Quick answers to common problems

# Citrix® XenApp® 6.5 Expert Cookbook

Over 125 recipes that enable you to configure, administer, and troubleshoot a XenApp® infrastructure for effective application virtualization

**Esther Barthel MSc**

[PACKT] PUBLISHING enterprise professional expertise distilled

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# About the Author

**Esther Barthel MSc** has been working in different roles and functions as an IT consultant since she finished her Masters degree in Computer Science in 1997. She has worked as a web developer, database administrator, and server administrator until she discovered how **Server-Based Computing** (**SBC**) combined servers, desktops, and user experience in one solution. She has been specializing in virtualization solutions such as SBC, VDI, application, and server virtualization for over seven years now and currently works as a senior consultant at PepperByte, where she designs and implements Citrix® solutions for both small-business and large-enterprise infrastructures scaling from 100 to 15,000 users.

Ever since she hosted introduction days for technical female student candidates, Esther has been sharing her passion and knowledge for IT. What started out as small internal meetings to report on the latest technologies is growing from technical blog posts into international presentations at Citrix® User Groups and events like E2EVC. There's no surprise that she has now taken up the challenge to write her first technical book, *Citrix® XenApp 6.5 Expert Cookbook*, for a well-known publisher, *Packt Publishing*, offering a selection of recipes (how-to's) that allow experienced Citrix® XenApp® administrators to automate, monitor, troubleshoot, and manage advanced XenApp® infrastructures.

Esther is a **Citrix Certified Professional - Apps and Desktops** (**CCP-AD**), **Citrix Certified Integration Architect** (**CCIA**), and **RES Software Certified Professional** (**RCP**).

You can follow her on social media on her blog (`http://www.virtues.it`), on Twitter at `@virtuEs_IT`, or contact her directly through e-mail, `techwriting@cognitionit.com`.

# Acknowledgments

I would like to thank Jozé Danen for all her love, patience, and understanding for the months it took to write this book. But even more so, I would like to thank her for her support and endless understanding while I struggled to balance work and life and spent many passionate hours delivering the best user experience, presenting enthusiastically, and sharing my knowledge with the community. Thank you, my love, for always being there to cheer me on!

A big thanks to my parents and sister as well who encouraged me to go for that Master of Science degree and have fun in my job. Mom, Dad, and sis, thank you so much for telling me over and over again how proud you are even though you might not always understand my technical rants.

I would also like to thank Sjaak Laan, the author of the book *IT Infrastructure Architecture*, *Lulu.com*, for being a great role model even though he might not be aware of it at all. And last but not least, Daniel Nikolic, CEO at PepperByte and Denamik, for sharing my vision and supporting my ambitions.

Special thanks to Carl Webster, Andrew Morgan, Helge Klein, Dane Young, Yoni Avital, Michel Stevelmans, Jason Poyner, and all other contributors to the Citrix® community for helping me show the power of community sharing and introducing their powerful tools and scripts!

# About the Reviewers

**Dragos Madarasan** is a support engineer for one of the fastest growing companies in Eastern Europe. After working as a freelance IT consultant and working for a Fortune 500 company, he now enjoys tackling complex scenarios and using his knowledge to bridge the space between IT and business needs.

Dragos publishes interesting cases on his personal blog, and whenever time permits, he enjoys taking part in the ITSpark community as a technical writer and speaker.

**Shankha Mukherjee** has over six years of experience in the IT Industry. He is currently working as a Windows L2 engineer at Accenture Services Pvt. Ltd., supporting client infrastructure for Windows, Citrix, and VMware.

He has a BTech degree in Information Technology. Previously, he has worked as a reviewer for the book, *Getting Started with Citrix XenApp 6.5*, *Packt Publishing*.

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I would like to thank Packt Publishing for giving me this opportunity again and would definitely look forward to more such opportunities.

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**Peter Nap** is an experienced Microsoft and Citrix® specialist with 14 years of experience mostly in server-based computing environments. His main areas of expertise are XenApp®, XenDesktop®, Microsoft Windows Server deployments and virtualization of applications, servers, and operating systems.

In his free time, he maintains his own website (`http://napplications.nl`) with free tools for ICT professionals because programming in C# is his passion. Currently, he is working for CGI as an infrastructure architect.

Peter Nap also reviewed the following titles for Packt Publishing:

- *Getting Started with XenApp 6.5*
- *XenDesktop 5.6 Cookbook*
- *XenDesktop 5 Starter*

**Sebastien Sollazzo** was born near Paris in France, and since 2005, he has been living in Quebec City, Quebec province, Canada. He has begun working with Citrix® products with Citrix® Metaframe 1.8 on Microsoft Windows NT4. Following every new iteration of Citrix® product, he has taken every opportunity to enhance his knowledge about each aspect of virtualization. He knows Citrix® products (XenApp®, XenDesktop®, Provisioning, NetScaler, and Branch Repeater), Microsoft (every Windows version, Active Directory, GPO, User Profile, and Printers), VMware (every vSphere version), Antivirus (Trend Micro, Kaspersky, and Symantec) very well and has a good knowledge of every technology involved in virtualization, such as Firewall (Checkpoint), IIS Server, DataBase (SQL, Oracle), and Scripting.

In 2009, Sebastien Sollazzo created his own company, Virtuel TI Inc, based in Quebec City, with a colleague, Michel Lajoie, to provide professional services for virtualization product to customers. Being an expert in all virtualization aspects, Virtuel TI consists of many specialized people in many technologies, which mainly include Citrix® and VMware , as well as strong expertise on Microsoft and Trend Micro technologies.

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I would like to thank my wife for giving me enough time to achieve all professional challenges such as my company and this book. Being a passionate man is not easy every day when 15 minutes of work gets extended to 1 or 2 hours. She always helps me surpass myself and takes care of the family, helping me find the right balance between work and family/leisure time.

