

# Magic Quadrant for Integrated Systems

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The integrated system market is in continuous flux. Traditional blade- and SAN-based integrated systems are now being joined by hyperconverged integrated systems, while disaggregated systems and software-defined anything are set to transform the market further.

## Strategic Planning Assumption

Hyperconverged integrated systems will represent over 35% of total integrated system market revenue by 2019.

## Market Definition/Description

Integrated systems are combinations of server, storage and network infrastructure, sold with management software that facilitates the provisioning and management of the combined unit. The market for integrated systems can be divided into three broad categories of integrated systems, some of which overlap. These categories are:

- **Integrated stack system (ISS)** — Server, storage and network hardware integrated with application software to provide appliance or appliance-like functionality. Examples include IBM PureApplication System, Oracle Exadata Database Machine and Teradata. Note that this research does not evaluate the "stack" components of any solution; therefore, this research should not be used as a primary basis for software selection.
- **Integrated infrastructure system (IIS)** — Server, storage and network hardware integrated to provide shared compute infrastructure. Examples include VCE Vblock, HP ConvergedSystem and Lenovo Converged System (formerly PureFlex).
- **Hyperconverged integrated system (HCIS)** — Tightly coupled compute, network and storage hardware that dispenses with the need for a regular storage area network (SAN). Storage management functions — plus optional capabilities like backup, recovery, replication, deduplication and compression — are delivered via the management software layer and/or hardware, together with compute provisioning. Examples include Gridstore, Nimboxx, Nutanix, Pivot3, Scale Computing and SimpliVity.

All integrated system categories can be delivered as an integrated reference architecture. Reference architectures are products in which two or more vendors certify a specification for a logical set of

hardware and/or software components and, ideally, offer a common source of service and support. Reference architectures can form any one of the categories listed above, and valid integrated systems can target specific reference architecture opportunities.

As an additional type of reference architecture, hyperconvergence vendors may engage with one or more hardware vendors to create a solution based on their own software stack supported by third-party hardware. Examples include Cisco working with Maxta, Atlantis Computing and SimpliVity, and Dell working with Nutanix. Some hyperconvergence vendors *only* deliver reference architectures through their software value-add (a "bring your own hardware" approach to complement their software solutions). We exclude such approaches from this research.

Some forms of reference architectures, such as EMC VSPEX, allow vendors to group separate server, storage and network elements from a menu of eligible options to create an integrated system experience. This reference architecture type may be based on a loose partnership between hardware and software vendors, or between multiple hardware vendors. Support and escalation may also be divided across multiple vendors. Reference architectures that *only* support a variety of hardware and software components are more variable by their nature and, therefore, more difficult to assess versus packaged integrated systems. Deploying these reference architectures without a single point of support may also result in a variable support experience that makes it difficult to assess them versus packaged integrated systems. Because of these factors, we have chosen not to evaluate this reference architecture type in this research. However, where eligible vendors also engage in initiatives to create a reference architecture from a prescriptive blueprint, we do assess this reference architecture type as part of our overall evaluation of the vendor.

Adding further market complexity, potential buyers frequently evaluate different categories of integrated systems against one another. For instance, because IIS solutions are generic, multipurpose systems that can run a variety of workloads, it is common for one IIS offering to be compared with another. But buyers who want to deploy a specific workload might compare an ISS solution, like Oracle Exadata Database Machine or IBM PureApplication System (both of which have the workload embedded), with a generic IIS that is also capable of running the workload, or with an IIS platform that has an applicable reference architecture.

That being said, it would be rare to see one ISS competing with another ISS, because the choice of stacks and workload takes priority over the choice of platform. So, if Oracle Database Management System (DBMS) serving deployment is the required workload, the preferred ISS solution would obviously favor an Oracle Engineered System. However, client inquiries indicate that HCIS solutions are increasingly challenging IIS competition, especially where concerns about technology lock-in are high.

It is also increasingly common for HCIS solutions to be evaluated as a form of IIS solution, especially in greenfield situations where no integrated system has been bought before. HCIS vendors will challenge the need for, and expense of, SAN technology and enterprise blade servers — both of which are usually associated with IIS solutions.

It is because these different types of systems are evaluated against each other that this Magic Quadrant assesses different classes of integrated system. It assesses the vendors in terms of hardware (server, network and storage), operating system and virtualization software alongside any

associated management tools and high availability (HA) solutions. It considers hardware depth and scale, software stack management breadth and depth, and support of the infrastructure, as well as flexibility in the use of reference architectures. This research is not intended to judge embedded software stacks, application or platform components individually, such as middleware, DBMS software and cluster software in the application or DBMS tiers.

## The Technology

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Most IIS and ISS solutions are based on blade server technology, with closely coupled SAN or network-attached storage (NAS), which enable boot-from-disk capability for all physical and virtual nodes; thus, making the system stateless. Blades are not a prerequisite, however, and some vendors will promote rack-based solutions as well.

HCIS solutions, in contrast, are usually based on rack-optimized nodes, which can be extended in number through the life of the system. The majority of IIS and ISS solutions are really effective packaging of server, storage and networking components that are sold as separate products in their own right, while HCIS solutions are purpose-designed and -built to form part of an integrated system. While the individual building blocks of both HCIS solutions and IIS/ISS solutions may be as small as a single-socket rack-optimized node or blade server, it is common for IIS/ISS solutions to scale to dozens — even hundreds — of nodes. HCIS solutions offer broad scaling in theory, but are usually limited to smaller configurations. HCIS scaling is also influenced by the probability that some nodes will be deployed for more storage rather than extra compute capacity. Most HCIS vendors promote the software differentiation of their solution, and prefer to stress that the hardware is highly commoditized. But we are also seeing the emergence of new-generation chassis-based fabric-based computers (FBCs) that merge the three compute, storage and network elements more seamlessly. These solutions will place more emphasis on hardware differentiation.

Overall, the great majority of integrated systems are based on Intel or AMD x86 technology, but there is some support for reduced instruction set computer (RISC) variants like Power and SPARC, and the emerging market for ARM and Intel Atom processors will have applicability for some integrated system use cases.

# Magic Quadrant

Figure 1. Magic Quadrant for Integrated Systems



Source: Gartner (August 2015)

## Vendor Strengths and Cautions

### Cisco

Last year, this Magic Quadrant assessed Cisco on its collaboration with NetApp and EMC, which both remain active today. But Cisco's partnering strategy has expanded since then to include many

more choices for integrated systems. Today, Cisco's Unified Computing System (UCS) integrated infrastructure portfolio includes an expanded combination of storage reference architectures, including Hitachi, IBM and Nimble Storage. These all build on the NetApp FlexPod reference architecture paradigm. Cisco continues its partnership with VCE, but at a lowered investment given it was acquired by EMC. In addition to providing vertically scaling integrated systems such as it does with VCE and the storage vendors listed above, Cisco has a presence in the market for HCIS through technology partnerships with SimpliVity, StorMagic, ScaleIO, Maxta, and VMware Virtual SAN hosted on rack-optimized Cisco UCS. These partnerships enable Cisco to deliver a single scale-out HCIS solution hosted on rack-optimized UCS systems. Cisco has evolved a management strategy, UCS Director, to enable the hoster's central systems to manage distributed remote sites and edge systems, or to create clustered solutions for applications based on big data analytics, such as Hadoop.

Cisco's highly visible success as a partner in the VCE coalition, together with its NetApp reference architectures, has enabled the company to establish credibility as a compute vendor in large global 500 enterprises and to become a leader in the blade server market. But with market interest in HCIS continuing to grow, Cisco has yet to demonstrate that it can extend its success to modular, scale-out systems that integrate UCS and direct-attached storage from center to edge, and deliver a software-defined storage (SDS) offering that can compete with many recent entrants in the HCIS market. Moreover, as Cisco continues to expand partnerships beyond VCE that may compete more directly against non-Cisco compute nodes of EMC (made up of VxRacks and VSPEX Blue), users should validate Cisco's ability to deliver a single integrated service and support experience across an array of configurations while maintaining an ever-expanding compatibility and validation matrix among partners and component suppliers.

### **Strengths**

- Cisco has a strong Vblock data center presence with repeat buys.
- Cisco offers multiple storage reference architectures, including a market-leading NetApp solution that uses FlexPod, while expanding its portfolio of solutions through partnerships with SimpliVity, StorMagic, Maxta and other HCIS technologies.
- Cisco has a large global sales channel and support team with strong complementary engineering capabilities.

### **Cautions**

- Cisco's lack of native storage solutions creates barriers to further IIS/HCIS progress for the company, as this emphasizes the reliance on external partners.
- Cisco's HCIS strategy is still in a nascent phase, and builds mainly on partnerships such as those with SimpliVity, Maxta and StorMagic.
- Cisco faces further competitive dilution as EMC-VCE broadens its focus to offer low-cost compute, scale-out storage and expanded management capabilities.

