

Lenovo Hybrid Cloud Solutions for VMware Cloud Foundation

Increase business flexibility and agility

The Challenge

In an ever-evolving business and regulatory landscape, companies seek to maximize their agility, scalability, and efficiency to optimally respond to market changes. Companies are drawn to hybrid cloud solutions for their ability to leverage the scalability of the public cloud while maintaining the security and control of their sensitive data within a private environment. This dynamic fusion not only accommodates fluctuating demand but also enables improved efficiency, cost-effectiveness, and the flexibility to adapt to rapidly changing business needs.

The Solution

Lenovo hybrid cloud solutions with VMware Cloud Foundation™ (VCF) combine VMware's flagship platform for modernizing data centers and deploying modern apps with best-in-class data center infrastructure, software and services from Lenovo. Harness the power of Lenovo's ThinkAgile hyperconverged or ThinkSystem x86 servers combined with VCF to create an on-premises software-defined datacenter (SDDC) that seamlessly connects to VMware-based services with public cloud providers. VCF and other VMware software are also available through Lenovo for simplified purchasing and support.

VMware Cloud Foundation

VCF provides a complete set of software-defined services for compute (VMware vSphere®), storage (VMware vSAN™), networking (VMware NSX®), container (VMware Tanzu®) and cloud management (VMware Aria®). The result is an agile, reliable, efficient cloud infrastructure that offers consistent operations across private and public clouds.

VCF brings full stack integration of the HCI infrastructure layer together with native Kubernetes capabilities built into the stack to provide an automated, turnkey hybrid cloud solution. Eliminate siloed infrastructure. Move applications to the cloud or back on premises without refactoring. Security and compliance policies are linked to each application, which enables consistent adoption wherever workloads are deployed and managed.

Highlights

- Improve business agility with enhanced application portability, scalability and security
- Extend your hybrid cloud to the edge where many businesses' data is generated
- Simplify IT with consolidated VM and container management
- Ignite business innovation leveraging AI workloads on a scalable hybrid cloud platform
- Purchase the entire solution, including VMware software, through Lenovo for simplified procurement and single point of support

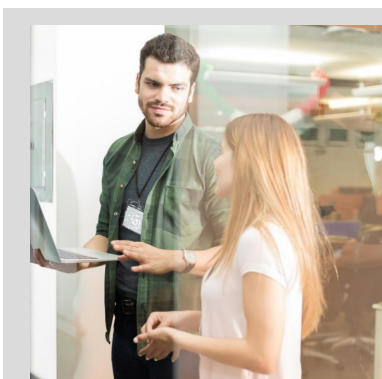
Key features of VMware Cloud Foundation include:

- **Multi-Cloud Infrastructure:** Establish a robust cloud operating model that can be deployed on premises, at the edge or in the cloud.
- **Scalable, Consistent Architecture:** Enable accelerated cloud adoption and workload migration across on premises and cloud deployments with complete management and visibility.
- **Consolidated VM and container management:** Leverage container technologies to accelerate application deployment and improve application portability, scalability, and security.
- **AI-Ready Infrastructure:** Discover an end-to-end platform optimized for AI workloads that delivers best-in-class AI software.

Continuous Enhancement

VMware has developed a wide range of new technologies that enhance components of VCF and can be incorporated into the hybrid cloud solutions with Lenovo and VMware. The new technologies include:

- **vSAN Express Storage Architecture (ESA)** is a new storage architecture designed to take advantage of today's high performance storage hardware, including DDR5 memory and NVMe drives. A [comparison](#) of ESA with vSAN Original Storage Architecture (OSA) has been developed by Lenovo, Intel and VMware.
- **vSphere Distributed Services Engine™** enables the offload of networking and communication workloads from the CPU onto hardware accelerators such as Data Processing Units (DPUs) or SmartNICs to improve performance for AI, machine learning, and other specialized tasks. A [positioning document](#) has been created by Lenovo and VMware.
- **VMware Edge Compute Stack** enables organizations to build, run, manage, connect, and protect edge-native applications across a hybrid cloud at both the near and far edge locations and can run on [Lenovo ThinkEdge](#) servers.
- **VMware Private AI Foundation** enables enterprises to fine-tune Large Language Models (LLM) and run inference workloads in their data centers for privacy, performance, compliance, and other reasons. To learn more about the solution, please read the "Deployment to a virtual environment" chapter of this [Lenovo Reference Architecture](#).



