# Citrix XenDesktop Implementation

# Citrix XenDesktop Implementation A Practical Guide for IT Professionals

Gareth R. James

Kenneth Majors Technical Editor



AMSTERDAM • BOSTON • HEIDELBERG • LONDON NEW YORK • OXFORD • PARIS • SAN DIEGO SAN FRANCISCO • SINGAPORE • SYDNEY • TOKYO Syngress is an imprint of Elsevier



Acquiring Editor: Angelina Ward Development Editor: Heather Scherer Project Manager: Heather Tighe Designer: Joanne Blank

Syngress is an imprint of Elsevier 30 Corporate Drive, Suite 400, Burlington, MA 01803, USA

© 2010 Elsevier Inc. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or any information storage and retrieval system, without permission in writing from the publisher. Details on how to seek permission, further information about the Publisher's permissions policies and our arrangements with organizations such as the Copyright Clearance Center and the Copyright Licensing Agency, can be found at our website: www.elsevier.com/permissions,

This book and the individual contributions contained in it are protected under copyright by the Publisher (other than as may be noted herein).

#### Notices

Knowledge and best practice in this field are constantly changing. As new research and experience broaden our understanding, changes in research methods or professional practices, may become necessary. Practitioners and researchers must always rely on their own experience and knowledge in evaluating and using any information or methods described herein. In using such information or methods they should be mindful of their own safety and the safety of others, including parties for whom they have a professional responsibility.

To the fullest extent of the law, neither the Publisher nor the authors, contributors, or editors, assume any liability for any injury and/ or damage to persons or property as a matter of products liability, negligence or otherwise, or from any use or operation of any methods, products, instructions, or ideas contained in the material herein.

#### Library of Congress Cataloging-in-Publication Data

James, Gareth R.

Citrix XenDesktop implementation : a practical guide for IT professionals / Gareth R. James. p. cm. ISBN 978-1-59749-582-0 1. Computer networks-Remote access. 2. Virtual computer systems. 3. Citrix XenDesktop. I. Title. TK5105.597J356 2010 005.4'3-dc22

2010026570

#### **British Library Cataloguing-in-Publication Data**

A catalogue record for this book is available from the British Library.

ISBN: 978-1-59749-582-0

For information on all Syngress publications visit our website at www.syngress.com

Printed in the United States of America

10 11 12 13 14 10 9 8 7 6 5 4 3 2 1

Typeset by: diacriTech, Chennai, India



I want to thank my absolutely gorgeous wife Charlotte, for her advice and direction. Without Charlotte this project would most likely never have been started and almost certainly never have been finished. I also want to thank my children Joel, Rosalie, Daniel and Sarah—children really are God's richest blessing. And lastly to my father who was a family man, musician, writer, journalist, and activist in South Africa's darkest days.

- Gareth James

#### CHAPTER

### Introduction

# 1

#### **INFORMATION IN THIS CHAPTER**

- Desktop Virtualization
- Components of a Citrix VDI Solution
- The Project-Based Approach

Desktop virtualization is a very broad topic, which can encompass various virtualization technologies. This book is aimed at specifically addressing how to implement a virtual desktop infrastructure (VDI) solution using Citrix XenDesktop.

This book is not meant as a definitive guide to any one of the technologies discussed in this book, but sets out to tie the components together in a simple, easy-to-grasp manner. We certainly hope it enables you, the reader, to accelerate through the discovery stage, straight through to implementing your own proof of concept or pilot of the technology.

#### **DESKTOP VIRTUALIZATION**

Desktop virtualization has become a catch all phrase for various mechanisms that simplify the management of the user's desktop environment.

VDI is a concept that has been around for some years. The basic concept is to host the desktops in the datacenter rather than on the user's desk. This concept was pioneered by Hewlett-Packard about 5 years ago. The first iteration of the idea involved taking a rack of blade computers, and installing Windows XP on each blade; users then accessed their assigned blade using a standard Microsoft RDP (Remote Desktop Protocol) client. As a concept, it worked for some high-end requirements. The advent of server virtualization into the mainstream has meant that we can now host 30+ desktops on a single server,<sup>A</sup> such that this technology is now far more affordable. Figure 1.1 is a diagram of a basic VDI.

The Client Hypervisor is another desktop virtualization technology. The Client Hypervisor entails installing a hypervisor on a laptop or PC, which is used to host one or more desktop operating systems. This technology should not be confused with "Type 2" hypervisors like virtual PC or VMware workstation that execute on top of a guest operating system. This differs from a server hypervisor insofar as it allows the guest operating system to be accessible from the device itself.

<sup>&</sup>lt;sup>A</sup>Citrix has released test results of 130 virtual desktops on one 72GB dual socket, quad-core Intel Xeon x5570. Running Windows XP guests at 512MB RAM per guest.



#### FIGURE 1.1

A basic VDI layout.

This includes exposing peripherals like USB (Universal Serial Bus), LPT ports, and importantly the graphics processing unit direct to the guest operating system. The user can thus access the guest operating system (Windows 7, for example) as if it were locally installed. There are plans to dove-tail this (currently beta) technology into VDI, such that you could access the same guest virtual machine (VM) using the VDI-hosted mechanism, or even "check out" the VM by dragging the whole VM virtual disk down to a laptop to make it available offline.

Depending on your point of view (or who you work for), Microsoft Remote Desktop Services (RDS) – formerly called Terminal Services – Citrix XenApp, Presentation Server, or MetaFrame is also regarded as a form of desktop virtualization. The difference between this method and VDI is that the operating system used is shared by multiple users, and that it is implemented on a Microsoft server rather than a Microsoft desktop operating system. Additionally, because the overhead of running the operating system is shared rather than requiring an individual instance per user, one typically achieves a higher user density using RDS over VDI. Most organizations would benefit from having a blend of both technologies, with RDS catering for minimal environment, task-based users, and VDI providing a richer environment for the users with higher resource requirements. Microsoft has included RDS CAL in its premium VDI suite, such that the user can connect to a hosted desktop operating system, or a server operating system using RDS, or indeed both if required. Citrix, likewise, both as part of desktop virtualization and their new XenDesktop 4 licensing model, allows the user to use a hosted desktop operating system (XenDesktop) and also to connect to a server desktop using their XenApp product, as part of the same licensing suite. For the sake of clarity, I will refer to the Citrix VDI solution as XenDesktop, and to the RDS (Terminal Services) solution as XenApp, although both products are included in the XenDesktop 4 license suite.

Desktop streaming is a further type of desktop virtualization. VDI and RDS are datacenter-based solutions and the Client Hypervisor is client end virtualization, desktop streaming is a combination of both. Desktop streaming involves mounting a virtual disk over the network to a physical device. The device could be a normal PC or a diskless device. Based on the MAC address of the machine, either you could choose a virtual disk to mount or the administrator could assign one to the MAC address. Citrix Provisioning Server is a mature technology that Citrix acquired when they bought Ardence back in 2006. Dell uses this technology as part of its "Flexible Computing Solution" and refers to it as on-demand desktop streaming (ODDS). This technology can be used with physical or even VMs! Citrix integrates the technology into its XenDesktop VDI solution, but it is important to note that it can be used separately and is a valid solution in its own right.

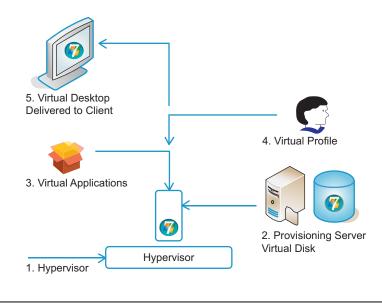
Application virtualization is sometimes included in the definition of desktop virtualization – whether you include it in the definition or not, it should most certainly be included as part of your

implementation. Application virtualization products include Citrix XenApp streaming and Microsoft App-V. Both products function in a similar way, instead of installing each application into the operating system, embedding themselves into the file system and registry, the applications are presented with a virtual file system and a virtual registry, unique to that application. Streamed applications work in an isolation environment. This means that applications don't conflict with each other, and they don't need to be installed in order to execute. Decoupling the application from the host operating system means we greatly simplify the application management on our desktop. This modular approach means that we can easily build out complex and unique guest environments from commonly used building blocks.

Virtual Profiles is another component commonly used within the framework of desktop virtualization. Virtual Profiles fits into the category of "complementary technology." Virtual Profiles is an extension of the roaming profile concept. Roaming profiles is essentially the ability to centralize the user settings on a file share, Virtual Profiles extends this capability to include files and registry keys not traditionally included in the users settings. Virtual Profiles also includes sophisticated mechanisms for managing user settings, including the ability to merge settings from multiple user sessions, and to do intelligent conflict handling. Virtual Profiles provides a more robust solution for handling a situation where users may have multiple access mechanisms to access their working environment.

#### **COMPONENTS OF A CITRIX VDI SOLUTION**

The Citrix approach to VDI is a layered, modular approach. This approach allows you to leverage different technologies at each layer, when composing the overall solution (see Figure 1.2).



#### FIGURE 1.2

Conceptual diagram of the complete solution.

3



#### FIGURE 1.3

Multiple guest VMs hosted on server hardware.



#### FIGURE 1.4

Provisioning server providing a virtual disk.

Starting at the server hardware level, the Citrix solution is hypervisor agnostic. The hypervisor may be Citrix's XenServer, Microsoft's Hyper-V, or VMware's ESX/vSphere (see Figure 1.3).

Next, you make use of Citrix's provisioning server to mount a virtual disk into the VM – this technology is the one most people are unfamiliar with – it allows you to use one virtual disk to boot multiple VMs simultaneously, thus dramatically reducing storage requirements. The greatest benefit is that you manage one desktop image for multiple users – you have guaranteed consistency across the desktop pool, and updates and patches are applied to one common use instance. The provisioning server acts as a "clever" file server, sharing a VHD format virtual disk, the workstations mount the .vhd file as their hard disk (see Figure 1.4).

Virtual applications are then "delivered" into the user's desktop based on their user credentials. These applications can be installed dynamically, and can integrate user-installed applications. Virtual Profiles then inject the users' application and environment settings. The virtual desktop is then delivered to the end point over a presentation layer protocol. High Definition User Experience (HDX) includes the Citrix ICA protocol and the other technologies built around ICA to connect peripherals and deliver content to the end point.

#### THE PROJECT-BASED APPROACH

This book has been structured in such a way that you could run a XenDesktop project by simply following the chapters one by one. The "step-by-step" approach to the installation and configuration sections is meant to give you, the implementer, the information and the visual cues of the dialog boxes to successfully perform the implementation. We have tried to arrange the information – as far as possible – in such a way that you can omit sections not relevant to your project. The scope

of every project is different, but we hope this gives you a basic framework from which you can extrapolate your own project.

"User profiling" will normally precede a project of this nature. In almost every company, there will be a mix of technologies used to cater to the different needs of different groups of users. This book presumes that either "user profiling" has already been done, or that your proof of concept environment will highlight the groups of users that it would benefit the business to move onto virtual desktops.

# Installation of the Broker – Desktop Delivery Controller

2

#### INFORMATION IN THIS CHAPTER

- How the Desktop Delivery Controller Works
- DDC Installation
- Active Directory Integration

#### HOW THE DESKTOP DELIVERY CONTROLLER WORKS

The Desktop Delivery Controller (DDC) is the core technology used to couple the XenDesktop components together. The DDC is effectively the traffic controller, directing the user to their assigned desktop based on their user credentials (see Figure 2.1).

The XenDesktop technology has drawn from the Citrix XenApp technologies. In the context of XenApp, the users are mapped to assigned applications, whereas in XenDesktop, they are mapped to assigned Desktop Groups. The most notable difference is that the components being assigned are not resident on the machines doing the brokering. The Citrix "Farm" mechanism remains largely the same, but the portion being "presented" to the users – a Windows desktop operating system – had to be rebuilt. The Virtual Desktop Agent components are designated as "PortICA" in some of the registry settings. This is because the ICA (Independent Computing Architecture) protocol<sup>A</sup> was "ported" from Windows server to Windows desktop operating systems. It may be useful – for those familiar with XenApp – to think of it in terms of the XenApp management components remain on the DDC, but the ICA stack has been moved to a Windows XP, Windows Vista, or Windows 7 workstations.

Multiple virtual desktops are installed on a physical server; these virtual desktops have a Virtual Desktop Agent installed on them. The Virtual Desktop Agent registers with the DDC.

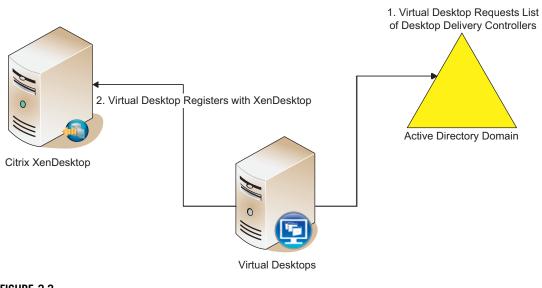
Figures 2.2 and 2.3 illustrate how the components interact.

- 1. The Virtual Desktop Agent queries Active Directory for the DDC address.
- 2. The Virtual Desktop Agent then registers the virtual desktop as available for use.
- **3.** The user requests a virtual desktop from the DDC.
- 4. The controller returns the connection information.
- 5. The virtual desktop launches to the user.

<sup>&</sup>lt;sup>A</sup>The ICA Protocol is a presentation layer protocol, which allows a Windows desktop to be accessible over a network. ICA transmits screen updates to the end point and receives keyboard and mouse clicks from the end point.



The Desktop Delivery Controller.



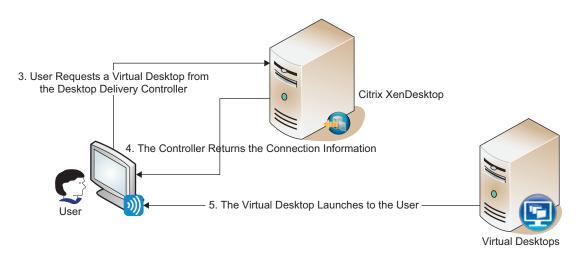


Virtual desktop registration.

It is important to note that the DDC brokers the connection, but once the connection is established, the communication is directly between the user's device and the virtual desktop. If the DDC is rebooted, it would not affect the connected sessions.

A single DDC can broker literally thousands of virtual desktops. A recent whitepaper cites scalability testing of three DDCs managing a farm of 6000 virtual desktops.<sup>B</sup> (4vCPU 4GB RAM per controller), two of the servers were configured to perform registrations, one to act as only a farm master. Most environments will include at least two DDCs, providing load balancing and failover.

<sup>&</sup>lt;sup>B</sup>"Delivering 5000 Desktops with Citrix XenDesktop."



Connecting to a virtual desktop.

#### FAQ

Physical or Virtual? The DDC is a fairly light load and can be comfortably be run as a virtual machine (VM) on the hypervisor infrastructure.

The very simplest proof of concept can be conducted with two PCs – one configured with a desktop operating system and the other configured with Windows Server 2003 and the DDC software. This can be a quick and effective way of demonstrating the performance when connecting to a remote workstation. The workstation could be a physical machine or a VM.

#### Prerequisites

#### Important Considerations

- **1.** The user account performing the installation must be a local administrator on the server. If an enterprise database is being used, it should also be db\_owner of the database.
- **2.** Only Windows Server 2003 is supported for the DDC. The version can be SP2 or R2, (System Center Virtual Machine Manager [SCVMM] requires R2 for Hyper-V integration). Both x86 and 64-bit versions are supported. This will change with the next release, but not yet at the time of writing.
- **3.** Terminal Services in application mode must be installed otherwise, you will be prompted for the Windows 2003 CD during installation to add this component.

The DDC is based on the XenApp software, and this is a legacy link to XenApp.

9

- **4.** IIS must be installed otherwise, you will be prompted for the Windows 2003 CD during installation to add this component.
- 5. Install NET 3.5 SP1 and all the latest Windows Updates.
- **6.** Install JRE 1.5.0\_15 this can be found in the Support folder off the root of the XenDesktop Media.

The Microsoft Updates to the .NET Framework have introduced significant scalability improvements.

For Hyper-V only,

7. Install the SCVMM Administrator Console on the server *before* installing the Citrix DDC software. If the SCVMM Administrator Console isn't installed, only the XenServer and VMware hypervisors are available for integration.<sup>C</sup>

SQL Express or an Access format database is sufficient for a proof of concept. A pilot or production should make use of an Enterprise Database, which can be easily backed up and restored as required.

- **8.** Microsoft SQL 2000 or 2005, or Oracle 11 g Release 1 Microsoft SQL 2005 is recommended. Microsoft SQL 2008 was not officially supported at the time of writing it does indeed work with the backward compatibility pack, so I would be comfortable using it for a proof of concept system, but not for a production system.
- **9.** The installer user account must have db\_owner rights to the SQL database. We recommend a service account be used for this purpose in production environments.

#### TIP

Ask the database administrator in your organization to create a database for you. Installing a separate SQL Server will incur extra licensing costs, and probably also annoy the database administrator! It is a small (less than 100 MB), low-impact database that can very easily coexist with other databases on an SQL Server.

Provisioning server requires Microsoft SQL 2005 or Microsoft SQL 2008 if you wish to use the same database server; at the time of writing, we would recommend Microsoft SQL 2005. Check the Citrix Web site for the latest support, the latest XenApp release is geared toward SQL 2008, and XenDesktop support may well be included by the time this goes to press.

#### **DDC INSTALLATION**

To obtain the software, log in to www.mycitrix.com and select **Downloads** | **XenDesktop**.

The XDS\_4\_0\_0\_dvd.ISO file is more than 1 GB in size, so this is definitely something you want to start downloading the day before your implementation.

<sup>&</sup>lt;sup>C</sup>If you decided to add Microsoft Integration after installation, Add/Remove Programs | Citrix Pool Management | Change | Modify | Add Microsoft SCVMM Plug-In.

If IIS is not installed, you will be prompted for the Windows Server 2003 disk and IIS will be installed. By default, the Setup program will install Web Interface on every DDC.

#### **DDC** Installation – Step by Step

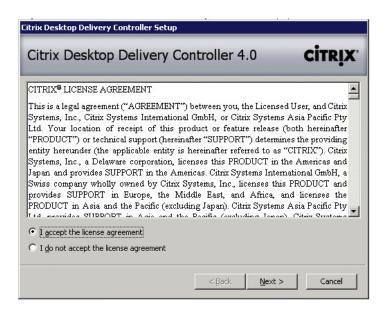
- 1. Mount the XenDesktop 4 DVD on your server.
- 2. The DVD should autorun, if it doesn't, click autorun.exe in the root of the DVD.
- 3. Click Install Server Components (see Figure 2.4).
- 4. Change the radio button to accept the license agreement, and click Next (see Figure 2.5).

You may choose to deselect the Citrix License Server (see Figure 2.6). There is only one license server per farm. For a proof of concept environment, we would recommend that you install all the components on a single server.



#### FIGURE 2.4

Installing server components.



Accepting the license agreement.

itrix Desktop Delivery Controller Setup	
Citrix Desktop Delivery Controller 4.0	CITRIX
Select Components	
Select the components to install on this server. All components need to be insone server in a farm.	stalled on at least
<ul> <li>Citrix Desktop Delivery Controller</li> <li>Citrix Management Consoles</li> <li>Citrix License Server</li> </ul>	
A description is displayed here when you select a component.	
< Back	Cancel

#### FIGURE 2.6

Selecting components to install on the server.

Citrix Desktop Delivery Controller 4.0	CITRIX
Freate or Join a Farm	
Servers running Citrix Desktop Delivery Controller are grouped into fam	ns.
If this is the first controller to be installed in a farm, click Create new far farm, click Join existing farm.	m. To join an existing
⊙reate new farm	
Iype a name for the farm: Demo Farm	
O Join existing farm	
C Join existing farm Iype the name of the first controller in the farm:	

Creating or joining a farm.

For a live/production environment, it is advisable to install the Citrix License Server on a separate server. The Citrix License Server should preferably reside on a server that is not acting as a DDC. A server that is not subject to down time is ideal; a dedicated VM is commonly used.

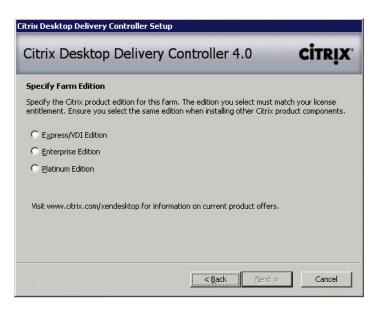
 For the first DDC in your organization, type in the name of the XenDesktop Farm<sup>D</sup> and click Next (see Figure 2.7). This section covers creating the first DDC.

If you are adding a second or subsequent DDC, select **Join existing farm** – "Type the name of the first controller in the farm" this will fetch all the configuration settings – including the Active Directory configuration and replay those setting for your additional DDC.

- **6.** Select the correct edition that you have purchased, or plan to purchase. If you are evaluating the software, select **Platinum Edition** you can choose if you need all the features later (see Figure 2.8).
- 7. The dialog box shown in Figure 2.9 could be a bit confusing; it doesn't refer to using an existing database, but rather a database server. By this they mean a separate database server, like an SQL Server. For a proof of concept, we recommend that you leave this blank and skip down to Step 15, and for a live/production environment, use an enterprise database server in your environment such that it is simple to both back up and restore your farm settings.

The SQL Server option is available – Oracle would only appear in the drop-down list if the Oracle client were installed (see Figure 2.10). The following steps are for a Microsoft SQL database.

<sup>&</sup>lt;sup>D</sup>Farm – Citrix uses the term farm to designate a group of DDCs. The farm will load balance tasks among the servers, the farm also serves as a high availability mechanism – if any of the DDCs were to fail, the XenDesktop virtual workstations would automatically be redirected to another controller in the farm to take over the role of managing the workstations.



Selecting the farm edition.



#### FIGURE 2.9

Choosing SQL express or an enterprise database.

Citrix Desktop Delivery Controller Setup		
Citrix Desktop Delivery Co	ontroller 4.0	CITRIX
Database Configuration		
Select the database server type that hosts the SQL Server		data store):
(No database configured)		
	< Back Next >	Cancel

Enterprise database configuration.

- 8. Click Configure.
- **9.** This brings up a standard Microsoft ODBC (Open Database Connectivity) dialog box (see Figure 2.11). Select the appropriate SQL Server.
- **10.** Select the authentication type, Windows NT authentication is most commonly in use (see Figure 2.12).
- **11.** From the drop-down list, select the database that the SQL administrator has created for you (see Figure 2.13).
- **12.** Click **Finish** (see Figure 2.14).
- 13. Click Test Data Source... to verify connectivity (see Figure 2.15).
- 14. Click OK (see Figure 2.16).

You have now created a file-based DSN (data source name). To check the setting, you can read the file using notepad or a text editor: C:\Program Files\Citrix\Independent Management Architecture\MF20.dsn

15. Click Next (see Figure 2.17).

If all of the Windows prerequisites aren't installed, the following pops up: Figure 2.18 Steps 16 through 18 are only required if the Windows prerequisites aren't met.

- **16.** Unmount your XDS\_4\_0\_0\_dvd.ISO and mount the Windows 2003 .ISO that was used to install the base operating system, and click **OK** (see Figure 2.18). Windows will then install the components (see Figure 2.19).
- 17. Remount the XDS\_4\_0\_0\_dvd.ISO, and click OK (see Figure 2.20).

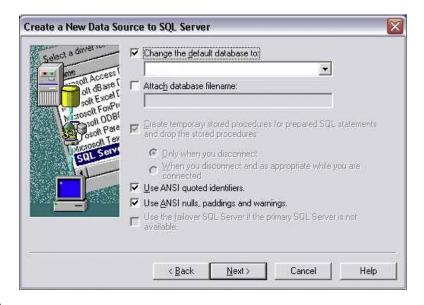
Freate a New Data Sour	ce to SQL Server 🔀
Select a driver to me off Access of Base I Historic Form Just Const Form Second Form Just Const Form Second Form Second Form	This wizard will help you create an ODBC data source that you can use to connect to SQL Server. What name do you want to use to refer to the data source? Name: MF20.dsn How do you want to describe the data source? Description: Which SQL Server do you want to connect to? Server: Server: Server want to connect to?
	Finish <u>N</u> ext > Cancel Help

Creating an ODBC connection.

Create a New Data Sour	ce to SQL Server	×
Select a dirver to: ne soft Access of dasse of dasse in soft Excel in soft Excel in soft Excel in soft Excel in soft For profit Access of dasse in soft Excel in soft For profit Access in	How should SQL Server verify the authenticity of the login ID?	
	Client Configuration  Connect to SQL Server to obtain default settings for the additional configuration options.  Login ID: administrator  Password:	
	< <u>B</u> ack <u>N</u> ext > Cancel Help	

#### FIGURE 2.12

Configuring database authentication.



Database selection.

Selact a diversion	Г	Change the language of SQL Server system messages	s to:
I here I la		English Use strong encryption for data	
N ztosoft Fom	2	Perform translation for character data $\underline{U}$ se regional settings when outputting currency, numbritines.	ers, dates and
SUL Serv	Γ	Save long running queries to the log file:	Browse
	F	Long query time (milliseconds):	30000
		CASTATS LOG	Browse

#### FIGURE 2.14

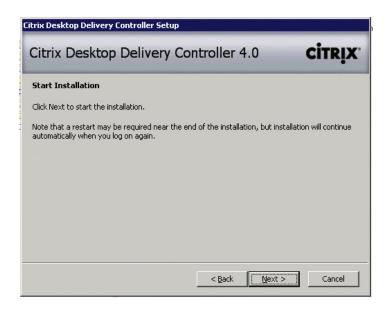
Finalizing database settings.

ODBC Microsoft SQL Server Setup	SQL Server ODBC Data Source Test
A new ODBC data source will be created with the following configuration:	Test Results Microsoft SQL Server ODBC Driver Version 03.81.7713
Data Source Name: Data Source Description: Server: Database: Language: (Default) Translate Character Data: Yes Log Long Running Queries: No Log Driver Statistics: No Use Integrated Security: No Use Regional Settings: No Use Regional Settings: No Prepared Statements Option: Drop temporary procedures on disconnect Use Failover Server: No Use ANSI Quoted Identifiers: Yes Use ANSI Quoted Identifiers: Yes Use ANSI Quoted Identifiers: Yes Use ANSI Quoted Identifiers: Yes Use ANSI Null, Paddings and Warnings: Yes Data Encryption: No	Running connectivity tests Attempting connection Connection established Verifying option settings Disconnecting from server TESTS COMPLETED SUCCESSFULLY!
Iest Data Source         OK         Cancel	

FIGURE 2.16

Testing the data source.

Test results dialog box.

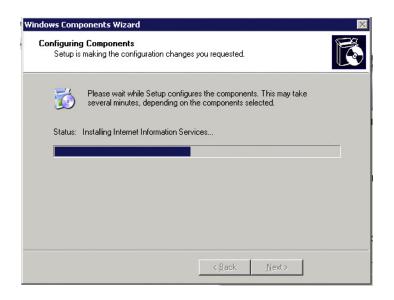


#### FIGURE 2.17

Initiate installation.

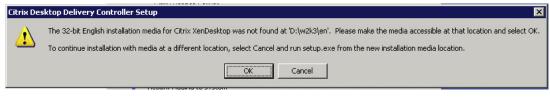


Windows 2003 media.



#### FIGURE 2.19

IIS installation progress.



#### FIGURE 2.20

Mount XenDesktop media.

18. Click Yes to restart the server following the Windows component installation (see Figure 2.21).

You may need to launch the autorun.exe again if it doesn't launch automatically. If you have reached this stage, you may be drumming your fingers on the table waiting for the .Net 3.5 framework to install – yes, it does take a while!

- **19.** The dialog box shown in Figure 2.22 appears six times, click **Continue Anyway** for each. There are three universal drivers (and three hotfixes). The drivers being installed are the Citrix Universal Printer drivers, which have not been digitally signed.
- 20. The server requires a further restart to complete your installation (see Figure 2.23).

Restart (	Computer 🛛 🕅
	It is necessary to restart your computer to continue the installation.
	When the computer has restarted, log on as the current user to continue with the installation. If the Citrix Desktop Delivery Controller setup program does not restart automatically, run the setup program again from the installation media.
	Do you want to restart the computer now?
	<u>Yes</u> <u>N</u> o

#### FIGURE 2.21

Restart dialog box.



#### FIGURE 2.22

Unsigned drivers installation.

Restart (	onputer 🛛 🕅
	It is necessary to restart your computer to continue the installation.
	When the computer has restarted, log on as the current user to continue with the installation. If the Citric Desitop Delivery Controller setup program does not restart automatically, run the setup program again from the installation media.
	Du you wak lu restart lite computer row?

Server restart.

#### **DDC Installation Recommendations for Large Farms**

IIS running on every DDC will place unnecessary load on the DDC. Recommendation: For larger farms, run Web Interface on separate load-balanced Web servers.

#### TIP

To prevent IIS and Web Interface being installed on every server, run the setup.exe program from the command line with the -nosites switch. For example "D:\w2k3\en\setup.exe -nosites"

Recommendation: For performance, it is better to point the Web Interface Servers at the member servers than at the farm master. This reduces load on the farm master.

#### **Dedicated Farm Master for Large Farms**

Recommendation: In larger sites, dedicate a server to act as the farm master. Having a dedicated farm master allows it to better process connections.

<sup>E</sup>To configure a farm master, change the following registry keys:

```
HKLM\Software\Citrix\IMA\RUNTIME\UseRegistrySetting
DWORD=UseRegistrySetting
Value=1
```

that enables the use of the registry key, then

```
HKLM\Software\Citrix\IMA\RUNTIME\MasterRanking
DWORD=Value
Value= 1 indicates 'Master',2 indicates 'Backup'3 indicates 'Member', and 4 indicates
'Slave Only'
Set the Value of MasterRanking to "1" and restart the server.
```

In order to offload the work on to the member servers, the registry needs to be changed such that the farm master is responsible for fewer registrations

```
HKLM\Software\Citrix\DesktopServer\MaxWorkers
DWORD=Value
```

Set the value to a lower number than the member servers. This can be set to zero such that it doesn't process any registrations, but caution should be exercised; you must understand that you are disabling it from processing registrations, and if you only have two DDCs, this could give you a resiliency issue.

Recommendation: Set this value to zero – if you have two or more member servers in addition to the farm master.

#### **ACTIVE DIRECTORY INTEGRATION**

The Active Directory Wizard can be used to integrate your XenDesktop Farm with Microsoft Active Directory.

The question most often asked is "Why?" XenDesktop uses Active Directory to present a list of DDCs to the virtual workstations. If any one of the DDCs were to fail, the workstations could query Active Directory and attach to an alternative DDC within a matter of seconds. This is a high availability mechanism that means your broker is highly resilient.

The second question is that of risk, the Active Directory Administrator in any environment wants to be absolutely sure that this will not have an adverse effect on Active Directory. The most important point to convey is that it does *not* update the Active Directory Schema. So what does it do? It creates a number of objects in a designated organizational unit (OU) of your choice.

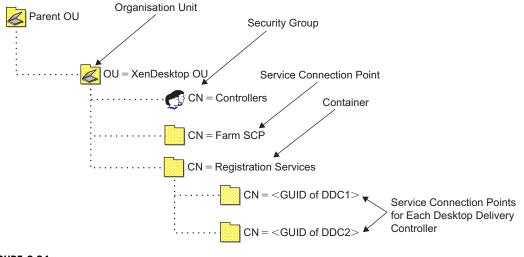
Inside the OU it creates a Controllers Security Group, which contains the machine accounts of all the DDCs. The Controllers Security Group is used for security purposes, virtual desktops will only register with servers in this group. It creates a Service Connection Points (SCP) object<sup>F</sup> called "Farm SCP" (see Figure 2.24). This contains the name of the farm. If your organization has more than one XenDesktop environment, when installing the Virtual Desktop Agent, you will have an option of which farm the desktop belongs to. It also creates a container called "RegistrationServices" – whenever a new DDC is added to the farm; its objectGUID is added to the RegistrationServices container. That's a lot of information; however, you will no doubt have to give it to the Active Directory Administrator before you are allowed to run the Active Directory Wizard.

The Active Directory Configuration Wizard could either be run by a domain administrator (using runas, for example) or the domain administrator could delegate you permission to the parent OU – you need CreateChild permissions on the parent OU.

#### AD Integration – Step by Step

- 1. Launch the Active Directory Configuration Wizard: Start | Programs | Citrix | Administrative Tools | Active Directory Configuration Wizard (see Figure 2.25).
- **2.** Click Next (see Figure 2.26).

<sup>&</sup>lt;sup>F</sup>SCP objects are Service Connection Points. SCP objects are used to publish services in Active Directory. They are used to locate services or information about services. Microsoft Exchange and Microsoft SQL can also make use of SCP objects.



Active Directory XenDesktop farm objects.

administrator		
Manage Your Server	😏 My Computer	
CN Command Prompt	Control Panel	•
Windows Explorer	Administrative Tools	•
Delivery Services Console	Catalog	-
Presentation Se 🥸 Windows	Update	
Citrix Web Inter	ies   rative Tools	_
Streaming Profil 🛗 Microsoft		ration Tools
Notepad 🛅 Startup	PowerShell 1.0	g Profiler    sentation Server
Active Directory 🌽 Internet Configuration W 🗐 Outlook f		
All Durantees A	Assistance hCenter 5.5	
	💋 Log Off 🛛 💽 Shut Down	wn

#### FIGURE 2.25

Active Directory Configuration Wizard start menu item.



Active Directory Configuration Wizard.

🕞 Active Directory Configuration Wizard	_ 🗆 X
Citrix Desktop Delivery Controller 4.0	CITRIX
Configure Farm OU in Active Directory	
Select an existing Active Directory OU using the Browse button. You can eithe farm OU or create a new farm OU within it.	r use this as your
Select OU	
DU=Citrix Xendesktop,0U=Citrix,DC=citrixsa,DC=net	Browse
Create farm OU within the OU selected above	
< <u>B</u> ack <u>N</u> ext >	Cancel

#### FIGURE 2.27

Active Directory OU selection.

- **3.** Click **Browse** to navigate to the correct location within the Active Directory. If the OU you have been assigned has already been created, select the OU and click **Next** (see Figure 2.27).
- **4.** If the OU has not been precreated, and if you have sufficient permissions, you can select the check box **Create farm OU within the OU selected above** and create the OU in the required location. Enter the OU name and click **Next** (see Figure 2.28).
- 5. Click "Add Local Machine" and click Next (see Figure 2.29).

#### TIP

If you need to change the OU for any reason, you will need to select all the DDCs in your farm and the wizard will reconfigure the settings for all the DDCs.

6. Click Finish (see Figure 2.30).

Active Directory Configuration Wizard	
Citrix Desktop Delivery Controller 4.0	CITRIX
Configure Farm OU in Active Directory	
Select an existing Active Directory OU using the Browse button. You can either farm OU or create a new farm OU within it.	use this as your
Select OU OU=Demo,DC=citrixsa,DC=net	Browse
Create farm OU within the OU selected above Demo Farm	
< <u>B</u> ack <u>N</u> ext >	<u>C</u> ancel

#### FIGURE 2.28

Create a farm OU.



Add Desktop Delivery Controllers to the farm.

Active Directory Configuration Wizard	
<b>CİTR</b> İX'	Completing the Active Directory Configuration Wizard The following configuration will be applied when you click Finish.
	AD Setup will perform the following tasks
	Initializing Farm OU
	UU=Demo Farm Farm SCP' SCP 'Controllers' Group 'RegistrationServices' OU
	Copy To Clipboard
	< <u>B</u> ack <u>F</u> inish <u>C</u> ancel



AD setup verification.

Common issues are as follows:

- 1. Insufficient permissions will result in the Active Directory Wizard failing.
- **2.** Computer account If the DDC is configured as a VM, check the event log for domain type errors. If neccessary, re-add the DDC to the domain.
- **3.** Time sync The VM should be time syncing to the domain, not to the hypervisor (XenServer/ Hyper-V/VMware).

#### **SUMMARY**

In this chapter, we dived straight into the installation of the Citrix Virtual Desktop broker. We briefly covered how the DDC mechanism actually works, and then we looked at the practical installation steps. The integration of the DDC with Microsoft Active Directory ties the broker to the authentication mechanism. We covered how the Active Directory integration works, and then we stepped through the process of integrating XenDesktop with the Active Directory.

## Configuring the Desktop Delivery Controller

3

#### INFORMATION IN THIS CHAPTER

Basic Configuration Settings

The configuration section is separated into two parts, the basic settings are enough to get you to the stage of being able to remotely attach to a virtual desktop, the advanced settings covers configuration that may or may not be necessary depending on your environment.

Some of the advanced configuration settings have dependencies on the interaction with the hypervisor. Consequently, I have structured this such that we perform the basic configuration settings first, and then install a virtual instance on the hypervisor of choice, then subsequently address some of the more advanced settings.

After the XenDesktop software has been installed, you may have noticed two errors in the event logs, the first regarding the configuration of the Active Directory OU (Organizational Unit), which we dealt with in the previous section, and the second error regarding the license server, which we deal with in this section. The Citrix License Server should be familiar to a lot of readers who are already working with Citrix technology.

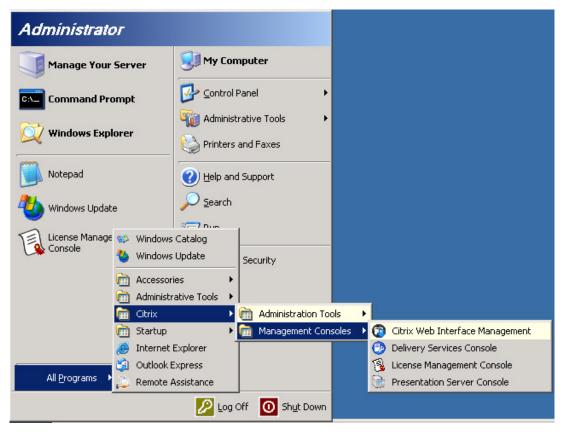
#### **BASIC CONFIGURATION SETTINGS**

The following configuration tasks are all that is required to do a very basic connection to an individual desktop. It is preferable to confirm the functionality of the Desktop Delivery Controller (DDC) at this stage, before we introduce the hypervisor layer. It is also simpler to troubleshoot any issues with a very basic setup.

This section also serves as a template for those wanting to do a very basic demonstration of how a virtual desktop functions.

#### Performing an Initial Discovery – Step by Step

The first task we have to perform is to check that the software is functioning correctly.



Checking the software.

1. To do this, select Start | All Programs | Citrix | Management Consoles | Delivery Services Console (see Figure 3.1).

#### NOTE

The Delivery Services Console is the new name for the Access Management Console (see Figure 3.2).

- 2. Click Next (see Figure 3.2)
- **3.** Click Next (see Figure 3.3).
- **4.** Click **Add Local Computer** this will add the machine you are working on to the discovery list.

If you have only one Desktop Delivery Controller, jump to Step 7.

5. Click Add (see Figure 3.4).

- Delivery	/ Services Console				
File Action Vie	ew <u>H</u> elp				
	Configure and run discovery				
Citrix Delivery	<b>CİTRIX</b>		-		
Alerts			<b>CİTRIX</b>		
- 🦉 Search Re	Welcome				
			-		
👘 Confiç		This is the discovery wizard for the Delivery Services Console. It will guide you through the discovery	o manage you		
😇 Desktı	Steps	process.	h contact betw		
	► Welcome	Before using the Delivery Services Console, you must run discovery to establish contact between			
	Select Products or	items in your deployment and the console.			
	Components	Select Next to continue or Cancel to stop the discovery process.			
	Configure Discovery		Delivery Conti		
	Discovery Progress		er your deskto controllers		
			concrollers		
			achable Er		
		Skip this screen in future	for a range of		
			_ example, serv ing the Search		
		Next > Cancel	come of your n		
		<u> </u>			
	· · · · · · · · · · · · · · · · · · ·				

The discovery wizard for the Delivery Services Console.

- 6. Enter the hostname(s) of the other Desktop Delivery Controllers, and Click OK (see Figure 3.5).
- 7. Click Next The discovery will now start (see Figure 3.6).
- 8. Click Finish Any errors would appear in the Description Pane (see Figure 3.7).

#### NOTE

The discovery is automatically performed each time you open the Delivery Services Console. There will be the facility to cache this information in the following version of the product.

#### TIP

There are two main reasons that a discovery might fail. First, confirm the name you are trying to discover is correct. If you execute a ping <servername> and the name doesn't resolve correctly, then you need to check the DNS (Domain Name System) settings. Second, check whether all the Citrix Services on the target Desktop Delivery Controller are functioning, and if necessary, start the services.

Configure and run discovery					
CITRIX* Select Products or Components					
Steps	to search for.				
✔ Welcome	Products or components:				
<ul> <li>Select Products or Components</li> </ul>	Configuration Tools				
Configure Discovery	Desktop Delivery Controller				
Discovery Progress					
	< Back Cancel				

Selecting products or components.

This console should have a very familiar look and feel to Citrix engineers (see Figure 3.8). It is based on the old Access Management Console, but instead of publishing applications, you are now publishing desktops. The Access Management Console has now been renamed the Delivery Services Console within XenApp 5 too, so as to better align the products.

#### Configure the XenDesktop License Server – Step by Step

This section steps through adding your license file to your license server. If you haven't as yet obtained your license file, see Chapter 12, "Implementing Virtual Profiles into the Virtual Desktop," for details.

	<u> </u>	
	Configure and run discovery	
7	CÍTRIX	
=	Select Controlers	
a ç		Specify at least one controller running Citrix Desktop Delivery Controller in each farm that you
9	Steps	want to administer.
	✔ Welcome	
	<ul> <li>Select Products or Components</li> </ul>	Add <u>L</u> ocal Computer
	Configure Discovery	Controllers: CITRIX2K3DEMO Add
	Desktop Delivery	
	Controller	<u>R</u> emove
	Select Controllers	
	Preview Discovery	
	Discovery Progress	
		< <u>B</u> ack <u>N</u> ext > Cancel

Selecting a controller.

Add Controller		×	
Enter the controller nam	e:		
OtherDesktopDeliveryController			
	ОК	Cancel	

#### FIGURE 3.5

Add Controller dialog box.

Configure and run discovery					
CITRIX'					
Preview Discov	ay.				
Steps	Check the summary configu discovery, click Next.	ration information below. To make any o	shanges, click Back. To start		
<ul> <li>Welcome</li> <li>Select Product Components</li> <li>Configure Disci Desktop De Controller</li> <li>Select D</li> <li>Preview Disci Discovery Prog</li> </ul>	very ivery Introllers Wery	ar GAS: CITRIX2K3DEMO			
		< <u>B</u> ack	Next> Cancel		

Preview Discovery.

#### NOTE

The License Console interface is being completely redesigned, and this will affect the next version of XenDesktop. The new license server is covered in the appendices.

- 1. Select Start | All Programs | Citrix | Management Consoles | License Management Console (see Figure 3.9).
- 2. Click Configure License Server (see Figure 3.10).
- 3. Select Copy License file to this license server (see Figure 3.11).

figure and run discovery	
TRIX.	
iscovery Progress	
Use this page to monitor the progress of discovery and check any errors.	
teps	
Welcome Discovery completed	Stop Discovery
Select Products or Components	<u>Tob pression</u>
Configure Discovery  Configure	
Desktop Delivery Controller Description	
Select Controllers	
Preview Discovery	
Discovery Progress	
< <u>Back</u>	Cancel

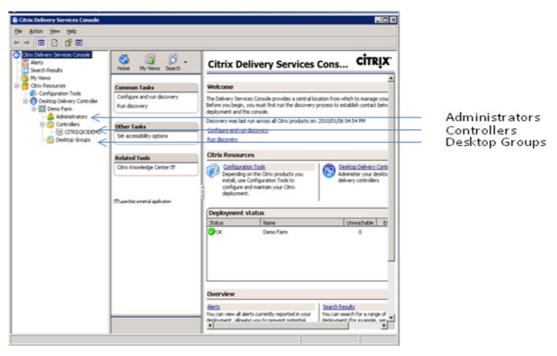


Discovery progress.

4. Browse to the location of your license file. Click Open, and then click Upload (see Figure 3.12).

Overdraft is a new addition to the License Console (Figure 3.13). This column shows you if your licenses are "overdrawn." Citrix has added an overdraft to the license model to leave 10% headroom to allow for staff churn (leavers and joiners).

- **5.** Open the Desktop Delivery Controller. Right-click on your **Farm name | Modify farm properties | Modify license server properties** (see Figure 3.14).
- **6.** Specify the License Server Name or IP (Internet Protocol) Address, and click **OK**. Using a hostname is preferred while using a clone in a disaster recovery site (see Figure 3.15).



Delivery Services Console.

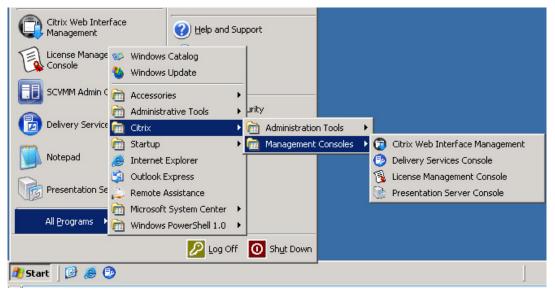
## FAQ

How long can the license server be off before my servers leave the grace period? The grace period is now either 720 h or 30 days. It is, however, not a desirable state to have your farm in, as it could potentially cause issues. New servers need to register with a license server at least once before they can enter a grace period. I would recommend having HA (High Availability) enabled on the license server if it is a virtual machine, and for disaster-recovery scenarios, a cold standby clone (i.e., same hostname) that is an exact copy of the license server – perhaps with the exception of the IP address if the disaster recovery site uses a separate subnet.

# Install the Virtual Desktop Agent on a Test Workstation - Step by Step

You require at least one test workstation to test the functionality of your Desktop Delivery Controller. I advise installing this on a laptop or a desktop that is part of the target domain. I like to install the agent on an existing machine as it is already part of the domain and has the end users applications already installed – but mostly because it makes a really nice demo.

If you do not have a suitable workstation available, skip forward to Chapter 4, "Installing the Virtual Desktop," and install a suitable workstation on the hypervisor of your choice.



Selecting the License Management Console.

# NOTE

You will need administrative rights on the workstation in order to install the agent.

1. If you have cut the XDS\_4\_0\_0\_dvd.ISO to a physical DVD, you can just place that in the DVD drive of the workstation. If necessary click on the **autorun.exe** on the root of the DVD. The autorun automatically detects the guest operating system and launches the correct .msi file (see Figure 3.16).

Otherwise, it is perhaps simpler to copy the relevant "XdsAgent.msi" file to your workstation. Navigate to the DVD mounted on the Desktop Delivery Controller.

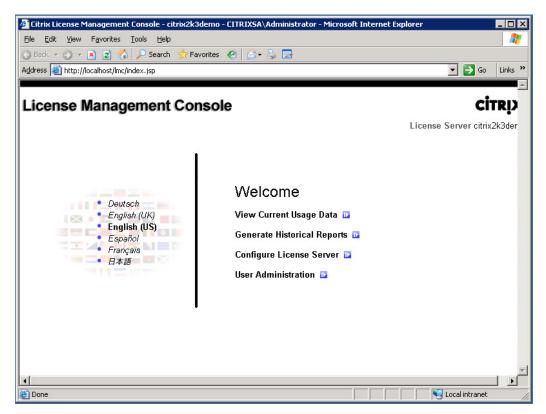
If your workstation is 32 bit, copy <driveletter>:\w2k3\en\VirtualDesktop\XdsAgent.msi (if you are unsure whether it is 32 or 64 bit, use this file), to your workstation.

If your workstation is 64 bit, copy <driveletter>:\x64\en\VirtualDesktop\XdsAgent.msi to your workstation.

**2.** If the .NET Framework 3.5 SP 1 is not yet installed, it will automatically detect and prompt you to install it. Click **Install** (see Figure 3.17).

# NOTE

The .NET 3.5 Framework can take a long time to install - don't assume it has hung, it will eventually finish!



The License Management Console welcome screen.

- **3.** Click Next (see Figure 3.18).
- 4. Toggle the radio button to accept the license agreement, and click Next (see Figure 3.19).
- 5. Click Next to accept the defaults (see Figure 3.20).

#### NOTE

Sometimes it is necessary to change the Desktop Delivery Controller listener port from 8080 to another number (normally if the port is in use by another application) – this dialog box gives you the opportunity to change the workstation to match the server port.

**6.** Select **Next** to let the wizard automatically configure the Windows Firewall (see Figure 3.21).

If your desktop standard includes a third-party firewall, this will need to be manually configured.

The Microsoft Firewall can be configured through a Group Policy. The Policy settings are located under – Computer Configuration | Administrative Templates | Network | Network Connections | Windows Firewall. The Microsoft recommended settings are to allow the use of Local

Configuration : License Files - citrix2k3demo - Citrix License Management Console - CITRIXSA\Ad -	- Microsoft Internet Explorer	
😋 Back 🔻 🕤 👻 😰 🏠 🔎 Search 👷 Favorites 🛷 😥 🛃		
Address 🕘 http://localhost/lmc/configuration/licenseFiles.jsp		🔁 Go 🛛 Links 🎽
,,		
License Management Console	CITRIX.	
Current Usage Historical Usage Configuration User Administration	License Server citrix2k3demo	
License Files File Locations Threshold Options License files folder on license server: C:\Program Files\Citrix\Licensing\MyFiles\		
To add or update licenses for this license server: Step 1: Download license file from MyCitrix.com S Step 2: Copy license file to this license server D		
NOTE: If you came to this page during a product installation, complete these s then click here to close the browser window and return to the setup program.	teps and	
License File Name Date		
citrix_startup.lic Jan 6, 2010		
Complete License Inventory 🔤		
Done		aliptrapet

Citrix License Management Console.

Port exceptions; however, some organizations may have stricter policies that will override your local settings. If you find that communication is being blocked, it may be worthwhile running a Resultant Set of Policy using the Microsoft Group Policy Management Console to ascertain which settings are being applied, and where they derive from.

7. Select the correct XenDesktop Farm<sup>A</sup> from the drop-down list, and click Next (see Figure 3.22).

## NOTE

There may be a requirement for separate farms for different divisions or departments. It is also a good idea to keep your development/test farm completely separate from any live/production farms.

<sup>&</sup>lt;sup>A</sup>The setup wizard queries Active Directory for the farm SCP (Service Connection Point) objects, and it returns all the XenDesktop farms.

🏄 Configuration : Upload	license file - citrix2k3	lemo - Citrix License Manag	ement Console - CITRI - M	icrosoft Internet Explorer	
, <u>File E</u> dit <u>V</u> iew F <u>a</u> vori	tes <u>T</u> ools <u>H</u> elp				2
🔇 Back 🝷 🕥 👻 😰	- 🏠 🔎 Search 🛛 👷 i	avorites 🤣 🔗 🍃 🕞			
Address 🕘 http://localhost	:/lmc/configuration/upload	.icenseFile.jsp		💌 🏓 Go	Links »
					<u> </u>
License Man	agement Co	nsole		сіт	rix.
				License Server citrix2	k3demo
Current Usage	Historical Usage	▹ Configuration	User Administration		
License Files File Locations Threshold Options		Jpload license	e file		
License File	,	I Settings\Administrator.C∏ Cancel □	RIXSA\Desi Browse		
	Specifying an exi	sting file will cause that	file to be overwritten.		
•	-pjing dirom				ا ن د
Cone Done				Local intranet	1.

Citrix License Management Console - upload license file.

- **8.** Click **Install** (see Figure 3.23).
- **9.** As with the Desktop Delivery Controller, the printer drivers haven't been signed. This pop-up box will come up more than once; click **Continue Anyway** (see Figure 3.24).

#### NOTE

These are the Citrix Universal Print Drivers, which can be used in conjunction with the client-based printers.

**10.** Click **Yes** to restart (see Figure 3.25).

#### TIP

Scan the Application Event Log of the workstation after the reboot. The logging is quite verbose and (unlike some products) the event messaging is pretty good at finding problems. Most common issues are around the communication between the workstation and the Desktop Delivery Controller.

Check:

- The virtual desktop computer account
- The time on the virtual desktop and the Desktop Delivery Controller this must be in sync. Make sure that the virtual desktop is using the Domain Controller to set its time and *not* the Server Virtualization Platform. Citrix recommends using NTP (Network Time Protocol) for the virtual desktops and Desktop Delivery Controller.

License Management C		nsole		Help 🖻		<b>Citrux</b> License Server citrix2k3demo	
Current Usage	Historical Usage	Configuration	User	Administra	ation	LICENSE SE	TVET CILITAZ KSGEIIIO
-	AM GMT+02:00 Jan 7, Complete License Inv		<u>Type</u>	Installed	In Use	Available	<u>% in Use</u> Overdra
itrix EdgeSight for En	ndpoints	Concurrent User	Evaluation	108	0	108	0 9
itriv Dravisioning Con	ver for Desktops	Concurrent System	Evaluation	207	0	207	0 9
/itmx Provisioning Sen	rer for Beentepe						
		Concurrent System	122	108	0	108	0 9
Citrix Provisioning Serv	vices	-	Evaluation	108 5,000	0	108 4,999	09
Citrix Provisioning Serv Citrix Start-up License	vices	Concurrent System	Evaluation System	5,000	-		
Citrix Provisioning Sen Citrix Start-up License Citrix StorageLink	vices	Concurrent System Server	Evaluation System	5,000 108	1⊡	4,999	0 0
Citrix Provisioning Sen Citrix Start-up License Citrix StorageLink Citrix XenApp Enterpris	vices	Concurrent System Server Concurrent System	Evaluation System Evaluation	5,000 108 108	1 <u></u> 0	4,999 108	00
Citrix Provisioning Serv Citrix Start-up License Citrix StorageLink Citrix XenApp Enterpris Citrix XenApp Platinum	rices se	Concurrent System Server Concurrent System Concurrent User	Evaluation System Evaluation Evaluation	5,000 108 108 108	1 0 0	4,999 108 108	009
Citrix Provisioning Sen Citrix Provisioning Sen Citrix Start-up License Citrix StorageLink Citrix XenApp Enterpris Citrix XenApp Platinum Citrix XenDesktop Ente Citrix XenDesktop Ente	vices se 1 erprise	Concurrent System Server Concurrent System Concurrent User Concurrent User	Evaluation System Evaluation Evaluation Evaluation Evaluation	5,000 108 108 108 108	1 0 0 0	4,999 108 108 108 108	0 0 0 9 0 9 0 9
Citrix Provisioning Serv Citrix Start-up License Citrix StorageLink Citrix XenApp Enterpris Citrix XenApp Platinum Citrix XenDesktop Ente Citrix XenDesktop Ente	vices se n erprise erprise	Concurrent System Server Concurrent System Concurrent User Concurrent User User/Device	Evaluation System Evaluation Evaluation Evaluation Evaluation	5,000 108 108 108 108 108	1 0 0 0 0 0	4,999 108 108 108 108 108	0 0 9 9 0 9 0 9 0 9 0 9
Citrix Provisioning Sen Citrix Start-up License Citrix StorageLink Citrix XenApp Enterpris Citrix XenApp Platinum Citrix XenDesktop Ente Citrix XenDesktop Ente Citrix XenDesktop Plat	vices se 1 erprise erprise inum	Concurrent System Server Concurrent System Concurrent User Concurrent User User/Device Concurrent System	Evaluation System Evaluation Evaluation Evaluation Evaluation	5,000 108 108 108 108 108 108 108	15 0 0 0 0 0 0	4,999 108 108 108 108 108 108	0 0 9 9 0 9 0 9 0 9 0 9 0 9
Citrix Provisioning Sen Citrix Start-up License Citrix StorageLink Citrix XenApp Enterpris Citrix XenApp Platinum Citrix XenDesktop Ente	vices se n erprise erprise inum inum	Concurrent System Server Concurrent System Concurrent User Concurrent User User/Device Concurrent System Concurrent System	Evaluation System Evaluation Evaluation Evaluation Evaluation Evaluation	5,000 108 108 108 108 108 108 108 108	1 🖬 0 0 0 0 0 0 0	4,999 108 108 108 108 108 108 108	0 0 0 9 0 9 0 9 0 9 0 9 0 9 0 9

Citrix License Management Console – click **Current Usage** tab to view your license allocation. Confirm that you have the correct product(s) listed.

- DNS, check that you can resolve the fully qualified domain name (FQDN) of the virtual desktop from the Desktop Delivery Controller and vice versa.
- Confirm that port 8080 (or the configured port) is open for communication. The command line *netstat* will show connections to hosts, and the ports in use.
- XDPing /host <hostname> (CTX123278).

🕏 Citrix Delivery Services Console		
Eile Action View Help		
Citrix Delivery Services Console	My Views Search	Demo Farm CiTRIX
My Views		☑ Contents
Configuration Tools	non Tasks	
🔄 🧑 Desktop Delivery Controller	ge display 🕨 🕨	Administrators Choose columns
Demo i Change display	e desktop group	Name 🛆
Ad Create desktop group	farm properties	3 Administrators
De Modify farm properties	Modify all properties	
Add administrator	Modify license server propert	ies
Save in My Views	Tasks	
All Tas <u>k</u> s 🕨	nize display	Controller Folders
<u>⊻</u> iew ►	nize uispiay	Name A
 		Controllers
Refresh	d Tools	
Properties	Knowledge Center 🖻	1 item
Help		Select one or more items to view details and associated tasks
t⊈Launc	hes external application	
		1

Citrix Delivery Services Console - farm menu.

Successful registration with the Desktop Delivery Controller is what you are looking for in the event log (see Figure 3.26).

# Virtual Desktop Group Creation – Step by Step

Now that we have a test workstation, we can set up a test Desktop Group. Return to the Desktop Delivery Controller and open the Citrix Delivery Services Console.

- 1. Right-click on Desktop Groups | Create Desktop Group (see Figure 3.27).
- 2. Click Next (see Figure 3.28).
- **3.** Leave the Default selection at **Pooled** and click **Next** (see Figure 3.29).

**Pooled** – All users draw from a common pool of workstations, workstations are randomly assigned and the user will (most likely) get a different computer name at each logon.

Demo Farm - Farms Properties		×
Properties: Properties: - Farm-wide - Connection Access Controls - Desktop Delivery Controller - Session Reliability - ICA - License Server - HDX	License Server Specify either a new license server name or an IP address. Name: CITRIK2K3DEMO Port number (default 27000): 27000	
	OK Cancel Apply	

Farm properties - license server.

**Assigned** – The user always gets the same workstation. Sometimes, this is useful if the user requires a specific machine name or IP address for some applications such as a Cisco softphone, for example.

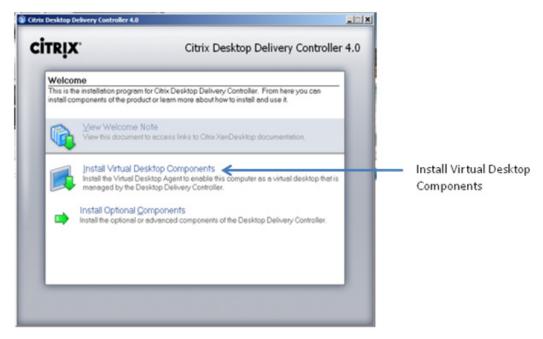
There are two types of assigned desktops:

Assign on first use – Sometimes called "sticky," the first workstation you draw becomes the one you always use, and no other user will receive the workstation.

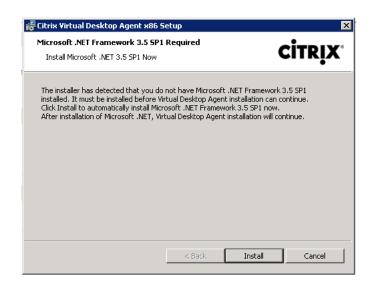
Preassigned - The administrator decides explicitly which user receives which desktop.

## TIP

Try to use Pooled wherever possible. It is far simpler to manage a generic pool of common use devices. User uniqueness can almost always be achieved through a combination of virtual applications and Virtual Profiles.

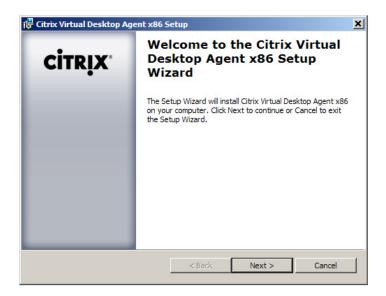


Citrix Desktop Delivery Controller 4.0 installation program.



#### FIGURE 3.17

Microsoft .NET Framework install dialog box.

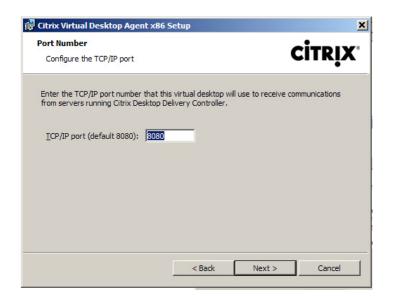


Virtual Desktop Agent setup wizard.

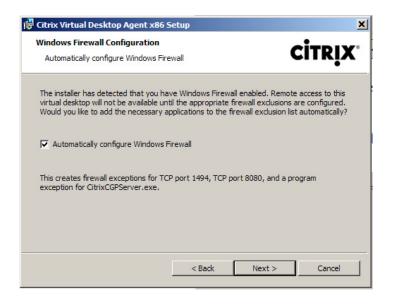
Citrix Virtual Desktop Agent x86 Setup
End-User License Agreement
Please read the following license agreement carefully
CITRIX <sup>®</sup> LICENSE AGREEMENT
This is a legal agreement ("AGREEMENT") between you, the Licensed User, and Citrix Systems, Inc., Citrix Systems International GmbH, or Citrix Systems Asia Pacific Pty Ltd. Your location of receipt of this product or feature release (both hereinafter "PRODUCT") or technical support (hereinafter "SUPPORT") determines the providing entity hereunder (the applicable entity is hereinafter referred to as "CITRIX"). Citrix Systems, Inc., a Delaware corporation, licenses this PRODUCT in the Americas and Japan and provides SUPPORT in the Americas. Citrix Systems International GmbH, a Swiss company wholly owned <b>v</b>
<ul> <li>I accept the terms in the License Agreement</li> <li>I do not accept the terms in the License Agreement</li> </ul>
< Back Next > Cancel

#### FIGURE 3.19

License agreement.



TCP/IP port number.

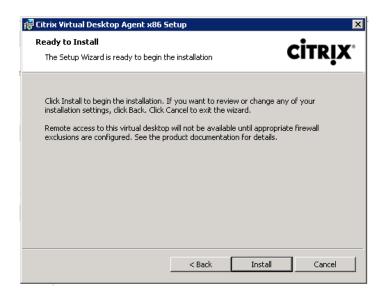


#### FIGURE 3.21

Firewall configuration.

🚏 Citrix Virtual Desktop Agent x86 Setup	×
Farm Selection	
Select the farm for this virtual desktop	<b>CİTR</b> İX'
This virtual desktop is not associated with a farm. If you know th this virtual desktop, select it from the list below. Otherwise an ac this remotely later. See the product documentation for details. C Configure the farm later Select the farm now List of farms:	
Demo Farm Citrix-Xendesktop Demo Farm	V
< Back Ne	ext > Cancel

Farm selection.



#### FIGURE 3.23

Ready to install.



Windows logo warning.

🙀 Install	er Information	×
i)	You must restart your system for the configuration changes made to Citrix Virtual Desktop Agent x86 to take effect. Click Yes to restart now or No if you plan to manually restart later.	
	Yes No	

#### FIGURE 3.25

Restart dialog box.

**4.** In this example, we are attaching to a simple workstation on the network, so the hosting infrastructure we should choose is **None** (see Figure 3.30).

#### NOTE

If you have in fact installed your test workstation on a hypervisor, at this stage choose **None** – the workstation will function normally, but you will lose some of the hypervisor integration features. The integration of the Desktop Delivery Controller and the hypervisors will be discussed in the next chapter.

- 5. Click Add to add a computer account from Active Directory (see Figure 3.31).
- **6.** The selector is a standard Microsoft one, find your computer name in Active Directory and click **OK** (see Figure 3.32).

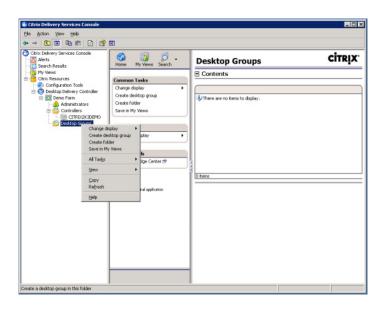
Event Properties	?×
Event	
Computer: CITRIX-XPDEM0	<ul> <li>★</li> <li>▲</li> </ul>
Description: The Citrix Desktop Service successfully registered with delivery contro citrix2k3demo.citrixsa.net (IP Address 172.31.250.94). The registration sequence is not complete until status communication has been receive from the controller. The endpoint address of the controller is http://citrix2k3demo.citrixsa.net:8080/Citrix/CdsController/IRegistrar.	
Data:  Bytes  Words	<
OK Cancel Ap	ply

Event log entry.

#### TIP

In larger organizations, where the Active Directory tree structure is large, it is often simpler to enter <DOMAINNAME>\<COMPUTERNAME> and click **Check Names**. In my example, the syntax would be as follows: citrixsa\citrix-xpdemo. This tip is also applicable to the User Selector in the next step.

- 7. Click Next (see Figure 3.33).
- **8.** To add users, click **Add** again this is a standard Microsoft selector, add the required group or test user (see Figure 3.34).
- **9.** Click the **Check Names** button to verify the username or group and then click **OK** (see Figure 3.35).
- 10. Click Next (see Figure 3.36).
- 11. Give your Desktop Group an appropriate name, and click Next (see Figure 3.37).
- 12. Click Next (see Figure 3.38).
- **13.** Click **Finish** (see Figure 3.39).



Delivery Services Console.

Welcome Welcome to the Create D	vesktop Group wizard.
Steps	This wizard guides you through the process of creating a group of virtual desktops so users can connect to a desktop running in the desktop hosting infrastructure.
Welcome	connect to a desktop forming in the desktop hosting intrastructure.
Assignment Type	After creating a desktop group, you can change its settings by selecting the desktop and choosing Modify desktop group properties from the Common Tasks pane in the Delivery Services Console.
Hosting Infrastructure	Modily desktop group properties from the common 1 asks pane in the Derivery Services Console.
Virtual Desktops	
Users	
Desktop Group Name	
lcon	
Publishing Options	
	Skip this screen in the future

#### FIGURE 3.28

Create Desktop Group.

Assignment Type Specify if this desktop g	roup is pooled or assigned.
Steps Velcome Assignment Type Hosting Infrastructure Vitual Desktops Users Desktops Users Desktops Group Name Icon Publishing Options	Specify whether desktops in this desktop group will be allocated to users from a pool or assigned to specific users.
	Use Desktop Group for VM Hosted Apps VM Hosted Apps is a feature of Chris XenApp. Refer to the XenApp documentation at <u>http://support.chris.com/proddocs</u> to learn more.

Assignment type.

NITD IV'	
CITRIX Hosting Infrastructure Select your desktop hosti	ng infrastructure.
Steps Welcome Assignment Type Hosting Infrastructure Logon Information Virtual Desktops Users Desktop Group Name Icon Publishing Options	Select the desktop hosting infrastructure for this desktop group. If the technology you are using is not in the list, select None. Hosting infrastructure: Citrix Xen VM Infrastructure (included with XenDesktop) Citrix Xen VM Infrastructure (included with XenDesktop) Microsoft Visualization VM ware visualization VM ware visualization

## FIGURE 3.30

Hosting infrastructure.

Virtual Desktops Select virtual desktops to	add to this desktop group.
Steps	To select virtual desktops, click Add.
✔ Welcome	Virtual desktops:
<ul> <li>Assignment Type</li> </ul>	AD Computer Account Add
<ul> <li>Hosting Infrastructure</li> </ul>	Remove
<ul> <li>Virtual Desktops</li> </ul>	
Users	
Desktop Group Name	
Icon	
Publishing Options	
	Export to File Import from File

Virtual desktops.

Select Computers		? ×
Select this object type:		
Computers	<u>O</u> bject Type	s
Erom this location:		
Demo	Locations.	
Enter the object names to select ( <u>examples)</u> :		
<u>citrix-xpdemo</u>	<u>C</u> heck Nam	es
<u>A</u> dvanced	OK Cance	<u>'</u>

#### FIGURE 3.32

Select computers.

Open your Desktop Group and view the status of the machine that you have added.

The desktop should appear as "Idle" if it is ready for use (see Figure 3.40). If the Desktop State reads *In Use*, log off any user on the machine. If the Desktop State reads *Not Registered*, hit **F5** to refresh the console. If it remains *Not Registered*, try restarting the "Citrix ICA Service" on the workstation – and check the event log to see if it is registering correctly.

The specific details of virtual Desktop Group creation for XenServer, Hyper-V, and VMware are also covered in detail in Chapter 4, "Installing the Virtual Desktop."

Virtual Desktops Select virtual desktops to	add to this desktop group.
Steps	To select virtual desktops, click Add.
Welcome	Virtual desktops:
' Assignment Type	AD Computer Account Add
<ul> <li>Hosting Infrastructure</li> </ul>	citrix-xpdemo.citrixsa.net Remove
Virtual Desktops	
Users	
Desktop Group Name	
lcon	
Publishing Options	
	Export to File Import from File

Virtual desktops.

eate Desktop Group (5/8)					
Users					
Specify the users that can	access desktops in thi	is desktop group.			
Steps	To add users, clic	k Add.			
/ Welcome					
Assignment Type	Configured <u>u</u> sers:				
					A <u>d</u> d
<ul> <li>Hosting Infrastructure</li> <li>Virtual Desktops</li> </ul>					Re <u>m</u> ove
Virtual Desktops					
Desktop Group Name					
lcon					
Publishing Options					
	1				
			< <u>B</u> ack	( <u>N</u> ext>	Cancel

# FIGURE 3.34

Add users.

Select Users or Groups	? ×
Select this object type:	
Users or Groups	Object Types
Erom this location:	
Entire Directory	Locations
Enter the object names to select ( <u>examples)</u> :	
Administrator	<u>C</u> heck Names
Advanced OK	Cancel

Select users or groups.

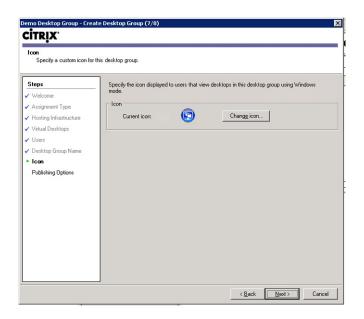
reate Desktop Group (5/8)		٤
<b>Users</b> Specify the users that can	access desktops in this desktop group.	
Steps	To add users, click Add.	
✓ Welcome	Configured <u>u</u> sers:	
🗸 Assignment Type	CITRIXSA\Administrator	Add
✓ Hosting Infrastructure		
🗸 Virtual Desktops		Remove
Users		
Desktop Group Name		
lcon		
Publishing Options		
		< <u>B</u> ack <u>N</u> ext> Cancel
		Cancel

# FIGURE 3.36

Add users.

