



*Operating System*

## **Deployment Cost Savings with Microsoft® Windows® 2000 Professional Beta 3**

### **Technical Walkthrough**

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#### **Abstract**

*Windows 2000 Professional provides a powerful range of deployment tools and options that can dramatically reduce the cost of deployment.*

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## INTRODUCTION

The total cost of ownership (TCO) for any IT investment is driven by a combination of technology, people, and process. In general, the capital cost of software represents only a small portion of the overall cost. However, "best practices" can help ensure a smooth and timely deployment of new technology that allows you to:

- **Reduce labor requirements.** Using tools to automate previously manual deployment processes can dramatically reduce costs.
- **Implement and continuously refine effective Information Services (IS) processes.** Business and project goals should be strongly aligned.
- **Minimize desktop complexity.** A homogeneous environment is rare; the key is "manageable diversity."

This walkthrough deals primarily with the first best practice—ways to reduce costs by automating tools in the Microsoft® Windows® 2000 Professional operating system. However, many of the possible deployment techniques can form the basis for more efficient IS processes, easing complexity at the desktop for client computers.

To quantify the benefits that are possible with the deployment options in Windows 2000 Professional, first examine the typical processes currently used. Figure 1 below shows the typical steps in preparing for a desktop deployment together with an estimate of the amount of time each step requires. Deploying a desktop configuration takes approximately four hours using "traditional" or manual processes:

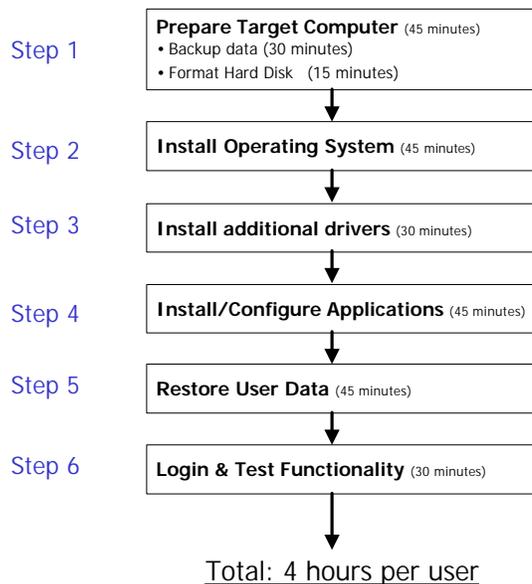


Figure 1: "Traditional" Deployment Process

Four primary methods for deploying Windows 2000 Professional 'out-of-the-box' are discussed in this paper:

- Disk duplication
- In-place upgrade
- Unattended installation
- Remote installation service

For more details about the deployment technologies in Windows 2000 Professional see the following white paper: [Windows 2000 Professional Automated Deployment Options](#).

In addition, several other deployment methods are also available using Microsoft Systems Management Server and thirdparty solutions. These tools can provide significant added value in complex computing environments.

## Disk Duplication

### Definition

The process of copying (also called "cloning") a standard computer configuration—the operating system, device drivers, and applications. This very fast deployment method can take as little as 5-10 minutes per desktop.

### When to use

Use this process for identical or nearly identical hardware configurations.

## In-place Upgrade

### Definition

The process for installing the operating system directly over (or alongside) the existing operating system.

### When to use

Use this method when deploying to machines that differ from each other. This approach supports both upgrading or creating new systems.

## Unattended Installation

### Definition

The process of scripting an installation process that requires little or no user input.

### When to use

This method is suitable for any computers that meet the minimum requirements for Windows 2000 Professional.

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## Remote Installation

### Definition

The process for installing the operating system from a specially configured Remote Installation Service server.

### When to use

Use this approach if you have Windows 2000 Server in place and computers with network adapter cards that include PXE DHCP-based boot ROM version .99c or greater support. This method is applicable to systems with the specific network adapter card.

## REDUCING OVERALL DEPLOYMENT EFFORT

Each of the previously discussed methods of deployment—disk duplication, in-place upgrade, unattended installation, and remote installation—can be effectively used to reduce the overall time and cost of deployment. Table 1 below compares the estimated deployment time for each of the Windows 2000 Professional deployment options.

