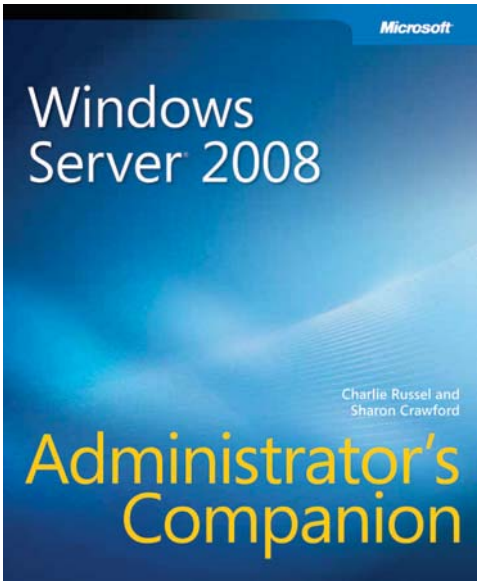

Windows® Server 2008 Administrator's Companion

Charlie Russel and Sharon Crawford

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Chapter 9

Installing and Configuring Server Core

The usual progression for an operating system (or an application, for that matter) is to grow and add features, sometimes well beyond what any of us want or need. Windows Server 2008 reverses that trend with a completely new installation option—Server Core. When you install Windows Server 2008, regardless of which edition you're installing, you have the option of choosing a full installation, with everything, or just the Server Core portion.

Server Core is just the essentials, with little or no graphical interface. The logon provider has the same graphical look, but then, when you've logged in, all you see is a single command-shell window, as shown in Figure 9-1.

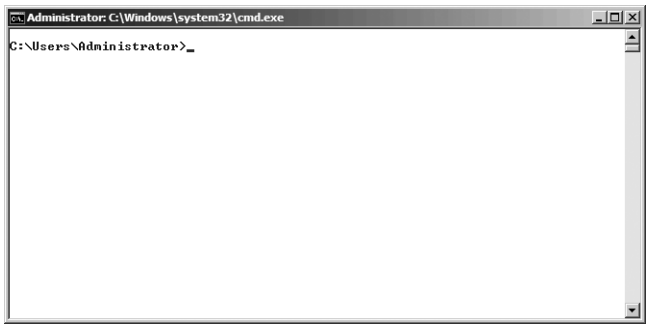

Figure 9-1 The Windows Server 2008 Core desktop.

> **Note** For improved readability in screen shots used here and in the rest of the book, I've changed the default color scheme for Command Prompt windows to dark blue text on a white background.

Benefits of a Server Core Installation

All Windows Server 2008 editions support Server Core, with the exception of Compute Cluster Edition. And installing Server Core doesn't give you a break on the cost of the license—it's exactly the same license and media as the full Windows Server 2008 installation. At install time, you simply choose which edition you are installing. So, if you don't save any money, and you don't have special media, and you have reduced functionality, why in the world would you choose Server Core over the full product? It's simple, really: security and resources. Let's take a look at those two in a bit more depth before we go on to the details of how to actually install and configure Server Core.

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Security

In the old days, whenever you installed Windows Server, it automatically installed just about everything that was available, and turned on all the services that you were likely to need. The goal was to make installation as simple as possible, and this seemed like a good idea at the time. Sadly, the world is not a friendly place for computers any more, and that approach is no longer safe or wise. The more services that exist, and the more services that are enabled, the more attack vectors the bad guys have to work with. To improve security, limiting the available attack surfaces is just good common sense.

In Server Core, Microsoft has completely removed all managed code, and the entire .NET Framework. This leaves a whole lot fewer places for possible attack. This does, obviously, impose some severe limits on what you can and can't do with a Server Core installation. And it also means that there isn't any PowerShell possible, which in our opinion is easily the biggest limitation of Server Core—but one that we hope will be resolved in a later version of Windows Server.

The default installation of Server Core has only 38 services running. A typical full Windows Server 2008 installation, with one or two roles enabled, is likely to have 60 or even 70 or more services running. Not only does the reduced number of services limit the potential attack surface that must be protected, but it also limits the number of updates that are likely to be required over the life of the server, making it easier to maintain.

