



Citrix runs on Citrix

Lessons learned from delivering virtual desktops
to Citrix employees



Overview: implementing virtual desktops at Citrix

Citrix® does more than promote the advantages of virtual desktops to customers: we also benefit from the flexibility and mobility that virtual desktops and applications can deliver. This paper describes the infrastructure we adopted and the tweaks that we made to ensure the success and smooth operation of our implementation. We wanted to share them with you, our customers and prospects, to make it easier for you to use Citrix products to implement virtual desktops in your own organizations.

We chose to use Citrix XenDesktop® 5 on Citrix XenServer® 5.6 and Citrix NetScaler® to deliver flexible and secure virtual desktops to Citrix employees, anywhere and on any device. Citrix XenDesktop lets you deliver on-demand virtual desktops and applications to users wherever they work, on any type of device they prefer. We've found—and our customers have also reported—that increasing user choice, flexibility and mobility helps unlock the full productivity and creativity of every worker. At the same time, it helps your organization as a whole adapt rapidly to new challenges and opportunities, improving business agility and making desktop management simpler, more secure and lower-cost compared to traditional computing architectures.

How we deliver XenDesktop 5

Hardware

We use HP BladeSystem c7000 enclosures to house HP ProLiant BL460c G6 blade servers configured with dual six-core Intel Xeon processors that have 128GB memory each. Cisco Catalyst Blade Switch 3020 for HP delivers the blade enclosure networking, which provides access to the management, public and storage networks. For storage, we rely on NetApp FAS3240 with 512GB PAM cards. We use the Citrix NetScaler MPX™ platform for load balancing and SSL offloading to ensure highly available and secure access to the XenDesktop 5 infrastructure.

Software

We implemented Citrix XenServer 5.6 as our hypervisor (not FP1), Citrix XenDesktop 5 and Microsoft Windows Server 2008 R2. For the virtual desktops we chose Microsoft Windows 7 X86 configured with Citrix Receiver™ to deliver Citrix XenApp™ published and streamed applications, as well as the ability to run locally installed applications on the dedicated virtual desktops.

Environment

Our environment consists of three logical modules: infrastructure, server and storage.

The infrastructure module comprises Citrix NetScaler devices, Citrix Licensing Server and MS SQL database servers configured as a cluster for redundancy. These components help us provide our users a robust and highly available XenDesktop environment.

The server module delivers the XenDesktop servers and virtual desktops. We use XenServer 5.6 as the basis for this module and deliver XenDesktop servers as virtual machines on one XenServer resource pool and Windows 7 virtual desktops on another XenServer resource pool.

The storage module incorporates the NetApp filer volumes used to deliver servers and desktops.

