

Critical Capabilities for Hyperconverged Infrastructure Software

Published 17 November 2021 - ID G00742565 - 24 min read

By Analyst(s): Philip Dawson, Jeffrey Hewitt, Julia Palmer, Tony Harvey

Initiatives: [Data Center Infrastructure](#); [Cloud and Edge Infrastructure](#)

Hyperconverged infrastructure software critical capabilities span compute, storage, networking and management. I&O leaders should select HCI software when it addresses their requirements in the four use cases of cloud-native, edge, hybrid cloud and virtual desktop infrastructure.

This Critical Capabilities is related to other research:

[Magic Quadrant for Hyperconverged Infrastructure Software](#)

[View All Magic Quadrants and Critical Capabilities](#)

Overview

Key Findings

- Hyperconverged infrastructure (HCI) software is a mature market. Vendors' positions have consolidated with the pandemic; use cases have stabilized around hybrid cloud, edge and virtual desktop infrastructure (VDI). Only the cloud-native use case is a new direction tied to application development.
- While many infrastructure and operations (I&O) leaders believe that HCI offers an on-premises "cloudlike infrastructure," traditional and alternative architectures, as well technical specialists, are factors for any well-managed digital infrastructure.
- I&O leaders continue to leverage HCI for edge computing use cases, but scale, security and management challenges remain.
- The desire for increased simplicity, efficiency and agility, combined with hybrid cloud deployments and virtualization refresh cycles, is driving enterprises toward hyperconverged infrastructure.

Recommendations

I&O leaders responsible for data center infrastructure should:

- Select HCI projects by examining products with strong cloud capabilities, including hybrid cloud, API, and/or application portability, automation and management.
- Drive IT projects toward the applications tied to business use cases, and then select HCI as needed. Do not assume HCI is a target for every project.
- Start HCI pilots during refresh of virtualization infrastructure in hybrid cloud and virtual desktop infrastructure use cases, especially in organizations new to HCI.
- Drive HCI solutions as part of an overall integrated systems and intelligent platform strategy by enabling administration, application and automation functions.

Strategic Planning Assumptions

By 2027, 60% HCI will be equally distributed across hosted data centers, cloud and edge, up from less than 30% in 2021.

By 2026, over 45% of HCI units will be deployed at edge locations, which is a substantial increase from fewer than 15% in 2021.

What You Need to Know

The hyperconverged infrastructure market has evolved; there has been a distinct bifurcation, with hyperconverged integrated systems (HCIS) as the direction driven by hardware providers, and HCI software driven by the software providers. The latter is the focus of this analysis and is distinct from the former, because it supports and is sold on server hardware solutions from multiple server providers.

HCI software has become the mechanism for driving a wider array of solutions. Some of those solutions focus on market niches that may align with specific use cases or particular geographies. Other HCI software solutions are focused broadly on more cloud-related functionality.

The HCI space has been impacted by the COVID-19 situation. The most prevalent impact has been the requirement by many organizations to enable remote working. This has sustained VDI as an important use case for HCI software deployments. Other use cases related to the public cloud have continued to evolve more dramatically. Edge continues to be a challenge beyond remote office/branch office (ROBO) for HCI vendors, and many niche vendors are strong in the edge use case in distinct verticals like manufacturing, retail and distribution, and defense.

As it has promised since it first appeared in the market, HCI software can be an enabling architecture for the hybrid cloud. Like public cloud infrastructure, HCI software is software-defined and API-driven, meaning that it can be managed using the same tools and techniques used to manage the public cloud. Many HCI software vendors have extended beyond hybrid cloud to support cloud-native applications by introducing support for both software containers as well as Kubernetes. Some HCI software providers have extended the use of their tools to manage applications in a number of the largest public cloud provider environments, like Alibaba Cloud, Amazon Web Services (AWS), Google Cloud Platform (GCP) and Oracle Cloud.

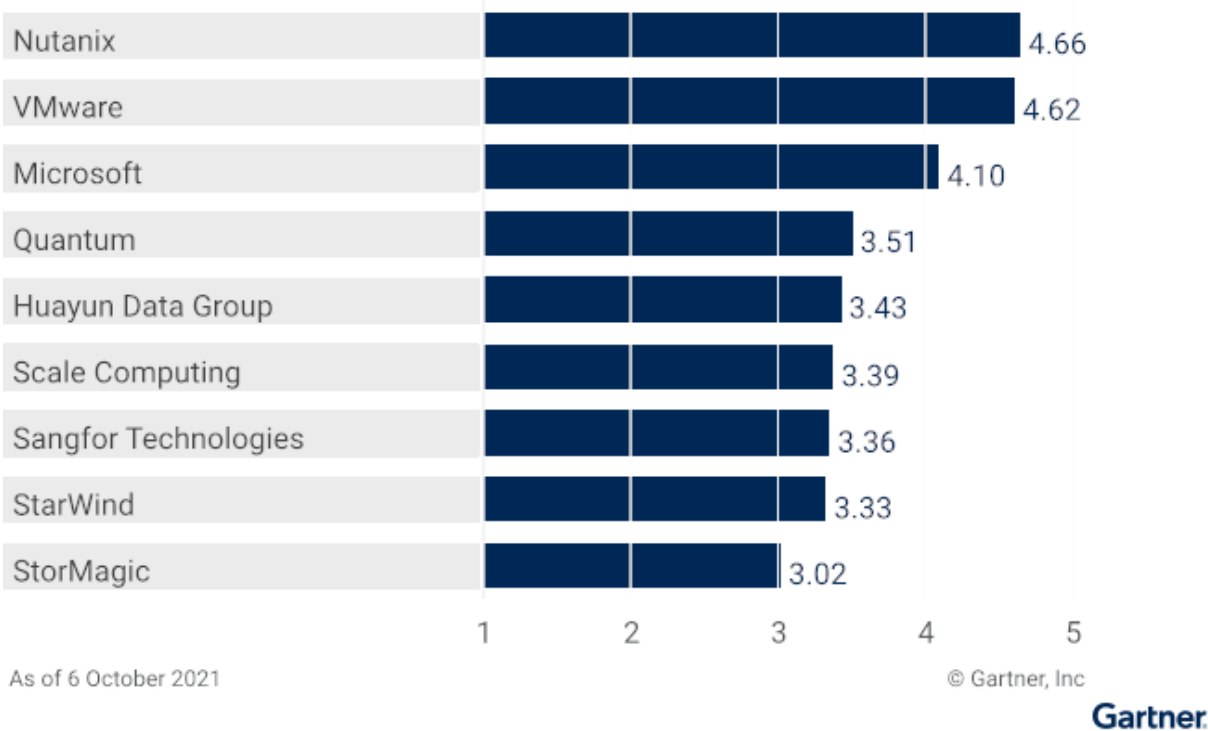
Finally, the HCI software market is now mature on many fronts, to an extent that all use cases are led by the same three vendors. One observation is that while HCI is core to vendors like Nutanix, it is more tangential to vendors like Microsoft and VMware that drive HCI through adjacent markets. Indeed, in just the edge use case, Microsoft scores near parity with VMware and Nutanix.

