10 Key Considerations for Selecting Hyper-Converged Infrastructure

What to Know Before You Choose a Solution
As IT grapples with how to meet growing demands from the business and still keep costs in check, one thing is clear: Traditional infrastructure isn’t the answer. Expensive, complex hardware doesn’t allow IT to run an agile, lean organization that aligns with the fast pace of business. Something has to change. Hyper-Converged Infrastructure (HCI) has emerged as a compelling answer to this problem, offering a modern infrastructure that is both cost-effective and easy to use. But as more HCI solutions appear on the market, it’s important to understand how they vary, what benefits they do and don’t offer, and the significance of the right architecture.

Choosing a new infrastructure solution requires careful consideration. An inferior HCI solution can result in silos, vendor lock-in, expensive upgrade and expansion paths, and unpredictable performance. To help you avoid these pitfalls, we’ve outlined 10 key considerations to keep in mind to ensure you purchase an HCI solution that moves your business forward, rather than one that could hold you back.

What Is Hyper-Converged Infrastructure?

Hyper-Converged Infrastructure (HCI) allows the convergence of compute, storage, and management onto industry-standard x86 servers, enabling a building-block approach with scale-out capabilities. In a hyper-converged infrastructure, all key data center functions run as software on the hypervisor in a tightly integrated software layer.
What to Look For in a Hyper-Converged Infrastructure Solution

1. A Proven Hypervisor Offers Confidence and Lowers Risk
2. A Simple, Integrated Software Stack Allows You to Do More With Less
3. Advanced Automation Capabilities Enable IT Agility
5. Flexible Deployment Models Align IT Expertise With Business Priorities
6. Consistent, High Performance Satisfies Demanding Business-Critical Applications
7. Advanced Data Services Enable You to Handle Explosive Data Growth
8. Lowest TCO Frees Up Budget for Strategic Investments
10. Excellent Customer Support Ensures Immediate Issue Resolution
A Proven Hypervisor Offers Confidence and Lowers Risk

The hypervisor forms the foundation of hyper-converged infrastructure—it’s the “hyper” in hyper-converged. It provides all the benefits of virtualization, from operational efficiency to increased availability, which is why you’ll want to pay close attention to it as you evaluate HCI solutions.

Look for these characteristics in a hypervisor:

**Industry-leading**: Does it have a long-standing reputation for performance, quality, and customer satisfaction?

**Broadeset ecosystem**: Does it provide a robust set of application partners, so that you can virtualize any application with confidence?

**Compatibility**: Is it compatible with your existing data center? What level of management overhead will it require? Does it have any potential integration challenges?

**Future-ready**: Will it support the needs of third-party applications and new cloud technologies? Does it offer a broad range of OS support, from Windows to Linux to Unix?

**Extensibility**: Will it allow you to optimize cost savings by better utilizing your existing hardware and reducing server requirements?

A Market Leader

More than 500,000 enterprises—including 100% of the Fortune 100—trust VMware as their virtualization infrastructure platform. VMware has been recognized as a leader in the 2016 Gartner “Magic Quadrant for x86 Server Virtualization Infrastructure”. This is the seventh year in a row VMware has received this recognition.*

---

* Gartner, Magic Quadrant for x86 Server Virtualization Infrastructure, August 2016

Gartner does not endorse any vendor, product, or service depicted in its research publications, and does not advise technology users to select only those vendors with the highest ratings or other designation. Gartner research publications consist of the opinions of Gartner’s research organization and should not be construed as statements of fact. Gartner disclaims all warranties, expressed or implied, with respect to this research, including any warranties of merchantability or fitness for a particular purpose.
One of the implicit promises of HCI is that it will help you work more efficiently. A single software stack helps deliver on that promise.

**With a single stack, you can:**

**Reduce complexity.**
With fewer software components to install, manage, monitor, and troubleshoot, fewer things can go wrong. When an issue does arise, you can identify it faster.