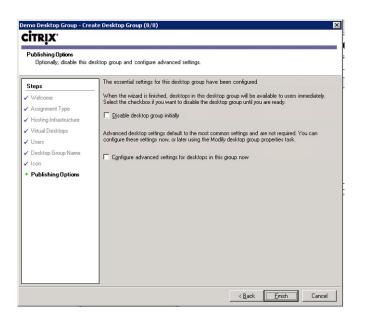
emo Desktop Group - Cre	ate Desktop Group
C <b>İ</b> TRIX'	
Desktop Group Name	scription for this desktop group.
Steps	Specify the name and description displayed to users that view desktops in this desktop group using Windows mode.
✓ Welcome	Display name:
<ul> <li>Assignment Type</li> <li>Hosting Infrastructure</li> </ul>	Demo Desktop Group
<ul> <li>Virtual Desktops</li> </ul>	
Users	Description:
Desktop Group Name	
lcon	
Publishing Options	
	< Back Next > Cancel

Desktop Group name.

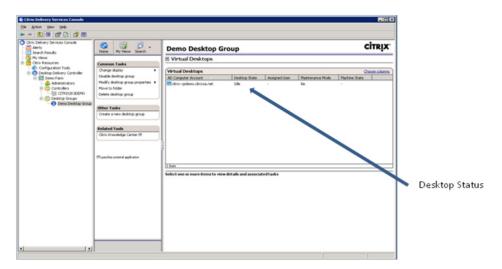


#### FIGURE 3.38

Select icon.



Publishing options.



#### FIGURE 3.40

Virtual desktop status.

# **Connectivity to a Single Desktop**

By default the Desktop Delivery Controller automatically installs the Web Interface component, so nothing further is required to perform the testing. Connectivity can be tested by connecting to the autoinstalled Web site.

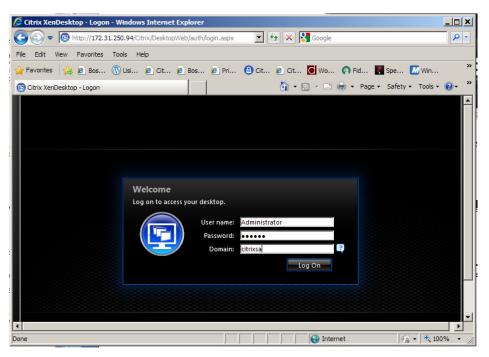
1. Type the hostname or IP address into the Web browser on your laptop/PC, you will be automatically redirected to the logon page. Enter the test username, password, and the domain name in the fields and click Log On (see Figure 3.41).

The Desktop Delivery Controller will now prompt you to install the Citrix client.

2. Click the information bar to allow the Citrix Helper Control to run add on (see Figure 3.42).

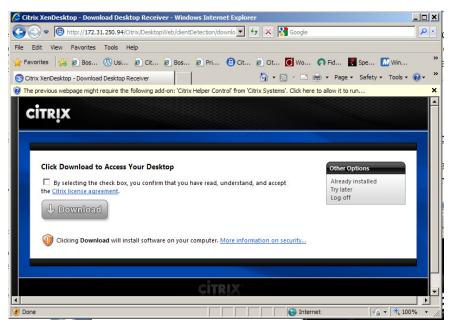
# NOTE

In the event that you have an earlier version of Citrix client, you do have the option to bypass this by clicking **Already Installed**. The earlier versions of Citrix clients do not include some of the newer HDX features. The latest version of the client adds a handy toolbar at the top of the screen, which allows configuration of various client settings.



#### FIGURE 3.41

Web interface portal.



Citrix client installation.

- **3.** Click **Run** The Helper Control will try to detect if the Citrix client is installed (see Figure 3.43). If you already have a Citrix client, you can either choose to upgrade the Citrix Receiver or skip past and upgrade later. This will take you to Step 7.
- **4.** Select the checkbox to agree with the Citrix License Agreement, and then click **Download** (see Figure 3.44).
- 5. Click Run to install after downloading (see Figure 3.45).
- 6. Click Run to execute (see Figure 3.46).

The "CitrixOnlinePluginWeb" will automatically uninstall previous Citrix client versions.

- 7. Click OK (see Figure 3.47).
- 8. If necessary click the click to connect tab inside the Web page (see Figure 3.48).

If you add the Web site to the Trusted Sites Zone, then by default if your user belongs to one Desktop Group, then the desktop will autolaunch. This may be something you wish to do through a Microsoft Group Policy for the Live/Production Web Interface site.

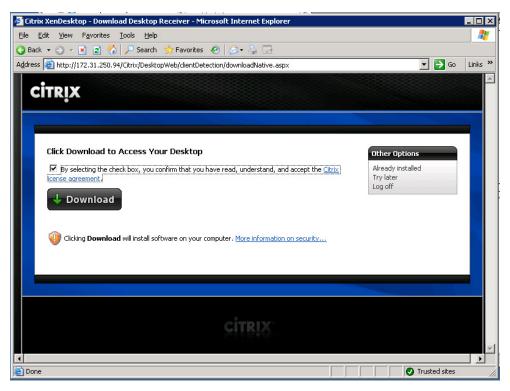
The virtual desktop will now launch as shown in Figure 3.49.

#### NOTE

The native USB (Universal Serial Bus) redirection will only work once you have rebooted the workstation running the Citrix Receiver.



Run ActiveX control.



#### FIGURE 3.44

License agreement and download page.



Citrix online plugin.



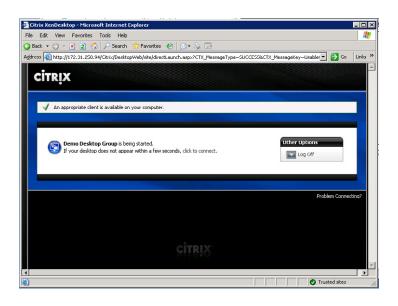
#### FIGURE 3.46

Run online plugin executable.



#### FIGURE 3.47

Successful installation.

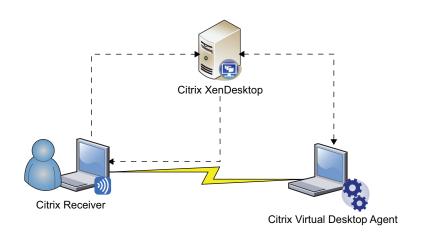


Desktop connection page.



#### FIGURE 3.49

Citrix desktop viewer.



XenDesktop connection demonstration.

#### Checkpoint 1 – Connectivity Demonstration

You should have reached this stage during the first day – if all the prerequisites were met – if you spent a few hours waiting for IP addresses or security for the OU creation, you may well be into your second day of this project. It is, however, significant because you can already show some tangible results. Because the XenDesktop architecture comprises many components, it is useful to show the individual component functionality in isolation from each other to clarify how each component functions.

This is a good time to get all the interested parties gathered around for a mini demonstration. Here is the picture:

During this demonstration, you will show the connectivity from one workstation to another, with the Desktop Delivery Controller brokering that connection. If possible use a whiteboard to draw the picture shown in Figure 3.50. What is important to note is that the session established is a direct one, from one workstation to another, with the Desktop Delivery Controller purely brokering the connection.

The user experience with XenDesktop is simply flawless; demonstrate how the local user experience on the local desktop is identical to working on the remote desktop. It is at this point that you achieve buy-in from both technical and nontechnical parties. If possible run a small video clip on the remote desktop, YouTube is a good option; the performance of video streaming from the remote desktop never fails to impress the audience. It never fails to amaze me how, no matter how many meetings you may have before this stage, the physical demonstration clarifies what you are trying to achieve.

## TIP

Ask for a USB memory stick from one of those watching, plug it in, and demonstrate how the local peripheral seamlessly redirects to the remote desktop.

# SUMMARY

This section aims to draw together the most basic functions of the XenDesktop broker. To that end, we first ran the initial configuration of the Desktop Delivery Controller, we added a license to the license server, and added the XenDesktop agent to a test machine. This "virtual desktop" was then associated with the Desktop Delivery Controller by adding it to a Desktop Group.

The connectivity demonstration is included for both you and the project sponsors to crystallize the concept of what we are trying to achieve.

# CHAPTER

# Installing the Virtual Desktop

4

## INFORMATION IN THIS CHAPTER

- Virtual Desktop Recommendations
- Citrix XenServer
- Microsoft Hyper-V
- VMware vSphere
- Blade Hardware

Installing the base virtual desktop onto a hypervisor is one of the simplest tasks, and also it has no dependencies up until you start integrating it with the provisioning server, which is discussed in Chapter 7, "Fundamental Configuration of the Citrix Provisioning Server."

#### TIP

Perform this task when waiting for a network change, a DHCP (Dynamic Host Configuration Protocol) scope to be created, or an OU (Organizational Unit) to be created, and so on.

This section makes the assumption that the hypervisor layer is already in place, and we cover how to perform the virtual desktop installation on these hypervisors.

Hypervisor integration is an important feature of XenDesktop. This extends the reach of the Desktop Delivery Controller (DDC) to interact with virtual machine power settings. The Desktop Delivery Controller can thus power on or off virtual desktops as required, and it also provides the end users with the ability to perform a "physical" reboot of their virtual desktop.

# VIRTUAL DESKTOP RECOMMENDATIONS

This section covers some general resource recommendations for the virtual desktops that you will be provisioning to your users.

#### Memory

Windows XP – At least 512 MB, preferably 1024 MB. Windows 7 – At least 1024 MB, preferably 2048 MB.

# vCPU

Normally one vCPU (virtual CPU) is sufficient. Processor-intensive applications – if you are running multiple multithreaded applications, you may benefit from adding further vCPUs.

## NOTE

Adding additional vCPUs doesn't necessarily improve performance – rule of thumb – start with one, if the CPU bottlenecks, then test with two.

# Disk

Rule of thumb, assign a 15GB disk for Windows XP, or 25GB disk for Windows 7.

## TIP

Calculate the space that your applications consume on your physical desktops. Remember if you are using a shared virtual disk (vDisk), the consumption of SAN (Storage Area Network) space is minimal.

# Network

A single network card is sufficient. Multihomed does work, but the connection will only take place over the network card, which registers the machine on the Desktop Delivery Controller.

It is highly recommended that the virtual desktops be placed on a separate VLAN (Virtual LAN). Desktop virtualization is introducing users' desktops into your datacenter; traffic that these machines generate is best isolated from your servers. PXE (Preboot Execution Environment) and DHCP may be required by the virtual desktops. DHCP and PXE requirements are discussed in Chapter 6, "Installation of the Citrix Provisioning Server."

Hyper-V – Synthetic adapters perform better and incur less processor overhead; however, they don't support PXE. We recommend using two adaptors, one synthetic and one legacy. The legacy adaptor can be used by the VM at boot time and the synthetic adaptor will be used by the VM once booted (synthetic has network priority).

For the purposes of a POC (Proof of Concept), a single legacy adaptor is recommended; this will function sufficiently well and is simpler to configure.

# **Active Directory**

Domain member: Disable machine account password changes.

This can be done through a Local Computer Policy, or through a Domain Group Policy (see Figure 4.1).

Instead of the computer account password changes being initiated from Active Directory, they will be managed from the provisioning server.

#### TIP

It is not necessary to do this manually if you will be using the provisioning server to provide the vDisk. The XenConvert Optimizer will automatically perform this function.

File Action View Favorites Window	Help				_8
Console Root Console Root Console Root Console Root Console Root Console Root Computer Configuration Computer Conf	Policy         Image: Comparing the second part of the se	Disabled Disabled 25 logons 14 days Disabled Disabled Disabled Enabled Enabled		Actions Security Options More Actions Domain member: Disa More Actions	able m
	Microsoft network server: Digitally sign communications (if client ag	Disabled Enabled	•		

Security policy - disable machine account password changes.

Your base build machine must be added to the domain.

Use a computer name that you won't use in your target pool. For example, use something generic like "BaseBuildMachineWin7." You will use provisioning server to assign the computer names according to your corporate standards.

# **Microsoft License**

Microsoft volume license editions are recommended. Windows 7 will try to reactivate the software if it detects that the hardware has been changed. This is resolved by using a volume license edition.

# **General Performance "Tweaks"**

The XenConvert Optimizer performs many of the best practice "tweaks" for you, and it can be run on your virtual machine before you upload your base build desktop to a vDisk.

There are a large number of "tweaks" that you can apply. Most of these settings are configurable through Citrix or Microsoft policies. I have included below some of the more common settings, please refer to Chapter 5, "Desktop Delivery Controller – Advanced Configuration Settings," for more details on configuring these settings.

# Graphics

The general rule is the less graphical "features" you use, the less traffic you incur. Changes like this should be done judiciously. The Citrix optimizations over the last few years means that the difference in network traffic is actually relatively small. Some simple changes can be made with very little impact to the user experience.

#### **Disable Menu Animations**

Disable window contents while dragging – this just drags a frame, and not the window contents, the contents are only displayed when the window is released.

A good rule of thumb is to keep a "Desktop" like graphical experience for LAN (Local Area Network)/Metro LAN type connections and to scale back when displaying virtual desktops over WAN (Wide Area Network) links. The Citrix Policies section will cover policies that have preset settings for connection types.

#### Audio

Disable System Beep while printing Use the "No Sounds" Sound Scheme

#### TIP

Don't assume that users don't use audio, a large amount of user training, and increasingly corporate "webinars," require sound.

## Windows Vista and 7

Disable UAC (User Account Control) when logged in as an administrator.

# **CITRIX XENSERVER**

The Desktop Delivery Controller connects natively to Citrix XenServer, without requiring any addons. The only "gotcha" around this is that multiple hosts should be specified, using the **Options** button to prevent having a single point of failure.

# Installation

- 1. Connect to the Citrix XenCenter Start | Programs | Citrix XenCenter 5.5.
- 2. Select one of the XenServers in the left-hand pane, right-click New VM... (see Figure 4.2).
- 3. Select your desktop operating system, and click Next (see Figure 4.3).
- 4. Give the machine a display name and description (see Figure 4.4).
- **5.** Place the DVD in the physical server as shown in Figure 4.5, or mount the .ISO file to the XenServer. See Chapter 13, "Advanced XenDesktop Client Settings Audio and Video and Peripherals," for more information on creating an .ISO share on Citrix XenServer.
- 6. Select Automatically select a host server with available resources and then click Next (see Figure 4.6). If you want to select a specific host, then select Use this server as the VM's host server and select the desired host server.
- 7. Select one vCPU and 1024 MB of RAM (see Figure 4.7).

You may choose to increase the amount of RAM for users who require more memory.

8. Click Add... to add a virtual disk, add a 20GB disk to your VM (see Figure 4.8).

🕺 XenCenter							_ [] ×
File View Pool Server VM Storag	pe Templates Tools Window Help						
GBack • DForward •   📑 Add New	Server 🔰 🔛 New Pool 🔡 New Storage 📷 N	lew VM 🕴 🕘 Shut	Down 🛞 Reboot 🕧	Suspend		8	System Alerts: 4
Show: Server View 🔎 🔹	a xenserver1					Logged in a	s: Local root account
Construction     C	Search General Storage Network NGS Con- xenserver1 Overview Name Default instal of XecServer ConvAccess Gatewy (initial image ve.)	CPU Usage	Used Memory	Disks (vg / max (Bo) wols out of date (version	Network (avg/maxKBs) i/1 4.1 mstalled)		e: Local root account Search Options  Uptin 25 days 3 hour 53 days 5 hour
Windows Server 2003 P/52 Windows Server 2003 x54 La Windows Server 2008 x54 Windows XP Master Windows XP SP2 Windows XP SP3							
Windows7-1	•						

Citrix XenCenter.

New VM - Citrix Systems Den	10	_ 🗆 🗙
Select an operating	system for the new virtual machine	?
Template Name Location Home Server CPU & Memory Virtual Disks Virtual Disks Virtual Interfaces Finish	Templates: SUSE Linux Enterprise Server 11 SUSE Linux Enterprise Server 11 x64 Windows 7 x64 Windows 7 x64 Windows Server 2003 Windows Server 2003 Windows Server 2008 Windows Server 2008 R2 x64 Windows Server 2008 R2 x64 Windows Vista Windows >Windows Vista Windows Vista Wista Wista Wista Wi	
CITPLY:	Description: Clones of this template will automatically provision their storage when first booted and then reconfigure themselves with the optimal settings for Windows 7. VCPUs: 1 Memory: 1 GB	
CIIKIX	< Previous Next > Finish	Cancel

#### FIGURE 4.3

New VM operating system selection.

🗴 New VM - Citrix Systems Den	10		
💼 Enter a name and d	escription for the	e new virtual machine	0
Template Name	Name:	Windows 7 Demo Machine	
Location Home Server CPU & Memory Virtual Disks Virtual Interfaces Finish	Description:	Windows 7 Desktop Virtual Machine	
CITRIX		< Previous Next >	Finish Cancel

Name and description.

🗴 New VM - Citrix Systems Der	mo		_ <b>_ </b>
💼 Enter the location of	of the guest operating syste	m installation media	0
Template Name Location	Select a physical DVD/CD-ROI for your guest operating syst media.	۹ drive and insert the installation media em, or use an ISO image of your installation	
Home Server CPU & Memory Virtual Disks Virtual Interfaces Finish	Physical DVD Drive:     ISO Image:	DVD drive 0 on xenserver3 en_windows_7_enterprise_x86_dvd_X15-70745.iso	Y
CITRIX			
		< Previous Next > Finish	Cancel

## FIGURE 4.5

Location of installation media.

🗴 New VM - Citrix Systems Der	no	_ <b>_ X</b>
Select a location fo	r the new virtual machine	0
Template Name Location Home Server	The home server provides the resources for a VM in a pool. XenServer will always attempt to use the resource the home server if it can.	s of
CPU & Memory Virtual Disks Virtual Interfaces Finish	Use this server as the VM's home server:	
CITRIX.		
	< Previous Next > Finish C	Cancel

Home server selection.

New VM - Citrix Systems De	mo CPUs and the initial memory allocation for the new VM	<u> </u>
Template Name Location Home Server	Number of vCPUs: 11	
CPU & Memory Virtual Disks Virtual Interfaces Finish	xenserver3 Physical CPUs: 4 Total memory: 8062 MB Free memory: 4377 MB	
CITRIX		
	< Previous Next > Finish	Cancel

#### FIGURE 4.7

CPU and memory.

New VM - Citrix Systems Den		al disks for the new virtual mach	ine	:
Template Name Location Home Server	You can add, m next page.	ual disks for the template you have selected odify or delete virtual disks, if required. Whe talled on the new machine:	l are listed below. en you have finished, click "Ne	xt" to continue to the
CPU & Memory	Size (GB)	Location		Shared
Virtual Disks	20	Local storage on xenserver3		No
Virtual Interfaces				
Finish				
<b>CITRIX</b>			Add E	dit Delete
		< F	Previous Next >	Finish Cancel

Virtual disks.

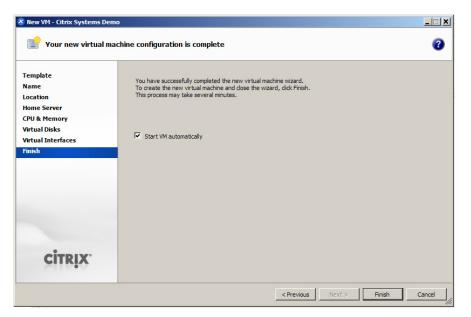
**9.** Add a network card, from the drop-down box select the correct network for it to attach to (see Figure 4.9).

If the XenServer is multihomed, you will have multiple networks to select from. For example, Network 0, Network 1, Network 2, and Network 3. Bonding is often used to create a single resilient interface.

- **10.** Click **Finish** (see Figure 4.10).
- **11.** The installation will now be performed through the XenCenter Console. As shown in Figure 4.11, the installation follows the normal procedure as on a physical host.
- **12.** Right-click on the new virtual machine in the left-hand pane, select **Install XenServer Tools** (see Figure 4.12).
- 13. Click Run xensetup.exe (see Figure 4.13).
- 14. If UAC is enabled, you will receive the dialog box shown in Figure 4.14, click Yes.
- 15. Select I accept the terms in the License Agreement, and click Next (see Figure 4.15).
- 16. Click Install (see Figure 4.16).
- 17. Click Finish (see Figure 4.17).
- **18.** Add the VM to the domain.
- **19.** Install the Virtual Desktop Agent on the XenServer virtual machine. See Chapter 3, "Configuring the Desktop Delivery Controller," for step-by-step instructions.

New VM - Citrix Systems Der		es for the virtual machine		×
Template Name Location Home Server CPU & Memory	delete virtual netv When you have fir	network interfaces for the templat ork interfaces, if required, nished, click "Next" to continue to th erfaces installed on the new virtual		n add, modify or
Virtual Disks	Name	A MAC Address	Network	
Virtual Interfaces	interface 0	auto-generate	Network 0	-
CITRIX			Add	Delete
			< Previous Next > Finish	Cancel

Virtual interfaces.



#### FIGURE 4.10

Successful completion dialog box.

# 74 CHAPTER 4 Installing the Virtual Desktop

Windows 7 Demo Machine		Logged in as: Local root accou
neral Storage Network Console F	terformance Snapshots Logs	
7600.16385.090713-12	55_x86fre_dient_en-us_Retal_Ultimate-GRMCUU/RER_EN_DVD.iso	Looking for guest console
Star.	tall Windows	
	Windows 7	
	VVIII GOVUS /	
	Language to install: English	
	Time and currency formatic English (United States)	
	Keyboard or input method: US	
	Enter your language and other preferences and click "Next" to continue.	
	opyright # 2009 Microsoft Corporation. All rights received.	Next
		Tiew
		- 1
Send Ctrl-Alt-Del	🗐 Scale	Undock (Alt+Shift+U)   Fullscreen (Ctrl+Alt

### FIGURE 4.11

Virtual machine console.

Insta	all XenServer Tools
♪	Any CD or DVD currently in the Virtual Machine's CD drive will be ejected when XenServer Tools are installed.
	Read more about installing XenServer Tools
	Install XenServer Tools Cancel

#### FIGURE 4.12

Install XenServer tools.

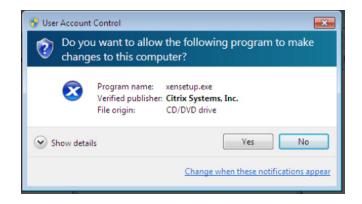
# Integration

In this section, we return to the integration of the Desktop Delivery Controller with the hypervisor.

Following the same procedure as in Chapter 3, "Configuring the Desktop Delivery Controller," we are adding a Desktop Group for Citrix XenServer.



Run xensetup.

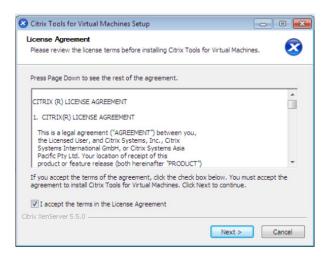


### FIGURE 4.14

User account control.

- 1. Choose Citrix Xen VM infrastructure (see Figure 4.18).
- **2.** For XenServer HA Pools, click **Options**... (otherwise skip to step 3). Enter in the field:

```
Address=[HTTP://<IP of XenServer1>;HTTP://<IP of XenServer2>] (see Figure 4.19).
XenServer1 XenServer2
```



Citrix license agreement.

Citrix Tools for Virtual Machines Setup	- • •
Choose Install Location Choose the folder in which to install Citrix Tools for Virtual Machines.	8
Setup will install Citrix Tools for Virtual Machines in the following folder. To in folder, click Browse and select another folder. Click Install to start the instal	
Destination Folder           C:\Program Files\Citrix\XenTools	Browse
Space required: 2.5MB Space available: 3.9GB	
Citrix XenServer 5.5.0	Cancel

#### FIGURE 4.16

Choose install location.



Reboot dialog box.

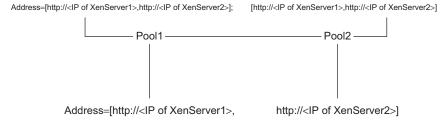
Create Desktop Group (3/9)	X
<b>CİTRIX</b> '	
Hosting Infrastructure Select your desktop hostin	g infrastructure.
Steps	Select the desktop hosting infrastructure for this desktop group. If the technology you are using is not in the list, select None.
✓ Welcome	
🗸 Assignment Type	Hosting infrastructure:
Hosting Infrastructure	Citrix Xen VM infrastructure (included with XenDesktop)
Logon Information	
Virtual Desktops	
Users	
Desktop Group Name	
lcon	
Publishing Options	
	< <u>B</u> ack <u>N</u> ext > Cancel

#### FIGURE 4.18

Hosting infrastructure - Citrix Xen VM infrastructure.



Hosting infrastructure options.



#### FIGURE 4.20

Selecting multiple pools.

Take care when specifying the XenServer hosts in your pool. Bear in mind if the servers listed are unavailable, the Desktop Delivery Controller will have no means of communicating with the XenServer farm. For larger implementations, multiple XenServer pools can also be addressed. Separate pools are delimited with square brackets and a semicolon (see Figure 4.20).

- **3.** Enter the IP address of a XenServer in your pool, and enter the username and password (see Figure 4.21).
- **4.** Click **Add**... (see Figure 4.22).

The Desktop Delivery Controller enumerates all the VMs running on the servers, and you are given the option to select one or more VMs to add to the Desktop Group.

**5.** Select all the virtual machines that you want to add to your Desktop Group, and then click **OK** (see Figure 4.23).

Figures 4.24 and 4.25 show two scenarios: in the first (Figure 4.24), the computer account was found automatically – this is normally the case and in the second (Figure 4.25), the computer account wasn't discovered automatically. This is generally due to DNS (Domain Naming System) issues. To circumvent this problem, select the computer in the Virtual Machine Column and click **Edit**..., you are presented with a standard Microsoft Active Directory account selection dialog box; select your computer account to manually associate the correct computer account with the virtual machine.

Create Desktop Group (4/9)	×
ĊĬŦŖĮX'	
Logon Information Specify the logon details f	or the hosting infrastructure.
Steps ✓ Welcome ✓ Assignment Type	Specify the address and administrator logon information for the hosting infrastructure supporting the desktop group.
✓ Hosting Infrastructure	http://172.31.250.101
Logon Information	For example, https://xenserver.example.com
Virtual Desktops	User name:
Users	root
Desktop Group Name	Password:
Icon	XXXXXXXX
Publishing Options	

Logon information.

## 6. Click Next

#### TIP

If you receive a little red error icon in the Citrix Delivery Services Console, then hover the mouse over the red icon to read a descriptive message (see Figure 4.26).

Add users, and assign a Desktop Group name following the steps you performed earlier in Chapter 3, "Configuring the Desktop Delivery Controller."

CITRIX Virtual Desktops Select virtual desktops to	add to this desktop group.			
Steps	To select virtual desktops, cl	ick Add.		
<ul> <li>Welcome</li> <li>Assignment Type</li> <li>Hosting Infrastructure</li> <li>Logon Information</li> <li>Virtual Desktops Users Desktop Group Name Icon Publishing Options</li> </ul>	Virtual Machine	AD Computer A		Add
		Export to File	Import from File	Cancel

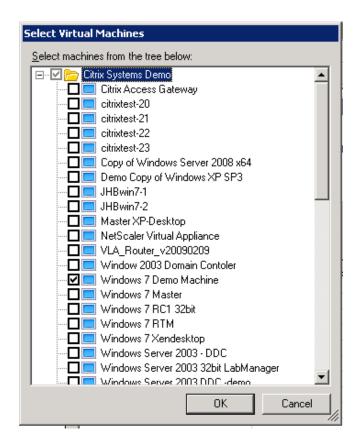
Virtual desktops.

# **MICROSOFT HYPER-V**

XenDesktop virtual desktops can be hosted on any hypervisor. The hypervisor integration features for Hyper-V require the use of Microsoft System Center Virtual Machine Manager.

# Installation

The installation of a virtual desktop can be done through the Hyper-V Manager Console, or the System Center Virtual Machine Manager. In this example, I have created a new Windows 7 virtual desktop using the System Center Virtual Machine Manager.



Select virtual machines.

Due to the PXE requirements of provisioning server, I have selected the network adaptor to be an "Emulated" network adaptor, rather than the default "Synthetic" adaptor. If installing using the Hyper-V Manager Console, change the option to be a legacy network adaptor. Microsoft uses two different terms in the two consoles.

## NOTE

Synthetic network adaptors do perform better, but don't support PXE. For the purposes of a POC, a single legacy adaptor is recommended; this will function sufficiently well and is simpler to configure.

- 1. Open Microsoft System Center Virtual Machine Manager.
- 2. Click New virtual machine (see Figure 4.27).
- **3.** Change the radio button to **Create the new virtual machine with a blank virtual hard disk** (see Figure 4.28).

		ld.	
' Welcome	<u>V</u> irtual desktops:		
Assignment Type	Virtual Machine	AD Computer Account	A <u>d</u> d
'Hosting Infrastructure	Windows 7 Demo Machine	DEM07.citrixsa.net	Remove
Logon Information			
Virtual Desktops			<u>E</u> dit
Users			
Desktop Group Name			
Icon			
Publishing Options			

Scenario 1.

- 4. Enter a name for the virtual machine, and click Next (see Figure 4.29).
- 5. Select Memory and change to 2048 MB, select Virtual DVD Drive (see Figure 4.30).
- **6.** Click **Browse** (or mount the DVD in the physical DVD on the Hyper-V server; see Figure 4.31). In this example, you will browse to an ISO image.

## TIP

Select **Share image instead of copying it**, otherwise SCVMM (System Center Virtual Machine Manager) will make a copy of the ISO and store it with the VM.

Virtual Desktops Select virtual desktops to	add to this desktop group.		
Steps	To select virtual desktops, click	.Add.	
/ Welcome	∐irtual desktops:		
Assignment Type	Virtual Machine	AD Computer Account	A <u>d</u> d
<ul> <li>Hosting Infrastructure</li> </ul>	Windows 7 Demo Machine		Re <u>m</u> ove
Logon Information			
Virtual Desktops			<u>E</u> dit
Users			
Desktop Group Name			
lcon			
Publishing Options			
		Export to File Import	from File
			ioin r lie



Scenario 2.



#### FIGURE 4.26

Virtual machine error.

File View Go Actions	Hyperv.citrixsa.net Help		
	bs 🕝 PRO Tips (0) 🔔 Networking 🗷 PowerShell 🕧 Help		
Virtual Machines	All Hosts Virtual Machines (9)	A	ctions >
Host Groups	Search	🔎 🔽 None 🔽 Vit	rtual Machine Manager 🛛 🔺
Overview	Name ▲         Status         Job Status         Hos           Image: The state         Tonhyperv1         Saved State         Hyp           Image: Tonhyperv2         Saved State         Hyp	erV CITRIXSA\A 0 %	* New virtual machine
	Tonhyperv3         Stopped         Hyp           DDC on Hyperv         Saved State         Hyp           PVS2 on Hyp         Saved State         Hyp	erV CITRIXSA\A 0 % erV CITRIXSA\A 0 %	Add host
Filters <u>Ck</u>	🔚 🖬 XenApp for Saved State 🛛 🛛 Hyp	erV Unknown 0% erV Unknown 0%	server Help Hosts
Status Owner Operating system Added date	• • •	E.	New host group Properties rtual Machine
Fag	Status: Completed Proper	rty Previous Value	) Start ) Stop ) Pause
Hosts	Started:         1/21/2010 8:11:42 AM         S           Duration:         00:00:30         V	firtual Server Unknown	Save state Discard saved state Shut down
Virtual Machines Library	Current step: Refresh virtual machine	Itatus         Not Responding           Virtual Machine - 7onhyperv1         Image: Comparison of Compa	Connect to virtual machine Migrate storage Migrate
i Jobs	-	Virtual Machine - 7onhyperv2	✓ New checkpoint ▲ Manage checkpoints
	Summary Networking and Storage Latest Job		Disable undo disks

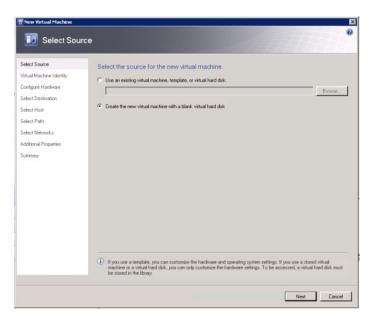
System Center Virtual Machine Manager.

Using ISO images is simpler than mounting physical DVDs, especially if your physical host is in the datacenter. Inside the SCVMM, select **Library** | **Add library server**. Using this procedure, you can add a server share that contains your ISO images.

- 7. Select the ISO image and click OK (see Figure 4.32).
- **8.** Select the virtual disk and change the size to 25 GB (see Figure 4.33). Change the disk type to "Fixed."

Fixed disks offer far better performance. Dynamic disks save disk space, but use more CPU cycles growing the disk and have higher overhead on the disk subsystem due to the way the VHD (Virtual Hard Disk) is aligned.

- **9.** If your network adaptor is "Emulated," click **Next**. If the network adaptor is marked as "Synthetic," you will need to remove it using the **Remove** button, and add an emulated adapter using the **Network Adapter** button (see Figure 4.34).
- **10.** Click Next (see Figure 4.35).

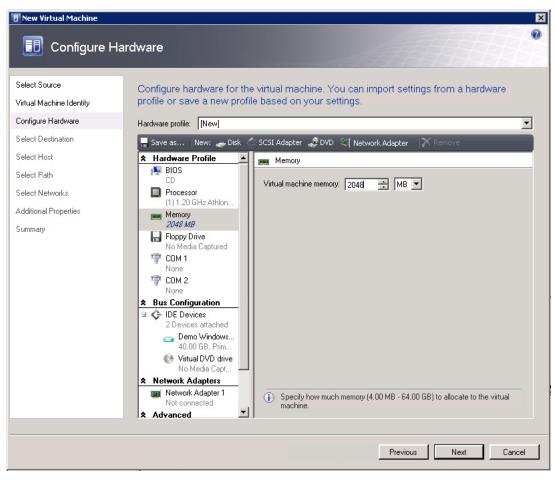


Select source.

	Virtual machine name:
Artual Machine Identity	Demo Windows 7
Configure Hardware	Owner:
elect Destination	CITRIXSAVAdministrator Browse
elect Host	Format: domain/username
elect Path	Description:
Select Networks	
dditional Properties	
ummaty	

#### FIGURE 4.29

Virtual machine identity.



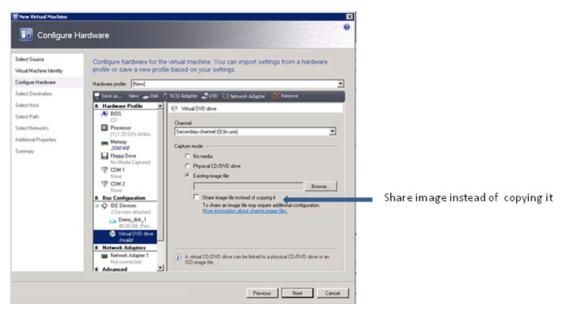
Configure hardware – memory.

Microsoft uses a library mechanism for the centralized storage of standardized virtual machines and standard templates. We, however, want to deploy a virtual machine to a host.

**11.** Click Next (see Figure 4.36).

System Center Virtual Machine Manager gives you a placement option for when you are managing multiple Hyper-V servers.

- **12.** Change the path if you wish to place the virtual hard disk in an alternative location, and click **Next** (see Figure 4.37).
- **13.** Select the network adapter to connect your virtual machine to the network. Click **Next** (see Figure 4.38).

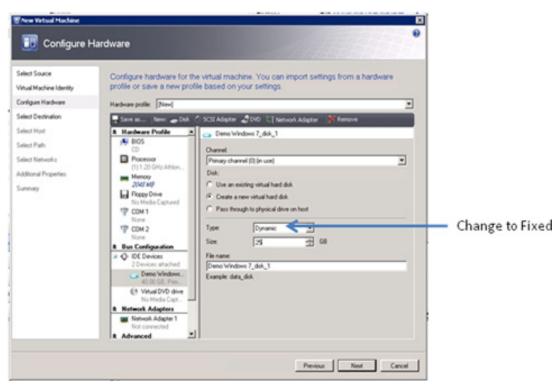


Configure hardware - virtual DVD drive.

arch	, <b>⊘ _</b> in	Туре
ame	Owner Desc	ription Path
Type: ISO Image		
7.iso	Unknown	\\HyperV.citrixsa.net\VMs\
boot.iso	Unknown	\\HyperV.citrixsa.net\VMs\
PVS51SP1.iso	Unknown	\\HyperV.citrixsa.net\VMs\
xd4.iso	Unknown	\\HyperV.citrixsa.net\VMs\

#### FIGURE 4.32

Select ISO.

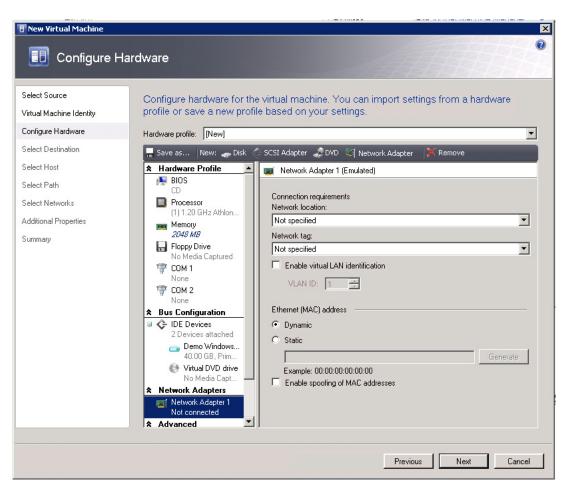


Configure hardware - disk.

- **14.** Change the "Operating system" dropdown to reflect the Guest Operating System in this case, Windows 7 (see Figure 4.39).
- **15.** Click Create (see Figure 4.40).

When you now start the virtual machine, you can install Windows 7 – as you would on a physical hardware (see Figure 4.41).

- **16.** Hyper-V Integration Services. Right-click on your virtual desktop and select **Install virtual guest services** (see Figure 4.42).
- **17.** Add the VM to the domain.
- **18.** Install the Virtual Desktop Agent on the Hyper-V virtual machine as you did in the previous section. See Chapter 3, "Configuring the Desktop Delivery Controller," for step-by-step instructions.

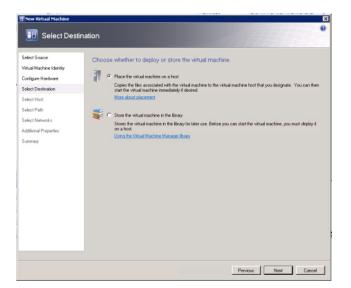


Configure hardware - network adaptor.

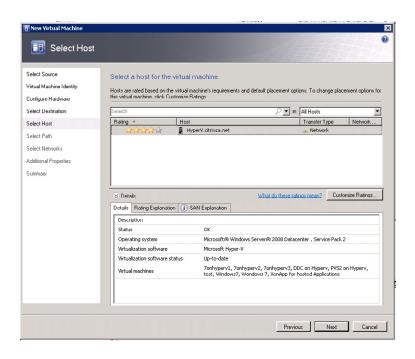
## NOTE

Windows 7 is an "Enlightened" operating system, which gives it performance benefits when running virtualized. "Enlightened" is a term coined by Microsoft that means the operating system is aware of the fact that it is running virtualized. In fact, testing<sup>A</sup> on Hyper-V shows Windows 7 outperforming Windows XP by a significant margin.

<sup>A</sup>Performed with LoginVSI Scripts from www.loginconsultants.com.

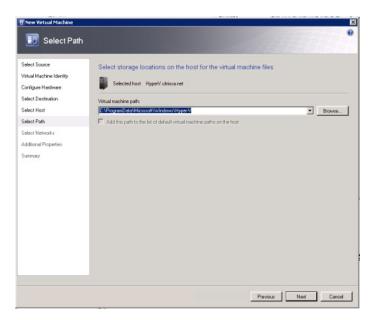


Select destination.

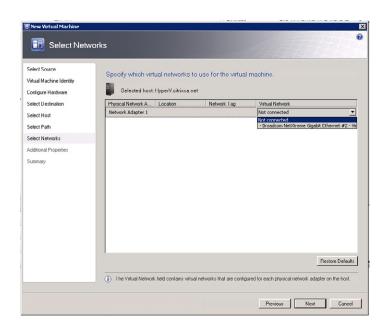


#### FIGURE 4.36

Select host.

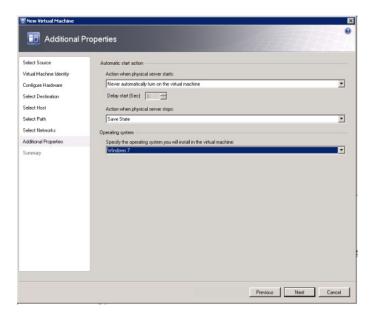


Select path.



#### FIGURE 4.38

Select networks.



Additional properties.

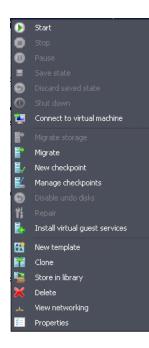
	Review the virtual r	machine settings.
/irtual Machine Identity	Summary:	
Configure Hardware	Property	Value
elect Destination	Virtual machine	Demo Windows 7
elect Host	Owner	CITRIXSA\Administrator
	Destination host	HyperY.citrixsa.net
Select Path	Path	C:\ProgramDatal/Microsoft\Windows\Hyper-V(Demo Windows 7
Select Networks	Operating System	Windows 7
Additional Properties		
		ine after deploying it on the host

#### FIGURE 4.40

Summary dialog box.



Virtual machine viewer.



#### FIGURE 4.42

Virtual machine options.

## Integration

This section discusses the process of adding a virtual desktop hosted on Hyper-V to Citrix XenDesktop.

Following the same procedure as in Chapter 3, "Configuring the Desktop Delivery Controller," we are adding a Desktop Group for Microsoft Hyper-V.

- **1.** Choose **Microsoft virtualization** (see Figure 4.43).
- **2.** Enter the name of the System Center Virtual Machine Manager server and a username and password, with sufficient permissions to administer the SCVMM (see Figure 4.44).

Create Desktop Group (3/9)	X
CIIRIN	
Hosting Infrastructure	
Select your desktop hostir	ig infrastructure.
Steps	Select the desktop hosting infrastructure for this desktop group. If the technology you are using is
	not in the list, select None.
✓ Welcome	Hosting infrastructure:
<ul> <li>Assignment Type</li> </ul>	Microsoft virtualization
Hosting Infrastructure	
Logon Information	Options
Virtual Desktops	
Users	
Desktop Group Name	
lcon	
Publishing Options	
	< Back Next > Cancel
	< <u>B</u> ack <u>N</u> ext > Cancel



Hosting infrastructure.

Specify the logon details	for the hosting infrastructure.
Steps Velcome Assignment Type Hosting Infrastructure	Specify the address and administrator logon information for the hosting infrastructure supporting the desktop group. Address: HupeV chrissa net
Logon Information Virtual Desktops Users Desktop Group Name Icon Publishing Options	For example, SCVMMSYSTEMNAME.DDMAIN.COM User name: [citrixsa.net/administrator Password: reconser

Logon information.

### TIP

Use the format <domainname>\<username>, and use the FQDN (Fully Qualified Domain Name) if you find that you are unable to authenticate.

- **3.** Click **Add**... (see Figure 4.45).
- 4. Select the virtual machine that you want (see Figure 4.46).
- **5.** Click **Next** (see Figure 4.47).

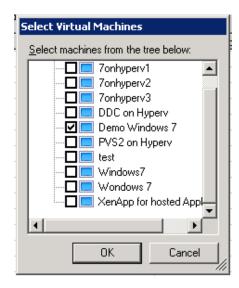
Add users, and assign a Desktop Group name following the steps from Chapter 3, "Configuring the Desktop Delivery Controller."

# **VMWARE VSPHERE**

Where the Microsoft SCVMM software is used to connect to a Microsoft SCVMM server, with VMware we connect to the vCenter (previously referred to as the Virtual Center). Specifically, we connect to the software development kit (SDK) component on the vCenter Server. The SDK is an integration point for other vendors to plug their software into the vCenter. The communication between the Desktop Delivery Controller and the vCenter is done using either HTTP or HTTPS.

		ck Add.	
/ Welcome	<u>V</u> irtual desktops:		
🖌 Assignment Type	Virtual Machine	AD Computer Account	A <u>d</u> d
<ul> <li>Hosting Infrastructure</li> </ul>			Remove
<ul> <li>Logon Information</li> </ul>			Edit
Virtual Desktops			
Users			
Desktop Group Name			
lcon			
Publishing Options			
	1		

Virtual desktops.



#### FIGURE 4.46

Select virtual machines.

Steps	To select virtual desktops, click	k Add.	
Welcome	<u>V</u> irtual desktops:		
Assignment Type	Virtual Machine	AD Computer Account	A <u>d</u> d
Hosting Infrastructure	Demo Windows 7	demowindows7.citrixsa.net	Remove
Logon Information			
Virtual Desktops			<u>E</u> dit
Users			
Desktop Group Name			
lcon			
Publishing Options			

Virtual desktops.

As with Microsoft's free Hyper-V product, VMware's free ESXi product can be used to host the virtual desktop.

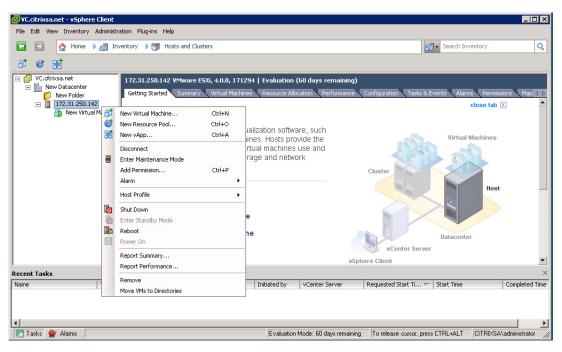
The VMware integration includes support for vSphere, VMware ESX 3.5, and ESX 3.0.

It is more secure to conduct the communications using HTTPS than HTTP. It is, however, much simpler to enable HTTP access. I would recommend using HTTP for a proof of concept type of environment.

## Installation

The installation of the virtual desktop can be performed using the vSphere Client. The vSphere Client is connected to either an individual ESX instance, or to the vCenter Server. In this example, I will connect to a vCenter Server, but the process would be identical on a stand-alone ESX Server.

- **1.** Open the vCenter Console.
- 2. Right-click on your physical host, and select New Virtual Machine (see Figure 4.48).



vSphere Client.

- **3.** Leave the default at **Typical**, and click **Next** (see Figure 4.49).
- **4.** Specify a machine name and an Inventory Location (see Figure 4.50). Select the correct Resource Pool.

#### NOTE

Use of a dedicated Resource Pool is recommended.

5. Select the storage you would like to use, and click Next (see Figure 4.51).

## NOTE

In this example, I am only presented with one storage option. In most production environments, there will be storage which is dedicated to production, and some (often cheaper storage) dedicated to development. Choose the appropriate assigned storage.

- **6.** Select the Guest Operating System (see Figure 4.52).
- **7.** Set the disk size to 25 GB (see Figure 4.53).

🚱 Create New Virtual Machine	
Configuration Select the configuration fo	Virtual Machine Version: 7
Configuration Name and Location Datastore Guest Operating System Create a Disk Ready to Complete	Configuration Typical Create a new virtual machine with the most common devices and configuration options. Custom Create a virtual machine with additional devices or specific configuration options.
Help	< Back Next > Cancel

Create new virtual machine.

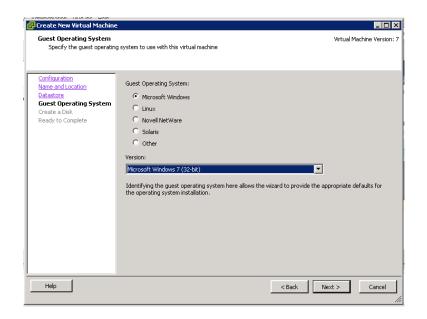
Create New Virtual Machi Name and Location Specify a name and loca	ne Virtual Machine Version: 7
Configuration Name and Location Datastore Guest Operating System Create a Disk	Name: Windows 7 Wirkual machine (VM) names may contain up to 80 characters and they must be unique within each vCenter Server VM folder.
Ready to Complete	Inventory Location:
Help	< Back Next > Cancel

#### FIGURE 4.50

Name and location.

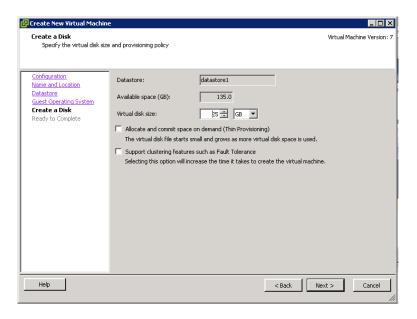
	_					
Configuration Jame and Location	Select a datastor	e in which to store th	ie virtual machii	ne files:		
Oatastore	Name	Capacity	Provisioned	Free Type	Thin Provisioning	Acc
Guest Operating System Create a Disk	[datastore1]	144.00 GB	28.89 GB	134.97 GB VMFS	Supported	Sing
	Compatibility: Validation not ap	plicable this time.				

Datastore.



#### FIGURE 4.52

Guest operating system.



Create a disk.

## NOTE

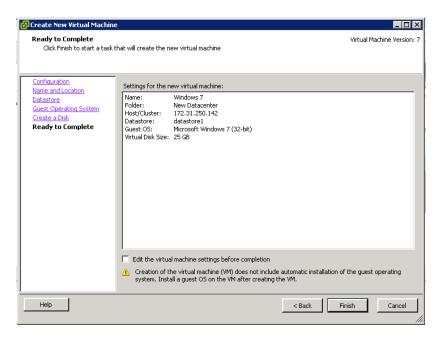
Thin Provisioning is useful in scenarios where provisioning server is not being used to provide a common vDisk.

- 8. Click Finish (see Figure 4.54).
- **9.** Select your virtual machine, and click **Edit virtual machine settings** in the right-hand pane (see Figure 4.55).
- 10. First select CD/DVD Drive, select the Device Type, and Connect at power on (see Figure 4.56).

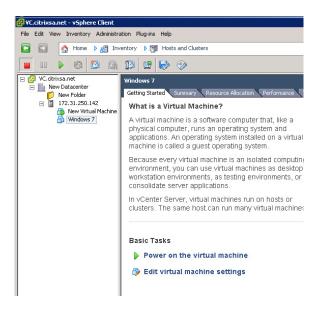
## NOTE

Using a **Client Device** will be the slowest, you effectively mount your local CDROM to the virtual machine. The **Host Device** option requires that you have physical access to the server – or something like Integrated Lights Out/DRAC (Dell Remote Access Card) to have a "virtual" physical on the server. A **Datastore ISO File** is most often the most elegant solution. Uploading an ISO file to a datastore is useful, as you can very easily remount the ISO to the machine or other machines.

- **11.** The installation will now be performed through the vCenter Console. As shown in Figure 4.57, the installation follows the normal procedure as on a physical host.
- **12.** Select the virtual machine, right-click and select **Guest | Install/Upgrade VMware Tools** (see Figure 4.58).

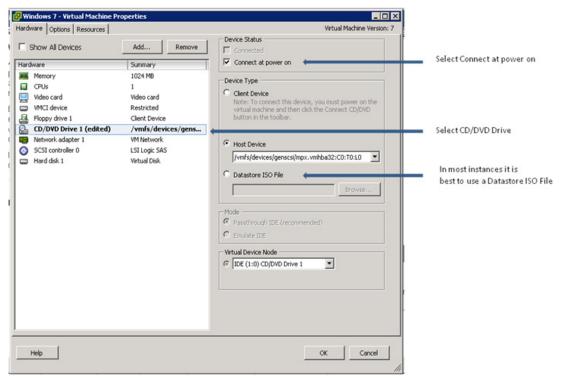


Ready to complete.



#### FIGURE 4.55

vSphere Client - virtual machine settings.



Virtual machine properties.

- **13.** Click **OK** to acknowledge the warning (see Figure 4.59), click **Run setup.exe** when autoplay launches the VMware Tools setup program (see Figure 4.60).
- 14. Click Next to install the VMware Tools (see Figure 4.61).
- 15. Select Typical and click Next (see Figure 4.62).
- 16. Click Install (see Figure 4.63).
- 17. Click Finish (see Figure 4.64).
- **18.** Click **Yes** (see Figure 4.65).
- **19.** Add the VM to the domain.
- **20.** Install the Virtual Desktop Agent on the VMware Virtual Machine. See Chapter 3, "Configuring the Desktop Delivery Controller," for step-by-step instructions.

## Integration

This section discusses the process of adding a virtual desktop hosted on VMware vSphere to Citrix XenDesktop.

Following the same procedure as in Chapter 3, "Configuring the Desktop Delivery Controller," we are adding a Desktop Group for VMware vSphere.



vSphere Client - guest console.

8

7	Fower	Microsoft Windows 7 (32-bit)	
	Guest	Answer Question	
2	Snapshot Open Console	Enter Full Screen (Ctrl+Alt+En Send Ctrl+Alt+del	iter)
<b>₽</b>	Edit Settings Migrate	Install/Upgrade VMware Tools	
<b>*</b> *	Clone Template	vered On 2.31.250.142	
	Fault Tolerance	•	_
	Add Permission Ctrl+P Alarm	•	
	Report Performance		
	Rename		
	Remove from Inventory Delete from Disk		

#### FIGURE 4.58

Virtual machine options.

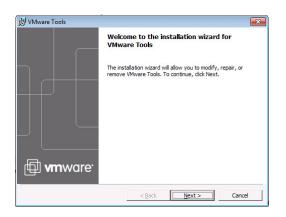


Install VMware tools.



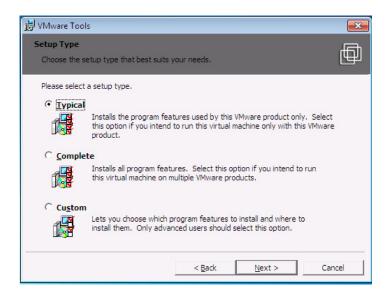
#### FIGURE 4.60

VMware tools - setup.

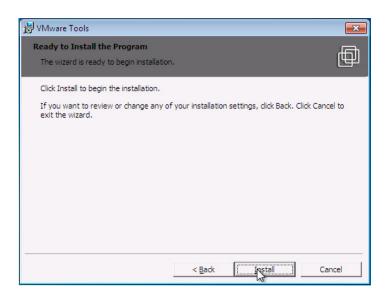


#### FIGURE 4.61

VMware tools - installation.

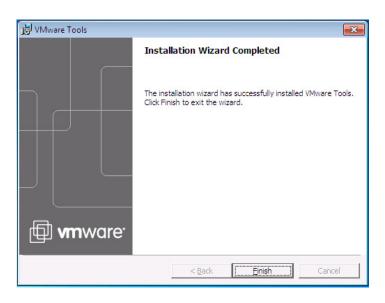


VMware tools – setup type.



#### FIGURE 4.63

VMware tools - ready to install.



VMware tools - installation wizard completed.

🔡 VMwar	e Tools	83		
⚠	You must restart your system for the configuration changes made to VMware Tools to take effect. Click Yes to restart now or No if you plan to restart later.			
	<u>Y</u> es <u>N</u> o			

#### FIGURE 4.65

```
VMware tools - restart.
```

1. Select VMware virtualization and click Next (see Figure 4.66).

The interaction between the Desktop Delivery Controller is done through the vCenter SDK. The SDK is built into the vCenter, and is normally accessible only through HTTPS. Please see the appendix "VMware SDK Integration" for details.

2. Enter the path to the vCenter SDK – for example, HTTP://<vCenterhostname>/sdk or HTTPS:// <vcenterhostname>/sdk. Enter a username and password to attach to the vCenter (see Figure 4.67). Remember when using HTTPS, the hostname string must match the certificate, i.e., the FQDN includes the full domain path – mymachine.mydomain.com. The username and password must

Create Desktop Group (3/9) CITRLX Hosting Infrastructure Select your desktop hostin	g infrastructure.
Steps Velcome Assignment Type Hosting Infrastructure Logon Information Vitual Desktops Users Desktop Group Name Icon Publishing Options	Select the desktop hosting infrastructure for this desktop group. If the technology you are using is not in the list, select None.  Hosting infrastructure: VMware virtualization
	< <u>B</u> ack <u>N</u> ext> Cancel

# FIGURE 4.66

Hosting infrastructure.

Create Desktop Group (4/9)	X
CÍTR <b>I</b> X'	
Logon Information Specify the logon details fi	or the hosting infrastructure.
Steps  Welcome  Assignment Type	Specify the address and administrator logon information for the hosting infrastructure supporting the desktop group. Address:
✓ Hosting Infrastructure	https://vc.citrixsa.net/sdk
Logon Information	For example, https://VirtualCenter.example.com/sdk
Virtual Desktops	User name:
Users	administrator
Desktop Group Name	Password:
Icon	жинини
Publishing Options	
- L	
	< <u>B</u> ack <u>N</u> ext> Cancel

# FIGURE 4.67

Logon information.

have the correct rights assigned to connect to the vCenter. This is an area to flag, changing the password or rights of the login account will have an adverse affect to the interaction between the Desktop Delivery Controller and the vCenter.

# TIP

Having insufficient permissions is a common problem when integrating with VMware.

- 3. Click Add..., and this will enumerate the desktops from the datacenter (see Figure 4.68).
- **4.** Browse your virtual infrastructure (see Figure 4.69).

# NOTE

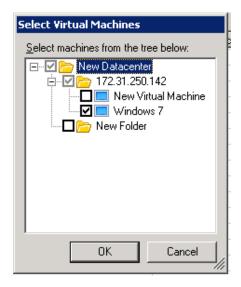
Citrix XenDesktop supports the use of VMware "Resource Groups." In fact I would recommend using a dedicated Resource Group; it is a good way to isolate you environment from other VMware guests – you can leverage having dedicated resource allocations, and also has the security benefit that you can isolate it as a separate security entity.

5. Click Next (see Figure 4.70).

Create Desktop Group (5/9 CITRUX Virtual Desktops Select virtual desktops to	) 💌
Steps Velcome	To select virtual desktops, click Add. 
<ul> <li>Assignment Type</li> <li>Hosting Infrastructure</li> <li>Logon Information</li> <li>Virtual Desktops</li> <li>Users</li> <li>Desktop Group Name</li> <li>Icon</li> <li>Publishing Options</li> </ul>	Vitual Machine       AD Computer Account         Add       Remove         Edit       Edit
	Export to File Import from File  < <u>Back</u> Next > Cancel

# FIGURE 4.68

Virtual desktops.



# FIGURE 4.69

Select virtual machines.

eate Desktop Group (5/9	)		
<b>itrix</b> .			
Virtual Desktops Select virtual desktops to	add to this desktop group.		
Steps	To select virtual desktops, cl	ick Add.	
* Welcome	⊻irtual desktops:		
Assignment Type	Virtual Machine	AD Computer Account	
Hosting Infrastructure	Windows 7	USER-PC.citrixsa.net	Remove
Logon Information			Edit
Virtual Desktops			<u> </u>
Users			
Desktop Group Name			
lcon			
Publishing Options			
		Export to File Import from File	1
		< Back Nex	t> Cancel

### FIGURE 4.70

Virtual desktops.

**6.** Add users, and assign a Desktop Group name following the steps from Chapter 3, "Configuring the Desktop Delivery Controller."

# **BLADE HARDWARE**

Installation onto a blade hardware would be done in exactly the same way as installing onto a standard PC hardware.

This hardly warrants a section on installation; however, I do wish to highlight that this is a valid option.

Blade hardware solutions are obviously more expensive because you are dedicating a blade to every single user. It will most likely only be relevant to some organizations, and even then to a subset of their users.

The main areas of application would be high-end users with massive resource requirements. Financial brokers in banks are a good example of users this may be relevant to. Additionally, some financial applications can't tolerate, from a business or security point of view, the very small time drift that one gets by placing a desktop on a hypervisor.

A blade hardware solution can also be used in conjunction with provisioning server. We add an extra layer of resilience, the user can utilize any one of the physical blades with their vDisk thus removing the dependency on a single piece of hardware.

# SUMMARY

In this section, we discussed the installation of the virtual desktop onto the server infrastructure. We first discussed some general sizing and specification guidelines for the desktop operating systems. We then covered the installation and integration onto XenServer, Hyper-V, and VMware hyper-visors – step-by-step installation on the hypervisors, and then the tying together of the hypervisor layer to the Desktop Delivery Controllers. Lastly, we briefly addressed the option of using individual blade servers for each user.

# Desktop Delivery Controller – Advanced Configuration Settings

5

# INFORMATION IN THIS CHAPTER

- Delivery Services Console
- · Web Interface Configuration for the Integrated Web Site
- XenDesktop Policies and Printing
- Bandwidth

This chapter discusses some of the more advanced configuration settings. We will go into some detail covering the configuration settings. This chapter has a change in pace and focus from the preceding chapters; although most of the chapters discuss the details required to get an implementation working, this chapter deals in fairly granular detail with the console options of the core component. Depending on your implementation (and the available time you have), you may decide to skim through this chapter, or you may spend more time studying the details.

This chapter has been specifically placed after Chapter 4, "Installing the Virtual Desktop," which discusses hypervisor installation. Some of the advanced settings, like idle pool settings, use the hypervisor integration functionality to control the virtual machines.

# **DELIVERY SERVICES CONSOLE**

The majority of XenDesktop settings are configured through the Delivery Services Console. The exceptions to this are the Citrix Policies that are configurable through the Presentation Server Console, which will be discussed in the following section.

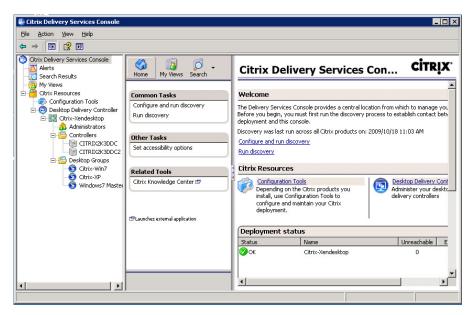
In terms of ongoing operational tasks, the Delivery Services Console is an interface that an administrator will almost always have opened.

What follows is a "walk-through" of the Delivery Services Console. Ideally, you should follow this section with a Delivery Services Console opened in front of you, as this will be the easiest way to familiarize yourself with it. If you have used the Citrix XenApp consoles, you will notice many commonalities between this console and that of XenApp.

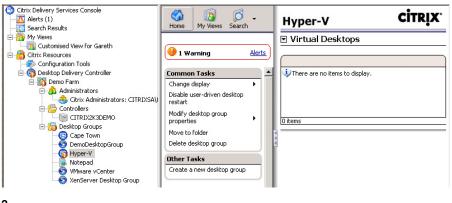
Open the Delivery Services Console – Start | All Programs | Citrix | Management Consoles | Delivery Services Console (Figure 5.1).

Nodes in the left-hand pane:

Alerts – Any warnings or errors are reported under the Alerts node.



Delivery Services Console.



#### FIGURE 5.2

Locating alerts in the console.

The alerts mechanism is quite intuitive. In the above example, I created an alert by removing all the virtual desktops from a Desktop Group. This creates a Warning Alert under the **Alerts** node informing the administrator that there aren't any virtual desktops configured in the Desktop Group. It also creates a breadcrumb trail, which you can follow from **Desktop Delivery Controller** | **Demo Farm** | **Desktop Groups** | **Hyper-V**, (Figure 5.2) which is the Desktop Group with the problem.

# NOTE

Warnings are denoted with an orange alert, whereas errors are denoted with a red alert.

**Search Results** – Right-clicking on this node gives you the option to search for items in the XenDesktop farm.

**Run new advanced search** (Figure 5.3). You have options to search by:

- Sessions By User (Figure 5.4)
- Desktop Groups By User
- Discovered Items

The **Browse**... button allows you to search a subset of the discovered items. This is the simplest mechanism to find objects in your XenDesktop farm.

**Rerun search** (Figure 5.3) – runs the same search again if you need to find changes to the search. **Save In My Views** (Figure 5.3) – saves the current search in the My Views folder.

Run new advanced search Rerun search Save in My Views	
All Tas <u>k</u> s	۲
⊻iew	١
Refresh	
<u>H</u> elp	

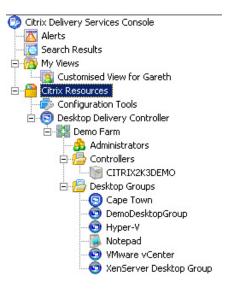
#### FIGURE 5.3

Search results menu.

Advanced Sea	ırch		×
Find items (fo	r example, servers, applications, or users	s) in your Citrix de	ployment.
<u>Find:</u>	Sessions By User	•	
<u>N</u> ame:			
Search in:	Citrix Resources		Browse
		Search	Cancel

### FIGURE 5.4

Search dialog box.





The Citrix Resources node.

**My Views** (Figure 5.5) – the **My Views** option is used to provide a view of a specific object or folder in the XenDesktop farm. You can create a custom folder with contents that you wish to view regularly.

My Views is really only useful in implementations where you have created a large number of objects, and it saves time to be able to quickly navigate to a subset of these objects.

The **Citrix Resources** (Figure 5.5) node contains the XenDesktop farms that you have "discovered" when you first opened the Console.

Select **Citrix Resources** and **Configure and Run Discovery** to add Desktop Delivery Controller servers you wish to query in order to add their farm information to console. The **Run Discovery** option simply reruns the discovery against the Desktop Delivery Controllers that you have already added.

The Citrix Resources – **Configuration Tools** (Figure 5.5) node simply gives you options to run a discovery of objects in your XenDesktop farm.

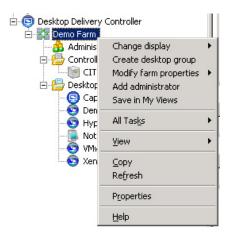
The Citrix Resources – **Desktop Delivery Controller** (Figure 5.5) node contains the XenDesktop farm (or farms) that have been discovered.

The farms that have been discovered are a subnode of the **Desktop Delivery Controller** node.

In order to configure farm settings, right-click on the farm that you created in Chapter 2, "Installation of the Broker – Desktop Delivery Controller."

Select the **Properties** option (Figure 5.6).

**Connection Access Controls** (Figure 5.7) – Radio button option, either set to **Any connection** or to **Citrix Access Gateway connections only**. Citrix Access Gateway is the Citrix SSL VPN (Virtual Private Network), and this setting would make the farm available to all users or only to those remote users tunneling in through the VPN.



Farm options menu.

roperties:	Farm-wide
Farmvide Connection Access Controls Desktop Delivery Controller General Session Reliability □ ICA Auto Client Reconnect Keep-Alive □ License Server □ HDX □ Browser Acceleration □ Flash	Select any of the subcategories listed in the tree to set properties for individual pages.

### FIGURE 5.7

Farm properties dialog box.

# **Desktop Delivery Controller – General (Figure 5.7)**

- XML Service DNS resolution a tick box enabling the Citrix XML services to return the FQDN (DNS hostname) to the clients; in other words, the Desktop Delivery Controller sends the machine name to the end point rather than an Internet Protocol (IP) address.
- Enable 32-bit icon color depth a tick box that enables high color depth of the icons displayed to the user in Web Interface or through the XenApp Services (PN Agent) client.
- Session Reliability This is a tick box that enables you to enable or disable session reliability. Session reliability assists by freezing the current screen should the connection drop and then it automatically attempts to reconnect in the background. You also have the option to change the default port from 2598 to a different port.

# NOTE

The primary port used by the XenDesktop client is 2598. I don't recommend changing it unless there is a very compelling reason. There is a further option to change the time the sessions are kept active from 60 s to a different number. This could be increased if you are running over unreliable/slow links – like a VSAT (Satellite) connection.

# ICA (Figure 5.7)

• Auto Client Reconnect (Figure 5.7) – this option sets how the Citrix Client must respond to interrupted ICA (HDX) sessions. There are two options: Require User authentication – when sessions reestablish you need to reauthenticate. Reconnect automatically – the reconnection doesn't require reauthentication. There is also a tick box option to log automatic reconnection.

# TIP

The default is **Reconnect automatically** and not to log events – the default is recommended. Reauthentication should only be required in "high security" environments, and the logging can create a lot of events if your links are bad.

Keep-Alive (Figure 5.7) – ICA keep-alives are not enabled by default as their functionality overlaps with that of session reliability. If you are using session reliability, you won't need keep-alives and if you aren't, then you can enable this setting. The keep-alive maintains the session for 60 s (by default) if a disconnection is detected. This – like session reliability – stops the session from being dropped immediately if it is interrupted. The keep-alive timeout can be increased for high latency networks.

# NOTE

If Session Reliability is disabled, port 1494 will be used by the ICA client to connect.

# TIP

Use session reliability, if possible, as it provides a more intuitive experience for the user.

License Server (Figure 5.7) – Set the license server hostname and port number for the entire farm.

# HDX (Figure 5.7)

- Browser Acceleration By default enabled, this accelerates Web browser traffic within the XenDesktop session. There is a further option to "Compress JPEG images to improve bandwidth" and the levels can be set to Low, Medium, or High through a drop-down list; the higher the compression, the lower the bandwidth. This may be useful in WAN scenarios. Variable image compression check box will automatically adjust the setting based on the user's available bandwidth.
- **Flash** Tick box to "Enable Adobe Flash Player." This will redirect flash content to play directly to an "Adobe Flash Player" installed on the client rather than through the virtual desktop.

# TIP

Flash redirection is great for LAN links, giving the user the Flash rendering locally on their physical device. This does require Flash Player on their device, and thus only works with "Windows" type end points.

The Administrators (Figure 5.5) node: Citrix Resources – Desktop Delivery Controller – <Your Farm> – Administrators. This node gives you the option to add administrators to your XenDesktop farm.

Right-click on the **Administrators** node, or select **Add Administrator** in the central pane. You can allocate *delegated administration* or *full control privileges* to a user or group.

Delegated administrators can view everything in the Delivery Services Console. Delegated administrators can perform maintenance tasks on the user and machine objects such as logging off users, sending them messages, and stopping or starting virtual desktops. Delegated administrators can't do farm level tasks like changing Desktop Groups.

# TIP

After installation, only the account that executed the installation is an administrator for the farm. This represents a single point of failure. Should that account be deleted, disabled, or be otherwise unavailable, you will not be able to administer the XenDesktop farm. Add an Administrative Group and grant it full control over your farm. You can also add the "Local Administrators" group, which will grant the rights to all users who are local administrators on the Desktop Delivery Controller.

The **Controllers** (Figure 5.5) node has an option for you to "Create Folder." In larger environments this would help you to sort your Desktop Delivery Controllers into groups.

Right-click on the Desktop Delivery Controller you have created. Select Properties.

**License Server** (Figure 5.8) – Use farm setting set the server to automatically inherit the settings you set at a "farm level." Deselect, and you could assign a separate license server and port number for an individual Desktop Delivery Controller.