## Dell

Dell offers a broad portfolio of integrated systems that span the whole integrated system market. Platforms like PowerEdge VRTX and Microsoft Cloud Platform System (CPS) are highly differentiated versus the competition. VRTX offers a low-end, integrated system aimed at small or midsize business (SMB), midmarket, branch and departmental needs. VRTX is designed to be deployed and easily managed in a regular office without the need for dedicated IT infrastructure. CPS, a tailored Azure platform for cloud projects, is a joint development between Dell and Microsoft wherein hardware support is unique to Dell. However, Dell's broadest market opportunity comes from the PowerEdge FX2 platform, which launched in 2014. Dell sells FX2 both as a new generation blade server and as an integrated system. Dell is also a certified hardware node vendor for VMware's Evo:Rail and a certified SAP Hana appliance vendor.

Dell has many software assets that facilitate integrated system deployment, including close integration between the Active System Manager management suite and Dell's own cloud management platform, Dell Cloud Manager. In addition, Dell has a strong relationship with Nutanix, with the Nutanix software suite being certified as the Dell XC integrated appliance.

Dell is a globally recognized data center brand that is executing its separate server, networking and storage strategies well, and existing users of Dell servers and other technology should consider the company for relevant integrated system projects. However, Dell pursues a "pull" marketing approach that reacts to customer demand, but has struggled to create broad awareness and recognition in this market, where Dell has not established itself yet as a leading vendor. Sales have consequently been sluggish across the portfolio.

### Strengths

- Dell sells a strong portfolio of integrated systems that spans all the categories that Gartner has defined, and is aided by strong partnerships with vendors like Nutanix and Microsoft.
- Some Dell solutions, such as VRTX and CPS, are highly differentiated in the market.
- Dell has overcome the uncertainties over going private and is executing its server and storage strategies well, giving the company a good global foundation for integrated system market growth.

### Cautions

- Dell's integrated system positioning has been inconsistent. Multiple branding initiatives and a variety of software acquisitions have muddled the end-user perception of Dell as an integrated system vendor.
- FX2 has the capacity to be a unifying force for Dell's strategy, but a muted product launch robbed Dell of the opportunity to make a stronger initial impression with what is a highly innovative product.
- Although successful in their respective markets, platforms like VRTX and CPS address a very finite audience, with limited opportunity for sales success to benefit Dell's broader integrated system market opportunity.

## EMC (VCE)

In December of 2014, EMC acquired 90% ownership of VCE. Cisco owns 10% with long-term agreements with VCE regarding engineering, customer support and resellers. VCE is now a member of the EMC Federation. As a result of the ownership change we no longer assess VCE independently of EMC, and this year's reference to the vendor as EMC (VCE) reflects the transition in progress. With its majority ownership of VCE, EMC has become a formidable source of integrated systems, providing combined EMC-VCE engineering designs. EMC has kept VCE's organization intact including engineering, sales, support and marketing, with close collaboration among VCE and other members of the EMC Federation. VCE continues to run its factory integration (in the dedicated VCE assembly facility), testing and support.

Most recently, VCE announced its rack-scale hyperconverged VxRack. The first VxRack is expected to ship in 3Q15 using Britebox servers, Cisco top of rack (ToR) switches and EMC ScaleIO software-defined storage. Later this year, a second VxRack personality will ship encompassing VMware's Evo:Rack.

VCE announced VxBlocks that offer the choice of Cisco Application-Centric Infrastructure (ACI) and VMware's NSX software-defined networking solutions. VxBlocks, Vblocks and VxRacks will scale up and scale out using a new architecture called Vscale. VCE also enables technology extensions such as EMC Isilon storage and Cisco UCS servers to attach to Vblocks. VCE's Vision software will expand its provisioning, compatibility and life cycle management across multiple systems with connected blocks and racks. The combination of EMC and VCE represents EMC's other integrated system interests, such as VSPEX Blue (which is an EMC-branded HCIS implementation of Evo:Rail with additional EMC-sourced capabilities that enable data protection, backup and recovery in an appliance platform). Users will need to hold discussions potentially with multiple arms of EMC and its VSPEX suppliers to ascertain specific roadmap, direction and overall integration strategies.

### Strengths

- EMC is able to build on VCE's established position as one of the clear leaders in the integrated system market with Vblocks.
- EMC offers factory-integrated and -validated reference architectures for enterprise mission-critical applications.
- EMC is a proven global vendor with extensive channel and direct sales, plus service, support.

### Cautions

- EMC's VSPEX Blue hyperconverged solutions have relatively high average entry upfront costs and long configuration to deployment cycles versus competing HCIS solutions.
- EMC-VCE has not been in the market long enough to establish a reputation in HCIS and in creating scale-out capability on Vblock fabric.

- EMC may struggle with how to position its various platforms based on use cases, applications and scale, including recognition that new SAN-less racks and VSPEX appliances pose potential cannibalization of SAN-based block solutions.

## Fujitsu

Fujitsu has been investing in an integrated system portfolio for longer than most vendors, with initiatives like FlexFrame (built on a collaboration with SAP and NetApp) and Processing Area Network (PAN) Manager (an alliance with Egenera) dating back more than a decade. As Fujitsu has expanded its portfolio to include more reference architectures and ready-to-run systems, its previous lack of a consistent brand has created growing confusion over its company strategy and commitment. In 2014, Fujitsu simplified its integrated system brand under the name Primeflex. The company has now implemented the branding across all regions, including Japan (where separate branding has previously been the norm for many years).

Today, Fujitsu sells multiple offerings that target a range of workloads and use cases — primarily Primeflex for SAP Landscapes (with scope for OpenStack support), Primeflex for SAP Hana (which can be integrated with Primeflex for SAP Landscapes), Primeflex for HPC, Primeflex Cluster-in-a-box, Primeflex for VMware VDI, Primeflex for VMware Evo:Rail, Primeflex for Cloud, Primeflex for Hadoop, Primeflex for HA Database and Primeflex for Analytics. Fujitsu also offers numerous reference architectures as Primeflex solutions that target workloads like virtual desktop infrastructure (VDI), VMware VSAN (software-defined storage), Microsoft Exchange and Microsoft Lync. These solutions are driven both by direct and indirect channels.

The breadth of the Fujitsu portfolio is impressive, but creates an added responsibility for Fujitsu to demonstrate how it can position its products to address multiple target segments more effectively than the competition. Without clear positioning, it becomes a challenge for Fujitsu to demonstrate its strengths and points of differentiation in an increasingly crowded and confused market.

## Strengths

- Fujitsu has created a broad combination of integrated systems, appliances and reference architectures, which are well-supported by Fujitsu's own technology and by that from partners such as SAP. The company also offers an end-to-end service portfolio and good independent software vendor (ISV) partnering.
- Fujitsu is steadily extending its global sales reach beyond its stronger regions of Japan and Western Europe, but it is still able to focus regionally where required. For instance, Primeflex for VMware Evo:Rail has achieved most traction with U.S. and Western European audiences, while Primeflex for HPC has been shipped more widely in Asia/Pacific.
- Fujitsu has successfully unified its product portfolio, including reference architectures, under one worldwide terminology named Primeflex.

## Cautions

- Fujitsu's sales success in the market is still limited, caused mainly by an unclear strategy (now resolved), and an evolving market strategy for how to compete in hyperconvergence area.
- Fujitsu is less strong in its indirect channels and partnering outside of Japan and Western Europe, thus limiting its appeal and viability for international customers.
- For markets like the U.K., the U.S. and Japan (where Fujitsu's local business is skewed in favor of strong services and integration skills), the company has competing local priorities, where the focus on services and system integration weakens the ability to achieve integrated system momentum.

## Gridstore

Founded in 2009, Gridstore began as an NAS vendor, targeting small and midsize enterprises. The company's experience led it to identify a gap in the market for a low-cost hyperconverged appliance built on Microsoft's Hyper-V. This realization led Gridstore to create its HyperConverged Appliance, an enclosure that can contain up to four nodes and scale-out to create larger systems. Two node types are currently available for this appliance: a flash compute node (FCN) and a flash storage node (FSN) to add capacity when additional compute is not needed. The decision to restrict itself to Hyper-V has enabled Gridstore to benefit from Hyper-V gains in market share, which are often driven by Hyper-V's cost advantage relative to VMware and by growth in the Azure customer base. Focusing on Hyper-V has benefited Gridstore by simplifying investments in research and development, and in integration testing. This streamlines product positioning and messaging, and helps to make Gridstore an appealing Microsoft partner. First customer shipments began in September 2014, and early reference checks indicate the system is stable. In addition, Gridstore's ability to secure three rounds of financing indicates sales are tracking close to plan.

Rather than rely upon external storage systems for storage, Gridstore has chosen to leverage its earlier development work in NAS into its storage layer. The result has been a storage layer that uses erasure coding for data protection, includes data flows that minimize internode traffic, and offers the ability to leverage Microsoft file compression technology into typical 2-to-1 to 5-to-1 reductions in physical storage requirements. While these architectural features are not unique, they do improve product attractiveness relative to converged infrastructures lacking erasure coding and/or storage efficiency features.