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# Preface

Classified as a server-based computing solution, Citrix® XenApp® offers companies a solution for Windows applications to be virtualized, centralized, and managed in the datacenter and delivered to end users from a single application portal (or store) at any time, any place, and any device. Making use of Microsoft's Remote Desktop Services, Citrix® XenApp® hosts multiple user sessions on a single Windows Server while supporting enhanced user experience through the Citrix® HDX technology that delivers bandwidth-efficient, high-quality multimedia. Combined with Citrix® Web Interface or StoreFront, users are provided with a single portal or store that unlocks the published applications and desktops. With the NetScaler Gateway, secure remote access is also supported.

By combining products such as Citrix® XenApp®, Citrix® License Server, Citrix® Web Interface or StoreFront, NetScaler Gateway, and Microsoft's Remote Desktop Services, you can implement a full XenApp® infrastructure to deliver Windows applications and desktops to end users.

*Citrix® XenApp® 6.5 Expert Cookbook* will not only focus on Citrix® XenApp® as a product but will take all components of the XenApp® infrastructure into account and offer practical guidelines to install, configure, maintain, and script all parts of that infrastructure.

## What this book covers

*Chapter 1*, *Remote Desktop Services*, covers the foundation of each Citrix® XenApp® infrastructure by offering practical how-to's for installing, configuring, and troubleshooting Microsoft's Remote Desktop Services, both Session Host and License Server.

*Chapter 2*, *Citrix® License Server*, provides practical guidelines for installing, configuring, and troubleshooting the Citrix® License Server.

*Chapter 3*, *Citrix® Web Interface*, offers different recipes for installing, configuring, and troubleshooting the Citrix® Web Interface.

*Chapter 4*, *Citrix® StoreFront*, zooms into the successor of the Citrix® Web Interface with practical guidelines for installing, configuring, and troubleshooting Citrix® StoreFront.

*Chapter 5*, *The NetScaler Gateway*, enables the implementation of remote access to Citrix® XenApp® published desktops and applications with guidelines for configuring, managing, and troubleshooting the NetScaler Gateway.

*Chapter 6*, *XenApp® Management*, focuses on Citrix® XenApp® management activities by offering practical how-to's for configuring load evaluators, worker groups, printing, and the HDX Mediastream Flash Redirection.

*Chapter 7*, *XenApp® Maintenance and Monitoring*, zooms in on the available tools to support administrators with Citrix® XenApp® maintenance and monitoring tasks.

*Chapter 8*, *XenApp® Policies*, provides practical guidelines for XenApp® policy configurations for printing, shadowing, assigning load evaluators, redirecting client drivers, and enhancing user experience.

*Chapter 9*, *XenApp® Troubleshooting*, offers practical how-to's for troubleshooting XenApp servers and user sessions.

*Chapter 10*, *PowerShell and Command-line Tooling*, focuses on command-line tools and PowerShell scripts to automate maintenance and monitor tasks in a XenApp® infrastructure.

*Chapter 11*, *XenApp® Infrastructure Best Practices*, covers the best practices provided by Citrix® for different aspects in a XenApp® infrastructure, such as virtualization, computer and user settings, policies, profiles, antivirus, and high availability.

*Chapter 12*, *Citrix® Community*, introduces you to the Citrix® community and many tools and scripts that are developed by its members. Based on their own practical experiences, each tool or script will compliment the Citrix® XenApp® infrastructure and its administrative activities.

# What you need for this book

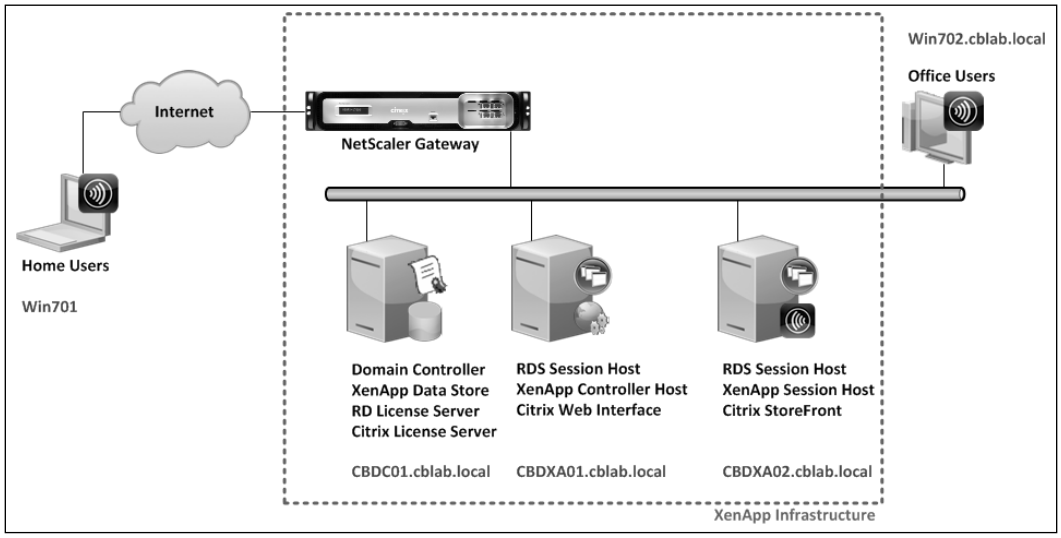
This book covers more than just Citrix® XenApp® 6.5 as it will focus on all the required infrastructure components to deliver published desktops and applications to end users.

To test each and every step, script, command line, and management tool discussed in this book, a small lab environment was used with the following virtual machines:

- **CBDC01.cblab.local**: This is a Windows Server 2008 R2 domain controller with additional software installed to support the XenApp® data store (SQL Server 2008 R2 database), RD license server and Citrix® License Server (Version 11.9) roles.
- **CBXA01.cblab.local**: This is a Windows Server 2008 R2 XenApp® 6.5 controller host with additional software installed for the Citrix® Web Interface (Version 5.4).
- **CBXA02.cblab.local**: This is a Windows Server 2008 R2 XenApp® 6.5 session host with additional software installed for Citrix® StoreFront (Version 2.1).