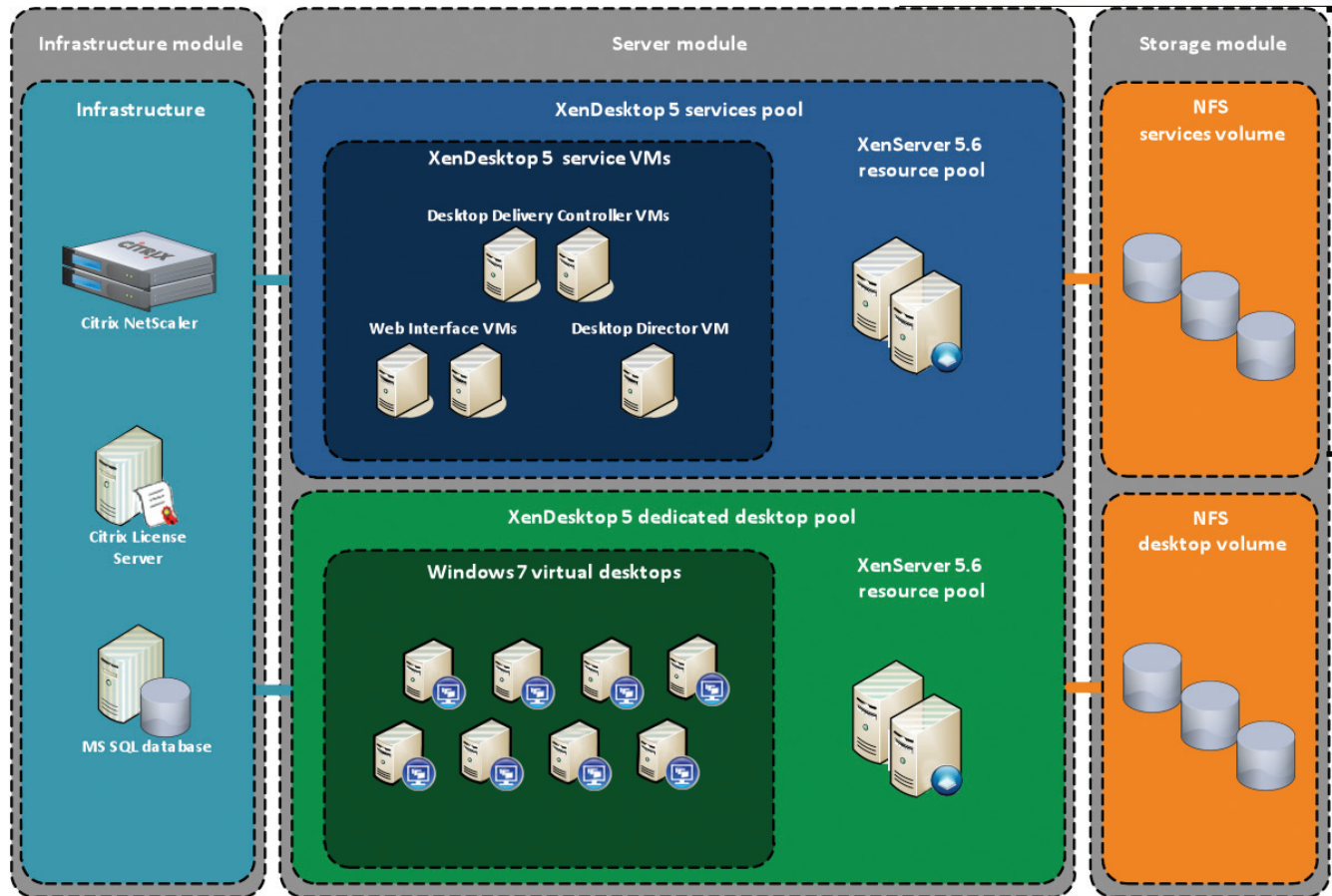


Figure 1: Citrix XenDesktop 5 environment

XenDesktop server interactions

The process begins when a user contacts the Citrix Web Interface (WI) server and authenticates. The WI provides secure access to XenDesktop resources from anywhere, through any device with a web browser. It serves as the initial broker between users and the Desktop Delivery Controller (DDC).

The DDC consists of services that authenticate users, manage the assembly of users' virtual desktop environments and broker connections between users and their virtual desktops. It controls the state of the desktops, starting and stopping them based on demand and administrative configuration.

Users access their resources through a standard web browser or through the Citrix online plug-in with Citrix Receiver. The WI server then hands off to the DDC, which brokers the communication between the user and the virtual desktop.

Once users establish this link, the clients and the virtual desktop agents communicate as peers.

We use the other components only to administer the virtual desktop. For example, we work with the Desktop Director (DTD) to get an overview of our XenDesktop-hosted desktops. It enables us to perform basic maintenance tasks and to monitor and troubleshoot system issues. We can also view and interact with users' sessions, using Microsoft Remote Assistance, to troubleshoot problems.