## Strengths

- Gridstore is well-positioned to expand market interest via growth in the customer base and market share of Hyper-V.
- Gridstore provides a scale-out architecture that can mix and match FCNs and FSNs, enabling customers to add storage or compute as needed.
- Gridstore offers tight integration with Hyper-V and Azure management tools.

## Cautions

- Gridstore is a nascent vendor entirely dependent upon venture funding.
- Gridstore has limited market validation and a very small installed base.
- Gridstore marketing, sales and support strategies are still in a formative stage.

## Hitachi

Hitachi's primary IT subsidiary — Hitachi Data Systems (HDS) — propels the company's integrated system business with product strategy and engineering driven globally through its U.S. subsidiary. And although HDS is recognized as a well-established storage vendor, the company can build on Hitachi's overall strong reputation in its core Japanese market to maintain its position as a leading vendor across systems, software and services. Hitachi has an impressive track record in multiple industry segments that helps the company to win high praise for customer support and strategic partnering.

Hitachi Unified Compute Platform (UCP) and the UCP Director suite (which enables unified management of compute, network and storage technology based on user-defined policies) was launched in 2012. UCP Director software also enables API access to ISVs and service providers, facilitating easy plug-ins that extend the "integrated" experience beyond Hitachi's own technology. UCP addresses three typical use cases: virtualization/data center modernization, business intelligence and high-performance databases. The company sells numerous tailored versions of UCP that address more specific use cases via partnerships with vendors like VMware, Microsoft, SAP and Oracle. In addition to preconfigured UCP models based on its own servers and storage, Hitachi also works with Cisco to sell a validated design based on Cisco UCS and Hitachi storage.

As part of the Hitachi strategy to better-position itself as a global IT player, statements and documents suggest a growing emphasis on investment in software and services alongside the existing hardware focus. Overall, Hitachi Data Systems needs to carefully balance and coalesce investments and resources that span fully integrated UCP, storage reference architectures (for example, from Cisco) and software/services to maximize its integrated system execution. Both Hitachi's domestic (Japanese) and international lines of business will need to continue to demonstrate sustained commitment to integrated systems, storage and servers to maintain the market momentum that has been achieved thus far.

## Strengths

- Hitachi (and Hitachi Data Systems) is able to build on a strong and established storage vendor reputation, as well as growing recognition for high-quality customer support and technology innovation, expanding from a storage and system vendor to support for mobile and social innovation (for example, Mode 2) that leverages its UCP technology.
- Hitachi Data Systems has broadened the appeal of Hitachi UCP through strong alliances with global ISVs and other partners. As a result of these alliances, Hitachi Data Systems provides API access for integration with third-party software and management tools (such as automation and orchestration based on its vision for microservices), with service provider tools and portals.

- The growing investment in blade servers, along with Hitachi Data Systems' focus on topical markets like SAP Hana, enhance the Hitachi UCP market opportunity and its sales growth.

### Cautions

- Hitachi Data Systems is in the midst of developing global coverage, including hyperconverged integrated systems to rival the rapid advances in the industry. As a leading storage vendor, it is challenged to develop and execute the balance where a cohesive hyperconverged strategy is compatible with the need to preserve market demand for integrated systems based on external controller-based storage.
- The Hitachi Data Systems partnership with Cisco has absorbed the company's sales channels and alliances, and may distract its corporate positioning, causing confusion among some users.
- To help gain international acceptance, Hitachi has chosen to drive its integrated system strategy from California, although the IT market clearly perceives Hitachi as a Japanese company. This places particular onus on Hitachi to deliver consistent global messaging.

### HP

During the past year, HP has expanded its already comprehensive portfolio of ConvergedSystem model categories to address new workload performance and capacity demands. Models range from Moonshot, which offers high density and lower power consumption, to Apollo, which offers high compute performance and analytics capabilities. HP provides ConvergedSystem offerings, including Hana systems, targeted at data management, analytics, data center consolidation, virtualization and cloud; in addition, it offers a hyperconverged solution with the ConvergedSystem 200-HC StoreVirtual.

HP's leadership position in x86 servers should provide it and its channel partners significant go-to-market opportunities that few competitors have; but HP has been slow to capitalize on the opportunity. As market momentum has built, HP has achieved only limited integrated system market success with poor conversion and upgrade rates in proportion to its vast blade and rack-mounted installed base, allowing competition — primarily from Cisco-NetApp and VCE — to usurp ground in data centers, where HP had strategic presence. More recently in the past 12 months, HP has been gaining greater recognition and adoption with a strong value proposition based on HP OneView. HP OneView delivers integration of 3PAR and blades as reference architectures, or gives users flexibility to construct an optimized integrated system, perhaps obviating the need to purchase a preintegrated system.

HP has set about overcoming suboptimal efficiencies in sales and marketing, while enhancing the ease and functional use of its HP OneView infrastructure management through an automation hub. OneView market acceptance is now building, with about 200,000 licensed users deployed to date. This should enable HP to generate more interest and adoption from both its legacy installed base and in competitive RFPs. To make platform selection easier, customers and prospects should demand that HP create better coherence among family brands and emphasize heterogeneity in storage and networking (for example, HP will include Cisco and Arista switches). HP is building

market recognition in scalable software-defined hyperconvergence, while Helion CloudSystem is gaining increased recognition as an integrated hybrid cloud. HP has also been expanding its vision to build a "composable infrastructure" API and ecosystem to enable Mode 2 application modernization and agility based on hyperconverged integrated systems; as of yet, this is in the early stages.

### Strengths

- HP has a broad portfolio of integrated systems and reference architectures (from hyperconverged ConvergedSystem 200-HC StoreVirtual to the ConvergedSystem 900 for SAP Hana), along with a strong channel and relationships among ISVs (Microsoft, SAP, VMware, Citrix) that target various use cases (data analytics, SQL Server, Oracle and video streaming).
- Unlike many vendors, HP can offer single-vendor server network storage end-to-end contract support and accountability with factory preintegration and pay-per-use options.
- HP integrated system users benefit from improved HP OneView holistic resource and life cycle management and analytics, with easier and quicker infrastructure deployments via configuration templates.

### Cautions

- At times, Gartner client feedback indicates that HP has not yet crystalized messaging, positioning, selection, and build and order processes related to its complex portfolio of integrated system solutions.
- HP offers reference architectures and builds among other network and storage equipment suppliers for OneView; support for these architectures and builds is only becoming available on a gradual basis as OpenView adoption builds.
- HP's HCIS offering (HP ConvergedSystem 200-HC StoreVirtual) is still in early rollout and is just beginning to ramp up as HCIS competition increases from nontraditional IT vendors, such as Nutanix and SimpliVity.

### Huawei

Huawei has a position of strength in its domestic market, China. However, the company lacks global recognition as a data center brand, although it is working to rectify the situation. Huawei's integrated system business is nascent, but growing, with over 30% of revenue vested with key customers outside Huawei's Asia/Pacific home market. Huawei is able to leverage presence in markets where its campus/core networking and telco presence is strong to sell integrated systems. The company is also targeting emerging markets through both direct presence and channel recruitment.

Huawei's integrated system product is called FusionCube, and is based on Huawei's E9000 blade platform. When deployed with FusionSphere and FusionAccess, FusionCube offers a good mix of physical, virtual and private cloud hardware and software. FusionCube is targeted at two key markets: virtualization and private cloud; and, enterprise database management system (DBMS)

and data warehouse environments, including Oracle, SAP, IBM and Microsoft. FusionCube uses a federated (or scale-out) storage architecture, which is more akin to the architectural style of an HCIS, as opposed to that of external controller-based storage.

Key areas of strength for FusionCube are virtual desktop infrastructure, server virtualization and DBMS. Huawei is a certified SAP Hana provider and certified to scale out Hana deployments on FusionCube to 16TB. FusionCube is appropriate for Huawei software users, but also supports multiple third-party software options like VMware, Oracle, DB2 and SAP, for example. We recommend that users of other x86 servers and solutions validate the available level of third-party software certification and local support.

### Strengths

- Huawei is an established data center brand in China, with a growing customer base across the world.
- Huawei is growing its global presence and can leverage existing acceptance in telecommunications and data center networking accounts to do this.
- Huawei's investment in integrated system technology supports its goals of becoming a global data center brand. Huawei leverages latest-generation technologies, and also has a track record of unique technology innovation and differentiation.

### Cautions

- ISV support for FusionCube is improving, but Gartner client inquiries have indicated potential for support and certification issues with some third-party software vendors.
- Huawei is still growing its global presence; outside of Asia/Pacific, direct or partner coverage may be lacking, depending on location.
- Huawei's recognition as an integrated system provider is only gradually building on the back of outbound promotion at Huawei events and other conferences, so the company's credibility among IT organizations outside its home geography is inconsistent.