- **CBCNG01**: This is a virtual NetScaler Gateway appliance (Version 10.1 build 118.7.nc) hosting the virtual servers that support remote access for the Web Interface and StoreFront.
- **Win701**: This is a standalone virtual desktop with Windows 7 Professional (64-bit) to represent a remote user. Additional software is installed for the Citrix® Receiver (Version 4.0) and online plug-in (Version 14.0)
- **Win702.cblab.local**: This is a domain-joined virtual desktop with Windows 7 Professional (64-bit). It represents an internal office user. Additional software is installed for the Citrix® Receiver (Version 4.1) and Online Plug-in (Version 14.1).

The following is a graphical representation of the XenApp® infrastructure created in the lab environment:




The following software were used to build the Citrix® XenApp® infrastructure:

- Windows Server 2008 R2
- Citrix® XenApp® 6.5
- Citrix® Web Interface 5.4
- Citrix® StoreFront 2.1
- Citrix® Receiver 4.0

# Who this book is for

This book is for Citrix® XenApp® experts who want to get hands-on knowledge of the guidelines for the advanced features and configurations not only of Citrix® XenApp® but also of all the components of a XenApp® infrastructure.

Citrix® XenApp® administrators who have read *Getting Started with Citrix XenApp 6.5*, by *Guillermo Musumeci*, *Packt Publishing*, and are looking for instructions to go beyond the management consoles will also like this book. Each chapter offers recipes that focus on additional management, installation, and configuration scripts based upon command-line tools and PowerShell.

# Conventions

In this book, you will find a number of styles of text that distinguish between different kinds of information. Here are some examples of these styles, and an explanation of their meaning.

Code words in text, database table names, folder names, filenames, file extensions, pathnames, dummy URLs, user input, and Twitter handles are shown as follows: "To use the RDS provider you simply need to change your location to the RDS drive by using the `Set-Location` cmdlet"

A block of code is set as follows:

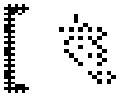
```
netstat -a > tcpconn.txt
```

Any command-line input or output is written as follows:

```
servermanagercmd.exe –install RDS-Licensing -logPath C:\logs\log.txt
-restart
```

**New terms** and **important words** are shown in bold. Words that you see on the screen, in menus or dialog boxes for example, appear in the text like this: "clicking the **Next** button moves you to the next screen".

Warnings or important notes appear in a box like this.



Tips and tricks appear like this.

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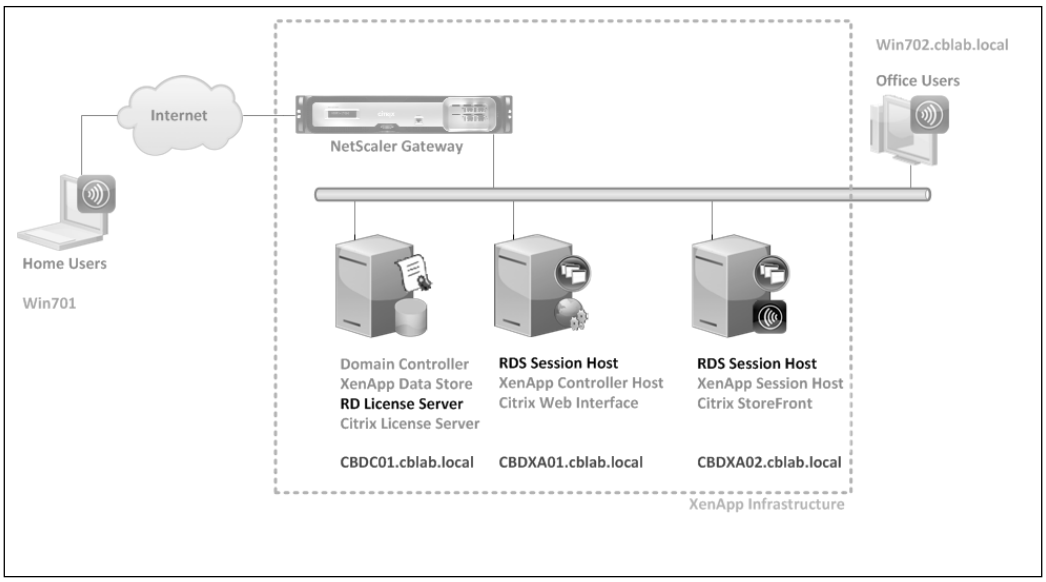
# 1
# Remote Desktop Services

In this chapter, we will cover the following topics:

- Scripting a command-line installation of the RD License Server
- Configuring the RD License Server
- Scripting a command-line installation of the RD Session Host
- Configuring the RD Session Host
- Configuring RDS settings with Microsoft Group Policies
- Revoking RDS Device CALs with RD License Manager
- Creating RDS Per User CALs reports
- Using the Licensing Diagnosis snap-in for RD Session Hosts
- Troubleshooting RD License Server discovery
- Troubleshooting RD License Issuance
- Rebuilding the RD License Database
- Recovering your RDS CALs to a new RD License Server

# Introduction

A **Citrix XenApp** (**CXA**) infrastructure consists of many components to ensure that its users can start a published desktop or an application. One of the core components in the infrastructure is the **Remote Desktop Services** (**RDS**) role that can be installed on a Windows Server, allowing multiple and simultaneous desktop sessions to run on one Windows Server. This chapter offers a number of tips and tricks to manage, monitor, and troubleshoot the RDS Windows server role within the XenApp infrastructure.




The Citrix® XenApp infrastructure relies on two important Remote Desktop role services—the **Remote Desktop** (**RD**) **License Server**, which manages the RDS **Client Access Licenses** (**CALs**) that are required to start a Remote Desktop session on a Windows Server and the **Remote Desktop** (**RD**) **Session Host** that actually runs the user sessions on the Windows Server.

# Scripting a command-line installation of the RD License Server

This recipe will show you how to build an unattended installation for the RD License Server by using command-line instructions. In this way, you can create an unattended installation sequence for your XenApp infrastructure deployment.

