

# Lenovo Client Virtualization Solutions for Citrix Virtual Apps and Desktops

## Enabling analytics and machine learning on growing business data

### Meeting the Needs of the Mobile Workforce

Today's business and IT leaders know the pressures to enable a more flexible, mobile workforce are intense. Distributed workforces, demands for mobility, growing compliance pressures, security concerns, cost containment priorities, and BYOD (bring your own device) environments are just a few of the challenges they face. Client virtualization is a powerful solution to meet the need for flexibility and global availability of compute resources, while managing data security and compliance on mobile devices.

The Lenovo Client Virtualization Solutions for Citrix Virtual Apps and Desktops help your organization meet these business requirements by centrally managing the desktop image within the corporate IT environment rather than at the remote worker or office location. With user data, user profiles and application data files on centralized servers, data center security and manageability are extended down to the user resources. Users have anywhere, anytime, secure access to data and applications from any device, including tablets and smartphones.

### Deliver Secure Desktops While Cutting IT Costs

Citrix Virtual Apps and Desktops delivers fully-functioning virtual Windows or Linux desktops and the applications employees need to remain productive. The virtual desktops are delivered securely and have the same look and feel as locally installed desktops - even with demanding applications, such as 3D CAD engineering or design apps.

Administrators can easily and centrally manage their master images while providing users with a customized and personalized desktop experience. Citrix Virtual Apps and Desktops also enables automated desktop thin provisioning - giving desktops the appearance of having more physical resources than are actually available - to reduce the cost of VDI and shared storage below that of managing a local PC.

### Highlights

- Simplify your IT infrastructure –focus on the applications that drive the business instead of spending a lot of time and effort on infrastructure management
- Manage both cloud-based and traditional enterprise applications as a unified public cloud service
- Deploy virtual desktops in under 30 minutes; easily managed from the virtualization console
- Reduce upfront CapEx by minimizing infrastructure requirements with cloud management

### Simplify Solutions Infrastructure with ThinkAgile Systems

Hyperconverged systems have become the infrastructure of choice for VDI implementations. With compute, storage and virtualization co-located on a single node, organizations are able to share system resources with other applications, significantly reducing the cost per virtual machine (VM) of the VDI environment.

Citrix Virtual Apps and Desktops has been certified on Lenovo ThinkAgile HX (Nutanix-based) and VX (VMware-based) hyperconverged servers. The ThinkAgile systems enable 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.

The ThinkAgile systems scale rapidly to meet the growing needs of your business. Start small with initial deployments for one hundred end users or less and linearly scale to tens of thousands of users without additional performance overhead, or complex management.

### Nutanix InstantOn for Citrix Cloud: Accelerating VDI Deployments

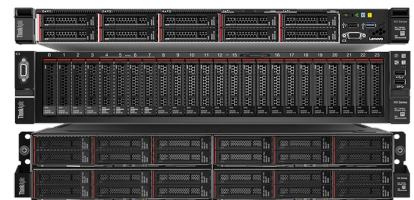
By combining the usability of Citrix Cloud with the simplicity of Nutanix, ThinkAgile HX with Nutanix InstantOn for Citrix Cloud delivers a turnkey VDI and application virtualization solution that greatly reduces implementation complexities across the complete solution stack. Enterprise and SMBs can implement hybrid cloud VDI within hours of racking the appliance. Plus, with the subscription-based pricing from Citrix and the scale-as-you-grow model from Lenovo and Nutanix, they can greatly reduce upfront CapEx costs — while the streamlined solution stack reduces ongoing maintenance and the need for specialized IT resources.

Some of the key benefits of the solution include:

- **Reduced Total Cost of Ownership:** Lenovo's ThinkAgile HX series allow companies to deploy the appropriate amount of server, storage and networking resources to meet their current requirements, thereby eliminating risk and mitigating overprovisioning.
- **Ease of Scale:** Using Lenovo ThinkAgile HX with Nutanix InstantOn for Citrix Cloud, businesses can start with a small VDI pilot project and grow to thousands of users without disruption, performance-related risks or large, upfront costs.
- **Faster Turnkey Deployment:** Lenovo ThinkAgile HX with Nutanix InstantOn for Citrix Cloud also gives IT teams the benefit of a turnkey and risk-free VDI and application virtualization solution that delivers faster time-to-value.

Leonteq, a financial services firm based in Switzerland, runs Citrix XenDesktop on four Lenovo ThinkAgile HX Series clusters. "We were really impressed with the flexibility, reliability and price-performance ratio of the Lenovo hardware. Thanks to lower licensing costs, a smaller physical footprint and more processing power, we were able to reduce our operating costs."

– *Jasenko Jorgic,*  
*Head of Infrastructure,*  
*Leonteq*



ThinkSystem HX and VX hyperconverged systems

### Powered by Lenovo

Reference architectures also exist for several Lenovo ThinkSystem servers with VMware vSAN virtualization. Systems of note include:

- ThinkAgile VX hyperconverged servers
- SR665 or SR645 - 2U or 1U, 2-socket servers, respectively, that provide good cost/user. The SR665 supports up to 6 NVIDIA GPU modules for power users employing 3D rendering or medical imaging applications
- SR650 or SR630 - 2U or 1U, 2-socket servers, respectively, that provide extensive flexibility along with large memory and storage capacity to fit almost any customer environment
- SD530 - A dense 2U configuration that supports up to four 2-socket servers for customers with limited space in their data center

All Lenovo ThinkSystem and ThinkAgile servers are high performance systems, regularly holding numerous world performance benchmarks. ThinkSystem servers currently hold the 1-socket and 2-socket world record in virtualization performance<sup>1</sup>. Engineered for always-on productivity, ThinkSystem servers are consistently ranked high in x86 server customer satisfaction and #1 in x86 server reliability<sup>2</sup>.

