



Azure Virtual Desktop and IGEL on ThinkAgile MX

Solution Brief

Remote hybrid workplace solution

The pace of technology change is accelerating everywhere, especially in the workplace. In recent years, companies have come to realize that a flexible, secure workplace is here to stay. Azure Virtual Desktop is a hybrid cloud-based VDI solution that can be used to deploy and scale Windows desktops and apps on Azure Stack HCI in minutes to enable secure, remote work.

Companies of all sizes are pushing to set up VDI with remote connectivity, security, and management capabilities so that employees can remain productive and access necessary apps from wherever they are. Moving to the cloud offers many benefits to enterprises, including scalability, cost efficiencies, and near-limitless data capacity. However, many industries are required to keep their data on-premises due to data sovereignty needs and regulatory requirements.

Azure Virtual Desktop (AVD) brings all cloud benefits on-premises by using familiar tools and applications based on Windows with a fully managed, cloud-hosted VDI management plane. Azure Stack HCI with Azure Virtual Desktop on Lenovo Systems helps companies overcome their remote work challenges in a powerful and efficient manner.

Lenovo Solutions for Microsoft Azure Stack HCI and AVD on ThinkAgile MX650 V3 are optimized for both scale and performance and are **Accelerated by Intel** offerings. This technical brief features Microsoft Azure Stack HCI and AVD running on a high-performance Lenovo dual socket 2U rack mount enterprise server. The server is configured with 4th Generation Intel® Xeon® Scalable processors, TruDDR5 4800MHz memory and P5620 NVMe drives among a variety of storage options, including support for the PCIe 5.0 standard devices for I/O. These 4th Gen Intel Xeon processors offer anywhere from 16 to 60 cores and 16x 4800 MHz DDR5 DIMMs per socket.

The MX650 V3 server is a storage-dense offering, with up to 40x 2.5" drive bays in the front, middle, and rear of the server and 5 different slot configurations at the rear. Onboard NVMe PCIe ports allow direct connections to 16 NVMe SSDs, freeing up PCIe slots and lowering NVMe solution acquisition costs.

Highlights:

- Reduce time to value with pretested and sized hardware configurations
 - Simplified evaluation, fast and easy deployment and workload optimized performance
 - VDI sized solution with optimal compute, memory, storage and networking components
- Reduce TCO through better performance, rapid deployment and advanced hardware
Optimize performance with pretested ThinkAgile MX650 V3 hardware configurations

Business VDI solutions with faster time-to-value

Lenovo MX650 V3 systems are methodically tested and tuned to save you months of configuration, setup, testing, and tuning. With these new servers, you get the following advantages:

- Realize better performance for popular workloads running on 4th generation Intel Xeon Scalable processors than on similar servers equipped with previous generation processors
- Improve performance and scale of VDI solutions with higher core counts, memory bandwidth and PCIe Gen 5 devices
- Improve density and support more and larger virtual desktops per host

Microsoft Azure Virtual Desktop

With Azure Virtual Desktop for Azure Stack HCI, IT administrators can create a full Windows 10, Windows 11, or Windows Server desktop virtualization environment that can be used on any device.

With AVD, IT administrators can view all components on the same management plane, and it is simple to create and use Azure Virtual Desktop sessions on an Azure Stack HCI cluster. With the support of Azure Virtual Desktop for Azure Stack HCI, Windows 10 and Windows 11 multisession capabilities are available for on-premise environments. IT staff can support multiple users on a single virtual machine (VM). This greatly reduces the number of VMs and the system-resource overhead costs while still providing the same resources to all users. Azure Virtual Desktop also simplifies management and user support. Because Azure Virtual Desktop is a managed service, organizations don't need to deploy a VDI themselves or have the burden of upgrading infrastructure. This is a huge advantage compared to other VDI solutions.

The following is a high-level summary of what is needed to run Azure Virtual Desktop on Azure Stack HCI:

- An Azure Stack HCI cluster with a minimum of 2 nodes. It's recommended to have at least 16 cores with 256GB memory per node, but this is largely determined by your workload requirements.
- For starters, 1TB of storage capacity in your Azure Stack HCI storage pool used to store virtual machines. However, this will also be determined by your workload requirements.
- External internet connectivity for both the Azure Stack HCI nodes, and the Azure Virtual Desktop components.
- An Azure subscription for Azure Virtual Desktop Session Host Pool with the appropriate permissions.
- Network Validation for AVD Links, reference - <https://docs.microsoft.com/en-us/azure/virtualdesktop/safe-url-list>
- Configure UEFI (Bios) settings to set Operating mode to Maximum performance.