## Getting ready

To install the RD Licensing Role Service you need to install and set up a new Windows Server 2008 R2 server or add the Windows Role Service to an existing server.

To build an unattended installation for the RD License Server, you can use the `servermanagercmd.exe` command to add the Windows Role Service to the server.

## How to do it...

To add the RD License Server service to a Windows server, follow this step:

1. Run the following command line on a Windows Server 2008 R2 server:

```
servermanagercmd.exe –install RDS-Licensing -logPath C:\logs\log.
txt -restart
```

## How it works...

When you run the `servermanagercmd.exe` command, the following message is shown:

```
Servermanagercmd is deprecated and not guaranteed to be supported in
future releases of Windows. We recommend that you use the Windows
PowerShell cmdlets that are available for Server Manager.
```

Even though it might no longer be supported in future releases, it still works with Windows Server 2008 R2 to create an unattended installation to add Windows features, roles, or services to Windows Server 2008 R2. You can run the `servermanagercmd.exe` command with various parameters.

To check the installed roles and features on a Windows Server 2008 R2 server, you can use the following command line:

```
servermanagercmd -query [<query.xml>] [-logPath <log.txt>]
```

Windows Server 2008 R2 uses the following parameters:

- `-query`: This specifies an optional XML file used to save the results of the query
- `-logPath`: This specifies an optional log file other than the `%windir%\temp\servermanager.log` path used by default

When you want to change the installed roles and features on a Windows Server 2008 R2 server, you can add the following parameters to the `servermanagercmd` command:

```
servermanagercmd [-install|-remove] <Id> [-allSubFeatures]
[-resultPath <result.xml>] [-restart] [-whatIf] [-logPath <log.txt>]
```

This command uses the following parameters:

- `-install`: This installs the specified role, role service, or feature on the Windows Server
- `-remove`: This removes the specified role, role service, or feature from the Windows Server
- `-resultPath`: This specifies the XML file that saves the results of the command
- `-logPath`: This specifies an optional log file other than the `%windir%\temp\servermanager.log` file used by default

## There's more...

You can read more about `servermanagercmd.exe` on Microsoft TechNet: `http://technet.microsoft.com/en-us/library/ee344834(v=ws.10).aspx`.

If you are not comfortable using a deprecated command or if you want to use a method that will be supported in future Windows server releases, you can also use Windows PowerShell to install the required Windows Server 2008 R2 roles and features. Windows PowerShell 2.0 is installed by default on the server. The following PowerShell commands will install the RD Licensing Role Service on the server:

```
Import-Module ServerManager
Add-WindowsFeature –Name RDS-Licensing –LogPath <log.txt> -Restart
```

You can read more about the Add-WindowsFeature PowerShell cmdlet on Microsoft TechNet: `http://technet.microsoft.com/en-us/library/ee662309.aspx`.

## See also

- The *Configuring the RD License Server* recipe

# Configuring the RD License Server

This recipe will show you how to configure the RD License Server by using Windows PowerShell scripts to create an unattended installation for the configuration of your XenApp infrastructure.

## Getting ready

In order to configure the RD Licensing Role Service, you need to have the RD License Server installed. You can use the unattended installation directions in the previous recipe for installing the RD License Server.

To run the provided PowerShell commands, the default execution mode for PowerShell scripting needs to be changed so that the commands can be run on the server. You can change the PowerShell execution mode from `Restricted` to `RemoteSigned` with the following PowerShell command:

```
Set-ExecutionPolicy RemoteSigned -Force
```

## How to do it...

To configure the RD License Server through command-line tools and/or scripts and build an unattended configuration script, follow these steps:

1. Run the following Windows PowerShell script to configure the RD License Server:

```
# Import the RDS PowerShell module
Import-Module RemoteDesktopServices
# Navigate to the RDS Provider for Windows PowerShell
Set-Location RDS:
# Navigate to the RD License Server configuration
cd  RDS:\LicenseServer\Configuration
# Config required info fields for the activation process
Set-Item –Path .\FirstName -Value Test
Set-Item –Path .\LastName -Value User
Set-Item -Path .\Company -Value CBlab
Set-Item -Path .\CountryRegion -Value "Netherlands, The"
# Optional info can be configured with the following lines
Set-Item -Path .\eMail -Value  <Email>
Set-Item -Path .\OrgUnit –Value <OU>
Set-Item -Path .\Address –Value <Address>
Set-Item -Path .\City –Value <City>
Set-Item -Path .\State –Value <State>
Set-Item -Path .\PostalCode –Value <PostalCode>
# Navigate to the RD License Server configuration
cd  RDS:\LicenseServer
# Activate the RD License Server
Set-Item –Path .\ActivationStatus -Value 1 -ConnectionMethod AUTO
-Reason 5
```

You can use the `Get-Help` command to get more information on the available options per item, which is as follows:

```
Get-Help Set-Item -Path RDS:\LicenseServer\
ActivationStatus –Detailed
```

2. Add the purchased RDS CALs by using the provided wizard.

Using a PowerShell script to automatically add the purchased RDS CALs requires detailed knowledge of the license agreement arrangements with Microsoft and Windows PowerShell only currently supports adding RDS CALs through the automatic connection method. To keep away from adding fraud sensitive information such as your Microsoft agreement number or purchased License keys to commonly available scripts, I recommend adding the RDS CAL packs manually to the configured RD License Server rather than automating these steps in your PowerShell scripts.

## How it works...

When you import the Remote Desktop Services module in Windows PowerShell, the Remote Desktop Services (RDS) provider is also included. This provider enables you to configure RDS settings through Windows PowerShell by allowing you to change the RD License Server and RD Session Host server settings with default PowerShell cmdlets, such as `Get-Item`, `Set-Item`, `New-Item`, and `Get-ChildItem`.