### IBM

As a result of selling its PureFlex technology to Lenovo, IBM's portfolio now focuses on related integrated stack systems like PureApplication System (integrated with application code and middleware) and PureData System (integrated with database management and big data analytics). IBM has also retained ownership of the PureSystems brand. Multiple offerings are packaged as "patterns" (IBM's terminology for blueprints) under the PureApplication umbrella, including IBM Cloud Manager for OpenStack (cloud infrastructure), Expert Integrated Systems (big data and Hadoop), and Mobile Application Platform (mobile applications). Flex System Manager is the name of IBM's integrated management tool that works across all PureSystems products; ownership of this technology did not transition across to Lenovo.

IBM has partnered with Cisco to jointly market and support the VersaStack reference architecture, which is based on IBM Storwize storage and Cisco UCS blade servers. Although IBM no longer owns any x86 assets, it still works closely with Lenovo and can resell and support Lenovo's intellectual property. However, new products like PurePower System indicate IBM's continued investment in integrated systems, and show that the company's preferred strategy is to promote the Power architecture as the foundation for most of its integrated system strategies moving forward.

IBM has strong ISV relationships, especially in vertical industries like financial services, retail, healthcare and energy, where IBM has a strong corporate track record. IBM is also focusing on leveraging the corporate strengths in cloud and big data analytics markets. For instance, IBM is investing in delivering coexistence between its integrated systems and comparable functionality on top of SoftLayer to enable workloads to move work back and forth. But to date, the company has made limited progress in turning market recognition for software and services into tangible growth for integrated systems.

### Strengths

- IBM has a strong reputation that spans hardware performance, software, services and support.
- PureApplication and PureData are tuned and optimized to run IBM software stacks with high performance and functionality.
- With no in-house x86 strategy to defend, IBM is able to pursue a stronger focus on Power-based solutions and partner with multiple x86 vendors, including Lenovo and Cisco.

### Cautions

- With the market strongly skewed toward general-purpose solutions based on x86 technology, IBM's market presence has become more niche-oriented with a focus on stack integration.
- Despite the strong software focus, IBM has not yet achieved recognition as a vendor committed to the hyperconvergence category of the market.
- New go-to-market partnerships with Cisco, Lenovo and other vendors are relatively unproven.

### Lenovo

In October 2014, Lenovo bought IBM's complete portfolio of x86 servers and networking switches, along with the supporting IBM business. Lenovo has employed the majority of IBM's global research and development, factory and field-based staff focused on x86 servers. In addition, Lenovo now owns IBM labs and manufacturing locations in Raleigh, North Carolina; San Jose, California; Kirkland, Washington; and Taipei, Taiwan. Lenovo also owns 18 other global sales support offices, thanks to this deal. Lenovo acquired the PureFlex System, and has since renamed the family Lenovo Converged System for Infrastructure. Additionally, in January 2015, Lenovo announced its certification as a VSPEX reference architecture partner for EMC, and has already gained hundreds of customers.

Lenovo's Converged System is based on the Flex System chassis, a blade architecture that was introduced by IBM in 2012. With Converged System, networking is integrated and IBM's Storwize V7000 delivers external-based storage. System management is delivered by Lenovo XClarity, a brand-new management platform that is designed to take advantage of plug-ins and third-party management software integration from providers such as Microsoft and VMware. The XClarity strategy is relatively distinct from other integrated systems in that it is purposely designed to be simple, meaning the depth and breadth of its capabilities are narrower than most competing products. However, when combined with a sophisticated piece of hardware, such as the Lenovo Converged System, customers will have to rely on additional third-party tools to deliver appropriate depth and breadth of management capability to make up for where XClarity is lacking.

Lenovo's Converged System strategy is appealing to new customers, but represents disruption for existing PureSystems and Flex System customers. Today, IBM and Lenovo have agreements in place that Lenovo will function as an original equipment manufacturer for Flex System Manager and develop Power-based Flex System blades through to the end of this decade. This ultimately means a migration is in the future for existing PureSystems or Flex System customers, causing future disruption. Lenovo is investing in configurations tools and special programs to motivate and assist channel partners as the transition to a more holistic strategy progresses.

### Strengths

- Lenovo has a leading market presence and global coverage with its acquired System X business, existing ThinkServer and Wanquan server customers, and via its large network of channel partners.
- Lenovo has maintained the enterprise credentials inherited from IBM's success in this market, such as SAP Hana certification with Lenovo Converged System.
- Flex System enhancements, along with additional postacquisition partnerships like closer alignment with EMC, have played an important role in proving Lenovo's attractiveness as a partner provider and augmenting its integrated system strategy.

### Cautions

- Gartner inquiries and client surveys indicate a decreasing confidence in Lenovo's credibility as an enterprise vendor following the System X acquisition.
- Lenovo must demonstrate that it can retain the staff and channel partners that have been inherited through the acquisition. It must also maintain its enterprise focus while shifting the focus of its business, including transitioning integrated systems to a volume-oriented market.
- Lenovo must execute credible postacquisition roadmaps to demonstrate that the previous IBM investment in integrated system engineering and product innovation will not suffer under new ownership.

## NetApp

NetApp's participation in the integrated system market rests on two offerings: its well-known FlexPod offering and its differentiated VMware Evo:Rail offering, which constitutes a small portion of its converged infrastructure revenue overall.

FlexPod began as a reference architecture that has benefited from years of Cisco and NetApp joint development and a cooperative support agreement to become a valid integrated system assembled by value-added resellers (VARs) at the customer's site. FlexPod's appeal is further enhanced by collaboration with other vendors, such as VMware, Microsoft, Oracle, SAP, Citrix and Red Hat, and through marketing programs such as FlexPod Express for small enterprises and FlexPod Select for specialized workloads like Hadoop. FlexPod has seen strong market acceptance driven by its use of Cisco and NetApp hardware, co-marketing programs and a VAR network consisting of more than 1,000 partners certified to sell FlexPod, and over 90 FlexPod Premium Partners that drive the vast majority of FlexPod sales. Microsoft and Citrix have also agreed to participate in the FlexPod Cooperative Support Program, along with Cisco, NetApp and VMware. The FlexPod portfolio has also expanded, with support for a wider number of SKUs.

NetApp Integrated VMware Evo:Rail solution is initially targeting NetApp enterprise customers with many remote offices. Integrating its entry-level fabric-attached storage (FAS) systems into its Evo:Rail solution enables these large enterprises to share the same technology between their data centers and remote offices with all its attendant benefits, but without a proportional increase in management overhead. NetApp's Ontap Edge has also provided its customer base a path to a software-defined data center, along with financial and operational advantages. Foremost among these advantages is the ability to offload data protection overhead, enable thin provisioning and perform in-band compression and postingest deduplication — all attributes that make it particularly attractive in VDI environments.

### Strengths

- NetApp has a worldwide presence, a huge installed base, FlexPod success, sales bandwidth and partnership relationships.
- Both FlexPod and Evo:Rail offer integration with the cloud.
- FlexPod is designed to be hypervisor-agnostic, and is validated with VMware ESX, Hyper-V and XenServer. FlexPod will also work with bare metal when no hypervisor is suitable.

### Cautions

- Changes in NetApp senior management and losses of key personnel may portend future changes of focus in marketing and product strategies.
- Cisco's new management team has de-emphasized its relationship with NetApp and may not be as emotionally invested in the business-to-business relationship as the old guard. The Cisco relationships with hyperconvergence vendors like SimpliVity and expanded partnerships with other storage vendors indicate a reduction in the strategic value of NetApp as a partner.

- NetApp has a partner-dependent business model, making the company less attractive to customers who favor a more holistic, single-vendor solution, such as those from Oracle, IBM and HP.

## Nimboxx

Nimboxx is a privately owned HCIS vendor, based in Austin, Texas. The company began shipping products in 2014. Its AU series comprises three HCIS nodes, and Nimboxx sells a specialized appliance targeted at VDI deployments that is based on the same technology. The AU-110 is a 1U appliance based on low-end, one-socket nodes with 64GB RAM and 4.8TB disk storage. The AU-110x greatly increases memory to 256GB RAM and doubles storage to 9.6TB per node. The company recently released a third HCIS appliance version called the AU-120X that increases raw storage capacity to 14.4TB while still keeping the same 1U form factor. Nimboxx specializes in delivering a complete software stack, and the software suite includes a kernel-based virtual machine (KVM)-based hypervisor, minimizing dependency on third-party vendors like VMware or Microsoft. In February 2015, Nimboxx acquired Verde VDI software technology from Virtual Bridges. This acquisition enabled Nimboxx to sell a complete hardware and software solution for VDI, named the VE-100. The acquisition of Verde also provided access to Verde's international customer base and channel, which greatly improved Nimboxx's international reach and viability.

Nimboxx is focused on high-performance technology (claiming up to 360,000 input/output operations per second [IOPS] per node) and rapid time to deploy. The company targets a range of standard workloads such as file, database and Web serving, but is also committed to invest in APIs for more open connectivity to public cloud services like Amazon Web Services and Google Nearline. Hadoop and container support are also offered. Nimboxx is growing fast, but from a very small base. The company only commenced shipments during 2014, so customers — especially international ones — should validate the breadth and depth of Nimboxx's skills to address their needs.