The high-level AVD deployment steps include the following:

- Select Validated Network Topology: Identify the network reference pattern corresponding to how your servers are cabled. You will define the network settings based on this topology.
- Review the Requirements and Complete the Prerequisites and a deployment checklist before you begin the deployment.
- Prepare your Active Directory (AD) environment for Azure Stack HCI deployment.
- Download Azure Stack HCI, version 23H2 OS ISO from Azure portal.
- Install OS: Install Azure Stack HCI operating system locally on each server in your cluster.
- Configure the Proxy (Optional): Configure proxy settings for Azure Stack HCI if your network uses a proxy server for internet access.
- Register Servers with Arc and Assign Permissions: Install and run the Azure Arc registration script on each server you intend to cluster. Assign required permissions for the deployment.

- Deploy the Cluster via Azure Portal: Use the Azure portal to select Arc servers to create Azure Stack HCI cluster.
- Create a Host Pool: This is the first step in deploying Azure Virtual Desktop.
- Create a Workspace: This is the second step in deploying Azure Virtual Desktop.
- Create an Application Group: This is the third step in deploying Azure Virtual Desktop.
- Create Session Host Virtual Machines: This is the fourth step in deploying Azure Virtual Desktop.
- Enable Diagnostics Settings (Optional): This is an optional step in deploying Azure Virtual Desktop.
- Assign Users or Groups to the Application Group: For users to get access to desktops and applications, assign users or groups to the application group.

Lenovo ThinkAgile MX650 V3 offerings are ideal for modernizing your data center because of their low cost and high-performance capabilities. They are industry standard x86 servers providing cost effective computing and fast high-density local storage.

Lenovo ThinkAgile MX650 V3 servers offer the necessary performance for bare metal or virtualized workloads. High performance can be achieved using Azure Stack HCI and Storage Spaces Direct technology which are built into Windows Server HCI OS. Several technologies, such as NVMe storage and remote direct memory access (RDMA) networking, are natively supported in Windows servers to enable the highest levels of performance.

A typical AVD node configuration features the following main components:

- Servers: 2x or 4x Lenovo ThinkAgile MX650 V3
- Processor: 2x 4th Gen Intel Xeon Platinum 8480+ processor with 64 cores
- Memory: 1TB per node of TRUDDR5 4800 MT/s memory
- Storage: 8x Solidigm NVMe mixed use SSDs 1.6TB
- OS Storage: 2x 480GB M.2 SATA SSDs for the operating system (RAID 1)
- Software: Microsoft HCI OS

This high-performance VDI solution with Microsoft Azure Virtual Desktop features the latest Solidigm NVMe mixed use SSDs. These SSDs help build a low latency solution for mission critical VDI environments.



Figure 1. Lenovo ThinkAgile MX650 V3

Microsoft Azure Virtual Desktop and IGEL: A Seamless Integration for Modern Workspaces

Introduction to IGEL in the Azure Virtual Desktop Ecosystem

As Azure Virtual Desktop for Azure Stack HCI can be versatile, organizations continually seek more efficient, secure, and cost-effective solutions to manage their connecting devices. IGEL, the secure Endpoint OS, offers an ideal complement to AVD, extending its capabilities to a wide range of endpoints, including the innovative ThinkCentre Neo 50q, the versatile ThinkPad L14, and the compact ThinkCentre M75q. This integration between IGEL and AVD facilitates a seamless virtual desktop experience, whether on-premise or in the cloud, tailored to meet the diverse needs of modern organizations.

Seamless Integration with Azure Virtual Desktop

IGEL's operating system is designed to support AVD deployments, offering a secure, manageable, and scalable solution for accessing Windows 10, Windows 11, and Windows Server desktops and applications from virtually any device. This compatibility ensures that organizations can provide their workforce with access to their digital workspace in a consistent and efficient manner, irrespective of the physical location or device used.