To use the RDS provider, you simply need to change your location to the RDS drive by using the following `Set-Location` cmdlet:

```
Set-Location RDS:
```

To view the current configuration of the RD License Server, use the following `Get-ChildItem` cmdlet:

```
Get-ChildItem .\LicenseServer\Configuration
```

With the `Set-Item` cmdlet, you can change a setting by specifying the location of the configuration item and the new value that has to be set, as shown in the following command line:

```
Set-Item -Path RDS:\LicenseServer\Configuration\<ConfigItem> -Value
<ConfigItemValue>
```

The `Set-Item` cmdlet uses the following parameters:

- `-Path`: This path specifies the configuration item whose settings need to be changed
- `-Value`: This specifies the new value for the specified configuration item

Activating your RD License Server is also done with the following `Set-Item` cmdlet:

```
Set-Item –Path RDS:\LicenseServer\ActivationStatus -Value <Status>
-ConnectionMethod <ConnectionMethod> -Reason <Reason>
```

The `Set-Item` cmdlet uses the following parameters:

- `-Path`: This path specifies the configuration item whose settings need to be changed.
- `-Value`: This specifies the new value for the specified configuration item. Valid entries for `ActivationStatus` are `1` (Activate) or `0` (Deactivate).
- `-ConnectionMethod`: This specifies the connection method used for the activation process. Currently only AUTO is supported for PowerShell cmdlets.
- `-Reason`: This specifies the reason for the activation. Valid entries are `0` (server redeployed), `4` (server upgraded), and `5` (first-time activation).

As mentioned in the *How to do it...* section, you can use the `Set-Item` cmdlet to install the purchased RDS CAL packs. The required parameters for the cmdlet depend upon the used license type and agreement with Microsoft. When you are uncertain about the parameters you will need to provide, use the following `Get-Help` cmdlet to find the required parameters and corresponding values:

```
Get-Help New-Item -Path RDS:\LicenseServer\LicenseKeyPacks -Detailed
```

The next two examples show you how the required parameters change depending on your license type.

An example of the required parameters for an open license:

```
New-Item -Path RDS:\LicenseServer\LicenseKeyPacks -ConnectionMethod
AUTO -LicenseType OPEN -LicenseNumber 0000000 –AuthorizationNumber
'XXXXXXXXXXXXXXX' -ProductVersion 1 -ProductType 1 -LicenseCount 1
```

An example of the required parameters for a retail license:

```
New-Item -Path RDS:\LicenseServer\LicenseKeyPacks -ConnectionMethod AUTO
-LicenseType RETAIL -LicCode 'XXXXX-XXXXX-XXXXX-XXXXX-XXXXX'
```

If you receive a permission denied error when running the PowerShell command, check out the Microsoft Knowledge Base article available at `http://support.microsoft.com/kb/2648662/en-us`.

Adding RDS CALs normally has to be performed only once during the initial configuration of the RD License Server as scripting this part of the configuration is subjected to the license type used. The manual installation of the CALs takes far less time than developing and testing the required PowerShell commands.

To avoid addition of fraud sensitive information such as your Microsoft Agreement number or purchased License keys to commonly available scripts, I recommend adding the RDS CAL packs manually to the configured RD License Server and to avoid automating these steps in your PowerShell scripts.

## There's more...

You can read more about the RDS provider for Windows PowerShell at Microsoft TechNet: `http://technet.microsoft.com/en-us/library/ee791871(v=WS.10).aspx`.

If you are not comfortable running the provided PowerShell script, you can always configure and activate your RD License Server manually by following the instructions from Microsoft TechNet available at `http://technet.microsoft.com/en-us/library/cc770368.aspx`, and add RDS CAL license packs manually by following the instructions from Microsoft TechNet available at `http://technet.microsoft.com/en-us/library/cc770368.aspx`.

## See also

- The *Scripting a command-line installation of the RD License Server* recipe

# Scripting a command-line installation of the RD Session Host

This recipe will show you how to build an unattended installation for the RD Session Host by using command-line instructions. In this way, you can create an unattended installation sequence for your XenApp infrastructure deployment.

## Getting ready

To install the RD Session Host server Role Service, you need to install and set up a new Windows Server 2008 R2 server or add the Role Service to an existing server.

## How to do it...

To add the RD Session Host server Role Service to a Windows server, follow these steps:

1. Run the following command-line on a Windows Server 2008 R2 server:

```
servermanagercmd.exe -install RDS-RD-Server -logPath C:\logs\log.
txt -restart
```

A restart is required when installing the RD Session Host role to complete the installation.

## How it works...

The `servermanagercmd.exe` command is explained in detail in the *Scripting a command-line installation of the RD License Server* recipe.

## There's more...

As an alternative method to the deprecated `servermanagercmd.exe`, you can use Windows PowerShell to install the the Windows Role Service. You can use the following PowerShell command to add the RD Session Host Role Service:

```
Import-Module ServerManager
Add-WindowsFeature –Name RDS-RD-Server –LogPath <log.txt> -Restart
```

## See also

- The *Configuring the RD Session Host* recipe

# Configuring the RD Session Host

This recipe will show you how to configure the Remote Desktop Session Host by using PowerShell scripts to create an unattended installation and configuration for your XenApp infrastructure.

## Getting ready

To configure the RD Session Host, you need to have the RD Session Host role installed on a Windows server. You can use the unattended installation directions from the previous recipe for the installation of the RD Session Host.

To run the provided PowerShell commands, you will need to change the default execution mode for PowerShell to a less restrictive mode on the server.