Resources

The second major benefit to running Server Core is the reduced resources required for the base operating system. While the official requirements for installing Windows Server 2008 are the same for Core as for a full installation, the effective numbers are significantly less, in our experience—with the exception of the disk space required (only 2–3 GB of HD space for a running Core installation). Plus with the limited subset of tasks that you can perform, we think Server Core is ideal for running those infrastructure tasks that everyone runs, and that doesn't require much interaction over time. Tasks such as DHCP, DNS, and increasingly Virtualization. Now if it just had PowerShell.

Installing Server Core

Installing Windows Server 2008 Server Core is ultimately the same as installing the full graphical version of Windows Server 2008. The installation engine is the same, and the only difference occurs during the install, when you have to choose which version of Windows Server 2008 to install, as shown in Figure 9-2.

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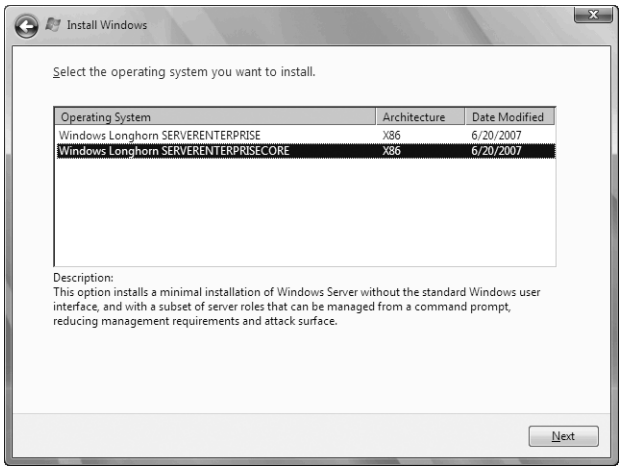

Figure 9-2 During initial installation, you make an irrevocable choice between Server and Server Core.

Once installation completes, you're presented with the initial logon screen. Log on as Administrator, with no password, and you'll be immediately prompted to change the password and then logged on to the desktop, as shown earlier in Figure 9-1. All initial configuration takes place from the command line, though once you've configured the basics, you'll be able to use familiar management consoles remotely.

You can use an unattend.xml file to automate the initial install and configuration of your Server Core installation. For details on the settings and syntax of unattend.xml, see *http://go.microsoft.com/fwlink/?LinkId=81030*.

Configuration

All configuration tasks for Server Core can be done at the command line, and all the initial tasks have to be done at either the command line or as part of the installation process by using an unattend.xml script. Once you're performed these initial configuration tasks, you can then use regular Windows management consoles to manage the additional settings. Unfortunately, there isn't a single command shell for the tasks, but a collection of old favorites, each with a different behavior and syntax.

Initial Configuration

The initial steps you'll need to perform on a Server Core installation will depend somewhat on your intended use of the installation, but we think that the following ones are the most obvious:

- Set a fixed IP address.
- Change the server name to match your internal standards.
- Join the server to a domain.
- Change the default resolution of the console.
- Enable remote management through Windows Firewall.

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- Enable remote desktop.
- Activate the server.

We'll walk through these steps for you, and leave you with a couple of basic scripts that you can modify to automate these tasks for your environment. Table 9-1 contains the settings we'll be using during this install scenario.

Table 9-1 Settings for Initial Server Core Configuration (Example)

Setting	Value
IP Address	192.168.51.4
Gateway	192.168.51.1
DNS Server	192.168.51.2
Server Name	Hp350-core-04
Domain To Join	example.local
Default Desktop Resolution	1024x768
Remote Management	Enable for Domain Profile
Windows Activation	Activate

Set IP Address

To set the IP address for the server, you need to use the netsh command-line tool. Follow these steps to configure TCP/IP:

1. From the command window, use netsh to get the "name" (index number) of the network card.

   ```
   netsh interface ipv4 show interfaces
   ```

2. The result will be something like the following:

   ```
   C:\Users\administrator>netsh interface ipv4 show interfaces



   Idx  Met   MTU   State        Name

   ---  ---  -----  -----------  -------------------

     2   10   1500  connected    Local Area Connection

     1   50 4294967295  connected    Loopback Pseudo-Interface 1
   ```

3. The *Idx* value for your real network card (2, in this case) will be used as the name value in future commands for netsh.

