

## W2K Desktop Management

by Lenny Bailes for CMP Windows NT Magazine

### **Introduction:**

"Objects in the Intellimirror are closer than they appear." Windows 2000 includes a number of new features designed to ease the burden of desktop management. Your enterprise may have hundreds of workstations now running versions of Windows 9.x or Windows NT4. Microsoft boasts that the "Intellimirror" features built into W2K can reduce the overall cost of supporting all of those users. Windows 2000 Server permits administrators to perform unattended, automated OS upgrades, replicate desktop and security settings, and automatically distribute/install new applications with much greater facility than Windows NT4.

Intellimirror is Microsoft's marketing term for a series of desktop management features that depend upon W2K's Active Directory Services. In a Windows 2000 domain, administrators can replicate (mirror) system settings, applications, and data files associated with any user or group of users to some or all of the workstations on the network. ADS Group Policy Services permit an administrator to configure and replicate a variety of global and local security settings: system and desktop access privileges, access controls on programs and files, and security-sensitive values written to the Windows registry.

Windows 2000 policies can be applied at any level of the ADS organizational tree: to sites, domains, computers, organizational units, or to individual users. (Organizational units replace domain security groups in Windows 2000, integrating user accounts and permissions with accounts for physical workstations and servers.) The Active Directory Intellimirror features reduce the need for administrators to constantly revisit individual servers and workstations scattered throughout the enterprise: W2K Pro workstation installations, system and application updates, and security policies can all be managed centrally from a single primary domain controller. Windows 2000 Terminal Services (licensed from Citrix, Inc. and the equivalent of their Winframe product) allows an administrator to log on to a primary domain controller remotely from any workstation on the network. With the Terminal Services Client an administrator can gain full control of a domain controller or other remote server from any computer running Windows 95/98, Windows NT4 or Windows 2000.

(See Term.pcx)

Microsoft's website is packed with literature that extols the cost-saving benefits of automated deployment and centralized management under Windows 2000:

Windows 2000 will give IT managers centralized control over all the desktop computers in an organization. Managers of particular departments can insure that all users have the particular applications they need. Traveling sales representatives and other mobile users can see their preferred desktop arrangement from any computer on the network. With Windows 2000 Server, administrators can create a centralized administrative model that permits distributed control at lower level domains.

[See fig: ADS.PCX W2K's Active Directory Services

Windows 2000 provides the ability to access more levels of administration and allows for greater granularity of management than Windows NT Server 4.0: from domain-wide policies down to the contents of the IE Favorites folder on each user's desktop,

Arthur Anderson, a well-known accounting firm, has published a study on the Return on Investment benefits an enterprise can gain by deploying Windows 2000. This report, linked to Microsoft's website, states:

"Deployment & Upgrade in a native Windows 2000 environment is a benefit over that in previous Microsoft operating systems. Even when there is no Windows 2000 Server supporting some of the automated deployment tools such as Remote Installation Service (RIS), organizations will see

a benefit from reduced administrator hands-on time, more devices that successfully self-configure, improved Plug and Play, and expanded hardware support.

When Windows 2000 Professional is used in conjunction with Windows 2000 Server, the benefits increase significantly over previous Microsoft operating systems. This is particularly true in the areas of deployment (both mass rollouts and ongoing distribution of PCs), management and administration using IntelliMirror™ management technologies and Active Directory™ directory services, and support for full system and application automatic recoverability. As a platform benefit, these features result in the ability to deploy faster, administrate better, and recover more quickly than with Windows 98, Windows 95, and the Windows NT® Workstation operating system, version 4.0."

## **Installing the Operating System**

Windows 2000 Server offers two methods to automate the deployment of the Windows 2000 Professional operating system to workstations on the network. Using either technology, administrators can replicate the base version of W2K Pro or prepare customized installations that include pre-configured desktop settings and/or third-party applications.

The most widely supported technique is to create an answer file script for unattended setup from a W2K Pro CD or disk image. This is accomplished through the Setup Manager application bundled on the W2K Server CD. Microsoft includes a sample answer file that can be modified to tell Setup how to interact with your individual system requirements.

