Lenovo ThinkAgile SXM Series
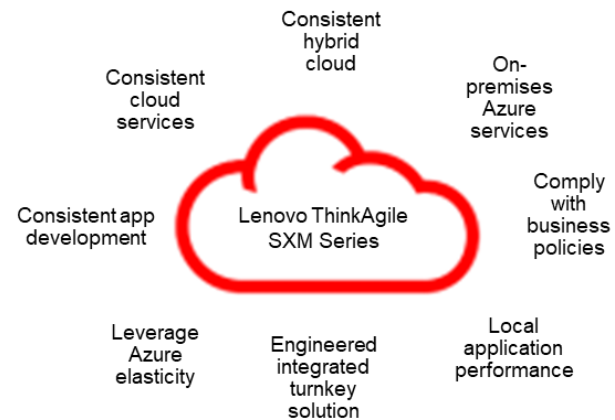
Fully Integrated Hybrid Cloud Solution

With a hyperconverged hybrid cloud solution engineered and integrated by Lenovo and Microsoft, you're free to focus on cloud services—instead of your infrastructure. Lenovo ThinkAgile SXM is a turnkey, rack-scale solution optimized with a resilient, high-performing, and secure software-defined infrastructure (SDI).

It's the perfect platform to:

- Deliver Azure cloud services from the security of your own data center
- Enable rapid development and iteration of applications with on-premises deployment tools to help transform your organization
- Unify application development across your entire hybrid cloud environment
- Easily move applications and data across private and public clouds

Simplify Your Hybrid Cloud

ThinkAgile is an integrated engineered solution that comes direct from Lenovo—ready to go—with all features, support, and deployment services included. With benefits like IT agility, lower TCO, and a transformative customer experience, ThinkAgile provides the ease and speed of a public cloud with the security and control of on-premises IT.

As useful as the public cloud is for many purposes, it does create data security and privacy concerns for data centers. For example, many countries require that sensitive data be stored within the borders of that country. Similarly, many companies require that the data be stored somewhere entirely within their control.

Challenges and Solutions

Due to the nature of the public cloud, it's impossible to guarantee that these requirements will be met. And while a private cloud may meet a company's security requirements, it doesn't offer the flexibility of the public cloud.

Another concern about the public cloud is application performance. Certain application workloads have stringent performance and latency requirements that cannot be guaranteed by the public cloud (streaming video, for example). A far more dependable solution is required.

The ThinkAgile SXM hybrid cloud offering provides the solutions to satisfy these requirements. Because all data is kept inside highly secure servers in your data center, it's much simpler to comply with governance laws of your country, and your own policies and practices.

By reducing the distance your data has to travel to mere meters/feet, rather than cross-country or even globally, latency is reduced, workloads run more efficiently, and performance requirements can be more easily achieved.

Lenovo and Microsoft worked together to engineer the solution components— Lenovo software defined infrastructure and the Azure Stack Hub —to make sure they perform seamlessly. There is no need to worry about configuring and tweaking settings for virtual or physical infrastructure. Your IT personnel can now focus more on building proficiencies in deploying and operating cloud services—such as IaaS, PaaS, and SaaS—and less on your infrastructure.

Agility of Public Cloud

Microsoft Azure Stack Hub is an extension of Azure, with an ever-growing subset of Azure cloud services. These services enable customers to select, provision and monitor the required services for their environments. The services enable Azure Stack Hub to offer the same ease of use as is expected of a cloud environment and thus bring the agility of the public cloud to the private data center. Because the services are the same as they are in the public cloud, Azure Stack Hub enables consistent cloud services across the Microsoft Azure environment. Azure Stack Hub software is deployed on powerful, ultrareliable, and innovative Lenovo ThinkSystem SR650 V3 nodes in a hyperconverged, clustered configuration engineered for high stability, resilience, and performance.

Powered by Ultrareliable Lenovo Servers

A solution that's offline is no solution at all. Therefore, the ThinkSystem SR650 V3 2U server node is the perfect hardware platform for this solution. Equipped with two powerful Intel® Xeon® Scalable family processors, its extreme reliability, huge internal storage and memory capacity, and large number of I/O slots make it an ideal foundation for this solution.

The SR650 V3 configurations used in this solution are storage-dense, with a high-performance four-SSD caching tier and a twelve-HDD data tier, along with two mirrored boot drives. You can start with as few as four nodes, and grow to sixteen.

Consistently scoring #1 for reliability* in independent customer surveys, the SR650 V3 provides the performance, availability, capacity, and quality your data center demands for a cloud environment.

