Remote Deployment Manager 3.2

User's Guide

Updated January 28, 2003

Note: Before using this information and the product it supports, be sure to read the information in Appendix C. Notices and Trademarks.

First Edition (January 2003)

Table of Contents

About The User's Guide

Introduction

This guide explains the capabilities of IBM® Remote Deployment Manager 3.2. At this time, RDM is licensed and available at no charge for use on IBM systems. You must purchase the System Installation Tool Kit to obtain a license to use RDM on non-IBM systems.

Although one of the features of RDM is to distribute software to systems across a LAN, the terms and conditions of the IBM International Program License Agreement for RDM do not grant any license to install, copy, or use any application software or operating system software not provided with RDM. This includes, but is not limited to, Microsoft® Windows® 3.1, Windows 95, Windows 95 OSR2, Windows 98, Windows NT® 4.0, Windows 2000 Professional, Windows 2000 Server and Advanced Server, Windows XP Professional, and DOS. Always ensure that you have obtained suitable licenses for any software you intend to use with RDM.

This guide is organized as follows:

- ▶ Chapter 1, "Overview and Concepts", contains an introductory overview of the purpose and features of RDM. The various concepts relevant to RDM are also discussed. It is important to understand the information discussed in this chapter to take full advantage of RDM.

- ▶ Chapter 2, "Installation", contains instructions on how to install and uninstall RDM. Also included are instructions on how to run RDM from another computer and how to modify or repair components of the installation.

- ▶ Chapter 3, "An Overview of the Interface", provides a graphical view of the main windows of the RDM console.

- ▶ Chapter 4, "Working with RDM", describes the main functions and operations of RDM.

- ▶ Chapter 5, "Examples", provides step-by-step instructions to familiarize users with RDM's wizard features. These exercises are recommended for all RDM users.

- ▶ Chapter 6, "Advanced Administrative Topics", discusses advanced administrative tasks such as the management of RDM control files and the RDM database.

- ▶ Chapter 7, "Utilities", contains instructions on how to use the utilities supplied with RDM.

- ▶ Chapter 8, "Troubleshooting", provides solutions to some basic RDM questions and points out where to find on-line support.

- ▶ Appendix A, "Error Messages", lists all the error messages generated by RDM.

- ▶ Appendix B, "Examples of User-Created Batch Files", contains examples and instructions for manually creating batch files within RDM. These examples are only recommended for experienced RDM users.

- ▶ Appendix C, "Notices and Trademarks", contains information on all relevant Notices and Trademarks for RDM.

Who Should Read The Guide

This guide is intended to help network administrators understand the concepts and procedures of RDM. To effectively use this guide, you should already have an extensive knowledge of your Network environment as well as Windows NT 4.0 Server, Windows 2000 Server, or Windows 2000 Advanced Server.

How to Use the Guide

You can use this guide to help you understand the features, capabilities, interface, and concepts of RDM before installing the program. You can also use this information to assess the technical skills required to implement, use, and maintain the program. Finally, you can use this guide as a reference, in particular when it comes to the not so everyday administrative aspects of RDM.

If you are new to RDM, this guide is most effective when read in the following order:

1. Review Chapter 1, "Overview and Concepts" to become familiar with the overall concepts and capabilities of RDM. This chapter will also help you become familiar with new terminology.

2. Download the RDM program from the World Wide Web.

3. Use Chapter 2, "Installation" to ensure your server software meets the minimum requirements, including having Microsoft DHCP Services installed.

4. Then, install the program and start it.

5. While the program is running, read through Chapter 3, "An Overview of the Interface" and use the program to open each notebook and select each page as you read about it in this guide. This will help to familiarize you with the interface.

6. Now read Chapter 4, "Working with RDM" to understand the basic functionality of RDM.

7. Before you start using the functionality described in Chapter 4, it is highly recommended that you first review the detailed examples in Chapter 5, "Examples".

How to Find Your Way Around

This guide is organized in numbered chapters and sections as well as unnumbered subsections. The Table of Contents above lists the different major sections and corresponding page numbers. In the text you'll frequently find references to other sections. In most cases the page number is given for your convenience. If you are viewing the guide on-line with Acrobat Reader, you will be able to go to the corresponding section by clicking the section name or the page number. In general, the Table of Contents, references to chapters and section headings in the text, references to page numbers, and references to the World Wide Web are hyperlinked. You will notice that the cursor changes when you move it above hyperlinked text.

Further Reference

In addition to this guide, there are various other sources that you can consult on RDM:

► Context-sensitive help provided with RDM. From the main window, select the **Help** menu and click the **Help Index**.

► The compatibility and configuration guides list compatibility of RDM with system hardware, network adapters, and operating systems. For details, go to the RDM home page at http://www.ibm.com/servers/eserver/xseries/systems_management/sys_migration/rdm.html.

► Last minute updates and changes are given in ReadMe files. Please visit the RDM home page.

► Subscribe to the RDM Users Forum to discuss problems and solutions with fellow users. Please see http://www7.pc.ibm.com/~UMS/.

► Get technical support. Support is available for supported systems (IBM and non-IBM) through e-mail or fee-based telephone support. Telephone support is not available in all countries. For more

information about the fee-based telephone support, see http://www.ibm.com/support or http://service.software.ibm.com/supportline.html. For more information about e-mail support, please visit the RDM home page.

▶ To purchase the System Installation Tool Kit to use RDM on non-IBM systems, please visit http://www.pc.ibm.com/ww/solutions/lcc/sit.html.

Chapter 1. Overview and Concepts

RDM provides you with tools to simplify the configuration of your computer and the deployment of your choice of Windows operating system and applications. Once computers are added to the RDM database, you can remotely install, maintain, and update software on these systems. With RDM, a network administrator can:

- ▶ Remotely identify computers and gather important vital product data such as serial number, machine type model, system memory, hard disk drive capacity, and BIOS level.

- ▶ Remotely perform automated installations of Windows 98, Windows NT 4.0 Server and Workstation, Windows 2000 Professional and (Advanced) Server, and Windows XP Professional as well as applications.

- ▶ Power-on computer systems by sending a Magic Packet to Wake on LAN® enabled systems.

- ▶ Update or flash a selected system's BIOS or modify a selected system's CMOS settings.

- ▶ Completely erase a system's hard drives, in preparation for disposing or reassigning the computer.

- ▶ Back up to, or restore the boot partition from, a hidden area on the hard drive.

RDM 3.2 is licensed for use, at no fee, to deploy IBM systems. For a per system fee, RDM 3.2 is licensed to deploy non-IBM systems.

Note: RDM version 3.2 can recognize, link to, and control systems on directly attached LAN segments or across routers using the Preboot Execution Environment (PXE) protocol. RDM version 3.2 will support both PXE 1.0 and PXE 2.0.

1.1 Changes in Version 3.2

Remote Deployment Manager (RDM) version 3.2 is an update to RDM 3.1. This version continues to demonstrate our commitment to provide best-in-class system management software that can be used with IBM @server xSeries, IntelliStation® workstations, NetVista™ desktops, ThinkPad® notebooks, and Point-of-Sale systems.

RDM version 3.2 introduces the following changes and additions:

- ▶ All fixes and support added in RDM 3.1.01 Patch 1 and RDM 3.1.01 Patch 2

- ▶ Support for new IBM systems and new IBM network and other adapters. Please see the RDM Compatibility and Configuration Guide located at the RDM home page for detailed information.

- ▶ Fixes to reported problems.

- ▶ Documentation:

  - New RDM 3.2 User's Guide.

  - New Compatibility Guide.

- ▶ Installation:

  - Can upgrade or migrate from RDM 3.1.

  - Can upgrade or migrate from RDM 3.1.01.

RDM version 3.1.01 introduced the following changes and additions:

▶ RAID Direct Setup File Creation utility. This utility allows the user to create a script file that can be used to configure RAID remotely.

▶ Manage Deployment Source Files utility. This utility enables the user to graphically remove deployment files and profiles that are no longer needed.

▶ Power Restore and Secure Data Disposal now enabled for ServeRAID™ systems.

▶ Support for new IBM systems and new IBM network and other adapters. Please see the RDM Compatibility and Configuration Guide located at the RDM home page for detailed information.

▶ Fixes to reported problems.

▶ Documentation:
  ▪ New RDM 3.1.01 User's Guide.
  ▪ New Compatibility Guide.

▶ Installation:
  ▪ Can upgrade from RDM 3.1.
  ▪ Can migrate from RDM 3.1.01.

RDM version 3.1 introduced the following changes and additions:

▶ Unattended installation of:
  ▪ Windows XP Professional
  ▪ Windows NT 4.0 Terminal Server

▶ Clone installation using PowerQuest Deploy Center technology:

- Built-in profile to capture a donor system's primary (first) partition.

- Built-in ability to deploy prepared images to target systems that are then processed to add system-unique personalization. The donor image is first prepared using Microsoft's System Preparation Tool (SysPrep), and then, using the System Assignment Wizard on the RDM server, individual system personalization can be specified. The following operating systems are supported with this function:

  - Windows 2000 Professional

  - Windows 2000 Server (stand-alone server)

  - Windows 2000 Advanced Server (stand-alone server)

  - Windows XP Professional

- Ability to deploy images to target systems without post-processing. Using this ability, for example, an administrator can deploy any Windows operating system that has been prepared using Microsoft's SysPrep, and the end-user can enter the personalization information on the target system. Windows operating systems that could use this ability include:

  - Windows 2000 Professional

  - Windows 2000 Server (stand-alone server)

  - Windows 2000 Advanced Server (stand-alone server)

  - Windows XP Professional

  - Windows NT Server 4.0 (stand-alone server)

  - Windows NT Workstation 4.0

- Ability to import image files captured using other RDM servers, or with other PowerQuest imaging products.

  Note: The built-in PowerQuest Deploy Center imaging tool only supports low-compression and non-compressed images. To support high-compression images, upgrade to the full version of Deploy Center.

▶ Power Restore using PowerQuest Deploy Center technology:

  - Replaces LCCM 3.0's IBM Rapid Restore.

  - Can capture two compressed snapshots of the primary partition to provide backup and restore while using the same amount of disk space as IBM Rapid Restore.

  - Power Restore can be initiated remotely through the RDM console.

  - Power Restore can also be initiated locally via diskette, CD, or IBM Boot Manager.

▶ Support for upgrade to use full-function PowerQuest Deploy Center.

▶ ServeRAID™ can now be configured without the use of a donor system.

▶ Increased the limit for the number of concurrently processing systems to 150 (requires suitable network bandwidth).

▶ Support for new IBM systems and new IBM network and other adapters. Please see the RDM Compatibility and Configuration Guide located at the RDM home page for detailed information:

  - Handle required password for BIOS/CMOS update on some newer NetVista systems.

  - Update embedded controller firmware on some newer ThinkPad systems.

▶ Improvements in the RDM Console:

- Can select an RDM Server when the RDM Console starts (i.e., manual configuration changes no longer needed).
- Right-click menus allow faster access to system and profile actions.
- Delete key can be used to delete systems and profiles.
- Change terminology for target computers to "Systems" (instead of "Clients").

► IBM Director 3.1 Agent (including Server Extensions) can be configured and installed via unattended installation profiles.

► Integration with System Migration Assistant 3.0.

► Fixes to reported problems.

► Installation:
- Can install RDM Server on workstation operating systems:
  – Windows NT 4.0 Workstation
  – Windows 2000 Professional
  – Windows XP Professional

For an overview of the changes and additions introduced in LCCM 3.0, visit the RDM home page.

1.2 Supported System Configurations

The system configurations for RDM 3.2 are those supported by IBM's compatibility tests for a variety of hardware, software, and firmware combinations. The test results are accessible in the compatibility guide on the RDM home page. This guide will be updated as additional test cases are completed.

IMPORTANT: Before using RDM 3.2, check the compatibility test results and browse the rest of the RDM web site for additional information and tips concerning the installation and use of RDM.

1.3 Supported Operating Systems

Operating systems can be easily installed on systems using RDM via wizard-generated profiles or manual profiles (see "Software Profiles" on page 16). There are few built-in RDM restrictions on what you can do with a manual profile. Wizard-generated profiles support the following operating systems:

► Unattended install profiles:
- Windows XP Professional, 32-bit version.
- Windows 2000 Professional (service pack 1 and 2).
- Windows 2000 Server (service pack 1 and 2).
- Windows 2000 Advanced Server (service pack 1 and 2).
- Windows NT 4.0 Workstation (with any service pack).
- Windows NT 4.0 Server (with any service pack).
- Windows NT 4.0 Terminal Server (with any service pack).

Note: The unattended install of Windows NT 4.0 Terminal Server Edition requires a special procedure. For details, see "Unattended Install of Windows NT 4.0 Terminal Server" on page 216.

- Windows 98 (with any service pack).
- Windows 98 Second Edition.

▶ CloneIt Agent clone install profiles:

- Windows 98 (with any service pack).
- Windows 98 Second Edition.
- Windows 95.
- Windows 95 OSR2.

▶ PowerQuest clone install profiles:

- Windows XP Professional, 32-bit version.
- Windows 2000 Professional (service pack 1 and 2).
- Windows 2000 Server (service pack 1 and 2).
- Windows 2000 Advanced Server (service pack 1 and 2).

PowerQuest clone install images are created using the Deploy Center functionality while CloneIt Agent clone install images are created using the CloneIt Agent Wizard. Use the method that is appropriate for the operating system that you are trying to clone.

RDM does not support remote installation of the following operating systems:

▶ Clone Agent clone install and unattended install of the Traditional Chinese editions of Windows 98 and Window 98 Second Edition.

▶ Unattended install of Windows XP Professional, Japanese edition.

▶ Unattended install of Windows XP Professional, Finnish & Swedish editions.

▶ Unattended install of Windows 2000, Finnish & Swedish editions.

1.4 RDM Components

Remote Deployment Manager is divided into several components. The functions of each of the major components are described in the following sections. For more information on the hardware requirements and installation of these components, see Chapter 2,"Installation".

Console

The RDM console is used to set up and initiate administration tasks on systems, such as scanning a system, creating a profile, and deploying an operating system. The console can be installed on the same machine as the server, or on a separate machine. The interface of the RDM console consists of the following major components:

▶ **Installation/Maintenance window**. This is the main window of the program, where you can view the various systems and profiles, assign systems to profiles, start or stop the scan operation, and start processing changes. Also, you can create new PowerQuest clone image profiles using the **Deploy Center** built-in profile.

▶ **Progress and Errors window**. This window displays the status of events as systems are being processed.

- ► **Defaults notebook**. You use this notebook to define global default parameters, such as how and when processing will take place, timeout duration, the administrator password to assign to each system, and specific questions (prompts) to display at the system during a scan process.

- ► **Individual System Details notebook**. The information in this notebook is typically gathered automatically by the scan process for each system it detects. You can also create, copy, or modify the notebook manually. The notebook contains information about each system, such as the serial number, network address, key hardware installed, image assigned, and BIOS level. It also contains the values unique to each system that you use to personalize an image. You can also use this notebook to perform maintenance operations on systems, such as updating the BIOS code or changing the administrator password. You can use the Scheduler feature to override the Default Scheduler and schedule a processing change at a specific date and time, or to schedule a repeat event.

- ► **Software Profile Details notebook**. The Software Profile Details notebook contains information about the image that is associated with a specific profile. This information can be created automatically using RDM's Profile Wizard, or manually using the Software Profile Details notebook. It contains:

  - ▪ A description of the profile contents.

  - ▪ The minimum hardware required by a system to use the profile.

  - ▪ The name of the preload image batch file used to prepare the local hard disk of the system, and the name of the final image batch file used to install the software.

  - ▪ A listing of default personalization names and values common to all systems using this profile.

The console also gives access to a series of wizards, designed to aid the RDM Administrator in completing the following tasks:

- ► **CloneIt Wizard**. The CloneIt Agent is run on a donor computer and completes all the necessary processing that is required to create a valid CloneIt Agent clone image for that computer (for example creating a compressed image of all the software on the system and transporting this to the RDM Server).

- ► **Profile Wizard**. This wizard has the purpose of creating software profiles and automatically creating all the RDM batch control files associated with this profile. The wizard uses either a PowerQuest clone image or a CloneIt Agent clone image to create a clone install profile or takes the RDM Administrator through a series of steps to create an unattended install profile.

- ► **System Assignment Wizard**. This wizard is typically run when a system is assigned to a profile and has the purpose of ensuring that all of the substitution parameters for that system have values assigned to them before the system is processed (i.e., before clone install or unattended install commences).

The console is described in detail in Chapter 3, "An Overview of the Interface". The wizards as well as the functionality of the Deploy Center built-in profile are described in Chapter 4, "Working with RDM".

Server

The RDM server can be installed on a Windows NT 4.0 Server, Windows 2000 Server, and Windows 2000 Advanced Server. The RDM server can be installed on various types of server, depending on the OS used.

For Windows 2000 Server or Windows 2000 Advanced Server, RDM can be installed on a:

- ► **Domain Controller**. The domain controller maintains the central domain authorization database and validates connections to the domain it controls.

- ► **Stand-Alone Server**. A stand-alone server can be a member of a domain or a workgroup but it cannot be the domain controller. The standalone server is not involved with user account logon

verification and depends on the domain controller to validate connections to the domain to which it belongs.

For Windows NT 4.0 Server, it can be installed on a:

▶ **Primary Domain Controller (PDC)**. The PDC server maintains the master copy of the central domain authorization database and validates connections to the domain it controls.

▶ **Backup Domain Controller (BDC)**. The BDC server maintains a duplicate copy of the central domain authorization database, which is periodically synchronized with the PDC's master copy. In case of the breakdown or absence of the PDC, the BDC can become the PDC. Domains can have multiple BDC's per domain for improved performance and increased network security.

▶ **Stand-Alone Server**. A stand-alone server can be member of a domain or a workgroup but it cannot be a PDC or BDC server. A standalone server is not involved with user account logon verification and depends on the PDC or BDC to validate connections to the domain to which it belongs.

PXE Services

The RDM PXE Service is a service that is needed to enable the PXE 2.0 protocol. It also supports the older PXE 0.99 protocol (which is often referred to as "PXE 1.0").

Preboot Execution Environment (PXE) is an industry standard client/server interface that allows networked computers that are not yet loaded with an operating system to be configured and booted remotely. PXE is based on Dynamic Host Configuration Protocol (DHCP). Using the PXE protocol, systems can request configuration parameter values and bootable images from the server.

The PXE process consists of the client initiating the protocol by broadcasting a DHCPDISCOVER message containing an extension that identifies the request as coming from a client that uses PXE. When the RDM PXE Service receives this message, it sends the client a list of boot servers that contain the network bootstrap programs that are available. The client then contacts a boot server and receives the name of a network bootstrap program and a location of a file server from which this program can be downloaded. The client downloads the program using Trivial File Transfer Protocol (TFTP) and executes it. Within RDM, the network bootstrap program is used to load operating systems and do additional maintenance tasks

Share Point

The share point is a repository for the files that RDM uses to run its tasks. In the simplest case, there is only one share point, and it is on the RDM server. All files are downloaded from that share point to the RDM systems. In the more general case (i.e., a Wide Area Network), there are share points at remote locations as well as on the RDM server. Files are downloaded from a "nearby" share point to the RDM systems. The reason for having remote share points is to minimize the network traffic by making large downloads come from a local-to-the-system server.

There are several distinct parts to an RDM share point:

▶ TFTP server - This program, \IBMTCPIP\TFTPD32.EXE, is used to download files from the share point to RDM systems. The RDM install program installs and configures this program on the share point.

▶ DOS image files - These files are the pre-boot DOS operating systems that RDM loads onto a system in order to do its processing. These files, approximately 2-megabytes in size, are downloaded several times (via a TFTP get command issued from the system) during an RDM process. The RDM install program creates these files on the share point. However, if the user modifies a DOS image or creates a new one (on the RDM server), he must then copy them manually to the appropriate directory on the remote share point.

▶ Windows install image files - These are the large Windows install images that RDM uses to deploy Windows to its systems. These files, often involving hundreds of megabytes of data, are downloaded once (via a NETBIOS command) during an RDM process. The UNC name for this directory is called the Distribution Share Point on the Software page of the **Software Profile Details** notebook (for an unattended install profile). The user manually copies these files from the RDM server to the appropriate directory that the RDM install program created on the remote share point.

System

The RDM system boots to the network using the PXE protocol. There are several types of agents that may run on the system:

Bootstrap agent

The bootstrap agent contacts the RDM server and receives instructions on whether to pass control to:

▶ A second level bootstrap.

▶ A custom bootable diskette image.

▶ An RDM preboot DOS agent.

▶ The local hard drive.

Preboot DOS agent

The Preboot DOS agent is a bootable diskette image containing a DOS operating system with a communications stack. It is downloaded by the bootstrap agent from the network (via TFTP) to a virtual floppy drive. The Preboot DOS agent boots and then performs actions on a system as directed by the RDM server.

IBM Director Agent

The IBM Director Agent may or may not be present on the system after its production operating system is loaded and running. If present, the user can use its interface to shut down a system or to restart a system that is up and running to initiate service boots. If it is not installed, you must find another way to shut down and restart systems. RDM does **not** interface with IBM Director Agent (i.e., RDM does not call IBM Director Agent to shut down or restart systems).

Specifically, the RDM server starts processing of the systems by waking up the systems (so that these boot to the network). If RDM cannot wake a system, the user must power it on (again, so that it boots to the network). There are several reasons why the RDM server might not have been able to wake the computer:

▶ The hardware does not support Wake on LAN.

▶ The computer is already awake (i.e., booted and running an operating system).

▶ Wake on LAN is supported but not properly configured.

In general, there are a number of ways that a system can be powered on:

▶ If the system is powered off:

 ▪ The user can power the system on manually so it boots to the network.

 ▪ The RDM server can use Wake on LAN to power the system on so it boots to the network.

▶ If the system is up and running (i.e., booted and running Windows):

- The user can shut down the system manually, and then power the system on manually so it boots to the network.
- The user can shut down the system manually, and then RDM can use Wake on LAN to power the system on so it boots to the network.
- The RDM server can reboot the system automatically using a Netfinity Services API, if the system is configured so that it then boots to the network. This requires that IBM Netfinity Manager is installed on the RDM server and that Netfinity Services is running on a system.
- The RDM server can power off the system automatically using a Netfinity Services API, and then RDM can use Wake on LAN to power the system on so it boots to the network. This requires that IBM Netfinity Manager is installed on the RDM server and that Netfinity Services is running on a system.
- The user can shut down the system manually via IBM Director Agent, and then power the system on manually so it boots to the network.
- The user can shut down the system manually via IBM Director Agent, and then RDM can use Wake on LAN to power the system on so it boots to the network.

1.5 Basic Operations

This section describes the system-focused operations you are likely to run with RDM after you have installed the software and have made the changes and additions necessary to meet the demands of your organization. Chapter 4, "Working with RDM", describes in detail how to run these basic operations and how to make the necessary changes and additions to RDM.

Scan Systems

RDM has a scan feature that automatically searches the LAN for new systems that are booting to the network using PXE. When it finds a new system, RDM interrogates the system for hardware information, such as the serial number and network address. RDM then assigns a default name to the system and creates an Individual System Details notebook for the new system.

Assign the System

Once RDM has recognized a new system, you can assign the system to a software profile. Each profile has an associated image (set of software) on the server. When you assign a system to a profile and click the **Process** button, the system performs one of the following actions the next time it starts with a PXE network boot:

▶ **OS Clone Profiles**. If a system is assigned to an Operating System Clone profile, the server sets up a temporary operating system environment on the system; and then downloads one or more batch files. The system first runs an optional preload image batch file to prepare its hard disk to accept data, then runs a final image batch file to copy an image (operating system and application programs) from the server to its hard disk. Optionally, the final image batch file can contain instructions to personalize the installed image by adding system-unique information such as a unique network logon, TCP/IP address, and so on. On subsequent restarts, the system downloads only a short bootstrap load instruction from the server, which instructs the system to start from its own hard disk.

▶ **OS Install Profiles**. If a system is assigned to an Operating System Install profile, the process actually performs a complete unattended installation of a Windows operating system on the system. On subsequent restarts, the system downloads only a short bootstrap load instruction from the server, which instructs the system to start from its own hard disk.

- ▶ **Secure Data Disposal Profiles**. If a system is assigned to a Secure Data Disposal profile, RDM erases all data on all the system's hard drives.

Profiles are unique to the RDM program. A profile is used to identify the associated image that resides on the server, or the batch files used to copy an image from the server. You can customize RDM to meet the demands of your organization by creating additional software profiles. These profiles are associated with images that contain the combination of OS and additional software applications that you need.

Perform Ongoing Maintenance

From your RDM console, you can perform the following maintenance functions on your systems:

- ▶ **Update BIOS**. Update or flash a system's BIOS (for example, for BIOS enhancements or bug fixes, or to change the BIOS to match the local language).

- ▶ **Update CMOS Settings**. Modify a selected system's CMOS settings (for example, change boot sequences, enable/disable onboard components, restore passwords, etc.).

- ▶ **Partition Backup/Recovery**. Restore systems through Power Restore in the event of data corruption or virus infection. Power Restore creates a backup of the operating environment (that is, active partition) on a hidden partition on the drive. You can later recover the system from the hidden partition get the system up and running with minimal network traffic.

- ▶ **Secure Data Disposal**. Remove all data on a hard disk drive with RDM's Disposal task, protecting sensitive information when a drive is re-deployed or retired. Please beware that your data will be **non-recoverable** after you run this operation.

- ▶ **Change BIOS Administrator Password**. Assign or change the administrator password on one or more computers to protect the BIOS settings against unauthorized end-user changes.

- ▶ **User-Defined Batch File**. You can create batch files to do user-defined maintenance on systems. Any function that can be initiated from a DOS environment is applicable. Such maintenance can be done as part of an operating-system deployment or later, after the computer has been configured.

1.6 On-Screen Help

When you are running RDM, you can find on-screen help by doing one of the following:

- ▶ Click **F1**.
- ▶ Select **HELP** from the menu bar of the Installation/Maintenance window.

1.7 Concepts

The following conceptual information will help you understand the various elements used by RDM.

Images

An image is the software stored on a server that is downloaded to a system during an operation. Images vary in size and in the type of software they provide to the system. The purpose and content of each image depends on the task to be accomplished, as well as the method used to download the image from the server to the system.

Operating-System Unattended Install Images

The Operating System unattended install image is stored in a directory on the RDM server referred to as the distribution share point (unless you use a remote share point). The Profile Wizard will generate all the necessary files for an unattended install including copying all the required setup files to the distribution share point on the RDM Server. These files include:

▶ Files from the Microsoft Windows CD.

▶ Application files.

▶ Batch files to control the RDM processing.

The Operating System unattended install process performs a complete unattended installation of a Windows operating system using the Windows install program.

Operating-System Clone Install Images

The clone install image (cloned from a donor computer) contains the software, designed to meet the requirements of a specific end user, department, or group of end users that perform similar tasks. The image consists of:

▶ An Exact bit-by-bit copy of a donor computer.

▶ Batch files to control the RDM processing.

The clone install image is stored in a directory on your server referred to as the distribution share point. Multiple images can reside on a server, and the same image can be downloaded to multiple systems.

BIOS Update Images

RDM can read the contents of a flash BIOS update diskette and store it as an image on the server. Once the flash BIOS update is stored as an image on the server, you can use the Maintenance page of the Individual System Details notebook to update a system's BIOS level remotely.

CMOS Update Images

The CMOS update image is a file that contains some of the BIOS settings that are set through the system Configuration/Setup utility program. You use a donor computer and the Configuration/Setup utility program to save the settings you want. Next, you copy the settings to a file and copy the file to the server directory. Once the file is on the server, you can use the Maintenance page of the Individual System Details notebook to copy these settings to the system's CMOS memory.

RAID Configuration

RAID (Redundant Array of Independent Disks) is a way of storing the same data in different places (thus, redundantly) on multiple hard disks. By placing data on multiple disks, I/O operations can overlap in a balanced way, improving performance. Since multiple disks increase the mean time between failure (MTBF), storing data redundantly also increases fault-tolerance.

In the RAID Adapter Setup page of the Profile Wizard, if you select the option, it will prompt you for a RAID setup file. This file must be cloned from a donor machine that has exactly the same RAID subsystem (type of adapter, type and number of disks) as the target system. It may only be applied to a system that has an IBM ServeRaid adapter installed.

DOS Images

RDM's basic paradigm is for the system to boot to the network, download a DOS image and a few batch files to a virtual floppy drive (A:), boot DOS, and then run the batch files. Different kinds of RDM tasks may require different DOS images, and several DOS images are created when you install RDM. If you have RDM tasks that require a different DOS configuration than those provided in RDM, you can modify those images or even create your own new images.

Batch Files

RDM uses batch files for the following tasks:

- ▶ Hard disk preparation (usually to invoke the FDISK operation).
- ▶ Software installation (usually using FORMAT, COPY, XCOPY and RESTORE commands).
- ▶ Software personalization (to search for and replace character strings using variables).
- ▶ Software maintenance (to replace one or more files).

If you want to create your own batch files manually see page 273 for more details. This method is recommended for experienced RDM users only.

The Profile Wizard will automatically create all the necessary batch files to configure your systems for the successful installation of your operating systems and applications. This method is the preferred method for all RDM users.

Software Profiles

In many organizations, there are people doing the same or similar job and using the same software. In terms of support and maintenance, it is usually very important that these systems use an identical set of software. This often is difficult to achieve, and once achieved, difficult to maintain. However, using software profiles in RDM helps solve this problem.

You use a software profile to define a set of software and distribute it as an image via the LAN to one or more systems, thereby creating identical operating environments. As systems are added, the same image can be distributed to them. If the image is updated, all systems currently assigned to that software profile can be automatically updated with the revised image. No user intervention is required at the system for the initial software installation or for updates.

Typically, most organizations will have several software profiles, each for a different type of job. For example, in addition to the operating system:

- ▶ An administrative-assistant profile might include a word processor and calendar application.
- ▶ A marketing profile might include a spreadsheet and business graphics application.

After developing separate images for these functions and putting them on the server, you must create a software profile for each image and give each profile a descriptive name. Using the examples in the preceding list, the names "Administrators" and "Bob's Marketing Team" might be appropriate. When these profiles are created, the names appear in the Installation/Maintenance window. Each software profile is listed under profile type (Operating System Clone Profiles and Operating System Install Profiles). The RDM administrator would then assign each marketing computer to the profile named "Bob's Marketing Team" and each administrative assistant's computer to the profile named "Administrators".

Wizard-Generated Profiles

The Profile Wizard will enable you to generate a working RDM 'Profile'. The purpose of the Profile Wizard is to create a profile that contains the various files that are necessary to enable the RDM server to install a specified operating system and to configure the system-specific hardware and the user-specific parameters onto a system. This involves leading you through a series of screens that ask you in plain language to enter or select the various options that are necessary to create a valid working RDM 'Profile'. For example, you can set up a Windows 2000 unattended install profile in about 10 minutes.

Manual Profiles

You can create profiles by manually entering the information into the Software Profile Details notebook. When you create profiles with this method, you must create all of the appropriate RDM control files yourself. This method is only recommended for experienced RDM users.

Chapter 2. Installation

This chapter gives step-by-step instructions on how to install or upgrade RDM. Each section will describe a separate phase of the install process. The steps are as follows:

1. **Validate Prerequisites**. Ensure that your systems meet the requirements for RDM to operate successfully.

2. **Examine the Network Configuration**. This section gives examples of various network configurations and the install issues involved. Compare the network configuration in your organization with the examples to get an understanding of the issues pertaining to your environment.

3. **Upgrading RDM**. Read this section if you are running an upgrade.

4. **Install RDM 3.**. Run a complete install of the RDM software.

5. **Configure the DHCP Server**. Make sure that your DHCP server is properly configured.

6. **Configure Routers**. Properly configure your routers.

7. **Configure Switches and Hubs**. Make sure that your switches and hubs are properly configured.

8. **Additional Installation Information**. Review the information in this section to determine whether it applies to your setup.

9. **What To Do Next?** This section provides suggestions on additional installs and customizations, as well as some simple tests to validate your install.

The remainder of chapter 2 contains information on various additional install topics including repairing the install, uninstalling, removing components, and running a silent install.

Note: The installation package for RDM 3.2 can be used to perform either a new installation of RDM or an upgrade from version 3.1 or 3.1.01. If you need to upgrade an RDM or LCCM version earlier than version 3.1 to RDM 3.2, you must first upgrade to version 3.1. See "Upgrading RDM software" for additional details.

Note: Review the installation notes for changes or tips on the RDM home page.

2.1 Validate Prerequisites

RDM Server

▶ The minimum disk space requirement is 2 GB.

▶ The minimum memory requirement is 128 MB of RAM.

▶ One of the following server platforms (also see below):

  ▪ Windows NT 4.0 Server, Service Pack 6 or higher.

  ▪ Windows 2000 Server, Service Pack 2 or higher.

  ▪ Windows 2000 Advanced Server, Service Pack 2 or higher.

▶ Microsoft or other compatible standards-based DHCP Service. It must be installed on the RDM server or on another server in your network. See section 2.2, "Examine the Network Configuration".

▶ Your Windows server must be installed as follows:

- The server computer name cannot contain embedded spaces and cannot be longer than 16 characters.

- File and print sharing must be enabled.

- The TCP/IP protocol must be installed.

▶ In most cases, it is best if the file system is configured as NTFS. This allows you to set permissions and ensure the security of your server directories.

▶ If you plan to use IBM Netfinity Manager, you must install this on the Server. For more details, see the system prerequisites listed on page 19.

As an alternative to a server platform, the RDM server can also be installed on the following operating systems:

▶ Windows NT 4.0 WorkStation, Service Pack 6A or higher.

▶ Windows 2000 Professional, Service Pack 2 or higher.

▶ Windows XP Professional.

The RDM server functionality has only undergone minimal testing on these platforms and may not function as intended. The use of these platforms for the RDM server is only recommended for non-routed networks with a small number of systems. Also, you still need to configure a DHCP service that supports your environment; these operating systems provide no such DHCP service.

Note: For Windows XP Professional, you will also need to enable all shared folders that are part of the RDM installation. These include `\IBMTCPIP`, `\RDM`, and various folders included in both folders, including `\RDM\clntfile` and some of its subfolders, and `\IBMTCPIP\lctftp\new_lsa1`. To do so, right-click the folder and go to **Properties**. Enable file sharing under the **Sharing** tab. For the folders `\RDM\tmpfiles` and `\RDM\clntfile\PQImages`, you most also check the box "Allow network users to change my files".

RDM Console

The RDM console can be installed on NT 4.0 Workstation and Server, Windows 2000 Professional, Windows 2000 Server, Windows 2000 Advanced Server, and Windows 2000 XP Professional.

Remote Share Point

▶ The minimum disk space requirement is 2 GB.

▶ The minimum memory requirement is 128 MB of RAM.

▶ One of the following (also see below):

- Windows NT 4.0 Server, Service Pack 6 or higher.

- Windows 2000 Server, Service Pack 2 or higher.

- Windows 2000 Advanced Server, Service Pack 2 or higher.

▶ Your Windows server must be installed as follows:

- The server computer name cannot contain embedded spaces.

- File and print sharing must be enabled.

- The NetBEUI and TCP/IP protocols must be installed.

▶ In most cases, it is best if the file system is configured as NTFS. This allows you to set permissions and ensure the security of your server directories.

As an alternative to a server platform, the remote share point can also be installed on the following operating systems:

▶ Windows NT 4.0 WorkStation, Service Pack 6A or higher.

▶ Windows 2000 Professional, Service Pack 2 or higher.

▶ Windows XP Professional.

The remote share point functionality has only undergone minimal testing on these platforms and may not function as intended. The use of these platforms for the remote share point is only recommended for non-routed networks with a small number of systems.

Note: For Windows XP Professional, you will also need to enable all shared folders that are part of the remote share point. These are `\IBMTCPIP`, `\IBMTCPIP\lctftp\new_lsa1`, `\RDM`, and `\RDM\clntfile`. To do so, right-click the folder and go to **Properties**. Enable file sharing under the **Sharing** tab.

System

▶ When you assign a system to a software profile, make sure that the system's hard drive has sufficient space for the operating system and applications included in the profile.

▶ PXE 0.99, PXE 2.0, or PXE 2.1 is supported.

System requirements for Wake on LAN:

▶ The computer must be plugged into a power socket.

▶ The network adapter must be enabled to support Wake on LAN.

▶ The computer must have the BIOS Wake on LAN feature available and enabled.

▶ The network adapter must be properly connected to the computer system board or power supply.

▶ The computer must be properly connected to the network.

Optionally RDM can use IBM Netfinity Manager software to shut down and restart systems before processing changes. The use of IBM Netfinity Manager is limited to systems running Windows 95, Windows 95 OSR2, or Windows 98. The following requirements must be met before a forced shutdown will function correctly:

▶ IBM Netfinity Manager must be installed on the same computer or server that RDM is installed on.

▶ Netfinity Services (version 4.00.2 or greater) must be installed on each system you want to shutdown or restart.

▶ IBM Netfinity Manager must know about the systems. To ensure IBM Netfinity Manager knows about all affected systems, you must perform the following procedure:

a) Start IBM Netfinity Manager from your administrator console.

b) From the main window of IBM Netfinity Manager, select **Remote System Manager**.

c) Open a new group and give it a name (for example, "All_Systems").

d) From the IBM Netfinity Manager System pull-down menu, select **Discover Systems**. The systems appear in the group window as they are discovered.

IMPORTANT: If you hard drive has insufficient space, once you assign the system and then process it, RDM may allow processing to begin, then fail later, rather than detecting the unsuitability of the system for that profile before attempting to process it.

Network Adapters

RDM will automatically scan, configure, and recognize supported network cards only. For a list of supported network adapters and more information, review the RDM Compatibility and Configuration Guide on the RDM home page. To make RDM recognize unsupported network adapters, see "Installing Network Drivers" on page 195.

2.2 Examine the Network Configuration

This section shows examples of the various hardware configurations for using RDM in PXE environments.

Single LAN Environment Example

The following illustration shows the typical RDM single LAN environment. Routers are not supported in this environment.
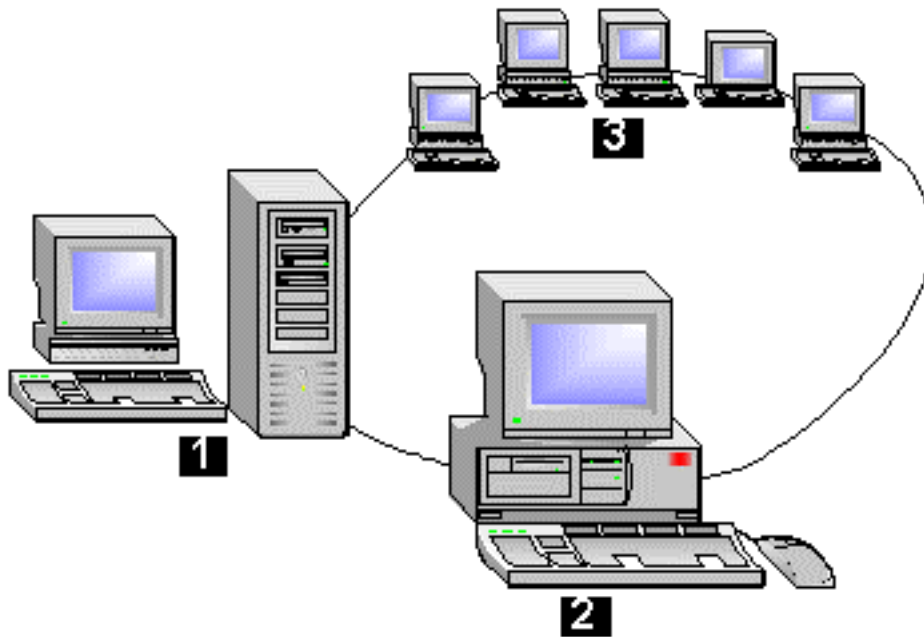
1. RDM server and console – RDM is installed here. A keyboard and monitor attached to the server can be used to run RDM from the server.
2. RDM Console – A computer on the LAN on which the RDM console is installed.

    Note: Only one console can be in use at any given time.

3. Systems – These are PXE enabled systems connected to the LAN.

Routed Network Environment Example 1

The DHCP server, RDM server, and RDM console are on the same system. The systems boot and connect either locally (through the local network segment) or through one or more IP routers. The Internet Protocol (IP) router must support the BOOTP Relay Agent function.
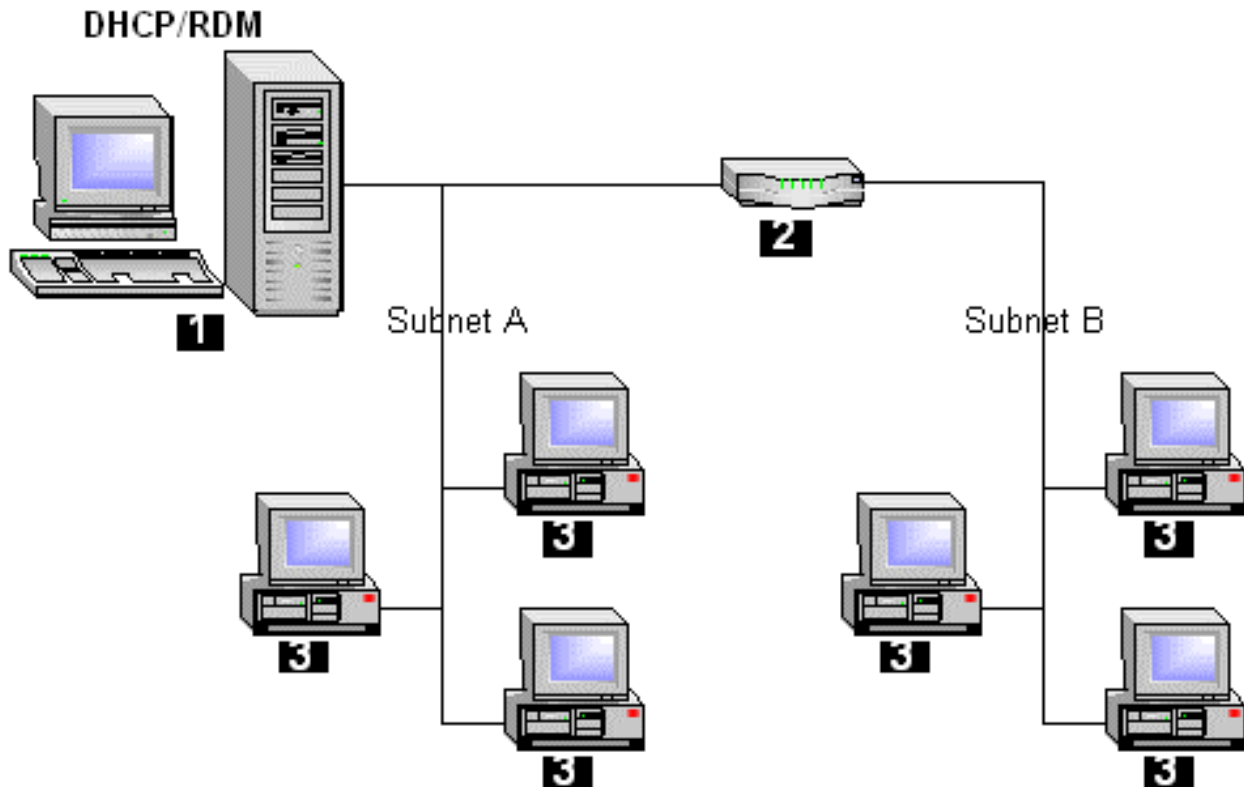
1. DHCP server, RDM server, and RDM console on same system.
2. IP router (one or more).
3. PXE systems.

Routed Network Environment Example 2

The DHCP server is installed on one system. The RDM server and RDM console are installed on another system. The systems boot and connect either locally (through the local network segment) or through one or more IP routers. The Internet Protocol (IP) router must support the BOOTP Relay Agent function.
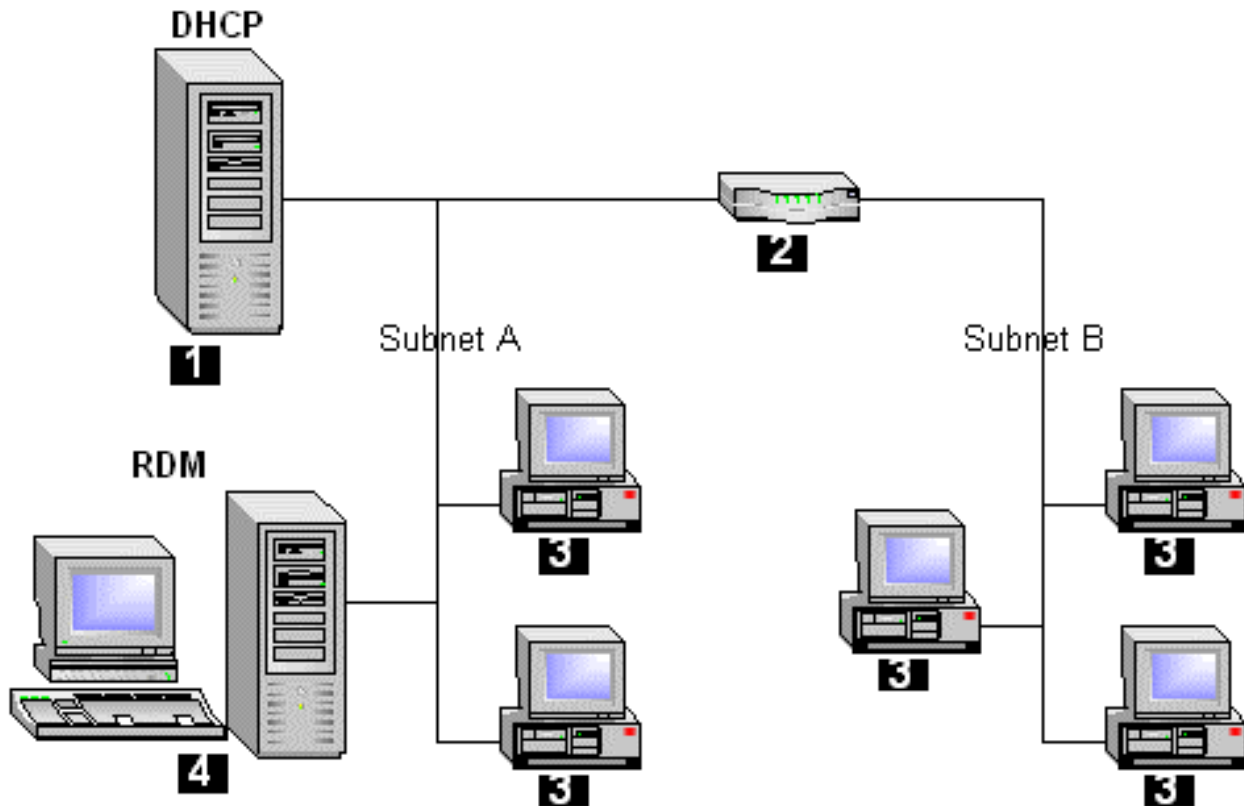
1. DHCP server.
2. IP router (one or more).
3. Systems.
4. RDM server and RDM console.

Routed Network Environment Example 3

The DHCP server and RDM server are on different computers separated by zero or more IP routers. The systems receive configuration data either locally or through one or more IP routers and boot. The systems connect either locally or through one or more IP routers. The Internet Protocol (IP) router must support the BOOTP Relay Agent function.
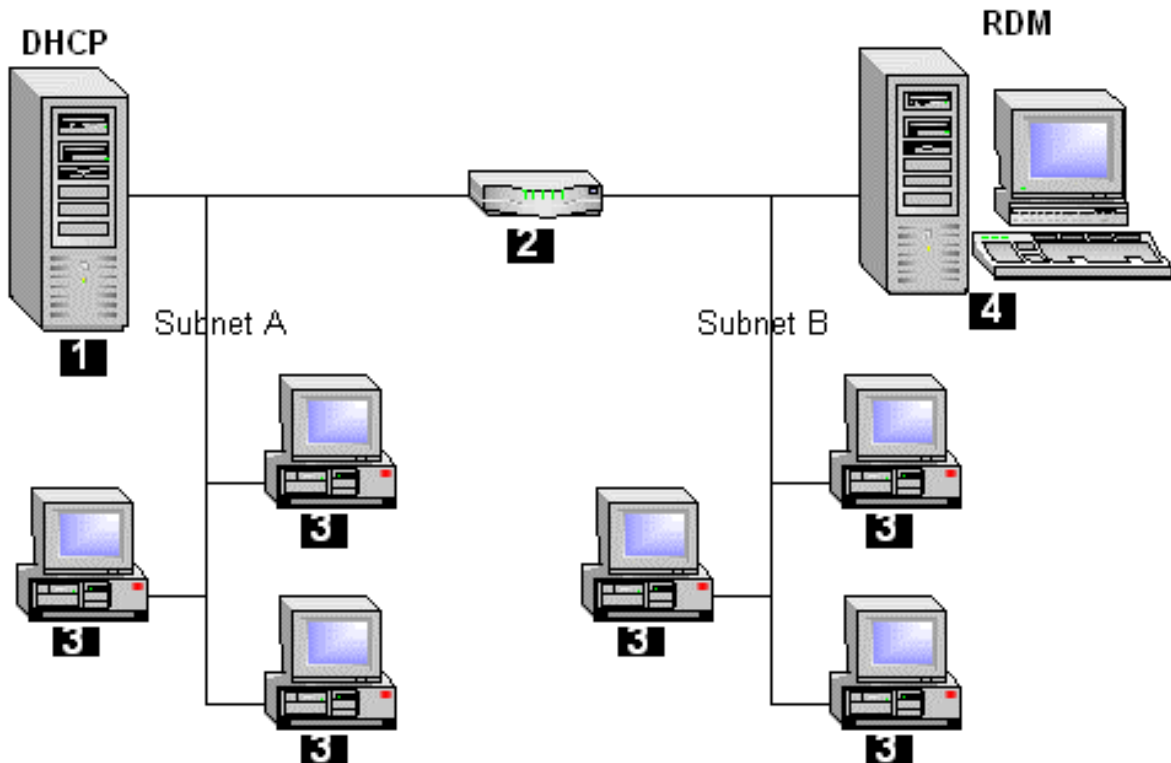
1. DHCP server.
2. IP router (zero or more).
3. Systems.
4. RDM server and RDM console.