Advantages of Deploying IGEL with AVD

- **Optimized User Experience:** IGEL's lightweight operating system is engineered to deliver a high-performance user experience, minimizing latency and enhancing productivity for end-users accessing AVD sessions. This optimization is crucial for scenarios demanding intensive computational resources or high graphical fidelity.
- **Enhanced Security:** Security remains a top priority for businesses, especially in hybrid work environments. IGEL's operating system incorporates a preventative security model, including read-only file systems, encrypted communications, and built-in support for multi-factor authentication. These features work in tandem with AVD's security protocols to protect sensitive data and applications from unauthorized access and cyber threats.
- **Flexibility and Choice:** The diversity of IGEL's supported devices, including the Neo 50q, L14, and M75q, offers businesses the flexibility to choose the right hardware to meet their specific use cases. Whether it's deploying lightweight endpoints for call center operations, powerful workstations for graphic-intensive tasks, or mobile solutions for on-the-go productivity, IGEL and AVD together provide a versatile platform that adapts to various operational needs.
- **Cost Efficiency:** Leveraging IGEL with Azure Virtual Desktop reduces management overhead, reduces the need for numerous security agents, and enhances energy efficiency. This integrated approach not only cuts operational and licensing costs but also supports environmental sustainability goals, offering a secure, efficient IT infrastructure at significantly reduced expenses.

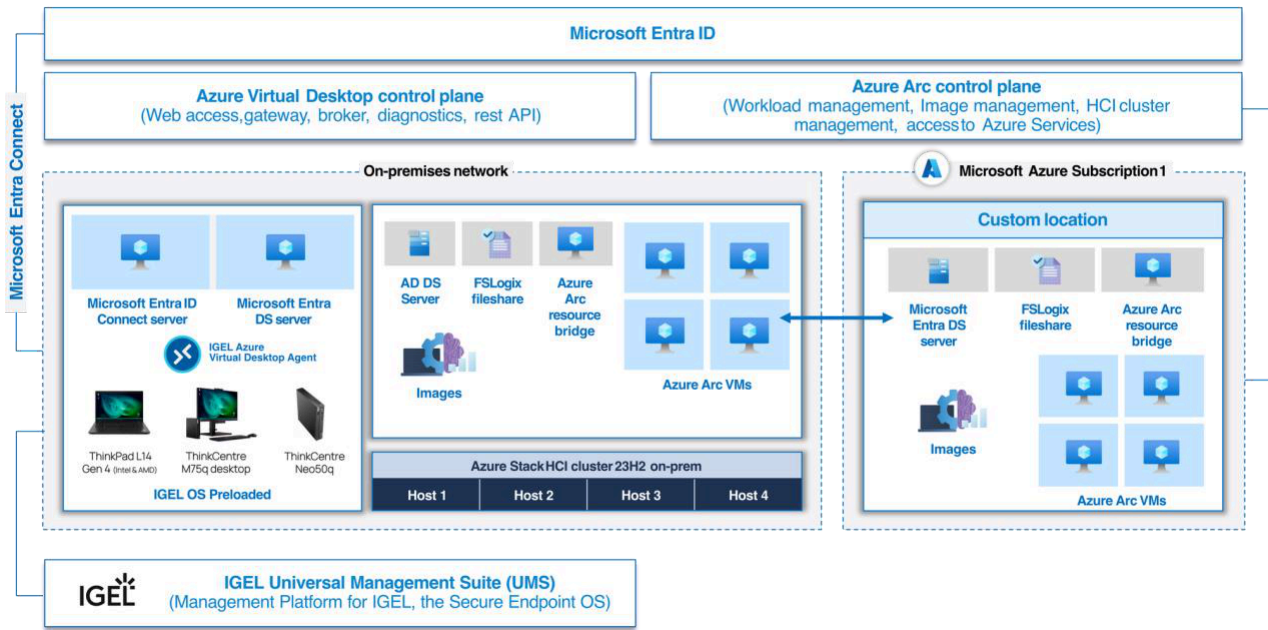


Figure 2. IGEL as part of a sample customer architecture diagram.

