Critical Capabilities for Hyperconverged Infrastructure Software

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Initiatives: Data Center Infrastructure; Cloud and Edge Infrastructure

Hyperconverged infrastructure software abstracts infrastructure that spans certified compute, storage, networking and management. I&O leaders should regard HCI software that helps address application support and requirements related to core IT, business-critical cloud, edge and VDI use cases.

This Critical Capabilities is related to other research:
Magic Quadrant for Hyperconverged Infrastructure Software
View All Magic Quadrants and Critical Capabilities

Additional Perspectives
- Invest Implications: Critical Capabilities for Hyperconverged Infrastructure Software
  (14 December 2020)

Overview

Key Findings
- A growing number of infrastructure and operations leaders believe that hyperconverged infrastructure (HCI) vendors are an on-premises “cloudlike infrastructure” solution for workload requirements; however, traditional and alternative architectures, as well as access to top-notch technical specialists, are factors for any well-managed digital infrastructure.

- I&O leaders are starting to leverage HCI for edge-computing use cases, but scale, cost, performance, security and management challenges remain.

- The desire for increased simplicity, efficiency and agility, combined with hybrid deployments and virtualization infrastructure refresh cycles, is driving enterprises toward hyperconverged infrastructure consolidation.

- Core IT and cloud use cases are catalysts for infrastructure refresh, cost optimization, transformation projects and deployments.
Recommendations

I&O leaders responsible for data center infrastructure should:

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

Strategic Planning Assumptions

By 2025, HCIs will be equally distributed across on-premises data centers, clouds and edges, migrating from 70% on-premises today.

By 2025, over 30% of HCI units will be deployed at edge locations, which is a substantial increase from fewer than 15% in 2020.

What You Need to Know

As the market has evolved, there has been a distinct bifurcation, with HCIS being one direction driven by hardware providers and HCI software being driven by and shifting the software providers. The latter is the focus of analysis and is distinct from the former because it supports and is sold on server hardware solutions from multiple server providers. This HCI software has become the mechanism for driving a wider array of solutions. Some of those solutions focus on market niches that may align to specific use cases or particular geographies. Other HCI software solutions are focused broadly on cloud-related functionality.

All HCI software, by definition, includes specific sets of functionality. That functionality is:

1. Virtual compute, storage and networking using a scale-out, shared-nothing architecture.
2. Unified, single-pane-of-glass management for virtual compute, storage and networking resources. (It should be noted that for the purpose of this particular analysis, while network management is required, it can be enabled through integrated third-party software by the HCI software provider.)
3. Local, direct-attached storage in each node, used in place of a storage array.
4. Enterprise-grade, high-availability and mobility, for both compute and storage.
5. Enterprise-grade data services (such as deduplication, compression and erasure coding).

6. Some level of choice of server and network hardware.

Some of that functionality may be enabled by their own hypervisors, management tools and networking or through only a storage platform combined with third-party software providers to complete the HCI software stack.

The rapid growth of public cloud has transformed infrastructure. Today, the typical IT organization has some infrastructure in the public cloud, some in data centers and some at the edge. This brings hybrid cloud architectures to the fore. Now, almost every data center is a hybrid data center. Connectivity to and portability between on-premises infrastructure and public cloud has become an ever more important design consideration for any data center.

Analysis

Critical Capabilities Use-Case Graphics

Vendors’ Product Scores for the Core IT Use Case

Product or Service Scores for Core IT

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As of 30 November 2020

Source: Gartner (December 2020)
### Vendors’ Product Scores for the Cloud Use Case

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As of 30 November 2020

Source: Gartner (December 2020)
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Product or Service Scores for Edge

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Source: Gartner (December 2020)
Vendors’ Product Scores for the Mission-Critical Use Case

Product or Service Scores for Mission-Critical

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Source: Gartner (December 2020)
### Vendors’ Product Scores for the VDI Use Case

**Product or Service Scores for VDI**

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As of 30 November 2020

Source: Gartner (December 2020)

### Vendors’ Product Scores for Edge Use Case

**Product or Service Scores for Edge**

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Source: Gartner (December 2020)
Vendors

DataCore

DataCore’s HCI software offering is DataCore Hyperconverged Virtual SAN. It supports Microsoft Hyper-V, Kernel-based Virtual Machine (KVM), VMware vSphere, Xen hypervisors, and container and container management solutions, including Docker, Kubernetes and LXC. Management can be done through a local console, integrations into vCenter and SCVMM, its SaaS-based analytics tool, or through a REST-based API. DataCore’s HCI software supports industry-standard x86 servers across multiple vendors.