Proxy Address Resolution Protocol (ARP) allows 2 computers on different subnets to communicate even though they do not know about the existence of a router between them.

In the above environment, the DHCP server is on one subnet, the RDM server is on the other subnet, and systems are distributed on both subnets. The router must have the Proxy ARP protocol enabled. The router must also have a BOOTP forward defined for the RDM PXE Service to reach systems on subnet A, and a BOOTP defined for the DHCP server to reach systems on subnet B.

In general, it is recommended that Proxy ARP protocol be enabled on all routers regardless of the configuration, though it is only required for RDM in the configuration described above.

Routed Network Environment Example 4

The DHCP server is separated from the RDM server by one or more IP routers. The systems receive configuration data (either locally or through one or more IP routers), boot, and connect (either locally or through one or more IP routers). The RDM console connects to the RDM server through one or more IP routers. The Internet Protocol (IP) router must support the BOOTP Relay Agent function.
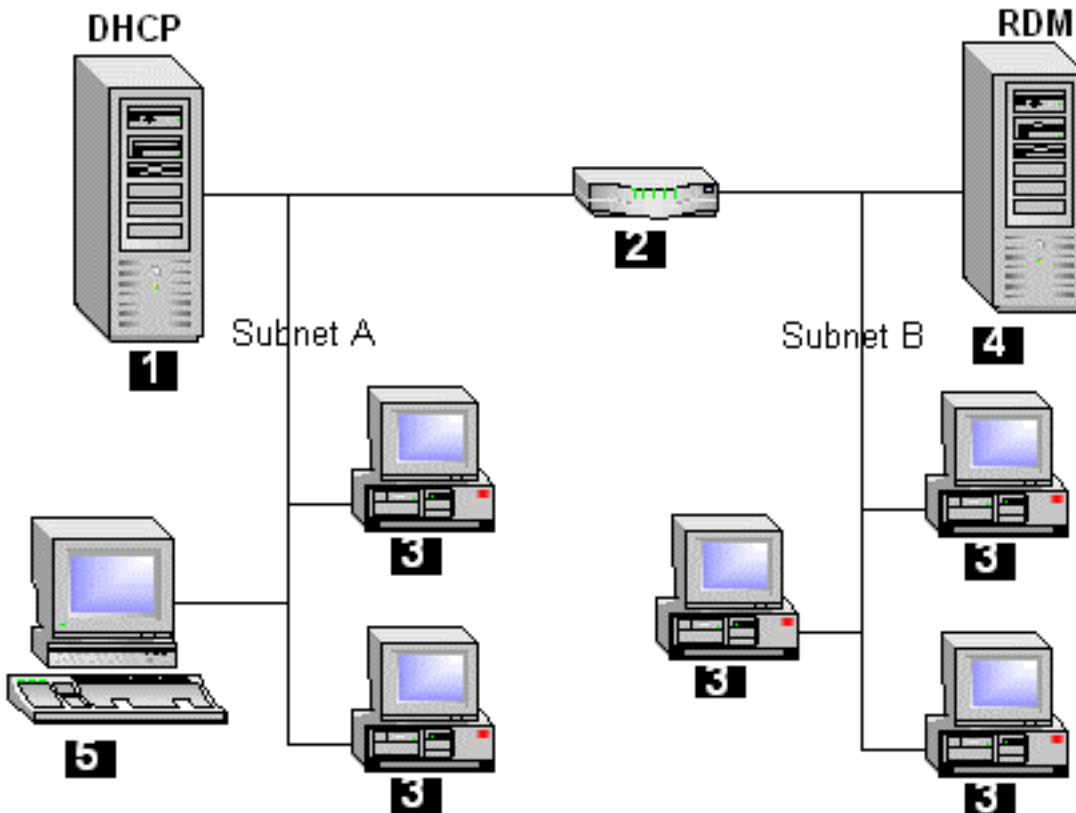
1. DHCP server.
2. IP router (one or more).
3. Systems.
4. RDM server.
5. RDM console.

Routed Network Environment Example 5

The DHCP server and RDM server are on the same LAN segment. The systems receive configuration data (either locally or through one or more IP routers), boot, and connect (either locally or through one or more IP routers). The Internet Protocol (IP) router must support the BOOTP Relay Agent function. The RDM console connects to the RDM server through one or more IP routers.
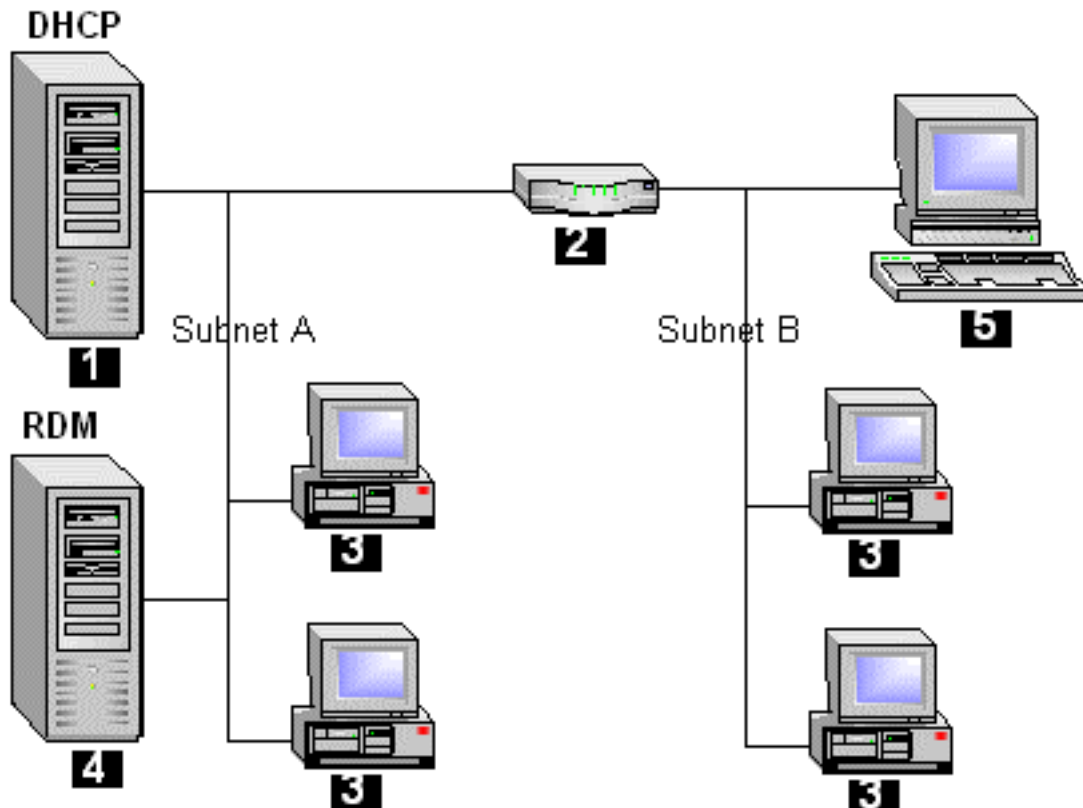
1. DHCP server.
2. IP router (one or more).
3. Systems.
4. RDM server.
5. RDM console.

Wide Area Network Environment Example
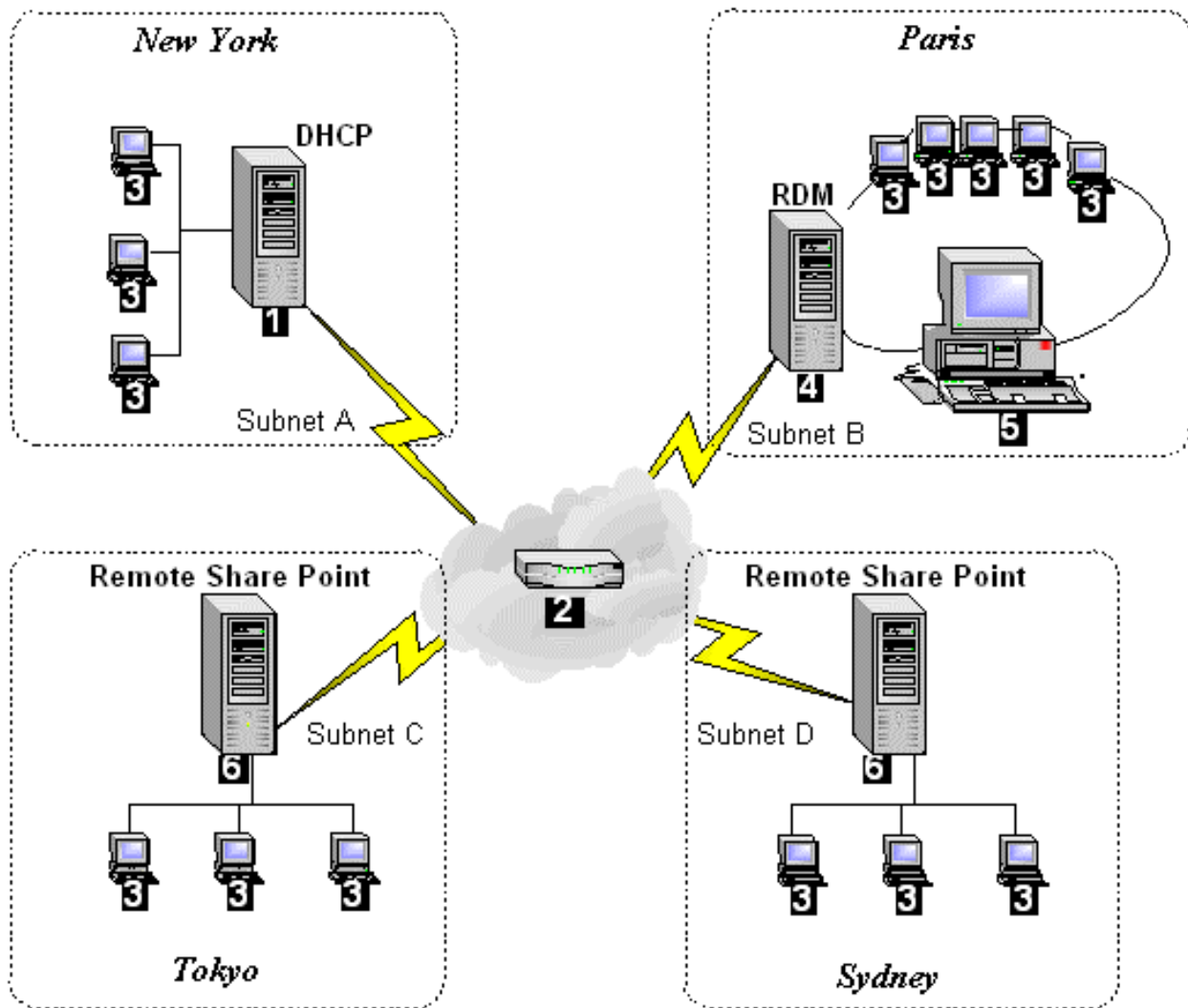
1. DHCP server.
2. IP router (one or more).
3. Systems.
4. RDM server.
5. RDM console.
6. Remote Share Point

2.3 Upgrading RDM software

IMPORTANT: Before you upgrade, backup your entire LCCM server.

If you are upgrading from RDM 3.1 or RDM 3.1.01 to RDM 3.2, you can migrate your data files to RDM 3.2, using the migration steps that are part of the Install procedure described in the next section. You can migrate from RDM 3.2 to RDM 3.2 on the same operating system, provided that you do not attempt to upgrade across languages. You can also migrate RDM 3.2 on a Windows NT 4.0 Server SP 4 or higher to RDM 3.2 on a Windows 2000 Server SP 2 or on a Windows 2000 Advanced Server SP 2.

If you made changes to NETWORK.LST, MACHINE.LST, VIDEO.LST, OPTIONS.TXT, or SCSI.LST, you should save a private copy of those old files before continuing the RDM 3.2 Installation. You may need to make equivalent changes to the new version of those files (for example if RDM 3.2 does not contain built-in support for your adapters). Starting LCCM 3.0, the format of NETWORK.LST and MACHINE.LST has changed. If you are upgrading from LCCM 2.5.1, see "RDM Control Files" on page 189 for details.

If you are upgrading from LANClient Control Manager™ (LCCM) versions 2.5.1 or 3.0, you must first upgrade to RDM 3.1 before upgrading to RDM 3.2. If you have an older version of LCCM, you must first upgrade to LCCM 2.5.1 and then upgrade to RDM 3.1 before you can upgrade to RDM 3.2.

Note: During an upgrade, RDM 3.2 will use the same install directories as the version currently installed. It is not possible to change the drive location and/or the name of the install directory. In many cases the install directory after an upgrade will be the `<drive>:\LCCM` directory. The default install directory during a fresh install, the `<drive>:\RDM` directory is used in the documentation to refer to the install directory.

Note: When upgrading from RDM 3.1 or RDM 3.1.01 to RDM 3.2, a directory named `<drive>:\TmpLCCMbk` will be created. This directory contains an archive of the old RDM 3.1 files that were replaced during the upgrade. This directory may be removed after the upgrade.

2.4 Install RDM 3.2

The Profile Wizard typically copies large amounts of data (e.g., operating system images and install directories) into subdirectories under the `<drive>:\RDM` directory. You should consider your disk space requirements carefully before installing RDM. You may want to consider installing RDM somewhere other than on your C: partition.

This section describes an interactive install. Alternatively, you can run a silent install. See "Performing a Silent Install" on page 55.

To install RDM, do the following:

1. Log on to your server as a network administrator or equivalent.

2. Download the IBM RDM compressed file from the RDM home page.

3. Run the **RDM3101I.EXE** program that you downloaded from the Internet. Wait while files are being extracted. This will take a few moments.

    Note: If you have the RDM version for both IBM and Non-IBM computers, that install file will be named **RDM3101N.EXE**. Unless otherwise stated, installation instructions for **RDM3101I.EXE** also apply to **RDM3101N.EXE**.
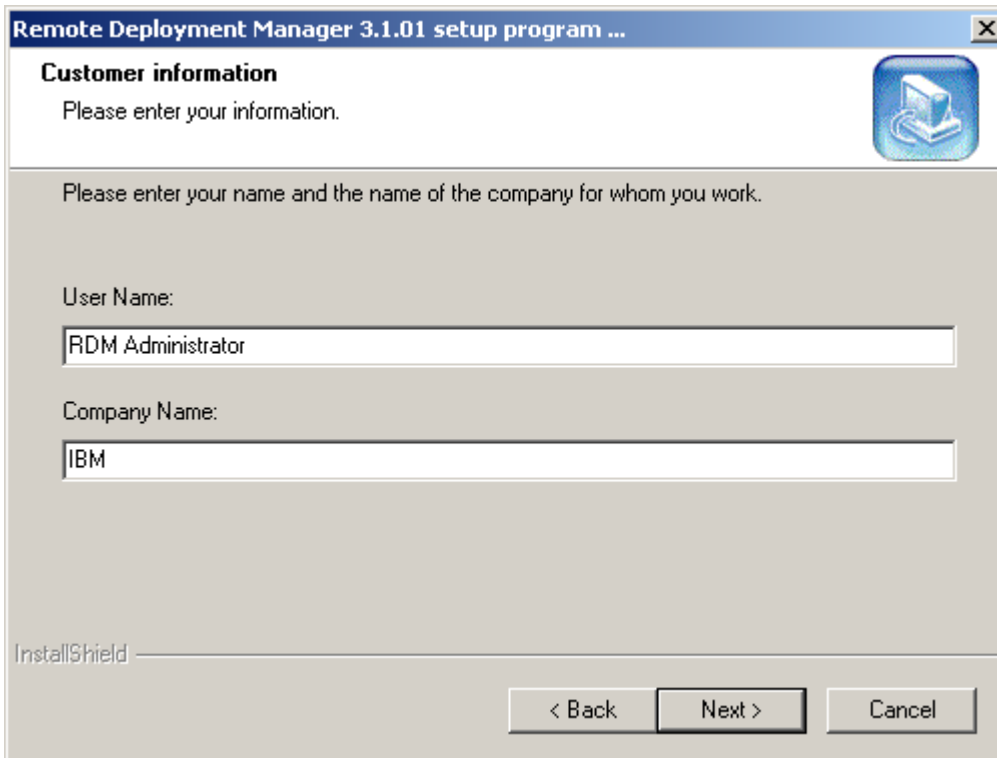
4. The RDM 3.2 Setup Welcome screen will be displayed. Click **Next** to continue with the setup program or **Cancel** to exit the program.
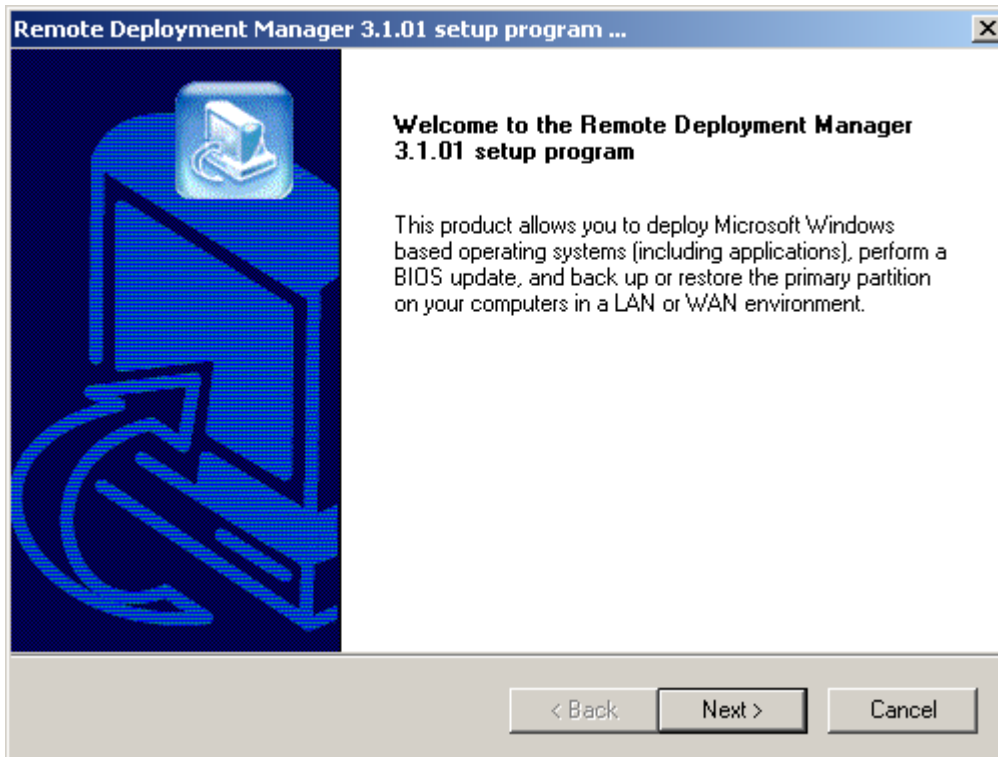
5. If you accept the terms and conditions of the license agreement, select **Yes** to continue with the setup program. Selecting **No** will cancel the setup program.
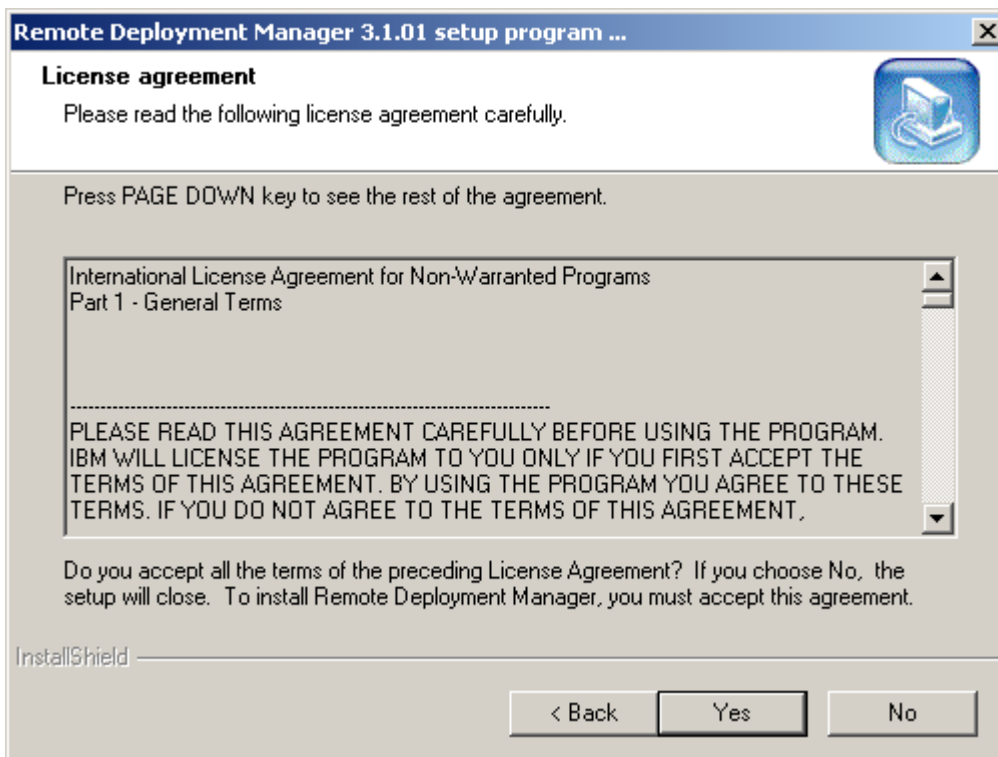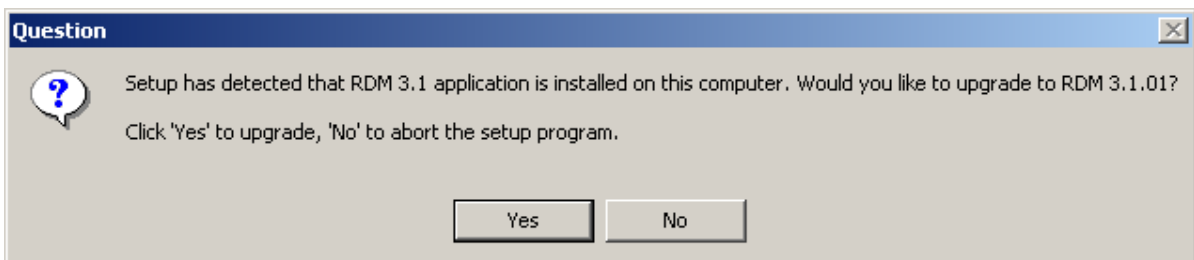
6. Enter your User Name and Company Name and click **Next**.
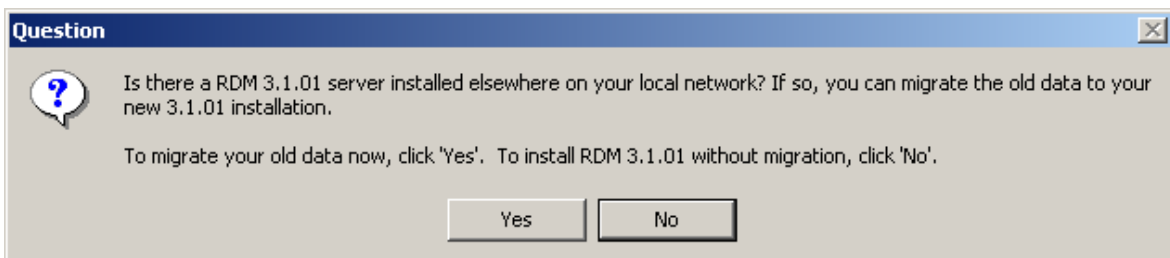
7. If you already have RDM 3.1 installed on this server, you will be asked if you wish to upgrade to RDM 3.2. Click **Yes** to continue or **No** to abort the install. You will be told that the old RDM settings will be used. Click **OK**. The install will then jump to step 14 below.

8. If you don't have RDM 3.1 installed on this server, you will be asked if you have an RDM server on your network, and if you wish to migrate the RDM data (system files and profiles) to the new RDM 3.2 installation. Click **Yes** to migrate this data, or **No** to continue installation without migration.

9. If you have chosen to migrate your old RDM data in the previous step, enter the host name of the RDM 3.2 server and click **Next**. You will not see this screen if you chose not to migrate data.
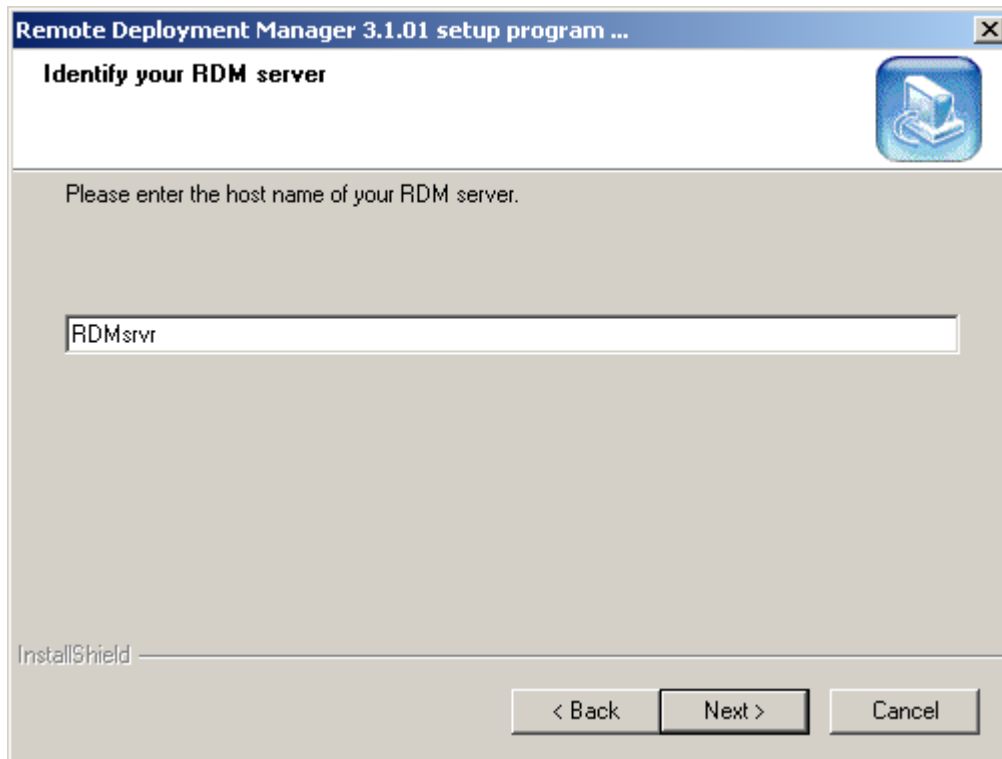
10. If you are upgrading from a paid version of RDM to a free version of RDM, you will no longer be able to deploy non-IBM systems. Click **Yes** to continue or **No** to abort installation.
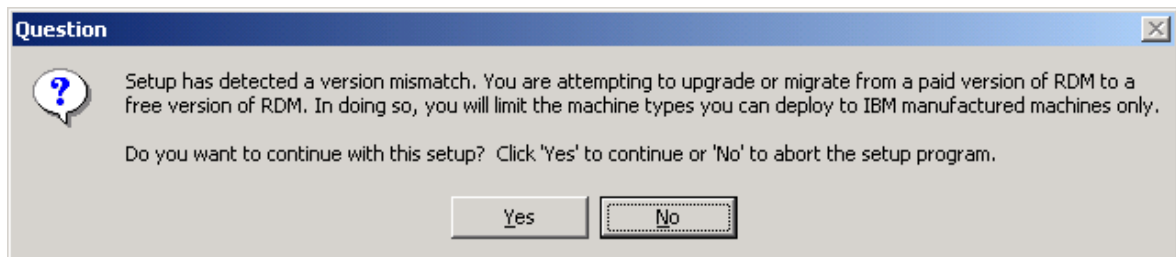
11. Select **Next** to accept the default folder name (recommended) for your RDM installation, or click **Browse...** to choose a different location.
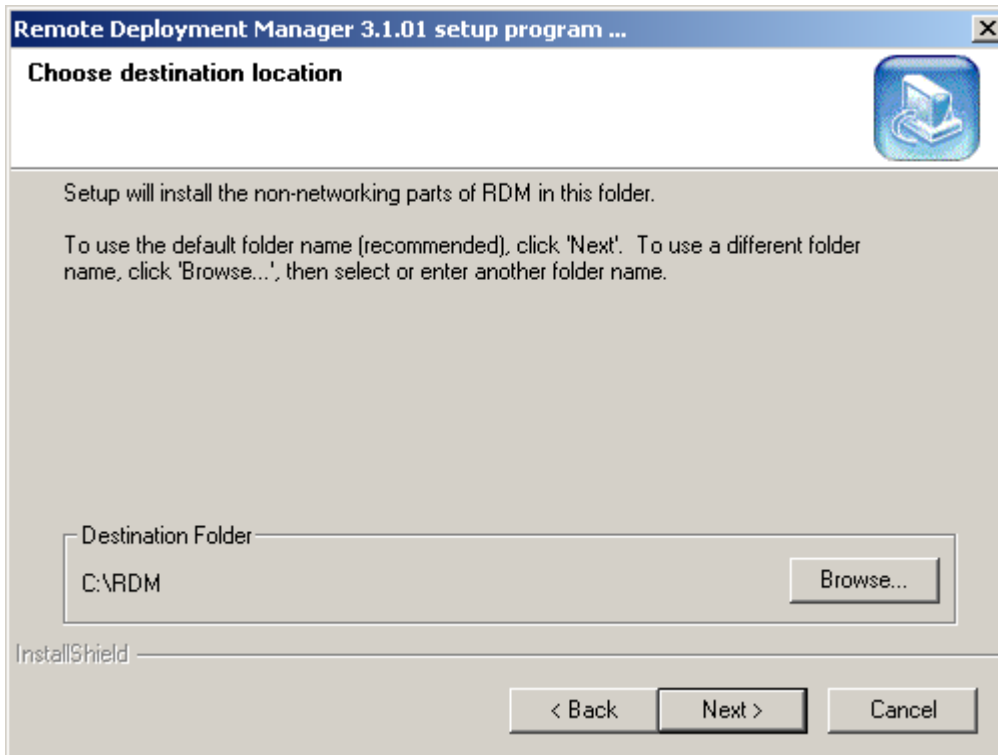
12. Select **Next** to accept the default folder name of IBMTCPIP (recommended) for the networking components of RDM.
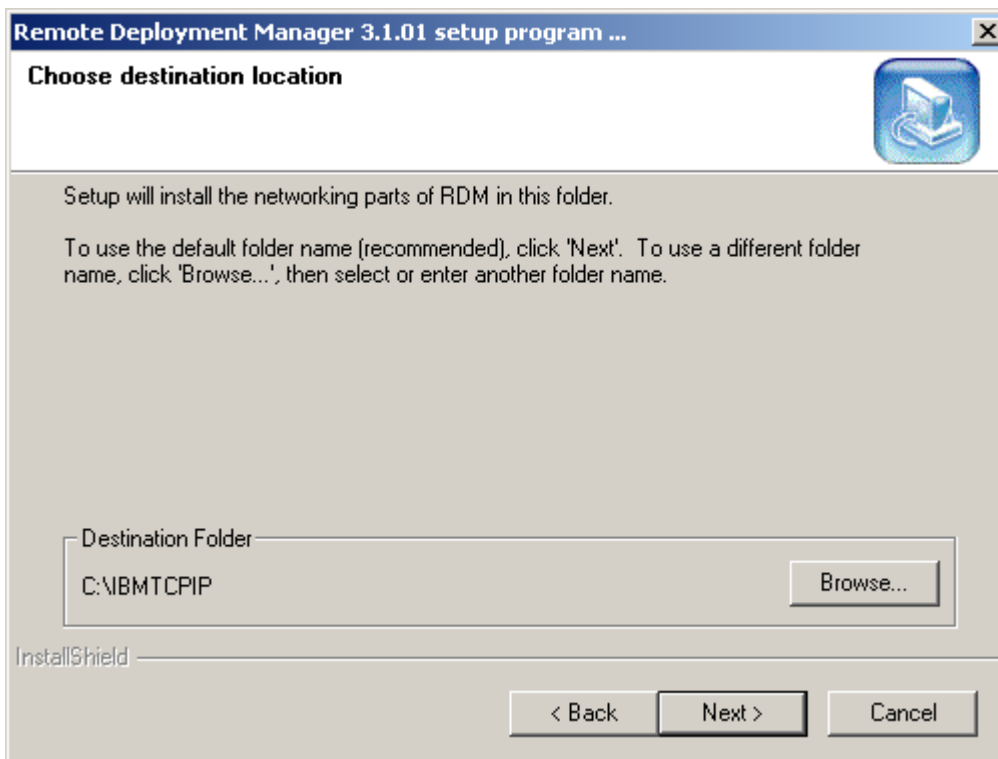
13. Select which type of installation you would like to do, Complete or Custom, then click **Next**.

- **Complete.** This will install all RDM components (server, console, and share point). You **MUST** choose this type of install whenever you install the RDM server.

- **Custom.** This will allow you to choose which RDM components to install. You should choose this type of installation when you are installing a remote share point or a remote console – that is, when you install these components on a different computer than the RDM server. You can install these components remotely on the same computer or on different computers. If you are selecting this option, go to step 4 of "Installing RDM Components" for further installation instructions.
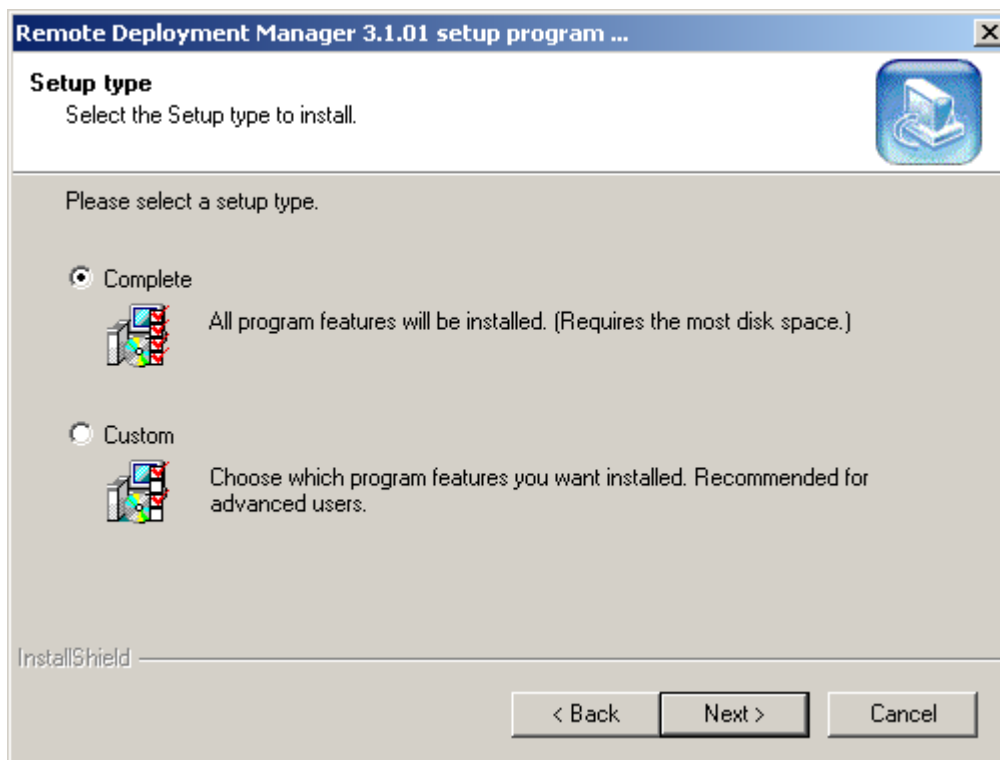
14. Review the setup information. If you would like to change any settings, click **Back**. Click **Next** to begin copying files.
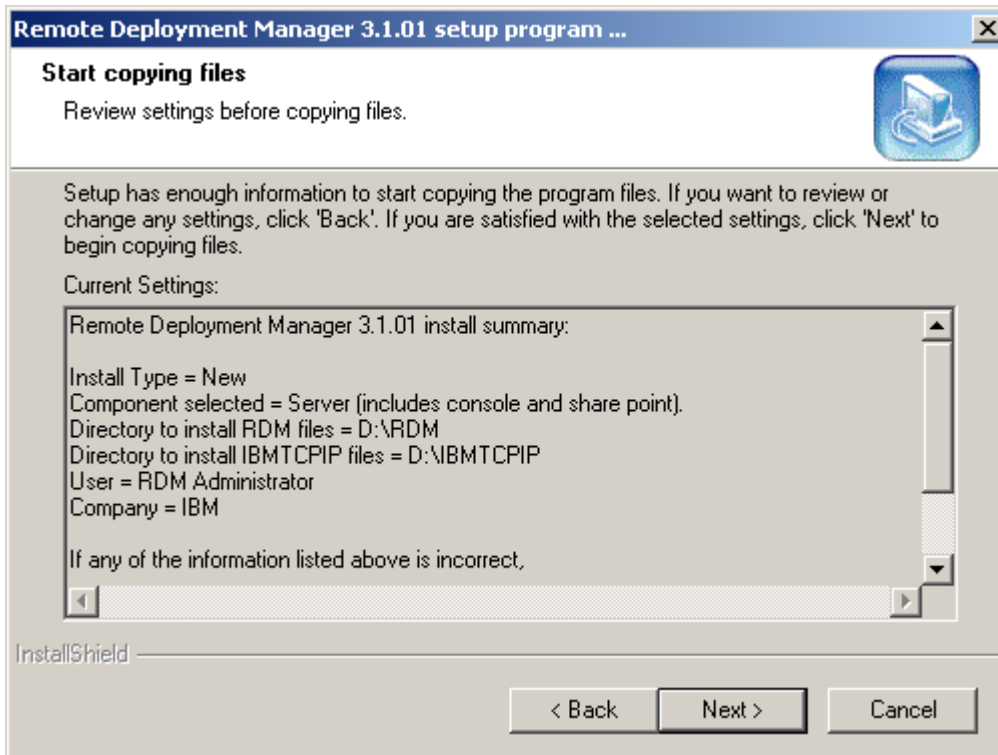
15. If you are performing an upgrade, you are asked to confirm before copying continues.
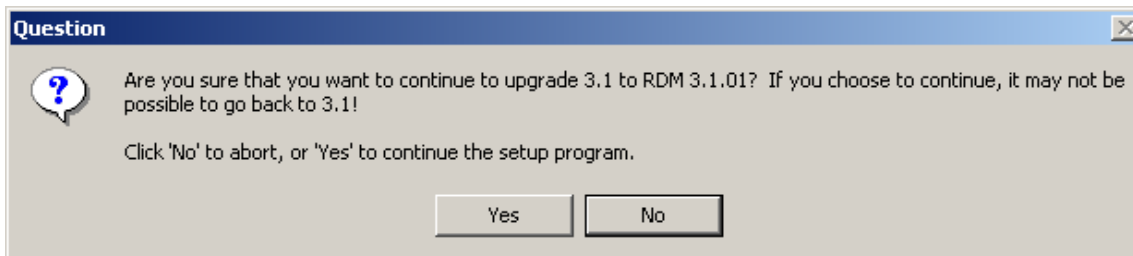
16. After all of the files have been copied, you will be prompted for the location of your DHCP server. Click **Yes** if your DHCP server is installed on the local machine, or click **No** if it is installed on another machine.
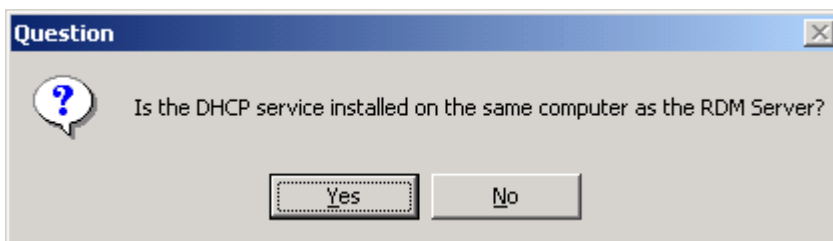
17. An informational screen appears reminding you to configure the DHCP Server.
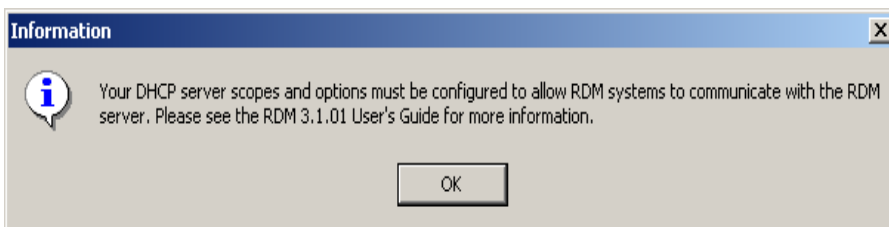
18. Click **Finish** to close the setup program.
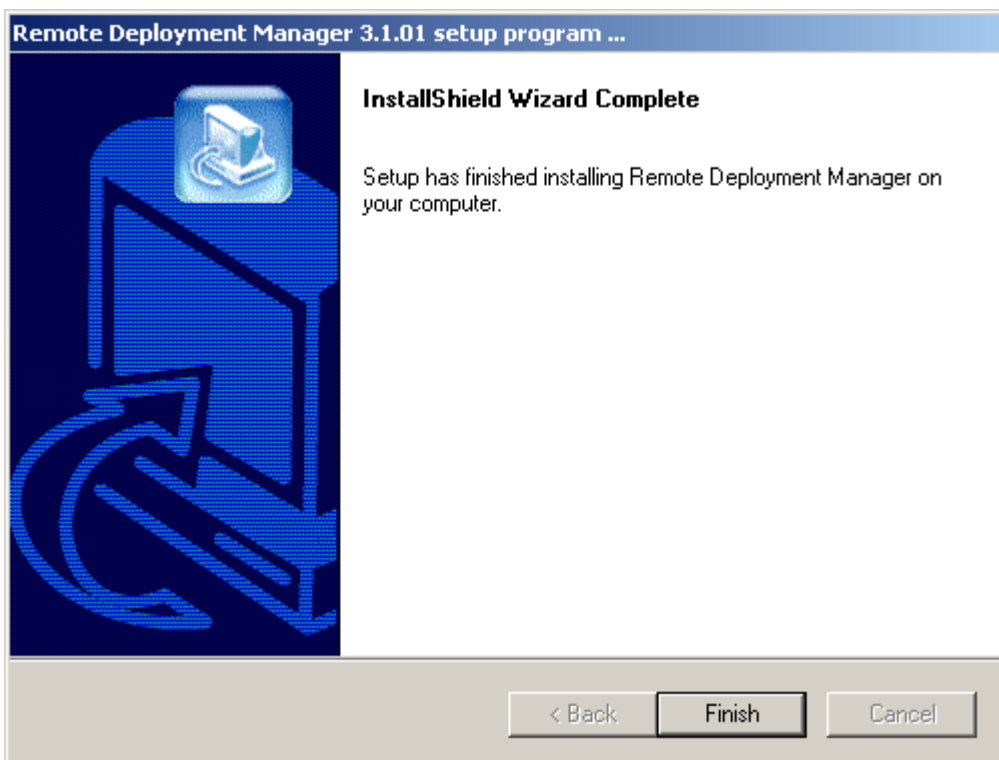
2.5 Configure the DHCP Server

In order for the RDM server and console to communicate properly with systems, you must have your Microsoft or other DHCP server configured properly. This means that:

▶ DHCP scopes must be defined for each subnet that contains RDM systems.

▶ DHCP option 3 must be configured in all cases.

▶ DHCP option 60 must be configured only when the RDM server and the DHCP server are on the same computer.

You must perform this configuration on any DHCP server.

Using the Microsoft DHCP Server on Windows NT 4.0 Server

You can configure the Microsoft DHCP server on Windows NT 4.0 using the DHCP Manager. Here is an outline of how you might do this in a simple configuration. You may have to do some of the steps differently, depending on your network configuration:

1. Select **Start** > **Programs** > **Administrative Tools** > **DHCP Manager**.
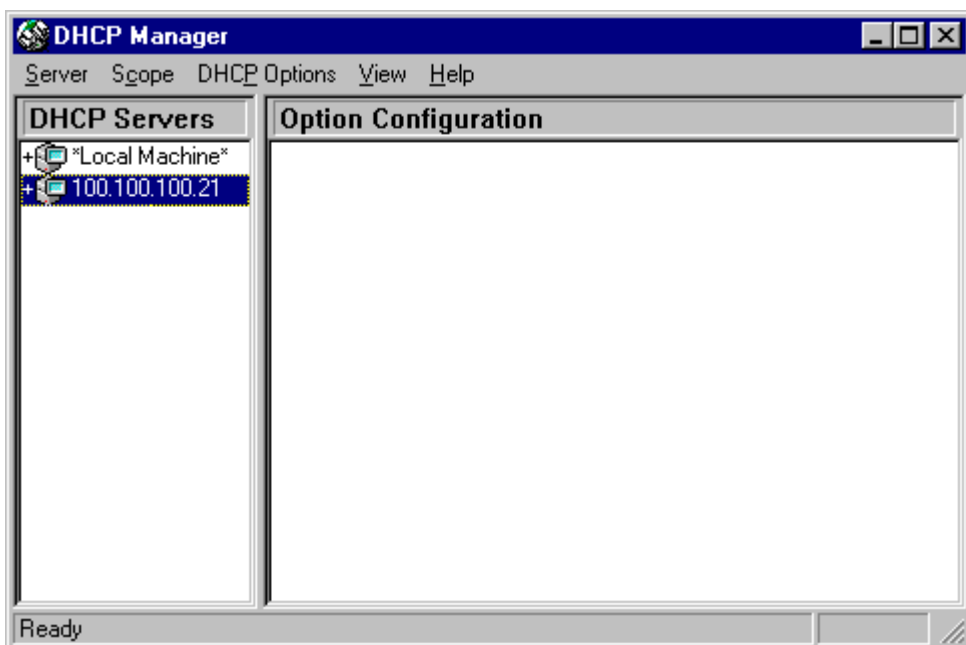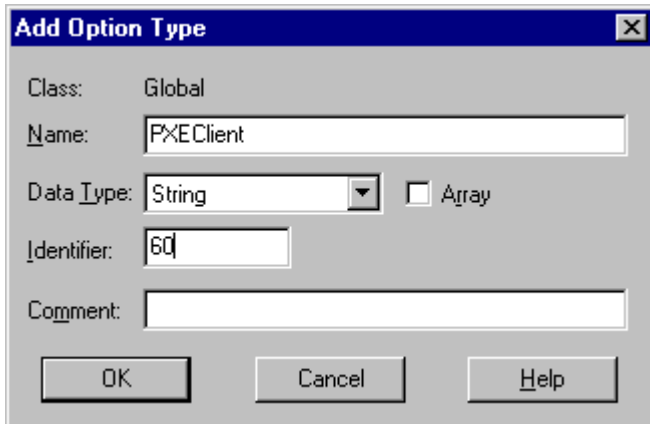
2. From the DHCP Manager, select **Local Machine**, and then from the menu, select **Scope** > **Create**. Under IP Address Pool, fill in the **Start Address**, **End Address**, and **Subnet Mask** fields for each scope that you need. Click **OK** to activate the scope.
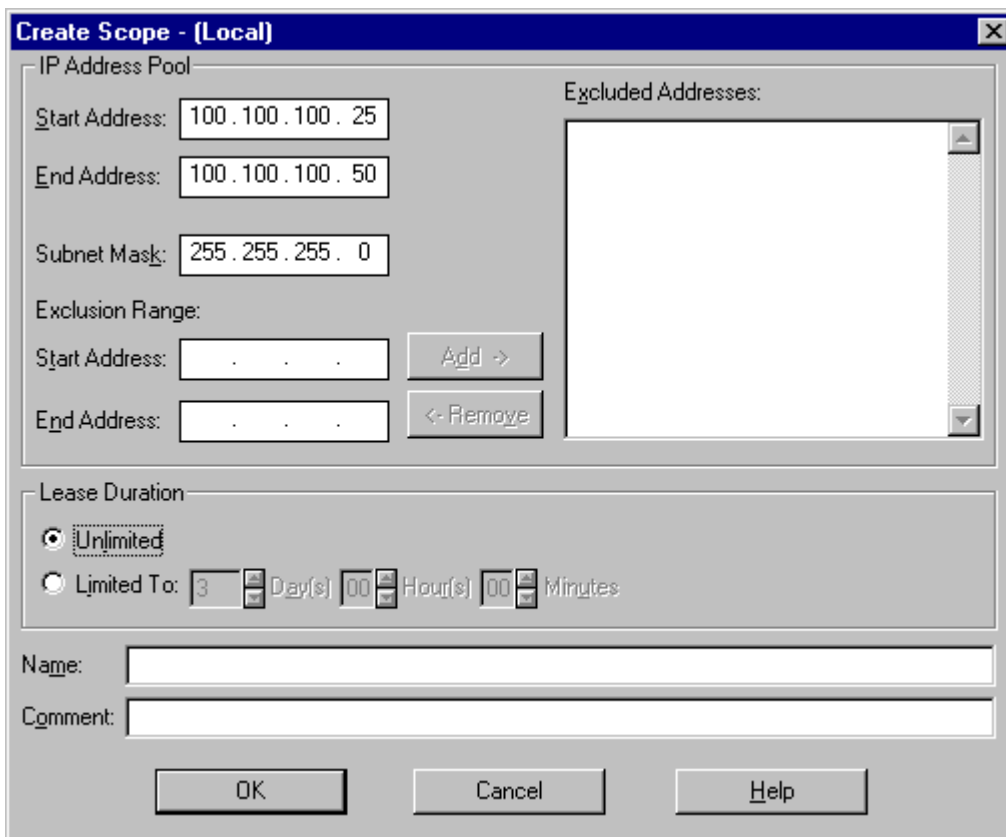
3. **Only if your DHCP server is installed on the same computer as your RDM server:** From the DHCP Manager menu, highlight the scope and select **DHCP Options** > **Defaults** > **New**.

