According to IDC, "hyperconverged infrastructure essentially collapses core storage, computing, and networking functions into a single software solution or appliance. Hence it is simply a more tightly integrated converged system with compute, storage, and networks decoupled from the underlying infrastructure and defined/configured at a software level."¹

There is more than one way to deliver a hyperconverged solution: as a hardware-software appliance in a pre-defined configuration, or as a flexible solution based on a purely software-defined architecture. In either case, the principal characteristic common to either approach is that expensive, monolithic storage frames and the physical SAN are both eliminated.

The result is a unified compute and storage infrastructure that is simpler to manage, reduces capital and operational expenses, and doesn’t require vendor-specific SAN or storage expertise.

WHY HYPERCONVERGE?

A full 44 zettabytes: That’s how much data there will be on the planet by 2020.² It’s 10 times more data than there was in 2014 — and far more data than traditional SAN-based IT infrastructures can ever hope to process, store, and analyze. It is not just the volume of data, but the rate at which it is created. IDC is reporting that 90 percent of all the digital data stored today was created in the last few years.³

Predicting the need for storage capacity becomes a struggle and a challenge that needs a systematic and predictable resolution. Hyperconvergence replaces the proprietary hardware-defined storage and physically converged infrastructure with a software-defined storage infrastructure that is virtually converged within the hypervisor tier, hence becoming “hyperconverged.” In hyperconvergence, hardware-defined elements for computing, storage, networking, and management converge into a highly simplified, software-defined virtual architecture.

The result is a dramatically simplified data center infrastructure that transcends the limitations of traditional systems. It improves scalability and performance, enhances manageability, and dramatically reduces the cost of operations in the long-term.

THE EVOLUTION OF THE IT INFRASTRUCTURE

As organizations continue to look for ways to handle growing demands on the technology infrastructure, the limitations of traditional hardware-defined infrastructures create pain points that cannot be resolved with traditional thinking. With SDS moving into the servers, new thinking and new architectural approaches are possible. The fusion of SDS and server virtualization enables hyperconvergence, moving Lenovo® customers a giant leap toward a 100 percent software-defined future.
Hyperconvergence is the next natural step in the evolution of the data center. Complex IT infrastructures are shifting away from familiar hardware-defined systems toward the new software-defined reality. Proprietary SAN-attached storage systems will slowly disappear from most environments, and be replaced by more efficient, modular hyperconverged building blocks.

**REDUCING COMPLEXITY TO LOWER COSTS**

According to the Storage Networking Industry Association (SNIA), about 60 percent of data center CAPEX and OPEX is spent on SANs and SAN-attached storage. Hyperconvergence potentially eliminates all of these costs.

By converging storage, storage management, and the SAN at the hypervisor level and placing the SDS stack adjacent to the workloads, hyperconvergence reduces IT complexity, increases application performance, and delivers a dramatically more adaptive infrastructure. Storage-intensive applications become easier to deploy, manage, and scale than on traditional systems. This in turn reduces capital and operating costs — a critical consideration at a time when data is growing far faster than budgets.

**FASTER TO DEPLOY**

In a hyperconverged architecture, compute, storage, networking, and I/O functions are all collapsed into a single, software-defined infrastructure that can be deployed or scaled in a fraction of the time required for conventional hardware-defined, discrete elements. By eliminating purpose-built or monolithic storage hardware and SAN switches, IT has far fewer physical elements to purchase and deploy and can do the job much more quickly.

**EASIER TO MANAGE**

Software-defined infrastructures are easier to manage than hardware-defined systems. Because they eliminate the need for multiple hardware systems for server, storage, networking, and other capabilities, there’s no need to juggle multiple management tools and interfaces. Users can now manage all resources from a common management framework.

**SEAMLESS TO SCALE**

Hyperconverged systems scale seamlessly and dynamically. Scaling to meet increasing demand is a matter of simply adding nodes for front-end processing or back-end capacity any time more compute power or storage is needed — or just as easily removing capacity for either when demand goes down. This elastic-scale approach overcome the complexity of scaling traditional hardware-defined systems.

In addition, a hyperconverged infrastructure improves ROI with:

**Higher performance**

Applications access storage without traversing a SAN. Storage access is dramatically faster, response times are reduced by orders of magnitude, and applications run better when hyperconverged.

