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*The Definitive Guide<sup>tm</sup> To*

# Windows Server 2003 Terminal Services

*Updated Edition*



*Greyson Mitchem*

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## Chapter 6: Managing User Profiles

User profile management is the linchpin to a successful terminal server deployment. Eighty percent of all end-user issues are most likely profile related. Careful analysis, planning, and implementation are required to ensure that you successfully manage user profiles, as the type of profiles you use will not only determine the level of autonomy and personalization your users will have in the terminal server environment but also dictate the amount of support your users will need.

Even with the improvements in profile management in Windows XP and WS2K3, user profiles are subject to corruption, and in a terminal server environment, corruption can be common because the server must handle the loading and unloading of many profiles simultaneously. Add that to the fact that in a load-balanced environment, users have the potential of logging into a different server each day, and you have a recipe for disaster.

This chapter will introduce you to the types of profiles available in WS2K3, how to implement each type, and options available for creating a mixed environment in which different servers use different types of profiles. It will also discuss third-party options that create additional flexibility for user profile management.

### Components of a User Profile

Both local profiles and local copies of roaming profiles are stored in C:\Documents and Settings\ by default on WS2K3. Each user's profile is stored in a folder labeled with the user's username. The profile folder is made up of the following subdirectories:

- Application Data—Application-specific data (custom dictionaries, for example); application developers decide what data to store here; this subdirectory is hidden by default
- Cookies—Internet Explorer (IE) cookies (Web site preferences)
- Desktop—Files, folders, and shortcuts that a user places on his or her desktop.
- Favorites—IE favorites
- Local Settings—Similar to Application Data, however, this folder is not included as part of a user's roaming profile; usually this folder is used for large application-specific files, such as Outlook OST files, and is hidden by default
- My Recent Documents—Shortcuts to a user's recently opened documents and is hidden by default
- NetHood—The user's My Network Places shortcuts; this subdirectory is hidden by default
- PrintHood—Shortcuts to the user's defined printers; this subdirectory is hidden by default

- SendTo—Shortcuts to applications and folders that the user has added to the Explorer Send To context menu; this subdirectory is hidden by default
- Start Menu—Start menu items that are not part of the All User profile
- Templates—User-created templates; this subdirectory is hidden by default
- My Documents—User files
- Windows—Per-user INI files
- NTUSER.DAT—The user registry (HKEY\_CURRENT\_USER); this subdirectory is hidden by default
- ntsuer.dat.LOG—A log file used for registry loading and unloading; this file is hidden by default

In addition to a folder for each user, the Documents and Settings directory also contains a Default User profile and an All Users profile (see Figure 6.1). The Default User profile is used as the basis for all new profiles created on the server. You can customize this profile so that new users receive specialized settings, desktop shortcuts, and so on—as we'll explore in the next section.

The All Users profile is used to store Start menu and desktop items that are displayed for all users on the server. It also contains the Shared Documents folder for workgroup mode servers. You can customize this profile with shortcuts common to all users on the server.