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4. Now, using the *Idx* value from step 2, run the following netsh command:

   ```
   netsh interface ipv4 set address name="<Idx>" source=static address=<IP Address>
   mask=<netmask> gateway=<IP Address of default gateway>
   ```

5. Next, specify the DNS server for the adapter, using netsh again:

   ```
   netsh interface ipv4 add dnsserver name="<Idx>" address=<IP Address of DNS Server>
   index=1
   ```

6. For secondary DNS servers, repeat the command in step 5, increasing the index value by one each time.

Renaming the Server and Joining to a Domain

The next step in initial configuration is assigning the name of the server and joining it to a domain. During initial installation of Windows Server 2008, an automatically generated name is assigned to the server and it is placed in the WORKGROUP workgroup. You'll want to change this to align the computer name with your corporate naming policy and join the server to the correct domain and Organizational Unit. Our naming policy here has three parts: the model of server, the functional role, and a number reflecting its IP address. Thus the Server Core computer we're building in this chapter is named hp350-core-04: it's a Hewlett Packard ML 350 G5 server, it is running Server Core, and the final octet of its IP address is four. Your server naming convention will undoubtedly be different, but the important thing is to be consistent. Our domain for this book is example.local.

To change the name of the server and join it to the example.local domain, follow these steps:

1. From the command prompt, use the netdom command to change the name of the server:

   ```
   netdom renamecomputer %COMPUTERNAME% /newname:<newname>
   ```

2. After you change the name, you must reboot the server.

   ```
   shutdown /t 0 /r
   ```

3. After the server restarts, log on to the Administrator account.

4. Use the netdom command again to join the domain.

   ```
   netdom join %COMPUTERNAME% /DOMAIN:<domainname> /userd:<domain admin account>
   /password:*
   ```

5. You'll be prompted for the password for the domain administrative account you used. Enter the password. When the domain join has succeeded, you'll again need to reboot the server.

   ```
   shutdown /t 0 /r
   ```

6. After the server restarts, log back on to a domain administrator's account. (You'll need to click Change User because the server will default to the local administrator account.)

Scripting Initial Configuration

If you set up more than one or two Server Core computers, you'll quickly get tired of doing all this interactively from the command prompt. We know we did. You have the choice of either using an unattend.xml file to set options during the install or

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using simple scripts to automate the process. Both work, and both have their adherents, but we tend to use scripts after the fact. You can modify the following three scripts (which you'll also find on the companion CD) for your environment to automate the initial TCP/IP, server name, and domain join steps.

The first script sets the IP address, sets the DNS server, and changes the server name.

```
echo off

REM filename: initsetup1.cmd

REM

REM initial setup for a Server 2008 Server Core installation.

REM command file 1 of 3

REM

REM Created: 4 September, 2007

REM ModHist: 5/9/07 - switched to variables (cpr)

REM

REM Copyright 2007 Charlie Russel and Sharon Crawford. All rights reserved.

REM   You may freely use this script in your own environment, modifying it

REM   to meet your needs. But you may not re-publish it without permission.



REM first, set a fixed IP address. You'll need to know the index number

REM of the interface you're setting, but in a default Server Core install,

REM with only a single NIC, the index should be 2. To find the index,

REM you can run:

REM      netsh interface ipv4 show interfaces

REM
```

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```
SETLOCAL

REM Change the values below to match your needs

SET IPADD=192.168.51.4

SET IPMASK=255.255.255.0

SET IPGW=192.168.51.1

SET DNS1=192.168.51.2

SET NEWNAME=hp350-core-04



netsh interface ipv4 set address name="2" source=static address=%IPADD%
mask=%IPMASK% gateway=%IPGW%



REM Next, set DNS to point to DNS server for example.local.

REM   192.168.51.2 in this case

netsh interface ipv4 add dnsserver name="2" address=%DNS1% index=1



REM Now, we need to change the computer name. After we're done, the server

REM must be restarted, and we can continue with the next batch of commands.

REM we use the /force command here to avoid prompts

netdom renamecomputer %COMPUTERNAME% /newname:%NEWNAME% /force



@echo If everything looks OK, the it's time to reboot

pause

REM now, shutdown and reboot. No need to wait.

shutdown /t 0 /r
```

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The second script we use is to actually join the server to the domain.

```
@echo off

REM Filename: initsetup2.cmd

REM

REM initial setup for a Server 2008 Server Core installation.

REM command file 2 of 3

REM

REM Created: 4 September, 2007

REM ModHist:

REM

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REM   You may freely use this script in your own environment, modifying it

REM   to meet your needs. But you may not re-publish it without permission.