   Fill in the **Name** field with "PXEClient", the **Data Type** field with "String", and the **Identifier** field with "60'.
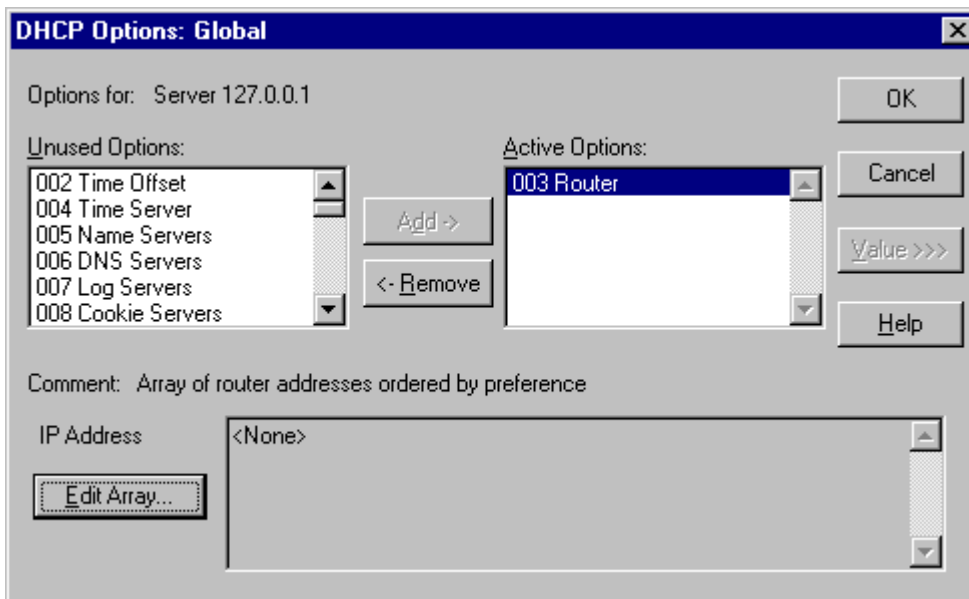
4. From the DHCP Manager menu, highlight the scope and select **DHCP Options** > **Global**.

   a) Select **003 Router**, and click **Add**.

b) Click **Value**, then **Edit Array**. If your DHCP server, RDM server, and all systems are on an isolated subnet, enter the IP address of the RDM server and click **Add**. Otherwise, enter the IP address of your router and click **Add**.
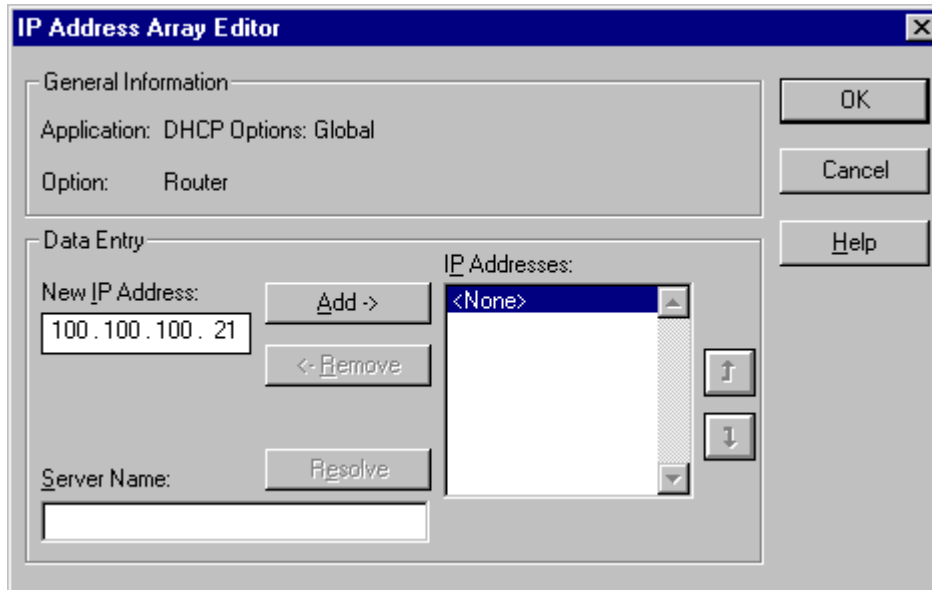
5. If your DHCP server and RDM server are on the same computer, from the DHCP Manager menu, highlight the scope and select **DHCP Options** > **Global**.

   a) Select **060 PXEClient**, then click **Add**.

   b) Enter "PXEClient" (exactly as shown, case sensitive, without the quotes) and click **OK**.

6. Close and reopen the DHCP Manager. Double-click on each scope to validate that it is configured properly.

Using Microsoft DHCP Server on Windows 2000 Server or Advanced Server

To configure a Microsoft DHCP server on Windows 2000 Server or Advanced Server, you can use the DHCP manager to configure scopes and set option 3. If the DHCP server is on the same computer as the RDM server, you need to configure DHCP option 60 using the Microsoft NETSH.EXE program or `<drive>:\RDM\PXEDHCP.BAT` program.

To configure the Microsoft DHCP server using the DHCP Manager and using NETSH.EXE:

1. Select **Start** > **Programs** > **Administrative Tools** > **DHCP**.
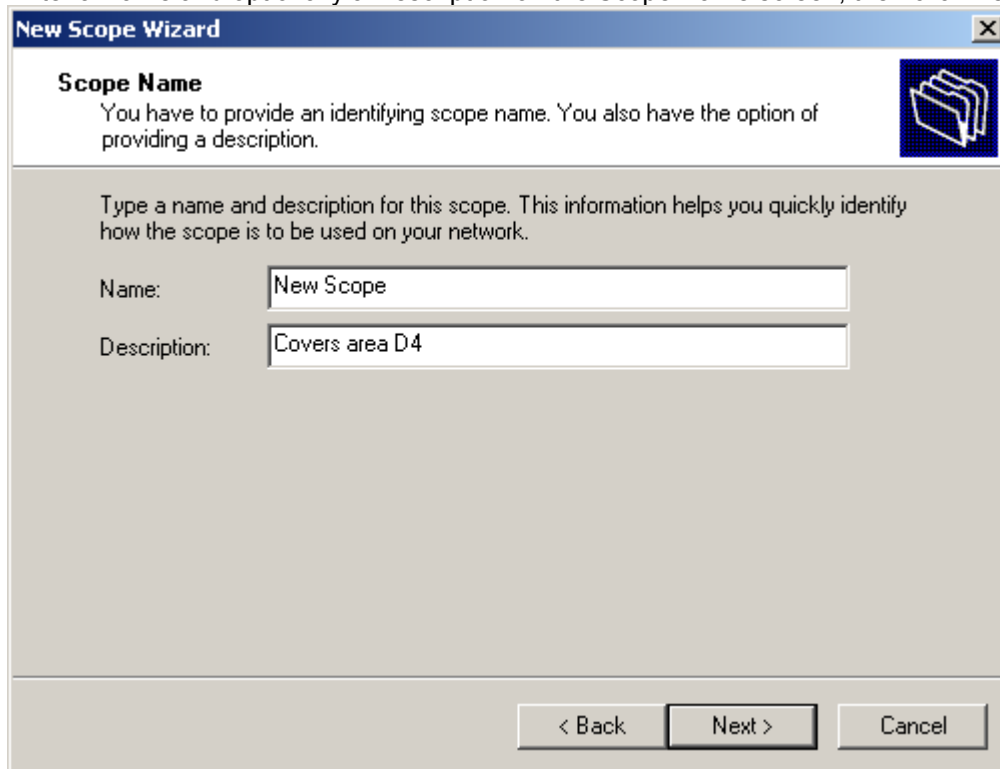
2. From the DHCP window, right-click the server node and select **New Scope**.
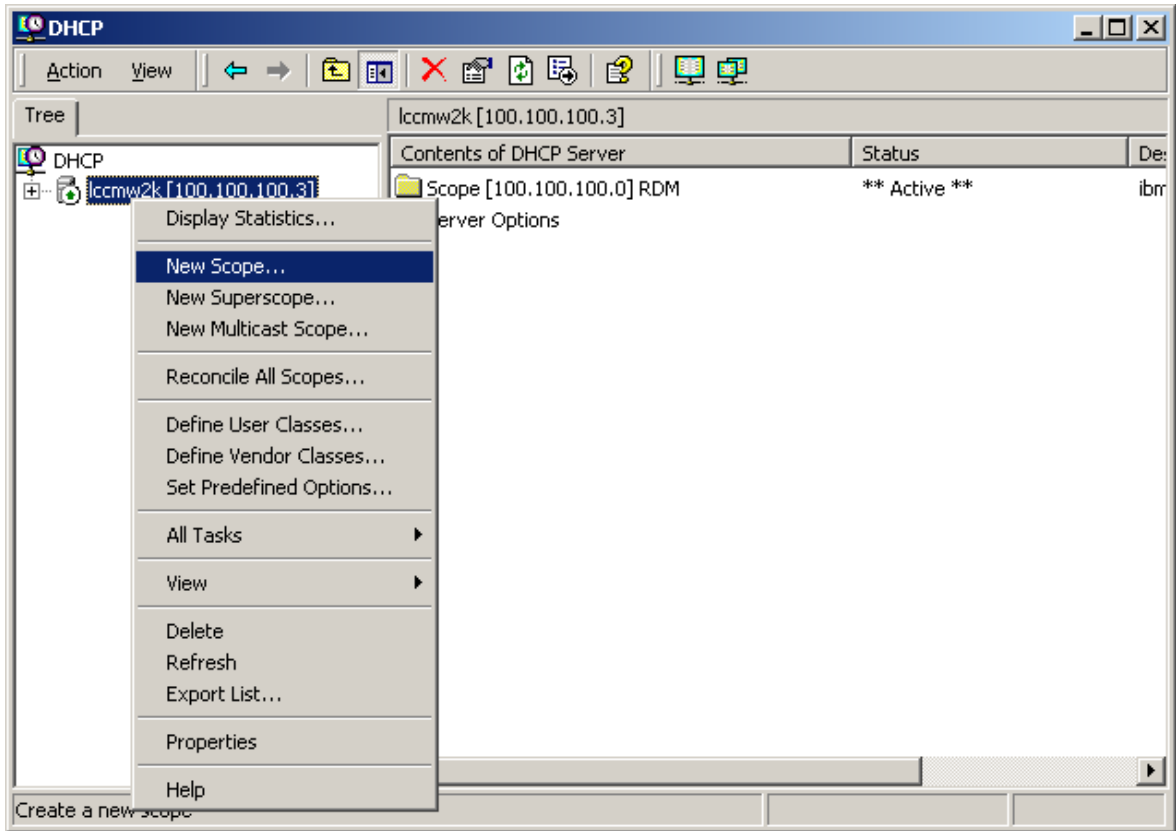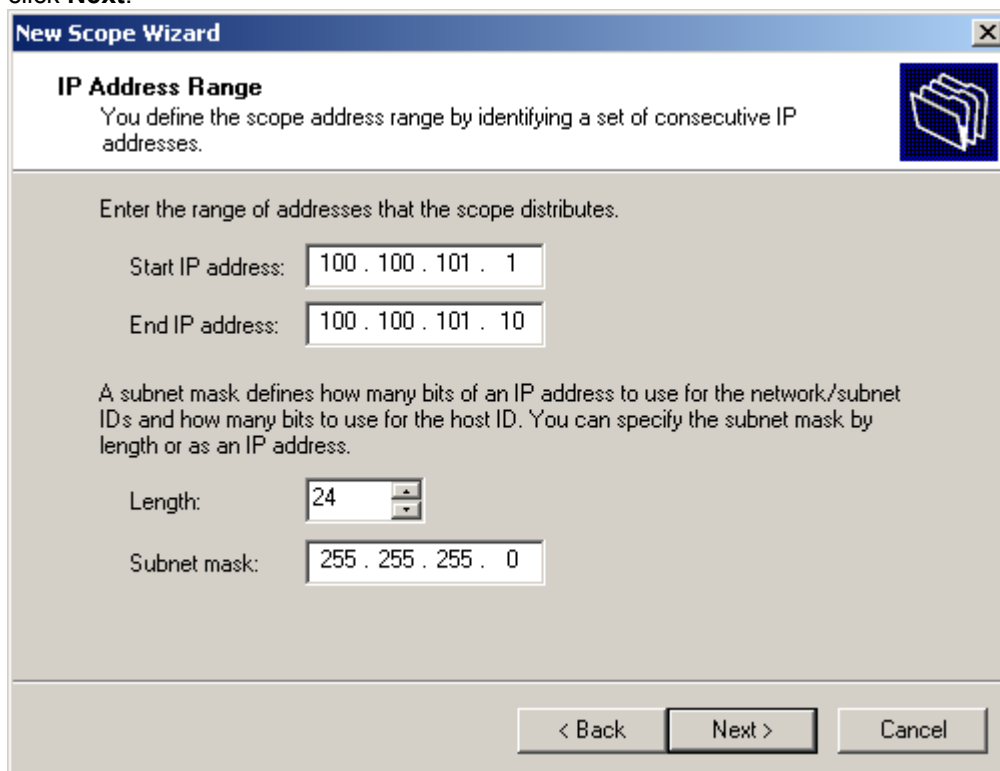
3. A New Scope Wizard will guide you through creating the scope. On the opening screen, click **Next**.

4. Enter a Name and optionally a Description on the Scope Name screen, then click **Next**.

5. Enter the Start and End IP address and Subnet mask on the IP Address Range screen, and then click **Next**.

6. If you have any IP addresses you wish to exclude from the scope, you can do so on the Add Exclusions screen, then click **Next**.

7. Specify the lease time on the Lease Duration screen, then click **Next**.

8. On the Configure DHCP Options screen, select **Yes** for configuring DHCP options, then click **Next**.
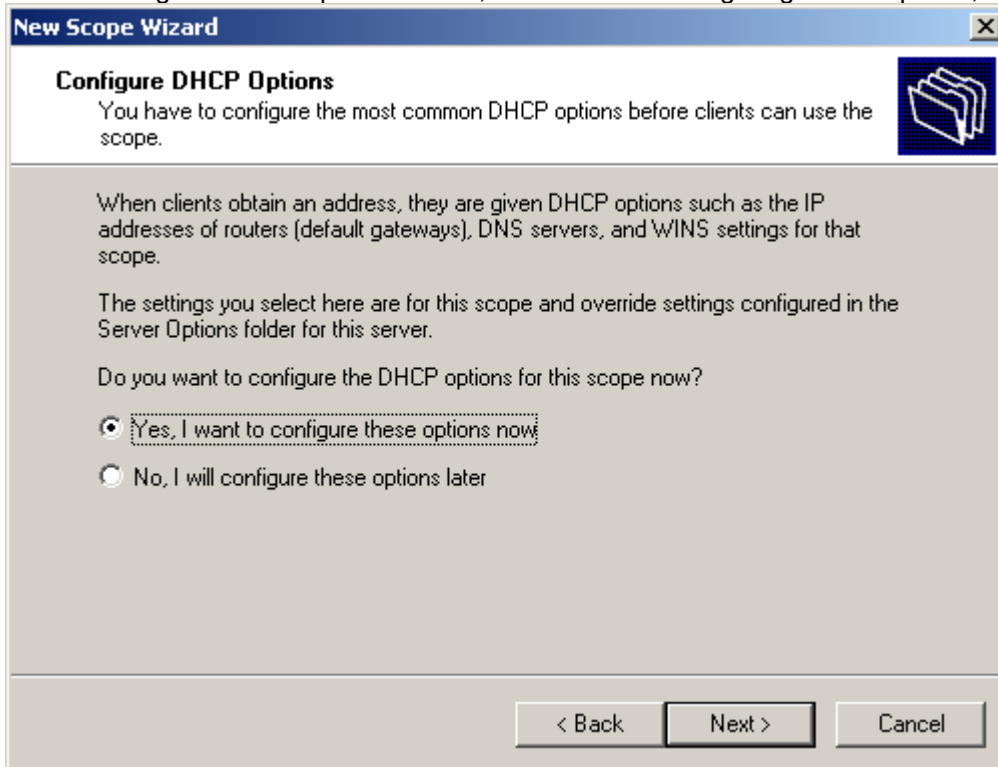
9. If your DHCP server, RDM server, and all systems are on an isolated subnet, enter the IP address of the RDM server and click **Add**. Otherwise, enter the IP address of your router and click **Add**. Then click **Next**.
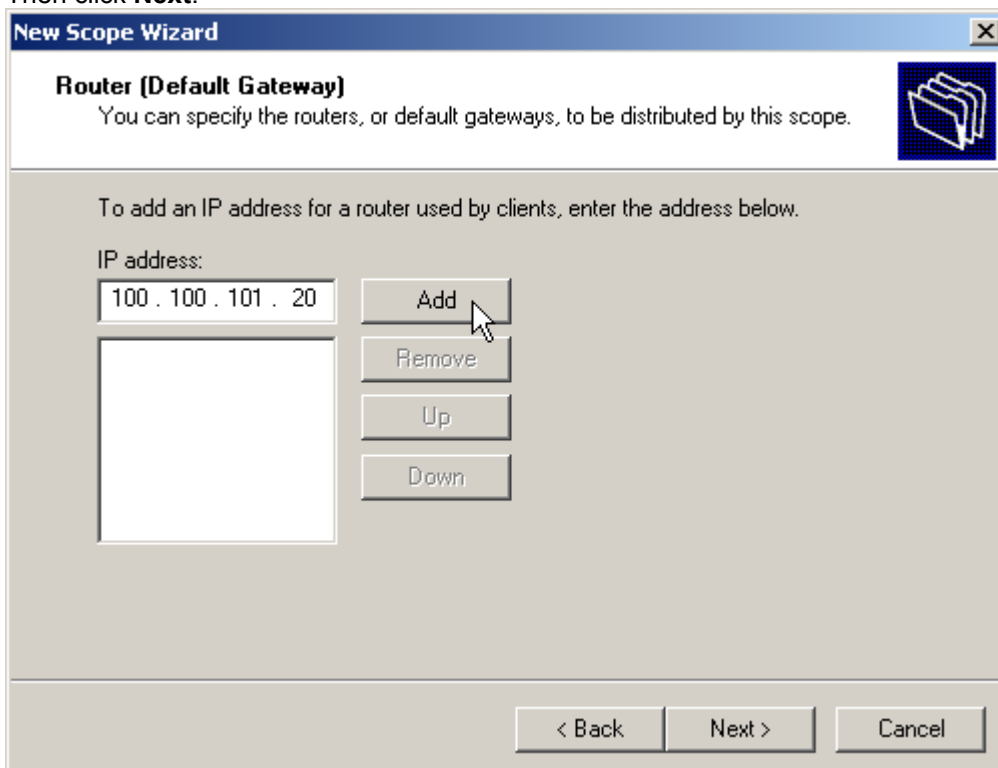
10. If desired, enter information on the Domain Name and DNS Servers screen. Click **Next**.

11. If desired, enter information on the WINS Servers screen. Click **Next**.

12. On the Activate Scope screen, select **Yes**, and then click **Next**.
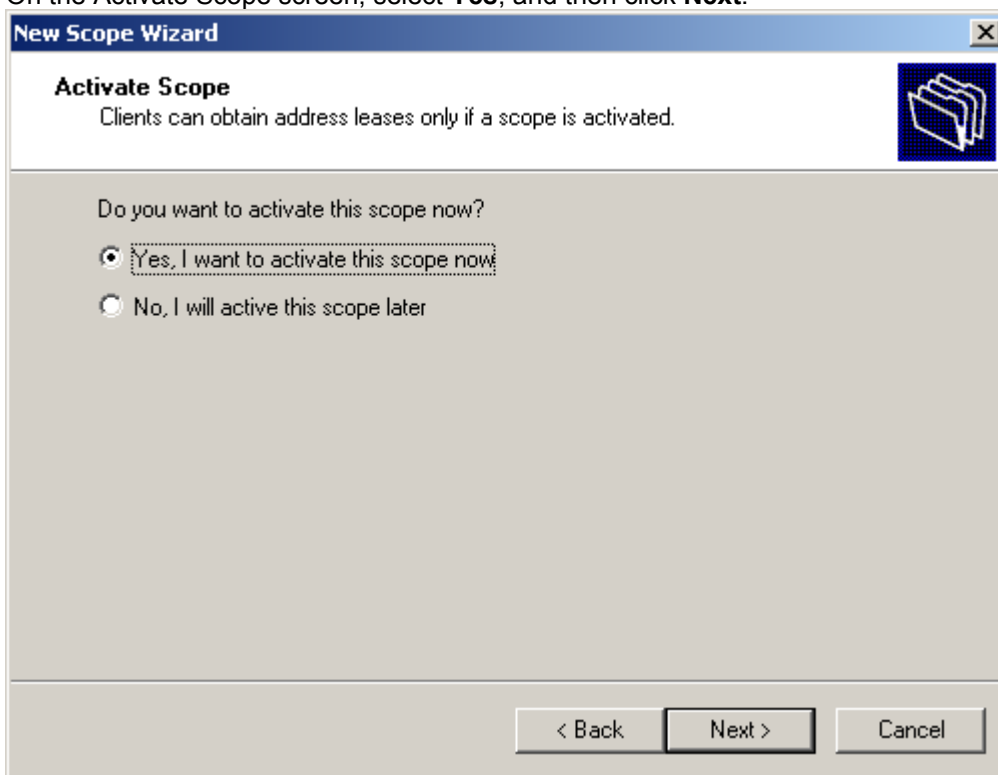
13. On the final screen, click **Finish**.

14. From a command window, run the following commands on the DHCP server **only if RDM is installed on that same server** to configure option 60:

```
netsh dhcp server add optiondef 60 PxeOption STRING 0 PXEClient
netsh dhcp server set optionval 60 STRING PXEClient
```

To configure option 60 using PXEDHCP.BAT instead of the `netsh` command:

1. From a command window, change to the RDM install directory.

2. Run the command PXEDHCP.BAT

The syntax of the command is:

```
PXEDHCP {L | R}
where
L        The DHCP service is on the RDM server.
R        The DHCP service is not on the RDM server.
```

Example:

```
pxedhcp L
```

2.6 Configure Routers

When a system first attaches to the network using PXE, it sends out DHCPDISCOVER messages requesting an IP address and a boot file. The DHCPDISCOVER message is a UDP broadcast message, and as such, will not normally be forwarded by a router. Consequently, the RDM server will not detect it. You need to configure the router to forward such messages:

- ▶ On a Cisco router, use an "`IP helper-address`" configuration command on the router interface to which a system is attached.

- ▶ On an IBM router, use an "`enable bootp forwarding`" configuration command. These commands instruct the router to forward the messages related to DHCP to the RDM server.

Also, when the IP scope is specified for a system subnet, a gateway address must be specified. If a system receives a DHCPOFFER message in response to the DHCPDISCOVER message, the system needs to know a gateway address to which it can send a corresponding DHCPREQUEST message.

To successfully use RDM in a routed environment, the following conditions need to be satisfied:

- ▶ Subnet Directed-broadcast forwarding must be enabled.

- ▶ Spanning tree protocol for system ports must be disabled.

- ▶ Proxy ARP forwarding must be enabled.

- ▶ The scope for the RDM system subnet must have a correct router entry for the subnet.

- ▶ BOOTP/DHCP forwarding must be enabled. The destination addresses must include the address of the RDM server, and at least one DHCP server that serves the RDM system subnet. The destination address may either be the network address of the servers, or their individual fixed IP addresses.

These are the **absolute minimal conditions that must be satisfied** before RDM will work in a routed environment. If your network policy will not allow any of these conditions to be satisfied, then RDM cannot be used in the environment. Please check your router documentation for the necessary configuration commands.

2.7 Configure Switches and Hubs

Next you need to configure your switches and hubs. Specifically, you need to disable spanning tree protocol (STP) on all ports connected to systems. It is not necessary to disable STP on ports connected to switches or routers

2.8 Additional Installation Information

The information in this section may or may not apply to your network configuration.

Windows NT 4.0 Installation Information

▶ If you are using a Primary Domain Controller (PDC), and a Backup Domain Controller (BDC) in Windows NT 4.0 Server, RDM must only run from one of these servers at any one time. This is because only one RDM session can run across your network at any one time, and as the RDM databases are not automatically synchronized between the BDC and the PDC, changes made to one database set will not automatically be carried across to the other.

▶ When you are installing RDM on a BDC, the PDC must be available, or the installation will hang.

▶ If you have installed RDM on a Backup Domain Controller you must now carry out the following additional steps:

  a) From the Desktop, select **Start**, **Programs**, **Administrative Tools** and then **Server Manager**.

  b) Select **Computer** and **Synchronize with Primary Domain Controller.** This will ensure that the User Accounts are replicated between the Primary and Backup Domain Controllers.

Configuring IBM Netfinity Manager to Detect Systems Across Routers

If you have Netfinity Services installed on a system which does not reside on the same subnet as the RDM server (i.e., separated from the RDM server by an IP router) then you will have to manually identify under IBM Netfinity Manager, the subnets that you wish IBM Netfinity Manager to have access to.

For IBM Netfinity Manager to detect systems across a router:

1. Create/edit file `C:\WNETFIN\TCPADDR.DSC`. This is located on the server on which IBM Netfinity Manager resides.

2. In file `C:\WNETFIN\TCPADDR.DSC`, place a valid IP address and subnet mask for every subnet that you want IBM Netfinity Manager to be able to access.

Multi-Homing

RDM will function on a multi-homing server without additional configuration. The RDM PXE Service and TFTPD Service detect which IP addresses are active at the time that service is started, and monitor those addresses. If an additional IP address is configured, or an existing one is changed, the following steps should be performed to ensure that the RDM services work properly:

1. Make sure the RDM is not processing or scanning systems.

2. Open the Services panel which should be located in the Control Panel folder.

3. Select the RDM PXE Service and press Stop. Wait for the operation to complete.

4. With the RDM PXE Service still selected, press Start.

5. Select the TFTPD Service and press Stop. Wait for the operation to complete.

6. With the TFTPD Service still selected, press Start. After this operation completes, RDM can resume normal operations.

An alternative procedure is to reboot the system where IP address changes were made. This reboot will automatically restart the affected services, and the new configuration will be read on restart.

Customizing Password Settings

In order to install RDM on a domain, which has a User Account Policy requiring a minimum password length, you can inform the **RDM3101I.EXE** program to use a default password meeting this minimum password length before you install or upgrade RDM 3.2, or you can make this adjustment after installation.

If you still need to install RDM 3.2:

1. Open a text editor program, such as NOTEPAD.EXE, and enter the following text:

   [Passwords]

   background=**<pwd1>**

   user=**<pwd2>**

   You should enter your own values for **<pwd1>** and **<pwd2>**. Make sure not to add spaces after the '**=**' (equal) sign.

2. Save your text (from step 1 above) as 'LCCM.INI' and place it in the same directory as **RDM31.EXE**.

3. Run **RDM31.EXE** and follow the prompts on screen.

Note: Users of systems configured with RDM must be informed of the value set for **<pwd2>**. They will be prompted for this password when powering on their system for the first time. The newly installed operating system will prompt users to enter a new password immediately.

If you have already installed RDM 3.2 and you wish to customize your passwords settings, you should do the following:

1. Create LCCM.INI as indicated in steps 1 and 2 above. Save LCCM.INI in your <drive>:\RDM directory (i.e., in the same directory as LANCNT.EXE).

2. Modify the password of user account 'LSAONE' in the User Manager to match the value entered for **<pwd1>**.

In addition to the above changes, the RDM PXE Service must be configured to pass these options to its systems. Perform the following steps to configure the RDM PXE Services:

1. Start the Registry Editor by choosing Start->Run... and entering "regedit".

2. Locate the following entry:

   HKEY_LOCAL_MACHINE\SOFTWARE\IBM\Remote Deployment Manager\PXE\ProxyDHCP

3. Right click on the ProxyDHCP entry in the left pane and choose New->Key.

4. Change the key name from "New Key #1" to "Pxevendor".

5. Right click on the Pxevendor entry in the left pane and choose New->String value.

6. Change the Name from "New Value #1" to "130".

7. Double-click on the 130 entry in the right pane.

8. Enter the new password to be used.

9. Open the Services control panel.

10. Single-click on the RDM PXE Services entry.

11. Press Stop and wait for this operation to complete.

12. Press Start and allow that operation to complete.

IMPORTANT: When an administrator changes the default user policies on an RDM server in order to limit the number of users with network access to the computer, the NET use command will fail for RDM systems.

2.9 What To Do Next?

This section describes recommended and optional steps to finish and verify your install.

Test the install

Now you are ready to run a test:

- ▶ Scan a system that is on the same subnet as the RDM Server.
- ▶ Scan a system that is on a different subnet from the RDM Server.

For more information on how to scan systems, see "Installation/Maintenance Window" on page 61, and "Scanning Systems" on page 91. If your tests are successful, you can proceed to the next chapter to start working with the RDM Console. Alternatively, you can make modifications to your install as described below.

Modify RDM defaults

If so desired, modify RDM defaults and test the resulting install again. For more information on how to modify RDM defaults, see "Defaults Notebook" on page 66.

Perform Custom Installs

If so desired, you can install remote consoles and/or share points. After you have added these components, make sure you test the resulting install.

2.10 Installing RDM Components

If you ran a custom install on a system and only installed a console, a remote share point, or both components, you can remove and/or add individual components. If you are installing a remote share point, you must configure it after installation.

To install RDM components:

1. Run the **RDM3101I.EXE** program that you downloaded from the Internet.

2. At the Remote Deployment Manager Setup screen, click **Modify**, then click **Next**.
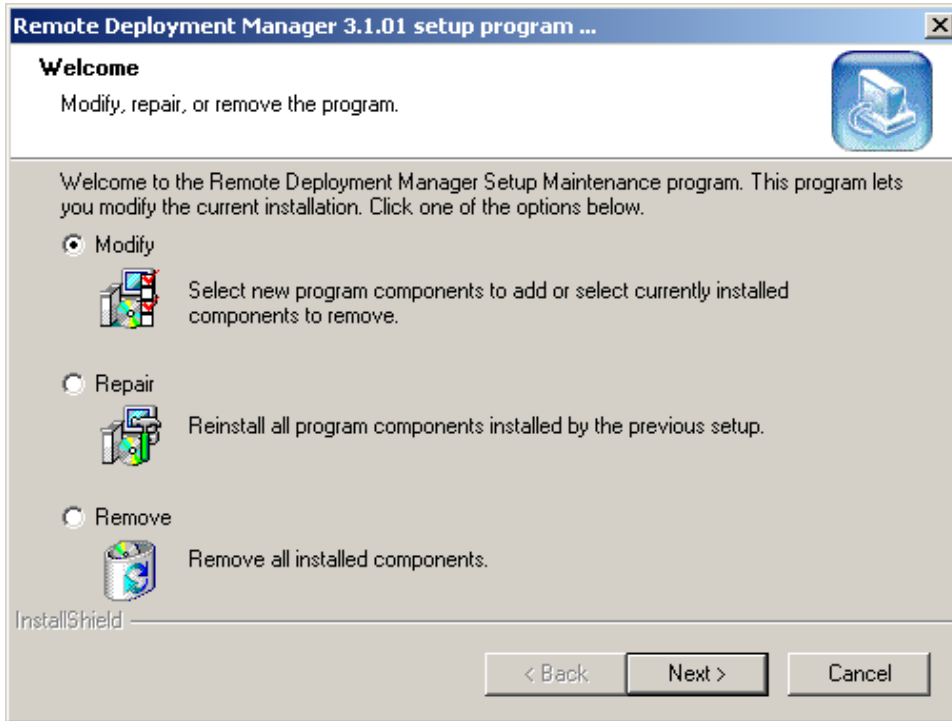
Note: It is not possible to use the **Modify** option on the RDM server to for instance selectively uninstall the console only. Select **Repair** to reinstall the server or select **Remove** to uninstall the server.

3. If you are using a free version of RDM to modify components installed with a paid version of RDM, you will no longer be able to deploy non-IBM systems. Click **Yes** to continue or **No** to abort.
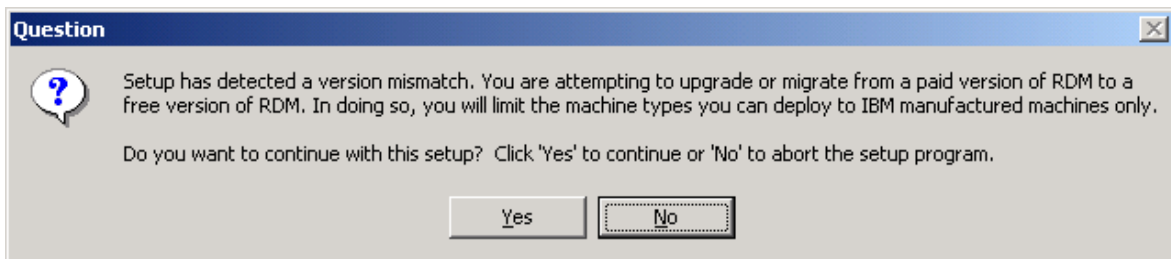
4. Choose the components you wish to install and/or remove:

- Server (includes console and share point). This will install the RDM server.
- **Console**. This will install a console.
- **Share Point**. This will install a remote share point, where you can store the image files for unattended installations.

If you select to install either the console or the remote share point (or both), but not the server, you must have an RDM 3.2 server already running on your network.
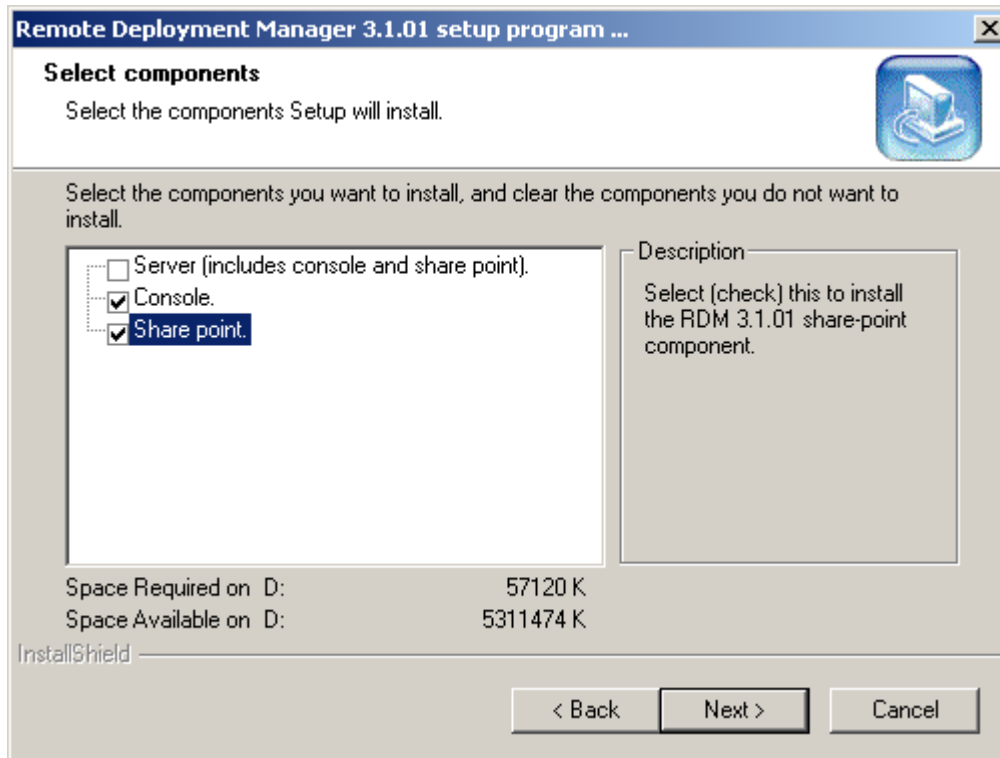
5. If you selected Custom installation, then selected to install the console, remote share point, or both, but did not select to install the RDM 3.2 server, you must already have an RDM 3.2 server installed. Enter the name of the server here and click **Next**.
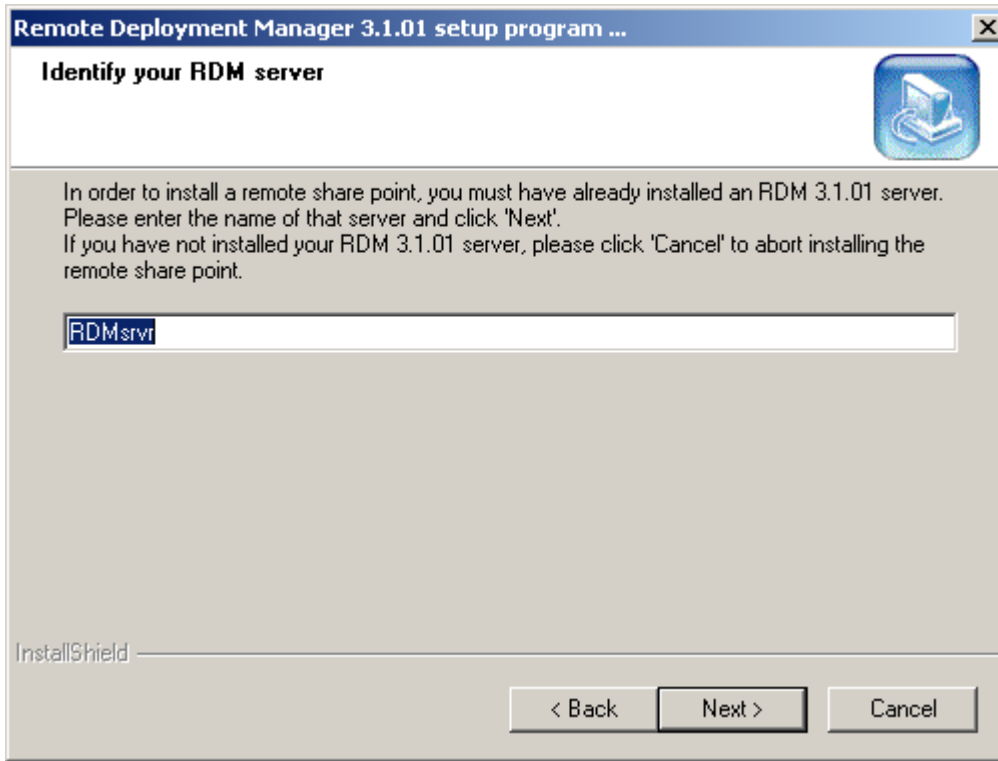
6. Review the setup information. If you would like to change any settings, click **Back**. Click **Next** to begin copying files.
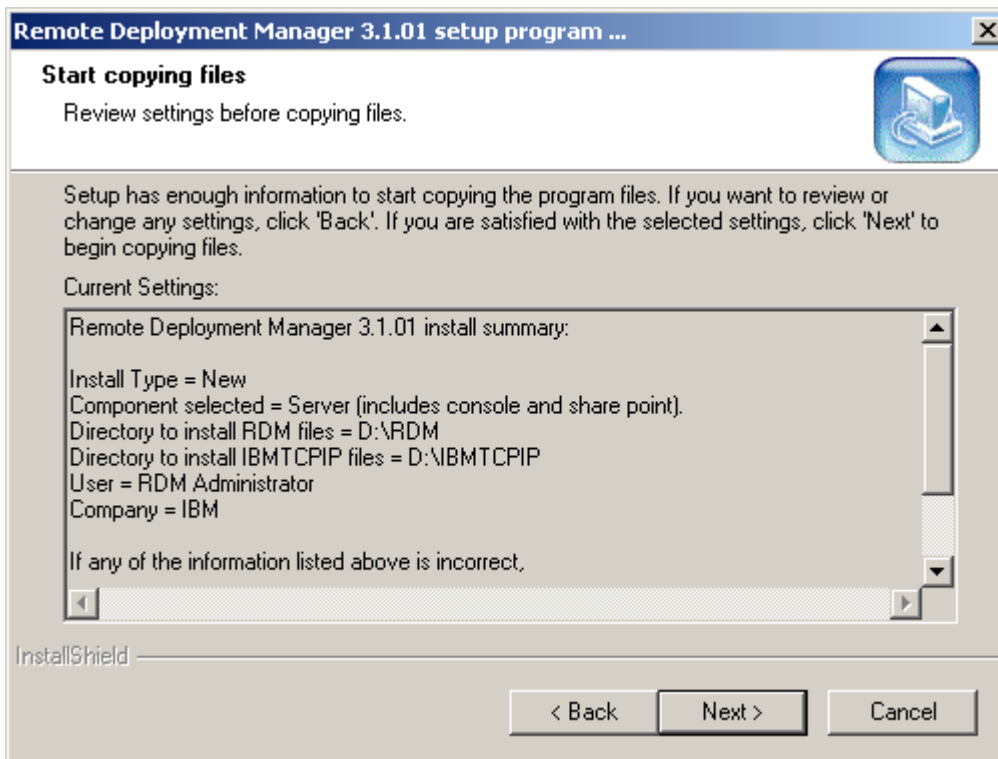
7. After all of the files have been copied, you will be asked to enter the IP address of the computer in the **Share IP** field, and the IP address of the subnet in the **Subnet IP** field.
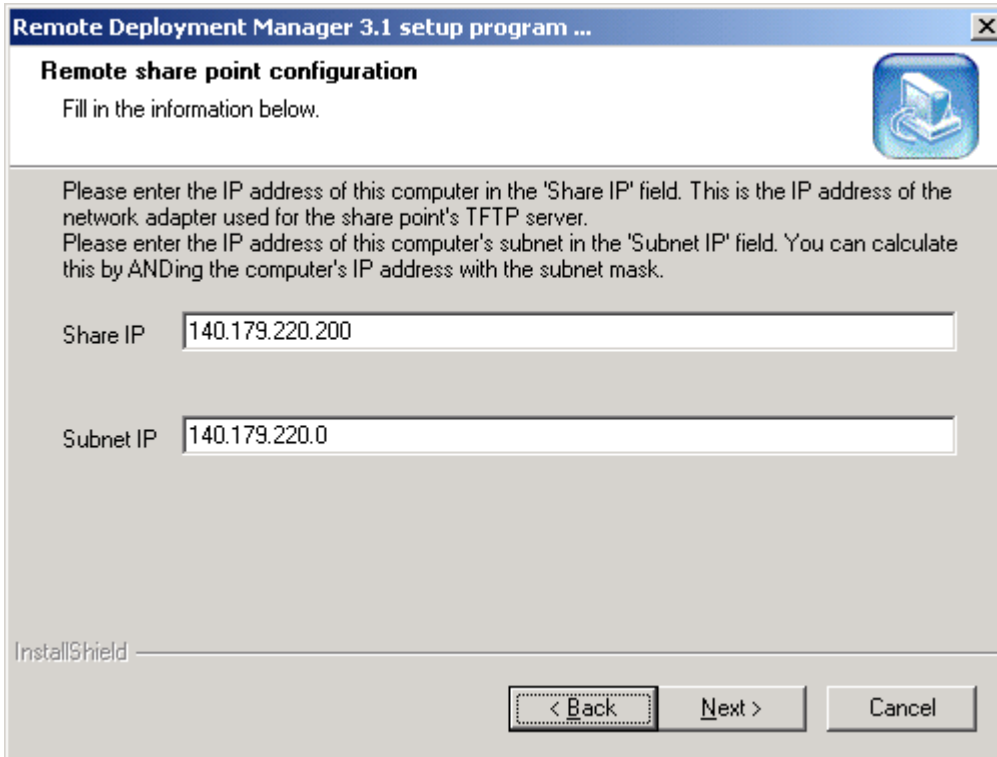
8. Click **Finish** to close the setup program.
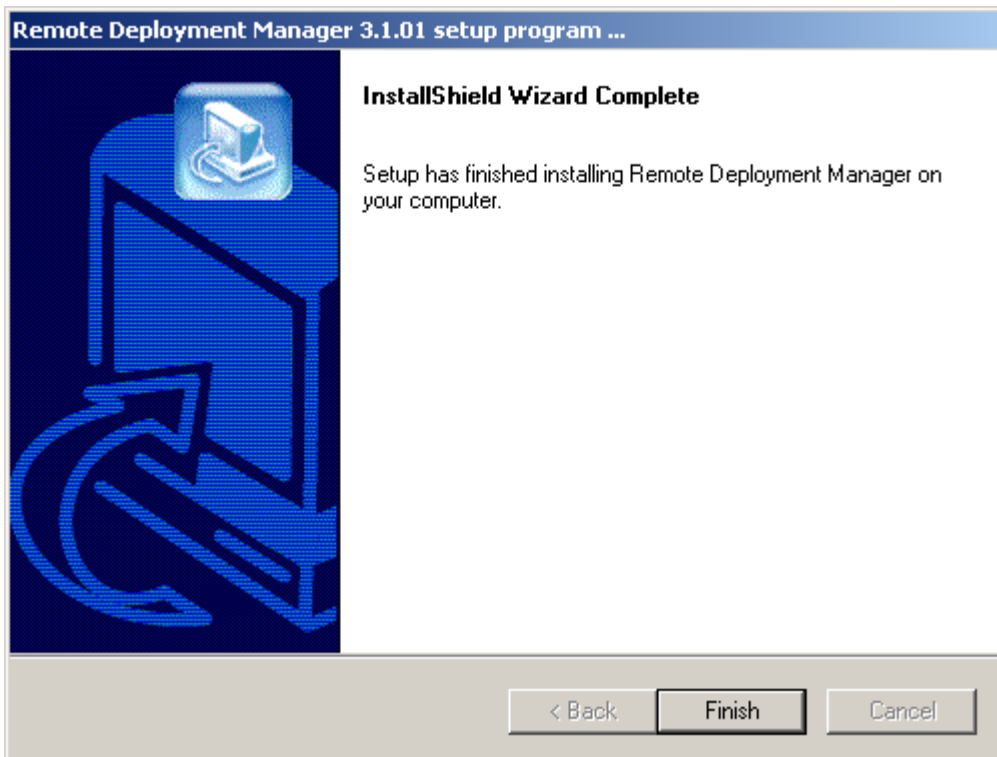
9. If you installed a remote share point, you must now configure it. On the RDM server, open the file `<drive>:\IBMTCPIP\RSP<n>.LOF`, and copy the contents of the file, which is a single line. Append this line to the file `<drive>:\IBMTCPIP\OPTIONS.TXT`. You must create this file if you are configuring your first remote share point. For more details, see "OPTIONS.TXT" on page 193.

After configuration is complete, the remote share point is ready for use. For details, see "Using Remote Share Points" on page 182.