You can change the PowerShell execution mode from `Restricted` to `RemoteSigned` by running the following PowerShell command:

```
Set-ExecutionPolicy RemoteSigned -Force
```

## How to do it...

To configure the RD Session Host, perform the following step:

1. Run the following PowerShell script to configure your RD Session Host:

```
# Import the RDS PowerShell module
Import-Module RemoteDesktopServices
# Navigate to the RDS Provider for Windows PowerShell
Set-Location RDS:
# Set General settings
cd RDS:\RDSConfiguration\TempFolderSettings
Set-Item -Path .\DeleteTempFolders -Value 1
Set-Item -Path .\UseTempFolders -Value 1
cd RDS:\RDSConfiguration\SessionSettings
Set-Item -Path .\SingleSession - Value 1
Set-Item -Path RDS:\RDSConfiguration\UserLogonMode -Value 0
# Set the License Mode: Per User = 4, Per Device =2
cd RDS:\RDSConfiguration\LicensingSettings
Set-Item -Path .\LicensingType -Value 2
# Specify the RD License Server by its FQDN
New-Item -Path .\SpecifiedLicenseServers -Name CBDC01.cblab.local
```

These are the basic settings that are required by the XenApp infrastructure. All other settings are focused on the RDP-TCP protocol used by RDS and not the ICA protocol that will be used by the XenApp servers.

The RDP-TCP settings are not discussed in detail in this book.

## How it works...

How the Remote Desktop Services provider works is explained in the *Configuring the RD License Server* recipe.

The RD Session Host-specific information can be found by using the following PowerShell command to view the current configuration for the RD Session Host server:

```
Get-ChildItem .\RDSConfiguration
```

To set the license mode for the RD Session Host, you can use the following command:

```
Set-Item -Path RDS:\RDSConfiguration\LicensingSettings\LicensingType
-Value <LicenseMode>
```

The `Set-Item` cmdlet uses the following parameters:

- `-Path`: This path specifies the configuration item whose settings need to be changed.
- `-Value`: This specifies the new value for the specified configuration item. Valid entries for the `LicensingType` are `2` (per device) or `4` (per user).

To specify an RD License Server for the RD Session Host to use, you can use the following `New-Item` cmdlet to add the server information:

```
New-Item -Path RDS:\RDSConfiguration\LicensingSettings\
SpecifiedLicenseServers -Name <FQDNLicenseServer>
```

The `New-Item` cmdlet uses the following parameters:

- `-Name`: This specifies the **Fully Qualified Domain Name** (**FQDN**) of the RD License Server

## There's more...

You can read more about the RDS provider for Windows PowerShell at Microsoft TechNet: `http://technet.microsoft.com/en-us/library/ee791871(v=WS.10).aspx`.

If you are not comfortable with running the provided PowerShell scripts, you can always configure your RD Session Host manually by following the instructions from Microsoft TechNet: `http://technet.microsoft.com/nl-nl/library/dd996653(v=ws.10).aspx`.

## See also

- The *Scripting a command-line installation of the RD Session Host* recipe
- The *Configuring RDS settings with Microsoft Group Policies* recipe

# Configuring RDS settings with Microsoft Group Policies

This recipe shows you how to use Microsoft Group Policies to ensure all XenApp servers will have the same Remote Desktop Services settings applied within your infrastructure by applying the settings to your servers from a centrally configured location with Microsoft Group Policies.

## Getting ready

To use Microsoft Group Policies and configure the required settings for your XenApp servers, you need to have the Group Policy Management feature installed on Windows Server 2008 R2 and be able to start the Group Policy Management Console on at least one of your servers.

You also need to ensure that the XenApp servers (or at least the RD Session Host servers) are put in their own **Organizational Unit (OU)** within Active Directory. This ensures you can attach **Group Policy Objects (GPOs)** with the required Group Policy settings to the server OU in Active Directory.

## How to do it...

To configure RDS settings with Group Policies, follow these steps:

1. Open the Group Policy Management Console by navigating to **Start** | **Run** | **gpmc.msc**.
2. Select the Active Directory OU that contains the XenApp or RD Session Host servers.
3. Click on the menu and navigate to **Action** | **Create a GPO in this domain** | **Link it here...**.
4. Enter a clear and explanatory name for your GPO, leave the Source Starter GPO set to **none**, and click on **OK**.
5. Select the newly created GPO.
6. Click on the menu and navigate to **Action** | **Edit...**.

7. Configure your RDS related settings and close Group Policy Management Console when you have finished.

The most common RDS related settings that can be configured through Group Policies are explained in the next section.

## How it works...

You can find all the RDS-related policy settings for Windows servers by navigating to **Computer Configuration** | **Policies** | **Administrative Templates** | **Windows Components** | **Remote Desktop Services** | **Remote Desktop Session Host** within the Group Policy Editor.

You can configure the following RDS Session Host settings:

| Subfolder | Settings | Configuration |
|---|---|---|
| Temporary folders | Do not delete the `temp` folder upon exit | This specifies whether RDS retains a user's per-session temporary folders at logoff.<br>Not configured = Temp folders are deleted unless specified otherwise. |
| Temporary folders | Do not use temporary folders per session | This specifies whether RDS creates session-specific temporary folders.<br>Not configured = per-session temporary folders are created unless specified otherwise. |
| Connections | Restrict RDS users to a single RDS session | This specifies whether users are restricted to a single remote RDS session.<br>Enabled = users who log on remotely will be restricted to a single session. |
| Connections | Allow users to connect remotely using RDS | This specifies whether remote access is allowed using RDS.<br>Not configured = the RDS setting determines whether a remote connection is allowed. |
| Licensing | Set the Remote Desktop licensing mode | This specifies the type of RDS client access license (RDS CAL) required: Per User or Per Device.<br>Enabled = Policy setting overrules installation settings. |
| Licensing | Use the specified RD License Servers | This specifies the order in which an RD Session Host server attempts to locate RD License Servers.<br>Enabled = RD Session Host server first attempts to locate the specified license servers. If this fails, it will attempt an automatic license server discovery. |

These are the basic settings that are required by the XenApp infrastructure to be set. All other policy settings are focused on the RDP-TCP protocol used by Windows Remote Desktop Services and not the ICA protocol that is used by the XenApp servers.

The RDP-TCP settings are not discussed in detail in this book.

## There's more...

You can read more on All Group Policy Settings for Remote Desktop Services in Windows Server 2008 R2 at Microsoft TechNet: `http at //technet.microsoft.com/en-us/library/ee791756(v=ws.10).aspx`.