# TIP

If you are using some "Device licenses" and some "User licenses," you would need to use different license servers to host these licenses, and then use the Desktop Delivery Controllers to service different Desktop Groups.

☑ Use farm settings	
License server         Specify either a new license server name or an IP address.         Name:       CITRIX2K3DEMO         Port_number (default 27000):       27000	
	Name:

Desktop Delivery Controller properties dialog box.

**XML Service** (Figure 5.8) – The XML service can be set to "Trust requests sent to the XML Service" – the default is to verify the requests first, but this can be enabled if you have put other security (like IPSEC etc.) in place first.

The XML port can also be altered here - if it is not being shared with IIS.

# TIP

```
Either use port 80 or port 8080 if possible. These are the "standard" ports. To set the port to 8080 if it is currently sharing with IIS, use the command ctxxmlss /U
This will unregister the XML service, and reboot the server.
ctxxmlss /R8080
This will register the port to 8080.
```

# Select Desktop Groups (Figure 5.9).

Shown above is the Desktop Group created on Citrix XenServer.

👺 Citrix Delivery Services Console							- 0 ×
Elle Action Yew Help							
	3 🖬						
Citrix Delivery Services Console	Home My Views Search	XenServer Deskt	op Group			CİTR	six.
My Views	Common Tasks	▼ Virtual Desktops					
- B Configuration Tools	Change display	Virtual Desktops				Choose of	olumns
E S Demo Farm	Disable desktop group	AD Computer Account	Desktop State	Assigned User	Maintenance Mode	Machine State	
- 3 Administrators	Enable user-driven desktop restart	DEMO7.citrixsa.net	Idie	-	No	On	
E 🏠 Controllers	Modify desktop group properties 🕨						
CITRIX2K3DEMO	Move to folder						
Desktop Groups     Desktop Group	Delete desktop group						
🔄 XenServer Desktop Group							
	Other Tasks						
	Create a new desktop group						
		11					



	Information
	Alerts
	Configured Users
	Read-only Properties
	Virtual Desktops In Use
•	Virtual Desktops

# FIGURE 5.10

Desktop Groups view menu.

Note that the machine state column is only available through integration with the hypervisor. The Desktop Delivery Controller interrogates the hypervisor for the current machine state and displays the information in the Delivery Services Console.

The central task pane contains some of the "Common Tasks."

**Change display** – gives you a drop-down list (Figure 5.10) allowing you to change the information displayed in the right-hand pane. Most of the nodes only have the options to View Information or Alerts, but at the Desktop Group level, we are able to select various views to display in the right-hand pane.

The default view is "Virtual Desktops" which is the view shown above.

- Information This option displays basic details of the Desktop Group.
- Alerts This option displays warning (orange)/error (red) messages.
- **Configured Users** This option displays the groups and users configured to use this Desktop Group.
- **Read-Only Properties** This option displays the current settings that have been set through the properties dialog box. (The **Farm** node also has a "Read Only" option.)
- Virtual Desktops In Use This option displays those desktops that are currently connected.
- Virtual Desktops This option displays all virtual desktops in the Desktop Group, and the virtual desktops' current state.

**Disable Desktop Group** (Figure 5.9) – This option disables the selected Desktop Group. This renders the Desktop Group inaccessible to the users. This setting will also stop the Desktop Group icon being presented to the user through Web Interface.

**Enable user-driven Restart** (Figure 5.9) – This setting adds a **restart** button to the Users Web Interface page (Figure 5.11).

This setting only works if your desktop is running on an "integrated" hypervisor because the actual restart action is an instruction sent from the Desktop Delivery Controller to the hypervisor – XenServer, the VMware SDK, or System Center Virtual Machine Manager.

**Move to Folder** (Figure 5.9) – allows you to move the Desktop Group to a subfolder. Subfolders can be created at the node above the Desktop Groups; it is useful in more complex environments to arrange your Desktop Groups according to structural (development/test/production) or business (Sales/Marketing/IT etc.) needs.

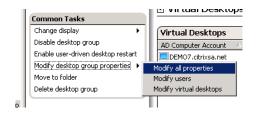
**Delete Desktop Group** (Figure 5.9) – allows you to delete a Desktop Group, and **Create a new Desktop Group** – as you would expect – allows you to create a new Desktop Group.

Click on Modify desktop group properties | Modify all properties (Figure 5.12).



#### FIGURE 5.11

Web Interface - "Restart" button.



#### FIGURE 5.12

Desktop Group modification menu.

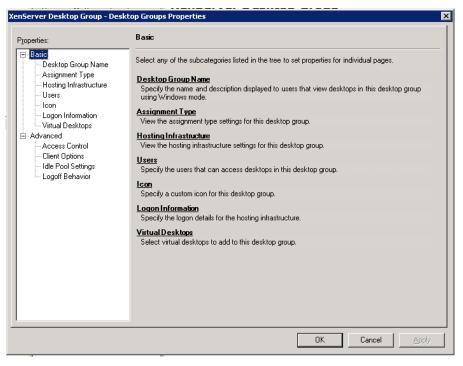
# Basic (Figure 5.13)

- **Desktop Group Name** The name and description of the Desktop Group can be amended. The Desktop Group can additionally be enabled or disabled from this menu, through a checkbox **Disable Desktop Group**.
- Assignment Type This is for viewing whether the assignment type is Pool/Assigned Assigned on first use and so on, and whether the Desktop Group is being used for VM-hosted apps or not.

# NOTE

These settings cannot be changed after the Desktop Group has been created. You would need to delete and recreate the Desktop Group.

• Hosting Infrastructure – Like the Assignment Type, this is a read-only setting. Under this, you can view the Hosting Infrastructure: XenServer – "Citrix Xen VM infrastructure," VMware – "VMware virtualization," Microsoft – "Microsoft virtualization," or without integration – "None."



# FIGURE 5.13

Desktop Group properties dialog box.

# **124** CHAPTER 5 Desktop Delivery Controller – Advanced Configuration Settings

- Users View and modify the users and groups assigned this Desktop Group. Add and remove buttons to modify users and groups.
- Icon Displays the current icon used to represent the Desktop Group to the users. The Change icon... button allows you to browse for an alternative, or your own custom icon.
- Logon Information View and modify the logon information for the hosting infrastructure. Here, you can edit the hostname/IP address of the server you are interfacing with, and the logon information.

# TIP

If the vCenter/SCVMM/XenCenter logon changes, this is where you would need to edit it on the Desktop Groups.

• Virtual Desktops (Figure 5.14) – View and modify virtual desktops assigned to your Desktop Group.

# TIP

The "Export to File" can be handy if you want to create (or recreate) a Desktop Group using the same group of virtual desktops.

<sup>o</sup> roperties:	Virtual Desktops		
⊟ Basic — Desktop Group Name — Assignment Type	To select virtual desktops, click Add. Virtual desktops:		
<ul> <li>Hosting Infrastructure</li> <li>Users</li> </ul>	Virtual Machine	AD Computer Account	A <u>d</u> d
- Icon	Copy of Windows 7 Demo Machin	Window7demo.citrixsa.net	Remove
<ul> <li>Logon Information</li> </ul>	Copy of Copy of Windows 7 Demo	Windows7demo2.citrixsa.net	
Virtual Desktops Advanced			<u>E</u> dit
Access Control			
- Client Options			
<ul> <li>Idle Pool Settings</li> <li>Logoff Behavior</li> </ul>			
Eggin Bondhor			
		port to File	
	E2	port to File Import from File	
		OK Canc	el App



Modify virtual desktops.

# Advanced (Figure 5.14)

- Access Control Access control is used in conjunction with Citrix Access Gateway, and this can be used to only allow users connecting through the Access Gateway and even with certain Access Gateway filters to access the Desktop Group. The default is to allow all connection types. The finer details of Access Gateway is outside the scope of this manual. The filters can allow you to do things like only allow users access if, for example, they have a certain antivirus package installed.
- Clients Options
  - **Appearance** Change the color depth; choose from 16 colors, 256 colors, high color (16 bit), and true color (24 bit). The default is true color.
  - **Connection Encryption** Choose the encryption level of the ICA protocol from Basic up to 128-bit(RC5).
  - **Connection Protocols** Currently ICA and Microsoft RDP are available. You can add the RDP protocol. By default only the ICA protocol is available.

# NOTE

You will lose ICA/HDX functionality if you choose the RDP protocol.

• Idle Pool Settings (Figure 5.15) – The Idle Pool Setting deserves specific emphasis. The Desktop Delivery Controller takes over managing the powering on or off of virtual desktops. This can be somewhat disconcerting for those who are familiar with managing this through a hypervisor management tool.

Select Idle Pool Settings in the left-hand pane (Figure 5.15). Set the number of virtual desktops you would like to remain powered on.

The idle desktops are virtual desktops that are powered on and waiting for a user to connect to them. In order to give users an "instant on" experience, as users log on, the Desktop Delivery Controller starts additional virtual desktops. The idle pool must be big enough such that the number of idle desktops isn't depleted before the additional virtual desktops become available. If the idle pool is depleted, the user must wait until a virtual desktop becomes available. Having a larger idle pool during peak times is advisable.

This can be used in conjunction with power management capabilities at the hypervisor level – XenServer Power Management (5.6) and VMware DPM. Intelligent powering off of virtual desktops can translate to significant power saving in the datacenter.

- Business days Select days that a pool of machines should be kept powered on for connection.
- **Day start** Specify the start of the business day, or the time from which your users start working.
- **Peak end** The peak start is automatically taken as the "Day start," the peak end is the time before which the bulk of your users have logged on.
- Day end Specify the end of the business day, or the time after which your users have finished work.
- Idle Desktop Count Specify the number of idle desktops that should be running during: Business hours, Peak time, and Out of hours.

KenServer Desktop Group - Desk	Idle Pool Settings
Properties: Basic - Desktop Group Name - Assignment Type - Hosting Infrastructure - Users - Icon - Logon Information - Vitual Desktops - Advanced - Access Control - Creint Options - Idle Pool Settings - Logoff Behavior	Ide Pool Settings         10         5         6         0
	OK Cancel Apply

Modify Idle Pool Settings.

During the initial installation and configuration phase, I recommend leaving all of the virtual desktops powered on. Institute the Idle Pool Settings in a production environment.

# NOTE

Booting multiple virtual desktops simultaneously can place a load on the hypervisor (the physical servers). Additionally, it is recommended<sup>A</sup> to stagger booting of virtual desktops in large environments, as this prevents placing an undue load on the physical servers.

<sup>A</sup>Best practices for Citrix XenDesktop with provisioning server.

The booting of virtual desktops can be throttled by altering the number of concurrent commands that may be executed. Limiting the concurrent commands prevents the Desktop Delivery Controller from starting too many virtual desktops simultaneously. Each environment differs from the next; the performance of the server hardware and the number of physical hosts across which the load will be spread should be considered when considering how many virtual desktops should be started at one time – basically you will need to test this, but you can try a "MaximumTransitionRate" of 20 as a starting point.

Edit the file "C:\Program Files\Citrix\VmManagement\CdsPoolMgr.exe.config."

# Add the line in bold and italics text.

```
<?xml version="1.0" encoding="utf-8" ?>
<configuration>
<appSettings>
<add key="LogToCdf" value ="1"/>
<add key="LogFileName" value ="C:\cdslogs\VMManager.log"/>
<add key="LogDebug" value="1"/>
<add key="MaximumTransitionRate" value="20"/>
</appSettings>
</configuration>
```

# TIP

Be aware that through hypervisor integration, the Desktop Delivery Controller will automatically shut down any desktops in your Desktop Group that exceed the number in the idle pool. If you want to power off the virtual desktops, change the idle pool to zero, or change it to one to boot an individual instance. Alternatively, disabling the Desktop Group will also disable the Desktop Group from being powered on or off by the Desktop Delivery Controller.

# Logoff Behavior (Figure 5.16)

Set the behavior of the virtual desktop – Restart on logoff, or Do nothing – i.e., leave the virtual desktop powered on.

enServer Desktop Group - Deskl	top Groups Properties	×
Properties:	Logoff Behavior	
Basic     Desktop Group Name     Assignment Type     Hosting Infrastructure     Users     Icon     Logon Information     Virtual Desktops     Advanced     Access Control     Client Options     Ide Pool Settings     Logolf Behavior	<ul> <li>Restart the <u>virtual desktop</u> Reboot the virtual desktop when the user logs off.</li> <li>Do nothing Do not perform any action when the user logs off.</li> </ul>	
	OK Cancel Apply	



Modify logoff behavior.

# TIP

To save your having to wait for virtual desktops to power up, during the installation and configuration phase, set the Desktop Group to "Do Nothing" at logoff.

Restart at logoff can, however, be very handy in a production environment. When using provisioning server to assign a virtual disk (vDisk) to the virtual desktop, a new updated vDisk can be assigned to the virtual desktop and the change will automatically only take place when the virtual desktop is restarted – which in this case would be at logoff.

The "Do nothing" setting is also often used in call center/shift worker type environments because it prevents a "reboot storm" between shifts. Rebooting the entire pool of virtual desktops can place significant load on the servers hosting the virtual desktops, and the time required to reboot the entire pool can potentially be an issue.

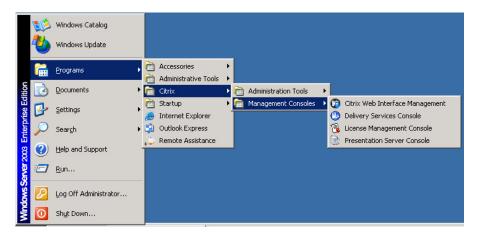
# WEB INTERFACE CONFIGURATION FOR THE INTEGRATED WEB SITE

Citrix XenDesktop automatically installs Web Interface as part of the default installation. The configuration of Web Interface has been moved out of the Delivery Services Console into its own console in this version of the product.

Click Start | Programs | Citrix | Management Consoles (Figure 5.17).

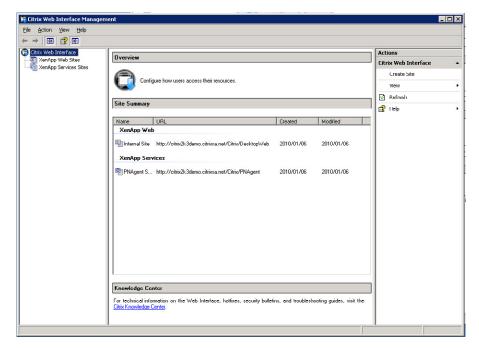
One of the most common requirements is to edit the Web site to automatically set the preselect to the active directory domain.

The following configuration is recommended for a single domain environment or an environment where all the users are in the same domain.



#### FIGURE 5.17

Launch Web Interface console.



Web Interface console.

# Set the Logon Domain

- 1. Select the Web Site somewhat confusingly called "XenApp Web Sites" (Figure 5.18).
- The XenApp Service Site is used to integrate with what most Citrix engineers refer to as Program Neighborhood Agent – now called Citrix Applications. The services site is used to populate the users **Start Menu** with the application icons, without requiring the user to log on to the Web site. This is a useful desktop integration tool, which is more applicable to virtual applications.
- 2. In the right-hand pane, select Authentication Methods (Figure 5.19).
- 3. Select Properties (Figure 5.20).
- 4. In the left-hand pane, select Authentication Type, and click Settings... (Figure 5.21).
- **5.** Select **Hide Domain box** (Figure 5.22) from the domain list, select **Pre-populated**, and click **Add**.... Insert the required domain name and then click **OK** and **OK** again.

Amending the Web site appearance is another simple task you can perform to customize the Web front end for your XenDesktop.

Click Web Site Appearance in the right-hand pane (Figure 5.23).

You can replace the standard Citrix logos with your own corporate logos – using either .gif or .jpg formats.

Add you images to the folder: C:\Inetpub\wwwroot\Citrix\DesktopWeb\media.

Citrix Web Interface	🔄 XenApp Web Sites		Actions
XenApp Web Sites XenApp Services Sites		e URL	XenApp Web Sites
		p://citrix2k3demo.citrixsa.net/Citrix/DesktopWeb	Create Site
			View
			Refresh
			😭 Help
			Internal Site - Edit Settings
	Internal Site		Server Farms Authentication Methods Web Site Appearance
	Summary Secure Access		Secure Access
	Name	Value	Resource Types
	Farm1 XML Service XML pot XML transport Authentication	localhost 80 HTTP	Client Deployment Client-Side Proxy Session Preferences Workspace Control Site Maintenance
	Authentication point Available methods	At Web Interface Explicit	Preview Site
	Resource Types and Clie		Help
	Resource types Available clients	Online Native client	

Web Interface management console.



### FIGURE 5.20

Authentication methods dialog box.

Serveral	Authentication Type
Donain Restriction Exploit Two Factor Authentication Password Settings Account Set Service	Specify whether users authenticate using Windows, NIS (UNDQ, or NDS.

Authentication properties dialog box.

Windows or NIS (UNIX) Settings	<b>I</b>
Domain Display	
O Display Domain box	
Domain list: Pre-populated	
citrixsa Move Up Move Down	
Add Edit Remoye To display more domains for users, select Display Domain box. UPN Restriction	
Allow any UPN suffix	
O Allow only the following UPN suffixes:	
Add Edit Remove	Add
Cancel	

# FIGURE 5.22

Domain settings dialog box.

leb Interface	XenApp Web Sites	Actions	
: Web Izeraface Introduce Web Seni Gandap Senices Sites	KanApp Web Sites      Arrow     Sec URL     The rane     Sec URL     The rane     Sec URL     The rane     Sec URL     The rane     Sec URL     The rane     Sec URL     The rane     Sec URL     The rane     Sec URL	Actions Zeology Web Stes Orade Ste Vere Parten Parten Determ Stee Laternication Methods Web Ste Appearance Secure Across Resource Types Cleft Dipols Cleft Dipols	• • • • • • • • • • • • • • • • • • •

Amending Web site appearance.

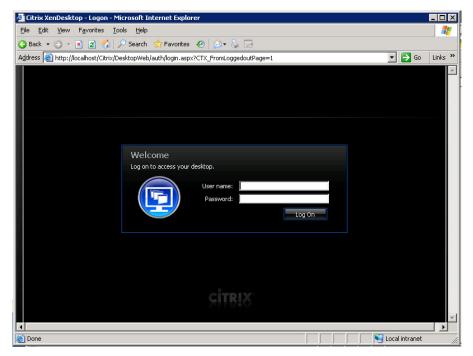
Layout	Specify screen layout, display, and	change view settings.
Appearanc	Define branding, images, and color	s used throughout the site.
<u>C</u> ontont.	. Configure custom text messages an	d area tab labeling.
verview .agout: Full g	raphics <u>S</u> creen: Logon	
	Verdament To anno per apalastere, nete par andretat.	
Show evan	ole image (hover over for element descriptions	)

# FIGURE 5.24

Web site appearance dialog box.

Amend the paths under "Appearance," for example ".media/mylogo.gif" (Figure 5.24).

Test your Web site by attaching to http://localhost (Figure 5.25) on the Desktop Delivery Controller. Having successfully tested the Web site from on the server itself, you can now test it from another workstation.



Web Interface logon page.

Site Maintenance	Manage IIS <u>H</u> osting
Preview Site	<u>R</u> epair Site Uninstall Site
😭 Help	Diagnostic Logging

#### FIGURE 5.26

Site maintenance menu.

# TIP

If you find that your Web site no longer functions, try the Repair Site from the Site Maintenance in the Actions Pane of the Web Interface Console (Figure 5.26).

# Web Interface Installed on a Separate Web Server Step-by-Step

In production environments, it is recommended that Web Interface be installed on a separate server from the Desktop Delivery Controller. As per Chapter 2, "Installation of the Broker – Desktop Delivery Controller," the Desktop Delivery Controller should be installed with the –nosites switch to prevent Web Interface from installing automatically.

In this chapter, we will use a "XenApp Web" site to provide access to the virtual desktops, and later in Chapter 10, you will learn how we use a XenApp services site to provision applications into the virtual desktops. In terms of planning, you can use the same Web Interface site(s), to provision both the virtual desktop and the virtual applications into the virtual desktops.

# TIP

The NetScaler VPX Express edition is a free VPX appliance. This makes a great load balancer. You can create multiple Web Interface sites and provide resilience using a NetScaler pair in front on the Web Interface sites. NetScaler VPX falls outside the scope of this book, but is most certainly worth investigating.

# Web Interface Prerequisites

- Operating system
  - Windows 2003 SP2 (32 bit or x64)
  - Windows 2008 SP2 (32 bit or x64)
  - Windows 2008 R2
- Components
  - IIS 6, 7, or 7.5 depending on their respective operating systems with the caveat that Windows 2003 x64 runs in 32-bit mode.
  - NET Framework 3.5 with Service Pack 1, and Visual J#.NET 2.0 Second Edition These installation files can be found under the support folder on the XenDesktop media.
  - ASP.NET 2.0 installed and enabled in IIS.

For example on Windows 2008: If IIS is already installed, check whether ASP .NET is enabled. Server Manager | Roles – right-click on the Web Server (IIS) and select Add Role Services (Figure 5.27).

- **1.** Mount the XenDesktop ISO on the Web Server. Browse to w2k3\en\Web Interface (the file is also located under x64\en\Web Interface, but it is exactly the same executable).
- 2. Select the preferred language from the drop-down list and click OK (Figure 5.28).
- 3. Click Next (Figure 5.29).
- 4. Toggle the license radio button to I accept the license agreement, and click Next (Figure 5.30).
- **5.** Accept the default location or click **Browse**... and select the desired folder then click **Next** (Figure 5.31).
- **6.** Change the radio button to **Copy the clients to the computer**, browse the XenDesktop DVD, for example, to D:\w2k3\en\Clients. Then click **Next** (Figure 5.32).

# TIP

If you "skip this step," the clients won't automatically deploy and install from the Web site, but will redirect to the Internet and try to download from there. It is much simpler to install the clients at this stage than to add them and edit the deployment settings later.

tole Services	Select the role services to install for Web Server (IIS):	
Confirmation	Role services:	Description:
Yogress lesuks	Web Server (Installed)  Web Server (Installed)  Static Content (Installed)  Static Content (Installed)  Default Document (Installed)  HTTP Referction  Aspectation Development (Installed)  Aspectation Development (Installed)  Aspectation Development (Installed)  SAFI Extensibility  Asp  Cold (Installed)  Statif Filters Server Side Includes  Health and Diagnostics (Installed)  Health and Diagnostics (Installed)  Logging Tools	ASP.NET provides a server side object oriented programming environment for building Web Sites and Web applications using managed code. ASP.NET is not simply a new version of ASP. Having been entirely re- architected to provide a highly productive programming experience based on the .NET Framework, ASP.NET provides a robust high statucture for building web applications.
	Request Monitor (Installed)     Tracing     Custom Logging	

Select the ASP .NET role service.

🗊 Select Language	×
Which language would you like to use installation?	during
English	•
ОК	Cancel

# FIGURE 5.28

Language selection dialog box.

- 7. Click Next (Figure 5.33).
- **8.** Click **Finish** (Figure 5.34), and selecting the **Start creating sites now** launches the "Citrix Web Interface Management" console.
- 9. Click Create Site in the right-hand pane (Figure 5.35).

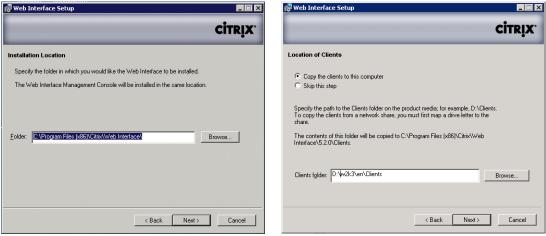


Introductory setup dialog box.



#### FIGURE 5.30

License agreement dialog box.



Installation location dialog box.

Web Interface Setup	
	CITRIX.
Ready to Install	
Click Back to change installation options. C	ick Next to start the installation.
	<back next=""> Cancel</back>

Installation initialization dialog box.

FIGURE 5.34

Successful installation dialog box.

10. Select XenApp Web, and click Next (Figure 5.36).

# NOTE

FIGURE 5.33

XenApp Web is for virtual desktops, XenApp services is for virtual applications provisioned to the virtual desktops.

11. Select the check box Set as the default page for the IIS site, and then click Next (Figure 5.37). 12. Leave the default to authenticate At Web Interface and click Next (Figure 5.38).

# FIGURE 5.32

Client location dialog box.

🛃 Web Interface Setup				
<b>CITRIX</b>	The Web Interface Was Successfully Installed			
	You must create and configure one or more sites using the Web Interface Management Console before your users can access their resources.			
	You can run the Web Interface Management Console at any time by clicking Start < All Programs < Citrix < Citrix Web Interface Management.			
	☑ Start creating sites now			
	< Back Finish Cancel			

Pie Action Vew Help		- O ×	
Consuccionador Arridgo Vielo Sens Exerdigo Services Sites	Cordigue how users access their resources.  Site Summary Name URL Creat  Knowledge Center  To technical information on the Web Interface, hotimes, security bulletins, red tooklechooring guides, viai the Cites Looklechooring •	Create Site	

Creating a site from the management console.

Create Site	Create Site
Select the type of site to create. Select the type of site to create. Xen&pp Web Hore: access resources through a Web browser Xen&pp Service: Users access resources using the Citix online plugin.	Specify IIS Location Specify the IIS location in which the site is hosted. This determines the URL for users to access the site. IIS site: Default Web Site Part: //Citik/KenApp/ Name. VanApp Set as the default page for the IIS site
Next>	Cancel

# FIGURE 5.36

### FIGURE 5.37

Site type dialog box.

IIS location dialog box.

# NOTE

Web Interface provides various authentication options, including using Microsoft AD Federated Services, Access Gateway (Citrix's SSL VPN appliance), third-party Kerberos or at the Web site. For the purposes of this book, we will assume Active Directory, but you should be aware of the various options.

Create Site	×	Ereate Site
CITRIX <sup>.</sup>		CİTRIX'
Specify Point of Authentication		Confirm Settings for New Site
Specify where user authentisation takes place. (A Web Interface ) The Web Interface authenticates users You can select from a tange of builty authentication method, including excited, past-through, and smart caid. We Print of suthenticate	'n	Check the summary information below. To make any changes, click Back. To create the site, click Next.  Site type Xendpp Web Site name Default Web Site Default Web Site Default web Site Default web Site Next Yes  Exemple site UTLL Inter/Children and/Children/app/ Authentication point: Web Interface
< Back	Next> Cancel	< Back Next> Cancel

Authentication point selection dialog box.

#### FIGURE 5.39

Summary information checklist.

Site successfully created		
You can configure the site now. If you continue without configuring the default configuration will be applied.	i site, the	
Configure this site now		

# FIGURE 5.40

Site configuration dialog box.

- **13.** Figure 5.39 is a dialog box, which provides a list of the settings you have chosen, check that the selections are correct, and click **Next**.
- **14.** The site is now installed. By default the check box **Configure the site now** is selected. It is simplest to configure the site at install. Click **Next** (Figure 5.40).
- **15.** Enter a "Farm name" this is a "Display Name" and it is not necessary that it be same as that of the XenDesktop farm; however, for practical purposes, it is advisable to use the same name. Click **Add**... to enter the names (or IP addresses) of your Desktop Delivery Controllers. Move the primary XML server to the top of the list. Click **Next** (Figure 5.41).

pecify Serve	r Farm				
pecify details o onfiguration usi	of the server farm providing ing the Server Farms task.	the resources. Settings ca	an be updated after in	itial	
Farm name:	Farm1		-		Enter a Farm Na
Servers (in fai	ilover order):				
		Move Up			
		Move Down	1		
Add 📢					ClickAdd
XML Service	port: 80				
Transport type		<b>T</b>			
SSL Relay po		_			
SSE melay po	IC 1993				
			Next >	Cancel	

Specify XenApp server farm dialog box.

# NOTE

If there are multiple servers in the farm, it is good practice to add a number of Desktop Delivery Controllers for resiliency. As previously mentioned, larger farms may use a dedicated server to provide XML services, the servers are accessed in order, and consequently the dedicated XML server should be at the top of the list. The Web Interface site will by default use port 80 to communicate with the XML service of the XenApp servers. Remember to change the XML port to match that on the Desktop Delivery Controllers (e.g., 8080).

16. Leave the selection at "Explicit" and click Next (Figure 5.42).

# NOTE

Explicit authentication is the appropriate authentication type for a Web Portal logon. When using the Web Services (formerly Program Neighborhood Agent), as we will be doing for XenApp applications, Pass-through is often the best option.

17. Click Add..., and then enter your domain name, click OK and Next (Figure 5.43).

# NOTE

You can alternatively set up domain customization after this stage using the procedure in the previous section. It is simpler to do the customization during the configuration. In a single-domain scenario, adding the domain name will automatically populate the domain field and hide the domain field from the user. In multidomain environments, where you are using this for security purposes, the user will need to log on using the syntax domain/username, as UPN logons aren't accepted.

Configu	re Authenöcotion Methods
	w users authenticate when logging on to access their resources. Note that some of these shorn methods may require additional configuration of your system before they will operate droe
Authent	ication methods (select one or more):
	Explicit
	Pass-through
	Pass-through with smart card
	Smart card
	Anonymous*
* Not su	pported by XenDesktop.

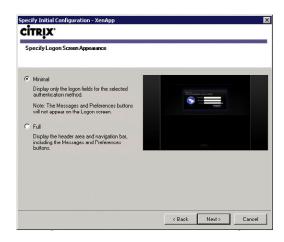
Configure authentication methods dialog box.

Specify Initial Configuration - XenApp	
CITRIX.	
Domain Restriction	
You can restrict access to users in selected domains. Settings can be updated after initial configuration using the Authentication Methods task.  Allow any domains  Restrict domains to the following: Domain list Coitrissa User of the context of	Enter a Domain Name
<back next=""> Cancel</back>	
ClickAdd	

### FIGURE 5.43

Domain restriction dialog box.

- 18. Select your preferred logon screen appearance (I prefer Minimal), and click Next (Figure 5.44).
- **19.** Leave the default at **Online** and click **Next** (Figure 5.45). Note: For more information on Resource Types, please see Chapter 10, "Configure Citrix XenApp for Application Provisioning."
- 20. Review your selections and click Finish (Figure 5.46).



Logon appearance dialog box.

Specify Initial Configuration - XenApp 🛛 🔀	Specify Initial Configuration - XenApp1	x
Citrix.	CİTRIX'	
Select Published Resource Type	Confirm Settings	
Select the types of resources available to users. Settings can be updated after initial configuration using the Published Resource Types task.	Uneck the summary information below. I o make any changes, click Back.	_
C Online Users access applications, content, and desktops hosted on remote servers.	Farm name Farm	-
C Offline Users stream applications to their desktops and open them locally. Users must	Servers 172.31.250.147 XML Service port	
install the Cluix utiline plugin. C Dual mode Users access both offline applications and online applications, content, and	ou XML Service transport type HTTP	
desktops, all on the same site.	Authentication methods Explicit	
	Domain testriction – Allow any domains	-
	Logon screen Minimal	•
< Back Next > Cancel	< Back Finish Cancel	
		_

#### FIGURE 5.45

Published resource type selection dialog box.

Settings confirmation dialog box.

FIGURE 5.46

# Integrating XenDesktop with Access Gateway

- A XenDesktop farm may be integrated with the Citrix SSL VPN the Access Gateway. Selecting Secure Access (Figure 5.47) allows you to
- 1. Define subnets which will access the virtual desktops through an Access Gateway. Alternatively, define the internal subnets as default (i.e., direct), and the default (i.e., all the rest) as Access Gateway.
- **2.** Specify the FQDN (Fully Qualified Domain Name) of the Access Gateway this must match the SSL certificate.
- **3.** Specify the Secure Ticket Authorities. The STA functions are integrated into both the Desktop Delivery Controller servers, and XenApp servers.

The full details of configuring an Access Gateway fall outside the scope of this book; however, it is important to underline that this is a significant feature. Using Access Gateway to access your virtual desktop could be used as part of your Disaster Recovery/Business Continuity plan.

The Access Gateway can provide full SSL VPN access, or for heightened security, SSL Proxy access to only their virtual desktop. The concept of providing just SSL proxy access is useful: instead of offering access to the network, you only provide remote access to a single virtual desktop. This is more secure as it dramatically reduces the surface of attack.

# NOTE

The Access Gateway VPX appliance is a virtual machine that can be used in place of a physical Access Gateway. The Access Gateway VPX appliance replaces the software-based Citrix Secure Gateway.

Ele Action Yew Help	gement.		
+ → € B B B B B B B B B B B B B B B B B B		Actives Xendeg Web Stas - Orade Se Vere D Behech - Photo - Edd Sectings - Server Famil	Secure Access

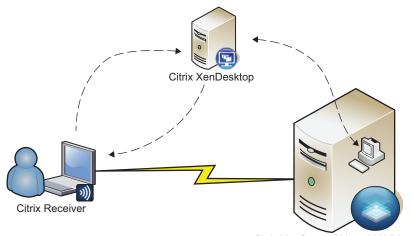
#### FIGURE 5.47

Use the secure access setting to configure Access Gateway.

# Checkpoint 2 – Connectivity to a Virtual Desktop

This is the second milestone in your desktop virtualization project. This demo may be better suited to a technical audience as the demo may be quite similar to what you demoed in the first milestone. A technical audience will better appreciate that the virtual desktop is now running on a hypervisor out of the datacenter and the distinction between that and a physical device.

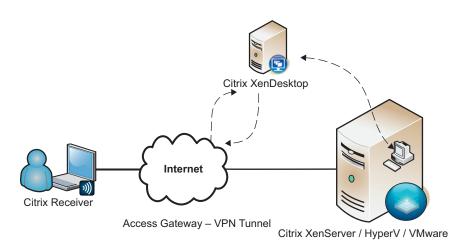
Here is the basic diagram to sketch out for your audience (Figure 5.48).



# Citrix XenServer / HyperV / VMware

#### FIGURE 5.48

Connecting to a virtual desktop.



#### FIGURE 5.49

Connecting to a virtual desktop over a VPN.

The exception to this rule would be if you have set up an Access Gateway or VPN access (Figure 5.49), the demonstration of a laptop connecting externally to a virtual desktop in the datacenter is something both technical and business stakeholders should see.

As with the first demonstration, emphasis on the video, audio, and peripheral (USB /webcams, etc.) capabilities are the aspects that define user experience to be the same if not better than a physical device.

## XENDESKTOP POLICIES AND PRINTING

Policies and printing are two areas that are important to plan for, because they become the two areas that operationally will need maintenance – as your users change, or your users' needs change.

These are also both areas that are being updated in the not too distant future, with new enhancements.

## **Citrix XenDesktop and Policies**

There are two types of policies that you can implement in a XenDesktop environment: Citrix Policies and standard Microsoft Policies. Citrix Policies are unique to a Citrix environment; the Microsoft Group Policies are implemented through Active Directory. It is recommended that the virtual desktops have their own Microsoft Policies separate from physical desktops.

Microsoft Policies are an important tool for managing the virtual desktop environment. There are many commonalities between your standard desktop policies and virtual desktop policies. Your existing desktop policies are a good starting point for creating your virtual desktop policies. It is a good idea to keep your virtual desktop policies separate from your standard desktop policies. Don't just link your existing Group Policy Objects (GPOs) to the new virtual desktop OU. The contents and settings of the desktops are very similar, but the physical implementation is obviously very different. We are placing user workstations in the datacenter, so there may well be different security requirements. Operationally, it will simplify your life to keep the policies separate. GPOs are applied by default to organizational units (OUs).

In the current version of XenApp, Citrix Policies are managed through the Advanced Configuration Console; in the next version of XenApp, these settings have been moved into the Delivery Services Console. We can expect these settings to be migrated into the Delivery Services Console in the following version of both XenApp and XenDesktop.

A further enhancement will be that these same policies will also be able to be configured through both a Microsoft GPO and the Delivery Services Console. The new settings will be made available to a Microsoft GPO by adding a custom .adm file to the GPO.

## Citrix Printer Options

Printing is an important consideration as we are changing the physical structure of attaching to our printers. Print job routing is important to consider.

There are three different mechanisms by which Citrix virtual desktops can attach to physical print devices.

- 1. Network printers
- **2.** Session printers
- **3.** Client autocreated printers

## **Network Printers**

Network printers work exactly the same as they would when using a conventional desktop PC. Network printers are mapped in the conventional way using a login script; the login script could be a simple batch file, .vbs or .kix, for example. The important thing to bear in mind with network printers is the location of the print server, the location of the virtual desktops, and the location of the print device.

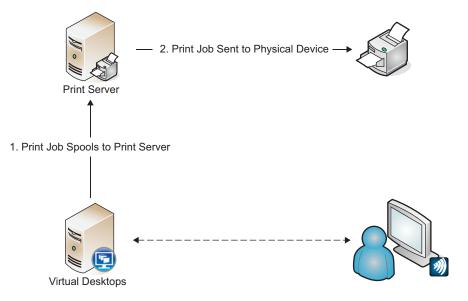
The print job will spool on the virtual desktop and traverse the network to the print server, and then to the print device. If your VDI project also includes a centralization aspect, the increase in print traffic needs to be considered. In Figure 5.50, you can see how the print job routes to the physical device.

The print traffic flows outside of the ICA stream and is not able to be compressed as it is outside of the ICA protocol. Physical devices like a Citrix Branch Repeater (or Cisco WAAS/Riverbed, etc.) are the best way to compress this type of traffic.

The print server should always be local to the virtual desktops, and this rule is applicable to all the types of printing. The print device and the user can be remote from the virtual desktop, but the print server should be on the same LAN as the virtual desktop.

## NOTE

The print server and the virtual desktop must have matching drivers. The Windows print server won't load a Citrix universal driver, and consequently the universal drivers can only be used with Client autocreated direct printing.





Network printer's job routing.

Client Side Rendering (CSR) is a new "feature" introduced since Windows Vista. This places the load on the client to perform the rendering rather than the server. I would recommend disabling this on a Windows 2008 print server, as it improves the performance of the virtual desktop.

## Session Printers

Session printers work in exactly the same way as a network printer. The differentiator is that the management of the printer mappings is managed using Citrix Policies. Session printers require a print server to work; the Citrix Policies only perform a mapping function. A session printer can be created using the standard filtering of policies. The two most commonly used filters would be to map a specific printer to

- 1. An Active Directory Group
- **2.** An IP subnet

Active Directory Groups are routinely used to map network printers; mapping to IP subnets, however, opens interesting possibilities. Depending on which subnet you logon to, you could be mapped a printer in that subnet, which could be useful if your users move around a lot.

## **Client Autocreated**

Client autocreated network printers are created on the virtual desktop, by reading the settings on the client device, and remapping the printers to the virtual desktop. The mechanism works by interrogating the print manager on the end point, and relaying that information to the virtual desktop. In effect, all your printers on the end point are automatically created in your virtual desktop.

## NOTE

Only client autocreated printers can make use of the Citrix universal print driver mechanism. Network printers and session printers must use native drivers.

There are two types of routing that can be used with autocreated client printers: connect directly or connect indirectly.

## **Connect Directly**

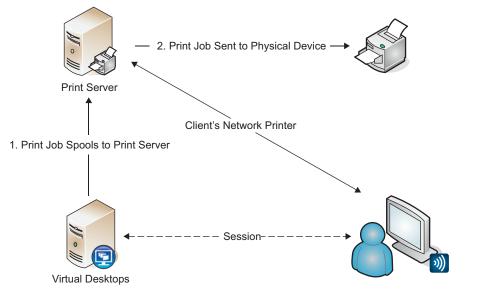
Connect directly (Figure 5.51) can only be used with network printers. The virtual desktop reads the connection details and creates its own connection to the print server.

## **Connect Indirectly**

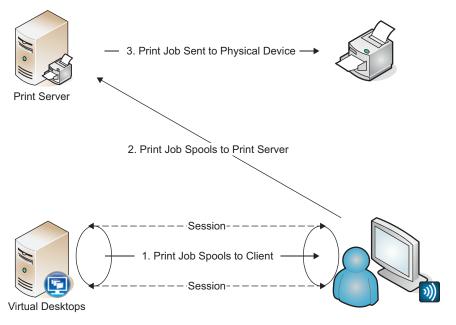
Connect indirectly (Figure 5.52) means that the print jobs always routes through the client device.

The print traffic to the client flows within the Citrix ICA session. The traffic is then sent to the print server, and from there to the print device.

This can be useful in scenarios where the print server is on a network that is not visible to the virtual desktop, but is visible to the client device (untrusted domains for example). Additionally, if it is unavoidable that the print server is local to the client device, but not to the virtual desktop, you may achieve better compression and management of the print traffic if it is kept within the Citrix Session.

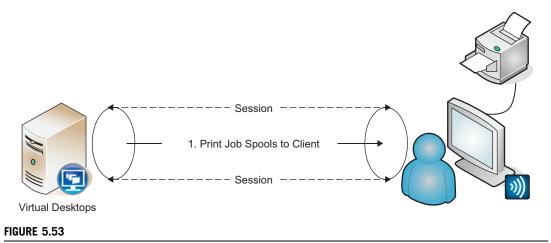


Autocreated printers using connect directly.



## FIGURE 5.52

Autocreated network printers using connect indirectly.



Autocreated local print devices.

## Locally Attached Devices

Locally attached (Figure 5.53) printers by their very nature always connect indirectly. As the physical device is attached to the client device, the print job will always route through the client device. A local print device could be connected through a USB or LPT port.

## Create a Citrix Policy Step-by-Step

1. Click Start | All Programs | Citrix Management Consoles | Presentation Server Console (Figure 5.54).

For those who are familiar with Citrix XenApp, you will see that this console is exactly the same as the XenApp Console. The Desktop Groups are even listed under the **Applications** folder. What we are interested in is creating policies to manage the settings in our XenDesktop environment. Select the **Policies** node in the left-hand pane. By default, there are no policies configured.

- 2. To create a policy, right-click on the Policies node.
- 3. Select Create Policy (Figure 5.55).
- 4. Enter a name for your policy, and click OK (Figure 5.56).

## TIP

The **Optimize initial policy settings for a connection type** check box allows you to apply the Citrix default recommendations for WAN, Satellite, or Dial Up. Selecting one of these from the drop-down list will create the recommended settings in your policy.

**5.** Right-click on the new policy you have created, and select **Properties** (Figure 5.57). The Citrix XenDesktop Policies enable you to configure how your users' sessions are configured. Based on the available bandwidth and your security settings, you can choose how the

Citrix Presentation Server Console Actions View Help	- Citrix-Xen	desktop			_ O ×
	2				 
Citrix-Vendestop	Contents	Name	2	Status Enabled Enabled Enabled	Description
					<u> </u>

Citrix Presentation Server Console.



#### FIGURE 5.55

Policies node menu.

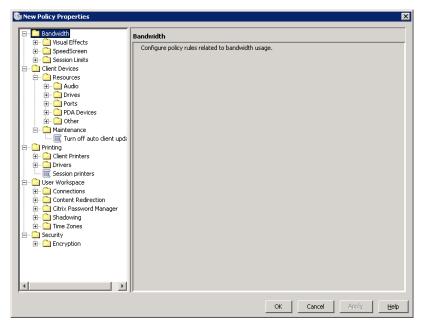
New Policy
Policy Name:
New Policy
Description:
Optimize initial policy settings for a connection type
Connection type:
WAN
OK Cancel <u>H</u> elp

#### FIGURE 5.56

New policy dialog box.



Policy menu.



#### FIGURE 5.58

Policy properties dialog box.

virtual desktop interacts with the end point. You can choose the how graphics get handled, how peripherals like USB devices get mapped from the end point to the virtual desktop.

- 6. Once you have chosen your settings click OK (Figure 5.58).
- 7. Right-click on your policy again (Figure 5.57), and select Apply this policy to....

Access Control Client IP Address	Select a conditional filter to specify how the policy is applied.
Client Name Users	All conditional filters configured for a policy must be met in order for the policy to a connection.
Virtual Desktop Group Name	Note: If no filters are selected, the policy will not apply to any connections to the farm.

Policy filters dialog box.

By default your policy will not apply to anyone. There are five different filters that you can apply. If the user matches the filter, the policy applies to the user (Figure 5.59).

- Access Control Based on the Citrix Access Gateway product. Used if the user logs in through a specific Access Gateway Farm, with specific Access Gateway Filters.
- Client IP Address This is particularly useful in XenDesktop environments, if the user logs on from a certain subnet, the policy applies to them. Given that the connectivity links between the XenDesktop and the subnet are known, we can choose appropriate settings.
- Client Name This setting is based on the hostname of the physical end point device; the policy may apply.
- Servers This setting is based on which XenApp server delivers an application; a policy will apply. Useful in DR (Disaster Recovery) scenarios where you may want different settings if you are accessing the failover XenApp servers.
- Users This setting is based on Active Directory either User or Group membership. Useful for security settings, or enabling peripherals for only a subset of users.
- Virtual Desktop Group Name This setting is based on the Desktop Group Name to which the virtual desktop belongs.

The **Servers** option is only available in the XenApp version of the console, and likewise, the Virtual Desktop Group Name option only exists in the XenDesktop version of the console.

8. Add the appropriate filter and click OK (Figure 5.59).

A green tick on the policy icon indicates it is active, an orange line indicates that it is disabled.

TIP

If you suspect that you have an issue with policies, it is preferable to disable policies than delete them.

## **Citrix XenDesktop Policy Settings Explained**

In this section, we will dig into the details of individual Citrix Policy settings. As with the rest of this chapter, only a subset of this information may be relevant to your implementation. I do, however, advise you to at least skim through this section, as you may well "discover" functionality that you were unaware of.

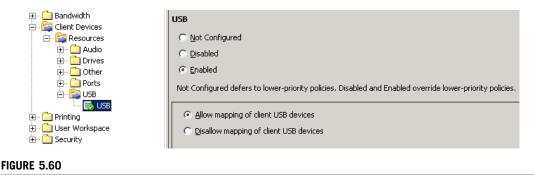
Figure 5.60 is an example of the Policy Console, note the "breadcrumb" mechanism, whereby you can intuitively find where settings have been configured by following the blue arrows to the configured settings.

Most of the policies have the following options (Figure 5.60):

- Not Configured This policy setting is not set.
- Disabled This policy prevents these settings of the rule from being applied.
- Enabled This policy causes the settings of the rule to be applied.

Not Configured and Enabled, are pretty easy to understand, but why the ability to disable a policy setting? Disabling a rule neither enables nor disables the settings; rather it prevents any other lower ranked policies from affecting the default setting. Multiple policies may be applied to a user, and the order in which they have been set will define the user's effective set of settings. Disabling a policy will cause all lower ranked policies for that setting to not be applied.

So, for example, I may have a policy that is enabled to allow USB mapping. I might also decide that I don't want users from a particular subnet to have the USB mapping allowed. This is often the case if you have an area that is publicly accessible – like Internet kiosks. I have set a general policy that I apply to "Domain Users" that allows USB mapping. By default USB mapping is not enabled.



Client USB mapping policy.

<u>Actions View Help</u>				
🔕 🖣 🖒 😰 🔯 📼 🕇 🛍	i 📑 🖻 숲 🔺 🔻 i	ò 😼 📓		
🖃 🎦 Demo Farm	Contents			
Policies	Name	A Priority	Status	Description
🎰 Printer Management	Ny most important policy	1	Enabled	
	🛃 Demo Policy	2	Enabled	
	🔜 my least important policy	3	Enabled	

Setting the ranking of policies.

There are two ways in which I could prevent the subnet from receiving the policy settings.

- **1.** We could create a higher ranked policy that sets this setting as "Disabled" and filter it to only apply to the subnet.
- **2.** We could set a higher ranked policy, where the policy is enabled, but set to **Disallow mapping of client USB devices**, and filter it to only apply to that subnet.

Both of these options will stop the user from mapping USB devices. My preference would be to enable the rule, and set it to **Disallow mapping of client USB devices** because it would be easier for anyone else scrutinizing the policies to understand.

So to reiterate, disabling a rule will have no affect on the settings, it only prevents other rules from affecting these particular settings. A disabled policy is somewhat similar to a Microsoft "No Override" setting, and similarly it should be used sparingly.

Clicking the double arrows makes the policy either the highest priority or the lowest priority. The single arrows move the policy up or down in single increments. Priority "1" is the top priority, and the higher the number, the lower the priority (Figure 5.61).

The Citrix Policies are grouped into the following subsections:

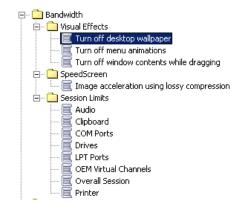
- Bandwidth
- Client Devices
- Printing
- User Workspace
- Security

We will step through each of these sections, with a brief explanation of each policy setting. It would be best to step through this section with the Presentation Server Console open in front of you, if at all possible.

## BANDWIDTH

Visual Effects (Figure 5.62)

• **Turn off desktop wallpaper** – this setting not only prevents unnecessary graphics being used, but also prevents the use of desktop wallpaper.



Citrix Policies - Bandwidth node.

Image acceleration using lossy com	pression
C Not Configured	
C Disabled	
Enabled	
Not Configured defers to lower-priority p	olicies. Disabled and Enabled override lower-priority policies
Note: Please see Help for compa Server.	tibility with previous versions of Presentation
Compression is enabled and set to high are disabled by default. Use this policy	by default. Progressive and Heavyweight compressions to override or tailor these settings.
Compression level: (progressive, if use	d, must be higher)
Do not use lossy compression	×
Restrict compression to connection	ons under this bandwidth
Threshold ( <u>K</u> b/sec):	1
SpeedScreen Progressive Display comp	vession level:
Ultra high compression; ultra low quali	ty 💌
Restrict compression to connection	ons under this bandwidth
Threshold (Kb/gec): 51:	2
Lise Heavyweight compression (ext	rra CPU, retains quality)

#### FIGURE 5.63

Image acceleration settings.

- **Turn off menu animations** this setting prevents start menu components from building out gradually sliding out.
- **Turn off window contents while dragging** if you move a application window from one part of the screen to another, the frame and contents are normally displayed while its is being moved. This setting moves only an outline frame of the window, and the contents are only displayed when the frame stops moving.

#### Speed Screen

Image acceleration using lossy compression (Figure 5.63) – this rule contains three settings:

**1.** Compression Level – This setting refers to the level of compression that should be used to display graphics. You can choose to degrade the graphics to decrease bandwidth usage.

SpeedScreen Progressive Display – This setting applies compression to images that are in motion. In other words, if I were to move a graphic object in my application, the image would degrade while in motion, and then sharpen up once it stops moving.
 A further subsetting on both of these rules is that you can choose that this only be applied to

bandwidths lower than the amount you define. This is useful when defining remote users.

**3.** Use Heavyweight compression – This setting retains graphic quality, but increases the load on the processor (CPU) of the virtual desktop.

## Session Limits (Figure 5.62)

The ICA protocol assigns virtual channels to different types of traffic sent between the client and the virtual desktop. The administrator can restrict the bandwidth used by virtual channels.

The settings are as follows (Figure 5.64):

- Not Configured Not set in this policy.
- **Disabled** The policy is disabled.
- Enabled The bandwidth limits specified are applied to the virtual channel.

## NOTE

Setting the policy to **Disabled** disables the policy; it does not disable the virtual channel.

- Audio Restricts the bandwidth of sounds.
- Clipboard Restricts the bandwidth of clipboard mirroring between the virtual desktop and the physical device.
- Com Ports Restricts the bandwidth of Com Port mapping.
- **Drives** Restricts the bandwidth of Drive mapping from the physical to the virtual desktop.
- LPT Ports Restricts the bandwidth of LPT Port mapping (for older printer types).
- **OEM Virtual Channels** Restricts the bandwidth of OEM virtual channels. Note: OEM virtual channels can be used with things like smart cards or other third-party hardware.
- **Overall Session** Total usage per session this enables you to restrict the total bandwidth usage.
- **Printer** Restricts the bandwidth of the printer channel, which is responsible for carrying print traffic.



#### FIGURE 5.64

Session limits for the audio virtual channel.

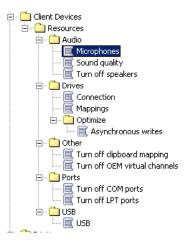
## NOTE

The printer channel only carries "client autocreated" printer traffic. Network printers – such as those mapped using logon scripts or "session printers" – are created using Citrix Policies. Both pass their print network traffic outside of the virtual channels, directly from the print server to the physical print device. This bandwidth setting will thus only affect "client autocreated" printers.

# **Client Devices**

When the **Bandwidth** node is enabled, the administrator can restrict the bandwidth used by the virtual channels, the **Resources** (Figure 5.65) node allows the administrator to disable or enable some of the virtual channels.

- 1. Audio
  - Microphones turn client microphones either on or off
    - Sound quality set sound quality to one of three settings
      - High sound quality; lowest performance
      - Medium sound quality; good performance
      - Low sound quality; best performance
  - Turn off speakers turn off audio mapping to client speakers
- 2. Drives
  - Connection enables or disables "Connect client drives at logon"
  - Mapping enables you to disable connection to any or all of the following:
    - Floppy drives
    - Hard drives
    - CD-ROM drives
    - Remote drives
    - USB disk drives



## FIGURE 5.65

Citrix Policies – Client Devices node.

- 3. Optimize
  - Asynchronous Writes enabling this setting can assist writes to client drives over links that are both high bandwidth and high latency.
- 4. Other
  - **Turn off clipboard mapping** enabling this setting prevents clipboard contents from being copied both to and from the client device (can be useful in high-security environments).
  - **Turn off OEM virtual channels** enabling this setting blocks OEM (third-party) applications from using custom virtual channels.
- 5. Ports
  - Turn off COM ports disables COM port mappings.
  - **Turn off LPT ports** disables LPT port mappings.
- **6.** USB
  - USB has settings to Allow or Disallow "mappings of client USB devices."

## NOTE

By default, client USB devices are not mapped.

## Printing

This section looks at the configurations covered in the Citrix Print Options earlier in this chapter (Figure 5.66).

*Client Printers* Client printers are any printers installed on the physical end point. Autocreation is the process of mapping the same printer inside the virtual desktop.

## 1. Autocreation

- Autocreate all client printers This setting maps all the printers.
- Autocreate local (non-network) client printers only This setting maps only printers that are physically attached to the client device.



#### FIGURE 5.66

Citrix Print Policies.

- Autocreate the client's default printer only This setting only creates the default printer of the client physical device.
- *Do not autocreate client printers* This setting does not map client-side printers to the virtual desktop.
- **2.** Legacy client printers This setting changes how client-side printers appear inside the user session, and is more applicable to how printers are created within XenApp where the user may have multiple sessions.
  - *Create dynamic session-private client printers* This setting creates client device printers that are linked to the session ID (and under XenApp not visible to other users).
  - *Create old-style client printers* This setting creates printers linked to the user account (which are visible under XenApp to other users on the same XenApp server).
- **3. Printer properties retention** This setting refers to printer-specific settings, for example, paper size (A4 or Letter), and where the printer options are stored.
  - *Saved on client device only* This setting saves the settings on the physical end point. This is not possible on read-only client devices. Use this if the settings can't be saved in the profile.
  - *Retained in user profile only* The printer settings are held in a roaming (or virtual profile). This is a common option in virtual desktop environments, and the one which I recommend.
  - *Held in profile only if not saved on client* This attempts to save the settings on the end point, and fails back to the profile if the client can't save the settings. This setting also uses extra time and bandwidth to perform this action.
- **4. Print job routing** Print job routing should be planned around the placement of virtual desktops, the print server, and the print device. Please see the previous section on Citrix Printer Options to ascertain the best option.
  - *Connect directly to network print server if possible* The virtual desktop maps the network printer, and spools directly to the print server.
  - Always connect indirectly as a client printer The virtual desktop spools the print job to the client device which then forwards it to the print server.
- 5. Turn off client printer mapping
  - *Turn off client printer mapping* This setting disables all connections to client printers using the autocreated method.

**Drivers** This section deals with print drivers. Native drivers are those released by the printer manufacturer (e.g., HP, Ricoh, Nashua, Minolta etc.). Print drivers are less of an issue in a virtual desktop environment than they are for Terminal Services/RDS as the drivers have typically been written for the virtual desktop operating system. Issues may still exist when using older drivers, intended for Vista, on Windows 7, so testing is important.

## 1. Native print driver auto-install

• *Install Windows native drivers as needed* – This policy results in the native print drivers downloading and installing from the print server onto the virtual desktop.

## NOTE

I recommend adding the necessary print drivers to the base image. Setting the driver to autoinstall can potentially result in the drivers installing repeatedly in subsequent sessions as the image is read-only.

• *Do not automatically install drivers* – This setting prevents the drivers from automatically downloading. The printer will then either be mapped with the universal driver if it is enabled, or it will simply be not mapped at all if the universal driver isn't enabled.

## 2. Universal driver

- Use universal driver only if the requested driver is unavailable This setting results in the native driver being used if it is installed, but failing back to the universal driver if it isn't installed (can be used in conjunction with "do not automatically install drivers").
- Use only printer model specific drivers This policy only allows the use of the native driver. If the native driver is not installed, then the printer will not map.
- *Use universal driver only* This policy prevents the use of native drivers, only the universal driver can be used.

**Session Printers** (Figure 5.67) If the policy applies to a given virtual desktop, all of the listed session printers are mapped to the users' virtual desktop.

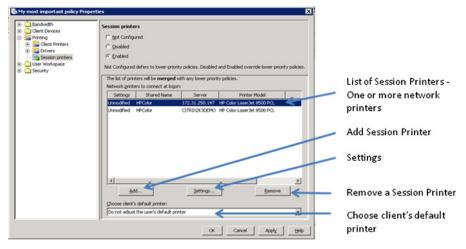
The Add... button enables you to add to the list of session printers.

The **Settings**... button (Figure 5.68) enables you to configure default settings for the printer, including paper size, number of copies, print quality (75 dpi to 600 dpi), orientation, and lastly, how the settings are applied. **Apply customized settings at every logon** overrides saving these settings in the profile.

The Remove button removes the highlighted printer from the list of session printers.

## Choose client's default printer

• Do not adjust the user's default printer – This option just adds the session printers to the user's list of printers, and the first printer created is set as the default printer. The default printer of the session is not saved to the profile.

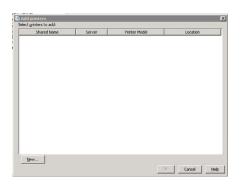


#### FIGURE 5.67

Session printer configuration.

Paper Size: Letter		-
Jector		
Copy Count:		
1 *		
🔽 Collated		
Print Quality:		_
600 dpi		<b>•</b>
Orientation:		
eportrait		
C Landscape		

Print job settings.



## FIGURE 5.69

Add printers dialog box.

- Set default printer to the client's main printer This sets the users default printer on the virtual desktop to be whatever is set on the client device.
- *<Session Printer>* You can also set one of the list of session printers (they are all listed) to be the user's default printer.

## Adding a Session Printer Step-by-step:

- 1. Click Add, and to add a network printer (Figure 5.69).
- 2. Click New.
- 3. Click Next (Figure 5.70).

You can change the connection credentials in the unlikely event that the logged on user account doesn't have visibility of the printer.

4. Type in a UNC path, or browse to a network printer and click Finish (Figure 5.71).

Add Network Printer to Fa	rm 🗙	Add Network Printer to Farm	×
Network Printe	r Credentials	Network Printer Location	
User credentials to use to co Console Administrator: C Qther: User name: Bassword: Domain:	CITREXSA\Administrator	Enter UNC Path UNC Path UNC Path:  Browse for printer Browse getwork:  Windows NT Remote Printers  Windows NT Remote Printers  CITRIXSA CITRIXSA  Fredor	
	Next Cancel Help	Back Einish Cancel Hel	lp

FIGURE 5.71

Connection user credentials dialog box.

Network printer location dialog box.

User Workspace

 Time Zones – "Do Not Use Clients' Local Time" Note: By default the virtual desktop automatically assumes the time zone on the client device.

## Security

• Encryption – SecureICA encryption – set the ICA encryption level. The encryption levels can be set to – Basic, RC5 (128 bit) logon only, RC5 (40 bit), RC5 (56 bit), RC5 (128 bit).

## NOTE

The default setting of basic is sufficient for most XenDesktop environments. Higher encryption levels will incur a processor overhead.

## **Microsoft Policy Settings**

As previously mentioned, the Delivery Services Console in XenApp 6.0 will integrate the Citrix Policies into it as one console. What will also be introduced will be the ability to manage the Citrix Policies through a Microsoft Group Policy Management Console. The changes within XenApp will no doubt also be introduced into XenDesktop. The standardization of managing all policies through the Microsoft Group Policy Management Console will be welcome news to many organizations.

Broadly speaking, a lot of the policy settings you would use in a Terminal Services/RDS environment are also applicable in a virtual desktop environment. A good recommendation is to redirect user data out of the virtual desktop. Redirect My Documents to a network location, for example, and hide the operating system hard drive. The virtual desktops are commonly pooled between all the users, and in this instance, if the user were to save data to a local hard drive, the information wouldn't persist between sessions.

Enabling loopback processing is a worthwhile concept to consider in a virtual desktop environment. Loopback processing on Microsoft GPOs alters how policy settings are applied. Normally policies are applied in the order Site, Domain, and then OU with machine policies applying at boot and user policies at logon; loopback processing processes the machine policies again after the user policies. Merge Mode applies both user and then machine policies, while Replace Mode only applies GPOs applied to computer account.

## TIP

Be aware that the Virtual Desktop Agent uses port 8080 by default to communicate with the Desktop Delivery Controller. Group Policy Objects defining firewall policies could potentially block the communication between the virtual desktops and the desktop.

## **Delivery Controller**

The use of Group Policies to manage Virtual Profiles will also be covered in more depth in Chapter 12, "Implementing Virtual Profiles into the Virtual Desktop."

## **SUMMARY**

This chapter dealt with the XenDesktop Management Consoles in depth. We stepped through the Delivery Services Console studying the settings for managing XenDesktop farms. This was followed by looking at the Citrix Web Interface Management Console, and how this should be configured for presenting virtual desktops to our users. The significant checkpoint covered was a demonstration of using these configurations to demonstrate a connection to a virtual desktop – significantly this includes all the components introduced since the first checkpoint. In the subsequent subsections, we discussed the Presentation Server Console, focusing on the Citrix printer options and Citrix policy settings in depth. Lastly, we briefly looked at how Microsoft Policies can be integrated with XenDesktop.

# Installation of the Citrix Provisioning Server

6

## INFORMATION IN THIS CHAPTER

- Prerequisites
- Recommendations
- DHCP Configuration
- Installation of Provisioning Server Step by Step

Provisioning server (PVS) is the component of a XenDesktop VDI (Virtual Desktop Infrastructure) solution that is typically the least understood. Provisioning server introduces "disk virtualization." In the same way we broke the link between one physical piece of hardware serving one operating system, we can now have one "virtual disk" being accessed by multiple virtual machines.

Provisioning server uses the network to mount the virtual disk to the virtual desktop. The Citrix terminology for this virtual disk is a vDisk.

When you normally create a virtual machine, you would assign memory, virtual CPU(s), network card(s), and disk. The disk would normally be in a VHD (XenServer/Hyper-V) or VMDK (VMware) format. With provisioning server, you only assign memory, CPU, and network resources, and there is no disk mounted for the base operating system. The "ah ha" moment is generally when you open the hypervisor console and show how there is no disk attached, and how the boot order is set to boot from the network.

Typically each virtual desktop is assigned an individual disk (see Figure 6.1).

A single vDisk is mounted to multiple virtual desktops through the network (see Figure 6.2).

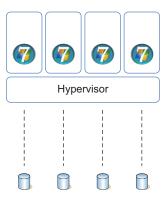
## FAQ

But how does the same disk boot multiple machines without resulting in conflicts?

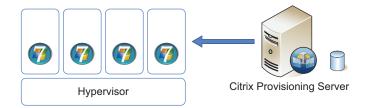
The provisioning server injects the virtual desktop "uniqueness" at boot time. The provisioning server uses a database to map virtual desktops to machine names and Security Identifiers (SIDs). Each virtual desktop has a virtual Mac address, which is associated with a virtual desktop computer name. The boot disk is read-only and is used by all the assigned virtual desktops, each virtual machine is additionally assigned "Write Cache," which is Read/Write, the virtual desktop uses this as working space for things like its pagefile, and any other write actions required by the operating system.

A single physical provisioning server "officially" scales to 480 virtual desktops; however, recent updates to the product have raised that number considerably.<sup>A</sup> For practical purposes, the scaling out is more likely to be determined by the redundancy requirement. Two or more provisioning servers can be set up in a High Availability cluster.

<sup>A</sup>Delivering 5000 desktops with Citrix XenDesktop – "ONE physical provisioning server could easily support 3300 desktops."



Virtual desktops without provisioning server.



#### FIGURE 6.2

Virtual desktops with provisioning server.

## FAQ

#### Physical or Virtual?

The provisioning server is a relatively heavy load, especially in terms of network requirements. For a small proof of concept or a pilot, it can be run as a virtual machine on the hypervisor infrastructure. For a production/live environment, one or more physical servers are recommended.

## FAQ

Can a vDisk hosted by Citrix Provisioning Server be used across multiple hypervisors? No, the vDisk will be specific to the hypervisor on which it was created. Each hypervisor presents virtual hardware and the drivers are specific to each hypervisor.

# PREREQUISITES

Important considerations:

- **1.** The user account performing the installation must be a local administrator on the provisioning server.
- **2.** An Active Directory Service Account for Citrix Provisioning Server. For proof of concept/pilot type implementations, the local Network Service Account can be used rather than an Active Directory user account.
- **3.** Windows Server 2003 SP2 and Windows Server 2008 and Windows Server 2008 R2 (32 or 64 bit) all editions are supported for the provisioning server.

The Installation Guide states "all versions." For a production environment, Windows Server 2008 (64 bit) would be the best choice in terms of performance and scalability. Windows Server 2008 R2 is currently supported in version 5.6.

SQL Express database is sufficient for a proof of concept. A pilot or production environment should make use of an Enterprise database, which can be easily backed up and restored as required.

**4.** Requires Microsoft SQL 2005 or Microsoft SQL 2008. Express editions included. Please see Appendix.

## TIP

As with the Desktop Delivery Controller, ask the database administrator in your organization to create a database for you.

- **5.** Have a separate logical or physical drive location available for virtual disks. SAN (Storage Area Network) storage is recommended if available.
- **6.** The .NET Framework 3.5.1 is required. This is installed on Windows Server 2003, but on Windows Server 2008 R2, you add it as a "Feature" under Server Manager.

# RECOMMENDATIONS

The following tuning tips should be used for production environments. If you are running a small proof of concept, you can safely ignore these optimizations.

Windows Server 2008 (64 bit) will give you the best performance. System cache allocations on Windows Server 2008 64 bit are far higher, and consequently your access to the vDisk is quicker.

If you can't use 64-bit Windows Server 2008 or Windows Server 2008 R2 in your organization, then disable Physical Address Extensions for your provisioning server. For Windows Server 2003 SP2 32 bit, use /NOPAE switch in your boot.ini file (NOPAE – No Physical Address Extensions). For Windows Server 2008 32 bit, run the bcdedit utility from the command line:

```
bcdedit /set nx AlwaysOff
bcdedit /set pae ForceDisable
```

For Windows Server 2003, setting performance to be optimized for system cache will improve performance. Windows Server 2003 LargeSystemCache:

Start | Settings | Control Panel | System | Advanced | Performance Section | Settings Advanced | Memory Usage | Select System Cache (see Figure 6.3).

Transmission Control Protocol (TCP) offloading has a detrimental effect on performance. This is a function that moves some tasks from the processor to the network card. The recommended setting is:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\TCPIP\Parameters\
Key: "DisableTaskOffload" (dword)
Value: "1"
```

Another network optimization is to disable Large Send Offload, for best performance set:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\BNNS\Parameters\
DWORD = EnableOffload
Value "0"
```

Performance Options ? 🗙
Visual Effects Advanced Data Execution Prevention
Processor scheduling
Choose how to allocate processor resources.
Adjust for best performance of:
Programs     C Background services
Memory usage
Choose how to allocate system memory.
Adjust for best performance of:
O Programs
- Virtual memory
A paging file is an area on the hard disk that Windows uses as if it were RAM.
Total paging file size for all drives: 1536 MB
OK Cancel Apply

#### **FIGURE 6.3**

Setting memory usage to system cache.

On your switches, disable the Spanning Tree Protocol (STP) and enable PortFast. PortFast is the Cisco term, but other vendors have the equivalent functionality.

Teaming your network cards in a provisioning server will also improve your network throughput. For performance, I recommend enabling both HA (High Availability) and load balancing in the NIC (Network Interface Card) teaming settings.

# **DHCP CONFIGURATION**

Citrix Provisioning Server is best used with a Dynamic Host Configuration Protocol (DHCP) server. Although it is entirely possible to use it without DHCP, it does, however, make the solution more complex to manage. Each guest virtual desktop will require an individual IP address and this can be achieved by assigning each machine an IP address out of a pool using DHCP, or a unique boot .ISO file would have to be mounted to each virtual desktop. Each boot .ISO file would have a different IP address, but point to the same Trivial File Transfer Protocol (TFTP) server to mount the virtual disk (vDisk). Clearly having different boot .ISO files for each virtual desktop is an onerous administrative task, and, moreover, it makes it very difficult to change IP ranges of the guests.

## NOTE

DHCP can be used with or without PXE (Preboot Execution Environment). A generic .ISO image can be used to define the location of the boot file if used in conjunction with DHCP. Building a boot .ISO is discussed in Chapter 8, "Additional Provisioning Server Configuration Settings."

There are two options for using DHCP: (1) a DHCP server<sup>B</sup> on a separate server is supported or (2) Microsoft DHCP can be installed on the Citrix Provisioning Server. For the sake of simplicity, it is easiest to have it installed on the Citrix Provisioning Server, as the installation wizard will then do the automatic configuration for you. A large number of organizations, however, keep very strict control over DHCP services on their network; in these cases, you will need to integrate into an existing DHCP server.

## Create the PXE Scope Options on a Microsoft DHCP Server – Step by Step

Any DHCP server that can support the 66 and 67 scope options can be used. In this example, we will be using a Microsoft DHCP server. These steps are required if the Citrix Provisioning Server and Microsoft DHCP are installed on separate servers.

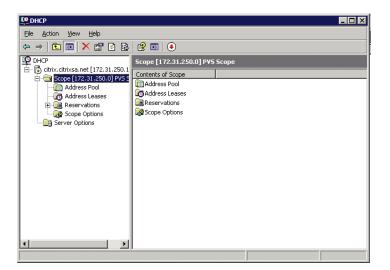
1. Select the DHCP server, and click Action (Windows Server 2003) (see Figure 6.4).

For Windows Server 2008, right-click on the IPv4, select Set Predefined Options... (see Figure 6.5).

2. Set Predefined Options (Windows Server 2003) (see Figure 6.6).

The remaining steps are identical for both Windows Server 2003 and 2008.