Application installation can be bundled into a setup script if an application has been prepared in an MSI (Microsoft Software Installer) package. (See the section on Windows Installer Services for more information on MSI.) The Windows 2000 Server CD includes an application repackaging tool, Seagate Winstall LE, that administrators can use to create MSI files manually or edit existing packages. If the enterprise uses Microsoft's Systems Management Server, W2K's Sysprep utility can add unique SID information to an MSI file combining a customized installation script and physical disk image into a single package. Sysprep also supports third-party product such as NetIQ and IBM Tivoli. It can only be used when the master and target computers have identical hardware configurations. Unattended setup doesn't support installation of applications that run as services or ISA-bus driver files.

The second bundled technology for deploying W2K Pro throughout an enterprise is RIS, the W2K Remote Installation Services. RIS is a component feature of Windows 2000 Server that can create disk images of base or customized W2K Pro OS configurations. These images are stored on an RIS Server along with scripts that automatically unpack and install W2K Pro across the network for requesting client workstations. Different images can be created for each configuration specific to a group of computers. During Setup, a list of installation choices are displayed that can be limited according to policies set for a particular user or group.

To use RIS, you must have a Domain Controller running Windows 2000 Active Directory Services. Windows 2000 DHCP and DNS services must also be available, although they can be installed on separate servers. Computers that include PXE (Pre-Boot Execution Environment) ROM v.0.6 or higher can be updated to W2K automatically across single or multiple sites, by switching on the power and entering a keystroke. Client workstations that lack PXE ROM on the network card can use Remote Installation floppy boot disks created by the RIPREP utility.

RIS images are hardware-independent, but remote installations are limited to single C-drive partitions on requesting client machines. The client hard disk must be equal to or larger than the server partition that stores the image. To perform remote installations through a floppy boot disk, the target computer must use a supported network card. Currently, the system has no "generic NE 2000" compatible format. Either your NIC is on the list or it isn't.

RIS is a more powerful feature than unattended installations through Setup manager. Disk images can be stored on any computer running W2K Server or Professional on an NTFS-formatted partition. Administrators can also burn installation images into a CD-ROM for distribution to remote sites with low network bandwidth. The RIPREP utility can take a snapshot of any W2K Pro desktop in an advanced, customized state and convert it into an installation image.

(See RIS1 or RIS2.PCX)

## Windows Installer Service

In addition to automating the installation of the W2K Pro operating system, itself, Windows 2000 provides a convenient system for administrators to standardize application and W2K service installation for users across an enterprise. Windows Installer Service is a function of the global policy editor built into Active Directory Services. Administrators can create on-demand application shortcuts that appear automatically on the Start Menu (assign) or in the Add/Remove Programs Control Panel dialog (Publish) when a user logs onto a workstation. The first time the user clicks the icon, the designated application or service is installed on the computer. The policy that installs the application can be configured to follow the user around from workstation to workstation. Assigned or published applications can also be installed when the user double-clicks a document with an associated file extension. Applications natively authored to use Windows Installer technology can also support a "Just in time" feature that distributes only a portion of an application's optional features. (Additional program modules can be installed later, on-demand, ala Office 2000.) If a critical application file becomes corrupted or is accidentally deleted, self repair software can retrieve needed files and automatically reinstall them over the network. A list of "gold logo applications that support these features is currently available on Microsoft's Website. (See the Links sidebar for more information.).

(See fig: Appinst.pcx)

To take full advantage of the Windows Installer Service, an application or service to be replicated must first be bundled into a package called an msi file. This is, essentially, a pre-configured image of the application that will modify itself to accommodate the configuration of the user's computer. Microsoft is encouraging vendors of new Windows 2000 applications and application upgrades to bundle MSI packages on their product CDs. (Office 2000 has one. An Admin.msi package included in Windows 2000 Server permits the entire contents of the Administrative Tools folder to be replicated across the network.) The Winstall LE application included on the W2K Server CD permits users to create MSI packages for some older applications and edit existing packages.