## Strengths

- Nimboxx ships a complete hardware/software solution, which includes a KVM-based hypervisor.
- Nimboxx addresses a wide variety of use cases, including emerging opportunities like containers, public cloud and OpenStack.
- The Verde acquisition provides Nimboxx with its own in-house VDI solution and expands Nimboxx's international channel reach.

## Cautions

- Nimboxx is a nascent vendor that is dependent on venture funding.
- Nimboxx channel partnerships and support infrastructures are new and relatively unproven, particularly outside the U.S.

- As shipments only commenced in 2014, Nimboxx's technology is relatively unproven, with a limited installed base size and few reference accounts.

## Nutanix

Founded in 2009, Nutanix is a privately funded HCIS vendor that began shipping product in 2011. Since then, the company has built an installed base of more than 1,400 customers (some with installations of 100 nodes and one with 1,500 nodes), working through more than 750 channel partners worldwide. Nutanix has grown its head count to more than 1,100 employees, created a worldwide presence that encompasses more than 70 countries across six continents, and has secured five rounds of financing to sustain its sales momentum and vision. Strategically important relationships with VMware, Dell and Microsoft (plus other top software vendors) have enabled Nutanix to openly support VMware and Hyper-V and develop its own Acropolis hypervisor based on KVM.

Nutanix has done an excellent job of aligning its marketing and product development strategies in the development of Nutanix OS (renamed Acropolis for the runtime software and Prism for the management software in its latest release) and its software stack that spans storage, networking, and compute. By eliminating the need for external storage arrays and building compression, deduplication and erasure coding into its distributed storage fabric, Nutanix has created a compelling low total cost of ownership (TCO) story wherein availability, performance and scalability are not sacrificed. Much of the NX Series appliance ownership advantage is attributable not only to the elimination of external storage arrays with their high-gross margins or the use of commodity hardware, but also to the compression and deduplication of data stored on hard-disk drives (HDDs). Owning the entire software stack has also enabled Nutanix to offer its customers cross-hypervisor high availability and mobility — a big deal for users leveraging the unique value propositions of various hypervisors or considering bursting to Amazon or Azure clouds.

## Strengths

- Nutanix has gained market credibility, established a worldwide presence with approximately 30% of revenue coming from outside of North America and built an installed base that provides significant upgrade and expansion revenue.
- With the launch of Xtreme Computing Platform composed of Acropolis and Prism, Nutanix is now a complete infrastructure solutions company, providing its customers flexibility in their choice of hypervisors and cloud usage.
- The Acropolis scale-out architecture, along with the ability to scale compute and storage independently, enables users to grow Nutanix deployments incrementally to meet application needs.

## Cautions

- Nutanix is no longer small enough for the established system vendors to ignore or dismiss, and will therefore confront tougher competition going forward.

- Nutanix still lacks proven channel and support capability in some countries, so international users should validate these capabilities.
- Many conservative IT organizations are reluctant to do business with privately held companies in the belief that they lack proven governance, transparency or likelihood of longevity.

## Oracle

Oracle leads its integrated system offering with the Engineered Systems family of products. Since the 2008 launch of Exadata, Oracle has evolved and grown its Engineered Systems portfolio to achieve a dominant position in the market for integrated stack systems — where most deployed systems are integrated with Oracle software. While most momentum has revolved around Exadata, the opportunity for other Oracle stack inclusion is growing.

Oracle remains particularly strong with both Exadata and SuperCluster. With the embedded Exadata storage engine, SuperCluster has evolved over the past year to become a viable SPARC/Solaris equivalent to Exadata, although, it was initially targeted more as a multiworkload integrated infrastructure for the Solaris installed base.

Inquiries indicate customers are increasingly running multiple workloads on Engineered Systems, which include the Oracle Database Appliance and Exalogic. This broadening of adoption is good, but further blurs the boundaries of an integrated stack system. Consolidation of multiple workloads also emphasizes the maturity needed for mixed workload consolidation and high-availability/disaster recovery storage management of Oracle Virtualization.

While Oracle is maintaining a leadership position in the integrated system market, its vision remains bound due to increased focus on the optimum deployment of Oracle applications and DBMS software. Oracle maintains limited market presence as a general-purpose integrated system vendor. We expect this direction to continue, whereby Oracle will focus increasingly on optimum Oracle workload performance, and its SPARC/Solaris technology, where progress on software on silicon will further blur the lines on how price performance is calculated per Oracle license. This will also be reflected in more Engineered Systems being focused on SPARC/Solaris, which could impact the current equilibrium of Oracle's x86 Linux Engineered Systems market and eventually put pressure on Oracle to settle on one or the other as its technology foundation.

## Strengths

- Oracle offers a strong portfolio of integrated systems, with proven performance benefits for Oracle software workloads.
- Oracle enables application owners to become effective buying centers and points of administration for its Engineered Systems.
- Oracle has aggressive marketing, close alignment of its software and hardware strategies, and an opportunity to cross-sell and upsell into its installed base.

## Cautions

- Oracle's Engineered Systems are perceived as relatively expensive as they tie in server and storage infrastructure with Oracle software.
- Gartner client inquiries demonstrate a continued fear of vendor lock-in of integrated software stacks, tied to hardware asset life cycles and varieties of licensing models (for example, Core, User and Enterprise License Agreement [ELA]).
- Oracle's focus on creating SPARC/Solaris differentiation versus solutions based on Linux/x86 risks rebalancing the current dual platform equilibrium.

## Pivot3

Pivot3 has actually been in the IT solutions market since 2002, offering strong technologies around surveillance and security. The rapid growth of market interest around hyperconvergence has enabled Pivot3 to reposition itself to address a wider market opportunity, and focus its storage performance and efficiencies in specific industries such as healthcare, government, transportation and gaming. Pivot3 cites its architecture and patents as providing enhanced levels of scalability (across clusters of multiple hypervisor-based clusters), linear scalability in IOPS, and an efficient data protection scheme with erasure coding and active/active fault tolerance across appliances.

Pivot3 has developed hardware partnerships with Dell and Supermicro, and recently, Lenovo, with Dell providing additional integration and support capabilities, as well as a broader global reach. With more than 300 global channel partners, Pivot3 has amassed a broad base of industry expertise with more than 1,600 customers. Pivot3 competes not only with a host of HCIS vendors but also with larger traditional integrated system vendors that are expanding their portfolios with scale-out HCIS offerings. Together with workloads like VDI that are common to most HCIS vendors, Pivot3 also has a strong focus on the surveillance market, and has opened software development labs in Texas to focus on this market.

## Strengths

- Pivot3's industry experience of more than a decade contributes to its current hyperconverged architecture message and credibility.
- Pivot3 is able to differentiate against many other vendors via direct input/output (I/O) performance, granular scalability, high storage capacity efficiency and multiappliance global active/active high availability.
- Pivot3 offers vertical industry and specialized solutions through its growing base of channel partners.

## Cautions

- Pivot3 is undergoing the growing pains of repositioning the company from its earlier narrow focus and niche approach to a broader set of market opportunities, while adding new executive talent to support this transition.

- Many Pivot3 channel relationships are at an immature stage, while the company develops its channel and solutions partner strength for broader coverage.
- Pivot3 has limited hardware OEM partnering and limited third-party support.

## Scale Computing

Founded in 2008, Scale Computing is a privately held company that is attempting to position itself as the HCIS provider of choice for SMBs with 50 to 500 employees, where ease of use and price are the paramount decision criteria. Scale Computing's first product was a scale-out storage cluster that, with enhancements, is now providing the storage layer of its HC3 virtualization platform. An experienced management team, a rapidly growing installed base of HC3 customers and the ability to raise multiple relatively small rounds of venture capital funding have all aided Scale Computing in this effort.

To limit unburdened manufacturing costs, the current family of HC3 virtualization platforms uses an open-source hypervisor (based on KVM) and a Web-based GUI, and eliminates the need for a separate physical management server. Scale Computing's development priorities are somewhat counterbalanced by the HC3's use of RAID 10 to protect against solid-state drive (SSD) and HDD failures, and via the lack of data reduction services, such as data compression and deduplication. However, the use of RAID 10 does benefit performance by improving the locality of reference between applications running virtual machines and the corresponding data protection. It also provides high levels of locality of reference to improve performance running the storage stack in the kernel. This improves performance and reduces memory overhead. HC3 supports the use of snaps, which protect against logical corruption problems and asynchronous remote copy, which protects against site failures.

## Strengths

- Scale Computing is targeting a market that is not well-served by larger competitors, as those competitors have inherently higher costs.
- Scale Computing has created a scale-out architecture that can be efficiently sized to individual workloads.
- Scale Computing's technology enables direct provisioning of virtual machines.

## Cautions

- HC3's current lack of data compression, deduplication and erasure coding as an alternative to RAID 10 could — depending upon workloads — narrow or eliminate the HC3 cost advantage relative to other integrated systems.
- Many SMBs may be unwilling to swap their current hypervisor (frequently VMware or Hyper-V) for a proprietary KVM-based hypervisor, which may not be supported by key ISVs.