<sup>&</sup>lt;sup>B</sup>Various types of DHCP servers are supported, including Tellurian and Microsoft DHCP.



DHCP on Windows Server 2003.

File       Action       View       Help         Image: Second Sec
PHCP       Contents of DHCP Server       Status         Image: Imag
Image: Second
🖃 🐌 IPv4 🛛 🕞 Server Ontions
New Scope
New Superscope New Multicast Scope
Define User Classes
Define Vendor Classes
Reconcile All Scopes
Set Predefined Options
View •
Refresh
Export List
Properties
Help

#### FIGURE 6.5

DHCP on Windows Server 2008.

Display Statistics
New Scope New Syperscope New <u>M</u> ulticast Scope
<u>B</u> ackup Rest <u>o</u> re
Reconcile <u>A</u> ll Scopes Unauthori <u>z</u> e
Defi <u>n</u> e User Classes Define Vendor <u>C</u> lasses S <u>e</u> t Predefined Options
All Tas <u>k</u> s 🕨 🕨
Delete Refresh Export List
Properties
Help

DHCP options on Windows 2008.

- **3.** Click Add... (see Figure 6.7).
- **4.** Enter **Boot Server Host Name**, change the Data Type to **String**, set Code as **66**, and enter a Description as **TFTP boot server host name**. Click **OK** (see Figure 6.8).
- 5. And click Add... again.
- **6.** Enter **Bootfile Name**, change the Data Type to **String**, set Code as **67**, and enter a Description as **Bootfile Name**. Click **OK** (see Figure 6.9).

The options have now been added to DHCP, and now we can configure them.

- 7. Select your scope, and select Scope Options, and right-click.
- **8.** Select **Configure Options** (see Figure 6.10).
- **9.** Scroll down to scope option 66, and select it. Inside String value, add the IP address of the provisioning server, and if you have more than one provisioning server, then delimit the entries with a semicolon for example: 192.168.0.10;192.168.0.11 (see Figure 6.11).
- **10.** Scroll down to scope option 67, and select it. Inside the String value, enter the text: **ARDBP32.BIN** (see Figure 6.12).

ARDBP32.BIN is the boot file that we are offering on the PXE server.

Predefined Option	s and Values	? ×
Optio <u>n</u> class:	DHCP Standard Options	•
Opti <u>o</u> n name:	002 Time Offset	•
		<u>)</u> elete
Description:	UCT offset in seconds	
_Value		
Long:		
	OK 0	Cancel

Predefined options and values.

Option Type	? ×
Class:	Global
<u>N</u> ame:	Boot Server Host Name
<u>D</u> ata type:	String
<u>C</u> ode:	66
Description:	TFTP boot server host name
	OK Cancel

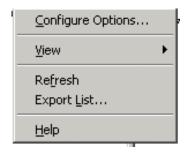
## FIGURE 6.8

TFTP option type.

	Option Type		? ×
	Class:	Global	
~~	<u>N</u> ame:	Bootfile Name	
ċ	<u>D</u> ata type:	String 🔽 🗖 Array	
	<u>C</u> ode:	67	
	Description:	Bootfile Name	
		OK Cano	el

#### FIGURE 6.9

Bootfile option type.



Configure scope options.

General Advanced	? ×
Available Options ☐ 065 NIS+ Servers ☑ 066 Boot Server Host Name ☐ 067 Bootfile Name ☐ 068 Mobile IP Home Agents	Description ▲ A list of IP a TFTP boot s Bootfile Nan Mobile IP hc ▼
Data entry String value:	
	Cancel Apply

## FIGURE 6.11

Scope options – option 66.

Scope Options	? ×
General Advanced	
Available Options	Description 🔺
066 Boot Server Host Name	TFTP boot :
🗹 067 Bootfile Name	Bootfile Nan
068 Mobile IP Home Agents	Mobile IP ha
069 Simple Mail Transport Protocol (SMTP) Servers	List of SMTF
	•
Data autor	
Data entry	
String value:	
ARDBP32.BIN	
OK Cancel	

Scope options - option 67.

# **INSTALLATION OF PROVISIONING SERVER – STEP BY STEP**

Insert Provisioning Server DVD, or mount PVS .ISO if you are using a virtual machine. If autoruns are enabled, you will get the dialog below, otherwise double-click **autorun.exe** on the root of the provisioning server media.

- 1. Select Server Installation (see Figure 6.13).
- **2.** Click **Install Server**<sup>C</sup> (see Figure 6.14).
- 3. Click Next (see Figure 6.15).
- 4. Toggle the radio button to accept the license agreement, and click Next (see Figure 6.16).
- 5. Enter a User Name and Organization details, and click Next (see Figure 6.17).
- 6. Click Next (see Figure 6.18).

<sup>&</sup>lt;sup>C</sup>The provisioning server will share the same license server that we previously installed for the Desktop Delivery Controller.

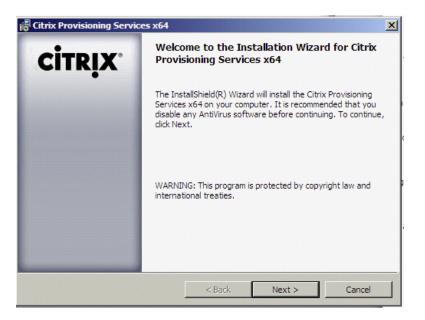


Provisioning services installation.





Server installation.



Provisioning services installation welcome.

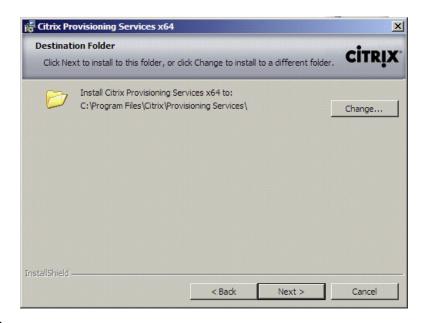
i <sup>®</sup> Citrix Provisioning Services x64	×		
License Agreement You must view the entire license agreement in order to continue.	CITRIX.		
CITRIX <sup>®</sup> LICENSE AGREEMENT	<u> </u>		
This is a legal agreement ("AGREEMENT") between you, the Licensed U Citrix Systems, Inc., Citrix Systems International GmbH or Citrix Systems As Pty Ltd. Your location of receipt of this product or feature release (both h "PRODUCT") or technical support (hereinafter "SUPPORT") detem providing entity hereunder (the applicable entity is hereinafter referen "CITRIX"). Citrix Systems, Inc., a Delaware corporation licenses this PRO the Americas and Japan and provides SUPPORT in the Americas. Citrix International GmbH, a Swiss company wholly owned by Citrix Systems, Inc. this PRODUCT and provides Support in Europe, the Middle East, Af	sia Pacific ereinafter ines the ed to as DUCT in Systems , licenses		
I accept the terms in the license agreement     Print     I do not accept the terms in the license agreement			
InstallShield			
< Back Next >	Cancel		

#### FIGURE 6.16

License agreement.

Citrix Provisioning Services x64	
Customer Information	eizeux
Please enter your information.	CİTRİX
User Name:	
Windows User	
Organization:	
Install this application for:	
<ul> <li>Anyone who uses this computer (all users)</li> </ul>	
O Only for me (Windows User)	
stallShield	
< Back Next	> Cancel
K BOCK NCK	

Customer information.



#### FIGURE 6.18

Destination folder.

You could choose to install your provisioning server on a second logical or physical drive, if you wish to install the operating system and applications on separate drives, click **Change...** and type or browse to the desired location.

- 7. Click Next (see Figure 6.19).
- 8. Click Install (see Figure 6.20).
- **9.** Click **Finish** (see Figure 6.21).

After the installation is complete, the Citrix Provisioning Services Configuration Wizard pops up.

**10.** Click Next (see Figure 6.22).

11. Select the DHCP option that you have chosen (see Figure 6.23 or 6.24).

## NOTE

If you want to use locally installed DHCP for a simple proof of concept, you must have installed DHCP before running the configuration wizard, otherwise it won't automatically add the scope options for you.

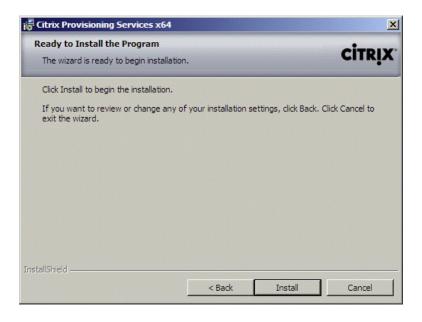
- **12.** Click Next (see Figure 6.25).
- **13.** Select **Create farm** for the first Citrix Provisioning Server, join existing farm for subsequent installations, and click **Next** (see Figure 6.26).

Local SQLExpress (see Figure 6.27). Dedicated SQL Server (see Figure 6.28).

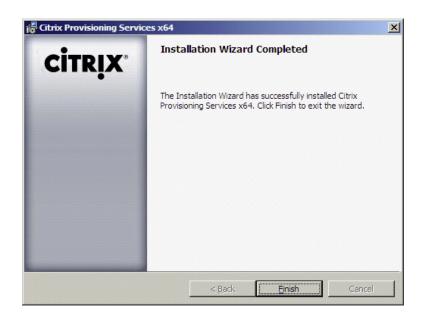
🖟 Citrix Provisio	ning Services x64	×
Setup Type Choose the set	up type that best suits your needs.	CITRIX
Please select a		fict
C Custom	Choose which program features you want installed and w will be installed. Recommended for advanced users.	
ListallShield	<pre>&lt; Back Next &gt;</pre>	Cancel

#### FIGURE 6.19

Setup type.



Ready to install.





Successful installation.



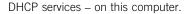
Provisioning Services Configuration Wizard.

Provisioning Services Configuration Wiza	ard		
DHCP Services Specify the service that will provide IP add Services target devices.	dress assignments	to Provisioning	
O The service that runs on this computer			
C Microsoft DHCP C Provisioning Services BOOTP ser C Other BOOTP or DHCP service	vice		
• The service that runs on another comp	outer		
	< Back	Next >	Cancel

#### FIGURE 6.23

DHCP services - on another computer.

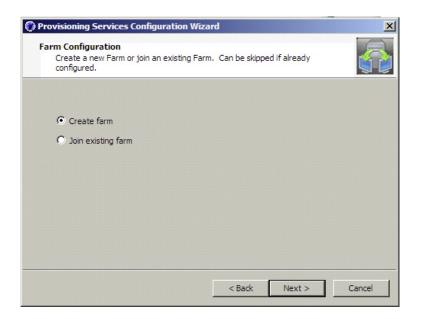
Provisioning Services Configuration Wizard	×
DHCP Services Specify the service that will provide IP address assignments to Provisioning Services target devices.	
<ul> <li>The service that runs on this computer</li> <li>Microsoft DHCP</li> <li>Provisioning Services BOOTP service</li> <li>Other BOOTP or DHCP service</li> <li>The service that runs on another computer</li> </ul>	
< Back Next >	Cancel





#### FIGURE 6.25

PXE services.



Farm configuration.

😵 Provisioning Service	s Configuration Wizard 🛛 🛛 🔀
Database Server Enter the Server a	nd Instance names.
Server name:	CITRIXPVS Browse
Instance name:	SQLEXPRESS
	Note: Leaving this blank indicates the default instance. Default SQL Server Express instance name is 'SQLExpress'.
Optional TCP port:	
	< Back Next > Cancel

#### FIGURE 6.27

Database server – SQLExpress.

🛞 Provisioning Service	s Configuration Wizard	×
Database Server Enter the Server a	nd Instance names.	
Server name:	MYSQLSERVER THEINSTANCECREATEDFORPVS	Browse
	Note: Leaving this blank indicates the default in Default SQL Server Express instance nam	
Optional TCP port:		
	< Back Next	> Cancel
	<b>_</b>	

Database server – SQL Server.

**14.** For a simple proof of concept, enter your hostname, and "SQLEXPRESS" in the Instance field (Figure 6.27), and for pilot or production systems, connect to a database instance that you have created for this purpose (Figure 6.28).

The way in which we create a back-end configuration database is analogous to the database that we create for the Desktop Delivery Controller.

## NOTE

Each Citrix component requires a separate database, first one for XenDesktop Desktop Delivery Controller, second for Citrix Provisioning Server, and a third for Citrix XenApp for Application provisioning. It can be the same database server, but there must be three different databases on the server.

**15.** Change the farm name to something specific to your environment. If you have more than one site or plan to use more than one site in the future, then enter a locale-specific name. You can use multiple sites for multiple physical locations, and also for high availability<sup>D</sup> or disaster recovery locations (see Figure 6.29).

<sup>&</sup>lt;sup>D</sup>Citrix Provisioning Server has sophisticated high availability capabilities.

New Farm	abase and Farm names.
Database name:	ProvisioningServices
Farm name:	Provisioning Server Demo Farm
Site name:	Johannesburg Site
Collection name:	Collection
Use Active Dire	actory groups for security
🔿 Use Windows ç	proups for security
Farm Administrato	r group:
citrixsa.net/Builtin	/Administrators
	< Back Next > Cancel

New farm.

16. Change the license server to point at the Citrix License Server you installed in Chapter 2, "Installation of the Broker – Desktop Delivery Controller," then click Next (see Figure 6.30).

Although it is possible to run the licensing locally on the Citrix Provisioning Server, it is recommended that the licensing is run separately. The Citrix Licensing Server provides licenses for all the XenDesktop components. This makes sense in the context of redundancy of all of the components including having multiple Citrix Provisioning Servers.

Select the appropriate user account. If in doubt, leave it at the default – Network service account, and select the check box Configure the database for the account (see Figure 6.31).

A "Specified user account" would be used if the virtual disks are being accessed from a network share. This is typically the case in a multiple Server Provisioning Server environment. Multiple provisioning servers can be used for load balancing and high availability. If using this option, also check **Configure the database for this account**.

The option "Local System Account" is as per the comment for use with a SAN – if your hard drive in the provisioning server is actually mounted from a SAN.

Provisioning Services Configuration Wizard	×
License Server Enter the license server hostname and port.	
License server name: citrix:2k3demo.citrix:sa.net	
☑ Use Datacenter licenses for desktops if no Desktop licenses are available	
< Back Next >	Cancel

License server.

The Stream and Soap Service user account you will use.	es will run under	a user accoun	t. Please select	what
Network service account	-			
○ Specified user account (	Required when (	using a Windov	/s Share)	
User name:				
Domain:				
Password:				
Confirm password:				
C Local system account (U	se with SAN)			
Configure the database f	or the account	-		

## FIGURE 6.31

User account.

 am Services Specify which networks will be used by the software stream services.
Available network cards:
Enter the first and last ports to use for management services communications. (Note that there must be at least 5 ports in the range and that all servers you install must have the same port range configured.) First port: 6905 Last port: 6909
Soap server port used for Console access: 54321

Stream services.

**18.** Select the network card that provisioning server will use (see Figure 6.32).

It is possible to configure servers with multiple network cards. Changing your IP address would require that the configuration wizard be run again.

**19.** Select the check box (by default it is cleared) – Use the Provisioning Services TFTP service (see Figure 6.33).

TFTP – Trivial File Transfer Protocol is a UDP-based (User Datagram Protocol) file-transfer mechanism. TFTP is used to download the boot file – ARDP32.BIN – to the virtual desktop.

**20.** Click Next (see Figure 6.34).

In a multiple provisioning server environment, the dialog box above gives the ability to configure multiple PXE boot servers. Simply click the **Add** button to configure multiple servers in your provisioning server farm with the PXE capability.

**21.** Click Finish (see Figure 6.35).

If your Windows Firewall is enabled, the installation dialog box may prompt you to either disable it, or open the relevant ports. See the Appendix for Citrix Communication Ports.

**22.** Click **Done** (see Figure 6.36).

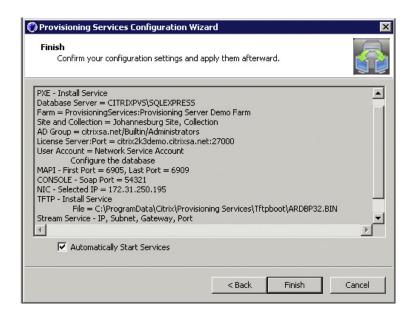


TFTP option and bootstrap location.

🛞 Provisionii	ng Services Configu	ration Wizard			×		
	Stream Servers Boot List Specify at least 1 and at most 4 boot servers.						
The bo boot pr			: devices may co	ontact to comple	ete the		
	IP Address	Subnet Mask	Gateway	Port			
	172.31.250.195	0.0.0.0	0.0.0.0	6910			
	Add	Edit R	emove	Move up Move down			
	Advanced	]	_				
			< Back	Next >	Cancel		

#### FIGURE 6.34

Stream servers boot list.



Confirm your configuration settings.



#### FIGURE 6.36

Successful installation.

# SUMMARY

This chapter discussed a basic introduction into how Citrix Provisioning Server functions. We then covered the software and hardware prerequisites. The Citrix Provisioning Server has fairly high resource requirements, so tuning recommendations were then addressed to achieve best performance. It is simplest to use DHCP to deliver the provisioning server settings to the virtual desktop; we discussed the DHCP configuration for a basic implementation. This chapter then explained in detail how to perform an installation of Citrix Provisioning Server.

# Fundamental Configuration of the Citrix Provisioning Server

7

## INFORMATION IN THIS CHAPTER

- The vDisk Store
- The vDisk
- Create a Base Target Device

This chapter introduces you to the fundamentals of using Provisioning Server in a XenDesktop environment.

The primary tool used to manage provisioning server is the Provisioning Services Console. The Provisioning Services Console (see Figure 7.1) allows us to manage how we provision virtual disks (vDisks) to workstations (Target Devices).

The Sites node (see Figure 7.2) allows us to configure:

Servers	Configure the provisioning servers in the farm.
vDisk Pool	These are bootable vDisks that we assign to machines. We can con-
	figure various aspects of how the vDisk functions.
Device Collections	Group our Target Devices so we can assign vDisks to these groups.
	The Target Devices are defined by their MAC addresses.
User Groups	Granular permission assignment.
Views	Customized views for groups.

The **Stores** node is used to configure the storage locations for the vDisks. It is important that all the provisioning servers in a farm can access the same vDisks to enable fail over and load balancing of the vDisks among provisioning servers in the farm.

The next three sections will deal with creating the vDisk Store, then creating a vDisk in the Store, and finally with assigning the vDisk to a Target Device.

# THE VDISK STORE

The first step required, before we can provision vDisks, is to create a storage location to store the vDisks and write cache.

🖳 Provisioning Services Console				
🙂 File Action View Window Help				_ Ð ×
🗢 🔿 📶 🗟 🔽 🖬				
Provisioning Services Console	Name	Devices	Active Devices	Description
<ul> <li>■ Provisioning Server Demo Farm (localhost)</li> <li>● ● Sites</li> <li>● ● Sites</li> <li>● ● Stores</li> </ul>	There a	are no item:	s to show in this v	iew.
		1		)

Provisioning Services Console.



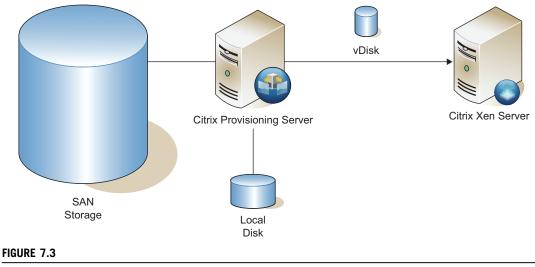
#### FIGURE 7.2

Sites node.

## **Design Decisions – vDisk and Write Cache Placement**

The vDisk component is always mounted through the provisioning server, which can store the vDisk in one of two places: on a local hard disk or on shared storage<sup>A</sup> (see Figure 7.3).

<sup>&</sup>lt;sup>A</sup>Shared storage referred to in this section could be Fiber Channel Storage Area Network or iSCSI.



vDisk storage options.

Using a distributed or clustered file system, multiple provisioning servers can attach to the same shared storage. Shared storage is, however, not a requirement for high availability. In a design using multiple provisioning servers, you can also simply copy the vDisk onto local storage on all the provisioning servers; because the vDisk is read only, this does not affect the ability to fail over. Deciding factors between the two would be the number of provisioning servers and the number of vDisks, and at a certain point, it would become desirable to maintain vDisks in one location.

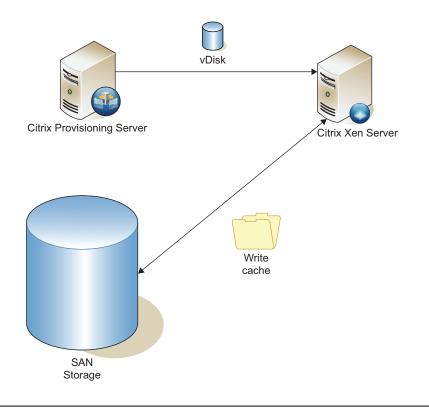
## vDisk Recommendation

Local storage is recommended for smaller implementations, larger Enterprise implementations can equally use local storage or Storage Area Network (SAN) attached storage. SAN storage may, however, be useful in larger environments where the benefits around the replication of the vDisks outweigh the costs.

## NOTE

Never place a vDisk on a Common Internet File System (CIFS) share (standard Windows share). Microsoft Windows will not cache data reads from a share to memory. A local disk or SAN-attached disk will cache to memory, resulting in requests from multiple virtual desktops to the vDisk being read from memory. Memory access will always be faster than disk.

The vDisk is attached from the provisioning server, the write cache could also be stored on the provisioning server or a Network share, or the write cache could be mounted directly at the hypervisor layer (see Figure 7.4).





Write cache placement.

The locations for write cache include<sup>B</sup> the following:

- Via the provisioning server on the provisioning server local hard drive, or on shared storage attached to the provisioning server.
- At the hypervisor layer on the local hard drive of the hypervisor (XenServer, vSphere/ESX or Hyper-V) or on shared storage (SAN/iSCSI) attached to the hypervisor layer.

Via the provisioning server is a simple solution, but it doesn't give the best performance. Caching to the local provisioning server hard disk is the simplest option, and as such useful for proof of concept implementations.

Write cache mounted at the hypervisor level will give the best performance. Write cache is used for all write operations and having this mounted locally will improve disk access speeds. The write cache could be written to local hard disk; however, this would prevent dynamic placement of virtual machines as it is utilizing a local resource, i.e., no XenMotion/VMotion or intelligent VM placement (SCVMM etc.). Shared storage at a hypervisor layer gives good performance and flexibility.

<sup>&</sup>lt;sup>B</sup>Provisioning server also has a cache to RAM option, but it isn't a good fit for VDI implementations.

There is an additional option of encrypting the write cache. Encryption will have a performance impact. Encryption is not recommended unless explicitly required.

#### Write Cache Recommendation

Shared storage at the hypervisor layer.

## NOTE

Using the write cache disk for more that write cache is not uncommon. The system disk is read only in many designs. The write cache disk is persistent, so it is a good location for things like EdgeSight logs. Other uses can be for applications that update regularly – clearly the applications file will need to be redirected to the "D: Drive." The write cache disk size recommendation of 1 GB would obviously need to be reviewed under these circumstances. User configuration settings are best managed using Virtual Profiles; the write cache disk is not the best place for these types of settings.

#### TIP

For a proof of concept or pilot environment, it may be sensible to store the write cache on the provisioning server. This serves two purposes: first is that it is simpler, and second is that it allows you to easily and accurately gauge how large all the write cache disks are growing – which is dependent on the applications decisions you may have taken. Should the write cache fill up, it would negatively impact performance.

## Create the Store – Step by Step

For the sake of simplicity, this section covers placing the vDisk and the write cache on the local disk of the provisioning server – Target Device shared storage.

It is recommended that the store be on disk with high access speeds. The location could be a SAN-mounted disk. The store could also reside on a network share.

Create a share on a separate drive to host your vDisks. You could, for example, create a P: drive and create a vDisk folder to contain the vDisks, create a second folder called WriteCache.

- 1. Right-click on the Stores node, and select Create Store (see Figure 7.5).
- **2.** Enter a name for your store, and select your site from the drop-down box (see Figure 7.6).
- **3.** Select the **Servers** tab check the box next to your provisioning server(s) (see Figure 7.7).

#### NOTE

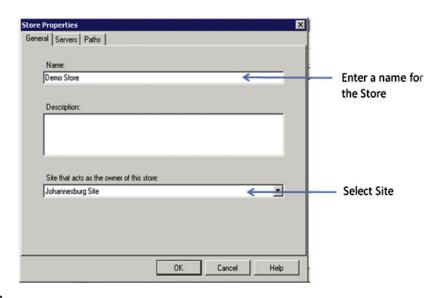
You would specify multiple servers if you wish the vDisk to be highly available.

- **4.** Select the **Paths** tab.
- **5.** Enter the path for the vDisk store, and click **Add**... and enter a path for write cache (see Figure 7.8).

In this example, I have placed the vDisk and write cache on the provisioning server. If you are placing the write cache on the Target Devices hard disk, you can leave the default write cache path blank.



Create store.



#### FIGURE 7.6

Store properties - General.

Store Properties			×	
General Servers Paths				
Site:				
Johannesburg Site				
Servers that provide this store:				
CITRIXPVS				<u> </u>
	ОК	Cancel	Help	
	OK			

Store properties – Servers.

Store Properties	×
General Servers Paths	
Default store path: C:\vDisks	
Default write cache paths:	
C:\WriteCache	Add
	Edit
	Remove
	Move Up
	Move Down
,	
OK Cancel	Help

## FIGURE 7.8

Store properties – Paths.

# THE VDISK

The vDisk is the fundamental element of provisioning server, which could be categorized as a "Virtual Disk" technology.

## Design Decisions – vDisk Mode – Private or Standard

Provisioning server has two disk modes for Citrix XenDesktop. The first is Private mode; this is as the name suggests a private individual disk for each and every virtual desktop. The second is Standard mode; a Standard mode vDisk is a shared common disk image for multiple virtual desktops.

The Private mode vDisks are Read/Write disks and the user's settings and changes are saved in the user's individual disk. There is a 1:1 relationship between virtual desktops and vDisks (see Figure 7.9).

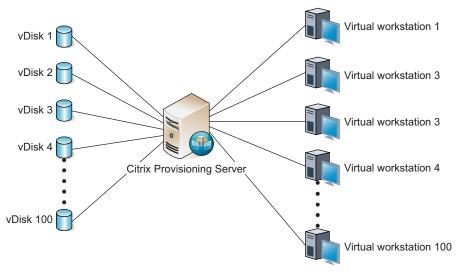
So, for example, in the scenario above, 100 vDisks have unique mappings to 100 virtual desktops.

This vDisk architecture is very similar to a normal distributed desktop environment. Over time the virtual desktop builds will drift from a standard build, with uniqueness held in each vDisk.

The storage requirements are an important aspect of virtual desktop infrastructure (VDI). If the vDisks are assumed to be 25 GB in size, then the storage requirements are as follows:

$$25 \text{ GB} \times 100 = 2500 \text{ GB} = 2500/1024 = 2.44 \text{ TB}$$

There are a small number of scenarios where it is desirable for the users' desktops to utilize Private mode vDisks. An example would be for software developers.





Utilizing Private mode vDisks.

The Standard mode vDisks are read-only disks and the uniqueness required in the session is stored in a write cache. Write cache is a delta to the base vDisk. The user's settings and changes are saved in the user's Virtual Profile (see Figure 7.10).

So, for example, in the scenario above, 100 virtual desktops share one vDisk, and use a separate write cache for each virtual workstation.

The provisioning server injects required machine uniqueness into the write cache at logon. Details like the computer name are held in the provisioning server database. These required unique machine settings are associated to the MAC address of the virtual desktop.

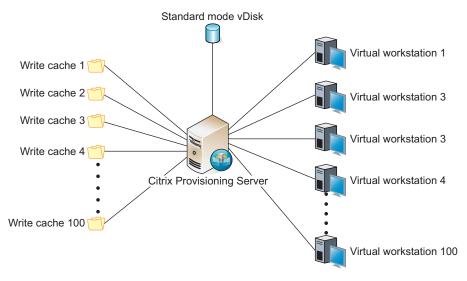
This vDisk architecture is a complete redesign of the desktop architecture. This approach utilizes multiple virtualization technologies in order to build out the virtual desktop in a completely modular way. Using a combination of virtual applications and Virtual Profiles, the desktop is built on demand. We are thus able to build multiple desktop types from common use component blocks.

Write cache requirements for normal Microsoft Office productivity type users are 300 to 500 MB. If the users use applications that make intensive use of temporary files, like some graphical application, then the requirements can be larger. Additionally if there are local logging requirements – Citrix EdgeSight for Endpoints, then that also should be taken into consideration. For the sake of simplicity, I have specified a 1 GB write cache, which should suffice for most scenarios.

If the vDisks are assumed to be 25 GB in size, and the write cache as 1 GB, then the storage requirements for 100 desktops are as follows:

$$25 \text{ GB} + 1 \text{ GB} \times 100 = 125 \text{ GB}$$

If we compare this to the Private mode vDisk example of 2.44 TB, we see that this is especially important for larger implementations.





Utilizing a Standard mode vDisk.

In Chapter 11, "Integrating Virtual Applications into the Virtual Desktop," we discuss Virtual Profiles. Virtual Profiles are used to store user and application settings outside of the virtual desktop.

#### Recommendations

Standard mode vDisk has two very important advantages over Private vDisk mode. First it greatly reduces the storage requirements for your virtual desktop environment. The second advantage is not as immediately obvious, and that is the single-instance image management. Managing your virtual desktops based on one vDisk means that updates and fixes need only be made to one base image and these are applied across the board.

The task of maintaining a standard desktop build is much simpler when utilizing a Standard vDisk. In some larger environments, there may be requirements for both types of vDisks: Standard mode vDisks catering for most users and a smaller subset of users using Private mode vDisks. Wherever possible use Standard mode vDisks.

## Create vDisk – Step by Step

- 1. Open the Provisioning Services Console Start | Programs | Citrix | Provisioning Services | Provisioning Services Console.
- **2.** The console can be run locally on the provisioning server, or on a remote host. In order to run the console on the provisioning server, leave the default at "localhost." To connect remotely, enter the hostname of the provisioning server. Click **Connect** (see Figure 7.11).

Connect to Fa	rm	×
Server Inform	nation	
Name:	localhost	
	(Name or IP address of a server on the farm.)	
Port:	54321	
I force I		
	(Port configured for server access.)	
Credentials -		
Credentiais		
Use my	Windows credentials to login	
C Use the	ese credentials to login	
Userna	ame:	
Domai	n:	
Passw	ord:	
	Save password	
🗖 Auto-lo	gin on application start or reconnect	
	Connect Cancel Help	

#### FIGURE 7.11

Connect to farm.

## 3. Select Sites | <YOURSITENAME> | vDisk Pool | Create vDisk (see Figure 7.12).

The VHD format allows you to create either a fixed format or a dynamic format. Fixed allocates the entire space required at creation, whereas a dynamic format disk will only allocate the disk space as required. In a VDI environment, a fixed VHD format is recommended (see Figure 7.13).

**4.** Enter your filename and a description. Edit the disk size, 15 GB is recommended for Windows XP and 25 GB for Windows 7. Click **Create Disk** (see Figure 7.13).

Your vDisk appears in the right-hand pane once it is created (see Figure 7.14).

😐 Provisioning Servi	ces Console						
😐 File Action View	v Window Help						
🗢 🔿 🖄 🖬 🛽	1 🎫						
⊡ 🥌 Sites ⊡ 📗 Johanne 📴 Serv	ver Demo Farm (localhost)						
E Solution De Sol	Create vDisk Add Existing vDisk Check for Updates						
Views Stores New Window from Here							
	Refresh Help						



Create vDisk menu.

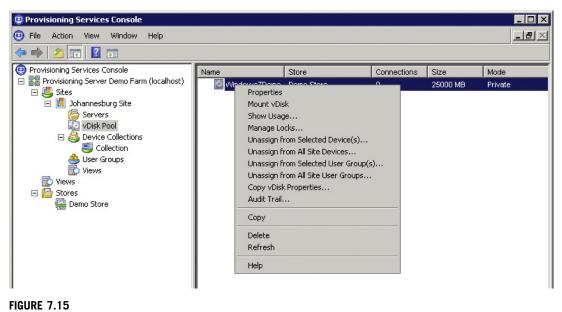
Create vDisk	×
Site that will contain the vDisk:	
Johannesburg Site	-
Store where the vDisk will reside:	
Demo Store	•
Server used to create the vDisk:	
CITRIXPVS	•
Filename:	
Windows7Demo	
Description:	
Windows 7 Blase Disk	
Size (in MBs): 25000 🐳	
VHD format: Fixed	
Create vDisk Close Help	

Create vDisk.

Name	Store	Connections	Size	Mode	Class
💟 Windows7Demo	Demo Store	0	25000 MB	Private	
	Domo Store		20000 mD	THYNC	

## FIGURE 7.14

A vDisk created in the store.



vDisk menu.

# **Configure vDisk Settings**

Now that the vDisk has been created, how it functions can be configured from within the console.

- 1. Right-click on the vDisk, and select Properties (see Figure 7.15).
- 2. Load balancing settings can be configured from General tab. There are two options: Use the load balancing algorithm or Use this server to provide the vDisk (see Figure 7.16). In an environment with multiple provisioning servers, the load balancing option can be used to share connections to the vDisk between multiple servers. Specifying a server from the drop-down list makes that server the connection point for the vDisk.
- 3. Click on the Edit File Properties....

The **Mode** tab gives you the options to set the disk from Private Image to Standard Image. Whenever building an image, or making changes, the disk must be in Private Image mode, the disk is then switched back to Standard Image mode for regular use (see Figure 7.17).

The **Options** tab enables the high availability, Active Directory machine account password management, and print management features (see Figure 7.18).

## High Availability

High availability is a very important setting to enable. If you configure multiple provisioning servers configured with your vDisk, it will automatically fail over to the alternative provisioning server, without any down time on the virtual desktop.

vDisk Pro	operties	×
General	Port Blocker	
Stor	e:	Demo Store
Site	:	Johannesburg Site
Filer	name:	Windows7Demo
Des	cription:	
Win	dows 7 Base D	Disk
BIO	S menu text (o	ptional):
A		algorithm may be used to provide the vDisk ices or a single server may be used.
	O Use the lo	ad balancing algorithm
	Use this set	erver to provide the vDisk
	Server:	CITRIXPVS
	Allow use of th	his vDisk Edit File Properties
		OK Cancel Help

vDisk properties.

## TIP

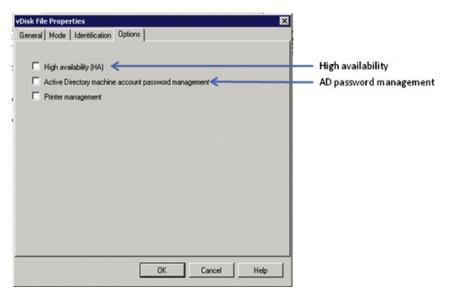
You can test your high availability by stopping the Streaming Service on one of your provisioning servers. The vDisk should automatically fail over.

#### Active Directory Integration

Active Directory machine account password management is another important setting for a VDI environment. Simply select the check box and the provisioning server will dynamically associate an Active Directory computer name with the vDisk at boot time. Active Directory integration needs to be configured in two places here, and under the server settings.

vDisk File Properties
General Mode Identification Options
Access mode Access Mode: Private Image (single device, RAW access)
Cache Type: Cache on server disk
Cache Size (MBs): 32
Automatic updates  Enable automatic updates for this vDisk  Apply vDisk updates as soon as they are detected by the server  Schedule the next vDisk update to occur on: 2010/01/24
OK Cancel Help

Configure the vDisk mode.



#### FIGURE 7.18

Configuring high availability and computer account management.

## **CREATE A BASE TARGET DEVICE**

The vDisk needs to be associated with Target Device. In a VDI scenario, this is most commonly a virtual MAC address, which we are associating with a vDisk.

In this section, the base Target Device will be the virtual desktop that you created in Chapter 4, "Installing the Virtual Desktop." What we are now doing is taking that virtual machines disk, and cloning it such that multiple virtual desktops can boot off the disk we have created.

Provisioning Services automatically creates a default Device Collection called "Collection." You as the administrator could create additional Device Collections (see Figure 7.19).

A Device Collection is a group of Target Devices. A Device Collection can contain one or more Target Devices. This is essentially a management unit for multiple Target Devices. I can, for example, assign a vDisk to a Device Collection, and it will assign the vDisk to all the Target Devices in the Device Collection. Clearly being able to manage disk associations as a group rather than individually is important in a XenDesktop environment. One would typically create a Device Collection for a department or group of users to which you assign the same vDisk.

- 1. The above diagram shows how to create a new Device Collection. Right-click on the **Device** Collections node, and select Create Device Collection (see Figure 7.19).
- **2.** Enter a name for your Device Collection.

In the following example, a Target Device will be added to the default Device Collection – "Collection."

- 1. Right-click on the collection, click Create Device (see Figure 7.20).
- 2. Enter a name and the MAC address of the virtual network card (see Figure 7.21).

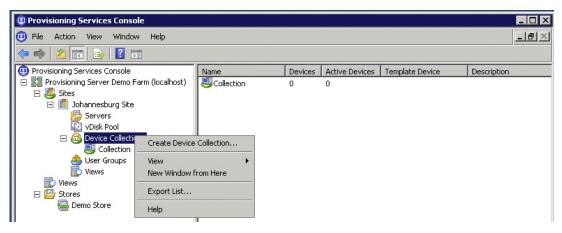


FIGURE 7.19

Device Collection menu.

🖳 Provisioning Services Console				
🙂 File Action View Window	Help			
🗢 🔿 🙋 🖬 🚺 🖬				
<ul> <li>Provisioning Services Console</li> <li>Provisioning Server Demo Fam</li> <li>Sites</li> <li>Johannesburg Site</li> <li>Servers</li> <li>VDisk Pool</li> <li>Device Collections</li> </ul>		Name	MAC	Booting From VDisk
User Groups Views Views Stores Demo Store	roperties ireate Device udit Trail arget Device iew lew Window from elete .efresh lelp	h Here		

Collection menu.

Create Device	×
Name:	
Demo	
Description:	
MAC:	
66 · CF · CA · 8E · 0C · 52	
Apply the collection template to this new device	
OK Cancel Help	

#### FIGURE 7.21

Create device.

## **Finding Your Virtual MAC Address**

## XenServer

1. Select the virtual machine and click on the Network tab – the MAC address is listed in the MAC column (see Figure 7.22).

## SCVMM

- 1. Right-click on your virtual machine and Properties (see Figure 7.23).
- 2. Select the Hardware Configuration tab, and select Network Adapter The MAC address is in the right-hand pane, under Ethernet [MAC] address (see Figure 7.24).

## VMware vSphere

- 1. Open the vSphere Client, select your virtual machine, right-click, and select Edit Settings... (see Figure 7.25).
- **2.** Select the **Network adapter** in the left-hand pane. The MAC address of the virtual machine appears in the right-hand pane (see Figure 7.26).

## TIP

If the virtual machine is shut down, you can select the MAC address and copy it to the clipboard.

## **All Hypervisors**

Once you have entered the MAC address, click OK.

The Target Device is now created (see Figure 7.27).

The "Booting From" is by default set to the vDisk. In the next section, we will change this to "Hard Disk."

XenCenter Eile View Poul Server VM Si	Uraye <u>T</u> emi	ilates Tuuls <u>W</u> ini	Juw Help				
🔆 Back 🔹 🕥 Forward 🔹 i 📑 Add	New Server	New Pool	New Storage 💼 New VM   (	🕘 Shut Down 🛞 I	Reboot 🕕 Suspend		System Alerts:
now: Server View	P •	😼 Windows 7 I	Demo Machine				Logged in as: Local root accou
XenCenter     WenCenter     WenCenter     WenCenter     Chrix Systems Demo     Wence Server1     Wence Server2     Server2     Server3		General Storage M Virtual Network I	letwork Console Performance	Snapshots   Logs		Add Interface Prop	erties Remove Interfac
Citrixtest-20		Device	MAC	Limit	Network	IP Address	Active
Copy of Windows Server Demo Copy of Windows S Master XP-Desktup Windows 2 Demo Machin Windows Server 2003 DI	KP SP3	0	66:cf:ca:8e:0c:52		Network 0	172.31.250.130	Yes



XenCenter.

🖪 Virtual Machine Manager		.citrixsa.net						
File View Go Actions								
🛃 Actions 💷 Columns 🧾	Jobs 🌆 I	PRO Tips (0) 斗 N	letworking 🛛 🔼 P	owerShell 🕐 i	telp			
Virtual Machines	AI	I Hosts Virtua	al Machines (10)					Actions ×
Host Groups	Sea	irch				🔎 💌 None	-	Virtual Machine Manager 🛛 🔺
Overview		Name 🔺	Status	Job Status	Host	Owner	CPU Average	* New virtual machine
🕀 📑 All Hosts	Ŀ	7onhyperv1	Saved State		HyperV	CITRIXSA\A	0%	Convert physical server
	Ŀ		Saved State		HyperV	CITRIXSA\A	0%	Convert virtual machine
		0 7onhyperv3	Stopped		HyperV	CITRIXSA\A	0%	Add library server
	Ŀ	DDC on Hyperv	Saved State		HyperV	CITRIXSA\A		Add host
					HyperV	CITRIXSA\A		Add VMware VirtualCenter
	Ŀ		Stop		HyperV	CITRIXSA\A	0%	server
			Pause		HyperV	CITRIXSA\A		🕡 Help
Filters C	lear 🦉	·	Save state		HyperV	Unknown	0%	All Hosts
Status	-	Wondows			HyperV	Unknown	0%	-
Owner	-	XenApp f	Shut down		HyperV	CITRIXSA\A	0%	Mew host group
Operating system	-	1	Connect to virtu	ual machine				Properties
Added date								Virtual Machine 🛛 🔺
Taq	-	Demo Wir					•	()) Start
Tay		inter i	Migrate		Dista	(1)		Stop
	4	Netv 🛃	New checkpoint		Disks	(1)		Pause
		Name	Manage checkpo	pints	40 GB of 25.0	00 GB total disk spac	e allocated	Save state
		Network 1						Discard saved state
🚺 Hosts		11			E Primary ch	iannel (0)		O Shut down
👔 Virtual Machines					40 GB of 25.	00 GB allocated		Connect to virtual machine
		E						
		19						Migrate storage
Jobs		E <u>×</u>	Store in library					🚏 Migrate
<u> </u>		~						Vew checkpoint
Ministration		~	View networking	1				Kanage checkpoints
		mmary Net 📒	Properties					🕤 Disable undo disks
		ninaly Neu -	Tropercies					22 Repair

System Center Virtual Machine Manager.

## Active Directory

Right-click on the **Target Device** | select Active Directory | Create Machine Account (see Figure 7.28). This will create a machine account in Active Directory based on the name on the device(s) you have created. You can select multiple devices and create multiple machine accounts (see Figure 7.29).

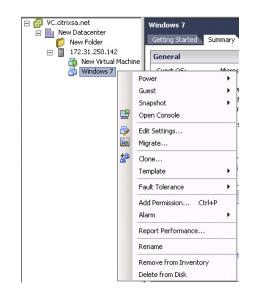
For the purpose of this initial Target Device creation, you will only need to create one machine account for this initial build machine.

Just for the purpose of example, Figure 7.29 shows the creation of machine accounts for W7demo1 to W7demo5, in the Demo Organizational Unit. The organizational unit can be chosen from the "Organizational unit" drop-down list.

Virtual machine properties.

## NOTE

Manual creation of machine accounts is usually only necessary for the first Target Device. The XenDesktop tool is the recommended way to perform bulk virtual desktop creation.



vCenter - Virtual machine menu.

#### FIGURE 7.26

Virtual machine properties.

Provisioning Services Console					_ 🗆 🗙
🙂 File Action View Window Help					_ B ×
🗢 🔿 🖄 🖬 🛛 🖬					
Provisioning Services Console	Name	MAC	Booting From	vDisk	IP Address
🖃 🎇 Provisioning Server Demo Farm (localhost)	Demo	66-CF-CA-8E-0C-52	vDisk		Down
🖃 😃 Sites					
🖃 📓 Johannesburg Site					
Servers					
🕼 vDisk Pool 🖃 🚑 Device Collections					
E 😂 Device Collections					
Views					
Views					
E Stores					
🖳 Demo Store					

A Target Device created in a collection.

0	Properties	P-F9	vDisk	vmware\v	mvdisk	172.31.250
	Disable					
	Mark Device Down					
	Set Device as Template					
	Audit Trail					
	Copy Device Properties					
	Target Device 🕨 🕨					
	Active Directory	Cre	eate Machin	e Account		
	Сору	De	lete Machine	e Account		
	Refresh					
	Help					

#### FIGURE 7.28

Computer account creation for a Target Device.

## TIP

The **Reset Machine Account Password**... option (see Figure 7.30) can be used on powered off Target Devices if you are experiencing issues with the computer accounts. Multiple accounts can be selected and reset simultaneously.

Create Machine A	ccounts in A	ctive Direct	tory	×
Domain: Organization unit: Devices:	citrixsa.net Demo			<b>v</b>
Target Device W7demo1 W7demo2 W7demo3 W7demo4 W7demo5			Status	
Create Acco	ount	Stop	Close	Help

Creating multiple computer accounts.

🛄 W7de	mo1 7E-A1-69-AF-1E-76	vDisk	Demo StoreWVindow	Down	
🛄 W7de	mo2 86-23-AC-71-07-5F	vDisk	Demo StoreW/indow	Down	
🥜 🛄 w7de	mo3 BA-9F-30-1B-BB	vDisk	Demo StoreWVindow	172.31.250	PVSDE
🛄 W7de	Properties	vDisk vDisk	Demo StoreWVindow Demo StoreWVindow	Down 172.31.250	P√SDE
🅜 🛄 🕅 de	Disable Set Device as Template	VDISK	Demo Storewvindow	172.31.230	PYSDI
	Move				
	Audit Trail	_			
	Copy Device Properties				
	Boot				
	Active Directory		1achine Account		
	Сору		lachine Account achine Account Password		
	Select All	_		_	
	Delete				
	Refresh	-			
	Help				

#### FIGURE 7.30

Target Device Active Directory actions.

## Assign a vDisk to the Base Target Device

The vDisk is at present blank, and as such we need to boot the virtual machine from the existing hard drive, such that we can copy the existing hard drive contents to the vDisk.

- 1. Right-click on the vDisk, and select Properties.
- 2. Change the Boot from option to "Hard Disk" as shown in Figure 7.31.

In order to attach the vDisk to the existing virtual machine running on the hypervisor, the boot order of the virtual machine needs to be changed to boot from the network.

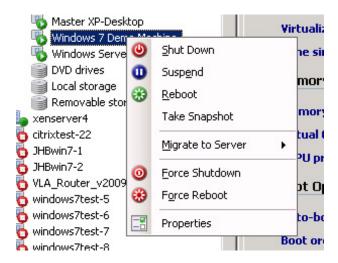
## XenServer

- 1. From the XenCenter Console, right-click and select Properties (see Figure 7.32).
- **2.** Select **Startup Options** (see Figure 7.33).
- **3.** Select **Network** in the right-hand pane, and "Move Up" to the top of the list, and then click **OK**.
- **4.** Reboot the virtual machine.

Target Device Pro	perties 🔀
General vDisks	Authentication Personality PortBlocker Status Logging
Name:	Demo
Description:	
Class:	
Boot from:	Hard Disk
MAC:	66 - CF - CA - 8E - 0C - 52
Port:	6901 📑
🗖 Disable th	is device
	OK Cancel Help

#### FIGURE 7.31

Target Device properties.



Virtual machine menu.

'Win	dows 7 Demo Machine' Properties		? ×
-0	General Windows 7 Demo Machine	Startup Options	
٩	Custom Fields <none></none>	Auto-start on server boot	
	CPU and Memory 1 VCPU(s) & 1024 MB RAM	Boot Order:	
٩	Startup Options Boot order: DVD-Drive, Hard Dis	Network Move Up	
▲	Alerts None defined	Hard Disk VM will not boot from devices below this line Move Down	n
V	High Availability HA is not currently enabled for p		
	Home server xenserver3		
ġ,	Advanced Options Optimize for general use		
70.4		<u>OK</u> <u>C</u> an	cel



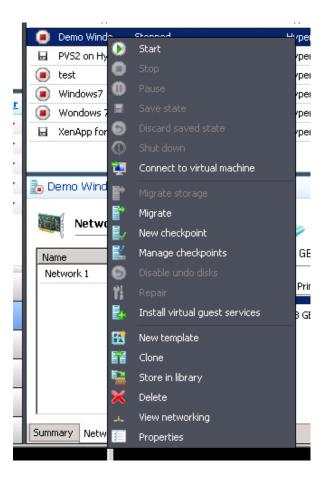
Startup options.

## SCVMM

- 1. Right-click on your virtual machine, select Properties (see Figure 7.34).
- **2.** Select the **Hardware Configuration** tab in the left-hand pane, select **BIOS**, and use the **UP** button to move PXE Boot to the top (see Figure 7.35).
- **3.** Reboot the virtual machine.

## VMware

- 1. Open the vSphere Client, select the virtual machine in the left-hand pane, and click Edit virtual machine settings in the right-hand pane (see Figure 7.36).
- **2.** Select the **Options** tab, select **Boot Options**, and then select the **Force BIOS Setup** check box (see Figure 7.37).
- **3.** Boot the virtual machine.

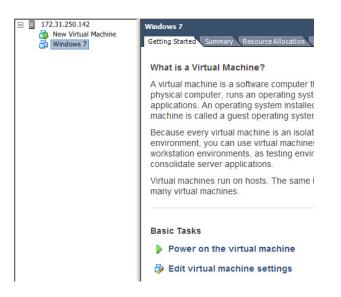


#### FIGURE 7.34

Virtual machine menu.

I Hardware Conferentian		
ieneral Hardware Configuration	Checkpoints Custom Properties Settings Action	ins
New: 🚙 Disk  SCSI Adapte	r 🝰 DVD 🔯 Network Adapter 🛛 🔀 Remove	
★ Hardware Profile ▲ ▲ BIOS	👰 BIOS	
PXE Boot Processor (1) 1.20 GHz At Memory 2048 MB	Startup order: PXE Boot CD IDE Hard Drive Floppy	Up Down
Floppy Drive No Media Capt COM 1 None	Enable Num Lock	
None  Bus Configuration  DE Devices 2 Devices attac Demo Wind		
25.00 GB, Virtual DVD xd4.iso		
Network Adapte     Connected to B     Advanced		
All services offe		
		OK Cano

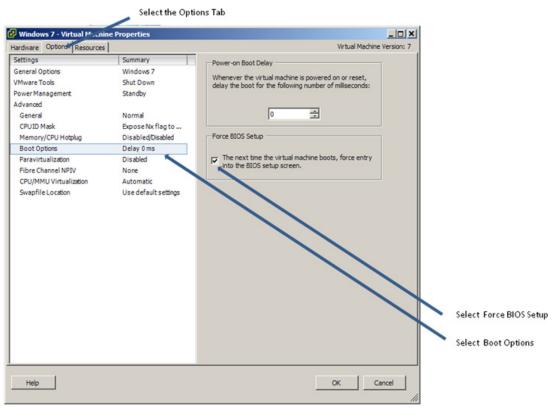
Hardware configuration - BIOS.





Virtual machine settings.

## 218 CHAPTER 7 Fundamental Configuration of the Citrix Provisioning Server



#### FIGURE 7.37

Virtual machine properties.

- **4.** Use the arrow keys to tab to the Boot menu. Use the arrow keys to select the network card, and use the + key to move the network card to the top of the list. Use **F10** to Save and Exit (see Figure 7.38).
- 5. Hit Enter or move to highlight Yes to confirm (see Figure 7.39).

#### All Hypervisors

The boot screen of your virtual machine should show the network card attaching to the PXE boot server and downloading the ardbp32.bin file (see Figure 7.40).

Common Errors

No Entry found in database for device	The MAC address entry on the provisioning server doesn't match the virtual machine
Invalid Boot Sector	The virtual machine is trying to boot from a blank vDisk, change the boot selection on the provisioning server to "Hard Disk"

Ma	in Adv		oenixBIOS arity	Setup Boot	Utility Exit	
	Network h	oot from Inte	1 F1000			Item Specific Help
	*Removable *Hard Driv CD-ROM Dr	Devices e				Keys used to view or configure devices: <enter> expands or collapses devices with a + or - <ctrl+enter> expands all <shift +="" 1=""> enables or disables a device. &lt;+&gt; and &lt;-&gt; moves the device up or down. <n> May move removable device between Hard Disk or Removable Disk <d> Remove a device that is not installed.</d></n></shift></ctrl+enter></enter>
F1 Esc	Help †↓ Exit ↔				Values ► Sub-Me	

BIOS menu.



#### FIGURE 7.39

Setup confirmation.

#### FIGURE 7.40

Downloading the boot file through TFTP.

# Install the Target Device Software – Step by Step

In order to copy the hard disk of your virtual machine to the provisioning server vDisk, the provisioning server Target Device client must be installed on the virtual desktop.

- **1.** Mount the provisioning server DVD (or ISO) to your virtual desktop. If it doesn't autorun, launch the autorun from the DVD.
- 2. Click Target Device Installation (see Figure 7.41).
- **3.** Select Target Device Installation (see Figure 7.42).
- **4.** Click **Install** (see Figure 7.43).
- **5.** Click Next (see Figure 7.44).
- 6. Toggle the radio button to accept the license agreement, and click Next (see Figure 7.45).
- 7. Enter a user name and organization details, click Next (see Figure 7.46).
- 8. Click Next (see Figure 7.47).

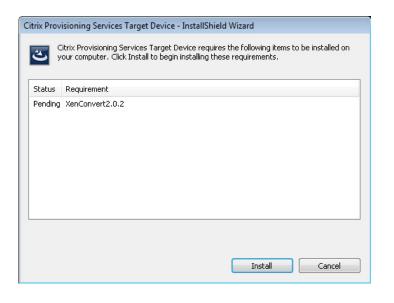
Server	le Installation Installation				
Target				- 1	
	Device Installs				
Holp a	Device motum	ation			
	and Support				
	wse DVD		🔞 E <u>x</u> it		
Install the Tar	get Device.				



Provisioning services installation.

<b>CİTR</b> İX.	Provi	sioning Services	
	Target Device Installation		
	<u>Back</u> I the Target Device.	Exit	

Target Device installation.



## FIGURE 7.43

Target Device installation requirement.



Installation welcome.

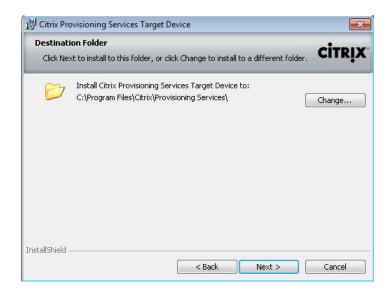
License Agreement	
You must view the entire license agreement in order to continue.	CITRIX
CITRIX <sup>®</sup> LICENSE AGREEMENT	*
This is a legal agreement ("AGREEMENT") between you, the Lice Citrix Systems, Inc., Citrix Systems International GmbH or Citrix Syst Pty Ltd. Your location of receipt of this product or feature release ( "PRODUCT") or technical support (hereinafter "SUPPORT") providing entity hereunder (the applicable entity is hereinafter "CITRIX"). Citrix Systems, Inc., a Delaware corporation licenses th the Americas and Japan and provides SUPPORT in the Americas International GmbH, a Swiss company wholly owned by Citrix Syster this PRODUCT and provides Support in Europe, the Middle Ex	ems Asia Pacific both hereinafter determines the referred to as is PRODUCT in . Citrix Systems ns, Inc., licenses
<ul> <li>I accept the terms in the license agreement</li> </ul>	Print
$\bigcirc$ I do not accept the terms in the license agreement	
istallShield	

### FIGURE 7.45

License agreement.

😸 Citrix Provisioning Services Target Device	
Customer Information	citrux.
Please enter your information.	CIIRIX
User Name:	
demo pc	
Organization:	
Install this application for:	
Anyone who uses this computer (all users)	
Only for me (demo pc)	
InstallShield	
< Back Nex	t > Cancel

Customer information.



### FIGURE 7.47

Destination folder.

😸 Citrix Provisioning Services Target De	vice		<b>—</b> ×
Ready to Install the Program			CITRIX
The wizard is ready to begin installation.			CIIRIX
Click Install to begin the installation.			
If you want to review or change any of exit the wizard.	your installation	settings, click Back. (	Click Cancel to
InstallShield			
דו וצרמויסו וופוט	< Back	Install	Cancel
	1966 - Carl I.		

Ready to install.

```
9. Click Install (see Figure 7.48).
```

**10.** Click **Finish** (see Figure 7.49).

If the virtual desktop is being presented with more than one Network Interface by the hypervisor, you will need to deselect the adapter marked inactive, and then click **OK** (see Figure 7.50).

### **HYPER-V**

If you created two network adaptors, one synthetic and one legacy, select the adaptor marked as (Emulated) for the provisioning server to bind to. If you want to execute this utility manually, it can be found on the virtual desktop under C:\Program Files\Citrix\Provisioning Services\BindCfg.exe.

**11.** Click Format disk (see Figure 7.51).

**12.** Click **Start** (see Figure 7.52).

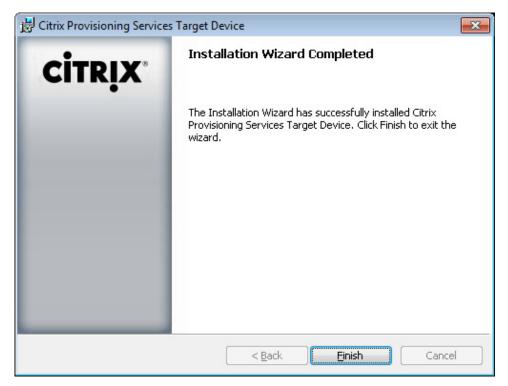
The disk you are now formatting is the vDisk that has been mounted to your virtual desktop through the network card.

**13.** Click **OK** (see Figure 7.53). **14.** Click **OK** (see Figure 7.54).

Your vDisk should now appear in the bottom right-hand corner in the task bar (see Figure 7.55).

### TIP

Windows 7 hides these icons by default, change the Notification Area to "Show icon and notifications" for vDisk status.

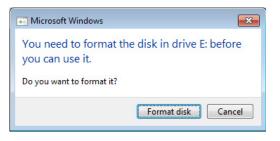


Installation wizard completed.

Provisioning Services Network Interface	is connected to ya	ur Provisioning Services	network.
All selected network interfaces should Adapter Description	d be in the same IF	IP Address	
Realtek RTL8139C+ Fast Ethernet NIC Citrix XenServer PV Ethernet Adapter	inactive 66 CF CA 8E 0C 52	172.31.250.130	
	ОК		

#### FIGURE 7.50

Selecting the Network Interface for use by provisioning server.



Format disk.

Format Local Disk (E:)
Capacity:
24.4 GB 🔹
File system
NTFS (Default)
Allocation unit size
4096 bytes 💌
Volume label
Format options
Quick Format Create an MS-DOS startup disk
Start Close



Format local disk.



Format local disk – warning.

FIGURE 7.54

Format local disk – completed.

Virtual Disk Status		
Exit		3:08 PM
	2 😼 📮 🕪	1/28/2010

## FIGURE 7.55

vDisk taskbar icon.

The vDisk status shows the provisioning server that the virtual desktop is connecting to and the mode the disk is currently in. The **Statistics** tab shows information about the read/write to the vDisk (see Figure 7.56).

# Copy the Target Device Hard Drive to the vDisk – Step by Step

- 1. Click Start | All Programs | Citrix.
- 2. Select XenConvert | XenConvert 2.0 (see Figure 7.57).
- 3. Click Next (see Figure 7.58).
- 4. Click Optimize (see Figure 7.59).

This will clean up and tweak the build before we copy it to the vDisk. The optimizations shown in Figure 7.60 are the best practice settings for a virtual desktop.

## TIP

Some organizations use two logical drives as part of their standard build – OS and Applications, for example. You can choose to include or exclude the extra volumes.

- 5. Click OK.
- 6. Then click Next.
- 7. Click Convert (see Figure 7.61).
- 8. Click Yes (see Figure 7.62).
- **9.** Click **Finish** (see Figure 7.63).

The Log button is a shortcut to the installation log file. This is useful when troubleshooting.

🖷 Virtual Disk Status	×
General Statistics	
Virtual Disk Informa	ation
Status:	Active
Server:	172.31.250.195 : 6922
Boot From:	Local Hard Drive
Virtual Disk:	Windows7Demo
Mode:	Private Image
Build 2950	ices Version 5.1 SP 1 -2009 Citrix Systems, Inc. All rights reserved.
Preferences Prompt status Show icon in 5	message in System Tray

vDisk status dialog box.





XenConvert menu item.

Citrix XenConvert 2.0.2	
	Welcome to Citrix XenConvert. This wizard will step you through the conversion of a workload for use with a XenServer or Provisioning Services.
	From This Machine (demo7)
	To Provisioning Services vDisk
CITRIX	
	<pre>&lt; Back Next &gt; Cancel Help</pre>

XenConvert workload type.

Citrix XenConvert 2.0.2					×
	-Choose up to four volumes to conver Volumes	t Usage %	Usage (GB)	Capacity (GB)	File System
	C: •	68 %	6.80	9.90	NTFS
	None				
	None				
	None				
	Provisioning Services vDisk	27 %	6.80	24.41	
CITRIX	Empty Recycle Bin     Log copied files	Optimize			
		< Back	Next >	Cance	el Help

## FIGURE 7.59

XenConvert - choose volumes.



Provisioning services device optimization tool.

Citrix XenConvert 2.0.2			×
		Convert This Machine to Provisioning Services vDisk.	
So	urce	C:	
De	estination	Provisioning Services vDisk	
	atus	Ready to Start	
Pr	ogress		
The second second			
CITDIX.			
CITRIX			
		A Back Convert Cancel Help	



XenConvert - convert.



XenConvert - erase warning.

Citrix XenConvert 2.0.2		
		Convert This Machine to Provisioning Services vDisk.
Sou	urce	C:
Des	stination	Provisioning Services vDisk
Sta	itus	Conversion was successful!
Pro	gress	
<b>CITRIX</b>		
		< Back Log Finish Help

### FIGURE 7.63

Conversion was successful.

**10.** Now that the disk has been duplicated to the vDisk, shutdown the Base Target Virtual Desktop. The Base machine currently has exclusive access to the vDisk as it is in "Private Mode."

## TIP

Remember to set the "Idle Pool" to zero, or the Desktop Delivery Controller will keep restarting the virtual desktop.

## **Remove Locks on the vDisk**

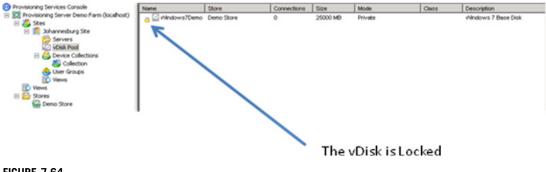
The mode of a vDisk can only be changed when there are no locks on the vDisk. A lock is registered by the provisioning server to indicate that the vDisk is in use. A clean shutdown of a virtual desktop mapped to a private mode vDisk will automatically remove the locks.

If a vDisk is in use, a padlock icon is displayed next to the vDisk (see Figure 7.64).

## **Removing Locks**

If a virtual machine hasn't shut down gracefully, or is showing locks erroneously, they can be manually removed.

- 1. Right-click on the vDisk and select Manage Locks... (see Figure 7.65).
- 2. Click Yes (see Figure 7.66).
- **3.** Click **Remove Locks** (see Figure 7.67).
- 4. Click Close.



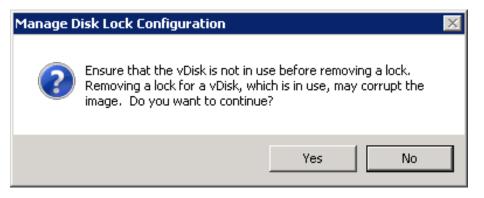
#### FIGURE 7.64

Locked vDisk.

a 🗐 Windows7Demo	Demo Store	c 350001 Properties Show Usage Manage Locks Unassign from Selected Device(s) Unassign from All Site Devices Unassign from All Site User Group(s Unassign from All Site User Groups Copy vDisk Properties Audit Trail	
		Copy Select All Refresh Help	

#### FIGURE 7.65

vDisk options menu.



Manage disk lock configuration.

Manage vDisk Locks	×
vDisk: vmhosted	-
Device: vmhostedapps1 Exclusive	
	I
	I
	I
	I
	I
Select all Clear all Remove Locks	
Close Help	

### FIGURE 7.67

vDisk locks.

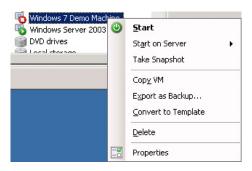
# Mount the vDisk to a Test Virtual Desktop

In this section, we will mount the vDisk to new diskless virtual machines. Open the Management Console for your hypervisor:

## XenServer

The easiest way to create a second machine with the same settings as your base Target Device is to clone the base Target Device.

- 1. Right-click on the base Target Device and select Copy VM (see Figure 7.68).
- 2. Click Copy (see Figure 7.69).



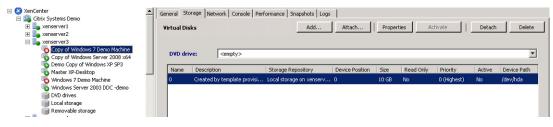
#### FIGURE 7.68

Virtual machine menu options.



### FIGURE 7.69

Copy virtual machine.



Virtual machine - Storage.

Delete system disk	×
This action will delete a system disk from the VM whic	h may leave it unbootable. Would you like to continue?
Yes	No

### FIGURE 7.71

Delete system disk.

**Fast clone** is the best option – this is just a pointer to the original hard disk. The **Fast clone** is almost instant.

- **3.** Select the **Storage** tab of the new VM and click **Delete** to delete the disk (see Figure 7.70).
- 4. Click Yes (see Figure 7.71).
- 5. Select the Network tab and copy the MAC address.

## TIP

Clicking **Properties** on the **Network** tab, and changing the radio button to Manual, gives you the ability to "cut and paste" the MAC address for later use.

6. Repeat the process to create a second diskless virtual desktop.

## SCVMM

- 1. Open SCVMM.
- 2. On the right-hand pane select New virtual machine (see Figure 7.72).
- **3.** Change the radio button to **Create the new virtual machine with a blank virtual hard disk** and click **Next** (see Figure 7.73).

Give your VM a name in the virtual machine name field, and click Next (see Figure 7.74).

- 4. Select BIOS and move "PXE Boot" to the top (see Figure 7.75).
- 5. Check the Network Adapter make sure it is "Emulated" and not "Synthetic."
- 6. Select the Hard Disk under Bus Configuration, and click Remove (see Figure 7.76).

🗄 Virtual Machine Manager - Hy	per¥.c	itrixsa.net						
File View Go Actions H	elp							
🔁 Actions 💷 Columns 🗏 Jobs	PR	:O Tips (0) 👍 N	etworking 🛛 🔼 Po	owerShell 🔞 H	elp			
Virtual Machines	All	Hosts Virtua	l Machines (10)					Actions ×
Host Groups	Searc	h				🔎 💌 None	-	Virtual Machine Manager 🛛 🔺 🗖
Overview		Name 🔺	Status	Job Status	Host	Owner	CPU Average	New virtual machine
🖬 📑 All Hosts	ы	7onhyperv1	Saved State		HyperV	CITRIXSA\A	0%	Convert physical server
	•	7onhyperv2	Saved State		HyperV	CITRIXSA\A	0%	
		7onhyperv3	Stopped		HyperV	CITRIXSA\A	0%	Convert virtual machine
	ы	DDC on Hyperv	Saved State		HyperV	CITRIXSA\A	0%	🚔 Add library server
		Demo Windo	Stopped		HyperV	CITRIXSA\A	0%	Add host
	H	PVS2 on Hyp	Saved State		HyperV	CITRIXSA\A	0%	Add VMware VirtualCenter server
		test	Stopped		HyperV	CITRIXSA\A	0%	🔞 Help
		Windows7	Stonned		HyperV	Linknown	n %	

Virtual machine manager.

H New Virtual Machine	X
🗊 Select Sour	ce
Select Source Vitual Machine Identity Configure Hardware Select Destination Select Host Select Path Select Networks Additional Properties Summary	Select the source for the new virtual machine.         Image: Im
	Next Cancel

## FIGURE 7.73

Select source.

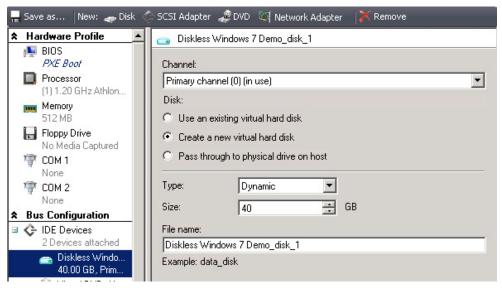
New Virtual Machine	hine Identity
Select Source	Vitual machine name:
Virtual Machine Identity	Diskless Windows 7 Demo
Configure Hardware	Owner:
Select Destination	CITRD/SAVAdministrator Browse
Select Host	Format: domain/username
Select Path	Description
Select Networks	
Additional Properties	
Summary	
	The vitual machine name identifies the vitual machine to VMM. The name does not have to match the computer name of the vitual machine. However, using the same name ensures consistent displays in System Center Operations
	Managet.  Previous Next Cancel

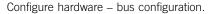
Virtual machine identity.

	12 DIO2	
👰 BIOS		
PXE Boot	Startup order:	
Processor	PXE Boot	Up
(1) 1.20 GHz Athlon	CD	
mm Memory	IDE Hard Drive	Down
512 MB	Floppy	
Floopy Drive		
Floppy Drive No Media Captured		
👘 СОМ 1	Enable Num Lock	
	I I Enable Num Lock	



Configure hardware – BIOS.





🗄 New Virtual Machine	×
🗊 Select Destin	ation
Select Source Virtual Machine Identity Configure Hardware Select Destination Select Host Select Path Select Networks Additional Properties Summary	Choose whether to deploy or store the virtual machine.

### FIGURE 7.77

Select destination.

- 7. Click Next.
- 8. Click Next (see Figure 7.77).
- 9. Click Next (see Figure 7.78).
- 10. Click Next (see Figure 7.79).

🖪 New Virtual Machine					
🗊 Select Host					
Select Source Virtual Machine Identity Configure Hardware Select Destination Select Host Select Host Select Networks		he virtual machine. the virtual machine's requirement customize Ratings. Host Host HyperV.citrixsa.net	, P , In   All   Tr		ement options for
Additional Properties Summary	<ul> <li>Details</li> <li>Details Rating Explan</li> </ul>	nation () SAN Explanation	What do these ratings i	mean? Custo	omize Ratings
	Description Status Operating system Virtualization softwar Virtualization softwar Virtual machines	re Microsoft Hype re status Up-to-date 7onhyperv1, 7	ndows Server® 2008 Datacente r-V onhyperv2, 7onhyperv3, DDC o v, test, Windows7, Wondows 7,	n Hyperv, Demo	Windows 7,
			Previous	Next	Cancel



Select host.