DataCore has enhanced its HCI software offerings to add automated operational monitoring service and analytics features as well as providing scalability and performance improvements.

DataCore scored consistently across all use cases and has good support for the edge use case, where it supports a wide variety of industry-standard hardware and permits the integration of existing storage solutions. For the cloud use case, it supports tiering of cold data to the cloud as well as a cloud-based analytics and management solution.

HUAYUN Data Group

HUAYUN Data Group’s HCI software offerings are Archer OS and Maxta. Archer OS and Maxta support a range of hypervisors, such as VMware ESXi, HUAYUN’s own KVM and other open KVMs. HUAYUN Data Group’s HCI software supports various brands of ARM and industry-standard x86 servers. It also provides RestAPIs and cloud management plug-ins for the Alibaba Cloud and the HUAYUN Public Cloud.

HUAYUN Data Group has enhanced its HCI software offerings in the past year to add VDI, CMP, networking capabilities such as ArSDN to manage multiple hybrid clusters, and in the storage area with Metro Storage Cluster for high reliability. It has also added automated operational monitoring service and analytics features. Archer and Maxta do not support Microsoft’s Hyper-V.

HUAYUN Data Group scored highest in the cloud, core IT and mission-critical use cases. Cloud is one of the top use cases on which HUAYUN Data Group focuses by facilitating centralized management and proactive failure analytics with its cloud management platform. For the core IT use case, HUAYUN supports a wide selection of industry-standard hardware and permits the independent scaling of compute and storage.

Microsoft

Microsoft Azure Stack HCI is a product in transition. Originally embedded into the Windows Server Datacenter Edition OS, with some management and integration with Azure Cloud, Azure Stack HCI is now an Azure service that can host Windows and Linux OSs on-premises. Management can be done locally through Windows Admin Center and powershell or through the Azure Cloud portal and API. Azure Stack HCI is supported on a variety of server solutions from Cisco, Dell EMC, Ericsson, Fujitsu, Hewlett Packard Enterprise, Hitachi Ltd., Hitachi Vantara, Inspur, Intel, Lenovo, NEC, QCT and Supermicro.
The latest version of Azure Stack HCI has been refactored and decoupled from the Windows OS. Unlike previous versions, Azure Stack HCI now provides only the Hyper-V Hypervisor, Network and HCI storage functionality that enables guest OSs to be installed on the HCI infrastructure. It now 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 Azure Site Recovery and Azure Cloud Backup from within the Azure Stack HCI management tools.

Azure Stack HCI's highest-ranked use cases are mission-critical, edge and VDI. To meet the needs of a mission-critical IT use case, Azure Stack HCI offers general-purpose infrastructure for hosting VMs that can be easily replicated or backed up into the Azure Cloud. For the edge use case, Azure Stack HCI provides a cost model, based on physical CPU cores, that scales down to edge-based solutions, as well as providing 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 Microsoft Hyper-V, VMware ESXi and XenServer hypervisors. The Nutanix HCI solution is composed of additional capabilities such as data services with Nutanix Volumes, Objects and Files, Nutanix Prism for management, Nutanix Flow for application security, Karbon for Kubernetes orchestration, Era for database management, Calm for application management, Leap for disaster recovery, and Mine for backup. Nutanix HCI software can be deployed on many server platforms, such as Nutanix-branded appliances (NX), OEM appliances (HPE DX, Dell EMC XC, Lenovo HX, Fujitsu XF and Inspur InMerge), and third-party hardware platforms (Cisco, HPE and others).