SETLOCAL

SET DOMAIN=example.local

SET DOMADMIN=Administrator



REM Join the domain using the netdom join command. Prompts for password

REM of domain administrator account set above



netdom join %COMPUTERNAME% /DOMAIN:%DOMAIN% /userd:%DOMADMIN% /passwordd:*
```

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```
REM now, shutdown and reboot. No need to wait, and that's all we can do

REM at this time



shutdown /t 0 /r
```

Finally, use the third script to enable remote management and activate the server.

```
echo off

REM initsetup3.cmd

REM

REM initial setup for a Server 2008 Server Core installation.

REM command file 3 of 3

REM

REM Created: 4 September, 2007

REM ModHist:

REM

REM Copyright 2007 Charlie Russel and Sharon Crawford. All rights reserved.

REM   You may freely use this script in your own environment, modifying it

REM   to meet your needs. But you may not re-publish it without permission.



REM Use netsh to enable remote management through the firewall for the

REM domain profile. This is the minimum to allow using remote MMCs to work

REM from other computers in the domain.



netsh advfirewall set domainprofile settings remotemanagement enable
```

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```
REM allow remote administration group
netsh advfirewall firewall set rule group="Remote Administration" new enable=yes



REM Allow remote desktop

REM (also works with group=”Remote Desktop” instead of name=)

netsh advfirewall firewall set rule name="Remote Desktop (TCP-In)" new enable=yes



REM Enable Remote Desktop for Administration, and allow

REM downlevel clients to connect

cscript %windir%\system32\scregedit.wsf /AR 0

cscript %windir%\system32\scregedit.wsf /CS 0



REM Now, run the activation script
REM No output means it worked

Slmgr.vbs -ato
```

Setting Desktop Display Resolution

To set the display resolution for the Server Core desktop, you need to manually edit the registry. We'd give you a script to do it, but it is dependent on correctly identifying the specific GUID for your display adapter. Not something we want to automate. So, to change the resolution on your Server Core desktop, follow these steps:

1. Open regedit.
2. Navigate to HKLM\System\CurrentControlSet\Control\Video.
3. One or more GUIDs is listed under Video. Select the one that corresponds to your video card. Hint: they each have a device description under the 0000 key that can sometimes help.
4. Under the GUID select the 0000 key, and add a DWORD DefaultSettings.XResolution. Edit the value to the X axis resolution you want. For a width of 1024 pixels, use 400 hexadecimal, as shown in Figure 9-3.

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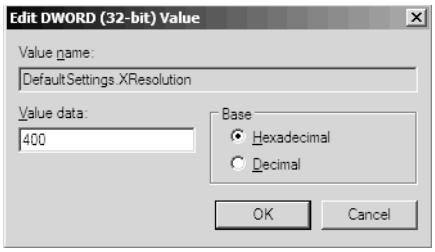

Figure 9-3 Editing the display resolution value for the X axis.

5. Add a DWORD DefaultSettings.YResolution. For height of 768 pixels, use 300 hexadecimal.

> **Note** In some cases, these keys will already exist. If they do, you can simply change their value as necessary.

6. Exit the registry editor and log off using the following:

```
shutdown /l
```

7. Once you log back on, the new display settings will take effect.

Enabling Remote Management

To allow access to the familiar graphical administration tools, you need to enable them to work through Windows Firewall. This requires another set of netsh commands. Use the following steps to enable remote administration and Remote Desktop:

1. From the command prompt, use the netsh command to enable remote management:

```
netsh advfirewall set domainprofile settings remotemanagement enable
```

2. Now, enable the Remote Administration group of firewall rules.

```
netsh advfirewall firewall set rule group="Remote Administration" new enable=yes
```

3. Finally, life is easier when you can connect using remote desktop, so let's enable that, too:

```
netsh advfirewall firewall set rule name="Remote Desktop (TCP-In)" new enable=yes
```

You should now be able to do additional management using familiar graphical tools from another server but connecting to the Server Core computer.

Activating the Server

The final step in basic configuration of the Server Core computer is to activate it. This requires using a Visual Basic script, which is provided. Use the following command:

```
Slmgr.vbs -ato
```

> **Note** All the basic initial setup commands for Server Core are included in the three scripts described in the UnderTheHood sidebar, and are also available on the CD that comes with the book.

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Installing Roles

Windows Server 2008 Core doesn't support all the possible roles and features of the full graphical Windows Server, but it does support the most important infrastructure roles. We think one of the most compelling scenarios for Server Core is as a remote site server to enable basic functionality at a remote site where nobody is available on site to administer it. By combining the DHCP Server, DNS Server , File Services, and Print Services roles with a read-only Active Directory Domain Services role, you have a "branch office in a box" solution—just add a remote access device such as a VPN router and you're in business.

The File Services role is added by default as part of the base Server Core installation, but you can add additional role services to support additional functionality.

The command used to install a role in Server Core is Ocsetup.exe. The exact same command is used to uninstall a role, but with the */uninstall* command-line parameter. The full syntax for Ocsetup is:

```
Ocsetup </?|/h|/help>

Ocsetup <component> [/uninstall][/passive][/unattendfile:<file>]
[/quiet][/log:<file>][/norestart][/x:<parameters>]
```

The important thing to remember about Ocsetup is that it is quite unforgiving. It is case sensitive, and even a slight mistake in the case of the component name will cause the command to fail.

A script to install the roles for this solution, except the domain controller role, would look like this:

```
@REM filename: SetupBranch.cmd

@REM

@REM Setup file to install roles for a branch office server

@REM

@REM Created: 5 September, 2007

@REM ModHist:

@REM

@REM Copyright 2007 Charlie Russel and Sharon Crawford. All rights reserved

@REM   You may freely use this script in your own environment,

@REM   modifying it to meet your needs.

@REM   But you may not re-publish it without permission.
```

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```
@REM Using "start /w" with ocsetup forces ocsetup to wait until it completes before
@REM going on to the next task.


@REM Install DNS and DHCP
@echo Installing DNS and DHCP roles...
start /w ocsetup DNS-Server-Core-Role
start /w ocsetup DHCPServerCore


@REM Now, install File Role Services
@echo Now installing File Role Services...
start /w ocsetup FRS-Infrastructure
start /w ocsetup DFSN-Server
start /w ocsetup DFSR-Infrastructure-ServerEdition


@REM Uncomment these two lines to add NFS support
@REM start /w ocsetup ServerForNFS-Base
@REM start /w ocsetup ClientForNFS-Base


@REM Install Print Server Role
@echo Installing Print Server Role
start /w ocsetup Printing-ServerCore-Role
```

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```
@REM Uncomment next for LPD support

@REM start /w ocsetup Printing-LPDPrintService
```

Note You can't include the DCPromo command in the script above because installing the Print Server role requires a reboot, and locks out DCPromo.

You cannot use DCPromo interactively to create a domain controller – you must create an unattend.txt file to use with it. The basic minimum unattend.txt file is:

```
[DCInstall]