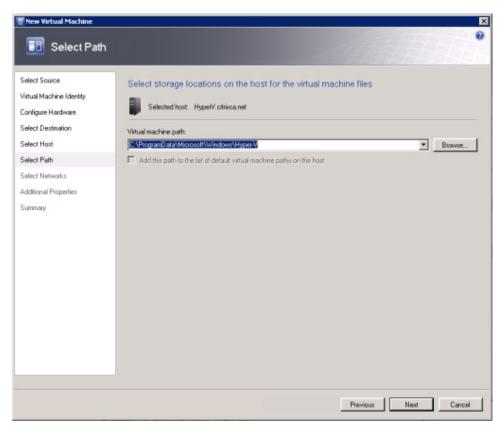
11. Select the network adapter from the drop-down list and click Next (see Figure 7.80).

By default no adapter is connected, so this needs to be changed.

- **12.** Click Next (see Figure 7.81).
- 13. Click Create (see Figure 7.82).

You will get a warning, which you can ignore (see Figure 7.83).

- 14. Right-click on your VM and select Properties | Hardware Configuration | Network Adapter (see Figure 7.84).
- 15. Change the Ethernet (MAC) address to Static, and click Generate to generate a MAC address.
- 16. Click OK.



Select path.

Select Source /irtual Machine Identity Configure Hardware	EN.	u <mark>al networks</mark> to HyperV.citrixsa.no	o use for the virtual	machine.
Select Destination	Physical Network A	Location	Network Tag	Virtual Network
Select Host	Network Adapter 1			- Broadcom NetXtreme Gigabit Ethernet #2
Select Path				
Select Networks				
Additional Properties				
Summary				

## FIGURE 7.80

Select networks.

B New Virtual Machine	X
Additional F	Properties
Select Source Virtual Machine Identity Configue Hardware Select Destination Select Host Select Path Select Networks Additional Properties Summary	Automatic start action Action when physical server starts: Never automatically turn on the virtual machine Delay start (Sec): Delay start (Sec): Seve State Cpervating system Specify the operating system you will install in the virtual machine: Windows Server 2003 Enterprise x64 Edition
	Previous Next Cancel

Additional properties.

# TIP

Copy the MAC address to a text file so you can use it later on provisioning server.

**17.** Repeat the process to create a second diskless virtual desktop.

## VMware

In order to create a diskless virtual machine on VMware vCenter, follow the same procedure as in Chapter 4, "Installing the Virtual Desktop." Alternatively, you could also right-click on your existing virtual machine, and select Clone to copy the virtual machine.

- 1. Right-click on the virtual machine, and click Edit Settings.
- 2. Select the Hard disk, and click Remove (see Figure 7.85).
- 3. Select Remove from virtual machine and delete files from disk, and click OK (see Figure 7.86).

New Virtual Machine		×
Summary		
Select Source	Review the virtual n	nachina sattings
Virtual Machine Identity	Summary:	naonino solungs.
Configure Hardware	Property	Value
	Virtual machine	Diskless Windows 7 Demo
Select Destination	Owner	CITRIXSA\Administrator
Select Host	Destination host	HyperV.citrixsa.net
Select Path	Path	C:\ProgramData\Microsoft\Windows\Hyper-V\Diskless Windows 7 Demo
Select Networks	Operating System	Windows Server 2003 Enterprise x64 Edition
Additional Properties		
Summary		
	Start the virtual maching	ne after deploying it on the host
	<ul> <li>To create the virtual</li> </ul>	machine, click Create. You can track progress of this job by viewing the Jobs page.
		Previous Create Cancel

Summary.



## FIGURE 7.83

Warning - virtual hard disks.

tual Machine Properties for I	Diskless Windows 7 Demo	
General Hardware Configuration	Checkpoints Custom Properties Settings Actions	
New: Disk SCSI Adap A Hardware Profile BIOS PXE Boot Processor (1) 1.20 GHz At Memory S12 MB Floppy Drive No Media Capt COM 1 None COM 2 None S02 MORE None DE Devices		
1 Device attach Vitual DVD No Media C Network Adapters Network Adapters. Connected to B Advanced Integration Servi All services offe Priority Normal Availability Mound	Ethernet (MAC) address Dynamic Current address: 00:00:00:00:00 Static 00:10:D8:B7:1C:00 Example: 00:00:00:00:00 OK Cancel	Static Generat



Network adapter.

## **Provisioning Server**

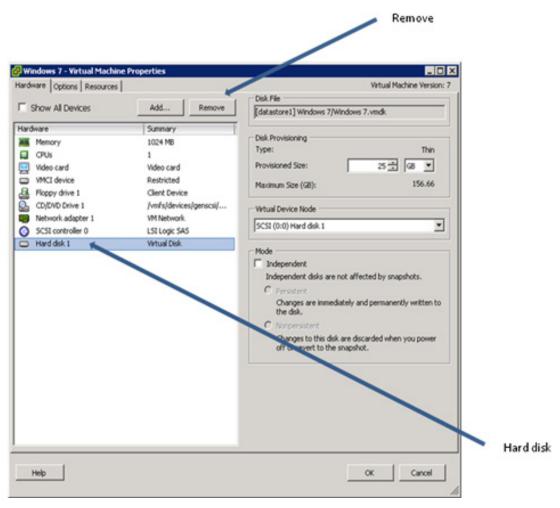
- 1. Connect to the provisioning server, and open the Provisioning Services Console.
- 2. Right-click on Device Collection and select Create Device Collection... (see Figure 7.87).
- 3. Assign your collection a name, and click OK (see Figure 7.88).
- 4. Right-click on your new collection, and select Create Device (see Figure 7.89).
- **5.** Enter a name in the Name field, and the MAC address in the MAC address field. Click **OK** (see Figure 7.90). Repeat this step for the second virtual desktop.

Important: The name will be used as the computer account name in Active Directory.

## TIP

To easily transpose the MAC address from the hypervisor, paste the MAC address you copied earlier into the Description field.

244 CHAPTER 7 Fundamental Configuration of the Citrix Provisioning Server

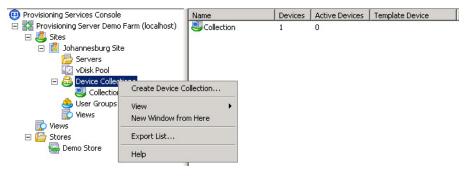


Virtual machine properties.



### FIGURE 7.86

Removal options.



Device Collection options menu.

Device Collection Properties	X
General Security Options	
Name: Demo Collection	
Description:	
Template target device:	
OK Cancel Help	

### FIGURE 7.88

Device Collection properties.

🧾 Demo Collection		
User Groups	Properties	
Views	Create Device	
	Audit Trail	
mo Store	Target Device	Þ
	View	Þ
	New Window from Here	
	Delete	
	Refresh	
	Help	

### FIGURE 7.89

Collection options menu.

Create Device
Name:
W7demo1
Description:
MAC: 0E - 89 - 63 - FF - 05 - 80
Apply the collection template to this new device
OK Cancel Help

Create device.

.11

Window7demo 0E 89 63 EE 05 8C	vDisk	Demo StoreWVindow	Down
Properties			
Disable			
Set Device as Template			
Move			
Audit Trail			
Copy Device Properties			
Boot			_
Active Directory	Create Ma	chine Account	
	Delete Mac	hine Account	
Сору	Reset Mad	nine Account Password	
Select All			_
Delete			
Refresh			
Help			

### FIGURE 7.91

Target Device options menu.

- **6.** Right-click on the device you have just added and select **Active Directory** | **Create Machine Account** (see Figure 7.91).
- **7.** You can select a domain, and an organizational unit, and click **Create Account** (see Figure 7.92).

As you can see from the example above, you can also select more than one object to create an account for.

The dialog box should return a status of success. Click Close.

Create Machine Ac	counts in a	Active Direc	tory	×
Create Machine Ad Domain: Organization unit: Devices: Target Device hyperv Window7demo	counts in /		Status	
Create Acco	ount	Stop	Close	Help

Create machine accounts in Active Directory.

Provisioning Services Console	Name	MAC	Booting From	vDisk	IP Address	Server	Description
🖃 🎇 Provisioning Server Demo Farm (localhost)	🥶 Mindow7demo	0E-89-63-FF-05-8C	vDisk	Demo Store Window	Down		0e:89:63:ff:05:8c
🖃 🔩 Sites 🖃 📴 Inhanneshurg Site	🛄 Windows7demo2	3E-2D-E7-50-A4-A0	vDisk		Down		3e:2d:e7:50:a4:a0
Servers							
🖃 🚭 Device Collections							
Collection							
🐣 User Groups							
E G Stores							
	1						

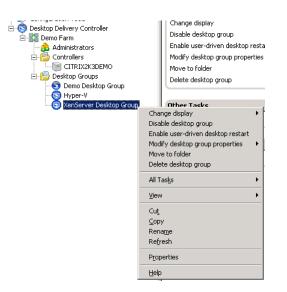


Device collection.

- 8. Your new virtual desktops should appear in the collection (see Figure 7.93).
- 9. Click vDisk Pool, select your vDisk, and drag it onto your collection.
- 10. Click Yes (see Figure 7.94).
- **11.** Start the VMs on your hypervisor.



Replace vDisk assignment.



#### FIGURE 7.95

Desktop Group options menu.

## NOTE

Only one will boot as the vDisk is in Private mode.

# Add the Virtual Desktop to the Desktop Group

You may choose to create a new Desktop Group, or you can add the virtual desktop to an existing Desktop Group.

- 1. Right-click on the Desktop Group and select Properties (see Figure 7.95).
- 2. In the left-hand pane, select Virtual Desktops, then click the Add... button (see Figure 7.96).

Basic     Desktop Group Name     Assignment Type	To select virtual desktops, click Add. Virtual desktops:					
<ul> <li>Hosting Infrastructure</li> <li>Users</li> </ul>	Virtual Machine	AD Computer Account	🗌 Add 🧲			
- Icon - Logon Information	Copy of Windows 7 Demo Machine Copy of Copy of Windows 7 Demo	Window/7demo.citrixsa.net Windows7demo2.citrixsa.net	Remove			
Advanced Access Control			<u></u>			
<ul> <li>Client Options</li> <li>Idle Pool Settings</li> <li>Logoff Behavior</li> </ul>						
			-			

Virtual desktop properties.

Window7demo.citrixsa.net Windows7demo2.citrixsa.net	Idle Not Registered	-	No No	

#### FIGURE 7.97

Virtual desktop state.

One of the virtual desktops should appear in the Delivery Services Console, with a Desktop State of *Idle*. The second will still be in a *Not Registered State* (see Figure 7.97) – in the next section, we will change the vDisk to "Standard Mode."

## TIP

If the new devices state is not Idle, refresh the view, if it remains in another state, check the event logs on the virtual desktop. Active Directory issues, computer account creation, and DNS issues, the virtual desktop resolving the address of the Desktop Delivery Controller, are the most common issues.

# Mount the vDisk to Two Virtual Desktops Simultaneously

In the previous section, you mounted a vDisk to a single virtual desktop. We will now take the second diskless virtual desktop you created and mount the same vDisk to that virtual desktop.

Construction Constructions In		(		(			(	
	Name	Store	Connections	Size	Mode		Class	Description
<ul> <li>Provisioning Services Console</li> <li>Provisioning Service Demo Farm (localhost)</li> <li>Services</li> <li>Shanesburg Site</li> <li>Services</li> <li>Services</li> <li>Service Collections</li> <li>Collection</li> <li>User Collection</li> <li>User Collection</li> <li>User Collection</li> <li>User Collection</li> <li>User Collection</li> <li>Services</li> <li>Stress</li> <li>Stress</li> <li>Stress</li> <li>Stress</li> <li>Services</li> </ul>	Name	Store Demo Store	0 0	Size 25000 MB	Mode Private	Unassign fi Unassign fi Unassign fi	k ie cks rom Selected Devic rom All Site Devic rom Selected Use rom All Site User : Properties	er Group(s)
						Help		

vDisk pool.

1. Shut down both virtual desktops.

### TIP

Make sure the Idle Pool Setting is set to zero – otherwise the Desktop Delivery Controller will just keep starting the virtual desktops.

2. Open the Provisioning Services Console – select vDisk Pool, right-click on your vDisk, and select Properties (see Figure 7.98).

## TIP

If there is a padlock next to the vDisk, see earlier in this chapter to remove the locks.

- **3.** Click Edit File Properties... (see Figure 7.99).
- **4.** Select the **Mode** tab, select **Access mode** and change it to **Standard Image**, click **OK**, and click **OK** again to close the vDisk properties (see Figure 7.100).

Cache type can be left at "Cache on server disk" – see the "Design Decisions" section for placement.

## TIP

Hit **F5** in the console to refresh the display.

Open a connection to the Desktop Delivery Controller; modify the Idle Desktop Count to two virtual desktops. For the procedure, see Chapter 5, "Desktop Delivery Controller – Advanced Configuration Settings."

You may need to restart the virtual desktops to acquire their new vDisk assignment if they are hung at the PXE boot screen.

vDisk Properties 🛛 🗙								
General Port Blocker								
Store:		Demo Store						
Site:		Johannesburg Site						
Filename:		Windows7Demo						
Description:								
Win	Windows 7 Base Disk							
BIO	BIOS menu text (optional):							
Load Balancing A load balancing algorithm may be used to provide the vDisk to the target devices or a single server may be used.								
	O Use the load balancing algorithm							
	Use this server to provide the vDisk							
	Server: CITRIXPVS							
	Allow use of th	this vDiskEdit File Properties	]					
		OK Cancel Help						

vDisk Properties.

## Checkpoint 3 – Booting Two VMs from a vDisk

In this demonstration, you can demonstrate the connection to two virtual desktops, which are booting from a single vDisk over the network.

This demonstration is applicable to a technical and management audience.

1. Open the Hypervisor Console, and navigate to view the disk attached to the virtual desktop:

## XenServer

Open the Storage tab of both virtual desktops and show how there is no disk attached (see Figure 7.101).

## SCVMM

Open the **Properties** of the virtual machine, select **Hardware Configuration**, indicate under Bus Configuration that there is no hard drive attached (see Figure 7.102).

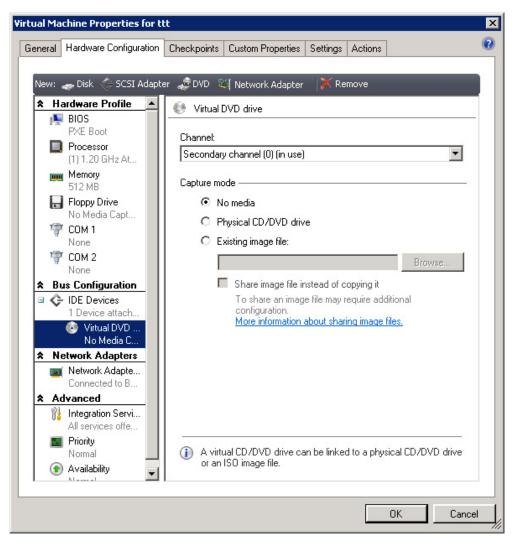
vDisk File Properties 🛛 🗙							
General Mode Identification Options							
Access mode Access Mode: Standard Image (multi-device, write-cache enabled)							
Cache Type: Cache on server disk							
Cache Size (MBs): 32 🚔							
Automatic updates  Enable automatic updates for this vDisk  Apply vDisk updates as soon as they are detected by the server  Description of the server  Descr							
C Schedule the next vDisk update to occur on: 2010/01/29							
OK Cancel Help							

vDisk file properties.

Copy of Copy of	of Windows 7 Den	no Machine					Logged in as:	Local root accou
neral Storage Net	work Console Perfo	mance   Snapshots   Logs						
'irtual Disks		Add	Attach	Propert	ties Act	ivate	Detach	Delete
DVD drive:	<empty></empty>							•
Name Descriptio	n	Storage Repository	Device Position	Size	Read Only	Priority	Active	Device Path

## FIGURE 7.101

Virtual desktop Storage tab on XenServer.



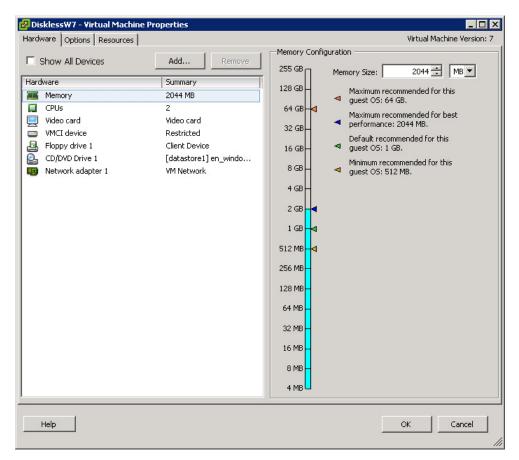
Virtual desktop bus configurations on Hyper-V.

## VMware

Edit the virtual machine properties of the virtual desktop. On the **Hardware** tab indicate how no disk is attached (see Figure 7.103).

## All Hypervisors

- 2. Open the Provisioning Services Console <YOUR> Farm I Sites I <YOUR> Site I vDisk Pool and right-click on your vDisk (see Figure 7.104).
- 3. Click Show Usage....



Virtual desktop Hardware tab.

Name	Store	Connections	Size	Mode	Class	Description	
😑 🔤 Windows7Demo	Demo Store	2	25000 MB	Cache on Server		Windows 7 Base Disk	Properties Show Usage Manage Locks Unassign from Selected Device(s) Unassign from All Site Devices Unassign from Selected User Group(s) Unassign from All Site User Group(s) Copy vDisk Properties Audit Trail
						-	Copy Refresh Help

## FIGURE 7.104

vDisk options menu.

- 4. The dialog box shows how two Target Devices are using the vDisk (see Figure 7.105).
- **5.** Open Windows Explorer on the provisioning server and show the folder where the WriteCache is stored (see Figure 7.106).

This shows how the "uniqueness" is saved outside of the vDisk.

- **6.** Connect to the Desktop Delivery Controller Open the Delivery Services Console, and display the Virtual Desktop Group that you have created (see Figure 7.107).
- 7. Open the Web Interface HTTP://<IP Address or hostname of the Desktop Delivery Controller>.

The connect will follow the same process you followed in the Milestone 1 Demonstration.

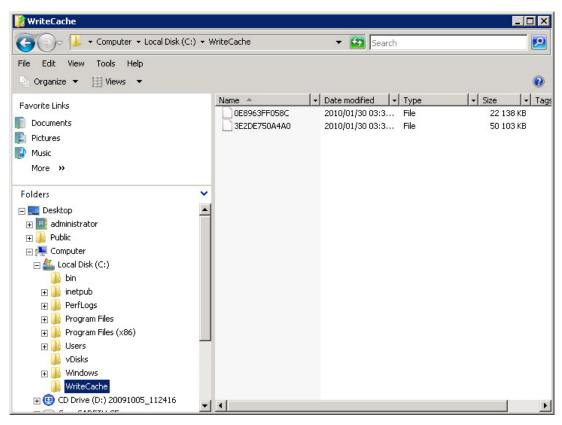
Show how the desktop state changes to *In Use* when a desktop is connected (see Figure 7.108).

I have noticed that a lot people only really "get it" when they see that the virtual desktop has no disk assigned.

Show vDisk usage vDisk: Windows7Demo				×		
Target Device Window7demo Windows7demo2	Device IP 172.31.250.151 172.31.250.153	Server IP 172.31.250.195 172.31.250.195	Server Port 6924 6923	Retries		
Shutdown Reboot Message Select all Clear all Refresh						
Target devices connected 2 Close Help						

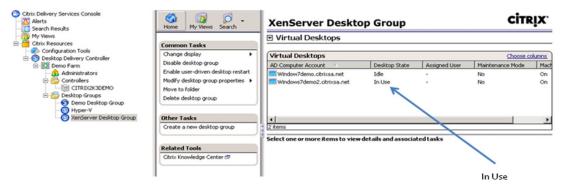
#### FIGURE 7.105

Show vDisk usage.



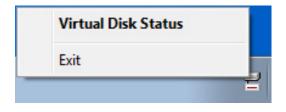
#### FIGURE 7.106

WriteCache files.



#### **FIGURE 7.107**

Virtual desktops - desktop state.



#### FIGURE 7.108

vDisk taskbar icon.

😾 Virtual Disk Status			<b>×</b>
General Statistics			
Boot Statistics			
Boot Time:	13	seconds	
Retries	0		
Bytes Read:	94,558	KB	
Bytes Written:	2,863	KB	
Throughput	7,493	KB/sec	
Session Statistics			
Uptime:	45:00		
Retries:	0		
Bytes Read:	384,011	KB	
Bytes Written:	65,904	KB	
Diagnostic Statistics			
Uptime:	45:00		Reset
Retries:	0		
Bytes Read:	384,011	KB	
Bytes Written:	65,904	КВ	

#### FIGURE 7.109

vDisk Statistics tab.

#### TIP

As an extra little demo, show live migration of the virtual desktop on the hypervisor, while you are logged on to it. The provisioning server is in effect acting as shared storage, so this can be done even if you have no SAN or iSCSI!

#### **Network Traffic**

If the question about network traffic arises – which it most certainly will if the network administrator is present – then right-click on the vDisk in the Notification Area on you virtual desktop.

Select Virtual Disk Status (see Figure 7.108).

Select the Statistics tab (see Figure 7.109).

You can show how much traffic has traversed the network due to the vDisk. In the case above, roughly 380 MB have been read, and 65 MB have been written in 45 min.

It takes roughly 70 to 80 MB to load the kernel of a Windows operating system over the network, thereafter the vDisk activity will be on demand.

## **SUMMARY**

The previous chapter dealt with the installation of Citrix Provisioning Server, this chapter dealt with the creation of a vDisk and collections of Target Devices using Citrix Provisioning Server. We defined the "vDisk Store" to host the vDisk. We then created the "blank" vDisk. The vDisk was then mounted to an existing virtual desktop. The virtual desktop's drive contents were then copied to the vDisk. The vDisk was then mounted to other Target Devices, and they were booted from the vDisk. Lastly we covered the details of how to perform a demonstration of booting virtual desktops from the vDisk.

## Additional Provisioning Server Configuration Settings

8

#### INFORMATION IN THIS CHAPTER

- Provisioning Server Configuration Programs
- Configure Server Settings
- Active Directory
- Configure Site Settings
- Using the Provisioning Services Boot Device Manager Step by Step
- Adding a Disk for Write Cache

The Citrix Provisioning Server is a large topic that probably deserves a book in its own right. In this book, we only look at those aspects that are commonly required when using it in conjunction with XenDesktop.

This chapter covers some additional useful settings. Particular note should be taken of the Active Directory settings, without which XenDesktop may not correctly function.

## **PROVISIONING SERVER CONFIGURATION PROGRAMS**

The configuration programs are under **Start Menu | Programs | Citrix | Provisioning Services** (see Figure 8.1).

The Provisioning Services Boot Device Manager is used in situations where PXE (Preboot Execution Environment) and/or Dynamic Host Configuration Protocol (DHCP) are not available to be used. This can be particularly useful in a proof of concept environment where DHCP is not available to be used in the datacenter. The use of DHCP is often restricted on networks. Care should also be taken with PXE that there are no clashes with other PXE services running. Microsoft SMS and Altiris Deployment Server are two examples of other programs that use PXE. The .ISO files can be used to provide the network location of the provisioning server, as well as to assign an IP address to the virtual desktop.

The Provisioning Services BOOTPTAB Editor can be used to manually edit the PXE boot file. It is not the recommended method of editing the boot file. The recommended mechanism to edit the boot file is to rerun the Provisioning Services Configuration Wizard, which will automatically make the changes to the file. 🙂 Provisioning Services Boot Device Manager

- Provisioning Services BOOTPTAB Editor
- Provisioning Services Configuration Wizard.
- 😐 Provisioning Services Console

#### FIGURE 8.1

Provisioning server configuration programs.

The Provisioning Services Configuration Wizard runs automatically as part of the provisioning server installation. It can also be run manually post-installation to correct or change any of the configuration settings.

The Provisioning Services Console is the primary management tool for Citrix Provisioning Server.

## **CONFIGURE SERVER SETTINGS**

The server settings are configured from the **Servers** node. Open the Provisioning Services Console, and select the **Farm | Sites | <Your Site> | Servers** (see Figure 8.2).

Provisioning Services Console			
🔨 File Action View Window Help			_B×
🗢 🔿 🖄 🖬 🛛 🖬			
Provisioning Services Console  Provisioning Server Demo Farm (localhost)  Servers Volsk Pool  Collection User Groups Views Views Views Demo Store	Cop Mai Shr Cor Cor Che Auc	resh	

#### FIGURE 8.2

Configure server properties.

Right-click on the server to amend the server settings. Select the Properties option.

The Stream Service can also be configured from the option list. Select **Stream Service** to stop or restart the **Stream Service**.

Rebalance devices will manually perform load balancing across multiple provisioning servers. This can be useful if you shut down a provisioning server, and if you have multiple provisioning servers, they will take over the vDisk loads from the one that is shut down. Provisioning server won't automatically rebalance the load back to the server if it restarts. The manual rebalance can be used in this instance.

## **ACTIVE DIRECTORY**

The Active Directory integration is set on the vDisk as described in Chapter 7, "Fundamental Configuration of the Citrix Provisioning Server." The server settings must also be configured to allow this to correctly function.

Select **Properties** to configure the server (see Figure 8.2).

Select **Enable automatic password support** (see Figure 8.3). As per Chapter 4, "Installing the Virtual Desktop," the password change will be initiated by provisioning server. The Active

Server Properties X
General Network Stores Options Logging
Enable automatic vDisk updates
Check for new versions of a vDisk
Check for incremental updates to a vDisk
Check for updates daily at: 12:00:00 AM 📑
Active Directory
Enable automatic password support
Change computer account password every this number of days: 7
Advanced OK Cancel Help

#### FIGURE 8.3

Enabling automatic password support.

Directory initiated changes are disabled through **Policy: Domain member: Disable machine** account password changes.

## **CONFIGURE SITE SETTINGS**

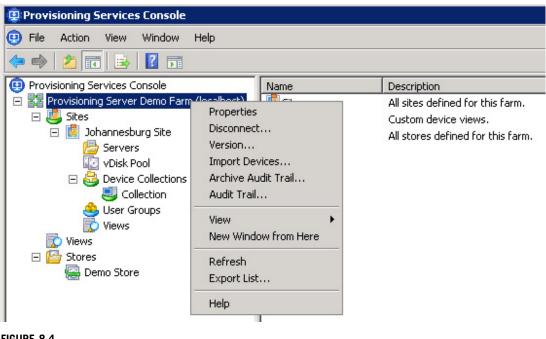
Right-click on the farm node, select **Properties** (see Figure 8.4).

The **General** tab is purely informational. The **Security** tab enables security to be delegated to specific groups (see Figure 8.5). In order to add these groups, they must first be added on the **Groups** tab. Security can be configured at the farm, site, and collection levels, but the groups available to be assigned can only be configured at a farm level.

The **Licensing** tab (see Figure 8.6) enables you to amend the license server settings. There are two types of licenses: Desktop and Datacenter licenses. Datacenter licenses are used by server operating systems, and desktop licenses are used for Windows XP and Windows 7 desktops.

Select the **Options** tab (see Figure 8.7). The **Auto-add** feature allows a user booting a device through PXE to select a vDisk without the MAC address being prepopulated. This is useful and can be particularly useful in non-VDI environments, but is disabled by default for security reasons.

**Auditing** is disabled by default. This allows tracking of actions performed in the Provisioning Server Console.



#### FIGURE 8.4

Configure farm properties.

Farm Pro	operties	×
General	Security Groups Licensing Options Status	
	oups with 'Farm Administrator' access:	
citris	ixsa.net/Builtin/Administrators	
	Add Remove	
	OK Cancel Help	

Farm security settings.

Farm Properties	×
General Security Groups	Licensing Options Status
License server name: License server port:	citrix2k3demo.citrixsa.net 27000
	OK Cancel Help

## FIGURE 8.6

Farm license settings.

Farm Properties	×
General Security Groups Licensing Options Status	
Auto-Add  Enable auto-add  Add new devices to this site:  Johannesburg Site  Note: A collection with a template target device must be specified for the site where the auto-add will take place.  Auditing  Enable auditing	
Offline database support  Enable offline database support  OK Cancel Help	

Provisioning server farm options.

**Offline database support** – is an important new feature, this allows the provisioning server to continue to be accessible even if the SQL database is unavailable. It does this by using a cached copy of the database.

#### TIP

Enable offline database support when designing for disaster recovery and business continuity.

## USING THE PROVISIONING SERVICES BOOT DEVICE MANAGER – STEP BY STEP

#### **Design Decisions**

Using PXE is a simple and elegant solution in most scenarios. There are, however, situations where it would be best to use a boot ISO file.

- **1.** There may be other PXE services running on the network for example, Altiris or Microsoft SMS.
- **2.** There may be a restriction based on a network policy.

The Provisioning Services Boot Device Manager can be used to create a boot file for a virtual machine. The boot file is loaded manually from an .ISO file rather than being copied over the network.

- 1. Launch Provisioning Services Boot Device Manager (see Figure 8.8).
- 2. Click Add to add an IP address. Click Next (see Figure 8.8).
- 3. Add the IP address of the Citrix Provisioning Server and click OK (see Figure 8.9).
- 4. Click Next (see Figure 8.10).
- 5. Click Next (see Figure 8.11).

Verbose Mode can be enabled for troubleshooting purposes.

#### DHCP

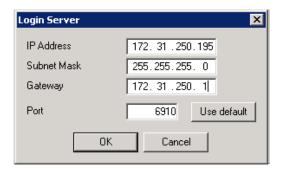
6. Configure the IP address mechanism (see Figure 8.12).

Using DHCP is much simpler as one .ISO file could be used to boot all the virtual desktops.

Boot Device Manage	ment		
Specify the Login S	erver		
Server Lookup			
Use static IP add			
Note: If High A	vailability is not being use Subnet Mask	d, only enter one serv Gateway	Port
Add	Edit Remove	Move U	p Move Down
		< Back N	lext > Cancel

#### FIGURE 8.8

Boot device management.

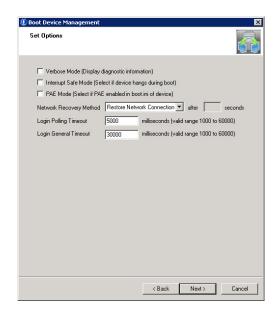


Login server.

Specify the Login Se	rver		Ś
Server Lookup			
C Use DNS to find the			
Host name Ima			
Use static IP addres			
Note: If High Av-	ailability is not being use	d, only enter one serve	er.
IP Address 172.31.250.195	Subnet Mask 255.255.255.0	Gateway 172.31.250.1	Port 6910
Add	Edit Remove	Move Up	Move Down
Add	Edit Remove	Move Up	Move Down
Add	Edit Remove	Move Up	Move Down
Add	Edit Remove	Move Up	Move Down
Add	Edit Remove	Move Up	Move Down
Add	Edit Remove	Move Up	Move Down
Add	Edit Remove	Move Up	a Move Down
Add	Edit Remove	Move Up	Move Down
Add	Edit Remove	Move Up	) Move Down

#### FIGURE 8.10

Boot device management – specify the login server.



Boot device management - set options.

urn the Boot De	vice
Device IP Configu Use DHCP to	
C Use Static De	vice IP
IP Address	0.0.0.0 Increase Port 6901 Use default
Subnet Mask	0.0.0.0
Gateway	0.0.0.
Specify DNS A This informatio	ddresses to lookup the Server n is used when the Server lookup method is DNS
Primary DNS S	erver Address 0.0.0.0
Secondary DN	S Server Address 0.0.0.0
Domain Name	
Boot Device Add an active	
Media Properties	
Protect SBD	
	dom password (make media Write-Once)
Generate rand	ann password (make media write orres)

#### FIGURE 8.12

Boot device management – DHCP.

## **NO DHCP**

If DHCP is not an option, then each virtual desktop needs an individual boot .ISO; each boot file contains the same server information but will use a unique assigned IP address (see Figure 8.13). The **Increase** button allows you to increment the IP address and the **Burn** button can then be used to create multiple boot .ISO files.

#### 7. Click Burn.

8. Enter a descriptive file name, and then click Save (see Figure 8.14).

For the No DHCP Scenario, click **Increase** and then click **Burn** again. In this situation, naming the files is best tied to a virtual desktop name.

Burn the Boot D	evice			4	2	
<ul> <li>Use Static De IP Address</li> <li>Subnet Mack</li> <li>Gatemay</li> <li>Specity DNS</li> <li>This informatic</li> <li>Primary DNS</li> </ul>	settieve Device IP vice IP 172: 31 - 250 255: 255 - 255 172: 31 - 250 Addresses to lookup in is used when the Server Address IS Server Address	0 1 b be Server Server lookup met	. 0	1 Use default		Increase
Boot Device Add an activ Chis ISO Image Media Properties Protect SED Generate tan Password	Recorder	ie neda Wite Oro	r) mation	×		

#### FIGURE 8.13

Boot device management - use static device IP.

🚇 Save As			×
00 📭 • ad	ministrator 👻 Documents	👻 🔂 Search	
	mybootfile  ISO File (*.iso)		•
Browse Folders		Save	Cancel //

#### FIGURE 8.14

Save as.

## ADDING A DISK FOR WRITE CACHE

In the Design Decisions in Chapter 7, "Fundamental Configuration of the Citrix Provisioning Server," on write cache placement, it was stated that for best performance write cache be held on a location other than the provisioning server. Recommended location is on shared storage attached to the hypervisor. When creating your Base Target Device, attach 1 GB (or 2 GB if you are using EdgeSight monitoring) disk to your Template VM, this will be specified as write cache.

Shut down all the Target Devices using the vDisk. Change your Idle Pool to zero using the Delivery Services Console on the Desktop Delivery Controller.

Place the vDisk in Private mode (see Figure 8.15); although we will be formatting the physical drive, and not the vDisk, we do need the settings, like the drive letter, to be saved to the vDisk.

Change the Idle Pool to 1 in the Delivery Services Console, and this will automatically start the virtual desktop. Login to the desktop.

As we will be amending the hardware allocations at a hypervisor level, it is simplest to login through the hypervisor console.

## Attaching a Disk

#### XenServer

- 1. Select the virtual machine, and in the right-hand pane select the Storage tab (see Figure 8.16).
- **2.** Change the **Name** to something sensible like write cache. Change the size to 1 GB, and click **Add** (see Figure 8.17).

Disk File Properties	
General Mode Ider	tification Options
Access mode	
Access Mode:	Private Image (single device, R/W access)
Cache Type:	Cache on server disk
Cache Size (MBs)	32 -
Automatic updates	- Constant of the Million Dial
-	atic updates for this vDisk
	isk updates as soon as they are detected by the server
C Schedule	the next vDisk update to occur on: 2010/01/29
	OK Cancel Help
	UN Caricei Help

#### FIGURE 8.15

Changing the vDisk mode.

	Storage	Add
R XenCenter		
Ne View Pool Server VM Storage Templates Tools	Window Help Wers Storage 😭 New Viti 😃 Shut Down 🋞 Reboot 🕕 Suspend	Viko System Alerts
Show: Server View 🔎 🔹	W7demo5	Logged in as: Local root account
Chris Systems Cenno  Chris Sy		Attach Properties Deactivate Detach Delete
Removable storage      Removable storage	DVD drive: compty> Name Description Storage Repository Device P	votion See Read Only Priority Active Device Path

	Name:	Write Cache	e
	Description:	, 	
	Size:	1.000 🛨	GB
Select a	a storage repo	sitory to crea	ate the disk on
isc 🖉	SI virtual disk	storage 28.	.5 GB free of 824.2 GB
Lo	cal storage on	xenserver1	201.2 GB free of 225.2 GB
<b>HA</b>	HeartBeat 1	GB required	when only 684 MB available
Lo	cal storage on	xenserver2	This storage repository cannot be seen from xenser
Lo	cal storage on	xenserver3	This storage repository cannot be seen from xenser
Lo	cal storage on	xenserver4	This storage repository cannot be seen from xenser
•			
			Add Cancel

#### FIGURE 8.17

Add new disk.

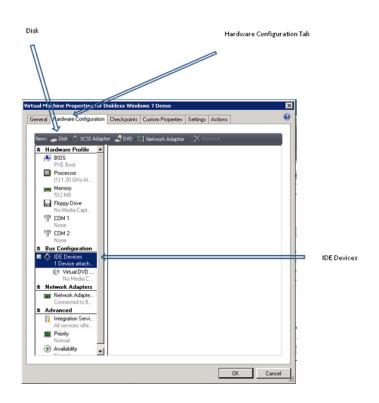
## System Center Virtual Machine Manager (SCVMM)

- 1. Right-click on you diskless virtual desktop and select Properties (see Figure 8.18).
- **2.** Select the **Hardware Configuration** tab, select the **IDE Devices** in the left-hand pane, then click **Disk** (see Figure 8.19).
- 3. Change the type to Fixed, and disk size to 1GB, then click OK (see Figure 8.20).

XenCenter – storage.

File View Go Action								
😫 Actions 💼 Columns 🗎	Jobs 🔚 PRO Tips (0) 🔔 Ne	itworking 🐹 PowerShell 🧯	Help					
Virtual Machines	HyperV.citrixs	a.net Virtual Machines ()						
Host Groups	Search							
Overview	Name ~	Status		lob Status	Host	Owner	CPU Average	-
🗄 📑 All Hosts	7 7 7 7 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Restoring		0 %	HyperV	CITRIXSA'jadministrato	r 0%	
HypelV	7 7 7 7 0 rhyperv2	Starting		0 %	HyperV	CITRIXSA)administrato	r 0%	
	() 7onhyperv3	Running	Γ	0.%	Hyper¥	CITRIXSA)administrato	r 0%	
	C DDC on Hyperv	Starting	Γ	0 %	HyperV	CITRIXSA)administrato	0.%	
	Demo Windows	7 Running			HyperV	CITRIXSA)administrato	r 0%	
	Diskless Window	s7Demo Running	_		HyperV	CITRIXSA\administrato	0%	
	PVS2 on Hyperv	Running	6			CITRIXSA)administrato	r 1%	
	( test	Ropped				CITRIXSA)administrato	r 0%	
	Windows7	Ropped				Unknown	0 %	
	Wandows 7	Stopped				Unknown	0 %	
	E XenApp for host	ed Appl Saved State	C			CITRIXSA\administrato	r 0%	
iters	-		0	Shut down				
	Glean		12	Connect to virtual ma	chine			
itatus	*							
hwner	-							
perating system	*							
dded date	Diskless Windo	ws 7 Demo						
ag	-							
	Status: Command:	Completed Stort-VM	Prop C			iue New Yak	10	
	Command: Started:	2/4/2010 9:26:32 PM	= <b>2</b> Yi		7.0	iemo		
	Starteg:	00:00:03	12		irvices	Running		
	Owner:	CITRIXSAlAdministrator	131					
	Progress:	100 % complete						
		-						
	Current step:	Start virtual machine						
in Hosts								
e0								

SCVMM – virtual machine options menu.



#### FIGURE 8.19

Hardware configuration - bus configuration.

vew: 🚙 Disk 🦑 SCSI Adaptı	er 🧈 DVD 🖾 Network Adapter 🛛 🔭 Remove
<ul> <li>Hardware Profile</li> <li>BIDS PXE Boot</li> <li>Processor (1) 1.20 GHz At</li> <li>Memory 512 MB</li> <li>Floppy Drive No Media Capt</li> <li>COM 1 None</li> <li>COM 2 None</li> <li>COM 2 None</li> <li>DE Devices 2 Devices attac</li> <li>Diskless Wi 1.00 GB, Pri</li> <li>Virtual DVD No Media Ca</li> <li>Virtual DVD No Media C</li> <li>Network Adapters</li> <li>Network Adapter Connected to B</li> <li>Advanced</li> <li>Integration Servi All services offe</li> <li>Priority Manual</li> </ul>	<ul> <li>Diskless Windows 7 Demo_disk_1</li> <li>Channel:</li> <li>Primary channel (0) (in use)</li> <li>Disk:</li> <li>Use an existing virtual hard disk</li> <li>Create a new virtual hard disk</li> <li>Pass through to physical drive on host</li> <li>Type:</li> <li>Fixed</li> <li>Size:</li> <li>1</li> <li>GB</li> <li>File name:</li> <li>Diskless Windows 7 Demo_disk_1</li> <li>Example: data_disk</li> </ul>

Hardware configuration - disk type.

#### VMware

- 1. Open the vCenter, right-click on the diskless virtual machine you previously created. Select Edit Settings....
- **2.** Click **Add**... (see Figure 8.21).
- 3. Select Hard Disk, and click Next (see Figure 8.22).
- 4. Select Create a new virtual disk, and click Next (see Figure 8.23).
- **5.** Change the disk size to 1 GB (or however large you require the write cache disk), click **Next** (see Figure 8.24).

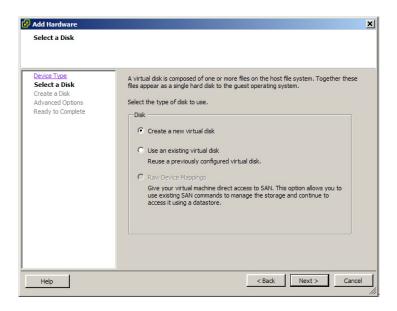
🕑 DisklessW7 - Virtual Machine	Properties	<u></u>
Hardware Options Resources		Virtual Machine Version: 7
Show All Devices	Add Remove	Memory Configuration 255 GB Memory Size: 2044 MB
Hardware Memory CPUs Video card Video card CO/DVD drive 1 CO/DVD Drive 1 Network adapter 1	Summary 2044 MB 2 Video card Restricted Client Device [datastore1] en_windo VM Network	128 GB     Maximum recommended for this       64 GB     Maximum recommended for best       32 GB     Quest OS: 64 GB.       16 GB     Default recommended for this       9 GB     Quest OS: 1 GB.       4 GB     Minimum recommended for this       2 GB     Minimum recommended for this       2 GB     Minimum recommended for this       2 GB     Minimum recommended for this       2 GB     Minimum recommended for this       2 GB     Minimum recommended for this       2 GB     Minimum recommended for this       2 GB     Minimum recommended for this       2 GB     Minimum recommended for this       2 GB     Minimum recommended for this       3 GB     Minimum recommended for this       1 GB     Minimum recommended for this       2 GB     Minimum recommended for this       3 GB     Minimum recommended for this       3 MB     Minimum recommended for this       3 MB     Minimum recommended for this       8 MB     Minimum recommended for this
Help		OK Cancel

Virtual machine properties - hardware.



#### FIGURE 8.22

Add hardware - device type.



Add hardware - select a disk.

	Allocate and commit space on demand (Thin Provisioning)     Support dustering features such as Fault Tolerance     Location     Store with the virtual machine     Specify a datastore:     Browse,
--	---

#### FIGURE 8.24

Add hardware - create a disk.

🛃 Add Hardware		×
Advanced Options These advanced options	do not usually need to be changed.	
Device Type Select a Disk Create a Disk Advanced Options Ready to Complete	Specify the advanced options for this virtual disk. These options do not normally need to be changed.          Virtual Device Node            © SCSI (0:0)          IDE (0:1)          Mode         Independent         Independent disks are not affected by snapshots.         Persistent         Changes are immediately and permanently written to the disk.         Nonpersistent         Changes to this disk are discarded when you power off or revert to the snapshot.	
Help	< Back Next > Cance	

Add hardware - advanced options.

6. Click Next (see Figure 8.25).

The mode settings aren't relevant to a XenDesktop VDI implementation and can be left at defaults.

7. Click Finish (see Figure 8.26).

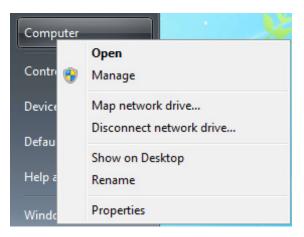
#### All Hypervisors

- **1.** Open Computer Management on the virtual desktop.
- 2. On the Start Menu, right-click on Computer and Select Manage (see Figure 8.27).
- **3.** Select **Disk Management**, the Initialize Disk dialog box will automatically pop up. Click **OK** (see Figure 8.28).
- 4. Select the new disk, right-click and select New Simple Volume (see Figure 8.29).

Follow the prompts to create a new volume called write cache, and format it with the New Technology File System (NTFS).

Add Hardware Ready to Complete Review the selected opt	ions and click Finish to add	the hardware.		2
Device Type Select a Disk Create a Disk Advanced Options Ready to Complete		Hard Disk New virtual disk 1 GB datastore 1 SCSI (0:0) Persistent		
Help			< Back Finis	h Cancel

Add hardware - ready to complete.

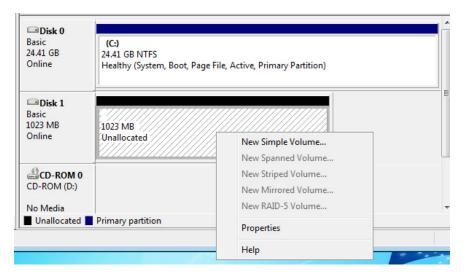


#### FIGURE 8.27

Computer manager.

File Action View Help	( 🖆 📽 🔍 🖉	3	
Computer Management (Local	Volume Layout	Type File System Status Capacity	Actions
System Tools	🖙 (C:) Simple	Basic NTFS Healthy (System, Boot, Page File, Active, Primary Partition) 24.41 GB	Disk Management
Construction     C			More Actions
Device Manager	ſ	Initialize Disk	
Storage     Disk Management     Services and Applications		You must initialize a diak before Logical Diak Manager can access it. Select diak: Ø Diak 1	
-	< Basic	Use the following partition style for the selected disks:	
	24.41 GB Online	Note: The GPT partition type is not incognized by all pervious versions of Windows. It is accommended for darks larger than 2TE, or darks used on Itanium-based computers.	
	Disk 1 Unknown 1.00 GB Not Initialized	L00 (B Unallocated	
	CD-ROM 0 CD-ROM (D:)		
· · · · · ·	No Media	Primary partition	

Initialize disk.



#### FIGURE 8.29

Disk options.

## **SUMMARY**

In Chapter 6, "Installation of the Citrix Provisioning Server," we dealt with installation and in Chapter 7, "Fundamental Configuration of the Citrix Provisioning Server," we dealt with implementation of vDisks to Target Devices. Chapter 8 delved into operational settings, and some more detailed configuration settings. We discussed the components of the Provisioning Services Console looking into server and site settings. We then looked at using the Boot Device Manager to create a boot file as an alternative to using PXE boot. Lastly, we covered adding a physical write cache disk for enhanced performance.

# Using the Setup Wizard to Create Multiple Desktops

9

#### INFORMATION IN THIS CHAPTER

- Prerequisites
- Create a Template Virtual Machine
- Xendesktop Setup Tool Installation

The XenDesktop Setup Wizard is a very important implementation tool, without which, the creation of virtual desktops would be an arduous time-consuming task.

The XenDesktop Setup Wizard is used to perform bulk virtual desktop creation. The wizard ties together all the various XenDesktop components to create the virtual desktops.

## PREREQUISITES

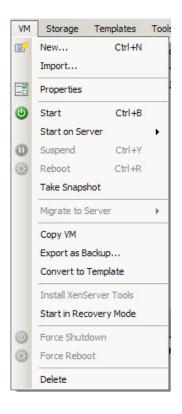
- 1. If required, a unique organizational unit for the Desktop Group in the Active Directory.
- 2. Create a Template VM on your hypervisor on which the hardware settings will be based.
- **3.** A Desktop Group can be precreated in the Desktop Delivery Services Console on the Desktop Delivery Controller.
- 4. A vDisk in Standard image mode.

## CREATE A TEMPLATE VIRTUAL MACHINE

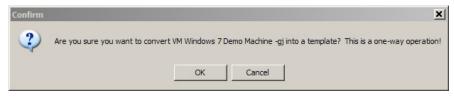
The XenDesktop Setup Wizard requires a Template Virtual Machine to base the hardware configuration on. Depending on where you want write cache, you will either have a diskless virtual machine, or it may have a small write cache disk attached.

## XenServer

- 1. Open the XenCenter; in the left-hand pane, select one of the virtual machines you created in the earlier chapters.
- 2. Click VM | Convert to Template (see Figure 9.1).
- **3.** Click **OK** (see Figure 9.2).
- 4. The virtual machine has now been converted to a template (see Figure 9.3).



XenCenter VM menu.



#### FIGURE 9.2

Template convert warning.

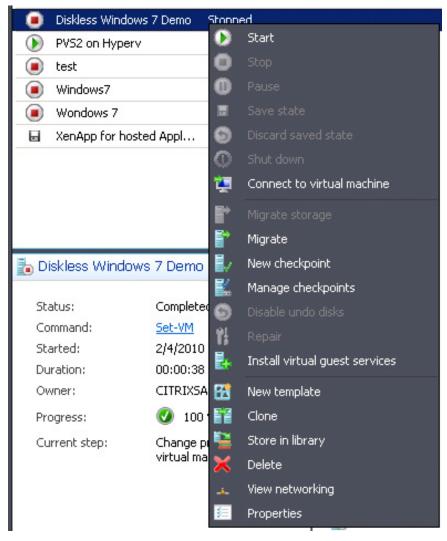


#### FIGURE 9.3

Template icon.

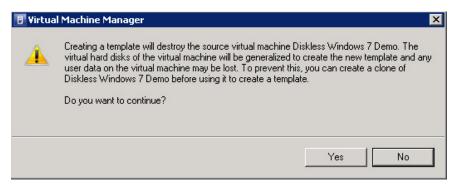
## SCVMM

- 1. Open the System Center Virtual Machine Manager; select the virtual desktop created in the previous chapter (see Figure 9.4).
- 2. Right-click and select New template.
- **3.** Click **Yes** (see Figure 9.5).
- 4. Create a name for your template, and click Next (see Figure 9.6).





Virtual machine menu options.

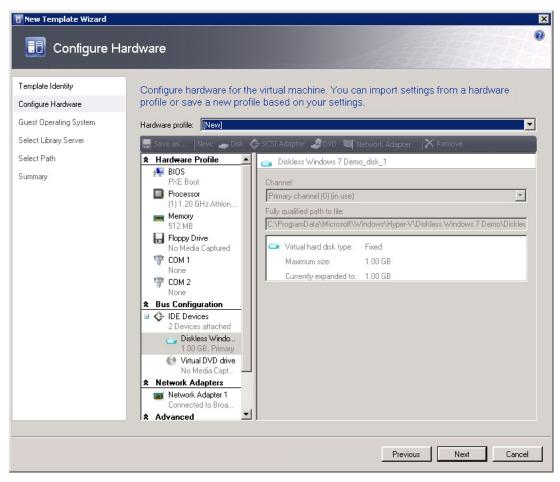


Template create warning.

New Template Wizard	lentity	0
Template Identity	Template name:	
Configure Hardware	Diskless Windows 7 Demo	1
Guest Operating System	Owner:	
Select Library Server	CITRIXSA\administrator Browse	J
Select Path	Format: domain/username	
Summary	Description	
	Next Cancel	

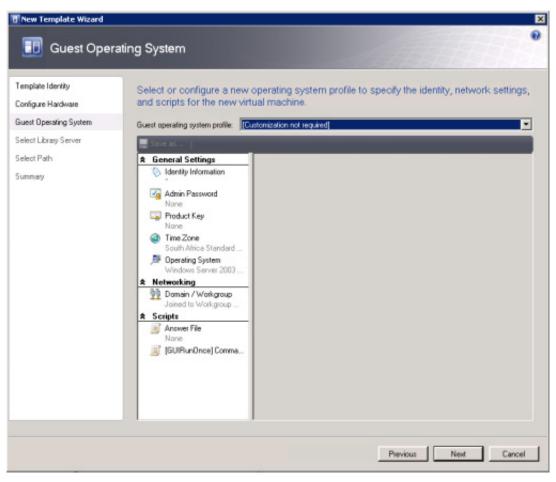


Template identity.



Configure hardware.

- 5. Leave the hardware configuration as it is and click Next (see Figure 9.7).
- **6.** Change the "Guest operating system profile" to **Customization not required** (see Figure 9.8). Provisioning server will perform the customization tasks.
- **7.** Select a library server for placement (the default should be fine in most cases), click **Next** (see Figure 9.9).
- **8.** Browse to the MSSSCVMMLibrary to define the virtual machine path for the template, and click **Next** (see Figure 9.10).
- 9. Click Create to create the template (see Figure 9.11).



Guest operating system.

There is currently an issue with write cache disks attached to a template created on SCVMM. This is not an issue with XenServer or VMware. The XenDesktop Setup Wizard doesn't attach the write cache disk defined in the template. This results in the virtual desktops being created, but without the write cache disk. You should manually attach a write cache disk in small environment. There is a workaround for this issue in the Citrix Document: *CTX124687 – XenDesktop Design Guide For Microsoft Windows 2008 R2 Hyper-V Version 1.1.* This document contains in its appendix a script to add write cache disks to VMs.

	the virtual machine.		
Search		P ■ n	
Library Server +	Transfer Type	Description	
HyperV.citrixsa.net		Virtual Machine Manager serve	er as library server
The server HyperV.ckrixs	a.net does not contain any host l	bus adapter (HEA) ports. Fibre Chan	nel SAN transfer
Cannot be used.		bus adapter (HBA) ports. Fibre Chan It ISCSI Initiator installed. ISCSI SAN	
Cannot be used.	a.net does not have the Microsol	ft iSCSI Initiator installed. ISCSI SAN	
Cannot be used.		ft iSCSI Initiator installed. ISCSI SAN	
Cannot be used.	a.net does not have the Microsol	ft iSCSI Initiator installed. ISCSI SAN	
	Library Server +	Lbray Server  Transfer Type HyperV.obrissa.net HyperV.obrissa.net Hide Datals	Ubray Server         Transfer Type         Description           HyperV.obrissa.net         Network         Virtual Machine Manager server

Select library server.

emplate Identity	Select the share location to save this virtual machine to.	
onligure Hardware uest Operating System	Selected libray: HypelV.citricsa.net	
elect Library Server	Virtual machine path:	
elect Path	\\HyperV.citiicca.net\MSSCVMMLibrary	Browse
rmay	Transfer over the network even if a SAN transfer is available.	
	How do I enable SAN transfers?	

#### FIGURE 9.10

Select path.

H New Template Wizard		×
🗊 Summary		•
Template Identity	Before you crea	ate the new template, review the settings that you chose.
Configure Hardware	Summary:	ale the new template, review the actings that you choose.
Guest Operating System	Property	Value
Select Library Server	Template	Diskless Windows 7 Demo
Select Path	Owner	CITRDSA\administrator
Summary		
		View Scipt
		S Alle 200
	To create the te	emplate, click Create. You can track progress of this job by viewing the Jobs page.
		Previous Create Cancel
		Previous Create Cancel

Summary.

VC.citrixsa.net  Kew Datacenter  New Folder  172.31.250.142  New Virtual  DisklessW7		ne	DisklessW7 Getting Started Summary Resource Allocation What is a Virtual Machine?			
Windows 7		Power Guest Snapshot Open Console Edit Settings Migrate Clone		* *	mpu s. Ai calli very nt, y i env	ne is a software compute tter, runs an operating s' n operating system insta ed a guest operating sys virtual machine is an isc ou can use virtual machi vironments, as testing er ver applications.
		Template Fault Tolerance Add Permission. Alarm Report Performe Rename Remove from In Delete from Disk	ance ventory	•		Clone to Template Convert to Template

#### FIGURE 9.12

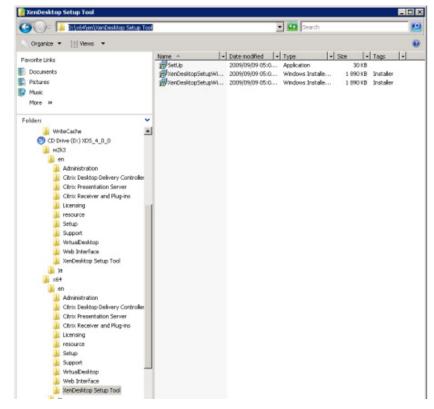
vCenter – Template options menu.

## VMware

1. Open the vCenter; select the virtual desktop, right-click and select Template | Clone to Template... (see Figure 9.12).

## XENDESKTOP SETUP TOOL INSTALLATION

- 1. Mount the XenDesktop 4 DVD on the **Provisioning Server**. The tool is not on the Provisioning Server Installation DVD as the provisioning server installation is generic, but the tool is specific to XenDesktop.
- **2.** Browse to <DVD Drive>:\w2k3\en\XenDesktop Setup Tool, or <DVD Drive>:\x64\en\ XenDesktop Setup Tool (which contains the same files!).
- **3.** Double-click **Setup** and it will launch the .msi (either the 32-bit or 64-bit version depending on your provisioning server) (see Figure 9.13).
- 4. Click Next (see Figure 9.14).
- 5. Accept the license agreement, and click Next (see Figure 9.15).
- **6.** To accept the default install path, click **Next** (click **Browse**... to install the files elsewhere) (see Figure 9.16).
- 7. Click Install (see Figure 9.17).
- 8. Click Finish (see Figure 9.18).



#### FIGURE 9.13

XenDesktop Setup Tool folder.



Citrix XenDesktop Setup Wizard Installer - welcome.

🚏 Citrix XenDesktop Setup Wizard Install
End-User License Agreement Please read the following license agreement carefully
CITRIX(R) LICENSE AGREEMENT Use of this component is subject to the Citrix license covering the Citrix product (s) with which you will be using this component. This component is only licensed for use with such Citrix product(s). CTX_code: EP_R_A32490
☑ I accept the terms in the License Agreement
Print Back Next Cancel

#### FIGURE 9.15

End-user license agreement.

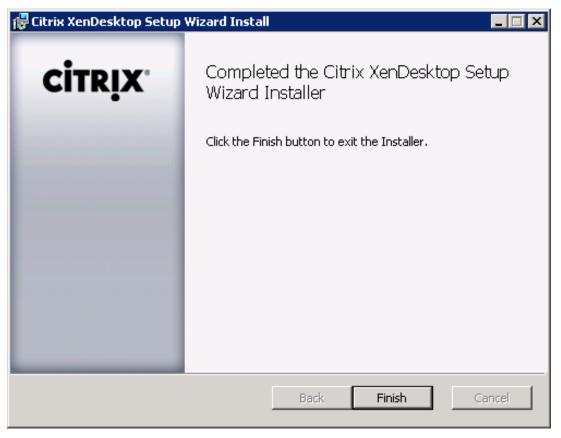
🙀 Citrix XenDesktop Setup Wizard Install	
Destination Folder Click Next to install to the default folder or click Browse to choose another.	CITRIX
Install Citrix XenDesktop Setup Wizard to:	
C:\Program Files\Citrix\XenDesktop Setup Wizard\	
Browse	
Back Next	Cancel

Destination folder.





Ready to install.

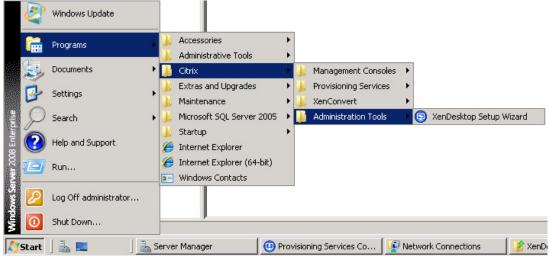


Completed the Citrix XenDesktop Setup Installer.

#### Checkpoint 4 Using The Xendesktop Setup Tool – Demonstration

Using the XenDesktop Setup Wizard is certainly an important checkpoint for you as an implementer. The demonstration of this set of capabilities would most likely be combined with the previous checkpoint. As with the previous checkpoint, this functionality will be best appreciated by a technical audience, and those involved in the implementation phase.

- 1. Click Start | Programs | Citrix | Administrative Tools | XenDesktop Setup Wizard (see Figure 9.19).
- 2. Click Next (see Figure 9.20).
- **3.** The wizard interrogates Active Directory for a list of XenDesktop farms. If there is more than one XenDesktop farm in your environment, it will appear in the drop-down list. Select your XenDesktop farm, and click **Next** (see Figure 9.21).
- 4. Select your hypervisor from the Hosting Infrastructure drop-down (see Figure 9.22).



XenDesktop Setup Wizard start menu item.



# FIGURE 9.20

XenDesktop Setup Wizard - welcome.

Desktop Farm Select the desktop farm to use		<b>CİTRİX</b> .
Steps Velcome Desktop Farm Hosting Infrastructure Virtual Machine Template Virtual Disk (vDisk) Virtual Desktops Organizational Unit Location Desktop Group Desktop Creation Summary	Select a desktop farm from the list of farms available in Active Directory. Desktop farm: Demo Farm	V

Desktop farm.

Steps       Hosting infrastructure:         Velcome       Citrix Xen VM infrastructure (included with XenDesktop)         Desktop Farm       Citrix Xen VM infrastructure (included with XenDesktop)         Vitual Machine Template       Vitual Disk (vDisk)         Virtual Desktops       Organizational Unit Location         Desktop Creation       Summary	× Citrix
	<b>*</b>

# FIGURE 9.22

Hosting infrastructure - virtualization.

# XenServer

1. Enter the IP address or computer name of the XenServer acting as the pool master (see Figure 9.23).

To find your pool master, log onto one of your XenServers. You can use putty to connect direct to the command line, or you can access the command line through the XenCenter Console (see Figure 9.24).

xe host-list	Lists the hosts in the pool and their UUIDs
xe pool-list	Lists the pool information – the tag master (RO) has the UUID (Universally Unique Identifier) of the host currently acting as the master

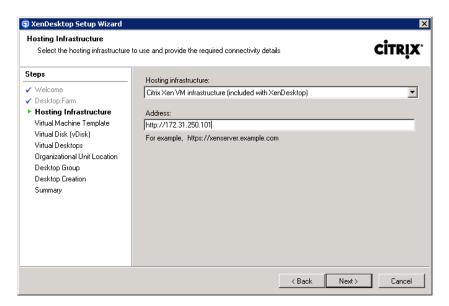
```
For example:
```

```
[root@xenserver1 ~]# xe host-list
uuid (RO)
                         : a9aab50d-83e7-4fc7-94c2-2b5e0cec0da9
         name-label ( RW): xenserver2
   name-description (RO): Default install of XenServer
                         : 93749c21-bfe6-4cfb-beac-b33f76e2b09c
uuid (RO)
         name-label ( RW): xenserver1
   name-description (RO): Default install of XenServer
                         : ba18891c-32bf-45b9-83d8-ae780e1d507e
uuid (RO)
         name-label ( RW): xenserver3
   name-description (RO): Default install of XenServer
uuid (RO)
                         : d537ad21-fd24-45cc-b1c1-3360a6767592
         name-label (RW): xenserver4
   name-description (RO): Default install of XenServer
[root@xenserver1 ~]# xe pool-list
uuid (RO)
                         : cb6067c9-04ac-6436-5b29-d6cbb91da066
         name-label ( RW): Citrix Systems Demo
   name-description (RW):
             master ( R0): 93749c21-bfe6-4cfb-beac-b33f76e2b09c
         default-SR ( RW): ceb3c00d-d887-38bb-743b-822733b1b3e8
```

We can see in this example that xenserver1 is the master (bold text for illustrative purposes).

- 2. Click Next to connect to the XenServer.
- 3. Enter the root username and password of the XenServer (see Figure 9.25).
- 4. The wizard retrieves the template list (see Figure 9.26).

Note the check box – if you are using an ISO to boot your virtual desktops, you may need to change this.



Hosting infrastructure - address.



# FIGURE 9.24

Accessing the XenServer Console.



XenServer administrator credentials.

Steps       Select a virtual machine from the list to use as a template. Desktops will be created usin memory. CPU, and network configuration settings from this virtual machine.         V besktop Farm       Virtual machine Template         Virtual Disk (vDisk)       Virtual Desktops         Organizational Unit Location Desktop Group       Windows 7 Demo Machine -gj       Windows 7 Virtual Desktop         Virtual Desktop Creation Summary       Virtual Machine Structure       Virtual Desktop         Virtual Desktops       Organizational Unit Location Desktop Creation       Virtual Machine -gj       Windows 7 Virtual Desktop         Virtual Desktop Creation       Virtual Wandows VP VanDesktop       Virtual Machine -gj       Virtual Desktop         Virtual Desktop Creation       Virtual Creation       Virtual VP VanDesktop       Virtual Desktop         Virtual Desktop Creation       Virtual Creation       Virtual VP VanDesktop       Virtual VP VanDesktop         Virtual Desktop Creation       Virtual VP VanDesktop       Virtual Desktop       Virtual VP VanDesktop         Virtual State       Virtual VP VanDesktop       Virtual Desktop       Virtual VP VanDesktop	Virtual Machine Template Select the virtual machine to use	to create new desktops		CİTRIX
Virtual Machine Template     Virtual Machine Template       Virtual Disk (vDisk)     dcsnap       Virtual Desktops     Windows 7 Demo Machine -gj     Windows 7 Virtual Desktop       Organizational Unit Location     Windows 7 Xendesktop     Windows 7 Virtual Desktop       Desktop Group     Windows Vista XenDesktop     Windows Vista XenDesktop       Desktop Creation     Windows VP XenDeskton     Virtual VP XenDeskton	✓ Welcome ✓ Desktop Farm	memory, CPU, and network configue Virtual machines:	ration settings from this virtual machine	
	Virtual Disk (vDisk) Virtual Desktops Organizational Unit Location Desktop Group Desktop Creation	dosnap Windows 7 Demo Machine -gj Windows 7 Xendesktop Windows Server 2003 template Windows Vista XenDesktop Windows XP XenDesktop	Windows 7 Virtual Desktop	) Drive

## FIGURE 9.26

Virtual machine template.

# **SCVMM**

- 1. Enter the computer name of your System Center Virtual Machine Manager server. Click Next (see Figure 9.27).
- 2. Enter domain credentials for the SCVMM server, and click **OK** (see Figure 9.28).
- **3.** The wizard retrieves the available templates. Select a template from the System Center Virtual Machine Manager. Click **Next** (see Figure 9.29).

👳 XenDesktop Setup Wizard		×
Hosting Infrastructure Select the hosting infrastructure	to use and provide the required connectivity details	<b>CİTRIX</b>
Steps Velcome Desktop Farm Hosting Infrastructure Virtual Machine Template Virtual Disk (vDisk) Virtual Desktops Organizational Unit Location Desktop Group Desktop Creation Summary	Hosting infrastructure: Microsoft virtualization Address: Typerv.chrixsa.net For example, SCVMMSYSTEMNAME.DDMAIN.CDM	<u> </u>
	< <u>B</u> ack	<u>N</u> ext > Cancel

# FIGURE 9.27

Hosting infrastructure.



#### FIGURE 9.28

System Center Virtual Machine Manager administrator credentials.

Virtual Machine Template Select the virtual machine to use	e to create new desktops	CİTRİX
Steps ✓ Welcome ✓ Desktop Farm		list to use as a template. Desktops will be created using the guration settings from this virtual machine.
✓ Hosting Infrastructure ➤ Virtual Machine Template Virtual Disk (VDisk) Virtual Desktops Organizational Unit Location Desktop Group Desktop Creation Summary	Name 7ontyperv3 Demo V/indows 7 Diskless Windows 7 Demo PVS2 on Hyperv test Windows 7 Wondows 7 ↓ ✓ Ignore template VM's bogt on	Path HyperV citricsa net:C:\ProgramD ata/Microsoft\ HyperV citricsa net:C:\ProgramD ata/Microsoft\ HyperV citricsa net:C:\ProgramD ata/Microsoft\ HyperV citricsa net:C:\ProgramD ata/Microsoft\ HyperV citricsa net:C:\ProgramD ata/Microsoft\ HyperV citricsa net:C:\ProgramD ata/Microsoft\ HyperV citricsa net:C:\ProgramD ata/Microsoft\ HyperV citricsa net:C:\ProgramD ata/Microsoft\ HyperV citricsa net:C:\ProgramD ata/Microsoft\ HyperV citricsa net:C:\ProgramD ata/Microsoft\ HyperV citricsa net:C:\ProgramD ata/Microsoft\ HyperV citricsa net:C:\ProgramD ata/Microsoft\ HyperV citricsa net:C:\ProgramD ata/Microsoft\

Virtual machine template.

Hosting Infrastructure		
-	to use and provide the required connectivity details	CİTRIX
Steps	Hosting infrastructure:	
/ Welcome	VMware virtualization	<b></b>
✓ Desktop Farm Hosting Infrastructure	Address:	
Virtual Machine Template	http://vc.citrixsa.net/sdk	
Virtual Disk (vDisk)	For example, https://VirtualCenter.example.com/sdk	
Virtual Desktops Organizational Unit Location		
Desktop Group		
Desktop Creation		
Summary		
	< Back	Next > Cancel

# FIGURE 9.30

Hosting infrastructure.

# VMware

1. Enter the name of your vCenter Server and the path to the SDK (see Figure 9.30) for example: HTTP (s)://<vCenterServer>/sdk.

- **2.** When prompted, enter the vCenter credential that has permissions to access the template and relevant resource group (see Figure 9.31).
- 3. Select the template you created earlier (see Figure 9.32).



Virtual Center administrator credentials.

Select the virtual machine to us	e to create new desktops		CITRIX
Steps         Velcome         Desktop Farm         Hosting Infrastructure         Virtual Machine Template         Virtual Disk (vDisk)         Virtual Desktops         Organizational Unit Location         Desktop Group         Desktop Creation         Summary	Select a vitual machine from th memory, CPU, and network con Vitual machines: Name New Template	e list to use as a template. Desktops will b figuration settings from this virtual machine Path /Datacenters/New Datacenter/vr	

#### FIGURE 9.32

Virtual machine template.

# All Hypervisors

4. Select a vDisk from your list of vDisks. Select Specify target device collection (see Figure 9.33).

# NOTE

By default the **Specify target device collection** is unchecked, and the Target Devices are created in the default collection. For management purposes, I recommend a separate Device Collection.

- 5. Specify a name for the Device Collection, and click Next (see Figure 9.34).
- 6. Specify the computer names that you want created for your desktops (see Figure 9.35).

# NOTE

These names are not labels, but the actual Active Directory Computer Accounts that will be created.

# TIP

This example will create W7demo1 to W7demo5, if you wanted to create W7demo6 to W7demo10 later, simply change the Start from to 6 and leave the number of desktops at 5.

**7.** Change the OU selection to **Custom OU**, browse to the OU you have been allocated, or have created for this project (see Figure 9.36).

