

Reference Architecture for Lenovo Converged HX Series Nutanix Appliances



Simplifying the modern datacenter



Simplify Solutions Infrastructure

Lenovo and Nutanix share a common vision of delivering an invisible infrastructure that does not demand significant time and resources to maintain. This frees IT to focus on delivering applications and drive innovation, greater efficiency and agility for their business, instead of managing their current complex infrastructure.

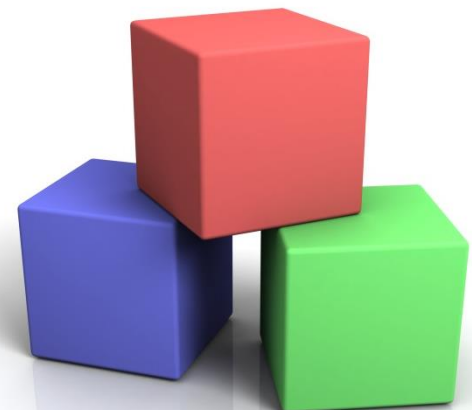
The Lenovo Converged HX Series Nutanix Appliance is simple to deploy. With compute, storage and virtualization co-located on a single node, the Lenovo Converged HX Series enables you to dramatically simplify your server, storage and virtualization deployments and pool your resources into a single virtualized infrastructure for more flexible and efficient utilization and management. Plus, it scales rapidly to meet the growing needs of your business. Lenovo designs its systems with open standards, enabling easy integration with third-party partners for best-in-class offerings.

The Lenovo Converged HX Series supports a rich suite of enterprise focused workloads which are detailed herein.

HX Series Appliance selection

Currently there are three HX Series appliances available to support configurations designed to address popular workloads:

- The Lenovo Converged HX7500 is perfect for high-performance workloads such as Microsoft Exchange, Microsoft SharePoint and databases like Microsoft SQL Server. This performance is enabled by higher end processors, four SSDs to support larger workloads and twenty 2.5" HDDs.
- The Lenovo Converged HX5500 is well suited for storage-heavy workloads such as file servers, Splunk and data center backups. This strong storage platform is enabled by cost effective 3.5" HDDs that include three different capacity options of 12TB, 24TB and 36TB.
- The Lenovo Converged HX3500 is ideal for deployments focused on compute-heavy environments. The Lenovo Converged HX3500 features a strong mix of two SSDs and six 2.5" HDDs to support generalized virtualization workloads such as web servers and VDI.



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Features & Options for Lenovo Converged HX Series Appliances					
Appliance Model	Drive Form Factor	Data SSDs	Data HDDs	Memory	CPUs
HX3500 for Compute Heavy Workloads	2.5"	2 x 400 GB 2 x 800 GB	6 x 1TB 6 x 2TB	128 GB	2630 v3
				256 GB	2660 v3
				384 GB	2680 v3
				512 GB	2697 v3
				768 GB	2699 v3
HX5500 for Storage Heavy Workloads	3.5"	2 x 400 GB 2 x 800 GB	6 x 2TB 6 x 4TB 6 x 6TB	128 GB	2620 v3
				256 GB	2630 v3
				384 GB	2660 v3
				512 GB	2680 v3
				768 GB	2697 v3
HX7500 for Performance Heavy Workloads	2.5"	4 x 400 GB 4 x 800 GB	20 x 1TB 20 x 2TB	128 GB	2643 v3
				256 GB	2680 v3
				384 GB	2697 v3
				512 GB	2699 v3
				768 GB	2699 v3

This requires efficiently delivering random and sequential read/write at high performance, across sizable amounts of active or hot data.

The Lenovo Converged HX7500 delivers a turnkey infrastructure solution for Microsoft applications. Run Microsoft SQL Server alongside other virtualized applications and benefit from:

- Higher performance and scalability: Start small and scale databases as your needs grow, but without the concessions of traditional infrastructure.
- Improved availability: Keep key applications protected and running with frequent, easy-to-restore backups and affordable, simple disaster recovery.
- Reduced operational complexity: Leverage simple, consumer-grade management, VM-centric operations and unprecedented insight into application and storage performance.