World-Class Networking

Because you need high-speed communications, each node includes a dual-port 10/25GbE NVIDIA Mellanox ConnectX-4 Lx adapter. This adapter is ideal for virtualized infrastructures, offering native hardware support for RDMA over Converged Ethernet, Ethernet stateless offload engines, overlay networks, and GPUDirect™ Technology for maximum performance.

The compact 1U NVIDIA Mellanox SN2410 Ethernet Switch, built around the Mellanox Spectrum® ASIC, is based on the Open Ethernet Platform. The SN2410 provides 48x 25GbE ports for internal networking and 8x 100GbE ports for external connectivity. Because the SN2410 switch is an ONIE-based (Open Network Install Environment) platform, it enables multiple operating systems to be mounted concurrently and take advantage of Open Networking and the capabilities of the Spectrum ASIC. The SN2410 offers L2 and L3 features with line-rate speed, high-bandwidth switching, filtering, and traffic queuing with no data delays.

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The SN2410, as part of the ThinkAgile SXM solution, comes preinstalled with NVIDIA Cumulus® Linux, a revolutionary OS that extends the Linux user experience beyond servers all the way to switches and provides rich routing functionality for large-scale applications.

Mellanox switches have a history of record-breaking performance and the SN2410 is no exception. It offers the world's lowest latency for a 100GbE switching and routing element.** It also delivers tremendous throughput: 4Tb/s with a landmark 2.97Bpps processing capacity. And the icing on the cake? It has the lowest power consumption on the market.*** So, not only do you get outstanding performance, you also get to lower your electrical bill.

Transformative Experience with ThinkAgile Advantage

All ThinkAgile solutions include a portfolio of software and services that supports the full lifecycle of your infrastructure. At every stage—from planning to deploying, supporting, optimizing, and end-of-life—Lenovo provides the expertise and services you need to get the most from your technology investment.

Lenovo will help you perform a presale TCO study to decide which configuration is right for you and then will ship it as a single unit, factory installed in a rack and ready to deploy. Configuration Services will discover your hosts and storage resources. Lenovo also will provide knowledge-transfer training to your IT personnel. After deployment, Predictive Analytics software will identify on a continuing basis — and usually resolve — storage related (and many infrastructure-related) issues, often before administrators are even aware of them.

Lenovo provides single-point-of-contact support for all the hardware and software used in the solution, including Microsoft's Azure Stack Hub and the Mellanox adapters. So, there will never be any finger-pointing. Periodic health checks enable you to maintain an optimized solution. At end of life, Lenovo offers data recovery services. And these are just a few of the many benefits Lenovo's software, services, and support provided with your solution.

The ThinkAgile SXM solution allows you to budget more accurately for IT expenses, better deliver on service-level agreement commitments, and ultimately generate greater end-user satisfaction.

Cloud-optimized ThinkSystem SR650 servers, factory-installed in a rack with NVIDIA Mellanox networking, form the foundation of the Lenovo ThinkAgile SXM.

Lenovo and Microsoft

With co-located engineering organizations and a history of technical collaboration, Lenovo and Microsoft consistently deliver innovative joint solutions for the data center. Lenovo's leadership in reliability, customer satisfaction, and performance—combined with Microsoft's leadership in software and cloud services—continues to deliver innovative data center solutions and lower TCO for our joint customers.

Model	Enterprise Starter SXM4600	Enterprise Full SXM6600
Rack	42U Rack	42U Rack
Compute Nodes	● 4-16x SR650 V3 servers (expandable to 16 nodes) ● 2x Intel® Xeon® Scalable processors, up to 60 cores ● Up to 2TB memory per node	● 16x SR650 V3 servers ● 2x Intel® Xeon® Scalable processors, up to 60 cores ● Up to 2TB memory per node
Management Node	1x SR630 V3; 2x 2nd Gen Intel® Xeon® Scalable processors; 128GB memory	
Hybrid Configuration	● Capacity Drives SAS: 12x 4TB, 6TB, 8TB,10TB ● Cache Drives NVMe: 4x 1.6TB, 3.2TB, 6.4TB	
All-Flash Configuration	● Capacity Drives SAS/SATA: 12-16x 3.84TB ● Cache Drives NVMe: 4x 1.6TB, 3.2TB, 6.4TB, 12.8TB	
Network	● 2x 25Gbps NVIDIA/Mellanox SN2410 switches (management, compute, and storage traffic) ● Mellanox ConnectX-4 Dual Port 10/25GbE Network Controller	
Integrated Solution Software	● Microsoft Azure Stack Hub; Lenovo XClarity	

