCIG TOP 5 report are or have been DCIG clients. This is not to imply that their solution was given preferential treatment in this report. In that vein, please keep the following points in mind when considering the information contained in this TOP 5 report:

- No provider paid DCIG a fee to research this topic or arrive at predetermined conclusions.
- DCIG did not guarantee any provider that its solution would be included in this TOP 5 report.
- DCIG did not imply or guarantee that a specific solution would receive a TOP 5 designation.
- All research is based upon publicly available information, information shared by the provider, and the expertise of those evaluating the information.
- DCIG conducted no hands-on testing to validate how or if the features worked as described.
- No negative inferences should be made against any provider or solution not covered in this TOP 5 report.
- It is a misuse of this TOP 5 report to compare solutions included in this report against solutions not included in it.

No provider was privy to how DCIG weighted individual features. In every case the provider only found out the ranking of its solution after the analysis was complete. To arrive at the TOP 5 solutions included in this report, DCIG went through a seven-step process to come to the most objective conclusions possible.

1. DCIG established which features would be evaluated.
2. The features were grouped into five general categories.
3. DCIG weighted each feature to establish a scoring rubric.
4. DCIG identified solutions that met DCIG's definition for a VMware vSphere solution.
5. A survey was completed for software or pre-integrated appliance (hardware + software) competitor to VMware vSphere.
6. DCIG evaluated each VMware vSphere alternative solution based on information gathered in its survey.
7. Solutions were ranked using standard scoring techniques. ■

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