Recently the vendor introduced Nutanix Clusters to support Nutanix HCI software in public cloud IaaS and enable hybrid cloud workflow (available in Amazon Web Services [AWS]). Over the last year, Nutanix expanded and enhanced its as-a-service offering into databases, disaster recovery and desktops. It also improved performance of the underlying platform and enhanced many management, disaster recovery and data services capabilities. Nutanix customers, like others, are now switching to software subscription licensing and can benefit from license migration between on-premises and cloud deployments.

Nutanix scores high in all use cases of this Critical Capabilities and has been leading the market in the core IT, mission-critical and cloud use cases. Nutanix is becoming the platform of choice for data center consolidation, although it has less focus on the edge or small-scale deployments.

**Pivot3**

Pivot3's Acuity HCI software supports VMware's ESX, including versions 6.0, 6.5 and 6.7, with 7.0 expected in 3Q20. The Pivot3 Management Application (P3MgmtApp) and vCenter Plugin leverage the Pivot3 REST API for all management functions. Pivot3’s HCI software is certified on a number of server providers’ solutions, including specific models from Dell Technologies, Lenovo and Supermicro.
In the past year, Pivot3 has added additional innovations in its Intelligence Engine to enhance REST APIs for faster application deployment times and has added the replication of encrypted volumes with integrated, policy-based key management. Pivot3 also upgraded its Customer Support Portal to include a Self-Service Customer Support Portal and Knowledge Base and enhanced its remote installation services. Microsoft Hyper-V, KVM and Xen hypervisors are supported only as external hosts (that is, not running internally on the Pivot3 nodes).

Pivot3’s top HCI software use cases are mission-critical, VDI and edge. Pivot3’s focus on the mission-critical use case stems from its enablement of security, evidence collection and national defense related to video surveillance and physical security requirements. Pivot3 specializes in high-performing VDI deployments with a packaged VDI solution optimized for Security Operations Centers (SOCs).

**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 data center consolidation, cloud transformation, enterprise applications and data protection/disaster recovery (DR). The company supplements its HCI functionality with additional components around aSV (Compute Virtualization), aNET (Network Virtualization), aSAN (Storage Virtualization), and NFV (Network Function Virtualization).

Much of Sangfor’s new refreshing drive to innovation and differentiation lies in the combination of all-in-one management, “one stop” security and virtual network integration. Sangfor also offers strong scaling and abstraction built on its own virtualization platform, offering a service addressing reliability and availability. Sangfor has also worked on and improved its software and integration partners. This program is built on a solid service and support foundation, leveraging mission-critical and core IT functions. A refreshing addition has been Sangfor’s effort on security and administration, which has progressed its capability across many use cases.

Sangfor’s HCI offering could use improvement, especially where 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 improve for the edge use case and IoT requirements. While HCI has moved to a software play, Sangfor also must look at working better and integrating with hardware and OEM capabilities. Finally, data services are also moving from a controller and storage hardware base and to be driven as a software service.

Sangfor performs solidly in the mission-critical use case and shows potential in addressing the cloud use case. It also performs well in our other three use cases.

**Scale Computing**

Scale Computing’s HC3 software uses its own KVM-based hypervisor. Its HC3 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 Intel, Lenovo and SuperMicro.

In the past year, Scale Computing has added a large-scale management capability to its web portal and REST-based APIs to enable rapid centralized management and deployment of VMs and containers. It has also added nodes with all-NVMe storage for higher-performance solutions and GPU solutions for advanced VDI users and edge analytics.

Scale Computing scored consistently across all use cases and did well in the edge, mission-critical 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. Scale Computing’s capability in the mission-critical use case stems from its support for small and midsize businesses that run their entire infrastructure on the HC3 software.

**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, 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).

Over the last year, StarWind enhanced management and introduced advanced telemetry with proactive support services. It now supports nodes with all-NVMe SSDs and introduced NVMe-oF over TCP support for Windows server deployments.

StarWind specializes in delivering reliable enterprise-grade, cost-effective solutions to mid-market customers. StarWind scored well for most use cases, and its product is best-suited for small data centers and edge deployments.