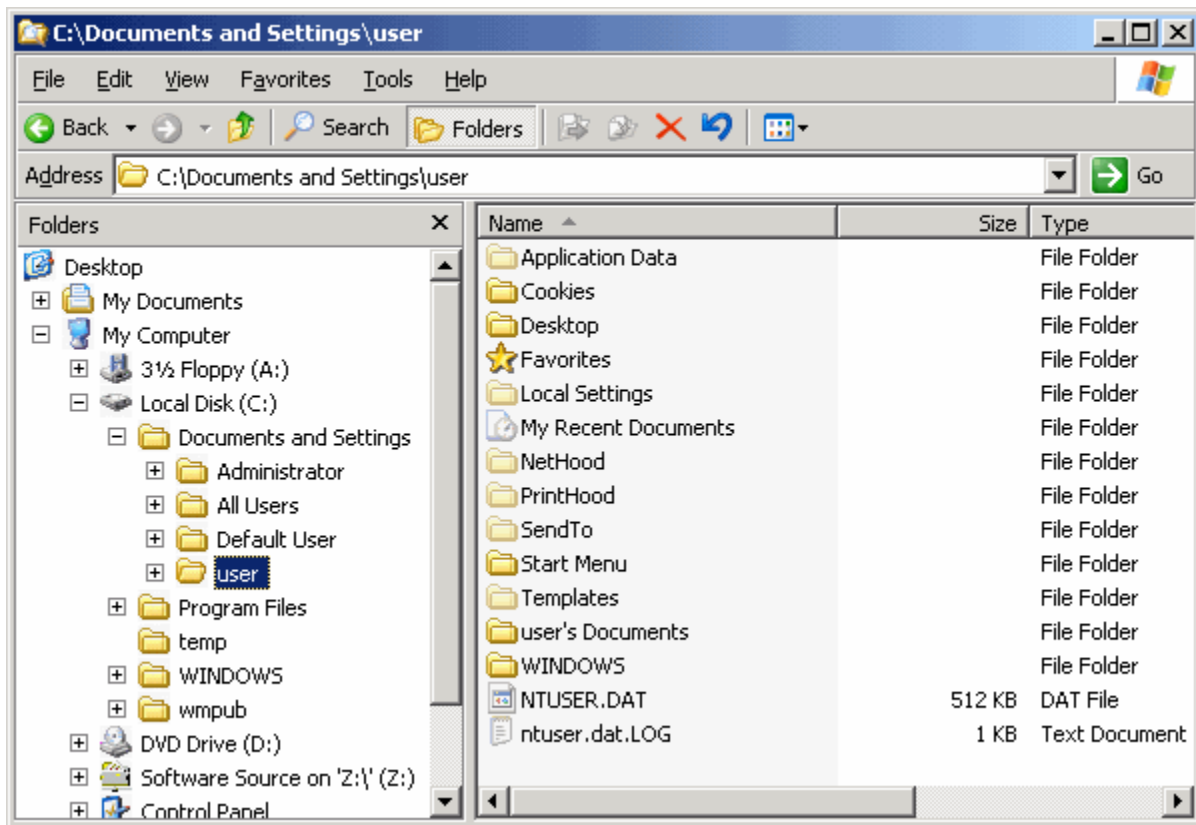


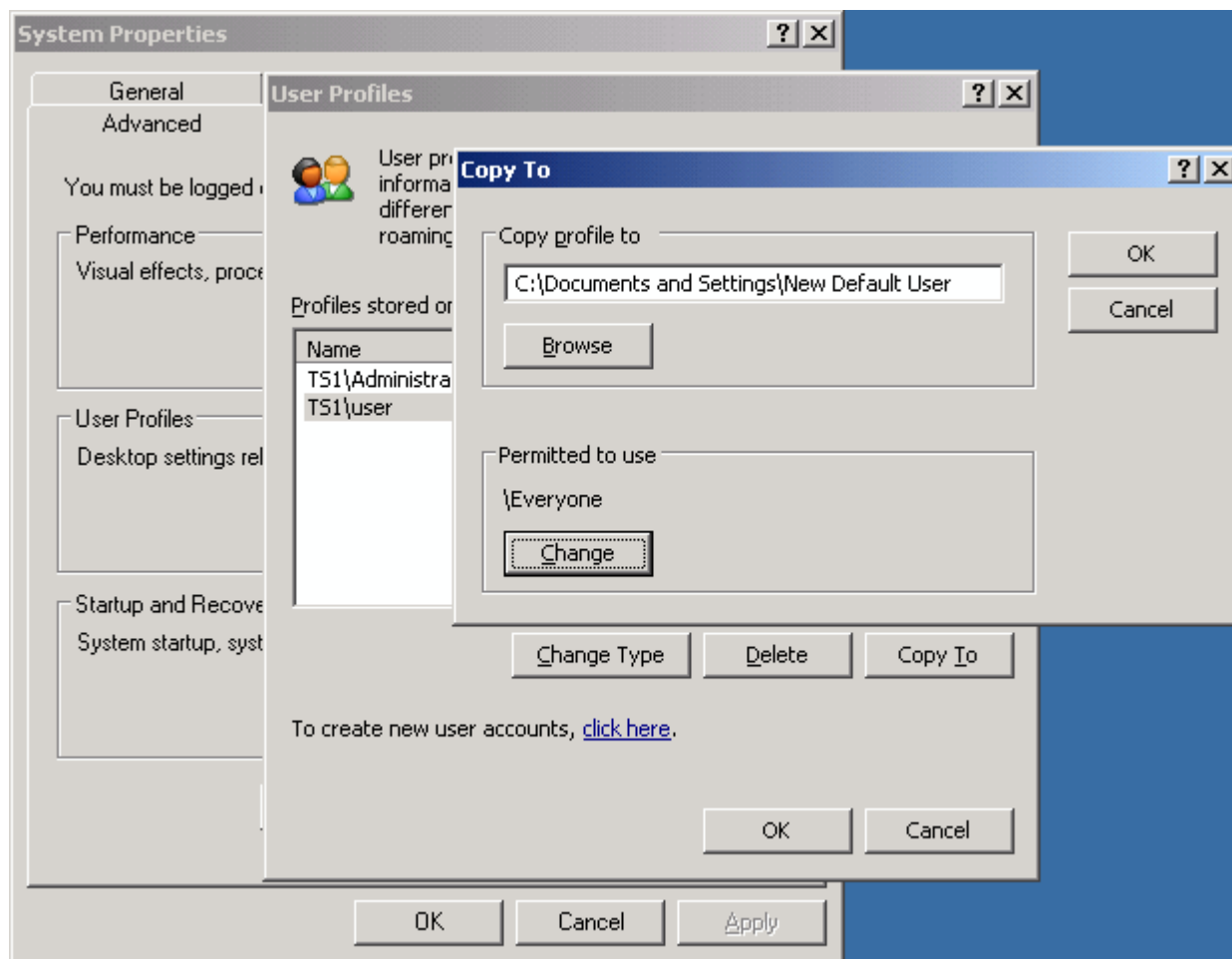
Figure 6.1: Components of a user profile.

## Customizing the Default User Profile

The following list highlights the steps necessary to customize the Default User profile:

- Log on to the terminal server as a non-administrative user. Be sure that this user account has not logged onto this server before so that all settings are default.
- Customize the profile to your liking—add desktop shortcuts, add corporate templates, configure preferences for Windows Explorer, and so on.
- Log out and log back into the server as an administrator.
- Click Start, Control Panel, then select System.
- On the Advanced tab, click Settings under User Profiles.
- In the *Profiles stored on this computer* list, select the user's profile that you created in the first step, then click Copy To.
- Under *Copy profile to*, enter the path to a temporary location for the new profile (see Figure 6.2).
- Under *Permitted to use*, click Change, and type  
Everyone  
into the search box, then click OK.
- Close the System Control Panel applet.
- Open an Explorer Window, and browse to C:\Documents and Settings.
- Rename the Default User folder so that you have a backup.
- Copy the new profile you just created to the C:\Documents and Settings directory, and rename it to Default User.

Now all new profiles created on this server will be based on your customized profile. You can copy this new Default User profile to other terminal servers as well.



**Figure 6.2: Creating a new Default User profile.**


- 👉 If your environment is conducive to having a single Default User profile for all computers in the domain, you can copy this Default User profile to the Domain Netlogon share. All computers in the domain will then use that Default User profile instead of the one in their own Documents and Settings directory.

## Types of User Profiles

Since the release of NT, Windows has supported three distinct types of user profiles:

- Local profiles—These profiles are specific to one computer and are stored on the local hard disk only (on WS2K3, they are stored in C:\Documents and Settings).
- Roaming profiles—These profiles are stored centrally on a file server and are copied to every machine that a user logs onto. At logoff, any changes made during the user session are copied back to the central file server. Roaming profiles allow users to have consistent settings across multiple computers.
- Mandatory profiles—A mandatory profile is a preconfigured profile that is stored on a central file server. At logon, a copy of the profile is made for the user with all the administrator-defined settings in tact. At logoff, changes that the user might have made during the session are discarded. Mandatory profiles provide a consistent user experience and minimize the chances of profile corruption by creating a fresh profile for the user at every logon.

In a terminal server environment, there are additional options available but they are based on these three types of profiles. You can configure a separate roaming or mandatory profile to be used exclusively on terminal servers so that your users can have separate settings for terminal servers and workstations. You can also configure a single server or group of servers to use a distinct roaming profile from the one defined in the user account.


 There are also third-party tools that offer alternatives to the native profile types. I will introduce you to some of them later in this chapter.

## The Profile Loading Process

With WS2K3, there are so many options available for profile types and locations that the profile selection process can become quite complex. The following list of profile options is provided in order of priority for logging in via Terminal Services (not at the console of the server).

Depending on what options are set, the system will use the first profile it finds:

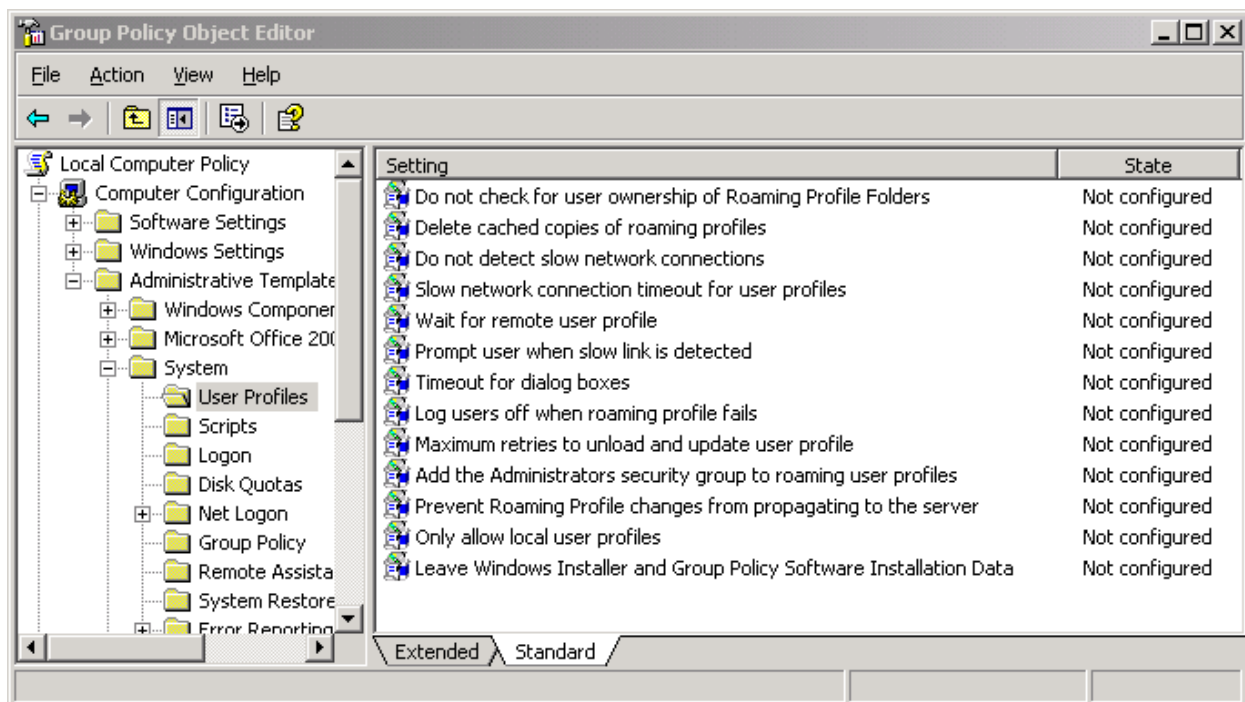
1. If the *Only allow local user profiles* policy setting is enabled, the system will load the user's local profile (if one exists) regardless of the roaming profile settings in the user's account. If the user does not have a local profile, a new one is created based on the Default User profile. When the user logs off, changes will be saved locally but not uploaded to any roaming profile location.
2. If the *Set Path for TS Roaming Profiles* policy setting is enabled and defined, the server will load the central profile found at the defined path.