Steps ✓ Welcome ✓ Desktop Farm	Select a vDisk from mode are listed. Virtual disks:	which to create you	r desktops, Only vDisks i	in standard image access
<ul> <li>Hosting Infrastructure</li> </ul>	Name	Site	Store name	Size
<ul> <li>Virtual Machine Template</li> </ul>	Windows7Demo	Johannesburg	Demo Store	25000 MB
Virtual Disk (vDisk)				
vDisk Device Collections				
Virtual Desktops Organizational Unit Location				
Desktop Group				
Desktop Creation				
Summary	Specify target de	vice collection		

## FIGURE 9.33

Virtual Disk (vDisk).

Select a device collection in w	which to create the target devices	CÍTRIX'
Steps Velcome Desktop Farm Virtual Machine Template Virtual Machine Template Virtual Disk (vDisk) Virtual Disk (vDisk) Urganizational Unit Location Desktop Group Desktop Creation Summary	Create new device collection     New Demo Device Collection     Use existing device collection     Collection	Y

vDisk Device Collections.

Specify names for the virtual de		
Steps	Number of desktops:	5
Desktop Farm     Hosting Infrastructure     Virtual Machine Template     Virtual Disk (vDisk)     vDisk Device Collections	Desktop names are ger Common name: Start from:	nerated from a common name followed by an identifying number.  Wf/demo  1
<ul> <li>Virtual Desktops</li> <li>Organizational Unit Location</li> <li>Desktop Group</li> <li>Desktop Creation</li> <li>Summary</li> </ul>		
	With the inform will be named "	ation you have entered 5 desktop(s) will be created, the first desktop W7demo1" and the last will be named "W7demo5".

# FIGURE 9.35

Virtual desktops.

😨 XenDesktop Setup Wizard		×
Organizational Unit Location Select the Active Directory Org	panizational Unit (OU) to which the desktops will be added	<b>CİTRIX</b> .
Steps  Velcome  Desktop Farm Virtual Machine Template Virtual Disk (vDisk) Volsk Device Collections Virtual Desktops Virtual Desktops Desktop Group Desktop Creation Summary	Use default OU The default Active Directory computer location will be used. Custom OU U=Demo Farm,OU=Demo,DC=citrixsa,DC=net	Browse
	< Back Next >	Cancel

Organizational unit location.

- **8.** Enter the name you wish to create for your Desktop Group in the **Create new desktop group** field, and click **Next** (see Figure 9.37).
- 9. Check whether the details are correct, and click Next (see Figure 9.38).
- 10. Click Finish (see Figure 9.39).

# The Result

To illustrate what the wizard has performed, open Active Directory Users and Computers.

- 1. Navigate to the OU that you specified the wizard has created the computer accounts in the domain (see Figure 9.40).
- **2.** Opening the XenCenter you will notice that two of the new virtual desktops have started (see Figure 9.41).
- **3.** On the **Network Properties** tab, you can see that each virtual desktop has a unique MAC address and IP address.
- 4. Open the Provisioning Services Console.
- **5.** Navigate to the Device Collection you specified, the computer names in the provisioning server are those created in Active Directory, and the MAC addresses are those created at the hypervisor level (see Figure 9.42).
- 6. Open the Desktop Delivery Services Console.
- Open the **Desktop Groups** nodes, the virtual desktops are shown in the right-hand pane. Due to the fact that the default Idle Pool is set to two, only two are currently powered up. The Desktop Delivery Controller can dynamically communicate with the hypervisor to power on or power off desktops (see Figure 9.43).

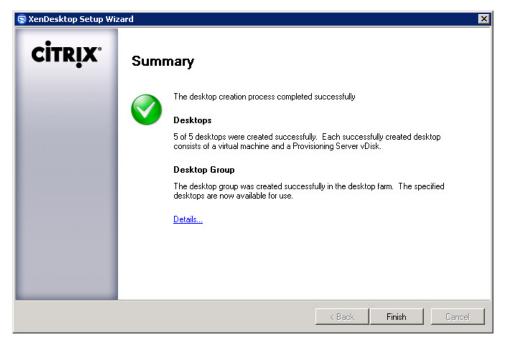
Desktop Group Specify a desktop group to whit	ch the desktops will be added	<b>CİTRİX</b> .
Steps Velcome Desktop Farm Virtual Machine Template Virtual Machine Template Virtual Disk (vDisk) Virtual Desktops Organizational Unit Location Desktop Group Desktop Creation Summary	<ul> <li>Create new desktop group DemoDesktopGroup</li> <li>Allow immediate access (enable desktop group)</li> <li>Use existing desktop group XenServer Desktop Group</li> </ul>	Y

Desktop Group.

Steps       Clicking Next will irreversibly start creating the desktops. Check the details below for accuracy first. <ul> <li>Desktop Farm</li> <li>Hosting Infrastructure</li> <li>Virtual Machine Template</li> <li>Virtual Disk (VDisk)</li> <li>Volisk Device Collections</li> <li>Virtual Desktops</li> <li>Organizational Unit Location</li> <li>Desktop Group</li> </ul> Desktop Creation Summary         Sammary           Desktop group name:         Desktop Group	XenDesktop Setup Wizard Desktop Creation Review the parameters that will b	be used to create the desktops	⊂ Citrix
	<ul> <li>Velcome</li> <li>Desktop Farm</li> <li>Hosting Infrastructure</li> <li>Virtual Machine Template</li> <li>Virtual Disk (vDisk)</li> <li>vDisk Device Collections</li> <li>Virtual Desktops</li> <li>Organizational Unit Location</li> <li>Desktop Group</li> <li>Desktop Creation</li> </ul>	first. Base desktop image: Virtual disk (vDisk): vDisk device collection: Active Directory OU: No. of virtual desktops: Desktop common name: Start numbering from:	Windows 7 Demo Machine -gj Windows7Demo New Demo Device Collection OU=Demo Farm,OU=Demo,DC=citrixsa,DC=net 5 W7dem0 1

# FIGURE 9.38

Desktop creation.



Summary.

🚡 Console Root\Active Directory Users and Computers [CITRIX.citrixsa.net]\citrixsa.net\Dem 💶 🗖 🗙						
Console Root	Name	Туре	Description			
Active Directory Users and Computers [CITRI> Active Directory Users and Computers [CITRI> Active Directory Users and Computers [CITRI> Active Directory Users and Computers Computers Computers Computers Demo Demo Demo Farm Domain Controllers ForeignSecurityPrincipals Dervers Users	Controllers W7demo1 W7demo2 W7demo3 W7demo4 W7demo5	Security Group Computer Computer Computer Computer Computer	Description			
	•					

# FIGURE 9.40

Active Directory Users and Computers.



XenCenter - virtual machines.

🖳 Provisioning Services Console							
😐 File Action View Window Help							_ 8 ×
🗢 🔿 🔁 📊 🚺 🖬							
Provisioning Services Console	Name	MAC	Booting From	vDisk	IP Address	Server	De
E 🚼 Demo Farm (localhost)	🛄 /\/7demo1	7E-A1-69-AF-1E-76	vDisk	Demo Store Windows 7Demo	Down		1
Sites Image: Site Site Site Site Site Site Site Site	🛄 W7demo2	86-23-AC-71-07-5F	vDisk	Demo Store Windows 7 Demo	Down		
Johannesburg Site Servers	🚫 🛄 🗤 7 demo 3	BA-9F-30-1B-BB	vDisk	Demo Store Windows 7Demo	172.31.250	<b>PVSDEMO</b>	
vDisk Pool	w7demo4	0E-DC-C7-B6-37-2D	vDisk	Demo Store Windows7Demo	Down		
Device Collections	🚫 🛄 🗤7demo5	76-70-63-8D-45-23	vDisk	Demo StoreWindows7Demo	172.31.250	PVSDEMO	
Collection							
Sew Demo Device Collection							
📤 User Groups							
E 🚺 Views							
E Demo Store							
	•						Þ

#### FIGURE 9.42

Provisioning Services Console – Device Collection.

	🙆 🔞 👩 🔒						CITRIX
Alerts Search Results	- Home My Views Search	DemoDesktopGr	oup				CIIRIN
My Views Citrix Resources	Common Tasks	Virtual Desktops					
Configuration Tools     Desktop Delivery Controller	Change display +	Virtual Desktops				Choose column	
E-S Demo Farm	Disable desktop group	AD Computer Account	Desktop State	Assigned User	Maintenance Mode	Machine State	
Administrators     Controllers     Desktop Groups	Enable user-driven desktop restart Modify desktop group properties  Move to folder	W7demo1.otrixsa.net W7demo2.otrixsa.net W7demo3.otrixsa.net	Not Registered Not Registered Idle	-	No No No	Off Off On	
Bernobesktopsroup     Style:     Hyper-V     XenServer Desktop Group	Delete desktop group	W7demo4.ctrixsa.net	Not Registered Idle	-	No No	off On	
•	Other Tasks						
	Create a new desitop group	Select one or more items to via	un dotaile and accoria	todtasks			
P	Related Tools	sectore of more remote a					
	Citrix Knowledge Center 19						
	C7 Launches external application						

#### FIGURE 9.43

Citrix Delivery Service Console – Desktop Groups.

So to recap, the XenDesktop Setup Wizard

- Creates the Active Directory Computer Accounts.
- Creates the virtual machines on the hypervisor.
- Uses the MAC addresses on the hypervisor, and the computer accounts in Active Directory, to create the Target Devices on the provisioning server.
- Creates a Desktop Group containing the virtual machines created on the hypervisor.

# **SUMMARY**

The XenDesktop Setup Wizard is a small but significant subject; operationally, it enables rapid bulk creation of virtual desktops. In this chapter, we looked at what is required for the wizard, the templates on the various hypervisors, and then the installation of the wizard. We then put the pieces together with instructions of how to use the wizard.

# CHAPTER

# Configure Citrix XenApp for Application Provisioning

# 10

# **INFORMATION IN THIS CHAPTER**

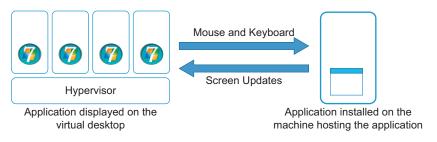
- Install Xenapp for Virtual Applications
- Install Web Interface
- Configure Xenapp Server
- Hosted Applications Regular Installed
- Hosted Applications Streamed to Server
- Streamed to End Point Applications
- Install VM-hosted Applications
- Microsoft App-V Applications

XenApp provides us with the mechanism required to keep the application layer separate from the operating system. Based on a user's Active Directory group membership, we can configure that users will receive different applications to suit their roles.

There are three different types of application provisioning we can use, and each has a particular use case.

- 1. XenApp-hosted application is the application provisioning that most people traditionally associate with Citrix the application is installed on a server operating system running Remote Desktop Services (formerly Terminal Services) and the application executes using CPU and memory on the server and only displays on the virtual desktop.
- **2.** VM-hosted application is the newest type of application provisioning delivered by Citrix. VM-hosted applications work almost identically to XenApp-hosted applications, with the exception that they are delivered remotely from a desktop operating system, rather than a server operating system.
- **3.** XenApp-streamed applications are packaged in and deployed into a virtual sandbox on the virtual desktop. XenApp-streamed applications execute on the virtual desktop using CPU and memory on the virtual desktop. Microsoft App-V performs the same function as XenApp-streamed applications App-V can be utilized in environments where App-V is the application virtualization standard.

XenApp-hosted applications are very useful in terms of application compatibility. The primary use case is to provide the user access to Windows XP–compatible applications when running Windows 7 as the virtual desktop. The majority of applications that are compatible with Windows XP will run on



Hosted applications are remotely presented to the virtual desktop.

Windows 2003 (Terminal Services), and for those that don't, there is VM-hosted Apps. XenApphosted applications have the additional benefit of offloading the application overhead off the virtual desktop onto the server as shown in Figure 10.1.

# NOTE

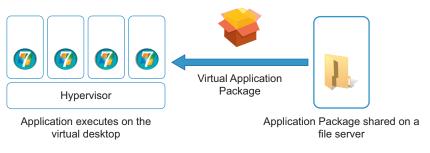
The XenDesktop installation DVD for XenApp now refers to XenApp-hosted applications as - "Server-hosted Apps."

VM-hosted applications are a relatively new technology, which extends what XenApp does with Remote Desktop Services (formerly Terminal Services) from a server operating system to the desktop operating system. We can now take an application that is not compatible with Remote Desktop Services, and publish it as a single instance from one desktop operating system to another. The most common use case would be to install an application on a Windows XP operating system – running as a VM (virtual machine) – and to publish that application to a Windows 7 virtual desktop. The application actually executes in memory and CPU on the Windows XP machine and only displays on the Windows 7 desktop. The down side is that you require a Windows XP virtual instance for every single user needing to use the application that is only Windows XP compatible. The high resource requirements means that this tends to have a limited use case for a few "Power Users" with a specific requirement.

## NOTE

It is worth noting that the Windows 7 feature – XP mode, isn't compatible with Windows 7 installed on a hypervisor. XP mode leverages Microsoft virtual PC, and virtual PC uses the virtualization assist processor features, which aren't available to a virtual CPU (vCPU).

XenApp-streamed applications fall into the category of what is generally regarded as application virtualization. Application virtualization does a great job of isolating applications from each other such that we can even run multiple versions of the same application on one machine. Various vendors have application virtualization offerings, they include Citrix XenApp-streamed applications, Microsoft App-V (formerly Softricity), VMware ThinApp, and Altiris SVS. The details vary, but the basics are the same; they present a virtual hard drive and a virtual registry to the application, the application thus runs in an isolated sandbox as shown in Figure 10.2. What application virtualization does not address is operating



XenApp-streamed applications copy the package to the virtual desktop.

system compatibility, in instances where the application has a specific operating system dependency; the application should be installed on its intended target operating system and presented to the virtual desktop using XenApp-hosted applications, or VM-hosted Apps.

XenApp-streamed applications allow the desktop to be built out in a completely modular way. Each user can have a customized desktop built on the same base build. Because applications are isolated from each other, they don't conflict like traditional locally installed applications do.

# INSTALL XENAPP FOR VIRTUAL APPLICATIONS

# **Design Decisions for Application Provisioning to Virtual Desktops**

For a POC, you can use Access, SQL Express, or SQL Server. For live/production environments, use SQL Server only.

# FAQ

Can I use the same Web Interface site for both XenApp and XenDesktop? Yes, you can run the same Web Interface site for both desktops and applications.

The Web Interface server should be installed on a separate server (typically virtual due to low resource requirements) from XenApp. The exception to this would be in a proof of concept where functionality is just to be tested.

# Prerequisites Windows 2003

# Control Panel | Add/Remove Programs | Add/Remove Windows Components | Terminal Server

This adds Terminal Services – Application Mode as shown in Figure 10.3.

The Java Runtime Environment, Version 1.5.0\_9, and .NET Framework Version 2.0 will automatically be installed if they aren't already present.

Windows Components Wizard	×
Windows Components You can add or remove components of Windows.	t
To add or remove a component, click the checkbox. A shaded box me part of the component will be installed. To see what's included in a con Details.	
Components:	
Security Configuration Wizard	0.6 MB 📥
Subsystem for UNIX-based Applications	1.3 MB
🗹 🍠 Terminal Server	0.0 MB
🗆 🍠 Terminal Server Licensing	0.7 MB
DDL Services	4.9 MB 🚬
Description: Configures this computer to allow multiple users to run one applications remotely.	or more
Total disk space required: 4.0 MB	Details
Space available on disk: 6645.6 MB	Decails
< <u>B</u> ack <u>N</u> ext > Cance	Help

Terminal Server component.

# **Prerequisites Windows 2008**

Add the following roles, using the Server Manager as shown in Figure 10.4:

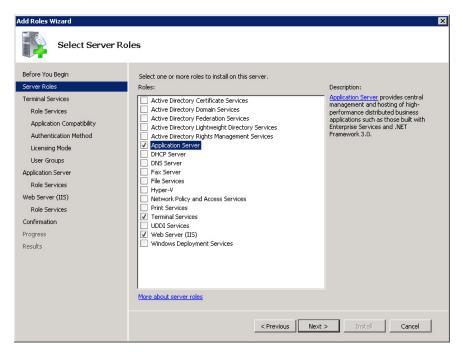
- Terminal Services
- Application server

If sharing a port between the Citrix XML service and IIS, add the Web Server (IIS) role and these role services:

- Security
- Windows Authentication
- IIS 6 Management Compatibility and all its subcomponents
- ISAPI Extensions
- ISAPI Filters

# NOTE

If possible, for performance reasons, do not install IIS on the same server as the XenApp server.



Configure application server role.

#### FIGURE 10.5

Add the Terminal Server Role services.

You will be prompted to configure the role.

You need only to select Terminal Server (see Figure 10.5).

Select Do not require Network Level Authentication (see Figure 10.6).

Select the type of Microsoft TSCAL (now called RDS CAL) your organization uses. If in doubt select **Per User** (see Figure 10.7).

XenApp for Windows 2008 requires .Net version 3.0, this is installed as an operating system feature through server manager.

Do not require Network Level Authentication
 Computers that are running any version of the Remote Desktop Connection client can connect to this terminal server.
 This option is less secure than when Network Level Authentication is used because user



This option is less secure than when Network Level Authentication is used because user authentication occurs later in the connection process.

#### FIGURE 10.6

Network level authentication is not required.

Configure later

Remind me to use the Terminal Services Configuration tool or Group Policy to configure the licensing mode within the next 120 days.

Per Device

A TS Per Device CAL must be available for each device that connects to this terminal server.

Per User

A TS Per User CAL must be available for each user that connects to this terminal server.

The licensing mode that you specify must match the TS CALs that are available from your Terminal Services license server.

#### FIGURE 10.7

Configure TS CAL type.

Select the .NET Framework 3.0 Features tick box (see Figure 10.8).

Adding the .NET Framework 3.0 will automatically prompt you to additionally add some required Role Services (see Figure 10.9):

- Web Server (IIS)
- Windows Process Activation Service

# Install JRE

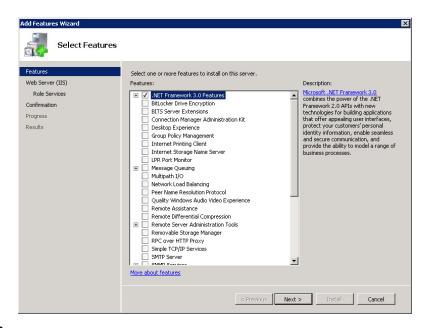
The JRE is installed automatically as part of the XenApp installation on Windows 2003, however on Windows 2008 you are required to manually install the JRE.

Download JRE 1.6 Update 5 and install it. The software can be obtained from www.java.com.

#### TIP

The JRE on the XenDesktop 4 DVD will also suffice, mount XDS\_4\_0\_0.ISO and navigate w2k3 or x64 depending on your operating system, then to the \en\ Support\JRE1.5 subfolders and execute jre-1\_5\_0\_15-windows-i586-p.exe.

Click Accept to install the JRE using the standard recommended features (see Figure 10.10).



Adding the .NET Framework 3.0 features dialog box.

Add Featu	res Wizard	×
¢:	Add role services and features required Features?	for .NET Framework 3.0
	You cannot install .NET Framework 3.0 Features unless the reinstalled.	equired role services and features are also
	Role Services:	Description:
	<ul> <li>Web Server (IIS)</li> <li>Web Server</li> <li>Application Development</li> <li>Security</li> <li>Windows Process Activation Service Configuration APIs</li> <li>.NET Environment Process Model</li> </ul>	Web Server (IIS) provides a reliable, manageable, and scalable Web application infrastructure.
		Add Required Role Services Cancel
(i) Why	are these role services and features required?	

# FIGURE 10.9

Required role services for .NET Framework 3.0.

License Agreement		S11
Please read the following license a	agreement carefully.	and the second
Sun Microsystems, Inc. Binary Code I	License Agreement	
for the JAVA 2 PLATFORM STANDA	RD EDITION RUNTIME ENVIRONM	1ENT 5.0
SUN MICROSYSTEMS, INC. ("SUN") IS BELOW TO YOU ONLY UPON THE CO CONTAINED IN THIS BINARY CODE LI TERMS (COLLECTIVELY "AGREEMEN DOWNLOADING OR INSTALLING THIS AGREEMENT. INDICATE ACCEPTANC BOTTOM OF THE AGREEMENT. IF YO	ONDITION THAT YOU ACCEPT A ICENSE AGREEMENT AND SUPPI NT"). PLEASE READ THE AGREE S SOFTWARE, YOU ACCEPT TH E BY SELECTING THE "ACCEPT"	LL OF THE TERMS LEMENTAL LICENSE MENT CAREFULLY. BY IE TERMS OF THE ' BUTTON AT THE
Typical setup - All recommended f	features will be installed.	
C Custom setup - Specify the featu	ires to install. For advanced use	rs.
stallShield		

# Web Interface

The options below only apply if you require IIS for Web Interface.

In the application server selection process, you will need to choose a number of options. Select application server foundation then scroll down (see Figure 10.11). Select

- ASP.NET
- .NET Extensibility
- ISAPI Extensions
- ISAPI Filters

Under Health and Diagnostics, select (Web Interface):

- HTTP Logging
- Request Monitor

Under **Security** option, select **Windows Authentication** (Web Interface) (see Figure 10.12). Scroll down and select everything under IIS 6 Management Compatibility (Web Interface) as shown in Figure 10.13.

Sun JRE license agreement.

elect the role services to install for Application Server: ole services:
<ul> <li>Application Server Foundation</li> <li>Web Server (IIS) Support</li> <li>COM+ Network Access</li> <li>TCP Port Sharing</li> <li>Windows Process Activation Service Support</li> <li>HTTP Activation</li> <li>Message Queuing Activation</li> <li>TCP Activation</li> <li>TCP Activation</li> <li>Named Pipes Activation</li> <li>Distributed Transactions</li> <li>Incoming Remote Transactions</li> <li>Outgoing Remote Transactions</li> <li>WS-Atomic Transactions</li> </ul>

Application server foundation role service.



## **FIGURE 10.12**

Application development role services.



IIS 6 Management Compatibility role services.

# Install .NET35

Mount the XA50\_WS08\_EN.ISO, and run <CDROM>\Support\DotNet35\dotnetfx35.exe to install .NET35.

Click Install to proceed with the installation (see Figure 10.14).

# Install XenApp Step by Step

In this section, we will go through the process of installing XenApp. For the sake of simplicity, I have chosen not to install the Password Manager or EdgeSight components at this stage.

- **1.** Insert the XenApp DVD or mount the XenApp ISO image (the name will vary depending on the version). Launch the autorun on the root of the DVD if it doesn't launch automatically.
- 2. Select your edition, I have selected Platinum (see Figure 10.15).
- **3.** Select application virtualization (see Figure 10.16).
- 4. Toggle the radio button to accept the license agreement and click Next (see Figure 10.17).
- 5. Click Next to get past the "Prerequisites" dialog box (see Figure 10.18).
- **6.** Typically, you would deselect **Citrix Licensing** if you have already installed a license server for XenDesktop, you will share the same license server. Deselect **Web Interface** if it is to be installed separately (see Design Decisions) for a proof of concept typically you will place this component on the same server (see Figure 10.19).

I recommend adding the XenApp Client to the server for a POC – simply for testing a loopback connection to the server if necessary. For production servers, don't add the client as it adds extra overhead (see Figure 10.20).

# 7. Click OK.

You will receive a warning on Windows 2008 - which you can safely ignore.

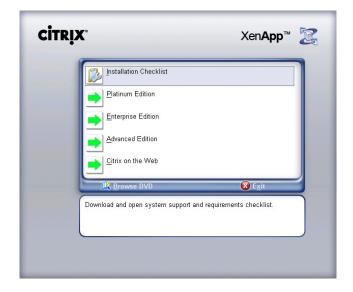
**8.** Select **Yes** to pass your logon credential through to the XenApp Client. Click **Next** (see Figure 10.21).

# NOTE

You would only select "No" if the client end point device were in a separate domain from the XenApp server. In this instance, the client end point device is the actual XenApp server.

🍒 Microsoft .NET Framework 3.	.5 Setup			
Welcome to Setup		.Net	Frame	ework
Be sure to carefully read and unde license terms. You must accept the				
MICROSOFT SOF	TWARE SU	JPPLEM	ENTAL	
Press the Page Down key to see m	nore text.		Γ	Print
I have read and ACCEPT the t	erms of the License	Agreement		
C I DO NOT ACCEPT the terms o	f the License Agreei	nent		
Send information about my set Details regarding the <u>data collection</u>		licrosoft Corpo	ration.	
Download File Size:	15 MB			
Download Time Estimate:	36 min (56 kbps) 4 min (512 kbps)			
		L	Install >	Cancel

.NET Framework 3.5 installation dialog box.

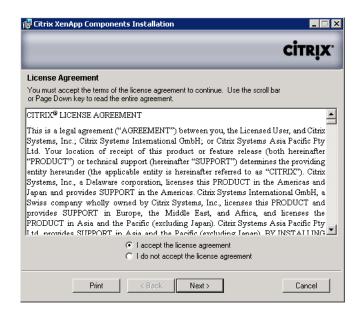


# FIGURE 10.15

Citrix installation dialog box.



Installation component selection.



#### **FIGURE 10.17**

License agreement.

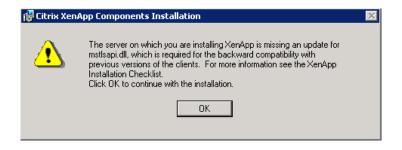


Prerequisites installation dialog box.

🙀 Citrix XenApp Components Installation	
	CITRIX.
Component Selection	
Select the components you want to install.	
	×
Description:         Provides users with access to applications through a standard Web browser.         Default       < Back	Cancel

## **FIGURE 10.19**

XenApp components dialog box.



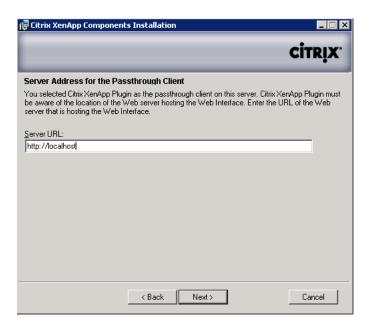
Benign warning on Windows 2008.

🚏 Citrix XenApp Components Installation	_ 🗆 X
сіт	RİX.
Passthrough Authentication for the Passthrough Client Select the desired passthrough authentication behavior.	
To pass your local Windows name and password automatically from the client to the server, like to enable passthrough authentication?	would you
ি Yes ◯ No	
To enable passthrough authentication as the logon method from the passthrough client to th click Yes. If you do not enable passthrough authentication now and want to enable it later, y reinstall the passthrough client on this server.	
< Back Next > Ca	ncel

#### **FIGURE 10.21**

Domain passthrough authentication dialog box.

- **9.** Enter the name of the Web Interface server. In this example, I have installed Web Interface on the XenApp server hence http://localhost. This should read http://<Web Interface Name or IP Address> (see Figure 10.22).
- 10. Select I already have a license server and click Next (see Figure 10.23).
- **11.** Select **Yes** to allow the installation of the Microsoft Visual C++ Redistributable (see Figure 10.24).
- 12. Click Next to install the Management Console snap-ins (see Figure 10.25).



Web Interface server address dialog box.

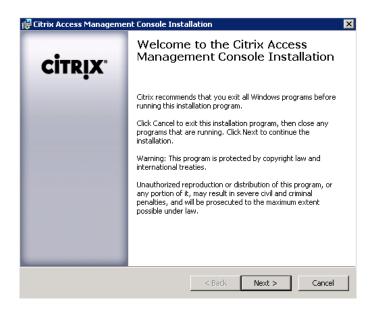
🙀 Citrix XenApp Components Installation	
ci	rrix.
Warning!	
You chose to install the product without installing a Citrix License Server. A license server is necessary to fully license the product.	
C Install a license server now.	
$\widehat{\mathbf{C}}$ . Latready have a license server, or will use the product DVD to install one later.	
< Back Next > C	ancel

#### **FIGURE 10.23**

License server installation dialog box.

Microsoft Visual C++ 2005 SP1 Redistributable Packag 💶 🗖 🗙
Please read the following license agreement. Press the PAGE DOWN key to see the rest of the agreement.
MICROSOFT SOFTWARE LICENSE TERMS MICROSOFT VISUAL C++ 2005 RUNTIME LIBRARIES These license terms are an agreement between Microsoft Corporation (or based on where you live, one of its affiliates) and you. Please read them. They apply to the software named above, which includes the media on which you received it, if any. The terms also apply to any Microsoft * updates, * supplements, * Internet-based services, and * support services for this software, unless other terms accompany those items. If so, those terms apply. By using the software, you accept these terms. If you do not accept
Do you accept all of the terms of the preceding License Agreement? If you choose No, Install will close. To install you must accept this agreement.
Yes No

Microsoft Visual C ++ 2005 license agreement dialog box.



#### **FIGURE 10.25**

Access Management Console installation dialog box.

- 13. Verify everything installed without errors and click Next (see Figure 10.26).
- 14. Click Finish to complete the console installations (see Figure 10.27).

If you have selected to Install Web Interface with XenApp Server, the Web Interface installation will occur now as part of your XenApp install – see the following section "Install Web Interface" for details.

- 15. Click Next to start the installation of the core components (see Figure 10.28).
- 16. Click Next (see Figure 10.29).
- 17. Select Create a new farm for the first XenApp server subsequent servers will Join an existing farm (see Figure 10.30).

See the "Design Decisions" section on page 309 for the selection of the database components.

If selecting an SQL server, you can follow the same steps as when using SQL for the DDC 2.2.1 Steps 8 through 14. This leads you through the process of creating a file DSN for your database connection.

- **18.** Enter the name of your farm and click **Next** (see Figure 10.31a, b).
- **19.** Click **Next** to confirm the credentials that will be used as the farm administrator (see Figure 10.32).

## TIP

Use your credentials at this stage, and change them later if necessary – only the credentials entered here will be the initial farm administrator.

	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
omponents:		
Component	Action	
Access Management Console - Diagnostics	Install	
Access Management Console - Framework	Install	
Access Management Console - Hotfix Management	Install	
Access Management Console - Knowledge Base	Install	
Access Management Console - Legacy Tools	Install	
Access Management Console - Report Center	Install	
Access Management Console - Web Interface	Install	
Citrix Password Manager Console	Install	
License Server Administration	Install	
XenApp Administration	Install	
XenApp Reports	Install	
ick Next to begin the installation. Click Cancel to exit the i	nstallation.	

#### FIGURE 10.26

Access Management Console installation list.



Installation results dialog box.



#### **FIGURE 10.28**

XenApp 5.0 installation.

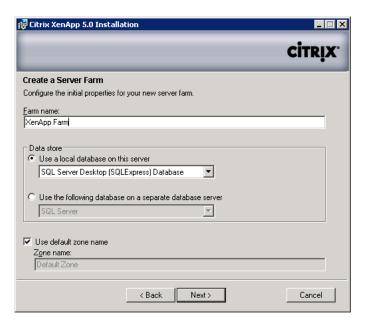
🚏 Citrix XenApp 5.0 Installation	_ 🗆 X
	CITRIX.
Component Selection	
Based on the Citrix XenApp edition you selected, the following components will be inst	stalled.
Citrix XenApp Application Streaming Load Manager WMI Providers	
Description: Citrix XenApp	
This feature has 3 of 3 subfeatures selected. These selections require 98MB on you	ur hard drive.
Current Installation location: C:\Program Files (x86)\Citrix\	Browse
Disk Cost Default < Back Next >	Cancel

XenApp 5.0 components dialog box.

🕞 Citrix XenApp 5.0 Installation
CİTRIX.
Create or Join a Server Farm
Choose to create a new server farm or join an existing one.
Create a new farm
O Join an existing farm
Select this option to add this server to an existing server farm running Citrix Presentation Server 4.5 or later. If you choose to join an existing farm, you will need to supply information about this farm later during Setup.
< Back Next > Cancel

# FIGURE 10.30

Create or join a server farm dialog box.



# FIGURE 10.31a

Datastore configuration dialog box.

🐺 Citrix XenApp 5.0 Installation	_ 🗆 X
сіт	RİX.
Create a Server Farm	
Configure the initial properties for your new server farm.	
Earm name:	
XenApp Farm	
Use a local database on this server     Access Database           Use the following database on a separate database server	
✓ Use default zone name Zone name: Default Zone	
< Back Next > Ca	ncel

# FIGURE 10.31b

Datastore configuration dialog box.

🚏 Citrix XenApp 5.0 Installation	_ 🗆 🗙
сіт	RİX.
Assign Farm Administrator Credentials	
Specify a Windows domain user to be the initial administrator of this server farm. When Setur complete, this administrator can use the Access Management Console to create additional administrator accounts and assign access rights.	o is
User name:	
Administrator	
Domain:	
CITRIXSA	
<back next=""> Car</back>	ncel

Assign farm administrator dialog box.

#### **20.** Click Next (see Figure 10.33).

IMA encryption is only required by some military and financial organizations; generally speaking I would recommend leaving it off.

**21.** Enter the same license server as for XenDesktop – bear in mind that XenDesktop Enterprise and XenDesktop Platinum both include XenApp licenses, which you are able to use (see Figure 10.34).

**22.** Tab to **Continue the product without installing licenses**, and click **Next** (see Figure 10.35).

You may receive a license server warning, which you can ignore (see Figure 10.36).

23. Click Next.

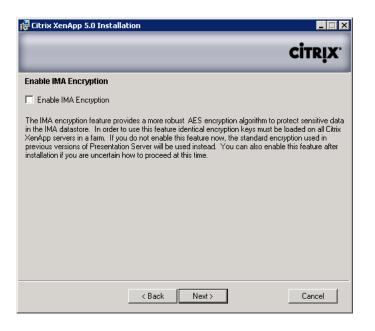
# NOTE

Shadowing security settings can only be changed at installation, so be careful to select the level of security required by your organization. These settings have been tied to the installation to prevent administrators from surreptitiously shadowing users. Previously, the acceptance popup could be enabled or disabled by the administrator.

If you have installed IIS on the XenApp server, you will receive the dialog box shown in Figure 10.37.

24. Accept the default to share port between IIS and the XML service, click Next.

IIS is not the only application that uses port 80 – some hardware vendor tools use a Tomcat service, which may also clash with the XML service – see the Tip on page 330. The Citrix XML Service is normally listed under Services, unless it is sharing with IIS, in which case it is not listed.

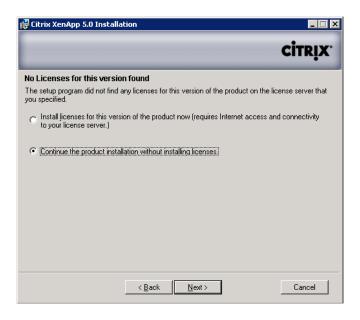


IMA encryption option.

🛱 Citrix XenApp 5.0 Installation			
Citrix.			
Citrix Licensing Settings			
Select one of the options to identify the license server			
Enter the host name for the machine hosting your Citrix License Server      Host name:      citrix			
License server port: 27000 Vise default port			
C Enter the correct host name later			
NOTE: Citrix XenApp cannot start initially unless it points to a valid license server. To point to a different license server after installation, use the Access Management Console.			
< Back Next > Cancel			

### FIGURE 10.34

Citrix License Server settings.



No licenses warning dialog box.

🚏 Citrix XenApp 5.0 Installation 📃 🔲 🗙			
Citrix.			
Configure shadowing			
Configure the shadowing functionality for ICA and RDP sessions on this server.			
If you allow shadowing, users may shadow other user sessions on this server. Remote control allows keyboard and mouse interaction while shadowing.			
IMPORTANT: Prohibiting shadowing during Setup is permanent. If you allow shadowing now, you can change this setting later or override it with specific user policies.			
C Prohibit shadowing of user sessions on this server			
<ul> <li>Allow shadowing of user sessions on this server</li> </ul>			
Prohibit remote control			
Force a shadow acceptance popup			
Log all shadow connections			
< Back Next > Cancel			

#### FIGURE 10.36

Configure shadowing dialog box.

🚏 Сіtrix ХеnАрр 5.0 Installation			
ci	rrix.		
Configure Citrix XML Service Port			
The Citrix XML Service provides the Web Interface and clients connecting over TCP/IP with the names of published applications available in a server farm. To do this, the Citrix XML Service uses a TCP/IP port on the server running Citrix XenApp.			
Select a TCP/IP port for the Citrix XML Service to use:      Share default TCP/IP port with Internet Information Services      Use a separate port			
TCP/IP <u>P</u> ort: 8080			
< Back Next > C	ancel		

Configure Citrix XML service port.

# TIP

The XML Port is the one area that is prone to clashing with other services. Scan through you list of services, if Citrix XML Service isn't listed (and it isn't sharing with IIS), then you will need to reregister the service. From the command line type: **ctxxmlss /R8080**. This will register the XML service on port 8080. Take care to change this port in Web Interface and in the server settings in the Delivery Services Console.

**25.** Select Add the list from the Users Group now option, and deselect Add Anonymous users also, then click Next (see Figure 10.38).

The anonymous users will add local user accounts to the XenApp server, which will more often than not be a security issue.

**26.** Click **Finish** to confirm the installation summary (see Figure 10.39).

If Web Interface is being installed on Windows 2008, you will be prompted to confirm the changing of the security settings (see Figure 10.40).

🛱 Citrix XenApp 5.0 Installation 📃 🔲 🗙
CITRIX.
Add users to Remote Desktop Users group
To connect remotely to Citrix servers running on Windows Server 2008, users must be members of the Remote Desktop Users group.
To add users, you can:
<ul> <li>Add the Authenticated Users now</li> <li>Add the list of users from the Users group now</li> <li>Skip this step, and add users later</li> <li>Add Anonymous users also</li> <li>If you skip this step, only administrators can connect remotely to this server until you add users to the Remote Desktop Users group.</li> <li>SECURITY NOTE: Any users added to the Remote Desktop Users group will have access via ICA and RDP connections.</li> </ul>
< Back Next > Cancel

Add users to the Remote Desktop Users group.

🛃 Citrix XenApp 5.0 Installation				
	CİTRIX.			
Review your selections listed below				
Click Back to change your selections. Click Fin	ish to install. Click Cancel to quit Installation.			
Server Farm Details				
Farm name: Zone name: Data store: Farm administrator:	XenApp Farm Default Zone Microsoft Access database CITRIXSA\Administrator			
Installation	n Summary			
Citrix XenApp edition:	Platinum Edition			
Citrix XML service port: Shadowing of ICA sessions: Prohibit remote control: Force a shadow acceptance popup: Log all shadow connections:	Shared with Microsoft IIS Enabled Disabled Disabled Disabled			
Additional features: WMI Providers				
< Back	Finish			

### FIGURE 10.39

Review selections dialog box.

🚼 Install	er Information	$\times$
	The security settings on this server prevent access to the Virtual Scripts directory. Citrix XenApp needs access to Virtual Scripts directory to use the Citrix XML service with Microsoft IIS. Do you want Setup to change your security settings? Select Yes to change your settings and continue Setup. Select No to exit Setup. If you do not want to change your settings, you can run Setup again and set a separate port for the Citrix XML service.	
	Yes No	

Virtual Scripts Security changes dialog box.

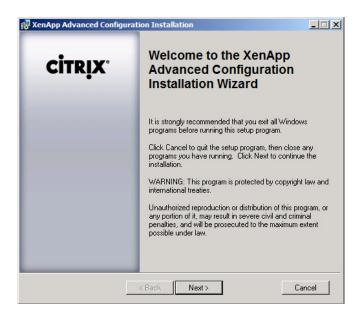
- 27. Click Yes.
- **28.** Click **Close** to finish this part of the installation (see Figure 10.41).

This section installs the Java-based Console for Citrix Policies (see Figure 10.42).

- 29. Click Next.
- **30.** Confirm the path, and click **Next** (see Figure 10.43).
- **31.** Click Next to install (see Figure 10.44).
- 32. Click Finish to confirm successful installation (see Figure 10.45).
- **33.** Click **Next** to install the documentation (see Figure 10.46).
- **34.** Confirm the path and click Next (see Figure 10.47).
- **35.** Click **Finish** (see Figure 10.48).
- 36. The summary displays all the components installed. Click Finish (see Figure 10.49).
- **37.** Click **Yes** to restart immediately (see Figure 10.50).



Successful installation dialog box.

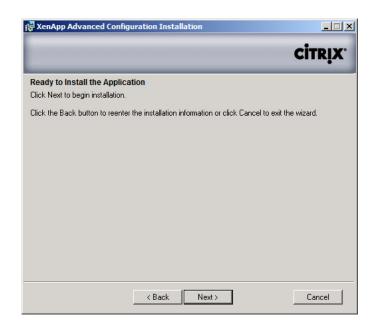


#### **FIGURE 10.42**

Advanced configuration installation dialog box.



Destination folder selection dialog box.

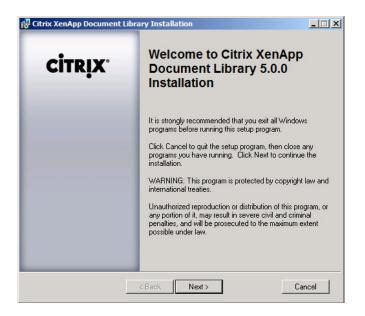


#### FIGURE 10.44

Install advanced configuration.

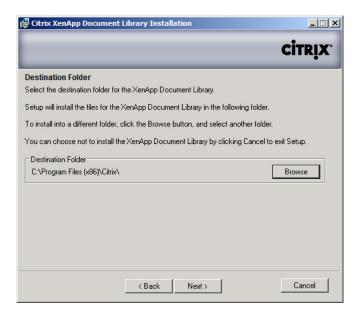


Successful installation dialog box.

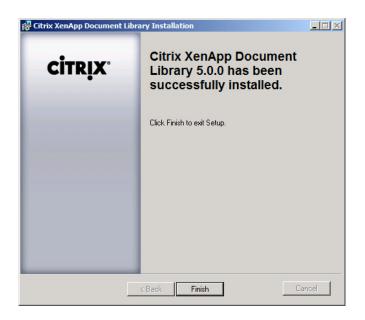


#### FIGURE 10.46

Document library installation dialog box.



Document library destination folder.

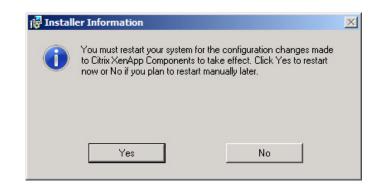


#### **FIGURE 10.48**

Document library successful installation.

🚏 Citrix XenApp Components Installatio	on	
		<b>CITRIX</b> .
Installation Summary Review the summarized installation results of a	Il components.	
Component	Result	
Citrix Licensing	Not selected	
Access Management Console	Successful	
Web Interface	Successful	
Citrix XenApp	Successful	
XenApp Advanced Configuration	Successful	
XenApp Document Library	Successful	
EdgeSight XenApp Agent	Not selected	
		Finish

XenApp components installation summary.



### **FIGURE 10.50**

XenApp post install restart.

# **INSTALL WEB INTERFACE**

In a POC environment, you may choose to install this component on the XenApp server, and in production/live environments, this should be installed separately on a dedicated Web server.

- 1. Insert the XenApp DVD or mount the XenApp ISO image. Navigate to <DVD>:\Web Interface WebInterface.exe.
- **2.** Select **OK** for English (see Figure 10.51).



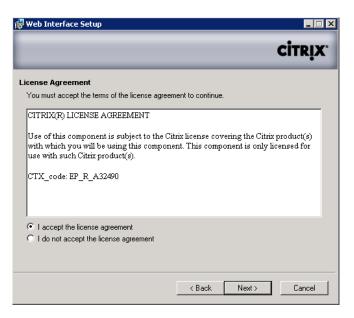
Select language dialog box.



#### **FIGURE 10.52**

Web Interface installation informational dialog box.

- **3.** Click Next to install Web Interface (see Figure 10.52).
- 4. Toggle the radio button to accept the license agreement, and click Next (see Figure 10.53).
- 5. Confirm the path and click Next (see Figure 10.54).
- **6.** Select Copy the clients to this computer this was previously on a separate DVD, but is now included on the same media (see Figure 10.55).



License agreement dialog box.

🙀 Web Interface Setup	
	CITRIX.
Common Components	
Select a location for common components.	
Destination folder	
C:\Program Files (x86)\Citrix\Web Interface\	Browse
	<back next=""> Cancel</back>

#### **FIGURE 10.54**

Common components destination folder.



Citrix client option dialog box.

### TIP

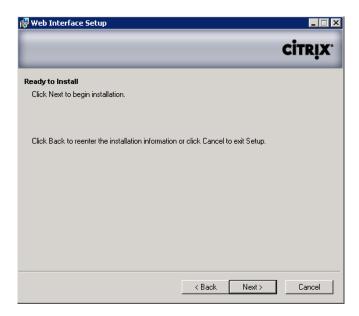
I recommend copying the clients – even if it is more time consuming – it will save you the complexity of having to configure the XenApp clients on the Web Interface later. If the clients aren't installed as part of the initial installation, Web Interface redirects users to download the client from the Internet.

- 7. Click Next to install (see Figure 10.56).
- 8. Click Finish to complete (see Figure 10.57).

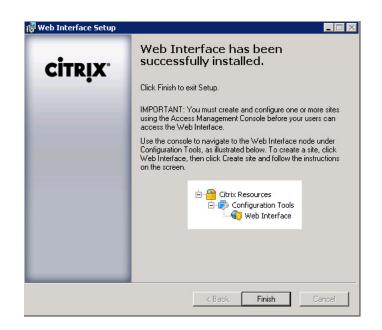
# **Configure Web Interface for Provisioning Applications to Virtual Desktops**

Web Interface for virtual desktops requires that the applications be seamlessly integrated into the desktop. The best approach is to use a XenApp services site with pass-thru authentication from the virtual desktop.

- 1. Open the Access Suite Console on the Web Interface server.
- **2.** Select **Citrix Resources** | **Configuration Tools** | **Web Interface** | **right-click** on the Web Interface, select **Create site** (see Figure 10.58).
- 3. Change the radio button to XenApp Services, and click Next (see Figure 10.59).



Installation initiation dialog box.



#### **FIGURE 10.57**

Successful installation dialog box.

🗓 Citrix Access Management Console				
File Action View Help	File Action View Help			
🗢 🔿 🖄 🖬 🖬 🛍 🙆 👔				
Citrix Access Management Console	Home My Views Search	Web Interface	<b>CİTR</b> IX'	
My Views	Common Tasks	Contents		
Licensing ➡ Diagnostic Facility ☐ ☐ Citrix Resources	Change display  Save in My Views			
Configuration Tools      Web Interfs     Web Interfs     Change displ     Web Interfs     Change displ     Web Interfs     Change displ     Zestation     Save in My V     Save in My V     Save in My V     Save in My V	ews Tasks			
Administ Run discover	•			
🔄 🕀 📂 Zones 🛛 View	ed Tools			
Password Mana Copy Refresh	bp Advanced guration Toots Knowledge Centers			
Help				

Citrix Access Management Console.



#### **FIGURE 10.59**

Select site type dialog box.

## NOTE

XenApp services was previously known as Program Neighborhood Agent, hence some of the legacy references to PNAgent.

- 4. Accept the default settings, and click Next (see Figure 10.60).
- **5.** Confirm your settings, and click **Next** (see Figure 10.61).
- 6. Click Next (see Figure 10.62).
- **7.** Enter a description for the XenApp farm. This doesn't have to match the actual farm name. Click **Add...** to add XenApp servers, enter the names of your XenApp servers. Move the primary XML server to the top of the list and click **Next** (see Figure 10.63).

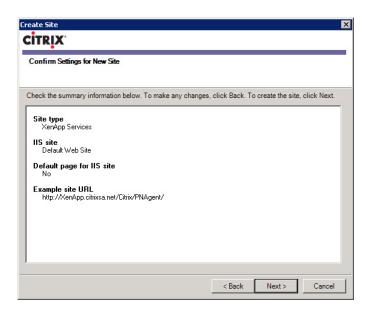
### NOTE

If there are multiple servers in the farm, it is a good practice to add a number of XenApp servers for resiliency. Larger XenApp farms may use a dedicated server to provide XML services, the servers are accessed in order. For best performance, the data collector should not be top of the list. The Web Interface site will by default use port 80 to communicate with the XML service of the XenApp servers. Remember to change the XML port to match that on the XenApp servers.

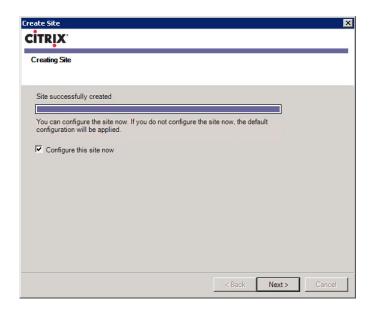
eate Site		
CİTRIX		
Specify IIS	Location	
Specify the	IIS location in which the site is hosted. This d	letermines the URL for users to access the site.
IIS site:	Default Web Site	-
Path:	/Citrix/PNAgent/	
	Set as the default page for the IIS site	
		< Back Next > Cancel

#### FIGURE 10.60

Specify IIS location dialog box.



Confirm settings dialog box.



#### **FIGURE 10.62**

Site creation progress dialog box.

Specify Initial Configuration - http://XenApp.citr	ixsa.net/Citrix/PNAgent 🛛 💌 🗕
CITRIX	
Specify Server Farm	
specify multiple server farms, use the Manage serve	b Interface displays published resources to users. To r farms task.
Farm name: MyXenApp Farm Servers (in failover order):	_
	Move Up Move Down
	Add Server 🔀
Add Edit Remove	Server name: XenApp
XML Service port: 80	OK Cancel
Transport type: HTTP	
SSL Relay port: 443	
	Next > Cancel

Specify server farm dialog box.

8. Change the Published Resource Type to Dual mode streaming (see Figure 10.64).

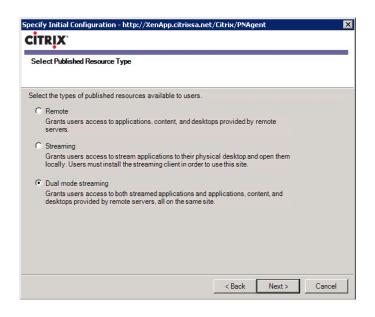
# NOTE

The default is "Remote," which would only provision hosted applications (and VM-hosted applications). To provision both remote and streamed applications, this must be changed to **Dual mode streaming**.

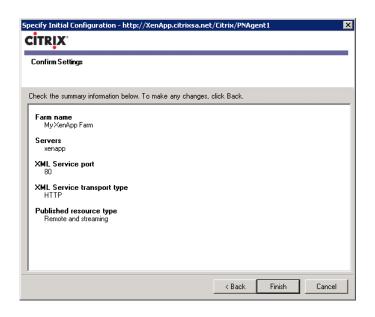
- **9.** Confirm your settings and click **Finish** (see Figure 10.65).
- **10.** Select the Web Interface site you have just created and right-click on the **config.xml** node. Select **Configure authentication methods** (see Figure 10.66).
- 11. Select the Pass-through (default) check box. Click OK (see Figure 10.67).

### NOTE

In the context of the virtual desktop, the XenApp client must seamlessly pass through the authentication XenApp server, and create the users' applications in the background.

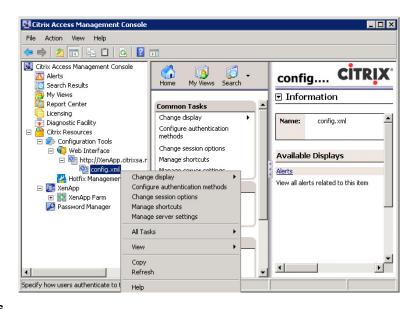


Select published resource type.



#### FIGURE 10.65

Confirm settings dialog box.



Access Management Console - configure authentication methods.

Configure Authentication Methods - config.xml	×	
Specify how users authenticate when using Citrix XenApp p Available methods:	olugin. Set as Default Properties	
Anonymous*		
Note: You should configure your system to support your selected authentication method(s) before enabling them. <u>More</u>		
(	DK Cancel	

#### **FIGURE 10.67**

Configure authentication methods.

# **CONFIGURE XENAPP SERVER**

This section illustrates the discovery process used by the Access Management Console for Citrix XenApp.

1. Select Start | Programs | Citrix | Management Consoles | Access Management Console (see Figure 10.68).

By default, it will automatically launch the "Configure and run discovery" wizard.

### NOTE

The discovery is run each time the console is opened. This requirement will be removed in the XenApp 6.0 version of the product.

- 2. Click Next (see Figure 10.69).
- 3. Click Next (see Figure 10.70).

#### TIP

To save time, deselect any products that you haven't installed.

4. Click Next to use the locally stored configuration files (see Figure 10.71).

In some larger environments comprising multiple Web Interface servers, the configuration can be centralized.

5. Click Add Local Computer (see Figure 10.72).

You could also click Add... to browse for additional XenApp servers. This is a good practice for resiliency.

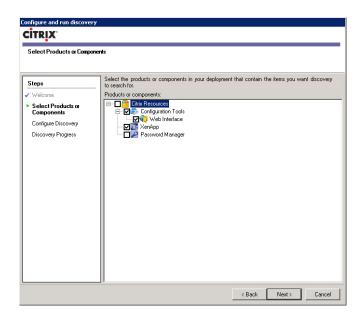


#### **FIGURE 10.68**

Access Management Console start menu item.

Configure and run discove	ery .
CITRIX'	
Welcome	
Steps * Welcome Select Products or Components Configure Discovery Discovery Progress	This is the discovery wizard for the Access Management Console. It will guide you through the discovery process. Before using the Access Management Console, you must run discovery to establish contact between items in your deployment and the console. Select Next to continue or Cancel to stop the discovery process.
	Skip this screen in future
	Next > Cancel

Discovery wizard welcome dialog box.



#### **FIGURE 10.70**

Discovery wizard product component selection.

Discovery etablishes contact between the Access Management Console and your Web Interface Installation. Note: The Web Interface is installed on this computer. When discovery completes, you can: • Create sites • Run local management tasks for sites installed on this computer • Discover sites installed on this computer Access all tasks for sites using this computer's local configuration files. • Contact the following servers running the Configuration Service Select of rentrally configured sites need to be upgraded. The server running the Configuration Service is typically the server running the XML Service. Servers: Add Edit Remove

Configuration services location.

Select Servers				
Steps	Specify at least one	server running Citrix XenApp in	each farm that you want to	administer.
✓ Welcome	-	Add Local Computer		
<ul> <li>Select Products or Components</li> </ul>	Servers:			
Configure Discovery	XENAPP			Add
<ul> <li>Configuration Tools</li> </ul>				Remove
<ul> <li>Web Interface</li> </ul>				
<ul> <li>Configuration</li> <li>Servers</li> </ul>				
XenApp				
<ul> <li>Select Servers</li> </ul>				
Preview Discovery				
Discovery Progress				

### **FIGURE 10.72**

XenApp – Select Servers dialog box.

Preview Discovery Steps			
Change			
Stehs	Check the summary configuration info discovery, click Next.	rmation below. To make any changes, click Back. T	o start
<ul> <li>Welcome</li> <li>Select Products or Components</li> <li>Configure Discovery</li> <li>Configuration Tools</li> <li>Web Interface</li> <li>Configuration Servers</li> <li>XenApp</li> <li>Select Servers</li> <li>Preview Discovery</li> <li>Discovery Progress</li> </ul>	Configuration Tools Web Interface XenApp Configuration Servers:	XENAPP	

Preview discovery dialog box.

- **6.** Click Next to confirm (see Figure 10.73).
- 7. Click Finish (see Figure 10.74).

The Access Management Console allows you to configure most aspects of your XenApp farm, including administration (security), applications, and servers (see Figure 10.75).

# TIP

Add a secondary administrator or administrator group after installing XenApp – and grant the "Full Administration" privileges. If the user account that performed the applications is unavailable (locked out, deleted, and so on) you will be unable to administer the Citrix farm. The **Add local administrators** option is a good choice in many environments – if your security policies allow it.

Use this page to monitor	the progress of discovery and check any errors.	
Steps	Discovery completed	
✔ Welcome	Discovery completed	Stop Discove
<ul> <li>Select Products or Components</li> </ul>	Close this wizard when discovery is successful	
Configure Discovery		
<ul> <li>Configuration Tools</li> </ul>	Errors: Double-click bold items to show additional detail.	
<ul> <li>Web Interface</li> </ul>	Description	
Configuration Servers		
XenApp		
Select Servers		
Preview Discovery		
Discovery Progress		

Discovery results dialog box.





Access Management Console.

# HOSTED APPLICATIONS – REGULAR INSTALLED

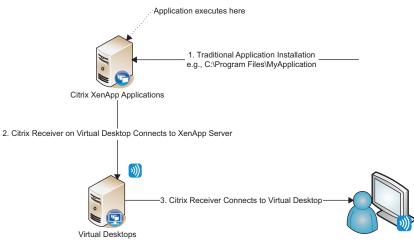
Hosted applications can be installed in the traditional manner directly onto all the XenApp servers in a farm. When applications are installed in the traditional manner care should be taken in more complex environments that applications do not clash. Using traditional methods, multiple versions of applications (e.g., Microsoft Office) cannot coexist on one server.

This method is, however, the simplest and quickest method to do basic testing. I would recommend using this method in a POC, especially if you are time constrained. In terms of your project plan, make sure that you have clear objectives – do you want to achieve desktop virtualization, application virtualization, or both? If you want to demonstrate the full features of both, then this impacts the project timeline.

Applications are installed on Windows 2003 or 2008 server. Terminal Services/Remote Desktop Services is used to allow the server to host multiple users, and the application is then presented over the network to the virtual desktop. The virtual desktop is in turn presented to the client device. The application is effectively tunneled from the XenApp server, inside the virtual desktop to the user (see Figure 10.76).

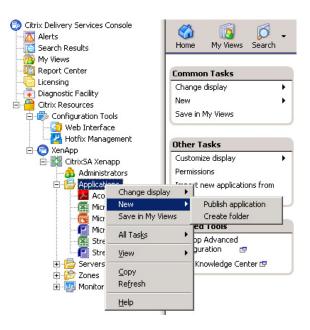
# Publish a Hosted Application – Step by Step

- 1. Open the Delivery Services Console, under the **XenApp** node, select your farm, and right-click on the **Applications** folder, select **New** | **Publish application** (see Figure 10.77).
- **2.** Click Next (see Figure 10.78).
- **3.** Enter a display name for your application, and a description if desired then click **Next** (see Figure 10.79).

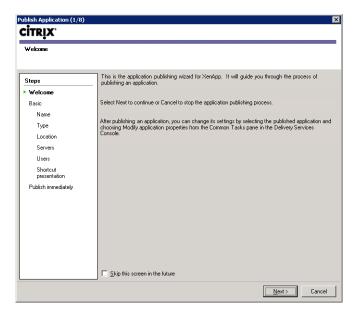


#### **FIGURE 10.76**

Hosted applications presented inside a virtual desktop.



Publish application menu in the Delivery Service Console.



#### **FIGURE 10.78**

Publish application welcome dialog box.

CİTRIX'	
Name	
Steps	Enter the name and description that you want to be displayed to clients for this application.
✔ Welcome	Display name:
Basic	Application Display Name
Name	
Туре	Application description:
Location	Description of My Application
Servers	
Users	
Shortcut presentation	
Publish immediately	

Published application display and description.

### NOTE

The display name is what appears to the user, so make it intuitive. The description field is not required, but can be useful for tracking applications and for whom they are intended – for example, a description could be "Legacy application version 10 required by users in Cape Town."

- **4.** Select **Application**, and under "Application type," select **Accessed from a server**. The server application type should be "Installed application" (see Figure 10.80).
- **5.** Enter or browse for a command line and working directory for the executable and then click **Next** (see Figure 10.81).

# NOTE

Citrix Streaming technologies overlap in some respects with the Application Isolation Environment (AIE) mechanism, including sharing some files. I would recommend using one of the two. Broadly speaking, the streaming supersedes AIE, and should be used instead.

Type View the application ty	pe. To change the type, use the Change application type task.	
Steps ✓ Walcone Baic ✓ Name ► Type Location Serves Uses Shotout preservation Publish immediately	Choose the type of application to publish.  Choose the type of application to publish.  Choose the type of application type  Application  Application  Application  Application  Application  Streamed to client  Note: To change the application type after publishing it, you must use the Change Application  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help  Guidt: Help	<ul> <li>Application</li> <li>Accessed from a serve</li> <li>Installed application</li> </ul>

Application type to publish.

Location Select and configure t	he resource being published.
Steps V Welcome	Enter the application location Enter the command line for the application you want to publish. You can also specify a default working directory for users. <u>More</u>
Basic	Command line:
<ul> <li>Name</li> </ul>	C:\WINDOWS\system32\notepad.exe
/ Туре	Br <u>o</u> wse
<ul> <li>Location</li> </ul>	Working directory:
Servers	C:\WINDOWS\system32
Users	, Browse
Shortcut presentation	Isolate application     Settings
Publish immediately	

### FIGURE 10.81

Application location dialog box.

- 6. To select the servers on which the application will be run, click Add..., from the Select Servers dialog box, click Add (or Add All to add all servers), click OK and then click Next (see Figure 10.82).
- 7. Click Add... to add users (see Figure 10.83).

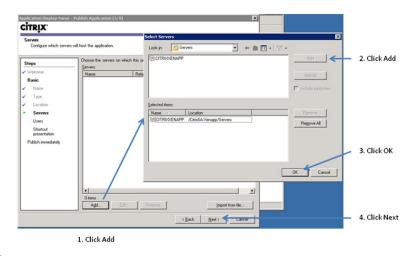
# NOTE

This mechanism works in exactly the same way as that of the Desktop Delivery Controller, when we added users to Desktop Groups.

- 8. Click Next (see Figure 10.84).
  - Client application folder can be used to organize how applications are presented to the user in Web Interface or through the online plug-in.
  - Add to the client's **Start Menu** creates an icon shortcut on the **Start Menu**, which can be useful in terms of usability the **Start Menu** in this case would be that of the virtual desktop.
  - Place under the Programs folder configures the previous setting to present the icons under the Programs folder on the **Start Menu**.
  - Start Menu folder creates a custom folder on the client's Start Menu.
  - Add shortcut to the client's desktop Adds the application icon to the users' desktops.
- 9. Select Configure advanced application settings now check box (see Figure 10.85).

## NOTE

You can configure these later, but for illustrative purposes, we will look briefly at all the options.



#### **FIGURE 10.82**

Select server to host the application.

Application Display Nam	e - Publish Application (6/8) 🛛 🔀
Users Configure the users w	ho may access the application.
Steps	Specify the users who can access this application. To add users, choose a directory type at the bottom and select Add. More
✓ Welcome	To add users, choose a directory type at the bottom and select Add. <u>Indirect.</u>
Basic	
🗸 Name	
🗸 Туре	C Allow anonymous users
<ul> <li>Location</li> </ul>	<ul> <li>Allow gnly configured users</li> </ul>
<ul> <li>Servers</li> </ul>	Configured users:
Users	📤 Domain Users (CITRIXSA\Domain Users)
Shortcut presentation	
Publish immediately	
	Select directory type:
	Add Remove
	< <u>B</u> ack <u>N</u> ext> Cancel

Configure users authorized to access the application.

Shortcut presentation           Steps           Veloome           Basic           V Name           V Type           Location           Servers           Users           Shortcut           presentation           Publish immediately	Configure the appearance and location of the application shortout. These settings function differently on different clerits. <u>Mase</u> Application icon Change icon  Clerit application folder Clerit application folder  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Application shortout placement  Appli	Client application folder Place the shortcut on the Start menu Place under Programs folder Custom name for the Start Menu folder Place the shortcut on the client's desktop
	(Back Next) Carcel	-

#### **FIGURE 10.84**

Configure application shortcut presentation.

Publish immediately	
Steps	The essential settings for this application have been configured.
✔ Welcome	When the wizard is finished, the application will be available to the configured users immediately. If you don't want the application to be available immediately, you can disable it until you are ready.
🖌 Basic	, , , , , , , , , , , , , , , , , , ,
🖌 Name	Disable application initially
🖌 Туре	
<ul> <li>Location</li> </ul>	
<ul> <li>Servers</li> </ul>	Advanced application settings default to the most common settings and are not required to be set for
✔ Users	the application to be available to users. You can configure these settings now, or you can configure them later using the application Properties tasks.
<ul> <li>Shortcut presentation</li> </ul>	
Publish immediately	Configure advanced application settings now
Advanced	
Access control	
Content redirection	
Limits	
Client options	
Appearance	

Publish immediately - or configure settings.

**10.** Click **Next** (see Figure 10.86). (You can ignore these settings when publishing applications to virtual desktops.)

### NOTE

These settings are only applicable if you are filtering your applications based on an Access Gateway access scenario. In this scenario, we are publishing applications to virtual desktops in the datacenter, and as such these settings would not be used in conjunction with VDI.

**11.** This is where you would set up FTA – file type associations. The FTA created here will create the FTA on the virtual desktop and automatically launch the application based on the file type. Select the relevant file types, and when finished, click **Next** (see Figure 10.87).

### TIP

If you have multiple applications that share file types, tweak these here to associate the desired application with the file type. For example, you may want .pdf documents to associate with Adobe Reader, and not Adobe Acrobat, or you may want .xls files to associate with Excel 2003 rather than Excel 2007.

citrix.	Publish Application (9/13)
Access control	
Steps	Configure Advanced Access Control for the application. - Configure what kinds of connections can access this application. <u>More</u>
<ul> <li>✓ Basic</li> <li>✓ Name</li> <li>✓ Type</li> <li>✓ Location</li> </ul>	Allow connections made through Access <u>Q</u> ateway Advanced Edition (version 4.0 or later)     Ary <u>connection</u> Ary connection that meets any of the following filters
<ul> <li>✓ Servers</li> <li>✓ Users</li> <li>✓ Shortcut presentation</li> </ul>	Access Gateway filters:
Publish immediately     Advanced     Access control	
Content redirection Limits Client options Appearance	Add Edk Remove
	Allow all other connections
	< <u>B</u> ack Cancel

Configure Advanced Access Control.

Content redirection				
Steps	-	ile types to be associated with the application	L	
Welcome	File types:	File Type		
/ Basic	.zap	Software Installation Settings		
Name	.xbap	XAML Browser Application		
Type		Windows Markup File		
	U.WSF	Windows Script File		
<ul> <li>Location</li> </ul>	.wfs	ADF Installer Package		
Servers	.vbs	VBScript Script File		
Users	U.VBE	VBScript Encoded Script File		
	.sfo	Citrix Optimization Session		
<ul> <li>Shortcut presentation</li> </ul>	.sct	Windows Script Component		
	.wsc	Windows Script Component		
<ul> <li>Publish immediately</li> </ul>	L .10g	Registration Entries		
<ul> <li>Advanced</li> </ul>	log .log	Text Document		
Access control	.scp	Text Document		
Content redire	.txt	Text Document		
	L	Text Document		
Limits	JSE .	JScript Encoded Script File		
Client options	ai. 🗖 🛛	JScript Script File		
Appearance	Select all	Deselect all		

### **FIGURE 10.87**

Configure file types to be associated.

- **12.** Leave the default options, and click **Next** (see Figure 10.88).
  - Limit instances allowed to run in server farm This can be useful if you have a limited number of licensed copies of an application.
  - Allow only one instance of the application for each user This can be used for license management, and also for those applications that only allow a user one session to a back end database.
  - You can additionally change the CPU priority of an application. I would not recommend tampering with this setting unless absolutely necessary.
- **13.** Leave the default settings, and click **Next** (see Figure 10.89).

There are three client options that could be configured here: **Client audio**, **Client encryption**, and **Printing**. The audio and encryption settings are normally not applicable when used with Xen-Desktop VDI, but the **Printing** option may still be applicable.

- Client audio
  - Enable legacy audio This option enables the redirection of audio from the XenApp server to the client.
  - Minimum requirement This option disallows clients that don't have audio support.

Application Display Name	- Publish Application (11/13) 🛛 🛛 🔀
<b>CİTRIX</b> '	
• Limits	
[	Configure the application limits
Steps	Concurrent instances
✓ Welcome	Limit instances allowed to run in server farm
🗸 Basic	
✓ Name	Magimum instances:
🗸 Туре	Allow only one instance of application for each user
✓ Location	
✓ Servers	CPU priority level:
✓ Users	Normal
<ul> <li>Shortcut presentation</li> </ul>	
🗸 Publish immediately	
🗸 Advanced	
<ul> <li>Access control</li> </ul>	
<ul> <li>Content redirection</li> </ul>	
Limits	
Client options	
Appearance	
	< <u>B</u> ack <u>N</u> ext > Cancel

#### **FIGURE 10.88**

Configure application limits.

Client options	
Steps Velcome Basic Name Type Location Servers Users Shortcut presentation Publish immediately Advanced	Configure the client options for the application Specify the default settings for the application when users connect. <u>More</u> Client audio ✓ Enable legagy audio <u>Minimum requirement</u> Note: These audio settings do not apply to Multimedia Acceleration. Connection encryption ✓ Enable SSL and TLS protocols ④ Important: There is no minimum requirement for this option. The settings on the client device can override this option.
<ul> <li>Access control</li> <li>Content redirection</li> <li>Limits</li> <li>Client options Appearance</li> </ul>	Encryption: Basic  Minimum requirement.  Printing  Start this application without waiting for printers to be created

Configure client options.

- Client encryption
  - Enable SSL and TLS protocols This option enables the use of SSL/TLS for connection to the application.
  - Encryption Basic, 128-bit login only, 40-bit, 56-bit, and 128-bit RC-5 encryption. These
    options enable the encryption of the ICA protocol. This is normally only necessary on an
    unsecured network.
  - Minimum requirement This option only allows access to client connecting using the encryption level defined above.
- Printing
  - Start this application without waiting for printer to be created This is the default, and that is to create printers asynchronously otherwise your logon is delayed until all your printers are created.
- 14. These settings only affect sessions that aren't running in seamless mode and can thus largely be ignored. Click **Finish** (see Figure 10.90).

Appearance				
Steps ✓ Welcome ✓ Basic	Configure the application appearance Session window <u>size:</u> 1024x768			
<ul> <li>Name</li> <li>Type</li> <li>Location</li> <li>Servers</li> </ul>	Colors: True color (24-bit)			
Users     Shortcut     presentation     Publish immediately     Advanced     Access control	Application Startup Settings Hide appligation title bar <u>M</u> aximize application at startup Note: Startup settings are ignored in seamless mode ICA sessions.			
<ul> <li>Content redirection</li> <li>Limits</li> <li>Client options</li> <li>Appearance</li> </ul>				

Configure application appearance.

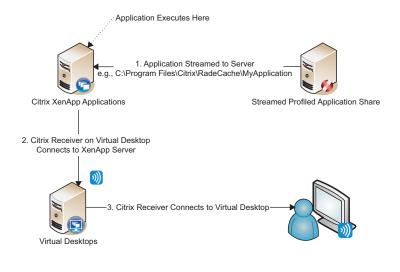
# **HOSTED APPLICATIONS – STREAMED TO SERVER**

Streamed to server applications are applications that have been profiled on the Server OS of the XenApp server. These applications aren't installed in the traditional manner, but rely on the streaming client on the XenApp server to execute in a virtual container on the XenApp server. This has benefits in more complex environments – applications are isolated from each other and they are simple to install and update across the XenApp farm. Using streaming, multiple versions of Microsoft Office can coexist on a single server.