Analysis

Critical Capabilities Use-Case Graphics

Vendors' Product Scores for the Hybrid Cloud Use Case

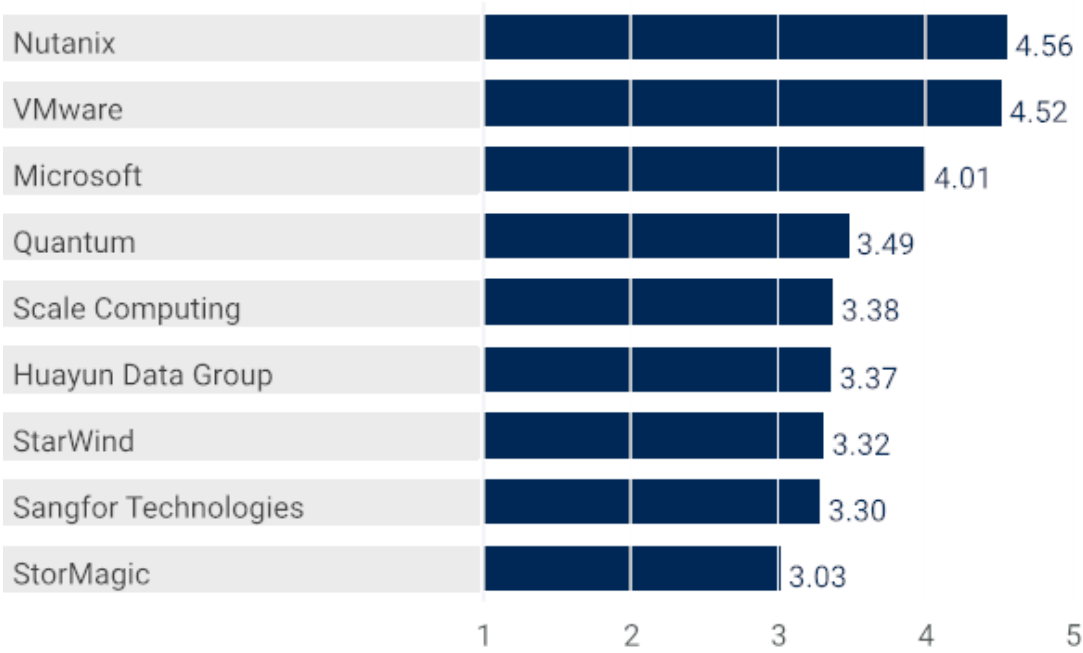
Product or Service Scores for Hybrid Cloud



Source: Gartner (November 2021)