 The system always appends the user's username to the path defined in the policy. If the user does not have a profile at this location, a new profile is created based on the Default User profile. When the user logs off, changes will be uploaded to the defined path.




3. If the user has a Terminal Services User Profile defined in his or her user account, the system will load the roaming profile found at that location. If the user does not have a profile at this location, a new profile is created based on the Default User profile. When the user logs off, changes will be uploaded to the roaming profile.
4. If the user has a User Profile Path defined in her or his user account, the system will load the roaming profile found at that location. If the user does not have a profile at this location, a new profile is created based on the Default User profile. When the user logs off, changes will be uploaded to the roaming profile.
5. If no roaming profile paths are defined, the system will load the user's local profile. If the user does not have a local profile, a new one is created based on the Default User profile. When the user logs off, changes will be saved locally but not uploaded to any roaming profile location.

You can also override the default profile unloading process. If you enable the *Prevent Roaming profile changes from propagating to the server* policy setting (see Figure 6.3), the system will load the user's roaming profile at logon but will not save changes to the central copy at logoff. This option can be helpful for servers used for testing and QA.



**Figure 6.3: User profile Group Policy options.**

If you are using roaming profiles, you can also conserve disk space by enabling the *Delete cached copies of roaming profiles* policy setting. Doing so tells the server to delete the local copy after changes have been successfully copied to the roaming profile location.


 If you enable the *Only allow local profiles* policy setting, local copies are not deleted by the *Delete cached copies of roaming profiles* function even if the user has a roaming profile defined.

## Configuring User Profile Types

### *On a Per-User Basis via Active Directory Users and Computers*

By default, all Windows systems will use local profiles. If you only have one terminal server, this default behavior can be fine; however, most environments have multiple servers that are either load balanced or provide different applications. If you want your users to have a consistent experience across the servers, you must configure either roaming or mandatory profiles.

To configure a profile on a per-user basis, use Active Directory Users and Computers (ADUC), and open the properties dialog box for the user account. You will see that there is both a Profile and a Terminal Services Profile tab (see Figure 6.4). The Profile tab is primarily used for workstation logons, and the settings on the Terminal Services Profile tab will be loaded only by terminal server sessions.

 If you use roaming or mandatory profiles for your workstations and you do not configure a separate profile on the Terminal Services Profile tab, the terminal server will load the same profile that is defined on the Profile tab.

To configure a specific roaming or mandatory profile to be used on terminal servers, go to the Terminal Services Profile tab.

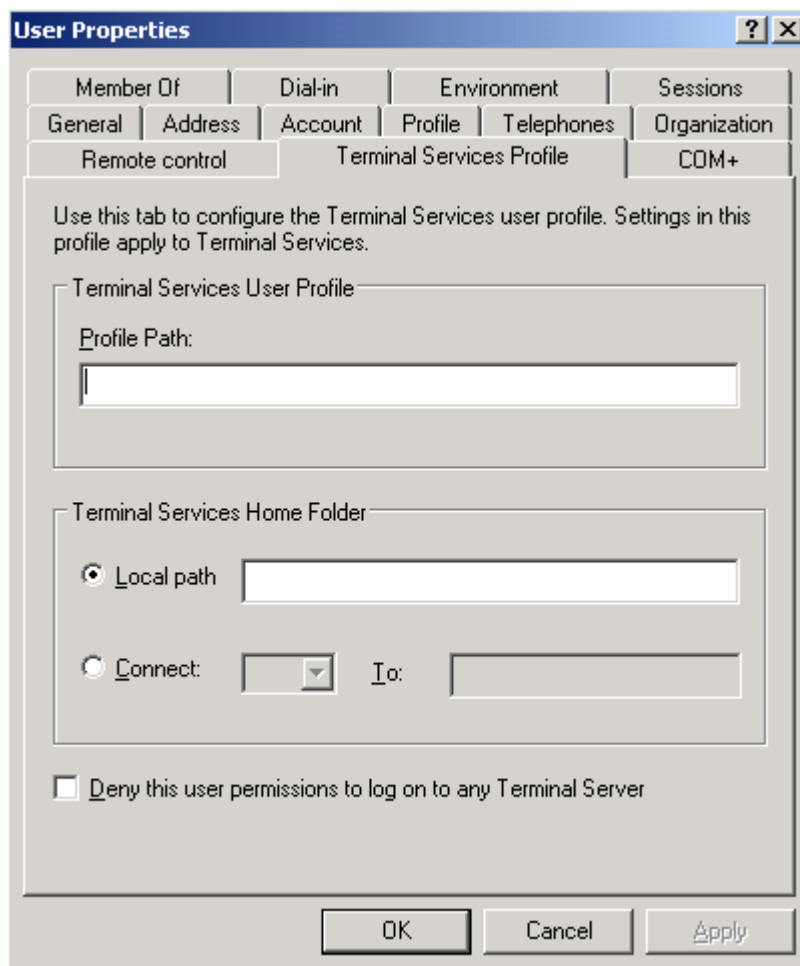



Figure 6.4: Configuring a Terminal Services Profile on a user account.

On this tab, specify the full UNC path to the profile you want this user to load at logon. If you want to use mandatory profiles, set all managed users to the same path, configure the central profile, and change the NTUSER.DAT filename to NTUSER.MAN. You can have multiple mandatory profiles (based on department, for example). Simply set the users' profile to the path for the profile you want them to use. On this tab, you can also configure a separate user home directory to be used on terminal servers, but that is fairly rare, as most likely your users will need the same home directory for both workstations and terminal servers.

 On this tab, you can also flag a specific user account to deny access to any terminal server.

### **On a Per-User Basis via ADSI**

Like the other Terminal Services user attributes, you can configure Terminal Services profile settings via ADSI. After opening a connection to the user object:

```
Set objUser = GetObject("WinNT://<domain name>/<username>,user")
```

or

```
Set objUser = Get Object("LDAP://<distinguished name of user>")
```

Set any of the following attributes:

```
objUser.TerminalServicesProfilePath = ["path to directory"]
objUser.TerminalServicesHomeDirectory = ["path to directory"]
objUser.TerminalServicesHomeDrive = ["drive letter:"]
objUser.AllowLogon = [1,0]
```