**Increase operational efficiency.**
A single stack brings key functions together in one place to reduce dependencies among teams. You can provision additional storage with just a few clicks—no extra software installs required.

**Minimize resource overhead.**
A streamlined software stack has no bolted-on virtual appliances that require their own resources, which minimizes your resource overhead and enables greater virtual machine density.

**Leverage existing investments.**
Imagine how much faster you could see the benefits of HCI without the need to learn new interfaces or obtain specialized skill sets. Look for a solution that doesn’t require training for quicker results.

**Achieve tighter data center integration.**
By integrating with other components in your data center, including virtual desktop solutions, network virtualization solutions, and more, you ensure that all pieces work together efficiently.

**A Market Leader**

With HCI powered by VMware vSAN™, you can manage storage through the familiar vCenter® interface, one you already know and trust. vCenter Server allows you to automate and deliver a virtual infrastructure from a single console.
Advanced Automation Capabilities Enable IT Agility

Enterprise-level automation can free up time and make your team more efficient. Look for an HCI solution that enables full automation to get the maximum value out of your investment.

Look for these automation capabilities:

**Automated storage provisioning.**
Save valuable time with automated provisioning and auto-discovery of resources.

**Centralized, policy-based management.**
With enhanced monitoring and built-in reporting capabilities, you can respond quickly to changing business needs.

**A self-tuning platform and QoS controls.**
Automatic rebuilding and rebalancing of storage and compute resources ensures alignment with VM SLAs.

**Intelligent provisioning.**
Flexibility on how to deploy servers solves the problem of unused, over-allocated storage—delivering big cost savings in the process.

**“Just-in-time” storage services.**
The ability to configure storage-as-needed enables you to match resources with business needs.

A Flexible Approach to Storage

With VMware vSAN, storage assets and capabilities are configured and assigned granularly to specific applications through simple policies. Alter policies or apply a new policy to automatically adjust storage capabilities to meet new business demands.
Non-Disruptive and Fine-Grain Scaling Allows You to Meet Growing Business Needs

Today’s business environments are unpredictable. Demand spikes, then ebbs, then spikes again. Traditional infrastructure doesn’t have the ability to respond quickly to changing needs, another area where HCI shines.

Here are the scaling capabilities to look for:

**Granular scale-up/scale-out.**
Scale out and scale up in a simple, straightforward way with the ability to scale compute and storage independently.

**Predictable performance scaling.**
Simplify planning and easily expand your environment to support additional applications or new users in a VDI environment, without the need to majorly expand a traditional storage silo.

The Simple Way to Scale

VMware vSAN can easily be scaled out, one node at a time, or scaled up, one drive at a time. You get the ultimate flexibility, without costly forklift upgrades.
With VMware vSAN, storage assets and capabilities are configured and assigned granularly to specific applications through simple policies. Alter policies or apply a new policy to automatically adjust storage capabilities to meet new business demands.

5. Flexible Deployment Models Align IT Expertise With Business Priorities

Every organization is different, and you’ll want to look for a solution that is flexible enough to meet your specific needs. Based on your budget and time considerations, you may opt for a custom solution or a turnkey solution that can be deployed fast.

Options to Meet Diverse Needs

VMware provides deployment models that ensure a solution that best aligns with your business needs.

1. VMware vSAN Ready Node - A ready-to-go hardware solution that makes an ideal building block for data center environments. Please consult the Lenovo Server configurator to choose a pre-certified vSAN Ready Nodes.

2. Lenovo ThinkAgile VX appliance - A turnkey appliance that comes fully integrated, preconfigured, and tested with specific software to automate configuration and lifecycle management.
Applications are becoming critical to the business, which makes them a high priority for IT. As the mix of workloads and users shifts, you want an HCI solution that will enable you to meet changing demand.

Select for these performance capabilities:

All-flash optimized.
The future of primary storage is flash, so this is a key factor in performance. It can also help lower your costs, both now and as all-flash systems drop in price.