For the wide number of existing programs that don't have MSI files, administrators can create a simpler distribution package called a .ZAP file. A ZAP file is simply an ASCII information script that runs the native setup program bundled with an application's installation files. The limitation of ZAP files is that they may not automatically accommodate themselves to policy restrictions an administrator has placed on a particular user or computer. The user may need to be granted additional access privileges for the application to update the system registry and other W2K Pro configuration defaults.

## Settings management

The policy feature of W2K Active Directory Services permits an administrator to replicate a standard desktop configuration and security settings across an enterprise from a single, central management console. The Administrative Templates sections in a Group Policy Object (under Computer Configuration and User Configuration) allow an administrator to build a standard desktop, configuring the contents of the Start Menu, cosmetic appearance of the Desktop, available Control Panel applets, Internet Explorer defaults, and so on. The Windows Settings sections are used to define account and password policies, global and local computer and user access rights. Perhaps the only thing missing from the picture is a set of pre-defined templates for various enterprise scenarios that an administrator might load automatically, eliminating the need to build new desktop management policies from the ground up.

See fig (setng.pcx)

In a white paper on global policy management, Microsoft tells us that:

"Costs associated with change and configuration management are reduced through use of Group Policy because Group Policy allows management control over groups of computers and users through single settings."

The support for creating and editing security policies in Windows 2000 RC2 is much improved over the Beta 3 release. The Administrative Tools folder includes pre-configured management consoles to edit global domain, domain computer, and local computer-specific security settings. Whereas in Windows NT 4, the operating system default is relaxed security that administrators must tighten, in Windows 2000 the pre-configured default is relatively tight security that an administrator may loosen.

See fig (secur1 and/or secur2.pcx)

Windows 2000 Server also includes an unadvertised Security Template Editor. You won't find it in the Administrative Tools group. To gain access to this tool, administrators must manually install a snap-in into a new management console..) The Security Template editor includes a set of permission templates for different types of computers that may be present in the enterprise. It can be used to generate different security policies for basic domain controllers, servers, and workstations and/or high security domain controllers, servers and workstations. If only a similar set of templates existed for creating custom desktop settings!

(Optional, See fig secur3.pcx)

### **User data management**

Under Windows 2000, datafiles can follow a user around from workstation to workstation. Microsoft points out that:

Because data can be automatically stored in locations that follow the user, as well as be highly resistant to failure, the cost associated with managing user data is significantly decreased.

Windows 2000 Roaming User Profiles and Desktop support are easy to set up through the Active Directory Services tree. In addition to migrating desktop defaults like Dialup profiles, Start Menu configuration, and Internet Explorer favorites, the My Documents folder associated with a specific user account can be redirected to a server share. From there, the contents of the folder will follow the user to any workstation.

(See Roam.pcx)

Administrators can also configure disk quotas to limit the amount of information a user can store on a given NTFS file system volume. The underlying structure of Windows 2000's IntelliMirror technologies is designed to encourage storing user data on the network rather than on local hard disks. The NTFS disk quota feature can ensure that all users on a network have adequate network storage space.

### **Summary**

The desktop management features included in Windows 2000 are a quantum leap over the administrative tools bundled with Windows NT 4. Microsoft stresses that IntelliMirror features can be used in small, medium, and large organizations.

(From the deployment guide bundled in the Windows 2000 Resource Kit:

"Used alone or in combination with other change and configuration management tools, IntelliMirror can dramatically lower the cost of the desktop life cycle. For example:

- Costs associated with change and configuration management are reduced through use of Group Policy because Group Policy allows management control over groups of computers and users through single settings.
- Smart technologies included in the Windows Installer service allow installation, repair, updating, and removal of applications to occur when needed and wanted. This reduces the support burden and increases availability of the user's computer."

[[OK, Rich -- here's my soapbox conclusion....]]