Vendors' Product Scores for the Cloud-Native Use Case

Product or Service Scores for Cloud-Native



As of 6 October 2021

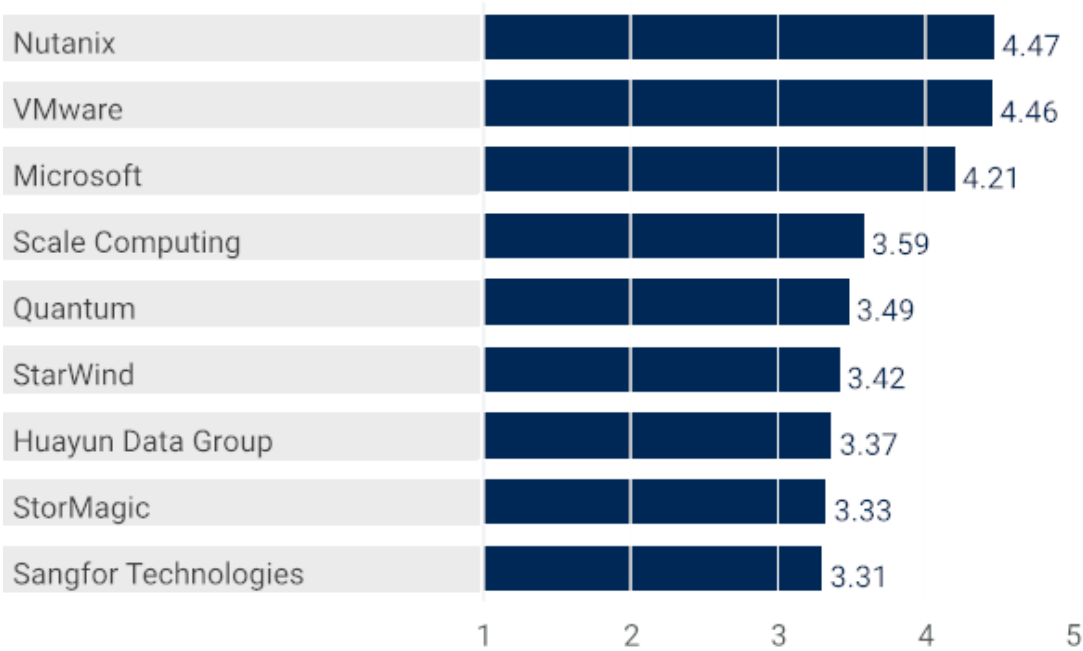
© Gartner, Inc



Source: Gartner (November 2021)

Vendors' Product Scores for the VDI Use Case

Product or Service Scores for VDI



As of 6 October 2021

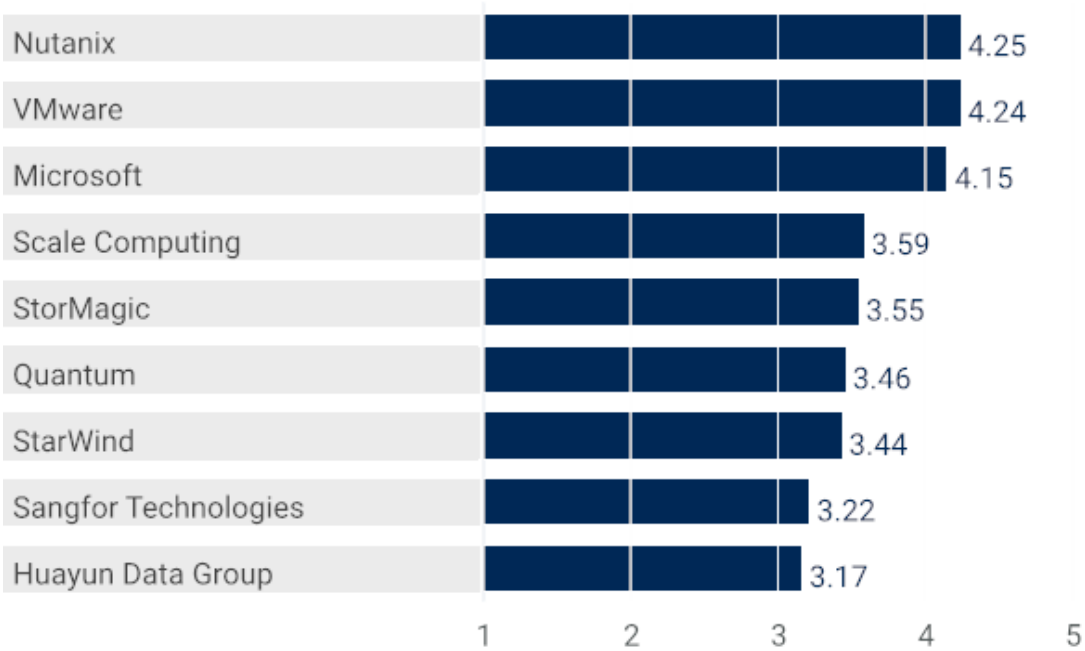
© Gartner, Inc



Source: Gartner (November 2021)

Vendors' Product Scores for the Edge Use Case

Product or Service Scores for Edge



As of 6 October 2021

© Gartner, Inc



Source: Gartner (November 2021)

Vendors

Huayun Data Group

Huayun Data Group's HCI software offerings are Archer OS and Maxta, which support Huayun KVM, IBM Power.KVM, Kubernetes, OpenStack KVM, Red Hat KVM and VMware vSphere. Huayun Data Group's HCI software supports industry-standard x86 and Arm servers, REST APIs, and cloud management plug-ins for Alibaba Cloud, Huayun public cloud, bare metal physical machines and IBM Power.

In the past year, Huayun Data Group has introduced two-node HCI products for edge computing use cases that offer fault tolerance. Huayun Data Group also introduced its cloud management platform, Huayun Cloud Manager, which includes ArcherOS and Maxta, and provides Kubernetes cluster and application management capabilities. Archer and Maxta do not support Microsoft's Hyper-V.

Huayun Data Group's highest score is in the hybrid cloud and cloud-native use cases. Hybrid cloud is one of the top use cases on which Huayun Data Group focuses by supporting proactive failure analysis and data backup and migration functions. For the Cloud Native use case, Huayun provides technical support for software containers, Kubernetes and life cycle application management. In addition, Huayun also provides the mixed orchestration capability of containers and VMs, enabling Layer 2/Layer 3 network connectivity for heterogeneous resources such as Kubernetes, VMs and bare metal.

Microsoft

Microsoft's Azure Stack HCI is an on-premises hyperconverged solution, managed from the Azure cloud that runs Windows and Linux OSs and selects Azure services such as the Azure Kubernetes Service (AKS) to run containers. Management can be done locally through Windows Admin Center and PowerShell or through Azure Portal and Azure Arc. Azure Stack HCI is supported on a variety of server solutions from Cisco, Dell EMC, Ericsson, Fujitsu, Hewlett Packard Enterprise, Hitachi, Hitachi Vantara, Inspur, Intel, Lenovo, NEC, QCT and Supermicro.