Support for next-generation hardware technologies.
A solution that allows you to adopt the latest technologies as soon as they become available will let you stay competitive without overhauling your entire system.

Efficient resource utilization.
Gain more performance right where you need it: your business applications. Enjoy greater VM density while delivering better application experiences to your end users.

A Hypervisor-Embedded Architecture

vSAN embeds storage directly into the hypervisor, optimizing the I/O path to deliver consistently fast response times. With vSAN, you can get up to 100K IOPs per node with sub-millisecond latencies.
As the number of devices and connected appliances continues to proliferate, data volume will keep growing. A good HCI solution can help you handle the challenges that come with big data.

**Look for these data storage capabilities:**

**Deduplication, compression, and erasure coding.**
These data efficiency features increase storage utilization for your ever-growing data needs.

**The ability to “set it and forget it.”**
Choose your settings and walk away; low overhead means you don’t need to worry about performance impact on other workloads.

**High availability – 99.999% is a must.**
Downtime is not an option. You’ll want to choose a solution that ensures zero downtime, and zero data loss.

**Built-in fault tolerance.**
Look for distributed RAID and cache mirroring, and support for stretch clusters for 0-minute RPO.

**Enterprise-Ready Storage**

vSAN’s deduplication and compression features deliver up to 10x space efficiency and 7x* data reduction, without consuming noticeable amounts of memory and CPU resources. Furthermore, erasure coding helps increase usable storage capacity by 100% while keeping data resiliency unchanged.

---

* VMware internal analysis, December 2015. Comparison to Virtual SAN 6.1 results. Results and ratios will vary based on actual workloads and deployment configurations.
Lowest TCO Frees Up Budget for Strategic Investments

If your IT organization is like most, you’re continually being asked to do more with less. Your business users want more, but your budget isn’t expanding fast enough to keep up with demand. That often leads to a trade-off between cost and quality, which creates frustration on both sides.

HCl can help lower your total cost of ownership in several ways, reducing your dependency on purpose-built hardware and reducing the burden on your team. You win in two ways: You not only free up space in the budget, but you now have time to focus on more strategic priorities for the business.

Choose a solution that drives savings by:

**Automating operational processes:** Integrated management and automation help reduce operational spend.

**Evolving existing expertise:** Leverage your knowledge of familiar VMware vSphere® and VMware vCenter™ environments to eliminate the learning curve.

**Eliminate support silos:** Use existing virtualization and hardware vendors you already know. Familiarity means you won’t have to learn a new platform or associated support processes and requirements.

A Demonstrated Path to Savings

HCl powered by vSAN provides up to 50% lower TCO*. It also includes a three-year support plan, helping you avoid unexpected support costs.

---

A good HCI solution not only gives you the ability to take advantage of emerging hardware technologies, but it also positions you to take advantage of future application demands and architectures.

**Look for these future-ready indicators:**

**Built for what’s next.**
A good HCI solution has both the architecture and vision to support today’s applications as well as those that are still in the future.

**Flexible enough to deploy any application.**
Choose a solution that lets you virtualize and deploy any application with confidence, including high-performing business-critical apps, virtual desktop infrastructure, private clouds, remote IT, and container-based applications for cloud-native environments, without any gaps in performance as usage grows.

**The Future-Ready Solution**

VMware ensures you have a scalable, high-performance storage solution for cloud-native applications with vSAN for VMware Photon™. The solution will deliver an agile, operational framework that is API-friendly, along with an on-demand consumption platform optimized for elastic workloads.
10. Excellent Customer Support Ensures Immediate Issue Resolution

When you have an issue with your HCI solution, you want to have the confidence that it will get solved fast.

**For a versatile solution, you’ll want:**

**No finger-pointing.**
A bolted-on HCI solution composed of disparate products can lead to headaches when issues arise. With a single-source vendor, there is no finger-pointing or passing the problem to someone else.

**Rapid troubleshooting.**
Advanced monitoring built into the tool can help identify problems quickly and even eliminate the need to contact support.