T-Systems NA, a leading IT service provider, launched a managed cloud service based on ThinkAgile VX and VCF to help customers move towards the cloud at their own pace.

"The initiative helps enterprises at any stage of their cloud journey move into a cloud - public, private or hybrid - by leveraging our Future Cloud Infrastructure."

Cesar Martinez, CEO, T-Systems North America

Powered by ThinkAgile VX

Lenovo ThinkAgile VX Series hyperconverged systems are the ideal platform for VMware Cloud Foundation. ThinkAgileVX systems are based on VMware vSAN, providing virtualization of compute and storage resources through familiar VMware tools and processes. ThinkAgile VX systems come in a variety of models and offer the broadest selection of components that are vSAN compliant giving customers the flexibility to configure the systems they need to meet any use-case.

From deployment through end of life, Lenovo ThinkAgile VX Series are simple to operate. ThinkAgile VX integrated systems are shipped from the factory with the hardware configured and software installed. When placed in your network, the system will auto-discover an existing vSAN cluster to join or create a new cluster to which other ThinkAgile VX nodes can be added.

Certified firmware updates are provided throughout the life of the ThinkAgile VX integrated systems via vSphere Lifecycle Manager (vLCM). vLCM speeds deployment, simplifies patching and updating software, and offers task automation via Best Practices to free up valuable time for your IT personnel.

Management of the entire solution is accomplished through a single pane of glass through VMware Aria or vCenter with Lenovo XClarity. The integrated management offering captures proactive platform alerts, enabling administrators to migrate workloads or replace failing components without incurring downtime.

If you need support, Lenovo ThinkAgile Advantage gives you a direct phone line to a team of experts who specialize in 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. Lenovo also provides comprehensive services such as deployment services, assessment workshops, hybrid cloud assessment, enterprise server software support, managed services, and health checks.

Powered by Lenovo

Although the recommended platform for VMware Cloud Foundation is ThinkAgile VX, VCF is supported on a wide range of additional Lenovo ThinkSystem and ThinkAgile servers. All Lenovo ThinkSystem and ThinkAgile servers are high performance systems, currently holding 536 world record benchmarks (as of January 1, 2024). Engineered for always-on productivity, ThinkSystem servers are consistently ranked high in x86 server customer satisfaction and are #1 in reliability among x86 servers for 9 years in a row ([ITIC](#)). This same independent survey also ranked Lenovo servers as one of the most secure systems in the market today.



ThinkAgile VX645 V3



ThinkAgile VX650 V3

Help for the Hybrid Cloud Journey

The Hybrid Cloud solutions from Lenovo and VMware can help customers at every stage of their hybrid cloud journey.

Moving to a Modern IT Infrastructure

The first step in a hybrid cloud journey is to move from a traditional 3-tier IT architecture to a hyperconverged infrastructure (HCI) environment.

HCI pools compute and storage resources in a server cluster and allows administrators to dynamically allocate those resources to the different applications residing on the cluster. HCI provides cloud-like flexibility in adjusting application resources to meet business needs and provides greater server utilization than older 3-tier architectures, which leads to fewer servers required and lower power consumption in the data center. With the increased amounts of internal storage available on servers, many customers have been able to replace their Storage Area Networks (SANs) with an HCI stack.

VMware is the market leader in virtualization with approximately 60% market share (Statistica, Dec. 2023). As such, many companies have VMware skills in their organizations. Lenovo ThinkAgile VX is based on VMware virtualization and thus companies can utilize those VMware skills to manage the HCI stack.

Moving to a Hybrid Cloud Environment

Customers with siloed VMware public and private cloud instances and on-premises landscapes can leverage VCF on ThinkAgile VX to connect those environments with consistent application management and security.