2.11 Reinstalling RDM

If your RDM installation is damaged, you can repair RDM while keeping your existing systems and profiles databases from the damaged installation. Perform the following from the administrator console, or at the computer on which you installed RDM, to repair RDM:

1. Run the **RDM3101I.EXE** program that you downloaded from the Internet.

2. At the Remote Deployment Manager Setup screen, click **Repair**, and then click **Next**.
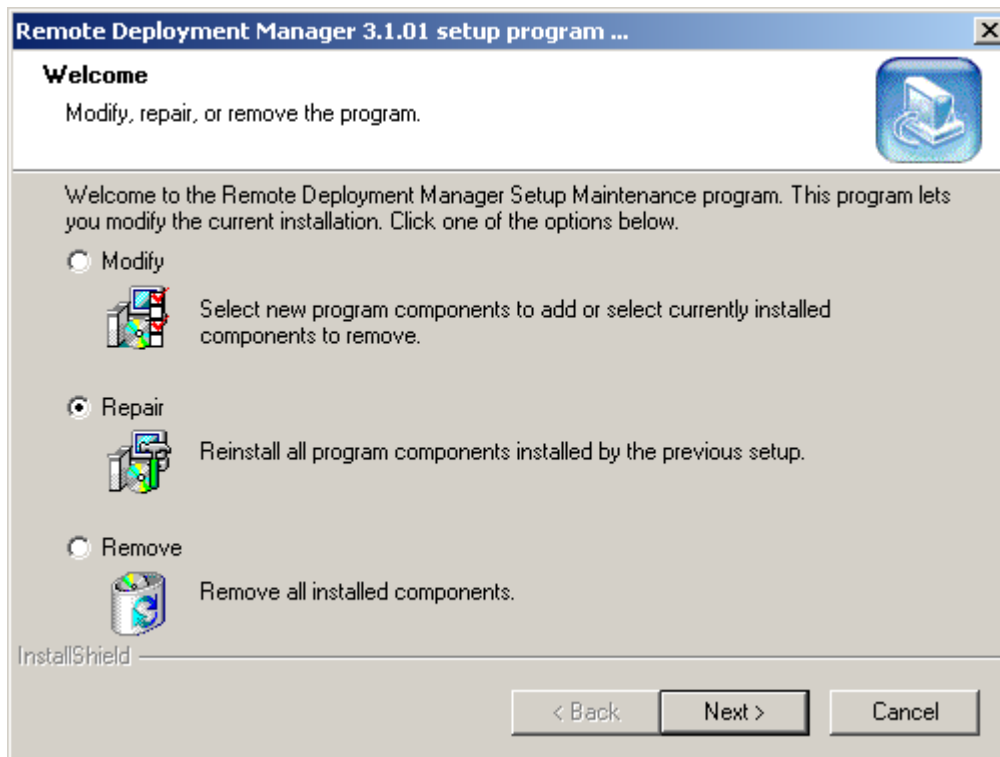
3. If you are repairing a paid version of RDM with a free version of RDM, you will no longer be able to deploy non-IBM systems. Click **Yes** to continue or **No** to abort installation.
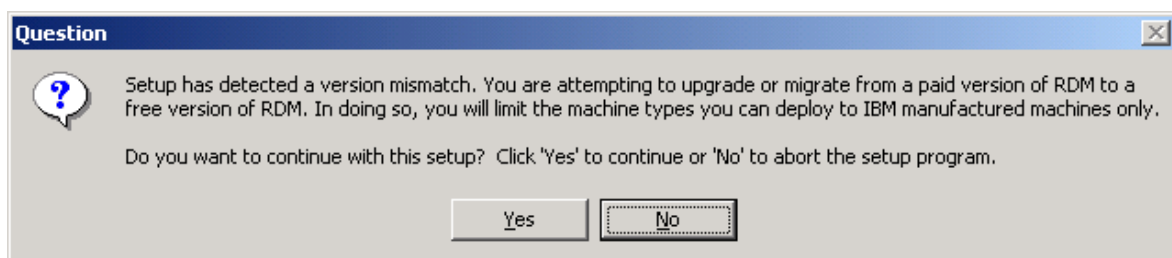
4. Click **Yes** to confirm that you want to reinstall.
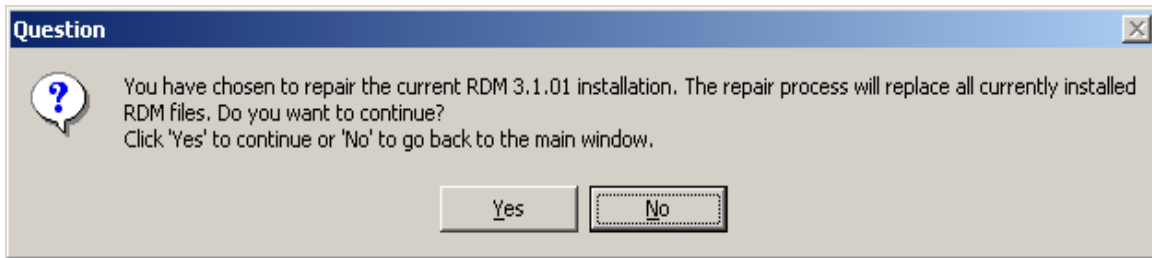
5. After all of the files have copied you will about the location of your DHCP server. Click **Yes** if your DHCP server is installed on the local machine, or click **No** if it is installed on another machine.
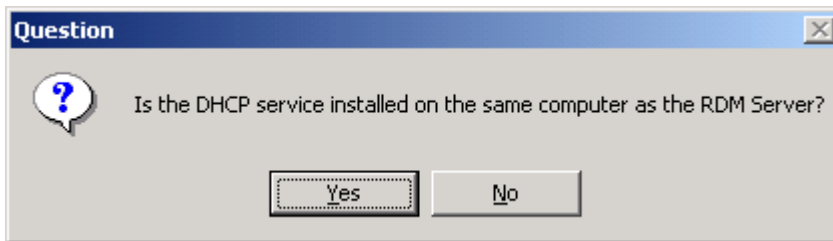
6. An informational screen appears reminds you to configure the DHCP Server. Click OK to finish the setup program.
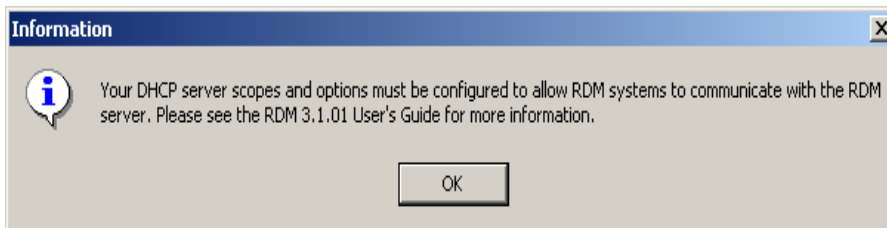
2.12 Uninstalling RDM

The following procedure permanently removes RDM from your server. **If you are upgrading from an earlier version of RDM**, do not use this procedure. Most of RDM's components will be removed, but RDM's program directory and files created or altered within this directory, such as the systems and profiles databases and image files, will not be removed.

Perform the following from the administrator console, or at the computer on which you installed RDM, to permanently remove RDM:

1. From the Windows Desktop, click the **Start** button.

2. Select **Settings**.

3. Select **Control Panel**.

4. Select **Add/Remove Programs**.

5. Select **Remote Deployment Manager 3.2**.

6. Click the **Add/Remove** button.

7. Click **Yes** to confirm your intention to remove RDM.

Alternatively, you can run the **RDM3101I.EXE** program that you downloaded from the Internet:

1. Click **Remove** to remove all installed components.
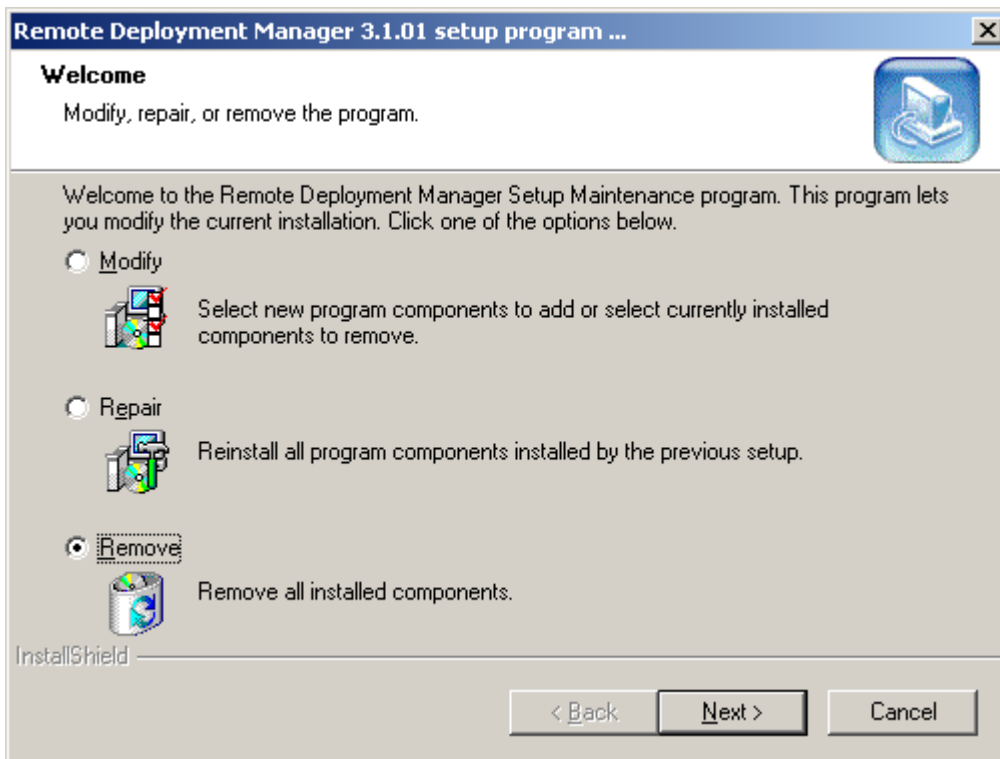
2. Click **OK** to confirm that you want to completely remove the application and all of its components.
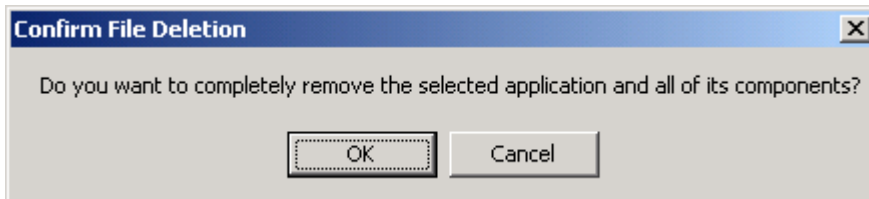
3. Click **Yes** to continue uninstalling.
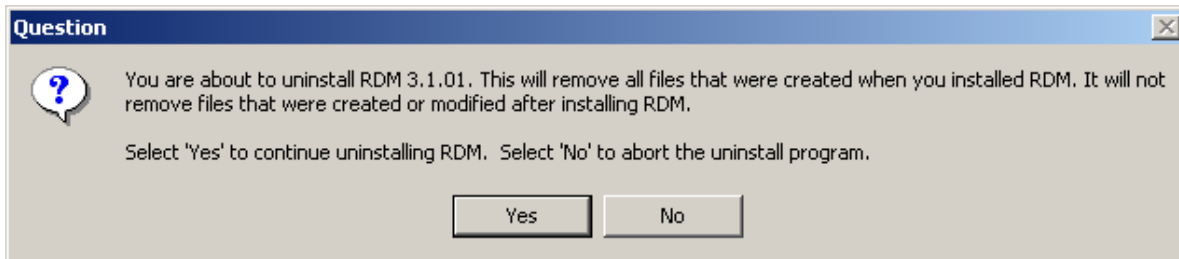
4. Once the Setup program has completed uninstalling RDM, click **Finish**.
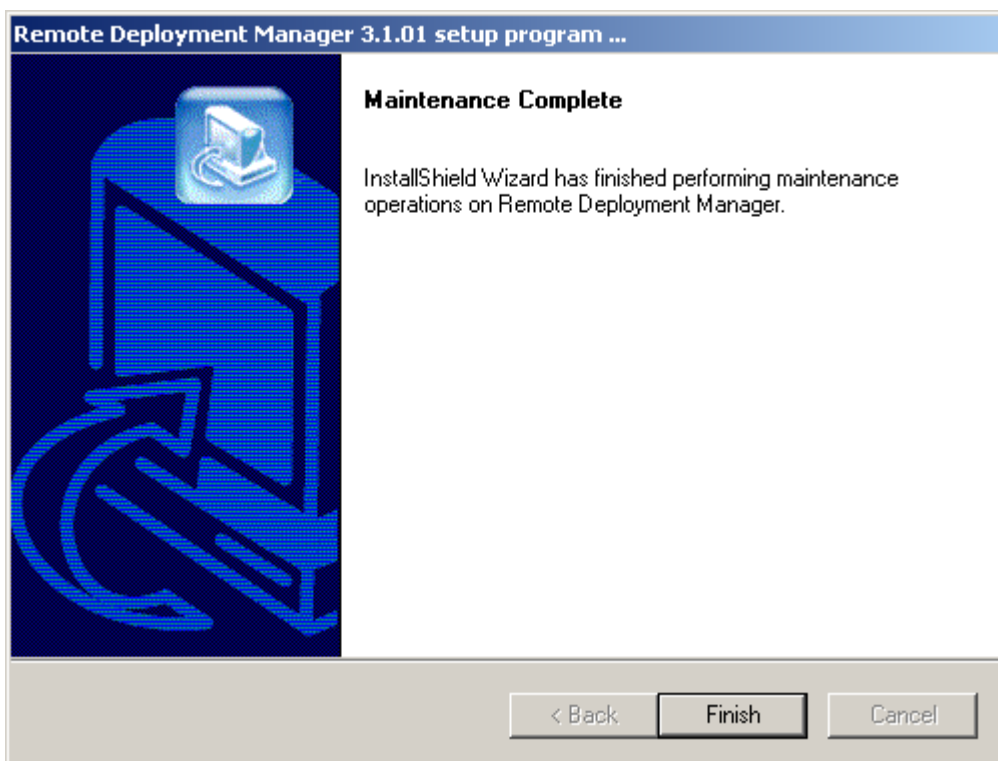
Note: When you have uninstalled RDM you may find that the program is still listed when you select **programs** from the start menu. This may happen occasionally if a previous RDM installation did not complete a successful installation.

Removing Redundant Files

To ensure that all redundant files are removed you can delete the following:

▶ The compressed RDM file that you downloaded from the World Wide Web.

▶ Any remaining files in the `<drive>:\RDM` and `<drive>:\IBMTCPIP` directories.

IMPORTANT: Ensure that you remove all RDM's user accounts from Windows NT 4.0's User Manager as they will no longer be required. This will ensure that systems will be numbered consecutively in any future installations of RDM.

2.13 Performing a Silent Install

To run a silent install of RDM you must extract the installation files from the **RDM3101.EXE** file that you downloaded from the RDM home page, configure a setup.iss file, and run the silent install command.

IMPORTANT: Silent install only supports a new installation. It does not support an update from RDM 3.1.

To extract the installation files, you can use one of the following methods:

▶ If you have WinZip installed, right-click **RDM3101I.EXE** and choose "**Extract to …**". Save the directory `Disk1` in the location of your choice.

► If you don't have WinZip installed, run **RDM3101I.EXE**. The Installation program will begin and the Welcome window will be displayed.
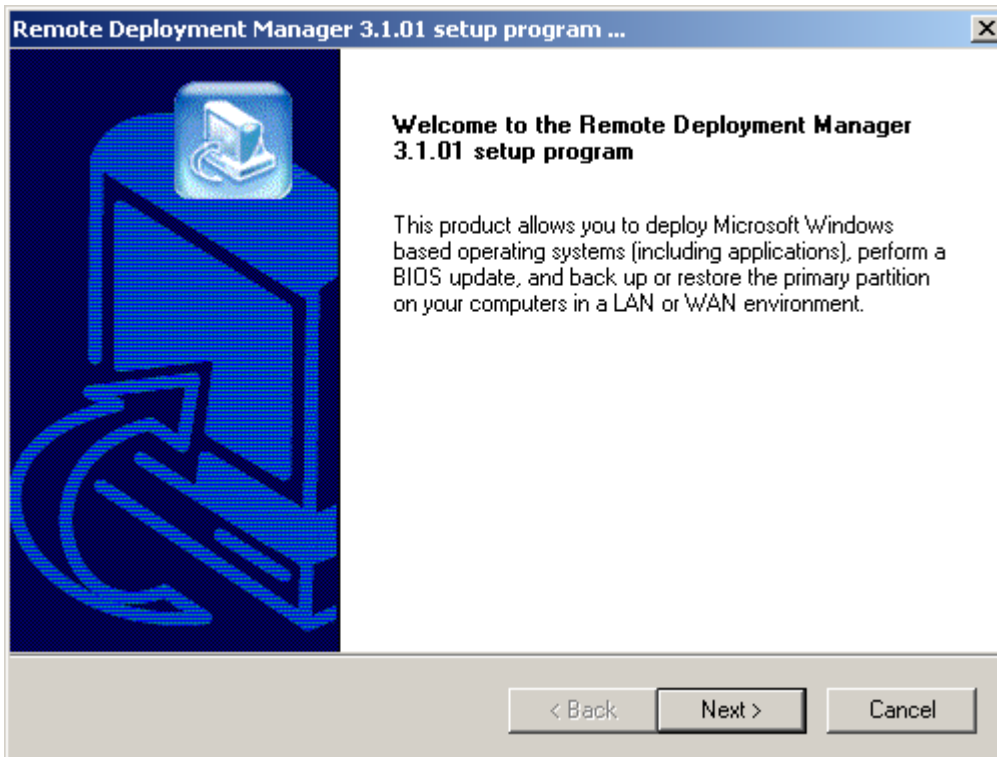
Open Windows Explorer and locate the `Disk1` directory (it will be in the directory pointed to by the TMP environment variable). Copy the `Disk1` directory to the location of your choice. Then, exit the RDM InstallShield program by clicking the **Cancel** button. Confirm the exit by clicking **Yes**.

Note: If you're running NT 4.0 Server, you will find the `Disk1` directory in the `C:\Temp` directory. If you're running Windows 2000 Server or Advanced Server, you will find it in the `C:\Document and Settings\<user name>\Local Settings\Temp\<wXyZ>~tmp directory`, where <wXyZ> stands for 4 random characters.

Now that the installation files are extracted, you need to create a setup.iss file that is appropriate for your environment. You can use one of the following methods:

► Modify the setup.iss file included in the `Disk1` directory. See the comments in this file for a detailed description. Some parameter values that you might want to change are:

  ▪ The hostname.

  ▪ The name of the primary user of RDM.

  ▪ The name of your company.

  ▪ The drive where the \RDM and \IBMTCPIP directories will be installed.

  ▪ The components to be installed, e.g. remote share point and console.

  ▪ For a Backup Domain Controller on NT 4.0 Server, the user account name.

► Run `setup -r` from the command line. The executable setup.exe is located in the `Disk1` directory. This will create an InstallShield response file named setup.iss in the `c:\winnt` directory. For more information on the setup command, see various articles on silent installation at http://support.installshield.com/.

Now you are ready to run the silent install command. From a command window go to your `Disk1` directory, and enter `setup.exe -s -f1<path>\setup.iss`

After the installation finishes, make sure you proceed with step 5 on page 17 to configure the DHCP manager, configure routers, and so forth.

2.14 Migration

If you need to move the RDM 3.2 server functionality to a new system, you can easily accomplish this by running the install program. You can migrate RDM to any other server running Windows NT 4.0, Windows 2000 Server, or Windows 2000 Advanced Server.

To start the migration process, go to your new system and run the install as described in section 2.4, "Install RDM 3.". In steps 8 and 9 you will be asked to locate the old RDM server. The RDM installation program will copy the necessary files to your new server, including system information, the software profiles, and all image files.

After the installation finishes, you should remember to power off the old RDM server system so that it will not to interfere with the newly installed system. Also, make sure you proceed with step 5 on page 17 to reconfigure the DHCP manager, routers, and so forth.

When you migrate from an NT 4.0 BDC to another BDC in the same domain, you must remember you are now sharing the same user accounts that the previous RDM server created on the PDC. If you were to remove the old RDM install, these user accounts will be removed along with everything else RDM created. To recover from this problem, you must run LCCMPREP.EXE on the PDC to recreate the user accounts for you.

Note: During migration, the contents of the `<drive>:\RDM\CLNTFILE` as well as the profiles and systems database are copied to the new machine. Make sure that the hard drive on the new machine has sufficient space. Generally, 2 to 4 GB hard drive space is recommended.

2.15 Upgrading Deploy Center

RDM 3.1 introduced clone profiles using the Deploy Center functionality provided by PowerQuest. This function continues in RDM 3.2. This Deploy Center functionality, which is used by the built-in profile Deploy Center, is used to create the clone image. In addition, this functionality is used during Power Restore to create backup images.

The Deploy Center functionality provided with RDM is a Lite version. It is possible to upgrade to the full version of Deploy Center, which provides, among other features, better data compression, and no limits on partition resizing or the number of partitions to image. You must use Deploy Center 5.01, build ImgCtr501.1.xxx. To find out if you already own the right version of Deploy Center, check the `ReadMe.txt` file that is located in the main installation directory.

To register Deploy Center Lite and find out more about the full version of Deploy Center, go to the **Help** menu on the **Installation/Maintenance** window and select **Register PowerQuest Components**.

Note: RDM users are licensed to use the Deploy Center Lite version that is included in RDM. In order to use the full version of Deploy Center with RDM, you must have a license for each system that uses the Deploy Center functionality. This includes the RDM server, each system that uses Power Restore, and each system that you deploy via clone install using Deploy Center.

After installing the full version of Deploy Center 5.01, build ImgCtr501.1.xxx, you must update the RDM server and the systems that use Power Restore to ensure that the full version is being deployed.

To update the RDM server:

1. Open the folder where Deploy Center is installed. The default location is `<drive>:\Program Files\PowerQuest\DeployCenter 5.0`.

2. Change directory to `TSKBUILD\Bin`.

3. Copy `PQIMGCTR.EXE` and `PQDPLCTR.RTC` to `<drive>:\RDM\CLNTFILE\PQID`. Assuming that both RDM and Deploy Center are installed in their default locations, the following two command lines can be executed to properly copy these files:

   ```
   copy "C:\Program Files\PowerQuest\DeployCenter
   5.0\TSLBUILD\Bin\PQIMGCTR.EXE" C:\RDM\CLNTFILE\PQID
   ```

   ```
   copy "C:\Program Files\PowerQuest\DeployCenter
   5.0\TSLBUILD\Bin\PQDPLCTR.RTC" C:\RDM\CLNTFILE\PQID
   ```

4. Create a temporary folder, such as `C:\FULL`.

5. Copy the `PKZIP25.EXE` file from `<drive>:\RDM` into the temporary folder.

6. Copy the `PQDIL.EXE`, `PQIMGCTR.EXE`, and `PQDPLCTR.RTC` files from the `<drive>:\RDM\CLNTFILE\PQID` folder into the temporary folder.

7. Open up a DOS command window and move the focus to the temporary folder.

8. Run the following commands:

   ```
   pkzip25.exe -del pqdil.exe pqidplyz.exe pqidplyz.rtc
   ```

   ```
   pkzip25.exe -add pqdil.exe pqimgctr.exe pqdplctr.rtc
   ```

9. Close the DOS command window.

10. Copy the file `PQDIL.EXE` from the temporary folder into the `<drive>:\RDM\CLNTFILE\PQID` folder, overwriting the old version of the file.

Note: The file `PQIMGCTR.EXE` is located in several places within the Deploy Center installation folder. The correct executable will be approximately 970K.

Systems that have Power Restore backup partitions, have the Lite version of Deploy Center installed locally. You must upgrade each system to ensure that the full version is now being used:

1. On the **Installation/Maintenance** window, double-click the system to open the Individual System Details notebook.

2. Click the **Maintenance** tab.

3. At the option "Run Maintenance file", click **Browse**.

4. Double-click the `PQID` folder, then choose `FULLIC.MNS` and click **OK**.

5. Ensure the checkbox next to "Run Maintenance file" is checked.

6. Click **OK** in the Individual System Details notebook.

7. Click **Process** to run the maintenance file on the system.

Alternatively, you can update a system locally:

1. Copy the files `PQIMGCTR.EXE` and `PQDPLCTR.RTC` from `<drive>:\RDM\CLNTFILE\PQID` on the RDM server to `<drive>:\RDM \CLNTFILE\Diskettes\FULLIC`.

2. Create a boot diskette.

3. Copy all files from `<drive>:\RDM \CLNTFILE\Diskettes\FULLIC` to the boot diskette.

4. (Optional) If you are making a bootable CD, use software that supports the creation of a bootable CD based on the diskette you just created.

5. On the system, make sure that the startup sequence is set to booting from diskette or CD (whatever is applicable). For details, see "Startup Sequences on the System" on page 186.

6. Power on or reboot the system from the boot diskette. The diskette should automatically perform the necessary steps to add `PQIMGCTR.EXE` and `PQDPLCTR.RTC` to the Power Restore partition.

7. After the machine powers down, remove the diskette.

8. (Optional) Change the startup sequence back to the original configuration.

Chapter 3. An Overview of the Interface

This chapter gives you an overview of the RDM Console. If you are new to RDM, it will be easiest if you use the RDM console to follow along with the instructions. You can also use this chapter as a reference to find where the various parameters are stored and can be configured.

3.1 Starting RDM

The following procedure is for starting RDM from the computer on which it was installed. Make sure that you are logged on to the network (at the RDM console) as an administrator or equivalent.

To start RDM:

1. Click the **Start** button on the Windows task bar.

2. Select **Programs**.

3. Select the **Remote Deployment Manager 3.2** folder.

4. Select **Remote Deployment Manager**.

5. The **Initialization** window will appear. Choose the name of the RDM server that you are going to use. If you always use the same RDM server, you can select the RDM server once and uncheck the checkbox "Show this dialog at startup?". Click **OK** to continue.
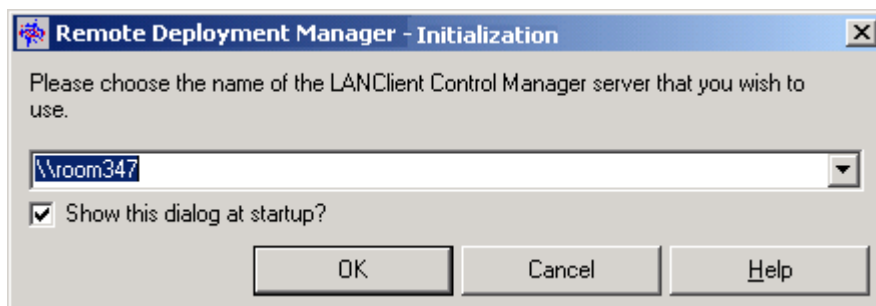
6. The RDM informational window appears. If you prefer, you can uncheck the checkbox that ensures that this window is displayed each time RDM is started. Click **OK** to continue.

Note: If you unchecked either window at an earlier point, but want to have it appear again during startup, go to the **Options** menu on the Installation/Maintenance console, and check the "Show Server List at Startup" or "Show about at Startup" option.

3.2 Installation/Maintenance Window

The Installation/Maintenance window is RDM's main window. Using the buttons in this window, you can scan for new systems, assign and de-assign systems to and from specific profiles, create PowerQuest clone images, and process system updates. The menu at the top of the window provides access to all other functions within the program.

You can use the mouse or keyboard (Alt key, Arrow keys, Tab key, Enter key, etc.) when moving within the Installation/Maintenance window and other windows of the program and when selecting items on the screen.

By clicking the **Process** button, you save new information and either process the systems immediately or initiate the Scheduler. Initiating the scheduler starts the system update at a scheduled day and time. For more information on the Scheduler, see "Individual System Details – Scheduler Tab" on page 89.

The following illustration shows the Installation/Maintenance window. When you first start RDM, you will not see new systems until you add them to the database. For more information, see "Scanning Systems" on page 91. You must also create software profiles before you can assign systems. For more information, see "Creating a Software Profile" on page 97.
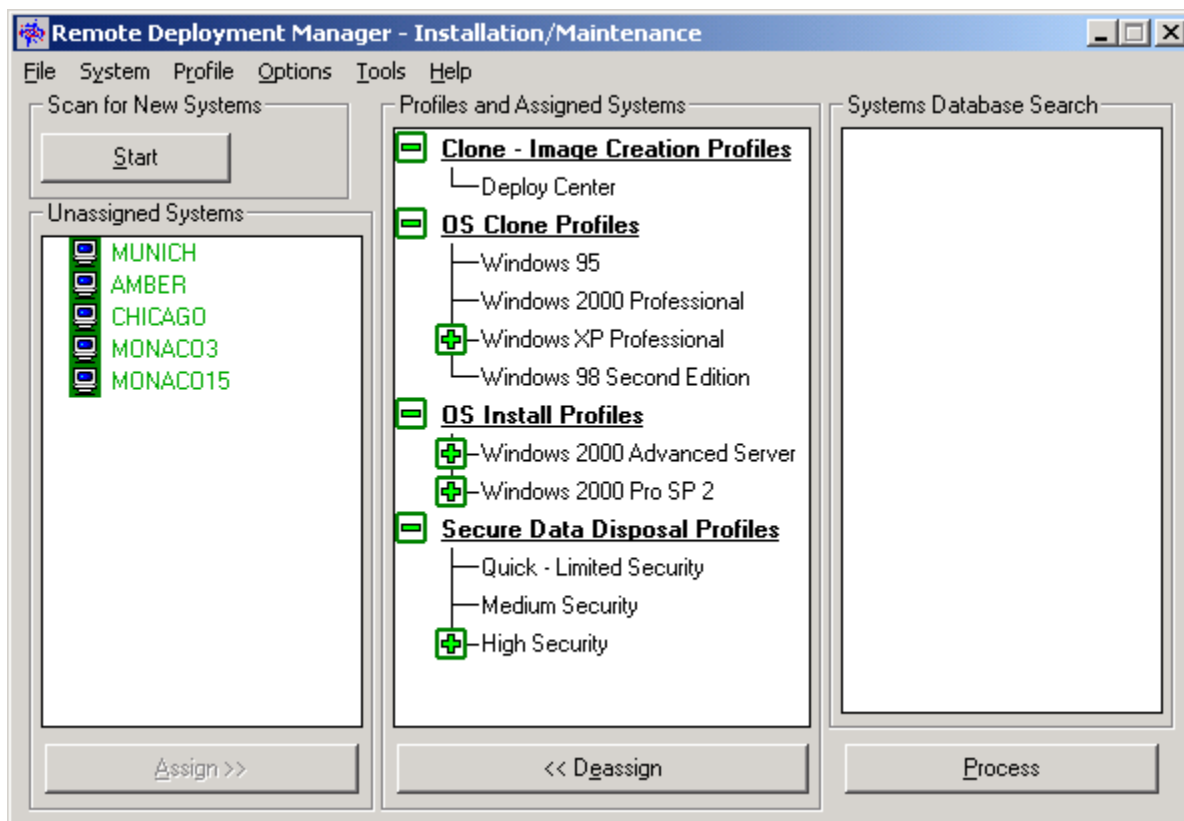
Selecting Systems

You can select one system or multiple systems before performing a procedure in the Installation/Maintenance window. Systems can be selected in one of three ways:

▶ To select one system, click the system using the primary mouse button.

▶ To select multiple systems, press and hold the CTRL key, click the individual systems using the primary mouse button, and release the CTRL key. Subsequent single clicks on individual systems while holding the CTRL key down toggle the selection state of that system.

▶ To select a contiguous group of systems, click the first system in the group, hold the shift key, and then click the last system in the group. All systems between the two that you click are selected.

Recognizing Systems within the Interface

If you are using a color monitor, you might notice that systems are displayed with different colors. The color of a system indicates specific qualities about the system:

▶ Green indicates that the system matches the minimum hardware requirements for the profile to which the system has been assigned.

- ► Gray indicates that the system currently has PXE disabled.
- ► Blue (background) indicates that the system is selected.
- ► Red indicates that the system may not match the minimum hardware requirements of the profile to which the system has been assigned. Mismatch problems might prevent the system from functioning correctly.

To show configuration mismatches:

1. Select a system shown in red within the Profiles and Assigned Systems column.
2. Select **System** from the menu.
3. Select **Show Mismatch**.

Details of the mismatch appear as part of the tree underneath the selected system. This function works on individual systems only. You cannot show mismatches for a group of systems.

3.3 RDM Processing

Changes made within RDM are saved in a temporary database until you click the **Process** button. This enables you to set up multiple changes before starting to process them:

- ► **Immediate changes**. Click the **Process** button to begin processing the changes. Once you select the **Process** button, the changes are saved to the RDM database and the processing begins. The Progress and Errors window opens and displays all jobs currently in the processing queue and their associated status.

- ► **Scheduled changes**. Once you click the **Process** button, the changes are processed when the scheduled time arrives. The Progress and Errors window opens and displays all scheduled jobs currently in the processing queue, including the day and time that the scheduled event will occur.

  Note: After setting a scheduled change and clicking on the **Process** button, you must leave your administrator console powered on and RDM running in order for the scheduled event to take place.

- ► **Upon Exiting**. When you attempt to exit from RDM and there are any processing changes in process or in the processing queue, an exit message window will display giving you the opportunity to save and process these changes before exiting.

Debugging Errors

Error codes can be returned by any process within the batch file being executed, or by any CMOS or BIOS process being run. RDM cannot keep a list of meanings and actions for any external program error messages. This is because the messages are dependent on the program that has returned them. If an error message has been returned:

- ► **By an image batch file for image installation**. A good way to debug is to step through the system batch files, one statement at a time. The easiest way to do this is to press the system's **F8** key as soon as the "Booting PC DOS" message appears on the system's monitor. Then, press the "**Y**" key to execute each statement. When you get to the statement concerning the error, you can analyze the problem.

  Another technique is to add a "ctty con" statement to the beginning of your image batch file and a "pause" statement after each line. Then, run the image batch file on a donor computer until you find the error. Check the error code against the appropriate documentation for the program in the image batch file that is not working. Correct the error and click the **Process** button again. In general, if you detect an error in a batch file, it is best to run through the batch file until it is completed rather than

breaking out of the batch file. You must remember to remove the "ctty con" and "pause" statements after correcting the batch file.

▶ **By a BIOS upgrade procedure or CMOS upgrade procedure**. On the original BIOS flash diskette, or in the directory containing the BIOS image, you will find a help file containing the error codes and a description of each error. Alternatively, after setting the diskette or BIOS-image directory as your default, you can type CMOSUTIL /? and click **Enter**. The directory containing the BIOS image is <drive>:\RDM\CLNTFILE\BIOS\BIOS_Flash_Name.

Progress and Errors Window

The Progress and Errors Window displays each time you click the **Process** button. Processing changes can occur immediately after you click the **Process** button or can be on a delayed schedule. An example of the Progress and Errors Window is shown below.
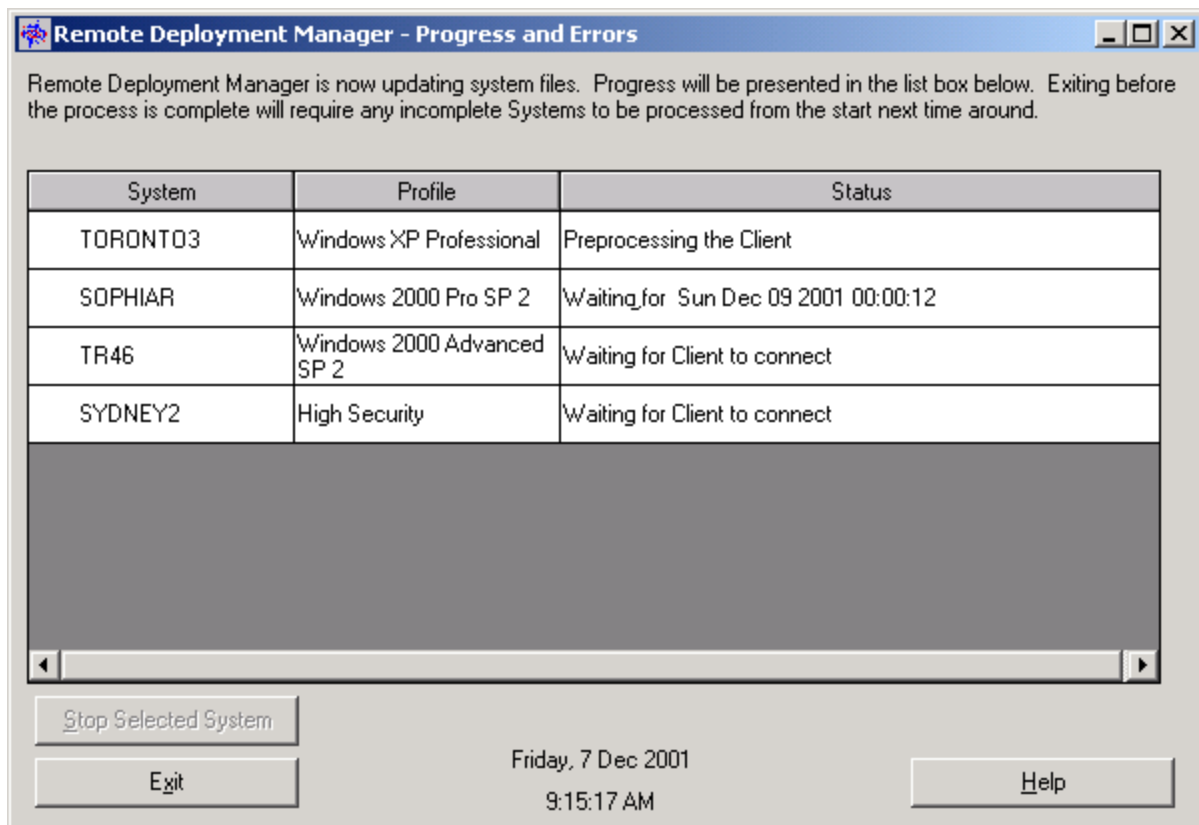
There are three columns of information within the Progress and Errors Window.

▶ **System**. This lists the name that is assigned to each system.

▶ **Profile**. This lists the software profile assigned to each system.

▶ **Status**. The Status column indicates whether the system is waiting, scheduled, processing, or completed. Error codes are also returned to the Status column, if there has been a failure.

During processing one of two icons can appear to the left of the systems column:

▶ **Black checkmark**. This indicates that a process has completed successfully, and an accompanying message will be displayed in the status column.

▶ **Red X**. This indicates that an error condition has occurred, details of this error condition will be displayed in the status column.

While the changes are processing, you can stop the processing of specific systems, or view the Individual System Details notebook or Software Profile Details notebook for one system or software profile.

To stop the processing of specific systems:

1. Select the specific system in the system column.

2. Click the **Stop Selected System** button to stop processing.

To view the Individual System Details notebook or Software Profile Details notebook for one system or software profile while processing of that system is in progress:

1. Click the Installation/Maintenance window to make it the active window.

2. Double-click a single software profile or system listed in the Profiles and Assigned Systems column.

Note: During processing, all changing of the Individual System and Software Profile Details notebooks is disabled. It is not possible to view all parameters on the Parameters tab or System Parms tab (Software Profile Details notebook only) using the backward and forward arrow buttons because these functions are disabled.

To view parameters on the Parameters tab of the Individual System Details notebook or Software Profile Details notebook:

1. Click the Installation/Maintenance window to make it the active window.

2. Double-click a single system or software profile listed in the Profiles and Assigned Systems column.

3. On double-clicking a system that is currently being processed, you may be presented with a dialog box, which states "One or more selected systems are currently being processed and cannot be configured, assigned, de-assigned or deleted. They can only be viewed individually at this time." Click **OK** to continue.

   OR

   On double-clicking a software profile that is currently being processed, you may be presented with a dialog box that states "One or more systems are assigned to the selected profile currently being processed. This profile cannot be configured or deleted, but it can be viewed at this time." Click **OK** to continue.

4. Click the **Parameters** tab, if it is not already visible.

5. Click the forward or backward arrow button to scroll to the set of parameters you want to view for the system being processed.

6. Click **OK** to close the details notebook of the system or software profile that is not currently being processed.

To view parameters on the System Parms tab of the Software Profile Details notebook:

1. Click the Installation/Maintenance window to make it the active window.

2. Double-click a single profile listed in the Profiles and Assigned Systems column.

3. You may be presented with a dialog box, which states "One or more systems are assigned to the selected profile currently being processed. This profile cannot be configured or deleted, but it can be viewed at this time." Click **OK** to continue.

4. Click the **System Parms** tab, if it is not already visible.

5. Click the forward or backward arrow button to scroll to the set of parameters you want to view for the profile currently being processed.

6. Click **OK** to close the Details notebook of the profile not currently being processed.

3.4 Exiting RDM

To exit from the program:

1. Select **File** from the Installation/Maintenance window.

2. Select **Exit**. If no details have changed, RDM automatically closes.

3. If details have changed but have not been processed, the following message window displays:
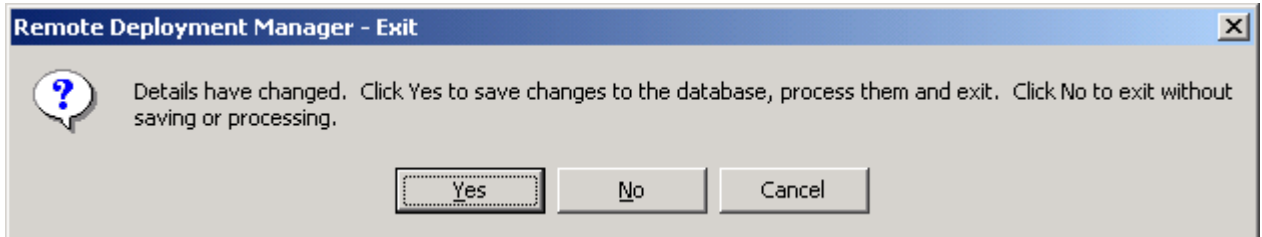
- Select **Yes** to save and begin processing the changes. The Progress and Errors Window displays. While this process is running, you can perform no other action within the program.

- Select **No** to discard all changes that have been made. Any changes that were in the processing queue, including repeat events, will have to be reentered after restarting the program.

- Select **Cancel** to return to the Installation/Maintenance window. No processing takes place.

3.5 Defaults Notebook

To change the default settings of RDM, you must access the Defaults notebook:

1. Select **Options** from the menu of the Installation/Maintenance window.

2. Select **Remote Deployment Manager Defaults**.

The Defaults notebook has four tabs:

- ▶ **General**. This page contains information about the BIOS administrator password, the system naming scheme, and the remote boot server name.

- ▶ **Processing**. This page contains information about the remote boot process, the text editor, and the system restart function.

- ▶ **Scan**. This page contains information about the optional user prompts that appear each time that the scan process discovers a system.

- ▶ **Scheduler**. This page contains information about how and when changes are processed.

To change to another page, click the tab with the name of the information you want to view or change. The four tabs and associated options are explained below.

Note: Some settings within the Defaults notebook are overridden by settings in the Individual System Details notebook. For more information, see "Individual System Details Notebook" on page 81.

Defaults - General Tab

▶ **BIOS Admin password**. The default value, if specified, is assigned to all new systems during the scan process. If the field is left blank, no password will be set. If a default password is set, it is assigned to new systems when you scan them in. The default password is then applied to all new systems when the **Process** button is clicked to process immediate changes or when scheduled jobs reach their set time on the processing queue. For more information, see "Managing BIOS/CMOS Settings" on page 155.

▶ **Default System name**. Every system managed by RDM must be allocated a name that is unique on the network. When the scan process generates systems, a name is automatically allocated. This name consists of the default system name base followed by an automatically generated number. The default system name base is an alphanumeric string with a maximum of seven characters. The string must start with an alpha character. The actual system name generated is the name base followed by a decimal number from 1 to 9999. You can change the system name base if the default is not suitable.

▶ **Default Server name**. This is the name of the RDM server that controls the remote boot process for your systems. Anyone using RDM must have administrator access privileges to this server. The default value is set during the installation of RDM. A single backslash, double backslash, or no backslash might precede the server name. Changing the server name has no effect until you stop and restart RDM.

▶ **Default IP broadcast address for Wake on LAN**. This field is the default IP address used to send wake-up frames to any system that does not have a wake-up address automatically configured. Valid IP broadcast addresses must be entered before RDM can awaken systems. It may be overridden by the IP broadcast address for Wake on LAN that is available on the Individual System Details – Hardware Tab page (see page 83).

The wake-up address must be configured so that wake-up frames are sent as MAC level broadcast packets on the LAN to which the system is attached. Wake-up frames are sent by the console, not

by the server. This configuration is therefore especially important if you are using a remote console.
The IP broadcast address for a subnet can be calculated using this formula:

```
( SM AND IP ) OR ( SM XOR A )
```

where

SM   is the subnet mask

IP   is the IP address of a system on that subnet

A   is 0xFFFFFFFF

For example, if

```
SM = 255.255.240.0 (dotted decimal) or 0xFFFFF000 (hexadecimal)

IP = 10.5.0.44 (dotted decimal) or 0x0A05002C (hexadecimal)
```

then

```
IP broadcast address =

( 0xFFFFF000 AND 0x0A05002C ) OR ( 0xFFFFF000 XOR 0xFFFFFFFF ) =

( 0x0A050000 ) OR ( 0x00000FFF ) =

0x0A050FFF (hexadecimal) or 10.5.15.255 (dotted decimal)
```

Defaults - Processing Tab
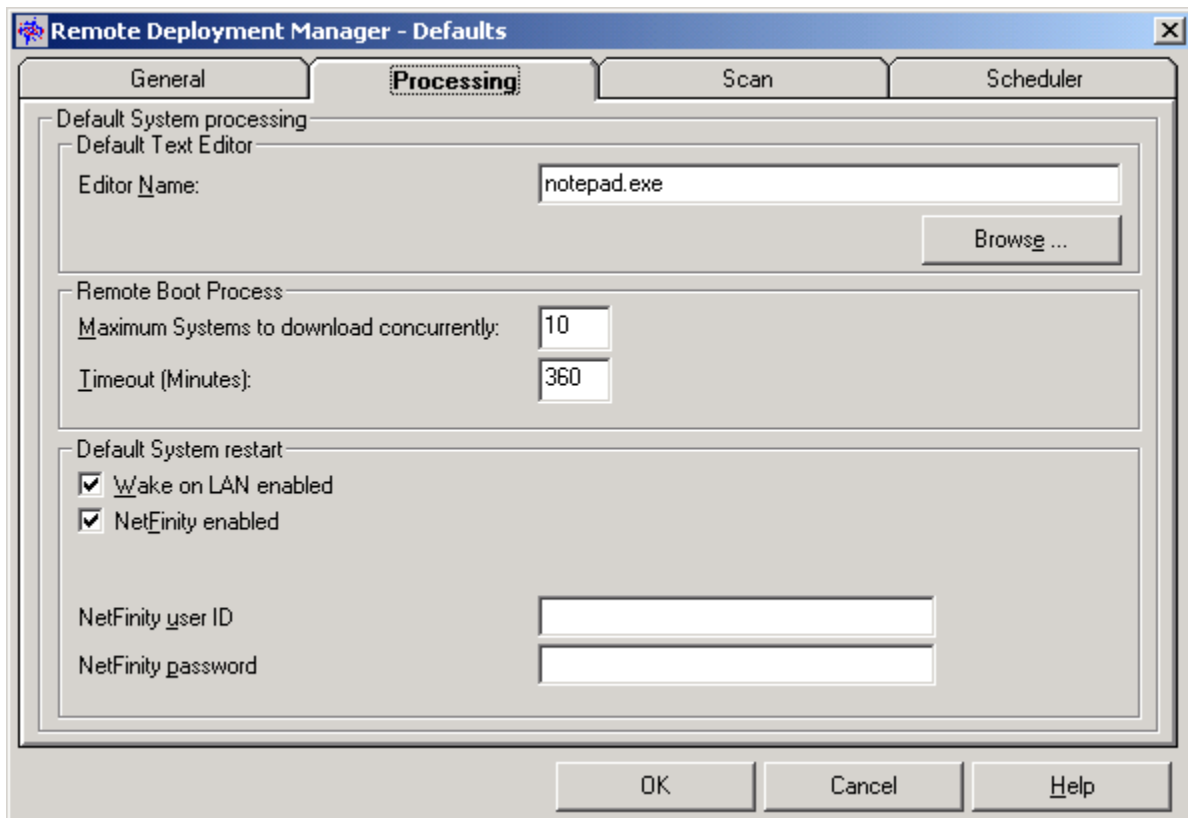
▶ **Default Text Editor**. You can specify the editor you want to use when editing files within RDM. Use the **Browse** button to locate the editor of your choice, or enter the name (path and file name) directly into the space provided.

▶ **Remote Boot Process**. Use the following fields to set limits for the remote boot process:

- **Maximum Systems to download concurrently.** This setting limits the number of systems that can download remote boot images at the same time. For example, if you specify 10 for this limit, and if more than 10 systems try to perform a remote boot download at the same time, all the downloads will work, but only 10 will actively transfer images over the network at the same time. When the first one completes, the eleventh will start, and so on until they have all been loaded. The purpose is to prevent excessive load on the network and the server. The optimum setting depends on many aspects of network setup, tuning, and loading.

  This setting should normally be a number between 1 and 10. However, you can override this to allow a higher number (up to 150) by creating a text file named `<drive>:\RDM\LCCM.INI` that contains the line:

  `PROCESSCONCURRENT=n`

  where n is an integer no larger than 150.

  Note: This setting affects only the number of concurrent downloads and not the number of systems that can operate in remote boot mode once download is complete.

- **Timeout (Minutes)**. This setting specifies the time limit to wait for processing to complete for each system. If the remote boot download is not completed in the specified time, an error message is returned and processing stops.

-

▶ **Default System restart**. Use the following fields to record restart options:

- **Wake on LAN enabled**. Systems that are powered off can be powered on by RDM. To power on systems, RDM sends a wake-up packet containing the media access control (MAC) address of the system in seven-second intervals across the network. When the network adapter of the system detects this packet, it powers on the system.

  Note: Some network adapter and computer manufacturers might also refer to the MAC address as the Universally Administered Address (UAA), the Network Interface Card (NIC) address, or the network address.

- **Netfinity enabled**. RDM can use the functions of IBM Netfinity Manager to remotely shut down and restart systems before processing changes. If you have IBM Netfinity Manager installed on your server, check this box to enable its functions. For details on alternative methods of shutting down and restarting systems see the Forced Shutdown section of "Individual System Details – Scheduler Tab" on page 89.

- **Netfinity user ID**. If you are using IBM Netfinity Manager, enter the IBM Netfinity Manager user ID here to enable RDM to issue IBM Netfinity Manager commands, without being prompted for a logon.

- **Netfinity password**. Enter your password for IBM Netfinity Manager here.

Defaults - Scan Tab

This page has the follow values:

▶ **User Prompt Screen at System**. You can set RDM to ask specific questions of the end user or installer at each system. These questions are asked on-screen at every new system detected by the scan process. Displaying questions during the scan operation is optional and only occurs if these questions are entered on this page. You can ask any question you want. That is, their actual meanings and uses are completely up to the RDM administrator. The answers are saved on the Details page of the Individual System Details notebook. They can be viewed, edited, and used as the value to display in lists of systems. If you do not specify any user prompts, the scan process completes without end-user input, and the values in the Individual System Details notebook are left blank, except in the case where your system has these values in its AssetID chip (see below):

- Contact.

- Location.

- Comments.

- **User Prompt Timeout (Minutes)**. You can also specify the timeout period for the end-user response. This is the number of minutes that the scan process will wait for each prompt to be answered. If no input is entered, the scan process completes, leaving the information blank. If no timeout is specified, the scan process waits indefinitely for input.

▶ **Automatically Assign and Process Newly Scanned Systems**. Enable this option if your systems contain Radio Frequency Identification (RFID) chips and are Asset Information Area (AIA) enabled. For more information on this function, see "Managing AIA-enabled Systems" on page 183.