While the HCI storage technology is still available as part of Windows Server Datacenter edition, Azure Stack HCI only supports the Hyper-V hypervisor, network and HCI storage functionality that enable guest OSs to be installed on the HCI infrastructure. It supports stretch clustering for fault tolerance with asynchronous and synchronous replication, one-touch upgrades and other features that have been common in other vendors' HCI stacks. Its differentiation is the tight integration with Azure Cloud and the ability to use Azure services, such as, AKS, Azure Site Recovery and Azure Backup from within the Azure Stack HCI management tools.

Azure Stack HCI's highest-rated use cases are hybrid, native cloud and edge. For cloud use cases, the cloud-based management and support for AKS provide both hybrid and cloud-native services. For the edge use case, Azure Stack HCI provides a cost model based on physical CPU cores that scales down to edge-based solutions, and also provides cloud-based management, backup and replication.

Nutanix

Nutanix offers one of the most comprehensive and mature products in the HCI software market. Its platform includes the AHV hypervisor and also supports the Microsoft Hyper-V and VMware ESXi hypervisors. Nutanix's HCI solution includes data services with Nutanix Volumes, Objects and Files; Prism for management; Flow for application security; Karbon for Kubernetes orchestration; Era for database management; Calm for application management; Leap for disaster recovery (DR); and Mine for backup. Nutanix HCI software can be deployed on many server platforms, including OEM appliances (Hewlett Packard Enterprise [HPE DX], Dell EMC XC, Lenovo HX, Fujitsu XF and Inspur inMerge), Nutanix-branded appliances (NX), third-party server hardware platforms and bare-metal Amazon Elastic Compute Cloud (EC2) instances.

Nutanix has licensing portability between different hardware platforms and private and public clouds. Recently, the vendor enhanced Nutanix Clusters public cloud integration with the ability to hibernate and resume virtual machines (VMs); this is now available on AWS. Nutanix also expanded its cloud-native Kubernetes support to include Red Hat OpenShift deployments. In addition, Nutanix has delivered new ransomware prevention, detection and recovery capabilities built into its network, compute, storage and backup/DR stack. Nutanix scores high in all use cases of this research and has been leading the market in the hybrid cloud and cloud-native use cases, with a marginal lead in edge and VDI use cases. Due to the rich feature set and broad data services, Nutanix is becoming the platform of choice for data center consolidation, and is being used to a lesser extent at the edge and small-scale deployments.

Quantum

Quantum (formerly Pivot3) Acuity HCI software supports VMware's ESXi, including versions 6.0, 6.5 and 6.7, with 7.0 still under qualification. The Pivot3 Management Application and VMware vCenter Plugin leverage the Pivot3 REST API for all management functions. Quantum Acuity HCI software is certified on a number of server provider's solutions including specific models from Dell Technologies, Lenovo, and Supermicro.

In the past year, Quantum has added Automated Upgrade Orchestration, a Health and Best Practices analyzer and passthrough GPU failover automation. Quantum has upgraded its customer support to include a self-service customer support portal and knowledge base and a full-featured resource point for upgrades, troubleshooting and other step-by-step procedures. Microsoft Hyper-V, KVM and Xen hypervisors are supported only as external hosts.

Quantum's top HCI software use cases are hybrid cloud and cloud-native. Quantum's focus on the hybrid cloud use case is intended to enable simplified management at scale through automation and intelligence. For the cloud-native use case, Quantum Acuity HCI seeks to enable comprehensive cloud video analytics on a resilient and scalable on-premises platform.

Sangfor Technologies

Sangfor Technologies' HCI is built on business-centric hyperconverged infrastructure. Sangfor HCI is the building block for Sangfor's HCI initiatives predominantly for hybrid cloud transformation, network virtualization and data protection/DR. The company supplements its HCI functionality with additional components around aSV (Server Virtualization), aNET (Network Virtualization), aSAN (Storage Virtualization), and NFV (Network Function Virtualization) as the Sangfor Cloud Platform and Sangfor Edge Cloud.

Much of Sangfor's drive for innovation and differentiation lies in the combination of all-in-one management, "one stop" for security and virtual network integration. Sangfor also offers strong scaling and abstraction built on its own virtualization platform, with a hybrid and multicloud offering, which addresses reliability and availability across private and public clouds. The Sangfor Partner Engagement Program for software and integration is built on a solid service and support foundation, leveraging on-premises, public cloud-to-edge locations. Sangfor's effort on security and administration has progressed its capability across many use cases.

Sangfor's HCI offering, strongest in the hybrid cloud use case, where hardware and AI functions can assist management and tooling as a foundation for administration, application and automation efficiencies. Sangfor's HCI location-based critical capabilities also must continue to improve for the edge use case. While HCI has moved to a software play, Sangfor also must continue to integrate with hardware and OEM capabilities. Sangfor Hybrid Cloud shows potential in addressing the cloud-native use case.

Scale Computing

Scale Computing's HC3 software uses its own KVM-based hypervisor. Its HC3 HyperCore software can be managed through a local web-based console, through a web-based portal that is designed to scale to thousands of edge locations and through API integrations into common automation software such as Ansible. Scale's HCI software is certified on a number of server providers' solutions, including models from Dell Technologies, Fujitsu, Intel, Lenovo, NEC and Supermicro.