Model	Entry SXM4400	Enterprise Starter SXM4400	Enterprise Full SXM6400
Rack	9565-RCH (25U)	9565-RCJ (42U)	9565-RCK (42U)
Compute Nodes	● 4-8x SR650 servers ● 2x Intel® Xeon® Scalable processors, up to 28 cores ● Up to 1.5TB memory per node	● 4-16x SR650 servers ● 2x Intel® Xeon® Scalable processors, up to 28 cores ● Up to 1.5TB memory per node	● 16x SR650 servers ● 2x Intel® Xeon® Scalable processors, up to 28 cores ● Up to 1.5TB memory per node
Management Node	1x SR630; 2x 2nd Gen Intel® Xeon® Scalable processors; 64GB memory		
Hyperconverged Storage	● 10x 4TB Capacity Tier (40TB raw) + 4x 800GB SSD Cache Tier ● Or, 10x 6TB Capacity Tier (60TB raw) + 4x 1.6TB SSD Cache Tier		
Network	● 2x 25Gbps NVIDIA/Mellanox SN2410 switches (management, compute and storage traffic) ● Mellanox ConnectX-4 Dual Port 10/25GbE Network Controller		
Integrated Solution Software	● Microsoft Azure Stack Hub; Lenovo XClarity		

* ITIC Global Reliability Study, lenovopress.com/lp1117.
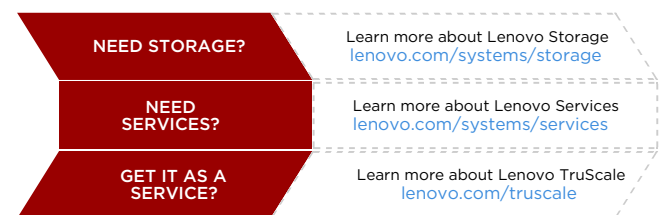** Tolly Report, December 2018.
*** Based on published competitor data.

About Lenovo

Lenovo (HKSE: 992) (ADR: LNVGY) is a US$62 billion revenue global technology powerhouse, ranked #171 in the Fortune Global 500, employing 77,000 people around the world, and serving millions of customers every day in 180 markets. Focused on a bold vision to deliver smarter technology for all, Lenovo is expanding into new growth areas of infrastructure, mobile, solutions and services. This transformation is building a more inclusive, trustworthy, and sustainable digital society for everyone, everywhere.

For More Information

To learn more about the Lenovo ThinkAgile SXM solution, contact your Lenovo representative or Business Partner or visit lenovo.com/thinkagile

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NEED SERVICES?	Learn more about Lenovo Services lenovo.com/systems/services
GET IT AS A SERVICE?	Learn more about Lenovo TruScale lenovo.com/truscale

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Reduce Time to Value With Intel Select Solutions

Accelerate infrastructure deployment with ease and reduced complexity with Intel Select Solutions and Lenovo ThinkAgile SXM.

Intel Select Solutions deliver preconfigured solutions optimized by Intel and Microsoft and validated and tested by Lenovo to provide high-performing infrastructure for modern computing needs.

These solutions are built using the latest Intel® Xeon® Scalable family processors and Intel P4600 NVMe cache tier devices, designed to accelerate performance and reduce latency.

There are stringent performance requirements for this solution which have all been met or exceeded by our Azure Stack Hub integrated systems.

Why Intel Select?

- **Simplified evaluation**. IT managers spend considerable time determining how to optimize IT, including how to migrate their workloads and transition to software-defined infrastructure. Since Intel Select Solutions conform to rigid hardware and software requirements, they eliminate guesswork and speed decision-making. Lenovo prevalidates the solution, built on Lenovo's #1 in server reliability, to provide confidence that your infrastructure will be available when you need it.
- **Fast and easy deployment**. With predefined settings and rigorous system-wide tuning, Intel Select Solutions are designed to increase efficiency in the IT testing process, speed time to service delivery, and increase confidence in solution performance.Workload-optimized performance.
- Intel Select Solution configurations are designed by Intel and their partners to deliver to a performance threshold for the workload, and are built on the latest Intel architecture foundation including the recently-launched Intel Xeon Scalable platforms. Lenovo ThinkAgile SXM incorporates these components in our integrated system offering.

Intel Select Configuration Specifications

Compute Nodes	4x–16x ThinkSystem SR650 servers 2x Xeon Gold Scalable processors 768GB memory: 24x 32GB DIMMs 2x 480GB M.2 SSDs
Storage	10x 8TB HDDs 4x 3.2TB Intel P4600 NVMe cache tier
Management	1x ThinkSystem SR630; 2x Intel Xeon Scalable processors; 64GB memory
Network	1x Mellanox CX-4 LX dual-port 25GbE NIC 2x 25Gbps NVIDIA/Mellanox SN2410 switches (management, compute and storage traffic)