**High availability at lower cost**

Of course, Lenovo customers already enjoy higher reliability as evidenced by the ITIC report. However, due to the greatly reduced CAPEX and OPEX costs of hyperconverged infrastructure, organizations can now implement high availability for those applications that previously could not be cost-justified for high availability. With far fewer discrete components in the architecture, hardware failures are less frequent, easier to manage, and more quickly resolved than with legacy systems.
Data efficiency
One of the most important benefits of a hyperconverged data center is that the entire infrastructure is managed in a single system. This reduces workforce costs over the long term, as there is less need for specialized resources to manage disparate systems.

Data protection
Backup, recovery, and disaster recovery are easier to implement in software-defined and hyperconverged infrastructures — frequently eliminating the need to purchase and manage multiple disparate products.

Lenovo and Nutanix
Lenovo’s global strategic partnership with Nutanix combines the industry-leading reliability of Lenovo enterprise systems with software from the industry leader in hyperconverged appliances since 2011.

The partnership will reduce IT complexity and cost and increase greater efficiency and agility in data centers of all sizes through:

- A jointly developed and branded family of Lenovo appliances powered by Nutanix software
- Sizable investments by both companies in joint platform development, performance engineering, and a dedicated and skilled salesforce

LENOVO CONVERGED HX SERIES
Lenovo Converged HX Series Powered by Nutanix deliver ready to deploy appliances designed to simplify every aspect of the data center infrastructure lifecycle — from procurement and deployment to management, scalability, and support. Customer benefits include:

- **Simplify IT infrastructure** by integrating server, storage, and virtualization in a centrally managed appliance with built-in predictive analytics.
- **Reduce costs** by implementing only what you need and then easily scale as needed.
- **Increase reliability** with trusted Nutanix infrastructure solutions and industry-leading Lenovo enterprise systems.

AVAILABLE CONVERGED HX SERIES SOLUTIONS

**Lenovo HX3500**
Designed for compute-heavy workloads, this solution is ideal for VDI, web server, light databases, and smaller virtualization workloads.

**Lenovo HX5500**
Designed for storage-heavy workloads, this solution can help customers with their workloads with large capacity needs, file servers, backup, Hadoop, and disaster recovery deployments (DR).

**Lenovo HX7500**
Designed for high performance, this solution can provide significant benefits for larger databases, MS SQL, Exchange, Oracle, and other I/O intensive workloads.
Nutanix use case: leading big-box retailer – test/dev and VDI

A large electronics retailer with 2,000 locations in North America needed to support test/dev environments and thousands of VDI clients. Building these services on conventional SAN-attached storage architecture was far too expensive. Internal pilots using Amazon Web Services showed dramatic savings, but Amazon is the company’s chief competitor.

A challenge was issued to IT managers to identify an on-premises solution that matched or beat AWS on both cost and performance criteria. After a detailed examination of several solutions, a private cloud infrastructure based on Nutanix was deployed.

Nutanix demonstrated a higher performing and less costly alternative to AWS by:

- Eliminating the expense of external SAN-attached or NAS storage and WAN connection costs
- Improving performance by keeping the infrastructure local and deploying workloads and storage in the same servers
- Eliminating AWS monthly subscription costs
- Providing an easy-to-buy appliance model that allows the company to scale quickly and incrementally by merely adding additional nodes

LENOVO: IDEAL FOR HYPERCONVERGENCE

High performance

Lenovo brings industry-leading performance to hyperconvergence in the data center. Our System x3650 M5 server platforms are rated No. 1 in x86 reliability and achieve superior performance with Intel® Xeon® processors. The entire System x product line offers the lowest downtime of any x86 servers.

Built for the data center

Lenovo offerings deliver enterprise-class features designed specifically to meet the demands of data centers. For example, industry-leading cooling in the System x3650 server supports a thermal range from 5° to 40°C.

Best-of-breed interoperability

There’s no “one size fits all” to optimize efficiency in the data center. That’s why Lenovo offers world-class data center systems built to seamlessly work with leading solutions providers.

Customer satisfaction

In survey after survey by Technology Business Research, Lenovo ranks No. 1 in customer satisfaction for System x. In the past five quarters, Lenovo’s six-month, one-time services and setup satisfaction score increased. Satisfaction continues post-purchase as Lenovo customers reported the highest satisfaction with customer care.

For more information, please visit lenovopartnernetwork.com/hx lenovopartnernetwork.com/ca/hx


© 2016 Lenovo. All rights reserved. Lenovo is not responsible for photographic or typographic errors. Lenovo, the Lenovo logo, ThinkServer, and System x are trademarks or registered trademarks of Lenovo. Intel, the Intel Logo, and Xeon are trademarks of Intel Corporation in the U.S. and/or other countries. All other trademarks are the property of their respective owners. Version 1.00, March 2016.