In the past year, Scale Computing has added deeper integration with operating systems and applications. The enhancements enable zero-touch provisioning of more complex solutions, desired-state configuration management and the ability to run Scale Computing software in GCP to enable a hybrid cloud solution.

Scale Computing scored just below the top three in three use cases, and did well in the edge and VDI use cases. Scale Computing has a strong focus on the edge use case, with its small software footprint and support for low-cost hardware, such as the Intel NUC. For the VDI use case, Scale Computing has strong support for VDI in edge locations as well as larger VDI solutions.

StarWind

StarWind's HCI offering is the StarWind Virtual SAN (VSAN) software. StarWind's HCI solution supports VMware, KVM, Zen and Hyper-V, but StarWind focuses on Hyper-V hypervisor deployments. StarWind Command Center is a single-pane-of-glass tool for working with multiple tasks on managing and monitoring IT infrastructure, storage, applications and service. StarWind HCI does not have official server OEM hardware certification and can be deployed on any x86 server hardware platform or StarWind-branded HyperConverged Appliance (HCA).

StarWind enhanced management and introduced advanced telemetry with proactive support services. It now supports nodes with all-nonvolatile memory express (NVMe) solid-state drives and introduced NVMe over fabrics/TCP support for Windows server deployments. In the last year, StarWind focused on performance, dedupe and compression with ZFS interoperability.

StarWind specializes in delivering reliable enterprise-grade, cost-effective solutions to midmarket customers. StarWind and its product are best-suited for small data centers and hybrid cloud and edge deployments.

StorMagic

StorMagic's HCI offering is SvSAN, a software product designed for edge computing use cases for distributed data centers and focusing on smaller HCI deployments. StorMagic supports VMware, Hyper-V and KVM hypervisors, but products are missing some enterprise features, data services and scalability compared to the market leaders. StorMagic is a highly flexible solution and can be deployed with any x86 server. SvSAN can scale out by adding compute nodes and support dissimilar server nodes in the cluster. StorMagic SvKMS provides enterprise key management for HCI customers requiring encryption and an integrated low-cost key manager.

Over the last year, StorMagic introduced "witness as a service," which provides remote quorum to eliminate the need for customers to deploy and manage the witness server themselves. It also added a Container Storage Interface (CSI) plugin to provide persistent storage for Kubernetes deployments. StorMagic can now be acquired as part of HPE GreenLake as-a-service program. StorMagic is adding digital repository services with its ARQvault product based on the recent acquisition of SoleraTec, a video and digital asset management software company.

Gartner clients have highlighted that StorMagic has demonstrated an efficient, reliable and performant solution for remote sites or small data centers based on a two-server nodes cluster pair. The product can utilize existing hardware as it has minimal hardware requirements as well as a single remote witness that can handle up to 1,000 edge locations.

StorMagic's highest scores were for the edge use case, as its product focuses on delivering cost-optimized, lightweight solutions for distributed data centers and edge deployments.

VMware

VMware's HCI combines vSAN, the VMware vSphere hypervisor (ESXi) and NSX networking. VMware provides a set of APIs with sample code for customers to automate their management tasks, and vSAN tightly integrates with other VMware products, such as vRealize Operations, vRealize Log Insight, vRealize Automation, and vRealize Orchestrator. VMware vSAN is certified on multiple servers from 15 different vendors, including Cisco, Dell Technologies, Ericsson, Fujitsu, HPE, Hitachi, Hitachi Data Systems, Inspur, Intel, Lenovo, NEC, QCT and Supermicro.

VMware has jointly engineered hybrid cloud and multicloud support with the leading public cloud providers, including Alibaba Cloud, AWS, Azure, GCP, IBM Cloud and Oracle Cloud to enable full-stack HCI deployments supported by a service consumption model. VMware partners with leading OEMs to provide on-premises infrastructure as a service, including Dell Technologies Cloud, HPE GreenLake and Lenovo TruScale, enabling customers to consume VMware HCI as a part of a fully managed on-premises service. VMware vSAN does not support Microsoft's Hyper-V, KVM or Xen hypervisors.

VMware vSAN's highest-rated use cases are hybrid cloud and cloud-native, with a high score across the board. To meet the needs of a hybrid cloud use case, vSAN enables infrastructure and operations to run, manage, connect and secure an entire application portfolio on hundreds of public clouds, including the top six hyperscale public cloud providers, without retraining VMware-experienced personnel. For the cloud-native use case, VMware HCI is designed to provide a developer environment that utilizes all of the VMware VM policy-based management and training with the integrated container orchestration and Kubernetes management tools.

Context

Hyperconverged infrastructure software provides virtualized compute, storage, networking and associated (cloud) management, all from a single instantiation running on server hardware. When the first HCI platforms emerged a decade ago, they were sold primarily as alternatives to expensive and complex storage arrays for VMware environments. These initial HCI solutions were sold primarily as appliances by a single hardware vendor — what Gartner defined as hyperconverged integrated systems (HCIS; see [Market Definitions and Methodology: Integrated Systems](#)).

The HCI software market is showing indications of increasing market maturity. Recent vendor consolidation and slowed revenue growth compared to previous years suggest that more acquisitions and mergers are likely, particularly among the niche vendors. It is also important to differentiate the nature of the HCI software vendor business models in comparing the providers as this market matures. As an example, for Nutanix, the sale of its HCI software is the strategic core of its business, from which it extends into other offerings. In contrast, HCI software is tactical for providers like Microsoft and VMware as a way to expand into the HCI space from their large installed bases in other businesses.