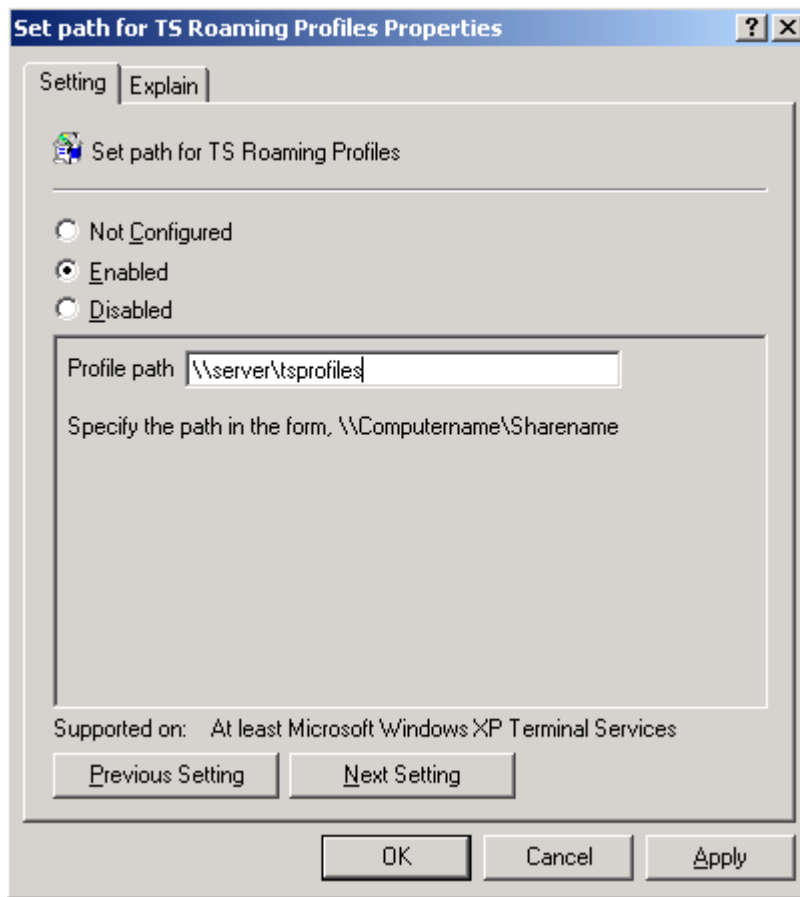
then save your changes:

```
objUser.SetInfo
```

### **Via Group Policy**

A new feature of WS2K3 is the ability to override the user account settings and configure a terminal server to use only local profiles or to use a separate roaming profile share from the one defined in the user account. To take advantage of either of these options, use GPMC to create or edit a Group Policy Object (GPO) that applies to your terminal servers.

To set an alternative roaming profile path, drill to Computer Configuration | Administrative Templates | Windows Components | Terminal Services. Configure the *Set Path for TS Roaming Profiles* setting with the UNC path of the file share you want to use. Do not specify the %username% variable, as it is automatically added to the path for each user. See Figure 6.5 for the UI for this setting.



**Figure 6.5: Configuring an alternative TS Profiles share via GPO.**

To configure the terminal server to ignore the TS Profile path in the user account and exclusively use local profiles, drill to Computer Configuration | Administrative Templates | System | User Profiles. Set *Allow only local user profiles* to enabled, as Figure 6.6 shows.

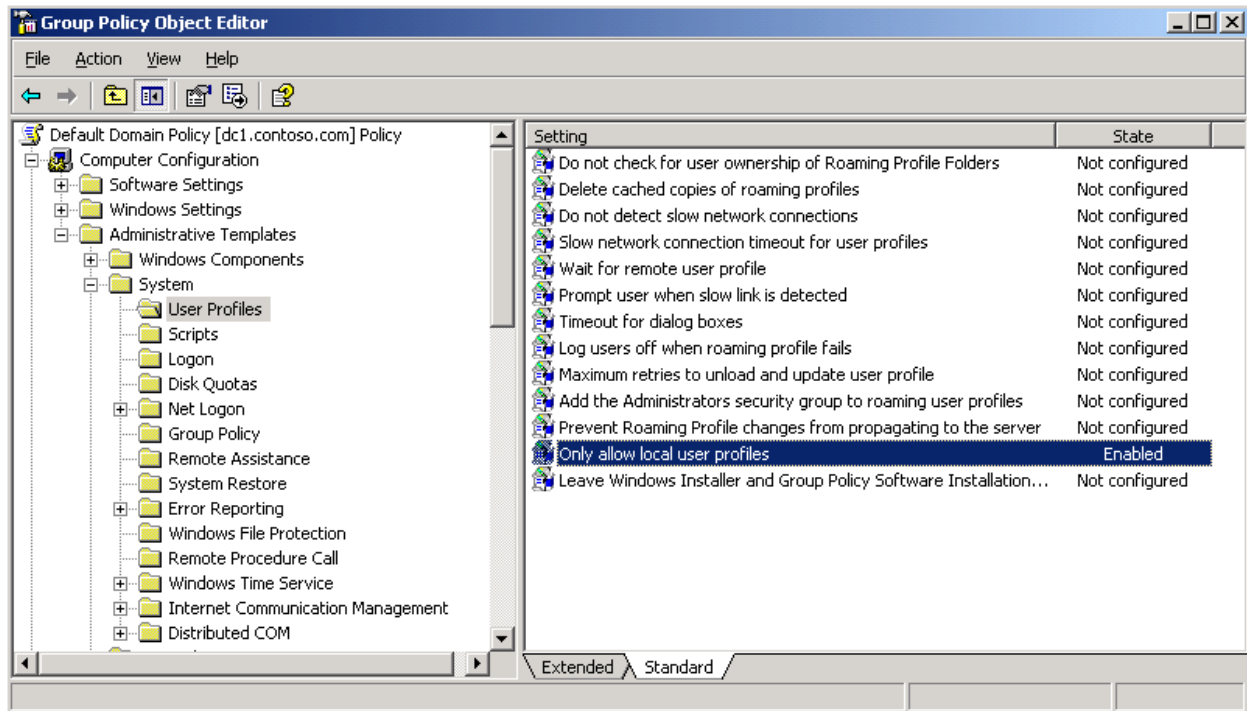


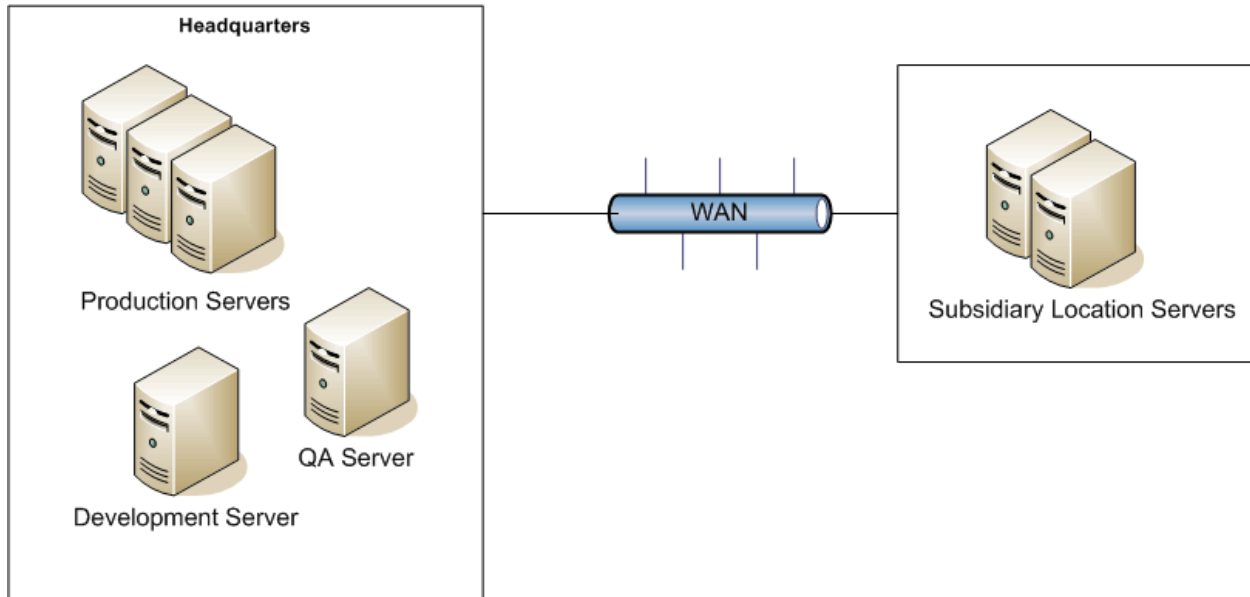
Figure 6.6: Configuring a server to use only local profiles.