## See also

- The *Configuring the RD Session Host* recipe

# Revoking RDS Device CALs with the RD License Manager

This recipe will show you how to manually revoke RDS Device CALs with the RD License Manager to manage the amount of available RD Licenses in your XenApp infrastructure.

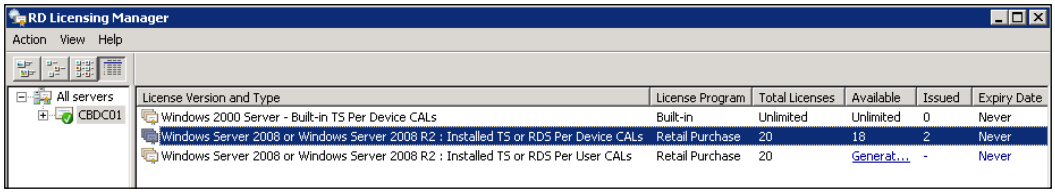
## Getting ready

To manage RDS Device CALs, a RD License Server needs to be installed and activated in the XenApp infrastructure. The RD License Server must also be issuing RDS Device CALs to client devices connecting to the RD Session hosts by the RDP protocol. Use the RD License Manager to check whether RDS Device CALs are issued by the RD License Server.

## How to do it...

To revoke RDS Device CALs, follow these steps:

1. Open the RD License Manager by navigating to **Start** | **Run** | **licmgr**.
2. Double-click on the RD License Server in the right pane.



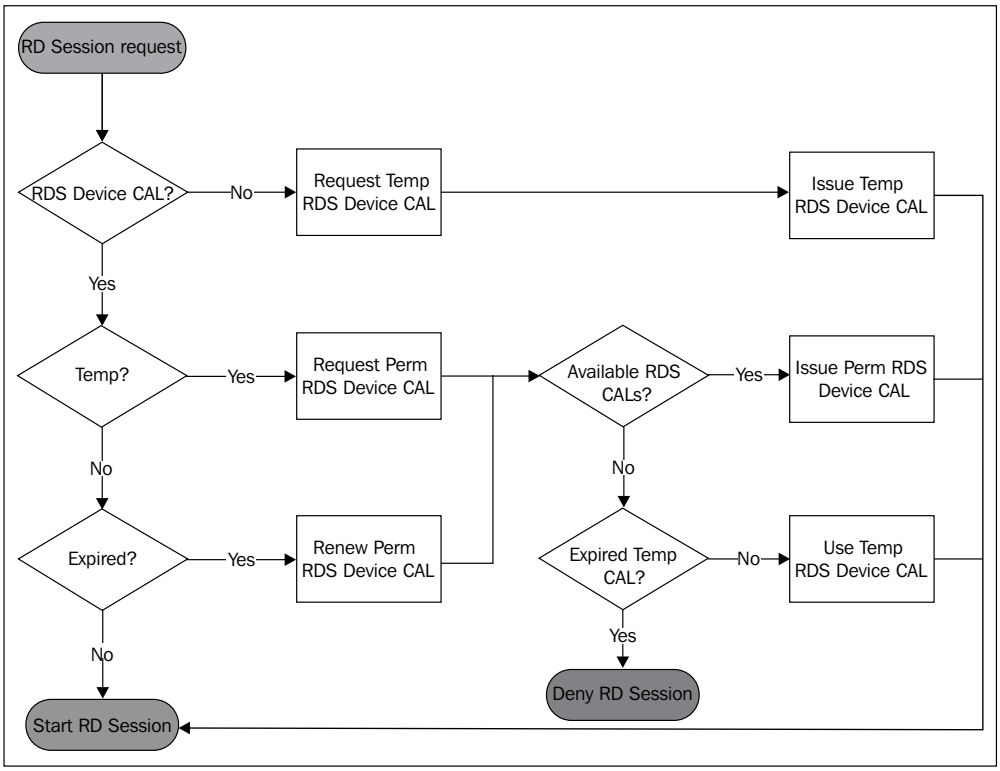

3. Double-click on **Installed TS or RDS Per Device CALs**, as shown in the previous screenshot
4. Right-click on the **Per Device CAL** that you want to revoke and select **Revoke License**.
5. Click on **Yes** to confirm the revocation of the CAL.
6. Click on **OK**.


The status of the revoked Per Device CAL has now been changed to **Revoked**.

## How it works...

Each RD Session Host needs to be configured with an RD License Server and the RD licensing mode to run user sessions. The configured RD licensing mode determines the type of RDS CAL that will be requested from the RD License Server. This can either be a Per User or a Per Device RDS CAL.

When a user wants to set up a Remote Desktop session on an RD Session Host, the host will check whether or not a valid RDS CAL is presented and will request an RDS CAL with the RD License Server, if one cannot be provided. The following flowchart provides a (simplified) view of the process followed by the RD Session Host to check and request an RDS Device CAL for the client device:




If the device cannot present an RDS Device CAL, a temporary RDS Device CAL will be issued by the RD License server. If the device presents a temporary or expired RDS Device CAL, a permanent RDS Device CAL will be issued if the RD License Server has RDS Device CALs available. If no RDS Device CALs are available, no permanent RDS Device CAL can be issued and the issued RDS Device CAL is not replaced on the client device. If a valid temporary CAL is available, a Remote Desktop session can still be started; if not, the request is denied, and the Remote Desktop session is denied.

An RD License Server can always issue temporary CALs whether it is activated or not. An unlimited supply of temporary RDS CALs is installed by default on each RD License Server. Temporary RDS CALs are valid for 90 days.

Each permanent RDS CAL issued by the RD License server is automatically configured with an expiry date. This date is a random period of 52 to 89 days from the request date. The expiry date for each RDS CAL is logged by the RD License server to ensure that when the expiry date is reached, the RDS CAL is automatically returned to the pool of available RDS Device CALs on the RD License Server. The returned RDS CAL can be issued immediately to a new device when a CAL is requested.

If by any chance you want to return a RDS Device CAL to the pool of available CALs before it is expired, you can use the RD Licensing Manager to revoke a Per Device CAL.