All HCI software, by definition, includes a certain set of functionality. Some of that functionality may be enabled by hypervisors, management tools and networking, or through only a storage platform combined with third-party software providers to complete the HCI software stack. That functionality is:

- Virtual compute, storage and networking, using a scale-out, shared-nothing architecture.
- Unified, “single pane of glass” management for virtual compute, storage and networking resources; for the purposes of this analysis, although network management is required, it can be enabled through integrated, third-party software by the HCI software provider.
- Local, direct-attached storage (DAS) in each node, used in place of a storage array.
- Enterprise-grade, high-availability (HA) and mobility, for both compute and storage.
- Enterprise-grade data services (e.g., deduplication, compression and erasure coding).
- Some level of choice of server and network hardware.

One of the attractions of HCI is the potential to create a cloudlike provisioning model, while maintaining physical control of IT assets and data on-premises in the data center, remote site or branch office. During the next few years, cloud deployment models will become increasingly important to meet short-term scale-up/scale-down requirements and backup and DR requirements. An important question for users is whether HCI is a stepping stone to the cloud or a “foreseeable future” resting place for applications and a good alternative to the public cloud from the performance, manageability at scale and cost perspectives. HCI is also meandering into “distributed cloud” (AWS Outposts, Google Anthos, Microsoft Azure Stack), as we expect the two markets to cross over and/or converge.

The adoption of HCI-based solutions continues to grow. However, with the exception of smaller organizations, HCI is unlikely to become a full-service platform for IT services for the entire portfolio. I&O leaders should evaluate HCI solutions and select vendors and products not because HCI or that vendor is growing rapidly, but rather because it fits with their particular use cases, growth expectations and application architecture direction. HCI is likely to become yet another silo to manage, so integration with higher-level management frameworks (including cloud management platforms) is key to supporting an already overtaxed operations staff.

Product/Service Class Definition

Critical capabilities are attributes that differentiate products/services in a class, in terms of their quality and performance. This methodology required analysts to identify the 11 critical capabilities for this HCI class of products. The following is a summary of the selected capabilities for each category.

Critical Capabilities Definition

Hardware

This critical capability assesses the integration of the vendor offerings with a range of hardware platforms and components.

Hypervisors

This critical capability assesses the breadth and depth of hypervisor support, predominantly for the hybrid cloud use case.

Containers

This critical capability assesses the breadth and depth of container support, predominantly for the cloud-native use case.

Data Services

This critical capability assesses the storage functions and services, backup, disaster recovery, and high availability as part of the storage offering and solution for all use cases.

AI Functions

This critical capability rates the ability of the product to leverage artificial intelligence, such as machine learning.

Management

This critical capability assesses the overall viability of key management and tooling differentiators. This includes management capabilities of all the other areas of focus in all use cases.

Software Stack

This critical capability assesses third-party stack integration as well as the vendor's own tools and infrastructure integration with alternate delivery models for all use cases.

Location

This critical capability assesses the ability of a solution to meet the price performance, availability and management requirements of remote locations, including remote office, branch office and edge.

Scaling

This critical capability assesses several key differentiators. This includes the related scale-up capabilities in the HCI node and the scale-out across nodes for either performance or availability.

Service and Support

This critical capability assesses the overall viability of service and support. This includes presales support, warranty and postsales support including help desk, escalations and engineering support for the HCI vendors and/or partners.

Security

This critical capability assesses security and compliance features of the vendor's HCI offerings.

Use Cases

Hybrid Cloud

This involves data center infrastructure HCI projects that consolidate n-tier architecture supporting core IT applications. HCI enables automation and hybrid cloud.

This use case is driven by cost/total cost of ownership (TCO savings).

Cloud-Native

Cloud-native HCI projects are deployments of new applications and rearchitected core IT applications in private, hybrid or public cloud deployments.

Edge

HCI projects support servers or edge gateways hosting and edge-based applications that interface with Internet of Things or sensor devices.

This also includes real-time processing, enabling and informing immediate, localized actions.

VDI

VDI benefits from HCI by simplifying the provisioning and hosting of user VMs in dedicated deployments. VDI is accessed over a LAN or WAN, using a remote display protocol.

Vendors Added and Dropped

Added

Quantum was added because it purchased Pivot3.

Dropped

DataCore Software was dropped because it was unable to meet the inclusion criteria.

Pivot3 was dropped because the company was purchased by Quantum.

Inclusion Criteria

The inclusion criteria represent the specific attributes that analysts believe are necessary for inclusion in this research. To qualify for inclusion, vendors need to meet the following criteria.

Functional Criteria

HCI software vendors must:

- Provide an integrated software stack, which includes unified management, and software-defined compute, storage and, optionally, networking.
- Combine VM and software-defined storage resources, both running on the same physical servers, as the primary deployment method.
- Virtualize local, internal and direct-attached storage, rather than shared networked storage, such as a storage area network and/or network-attached storage.
- Provide a mechanism to pool internal and direct-attached primary storage across servers into logical, abstracted virtual storage.
- Develop the storage and data management services integrated in the offering.