### Per Server (Local Machine Policy)

You can configure either of the previous settings on a per-server basis without creating a separate GPO in your domain. To do so, edit the local machine policy by launching the Group Policy Editor (GPEDIT.MSC) from a Run dialog box.

### Environment Example

Let's look at a user profile management example that takes advantage of many of the terminal server profile options. Many enterprise terminal server deployments require not only production servers but also development and QA instances as well as remote servers at a subsidiary or branch location. Figure 6.7 shows how this setup might look.



**Figure 6.7: Example enterprise terminal server deployment.**

At headquarters, you are using terminal server for remote access, so you have installed the full Office suite on your production servers. Your users require a fair amount of autonomy when it comes to their profiles—preferences, Internet favorites, and so on—so you implement roaming profiles. You configure the user accounts to store roaming terminal server profiles on a file server also at headquarters.

When preparing to deploy new applications, or upgrades to existing ones, you start by installing them on a development server. You want this server to be as isolated as possible, and you do not want your testing and packaging to be influenced by settings in your roaming profile, so you elect to enable the *Only allow local profiles* policy setting on that server.

After packaging new applications, you need your end users to put the server through its paces and validate that it behaves as expected. You deploy the package to a QA server and instruct your users to test it there. You want your users to have an experience as similar to production as possible, so you want the QA server to load their roaming profiles. However, you do not want their profiles damaged in the event that there are issues with the application, so you enable the *Prevent Roaming profile changes from propagating to the server* policy setting on your QA servers.

Meanwhile, one of your subsidiaries implements terminal servers to host departmental-specific applications. They want to maintain these servers at their location to keep the servers close to the data sources that are required by the applications. Users complain that their logons are taking a very long time. You recommend to the systems administrators at the subsidiary that they create a profile share at their location and implement the *Set Path for TS Roaming Profiles* policy setting to point to the local share. This way, users can log on to servers at either location without pulling a profile across the WAN.

## Optimizing Roaming Profiles

One of the drawbacks of roaming profiles is the time it takes to copy the profile from the network share to the server at logon and back again at logoff. You can optimize the process in a few ways. First, you should try to place the terminal server on the same network segment (or over a high-speed link) as the profile server. If you are forced to place one or more terminal servers across a WAN from your primary profile server, consider using an alternative profile path for these servers.

Next, look into omitting certain directories from the roaming profile. By default, the Local Settings folder does not roam with the user. It is either left local to the server or deleted at logoff if the *Delete cached copies of roaming profiles* policy setting is enabled. You can omit additional folders to reduce the amount of data copied to the server.

To do so, edit a GPO that applies to your user objects or one that applies to terminal server users via loopback policy processing. Use the *Exclude directories in roaming profiles* setting, which Figure 6.8 shows, and enter the directory names you want to omit. For example, you can add the desktop and Start menu if your users are not allowed to customize these.

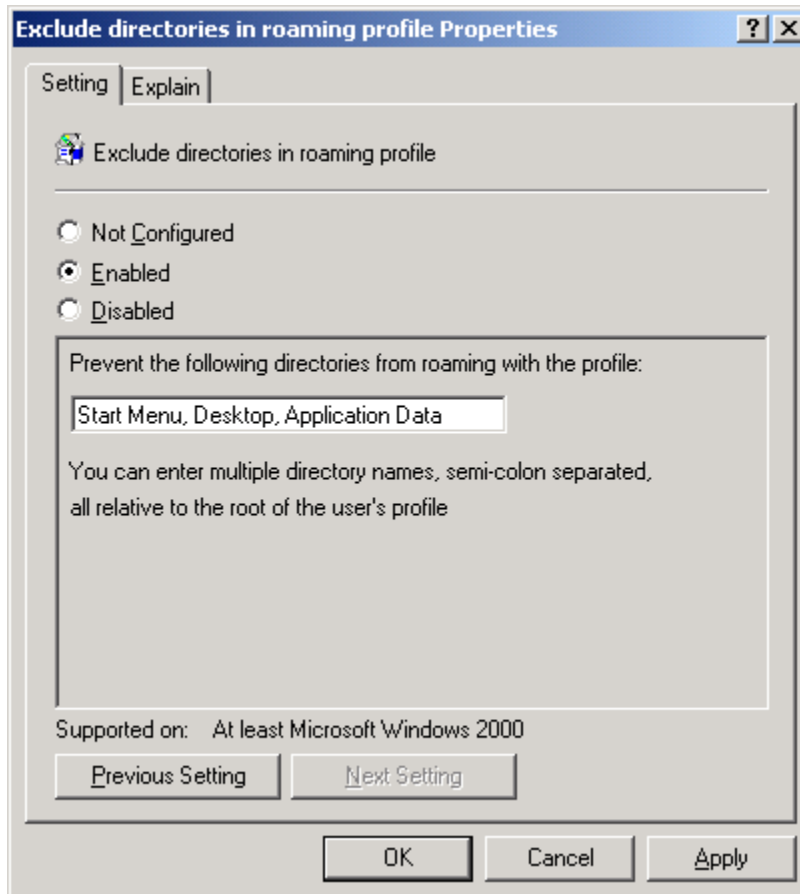
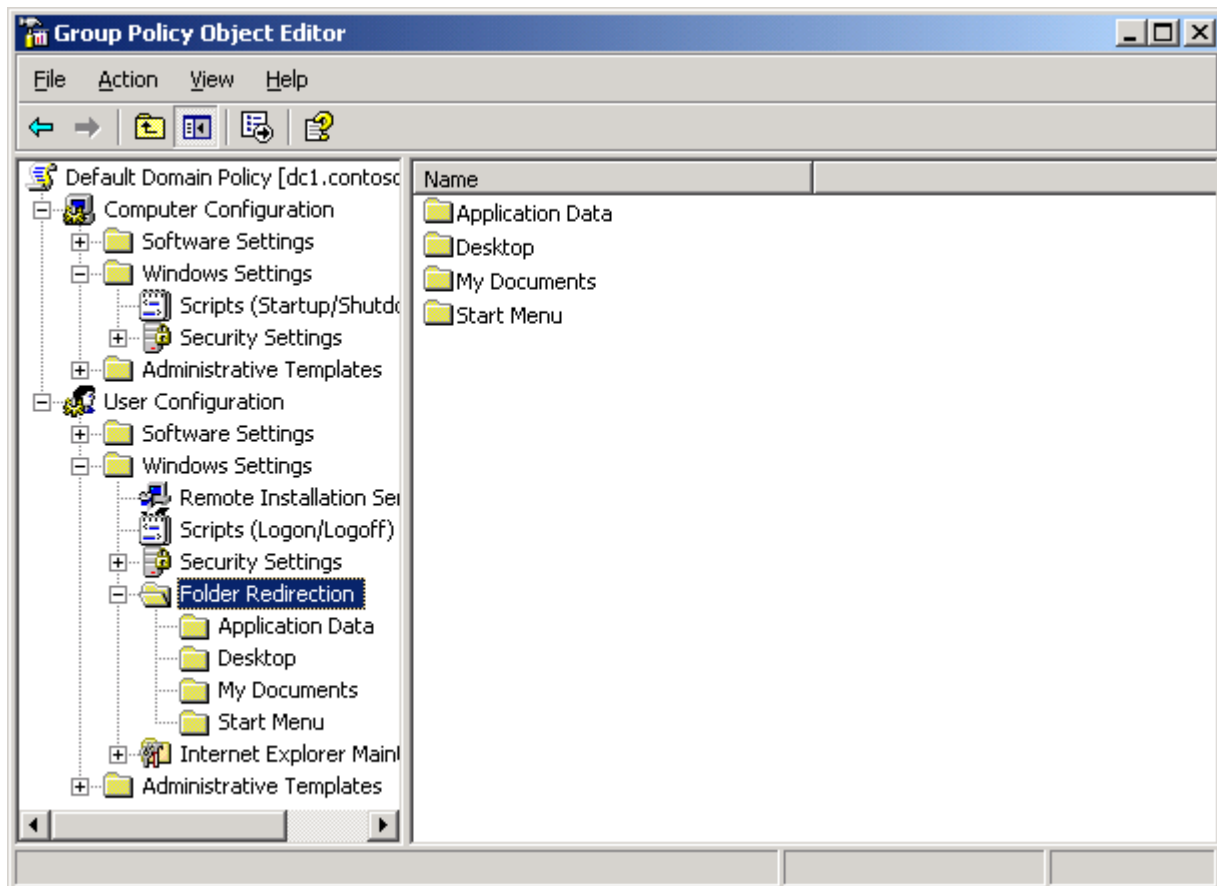