**StorMagic**

StorMagic’s HCI offering is SvSAN, which is focused on edge computing mission-critical use cases for distributed data centers. 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 very flexible on hardware configurations and has worked with HPE, Lenovo, Cisco and Dell EMC to identify recommended configurations.

Over the last year, StorMagic introduced a push-button capability for remote deployments and launched a Witness as a Service and Key Management as a Service cloud service. StorMagic now has subscription pricing models and entered the HPE Complete program, which dramatically improved global support and services.
Gartner clients highlighted that StorMagic has demonstrated the lowest TCO to run high-availability remote sites based on two servers per site. 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 solutions for the federated data centers and edge deployments.

**VMware**

VMware’s vSAN supports the VMware vSphere hypervisor (ESXi). VMware provides a set of APIs with sample code, and vSAN tightly integrates with other VMware products, such as vRealize Suite and vRealize Automation. VMware vSAN is supported on a variety of server solutions from Cisco, Dell EMC, Ericsson, Fujitsu, Hewlett Packard Enterprise, Hitachi Ltd., Hitachi Vantara, Inspur, Intel, Lenovo, NEC, QCT and Supermicro.

VMware has jointly engineered hybrid cloud support with the leading public cloud providers, including AWS, Azure, GCP, Oracle Cloud, Alibaba Cloud and IBM Cloud. VMware also has continued to expand partnerships with regional service providers and has more than 500 partners, which offer VMware HCI as public cloud infrastructure to customers. VMware vSAN does not support KVM, Xen or Microsoft’s Hyper-V hypervisors.

VMware vSAN’s highest-ranked use cases are core IT, VDI and edge. To meet the needs of a core IT use case, VMware HCI offers general-purpose infrastructure that unites block storage and file storage, using a single toolset to manage both the compute and storage infrastructure. For the VDI use case, VMware HCI provides instant clones for rapid provisioning.

**Context**

Hyperconvergence continues to grow as a segment of the integrated infrastructure systems market. The provider landscape consists of leaders in adjacent markets, a stand-alone public HCI company (Nutanix), and privately held, smaller HCI providers. A hyperconverged integrated system (HCIS) includes HCI software; however, HCI software is not limited to a system (hardware appliance) deployment model. Software-only/bring-your-own server, reference architectures, cloud and as-a-service deployments are growing. The advantages of software-only deployments, which include avoiding hardware vendor lock-in, are somewhat offset by the added complexity of the support model and the inability of software-only vendors to test and certify the myriad configuration options that customers may choose. Vendors with software-only options are expanding their OEM partnerships and server certifications to provide greater choice and an improved support experience.

Because the tandem scaling of compute and storage capacity is the biggest drawback of hyperconverged architectures, more vendors are offering compute-only and storage-only HCI nodes. Because resource and performance requirements vary substantially by workload, Gartner continues to recommend that infrastructure and operations (I&O) leaders conduct proofs of concept (POCs) to evaluate the compute, storage and networking requirements of their workloads running on HCI. I&O
leaders also should estimate resource consumption to determine the need for asymmetrical scaling and financial requirements. The POC should include a careful analysis of performance during node failures, the increase in risk during node failures and the time to recover from node failures.

Although there are multiple deployments of more than 100 nodes, most HCI implementations can be measured in tens of nodes or fewer. Even large deployments tend to be segmented into smaller clusters, but with centralized management across clusters. As HCI becomes more broadly adopted across a broader range of nonhomogeneous workloads, requirements will increase for HCI to operate more automated. This is also driven by container-native workloads that demand a bigger cluster size. This will include the capability to automatically provision HCI, rebalance, adapt to meet quality of service (QoS) requirements, detect anomalies, and prevent failures and data loss. When HCI is deployed at large scale, these capabilities will be increasingly necessary and key points of vendor differentiation.

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 steppingstone 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” (Outposts, Azure Stack, Anthos), 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. Customers’ I&O leaders should evaluate HCI solutions and select vendors and products not because HCI or that vendor is growing rapidly, 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 CMPs) 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 10 critical capabilities for this HCI class of products. The following is a summary of the selected capabilities for each category.