Business Criteria

HCI software vendors must:

- Provide evidence for each product to be evaluated of a minimum of 50 production customers brought to revenue; at least 25 in each of at least two of the major geographies (the Americas, EMEA and the Asia/Pacific/Japan region) in the 12 months ending 30 June 2021.
- Deliver complete Level 1 (call center/service desk) and Level 2 (escalation) support either directly or through a contracted service provider to facilitate quick and easy problem resolution. However, Level 3 (engineering) support can be delivered separately, based on vendors' engineering partnerships.
- Deliver solutions that meet user requirements in at least three of the use cases identified in this research: hybrid cloud, cloud-native, VDI and edge.
- Have delivered the product or products evaluated in this Critical Capabilities research in general availability by 30 June 2021.
- Provide HCI software that is portable to, sold within the past year to, and supported and qualified on branded x86 server hardware of at least two server providers, beyond any white-box or server hardware branded and badged with the HCI software provider's logo. At least one of those two server providers must be one of the top 10 x86-based server OEMs worldwide based on server vendor revenue estimates for 2021 published by Gartner. Those providers are Cisco, Dell Technologies, Fujitsu, H3C, HPE, Huawei, Inspur Electronics, Lenovo, Oracle and Supermicro.
- Own the software IP that enables the management functions and software-defined storage for their solution.

Table 1: Weighting for Critical Capabilities in Use Cases

(Enlarged table in Appendix)

Critical Capabilities ↓	Hybrid Cloud ↓	Cloud-Native ↓	Edge ↓	VDI ↓
Hardware	9%	7%	9%	7%
Hypervisors	15%	3%	4%	12%
Containers	8%	13%	2%	1%
Data Services	12%	11%	6%	11%
AI Functions	9%	13%	4%	4%
Management	12%	11%	18%	13%
Software Stack	8%	12%	8%	10%
Location	2%	6%	26%	15%
Scaling	11%	11%	2%	10%
Service and Support	6%	6%	6%	8%
Security	8%	7%	15%	9%
As of 6 October 2021				

Source: Gartner (November 2021)

This methodology requires analysts to identify the critical capabilities for a class of products/services. Each capability is then weighted in terms of its relative importance for specific product/service use cases.

Critical Capabilities Rating

Each of the products/services that meet our inclusion criteria has been evaluated on the critical capabilities on a scale from 1.0 to 5.0.

Table 2: Product/Service Rating on Critical Capabilities

(Enlarged table in Appendix)

<i>Critical Capabilities</i>	<i>Huayun Data Group</i>	<i>Microsoft</i>	<i>Nutanix</i>	<i>Quantum</i>	<i>Sangfor Technologies</i>	<i>Scale Computing</i>	<i>StarWind</i>	<i>StorMagic</i>	<i>VMware</i>
Hardware	2.8	4.0	4.6	3.8	2.8	2.7	2.7	2.6	4.3
Hypervisors	3.5	4.6	4.7	3.2	3.7	3.6	3.5	3.4	4.9
Containers	3.2	4.3	4.3	3.0	3.3	3.3	3.2	3.2	4.3
Data Services	3.5	4.4	5.0	3.5	3.0	3.2	3.3	2.5	4.8
AI Functions	3.0	2.1	4.5	3.4	3.0	2.5	3.0	2.0	4.5
Management	3.5	3.8	4.8	4.0	3.0	3.5	3.2	2.6	4.6
Software Stack	3.2	4.9	4.6	3.5	3.6	3.3	3.2	3.1	4.8
Location	2.8	4.4	3.0	3.0	2.8	4.4	4.0	4.9	3.2
Scaling	4.8	4.4	4.8	3.8	3.8	4.2	4.3	3.0	4.8
Service and Support	3.2	3.7	4.8	3.4	3.4	4.1	2.4	3.9	4.6
Security	3.2	4.3	4.6	3.5	4.1	3.2	3.8	4.0	4.6
As of 6 October 2021									

Source: Gartner (November 2021)

Table 3 shows the product/service scores for each use case. The scores, which are generated by multiplying the use-case weightings by the product/service ratings, summarize how well the critical capabilities are met for each use case.

Table 3: Product Score in Use Cases

(Enlarged table in Appendix)

Use Cases	Huayun Data Group	Microsoft	Nutanix	Quantum	Sangfor Technologies	Scale Computing	StarWind	StorMagic	VMware
Hybrid Cloud	3.43	4.10	4.66	3.51	3.36	3.39	3.33	3.02	4.62
Cloud-Native	3.37	4.01	4.56	3.49	3.30	3.38	3.32	3.03	4.52
Edge	3.17	4.15	4.25	3.46	3.22	3.59	3.44	3.55	4.24
VDI	3.37	4.21	4.47	3.49	3.31	3.59	3.42	3.33	4.46
As of 6 October 2021									

Source: Gartner (November 2021)

To determine an overall score for each product/service in the use cases, multiply the ratings in Table 2 by the weightings shown in Table 1.

Critical Capabilities Methodology

This methodology requires analysts to identify the critical capabilities for a class of products or services. Each capability is then weighted in terms of its relative importance for specific product or service use cases. Next, products/services are rated in terms of how well they achieve each of the critical capabilities. A score that summarizes how well they meet the critical capabilities for each use case is then calculated for each product/service.

"Critical capabilities" are attributes that differentiate products/services in a class in terms of their quality and performance. Gartner recommends that users consider the set of critical capabilities as some of the most important criteria for acquisition decisions.

In defining the product/service category for evaluation, the analyst first identifies the leading uses for the products/services in this market. What needs are end-users looking to fulfill, when considering products/services in this market? Use cases should match common client deployment scenarios. These distinct client scenarios define the Use Cases.

The analyst then identifies the critical capabilities. These capabilities are generalized groups of features commonly required by this class of products/services. Each capability is assigned a level of importance in fulfilling that particular need; some sets of features are more important than others, depending on the use case being evaluated.