InstallDNS = Yes

ConfirmGC = yes

CriticalReplicationOnly = No

RebootOnCompletion = No

ReplicationSourceDC = hp350-dc-02.example.local

ParentDomainDNSName = example.local

ReplicaOrNewDomain = ReadOnlyReplica

ReplicaDomainDNSName = example.local

SiteName=Default-First-Site-Name

SafeModeAdminPassword = <passwd>

UserDomain = example

UserName = Administrator

Password = <passwd>
```

Important The passwords fields must be correct, and will be automatically stripped from the file for security reasons. For Server Core, you must specify a *ReplicationSourceDC* value. You should set *ReplicaOrNewDomain* to the value shown here and *ReadOnlyReplica* to create a read-only domain controller.

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To install the read-only Domain Controller role, follow these steps:

1. Use Notepad or your favorite ASCII text editor (we use GVim, which works quite well in Server Core) to create an unattend.txt file with the necessary settings for the domain you will be joining. The specific filename of the unattend file is not important because you specify it on the command line.
2. Change to the directory that contains the unattend file. If the server has any pending restarts, you *must* complete them before promoting the server to domain controller.
3. Run DCPromo with the following syntax:

   ```
   Dcpromo /unattend:<unattendfilename>
   ```

4. If there are no errors in the unattend file, DCPromo will proceed and promote the server to be a read-only domain controller, as shown in Figure 9-4.

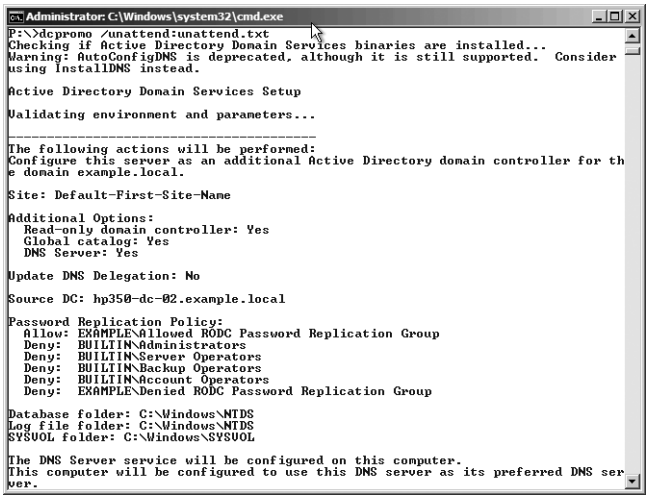

Figure 9-4 Use DCPromo to create a read-only domain controller with an unattend file.

Listing Roles

The Oclist.exe command provides a complete list of the available Server Core roles, role services, and features, as well as their current state. Use Oclist to get the exact, case-sensitive list of the features and roles you want to install.

Managing a Server Core Computer

Managing a Server Core computer is a different experience for most system administrators. None of the graphical tools you're used to using is available *on the server*. But once you've configured the Server Core computer for remote management, as described under "Initial Configuration" earlier in the chapter, you can create management consoles that point to the Server Core computer, which allow you to do all your tasks from a graphical console.

> **More Info** For details on how to create custom MMCs, see Chapter 14, "Managing Daily Operations."

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There are four basic ways to manage a Server Core installation. They are:

- Locally using a command prompt.
- Remotely, using Remote Desktop. The shell in Remote Desktop will have only the same functionality (a command prompt) as being logged on locally.
- Remotely using Windows Remote Shell.
- Remotely using an MMC snap-in from a server running Windows Vista or Windows Server 2008.

Some tasks are a bit tricky in Server Core—we're used to usually doing them exclusively from the GUI. An obvious task is changing the password on your account. For that, use the **net user <username> *** command. Some of the tasks that can be a problem. Table 9-2 shows some solutions.

Table 9-2 Common Task Workarounds in Server Core

Task	Solution/Workaround
Enable automatic updates	`Cscript %windir%\system32\scregedit.wsf /AU [value]` Where values are: 1 – disable automatic updates 4 – enable automatic updates /v – view current setting
Enable Remote Desktop for Administrators	`Cscript %windir%\system32\scregedit.wsf /AR [value]` Where values are: 0 – enable Remote Desktop 1 – disable Remote Desktop /v – view current setting
Enable Terminal Server clients from Windows versions prior to Windows Vista	`Cscript %windir%\system32\scregedit.wsf /CS [value]` Where values are: 0 – enable prior versions 1 – disable prior versions /v – view current setting
Allow IPSec Monitor remote management	`Cscript %windir%\system32\scregedit.wsf /IM [value]` Where values are: 0 – disable remote management 1 – enable remote management /v – view current setting

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Configure DNS SRV record weight and priority	`Cscript %windir%\system32\scregedit.wsf /DP [value]`
	Where DNS SRV priority values are:
	0-65535. (Recommended value = 200)
	/v – view current setting
	`Cscript %windir%\system32\scregedit.wsf /DW [value]`
	Where DNS SRV weight values are:
	0-65535. (Recommended value = 50)
	/v – view current setting

Update User passwords	Net user <username> [/domain] *
Installing .msi files	Use the /q or /qb switches from the command line with the full .msi filename. /q is quiet; /qb is quiet but with a basic user interface
Changing the time zone, date, or time	timedate.cpl
Change internationalization settings	intl.cpl
Using Disk Management console	From the command line of the Server Core installation: Net start VDS Then run Disk Management remotely.
Get Windows version information	Winver is not available. Use systeminfo.exe instead.
Get Help (regular Windows Help and Support files are not viewable in Server Core)	`Cscript %windir%\system32\scregedit.wsf /cli`

Using Windows Remote Shell

You can use Windows Remote Shell to remotely execute commands on a Server Core computer. But before you can run Windows Remote Shell, you need to first enable it on the target Server Core computer. To enable Windows Remote Shell, use the following command:

```
WinRM quickconfig
```

To run a command remotely, use the WinRS command from another computer using the following command:

```
Winrs –r:<ServerName> <command string to execute>
```

Using Terminal Server RemoteApp

One neat trick that we like is to use the new TS RemoteApp functionality of Windows Server 2008 to publish a Command Prompt window for the Server Core computer directly

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onto our desktop. This is simpler and more direct, and saves screen real estate, which is always a benefit. To create an RDP package that you can put on your desktop, follow these steps:

1. On a Windows Server 2008 server that has the Terminal Services role enabled, open the TS RemoteApp Manager, as shown in Figure 9-5.

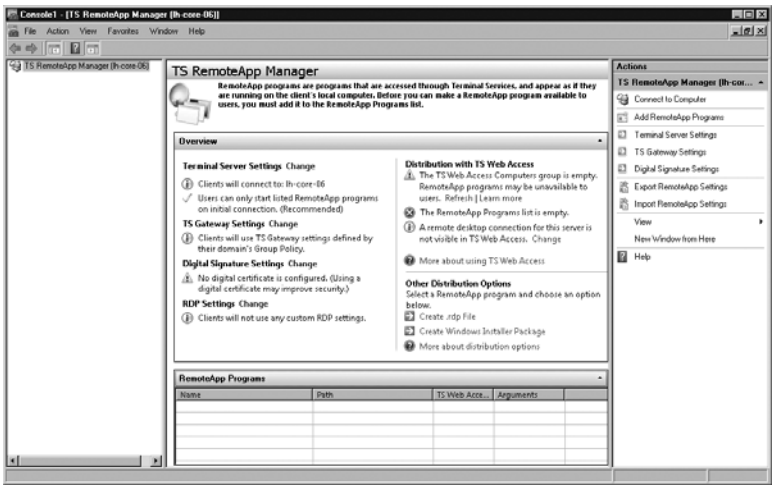

Figure 9-5 Use the TS RemoteApp Manager to create a remote cmd.exe window.

2. Connect to the Server Core computer you want to build an RDP package for.
3. Click Add RemoteApp Programs in the actions pane to open the RemoteApp Wizard.
4. Click Next to open the Choose Programs To Add To The RemoteApp Programs List page, shown in Figure 9-6.

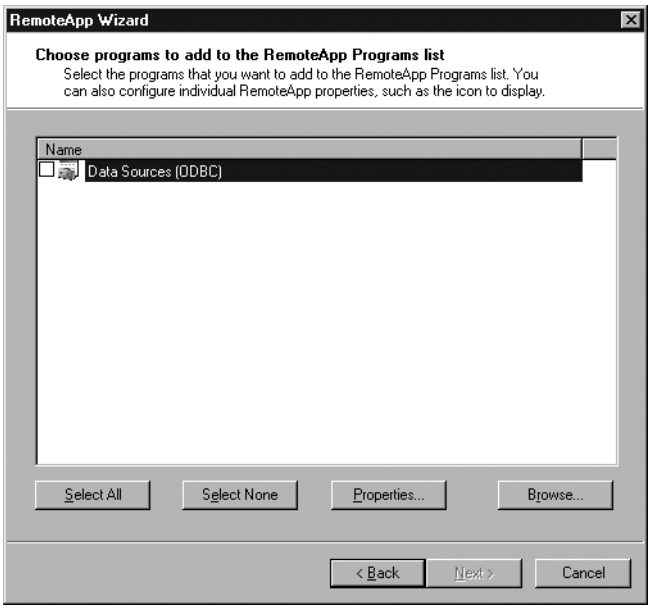

Figure 9-6 The Choose Programs To Add To The RemoteApp Programs List page of the RemoteApp Wizard.

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5. Click Browse, and navigate to \<ServerName>\c$\windows\system32\cmd.exe. Click Open.
6. Click Next and then click Finish to add the remote program and return to the TS RemoteApp Manager.
7. Select cmd.exe in the RemoteApp programs pane and click Create .rdp File in the actions pane.
8. Click Next, and specify any additional package settings for the RDP package. Note the location where the package will be saved.
9. Click Next and then click Finish to create the RDP package.
10. Copy the package to the computer where you will use it.

Now you can open a Command Prompt window directly onto the Server Core computer simply by double-clicking the RDP package you created and saved.

Summary

In this chapter we've covered some basic steps for setting up and configuring the new Server Core installation option of Windows Server 2008. We think this is an exciting and powerful new way to get the power of Windows Server while maintaining very high levels of security and ease of management. And yes, we know that sounds a bit like marketing hype, but we actually think that Server Core is an important step forward.

In the next chapter, we'll cover managing and configuring your printers using the Printer Management console.

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