- Some IT organizations will be nervous doing business with a privately held IT company that has yet to prove its long-term viability in the integrated system market.

## SGI

SGI is recognized as a provider of high-performance computing (HPC), and most of the company's integrated system focus on maintaining this reputation. The company is growing its HPC market share; for example, SGI's share of the list of the top 500 global supercomputers has grown from slightly over 3% to 5.8% in the past 18 months, which compares well with vendors like Lenovo (3.4%), Fujitsu (2.6%) and Dell (2%).

SGI sells a variety of solutions: SGI ICE XA, which is the flagship product, aimed at addressing the most complex and challenging HPC needs; SGI Rackable platform, which addresses a broader spectrum of HPC requirements, and can be scaled from a relatively small configuration; and SGI UV, a platform intended to broaden SGI's reach beyond its HPC roots. SGI has launched a version of the UV aimed at SAP Hana users, and the system is currently the largest certified Hana appliance — recently extended to address up to 20 sockets as a single node, with support for 15TB memory (and a plan of record to further increase to 32 sockets and 24TB of memory in the near future). SGI aims to target additional in-memory compute opportunities with this platform, across a range of markets and workloads. Finally, SGI has also targeted extreme scale-out workloads like Hadoop and data warehouses with the InfiniteData Cluster, which can support almost 2PB of storage per rack.

SGI is well-positioned in markets for HPC and other extreme-scale workloads, but the company must still work hard to expand its installed base into vertical markets, where other brands are more prevalent and technology excellence is not always the primary driver. SGI's international breadth beyond the U.S. is good, especially in Europe and Japan, but technology buyers should validate the strength of SGI's local skills, especially for projects outside SGI's HPC domain.

A new alliance with Dell should enable both companies to leverage each other's complementary strengths in deal situations that would normally challenge either the technology portfolio or industry know-how of each individual vendor. SGI is expected to pursue other alliance opportunities.

## Strengths

- As a globally respected expert in the HPC market, SGI is well-positioned to benefit from the strong HPC attributes that many emerging Mode 2 workloads will exhibit.
- SGI is one of a handful of vendors to command credibility among the HPC buying community, and has a natural annuity business of existing and new HPC buyers looking to extend or replace existing configurations.
- By investing in platforms like UV and InfiniteData Cluster, and through alliances with vendors like SAP and Dell, SGI is able to leverage its technology strengths to target workloads and commercial markets beyond its traditional industry focus.

## Cautions

- SGI's strong and lasting association with HPC creates a challenge for the vendor to demonstrate the aptitude to address broader market needs.
- SGI's client base is numerically small, which makes the company dependent on a sales funnel that is prone to spikes and uncertainty.
- SGI will be challenged to grow its SAP viability where vendors like HP have a much more established footprint, and where buyers are less likely to be swayed by vendor arguments based on a strong technology orientation.

## SimpliVity

SimpliVity is a Boston-based HCIS vendor that has made rapid progress since its first product shipments started in 2013. The company has capitalized on the strong acceptance of the term "hyperconvergence," which is rivaled only by the market interest in containers during the past 12 months. SimpliVity has not only ridden the hyperconvergence cycle, but has differentiated itself in a crowded market by its use of hardware-assisted compression and deduplication. This enables SimpliVity to deliver an active expansion strategy, both technically and commercially — the evidence being strong bottom-line commercial growth and a marked increase in client inquiry. SimpliVity has also commenced partnering with other vendors, including an established OEM relationship with Cisco and rumors of further partnerships with other major system vendors. This has propelled SimpliVity into consideration for many CIOs' portfolios. Diversity and solution breadth is demonstrated by the SimpliVity claim that over half its clients run their complete IT infrastructures on the SimpliVity-branded solution.

SimpliVity's vision remains strong in 2015, with the main improvement reflected in consistent execution. This has included expansion and growth on all fronts from a strong, early VDI base. Other use cases, like mission-critical workloads, ERP, high availability/disaster recovery and DBMS clusters are being increasingly implemented by SimpliVity, but still need qualifying with valid references — especially across all geographies and verticals. However, these workloads represent nuances and opportunities that SimpliVity and other HCIS vendors are grasping with success. During the next year, we expect SimpliVity to further improve on scalability, load balancing, failover/fallback capabilities, HA functions, remote replication, stretch cluster deployments and to further expand hypervisor/container support. This should help SimpliVity improve relative product attractiveness and drive continued revenue growth in the coming years, which the company can most easily expand through incremental sales to its SMB/midmarket base. However, for enterprise users, SimpliVity's replication techniques will often overlap with other domain replication, such as storage, VM, cluster, DBMS and file system. This puts the onus on SimpliVity to prove a business case for displacing incumbent technologies.

## Strengths

- SimpliVity has been able to grow its value proposition from a foundation of project-based opportunities like VDI, to address an ever-broader variety of mission-critical use cases. This has

developed from SMB/midmarket growth to increasingly displace existing enterprise Infrastructure.

- The HCI modularity of OmniCube enables high scaling in small server/storage increments; and it has a highly innovative design that incorporates in-line deduplication and data compression at origin, and provides a global namespace and native virtual machine backup.
- SimpliVity's management tools connect to existing management frameworks via standard APIs (vCenter/OpenStack), and wide-area support facilitates business continuity strategies and management of remote sites.

### Cautions

- Clients should validate the pre- and postsales capabilities of local channel partners (especially outside North America).
- SimpliVity is more mature at selling to SMB/midmarket customers. For greater success in selling to enterprise customers, the company needs to prove a robust business case to displace existing solutions that address the HA and disaster recovery needs established in the enterprise portfolio.
- Because shipments of OmniCube began in early 2013, the installed base is still growing from a foundation that was initially skewed toward projects like VDI. Users should qualify more complex use cases using relevant reference clients, preferably in the same vertical industry and/or region.

### Teradata

Teradata's origins date back to 1979, although the company spent many years as a division of NCR before being spun out in 2007. The company has been shipping integrated systems for over 15 years, although always with a strong focus on business intelligence. The company is based in Dayton, Ohio, and has offices around the globe.

Teradata has always maintained a strong presence in the enterprise data warehouse and analytics market, and has a very loyal installed base. But it competes on two fronts: First, it competes with Moore's Law in that the hardware needed to address its average workloads halves every 18 months. Second, it competes again with Moore's Law in that its competitors double their capabilities year over year. As a result, Teradata is increasingly delivering its greatest value and differentiation through software, although much of the company's value and margin is dependent on sales of servers, disks and other hardware.

With the advent of large in-memory and virtualized mission-critical workloads, Teradata is facing renewed competition from major system vendors with the growing market focus on large or in-memory analytics for SAP, SQL Server, Oracle or Hadoop. Individually, the technologies slowly erode the Teradata value proposition, but collectively they mean that Teradata is stretched to differentiate on many fronts. This places ever greater emphasis on Teradata's ability to find new customers and not rely on churning the base. But with partners like SAP increasingly investing in software products that compete with Teradata (for example, SAP Hana), this increases the potential

for established mainstream hardware vendors like Dell, HP and Cisco to marginalize the business case for Teradata.

### Strengths

- Teradata has a very loyal installed base and community, and strong sales and service are associated with Teradata's stack and infrastructure.
- Teradata offers a portfolio of proven integrated systems, which build on the company's strong origins as an enterprise data warehouse (EDW) solution and support a growing range of analytics needs.
- Teradata's solutions are built on differentiated software and switch capabilities that harness commodity components from hardware partners to achieve maximum business value.

### Cautions

- Teradata is unable to prevent its users from being exposed to more choices and alternate architectures or solutions through the introduction of competitive open-source and/or in-memory databases and disk caching technologies from major system vendors.
- Teradata is still primarily perceived as a high-end solution that is relatively expensive.
- Teradata only addresses the markets for EDW/analytics, and has limited focus on opportunities for alternate and/or transactional workloads.

### Vendors Added and Dropped

We review and adjust our inclusion criteria for Magic Quadrants and MarketScopes as markets change. As a result of these adjustments, the mix of vendors in any Magic Quadrant or MarketScope may change over time. A vendor's appearance in a Magic Quadrant or MarketScope one year and not the next does not necessarily indicate that we have changed our opinion of that vendor. It may be a reflection of a change in the market and, therefore, changed evaluation criteria, or of a change of focus by that vendor.

#### Added

The following vendors were added to this Magic Quadrant:

- Cisco — The 2014 version of this Magic Quadrant assessed Cisco and NetApp jointly, as their FlexPod partnership was exclusive. Cisco now has comparable relationships with several other storage vendors, namely EMC, IBM, Nimble and Hitachi. Cisco also has alliances with HCIS vendors like Maxta, SimpliVity and Atlantis. As a result, it is appropriate to assess Cisco individually.
- EMC (VCE) — EMC was indirectly represented in the 2014 version of this Magic Quadrant through the partial ownership of VCE. Because VCE is now fully controlled by EMC, and EMC

has many other integrated system interests, it is now appropriate to reflect the transition from VCE to EMC.