**Table 1. Comparing Time (minutes) for Windows 2000 Professional Deployment Options**

	<b>Traditional (Manual)</b>	<b>Disk Duplication</b>	<b>In-place Upgrade</b>	<b>Unattended Installation</b>	<b>Remote Installation</b>
<b>1. Preparing target computer</b>					
Backup user data	30	30	30	30	30
Format hard disk	15	0	0	15	0
<b>2. Install operating system</b>	45	10	45	45	60
<b>3. Install device drivers</b>	30		30		
<b>4. Install applications</b>	45		45		
<b>5. Restore data</b>	45	45	45	45	45
<b>6. Login and test functionality</b>	30	15	30	15	15
<b>Minutes per computer</b>	240	100	225	150	150
<b>Time saved versus manual method</b>		58.3%	6.2%	37.5%	37.5%

The following step-by-step analysis of the deployment process shows how the process is improved, and in many cases steps are eliminated, with Windows 2000 Professional.

### Step 1: Prepare Target Computer

Preparing the target computer involves two steps: backing up user data and formatting the hard disk. The time required for these activities varies depending on the deployment method used. For all scenarios (except when deploying a computer to a new employee or to a user who previously did not have a computer), however, you will need to back up the user data.

It may also be necessary to reformat the hard disk before installing the operating system and other software. This would typically be done in two situations:

- To change file system type (for example, from FAT to NTFS).

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- To verify (or re-verify) the disk media (that is, perform a surface scan and low level format to ensure the target drive is 'clean').

#### Windows 2000 Professional Benefits

Using the disk duplication, in-place upgrade, or remote installation method saves time because these approaches do not require you to reformat the disk. Eliminating the need for this one step alone represents a 6 percent time saving over the traditional manual method.

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## Step 2: Install Operating System

## Step 3: Install Device Drivers

## Step 4: Install Applications

Using the manual method, these three steps represent 50 percent of the overall deployment effort. The actual level of effort will vary depending on factors such as the diversity of device drivers to be integrated and the number of applications to be installed. However, the time involved in these steps represents the bulk of the deployment process.

### Windows 2000 Professional Benefits

As shown in Table 1, it is possible to dramatically reduce the time required for this segment of the process. Using the disk duplication, unattended installation, or remote installation methods, administrators can build and rapidly deploy a fully tested and configured computer image consisting of the operating system, device drivers, applications, and other components (such as Internet Favorites, Custom Dictionaries, Clip Art). The capability to deploy fully configured computer system images can reduce deployment time anywhere from 13-54 percent.

## Step 5: Restore User Data

All deployment methods require approximately 45 minutes to restore user data. However, this assumes that the user is not a new employee, a new computer user, or a user who stores data locally. In situations where user data is centrally stored and managed, much less time will be required for this step.

### Windows 2000 Professional Benefits

Although using Windows 2000 Professional does not offer immediate time savings during this phase of deployment, its ability to synchronize data between local and server storage and to rapidly recover from system failures allows managed central storage of user data and reduces the need for extended backup and restoration of locally stored information.

## Step 6: Login and Test Functionality

Any new technology deployment should be tested to ensure that the system functions as expected. This verification can take many forms; at the lowest level, it involves logging in to the machine and accessing key applications and resources.

### Windows 2000 Professional Benefits

By being able to deploy and centrally manage standardized software configurations using Windows 2000 Professional, you can do a large proportion of testing before deployment. This helps to accelerate the user acceptance phase, and directly reduce deployment labor costs.

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## FOR MORE INFORMATION

For the latest information on Windows2000 Professional, check out our World Wide Web site at <http://www.microsoft.com/windows/professional> and the Windows NT® Server Forum on the Microsoft Network (GO WORD: MSNTS).

### Before You Call for Support

Please keep in mind that Microsoft does not provide support for these walkthroughs. The purpose of the walkthroughs is to help you evaluate the Windows2000 features. For this reason, Microsoft cannot respond to questions you might have regarding specific steps and instructions.

### Reporting Problems

Problems with Microsoft Windows 2000 Beta 3 should be reported via the appropriate bug reporting channel and alias. Please make sure to adequately describe the problem so that the testers and developers can reproduce it and fix it. Refer to the Release Notes included on the Windows2000 Beta 3 distribution media for some of the known issues.