Microsoft SQL Server

As one of the fastest growing database platforms, Microsoft SQL Server deployments are becoming increasingly critical to organizations. They are used in everything from departmental databases to business-critical workloads, including enterprise resource planning, customer relationship management and business intelligence. At the same time, enterprises are virtualizing SQL Server to consolidate their datacenter footprint, control costs and accelerate provisioning. These trends of delivering SQL Server databases as dynamic, virtualized services make it essential to select the right server and storage architecture.

Database performance has long been the primary criteria for selecting infrastructure. Multicore processors and large system memory capacity have now moved the performance conversation away from compute to the storage system. Storage solutions that support virtualized SQL Server VMs need to handle a dynamic mix of transactional (OLTP) and analytical (OLAP) databases, along with their unique storage I/O profiles and active data sets.



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SAP NetWeaver for Business Applications

SAP NetWeaver is the ideal candidate for virtualization in a web-scale private cloud environment bringing benefits such as ability to handle rapid performance and data growth, consolidation of datacenter footprint and predictable licensing costs.

Whether upgrading existing infrastructure or deploying new environments, The Lenovo Converged HX7500 provides an invisible infrastructure that is the ideal certified solution for virtualized SAP and associated database landscapes. It brings the benefits and economics of web-scale technologies to SAP landscapes large and small.

With linearly scaling, as well as high performance for both random read/write and sequential storage operations, the Lenovo Converged HX7500 can simultaneously support transactional and analytical NetWeaver workloads with terabytes of active data. And, by eliminating the need to overprovision storage in order to maintain long-term performance, IT teams can significantly reduce capital investment and physical footprint by as much as 80%.

The Lenovo Converged HX7500 incorporates powerful data protection and high availability capabilities for keeping SAP landscapes running and well protected. You can also quickly clone and deploy new high performance development and test environments without having to worry about copying data, which accelerates your overall development cycles.



Microsoft Exchange Server

Email has become one of the fastest growing critical workloads in today's information rich organizations. Microsoft Exchange deployments are now considered to be mission critical, requiring careful planning, deployment and management to ensure high performance, availability and easy scalability. With the Lenovo Converged HX7500, IT managers can finally deliver highly scalable and responsive Microsoft Exchange services with large mailboxes – without the excessive costs and complexity of traditional shared SAN and NAS storage systems.



The Lenovo Converged HX7500 removes the complexities of managing separate storage, server and virtualization environments, eliminating the need for dedicated resources. With this platform, your Exchange installations can co-exist with other enterprise applications in the same environment, resulting in superior resource utilization. Lenovo eliminates the need to overprovision isolated silos of storage, delivering the predictable, consistent performance and faster time-to-value your organization needs.

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Radically simplify the deployment of virtualized environments. You can quickly and easily spin up systems in less than a day without complex storage or network planning. The Lenovo architecture provides the many benefits web-scale technologies bring to enterprise virtualization environments, including live VM migration, high availability (HA), distributed resource scheduling (DRS) and fault tolerance.

The Lenovo Converged HX7500 keeps Microsoft Exchange available and running by delivering the flexibility needed to deploy and manage Microsoft Exchange deployments in both Database Availability Groups (DAG) configurations, as well as in traditional non-HA Exchange deployments. This architecture provides enterprise levels of resiliency – starting with the data (tunable redundancy and integrity checks), to the nodes (non-disruptive upgrades and data path redundancy) and to VM level (snapshots and metro-availability) improving disaster recovery and ensuring business continuity across your IT environment.

Deliver predictable performance and scalability. The Lenovo Converged HX7500 with web-scale architecture scales performance and capacity separately within each node and intelligently places data to deliver consistent performance. Data is tiered across local and remote SSDs and HDDs for reduced latency and faster delivery of Exchange data. This appliance deduplicates data in the performance tier, enabling larger working sets and greater mailbox density. Auto-discovery and quick addition of new nodes enables non-disruptive scaling of Exchange deployments, providing a cost-effective, pay-as-you grow model.

VMware Horizon Virtual Desktop

Whether you are planning to deploy hosted shared or virtual desktops, or virtualize your end-user applications, Lenovo can help you succeed. Using the Lenovo Converged HX3500 and VMware Horizon, you can deliver an excellent experience for a diverse mix of users spread across different locations, even at scale.