- Gridstore — Gridstore is a privately owned HCIS startup that has achieved enough client shipments to become eligible for the Magic Quadrant this year.
- Lenovo — The 2014 version of this Magic Quadrant assessed IBM. In late 2014, Lenovo acquired IBM's x86 server business, which included the PureFlex integrated system range, although IBM continues to sell other categories of integrated systems. As a result, Lenovo became a valid vendor for this document.
- NetApp — While the Cisco relationship remains NetApp's primary market activity, the company is also an active member of the VMware Evo:Rail program, so it is appropriate to assess NetApp individually.
- Nimboxx — Nimboxx is a privately owned HCIS startup that has achieved enough client shipments to become eligible for the Magic Quadrant this year.
- Pivot3 — Pivot3 is a privately owned HCIS startup that has achieved enough client shipments to become eligible for the Magic Quadrant this year.
- Scale Computing — Scale Computing is a privately owned HCIS startup that has achieved enough client shipments to become eligible for the Magic Quadrant this year.

### Dropped

The following vendors have been dropped from this Magic Quadrant:

- Bull — Atos acquired Bull in 2014. Atos is not yet targeting this market (although we believe it will in the future). Bull has subsequently been dropped.
- Unisys — The Unisys Forward solution is technically innovative and actively marketed by Unisys as a solution for mainframe and x86 users. But market momentum for the x86 variant has been very slow and we were not able to identify enough proven market achievement to create a valid analysis.

### Other Vendors to Consider

There are many more vendors in the market than this research can represent. Some vendors will be significant participants in a single domestic market, but lack global reach. Others sell pure software solutions that are difficult to assess alongside hardware-based alternatives. But for some end-user clients, these vendors may deserve consideration. We have briefly described seven such vendors below:

- **Atlantis Computing** — Atlantis is a venture-capitalist-backed startup with a well-proven software-based HCIS solution. The company has sold extensively outside its U.S. domestic market, but was not considered eligible for this Magic Quadrant because there was no hardware solution certified by the company. In May 2015, Atlantis remedied this, with the launch of a company-branded, all-flash HCIS appliance named HyperScale, which is based on

Supermicro hardware that is sold and supported by Atlantis. The company also offers factory preintegrated hardware/software solutions based on HP, Lenovo, Dell or Cisco hardware, with support also managed by Atlantis itself. With over 800 customers globally, Atlantis is already a well-proven solution for users who want to create their own HCIS experience on existing hardware.

- **Inspur** — Inspur is a localized provider of integrated systems. Inspur focuses on high-end application areas such as big-data- and financial-services-optimized products, branded In-Cloud AIO. However, due to Inspur's geographic focus on China, it did not meet the inclusion criteria for this Magic Quadrant.
- **Maxta** — Maxta is a privately held startup with a software solution called Maxta Storage Platform (MxSP) that is certified on hardware from multiple vendors, including Cisco, Dell, HP, Lenovo, Quanta and Supermicro. In theory, the MxSP solution should run on any suitable x86 platform, with support for multiple hypervisors and OpenStack. Maxta has developed — with partners — a family of reference architecture appliances (using the brand MaxDeploy) that leverage MxSP for several major server platforms. But with no branded hardware solution of its own, Maxta does not yet meet Gartner's inclusion criteria.
- **NEC** — NEC is one of the most prominent IT vendors in Japan, and it has strong brand recognition in its home market. Since 2010, NEC has shipped an integrated system called Cloud Platform Suite. The strategy with that product has further matured under the NEC Solution Platforms branding since 2013. NEC sells a broad portfolio of eligible integrated systems, including Cloud Platform Suite for cloud services, Data Platform Suite for data accumulation and analysis, and Application Platform Suit for vertical-oriented applications. Although NEC promotes its technology outside Japan (using the brand Nblock Integrated IT Infrastructure to target data center buyers in the U.S. and other countries), its international progress has been limited mainly to verticals, for example, its Application Platform for Hotels solution sold in the U.S. With few channel partners and limited recognition outside Japan, NEC has yet to make the level of required international investment that would make it a viable global vendor.
- **Stratoscale** — With operations in the U.S. and Israel, Stratoscale has made rapid progress to achieve Series B funding for its HCIS Software-Defined Data Center (SDDC) strategy. The Stratoscale solution is forward-looking and targets service providers and enterprises. Stratoscale claims to bring a bottom-up approach to solving the storage, compute, networking, virtualization and management aspects in one software solution, enabling users to go from bare metal to a fully loaded cloud in a matter of minutes. The company supports both its own KVM-based hypervisor and containers as well as OpenStack, with plans to accommodate additional Amazon APIs in the near future. Stratoscale is an advocate of "bring your own hardware," and has no branded hardware solution, which has made it ineligible for inclusion.
- **Supermicro** — Supermicro deserves mention due to its participation in the hyperconverged market as a key provider of off-the-shelf and custom-engineered products to key HCIS providers included or referenced in this analysis, such as Atlantis, EMC and Pivot3. Supermicro does not offer its own branded products that qualify for inclusion, but the company is a certified vendor in the nascent Evo:Rail market.

- **Unisys** — We included Unisys in this report in 2014. Our database of inquiries indicates limited shipments, revenue and market interest. Unisys has consequently failed to satisfy the inclusion criteria for this research due to the limited acceptance and adoption. But IT buyers with a strong Unisys allegiance should consider the solution if it satisfies performance and use case requirements.

## Inclusion and Exclusion Criteria

We have defined the following inclusion and exclusion criteria for inclusion in this Magic Quadrant:

- Integrated systems must have servers, storage, network and a management software layer. Some vendors will not have an integrated networking switch in their hardware, but will deliver some or all of the functionality in the virtualization software layer.
- Software-only integrated systems do not qualify at this time, as the customer or the integrator would have to layer the software on top of third-party hardware, and integrate and support the offering.
- If the end user has to do the integration, the technology is not an integrated system that is valid for inclusion; however, it may be an eligible reference architecture that delivers an integrated system experience. This, again, eliminates software-only solutions, because the customers have to configure their own hardware. The value proposition of an integrated system should remove the need for racking and stacking from the customers' hands.
- A system that ships with just a bunch of disks (JBOD) storage is not an eligible integrated system, unless the vendor delivers integrated management capabilities for the storage and related processes (such as what hyperconvergence vendors provide through functionality such as data compression, deduplication, backup and data recovery of workloads).
- The support aspect is considered crucial. Where two or more vendors partner, we believe that support Level 1 (call center/service desk) and support Level 2 (escalation) must be integrated between the organizations to facilitate quick and easy problem resolution. However, support Level 3 (engineering) can still be delivered separately for the individual components of integrated systems based on vendor partnerships.
- Eligible vendors must have shipped general availability integrated systems for at least six months (prior to the period ending 31 March 2015) across at least two of the following major geographies: the Americas, EMEA and Asia/Pacific.
- The vendor must be able to provide a minimum of five full production customer references, with at least three outside the home geography of the vendor.
- A vendor may have more than one integrated solution in its portfolio, of which this research assesses the overall combined solution and the vendor's effectiveness as a single representation.
- Where vendors are working together, they must demonstrate proven collaboration regarding engineering, laboratory coordination, certifications, qualifications and testing.

## Evaluation Criteria

### Ability to Execute

The market for integrated systems is complex, with greater dependency on very specific technology choices. For our assessment of Product or Service, we examined the degree of software integration available from the vendor or implementation partners, plus the vendor's ability to deliver on roadmap promises. Sales Execution/Pricing examines both direct and indirect execution, as most integration system strategies are highly dependent on the role of local channel partners. We have also increased the weighting for customer experience versus the 2014 version of this Magic Quadrant, as we believe this is a crucial measure of success in an increasingly congested market with many new players.

Table 1. Ability to Execute Evaluation Criteria

Evaluation Criteria	Weighting
Product or Service	High
Overall Viability	High
Sales Execution/Pricing	High
Market Responsiveness/Record	Medium
Marketing Execution	High
Customer Experience	High
Operations	Medium

Source: Gartner (August 2015)

### Completeness of Vision

The market for integrated systems is complex, with greater dependency on very specific technology choices. The Sales Strategy criterion for Completeness of Vision assesses both the direct strategy and the channel partner strategy. Offering (Product) Strategy focuses on the breadth of the total solution (including software integration), the investment in management tools and the technology portfolio breadth. Business Model examines the implementation services that are available through the vendor or channel partners, and the variety of solutions and use cases that can be addressed.

Table 2. Completeness of Vision Evaluation Criteria

Evaluation Criteria	Weighting
Market Understanding	High
Marketing Strategy	Medium
Sales Strategy	Medium
Offering (Product) Strategy	High
Business Model	Medium
Vertical/Industry Strategy	Medium
Innovation	High
Geographic Strategy	Medium

Source: Gartner (August 2015)

## Quadrant Descriptions

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### Leaders

Market leaders will typically be able to execute strongly across multiple geographies and other market segments, with integrated systems that cover at least two, if not all three of the multiple market categories (ISS, IIS and HCIS). They will also have active reference architecture initiatives to address vertical and other more specialized opportunities.