Defaults - Scheduler Tab
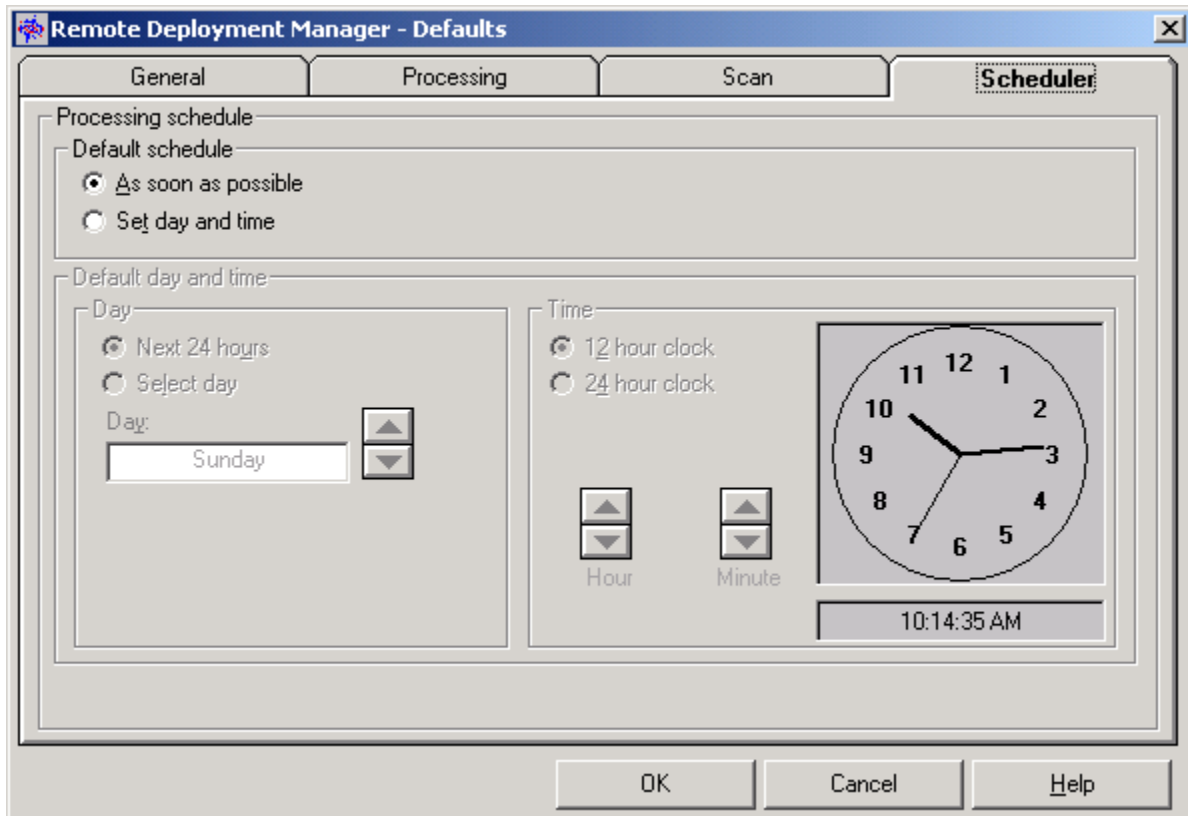
In the Defaults notebook on the Scheduler page, you can specify the day and time that RDM begins processing the changes that have been requested. Please be aware of the following:

▶ The scheduler information in the Defaults notebook is overridden by the scheduler information in the Individual System Details notebook.

▶ Use the schedulers for the Defaults notebook and the Individual System Details notebook with care. For example, if you incorrectly set the Scheduler for 3 p.m. instead of 3 a.m., and specify the forced shutdown or restart operating system options in the System Details notebook Scheduler, the systems are immediately restarted in the middle of the working day. Also, if you set the Scheduler to update systems during an overnight process, be sure to warn end users who might be running overnight processing that their systems will be shut down at the specified time, and that any end-user processing jobs in progress at that time will be terminated.

The following options are available on this page:

▶ **Default schedule**:

    ▪ **As soon as possible**. If you select this button, the changes begin processing as soon as you click the **Process** button in the Installation/Maintenance window. This is the default setting.

    ▪ **Set day and time**. Setting day and time enables RDM to process the changes unattended, at the day and time of your choice.

> **Note**: If you use the Scheduler to set a specific day and time, you must still click the Process button and leave the program running for the scheduled changes to take place. Clicking the Process button places the scheduled changes in the processing queue of the Progress and Errors window. When the specific day and time arrives, the scheduled changes are processed.

▶ **Default day and time**. The day and time fields are available only if you have selected the **Set day and time** radio button. Select these fields using the following values:

    ▪ Day:

      − **Next 24 hours**. Processing takes place as soon as the specified time is reached, after the scheduled job has been placed in the processing queue.

      − **Select day**. Select from the dropdown list the desired day to process the changes. Processing takes place as soon as the specified day and time is reached after the scheduled job has been placed in the processing queue.

    ▪ Time:

      − **12-hour clock** displays a clock using the 12-hour format (a.m. and p.m.).

      − **24-hour clock** displays a clock using the 24-hour format.

      − **Hour** selects the hour using the up and down arrows.

      − **Minute** selects the minute using the up and down arrows.

      − **Clock face**. The clock face provides you with an alternative method of setting the time. Click the clock face hour hand with your left mouse button. With your finger on the left mouse button, drag the minute hand to the chosen time on a 12-hour clock. You can drag the hour and minute hands simultaneously with the right mouse button on a 24-hour clock face.

3.6 Software Profile Details Notebook

Information about each software profile is managed in the Software Profile Details notebook. This notebook is displayed when you edit configuration details of an existing software profile or when you manually create a new software profile. To alter the details in any software profile you must use the Software Profile Details notebook. If you amend any details in the software profiles created by the Profile Wizard, you must be certain that you have modified the appropriate RDM control files accordingly.

To access a Software Profile Details notebook, do one of the following:

▶ Double-click an existing software profile within the Installation/Maintenance window.

▶ Select an existing software profile within the Installation/Maintenance window. From the menu, click **Profile**, then **Configure**.

The Software Profile Details notebook has the following tabs:

- ▶ **Details**. This page contains the profile name, profile type, and a description of the software.

- ▶ **Minimum HW**. This page contains information about the hardware required for the specific software profile.

- ▶ **Software**. This page contains fields that identify the image to be downloaded to systems.

- ▶ **Parameters**. This page contains information about parameters that are common for all systems assigned to the software profile.

- ▶ **System Parms**. This page contains information about parameters that are unique to individual systems assigned to the software profile.

Software Profile Details – Details Tab

The Details page contains the following fields:

- ▶ **Name**. The name of each software profile must be unique. Give the profile a descriptive name that identifies the group of systems for which it is intended or the job the profile is designed to do.

- ▶ **Type**:
  - ▪ **Operating System Clone**. Select this button if the profile will be used to perform a clone image installation.
  - ▪ **Operating System Install**. Select this button if the profile will be used to perform an unattended installation.

- ▶ **Description**. Use this space to write a description of the software profile.

Note: You will not be able to scroll this window during processing when a system assigned to this profile is being deployed. Wait until the system completes deploying.

- ► **Enable System Assignment Wizard**. For the wizard to start automatically when a system is assigned to a particular software profile, this box must be checked. For more details, see "Customizing Systems Using the System Assignment Wizard" on page 131.

- ► **Power Restore – backup partition**. Check this box to enable a Power Restore backup. For more details, see "Managing Power Restore Hard Drive Partitions" on page 162.

- ► **Operating System**. The operating system to be installed, including the operating system's language, will be displayed.

Software Profile Details – Minimum HW Tab

The Minimum HW page contains the following fields:

- ► **Network Adapter**. Select a network adapter from the drop-down list. If your adapter is not on the list, or if the systems assigned to this profile will be using a variety of network adapters, choose **Any Adapter – Don't Care**. This setting allows the image to be installed on any system.

- ► **Video Chipset**. Select a video chipset from the drop-down list available. If your video chipset is not on the list, or if the systems assigned to this profile are using a variety of video chipsets, choose **Any Video – Don't Care**. This setting allows the image to be installed on any system.

- ► **RAM**. Enter the minimum amount of random access memory required to download and use the software controlled by this profile. If you enter a value of zero, RDM ignores the minimum RAM requirements. The memory specified is in units of 1,048,576 bytes.

- ► **Hard Disk**. Enter the minimum amount of hard disk space required to download and use software controlled by this profile. If you enter a value of zero, RDM ignores the minimum hard disk requirements insofar as it will not declare a system to be mismatched with the profile if it has a small hard disk capacity. The hard disk space is specified in units of 1,000,000 bytes.

►   **RAID required**. Check this box to enable RAID. For more details, see "Profile Wizard - RAID Adapter Setup" on page 105.

Software Profile Details – Software Tab

The appearance of this screen is directly related to the type of process selected at **Software Profile Details – Details Tab**.

Operating System Clone
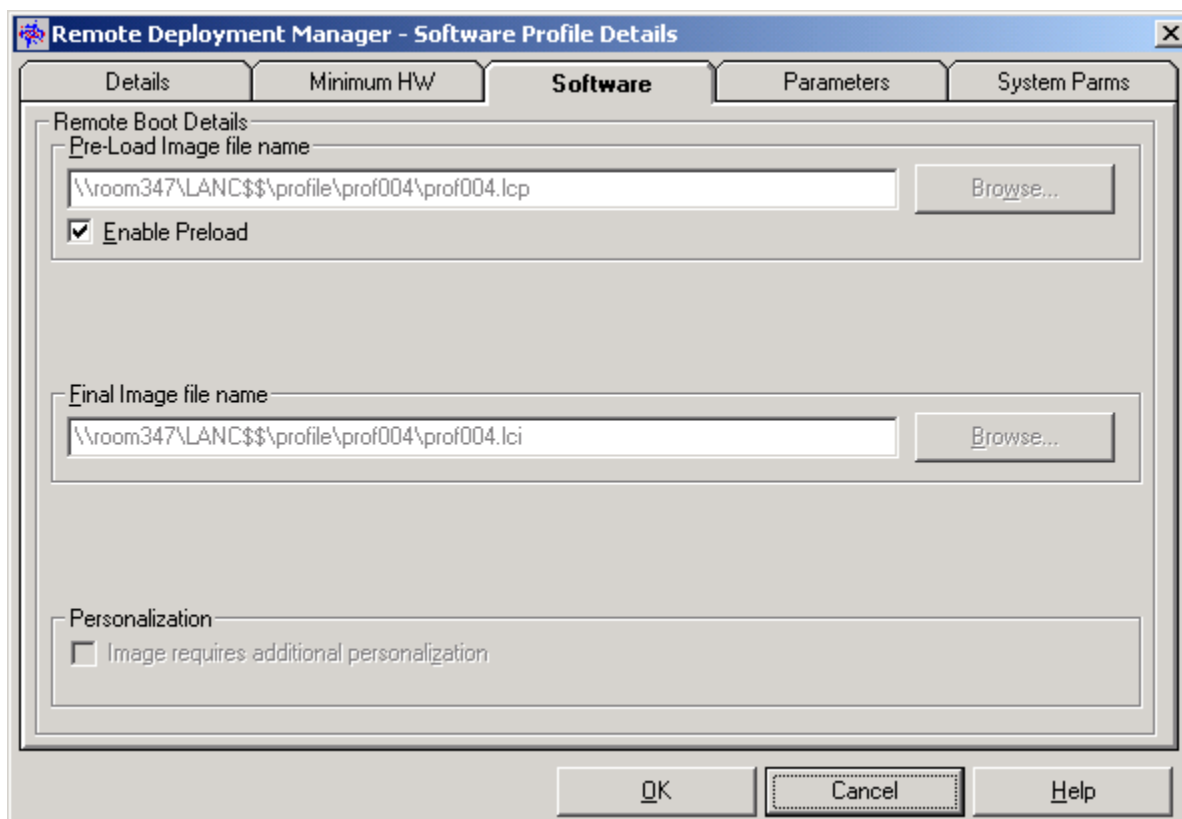
If you enabled the **Operating System Clone** radio button on the Details tab, the following options will be displayed:

►   **Preload Image file name**. Enter the path and name of your preload image batch file, or use the **Browse** button to locate the file. The file extension for preload image batch files is .LCP.

The preload image batch file specifies the actions to be performed at the system before downloading the final image. The preload image batch file is normally used to run FDISK on a new system. You must create the preload image batch file yourself. Multiple systems and multiple software profiles can use a single preload image batch file.

►   **Enable Preload**. Check this box to enable the specified preload image batch file to be downloaded to the system. Uncheck this box to disable the specified preload image batch file from being downloaded to the system.

►   **Final Image file name**. Enter the path and name of your final image batch file, or use the **Browse** button to locate the file. The file extension for final image batch files is .LCI. You can create the final image batch file yourself or use RDM's Profile Wizard to automatically create the file. For more information, see Chapter 4, "Working with RDM".

▶ **Personalization**. Check the **Image requires additional personalization** box if you want a personalization batch file to be included in your software profile. You will have to specify that file's name on the Software page of the Individual System Details window. For more details, see "Individual System Details – Software Tab" on page 85.

Operating System Install
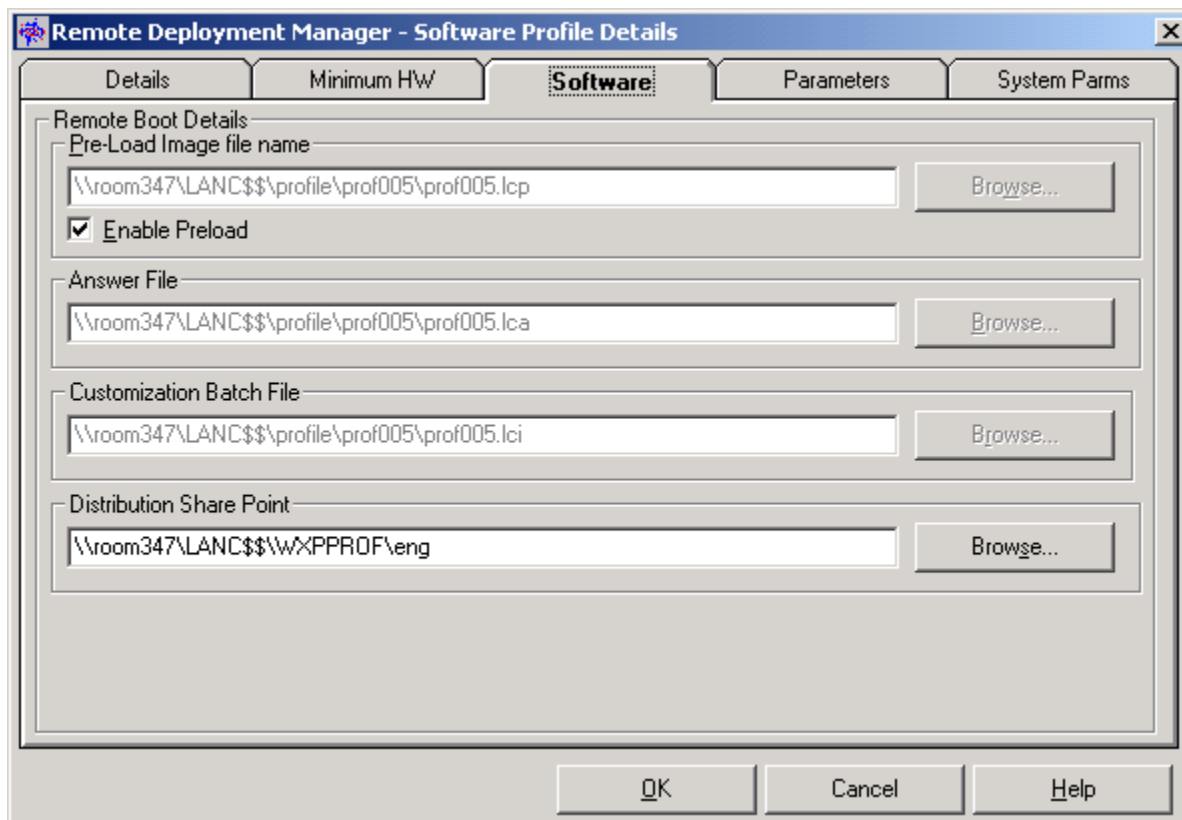
If you enabled the **Operating System Install** radio button on the Details page, the following options will be displayed:

▶ **Preload Image file name**. Enter the name and location of your preload image batch file, or use the **Browse** button to locate the file. The preload image batch file specifies the actions to be performed at the system before downloading the final image (typically, partitioning the hard drive). You can write the preload image batch file yourself to meet your specific requirements or use RDM's Profile Wizard to automatically create the file. A single preload image batch file can be used with multiple software profiles. The file extension for a preload image batch file is .LCP. For additional information, see "Preload Image Batch File" on page 275.

▶ **Answer File**. You can use the answer file to create a set of responses that will be passed to the Windows installation process to allow seamless unattended installation. A sample answer file (UNATTEND.TXT) is shipped with RDM.

▶ **Customization Batch File**. You can write the customization batch file yourself or use RDM's Profile Wizard to automatically create the file. It will run the program LCCUSTOM.EXE (see page 238). LCCUSTOM.EXE is a text-replacement utility that replaces parameters within the Answer file with values from the Parameters page of the Software Profile Details notebook and the System Parms page of the Individual System Details notebook.

▶ **Distribution Share Point**. The share point is the directory on the RDM server or remote share point, which contains the install image for an unattended install profile. The distribution share point is the directory where the installation files from the operating system's installation CD have been

copied. Each operating system supported will have it's own distribution share point. For details, see "Location of Unattended Install Directories" on page 188. For information on the use of a remote share point, see "Using Remote Share Points" on page 182.

Software Profile Details – Parameters Tab
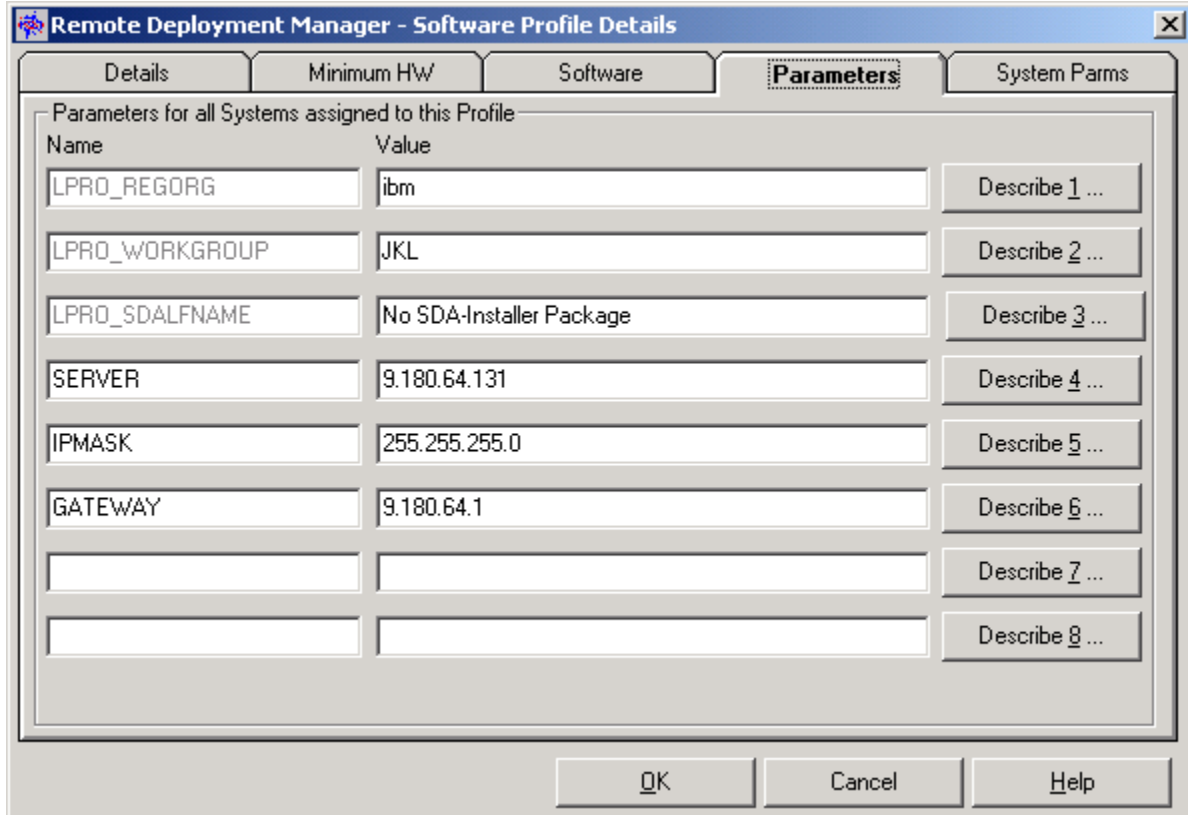
This tab specifies a group of named parameters that are passed to the final image batch file. The parameter values specified on this page are common for all systems using this profile. There are up to 24 possible parameter names and values available for each profile. Use the left and right arrows to navigate between the 3 pages of possible parameters. The parameters can be put in any order, and you can even leave intermittent blank entries, as the fields do not have to run contiguously.

Note: To define parameters whose values can be specified on a per-system basis, you must enter them in the System Parms page of this notebook. For more information, see "Software Profile Details – System Parms Tab" on page 79.

The following fields are available for this page:

► **Name**. You can specify up to 16 characters for the parameter name. The Name fields correspond to parameter names used in the final image batch files (.LCI files). In these batch files, the parameter names are always prefixed and suffixed by "%" sign. For example, in the illustration, the first parameter name, COMPANY, would be written in an image batch file as `%COMPANY%`.

► **Value**. You can specify up to 24 characters for the parameter value. This is the value that is passed to final image batch files for the parameter names specified in the corresponding Name field. In the illustration, "XYZ International" is returned as a value to a final image batch file that had a `%COMPANY%` parameter specified. Use RDM's LCCUSTOM.EXE or DEDITD.EXE utilities to perform this substitution.

- ▶ **Left and Right Arrow Buttons**. Click the right arrow button to show the next block of eight parameters, or the left arrow button to show the previous block of eight parameters. There are a total of 24 parameters available.

- ▶ **Describe**. When you click the button, a text-edit box pops up in which you can enter a parameter description. This description can be up to 127 characters long.

Note: If you use RDM's Profile Wizard to create your software profiles, the Profile Wizard will automatically make the correct entries into the Parameters page of your Software Profile Details notebook. These parameter names will be displayed as grayed-out entries and therefore cannot be edited, but you can change their values.

Software Profile Details – System Parms Tab

This page specifies a group of named parameters that are passed to remote boot final image batch (.LCI) files. The parameter specified on this page will have unique values for each system using this profile unless the default values are accepted. The following fields are available:

- ▶ **Name**. You can specify up to 16 characters for the parameter name. The Name fields correspond to parameter names used in the final image batch The names are also displayed on the Parameters page of the Individual System Details notebook, where unique values can be provided for each individual system.

- ▶ **Default Value**. The default values can be left blank because actual values will be defined in the Parameters page of the Individual System Details notebook. However, you can specify up to 24 characters for a default parameter value, which is displayed on the Parameters page of the Individual System Details notebook where it can be overwritten. Batch files that request system parameters take the values from the Parameters page of the Individual System Details notebook.

- ▶ **Left and Right Arrow Buttons**. Click the right arrow button to show the next block of eight parameters, or the left arrow button to show the previous block of eight parameters. There are a total of 24 parameters available.

- ▶ **Describe**. When you click this button, a text-edit box pops up in which you can enter a parameter description. This description can be up to 127 characters long.

Note: If you use RDM's Profile Wizard to create your software profiles, the Profile Wizard will automatically enter the correct parameters into the Systems Parms page of your Software Profile Details notebook. These parameter names will be displayed as grayed out entries and therefore cannot be edited, but you can change their values.

Parameter Conventions

Reserved Strings

The reserved character strings listed below are reserved for specific purposes when used as values in either the System Parms page of the Software Profile Details notebook or the Parameters page of the Individual System Details notebook. In the final image batch file, these strings pick up the values specified in the associated fields in the Details page of the Individual System Details notebook:

- ▶ `%CNAME%`. This character string yields the contents of the name field.

- ▶ `%CADDRESS%`. This character string yields the contents of the address field.

- ▶ `%CSERIAL%`. This character string yields the contents of the serial number field.

- ▶ `%LCCMCONTACT%`. This character string yields the contents of the contact field.

- ▶ `%LCCMLOCATION%`. This character string yields the contents of the location field.

- ▶ `%LCCMCOMMENTS%`. This character string yields the contents of the comments field.

LCCM Details

If you enter the string "`LCCMDETAILS`" (without the quotes) in a Name field in the Parameters page of the Software Profile Details notebook, then RDM will automatically create the following environment variable SET statements in the final image batch file IMAGE.BAT for your profile:

- ▶ `SET LCCMCONTACT=<system_contact_string>`

  where `system_contact_string` is the value taken from the Contact field in the Details page of the Individual System Details notebook.

- ▶ `SET LCCMLOCATION=<system_location_string>`

  where `system_location_string` is the value taken from the Location field in the Details page of the Individual System Details notebook.

- ▶ `SET LCCMCOMMENTS=<system_comments_string>`

  where `system_comments_string` is the value taken from the Comments field in the Details page of the Individual System Details notebook.

Note: RDM will remove "new line sequences" from the Contact, Location and Comments fields in the Details page of the Individual System Details notebook, prior to copying these to the associated SET statements.

Profile Wizard

The Profile Wizard automatically creates its own Profile and System Parameters denoted by the prefixes:

►   LPRO_

►   LCLI_

3.7 Individual System Details Notebook

Information about each system is managed from the Individual System Details notebook. This notebook displays when you edit configuration details of existing systems or create new systems without using the scan option.

To access the notebook for an existing system:

1. Select a system (or multiple systems) in the Installation/Maintenance window.

2. Select **System** from the menu.

3. Select **Configure**.

> **Note**: By selecting a single system, you can make changes for that system only. By selecting multiple systems, you make changes for all systems selected. When making changes for multiple systems, some fields are unavailable for editing. Fields unavailable for editing are grayed out.

To create a new Individual System Details notebook:

1. Select **System** from the menu bar.

2. Select **Create New**.

3. Fill in the appropriate fields on the notebook pages.

Note: You should never have to do this. It is much better to let the RDM scan function create your systems.

The Individual System Details notebook has the following tabs:

►   **Details**. You can use this page to view details about the system. For example: name, address, and serial number.

►   **Hardware**. You can use this page to view information about the system hardware.

►   **Software**. You can use this page to view details of the system's assignment to a software profile.

►   **Maintenance**. You can use this page to enter information about various maintenance procedures for the system, such as BIOS, CMOS, and administrator password updates.

►   **Parameters**. You can use this page to personalize information within a remote boot image for the system.

►   **Scheduler**. You can use this page to control when scheduled changes will take place for the system.

Individual System Details – Details Tab

The Details page of the Individual System Details notebook contains information that identifies the system:

▶ **Name**. If the system is created automatically by the scan process, RDM generates the name. If you manually create a system, you must enter the name here. The name must be unique and cannot be longer than 11 characters. It cannot be modified while configuring multiple systems. This name becomes the system name after an RDM operating-system deployment, so you may want to change the name before deployment. The RDM batch files use the variables `CNAME` and `CLIENT_NAME` for this field.

▶ **Address**. This is the 12-digit, hexadecimal, Universally Administered Address (UAA) of the network adapter installed on the system. The manufacturer of the network adapter sets this address. Some manufacturers also refer to this address as the Media Access Control (MAC) address or network interface card (NIC) address.

The system network adapter MAC addresses or system address, is normally collected during the scan process. If you create a system without using the scan process, you must get the network address from the system and enter it in this field. Also, when the network adapter for an existing system has been changed (for example, if the old one developed a fault), you can enter the new address here.

To find the network address for a system, turn on the system and let it attempt to start up from the network. The address is displayed on the screen along with other information. Alternatively, some network adapters have their addresses printed on labels attached to the adapter's bracket. If the network subsystem is integrated with the system board of the computer, the network address might be accessible through the Configuration/Setup Utility program.

▶ **Serial Number**. This is the system serial number that is collected during the scan process or manually entered when you create a system.

- ▶ **System Status**. If the **System disabled** checkbox is selected, the system cannot start via RDM using PXE.

- ▶ **System Control**. This field indicates whether this RDM program or another program is controlling this system. If you enable the **Not by this program** check box, it indicates that the system is controlled by another program and the scan operation is the only operation that can be performed on that system by this RDM program. The controlling program can be RDM running on another server or some other remote management program.

- ▶ **Model Type**. This field shows the machine type and model number of the system. This information is collected during the scan process.

For the following fields the end user or installer typically enters this information if questions were specified on the Scan page of the Defaults notebook. Alternatively, values in these fields might be filled in if the assigned system has a Radio Frequency Identification (RFID) chip and is Asset Information Area (AIA) enabled. For more details, see "Managing AIA-enabled Systems" on page 183. The actual meanings and uses of these fields are completely up to the RDM administrator. You can change or update these fields at any time:

- ▶ **Contact**.

- ▶ **Location**.

- ▶ **Comments**.

Individual System Details – Hardware Tab

The Hardware page of the Individual System Details notebook contains details about the installed hardware of each system. RDM uses this information to ensure that a new system meets the hardware requirements for a specific software profile. The system hardware details are normally collected by the scan process, but can be entered or modified using this page:

- ▶ **Network Adapter**. The Adapter identified in this box is the one that is detected by the scan process. It is strongly recommended that you do not change this setting.

- ▶ **Video Chipset**. As with the Network Adapter this Video Chipset is the one that the scan process identified. It is strongly recommended that you do not change this setting.

- ▶ **RAM**. This field displays the amount of installed random access memory (RAM). The amount specified is in units of 1,048,576 bytes.

- ▶ **Hard Disk.** This field displays the capacity of the primary hard disk drive. The amount specified is in units of 1,000,000 bytes. The text **Unconfigured RAID** displays in this field if you have an unconfigured RAID controller. In this case, if you manually configure the RAID, you may enter the RAID hard disk capacity for your system. If you replace a hard drive with one of a different size, you may want to update the value in this field.

- ▶ **RAID detected**. When checked, this field indicates that RAID has been detected. The size displayed refers to the first logical drive.

- ▶ **IP broadcast address for Wake on LAN**. This field is the IP address used to send wake-up instructions to the system.

  This IP broadcast address overrides the default IP broadcast address for Wake on LAN that is available in the General Defaults screen. The wake-up address must be configured so that wake-up packets are sent as MAC-level broadcasts on the LAN subnet to which the system is attached. The console, not the server, sends wake-up packets. This field is therefore especially important if you are using a remote console.

  If all of your systems are on a LAN that is included in the same subnet as the console, you can use the IP broadcast address 255.255.255.255 (the default). If your systems are not on the same subnet as the console, you must configure this field as a subnet directed broadcast address. The wake-up instructions will then be routed to the correct LAN for your systems. To determine the IP broadcast address for a system, see "Defaults - General Tab" on page 67.

- ▶ **Remote Boot Protocol**. This field displays the system network protocol detected by RDM during the scan process. This field is grayed out and cannot be changed because RDM 3.2 supports only PXE.

Individual System Details – Software Tab

The Software page of the Individual System Details notebook is used to set up the details of a system assignment to a software profile:

- ▶ **Assigned Profile**. Select an appropriate software profile from the drop-down list for the system (If there are no software profiles created, the default, **Unassigned**, is selected). If you assign a system to a profile using the Installation/Maintenance window, this field is filled in automatically.

- ▶ **Requested Profile Name & Date**. For systems equipped with a Radio Frequency Identification (RFID) or Asset ID chipset, RDM scan reads the EEPROM fields designated by RFID for software profile name (IMAGE) and date (IMAGEDATE). For more details, see "Defaults - Scan Tab" on page 71 and "Managing AIA-enabled Systems" on page 183.

- ▶ **Personality file for System**. (Only for systems assigned to clone profiles.) You can specify a personality batch file for clone systems by using the **Browse** button to select a file. Once a file is selected, click the **Edit** button if you want to edit the file. You can use a personality batch file to customize an image after its download at an individual system level instead of at the software profile level. For example, if an end user wants sound disabled, you can use a common software profile, but use a personality batch file to modify the appropriate files to disable sound for that end user only. Use this option only if you cannot use the parameter passing method discussed in "Passing Parameters to Image Batch Files" on page 214, or to pass more parameters than the RDM interface provides for. This field cannot be selected for multiple systems.

- ▶ **Remote Boot Status**:

  - ▪ The **Current Status** and **System last updated** fields are for informational purposes only. You cannot enter data into these fields.

  - ▪ **Mark System for reload**. You can force a reload of the software profile on the system at its next startup by clicking on the reload check box. This is useful if the software on the system has been damaged. Rather than try to diagnose the problem and replace the individual damaged files, you

can reload the whole image and ask the user to restart the system. The profile will be deployed only if the reload box is checked.

If you want to manage an already deployed system (without using RDM to load the operating system), you can scan the system, assign it to a profile, and then uncheck the reload box.

Individual System Details – Maintenance Tab

The Maintenance tab of the Individual System Details notebook is used to specify various actions to maintain and update the system. If you check any of the checkboxes, the next time the system is processed, the selected procedure runs. The following fields are available on the Maintenance page:

▶ **Current BIOS Level**. The scan process determines the current BIOS level. This field contains the name of the BIOS level currently installed on the system. This name will not match the level as reported by the BIOS setup screen of the system if you changed the default level name detected during the Import BIOS Flash Diskette process. For more information, see "Upgrade the BIOS Level" on page 157.

▶ **Update BIOS**. Check this box to update the system BIOS level at the next startup. Use the following fields to customize this selection:

  ▪ **Level**. Select the BIOS level from the drop-down list. This will enable the Update BIOS checkbox.

  ▪ **Language**. Select the BIOS language from the drop-down list.

▶ **Update CMOS with file**. Check this box to update the system CMOS settings. Enter the name of the file or search for a file by selecting the **Browse** button. This will enable the checkbox. The file extension for CMOS-update files is (.CMS). The CMOS settings will be updated the next time this system is processed. Refer to "Update the CMOS Settings" on page 159 for more information.

▶ **Update BIOS Admin Password**. Check this box to set or change the system BIOS administrator password. You can enter the new password or delete the current password. The password will be

updated the next time this system is processed. Refer to "Managing BIOS/CMOS Settings" on page 155.

▶ **Update Embedded Controller**. (Not applicable to all systems.) Check this box to update the system Embedded Controller settings:

- **Level**. Select the Embedded Controller level from the drop-down list. This will enable the Embedded Controller checkbox.

- **Current Embedded Controller Level**. Displays the current level on the system. If the system does not have an embedded controller, this field will be grayed out.

For details on how to update the embedded controller, see "Upgrade the Embedded Controller Level" on page 161.

▶ **Run Maintenance file**. Select this box to run a maintenance batch file. If your maintenance file is not found or the system is not assigned to a profile, the Run Maintenance file checkbox will be disabled.

A maintenance batch file is a DOS batch file used to perform a one-time action on a system the next time the system starts up. This maintenance file normally performs a partial image download or upgrade. For example, if your word processing package is upgraded, write a small maintenance file to copy only those new files that are required. This avoids running a full-image download.

If you select a maintenance batch file and check the **Run Maintenance file** box, the next time the system starts, instead of the operating system clone remote boot bootstrap or remote boot image being downloaded, a maintenance bootstrap is loaded on to the system and the specified batch file is run. When the batch file completes running, the system restarts and normal operation continues. You can use this process to update a single application on the system without reloading the whole image. You can enter the name of the maintenance batch file you want to use or you can use the **Browse** button to search for a file. Maintenance batch files must have a file extension of .MNS.

▶ **Power Restore**. Enable Power Restore to create a backup of your system's primary partition when it is in a known good state, or to restore the system's primary partition from an existing backup. For more details, see "Managing Power Restore Hard Drive Partitions" on page 162:

- **Backup partition**. Select this radio button to create your Power Restore backup.

- **Restore partition**. Select this radio button to restore your system's primary partition from an existing backup partition.

- **Power Restore Action**. This option determines which version is either restored during a restore partition action or is replaced by a newer version during a backup partition action. Up to two versions can be present on a system. You can either distinguish these versions by date (i.e., older versus newer) or by version number (i.e., A versus B). From the dropdown list, select the following options:

  – **A Image**. Image A is used to restore the system during a restore operation. If only image B exists, it will be used instead. During a backup operation the newly created version will become Image A, replacing the previous image A if present.

  – **B Image**. Image B is used to restore the system during a restore operation. If only image A exists, it will be used instead. During a backup operation the newly created version will become Image B, replacing the previous image B if present.

  – **Older Image**. The older image is used to restore the system during a restore operation. If only one image exists, this image will be used. During backup the older version is replaced by the newly created version if two versions already exist. If only one version exists, a second version will be created instead.

  – **Newer Image**. The newer image is used to restore the system during a restore operation. If only one image exists, this image will be used. During backup the newer version is replaced

by the newly created version if two versions already exist. If only one version exists, a second version will be created instead.

Individual System Details – Parameters Tab

The Parameters tab is used to personalize an image to contain information for an individual system. There are up to 24 possible parameter names and values available for each system. Use the left and right arrow buttons to navigate between the 3 pages of possible parameters. The values you specify here are passed to the profile batch files. Before you specify these values, you should first specify the corresponding parameter names in the System Parms page of the Software Profile Details notebook and assign the system to that profile. Do not process the system until you have filled in the desired values.

The following fields are available:

▶ **Name**. These names are used as variables in the various RDM batch files. They are taken from the System Parms page of the Software Profile Details notebook and cannot be edited here.

▶ **Value**. In the Value fields, you can use up to 24 characters to define a value for the corresponding parameter name. These values are passed to a final image batch file (.LCI file), a maintenance batch file (.MNS file), or a customization batch file (.BAT). An RDM utility program (LCCUSTOM.EXE or DEDITD.EXE) is used to substitute the actual values for the names in these batch files.

▶ **Left and Right Arrow Buttons**. Click the right arrow button to show the next block of eight parameters, or the left arrow button to show the previous block of eight parameters. There are a maximum of 24 parameters available.

▶ **Describe**. When you click one of the **Describe** buttons, a text box displays the parameter description. You can create or change the description in the corresponding Description text-edit box of the Software Profile Details notebook - System Parameters page. You cannot edit this information from within the Individual System Details window.

Note: Be careful when reassigning systems to new software profiles. The parameter values from this page must match those requested from any (.LCI) files, (.MNS) files, or (.BAT) files that the system uses in the new software profile. If the new profile has different parameters, you will need to change their values.

Individual System Details – Scheduler Tab
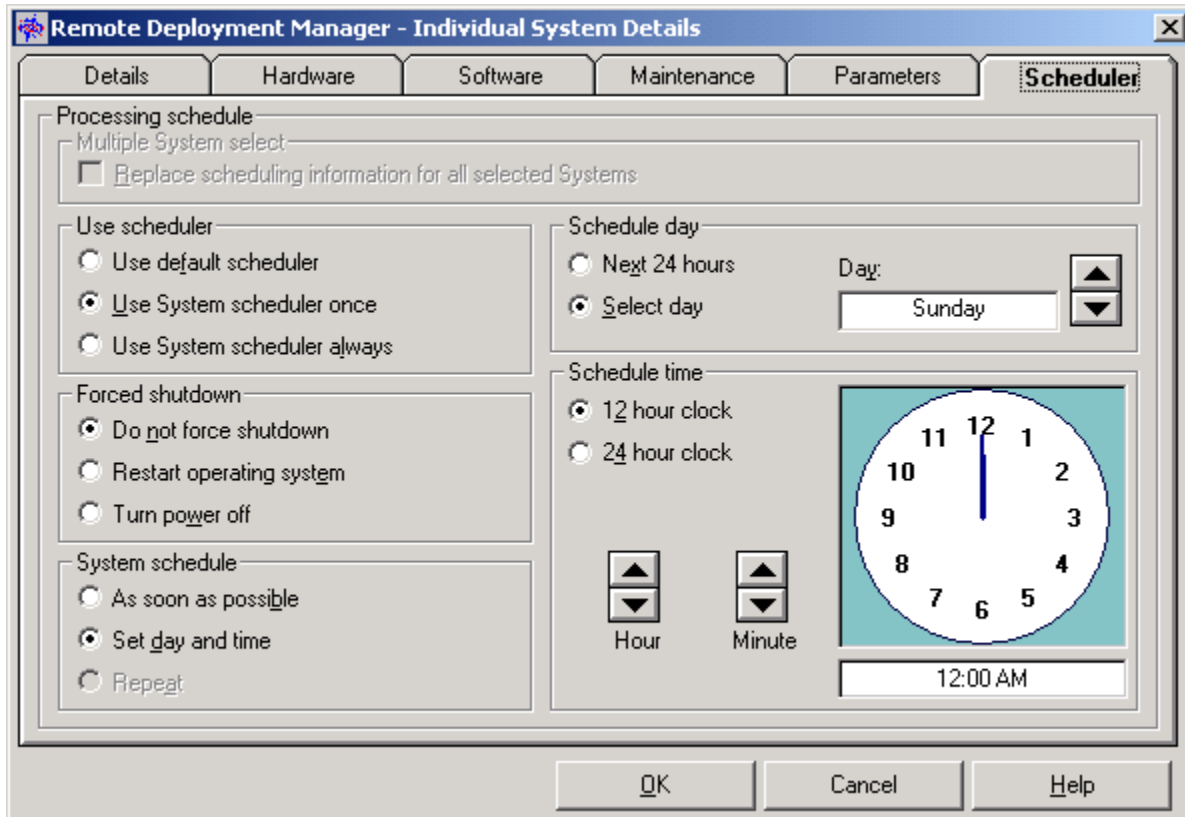
The Scheduler page is used to specify the date and time that RDM begins processing the changes that have been requested for the selected systems. You can schedule one-time events, such as an operating system install, or repeat events, such as a hard-disk backup, on a daily or weekly basis. This page specifies the day and time that changes to the systems are performed. Scheduled changes are placed on the list of actions to be taken in the Progress and Errors Window. You must **always** select the **Process** button to start scheduled jobs. For more information on processing changes, see "RDM Processing" on page 63.

Use the Scheduler for the Individual System Details notebook (and the Defaults notebook) with care. For example, if you incorrectly set the Scheduler for 3 p.m. instead of 3 a.m., and specify the forced shutdown or restart operating system options, the systems are restarted in the middle of the working day. Also, if you set the Scheduler to update systems during an overnight process and you have enabled forced shutdown, warn end-users who might be running overnight processing jobs of their own that their systems will be shut down at the specified time and that any end-user processing jobs in progress at that time will be terminated.

The following options are listed:

▶   **Multiple System select**. This box is grayed and not checked unless you selected multiple systems. If you have selected multiple systems and this box is checked, this schedule will be used for all selected systems.

- ► **Use Scheduler**:
  - ▪ **Use Default Scheduler**. If you select this option, all functions on this page are disabled and the Scheduler of the Defaults notebook is used instead.
  - ▪ **Use System Scheduler once**. If this option is selected, the schedule information on this page is used for the next system process only. Thereafter the system reverts to using the Scheduler of the Defaults notebook.
  - ▪ **Use System Scheduler always**. If you select this option, the schedule information on this page is retained and used for all future processes.
- ► **Forced shutdown**:
  - ▪ **Do not force shutdown**. If the system is still operating when the scheduled process time arrives, the system will not be shut down and restarted. The remote boot download takes effect the next time the end-user restarts the system, or via Wake on LAN if the system is powered-off and supports Wake on LAN, and Wake on LAN is enabled.
  - ▪ **Restart operating system**. Take care when selecting this option. If the system is operating when the scheduled time arrives, the system is restarted through IBM Netfinity Manager, even if it is processing a job. Any jobs in process are terminated and any unsaved data is lost. The Wake on LAN feature must be enabled in the Processing page of the Defaults notebook.
  - ▪ **Turn power off**. If this option is selected, the system will be powered off through IBM Netfinity Manager and then powered on through the Wake on LAN function to perform a clean startup.

The following options are available if either **Use System scheduler once** or **Use System scheduler always** is selected under Use Scheduler.

- ► **System schedule**:
  - ▪ **As soon as possible**. If you select this button, the changes process as soon as you click the **Process** button in the Installation/Maintenance window.
  - ▪ **Set day and time**. If you select this button, RDM will process the changes at the day and time of your choice.
  - ▪ **Repeat**. You can schedule a repetitive event to take place on a daily or weekly basis. The Repeat button in the System schedule section is available only if you have selected the **Use System Scheduler always** button in the Use Scheduler section.
- ► **Schedule Day**. This field is available only if you have selected the **Set day and time** or **Repeat** button. If you select **Repeat**, the selections change from **Next 24 hours** and **Select day** to **Repeat daily** and **Repeat weekly**:

- **Next 24 hours**. Processing takes place as soon as the specified time is reached, after the scheduled job is placed in the processing queue.

- **Select Day**. Selects the desired day to process the changes. Processing takes place as soon as the specified day and time are reached, after the scheduled job is placed in the processing queue.

- **Repeat daily**. Processing takes place as soon as the specified time is reached, after the scheduled job is placed in the processing queue. RDM will continue to process the assigned task every subsequent day at the assigned time.

- **Repeat weekly**. Selects the desired day to process the changes. Processing takes place as soon as the specified day and time are reached, after the scheduled job is placed in the processing queue. RDM will continue to process the assigned task every subsequent week at the assigned day and time.

-

▶ **Schedule time**. This field is only available if you have selected the **Set day and time** or **Repeat** button:

- **12-hour clock** displays a clock using the 12-hour format (a.m. and p.m.).

- **24-hour clock** displays a clock using the 24-hour format.

- **Hour** selects the hour using the up and down arrows.

- **Minute** selects the minute using the up and down arrows.

- **Clock Face**. You can use the clock face to set the time by an alternative method. Click the clock face with your left mouse button, keeping your finger on the left mouse button and drag the minute hands to the chosen time. Similarly, you can drag the hour and minute hands to the chosen time with the right mouse button. Time is displayed on a 24-hour clock face during this procedure.

Chapter 4. Working with RDM

In this chapter the more common RDM operations will be described. In the first sections you will learn the basic operations of RDM: scan systems, create software profiles, and assign systems. Subsequently, setting up RDM to deploy systems using unattended or clone install is described in more detail. Finally, other common operations are discussed. Advanced RDM functionality will be described in Chapter 6, "Advanced Administrative Topics".

4.1 Scanning Systems

This section provides step-by-step instructions for setting up systems for use with RDM and adding these to the RDM database.

Set Defaults Prior to Scanning

Prior to running your first scan procedure, you want to set specific defaults for RDM so that each scanned system is assigned the appropriate values. For more information, see "Defaults Notebook" on page 66. In particular, consider the BIOS administrator password and Common name base on the General Page and all fields on the scan page.

Use the Scan Feature

After you have set the desired defaults, you are ready for the following steps:

1. On your RDM console, click **Start** to scan for new systems.

2. Make sure that the hardware setup of your system is correct – that is, everything is connected and plugged in

3. The new systems being scanned must be turned on so that they boot to the network during the scan process. You can turn on the systems manually (recommended), or you can turn on the systems remotely using the RDM Wake Tool. For details about waking up the systems remotely, see "Waking up Systems Remotely" on page 92. The scan feature does not wake up systems.

4. If the system is properly configured, it will boot to the network with the PXE protocol. If this does not happen, see "Scan Feature Troubleshooting" on page 95.

5. If you have set the defaults on the Scan page of the Defaults notebook to collect user data when the new system is scanned, ensure that someone is present at each computer to answer the questions. If a timeout period has been set, the prompts must be answered within the allotted time or the processing will continue without collecting the end-user input.

6. If a default BIOS administrator password was specified in the General page of the Defaults notebook, the password is assigned to each new system detected during the scan operation.

7. Each new system is placed in the Unassigned Systems list of the main window.

The scan function collects details about new systems that boot to the network during the scan operation and for which no details are currently recorded in the RDM systems database. The details collected from a scan include things like:

▶ Network address.

▶ Type and model number.

▶ Serial number.

▶ Amount of random access memory (RAM) installed.

▶ Hard disk drive capacity.

▶ Network adapter.

▶ Video adapter or chip set.

To stop the scan process, click the **Stop** button. All systems that were properly setup are now added to the RDM database.

Note: If you stop the scan while more than one system is still processing, and then start the scan again, the system details information may display incorrectly.

Waking up Systems Remotely

Using the Wake Systems function, you can remotely power on systems without having to access their power switch. This function is useful to validate that your network is set up correctly, or whenever you need to power on a system remotely. It can also be used while the RDM scan function is running to avoid having to power on the computers manually.

1. Make sure that valid IP broadcast addresses have been entered in the General Page of the Defaults notebook. This is necessary for RDM to wake systems.