With Lenovo and VMware, you can start small with initial deployments for one hundred end users or less and linearly scale to tens of thousands of users without any upfront costs, additional performance overhead, or complex management. This removes a major hurdle facing most VDI projects today—taking desktop and application virtualization from the limited pilot deployments for a select few users to production, where it is expected to handle up to a thousand times more users, while maintaining an excellent user experience.

Accelerate the journey to application and desktop virtualization with Nutanix and VMware:

- Start small without the upfront costs and scale only as needed
- Ensure success with low risk using user-based sizing and validated designs
- Deliver an excellent user experience, regardless of scale or deployment type
- Lower acquisition and ongoing costs for all end users

By converging storage and computing in a highly distributed architecture, the Lenovo Converged HX3500 eliminates the restrictions of traditional storage infrastructure. It delivers storage and compute performance and capacity for both persistent and non-persistent desktops required by VMware Horizon. The Lenovo Converged HX3500 is able to deliver the performance VDI needs using local flash SSDs and the capacity users need. So you will be able to handle the needs of even the most demanding end users and deliver a consistent user experience for all your end users through common events such as boot and login storms, patch/update operations and application and OS upgrades.

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a few hours, without introducing complex storage configuration or network integration issues. Once deployed, compute and storage infrastructure can easily be scaled with the patented Nutanix Acropolis Distributed Storage Fabric. You can start small with initial deployments for one hundred end users or less and linearly scale to tens of thousands of users without any upfront costs, additional performance overhead, or complex management.

Citrix XenDesktop Virtual Desktop

Desktop virtualization and application virtualization have emerged as powerful tools to address a variety of IT challenges. These include growing end-user support costs, servicing remote and branch offices, improving information and application security and tackling initiatives such as BYOD and teleworking. Successful deployments of desktop and application virtualization always start with choosing the right solution from the right partners.

Using Lenovo Converged HX3500 running Citrix XenDesktop®, you can deliver an excellent end-user experience for a diverse mix of users spread across different locations, for hundreds to tens of thousands of end users. Accelerate the journey to application and desktop virtualization with Nutanix and Citrix:

- Get started in a fraction of the time without the upfront cost and seamlessly scale infrastructure as needed
- Ensure success with minimal to no risk with VDI Assurance and validated designs
- Create desktops with pre-assigned Nutanix service levels through Citrix XenDesktop Studio using the Nutanix plug-in
- Lower acquisition and ongoing costs by as much as 50% and run VDI alongside other workloads

The jointly validated converged infrastructure eliminates the risk in deploying persistent and non-persistent virtual desktops from pilot to production at scale. Getting started with Citrix XenDesktop and the Lenovo Converged HX3500 is quick and easy. With the Lenovo Converged HX3500, the award-winning Citrix XenDesktop is up and serving desktops in just



Bottom Line

The HX Series, powered by Intel® Xeon® processors, 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 HX Series models are backed by world-class Lenovo services and support.

The perfect complement to the HX Series, Lenovo Services guarantee a superior service experience. Providing outstanding value while supporting your uptime requirements, Lenovo Services offers choices to match your workload requirements ranging from base warranty extensions to same day committed repair, as well as hard drive retention, installation and customized service options. Investing in Lenovo Services guarantees genuine Lenovo quality parts, as well as reliable and consistent service from highly skilled, trained and certified technicians and access to Lenovo global remote and field support teams.

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Why Lenovo

Lenovo is a \$46 billion global Fortune 500 company and a leader in providing innovative consumer, commercial and enterprise technology. Lenovo enterprise systems deliver industry-leading performance, reliability and security in virtualized and cloud environments for analytics, database, virtual-desktop, infrastructure and web workloads. Lenovo also offers simplified and extensible systems management tools so you can manage your infrastructure on your own terms. Consistently ranked #1 in reliability and customer satisfaction, the Lenovo enterprise server, storage and networking portfolio provides the hardware for businesses that never stand still.

For More Information

To learn more about the Lenovo HX Series Appliances, contact your Lenovo representative or Business Partner or visit lenovo.com/systems/servers

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