**High customer satisfaction ratings.**
Year after year, VMware is ranked at the top (or near the top) in customer satisfaction for tech companies.* One call is all you need.

Source: As shown in 2014 Temkin Experience Ratings for Tech Vendors where VMware was #1 and in 2015 Temkin Experience Ratings of Tech Vendors where VMware was #5.
Why Lenovo?

You aren’t the only ones adopting hyperconverged infrastructure. So to gain a competitive advantage you need to build your data centre on the very best appliances out there. Lenovo ThinkAgile VX appliances are built on proven Lenovo servers, ranked #1 industry-wide in reliability and customer satisfaction and backed by world-class services and support.

#1 in customer satisfaction
Lenovo VX appliances exceed the evolving demands enterprises place on them including hardware quality, reliability, performance, and efficiency to reduce total cost of ownership. That’s why Lenovo is #1 in customer satisfaction in TBR’s Corporate IT Buying Behaviour and Customer Satisfaction Study for x86-based Servers.

The world’s most reliable servers
Lenovo x86 servers deliver the highest availability among all Intel x86-based systems, according to the ITIC Global Server Hardware, Reliability report (2016-2017).

World record-breaking performance
Lenovo has long been a leader in innovation, offering some of the world’s fastest systems to support your mission-critical applications. The Lenovo System x3850 X6 server, for example, holds 17 world-record benchmark results.

Security built-in
Lenovo servers are designed to integrate and embed security by default. We employ rigorous business processes, product design, and supply chain controls to ensure our products meet the most stringent customer requirements. We believe we have the most transparent, auditable, and secure supply chain in the server industry.

Supporting success
Lenovo is the reliability leader, but occasionally issues arise. And sometimes you may need help tackling your most complex IT projects. With Lenovo, you can access a full suite of flexible services to help you run a successful IT organization. You can also use Lenovo professional services to help you deploy complex solutions or enable the latest technologies. You can realize the value of your IT solution faster, and you can maximise the value of your deals.

8. Lenovo keeps #1 position in customer satisfaction, read more at TBR 2H16 Customer Satisfaction x86-based Study, December 2016 | http://lnv.gy/2m101DS
Lenovo ThinkAgile VX Series
Simplify IT infrastructure and accelerate time-to-value

vSAN Hyperconverged Architecture

Differentiating yourself from the competition is vital in today’s fast-moving business environment. To support your business, IT systems must be simple, agile, and cost-effective so you can meet your customers’ requirements to be ever online. Lenovo ThinkAgile VX Series enables you to meet these requirements by focusing on the business outcome you require, rather than on building your infrastructure.

ThinkAgile VX Series, powered by VMware vSAN, is available in several models. Each is preconfigured, pretested, and optimized to provide the simplest way to bring a new VMware hyperconverged environment online. If you have an existing VMware environment, VX Series can integrate into it easily. Designed for any size business from SMBs through large enterprises, VX Series can be used as infrastructure for remote office/branch office (ROBO) and retail stores as well as virtual desktop infrastructure (VDI) and enterprise applications.

Buying vs. Building Infrastructure

Typically, VMware vSAN installation is very much a do-it-yourself project. Customers must configure, test, debug, optimize, validate, etc., on their own. However, ThinkAgile VX Series eliminates all of that time and effort by completing those steps before it leaves the factory. VX Series arrives at your doorstep with everything you need to get started, already configured and ready to go, and Lenovo professionals to install and configure it for you. This greatly reduces your cost and time-to-value. But that’s only the beginning.
VX Series is simple to deploy. With compute, storage, and virtualization resources integrated into a single node, it enables you to dramatically simplify your infrastructure by pooling multiple sets of node resources into a single virtual structure for more efficient utilization and management. Plus, this infrastructure scales rapidly to meet the growing needs of your business. There is no need for expensive IT overprovisioning. You can wait until you actually need additional resources before you pay for them.