Critical Capabilities Definition

Hardware

The hardware attributes of these offerings include key differentiators, such as server/storage OEM/original design manufacturer (ODM) certified with the solution; predictive failure analytics; and large-scale memory in support of double-data-rate DRAM or persistent memory.
Other differentiators include benchmark data on SPEC performance, HCI-specific benchmarks like HCIBench or TPCx-HCI latency and throughput, the degree and depth of hardware integration to provide features such as firmware upgrades, and input/output (I/O) optimizations for flash. In addition, the hardware-critical capability includes available levels for support of the hardware, lights-out support and definitive templates for hardware compatibility.

Abstraction
This assesses the degree of software abstraction from the hardware elements involved in the HCI solution, including the combination of multihypervisor support and integration of containers.

Differentiators include support of software-defined infrastructure, storage, integrated networking, VMware NSX, and Cisco ACI or alternatives; full life cycle management; deployment/management of AWS/Azure/Google; and cloud management platforms (CMPs) (their own and from a third party). Other differentiators involve software-defined facilities and data center infrastructure management (DCIM) integration and support.

Data Services
This assesses the storage functions and services as part of the storage solution. Key differentiators involve publicly available benchmarks of performance for reads/writes of large and small objects, file or object support, and storage efficiency/data reduction features.

Other differentiators include the percentage of the customers that implement data reduction features; data efficiency schemes used in the storage service (such as erasure coding); tiering capabilities that allow data to be automatically placed on optimal and/or appropriate classes of storage by policy; and the average compression and deduplication ratio for most use cases. In addition, there is support for cache tiering; VM-level data service management; maximum/minimum throughput per VM; and in-line, federated, or serial compression and deduplication in performance and capacity tier.

AI Functions
This assesses automation and the use of algorithms to automatically perform functions such as prefailure detection and correction, performance optimization, and support notification.

Algorithms used may be time series, decision tree, random forest, anomaly detection and logistic regression.

These AI functions help deliver HCI as an intelligent platform with composable administration, programmable application and intelligent automation as an overall intelligent platform.

Management
This rates the viability of key management differentiators (for example, logical, physical partitioning or multitenancy features; self-service and metering features, with showback/chargeback analysis; available end-user training; and web or mobile applications available for monitoring).
This includes support for hybrid (private/public) cloud integration to manage multisite deployments; I/O optimization technique (hardware/software) available for performance tuning; management console (own/third-party), with published APIs/software development kits (SDKs); and monitoring for error conditions/performance/trending capacity analytics. Finally, there is automated policy enforcement, remediation, alert prioritization and grooming, as well as plug-ins for VMware vCenter and/or Microsoft SCVMM.

Software Stack
This critical capability assesses the software stack of the vendor. Key differentiators include integrated, vendor-owned stack/third-party stack; supported SAP HANA appliance/SAP HANA Tailored Datacenter Integration (TDI); support for mainstream VDI platforms; and prepackaged VM templates.

Other differentiators involve official support by mainstream line of business (LOB) application vendors (including SAP and Oracle); public, searchable repositories of officially supported applications/ISVs; and support for mainstream business intelligence (BI), analytics platforms and database software. In addition, there's support for mainstream PaaS environments, Java and .NET application platforms, as well as cloud APIs (such as Amazon S3 and OpenStack Swift).

Location
This critical capability looks at the ability of an HCI solution to be implemented in a variety of places that extend to those requiring low levels of scalability from one or two nodes, while maintaining optimal functionality across the data center, cloud and edge.

Flexibility of location includes the number of witnesses required and the methods used to achieve increased reliability, such as physical nodes and cloud-based virtual nodes.

Scaling
This rates such key differentiators as support for n-tier, monolithic, mission-critical DBMS and application-serving workloads; support for vendor-owned/third-party/high-availability failover; and workload recoverability — LAN-based synchronous/WAN-based asynchronous.

Additional differentiators include the total number of nodes/clusters, support for cross-cluster live migration; DBMS snapshots; DBMS cluster support (such as load balancing and high availability); scale-out application-serving support; and LAN-/WAN-based recoverability. This also includes support for Hadoop/Splunk/Spark, as well as snapshots into other application servers.