VMware Services are provided on several major public cloud platforms including AWS, Google Cloud, Microsoft Azure, IBM Cloud, Oracle Cloud, and Alibaba Cloud and are offered through thousands of VMware Cloud Providers. Connecting these environments with the on premises VMware Cloud Foundation on ThinkAgile VX solution enables businesses to enjoy the full benefits of hybrid cloud:

1. Migrate to Cloud on your schedule – Use the hybrid cloud environment to migrate applications to the public cloud (or back to on premises) at the appropriate time.
2. Scale on Demand – For seasonal or cyclical businesses, hybrid cloud environments allow the business to access public cloud resources for extra capacity when needed.
3. Build Modern Apps – Leverage containers and better integration between development, operations, and security to modernize your legacy applications or more quickly develop and deploy new cloud services/apps to take advantage of business opportunities.



"Lenovo ThinkAgile VX offered the optimal balance of price, performance and scalability. As a long-time user of VMware vSphere for server virtualization, we felt very confident choosing VMware HCI."

Glenn Johnson, CIO, Carolina Hurricanes

Extending Hybrid Operations to the Edge

Your organization's hybrid cloud environment can extend to branch offices, manufacturing plants, and other edge environments with the same consistent operational and management support through VMware Edge Compute Stack on Lenovo ThinkEdge systems.

Edge Compute Stack is a purpose-built, integrated VM and container-based stack that runs the full VMware vSphere and VMware vSAN on a variety of Lenovo ThinkEdge systems. The solution enables organizations to modernize and secure edge-native apps at the near and far edge leveraging low-cost, small form factor systems. The solution can run modern apps built on containers, or existing apps using virtual machines, and scale those applications horizontally with ease.

The solution requires only 2 small, light weight Lenovo ThinkEdge servers. Nearby devices can be connected via integrated Ethernet switching and USB connections. Far edge devices can be connected via an optional Wi-Fi access point, enabling integration of point-of-sale, scanners, cameras and IoT devices.

Lenovo TruScale Hybrid Cloud for VMware

With Lenovo TruScale IaaS, customers can scale their infrastructure up or down on demand, pay only for what they use, and enjoy the benefits of a consumption-based IT model. Lenovo is responsible for maintaining, supporting and securing the infrastructure, through proactive monitoring 24/7, regularly scheduled health checks with Lenovo Managed Services and Customer Success Managers and applying best practices for securing the management domains.

TruScale benefits include:

- Future proofed: Customers can maintain access to the latest technology with periodic refresh cycles
- Specific parts of the customer's private cloud can be scaled at will to meet changing Infrastructure needs without long procurement/ financial cycles.
- Customer IT teams to focus on growing their company's core competencies
- Flexible financial options are available ranging from consumption-based models to traditional leasing



ThinkEdge SE350 V2



ThinkEdge SE455 V3



“Engaging Lenovo TruScale has made our team more productive, effective and focused on our core business.”

Henrique Cardoso, IT Infrastructure and Security, Servimed

- 98% reduction in VM creation times
- 100% availability since implementation
- Freed 40% of IT time for more valuable tasks

Conclusion

Lenovo Hybrid Cloud solutions with VMware enable businesses to become more flexible and agile in their operations. Solutions are available for companies wherever they are on the hybrid cloud journey. The solutions leverage VMware's leading virtualization offerings with Lenovo's high performance and reliable hardware, software and services. All components of the solution are available through Lenovo for a simplified procurement and a single point of support.

Why Lenovo

Lenovo is a leading provider of data center infrastructure solutions. We partner with you to identify, design, install and support the solution that best ensures your organization's needs are met throughout the IT lifecycle. Lenovo complements a portfolio of leading x86 infrastructure with a full range of storage, software, and comprehensive services that provides excellent performance, reliability, and security for your IT environment from the edge to the cloud.

For More Information

To learn more about Lenovo Hybrid Cloud Solutions with VMware, contact your Lenovo sales representative or Business Partner or visit the www.lenovo.com/vmware.

Lenovo and VMware provide a complete end-to-end hybrid cloud offering providing consistent management and security from edge to core to cloud



Resources

[ThinkAgile VX product page](#)

[ThinkEdge server page](#)

[Reference Architecture](#)

[Deployment Guide](#)

Trademarks: Lenovo, the Lenovo logo, ThinkAgile®, ThinkEdge®, ThinkSystem®, and XClarity® are trademarks or registered trademarks of Lenovo. Intel® is a trademark of Intel Corporation or its subsidiaries. Microsoft® and Azure® are trademarks of Microsoft Corporation in the United States, other countries, or both. Other company, product, or service names may be trademarks or service marks of others.