2. Select **Tools** > **Wake Systems** to display the Wake Systems window.
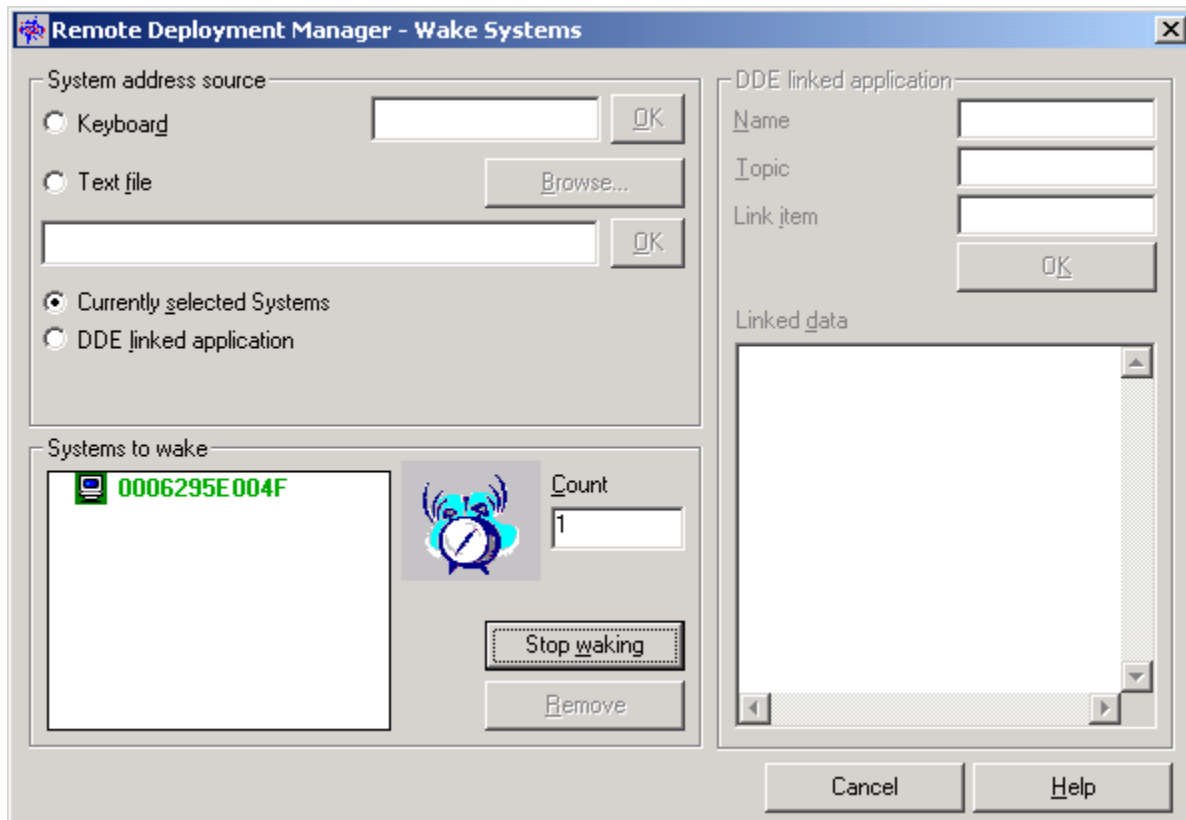
The following fields are displayed:

▶ **System address source**: The information in the system address source fields is used to identify MAC addresses of the computers you want to wake up. Systems can be started from the Wake Systems screen. A valid MAC address is any 12-character hexadecimal string, not case sensitive, delimited by blank characters, commas, single or double quotes, forward or back slashes. The delimiters do not have to match. When you select a source field, all systems found will be displayed in the Systems to Wake box. Choose one of the sources listed below:

- **Keyboard**. This is the default selection. If selected, the adjacent text field is enabled. If you enter a string and click **OK**, the string is parsed for any MAC addresses. The string may contain other information, such as model type or serial number, which is ignored. If a valid MAC address is found, it is added to the list of **Systems to wake**. If no valid MAC address is found, no error occurs. This allows an application that simulates the keyboard to continue to type in strings without hanging the input. The text field is also enabled for a standard paste operation, which allows input from most other sources.

- **Text file**. If selected, the **Browse** button is enabled. You may enter the path name of a file or use the browser to select a file. When you click **OK**, the file is read, parsed, and any valid MAC addresses are added to the list of **Systems to wake**. The **Count** field is continuously updated with the number of addresses found at that point. If any error occurs in reading the file, or no MAC addresses are found, a warning is issued requiring user acknowledgment. Several files may be selected sequentially and the MAC addresses are accumulated in the list.

- **Currently selected Systems**. If selected, the MAC addresses of any systems currently selected in the Profiles and Assigned Systems, Unassigned Systems, or Systems Database Search fields in the RDM Installation/Maintenance window are added to the list of systems to wake. If additional systems are selected in the Installation/Maintenance window, and the Wake Systems window is brought back into focus, these systems are added to the list.

- **DDE linked application**. This functionality is used to promote information to link a database program to RDM and use the functions of that program to read in systems to RDM. If selected, the DDE linked application subpanel is enabled with the fields initialized to the last values used. When you click the **OK** button, the link specified by the content of the **Name**, **Topic**, and **Link item** fields is opened and the data is displayed in the **Linked Data** field. If the link specification is invalid, a system error message pops up. The link remains live and the linked data is parsed for valid MAC addresses until either the **DDE linked application** radio button is deselected, or the specification of the DDE link is changed and you click the **OK** button again.

  The fields for the DDE linked application section are:

  - **Name**. Enter the name of the .EXE file for the linked application; for example, normally you will be linking to a spreadsheet application, so enter the name of the spreadsheet program (for example, 123W). The linked application must support DDE windows functions.

  - **Topic**. Enter the name of the data file that contains the MAC addresses (for example, LCCM.WK4).

  - **Link item**. Enter the row and column numbers that are to be linked (for example, a1..c20). Click **OK** to link the application.

  - **Linked data**. When you click **OK**, the linked data will appear in this area.

▶ **Systems to wake**: The list of addresses to be awakened is displayed as a scrollable list. New addresses are added to the list (in uppercase and in ascending sequence) as they are recognized:

- **Count**. This field tracks the number of systems currently in the list.

- **Start waking / Stop waking**. When the **Start waking** button is clicked, it changes to **Stop waking**. At this point the systems on the list are sent magic packets every 7 seconds. This process can run concurrently with adding addresses to the list from any of the processes above, and with the Scan process. When you click the **Stop waking** button, the waking process is stopped.

- **Remove**. You may select one or more addresses from the list and click the **Remove** button to remove addresses from the list. This may be done concurrently with reading addresses from file or from an external application.

Scan Feature Troubleshooting

If during a scan a system did not boot to the network, you must change your settings:

1. Check the RDM Compatibility Guide for information about your computer and its network adapter. The guide is available at the RDM home page.

2. Verify that the computer contains a supported network adapter:

   - Integrated Ethernet or Token-Ring subsystem that supports PXE.

   - Ethernet or Token-Ring adapter that supports PXE.

3. Change the network adapter settings. These settings can be accessed by pressing CTRL+S (or some other key combination, such as CTRL+ALT+B, depending on which adapter you have) while the computer is starting. The important settings are:

   - Network boot protocol: should be PXE.

   - Boot order: should be local drives first.

   Save the changed settings, and then reboot.

4. Change the system configuration. These settings can be accessed by pressing F1 while the computer is starting (or some other key, depending on which model computer you have). Save after changing the settings, and then reboot the system. The important settings are:

   - Start options, primary boot sequence. Make sure "network" is before any "hard drive":

     1. Diskette 0.
     2. CD-ROM.
     3. Network.
     4. Hard drive 0.

   - Start options, alternate boot sequence. Some computers do not have an alternate boot sequence. If present, the settings should be:

     1. Diskette 0.
     2. Network.

   Note: Some computers and network adapters have the ability to boot to the network when a specific key sequence is pressed after a manual power on. If your computer has this capability and it also has an alternate boot sequence, it is not necessary to set "network" before "hard drive" in its primary boot sequence.

   - Wake on LAN (WOL). If supported, it should be enabled. You will have to power on a non-WOL computer manually every time you process it with RDM.

5. Although in most cases it is not necessary, you may need to flash update the firmware on your network adapter or the BIOS on your computer before scanning it with RDM. If so, then download

the appropriate driver or BIOS update from the IBM web site and follow the instructions. Then reboot the system.

Note: If the scan process still cannot locate the systems, make sure that the NETWORK.LST file is configured correctly and that your network is properly configured for RDM operation. Refer to "NETWORK.LST" on page 189 and Chapter 8, "Troubleshooting" for more information.

Adding a System Manually

As an alternative to the scan process, which scans the entire network, you can enter the details of new systems directly into the Individual System Details notebook. This section describes two alternative methods.

WARNING: These methods are error-prone and are not recommended! The best way to add systems to RDM is via the scan process.

Create a New System

1. Before you begin, collect the Network address for each system you're planning to add manually.
2. Select **System** from the menu of the Installation/Maintenance window.
3. Select **Create New**.
4. When the Individual System Details notebook opens, enter information in the relevant fields. To create a new system, at a minimum you must record the following system information in the Details page:
    - A unique system name.
    - A unique network address.
5. After you have entered the appropriate information, click **OK**.
6. Select the **Process** button in the Installation/Maintenance window.

Copy an Existing System

An alternative method of creating a new system is to copy an existing system and enter the unique information that applies to the new system.

1. Before you begin, collect the Network address for each system you're planning to add manually.
2. Click an existing system from the Installation/Maintenance window.
3. Select **System** from the menu bar.
4. Select **Create Copy**.
5. When the Individual System Details notebook opens, all fields have been copied except those from the Details page. Enter information in the Details page for the new system, and alter any other relevant information. The system name and network address must be entered and must be unique for the new system to be created.
6. After you have entered the appropriate information, click **OK**.

What To Do Next?

▶ If you have already created the software profile, assign each system to the appropriate software profile. For more information see "Assigning Systems" on page 131.

▶ If an appropriate software profile does not exist, you must create one. This will be discussed in the next section.

4.2 Creating a Software Profile

The Profile Wizard makes it easy for an RDM user to create software profiles. This wizard leads you through the profile creation process without the need for the manual creation of batch files or manual entering of parameters in RDM's notebooks. The Profile Wizard will automatically create the necessary batch files and make the correct entries for you.

The resulting batch files and notebook entries made by the Profile Wizard can be altered manually, as necessary, if you need to add functions that are not part of RDM's default profiles. Be careful when you do this. If you make an error, the profile may not work at all, or it may appear to work but not give the results you expect. This avenue is only recommended for experienced RDM users.

The majority of section 4.2 is devoted to the Profile Wizard. Manual manipulation of software profiles is described at the end of this section.

Creating a software profile is a major component of deployment setup. However, successful deployment setup requires a number of additional steps, in particular for clone install. Deployment preparation is described in more detail for each type of profile separately in sections 4.4 through 4.5.

Software Profile Types

You can create two types of software profiles with the Profile Wizard: clone install - created either with the PowerQuest Deploy Center built-in profile or the CloneIt Agent - and unattended install. Depending on the type of install you can install different operating systems. See "Supported Operating Systems" on page 8 for a list of the Profile Wizard's supported operating systems for the different profile types.

During a CloneIt Agent clone install, the clone image will be an exact copy of the donor computer's software as well as its hardware and network setup and configuration. Most of the configuration options available for unattended install cannot be changed for this type of clone install. Therefore, the hardware setup of the systems that you will assign to a clone install software profile **must be identical** to that of the donor computer you used to create the clone image. The PowerQuest clone profile has more flexibility and allows for a greater degree of customization of a system as part of the install process, in particular with respect to the RAID adapter setup and Power Restore.

The unattended install option gives you the most flexibility in creating the software profile. Also, it does not have the same restrictions on the hardware setup of the system as the clone install option. However, when you install new systems, an unattended install will take significantly more time to complete than a comparable clone install. Therefore, if you can use a clone install software profile with its restrictions, it might be more advantageous to do so. Otherwise, use the unattended install profile.

You must have sufficient hard disk space to copy the operating system images onto your server. Reserve sufficient hard disk space for RDM's copies of the necessary install files, any service packs required, and images of all the applications you want to install. For more information, see "Unattended Install Directories" on page 188 and "Clone Image Directories" on page 188.

Navigation between Wizard Screens

Each wizard screen will provide **Next**, **Back**, and **Cancel** buttons. On the final wizard screen, the **Next** button will be re-labeled as **Finish**. The **Next** (or **Finish**) button will always be the default button if it is enabled.

RDM will only allow you to progress to the next screen (using the **Next** button) when the required information has been entered (some screens may have none or have defaulted values). In general, RDM will not allow the user to proceed to the next screen using the **Next** button until all the required information for that screen has been entered. Conditions that cannot be handled (like failure to read or write a file) in this way will be handled by warning pop-ups.

The **Back** button will return you to the previous screen (this will be disabled on some screens). When navigating between screens, all information entered will be retained, unless a change has been made to a

previous screen, which will affect subsequent screens (for example, changing the type of the profile). When this is the case, all information dependent on the changed data will be erased.

The **Cancel** button will always be available. When selected, it will abort the creation of the profile, after your confirmation. The wizard application allows you to perform system functions like clearing disk space without canceling the wizard operation. However, you must complete or cancel the wizard before you are allowed to perform any other action within the RDM console.

Running the Profile Wizard

This section describes in detail the various screens in the Profile Wizard for both unattended install and the two types of clone install. Notice that each type of profile requires its own information and has its own sequence of screens to follow. Where the various install types make use of a similar wizard screen, only one screen is described, with the differences between the types of install identified.

To start the Profile Wizard, choose the **New Profile** menu option within the RDM console. You will be presented with a dialog asking how you wish to create the profile. Two radio buttons will provide the choices of **Use the Profile Wizard** or **Manually with the Profile Notebook**. Select the first option and click **OK** to start the selected method of profile creation, or click **Cancel** to return to the main console without creating a profile.
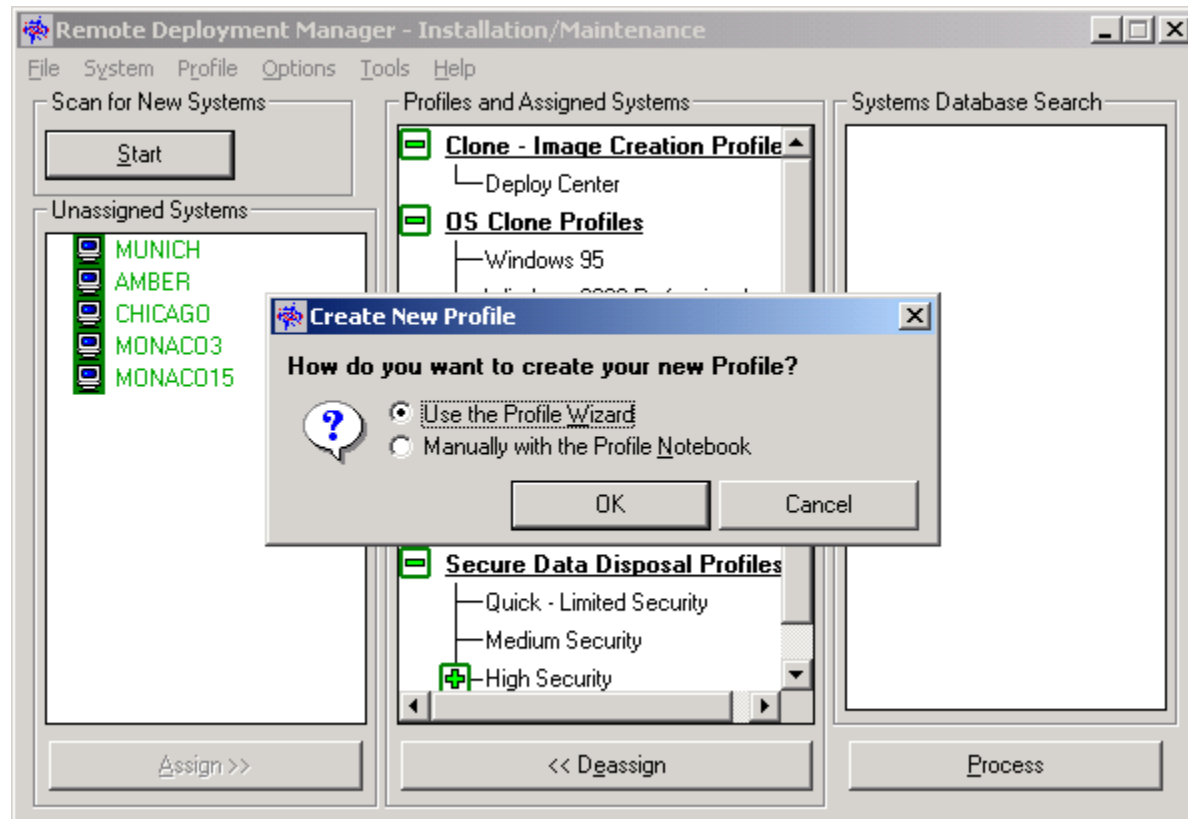
Profile Wizard - Welcome to the Profile Wizard

The Profile Wizard is designed to help you create working profiles. Experienced and new RDM users will find the Profile Wizard convenient to use. The following variables are shown:

▶ **Profile name**. A unique name that will identify your profile.

▶ **Unattended Install**. Allows the unattended installation of Microsoft Windows operating systems. RDM uses the Microsoft install program under the covers to accomplish this. Using an unattended installation profile to deploy multiple computers with different hardware specifications is possible.

 ▪ **Do you want to also install applications with this profile?** Allows you to install IBM System Management and other software. See page 119 for more details.

 ▪ **Do you want to keep the install directory?** Checking this option will ensure that the local copy of the operating-system installation files, which is copied to the system during processing, will remain on the system after deployment has finished. If not checked, the install directory will be deleted after the system has been successfully deployed.

 Note: The install directory will always be deleted after deployment if you are installing Windows XP Professional.

▶ **Clone Install using PQ Image**. Allows the installation of a complete operating-system clone image using the PowerQuest Image functionality. RDM uses its own built-in programs to deploy and personalize a clone image of a donor computer. The size of the image is limited only by the hard disk capacity of the system that will be using it. This imaging method clones a different set of operating systems than the CloneIt Agent method.

- ► **Clone Install using CloneIt Agent Image**. Allows the installation of a complete operating-system clone image using the CloneIt Agent. RDM uses its own built-in programs to deploy and personalize a clone image of a donor computer. The size of the image is limited only by the hard disk capacity of the system that will be using it.

- ► **Select the operating system you wish to install for this profile**. Choose one of the operating systems from the drop-down list.

- ► **Service Pack Upgrade**. Choose a service pack upgrade from the drop-down list, if applicable. For more information regarding this and the previous option, see "Supported Operating Systems" on page 8.

Profile Wizard - Supported International Language Selection

Note: You will only see this screen if you selected the unattended install option on the **Profile Wizard – Welcome to the Profile Wizard**.

The Supported International Language Selection screen allows you to select the operating-system language that will be downloaded to the systems assigned to the profile.

Profile Wizard - Unattended Operating System Files Selection
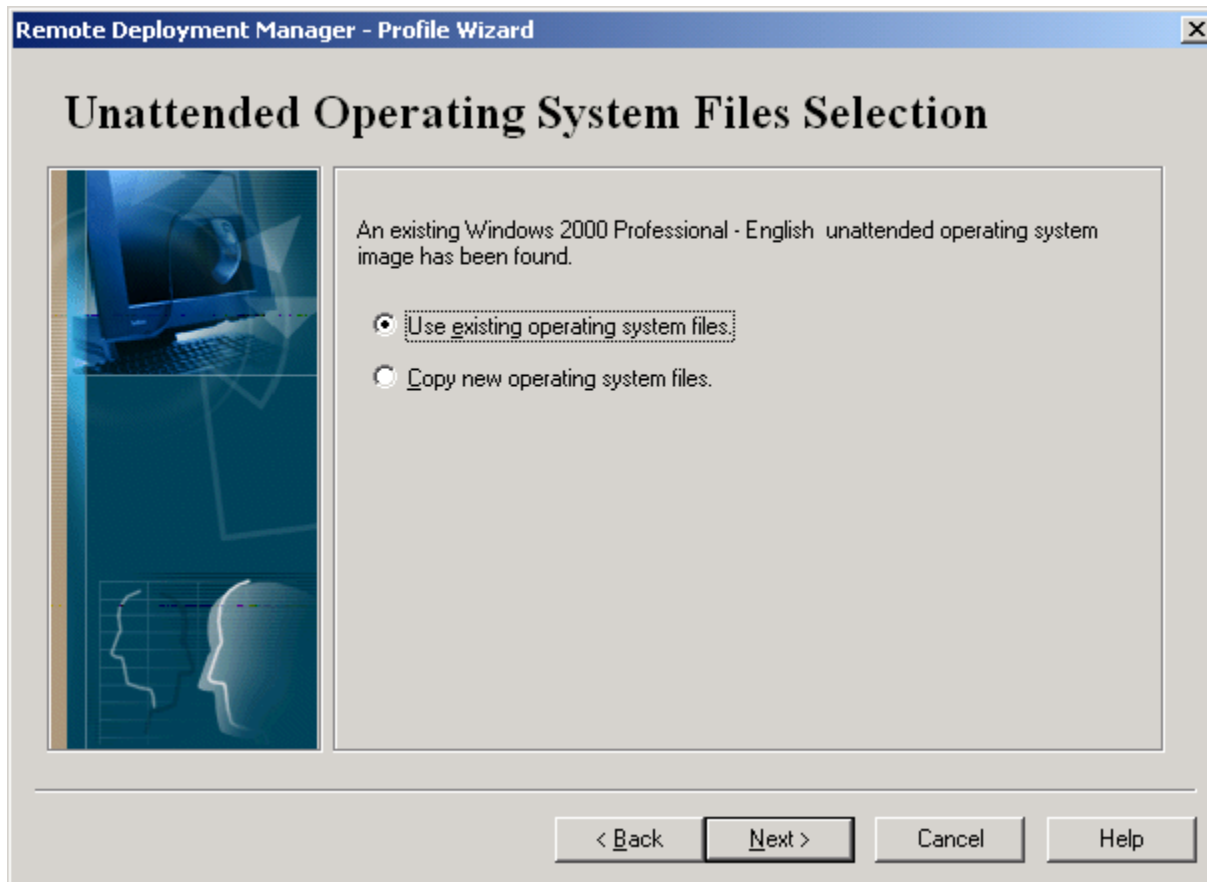
Note: You will only see this screen if you selected the unattended install option on the **Profile Wizard – Welcome to the Profile Wizard** screen and if operating system image files for unattended install are already present on the RDM server.

Select the appropriate radio button to either use the existing operating system files or to copy new operating system files to the server.

Profile Wizard – PowerQuest Clone Image Selection
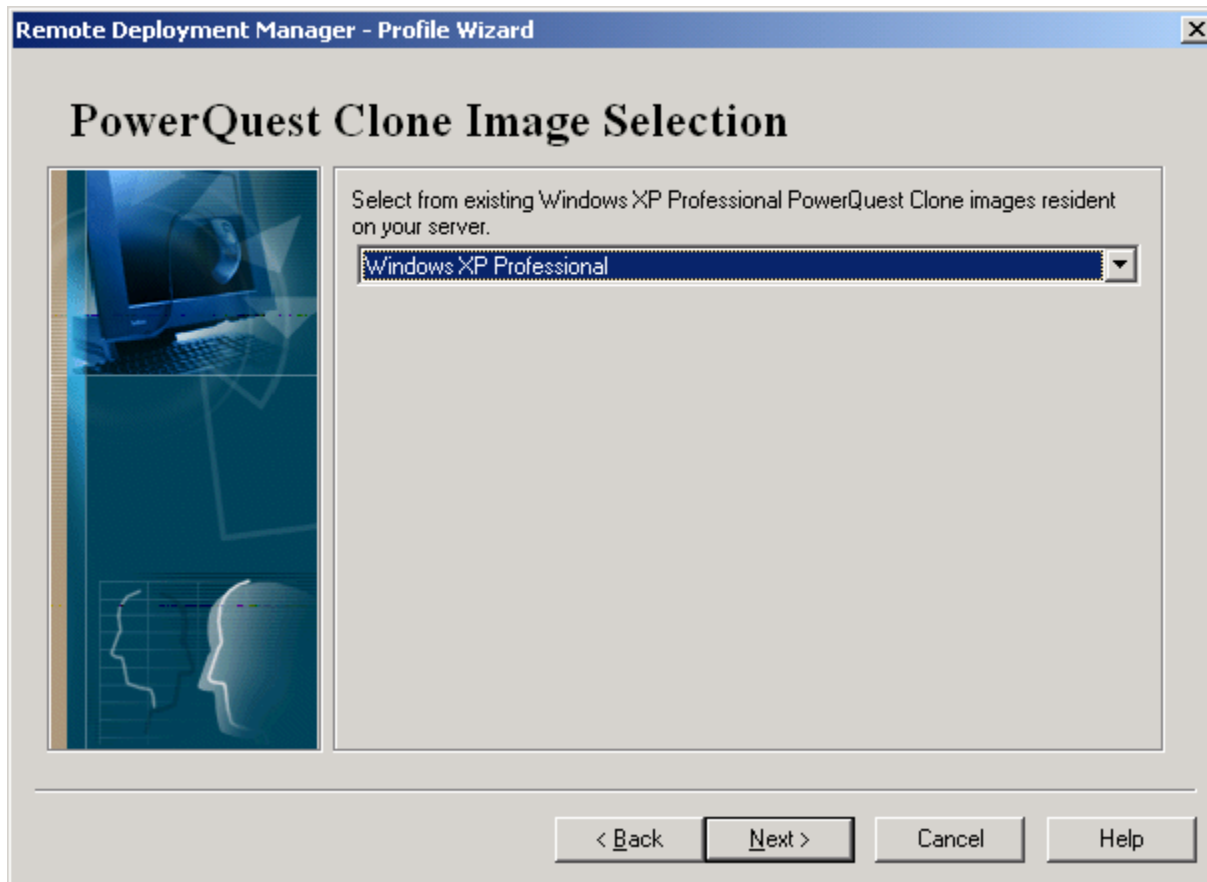
Note: You will only see this screen if you selected the PowerQuest clone install option on the **Profile Wizard – Welcome to the Profile Wizard** screen.

The PowerQuest Clone Image Selection screen allows you to select existing PowerQuest clone images from the drop-down list. If the clone image you want to install is not present, or none is available, you must exit the Profile Wizard and create an image (see "Setting Up PowerQuest Clone Deployment" on page 140). After creating the PowerQuest clone image from a donor computer, it will become available in the drop-down list.

Profile Wizard - Clone Image Selection
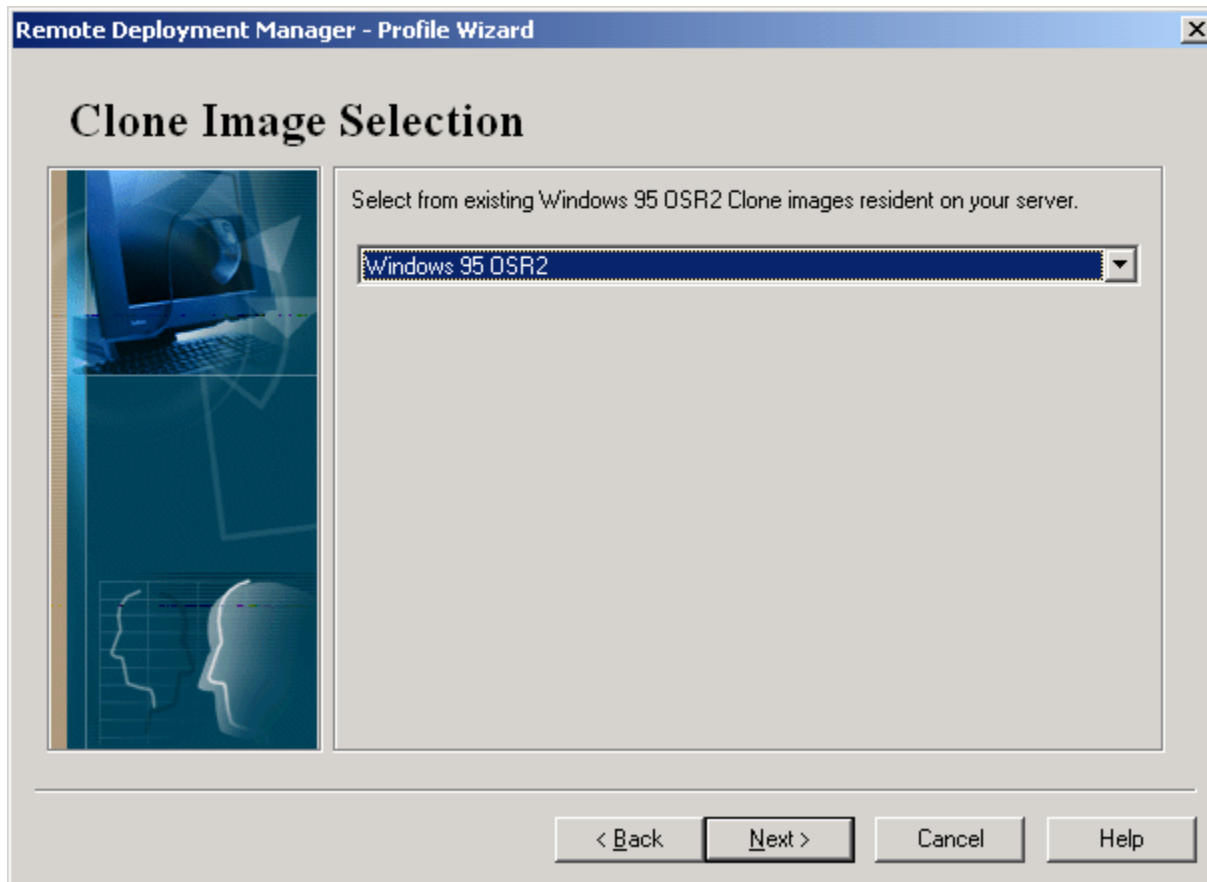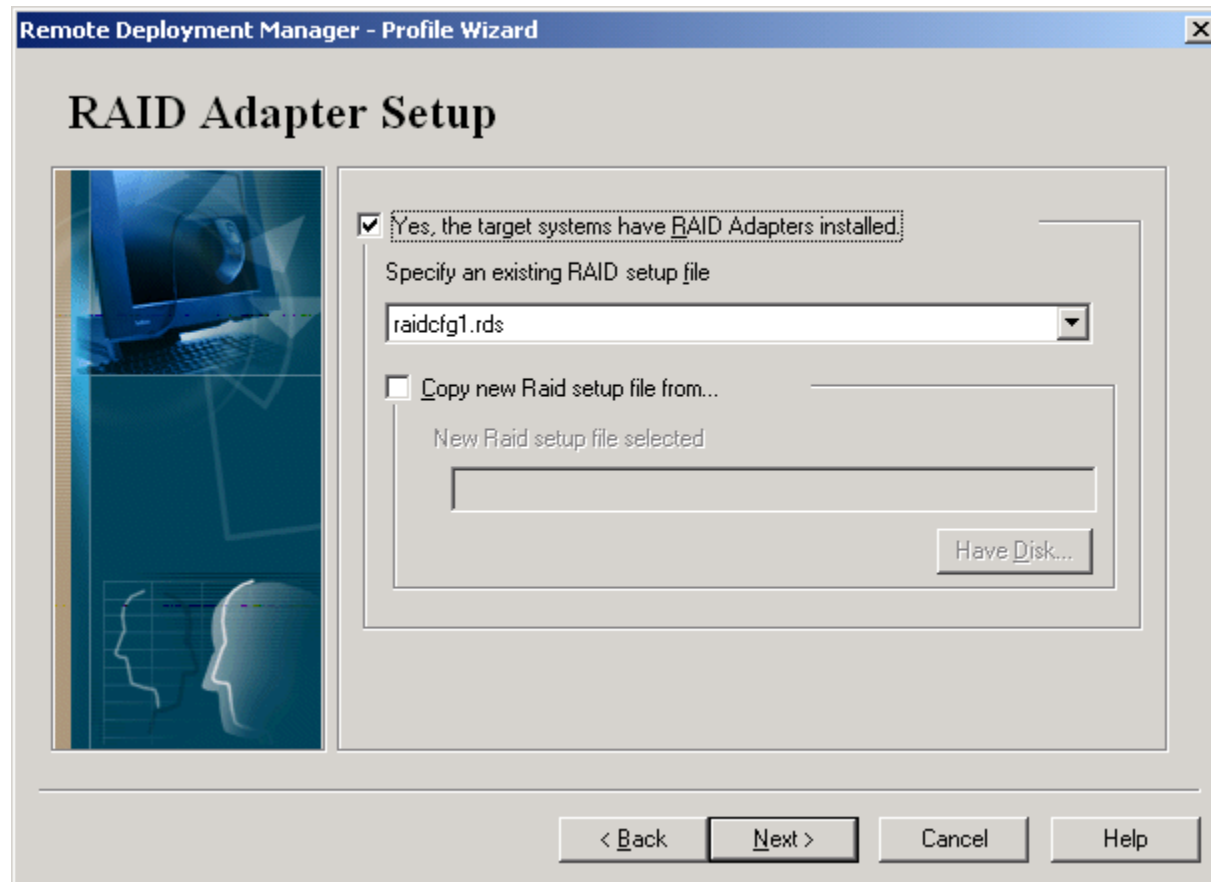
Note: You will only see this screen if you selected the CloneIt Agent install option on the **Profile Wizard – Welcome to the Profile Wizard** screen.

The Clone Image Selection screen allows you to select existing CloneIt Agent clone images from the drop-down list. If the clone image you want to install is not present, or none is available, you must exit the Profile Wizard and use the CloneIt Agent (see "Setting Up CloneIt Agent Clone Deployment" on page 144). This will allow you to create a clone image from a donor computer that will then be available from the drop-down list.

During a clone install, the clone image will be an exact copy of the donor computer's software, hardware and network setup and configuration. Therefore, many of the configuration options available for unattended install cannot be changed for a clone install. A large portion of the screens on the next pages will either be grayed out or will not appear at all during a clone install.

Profile Wizard - RAID Adapter Setup

Note: This screen, if shown, will be grayed out if you selected the CloneIt Agent clone install option on the **Profile Wizard – Welcome to the Profile Wizard** screen.

The RAID Adapter Setup screen allows you to enable RAID. Check the **Yes, the target systems have RAID Adapters installed** box if appropriate and select an existing RAID setup file from the drop-down list. If your systems have RAID adapters installed and you do not check this box, the installation process will fail, unless you have already configured the RAID adapter before assigning the system to the profile.

If the RAID setup file you want to use is not shown in the dropdown list, you must copy the file to the RDM server. To do so, check the **Copy new RAID setup file from...** checkbox and click the **Have Disk** button. You can look for Raid Clone Files, Raid Direct Setup File, or All Files. For details on how to create a RAID setup file, see "Creating a RAID Setup File" on page 181.

Profile Wizard - IBM Power Restore Partition Setup
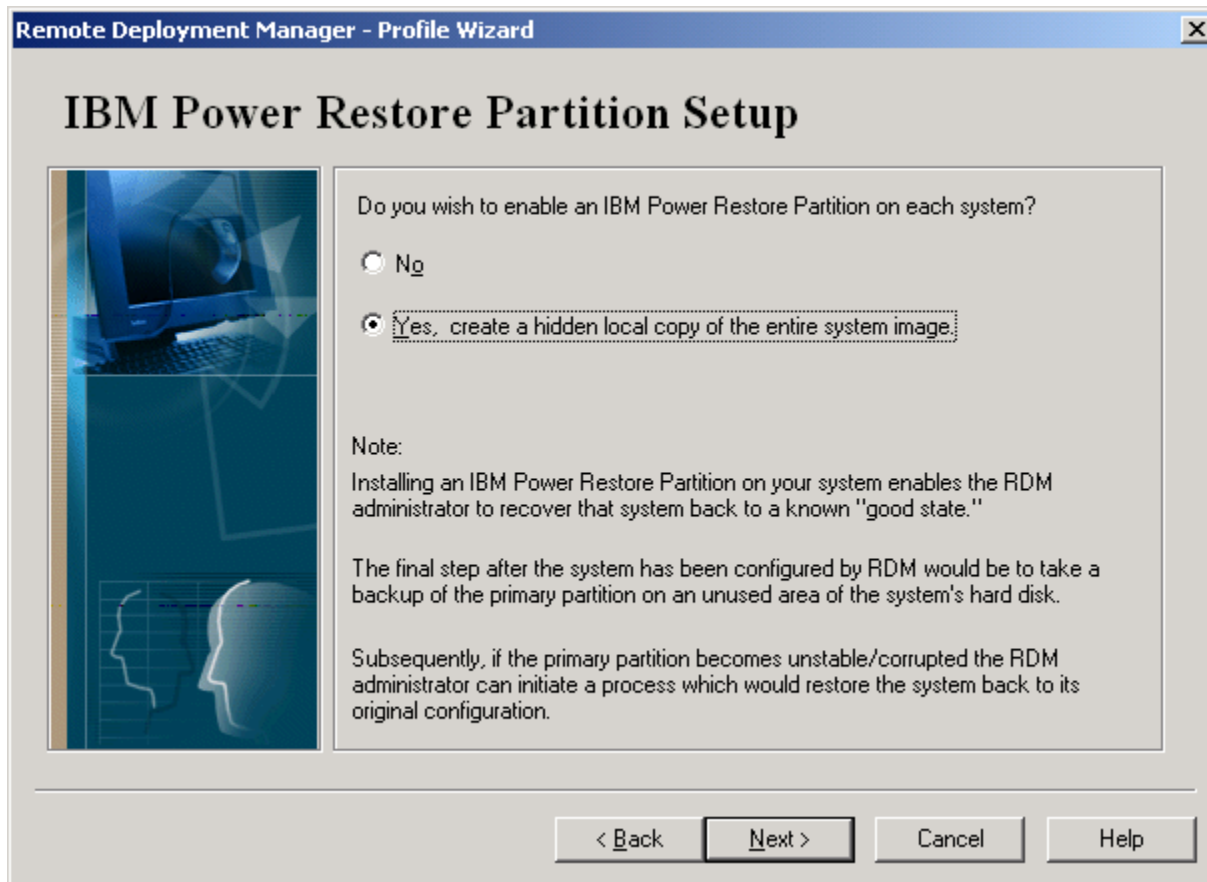
Note: This screen will be grayed out if you selected the CloneIt Agent clone install option on the **Profile Wizard – Welcome to the Profile Wizard** screen.

The IBM Power Restore Partition Setup screen allows you to enable the use of IBM's Power Restore program. The default for this screen is **No**, not to set up the partition. If you enable **Yes**, this will create a hidden partition that contains an exact copy of the operating-system partition you are about to install. It can be used for recovery, in case of failure due to corrupted or missing files on the operating system partition. For more information, see "Managing Power Restore Hard Drive Partitions" on page 162.

Profile Wizard - Target Machine's Disk Setup

Note: This screen will be grayed out if you selected the CloneIt Agent clone install option on the **Profile Wizard – Welcome to the Profile Wizard** screen. This page will not appear if you selected the PowerQuest clone install option.

The Target Machine's Disk Setup screen allows you to specify the hard drive partition(s) on your systems. The following options are always available:

► **Single partition of fixed size**. You can enter the size of your single partition in the **Size of fixed partition (C:)** field. The overall physical size of your hard disk and the partition size limitations imposed by the FDISK utility will impose limitations on the size of your partitions.

Note: If RAID has been enabled for your system and you have specified a single partition of a fixed size for your ServeRAID adapter, ensure that a corresponding entry specifying this partition size has been made in the Individual System Details – Hardware Page, in the hard disk field.

► **Single partition using maximum available space**. The actual space that RDM allocates depends on the operating system, file system, and whether or not a Power Restore partition is being created (see below).

► **First partition of fixed size, and second partition using remaining space**. You can enter the size of your first partition in the **Size of fixed partition (C:)** field. The overall physical size of your hard disk and the partition size limitations imposed by the FDISK utility will impose limitations on the size of your partitions. This option is not available for Windows XP Professional.

The following radio buttons are available depending on the operating system selected for the first and second partition:

▶ **FAT16**. This option ensures that your profile will install FAT16.

▶ **FAT32**. This option ensures that your profile will install FAT32.

▶ **NFTS**. This option ensures that your profile will install NTFS.

The following maximum partition sizes apply:

▶ FAT16 is a format option for all Windows operating systems except for Windows XP Professional. The maximum partition size of a FAT16 partition is 2 GB.

▶ FAT32 is not a format option with Windows 95, Windows NT 4.0 Server, Windows NT 4.0 Workstation, and Windows XP Professional. For the other operation systems, there are few RDM restrictions on partition size. The following maximums apply:

 ▪ If you don't use Power Restore, the maximum size of your partition is the size of the hard drive. If you choose to create two partitions, their maximum combined size is the size of the hard drive.

 ▪ If you use Power Restore with a single partition, the size of the Power Restore partition equals the approximate size of the single partition. In other words, the maximum size of the single partition is half the size of your hard drive, with the other half used by the Power Restore partition.

 ▪ If you use Power Restore with two partitions, the size of the Power Restore partition equals the approximate size of the first partition. In other words, the size of the second partition equals the size of the hard drive minus the size occupied by the Power Restore and first partitions.

▶ NTFS is a format option with Windows NT 4.0 Server and Workstation, Windows 2000 Professional, Server, and Advanced Server, and Windows XP Professional. The following maximums apply:

 ▪ For Windows NT 4.0, if you select **Single partition using maximum available space** and you don't use Power Restore, the maximum size is 7.8 GB. In all other cases, the maximum partition size of the first, second, and Power Restore partition is 2 GB.

 ▪ For Windows 2000 and Windows XP Professional, the same partition maximums apply with NTFS as described above for FAT32.

Note: If you chose to enable the Power Restore partitioning setup on the previous screen, Power Restore will automatically create a hidden partition on your system's hard disk. For more information, see "Managing Power Restore Hard Drive Partitions" on page 162.

Profile Wizard - Profile Customization

The Profile Customization screen allows you to customize your profile:

▶ **Company Name**. You must enter a name or you will not be able to continue. This name will be assigned to all systems that are installed with this profile. More than one profile can have the same company name.

▶ **Bitmap Option**. You can specify the default desktop wallpaper. Enter the name and path of the bitmap file name.

▶ **CD-Key**. A unique identification number can be found on the packaging of your operating system installation CD-ROM. If this is a multi-user key, enter it here.

Profile Wizard - System Migration Assistant
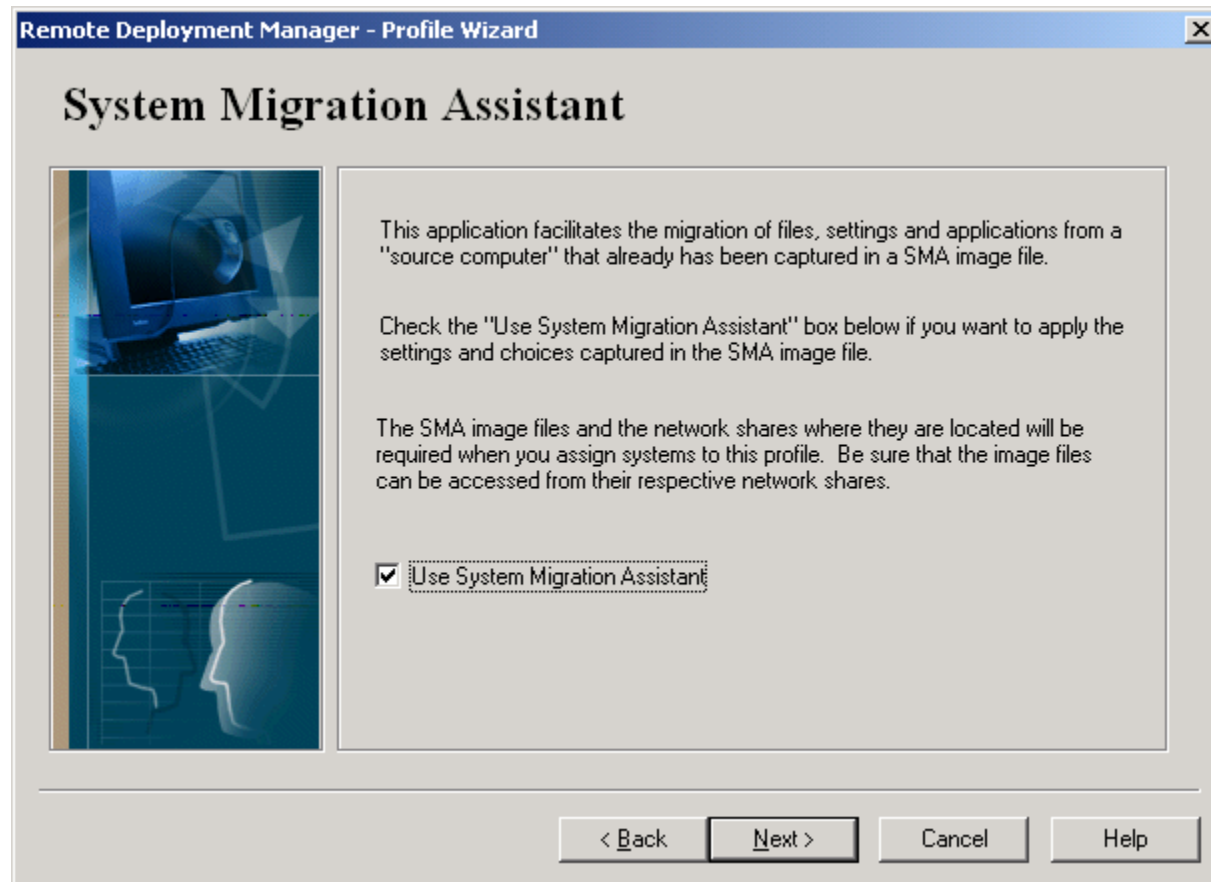
Note: You will only see this screen if you selected the unattended install option on the **Profile Wizard – Welcome to the Profile Wizard** screen.

When run separately, the IBM System Migration Assistant (SMA) can migrate applications, desktop, and network settings, user profiles, as well as files and folders from a source to a target computer. These files and settings must be captured in a SMA image file from the source computer before they can be applied to the target computer. However, when SMA is integrated as part of a software profile, desktop settings and user profiles cannot be migrated.

If you have an SMA image file and want to apply it to systems assigned to this software profile, check the box on this screen. The SMA image files and the network shares where they are located will be required when you assign systems to this profile. For RDM 3.1, the SMA image file must have been created with SMA 3.0.

For more information about System Migration Assistant, please visit the web site at http://www.pc.ibm.com/us/software/sysmgmt/products/sma/.

Note: If you want to migrate desktop settings and user profiles, do not check the box on this window. Instead, run SMA to apply the image file to a system after RDM has deployed the profile to this computer.

Profile Wizard - Software Delivery Assistant
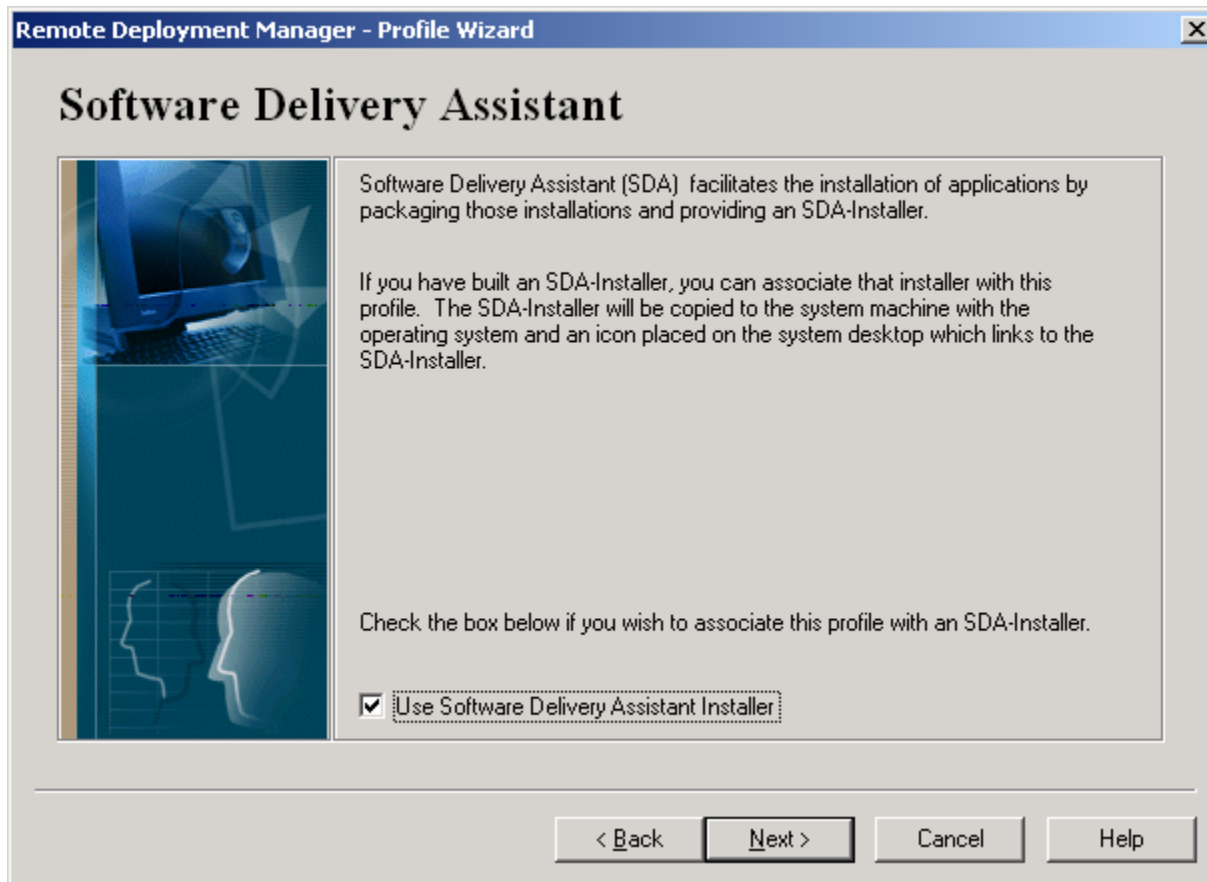
Note: You will only see this screen if you selected the unattended install option on the **Profile Wizard – Welcome to the Profile Wizard** screen.

Software Delivery Assistant (SDA) is an IBM Universal Manageability (UM) tool that packages application installations and produces an SDA Installer, which guides an end user to choose the software he or she wishes to install on the host system. For more information on Software Delivery Assistant, visit the SDA web site at http://www.pc.ibm.com/ww/software/applications/sda/index.html.

Note: The SDA Installer requires the installation of Microsoft Internet Explorer 4.0 or above in order to execute.