Service and Support
This critical capability rates the viability of service and support, including single-vendor support contact, dedicated service account manager, a minimum three- to five-year return to vendor (RTV) warranty, third-party product support, 24/7 live support and secure handling/disposal of customer data.
Additional differentiators involve roadmaps provided to customers and hardware compatibility lists. Also of significance is the use of remote support and administration functions.

**Security**

This critical capability assesses several key differentiators, including software patch management, denial of service (DoS) and distributed denial of service (DDoS) defense support, published hypervisor hardening best practices, and the encryption of guest VMs.

Other differentiators include Secure Sockets Layer (SSL)/Transport Layer Security (TLS) encryption of control plane traffic, management support of role-based access control (RBAC), management graphical user interface (GUI) support of multitenancy, and support of security information and event management (SIEM) tools. In addition, there is FIPS 140-2 Level 2 compliance; support for full-disk encryption (FDE)/self-encrypting disks (SEDs); support of network forensic tools (NFTs), such as Blue Coat and FireEye; and support for network intrusion prevention systems (NIPSs).

**Use Cases**

**Core IT**

Driven by cost/TCO savings, it involves data center infrastructure HCI projects that consolidate n-tier architecture supporting core IT applications.

HCI enables automation and hybrid cloud.

**Cloud**

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

**Mission-Critical**

Mission-critical HCI projects improve resiliency and scalability of business-critical applications (such as ERP and packaged applications that require vendor certification).

**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.

**Edge**

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

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

**Vendors Added and Dropped**
Added
No vendors were added to this year’s Critical Capabilities research.

Dropped
Cisco, Dell EMC, HPE and Huawei were dropped due to changes in the inclusion criteria, which exclude HCIS solutions (those will be covered in other Gartner publications).

Red Hat was dropped due to a narrowing of its focus to only three use cases.

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

Included HCI software vendors must:

- Provide an integrated software stack, which includes unified management and software-defined compute, storage and, optionally, networking.
- Combine virtual machine 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 SAN and/or NAS.
- 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

Eligible HCI software vendors must:

- For each product to be evaluated, provide evidence of a minimum of 50 production customers brought to revenue with at least 25 in each of at least two of the major geographies (the Americas, EMEA and the Asia/Pacific region) in the 12 months ending on 30 June 2020.
- 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 four of the use cases identified in this research.

- Have delivered the product or products to be evaluated in the Critical Capabilities research in general availability by 30 June 2020.

- Provide HCI software that is portable to, sold within the past year, 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 2020 published by Gartner. Those providers are Dell, HPE, Inspur Electronics, Lenovo, Cisco, Huawei, Super Micro Computer, Inc., H3C, Fujitsu and Oracle.

- Own the software IP that enables the management functions and SDS for their solution.
### Table 1: Weighting for Critical Capabilities in Use Cases

Viewing partial table. Click here to view full table

<table>
<thead>
<tr>
<th>Critical Capabilities</th>
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<th>Cloud</th>
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<th>VDI</th>
<th>Edge</th>
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</table>

Source: Gartner (December 2020)

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

<table>
<thead>
<tr>
<th>Critical Capabilities</th>
<th>DataCore</th>
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<th>Microsoft</th>
<th>Nutanix</th>
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<td>3.8</td>
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</table>

Source: Gartner (December 2020)

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.
**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 - 26 November 2019
Critical Capabilities for Hyperconverged Infrastructure - 28 November 2018
Critical Capabilities for Hyperconverged Infrastructure - 7 February 2018

Recommended by the Authors
Magic Quadrant for Hyperconverged Infrastructure Software
Hype Cycle for Infrastructure Strategies, 2020
Drive Administration, Application and Automation Capabilities of Infrastructure-Led Disruption
The Road to Intelligent Infrastructure and Beyond
Magic Quadrant for Hyperconverged Infrastructure
Critical Capabilities for Hyperconverged Infrastructure
Understanding Gartner's Hype Cycles
Data Center Infrastructure Primer for 2020
How Products and Services Are Evaluated in Gartner Critical Capabilities

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