Figure 6.8: Excluding directories from roaming profiles via Group Policy.

## Folder Redirection

You can reduce roaming profile size and improve user functionality through Folder Redirection. Folder Redirection allows you to redirect certain components of a user's profile to network locations. The most common use of this feature is to redirect the My Documents folder to the user's home directory. Doing so prevents the user from storing potentially large documents in the profile.

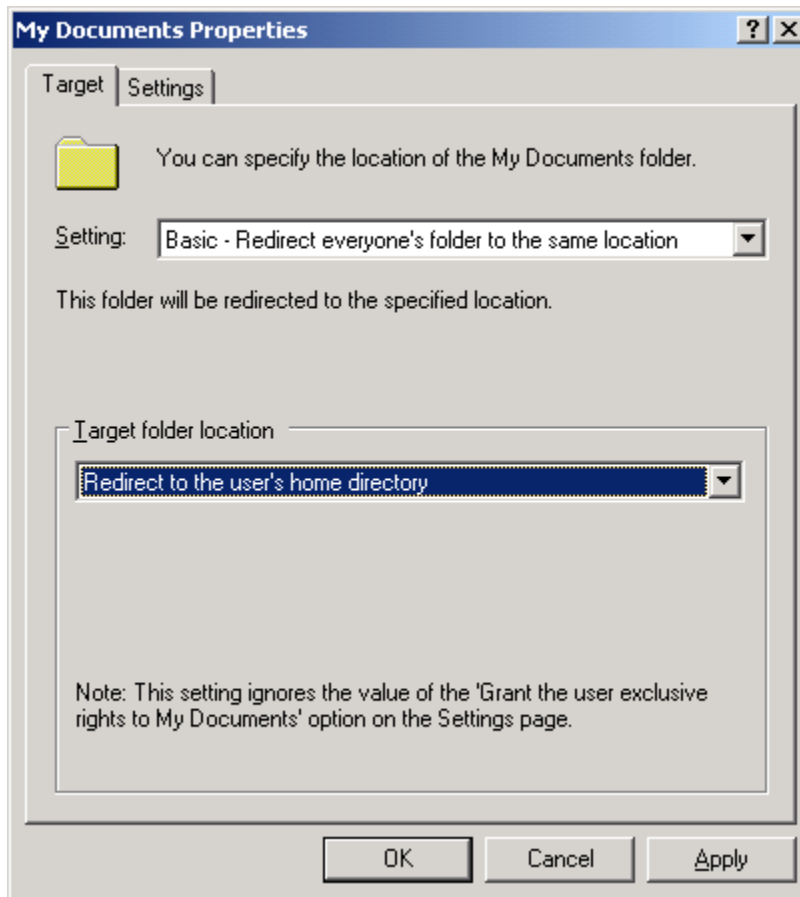
Folder Redirection is available only in an Active Directory (AD) domain. To access the settings, edit a GPO that applies to your users (either through direct link or via loopback policy processing). Drill to User Configuration | Windows Settings | Folder Redirection. Figure 6.9 shows the four folders available for redirection.



**Figure 6.9:** Folders available for redirection.


To redirect one of the folders, right-click the folder, and select Properties. In the resulting window, specify the mode for the redirection setting—Basic or Advanced—and select from the available options. For example, if your users have network home directories defined in their user accounts, you can specify to redirect the My Documents folder to that path, as Figure 6.10 shows.





**Figure 6.10: Redirecting the My Documents folder to the user's home directory.**

On the Advanced tab, you can specify whether to copy existing folder contents to the redirected location and what to do if the policy is removed.

 Be very careful when redirecting the Application Data directory, as application performance can be impacted if the network location is not on a high-speed link to the terminal server.

## Special Considerations for Mandatory Profiles

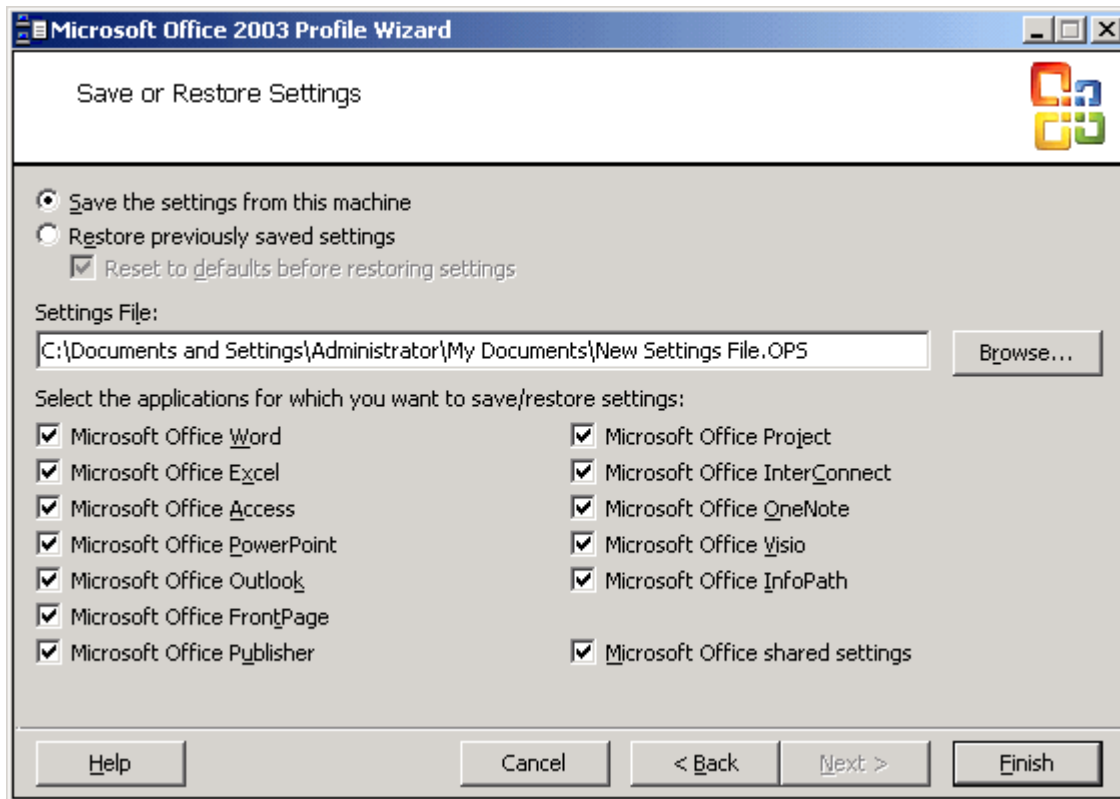
You might encounter certain applications that require per-user configuration or customized defaults. Microsoft Outlook is a common example of this type of application. Each user needs to have Outlook configured to point to the correct Exchange Server system and with the user's mailbox name.