If you have built an SDA Installer and want to associate it with this profile, check the box on this screen, then click **Next** to continue. Enabling this option ensures that the SDA Installer will be installed on the system and that an icon will be placed on the desktop pointing to the SDA Installer.
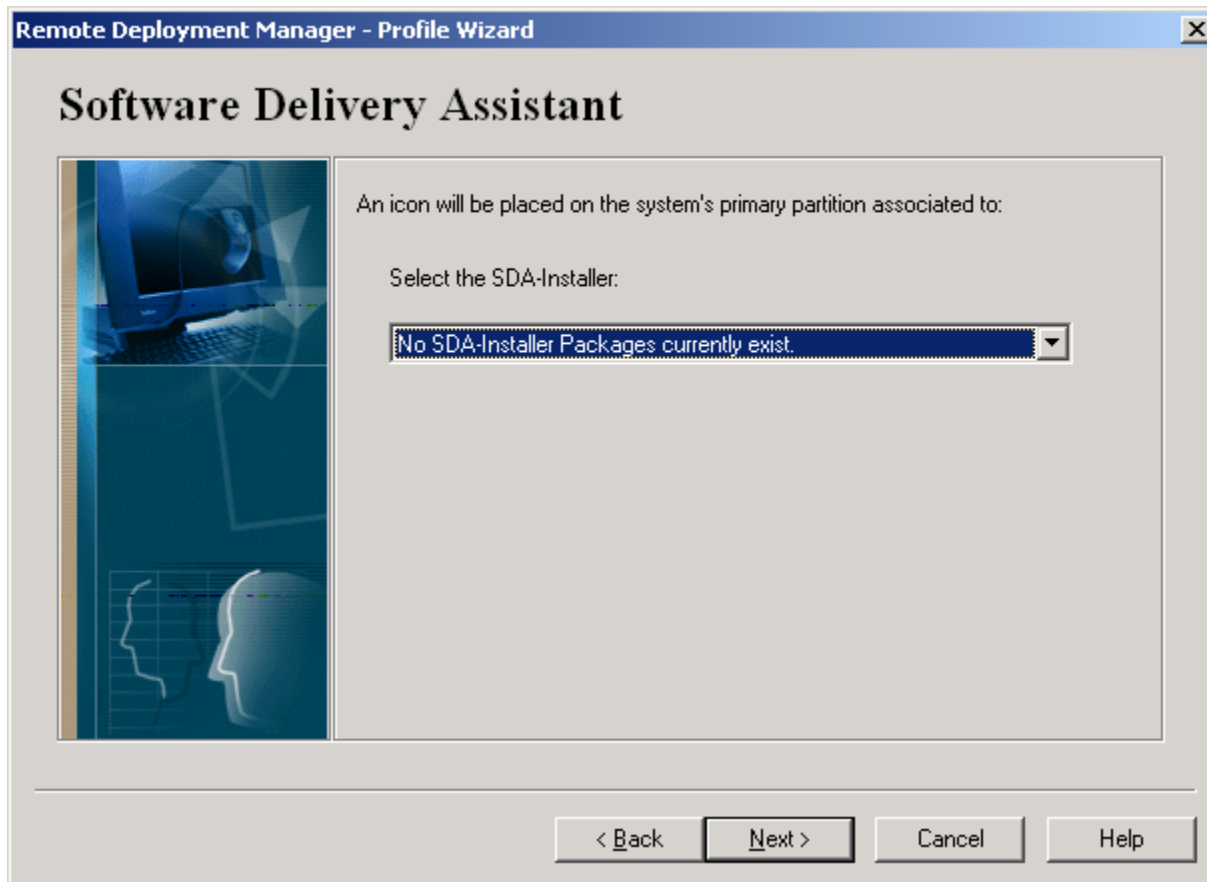
Now select an SDA Installer from the presented dropdown list. This list is populated with the names of self-extracting zip files, which are located in the `<drive>:\RDM\clntfile\SDAImage` directory. These zip files are SDA Installer directories which have been previously prepared by the user either via manual commands or with the supplied SDAPACK.BAT script provided in the main RDM directory (see "SDAPACK.BAT" on page 249 for details).

The self-extracting zip file will be copied to the system's primary partition ("C:") during OS installation and executed to re-create the SDA Installer directory on the system.

Profile Wizard - Regional Settings
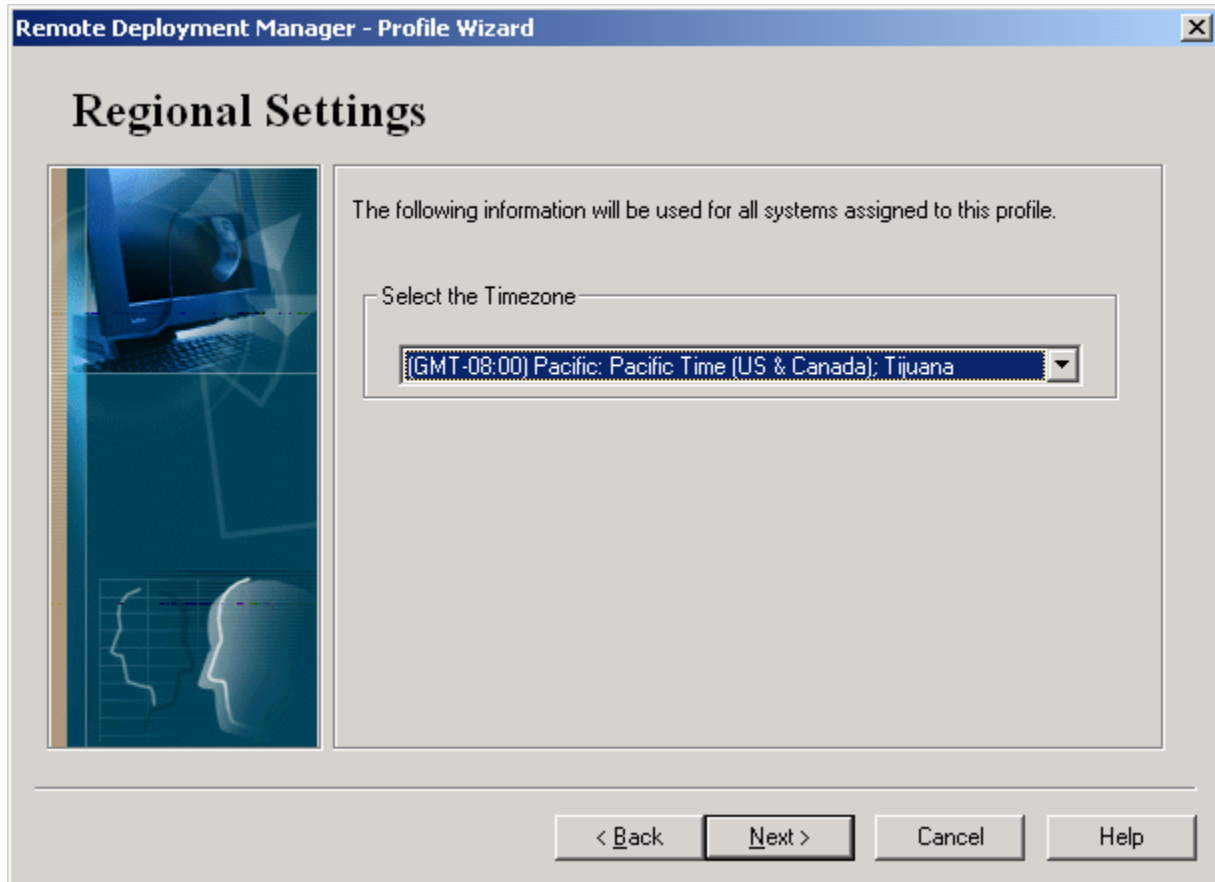
Note: You will not see this screen if you selected the CloneIt Agent clone install option on the **Profile Wizard – Welcome to the Profile Wizard** screen.

The Regional Settings screen allows you to specify the time zone for this profile. This option can be selected from the drop-down list.

Profile Wizard - Server Customization

Note: You will not see this screen if you selected the CloneIt Agent clone install option on the **Profile Wizard – Welcome to the Profile Wizard** screen or if you are not creating a server software profile.

The Server Customization screen allows you to specify the server type or network role of your Windows NT 4.0 Server, Window 2000 Server, or Windows 2000 Advanced Server system within your target domain. For Windows NT 4.0 only you will see the following options:

▶ **Server Type**:

  ▪ Primary Domain Controller (PDC).

  ▪ Backup Domain Controller (BDC).

  ▪ Standalone.

▶ **Select Server Licensing Method**:

  ▪ **Per Server**. If you select this option, you must also enter the number of system licenses you have purchased for this server.

  ▪ Per Seat.
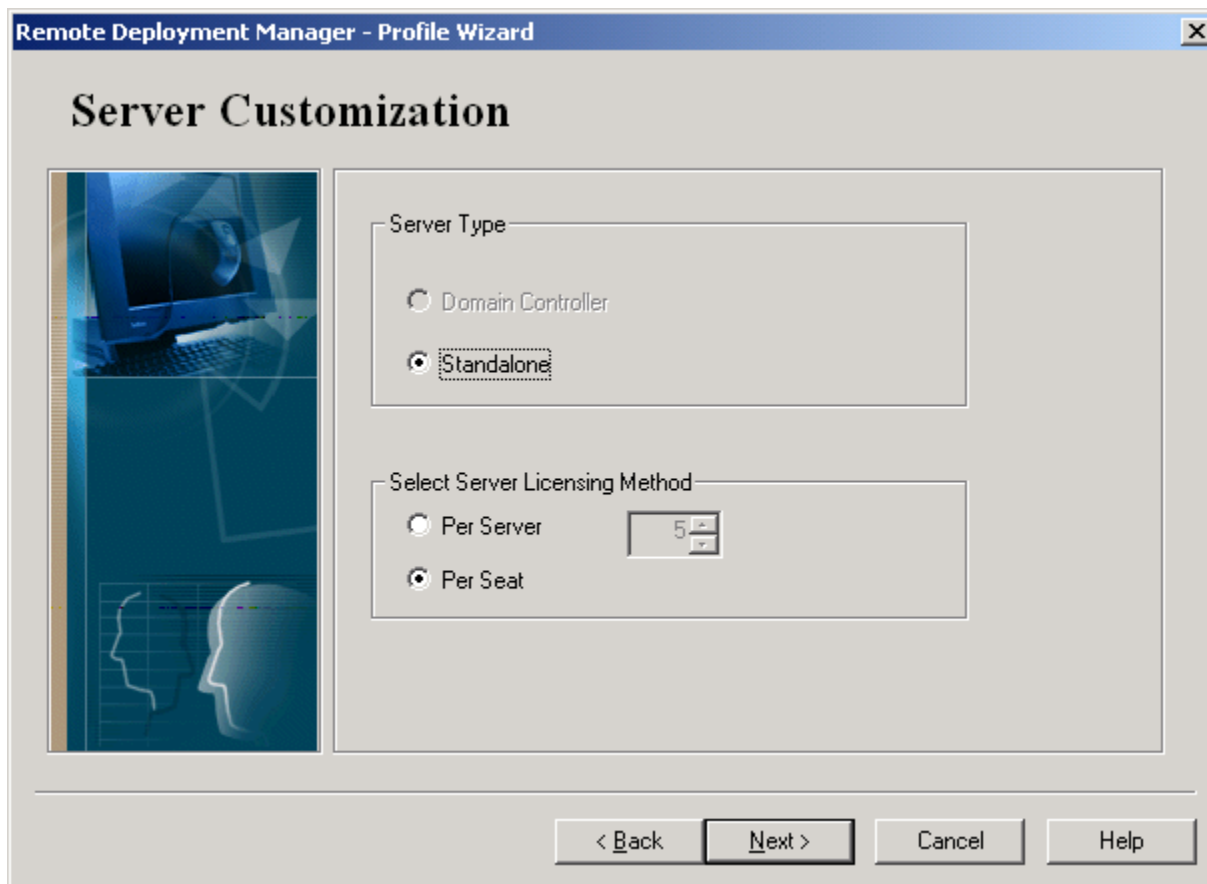
For Windows 2000 Server and Windows 2000 Advanced Server, you will see these options:

▶ **Server Type**:
   ▪ Domain Controller. This option is grayed out and cannot be selected.
   ▪ Standalone.

▶ **Select Server Licensing Method**:
   ▪ **Per Server**. If you select this option, you must also enter the number of system licenses you have purchased for this server.
   ▪ Per Seat.

Profile Wizard - Networking

The Networking screen allows you to enter the name of the workgroup or domain to which your system will belong. For a Windows NT 4.0 Server and Workstation, Windows 2000 Professional, Server, and Advanced Server profile, and Windows XP Professional the following options will be displayed:

▶ **Network Environment**. To join a workgroup, select the **Workgroup** radio button and enter the workgroup name. To join a domain, select the **Domain** radio button and enter the domain name. For Windows 2000 Professional and Windows XP Professional, you must also enter the Administrator name and password (not shown in above graphic).

▶ **Network Protocols**:

  ▪ **NetBEUI** is a non-routable protocol for use within peer-to-peer networks.

  ▪ **TCP/IP** is a routable protocol for use across networks.

  ▪ **IPX/SPX** provides connection services similar to TCP/IP and is used by Novell Netware operating systems.
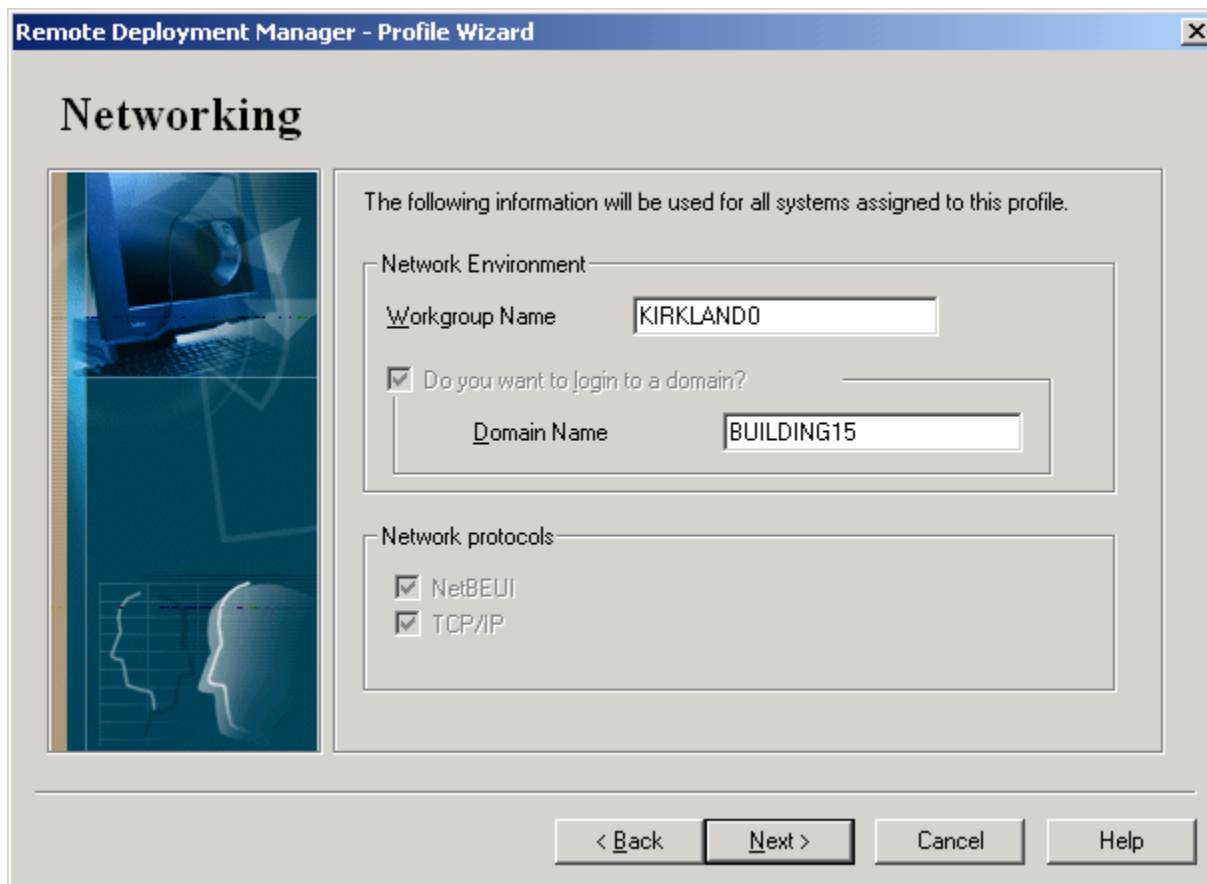
For a Windows 95, Windows 95 OSR2, Windows 98, or Windows 98 Second Edition profile the screen will contain the following difference:
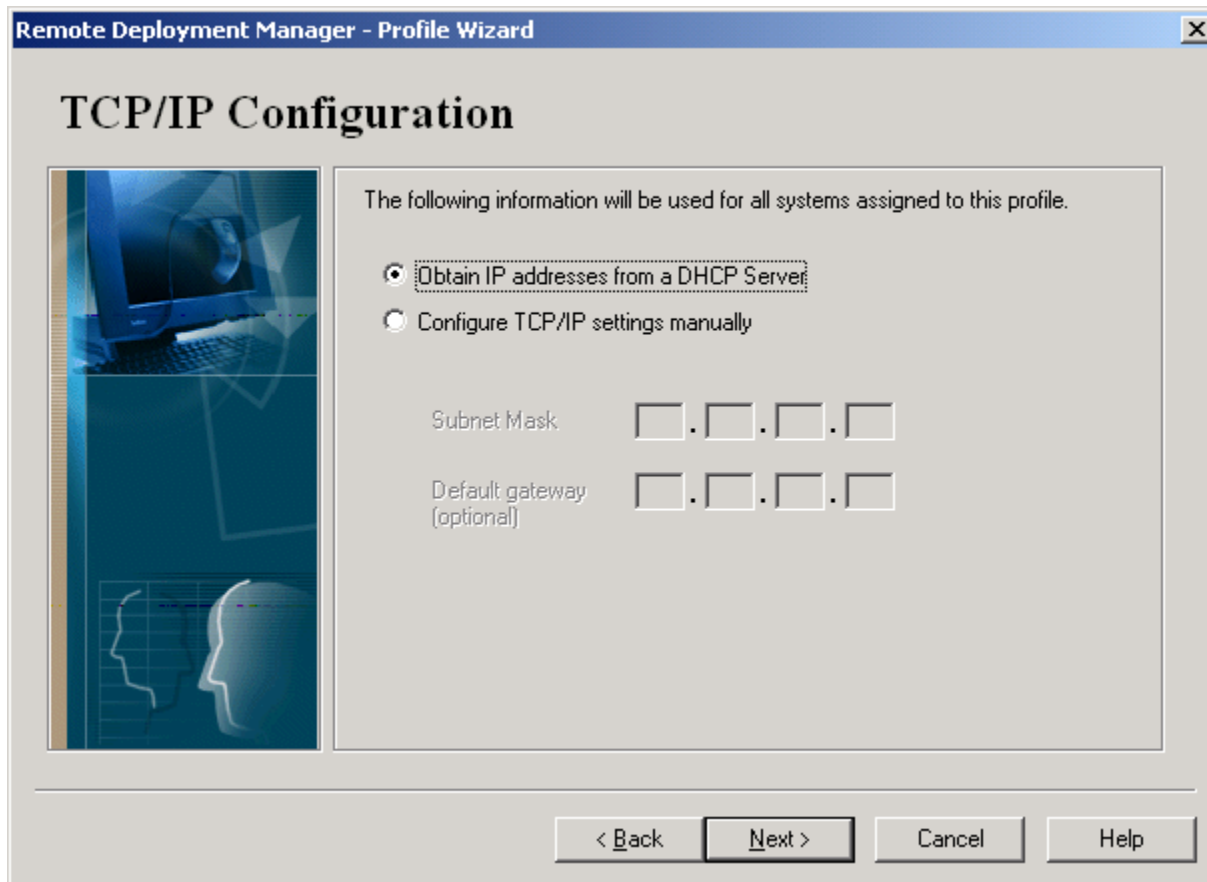
▶ **Network Environment**. For these operating systems the system must belong to a workgroup. To join a workgroup, enter the workgroup name. To join a domain check the **Do you want to login to a NT domain?** box, and enter the domain name.

Note: The Network Protocols section of the Networking screen will be grayed out if you selected the CloneIt Agent clone install option on the **Profile Wizard – Welcome to the Profile Wizard** screen.


Profile Wizard- TCP/IP Configuration

Note: You will not see this screen if you selected the CloneIt Agent clone install option on the **Profile Wizard – Welcome to the Profile Wizard** screen.

If you selected TCP/IP for the Network Protocol in the previous screen, the TCP/IP Configuration screen allows you to configure TCP/IP for each of your systems:

▶ **Obtain IP Address from a DHCP Server**. If this option is chosen, your DHCP Server will automatically obtain an IP address and configure some other TCP/IP settings for your systems.

▶ **Configure TCP/IP settings manually**. If this option is chosen, you must enter the settings manually:

▪ **Subnet Mask**. Enter the subnet mask for your network.

▪ **Default gateway**. If the server to which you want to connect resides on another network, you must enter the default gateway.

Profile Wizard - Application Selection
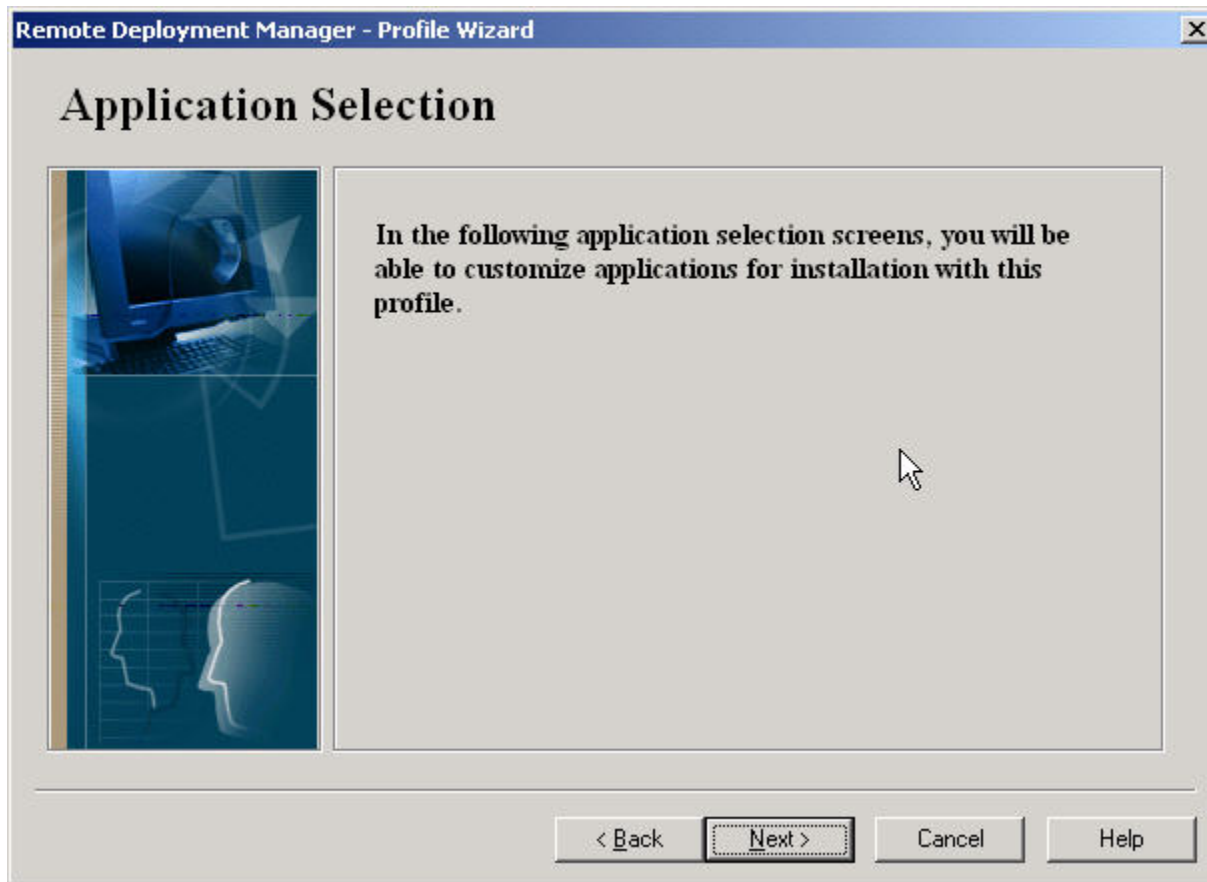
Note: You will only see this and the next screen if you selected the unattended install option on the **Profile Wizard – Welcome to the Profile Wizard** screen and checked the box under the question **Do you want to install applications with this profile?**

For more information, see "Setting Up Unattended Install Deployment" on page 140). Click **Next** to select and configure the applications that will be deployed by this profile.

Profile Wizard - Windows Application Selection
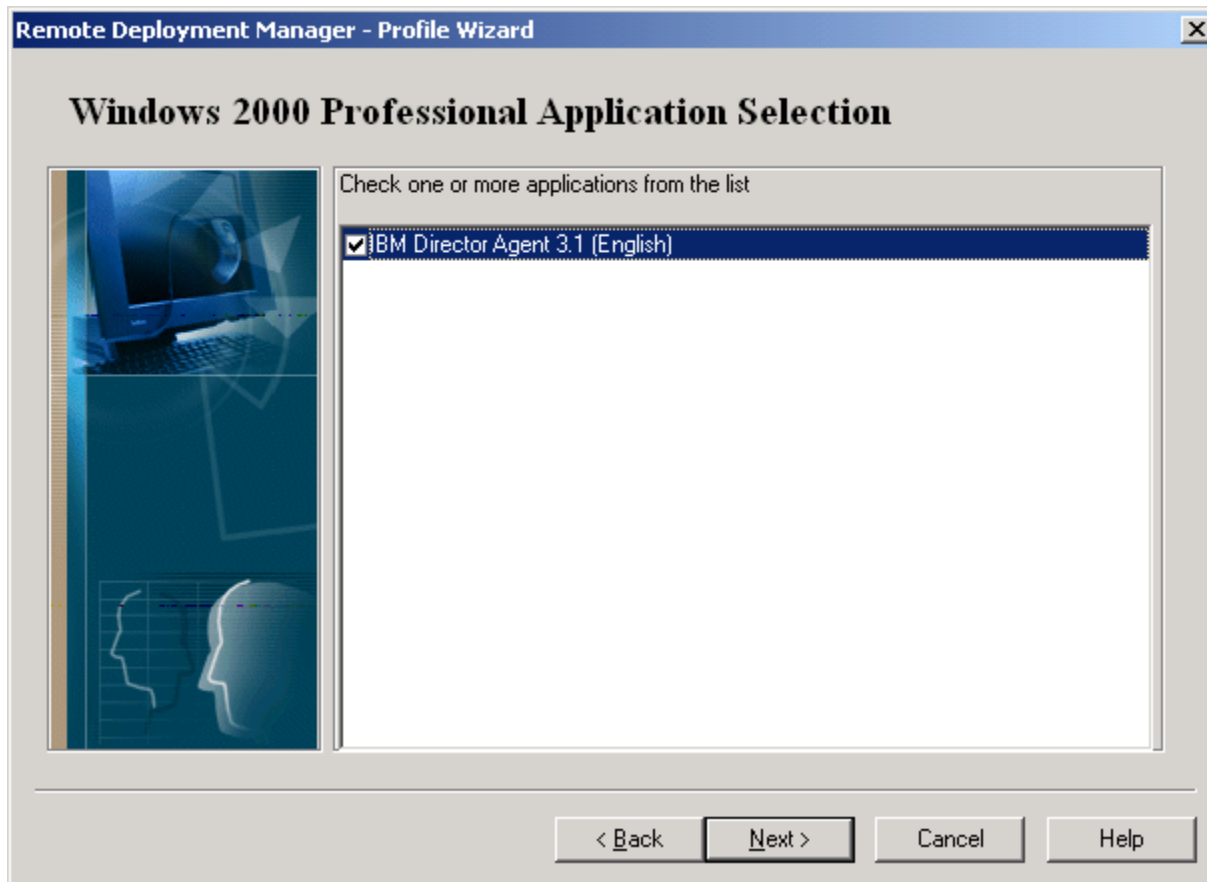
The Windows Application Selection screen allows you to choose the applications that the profile will deploy. This screen can include applications that are installed in the following ways:

▶ **Default installation options**. These applications, presented by default on this screen, will be installed using their own silent install program. However, these applications (with the exception of RDM itself) are not part of the RDM setup and must be obtained separately. The images needed to install these applications are built as part of the Profile Wizard procedure (see page 126). Therefore, you must obtain and unpack their install directories prior to running the Profile Wizard:

  ▪ **Netfinity Services**. This option is only available for Windows 98, Windows 98 Second Edition, Windows NT 4.0 Workstation, and Windows NT 4.0 Server.

  ▪ **IBM Director Agent**. This option is always available. For installation details, including system requirements and known limitations, see "Installing IBM Director Agent" on page 208.

  ▪ **Remote Deployment Manager (RDM) 3.1**. This option is only available for Windows NT 4.0 Server, Windows 2000 Server, and Windows 2000 Advanced Server. For details on how to obtain the installation files and (if applicable) modify the `setup.iss` file, see "Performing a Silent Install" on page 55.

Profile Wizard - Customizing IBM Director Agent

Note: You will only see this screen if you selected the IBM Director Agent option on the **Profile Wizard – Windows Server Application Selection** screen.

The IBM Director Agent screen allows you to enter configuration information:

▶ **IP Port Number**. Allows you to enter the IP Port Number.

▶ **Component Selection**. This option allows you to change the components that are installed. If you do not make alterations, product defaults will be used.

The following options are only shown for Windows 98 and Windows 98 Second Edition:

▶ **UserName**. Allows you to enter a User Name.

▶ **Password**. Allows you to enter a password.

▶ **Confirm Password**. Allows you to re-enter your password for confirmation.

Profile Wizard – Selecting IBM Director Agent Components

Note: You will only see this screen if you clicked the **Components Selection** button on the previous screen.

Profile Wizard – Customizing Netfinity Services

Note: You will only see this screen if you selected the appropriate option on the **Profile Wizard – Windows Server Application Selection** screen.

The Customizing Netfinity Services screen allows you to enter configuration information:

▶ **Netfinity Directory**. This option allows you to enter the directory in which to install Netfinity Services.

▶ **Component Selection**. This option allows you to change the components that are installed. If you do not make alterations, product defaults will be used.

Profile Wizard – Selecting Netfinity Service Components
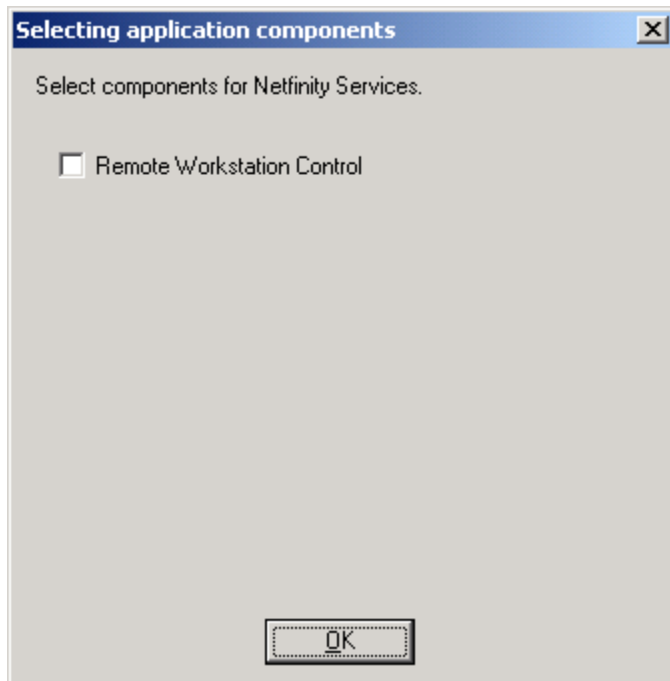
Selecting application components	✕

Select components for Netfinity Services.

☐ Remote Workstation Control

[OK]

Note: You will only see this screen if you clicked the **Components Selection** button on the previous screen.

The Remote Workstation Control component allows you to monitor and manage systems remotely without interrupting work in progress.

Profile Wizard - Profile Summary
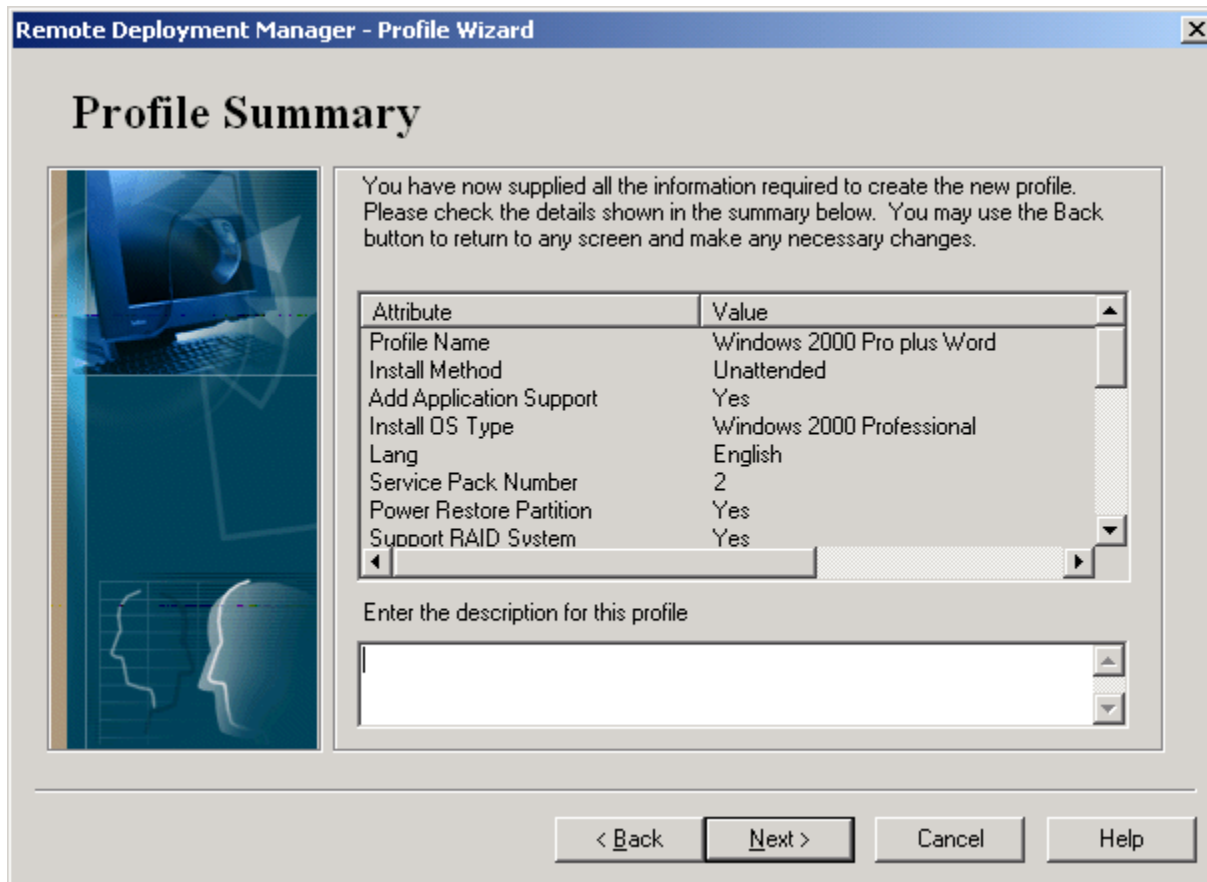
The Profile Summary screen gives a summary of the current profile. To make any changes, you must go back through the Profile Wizard.

If the window contains a **Next** button, it means that the wizard needs to copy some operating system or application images into the standard RDM distribution share point. Clicking the **Next** button will cause the Image Building window to display.

If the window contains a **Finish** button, it means that the profile uses existing images and that no new images need to be built. Clicking the **Finish** button will finish the creation process. If this is successful, you will be returned to the RDM console and the new profile will appear in the appropriate section in the profile list. Should there be any problems with the profile creation, you will be presented with a dialog box giving you the choice to continue with the creation or return to the wizard to resolve the problem.

Profile Wizard - Image Building
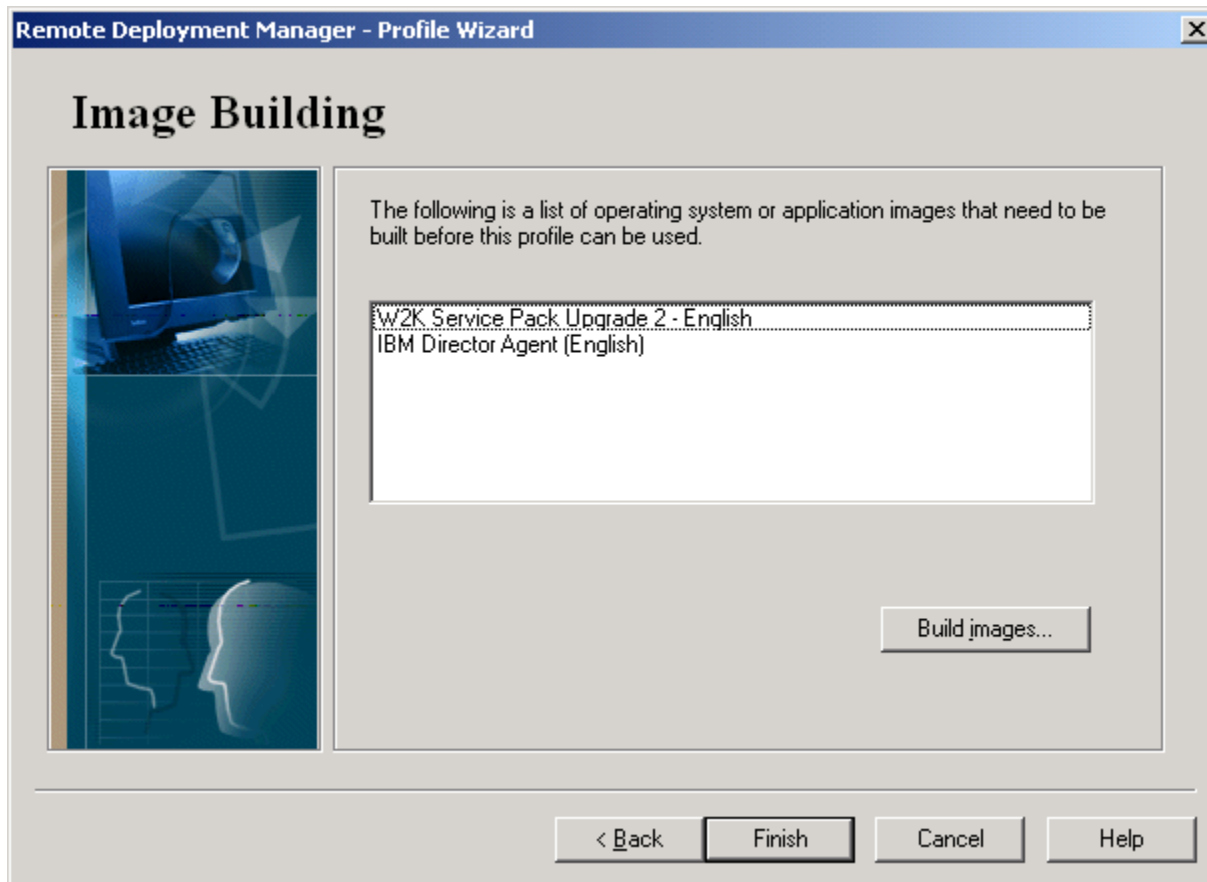
Note: You might only see this screen if you selected the unattended install option on the **Profile Wizard – Welcome to the Profile Wizard** screen.

If there are operating system and application images that need to be built before the software profile can be created, the Image Building screen will be displayed. Click the **Build images** button to start the Image Building process. You will then be prompted to select **Yes** to continue, or **No** to skip building the image. You must ultimately build all necessary images before exiting the Profile Wizard.

Note: The correct version of `setup.exe` for IBM Director Agent 3.1 (English version) is located in the folder `Director\win32\install\en`.

Copying New operating System Files
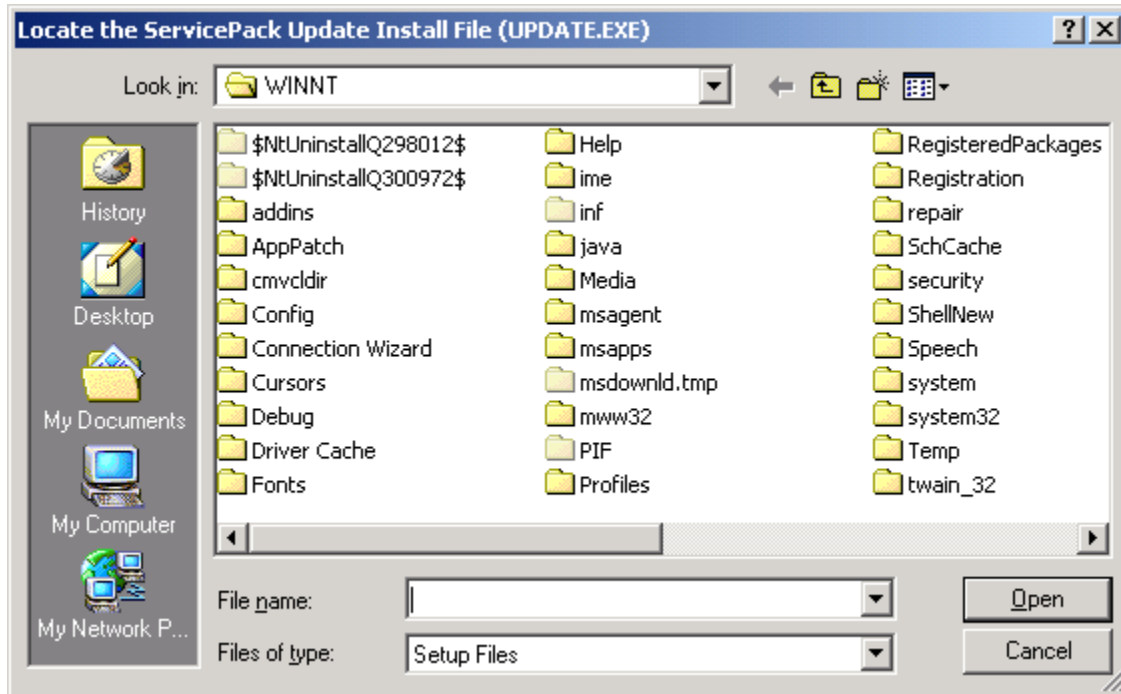
Note: You will only see this screen if you decided to build images on the previous screen.

Using this screen, you can browse for your setup file (see the title bar for the name of this file). When you have located your operating system's setup files, click **Open**. When the Successfully finished copying... dialog box is displayed, click **OK**. At the Profile Summary screen, "No more image files to build" will be displayed. Click **Finish**.

The Profile Wizard will copy each operating system into its own directory (see "Location of Unattended Install Directories" on page 188).

Creating a Software Profile Manually

To create a software profile manually instead of with the Profile Wizard, there are two alternative methods:

<u>Create a profile from scratch:</u>

1. Select **Profile** from the menu bar of the Installation/Maintenance window.
2. Select **Create New**. A new Software Profile Details notebook appears.
3. In the blank fields of the different pages, enter the information for the new software profile. Make sure that you enter a Profile Name on the Details page and select the correct type of profile – that is, Operating System Clone or Operating System Install. For more information, see "Software Profile Details Notebook" on page 73.
4. Click **OK** to save the new profile and return to the Installation/Maintenance window.

<u>Create a profile from a copy of an existing profile:</u>

1. Select the software profile you want to copy within the Installation/Maintenance window.
2. Select **Profile** from the menu bar of the Installation/Maintenance window.
3. Select **Create Copy**. When the copy is created, all fields are transferred except the profile name.
4. Enter a unique profile name in the Details page.
5. Edit the other fields that are different from the original software profile.
6. Click **OK** to save the new profile and return to the Installation/Maintenance window.

Note that copying a profile does not copy any of its underlying files.

<u>Create an image</u>

If you create a software profile from scratch or want to use a different image than the one used in the profile you copied, you need to create the image to be associated with this profile. You need to have the image available before you create the profile. There are several ways to create the image:

▶ Using the CloneIt Agent Wizard. This is the preferred method for creating Windows 95 and Windows 98 clone images. To create a clone image using this method, see "Setting Up CloneIt Agent Clone Deployment" on page 144.

▶ Using the built-in profile Deploy Center. This is the preferred method for creating all other clone images. To create a clone image using this method, see "Setting Up PowerQuest Clone Deployment" on page 140. For a detailed example of how to create a manual profile to deploy an image created with Deploy Center, see "Creating an Image Blaster Clone Profile" on page 176.

▶ Manually. These methods, described here, are only recommended for experienced RDM users.

Method A: Adding CloneIt Agent Clone Images using XCOPY

To create a CloneIt Agent clone image:

1. Set up a donor computer (operating system, applications, etc.) and test it thoroughly.
2. Create a backup batch file to prepare the image and transport it to the server.

   When copying directories using XCOPY, do not exceed the limit of 56 characters in the path name. If you have an especially deep file structure (many subdirectories under the main directory), you might encounter a problem if your extended directory structure becomes too long. This can cause

XCOPY to fail, as it runs out of space to store all the names of the directories, subdirectories, and files. If you encounter this problem, perform one of the following:

- Reduce the length of the directory structure involved. For example, when copying a new final image from a donor computer to your server, copy the files to a top-level directory on your server (instead of a directory under the RDM directory). Make sure this top-level directory has a short name (for example \DW59HYB1).

- Use another program for copying files from your server to your systems. For more information, see "Using Alternative Methods for Transporting Images" on page 212.

- You might also have to modify long file names or change hidden and system file attributes before using XCOPY. For more information, see "LCATTRIB.EXE" on page 236 and "DOSLFNBK.EXE" on page 227.

3. Transport the image to the server. For more information on copying files from the donor computer to the server, see "Creating a Donor Computer Profile" on page 211.

4. Create batch files with the appropriate file name extensions:

    a) If you choose, you can create a pre-load image batch file with the (.LCP) file name extension.

        This batch file is typically used to partition the hard disk on the system before the final image is downloaded. The pre-load image batch file executes a program such as FDISK.

        When you use the FDISK command, you can create a response file or use command line arguments in your pre-load image batch file. If you choose to use a response file, you must use an editor that allows input of nonprintable characters because the response file must contain the ENTER and ESC control characters. For more details, see "FDISK.COM" on page 228.

    b) Create a final image batch file with the (.LCI) file name extension.

        This batch file executes such programs as COPY or XCOPY on the system to transport all required software from a directory on the server to the hard disk of the system. Use specific commands for restoring attributes for system and hidden files, for restoring long file names, and for personalizing the image.

5. Copy the batch files to the server.

Method B: Adding Clone Images Using Other Programs

It is possible to use another commercially available program to create clone images that RDM can deploy. Please consult that program's documentation for more information.

Method C: Create an Operating System Unattended Install Image

RDM works in conjunction with the distribution features built into Windows NT 4.0 or Windows 2000 Server and provides the ability to pass individual system parameter values to a common Windows NT 4.0 answer file instead of using the Windows .UDF file for each individual system.

This procedure provides a high-level overview of the steps required to create an image and the associated files required for unattended installation. A working knowledge of Windows NT 4.0 Server and of editing the Windows NT 4.0 Workstation answer file (UNATTEND.TXT) is required in order to perform this procedure.

Note: In order to achieve 100% unattended installation of Windows NT 4.0 Workstation, all adapters and devices installed on or attached to the system must support unattended installation. Some adapters and devices do not support unattended installation and will prompt the user at the system for additional information or files during the Windows installation process. If you are unable to achieve 100%

unattended installations, contact the manufacturer of the adapter or device, or refer to the Microsoft Knowledge Base on the World Wide Web for possible tips or fixes.

To create an operating-system unattended install remote boot image:

1. Set up a directory to act as your distribution share point as shown:

   `C:\RDM\CLNTFILE\Dist_Sharepoint`

   where `\Dist_Sharepoint` is the directory of a specific share point.

   You can give the distribution share point directory any name you want.

2. Create a subdirectory under your distribution share point directory and name it "I386".

3. From the Windows NT 4.0 Workstation CD, copy the contents of the I386 directory and all of its subdirectories to the I386 directory in your distribution share point. For example:

   `XCOPY D:\I386\*.* C:\RDM\CLNTFILE\WINNT40\I386 /S /E /V`

4. Create the following two directories to set up the directory structure for network device drivers:

   ▪ `C:\RDM\CLNTFILE\Dist_Sharepoint\I386\$OEM$`

   ▪ `C:\RDM\CLNTFILE\Dist_Sharepoint\I386\$OEM$\NET`

5. Under the `$OEM$\NET` directory, create a directory for each type of network adapter that your systems will be using.

6. Next, copy the Windows NT 4.0 device driver and OEMSETUP.INF file from each network adapter device driver diskette into the appropriate network directory.

7. Edit the Windows NT 4.0 answer file, UNATTEND.TXT, to assign "dummy" parameter names to set unattended installation options and to set up network adapter information.

8. If your system's hard disk is not partitioned, it is essential to create a pre-load image batch file. Name and save this file with a (.LCP) extension under `C:\RDM\CLNTFILE`. Enable the pre-load image batch file within the Software page of the Software Profile Details notebook. If your system's hard disk is already partitioned and has sufficient capacity for the image you want to download, a pre-load image batch file is not required.

9. Create the customization batch file using DEDITD.EXE commands to assign variables to the dummy names you used in the answer file. Name and save this file with a (.LCI) extension under `C:\RDM\CLNTFILE`.

As an alternative you can use the more powerful LCCUSTOM utility to replace DEDITD.EXE for replacing all occurrences of a parameter with its value throughout a file.

When you create the software profile for the Windows NT 4.0 Workstation image, you will have to do the following within the Software Profile Details notebook:

► Fill in the Parameters page with the parameter names you used in the customization batch file and the associated default values, if any, that are common for all systems using the profile (for example, the organization name).