This method requires the profiling of all the required applications. It is best practice to stream your applications in a XenApp environment.

I would recommend streaming only a single application in a POC especially if you are time constrained, and in that way you can demonstrate the concept without having to profile all the applications (install the rest of the applications in the traditional manner).

Applications are streamed to the XenApp server, where the virtual application is placed in the radecache folder. The application is not installed per se; however, it does execute in an isolation environment on the XenApp server. The streamed application is presented to the virtual desktop over the network using the ICA/HDX protocol in exactly the same way as a traditionally installed application. From there, the application is tunneled from the XenApp server to the virtual desktop and on to the client device (see Figure 10.91).



Application streamed to XenApp and presented to virtual desktop.

# Publish a Streamed to Server Application

Publishing a streamed to server application follows much the same procedure as publishing a traditionally installed application. Follow the steps laid out in the previous section up to Step 3. The process of creating a profiled application will be discussed in the next section. In this section, we will assume that one has already been created.

- 1. Select Application, Access from a server, and Streamed to server from the drop-down list (see Figure 10.92).
- **2.** Enter the path to the profile application share, or browse to the share. Select the application to launch from the drop-down list (see Figure 10.93).

#### TIP

 $\%^*$  is the command-line parameter required to pass the content redirection to the client, such that a file type will automatically be associated with the published application.

You may need to choose the relevant application from a profiled suite – like MS Office for example (see Figure 10.94).

You can then follow the same steps as publishing regularly installed hosted applications.

There is only one other additional option that differs for publishing streamed applications, and that is to specify alternative profile paths based on the client's IP address. This is generally used if you are streaming to physical devices in multiple locations. It can be useful in this scenario if the XenApp servers are split across more than one physical site as it gives you the facility to stream the application from a local file server (see Figure 10.95).

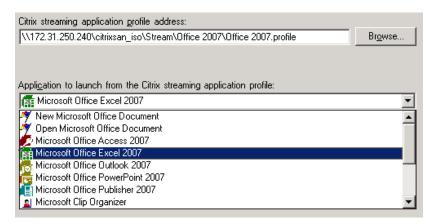
Type View the application by	e. To change the type, use the Change application type task,	
Steps Velcome Basic Name Type Location Servers Uses Shotod presentation Publish immediately	Choose the type of application to publish.  Choose the type of application to publish.  Choose the type of application to publish.  Choose the type of application type  Choose the type of application type  Choose the type of application type  Choose the type of application type after publishing it, you must use the Change Application  Distribution type the application type after publishing it, you must use the Change Application  Quick Help  Grants users access to stream a profile application to your servers and launch it through ICA.	<ul> <li>Application</li> <li>Accessed from a serve</li> <li>Streamed to server</li> </ul>

Application type dialog box.

Excel - Publish Application	(4/8) 🗙	3
<b>CİTRIX</b>		
Location Select and configure the	e resource being published.	
Steps Velcome Basic Name	Specify the application location. Enter the UNC address of the manifest file for the Chris streaming application profile you want to publish. Users must have access rights for the profile you specify; for example, make sure the file server pemilts all of your larget users to view and execute all files in the profile. <u>More</u> .	
Type     Location     Servers	Chix steaming application grolle address: [\\172.31.250.240/chixsan_ioo\Steam\Office 2007\Office 2007 prolle  Browne	Path to Profile share
Users Shortcut presentation Publish immediately	Appligation to lounch from the Otivi streaming application profile:	Application to launch
	Etha command line parameters: 51 These parameters will be placed into the command line where the proled application has specified application has roo " in its command line. Parameters string, these parameters will be added to the end of the command line.	%* for content redirection
	< gack Next > Cancel	

#### FIGURE 10.93

Application location dialog box.



Multiple applications in a profiled application suite.

Excel - Publish Application (	11/14) 🗙 🗆 🗴
CÎTRIX Alternate profiles	IX.
Steps Velcome	Configure alternate application profiles based on client IP range. Specify other profiles to use based on client IP addresses. <u>More</u>
✓ Basic ✓ Name	Primary_application profile location:         Imms           \\172.31.250.240\citrixsan_iso\Stream\Office 2007\Office 2007,profile         Imms
<ul><li>✓ Type</li><li>✓ Location</li></ul>	Alternate grofile locations:
<ul> <li>✓ Servers</li> <li>✓ Users</li> </ul>	Choose the alternate application profile to stream, and the client IP range for which the alternate profile applies.
<ul> <li>Shortcut presentation</li> <li>Publish immediately</li> </ul>	Client IP Range
✓ Advanced ✓ Access control	End IP: 0.0.0
Content redirection     Alternate profiles	Alternate profile:
Limits Client options	OK. Cancel
Appearance	Add Modify Remove 71, 109,
	< <u>Back</u> <u>Next</u> > <u>Cancel</u> 124, 1155, 1167,

#### **FIGURE 10.95**

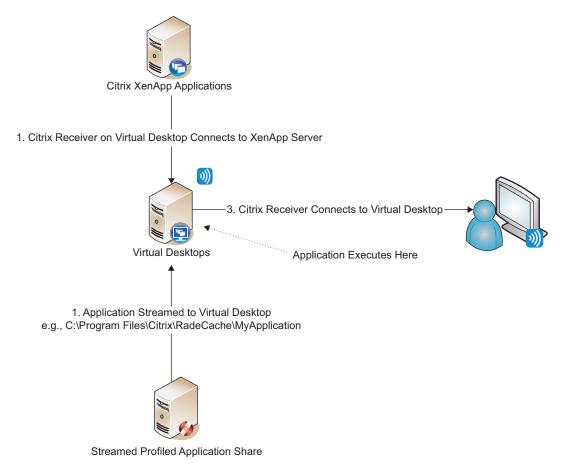
Specifying an alternative location for a profiled application.

# STREAMED TO END POINT APPLICATIONS

In a VDI environment, the end point to which the application is streamed is the virtual desktop.

Streamed applications should be profiled on the target operating system. In other words, if your virtual desktop is Windows 7, then you should profile the application on a Windows 7 desktop. The application should be profiled on a clean build workstation (nothing other than the operating system).

When the application is streamed to the virtual desktop, the XenApp client is only used to authenticate the user, and authorize the use of their assigned applications. These packages are then streamed down to the virtual desktop (in practice, they are generally "prestreamed") and they execute in an isolated environment on the virtual desktop. The application thus executes on the virtual desktop, which is presented over the network to the user through ICA/HDX (see Figure 10.96).



#### FIGURE 10.96

Applications streamed to end point.

# Install the Application Streaming Profiler

- 1. Insert the XenApp DVD (or mount the iso) to your workstation, and browse to Application Streaming Profiler, CitrixStreamingProfiler.exe (see Figure 10.97).
- 2. Leave the default at English and click Next (see Figure 10.98).
- 3. Click Next (see Figure 10.99).
- 4. Toggle the radio button to accept the license agreement, and click Next (see Figure 10.100).
- 5. Leave the installation folder at defaults, and click Next (see Figure 10.101).
- 6. Click Next (see Figure 10.102).
- 7. Click Finish (see Figure 10.103).
- 8. Click Yes to restart the workstation (see Figure 10.104).

Organize 🔻 Share with 👻				= - 🔳 🔞
📔 Pictures	*	Name	Date modified	Туре
😸 Videos		避 CitrixStreamingProfiler	9/10/2009 12:57 PM	Application
🜉 Computer				
🚢 Local Disk (C:)				
🔮 CD Drive (D:) XA5_FP2_PLT_2008				
🌗 Administration				
🌗 Application Streaming Profiler				
鷆 Citrix Receiver and Plug-ins				
퉬 Licensing				
鷆 Profile Management				
퉬 Provisioning Services				
퉬 Single Sign-On	=			
鷆 Support				
🌗 Web Interface				

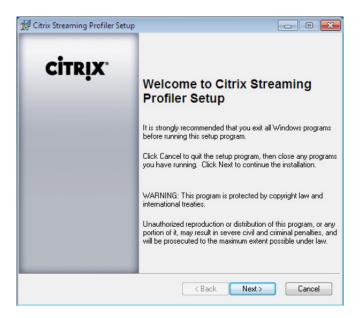
#### **FIGURE 10.97**

Citrix Streaming Profiler installation executable.

😽 Select Language		×
Which language would installation?	d you like to u	se during
English		•
0	ОК	Cancel

#### **FIGURE 10.98**

Select language dialog box.



Citrix Streaming Profiler welcome dialog box.

Citrix Streaming Profiler Setup	
	CITRIX.
License Agreement	
You must accept the license agreement	nt below to proceed.
CITRIX(R) LICENSE AGREEMENT	
	te Citrix license covering the Citrix product(s) with nt. This component is only licensed for use with
	I accept the license agreement     I do not accept the license agreement
Print	< Back Next > Cancel

#### **FIGURE 10.100**

Citrix license agreement.

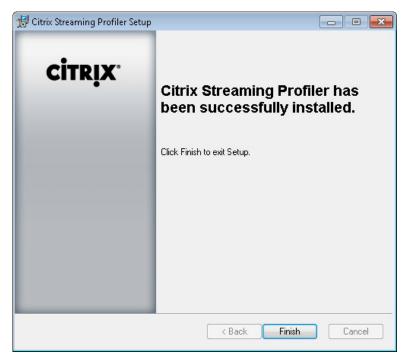


Destination folder dialog box.

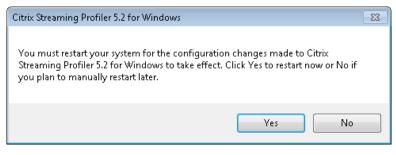
🔀 Citrix Streaming Profiler Setup	
	CITRIX.
Select Program Folder	
Program icons will be added to the following folder of the Start menu. To ch folder name, enter it below, then click Install to continue. C:\ProgramData\Microsoft\Windows\Start Menu\Programs\	ange the
<u>Ditrix\Streaming Profiler</u>	
< Back Install	Cancel

#### **FIGURE 10.102**

Select program folder dialog box.



Successful installation dialog box.



#### **FIGURE 10.104**

Restart Windows dialog box.

# **Profile a Streamed Application – Step by Step**

In this example, I will profile a simple application, in this case "Microsoft Word Viewer." Some more complex applications, for example Office 2007, require specific procedures in order to stream the application.

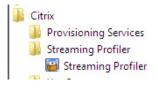
#### TIP

Do a quick search for your application on the support.citrix.com support site, to find if there are any specific requirements for the application you want to profile.

In general terms, simple applications will not require any "tweaking" for you to profile them.

- **1.** Click **Start | All Programs | Citrix | Streaming Profiler | Streaming Profiler** (see Figure 10.105).
- **2.** Click New Profile (see Figure 10.106).
- **3.** Click Next (see Figure 10.107).
- **4.** Enter a profile name in this example, I have given it the name "Word Viewer," and then click **Next** (see Figure 10.108).
- 5. Leave the Enable User Updates clear, and click Next (see Figure 10.109).

User updates are required by some applications, where the application may download updates from the Internet. Clearing this check box prevents most applications from automatically updating. The default setting is not to enable user updates - i.e., cleared.



#### **FIGURE 10.105**

Streaming Profiler start menu item.



#### **FIGURE 10.106**

Streaming Profiler welcome dialog box.

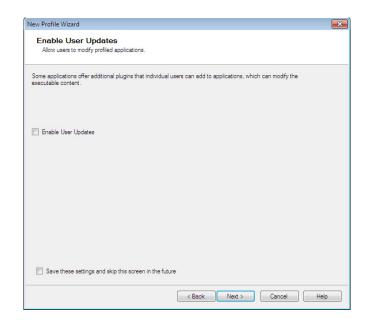
New Profile	e Wizard	]
~	Way This is the new profile wizard for the Ctrix Streaming Profiler for Windows, it will guide you through the process of installing applications that you want to stream to servers or end-user desktops.	
	Once built, a profile is copied to an App Hub where administrators can publish the profiled applications using the Citrix Delivery Services Console.	
	Select Next to continue or Cancel to stop the profiling process.	
	After creating a profile, you can change its settings by opening it in the profiler and choosing "Profile Properties" from the Edit menu or selecting a target and choosing "Target Properties" from the Edit menu.	
	Skip this screen in the future	
	< Back Next > Cancel Help	

New Profile Wizard informational dialog box.

Name Profile Enter profile name. profile.	The name you enter also be	comes the name of th	e folder that is creat	ed for the	
Profile name:					
Word Viewer					
		< Back	Next >	Cancel	Help

#### FIGURE 10.108

Configure profile name.



Enable User Update option.

**6.** "Set up Inter-Isolation Communication" is available for more complex virtual application interactions. Click **Next** (see Figure 10.110).

Where would you use Inter-Isolation Communication? Inter-Isolation Communication is required in instances where the virtualized applications need to communicate. For example, a third-party application makes a call to Microsoft Excel as part of a specific process, and if both the third-party application and Excel are virtualized, then this provides a mechanism for the two to interact.

**7.** You can leave the Set Target Operating System and Language at the defaults and click **Next** (see Figure 10.111).

Some applications only function correctly on a specific operating system and service pack combination. This functionality enables you to restrict the package to compatible operating system/ service pack combinations. The defaults will allow a broad range of compatibility. In this example, a package created on Windows 7 is accessible to Windows 7 32 bit, all service packs.

8. Select Quick Install, and click Next (see Figure 10.112).

#### Advanced Install

An advanced install may be required for more complex installation requirements, these include the following (see Figure 10.113):

- · Run install program or command-line script
- Install IE plugins, Web applications, or online updates (Microsoft Internet Explorer only)

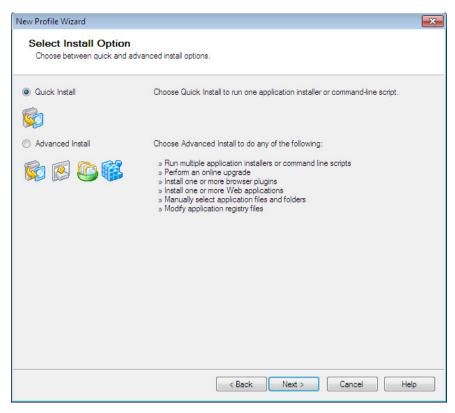
New Profile Wizard	×
Set up Inter-Isolation Communication Choose the other profiles to link to in this profile.	
Some applications are designed to interface directly with other applications to provide interoperability and extended functionality. Use this page to set up inter-isolation Communication in which profiled applications can communicate o the client device. Click Browse to locate your other profiles. Select the profiles to add and use the buttons to rank the selected profiles in order of priority, top being the highest rank.	
If your application should not reference other profiled applications, click Next to continue.	
Select linked profiles:	
Move Up	
Move Down	
< Back Next > Cancel H	elp

Set up Inter-isolation Communication.

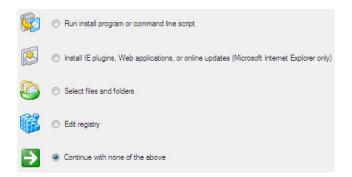
ecommendation: Applications should not be t perating system.	argeted to run on operating systems older	than the current profiler
Operating System	Service Pack	
Windows Server 2008 64-bit Edition	All service packs	
Windows 7	All service packs	
Windows 7 64 Bit	All service packs	
Windows Server 2008 R2 64-bit Edition	All service packs	=
arget language		
ect the language of the application you wan inese and Korean applications should be pro filed on the same operating system language	filed on an English operating system. Othe	r applications should be
elect the language of the application you wan inese and Korean applications should be pro filed on the same operating system language languages	filed on an English operating system. Others on which they are designed to run.	r applications should be
lect the language of the application you wan inese and Korean applications should be pro filled on the same operating system language anguages Afrikaans	filed on an English operating system. Others on which they are designed to run.	r applications should be
elect the language of the application you wan inese and Korean applications should be pro filed on the same operating system language languages	filed on an English operating system. Others on which they are designed to run.	r applications should be

#### FIGURE 10.111

Set target operating system and language.



Select install option dialog box.



#### **FIGURE 10.113**

Advanced install options.

- Select files or folders
- Edit registry

You could, for example, package something as simple as registry changes as a package, and then deploy it.

**9.** Click **Browse**... and navigate the installation setup file executable, .msi or script and then click **Next** (see Figure 10.114).

Click **Launch Installer**. The installation will take place into a virtual container, as noted on the screen. It can also perform a virtual reboot of the container (see Figure 10.115).

**10.** Follow the regular installation process.

# NOTE

If you look on the hard drive of the profiler, you will see that no files have actually been installed.

11. The Next button on the Run installer dialog box will become available when the install is complete. Click Next.

New Profile	Nizard 💌
011000	e Installer an installation program or command line script and enter any necessary command line ers.
Installation	program / command line script:
C:\Users\a	dministrator\Desktop\wdviewer.exe Browse
Command I	ine parameters (optional):
À	Profiler workstation boot drive is C:. Applications profiled using this profiler will be targeted to run on client workstations with boot drive C:. To ensure successful profiling, make sure the physical drives selected during application installation match those on the client workstations.
	< Back Next > Cancel Help

#### FIGURE 10.114

Choose installer dialog box.

Vew Profile Wizard			
Run Installer Complete the instal proce	dure for your installation program or command line script.		
Click Launch Installer to begin choose another installer or co	. After the installer starts, the Back button is disabled. If the installer fairect the parameters.	is to start, click Back to	
When the installation finishes,	olick Next.		
Installation program:	C:\Users\administrator\Desktop\wdviewer.exe		
		-	
Command line parameters:		<b>^</b>	
		-	
Launch Installer			Next Button Grayed Ou
1 The Profiler will per	form a Virtual Reboot if required for Profiling.		

Run installer dialog box.



#### **FIGURE 10.116**

Virtual restart notification.

- 12. Click OK to confirm the virtual restart (see Figure 10.116).
- **13.** Select the application and click **Run**. If there is more than one application, then run all of the applications in the window. This allows any processes or registrations that should take place on the first pass to be captured (see Figure 10.117).
- 14. Once you finish performing any additional tasks, close the application, and click Next.

The Select applications dialog box allows you to add or remove application executables that you want to publish to your users. You can also use the **Modify**... button to change the display name of the application (see Figure 10.118).

- **15.** If required by security policy, you can sign the profile using a certificate. Click **Next** (see Figure 10.119).
- **16.** Click **Finish** to complete the installation. You still have the option at this point to go back and change settings (see Figure 10.120).

The profiled application can now be saved. You can also manually edit the package if required (see Figure 10.121).

Some applications must be run once to com product activation). If you run the application The initial list contains application shortcuts run. If necessary enter the command line pa	n, wait until it has finished opening before discovered during installation. Select A	ore you click Next. Add to locate executable files you want to
Applications: Application Name	Status	Run
Microsoft Office Word Viewer 2003	Application Not Run	Add
Command line parameters (optional):		

Run application dialog box.

lew Profile Wizard Select Applications Select the applications you want to p	ublish from the	e Citrix Delivery Services Console.	<b>-</b> ×
The initial list contains application shortcu Select Add to locate executable files you	uts, browser plu want to publis	ugins, and Web applications discovered h.	during the installation.
Applications: Application Name	Version	Path	Add
Microsoft Office Word Viewer 2003	11.0.6412.0	c:\program files\microsoft office\office	Modfy Delete Recover
•		Þ	
		< Back Next >	Cancel Help

# FIGURE 10.118

Select applications dialog box.

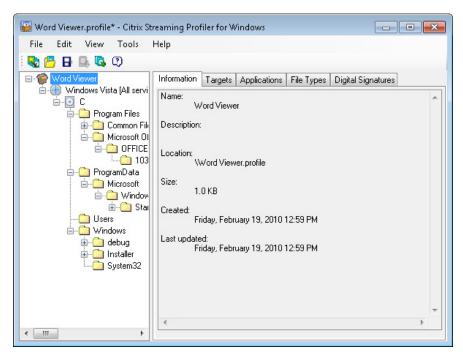
Ini	ing profiles guarantees their integrity and origin to protect end users from launching altered or corrupt applications.
)	Sign using key from selectable file
	Certificate / private key:
	Sign using locally installed certificate Local certificate, issued to:
	Browse
	Do not sign profile
	Skip this screen in the future

Sign profile dialog box.

Profile details:	ust be saved to an App Hub.	
Profile Name: User Updates: Digital Signature:	Word Viewer Disabled Not signed	*
Target Operating Systems:	Windows Vista [All service packs] Windows Server 2008 [All service packs] Windows 7 [All service packs]	
Languages: Boot Drive: Applications:	English C: Microsoft Office Word Viewer 2003	
		*

#### FIGURE 10.120

Build profile dialog box.



Citrix Streaming Profiler.

Profile directory (UNC path):			
			Browse
Profile name:			
Word Viewer			
Save to:			
	S	ave	Cancel

#### FIGURE 10.122

Saves As pop up box.

#### 17. Click File | Save.

18. Browse to a network share, and save the profiled application (see Figure 10.122).

#### NOTE

The profile is best stored on a file server. For best performance, the package will be best delivered from a server that is optimized to be a file server. Do not use a XenApp server to act as a file server.

# **Publish a Streamed Application**

In this section, we will look at how to take the package we just created, and to publish it to our users. The publishing mechanism is performed from the Citrix XenApp Access Management Console.

Precaching applications in the build will be discussed in this section.

Follow the same steps for publishing an application as per previous section, up to the point of selecting an application type.

1. Select Streamed to client and click Next (see Figure 10.123).

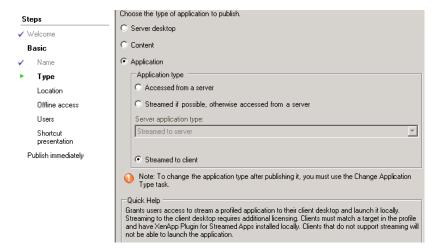
The **Streamed if possible, otherwise accessed from server** option is a mobility solution, which fails back to remotely accessing the application on the XenApp server. This is not really applicable to VDI type deployments.

2. Click Browse... to navigate to the <application>.profile file (see Figure 10.124).

#### NOTE

For application suites, where more than one executable is provided by the profiled package – use the **Application** to launch from the Citrix streaming application profile from the drop-down list to select the relevant application executable. The Microsoft Office Suite, for example, would provide a list of the Microsoft Office components – Excel Word, PowerPoint, and so on.

3. Leave the Enable offline access option deselected, and click Next (see Figure 10.125).

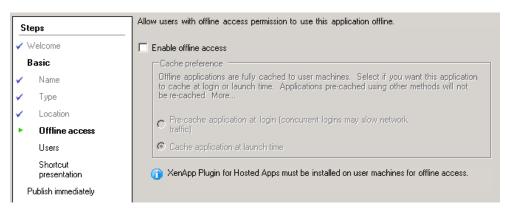


#### **FIGURE 10.123**

Application type options.

Excel - Publish Application (4	/8) 🗴
CITRIX: Location Select and configure the re	esource being published.
Steps Velcome Basic Name Type Location Offline access Users Shortcut presentation Publish immediately	Specify the application location.         Enter the UNC address of the manifest file for the Citrix streaming application profile you want to publish. Users must have access rights for the profile you specify; for example, make sure the file server permits all of your target users to view and execute all files in the profile. More         Citrix streaming application grofile address:         [\\\172.31.250.240\citrixsan_iso\Stream\Office 2007\Office 2007.profile         Appligation to launch from the Citrix streaming application profile:         [m]         Microsoft Office Excel 2007         Image: server parameters:         [%]         [%]         These parameters will be placed into the command line where the profile application has specified." as a parameters will be added to the end of the command line.
	<u> &lt; ₿</u> ack <u>N</u> ext> Cancel

Application location selection.





Offline access dialog box.

# NOTE

Enabling offline access is unnecessary as the virtual desktop is always online. If you are using Private mode (Read/Write)\virtual desktops, my preference is to choose **Cache application at launch time**, as this prevents all the applications trying to load as you log on.

The following steps are very similar to those steps for publishing a regularly installed hosted application; however, there are enough differences that we will briefly step through the relevant steps to assist you in publishing a streamed application.

- **4.** Click **Add**..., and browse the Active Directory for your desired User Group. Click **Next** (see Figure 10.126).
- **5.** Select Add to the client's Start menu and Add shortcut to client's desktop (see Figure 10.127).
- 6. Select Configure advanced application settings now and click Next (see Figure 10.128).
- 7. Leave the defaults allowing all connection types, and click Next (see Figure 10.129).
- **8.** Select the file type associations; this will cause the associated application to automatically launch if the user clicks on a file of that type. Click **Next** (see Figure 10.130).

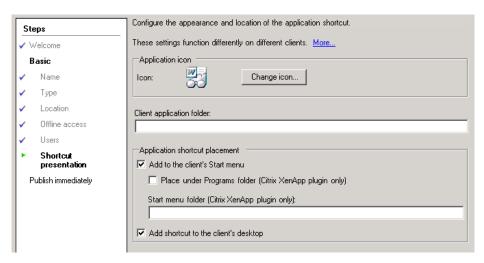
# NOTE

File type associations are an important aspect of virtual applications due to the fact that they aren't static on the virtual desktop. File type associations are established at logon, the XenApp streaming client establishes file type associations, and passes the information to the virtual desktop. If, based on the users group memberships', both Microsoft Word Viewer and Microsoft Word are streamed to the desktop, then the application that streams down last will have the file type associated with it.

✓	Name						
×	Туре		Allow anonymous users				
×	Location	• 4	Now only configured us	ers			
~	Offline access		Configured users:				
	Users		🤒 Domain Users (CITI	RIXSA\Domain Users)			
	Shortcut presentation						
P	ublish immediately	[	Select directory type:	Citrix User Selector Remove			<u> </u>
					< Back	Next >	Cancel

#### **FIGURE 10.126**

Users selection dialog box.



Shortcut presentation dialog box.

Ste	:ps	The essential settings for this application have been configured.
🗸 W	/elcome	When the wizard is finished, the application will be available to the configured users immediately. If you don't want the application to be available immediately, you can disable it until you are ready.
🖌 B.	asic	······································
× -	Name	Disable application initially
× -	Туре	
× -	Location	
× -	Offline access	Advanced application settings default to the most common settings and are not required to be set for
× -	Users	the application to be available to users. You can configure these settings now, or you can configure them later using the application Properties tasks.
×	Shortcut presentation	
► P	ublish immediately	Configure advanced application settings now
A	dvanced	
	Access control	
	Content redirection	
	Alternate profiles	
	User privileges	
		< Back Next > Cancel

#### **FIGURE 10.128**

Publish immediately dialog box.

CITRIX	
Access control	
Steps Velcome Basic	Configure Advanced Access Control for the application. Configure what kinds of connections can access this application. <u>More</u> I Allow connections made through Access Gateway Advanced Edition (version 4.0 or later)
<ul> <li>Name</li> <li>Type</li> <li>Location</li> </ul>	${\cal G}^{\ast}$ Any connection ${\cal C}^{\ast}$ Any connection that meets any of the following filters
<ul> <li>✓ Offline access</li> <li>✓ Users</li> <li>✓ Shortcut presentation</li> </ul>	Access Galeway filters:           Farm Name         Filter
Publish immediately     Advanced     Access control     Content redirection	
Alternate profiles User privileges	Add Edit Remove

Advanced access control dialog box.

Co	ntent redirection				
Ste	-	Configure the fil File types:	e types to be associated with the appli	cation.	
<b>√</b> \/	/elcome	Extension	File Type		
🗸 B	asic	.doc	Microsoft Word Document		 
<b>~</b>	Name	.dochtml	Microsoft Word HTML Document		
~	Туре	dot	Microsoft Word Template		
~	Location	.dothtml	Microsoft Word HTML Template Rich Text Format		
~	Offline access	.wbk	Microsoft Word Backup Document		
~	Users				
~	Shortcut presentation				
🗸 P	ublish immediately				
🗸 A	dvanced				
~	Access control				
×.	Content redirection				
	Alternate profiles				
	User privileges				
		Select all	Deselect all		
		Show all a	vailable file types for this application		

#### FIGURE 10.130

Content redirection - file types.

9. Click Next (see Figure 10.131).

**Configure alternative application profile based on client IP range** is a setting that enables you to define a location for the profile based on the client IP range. In the context of virtual desktops, this is useful if your virtual desktops exist in two separate datacenters, you can specify different application profile locations for the two datacenters.

**10.** Leave the **Run application as a least privileged user account** cleared, and click **Finish** (see Figure 10.132).

#### NOTE

Running the application with decreased privileges is a setting that is used for security purposes. If the user has administrative, or otherwise increased privileges, this setting would cause the application to execute with user-level privileges. This setting must be used with caution, as it could cause the application not to function correctly. When the XenApp streaming client authenticates the user, they will now be assigned the package based on their group memberships.

Alt	ernate profiles										
Ste	:ps	Configure	e alternate	applica	tion prof	iles based	on clien	t IP range.			
\	/elcome	Specify	other profil	es to u:	se basec	l on client l	IP addre	sses. <u>More</u>	<u></u>		
🖌 В	asic	Primary	application	profile	location:						
/	Name	Whype	v\vms\Wc	ord View	er/Word	d Viewer, pro	ofile				
/	Туре	Alternati	e profile loc	ations:							
,	Location	Client	IP Range		Profile I	Location					
	Offline access										
	Users										
	Shortcut presentation										
Ρ	ublish immediately										
A	dvanced										
	Access control										
	Content redirection										
	Alternate profiles										
	User privileges										

#### **FIGURE 10.131**

Alternative profiles locations.

User privileges					
Steps	Change what privileges the application is run with				
✓ Welcome ✓ Basic	The streamed application can run with normal user privileges, or it can be run with the user's privileges reduced to the lowest set available on the client machine.				
<ul> <li>Name</li> </ul>	The client system is more secure with this setting enabled.				
🗸 Туре					
✓ Location					
✓ Offline access	Run application as a least-privileged user account				
✓ Users					
<ul> <li>Shortcut presentation</li> </ul>	This setting only applies when streaming the application to the client desktop				
🗸 Publish immediately					
🗸 Advanced					
<ul> <li>Access control</li> </ul>					
<ul> <li>Content redirection</li> </ul>					
<ul> <li>Alternate profiles</li> </ul>					
<ul> <li>User privileges</li> </ul>					

User privileges dialog box.

# **INSTALL VM-HOSTED APPLICATIONS**

Conceptually, VM-hosted applications are similar to XenApp, with the exception that the applications are being hosted on a workstation operating system rather than a server operating system. Practically, the implementation of VM-hosted applications is actually just a variation of the standard Desktop Delivery Controller mechanism of XenDesktop.

The most common use case would be a requirement for an application that is Windows XP dependant, in an environment that is being standardized on Windows 7. There may be other use cases, where two applications required by the user require two different versions of Internet Explorer; however, in most cases, I would first consider XenApp before VM-hosted applications. VM-hosted applications, by their very nature, require a high level of server resources as one VM instance must exist for each user.

To install VM-hosted applications, you can choose to either install a second Desktop Delivery Controller and a separate farm, or you could use your existing XenDesktop farm, and create a separate Desktop Group that you are going to use to host the VM-hosted applications.

In this example, I will demonstrate how you would add a second farm to deploy VM-hosted applications.

# Create the VM-hosted Application Virtual Machines – Step by Step

The recommended installation procedure is to load the XenApp FP2 CD first - XA50\_FP2\_WS03.iso.

- 1. Launch Install XenApp (see Figure 10.133).
- 2. Run the Install VM-hosted Apps (see Figure 10.134).

This adds the registry key: [HKEY\_LOCAL\_MACHINE\SOFTWARE\Citrix\ManagementConsole]

"VMHostedAppsModeEnabled"=dword:0000001

**3.** You are then prompted to mount the DDC\_VDA.iso to your virtual machine (see Figure 10.135).

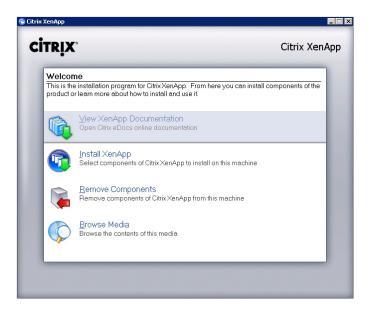
The installation after this point follows exactly the same procedure as that of a standard XenDesktop installation. Refer to Chapter 2, "Installation of the Broker – Desktop Delivery Controller," for a step-by-step guide.

In the previous sections, we have focused on Windows 7 as the guest operating system; in this section, the guest operating system used will be Windows XP as it is the most commonly used operating system for VM-hosted applications.

Most of the tasks below are exactly the same as the procedure you would follow when using XenDesktop to provision virtual desktops.

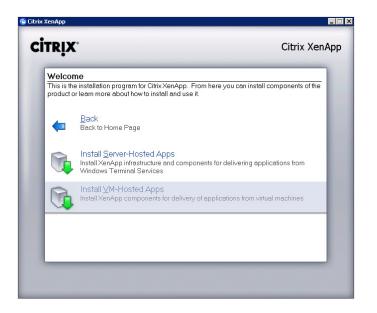
1. Create a virtual desktop of the required operating system.

**2.** Install the required application.





Citrix XenApp installation welcome.



Citrix XenApp component selection.

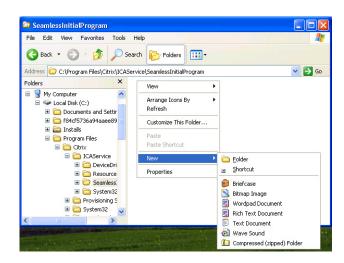
🧧 Citrix XenApp	×
Inset the media for VM-Hosted Applications or browse to its location.	OK Cancel
Location:	Browse

#### **FIGURE 10.135**

VM-hosted applications media location dialog box.

- **3.** Install the Virtual Desktop Agent. Mount DDC\_VDA.iso to the virtual desktop, and install the agent.
- **4.** Browse to C:\Program Files\Citrix\ICAService\SeamlessInitialProgram. By default this is empty, and will provide the user full desktop, and you can add a shortcut to your application by right-clicking in the folder and selecting **New | Shortcut**. Browse to your executable. Alternatively, you can simply drag and drop the shortcut into the folder. Change the security on the shortcut to allow your users access to the shortcut. Specifically a shortcut must be placed in the folder and not the executable (.exe) (see Figure 10.136).
- Enter the path to the application or click the Browse... button to locate the executable. Click Next – Accept the Name, then Finish (see Figure 10.137).

In this example, I have browsed to Solitaire (sol.exe).



Seamless initial program folder.

Create Shortcut	
R	This wizard helps you to create shortcuts to local or network programs, files, folders, computers, or Internet addresses. Type the location of the item: EtWINDOWS(system32(sol.exe) Browse Click Next to continue.
	< Back Next > Cancel

#### FIGURE 10.137

Create shortcut wizard.

#### Important

Do not place more than one shortcut in the SeamlessInitialProgram folder.

- 6. Install the Provisioning Server Target Device software.
- 7. Copy the Target Device Hard Drive to a vDisk.
- **8.** Change the vDisk mode to standard.

The following steps vary from how a similar task would be performed on XenDesktop.

- **9.** Open the Delivery Services Console and expand your farm. Then right-click on **Desktop** Groups.
- **10.** Select Create desktop group (see Figure 10.138).

Follow the wizard, as per normal.

11. When selecting the assignment type, select the check box Use Desktop Group for VM Hosted Apps (see Figure 10.139).

#### Important

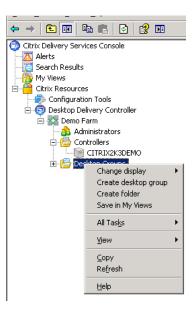
This attribute cannot be changed after creation; the Desktop Group must be deleted and re-created. Failure to select this tick box results in the application not appearing correctly in a Seamless Window.

When specifying the Desktop Group name, bear in mind that this will be the display name of the application to the user, so assign a name that will be recognizable to the users (see Figure 10.140).

Changing the icon is useful in the context of an application. In terms of user experience, you are providing a familiar visual cue. Click **Change icon**..., and browse to the application folder (see Figure 10.141).

#### TIP

The application icon is sometimes stored in the application's folder, if there are no .ico files, select the application executable, the icon is most often embedded in the executable (see Figure 10.142).



#### **FIGURE 10.138**

Create Desktop Group menu option.

Specify if this desktop g	Specify whether desktops in this desktop group will be allocated to users from a pool or assigned to specific users.
<ul> <li>Welcome</li> <li>Assignment Type</li> <li>Hosting Infrastructure</li> <li>Virtual Desktops</li> </ul>	Coperation activity     Coperation activity     Coperation activity     Coperation activity     Coperation activity     Coperation activity     Coperation activity     Coperation activity     Coperation activity     Coperation activity     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     Coperation     C
Users Desktop Group Name Icon Publishing Options	<ul> <li>Assigned</li> <li>A desktop that is permanently assigned to a particular user.</li> <li>Assign on first use</li> <li>Assign a desktop to the first user who connects to it.</li> <li>Pre-assigned</li> <li>Assign a desktop to a user prior to that user connecting.</li> </ul>
	✓ Use Desktop Group for VM Hosted Apps VM Hosted Apps is a feature of Citrix XenApp. Refer to the XenApp documentation at <u>http://support.citrix.com/proddecs</u> to learn more.

Assignment type dialog box.

Notepad - Create Desktop G CITRIX Desktop Group Name Provide a name and desc	roup 🛛 🗙
Steps	Specify the name and description displayed to users that view desktops in this desktop group using Windows mode.
✓ Welcome	
🗸 Assignment Type	Display name:
✓ Hosting Infrastructure	Notepad
<ul> <li>Logon Information</li> </ul>	Description:
🗸 Virtual Desktops	
🗸 Users	
Desktop Group Name	
lcon	
Publishing Options	

#### FIGURE 10.140

The Desktop Group name is the application display name.

Steps Velcome Assignment Type Hosting Infrastructure Cogon Information Virtual Desktops	Specify the icon displaye mode. Icon Current icon:	Ē		
Hosting Infrastructure     Logon Information		Ē		
Hosting Infrastructure     Logon Information	Current icon:			
Logon Information			Chan <u>ge</u> icon	
Users				
Desktop Group Name				
lcon				
Publishing Options				

Changing the icon for a VM-hosted application.

Icon Bro	wser			×
• Ch	oose from Ci oose an icor	rix <u>d</u> efault icons from a locally browsed <u>fi</u> le e an icon from C:\WINDOWS\NOTEPAD.EXE		Browse
			OK	Cancel

#### FIGURE 10.142

Selecting an application icon.

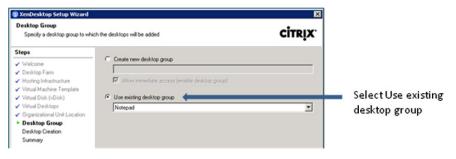
The simplest way to then configure VM-hosted applications is to use the XenDesktop Setup Wizard. The only difference between creating normal virtual desktops using the wizard and creating virtual desktops for application hosting is that the Desktop Group must be precreated. This is because the wizard does not have the facility to specify that the Desktop Group is intended for VM-hosted Apps.

Designating the Desktop Group as for "VM-hosted App" will automatically change how the application is presented to the users (see Figure 10.143).

When accessing the Web Interface site, an **Applications** tab is automatically created as shown in Figure 10.144. Resources are automatically filtered to be presented as either a desktop, or an application (see Figure 10.144).

Using farm aggregation, a Web Interface Services site can deploy both XenApp applications and VM-hosted applications into the virtual desktops. These will appear identically to the users.

In order to aggregate applications from multiple farms, Web Interface simply needs to be configured to communicate with both farms, and the applications from both farms will be displayed seamlessly to the user (see Figure 10.145).



#### **FIGURE 10.143**

Precreate a desktop group for XenDesktop Setup Wizard.



#### **FIGURE 10.144**

VM-hosted applications are added to the list of applications.

Manage Server Farms Add and edit farm nam and SSL server ports, I	es and specify	the order in w			specify XML
<u>F</u> arms (in change pass	word order):				
Name	XML port	XML trans	SSL Relay port	Servers	Move <u>U</u> p
XenApp Farm VMHOSTED	80 80	HTTP HTTP		localhost 172.31.250.147	Move <u>D</u> own
•					
Add Edit <u>R</u> emove					
Advanced Settings Configure socket po	oling and XML	Service comm	unication for all farr	ns.	Ad <u>v</u> anced
				OK	Cancel

Farm aggregations in Web Interface.

# **MICROSOFT APP-V APPLICATIONS**

Microsoft App-V is a standard application management infrastructure in many organizations. Microsoft App-V has functionality that overlaps with the XenApp streaming mechanism, but not with XenApp-hosted applications. It is advisable, from a standards perspective, to choose one mechanism to deploy your virtual applications. You could, for example, use both App-V to deploy virtual applications to your virtual desktops, and also use XenApp-hosted applications to present applications using HDX(ICA) into the virtual desktops.

Where we created streamed profiles using the Streaming Profiler, for App-V, we use the Microsoft Application Virtualization Sequencer. The sequencer is used to convert standard applications into Microsoft App-V sequences.

You can use traditional Microsoft methods to deploy App-V application to your virtual desktop.

Citrix has recently introduced a mechanism to deploy App-V packages using the Delivery Services Console.<sup>A</sup> You publish an App-V package in much the same way as you would a Citrix streamed application. When defining the application profile to be deployed, you specify the AppStreamingtoAppVConduit.profile. What this does is to call the App-V client on the virtual desktop to open a package sequenced with App-V.

In the above example, I have sequenced Word Viewer using App-V. I can then publish this to the user using the AppStreamingtoAppVConduit. This, as the name indicates, is a conduit for application streaming to App-V (see Figure 10.146).

This requires that the App-V 4.5 or 4.6 clients be installed on the virtual desktops.

<sup>&</sup>lt;sup>A</sup>Please refer to the Citrix White Paper – Application Streaming to App-V Conduit for more details.

CITRIX Location Select and configure th	ie resource being published.
Steps Welcome Basic Name Jype Location Offline access Users Shortcut presentation Publish immediately	Specify the application location.         Enter the UNC address of the manifest file for the Citrix streaming application profile you want to publish. Users must have access rights for the profile you specify: for example, make sure the file server permits all of your target users to view and execute all files in the profile. More         Citrix streaming application grofile address:         [\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\

Publishing and App-V sequence.

The Citrix Receiver can now be used as the mechanism for App-V clients. There is an App-V plug-in for the Citrix Receiver. As with other base components, I recommend that the App-V client be installed as part of the base build, if you will be using App-V.

In the context of virtual desktops, the online plug-in authorizes the user to use an application, and calls

```
%PROGRAMFILES%\Microsoft Application Virtualization Client\sfttray.exe
```

(which is the App-V client) to execute the .OSD format (App-V) application.

# SUMMARY

One of the keystones of the Citrix XenDesktop approach is that the components should be built out in a modular fashion. In this section, we addressed the provisioning of applications into our virtual desktops. We addressed the various different application virtualization mechanisms. We discussed very briefly the installation of XenApp servers, and then the configuration thereof. We focused on hosted applications, streamed to server-hosted applications, streamed to end point applications, and VM-hosted applications. This chapter dealt in depth with the installation, configuration, and publishing of these applications to the virtual desktop. Lastly, we discussed how Microsoft App-V applications can be integrated into a XenDesktop solution.

There have been many books written on the subject of Citrix XenApp, and this chapter doesn't attempt to cover all the details, but rather just to give you those details necessary to get you started in using XenApp within the context of XenDesktop.

# Integrating Virtual Applications into the Virtual Desktop

# 11

#### **INFORMATION IN THIS CHAPTER**

- Configure the XenApp Client
- Precache XenApp-streamed Applications
- Precache App-V Applications

There are a number of different ways to deliver the applications to your users with the virtual desktop.

"Locally installed applications" into the base vDisk is a strategy commonly followed to perform a basic proof of concept. In many cases, the time frame makes this a good option. In production environments, streamed applications are generally a better choice.

"Streamed applications," whether using Citrix Application Streaming or Microsoft App-V are a better choice. Application virtualization makes the application environment far more manageable and flexible.

Streaming applications to the users "on demand" means that the applications are sent to the virtual desktop only when required. This causes delays when launching the application, and is not recommended. There are two ways in which the applications can retain the management functionality of application virtualization, while performing like locally installed applications.

- **1.** Precache to the vDisk.
- **2.** Precache to the write cache disk.

Precaching means that the files have been sent down to the virtual desktop, but the shortcuts have not been created. The application files are inaccessible to the user until they have authenticated through the XenApp (or App-V) client.

Precaching to the vDisk needs to be done while the vDisk is in Private image mode - as it is normally in read-only mode. Precaching to the write cache disk can be done at any time as it is inherently read/write.

# NOTE

The strategy of using the write cache disk means that you would also need to reevaluate the write cache disk space requirements.

XenApp-hosted applications should not be discounted as an application delivery method. Presenting older Windows XP/2003 applications into a Windows 7 desktop is achieved simply by using XenApp. Additionally, applications that have complex requirements may not be well suited to streaming, and these should be placed on a XenApp server. An additional benefit would be that the application load is not incurred on the virtual desktops, but rather on the XenApp servers.

#### **CONFIGURE THE XENAPP CLIENT**

The Citrix XenApp client has now been renamed as the Citrix Receiver. The Citrix Receiver has been created to be a single point to update and control the various Citrix components. Download the Citrix Receiver from the www.citrix.com Web site (see Figure 11.1).

Download the Receiver for Windows, the online and the offline plug-in. The online plug-in is used for remote applications delivered to the user over the network using a Presentation Layer Protocol. The offline plug-in is used to deliver streamed applications that execute locally in an isolation environment.

Switch the base vDisk into Private image mode, such that the Citrix Receiver can be part of the base build.

#### Installing the Receiver and the Online Plug-in

The Receiver.msi is a silent installation, and the online plug-in is silent except for a success notification.

#### Installing the Offline Plug-in

The offline plug-in will be used for streamed applications. Execute the CitrixOfflinePlugin.exe executable that you have downloaded (see Figure 11.1).

- 1. Select the desired language, and click OK (see Figure 11.2).
- **2.** Click Next (see Figure 11.3).
- 3. Toggle the radio button to accept the license agreement (see Figure 11.4).
- 4. Click Install (see Figure 11.5).
- 5. Click Finish (see Figure 11.6).
- 6. Click Yes (see Figure 11.7).

After a virtual desktop restart, the online plug-in will pop-up and request the location of the Web Interface server. This location will be used by both the online plug-in and the offline plug-in to retrieve assigned applications.

7. Enter the hostname of the Web Interface server, and click Update (see Figure 11.8).

#### TIP

Enter the FQDN of the Web Interface site – best practice would be to use a Citrix NetScaler to perform server high availability and load balancing. If you are not going to use these features, then a Citrix Access Gateway will also perform well. Remember that the Web Interface Web site must be configured as a XenApp Services site. The XenApp Services site must be configured as a "Dual mode Streaming" site to provision both hosted and streamed applications. Pass through authentication must be configured on the Web site to seamlessly pass the user's credentials through to the Web Interface server.

Receiver					
Receiver for Windows 1.1	English	10/26/09	7.8 MB	.msi	Download 🔘
Designed specifical	lly for devices lever	aging Micros	soft Window	vs operating	system platforms.
Plug-ins					
r lug-llis					
Online plug-in	All Languages	9/29/09	13.8 MB	.exe	Download Download
Offline plug-in	All Languages	9/29/09	12.9 MB	.exe	Download 🔘
Dazzle	English	11/23/09	1.71 MB	.msi	Download D
E 11.1					

The Citrix Receiver and plug-ins.

Select Language	<b>—</b> ×
Which language would you stallation?	like to use during
English	•
	K Cancel

#### FIGURE 11.2

Select language.



Offline plug-in - welcome.



#### FIGURE 11.4

License agreement.



Destination folder.



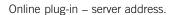
#### FIGURE 11.6

Successfully installed dialog box.

Citrix offline plug-in	23
You must restart your system for the configuratio plug-in to take effect. Click Yes to restart now or N restart later.	
	Yes No

Restart.

🕝 Change	Server - Citrix online plug-in	×
What is the	e address of the server hosting your published resources?	
<u>S</u> erver 4	Address:	
http://	xenapp.citrixsa.net	-
Example	<ul> <li>servername (for non-secure connections)</li> <li>https://servername (for secure connections)</li> </ul>	
	Update Cancel	
ÿ	The server you specify here can be used to remotely configure Citrix online plug-in settings. Only specify the address of a trusted server.	
	If you are unsure what to enter here please consult with your Administrator.	
FIGURE 11.8		



#### PRECACHE XENAPP-STREAMED APPLICATIONS

When using a "Standard image" vDisk, the best practice for provisioning user applications to the user desktops is to have the packages actually built into the base build. This effectively deploys the applications in their entirety to the virtual desktops, but stops just short of actually granting them access. This prevents the applications from deploying over the network to the virtual desktops. It does, however, require that the base vDisk be preconfigured with the applications.

So, for example, if a user has five applications assigned to them, they would in a physical desktop scenario, download the applications on demand down to the local device. The virtual applications are cached to C:\Program Files\Citrix\RadeCache\<perappcache>, where the <perappcache> would be as per application folder designated by a randomized string – for example,  $3055a6bb-bc81-4b41-8d2b-c0b56f4c163b_1$ . The folder contains the entire application in its isolated environment. For the curious, if you look under that folder, you will find a "device" folder which contains the virtual "c" drive and all its contents. You would have five such folders, each containing one of the applications. In a virtual desktop environment, you may have many more folders, containing all the applications the user may need.

The question you may ask is why precache if it is a one-off task? And the answer is that the users vDisk is read only, and their "cache" folder will need to be refreshed after each reboot, which could potentially result in far more network traffic, as the creation of the files under Rade-Cache would occur as often as the device reboots. This is only true if you are using a "Standard image" vDisk – a "Private image" vDisk would persist and keep the files. The strategy is thus to create the RadeCache folder contents while the vDisk is in "Private image" mode – i.e., read/write.

Copy your existing production vDisk. Change the new vDisk into private mode, and mount it to a virtual machine. This process will be dealt with in detail in Chapter 12, "Implementing Virtual Profiles into the Virtual Desktop."

Open a command prompt. Type the following:

#### cd C:\Program Files\Citrix\Streaming Client\

The radedeploy utility does not add itself to the path variables, so you will need to run it out of the folder. Radedeploy run without any switches returns usage information (see Figure 11.9). Use the following syntax to deploy the streamed application to the RadeCache folder (see Figure 11.9):

#### radedeploy /deploy \\<path to streamed packages>\<packagename>.profile

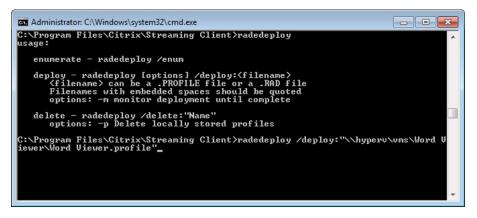
Repeat the process for each package you need to deploy.

It is important to note that this prepopulates the required files; however, it does not provide access to the application. The XenApp client authenticates the user and will push the shortcuts to the desktop or start menu (or both) depending on how you have published the application.

An application shortcut will point to the XenApp client (see Figure 11.10). For example, "C:\Program Files\Citrix\ICA Client\pnagent.exe" /CitrixShortcut: (1) /QLaunch "Word Viewer."

The application data is thus prepopulated, but access to the packages is managed by the XenApp Receiver.

The Citrix Receiver must have both the online plug-in and the offline plug-in, in order to use streamed applications. The offline plug-in provides the packages, and the online plug-in provides access by authenticating the user.



Using radedeploy to deploy packages.

Security	Details	Previous Versions
General	Shortcut	Compatibility
N N	/ord Viewer	
Target type:	Application	
Target location	: ICA Client	
Target:	"C:\Program Files\Citro	<pre>k\ICA Client\pnagent.exe".</pre>
Start in:		
Shortcut key:	None	
Run:	Normal window	•
Comment:		
Open File L	ocation Change Ic	on Advanced

#### FIGURE 11.10

XenApp services application shortcuts.

#### PRECACHE APP-V APPLICATIONS

The logic behind precaching App-V applications is exactly the same as that behind precaching XenApp-streamed applications. Deploying virtual applications over the network is best avoided, particularly if it will need to be done repeatedly. Cached App-V applications are loaded into %AllUsersProfile%\Documents\App-V Client\OSD Cache, which is a common folder for all users using the virtual desktop. As the folder name "OSD Cache" indicates, this folder is used to store the OSD content.

Precaching the App-V files doesn't present the application to the user. The application access can be managed using the standard Microsoft mechanism, or as per Chapter 10, "Configure Citrix XenApp for Application Provisioning," the XenApp can be used to authorize the use of the application. Access to the applications are managed by the XenApp online plug-in the same as XenApp-streamed applications.

In order to load an App-V package into cache, the sfttray.exe executable can be used to manually populate the cache.

For example,

%PROGRAMFILES%\Microsoft Application Virtualization Client\ sfttray.exe /load \\172.31. 250.105\appv\Microsoft Office Word Viewer 2003 11.0.8169.0.osd

This will load the application Word Viewer into cache. If the user is authorized to use the application, then the relevant icons are created automatically on the user desktop.

#### Checkpoint 5 Updating Packages in the Base Vdisk

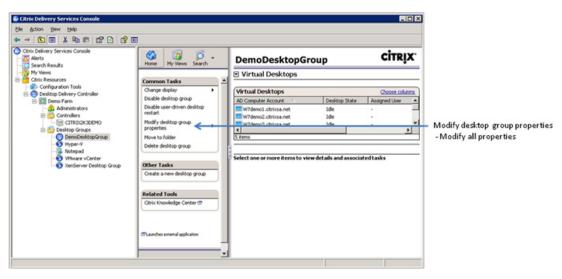
This section leads you through a demonstration of updating a package on the base image. This would be best tailored to a technical audience who would then understand how the application packages and things like hotfixes can be updated in the virtual desktop environment.

The previous checkpoint was aimed at demonstrating the ease of implementation, and the functionality of XenDesktop. This checkpoint has the aim of demonstrating how XenDesktop can be managed from an operational perspective.

- 1. Open the Provisioning Server Console on the provisioning server, and indicate which vDisk is in use (see Figure 11.11).
- 2. Open the Delivery Services Console on the Desktop Delivery Controller; select Modify desktop group properties in the common tasks pane, select Modify all properties from the menu (see Figure 11.12).
- 3. Change the "Idle Desktop Count" to zero (see Figure 11.13).
- 4. Open the hypervisor console XenCenter, SCVMM, or vCenter.
- 5. Shut down the virtual desktops through the relevant management console.
- **6.** Returning to the provisioning server, show how the virtual desktops are marked as "Down" (see Figure 11.14).
- **7.** Copy the vDisk and its .pvp (config) file and paste it into either another location, or rename the file in the same location (see Figure 11.15).
- 8. Open the Provisioning Server Console, right-click on the Store node, select Add Existing vDisk... (see Figure 11.16).
- **9.** Click **Search** to discover the vDisk, click **Add** to add it to the store, and then click **Close** (see Figure 11.17). You now have multiple versions of the vDisk (see Figure 11.18).

File Action View Window Help						_8
• 🔿 📶 🖬 🖬 🖬						
Provisioning Services Console	Name	MAC	Booting From	vDisk	IP Address	Server
🗄 🎇 Demo Farm (localhost)	🚫 🛄 vV7demo1	7E-A1-69-AF-1E-76	vDisk	Demo Store Windows 7Demo	172.31.250	<b>PVSDEMO</b>
🖻 😃 Sites	V7demo2	86-23-AC-71-07-5F	vDisk	Demo StoreMindows7Demo	172.31.250	<b>PVSDEMO</b>
Johannesburg Site Servers	VV7demo3	BA-9F-30-1B-BB	vDisk	Demo Store Windows7Demo	172.31.250	PVSDEMO
vDisk Pool	V7demo5	76-70-63-8D-45-23	vDisk	(Demo Store Windows 7Demo)	172.31.250	<b>PVSDEMO</b>
Collections     Collections     Collection     Collection     New Demo Device Collection     Whhosted     Whyare     User Groups     Wews     Vews     Stores						
	1					

Provisioning Services Console - Device Collection vDisk.



#### **FIGURE 11.12**

Delivery Services Console - Desktop Groups.

- Right-click on Device Collection, select Create Device Collection. Assign the Device Collection a name like Build or Development etc (see Figure 11.19).
- **11.** Add a Target Device to the Build Device Collection using the procedure outlined in Chapter 7, "Fundamental Configuration of the Citrix Provisioning Server."

Properties:	Idle Pool Settings
Basic     Desktop Group Name     Assignment Type     Hosting Infrastructure     Users     Icon     Logon Information     Virtual Desktops     Advanced     Access Control     Client Options     Idle Pool Settings     Logoff Behavior	10         5         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         <

Desktop Group properties.

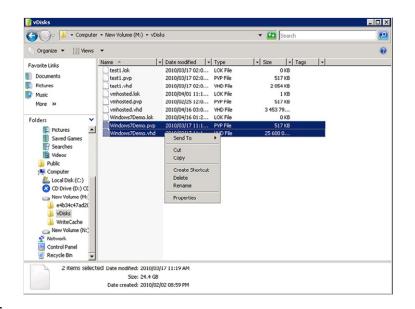
Name	MAC	Booting From	vDisk	IP Address
🛄 /\/7demo1	7E-A1-69-AF-1E-76	vDisk	Demo StoreWVindows7Demo	Down
🛄 🗤7demo2	86-23-AC-71-07-5F	vDisk	Demo StoreWVindows7Demo	Down
🛄 /\/7demo3	BA-9F-30-1B-BB	vDisk	Demo StoreWVindows7Demo	Down
🛄 /V7demo5	76-70-63-8D-45-23	vDisk	Demo StoreWVindows7Demo	Down

#### FIGURE 11.14

Provisioning Services Console – Device Collection.

In order to keep things as simple as possible, I recommend that you create a build Target Device, and a build Device Collection. This is a good way to separate "build and test" from production workstations.

**Important:** The build Target Device should not be part of the production Desktop Group. This creates conflicts as the Desktop Delivery Controller will affect the power setting of the virtual desktop.



vDisk files.



#### FIGURE 11.16

vDisk store options.

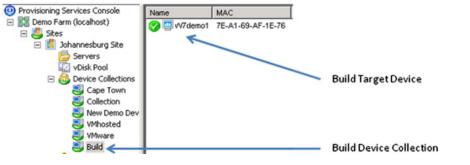
Add Existing vDisks	
Search a store for new vDisks Site to which the vDisk(s) will be added:	
Johannesburg Site	
Store to search:	
vmware	
Server to use for searching:	
PVSDEMO 💌	
Search <	1. Search for vDisks
Add checked vDisks to the vDisk Pool	
☑ Windows7Demo <	2. Discovered vDisk
	Provisioning Services Console 🛛 🗙
	One vDisk added.
	3. Add to Store
Enable load balancing for these vDisks	
Add Select All Clear All	
Close Help	

Add existing vDisks.

Provisioning Services Console	Name	Store	Connections	Size	Mode
🖃 🎇 Demo Farm (localhost)	🕑 test1	Demo Store	0	1500 MB	Private
🖃 😃 Sites	👝 🔝 vmhosted	Demo Store	1	10000 MB	Private
Johannesburg Site Servers	💟 vrnvdisk	Store 2	0	25000 MB	Private
VDisk Pool	💟 Windows7Demo	Demo Store	0	25000 MB	Cache on Server
🖃 🛃 Device Collections	💟 Windows7Demo v1	Store 2	0	25000 MB	Private
🔤 Cape Town	💟 Windows7Demo v2	Store 2	0	25000 MB	Private
I Collection					
Tem Dev 🧕 New Demo Dev					
See VMhosted					
UMware					

#### FIGURE 11.18

Multiple versions of a vDisk.



Provisioning Services Console - Device Collections.

Provisioning Services Console	Name	MAC	Booting Fre	om vDisk	IP Address	Server	
Demo Farm (localhost)	VV7demo1	7E-A1-69-AF-1E-76	vDisk	Como Otoro Windowo 7Domo	Down		<ul> <li>1. Select Target Device</li> </ul>
Target Device Properties	and and	00.00.00.74.07.75	×	Demo Store Windows 7Demo	Down		
	o	o. 1 1		Demo Store Windows 7Demo Demo Store Windows 7Demo	Down		<ul> <li>2. Select vDisks Tab</li> </ul>
General vDisks	T ersonality   T onbiocker	Status   cogging		Denio Store windowsi Denio	Down		2. Select voisks Tab
vDisks for this Device:							
Demo Store\Windows7Demo		Add					3. Click Add
		-				00	
		Remov	e As	sign vDisks		×	
		Printers		Filter			
C Options				Store: All Stores		-	
Include the local HD as a	a boot device					-	
Custom bootstrap files:				Server: All Servers		-	
		Add	1				
		Edt.	i r	Select the desired vDisks			
		Eat	-	Demo Store\test1 Demo Store\vmhosted			
		Remove		Store 2\vmvdisk			
(Note: Enabling multiple vDisks o		to be disclosed on the de		Store 2\Windows7Demo v1 Store 2\Windows7Demo v2	,		4. Select vDisk
(Note: Enabling multiple volsks o	r options will cause a menu	to be displayed on the de	rvice.j	SILIE 2 WYRIODWS7 DEIIIO Y2			4. Select vDisk
	ок (	Cancel H	elp				
			ab				
							<ul> <li>5. Click OK</li> </ul>
				1	/	_	
				OK C		Help	
			_		ancel	neip	

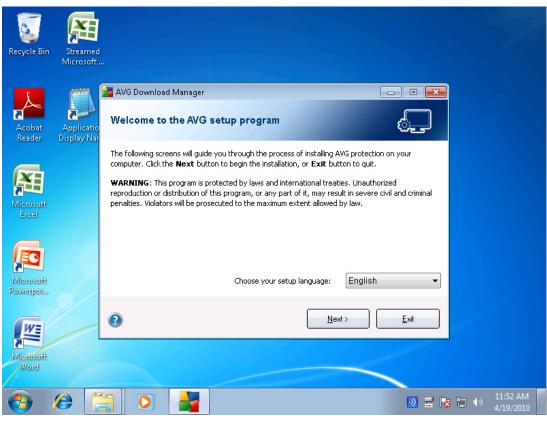
#### FIGURE 11.20

Assigning a vDisk to a Target Device.

12. Select the Target Device, right-click **Properties**, select **vDisk** tab, click **Add**..., select the vDisk you just copied, and click **OK** (see Figure 11.20).

You have now assigned your newly created vDisk to the Target Device.

**13.** Install something into your "build" vDisk, antivirus or antivirus update pattern files make a good demo (see Figure 11.21).



Virtual Windows 7 desktop.

- 14. Shut down the build Target Device to release locks on the vDisk.
- 15. Change the vDisk from Private image to Standard image (see Figure 11.22).
- **16.** "Drag and Drop" the new updated vDisk onto the **Device Collection**. Click **Yes** to accept the change to the vDisk assignments (see Figure 11.23).

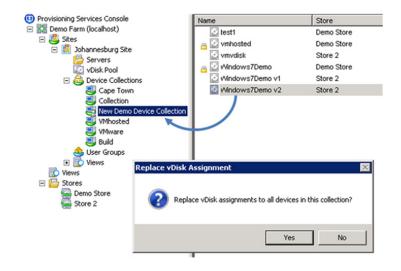
#### NOTE

This will update all the virtual desktops in the Device Collection to the new build.

- **17.** Amend the Idle pool on your desktop group to a nonzero number, to start the Desktop Group.
- **18.** Log into one of the virtual desktops and indicate the updated content.
- **19.** Demonstrate how the "Drag and Drop" of the "version 1" vDisk back onto the Device Collection can be used to simply "roll back" to an older version of the vDisk (see Figure 11.24).

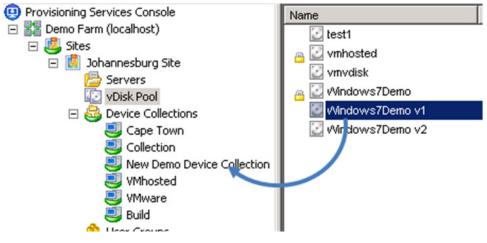


vDisk - access mode.



#### FIGURE 11.23

Replace vDisk assignment.



Roll back vDisk assignment.

#### **Discussion Point**

This is a good point at which to raise the question as to which components should be part of the base build, and which components should be streamed in. Antivirus, for example, would be part of the base build, but applications should normally be streamed in.

#### SUMMARY

This chapter covered application provisioning from the perspective of the virtual desktops. The previous chapter covered how the application provisioning is configured from the server side, and this chapter dealt with how the Citrix Receiver should be configured to present the applications to the user. We also covered how to prepopulate the application cache for best performance.

The checkpoint in this chapter is a demonstration of how the vDisks can be manipulated to operationally manage updates in the context of virtual desktops.

CHAPTER

### Implementing Virtual Profiles into the Virtual Desktop

## 12

#### **INFORMATION IN THIS CHAPTER**

• What Is a Profile?

In a traditional desktop environment, user settings are stored on the local device. In a virtual desktop environment, the user receives a standard build operating system, without any user settings. It is particularly important in a virtual desktop environment to have a mechanism to maintain user personalization. Hosted applications delivered to the virtual desktop also require individual user settings. Microsoft desktop operating systems use a mechanism called a user profile to store user-specific settings.

#### WHAT IS A PROFILE?

A user profile comprises the registry keys and files where the user's settings are saved. The user profile is located at C:\Documents and Setting\%username% in Windows XP and at C:\Users\%username% in Windows 7 as shown in Figure 12.1.

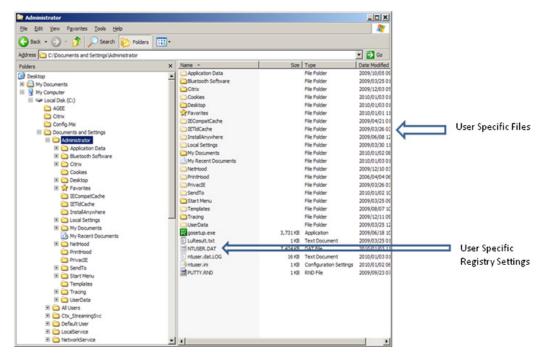
The user's HKEY\_CURRENT\_USER registry hive is loaded from NTUSER.DAT at logon, and saved at logoff. Likewise, application-specific files – for example, the user's Microsoft Word template is saved in the profile. Local profiles save the user settings to the local machine.

Roaming profiles are for users using multiple environments. Roaming profiles entail saving the user settings to a network location, the user settings are downloaded at logon, and saved at logoff as shown in Figure 12.2.

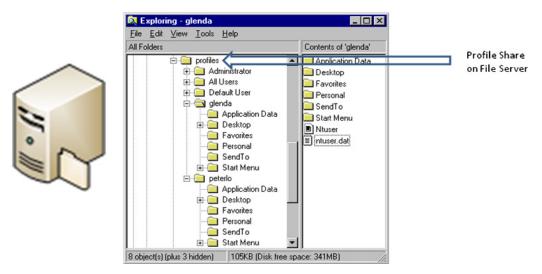
Most applications save user-specific settings to the user locations; however, some applications save settings into HKEY\_LOCAL\_MACHINE and to the application installation folder, rather than to the profile. In these cases, roaming profiles do not save the user's settings.

Roaming profiles have a further issue; they tend to "bloat." Over time, more and more files get added to the profile; some of these are temporary application files, or things like temporary Internet files. The profile must be downloaded at logon to receive the user settings, and as the profile grows in size, the logon time increases.

Virtual Profiles are an enhancement of the roaming profile concept. Virtual Profiles extend the roaming profile concept by allowing the administrator to include files and registry keys held outside of the standard locations. We could specify that "HKEY\_LOCAL\_MACHINE\Software\Strange-Applicaton\Settings" be saved to the Virtual Profile, and be injected at logon like the standard settings. This extends the user personalization to nonstandard applications.

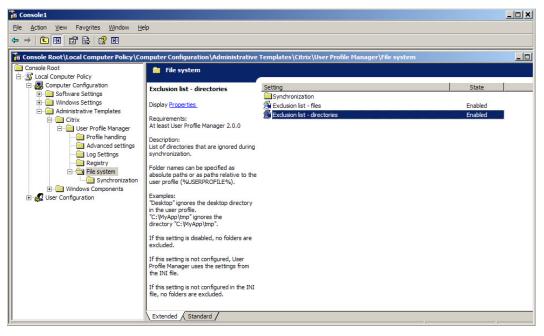


User profile stored on the workstation.



#### FIGURE 12.2

Roaming profiles are stored on a file server.



Creating a Virtual Profile exclusion list.

Using Virtual Profiles, the administrator could also specify that some files or registry settings held in the profile be excluded from being saved, as shown in Figure 12.3. This enables the administrator to control what is saved in the user settings at a far more granular level. The size of the Virtual Profile can be managed and slow logon times eliminated.

Additionally, Virtual Profiles add an enhanced mechanism for merging profile settings – hosted application settings with streamed application settings – providing a more consistent, robust profile.

#### TIP

For Windows XP, virtual desktops use UPHCLEAN from Microsoft in conjunction with Profile Management. It is not necessary with Windows 7 as UPHCLEAN is integrated into the operating system.

#### **Installation of Virtual Profiles**

Citrix Profile Manager can be downloaded from the Citrix Web site. It is part of the XenDesktop downloads under the Components section. Extract the contents of the download; you should have something as shown in Figure 12.4.

The .msi (Microsoft Installer) packages are for installation into the target virtual desktop. The .adm file is to be loaded into a Group Policy Management Console to control the Profile Manager settings.



Profile Manager installer packages.

There are two versions of the .msi: the 64-bit version and the 32-bit version. Execute the version relevant to your desktop operating system. If you are using provisioning server, you should mount the build vDisk in Private mode to add the Profile Manager to the base build.

#### Install Profile Manager – Step by Step

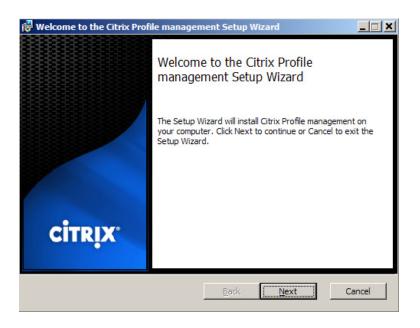
- 1. Double-click the profilemgt2.1.0\_x86.msi (profilemgt2.1.0\_x64.msi if your Windows XP/ Windows 7 is 64 bit).
- **2.** Click Next as shown in Figure 12.5.
- **3.** Accept the license and click **Next** as shown in Figure 12.6.
- **4.** Select the default path as shown in Figure 12.7. Click the **Change**... button to install the files in a different location. Click **Next** when finished.
- 5. Click Install as shown in Figure 12.8.
- **6.** Click **Finish** as shown in Figure 12.9.
- 7. Click Yes as shown in Figure 12.10 to reboot the system or No to reboot later.