### Challengers

Challengers are typically vendors with proven global presence and market achievement, who only target a narrower subset of the market, or who have not yet established themselves across the broader market.

### Visionaries

These are typically vendors who are focusing on strong innovation and product differentiation, but who are smaller vendors with limited reach, or larger vendors with innovation programs that are still unproven.

### Niche Players

Many integrated system vendors will address a more narrow market niche, or they may be vendors whose market programs have not yet established their differentiation and/or execution ability.

However, all vendors will have met the inclusion criteria and may address their specific market category with great effect.

## Context

The market for integrated systems has undergone significant change during the past 12 months — both in terms of the number of vendors addressing the market, and the architectural characteristics of the technology being sold. The dividing lines between integrated systems and other forms of data center infrastructure — which were already blurred by the integrated system trend — have become even more imprecise with the overlap between integrated systems and SDS, and the advent of software-only vendors that pursue a "bring your own hardware" strategy. The net result has been a surge in the volume and type of client inquiries, which this research should help address in terms of vendor selection and better understanding of an organization's integrated system needs.

The emergence of hyperconverged integrated systems has created the effect of a generational shift in the integrated system market. Until last year, established system vendors addressed the nascent integrated system market with preintegrated hardware comprising server, network and storage. Vendors have usually utilized existing technology elements, such as blade servers and SANs, to create an integrated system experience from technology that is usually sold separately through other channels. This first-generation market is still valid and viable today, depending on the use case. Through appropriate planning, configuration analysis and consultation with the vendor, the user is promised delivery of a self-sustaining and supported system that requires little ongoing maintenance and operations management. The value proposition most attractive to these organizations is the offloaded operations management and optimization of all the moving parts that make up the delivery platform. Many end-user organizations invest in these systems to be the centralized foundation for cloud services and data center modernization/virtualization initiatives. The common goal of these initiatives is always a focus on automated management of the resources presented by the system to enable quick and agile responses to enterprise business needs. Cloud and other service providers invest in such systems more rarely now, even though they were the primary target market for most early integrated system strategies. Integrated systems based on blade servers and SANs were generally regarded as too expensive and inflexible by the service provider community, which has yet to demonstrate renewed interest in hyperconvergence for their hardware investments.

Although every major system vendor has entered the integrated system market, no two have the same equipment, software and services for the variety of solutions and workloads that IT wants to deliver. Therefore, while the integrated system approach offers high potential returns, they are not cumulative across vendors. In other words, each vendor integrates within its own silo of technologies (or a mixture of technologies from allied vendors). However, integrating different integrated systems to coexist well together, as if they were a best-of-breed choice, remains a complex task that few, if any, vendors seek to simplify.

The second-generation market is harder to quantify, and introduces new blurring with SDS and other software-defined disciplines. Hyperconverged vendors typically characterize themselves as being primarily (a) software vendors, and (b) storage vendors.

In other words, these vendors believe their primary added value is delivered via the software stack, which seeks to integrate highly standardized hardware components into a single functioning system. They also focus more on delivering data resilience and robustness, and efficiently transporting data through the system. This is necessary for the HCIS vendors to convince their buyers that inexpensive hardware nodes with compute and direct-attached storage can be a viable replacement for the natural data integrity that SANs are able to deliver — albeit at relatively high cost compared with HCIS alternatives. This second generation of integrated systems is dominated by enterprising startups, many of which are included in this research. But the trend is also spawning new initiatives by the major system vendors, such as VMware's Evo:Rail strategy that is now supported by most major server vendors. Finally, as system vendors launch new-generation blade chassis technologies, these are likely to blur the distinction between servers and integrated systems further yet.

So while hyperconvergence does represent a new generation, it becomes more additive rather than cannibalistic — at least in the short term. HCIS solutions are able to extend the addressable market for integrated systems, and many organizations will buy an HCIS solution to address more distributed or workload-oriented needs, that will coexist with an integrated system based on a combination of blade and SAN-based technology that is located in the centralized data center.

As always, the choice of the right integrated system solution should rarely be made by the IT organization alone; additional stakeholders need to be part of the decision process around acquisition and consumption. As data center technology becomes increasingly modular, IT organizations, procurement departments, lines of business and asset control departments must reassess life cycle and depreciation planning approaches, as well as purchasing policies, to account for the unpredictable life spans of integrated systems.

## Market Overview

The integrated system market is growing rapidly, albeit from a low base. According to Gartner statistics, integrated system sales grew 30.4% over 2013, totaling \$8.7 billion and constituting approximately 10% of all server, external controller-based storage and data center networking spend by the end of 2014.

The concept of the integrated system is nothing new, yet the power of customer pull for this class of system has defined a new era and, thus, a new opportunity for data center infrastructure vendors. This new era of vendor activity emerged around 2010 and has caught industry attention, notably by the entrance of many traditional data center infrastructure OEMs and the emergence of many venture capitalist (VC)-funded startups. Today, VC activity in the integrated system market is arguably the strongest it has been for many years, and many of the VC-funded startups focus on HCIS. While HCIS is still considered nascent, it is the fastest-growing segment within the integrated system market, accounting for just under 5% of integrated system revenue in 2014.

As customer expectation matures, so too does provider understanding and innovation. As such, the integrated system market is beginning to grow in nuance, but users should still consider many of the integrated system products as adolescent, meaning more innovation, and importantly, more change is to come. As the market develops, we can expect to see further numbers of startup

organizations eager to enter. We will see consolidation, as some startups fail or get acquired, and we will see existing partnerships and coalitions thrive, evolve and disperse. We can also expect to see the once rigid, easily definable market segments begin to blur, as providers evolve their offerings, integrate new technologies and expand their market addressability with new product strategies.

## Gartner Recommended Reading

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

"Magic Quadrant for Modular Servers"

"Market Definitions and Methodology: Servers"

"How to Evaluate Vendors in the Hyperconverged Space"

"How Markets and Vendors Are Evaluated in Gartner Magic Quadrants"

### Evaluation Criteria Definitions

#### Ability to Execute

**Product/Service:** Core goods and services offered by the vendor for the defined market. This includes current product/service capabilities, quality, feature sets, skills and so on, whether offered natively or through OEM agreements/partnerships as defined in the market definition and detailed in the subcriteria.

**Overall Viability:** Viability includes an assessment of the overall organization's financial health, the financial and practical success of the business unit, and the likelihood that the individual business unit will continue investing in the product, will continue offering the product and will advance the state of the art within the organization's portfolio of products.

**Sales Execution/Pricing:** The vendor's capabilities in all presales activities and the structure that supports them. This includes deal management, pricing and negotiation, presales support, and the overall effectiveness of the sales channel.

**Market Responsiveness/Record:** Ability to respond, change direction, be flexible and achieve competitive success as opportunities develop, competitors act, customer needs evolve and market dynamics change. This criterion also considers the vendor's history of responsiveness.

**Marketing Execution:** The clarity, quality, creativity and efficacy of programs designed to deliver the organization's message to influence the market, promote the brand and business, increase awareness of the products, and establish a positive identification

with the product/brand and organization in the minds of buyers. This "mind share" can be driven by a combination of publicity, promotional initiatives, thought leadership, word of mouth and sales activities.

**Customer Experience:** Relationships, products and services/programs that enable clients to be successful with the products evaluated. Specifically, this includes the ways customers receive technical support or account support. This can also include ancillary tools, customer support programs (and the quality thereof), availability of user groups, service-level agreements and so on.

**Operations:** The ability of the organization to meet its goals and commitments. Factors include the quality of the organizational structure, including skills, experiences, programs, systems and other vehicles that enable the organization to operate effectively and efficiently on an ongoing basis.

#### Completeness of Vision

**Market Understanding:** Ability of the vendor to understand buyers' wants and needs and to translate those into products and services. Vendors that show the highest degree of vision listen to and understand buyers' wants and needs, and can shape or enhance those with their added vision.

**Marketing Strategy:** A clear, differentiated set of messages consistently communicated throughout the organization and externalized through the website, advertising, customer programs and positioning statements.

**Sales Strategy:** The strategy for selling products that uses the appropriate network of direct and indirect sales, marketing, service, and communication affiliates that extend the scope and depth of market reach, skills, expertise, technologies, services and the customer base.

**Offering (Product) Strategy:** The vendor's approach to product development and delivery that emphasizes differentiation, functionality, methodology and feature sets as they map to current and future requirements.

**Business Model:** The soundness and logic of the vendor's underlying business proposition.

**Vertical/Industry Strategy:** The vendor's strategy to direct resources, skills and offerings to meet the specific needs of individual market segments, including vertical markets.

**Innovation:** Direct, related, complementary and synergistic layouts of resources, expertise or capital for investment, consolidation, defensive or pre-emptive purposes.

**Geographic Strategy:** The vendor's strategy to direct resources, skills and offerings to meet the specific needs of geographies outside the "home" or native geography, either

directly or through partners, channels and subsidiaries as appropriate for that geography and market.

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