Keep in mind that only RDS Per Device CALs can be revoked and not RDS Per User CALs.

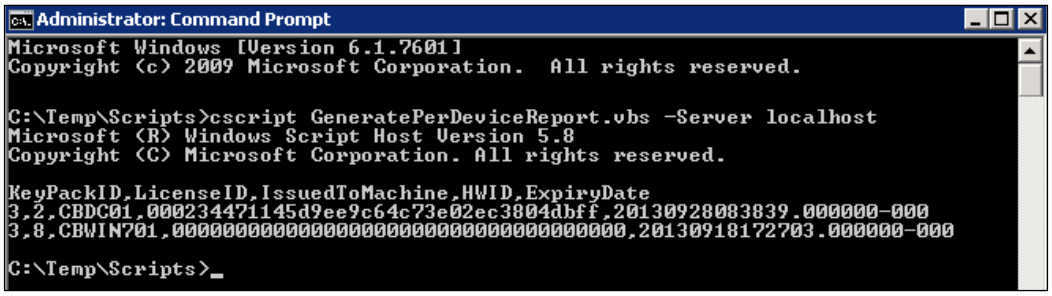
The revocation of RDS Device CALs is only meant to return issued CALs for devices that are no longer in use and there is no mechanism to dynamically manage your license pool. You are only allowed to revoke up to 20 percent of the CALs within a period of two and a half months.

## There's more...

You can read more about Remote Desktop licensing at Microsoft TechNet at `http://technet.microsoft.com/en-us/library/cc772298.aspx`.

You can read more about Remote Desktop licensing at Microsoft TechNet at `http://technet.microsoft.com/en-us/library/cc772298.aspx`.

To keep track of the issued RDS Device CALs and automatically generate reports, you can use the Visual Basic script that is developed and provided on Microsoft's MSDN website to generate RDS Per Device CAL reports. The following screenshot is an example of such a report:



You can download the script and read more about it at Microsoft's MSDN blog at `http://blogs.msdn.com/b/rds/archive/2007/08/10/generating-per-device-license-usage-reports-for-ts-license-servers-running-windows-server-2008.aspx`.

## See also

- The *Scripting a command-line installation of the RD License Server* recipe
- The *Configuring the RD License Server* recipe
- The *Creating RDS Per User CALs Reports* recipe

# Creating RDS Per User CALs Reports

This recipe will show you how to create RDS User CAL reports from the RD Licensing Manager. Unlike RDS Device CALs, the issued RDS User CALs are not shown in the management console. A report has to be created to get an overview of the issued RDS Per User CALs.

## Getting ready

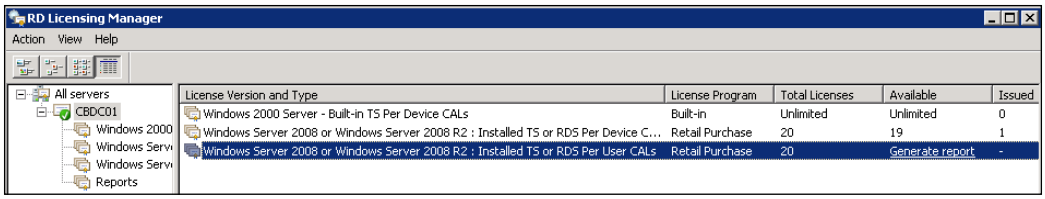
In order to manage your RDS Per User CALs, you need to have an RD License Server installed and activated so that it can issue RDS User CALs. In addition to this, you also need to have RDS Per User CALs installed on your RD License server and have your RD Session Host servers configured for the Per User license mode. This will ensure that your RD Session Host will request a valid Per User RDS CAL to be presented for each user that starts a Remote Desktop session on the server.

You can check the previous recipes in this chapter for directions on setting up and configuring your RD License Server and RD Session Hosts.

## How to do it...

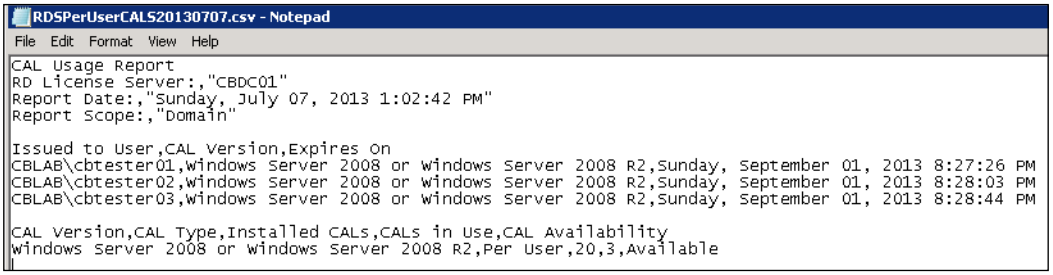
You can check whether your RD License server is issuing RDS Per User CALs with the RD Licensing Manager. Unlike the Per Device CALs where all issued licenses are shown in the console, a report has to be generated to get an overview of the issued RDS Per User CALs. Follow these steps to generate the report:

1. Open the RD License Manager by navigating to **Start** | **Run** | **licmgr**.
2. Double-click on **RD License Server** in the right pane.




3. Check if RDS Per User CALs are installed (shown in the right pane of the previous screenshot).
4. Right-click on **Reports** in the left pane and select **Create Report** | **Per User CAL Usage...**.
5. Select **Entire Domain** and click on **Create Report**.
6. Click on **OK**.
7. Right-click on the newly created report in the **Reports** overview and select **Save As**.
8. Save the report as a Comma Delimited (CSV) file.

You can view the report with either Notepad or Microsoft Excel as shown in the following screenshot:




## There's more...

If you want to automate the generation of the Per User RDS CAL usage reports, you can also run the following PowerShell script:

```
# Import the RDS PowerShell module
Import-Module RemoteDesktopServices
# Navigate to the RDS Provider for Windows PowerShell
Set-Location RDS:
# Generate the Per User CAL report
```