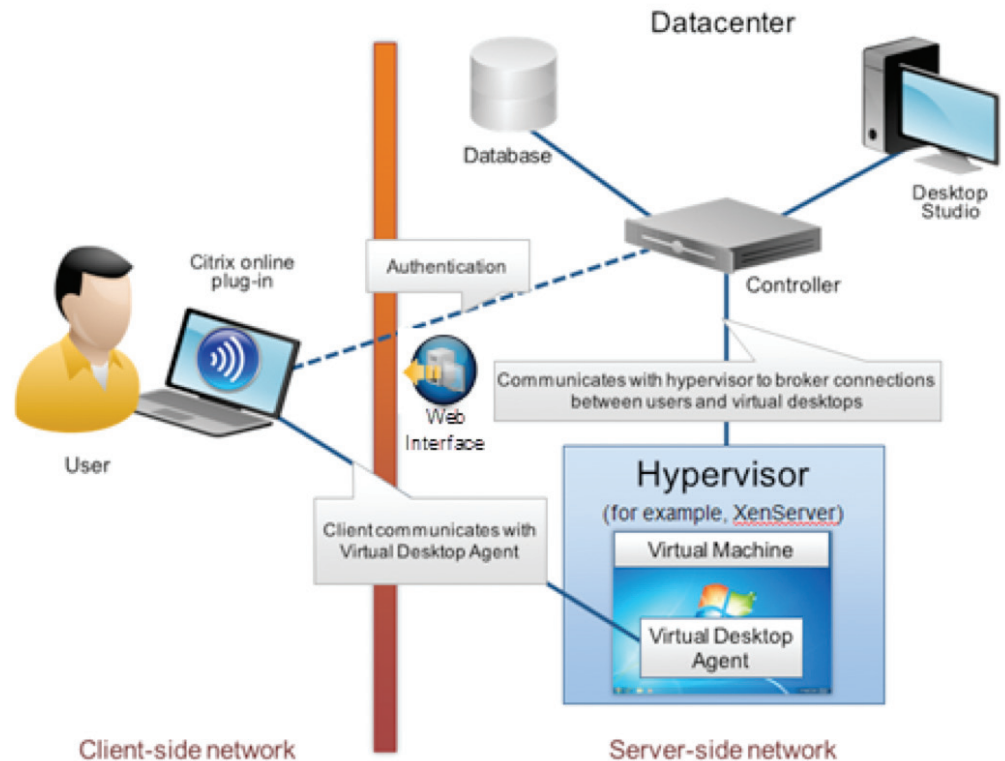


Figure 2: Citrix XenDesktop client and server interactions

What we modified: why and how

We found that tweaking certain settings helped us to introduce Citrix XenDesktop in a smooth fashion. For example, to ensure smooth operation and allow a large number of internal customers to log in simultaneously from day one, we increased the number of virtual desktops that the DDC has powered on and waiting for assignment. Using PowerShell, we modified certain DDC settings, called `PeakBufferSizePercent` and `OffPeakBufferSizePercent`. These are set to 10 percent by default, and we set them to 80 percent for the initial rollout of XenDesktop. After the initial rollout, we gained a more precise idea of our true requirements and reduced the number to 15 percent.

We also decided that the default settings for Max Active Action, Max New Actions per Minute and Max Power Actions as Percentage of Desktop—all found under Advanced Host Details—are too high for most environments. In order to prevent congestion and ensure stability of the XenServer pool, we recommend lowering the default values using the calculations below:

- Max active actions: # of XenServer hosts * 2 = X
- Max new actions per minute: # of XenServer hosts * 2 = Y
- Max power actions as percentage of desktops: 2

You'll find these settings on Desktop Studio. Desktop Studio, which we installed on the same server as the DDC, enables you to configure and manage your XenDesktop deployment by providing wizards to guide you through the process of setting up your environment, creating your desktops and assigning desktops to users. To alter these settings, select the Advanced button on the Change Host Details dialog. Advanced Host Details allow a more granular configuration of the hypervisor connection.

We utilize one machine policy and one user policy in Desktop Studio. We assign the machine policy to an organizational unit and the user policy to a machine type in Desktop Studio.

In dealing with virtual desktop images, we take a snapshot of each virtual desktop image prior to building any machines in Desktop Studio because Desktop Studio will automatically take a snapshot of the image if one doesn't exist. Also, we are careful to clear global unique identifiers from our virtual desktop images, to prevent issues that might otherwise arise with various applications.

Summary: reaping the benefits of virtual desktops

Citrix XenDesktop replaces the traditional approach to desktop management with a more flexible and more secure design in which one part doesn't have to disrupt any of the others when changes are needed. We've found desktop management has become so much easier now that the device, OS, applications and user settings are all shielded from each other. We can now manage components independently, eliminating redundant data, workload and management processes. It's fast and easy for us to assemble desktops dynamically based on business roles and deliver resources anywhere, on any device. Our users are happier than ever—and so are we, because we're saving the time and money we used to have to dedicate to maintaining our desktops.

**Worldwide Headquarters**

Citrix Systems, Inc.
851 West Cypress Creek Road
Fort Lauderdale, FL 33309, USA
T +1 800 393 1888
T +1 954 267 3000

Americas

Citrix Silicon Valley
4988 Great America Parkway
Santa Clara, CA 95054, USA
T +1 408 790 8000

Europe

Citrix Systems International GmbH
Rheinweg 9
8200 Schaffhausen, Switzerland
T +41 52 635 7700

Asia Pacific

Citrix Systems Hong Kong Ltd.
Suite 6301-10, 63rd Floor
One Island East
18 Westland Road
Island East, Hong Kong, China
T +852 2100 5000

Citrix Online Division

6500 Hollister Avenue
Goleta, CA 93117, USA
T +1 805 690 6400

www.citrix.com

About Citrix

Citrix Systems, Inc. (NASDAQ:CTXS) is a leading provider of virtual computing solutions that help companies deliver IT as an on-demand service. Founded in 1989, Citrix combines virtualization, networking, and cloud computing technologies into a full portfolio of products that enable virtual workstyles for users and virtual datacenters for IT. More than 230,000 organizations worldwide rely on Citrix to help them build simpler and more cost-effective IT environments. Citrix partners with over 10,000 companies in more than 100 countries. Annual revenue in 2010 was \$1.87 billion.

©2011 Citrix Systems, Inc. All rights reserved. Citrix®, XenDesktop®, XenServer®, NetScaler®, MPX™, Citrix Receiver™ and XenApp™ are registered trademarks of Citrix Systems, Inc. and/or one or more of its subsidiaries, and may be registered in the U.S. Patent and Trademark Office and in other countries. All other trademarks and registered trademarks are property of their respective owners.