Each vendor's product or service is evaluated in terms of how well it delivers each capability, on a five-point scale. These ratings are displayed side-by-side for all vendors, allowing easy comparisons between the different sets of features.

Ratings and summary scores range from 1.0 to 5.0:

1 = Poor or Absent: most or all defined requirements for a capability are not achieved

2 = Fair: some requirements are not achieved

3 = Good: meets requirements

4 = Excellent: meets or exceeds some requirements

5 = Outstanding: significantly exceeds requirements

To determine an overall score for each product in the use cases, the product ratings are multiplied by the weightings to come up with the product score in use cases.

The critical capabilities Gartner has selected do not represent all capabilities for any product; therefore, may not represent those most important for a specific use situation or business objective. Clients should use a critical capabilities analysis as one of several sources of input about a product before making a product/service decision.

Document Revision History

[Critical Capabilities for Hyperconverged Infrastructure Software - 9 December 2020](#)

[Critical Capabilities for Hyperconverged Infrastructure - 26 November 2019](#)

[Critical Capabilities for Hyperconverged Infrastructure - 28 November 2018](#)

[Critical Capabilities for Hyperconverged Infrastructure - 7 February 2018](#)

Recommended by the Authors

Some documents may not be available as part of your current Gartner subscription.

[How Products and Services Are Evaluated in Gartner Critical Capabilities](#)

[Magic Quadrant for Hyperconverged Infrastructure Software](#)

[Drive Administration, Application and Automation Capabilities of Infrastructure-Led Disruption](#)

[Data Center Infrastructure Primer for 2021](#)

© 2021 Gartner, Inc. and/or its affiliates. All rights reserved. Gartner is a registered trademark of Gartner, Inc. and its affiliates. This publication may not be reproduced or distributed in any form without Gartner's prior written permission. It consists of the opinions of Gartner's research organization, which should not be construed as statements of fact. While the information contained in this publication has been obtained from sources believed to be reliable, Gartner disclaims all warranties as to the accuracy, completeness or adequacy of such information. Although Gartner research may address legal and financial issues, Gartner does not provide legal or investment advice and its research should not be construed or used as such. Your access and use of this publication are governed by [Gartner's Usage Policy](#). Gartner prides itself on its reputation for independence and objectivity. Its research is produced independently by its research organization without input or influence from any third party. For further information, see "[Guiding Principles on Independence and Objectivity](#)."

Table 1: Weighting for Critical Capabilities in Use Cases

Critical Capabilities ↓	Hybrid Cloud ↓	Cloud-Native ↓	Edge ↓	VDI ↓
Hardware	9%	7%	9%	7%
Hypervisors	15%	3%	4%	12%
Containers	8%	13%	2%	1%
Data Services	12%	11%	6%	11%
AI Functions	9%	13%	4%	4%
Management	12%	11%	18%	13%
Software Stack	8%	12%	8%	10%
Location	2%	6%	26%	15%
Scaling	11%	11%	2%	10%
Service and Support	6%	6%	6%	8%
Security	8%	7%	15%	9%
As of 6 October 2021				

Source: Gartner (November 2021)

Table 2: Product/Service Rating on Critical Capabilities

<i>Critical Capabilities</i>	<i>Huayun Data Group</i>	<i>Microsoft</i>	<i>Nutanix</i>	<i>Quantum</i>	<i>Sangfor Technologies</i>	<i>Scale Computing</i>	<i>StarWind</i>	<i>StorMagic</i>	<i>VMware</i>
Hardware	2.8	4.0	4.6	3.8	2.8	2.7	2.7	2.6	4.3
Hypervisors	3.5	4.6	4.7	3.2	3.7	3.6	3.5	3.4	4.9
Containers	3.2	4.3	4.3	3.0	3.3	3.3	3.2	3.2	4.3
Data Services	3.5	4.4	5.0	3.5	3.0	3.2	3.3	2.5	4.8
AI Functions	3.0	2.1	4.5	3.4	3.0	2.5	3.0	2.0	4.5
Management	3.5	3.8	4.8	4.0	3.0	3.5	3.2	2.6	4.6
Software Stack	3.2	4.9	4.6	3.5	3.6	3.3	3.2	3.1	4.8
Location	2.8	4.4	3.0	3.0	2.8	4.4	4.0	4.9	3.2
Scaling	4.8	4.4	4.8	3.8	3.8	4.2	4.3	3.0	4.8

Service and Support	3.2	3.7	4.8	3.4	3.4	4.1	2.4	3.9	4.6
Security	3.2	4.3	4.6	3.5	4.1	3.2	3.8	4.0	4.6
As of 6 October 2021									

Source: Gartner (November 2021)

Table 3: Product Score in Use Cases

<i>Use Cases</i>	<i>Huayun Data Group</i>	<i>Microsoft</i>	<i>Nutanix</i>	<i>Quantum</i>	<i>Sangfor Technologies</i>	<i>Scale Computing</i>	<i>StarWind</i>	<i>StorMagic</i>	<i>VMware</i>
Hybrid Cloud	3.43	4.10	4.66	3.51	3.36	3.39	3.33	3.02	4.62
Cloud-Native	3.37	4.01	4.56	3.49	3.30	3.38	3.32	3.03	4.52
Edge	3.17	4.15	4.25	3.46	3.22	3.59	3.44	3.55	4.24
VDI	3.37	4.21	4.47	3.49	3.31	3.59	3.42	3.33	4.46
As of 6 October 2021									

Source: Gartner (November 2021)