Once the virtual desktop has restarted, you will see that the Profile Manager has installed as a service on the virtual desktop as shown in Figure 12.11.

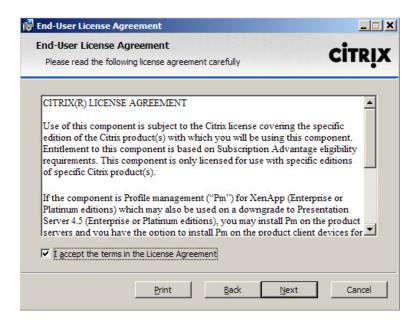
#### **Configuration of Virtual Profiles**

Citrix Profile Manager is configured by using a Group Policy. The ctxprofile2.1.0.adm file is included with Profile Manager. The .adm file extends the standard Group Policy to include the Citrix Profile Manager settings. Profile Manager also has a legacy .ini file mechanism that can also be used. The simplest way to configure the settings is by using a Group Policy.

Group Policies are preferable as you can dynamically manage the settings and the settings can be set differently for different groups of machines or users.



Profile Management Setup Wizard.

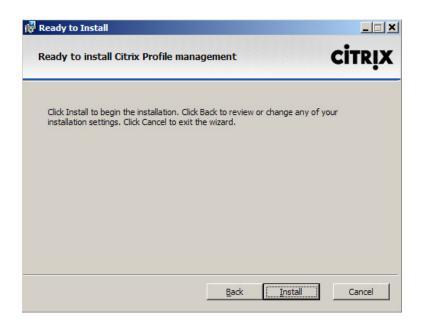


#### FIGURE 12.6

Citrix license agreement.

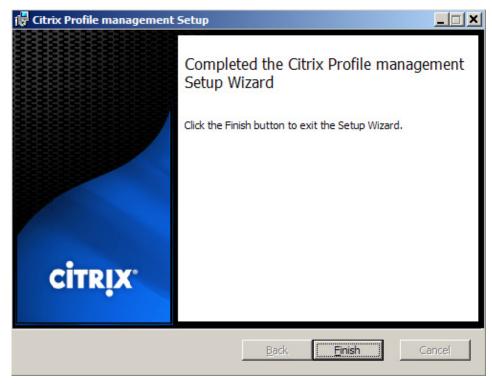


Destination folder dialog box.

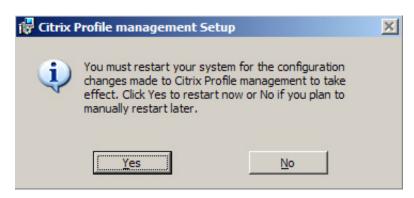


#### FIGURE 12.8

Ready to install dialog box.



Successful completion dialog box.



#### **FIGURE 12.10**

Restart system dialog box.

trix Use	r Profile	Manager Properties (Local Computer)
General	Log On	Recovery Dependencies
Service	name:	Citrix User Profile Manager
Display	<u>n</u> ame:	Citrix User Profile Manager
<u>D</u> escrip	tion:	Citrix User Profile Manager service
Path to	executable	e:
"C:\Pro	gram Files	Citrix\User Profile Manager\UserProfileManager.exe''
Startup	typ <u>e</u> :	Automatic
Service	status:	Stopped
9	itart	Stop <u>P</u> ause <u>R</u> esume
from he	re.	he start parameters that apply when you start the service
otait pa	ira <u>m</u> eters:	OK Cancel Apply

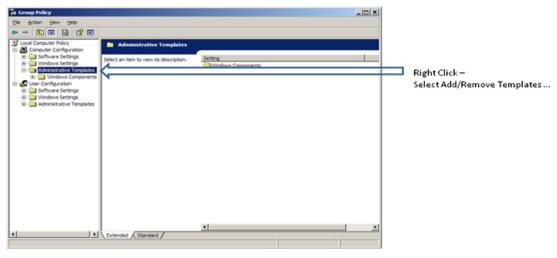
The Citrix User Profile Manager service.

In some instances, you may not have permissions to edit the Group Policies. If you are conducting a proof of concept, consider implementing the setting by just using a Local Machine Policy. Local Machine Policies are less flexible, and bear in mind that the vDisk of your virtual desktop will need to be in private mode when making changes.

#### Configure Virtual Profiles – Step by Step

- 1. From the *Run* command, execute gpedit.msc.
- 2. Under Computer Configuration, right-click on Administrative Templates select Add/ Remove Templates... as shown in Figure 12.12.
- 3. Click Add... and browse to Profile Management Folder as shown in Figure 12.13.
- 4. Select ctxprofile2.1.0.adm open as shown in Figure 12.14.
- 5. Select Enable Profile management Set to Enabled as shown in Figure 12.15.
- 6. Select Path to user store.
- 7. Set the path and click OK as shown in Figure 12.16.

The default location is in the user's home directory, under the Windows subdirectory. For a proof of concept or pilot, you may want to isolate the virtual desktop environment from the current environment. In this case, use the following syntax: \\fileserver\sharename\%username%.



Microsoft Group Policy editor.

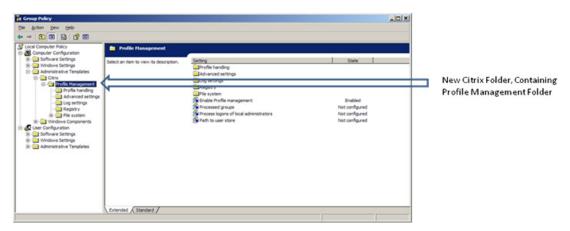
Vame	Size Modified
a] wmplayer	67KB 2006/04/25 10:

#### FIGURE 12.13

Add/Remove templates dialog box.

Policy Template	s	? X
Look <u>i</u> n:	Profile Management 2.1.0 🔽 🧿 🤌 💷 🔹	
My Recent Documents Desktop My Documents	Ctxprofile2.1.0.adm	
My Computer		en ncel

Browse to ctxprofile2.1.0.adm file.



#### FIGURE 12.15

Citrix folder in Group Policy Management Console.

	erties		? >
Setting Explain			
🗿 Path to user store			
C Not Configured			
• Enabled			
C Disabled			
Absolute path or path re	elative to the home d	lirectory:	
	sidave to the nome o		
Windows			
Supported on: At least	User Profile Manage	r 1.0.0	
	_	ir 1.0.0	
Supported on: At least Previous Setting	User Profile Manage Next Setting	er 1.0.0	
	_	r 1.0.0	Apply

Path to user store properties.

%username% is an environment variable that resolves to the user's logon name. The security settings for the "sharename" folder needs to include "Full Control" for "Creator Owner."

Profile Manager uses the user's logon credentials to Read/Write to the share, and one of the most common issues with Profile Manager is simple file/folder permissions.

By default, all of the standard profile settings are now saved to the specified location.

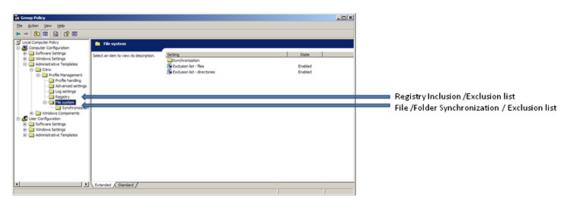
#### Additional Profile Manager Settings

If required extra files/folders or registry settings can be added to the Virtual Profile. Some applications, like terminal emulators, don't save their settings to the standard profile location. Filemon from Microsoft can be particularly useful to find where an application is saving its settings.

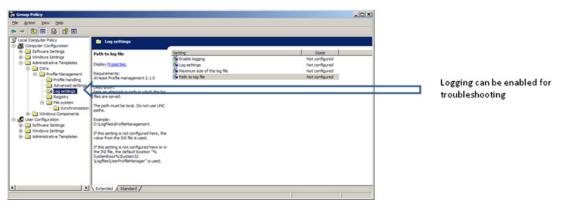
You may also choose to exclude some files/folders to prevent your profile growing unnecessarily large. Registry keys that you don't want saved can also be excluded as shown in Figure 12.17.

If required, logging can be enabled. The logs are granular, and they record each step of the process during the logon and logoff as shown in Figure 12.18.

Virtual Profiles are configured through a Microsoft Group Policy, and we believe more and more settings will be moved into Group Policies as it is adopted as a standard control mechanism.



Inclusion/exclusion lists for Virtual Profiles.



#### FIGURE 12.18

Enable logging for troubleshooting.

#### **Citrix Streamed User Profiles**

The "Profile Streaming" feature is currently out in "Tech Preview" as part of Profile Management 3.0, which means it is available for testing, but not yet for production. By the time this goes to print, it may well be out for general availability (GA), which means it has been regression tested for production.

Profile Streaming is a mechanism that allows the profile to be pulled down "on demand." Using normal "roaming profiles," or the existing Profile Management 2.1, the entire user profile must be fully downloaded before the user's session is initiated. This mechanism allows you to partially download the profile, only downloading the required components, and thus dramatically improving the logon time – by as much as five times faster.

#### SUMMARY

In this chapter, we considered how user personalization settings should be handled in a virtual desktop environment. We discussed how standard roaming profiles work, and then looked at how Virtual Profiles can extend on that principle. We then discussed the step-by-step procedures for installing, and then configuring Virtual Profiles. Lastly, we briefly discussed how "streamed" profiles will be used in the future.

### Advanced XenDesktop Client Settings – Audio and Video and Peripherals

# 13

#### **INFORMATION IN THIS CHAPTER**

Citrix Client-side Configuration

The user experience afforded by Citrix XenDesktop aims to be the equivalent or better than a physical desktop system. Configuring a desktop that fulfils the business and security requirements is not enough, the usability of the virtual desktop directly influences your users' productivity. The Citrix user-side technologies have been grouped under a broad umbrella called HDX – High Definition User Experience.

Different organizations will have varying requirements for these technologies. This chapter has been included last, not because it is an afterthought, but rather because this is where we have passed the stage of functional testing, and we now need to "tweak" the settings for the best user experience.

This chapter discusses primarily the client-side configuration. Bear in mind that these settings may be overridden by Citrix Policy Settings. Your configuration of graphics, USB devices, audio and files access for example, will all need to also be configured using the Citrix Policies discussed in Chapter 5, "Desktop Delivery Controller – Advanced Configuration Settings."

#### **CITRIX CLIENT-SIDE CONFIGURATION**

The latest Citrix clients are optimized for XenDesktop. Using existing older Citrix clients won't give you the options presented here.

The Microsoft RDS client has always had a connection bar, which would autohide at the top of the screen. The Citrix Receiver places the connection bar in the same location, and it similarly autohides when not selected.

#### TIP

If the Desktop Viewer Toolbar is not present, it is most likely due to the changes on the Web interface or how it was installed. The XenDesktop setup program enables the setting:

```
ShowDesktopViewer=On
```

In the file: WebInterface.conf – the default path is C:\Inetpub\wwwroot\Citrix\*DesktopWeb*\conf\ the drive letter and the DesktopWeb folder may vary depending on your installation.

If the Desktop Toolbar is missing, find the following line:

```
#ShowDesktopViewer=Off
```

To enable the Desktop Toolbar, remove the hash that comments out the line, and change the setting to  $\mathbf{0n}$ , as per the pervious example.

The XenDesktop Connection Bar shown in Figure 13.1 allows the user to configure his or her session settings. On the far left-hand side, you can select the desktop of the physical host. The virtual desktop connections are tiled in the center of the bar – if you have more than one virtual desktop open, you can use this to switch between desktops – the icon shows the screen background of the physical or virtual desktop, which make this intuitive to the users. The **Ctrl + Alt + Del** key combination sends the key sequence to the virtual desktop – which would otherwise be intercepted locally. The **Preferences** button presents a dialog box to configure the session settings. The **USB** button presents a drop down of all the USB devices connected to the physical device, giving the user the option to connect or disconnect devices from the virtual desktop.

The display settings include the following (see Figure 13.2):

- **1.** Scale to Fit keeps the geometry and simply resizes (this can cause a blurry display).
- **2.** Actual Size keeps the screen size and resolution display it in a Window if smaller, or with scroll bars if bigger than the host display.
- **3.** Change Resolution the default, automatically resizes, and alters the resolution accordingly.

The **USB** tab (see Figure 13.3) have the following options:

When the desktop starts, you can choose to automatically connect all the USB devices, display the list to the end user, or do nothing.

When a USB device is inserted while using the desktop – we have the same options – you can choose to automatically connect all the USB devices, display the list to the end user, or do nothing.



#### FIGURE 13.1

The Desktop Viewer Connection Bar.

Desktop Viewer Preferences	×
Display USB HDX	
Select the way you would like your virtual desktop displayed within the Desktop Viewer:	
O Scale to Fit	
Scale your desktop to fit within the Desktop Viewer window. Desktops sized above or below 100% may appear blurry.	
C Actual Size	
Do not scale your desktop. If your desktop is larger than the Desktop Viewer window you may need to scroll to see all of your desktop screen.	
Change Resolution	
Display your desktop within the Desktop Viewer window without scaling or scrolling. Your desktop will change resolution whenever you resize the Desktop Viewer window.	
OK Cancel	

The Desktop Viewer Preferences dialog box.

#### NOTE

Bear in mind that Citrix Policy Settings can override USB settings. Security policies sometimes requires USB ports be disabled.

The **HDX** tab (see Figure 13.4) have the following options: Flash Acceleration can be set to **Disabled**, **Enabled**, or **Prompt**.

#### NOTE

Flash Acceleration requires configuration in two places: at the farm level and at the client.

Display USB HDX You have installed the USB remoting software which allows you to connect local USB devices (such as memory sticks and handheld devices) to the desktop.
When desktop starts
C Connect all available USB devices
C Display the list of available USB devices and let me choose
<ul> <li>Do nothing</li> </ul>
When a USB Device is inserted while using the desktop
O Connect the USB device
O Display a message and let me choose
O nothing
OK Cancel

The Desktop Viewer - USB settings.

File Access determines the level of file access the virtual desktop has to the physical device. This can be set to **Disabled**, **Read Only**, **Read Write**, or **Prompt**.

Microphone, allows the use of a microphone at the physical end point. This can be set to **Enabled**, **Disabled** or **Prompt.** 

#### NOTE

Both the File Access and Microphone settings can be overridden at a Citrix Policy level. Selecting the **Remember my selection** checkbox will retain the setting for subsequent sessions.

Desktop Viewer Preferences	×
Display USB HDX	
Citrix HDX features deliver a full fidelity XenDesktop user experience.	
Flash Acceleration This feature improves the user experience of Flash content by running the Flash application on the client.	
Disabled  Remember my selection	
File Access This feature provides the virtual desktop access to the files located in your client.	
Read/write	
Microphone This feature provides the virtual desktop access to your local microphone. Enabled  Remember my selection	
These features should only be enabled if you trust the virtual desktop you are connecting to.	
OK Cancel	

The Desktop Viewer - HDX Settings.

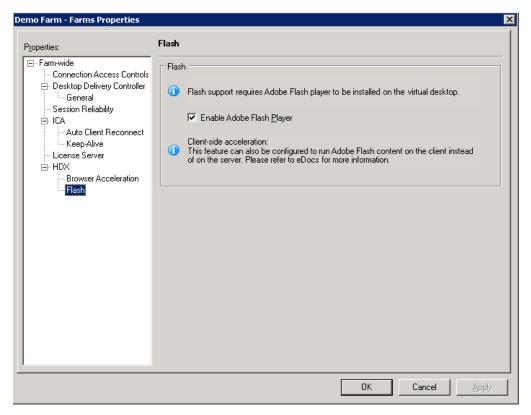
#### HDX Media Stream - Streaming Content

Flash streaming is a relatively new technology, which enables Adobe Flash content to be streamed directly to the physical end point, rather than rendering the content to the virtual desktop, and then displaying the content through the ICA stream.

#### **DESIGN DECISIONS**

The streamed media will consume significantly more bandwidth than the standard Independent Computing Architecture (ICA), so much so that you could actually degrade performance. This does perform very well over LAN (and LAN-like) networks, and should certainly be enabled if you are not bandwidth constrained.

To enable Adobe Flash Player, open the Delivery Services Console, right-click on the **Farm** and select **Properties** (see Figure 13.5).



Enable Adobe Flash Player.

#### Select HDX | Flash, and check Enable Adobe Flash Player.

Adobe Flash Player will also need to be installed on the virtual desktop, and should be included in the base build.

The streaming capabilities are not limited to Adobe Flash. Windows Media and RealPlayer streaming are also featured. The Windows Media Player in the virtual desktop will be automatically enabled for use with XenDesktop.

#### TIP

In some rare cases, HDX Multimedia streaming can cause issues, see the article CTX122963. This article contains an explanation of how to manually disable multimedia streaming.

#### Select HDX | Browser Acceleration (see Figure 13.6).

Unlike Flash Acceleration which is a client-side technology, Browser Acceleration is a serverside technology, which alters how Web-based content is rendered over the wire to the user. Images

no rann - ranns propercies		_
Demo Farm - Farms Properties  Properties:  Farm-wide Connection Access Controls Connection Access Controls Connection Reliability Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Connect Conn	Browser Acceleration   Browser Acceleration   Browser Acceleration   Browser Acceleration   Compress JPEG images to improve bandwidth  Image compression level  Higher compression level  Higher compression will improve the bandwidth usage at the expense of image quality.  Image compression levels:	
	Variable image compression ICA sessions can use the available bandwidth and image size to determine how much to compress images. Adjust compression level based on available bandwidth	

Enable Browser Acceleration.

embedded in Web pages can be compressed to high, medium, or low compression. The user experience is affected, the graphics embedded in the Web pages will display with degraded resolution.

There is an additional option to enable "Variable image compression," which leverages the adaptive capabilities within ICA to adjust the image compression based on the available bandwidth.

#### **DESIGN DECISIONS**

Browser Acceleration should be enabled for slow WAN links, but is unnecessary for LAN-based connections.

Related topics – Image Acceleration. Image Acceleration is a "Speedscreen" technology, which is enabled by default. Please refer to Chapter 5, "Desktop Delivery Controller – Advanced Configuration Settings," for the policies relating to Speedscreen Image Acceleration.

### HDX Plug and Play – USB Redirection

There have been a number of important technical developments to make the user experience in the area of USB redirection. The process has changed from being a form of emulation to doing native USB redirection. This vastly improves the compatibility of USB devices. The Citrix client now introduces client-side USB drivers; in fact, the USB redirection will not work without a reboot after installation.

USB devices can now be introduced plug and play. That is, they can be introduced during a session without requiring a session restart. The redirection results in the virtual desktop detecting USB devices in the same way as a physical PC.

USB devices can now include isochronous devices like webcams.

### **HDX Real-time Bidirectional Audio and Video**

The advances in the audio and video capabilities make it possible to use bidirectional audio and video devices within a virtual desktop. Video conferencing using webcams is feasible and there has been in-depth testing of VoIP solutions.

**Cisco and Avaya** soft phones have been tested on XenDesktop. The audio codecs available give the user high (CD) quality audio.

#### **DESIGN DECISIONS**

Enabling high-quality audio will increase the bandwidth requirements of each session utilizing audio. These requirements should be measured and accounted for as part of your design.

#### Microsoft OCS

Microsoft Office Communications Server (OCS) USB phones can be integrated directly into your virtual desktop. I have personally tested this and I must confess that I am impressed by the USB plug and play of the device and the audio quality.

#### TIP

Attach the OCS phone to the build virtual desktop, while the vDisk is in Private image mode. The OCS installation files will be loaded in the base image, and won't need to be copied up when attaching an OCS phone.

### HDX 3D

HDX 3D opens the possibility of using graphically rich applications on a virtual desktop. Applications like OpenGL and DirectX applications perform well. Virtual desktops running graphical applications can even be run over WAN links.

These technologies can even be used in conjunction with Picture Archiving and Communication Systems (PACS).

Graphical settings can be configured through Citrix Policies.

# **DESIGN DECISIONS**

Lossy compression will give the best performance but may not be appropriate in some environments – like medical images.

# **HDX Broadcast and HDX Intellicache**

HDX Broadcast refers to some of the built in optimizations of the ICA protocol. Being adaptive, it varies according to available bandwidth. The protocol is self tuning. HDX Intellicache refers to the added compression you can achieve by utilizing Citrix branch repeaters. Branch Repeaters are compression/ caching devices, which will further compress the ICA protocol datagrams, and even cache graphic requests for reuse. Branch Repeater compression appliances are highly recommended for WAN links.

# Installing the HDX Experience Monitor

The HDX monitor shown in Figure 13.7 is a useful tool that you can use to analyze how the HDX technologies are being utilized by the virtual desktop. This can also be a useful troubleshooting tool, as it will show you each installed component, and how they are configured.



#### FIGURE 13.7

The HDX monitor.

Download and install the hdx-monitor-x86.msi (or hdx-monitor-x64.msi for 64 bit) on the virtual desktop. The installation can be downloaded from http://hdx.citrix.com/hdx-monitor.

This monitor interrogates the ICA virtual channels, allowing you to monitor bandwidth usage of the components. The Smart Card and Printing ICA channels are also available to be monitored.

# SUMMARY

In this chapter, we discussed the Citrix HDX technologies. We specifically looked at how these settings can be configured on the client device side. We discussed configuring media streaming on the XenDesktop farm. We then looked at the details of the settings covered in the first part of this chapter:

- HDX Plug and Play
- HDX Real-time
- HDX Media Stream
- HDX 3D
- HDX Broadcast and HDX Intellicache

Lastly, we briefly discussed using the HDX experience monitor to look at details of an individual user's session. This chapter was intended to assist you in fine tuning the client device.

# Appendix

### INFORMATION IN THIS CHAPTER

- POC Prerequisite Checklist
- XenApp 6 for Windows 2008 R2
- VMware SDK Integration
- Citrix XenServer
- Downloading Citrix Software
- Installing Microsoft System Center Virtual Machine Manager SCVMM Step by Step
- Microsoft Licensing
- Using Snapshots

# POC PREREQUISITE CHECKLIST

Hardware, network, and a hypervisor of choice need to be in place before proceeding.

I have provided numbers wherever possible; however, each Proof of Concept (POC) will have a different number of required workstations for testing purposes. "Xx Workstations" below refers to the number of workstations for your POC.

#### Components

<ul> <li>Broker – to manage virtual desktops. Provides access to users.</li> <li>Virtual Disk Server – mounts a virtual disk to the virtual desktops. One vDisk can boot multiple virtual desktops.</li> </ul>	Citrix XenDesktop Citrix Provisioning Server (PVS)
<b>Virtual Application Server</b> – XenApp can provision applications to users into the virtual desktops. User applications are based on AD user or group memberships.	Citrix XenApp
Virtual Workstations	Windows XP, Vista or 7

The prerequisites are listed with two options: preferred or required. This is because there is either the simple way, or the more time-consuming way. Try for push for the simpler preferred option wherever possible.

# Networking

#### **Required** – **IP** addresses

- 1x build workstation IP address
- 1x provisioning server IP address
- 1x XenApp server IP address
- 1x DDC server IP address
- · Xx workstation IP addresses; each virtual desktop will need an IP address

All IP addresses should be in the same range as the server. Workstation addresses should also be in the server range.

We are putting workstations in the datacenter – we will need access over ICA TCP 2598 to all the workstations *inside* the datacenter.

# Preferred

A separate VLAN for the XenDesktop servers and workstations. On your switches, disable Spanning Tree or enable PortFast (STP Fast Link).

A DHCP scope in the server range with DHCP enabled.

Scope options for PXE enabled

066 IP address of the provisioning server 067 boot file name **ARDBP32.BIN** 

If this is not possible, then use the PVS to create an individual boot.ISO file for each workstation and mount the .ISO to each workstation. If you can get DHCP but not the scope options, then you can use one boot.ISO for all the workstations – which is still considerably less effort.

# **Active Directory Requirements**

- 1. Active Directory accounts for the following:
  - a. 1x build workstation
  - **b.** 1x provisioning server
  - c. 1x XenApp server
  - d. 1x DDC server
  - e. Xx workstations
- **2.** Dedicated organizational unit (OU)
- 3. Account operator privileges for PVS create computer accounts or at least manage them.
- **4.** Once off full control to create group objects and permissions in the OU this one is that could be done using a RUNAS when launching the AD Configuration Wizard.
- **5.** User account for managing the PVS/DDC/XenApp servers, with administrator privileges on those servers.
- **6.** In a Multiple Server Provisioning Server environment, an Active Directory Service Account for the Provisioning Server Stream and Simple Object Access Protocol (SOAP) service.
- **7.** Basic user account for user testing.

If the security precludes getting a dedicated OU, then use http://support.citrix.com/article/ ctx118976 to configure the workstations to a static DDC address.

# Hardware

- 1 GB for the Desktop Delivery Controller and Citrix XenApp Server, and 2 GB for the provisioning server
- 1 GB per physical host (hypervisor)
- 1 GB per workstation XP or
- 2 GB per workstation Vista/Windows 7

More is better. This could be blades or tower servers.

So a single server POC would start with 5 GB or more of memory per workstation.

# Software

### Required

- Windows 2003 media and licenses required for DDC (2003 R2 32 or 64 bit, if integrating with SCVMM)
- Windows 2003 or Windows 2008 media and licenses required for PVS (2008 preferred)
- XenDesktop 4 software either the .ISO or the media
- Desktop operating system media Windows 7/Windows XP

### Preferred

- Microsoft SQL 2000 or 2005 Or
- Oracle 11 g Release 1

# **Hypervisor**

XenServer 5/5.5, or VMware (any version from 3 to vSphere) preferably with vCenter and the SDK, Hyper-V, and preferably SCVMM.

The SDK (for VMware) or SCVMM are required for integration purposes, i.e., the XenDesktop Setup Wizard and for the DDC to power on or off VMs as required.

### Permissions

- XenServer full control
- SCVMM full control of the SCVMM
- vCenter full control of the resource group assigned to the project

# Storage

If fiber channel/iSCSI storage is used:

- 1x provisioning server 150 GB
- 1x XenApp server 20 GB
- 1x DDC server 20 GB
- 1x build workstation 20 GB

I tend to "oversize" the PVS in case it needs to be used as a software repository/profile server/ XenApp package repository.

You can comfortably request 500 GB LUN. It needs to be presented to all the physical boxes.

Fiber channel will give better performance than iSCSI, but iSCSI performance has improved and may be sufficient for your needs. Enterprise Storage is recommended for production systems, local storage can be used for pilots or very small environments.

# XenApp 6 FOR WINDOWS 2008 R2

The XenApp content in this book is based on the XenApp 5 Feature Pack 2 version of the product. At the time of writing XenApp 6 for Windows 2008 R2 has been released in the Tech Preview form. Broadly speaking, the settings that need to be configured haven't changed significantly, but rather the management consoles have been simplified.

# **VMware SDK INTEGRATION**

The interaction between the Citrix components (the Desktop Delivery Controller and the XenDesktop Setup Wizard) and the VMware hypervisor stack is done through the VMware SDK.

The VMware SDK is normally only accessible through HTTPS. The SDK security settings can, however, be changed to allow this communication to occur over HTTP. This is the first choice of many IT engineers – who hear the word "Certificates" and break out into a cold sweat! Humor aside, security policies don't always allow you to change the settings to HTTP. I would recommend HTTP for a proof of concept environment, but for a production environment, it would be advisable to use secured communications.

The XenDesktop Setup Wizard requires the changes be made on the provisioning server.

### Changing the SDK Requirements to HTTP

In order to change the SDK to allow HTTP access, one has to edit the proxy.xml file on the Virtual Center/vCenter Server. The proxy.xml file is in the "All Users" profile, which is C:\Documents and Settings\Application Data\VMware\VMware VirtualCenter\proxy.xml under Windows 2003, and C:\Users\Application Data\VMware\VMware VirtualCenter\proxy.xml on Windows 2008.

# **Connecting Using HTTPS**

This was fairly easy to manage in versions 3 and 3.5, unfortunately changes to how the certificates are created for vCenter (version 4) has made this trickier for the latest version of VMware's software.

# Versions 3 and 3.5

- 1. Locate RUI.CRT on the Virtual Center Server under C:\Documents and Settings\All Users\ Application Data\VMware\VMware VirtualCenter\SSL on Windows 2003, or C:\Users\All Users\Application Data\VMware\VMware VirtualCenter\SSL on Windows 2008.
- 2. Copy the certificate to the Desktop Delivery Controller (or provisioning server).
- **3.** Double-click on the certificate.
- 4. Click Install Certificate... (see Figure A.1).
- 5. Click Next to step forward through the wizard.
- **6.** Change the selection to **Place all certificates in the following store** and click **Browse**... (see Figure A.2).
- 7. Tick the Show physical stores select Trusted Root Certification Authorities and the subcontainer Local Computer, and click OK and then Next.
- 8. Click Finish.

Certificate	×
Certificate Information	
Windows does not have enough information to verify this certificate.	
Issued to: VMware default certificate	
Issued by: VMware Installer	
Valid from 2/23/2010 to 2/21/2020	
Install Certificate         Issuer Statement           Learn more about certificates         Issuer Statement	
ОК	

#### FIGURE A.1

Certificate details.

Certificate Import Wizard	
Certificate Store Certificate stores are system areas where certificates are kept.	✓      ✓ Search
Windows can automatically select a certificate store, or you can specify a location for the certificate.	Pe ▼ Size ▼ E Folder
Automatically select the certificate store based on the type of certificate     Place all certificates in the following store     Certificate store:	Select Certificate Store
Browse	Personal     Trusted Root Certification Authorities     Registry     Local Computer     Smart Card     Fnterprise Trust
Learn more about <u>certificate stores</u>	Show physical stores OK Cancel
< Back Next > Cance	

Certificate Import Wizard.

This adds a certificate for "vmware" to the Desktop Delivery Controller.

Also on the Desktop Delivery Controller, open the file C:\Windows\System32\drivers\etc\hosts with a text editor like notepad. Under the line:

"127.0.0.1	localhost"
Add the line:	
"xxx.xxx.xxx.xxx	vmware"

Where xxx.xxx.xxx is the IP address of your Virtual Center Server. Remember to use a <tab> between the IP address and the name.

Basically what we are doing is using the self-signed certificate built into Virtual Center to secure communications. The default certificate assigned to the Virtual Center is to the hostname "vmware," and using the host's entry, we are "tricking" the Desktop Delivery Controller into thinking that it is communicating with a host called vmware, and thus the certificate matches the hostname.

#### Version 4/vSphere

VMware recommends the use of a Commercial Certificate Authority to replace the default vCenter certificates. This involves obtaining a certificate from one of the trusted CAs like VeriSign, Thawte, Baltimore, or Entrust. You need to obtain a certificate of the "Web Server" type. You can also

alternatively create a self-signed certificate using OpenSSL. Documentation for changing the vCenter certificate can be found at www.vmware.com/files/pdf/vsp\_4\_vcserver\_certificates.pdf.

This will give you the steps to create a new root certificate – RUI.CRT. Once you have replaced the root certificate, follow the same steps as with the earlier versions to import the certificate into the Desktop Delivery Controller (or provisioning server).

# **CITRIX XenServer**

Citrix XenServer is the free hypervisor available for use with XenDesktop. Citrix Essentials for XenServer ships as part of the XenDesktop Enterprise and Platinum license. The hypervisor is free to use provided it is running "Citrix" loads – the XenDesktop management servers, XenApp and the workstations, may all be run without charge.

Even in scenarios where there is an existing hypervisor environment, it may be simpler to run XenServer in parallel with the existing environment. The first proof of concept system should always be installed in a development/test environment. Avoid installing the proof of concept system on live/production servers.

Installing your own environment frees you from being constrained in someone else's hypervisor environment. You are free to add/remove storage, change network settings (like VLANs), and so on, without having to wait for a change window.

# DOWNLOADING CITRIX SOFTWARE

### Your Organization Has Bought the Software

The software required for your Citrix XenDesktop implementation can be downloaded from www. mycitrix.com.

When you buy Citrix software, Citrix will send you an e-mail containing your username and password. If you have not received the e-mail, contact your Citrix reseller to find out who was registered as the contact person in your organization.

If some of the download files have a closed padlock icon next to them, this is due to the version of XenDesktop you have purchased.

XenDesktop Editions:

- 1. VDI Edition
- **2.** Enterprise
- **3.** Platinum

For a full feature list, see the Citrix Web site, the most significant differences in my view are:

- VDI Edition gives you the XenDesktop broker, but no XenApp or provisioning server.
- Enterprise Edition adds XenApp and provisioning server.
- Platinum Edition adds to Enterprise, Password Manager, EdgeSight Monitoring, the Branch Repeater (WanScaler) software client, and the Access Gateway SSL VPN.

# You Are Evaluating the Software

The software required for your Citrix XenDesktop implementation can be downloaded from www. mycitrix.com.

If you are a new user, you will need to register to create a new Login for yourself. Login to the portal. Select **Downloads | XenDesktop 4 Evaluation**. From here, you can download the Evaluation software and an Evaluation License File.

# **Obtaining the License File**

- **1.** Log on to www.mycitrix.com.
- 2. Select Product Previews/Beta Releases License Retrieval (see Figure A.3) if you have already received a license serial number through e-mail, select Activation System/Manage Assets jump to Step 5.
- 3. Click Retrieve License (see Figure A.4).
- 4. Click on one of the license serial numbers (see Figure A.5).
- 5. Click Continue (see Figure A.6).
- **6.** Select your country, and search for your reseller (I have chosen cannot find my reseller as I am doing this for demonstration purposes) click **Continue** (see Figure A.7).
- 7. Click Submit to confirm your contact details (see Figure A.8).
- 8. Confirm company details click Submit (see Figure A.9).

0010013011037710143200013	
My Profile	Activation System/Manage Assets
	Licensing Program Registration
	Manage My Renewals
My Tools	My Certification Manager
	My Support
Access your applications and utilities from	Non-Disclosure Agreement (NDA)
anywhere in My Citrix.	Pending Transactions & Certificates
	Product Previews / Beta Releases - License Retrieval
Choose a Toolbox 📃 🕨	Product Upgrades/Fulfillment
	Update My Company Information
	Update My Information
My Citrix	View Contracts/Agreements

#### **FIGURE A.3**

The MyCitrix toolbox.

Current Tool XenDesktop Evaluation

Retrieve License 🕟

#### FIGURE A.4

License retrieval.

### **Assigned License Codes**

New licenses. This table contains newly assigned licenses for your company. Please click the hyperlink to allocate a specific license. If you would like to retrieve more licenses, please select Retrieve More Licenses.

<u>Product Name</u>	<u>Serial Number</u>	<u>Issued To</u>	Date Issued
Citrix XenDesktop - Evaluation (90 day	) WXY3Y-G67GT-Q47LW-GKN3L-WANK	Gareth James	2010-01-07
Citrix XenDesktop - Evaluation (90 day	) WXY3Y-G67GT-R47LW-GKN3Y-GA	Gareth James	2010-01-07
Citrix XenDesktop - Evaluation (90 day	) WXY3Y-G67GT-F47LW-GKN7P-	Gareth James	2010-01-07
Citrix XenDesktop - Evaluation (90 day	) WXY3Y-G67GT-C47LW-GKNWG	Gareth James	2010-01-07
Citrix XenDesktop - Evaluation (90 day	) WXY3Y-G67GT-T47LW-GKN4Y- <b>B</b> 5500	Gareth James	2010-01-07

#### **FIGURE A.5**

Select serial number.

Current Tool Activate/Allocate	lp
--------------------------------	----

RSS NEWS FEED

you

- If you do not have your license code, go to View Licenses.
- Citrix MetaFrame XP customers can Activate Multiple Licenses
- If you are upgrading your Citrix Presentation Server licenses to a higher family edition, please follow these upgrade tips.

Please enter your license code information:		
	License Code	
Your License Code:	WXY3Y-G67GT-Q47LW-GKN3L-NKYXF	
* Sample License Code:	LA-0001216539-91149 WXY33-12ABC-DF3G4-HRW5Q-9?6EQ	

#### Continue 👂

#### **FIGURE A.6**

Activate/allocate the license code.

- **9.** This is the area where most people experience problems. If the license file doesn't *exactly* match your hostname, then it will not work. The most reliable way to obtain your hostname is from the command line. Click **Continue** (see Figure A.10).
- Before you proceed to the next step, log on to the license server, and open a command prompt Start | Run | CMD.

### 450 Appendix

Current Tool Activate/Allocat	te V Help RSS NEV	WS FEED O
Citrix Activation	System	<u></u>
	on Advisor, you must first select a country. If USA or Canada is selected, please wn box. For a faster response, enter at least the first 3 characters of the Soluti	
Select your Solution Advis Name I cannot find my rese Continue FIGURE A.7	sor by choosing the appropriate option button from the search results below. City Phone eller	

Search for a reseller.

Contact Name	Phone	Email Address	
Your Name	555-1212	Yname@dom.com	
rournamo	555 ILIL	Thance Guom.com	

Submit 🕑

#### **FIGURE A.8**

Contact details.

#### **11.** Type hostname.

This is the name you need to use, be careful to take note of upper and lower case letters (see Figure A.11).

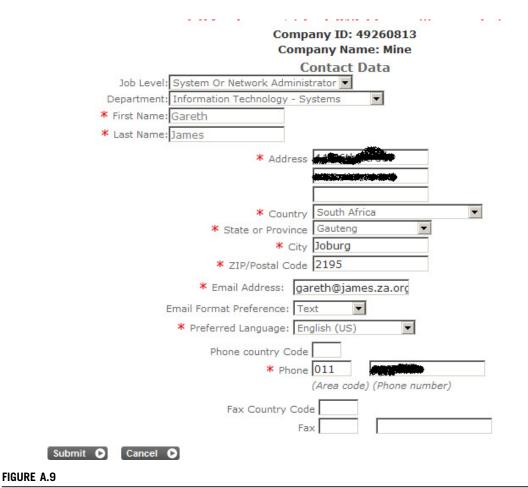
12. Enter the hostname and click Allocate. Remember upper and lower case matters (see Figure A.12).

**13.** Click **Confirm** (see Figure A.13).

14. Click Download License File (see Figure A.14).

Save the license file to a suitable location, and then copy to your license server (see Figure A.15).

Adding the license file to the license server is discussed in Chapter 3, "Configuring the Desktop Delivery Controller."



#### Company details.

You will now provide information that will allow you to generate a license file. After you have the license file, you can copy it to your license server to begin using the product.



#### FIGURE A.10

Hostname warning.

# 452 Appendix

📾 Command Prompt	
Microsoft Windows [Version 5.2.3790] (C) Copyright 1985-2003 Microsoft Corp.	
C:\Documents and Settings\Administrator.CITRIXSA>hostname citrix2k3demo	
C:\Documents and Settings\Administrator.CITRIXSA>_	

# FIGURE A.11

Hostname determination from the command prompt.

Citrix XenDesktop - Evaluation (90 day) Select Product:
Filter Products
Citrix XenDesktop - Evaluation (90 day)       Quantity to Allocate       Available/Total       99     99/99       90
Hostname of your Citrix license server: citrix2k3demo
Please note that the hostname of your license server is <b>CASE SENSITIVE</b> . To locate the hostname of your license server, follow these instructions.
Allocate

#### FIGURE A.12

Hostname entry.

#### **Confirm your Selection**

Citrix XenDesktop - Evaluation (90 day)

	Quantity to Allocate	Available/Total	Duration (Days)			
	99	99/99	90			
1	Hostname of your Citrix license server: citrix2k3demo					
1	Please note that the hostname of your license ser follow these instructions.					

Confirm Cancel

#### FIGURE A.13

Confirmation.

Download License File			
You have chosen to download the following licenses.			
File contents: License Server Name: citrix2k3demo Citrix XenDesktop - Evaluation (90 day) 99 90			
Download License File			

Download license file prompt.

File Download	×				
Do you want to open or save this file?					
Name: license_20100107031535.lic Type: lic_auto_file From: secureportal.citrix.com Open Save Cancel					
While files from the Internet can be useful, some files can potentially harm your computer. If you do not trust the source, do not open or save this file. What's the risk?					

#### FIGURE A.15

File download dialog box.

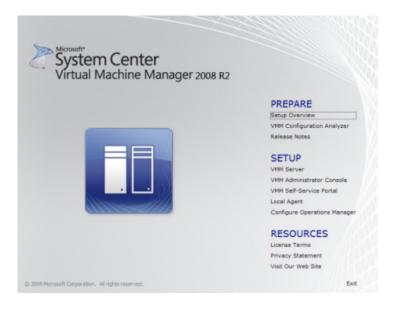
# INSTALLING MICROSOFT SYSTEM CENTER VIRTUAL MACHINE MANAGER – SCVMM – STEP BY STEP

In order to integrate properly with Microsoft Hyper-V, it is necessary to install the SCVMM Administrator Console on both the Desktop Delivery Controller and on the Citrix Provisioning Server.

Note: Windows 2003 R2 or above is required for SCVMM.

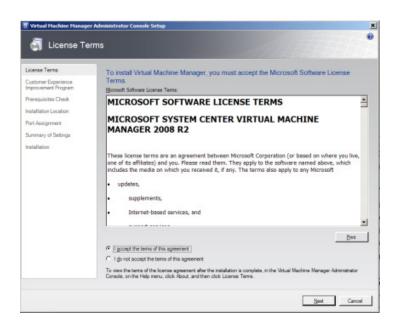
- 1. VMM Administrator Console setup (see Figure A.16).
- 2. Select I accept the terms of the agreement and click Next (see Figure A.17).
- 3. Select to enable Microsoft Update, and click Next (see Figure A.18).
- 4. Click Next (see Figure A.19).
- **5.** The Prerequisite Check will return any tasks that need to be performed before installation. Click **Next** (see Figure A.20).
- 6. Choose the path to install SCVMM. Click Next (see Figure A.21).
- 7. Leave the SCVMM port at the default (see Figure A.22).
- **8.** Click Install (see Figure A.23).
- 9. A successful installation will return a positive result. Click Close (see Figure A.24).

454 Appendix



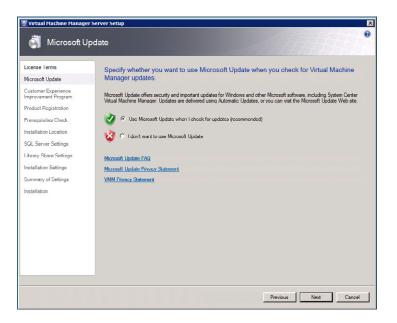
#### FIGURE A.16

System Center Virtual Machine Manager setup.

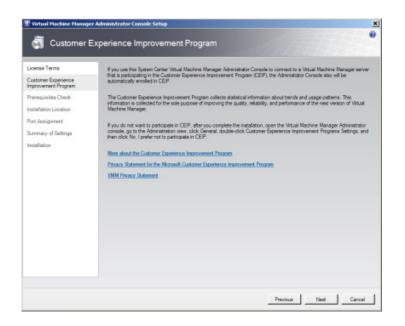


#### **FIGURE A.17**

License terms agreement.

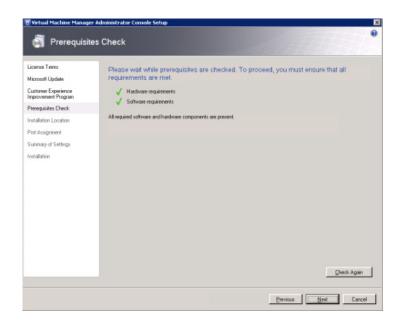


Microsoft updates option.



#### FIGURE A.19

Customer Experience Improvement notification.

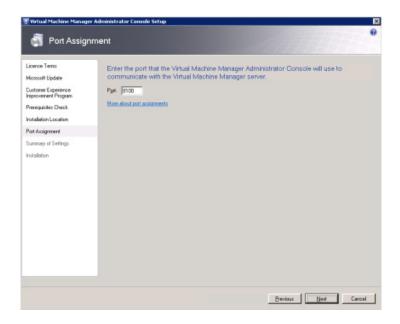


Prerequisite check.

Licence Texns Microsoft Update	Specify where to store the Virtual M Program flex location		S	
Customer Experience Improvement Program Pherequisites Check	C: Vhogram Files Microsoft System Center V	rtual Machine Manager 2008 R2		Browse
nstallation Location				
Port Ausignment				
iumnary of Settings notaliation				
	Installation path			
	System drive: Program Bez drive:	Required 512.00 MB 512.00 MB	Available 2.62 GB 2.62 GB	

#### FIGURE A.21

Installation location.

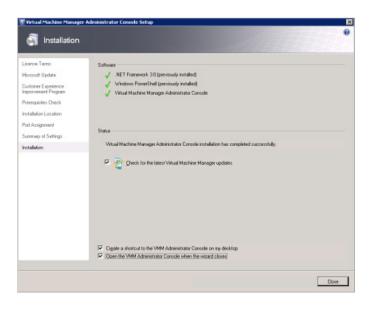


Port assignment.

cense Terms	Review the Virtual Machine Manage	r Administrator Console settings.
icrosoft Update	Setting	Value
ustomer Experience	Program files path	C:/Program Filesi/Microsoft System Center Virtual Nachin
provement Program	VMM server communications port	8100
erequisites Check.	Using Microsoft Update	No
stallation Location		
ort.Assignment		
unmary of Settings		
stallation		



Summary of settings.



Successful installation notification.

# **MICROSOFT LICENSING**

If you want to use Microsoft desktop operating systems, you will inevitably need to pay Microsoft at some stage. This cost is something that should be considered up front as part of the project cost. Each of your virtual desktops will require a license.

# **Virtual Servers**

Those components of the infrastructure that you have chosen to virtualize can take advantage of Microsoft's licensing options for virtualized servers. The best choice of licensing will depend on the number of virtual servers that you can run on a physical host.

Windows Server Standard Edition licenses are a simple 1:1 ratio. Each virtual edition needs a Standard Edition license.

Windows Server Enterprise Edition has a 4:1 ratio. Each Enterprise license entitles you to run four virtual instances of the Enterprise Edition.

Windows Server Datacenter Edition has an "all you can eat" kind of license. The Datacenter Edition is licensed per processor, but you can run as many virtual instances as you want on the physical host.

Use Microsoft's "Windows Server Virtualization Calculators" to calculate which option would be the most cost effective for your company.

# **Virtual Desktops**

Microsoft has launched its VECD license specifically for virtual desktops. VECD, which stands for Virtual Enterprise Centralized Desktop, covers a connecting device to access up to four virtual

machines running a Windows desktop operating system per device. This is obviously important for scenarios where the user may require access to legacy applications on Windows XP and additionally to run a Windows 7 desktop.

From a XenDesktop perspective, this could also include VM-hosted applications. There are two versions:

- 1. With software assurance
- **2.** Without software assurance

The pricing will vary depending on your Microsoft agreements. The key point to note is that buying VECD is significantly cheaper with software assurance.

### **VDI Suites**

Microsoft has released two VDI suites. These suites are aimed at providing all the building blocks you would use to build out a Microsoft VDI environment. Microsoft Virtual Desktop Infrastructure Standard Suite includes licensing for Hyper-V Server, System Center Virtual Machine Manager, System Center Configuration Manager, System Center Operations Manager, Remote Desktop Services (CAL), and Microsoft Desktop Optimization Pack (MDOP).

Remote Desktop Services (RDS) was previously referred to as Terminal Services (TSCALs). The Standard Suite includes the Remote Desktop Services rights to virtual desktops only – not to Windows Server RDS. It is important to note that MDOP includes desktop licensing for App-V.

The Premium VDI Suite includes RDS CALs to connect to Windows Server RDS. Additionally it also includes App-V for RDS, this is so that you can use App-V on the Windows Server RDS based desktops too.

From a XenDesktop perspective, if you are going to use XenApp to provision hosted applications to the virtual desktops, then the Premium VDI Suite will, in many instances, be more cost effective than buying the RDS CALs separately.

# **USING SNAPSHOTS**

Snapshots are an ideal way to take backups at significant points in the installation process. I recommend taking a snapshot before making any significant changes to any component of your environment. If an installation fails or is not error free, it is most often better to revert to the preinstall state, and begin the installation again rather than trying to "fix" the buggy installation.

#### NOTE

Use of snapshots in a production environment should be managed. Remember a snapshot is a "point in time" image of a state, the further the virtual machine moves from that state, the larger the snapshot. I have seen instances of snapshots left "running" for months, which are actually larger than the original virtual machine. In other words, delete old snapshots and don't use them as a long-term backup mechanism.

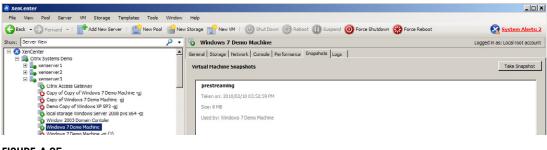
Take a snapshot of your virtual machine at this stage.

# **XenServer**

Click Take Snapshot from the Snapshots tab (see Figure A.25).

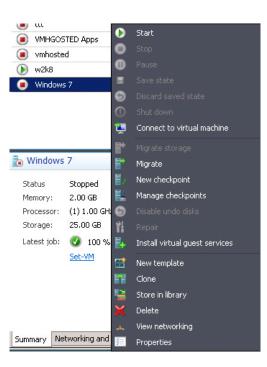
# SCVMM

Right-click on your virtual machine, and select New checkpoint (see Figure A.26).



#### FIGURE A.25

Using XenServer snapshots.



#### **FIGURE A.26**

Using SCVMM to create a checkpoint.

# VMware

Right-click on the virtual machine, select Snapshot and click Take Snapshot... (see Figure A.27).

<ul> <li>VC.citrixsa.net</li> <li>New Datacent</li> <li>DisklessW7</li> <li>New Temp</li> <li>New Virtua</li> <li>Window</li> </ul>	er 7 late Il Machine	Windows 7 Getting Started Summary Resource Allocati What is a Virtual Machine?
	Power	<ul> <li>rtual machine is a software compt</li> </ul>
	Guest	<ul> <li>sical computer, runs an operating</li> </ul>
	Snapshot	Take Snapshot
<u> </u>	Open Console	Revert to Current Snapshot
<b>B</b>		😰 Snapshot Manager
	Migrate	ironment, you can use virtual mac kstation environments, as testing
<b>2</b>	Clone	solidate server applications.
	Template	Center Server, virtual machines ru
	Fault Tolerance	<ul> <li>sters. The same host can run man</li> </ul>
	Add Permission Ctrl+P	
	Alarm	•
	Report Performance	sic Tasks
	Rename	Power on the virtual machine
	Remove from Inventory	Edit virtual machine settings
	Delete from Disk	Convert to a template

# FIGURE A.27

Taking a snapshot using vCenter.

# Index

Page numbers in *italics* indicate figures and tables.

# A

Access control. 125 Access format database, 10 Access Gateway VPX appliance, 143 Access Management Console, 32 Active Directory (AD) and XenDesktop farm integration adding DDC, 26 configuration wizard, 24 configuration wizard start menu icon, 23 configure farm OU, 25 organizational unit (OU) selection, 24 setup verification, 26 XenDesktop farm objects, 23 Application provisioning installation of Web Interface, 337-348 VM-hosted application, 307-308 Web Interface configuration, 340-348 Access Management Console, 342 configure authentication methods, 347 confirm settings dialog box, 344 IIS location dialog box, 343 select published resource type, 346 server farm dialog box, 345 site creation progress dialog box, 344 site type dialog box selection, 342 XenApp-hosted application, 307 XenApp-streamed applications, 307-309 Application Streaming Profiler destination folder dialog box, 370 executable, 368 license agreement, 369 restart Windows dialog box, 371 select language dialog box, 368 select program folder dialog box, 370 successful installation dialog box, 371 welcome dialog box, 369 Application virtualization, 2 management functionality of, 399

# B

Bandwidth session limits, 156–158 SpeedScreen settings, 155–156 compression level, 155 heavyweight compression, 156 progressive display, 156 visual effects, 154–155 Blade hardware solutions, 111 Boot device management DHCP, 267 login server, 266 set options, 267 static device IP, 268 Browser acceleration, 438

### C

Citrix Access Gateway, 116 Citrix Printer options, 145-149 client autocreated printers, 147 connect directly, 147, 148 connect indirectly, 147, 148 locally attached printers, 149 network printers, 146-147 session printers, 147 Citrix Profile Manager, 420 Citrix Provisioning Server, 2, 4 Citrix Streamed User Profiles, 428 Citrix XenServer, 447 DDC and hypervisor integration Citrix license agreement, 76 hosting infrastructure, 77-78 install location, 76 logon information, 79 multiple pools selection, 78 reboot dialog box, 77 run xensetup, 75 user account control, 75 virtual desktops, 80 installation Citrix XenCenter, 69 CPU and memory, 71 Home server selection, 71 installation media location, 70 name and description, 70 new VM operating system selection, 69 successful completion dialog box, 73 virtual disks, 72 virtual interfaces, 73 virtual machine console, 74 XenServer tools installation, 74 Client autocreated network printers, 147 connect directly, 147, 148 connect indirectly, 147, 148 locally attached printers, 149

Client Hypervisor, 1 Client printers autocreation, 158 legacy client printers, 159 print job routing, 159 printer properties retention, 159 turn off client printer mapping, 159 Client Side Rendering (CSR), 147

# D

Datacenter licenses, 262 DDC. see Desktop Delivery Controller Delivery Services Console advanced settings, 125-128 basic settings, 123-125 Citrix Resources node, 116 DDC properties dialog box, 120 desktop group modification menu, 122 desktop group properties dialog box, 123 desktop groups view menu, 121 farm options menu, 117 farm properties dialog box, 117 General-DDC enable 32-bit icon color depth, 118 session reliability, 118 XML Service DNS resolution, 118 HDX, 119-122 Adobe Flash Player, 119 Browser Acceleration, 119 ICA, 118 Auto Client Reconnect, 118 keep-alives, 118 idle pool settings modification, 126 locating alerts, 113, 114 logoff behavior, 127-128 search dialog box, 115 search results menu, 115 viewing desktop groups, 121 virtual desktop modification, 124 Web Interface-"Restart" button, 122 Desktop Delivery Controller (DDC) configuration settings connectivity to single desktop, 57-63 performing initial discovery, 29-32 Virtual Desktop Agent installation, 36-42 Virtual Desktop Group Creation, 42-52 XenDesktop License server configuration, 32-36 Delivery Services Console enable 32-bit icon color depth, 118 session reliability, 118 XML Service DNS resolution, 118

installation. 10-22 components installation, 12 configuring database authentication, 16 creating/joining farm, 13 database selection and settings, 17 enterprise database configuration, 15 IIS installation progress, 19 initiate installation, 18 license agreement, 12 mount XenDesktop media, 19 restart dialog box, 20 selecting farm edition, 14 server components, 11 server restart, 21 SQL express/enterprise database, 14 testing data source, 18 unsigned drivers installation, 20 Windows 2003 media, 19 installation recommendations, 21-22 prerequisites, 9-10 Virtual Desktop Agent installation Citrix Delivery Services Console-farm menu, 42 Citrix License Management Console, 39 License Management Console selection, 37 License Management Console welcome screen, 38 working description, 7-10 Desktop licenses, 262 Desktop streaming, 2 Desktop Viewer connection Bar, 432 HDX settings, 435 preferences dialog box, 433 USB settings, 434 Desktop Viewer Toolbar, 432 Desktop virtualization, 1-3 application virtualization, 2 Client Hypervisor, 1 desktop streaming, 2 virtual profiles, 3 DHCP server. see Dynamic Host Configuration Protocol (DHCP) server Disk virtualization, 165 Downloading Citrix software buying software, 447 obtaining license file, 448-450 software evaluation, 448 Driver native print, 159 universal, 160 Dynamic Host Configuration Protocol (DHCP) server bootfile option type, 172 configure scope options, 173

options on Windows 2008, predefined options and values, scope options-option 66, scope options-option 67, TFTP option type, on Windows Server 2003, on Windows Server 2008,

# E

Enterprise database, 10 Enterprise storage, 443 Enterprise XenDesktop Edition, 447

# F

Fiber channel, 443 Flash acceleration, 438 Flash streaming, 436

# G

Group Policy Objects (GPOs), 145

# Η

High Definition User Experience (HDX), 4, 119-122, 431 Adobe Flash Player, 119 Broadcast, 439 Browser Acceleration, 119 Experience Monitor installation, 439 HDX 3D, 439 Intellicache, 439 media stream-streaming content, 436-438 Microsoft OCS USB phones, 439 plug and play, 438 real-time bidirectional audio and video, 438-439 Hosted applications regular installed application location dialog box, 356 application type to publish, 356 configure advanced access control, 360 configure application appearance, 363 configure application limits, 361 configure application shortcut presentation, 358 configure client options, 362 inside a virtual desktop, 353 publish application menu, 354 publish application welcome dialog box, 354 publish immediately/configure settings, 359 published application display and description, 355 streamed to server application location dialog box, 365 application type dialog box, 365 multiple applications in profiled application suite, 366 Hypervisor, 443

# I

ICA, 118 Auto Client Reconnect, 118 keep-alives, 118

# L

Legacy client printers, 159 Licenses datacenter, 262 desktop, 262 Locally attached printers, 149 Locally installed applications, 399 Loopback processing, 163

# Μ

Microsoft App-V applications, 396-397 Microsoft Hyper-V with Citrix XenDesktop integration hosting infrastructure, 94 logon information, 95 installation configure hardware, 86-89 destination and host selection, 90 ISO selection, 87 path and network selection, 91 scenario 1 and 2, 82-83 source selection, 85 summary dialog box, 92 system center virtual machine manager, 84 virtual machine error, 83 virtual machine identity, 85 virtual machine viewer and options, 93 virtual machines selection, 81 Microsoft licensing VDI suites, 459 virtual desktops, 458-459 virtual servers, 458 Microsoft OCS USB phones, 439 Microsoft Policies, 145 .msi (Microsoft Installer) packages, 419

# Ν

Native print driver, 159 Network printers, 146–147

# 0

Offline Plug-in installation, 400–401 Online Plug-in installation, 400

# Ρ

Platinum XenDesktop Edition, 447 POC prerequisite checklist POC prerequisite checklist (Cont.) active directory requirements, 442 hardware, 442-443 hypervisor, 443 networking, 441-442 software, 443 storage, 443 Policies and printing Citrix policies, 145 delivery controller, 163 Microsoft policies, 145 Microsoft policy settings, 162-163 policy creation Citrix Presentation Server Console, 149 new policy dialog box, 150 policies node menu, 150 policy filters dialog box, 152 policy menu, 151 policy properties dialog box, 151 policy settings Client USB mapping policy, 153 set ranking of policies, 154 printer options, 145-149 client autocreated printers, 147, 149 network printers, 146-147 session printers, 147 Precache XenApp-streamed applications, 405-407 using radedeploy to deploy packages, 405 XenApp services application shortcuts, 406 Precaching App-V applications, 407-415 Print job routing, 159 Private vDisk mode, 198, 198 Profile roaming, 417, 418 user, 417, 418 virtual, 417, 419, 419 Profile Manager additional settings, 427 configuration add/remove templates dialog box, 425 browse to ctxprofile2.1.0.adm file, 426 Group Policy Management Console, 426 Microsoft group policy editor, 425 path to user store properties, 427 installation Citrix license agreement, 421 Citrix User Profile Manager service, 424 destination folder dialog box, 422 install dialog box, 422 Profile Management Setup Wizard, 421 restart system dialog box, 423 successful completion dialog box, 423

Profile streaming, 428 Project-based approach, 4-5 Provisioning Server (PVS) Active Directory, 261-262 configure server settings, 260-261 definition of, 165 disk attachment hypervisors, 275 **SCVMM. 270** VMware, 272-275 XenServer, 269 installation configuration settings confirmation, 188 customer information, 177 Database server-SQL server, 183 Database server-SQLExpress, 182 destination folder, 177 DHCP services-on another computer, 180-181 Farm configuration, 182 license agreement, 176 license server, 185 new farm, 184 provisioning services configuration wizard, 180 provisioning services installation, 175-176 PXE services, 181 server installation, 175 setup type, 178 stream servers boot list, 187 stream services, 186 successful installation, 179, 188 TFTP option and bootstrap location, 187 user account, 185 prerequisites, 167 recommendations, 167-169 Provisioning Server Configuration Programs, 259, 260 Provisioning Services Boot Device Manager, 259, 264-268 DHCP. 265 NO DHCP. 268 Provisioning Services BOOTPTAB Editor, 259 PVS. see Provisioning Server

# R

RDS. *see* Remote Desktop Services Rebalance devices, 261 Regular installed hosted applications application location dialog box, application type to publish, configure advanced access control, configure application appearance, configure application limits, configure application shortcut presentation, configure client options, inside a virtual desktop, 353 publish application menu, 354 publish application welcome dialog box, 354 publish immediately/configure settings, 359 published application display and description, 355 Remote Desktop Services (RDS), 459 Roaming profile, 417, 418

# S

SCVMM. see System Center Virtual Machine Manager SDK. see Software development kit Session printers, 147 add printers dialog box, 161 configuration, 160 connection user credentials dialog box, 162 network printer location dialog box, 162 print job settings, 161 Single desktop connectivity Citrix client installation, 58 Citrix desktop viewer, 61 Citrix online plugin, 60 desktop connection page, 61 license agreement and download page, 59 run ActiveX control, 59 run online plugin executable, 60 successful installation, 60 Web interface portal, 57 XenDesktop connection demonstration, 62 Snapshots, 459-461 SCVMM, 461 VMware, 461 XenServer, 459 Software development kit (SDK), 95 SpeedScreen, 155-156 compression level, 155 heavyweight compression, 156 progressive display, 156 SQL Express. see Structured Query Language Express Standard vDisk mode, 199, 199, 200 Streamed to end point applications advanced install options, 376 build profile dialog box, 380 configure profile name, 373 enable user update option, 374 install option dialog box, 376 installer dialog box, 377-378 inter-isolation communication set-up, 375 new profile wizard informational dialog box, 373 publishing mechanism advanced access control dialog box, 386 alternative profiles locations, 387 application location selection, 383

application type options, 382 content redirection-file types, 386 offline access dialog box, 384 publish immediately dialog box, 385 shortcut presentation dialog box, 385 user privileges dialog box, 388 users selection dialog box, 384 sign profile dialog box, 380 Streaming Profiler start menu item, 372 Streaming Profiler welcome dialog box, 372 target operating system and language, 375 virtual restart notification, 378 Streamed to server hosted applications application location dialog box, 365 application type dialog box, 365 multiple applications in profiled application suite, 366 Streaming applications, 399 Structured Query Language (SQL) Express, 10 System Center Virtual Machine Manager (SCVMM), 461 customer experience improvement notification, 455 installation location, 456 license terms agreement, 454 Microsoft updates option, 455 port assignment, 457 prerequisite check, 456 setup, 454 successful installation notification, 458 summary of settings, 457

# T

Template Virtual Machine SCVMM, 281–284 VMware, 284 XenServer, 279 Transmission Control Protocol (TCP), 168 Tweaks audio, 68 disable menu animations, 68 graphics, 67 Windows Vista and 7, 68

# U

Universal driver, 160 USB devices, 438 User profile, 5, 417, 418

### V

VDI. see Virtual desktop infrastructure
VDI suites, 459
VDI XenDesktop Edition, 447
vDisk Pool, 193
VECD. see Virtual Enterprise Centralized Desktop

Video conferencing, 438 Virtual applications JRE installation, 312 .NET35 installation, 316 prerequisites Windows 2003, 309 prerequisites Windows 2008, 310-316 virtual desktops, 309 Web interface, 314 Virtual Desktop Agent, 7 Virtual Desktop Agent installation Citrix Delivery Services Console-farm menu, 42 Citrix License Management Console, 39 current Usage tab, 41 upload license file, 40 License Management Console selection, 37 License Management Console welcome screen, 38 Virtual Desktop Group Creation adding users, 53-54 assignment type, 51 Citrix DDC 4.0 installation program, 44 computer selection, 52 Delivery Services Console, 50 desktop group creation, 50 desktop group name, 55 event log entry, 49 Farm properties-License Server, 43 farm selection, 47 firewall configuration, 46 hosting infrastructure, 51 icon selection, 55 license agreement, 45 Microsoft .NET Framework install dialog box, 44 publishing options, 56 restart dialog box, 48 setup wizard, 45 TCP/IP port number, 46 users/groups selection, 54 virtual desktop status, 56 virtual desktops, 52-53 Windows logo warning, 48 Virtual desktop infrastructure (VDI), 1 basic layout of, 2 Citrix approach, 3-4 vs. RDS, 2 Virtual desktops, 458-459 with provisioning server, 166 without provisioning server, 166 Virtual desktops installation active directory, 66-67 disk, 66 memory, 65 Microsoft License, 67

network, 66 tweaks audio, 68 disable menu animations, 68 graphics, 67 Windows Vista and 7, 68 vCPU. 66 Virtual Disks (vDisks) access mode, 414 Active Directory, 209-214, 212-213 add existing vDisks, 411 adding virtual desktop to desktop group, 248-249 architecture, 198-199 assigning base target device, 214-220 hypervisors, 218-220, 219 SCVMM, 216, 216-217 VMware, 216-220, 217-219 XenServer, 214, 215 assigning to target device, 412 configure settings, 203-204 Active Directory integration, 204 high availability, 203-204, 205 copying target device hard drive to vDisk, 227-232 creating, 200-201 creating base target device, 206-258 collection menu, 207 device collection, 206, 206 device creation, 207 Delivery Services Console, 408 desktop group properties, 409 hypervisors, 208-214, 212 mounting to test virtual desktop, 234-248 provisioning server, 243-248 SCVMM. 235-241 VMware, 241 XenServer, 234-235 mounting to two virtual desktops, 249-258 multiple versions of, 411 private mode, 198, 198 Provisioning Services Console, 408-409, 412 recommendations, 200 removing locks, 232 replace vDisk assignment, 414 roll back vDisk assignment, 415 standard mode, 199, 199, 200 store options, 410 target device software installation customer information. 223 destination folder, 223 format disk, 226-227 installation welcome, 222 installation wizard completion, 224-225

license agreement, 222 provisioning services installation, 220 target device installation, 221 vDisk taskbar icon, 227 two virtual desktops hypervisors, 253-258 SCVMM, 251 VMware, 253-258 XenServer, 251 vDisk files, 410 Virtual Mac address SCVMM, 208, 209-210 VMware vSphere, 208, 211 XenServer, 208, 208 Virtual Windows 7 desktop, 413 Virtual disks (vDisks) store Provisioning Services Console, 192 sites node, 192 storage creation, 195 general properties, 196 path properties, 197 server properties, 197 storage options, 193 vDisk recommendation, 193-195 Write Cache recommendation, 195 Virtual Enterprise Centralized Desktop (VECD), 458 Virtual profiles, 3, 419, 417, 419 see also Profile Manager Virtual servers, 458 VM-hosted applications, 307-308 application icon, 394 Assignment type dialog box, 393 Citrix XenApp component selection, 390 Citrix XenApp installation welcome, 389 Desktop Group menu option, 392 desktop group name, 393 farm aggregations in Web interface, 396 icon changing, 394 media location dialog box, 390 precreate desktop group, 395 seamless initial program folder, 391 shortcut wizard. 391 VMware, 461 SDK integration changing SDK requirements to HTTP, 444 connecting HTTP's, 444-447 version 4/vSphere, 446-447 versions 3 and 3.5, 445-446 VMware vSphere with Citrix XenDesktop integration hosting infrastructure, 108 logon information, 108

virtual desktops, 109–110 virtual machine selection, 110 installation datastore, 100 disk creation, 101 guest operating system, 100 name and location, 99 new virtual machine creation, 99 virtual machine options, 104 virtual machine properties, 103 virtual machine settings, 102 VMware tools installation and setup, 105–107 vSphere Client, 98

#### W

Web Interface configuration, integrated Web site amending Web site appearance, 132 authentication methods dialog box, 130 authentication point selection dialog box, 139 authentication properties dialog box, 131 client location dialog box, 137 configuring authentication methods dialog box, 141 domain restriction dialog box, 141 domain settings dialog box, 131 IIS location dialog box, 138 initialization, location, and successful installation dialog box, 137 introductory setup dialog box, 136 language selection dialog box, 135 launching Web Interface console, 128 license agreement dialog box, 136 logon appearance dialog box, 142 published resource type selection dialog box, 142 selecting ASP .NET role service, 135 setting logon domain, 129-133 settings confirmation dialog box, 142 site configuration dialog box, 139 site creation from management console, 138 site type dialog box, 138 summary information checklist, 139 Web Interface console, 129 Web Interface installed on Web server, 133-142 Web Interface logon page, 133 Web Interface management console, 130 Web Interface prerequisites, 134-142 Web site appearance dialog box, 132 XenApp server farm dialog box, 140 Windows Server Datacenter Edition, 458 Windows Server Enterprise Edition, 458 Windows Server Standard Edition, 458 Write Cache, 194 Write Cache disk, 269-275

# Х

XenApp 6 for Windows 2008 R2, 444 XenApp client configuration destination folder, 403 license agreement, 402 offline plug-in installation, 400-401 online plug-in installation, 400 XenApp installation Access Management Console installation dialog box, 322 Access Management Console installation list, 323 add users to remote desktop users group, 331 advanced configuration installation dialog box, 333 assign farm administrator dialog box, 327 benign warning on Windows 2008, 320 components dialog box, 319 configure Citrix XML service port, 330 configure shadowing dialog box, 329 create/join server farm dialog box, 325 datastore configuration dialog box, 326 destination folder selection dialog box, 334 document library destination folder, 336 document library installation dialog box, 335 document library successful installation, 336 domain passthrough authentication dialog box, 320 IMA encryption option, 328 install advanced configuration, 334 installation component selection, 318 installation dialog box, 317 installation results dialog box, 324 license agreement, 318 license server installation dialog box, 321 license Server settings, 328 Microsoft Visual C ++ 2005 license agreement dialog box, 322 no licenses warning dialog box, 329 prerequisites installation dialog box, 319 review selections dialog box, 331 successful installation dialog box, 333, 335 Virtual Scripts Security changes dialog box, 332

Web Interface server address dialog box, 321 XenApp 5.0 components dialog box, 325 XenApp 5.0 installation, 324 XenApp components installation summary, 337 XenApp post install restart, 337 XenApp server configuration Access Management Console start menu item, 348 configuration services location, 350 discovery results dialog box, 352 discovery wizard product component selection, 349 discovery wizard welcome dialog box, 349 preview discovery dialog box, 351 XenApp-hosted applications, 307, 400 XenApp-streamed applications, 307-309 XenConvert Optimizer, 67 XenDesktop Editions Enterprise Edition, 447 Platinum Edition, 447 VDI Edition, 447 XenDesktop integrating with Access Gateway, 143-145 XenDesktop Setup Wizard prerequisites, 279 Template Virtual Machine SCVMM, 281-284 VMware, 284 XenServer, 279 XenDesktop tool installation completing installation, 290 destination folder, 289 end-user license agreement, 288 hypervisors, 299-301 result analysis, 301-305 SCVMM, 294 setup tool folder, 287 setup wizard installer-welcome, 288 VMware, 294-298 XenServer, 290-294 XenServer, 459