These types of programs pose a unique challenge when using mandatory profiles. You do not want to require users to configure them manually every time they logon, but as changes are not saved to a mandatory profile, that is exactly what will happen if you do not automate the process for them. There are many ways to do so—logon scripts, customized mandatory profiles, or Windows Installer Transforms (MST files).

Microsoft Office has some special features built-in to help with this process. The Office resource kit contains the tools you need to customize and personalize Office for your users, even when using mandatory profiles:

- Custom Installation Wizard—Used to create a Windows Installer Transform (MST file) to not only select which components of Office are installed on your terminal server but also include OPS and PRF in the base installation.
- Custom Maintenance Wizard—Allows you to modify installed components or change defaults after the initial installation.
- Profile Wizard—Used to create OPS files to modify user defaults in Office.

With the Profile Wizard, you configure all Office applications to your liking—changing defaults, such as disabling background spell check, changing multiple-window views, and so on—then save all the settings to an OPS file. This OPS file can then be deployed to your terminal servers so that users will have the settings imported into their mandatory profiles when launching Office applications. Figure 6.11 shows the Profile Wizard interface.



**Figure 6.11: The Office 2003 Profile Wizard.**

If you choose not to include the OPS file in the installation transform, you will need to import the OPS file into the mandatory profile at logon. This method can be helpful if you have groups of users that require unique settings—you can import a different OPS file for each group. To import an OPS file, copy the PROFLWIZ.EXE to your servers, and run the following command line:

```
Proflwiz.exe /r Department.ops /q
```

### **Preferences vs. Policies**

Most of the settings that can be configured in an OPS file can also be managed via Group Policy. Be careful not to confuse the difference between preferences and policies. OPS file preferences set defaults only. Users can change any of the settings you specify in an OPS file to suit their liking. If you do not want your users to be able to change certain settings, you should manage those settings via Group Policy.

For example, suppose that on a terminal server you do not want Microsoft Word to perform background spell checking, as that can become processor intensive if 50 users are working in Word at the same time. If you disable background spell check in the OPS file, there is nothing to prevent users from turning it back on—it is only a preference. If, however, you disable background spell checking in a Group Policy, the setting will become grayed out in the users' interface, and the user will not be able to re-enable it—it is a policy.

## Microsoft Outlook PRF Files

Outlook is unique among the Office applications, as it not only uses its own profile system but also requires unique configuration for each user. The Office resource kit addresses this requirement with PRF files. A PRF file contains all the information needed to create a new Outlook profile for your users. In a PRF file you can:

- Define email services—POP, Microsoft Exchange, and so on
- Set email server information—POP and SMTP addresses, Exchange Server information, and so on
- Define message stores—PST files or Exchange server storage

You can create a PRF file by using the Custom Installation Wizard. During the process of creating an MST file with the wizard, you are offered the option of creating a new PRF file and either saving it alone for manual edits and deployment or including it in the MST file for deployment with the installation of Office itself.

Once you have created the PRF file, there are several options available to import the PRF file into the mandatory profile:

- Import the PRF file in the Custom Installation Wizard or Custom Maintenance Wizard to specify profile settings in a transform, then include the transform when you deploy or update Outlook.
- Specify the PRF file as a command-line option for Outlook.exe to import a PRF file without prompting the user, as the following example illustrates:
- Specify the PRF file as a command-line option for Outlook.exe but prompt the user before importing the PRF file. For example:

```
outlook.exe /importprf \\server1\share\outlook.prf
```

```
outlook.exe /promptimportprf \\localfolder\outlook.prf
```


If you put the specified PRF file on a network share, the settings might not be applied if the file is not found or is not available when Outlook runs.

- Launch the PRF file directly on users' computers by having users double-click the file.
- Configure the registry to trigger Outlook to import the PRF file when Outlook starts up. You can use the Add/Remove Registry Entries page in Custom Installation Wizard or the Custom Maintenance Wizard to deploy these registry key options to your users. You can also use the wizards to distribute the PRF file to users by using the Add/Remove Files page.

Delete the

HKEY\_CURRENT\_USER\Software\Microsoft\Office\11.0\Outlook\Setup\First-Run and HKEY\_CURRENT\_USER\Software\Microsoft\Office\11.0\Outlook\Setup\FirstRun registry key values. Next, in the

HKEY\_CURRENT\_USER\Software\Microsoft\Office\11.0\Outlook\Setup subkey, set the value of ImportPRF to a string value that specifies the name and path of the PRF file. For example, set ImportPRF to \\server1\share\outlook.prf.

 You can download the Office resource kit from <http://www.microsoft.com/downloads/details.aspx?FamilyID=4bb7cb10-a6e5-4334-8925-3bcf308cfbaf&DisplayLang=en>.

## Third-Party Products for Profile Management

As you have no doubt realized, user profiles can be the biggest challenge for any Windows systems administrator. Users want the convenience of roaming profiles, but with frequent logons to multiple machines, these profiles can become corrupt. Systems administrators want the central control of mandatory profiles but must face the challenge of editing them when changes are needed. There are third-party products that can help you bridge the gap between the two.

Most of these products use a central database to store administrator-defined settings. You can define both global settings that are the same for all users and settings that users should be allowed to “roam” (such as Outlook settings). You can then implement mandatory profiles, while still enabling users to retain specified customizations between logons and across multiple servers.

One of the components of triCerat’s Simplify Suite is Simplify Profiles, which gives you the ability to leverage the stability of mandatory profiles while still enabling users to save designated settings across sessions and servers. Simplify Profiles also makes changes to settings in the profiles easy by providing a central UI for edits (see Figure 6.12).