### Optimized Configurations

Lenovo has designed and tested several configurations of Citrix on ThinkAgile HX. These configurations are optimized for performance and scalability. They can be used as is, as building blocks for larger installations, or as a base from which customizations can be made. The current Solution IDs include:

Solution ID	Supporting
SID0000209	200 Office Workers
SID0000210	150/50 Office/Knowledge Workers
SID0000211	160 Power Users

These recommended configurations can be found on Lenovo's Data Center Configurator tool at [dcsc.lenovo.com](http://dcsc.lenovo.com). Just select "Deployment Ready Solutions" and then "Client Virtualization".

Lenovo ThinkSystem servers with Citrix Virtual Apps and Desktops provide a high performance, cost effective client virtualization solution



ThinkSystem SR665/SR650



ThinkSystem SR645/SR630

### Complementary Hardware

All configurations support on-board storage, and the SR- and SD- systems support attached storage with the Lenovo ThinkSystem DE or DM series storage arrays. These all-flash and hybrid arrays offer a range of connectivity options, minimizing latency and maximizing performance.

Connecting the servers to the storage in this solution can be easily accomplished with network switches. The recommended offerings for this solution are 1 GbE switches for office and knowledge workers, and 10 GbE switches for power users (utilizing heavy graphics applications like CAD/CAM and AI model rendering).

### Complementary Software

Lenovo offers a wide range of complementary software offerings for your Citrix Virtual Apps and Desktops environments.

Data can be backed up with Veeam® Availability Suite™. Veeam Agents for Microsoft Windows and Linux work with Veeam Availability Suite to deliver comprehensive backup and recovery for ALL workloads — virtual, physical and cloud — with a single management console.

The delivery of graphics-rich desktops and workstations is facilitated by NVIDIA® virtual GPU (vGPU) software in conjunction with NVIDIA GPUs. Today's digital worker requires more graphics-intensive applications and operating systems to be productive. Windows 10 provides a rich, immersive experience and is the most graphically intensive operating system to date. NVIDIA GRID is designed to deliver Windows desktops and applications at full performance while NVIDIA Quadro Virtual Data Center Workstation (vDWS) software allows users to access their professional visualization applications with full features and performance from any device, anywhere.

Lenovo XClarity™ Administrator is a centralized resource management solution that is aimed at reducing complexity, speeding response, and enhancing the availability of Lenovo server systems and solutions. It captures industry-leading proactive platform alerts, enabling administrators to migrate workloads or replace failing components without incurring downtime.

### End-to-End VDI Solution

Completing the Lenovo end-to-end client virtualization solution for Citrix environments are the endpoints. Lenovo offers a wide range of PCs, tablets, thin clients and smartphones for end user access. Lenovo streamlines device deployment and management, and simplifies the ability to rapidly deploy additional devices, scaling to thousands of connected devices.

### Tying It All Together

In today's rapidly-changing technology environment, empowering your data center transformation isn't just a necessity—it's also a journey. Regardless of your current environment, Lenovo Services is a true business partner that will take you from where you are, to where you want to be. At every stage, you'll get our expertise and services to help you:

- Drive Digital Transformation. You'll get the best architectures suited to your unique needs, along with our industry insights, expert guidance, and hands-on experience.
- Foster Innovation. Free up your internal resources to focus on initiatives that grow your business.
- Simplify Your Support Experience. Gain a trusted partner who understands your systems and solutions to fully support and optimize your data center.

A regional health care provider needed a modern, secure, manageable and cost effective infrastructure for their EPIC system. The company reduced PC capital expense by \$800,000 a year and improved clinician productivity by 20% implementing a Citrix VDI solution on Lenovo ThinkAgile HX with Lenovo endpoints.

When Citrix is implemented on ThinkAgile HX or ThinkAgile VX systems, Lenovo Services guarantees a superior service experience. Providing outstanding value while supporting your uptime requirements, we offer 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, with access to our global remote and field support teams.

### 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 solutions for Citrix Virtual Apps and Desktops, contact your Lenovo sales representative or Business Partner or visit: [www.lenovo.com/businesscontinuity](http://www.lenovo.com/businesscontinuity)

Other Resources:

Design Briefs -

[Lenovo Validated Design for Citrix Virtual Apps and Desktops on ThinkAgile HX](#)

[Lenovo Validated Design for Citrix Virtual Apps and Desktops on ThinkAgile VX](#)

[Lenovo Validated Design for Citrix XenDesktop with Nutanix InstantOn](#)

Reference Architectures -

[Lenovo Validated Design for Citrix XenDesktop with ThinkAgile HX](#)

[Lenovo Validated Design for Citrix XenDesktop with ThinkAgile VX](#)

Case Studies - [www.lenovosuccess.com](http://www.lenovosuccess.com)

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Lenovo provides a complete end-to-end Citrix VDI offering with end points, servers, software and services