**Flexibility and Choice**

ThinkAgile VX Series comes in a wide range of platforms and offers full configure-to-order (CTO) flexibility to meet any use-case. All systems are available in either all-flash or hybrid configurations:

- **VX 3000 Series**—General-purpose 1U and 2U 1-node platform optimized for compute-heavy applications, such as VDI. Available with GPU hardware for accelerating graphics-intensive VDI deployments.
- **VX 5000 Series**—Storage-dense 2U 1-node platform optimized for fast, high-capacity storage applications, such as email, big data, and analytics
- **VX 7000 Series**—2U 1-node platform optimized for the highest-performance workloads, such as databases and collaboration.

**Scalability and Performance**

Based on Lenovo ThinkSystem platforms that incorporate powerful Intel® Xeon® processor Scalable family CPUs, VX Series allows you to start small, with as few as three nodes, and scale either by adding more storage capacity or by adding nodes one at a time. This enables you to scale capacity and performance easily and without disruption to day-to-day operations. All-flash models support inline de-duplication, compression, and encryption to give you an optimized, secure, high-performance platform with maximum usable capacity.

**Fast Time-to-Business-Use**

All ThinkAgile platforms are delivered with Lenovo ThinkAgile Advantage. Lenovo Services will set up and configure your new solution and provide any training you need to get the system operational. Your VX Series will be up and running productively in hours instead of days or weeks. Once your VX Series is deployed, you’ll have the utmost in productivity. After all, the new ThinkSystem servers have already achieved 42 world record benchmarks. And dating back to 2001, Lenovo servers have achieved nearly 200 world record results, demonstrating a history of performance innovation.
Typically, VMware vSAN installation is very much a do-it-yourself project. Customers must configure, test, debug, optimize, validate, etc., on their own. However, ThinkAgile VX Series eliminates all of that time and effort by completing those steps before it leaves the factory. VX Series arrives at your doorstep with everything you need to get started, already configured and ready to go, and Lenovo professionals to install and configure it for you. This greatly reduces your cost and time-to-value. But that's only the beginning.

If you need support, Lenovo ThinkAgile Advantage gives you a direct phone line to a team of experts who support only ThinkAgile solutions. The experts will rapidly diagnose any hardware or software issues and remain with you as the single-point-of contact throughout the entire support process.

Greater Reliability

A successful hyperconverged solution requires reliable server platforms. Because servers perform both the compute and pooled-storage missions, uptime is more important than ever.

For the fourth year in a row, Lenovo servers achieved the #1 reliability rating of all x86 servers worldwide, according to the ITIC 2016-2017 Global Server Hardware and OS Reliability Survey† The independent survey polled hundreds of global businesses and once again Lenovo servers came out ahead of all other x86 servers.

Not surprisingly, this high reliability—coupled with the ease of use and high performance of Lenovo servers—has consistently resulted in #1 ratings in TBR customer satisfaction surveys. In fact, in the latest survey Lenovo servers finished first in all 22 categories of customer satisfaction and #1 overall for the 7th consecutive time. This can only happen when there is a history of sustained innovation in technologies that promote reliability and ease of use.

Bottom Line

ThinkAgile VX Series enables you to simplify your IT infrastructure and drive down costs through the combination of preloaded easy-to-use software on powerful, extremely reliable hardware. All VX Series models are backed by world-class Lenovo services and support.

The perfect complement to the VX Series, Lenovo’s comprehensive data center services portfolio spans the entire lifecycle of your Lenovo IT assets. Tailor your data center services to meet specific business needs and response-time targets with preconfigured support levels. Service options include assessment workshops, hardware installation, enterprise server software support, managed services, health checks, and more.

To learn more about the Lenovo ThinkAgile VX Series go to www3.lenovo.com/us/en/data-center/Lenovo-ThinkAgile-VX-Series/p/WMD00000340
Learn why Lenovo has the right solution for any workplace

Join Us Online

www.facebook.com/lenovo

www.twitter.com/LenovoBusiness