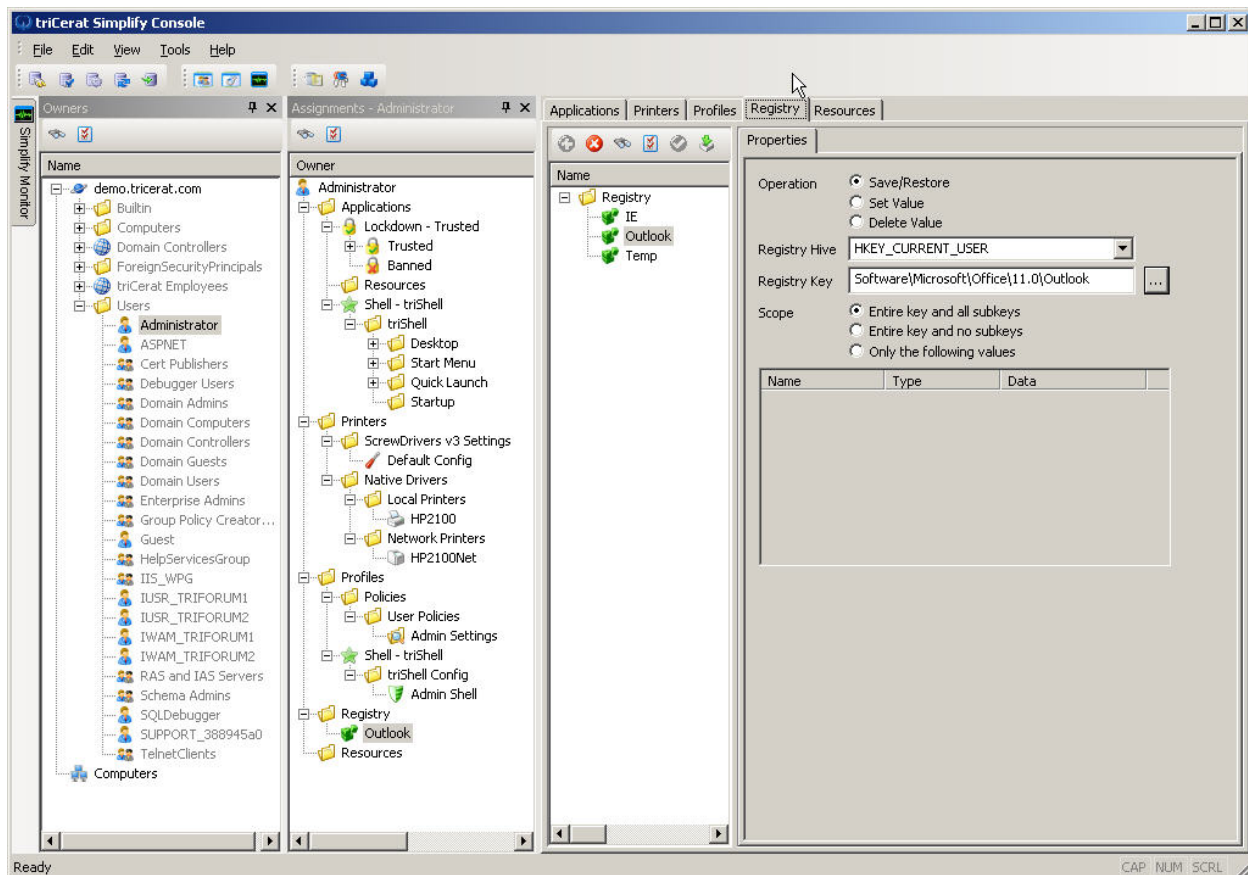


Figure 6.12: triCerat’s Simplify Profiles UI.

Another option is AppSense Environment Manager, which uses XML to centrally store administrative lockdowns and selected user settings. It will automate the configuration of many applications, including Microsoft Outlook profiles, and integrates with AD policies.

## User Profile Hive Cleanup Service

Regardless of whether you use local, roaming, or mandatory profiles, user sessions can get locked in memory at logoff. This lock can occur because of software defects, quick logon/logoffs, or hung applications. When a user session is locked, the server cannot properly unload the profile and cannot reclaim all the resources used by the session. Microsoft's User Profile Hive Cleanup (UPH Clean) service can assist in this process.

UPH Clean monitors the user logoff process, and if any user process handles are keeping the user hive from being unloaded, UPH Clean will proactively kill the process so that the profile can be unloaded. UPH Clean is fully supported by Microsoft and should be installed on all your terminal servers.

### *Installing UPH Clean*

To install UPH Clean, download the MSI package from Microsoft's Web site at <http://www.microsoft.com/downloads/details.aspx?familyid=1b286e6d-8912-4e18-b570-42470e2f3582&displaylang=en>. Either install the package manually or assign it to your terminal servers via Group Policy. UPH Clean is a simple set it and forget it tool, although there are some advanced logging options that you can control via the registry. See the readme.txt file for the current information on these options.

After the installation is complete, you will see a new service running on your server—User Profile Hive Cleanup (see Figure 6.13). Now, if a user's profile is being held open at logoff, UPH Clean will kill the process and create an Application Log entry listing the offending process. You should check this log occasionally and try to correct any applications that cause frequent problems.

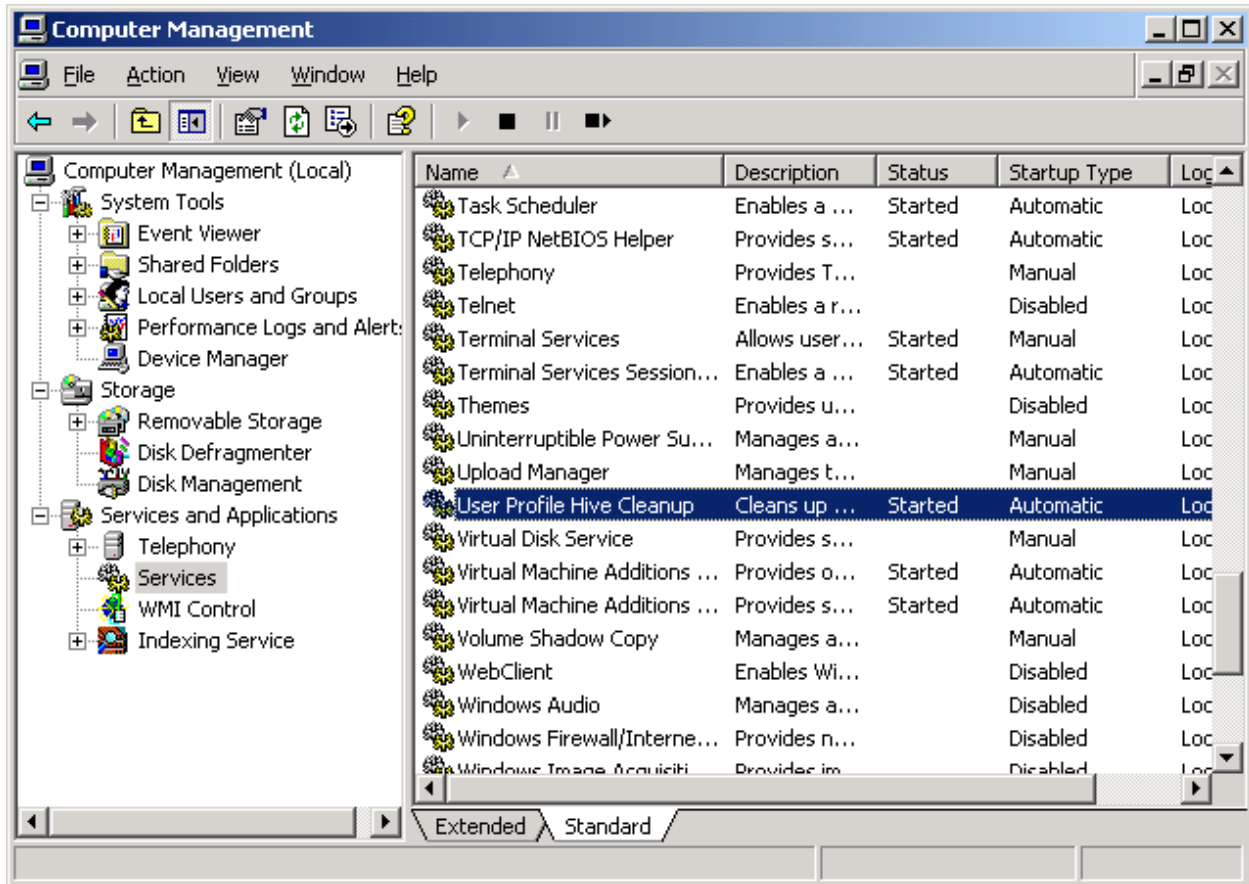


Figure 6.13: The User Profile Hive Cleanup service.

## Summary

User profile management can make or break your terminal server implementation. You need to find the “sweet spot” between usability and stability. Users want fast logons, consistent settings and preferences, and some level of cosmetic autonomy. Administrators want centralized management, stability, and supportability.

Each terminal server environment is unique. You must select from the available options to find the combination that is right for your implementation—that might be fully configured mandatory profiles or it might be complete roaming profiles with folder redirection. Luckily, WS2K3 offers a wide variety of settings to fit most needs—and third-party vendors extend that set where it is needed.

The next chapter will cover security and critical updates and will introduce you to Windows Update, Software Update Services, and the Security Configuration Wizard.

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