Performance Testing

Details and results are coming soon

Bill of Materials

Table 1. Bill of Materials

Part number Feature code	Product Description	Qty
7D76CTO1WW	Server: ThinkSystem SR650 V3 - 3yr Warranty	1
BLKK	ThinkSystem V3 2U 24 x 2.5" Chassis	1
BNOM	Intel Xeon Platinum 8480+ 64C 350W 2.0GHz Processor	2
BNFC	ThinkSystem 128GB TruDDR5 4800 MT/s (4Rx4) 3DS RDIMM	32
B8NY	ThinkSystem RAID 940-8i 4GB Flash PCIe Gen4 12Gb Adapter	1
BNEG	ThinkSystem 2.5" U.2 P5620 1.6TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	8
B8LU	ThinkSystem 2U 8 x 2.5" SAS/SATA Backplane	1
BH8D	ThinkSystem 2U/4U 8 x 2.5" NVMe Backplane	1
BM8X	ThinkSystem M.2 SATA/x4 NVMe 2-Bay Enablement Kit	1
AUUV	ThinkSystem M.2 128GB SATA 6Gbps Non-Hot Swap SSD	2

B93E	ThinkSystem Intel I350 1GbE RJ45 4-port OCP Ethernet Adapter	1
BLKM	ThinkSystem V3 2U x16/x16/E PCIe Gen4 Riser1 or 2	2
BMUF	ThinkSystem 1800W 230V Platinum Hot-Swap Gen2 Power Supply	2
BLL6	ThinkSystem 2U V3 Performance Fan Module	6
BRQ1	ThinkSystem SR650 V3,SATA CBL,SLx8-SLx4,M.2-M.2(MB),150mm	1
BSYM	ThinkSystem SR650 V3,PCIe4 Cable,Swift8x-SL8x,2in1,PCIe 6/5(MB) to BP1/BP2	1
BETS	ThinkSystem V3 2U SFF C0 (RAID) to Front 8x2.5" BP1	1
BPE3	ThinkSystem SR650 V3 MCIO8x to SL8x CBL, PCIe4, 8x2.5AnyBay, 200mm	2
BQ12	G4 x16/x16/E PCIe Riser BLKM for Riser 1 Placement	1
BQ19	G4 x16/x16/E PCIe Riser BLKM for Riser 2 Placement	1
7S0XCTO2WW	Lenovo XClarity XCC2 Platinum Upgrade	1
5641PX3	XClarity Pro, Per Endpoint w/3 Yr SW S&S	1
1340	Lenovo XClarity Pro, Per Managed Endpoint w/3 Yr SW S&S	1
QAA8	SR650 V3 3Y Standard	1

Accelerated by Intel

To deliver the best experience possible, Lenovo and Intel have optimized this solution to leverage Intel capabilities like processor accelerators not available in other systems. Accelerated by Intel means enhanced performance to help you achieve new innovations and insight that can give your company an edge.



Why Lenovo

Lenovo is a US\$70 billion revenue Fortune Global 500 company serving customers in 180 markets around the world. Focused on a bold vision to deliver smarter technology for all, we are developing world-changing technologies that power (through devices and infrastructure) and empower (through solutions, services and software) millions of customers every day.

For More Information

To learn more about this Lenovo solution, contact your Lenovo Business Partner or visit:

<https://www.lenovo.com/vdi>

References:

Lenovo ThinkAgile SR650 V3: <https://lenovopress.lenovo.com/lp1601>

Related product families

Product families related to this document are the following:

- [Microsoft Alliance](#)
- [ThinkAgile MX Series for Microsoft Azure Stack HCI](#)

Why IGEL

IGEL is a leading force in the secure endpoint OS market, revolutionizing how enterprises manage their digital workspaces in collaboration with industry giants like Microsoft and Lenovo. Through these strategic partnerships, IGEL is enhancing the integration of cloud workspaces, leveraging Lenovo's robust hardware and Microsoft's expansive cloud infrastructure. Together, they deliver seamless technology solutions that empower organizations across the globe. With a steadfast commitment to innovation, IGEL, in concert with Microsoft and Lenovo, is providing the foundation for a secure, efficient, and sustainable cloud-first future, powering the enterprises of today and tomorrow.

For More Information

To learn more about IGEL, please visit www.igel.com

References:

Azure Virtual Desktop agent with IGEL OS: <https://app.igel.com/#/api/avd/1.1.96+1>

- <https://www.igel.com/lenovo/>
- <https://www.igel.com/AVD>
- https://psref.lenovo.com/Product/ThinkCentre/ThinkCentre_neo_50q_Gen_4_Thin_Client
- https://psref.lenovo.com/Product/ThinkPad/ThinkPad_L14_Gen_4_Intel
- https://psref.lenovo.com/Product/ThinkCentre/ThinkCentre_M70q_Gen_4

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