Enterprise managers also need to know that it will take time and money to train administrators of current Windows NT networks to the point where they are up to speed on the management technologies built into Windows 2000 Server. The new features are multifaceted and powerful, but administrators won't learn them overnight. The final release has yet to be tested under the day-to-day pressures of enterprise-productivity environments. If your business is looking for a centralized desktop management solution, it can set up a Windows 2000 pilot program right now through Microsoft's corporate preview program. This is probably the best way for you to evaluate the costs and benefits the new operating system may generate in the real world.

### **Sidebar 1: Links**

#### **Arthur Anderson Return on Investment study:**

<http://www.microsoft.com/windows/professional/news/OtherSay/roi.asp>

#### **Windows 2000 Homepages:**

<http://www.microsoft.com/windows/professional/>

<http://www.microsoft.com/windows/server/>

<http://www.microsoft.com/Windows/server/Overview/intro/advanced.asp>

#### **What's new in Windows 2000 RC2**

<http://www.microsoft.com/windows/server/beta/askdev/99Sep15.asp>

#### **Win2K gold logo applications with MSI support:**

(can be deployed automatically through W2K Installer Services)

<http://www.microsoft.com/windows/professional/deploy/compatible/>

#### **Windows 2000 Corporate Preview Site:**

<http://www.microsoft.com/windows/preview/default.asp>

#### **Microsoft Management Services walkthroughs for W2K Beta testers:**

<http://www.microsoft.com/windows/server/Deploy/management/default.asp>

On this page, you'll find technical walkthroughs to test W2K's Group Policy, Windows Installer, Remote OS Installation, User Data and Settings Management and other W2K server features.

#### **Microsoft TechNet support site (for self-help answers):**

<http://www.microsoft.com/technet/support/default.htm>

Tables:

[Rich, these are from the Windows 2000 Resource Kit Deployment Guide. I think you can probably print them any of them you like as callouts , if we ask Microsoft for permission:

**Table 1.6 Desktop Management Solutions**

<b>Feature</b>	<b>Description</b>	<b>Benefits</b>
IntelliMirror	IntelliMirror is a group of features that can be used to mirror users' data, applications, and customized operating system settings to a Windows 2000–based server	Users have access to all of their information and applications, whether or not they are connected to the network. Reduces the need for administrators to revisit desktops for application or operating system updates.
Windows Installer	Windows Installer allows an administrator to specify a suite of applications that will always be available to a user or a group of users.	Enables remote deployment and maintenance of applications by system administrators. Reduces the number of dynamic-link library (DLL) conflicts.
Remote Install	DHCP-based remote start technology installs the operating system on a client's local hard disk from a remote source. A network start can be initiated by either the system BIOS, a specific function key, or a remote boot floppy provided for ROM-less client computers.	An administrator does not have to visit a computer to install the operating system. Remote Install also provides a solution for propagating and maintaining a common desktop image throughout your enterprise.
Roaming Profiles	Roaming Profiles copies registry values and document information to a location on the network so that a user's settings are available wherever the user logs on.	Users have the ability to travel and still have their documents and system information readily available.
Option Component Manager	Windows 2000 Server Setup allows you to bundle and install add-on components during or after any system setup through an installation module.	Reduces the amount of time required for deployment setup and reduces the number of trips to individual computers.
Disk Duplication	You can customize a single Windows 2000 Server or Windows 2000 Professional setup and clone it across similar computers.	Cloning can save you time and money when deploying a large number of servers or desktops.

**Table 1.12 Storage Management**

<b>Feature</b>	<b>Description</b>	<b>Benefits</b>
Remote Storage Service (RSS)	Monitors the amount of space available on a local hard disk. When the free space on the primary hard disk drops below the level necessary for reliable operation, RSS automatically removes local data that has been copied to remote storage.	Allows administrators to manage the amount of free disk space by migrating files to a tape library where the files remain active from the user's perspective.
Removable Storage Manager (RSM)	Allows administrators to manage removable storage devices and functions. Administrators can create media pools that are owned and used by a given application.	Allows administrators to optimize network performance by controlling where data is stored. Also makes it possible for multiple applications to share the same storage media resources.