► Fill in the System Parameter page with the parameter names you used in the customization batch file that will have values unique to each individual system (for example, the Windows NT 4.0 product identification number from the Certificate of Authenticity).

4.3 Assigning Systems

You can assign systems to software profiles using the System Assignment Wizard, which is the preferred method for all RDM users, or you can assign systems manually, which is recommended only for experienced RDM users. Both methods are described in this section.

To assign systems to Software Profiles:

1. Select the software profile in the **Profiles and Assigned Systems** column in the Installation/Maintenance window.

2. Select one or more systems in the **Unassigned Systems** column.

3. Click the **Assign** button. The systems appear listed below the software profile you selected.

4. Customize each system's information by using the System Assignment Wizard or manually, whatever you prefer. Using the System Assignment Wizard is the default method.

5. Next, click the **Process** button to save and process the changes. After the changes are processed, the new software profile takes effect the next time the system restarts (or as soon as the change is applied if the system is already waiting to start up).

Instead of using the **Assign** button, you can use the drag-and-drop method. To do this, select the systems you want to assign, then drag and drop them (using the primary mouse button) onto the desired software profile. You can also reassign systems to new software profiles within the **Profiles and Assigned Systems** box. To do this, use the drag-and-drop method for each system (not for multiple systems).

Customizing Systems Using the System Assignment Wizard

The System Assignment Wizard is a program that asks you to fill in a series of system parameters for a particular system when it is being assigned to an RDM profile. The purpose of the System Assignment Wizard is to ensure that any mandatory system parameters are filled in before the system is processed. If the parameter values are not correctly entered, then the system will fail when it is being processed.

Unless it is disabled in the profile notebook, the wizard will start automatically when systems are associated to a profile. The wizard consists of several screens designed to make assigning systems as easy as possible. There is one wizard window for each parameter listed on the System Parms page of the Software Profile Details notebook. Default values on the screen will be accepted unless you enter values to override them.

The following pages display the various screens of the wizard and explain the various customization options provided. They are based on an operating-system-install profile created with the Profile Wizard.

System Assignment Wizard - System Assignment
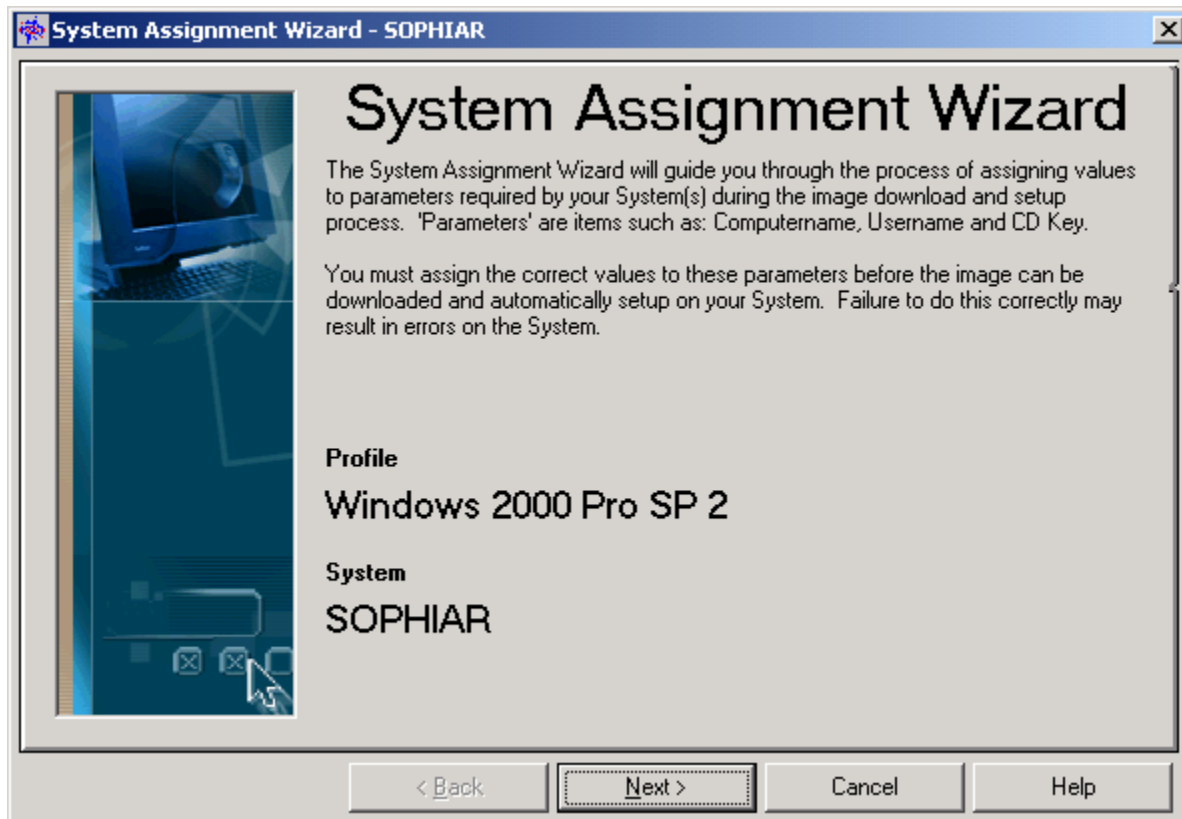
The System Assignment Wizard screen identifies the existing profile name and system name to which your scanned system is to be assigned. Click **Next** to continue.

System Assignment Wizard - Registered User

In the space provided under **Customized value**, enter the name of the person who will use this system, and click **Next**.

System Assignment Wizard - Product ID

In the space provided under **Customized value**, specify a product ID for the operating system being installed. This can usually be found on the software packaging of your operating system installation disks/CD-ROM. Click **Next** to continue.

Note: You may be required to enter the Product ID over two screens, please enter the Product ID in the format indicated.

System Assignment Wizard - Network Username

In the space provided, specify a network username for your system. The default value is a blank field. Click **Nex**t to continue.

When the profile to which you are assigning your system is a Windows NT 4.0 Server, Windows 2000 Server, or Windows 2000 Advanced Server unattended install, do **NOT** leave this field blank. Enter **Administrator** or another username as your network username.

After assigning the system to the profile and processing the system (by clicking the **Process** button and waiting for deployment to complete successfully), you will be prompted to enter a password for your system's Administrator account when you first start the computer. At this stage do the following:

1. Click **OK** (do not enter a password).
2. When prompted enter a new password.
3. Confirm your new password.

After logging onto your server you can manually create a user account for a new username via Windows NT 4.0's User Manager or the similar Window 2000 function.

System Assignment Wizard - Description

The Description screen allows you to give a description of a system. Click **Nex**t to continue.

System Assignment Wizard - SMA Filename

Note: You will only see this screen if the system is being assigned to an unattended install software profile with System Migration Assistant enabled. For more details, see "Profile Wizard - System Migration Assistant".

Provide the name of the SMA image file to be applied to this system.

System Assignment Wizard - SMA Network Share
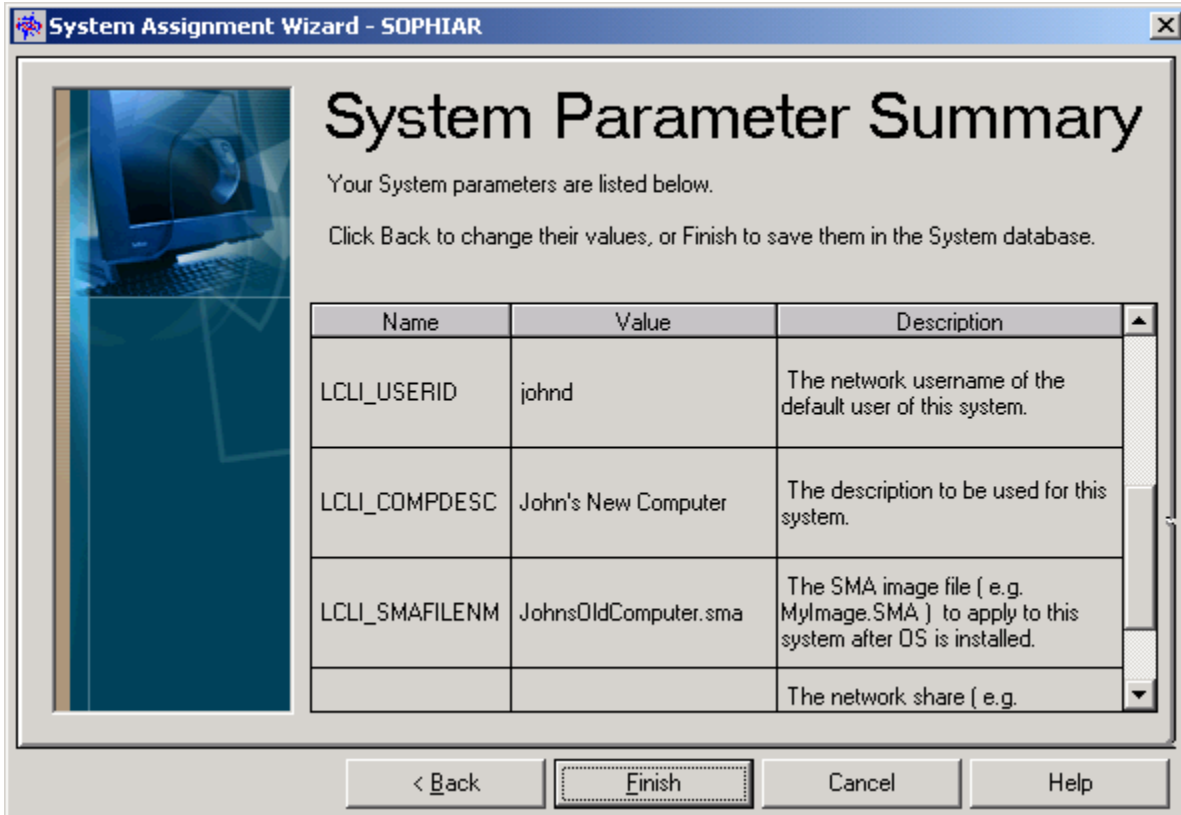
Note: You will only see this screen if the system is being assigned to an unattended install software profile with System Migration Assistant enabled. For more details, see "Profile Wizard - System Migration Assistant".

Provide the network share of the SMA image file to be applied to this system.

System Assignment Wizard - System Parameter Summary

The System Parameter Summary screen provides you with a summary of your system. Changes cannot be made on this screen; it is for information and verification purposes only. To make changes, you must go back through the System Assignment Wizard making any necessary changes as required. Once this is complete, click **Finish** to start the system assignment process.

Note: Highlighted lines indicate that no values have been entered to override default values.

Customizing Systems Manually

The System Assignment Wizard is used by default. To assign the system to a profile manually, you must disable the default setting by unchecking the **Enable System Assignment Wizard** box on the General page of the Software Profile Details notebook.

If the system requires additional personalization at the individual system level (for example, a user ID, password, or IP address), open the Individual System Details notebook for each newly assigned system and fill in the values for each name listed on the Parameters page. For details, see "Individual System Details – Parameters Tab" on page 88.

4.4 Setting Up Unattended Install Deployment

The best way to create a new unattended install software profile is through the Profile Wizard. The Profile Wizard allows you to easily set the various options. Also, the operating system image and the images for default applications (see page 120), which are needed to successfully deploy the profile, are built while running the Profile Wizard (see page 126).

Specifically, setting up a system for unattended install deployment requires the following steps:

1. If you need to build a new image for an operating system and/or a new service pack, make sure you have the installation directory (release CD) available.

   Caution: RDM does minimal validation on the installation media you provide. It is possible to specify one language of an OS or a specific service pack and then provide a different language or service pack CD. Make sure you specify and supply the installation media you intend to deploy.

2. If you need to build a new image for a default application, make sure you have the installation director (release CD) available

3. Create the unattended install profile using the Profile Wizard. For details, see "Running the Profile Wizard" on page 98.

4. Assign systems for deployment and click **Process** to start deployment. For details on assigning, see "Assigning Systems" on page 131.

Unattended install deployment only supports certain operating systems. For details, see "Supported Operating Systems" on page 8.

Note: For detailed examples of how to set up a system for unattended install deployment, see "Unattended Install of Windows 2000 Server without Applications" on page 167 and "Unattended Install of Windows NT 4.0 Workstation with Applications" on page 169.

4.5 Setting Up PowerQuest Clone Deployment

When you create a PowerQuest clone install software profile using the Profile Wizard, you select an appropriate clone image from a list of available images on the **Profile Wizard – PowerQuest Clone Image Selection** screen (see page 103). If you are planning to create a PowerQuest clone profile that uses a new image, you must first prepare this image. This is done with the built-in profile Deploy Center.

Specifically, setting up a system for PowerQuest clone deployment requires the following steps:

1. Build the donor computer. This can be done using RDM.
2. Capture an image of the donor computer, using the Deploy Center profile.
3. Create the PowerQuest Clone profile and assign systems for deployment.

As an alternative to the first two steps, you can also import a PowerQuest image.

The built-in Deploy Center profile only supports certain operating systems. For details, see "Supported Operating Systems" on page 8.

Note: For detailed examples of how to set up a system for PowerQuest clone deployment, see "PowerQuest Clone Install of Windows XP Professional" on page 174 and "Creating an Image Blaster Clone Profile" on page 176.

Building the Donor Computer

Before you capture the donor image, you must build a donor computer:

1. Install the operating system and all other required application software on the computer that you want to use as the donor for the clone image. This can be done with RDM. Consider defragmenting the hard drive to speed up the cloning process.

   Note: If you are planning to deploy systems with Power Restore partitions, it is recommended that you setup your donor computer with a Power Restore partition. This action ensures the donor partition will not be too large to prevent the creation of a Power Restore partition on the systems.

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2. Make a thorough check to ensure that all the required application software is installed and working correctly on the donor computer. Also make sure that the computer is set up for a network boot.

3. Run Microsoft's SysPrep® utility to remove much of the unique information on the donor computer's operating system. For both Windows 2000 and Windows XP, the required `SysPrep.exe` and `setupcl.exe` files are located at `\support\tools\deploy.cab` on the Microsoft install CD. Both of these files need to be copied to the `C:\SysPrep` folder.

   Important: Microsoft strongly recommends that computers that will be prepared using SysPrep should **not** be members of domains, but rather should be members of workgroups.

Run SysPrep in the following manner:

▶ For Microsoft Windows 2000, run SysPrep from either a command prompt or from the Windows Explorer. Click **OK** to allow SysPrep to complete. The donor computer should shut down.

▶ For Microsoft Windows XP Professional, run SysPrep from either a command prompt or from the Windows Explorer. Click **OK** to allow SysPrep to continue. A dialog box will then be shown. Select the MiniSetup check box and make sure Shutdown is shown in the drop down box. Then click **OK** to allow SysPrep to complete. The donor computer should shut down.

▶ After running SysPrep on most laptop computers, the computer will not shut down automatically. The system can be shut down manually without any errors once the blue screen with the mouse pointer appears after a few minutes.

The MiniSetup option that is used with SysPrep for Windows XP Professional has limitations on its definition of new users. As a result of this, a system deployed with a PowerQuest clone install of XP Professional which uses the new-style login screen, will not show the RDM-assigned user. Instead users will have to press the Ctrl+Alt+Del key combination twice in rapid succession to bring up the "classic" login screen, which will display the RDM-assigned user.

Alternately, you can prepare the donor computer to not use the new-style login screen prior to running SysPrep. To do this, use the following steps:

1. Log onto the donor computer as an Administrator.
2. Click on the **Start** button in the Taskbar.
3. Click on the **Control Panel** option.
4. In the Control Panel dialog, click on the **User Accounts** option.
5. Click on the **Change the way users log on or off** option.
6. In the User Accounts dialog, clear the **Use the Welcome screen** checkbox.
7. Click on the **Apply options** button.
8. Close the User Accounts dialog.
9. Close the Control Panel.

Note: For more details on how to run SysPrep to prepare a machine for disk duplication, see the `deptool.cmh` help file available in the same location.

Capturing the Donor Image

The built-in profile Deploy Center allows you to create a clone image by making an exact copy of the first partition of the donor computer. It creates the new image and copies the compressed image file to the RDM server so that it can be used to install duplicate cloned images onto other systems **with identical hardware** as the donor computer.

In order to capture a donor image, the donor computer must be known to RDM. If the donor computer has not been scanned into RDM previously, restart the donor computer and scan it into RDM. A newly scanned donor will appear in the "Unassigned Systems" panel on the left of the Installation/Maintenance window. Assign the donor computer to the built-in profile Deploy Center by dragging and dropping the computer onto the Deploy Center profile, or by selecting both the system and profile and clicking the **Assign** button.
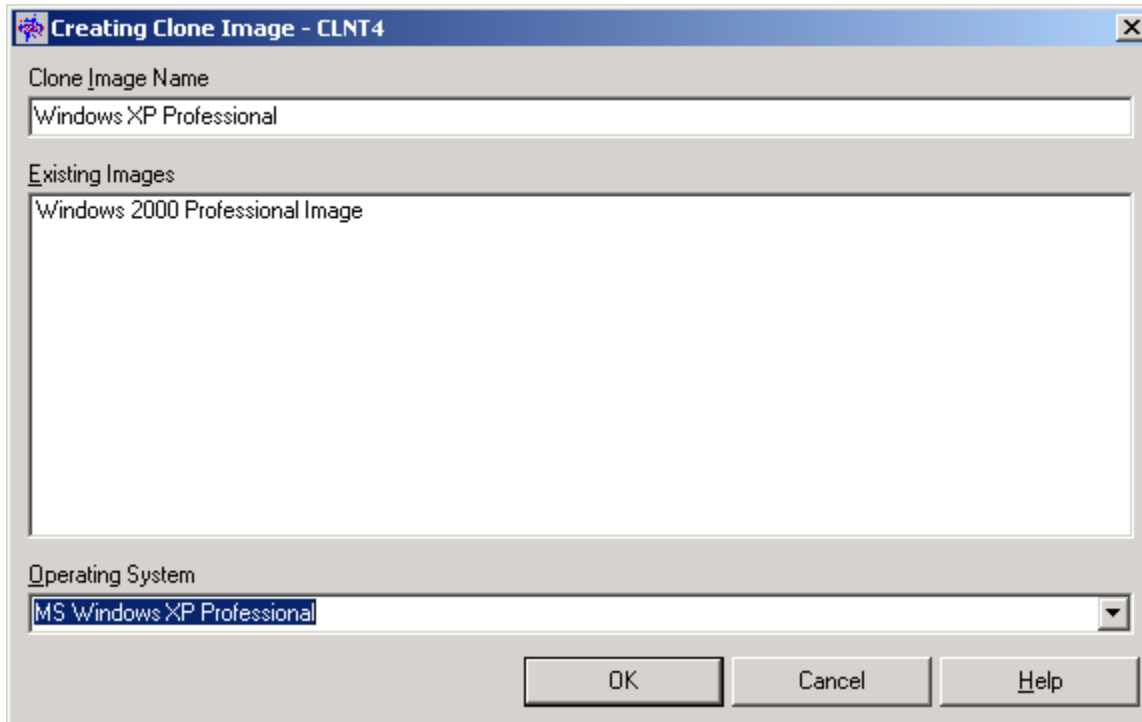
Enter the name of the clone image and select the operating system from the dropdown list. Existing images are given. When you have entered the information, click **OK**. The actual image will not be created until you click the **Process** button on the Installation/Maintenance window.

Importing the Clone Image

If you already have a PowerQuest clone image, you can import it into RDM. To do so, go to he Installation/ Maintenance window, click the **Tools** menu, and select **Import PowerQuest Image File**.
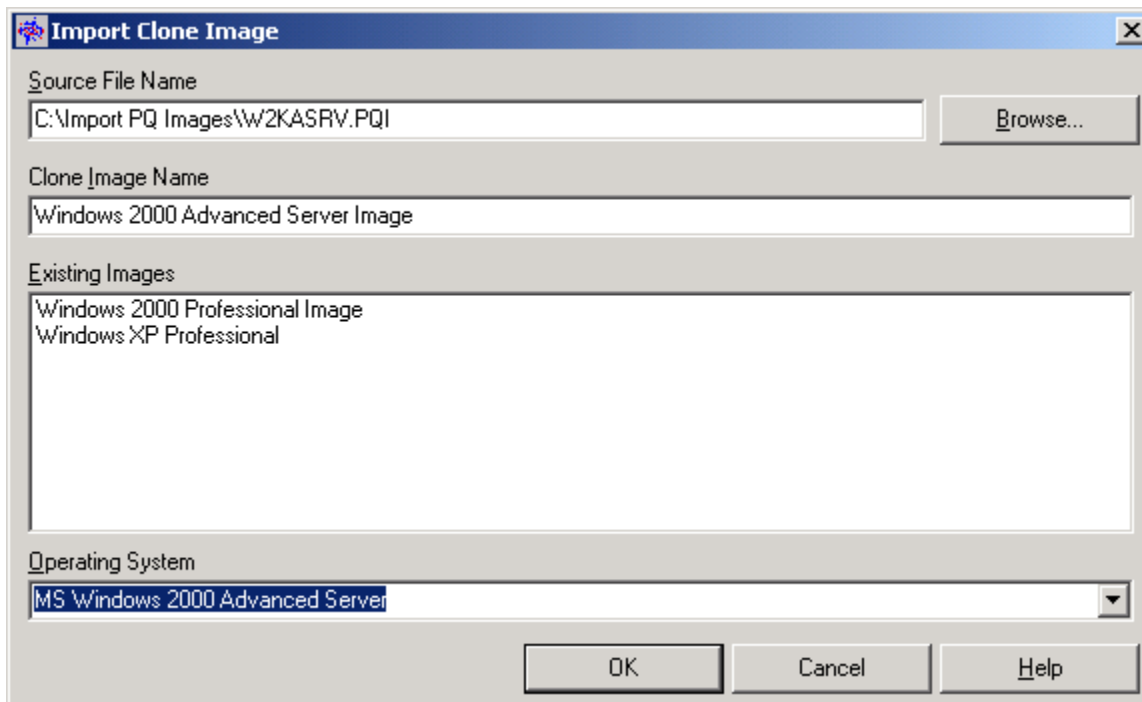
Enter the image file name in the Source File Name field or use the **Browse** button to locate the file, and enter the name of the clone image in the Clone Image Name field. The image will be known under this name in the Profile Wizard. Select the correct operating system from the dropdown list. Existing images are given. When you have entered all valid information, click **OK**. While the image is being imported, a message appears asking you to wait until the process is completed.

Creating and Deploying the Profile

The easiest way to create a PowerQuest Clone Profile is via the Profile Wizard:

1. On the Installation/Maintenance Window, select **Create New…** from the **Profile** menu.

2. From the **Create New Profile** dialog, choose **Use the Profile Wizard**.

3. On the **Welcome** screen, enter a appropriate name for the profile. Select the radio button **Clone install using PQ image**, select the operating system, and click **Next**.

4. On the **PowerQuest Clone Image Selection** screen, go to the drop down list and choose the image you wish to deploy with this profile. Click Next.

5. Enter the appropriate options on the additional windows of the Profile Wizard. For details, see "Running the Profile Wizard" on page 98. On the final window, click **Finish** to exit the Profile Wizard.

6. The new profile is ready. Assign the desired system(s) to the profile and click **Process** to start deployment. For details on assigning, see "Assigning Systems" on page 131.

Known Limitations of PowerQuest Clone Deployment

The following limitations have been identified:

▶ Image capture is only done on the primary partition of the donor computer.

▶ The built-in profile Deploy Center can only deploy a single partition to a system.

Note: These limitations can be overcome by obtaining the full version of Deploy Center. For details, see "Upgrading Deploy Center" on page 57.

▶ During testing, we found a problem with deploying Windows XP Professional images under the following conditions:

 ▪ The RDM server resided on a Windows 2000 Domain Controller.

 ▪ The system was to join the domain on which the RDM server resided.

 Under this scenario, during mini-setup, the system would attempt to join the domain and would either get an unknown error or an error saying the user was not allowed to join the domain. Through user intervention at the system, the setup was able to complete.

4.6 Setting Up CloneIt Agent Clone Deployment

When you create a CloneIt Agent clone install software profile using the Profile Wizard, you can select an appropriate clone image from a list of available images on the **Profile Wizard - Clone Image Selection** screen (see page 104). If you are planning to create a CloneIt Agent clone profile that uses a new image, you must first prepare this image. This is done with the CloneIt Agent Wizard.

Note: For a detailed example of how to set up a system for CloneIt Agent clone deployment, see "CloneIt Agent Clone Install of Windows 98" on page 172.

The CloneIt Agent Wizard allows you to create a clone image by making an exact copy of a donor computer. It creates the new image and copies the compressed image file to the RDM server so that it can be used to install duplicate cloned images onto other systems with identical hardware as the donor computer. The CloneIt Agent Wizard only supports a limited number of computer platforms. For details, see "Supported Operating Systems" on page 8.

Before you run the CloneIt Agent Wizard, you must first prepare a donor computer for cloning. This is described in the next section.

Preparing the Donor Computer

To build a donor computer, follow these steps:

1. Install the operating system and all other required application software onto the computer that you want to use as the donor for the clone profile.

2. Connect the new donor computer to a LAN that can be accessed by the RDM Server.

3. Make a thorough check to ensure that all the required application software is installed and working correctly on the donor computer, and that the network connection is operating properly.

4. Shut down and restart the donor computer.

5. Allow the donor computer to restart fully, allowing sufficient time for all programs to load that may have been placed into Window's automatic Startup folder.

6. When startup has completed, shut down all programs that are currently active on the donor computer, leaving only the Windows operating system active. Active programs are displayed on the Windows taskbar at the bottom of the screen. Right-click active items and select **Close**.

Run the CloneIt Agent Wizard

To start the wizard from the donor computer:

1. Make sure you are logged onto the domain with **Domain Administrative** rights.

2. From the desktop, double-click the **Network Neighborhood** resource and then **Entire Network**. A list of available servers will be displayed.

3. Locate the RDM server and double-click it. A list of shared folders will be displayed for this server.

4. Double-click the share **LANC$ADM**. This will open the RDM program installation directory.

5. Double-click **CloneItAgent.exe**.

Click **OK** to begin the Cloning process. An easy to use CloneIt Agent Wizard will begin on the donor computer. Follow the simple on-screen instructions to create the clone.

CloneIt Agent Wizard - CloneIt Agent
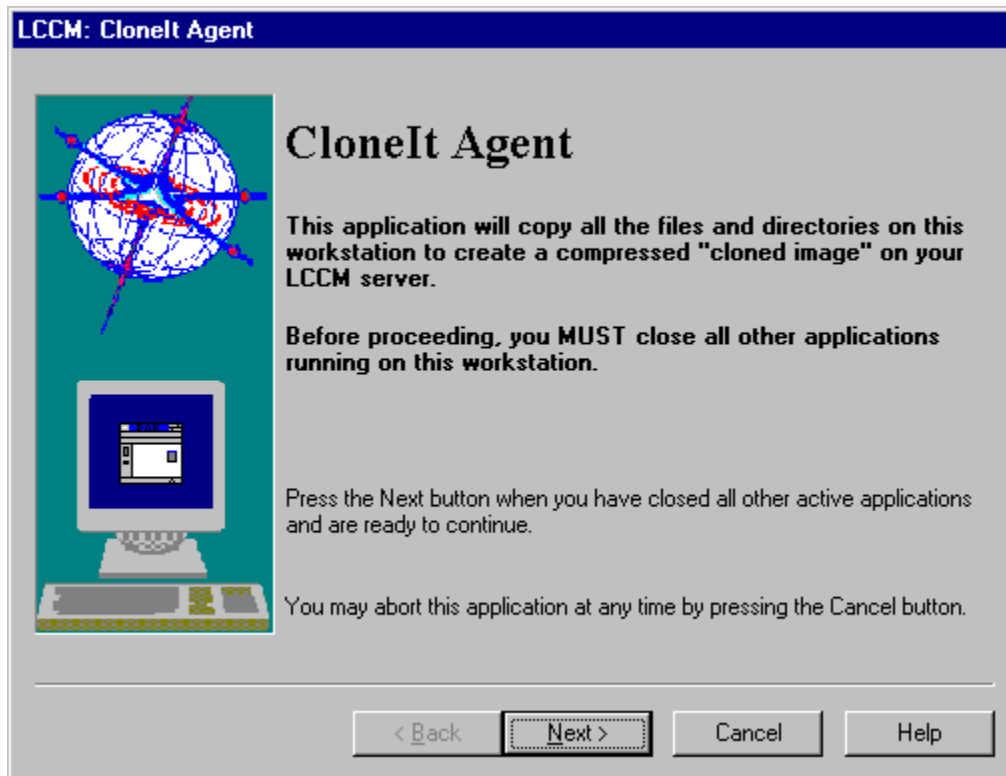
The CloneIt Agent screen provides a description of the CloneIt process. Click **Next**.

CloneIt Agent Wizard - This Workstation
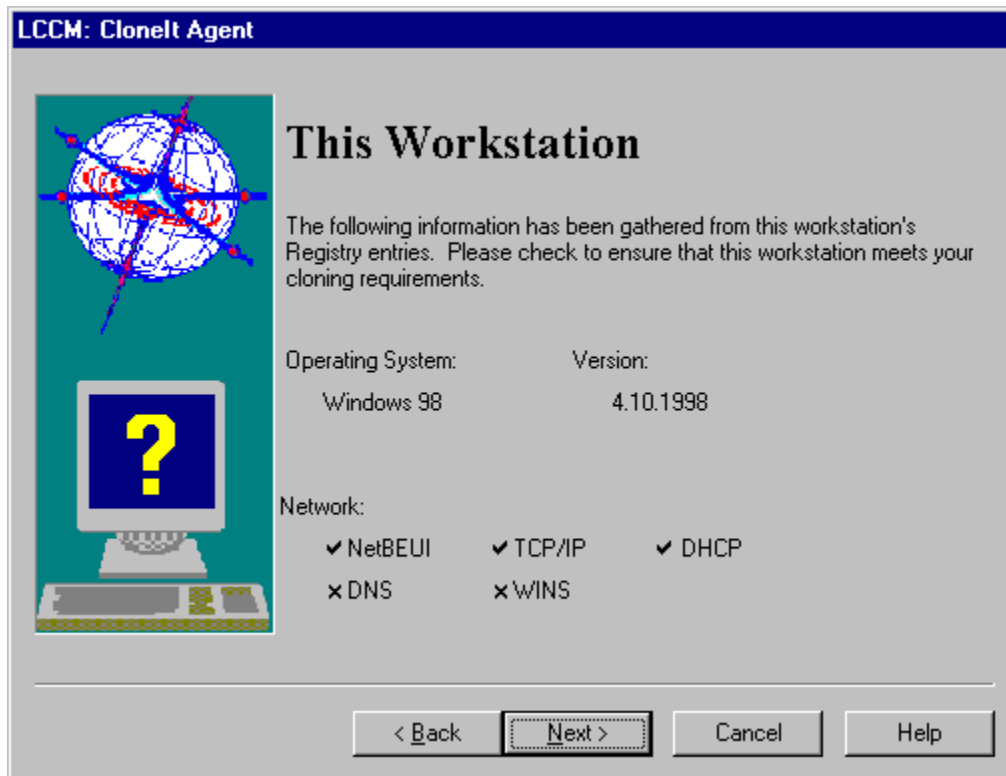
The Workstation screen gives details from the donor computer's registry. Verify these details and click **Next**. If the details do not meet your requirements, you should cancel at this stage.

CloneIt Agent Wizard - Cloned Image Name
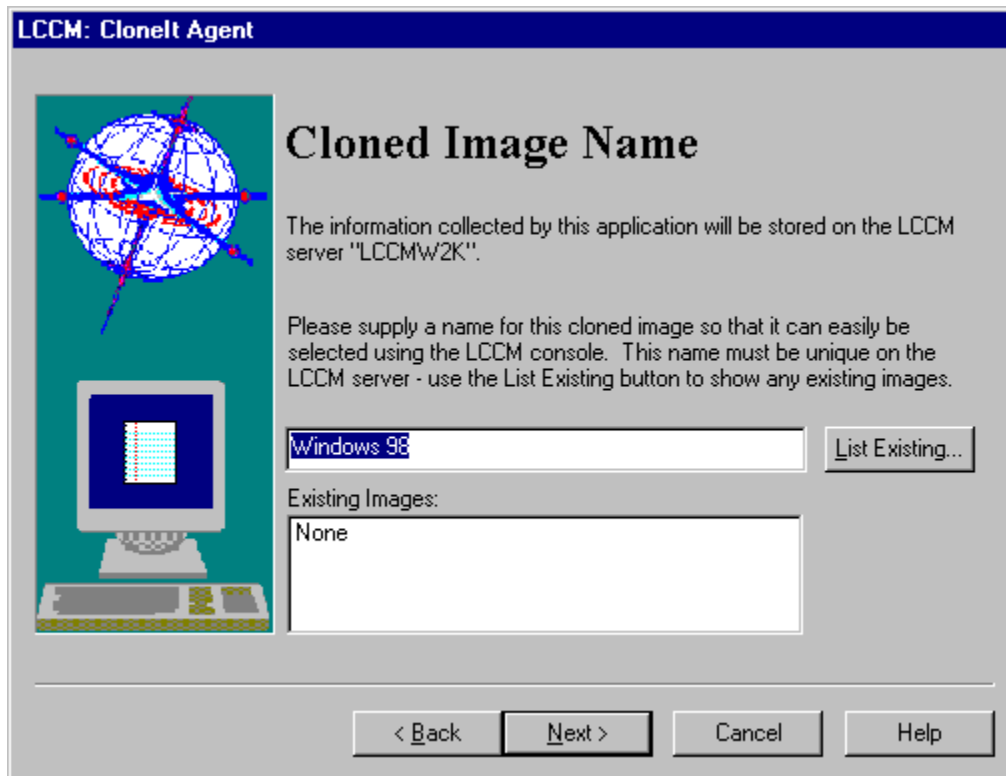
The Cloned Image Name screen indicates the RDM server on which the cloned image will be stored, and allows you to specify a descriptive name:

▶ **Existing Images**. Displays a list of existing CloneIt Agent Images.

CloneIt Agent Wizard - Begin Cloning
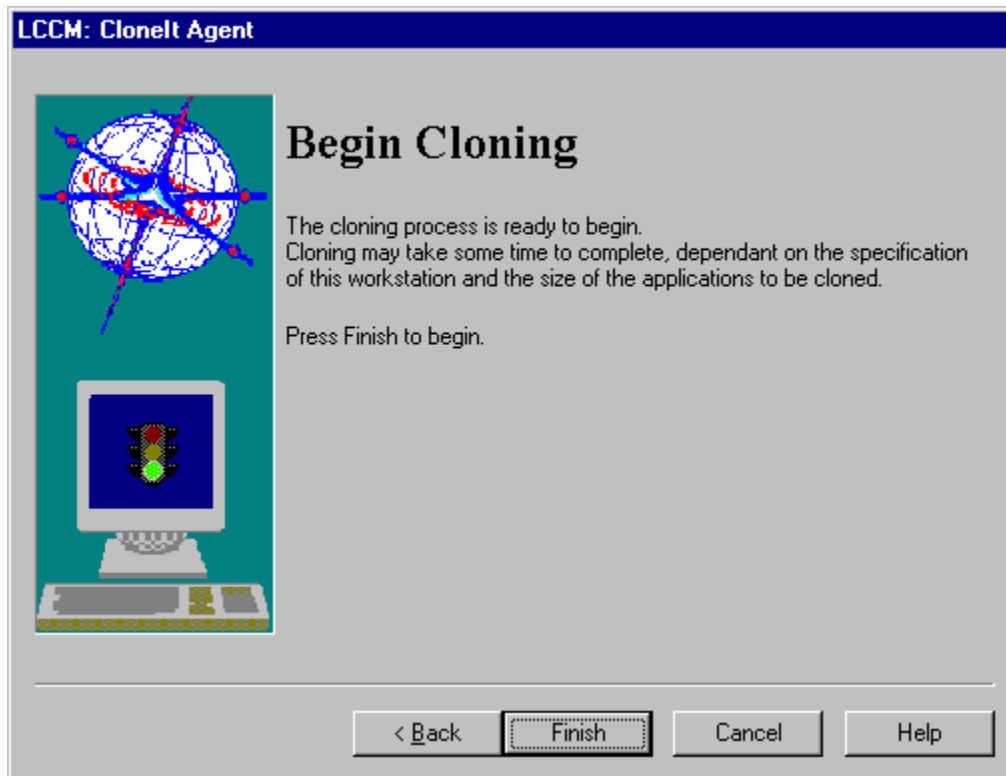
The cloning process is ready to begin. You can make any changes at this stage by going back through the wizard. Click **Finish** to begin the cloning process.

Once the cloning process has begun, the Cloning in Progress screen will be displayed giving the current status of the cloning process and the estimated time remaining in minutes and seconds.

4.7 Secure Data Disposal

The Secure Data Disposal tool is a utility for performing a low-level erase of hard drives on a system. It is used before disposal or re-deployment of systems. It has the ability to detect all drives and partitions (even hidden partitions) and to wipe out all data and files so they cannot be reconstructed.

Three levels of Secure Data Disposal security are available:

► Quick – overwrites the partition table of each drive with zeros. The data on the drive is inaccessible to any normal operating system based disk and file management tools.

► Medium – overwrites each sector with a fixed bit pattern. The data on the drive will be inaccessible to commercially available data recovery tools.

► Secure – overwrites each sector multiple times. The data on the drive will be inaccessible to any tools at any level.

Each of the above levels appears as a separate predefined profile, which cannot be configured or deleted. For most systems, you can use one of these profiles to deploy the Secure Data Disposal Tool. If your computer has a ServeRaid adapter, you cannot use these built-in profiles. Instead, you must create a new profile.

Using a Predefined Secure Data Disposal Profile

To successfully dispose of a system, drag the system onto the particular level of the Secure Data Disposal tree, within the Profiles and Assigned Systems box, then click **Process**. A warning dialog box will be presented asking if you are sure that you want to proceed and that the system data will be erased once processed. Once the data is erased the system is available for re-deployment and can be assigned to another RDM profile.

Using Secure Data Disposal with RAID

The predefined Secure Data Disposal profiles cannot be used on computers that contain ServeRAID adapters. Instead you must create a manual profile that runs the Secure Data Disposal program on these system. The process to do this is the following:

1. Create a batch file RAIDSCRB.LCI. A detailed example of such a batch file is given below.

2. Create a manual clone profile that uses RAIDSCRB.LCI as the final image file on the Software page. Check the "RAID required" box on the Minimum HW page. For details on how to create such a profile, see "Creating a Software Profile Manually" on page 128.

3. Assign systems to this profile and click the **Process** button.

Your batch file logic should load the appropriate ServeRAID device driver, reconfigure the RAID as RAID 0 for all drives, and then run SCRUB3.EXE with the appropriate command-line arguments. The result will be that all sectors except those reserved for the ServeRAID configuration will be erased based on your SCRUB3.EXE command line arguments.

The following sample file shows one way to set up your RAIDSCRB.LCI file:

```
REM Load the ServeRAID device driver
IF "%RAIDCONFIG%"=="2"  goto LOADTYPE2
%LCCMPATH%\dynaload %DOSPATH%\IPSRASPI.SYS /Q
GOTO CHKERROR
:LOADTYPE2
%LCCMPATH%\dynaload %LCCMPATH%\defaults\oem\textmode\IPSRASPI.SYS /Q
:CHKERROR
```

```
REM Delete the current ServeRAID configuration
%LCCMPATH%\IPSSEND SETCONFIG 1 DEFAULT NOPROMPT
if ERRORLEVEL 1 goto ERROR

REM Configure RAID 0 for all drives (the default factory configuration)
%LCCMPATH%\IPSSEND CREATE 1 LOGICALDRIVE NEWARRAY MAX 0 3 1 3 2 3 3 3 5
NOPROMPT
if ERRORLEVEL 1 goto ERROR

REM Run the Secure Data Disposal program
%LCCMPATH%\scrub3 /D=ALL /L=2
if ERRORLEVEL 1 goto ERROR

goto NOERROR
:ERROR
echo "An error occurred."

:NOERROR
```

4.8 Managing Software Profiles

View or Edit an Existing Profile

To view or edit an existing profile:

1. Double-click the software profile within the Installation/Maintenance window. Alternatively, highlight the software profile, select **Profile** from the menu, and then select **Configure**. The Software Profile Details notebook appears.

2. Do one of the following:

   ▪ To view the profile, select the appropriate pages of the notebook.

   ▪ To edit the profile, modify the appropriate fields of the various pages of the notebook. For more information, see "Software Profile Details Notebook" on page 73.

   Modifications to an existing profile will not take effect on a system already assigned to this profile unless you check the **Mark system for reload** checkbox on the Software page of the Individual System Details notebook. If you check this box, the entire image will be reinstalled on the selected system.

3. Click **OK** to return to the Installation/Maintenance window.

Delete a Profile

To delete an existing Software Profile:

1. Select the profile within the Installation/Maintenance window.

2. Select **Profile** from the menu.

3. Select **Delete**.

4. Select **Yes** in the message box that displays.

All systems assigned to the deleted software profile are placed in the Unassigned Systems list of the Installation/Maintenance window.

4.9 Managing Systems

Deassign a System from a Software Profile

Deassigning a system from a software profile changes an assigned system into an unassigned system. After you de-assign a system, the system appears in the **Unassigned Systems** box.

To deassign one or more systems from a Software Profile:

1. Select a system or multiple systems within the Profiles and Assigned Systems box.

2. Click the **Deassign** button.

IMPORTANT: If a system whose primary startup sequence is "network" is left in the **Unassigned Systems** box after the changes are processed (clicking the **Process** button), the system will not be able to start up normally. The system will stop or loop at the PXE screen. If the system has a PXE bypass mechanism (such as the **Home** key used by some IBM Personal Computer models), the end user can bypass the PXE screen and start the system from its own hard disk. On models that do not have a PXE bypass mechanism, the only method of starting an unassigned system from its own hard disk is to modify the startup sequence and insert Diskette, CD-ROM, or Hard Drive in front of Network in the startup sequence.

Temporarily Disable a System

To temporarily disable a system from starting:

1. Select a system or multiple systems within the Profiles and Assigned Systems box.

2. Access the Individual System Details notebook by doing one of the following:

    - Double-click one of the selected systems.
    - Select **System** from the menu, and then select **Configure**.

3. Select the **Details** page.

4. Check the **System Disabled** check box.

5. Click **OK** to return to the Installation/Maintenance window.

6. Click the **Process** button to save and process the changes.

A disabled system appears gray in the Installation/Maintenance window.

Note: To disable a system before downloading, uncheck the **Mark system for reload** checkbox in addition to checking the **System Disabled** checkbox.

Delete a System

To delete one or more systems:

1. Select a system or multiple systems anywhere in the Installation/Maintenance window.

2. Select **System** from the menu bar.

3. Select **Delete**.

Select how Systems are Displayed

You can customize how systems are displayed within the boxes of the Installation/Maintenance window. You can list them according to any of the following attributes:

- ▶ Name.
- ▶ Network Address.
- ▶ Serial Number.
- ▶ Contact.
- ▶ Location.
- ▶ Comment.

To select how systems are displayed:

1. Select **Options** from the menu of the Installation/Maintenance window.
2. Select **Display Systems By**.
3. Select a value from the list that appears.

Note: The default attribute for displaying systems is Name. Of the options provided by RDM, only Name and Network Address are guaranteed to be unique. Location or Contact might be more useful, depending on your organization.

Search Specific Systems

You can perform a database search for any alphanumeric values (text and numbers) stored in RDM that might help you identify individual systems or groups of systems. For example, you can locate systems that have a specific BIOS level or video chip set. You can search for field values stored in any of the pages of the Individual System Details notebook (or combinations of these values).

To perform a search on existing systems:

1. Select **Tools** from the menu in the Installation/Maintenance window.
2. Select **Search For System**.
3. Enter the keywords you want to search for; you can also enter partial words. Leave a space between each word.
4. Select one of the following search types:
   - **AND** – finds occurrences that match all the keywords entered in.
   - **OR** – finds occurrences that match any of the keywords entered in.
5. Click **OK**. Search results are displayed in the Systems Database Search box of the Installation/Maintenance window. You can then select, edit, copy, or delete individual systems or groups of systems from this window.

Edit a System

To modify an existing system:

1. Select a system in the Installation/Maintenance window.
2. Access the Individual System Details notebook by doing one of the following:

- Double-click the selected system.
- Select **System** and then **Configure** from the menu.

3. Edit the desired fields of the different pages.

4. Click **OK** to return to the Installation/Maintenance window.

5. Click the **Process** button to save and process the changes.

Force an Image Reload at Next Startup

This procedure forces an image reload onto selected systems at the next system startup. You might want to use this procedure if the software on the system has been damaged. Rather than try to diagnose the problem and replace the damaged files individually, you might save time by reloading the entire software profile.

To force an image reload at next startup:

1. Select a system or group of systems within the Installation/Maintenance window.

2. Access the Individual System Details notebook by doing one of the following:
   - Double-click a selected system.
   - Select **System** and then **Configure** from the menu.

3. After the Individual System Details notebook appears, select the **Software** page.

4. Click the checkbox for **Mark System For Reload**.

5. Click **OK** to return to the Installation/Maintenance window.

6. Click the **Process** button to save and process the changes.

Deploy a Maintenance File

To assign systems to a maintenance image:

1. **Select** the systems you want to update in the Installation/Maintenance window.

2. Access the Individual System Details notebook by doing one of the following:
   - Double-click one of the selected systems.
   - Select **System** from the menu; then select **Configure**.

3. Select the **Maintenance** page.

4. Use the **Browse** button to select the correct maintenance file, or enter in the full path and file name directly into the field provided (beside the Run Maintenance file check box). RDM maintenance files are DOS batch files whose filenames have the extension MNS (although it is possible to use files with other extensions).

5. Check the **Run Maintenance File** check box.

6. Select the **Scheduler** page of the Individual System Details notebook and verify the Scheduler information.

7. Click **OK** to return to the Installation/Maintenance window.

8. Click the **Process** button to process these changes.

Schedule a Repeat Event

You can use RDM to perform scheduled repeat events, such as running virus scans or backing up data, on a daily or weekly basis. To schedule a repeat event (other than re-installing the image):

1. Create a maintenance-image file (.MNS) containing the commands required to accomplish your event.

2. Open the Individual System Details notebook for a system or group of systems on which you want to perform the repeat event.

3. On the Maintenance page:

   a) Check the **Run Maintenance File** check box.

   b) Using the **Browse** button select the maintenance-image file.

4. On the Scheduler page:

   a) Select the **Use System Scheduler Always** radio button.

   b) Select the **Repeat** radio button.

   c) Select either the **Daily or Weekly** radio button. If you selected **Repeat Weekly**, select the day of your choice by clicking the up or down arrows within the Schedule day section**.**

5. Click **OK**.

6. In the Installation/Maintenance window, click the **Process** button.

The maintenance file will run on the day selected and repeat either daily or weekly, depending on your selection.

To stop the maintenance file from running:

1. Open the Individual System Details notebook for a system or group of systems.

2. On the Maintenance page, uncheck the **Run Maintenance File** check box.

3. Click **OK**.

4. On the Installation/Maintenance window, click the **Process** button.

In some situations, such as a classroom, this functionality can be used to reinstall the complete image (operating system and applications) upon the completion of a course so that it is ready to be used by the next group of students. To use the repeat Scheduler to accomplish this task:

1. Open the Individual System Details notebook for a system or group of systems on which you want to reinstall the image.

2. On the Software page, check the **Mark system for reload** check box.

3. On the Scheduler page:

   a) Click the Use System Scheduler Always radio button.

   b) Click the **Repeat** radio button.

   c) Click either the **Daily or Weekly** radio button. If you selected **repeat weekly**, select the day of your choice by clicking the up or down arrows within the Schedule day section.

4. Click **OK**.

5. In the Installation/Maintenance window, click the **Process** button.

4.10 Managing BIOS/CMOS Settings

On most IBM computers, pressing **F1** (or some other function key) while the computer is starting up normally accesses the BIOS settings. These BIOS settings can be password protected to help prevent unauthorized users from making changes to for instance the startup sequence. RDM can set or change the BIOS Administrator password on some (but not all) computers. Please note that:

► The default BIOS administrator password is set only during the scan process. If the default BIOS administrator password is set after the system has been scanned, the password will not be applied to that system. For more details, see "Defaults - General Tab" on page 67.

► Changing the default password does not affect the passwords of systems that have already been scanned. To change the BIOS administrator password for systems that have already been created, see the next section.

► The BIOS administrator password code is based on the positions of the keys, not the characters typed. If any of your systems use a keyboard layout that is different from the keyboard layout you use to operate RDM (for example, a keyboard for another language), the BIOS password set through RDM might not be recognized when typed on the system keyboard. Be sure to use only characters that occur in the same position on all keyboards used.

CMOS is a small block of data that contains some of the BIOS configuration settings of a system. You might want to create different CMOS images depending upon your end-users or variations in the installed hardware. For example, you might want to allow some systems access to their diskette drives, while restricting diskette-drive access for other systems. If you update the CMOS settings, you must make sure that these changes are compatible with the system's BIOS level. For more information, see page 159.

Note: The BIOS administrator password is also known as the Privileged Access Password (PAP). Although these terms are interchangeable, RDM consistently uses the former term.

Change or Delete a BIOS Administrator Password

The BIOS administrator password can be changed or deleted on the Maintenance page of the Individual System Details notebook (see page 86). You can change or delete a BIOS administrator password that has already been assigned to one or more systems. To do so:

1. Select the systems you want to update in the Installation/Maintenance window.

2. Access the Individual System Details notebook by doing one of the following:

   ▪ Double-click a selected system.

   ▪ Select **System** from the menu bar; then select **Configure**.

3. Select the **Maintenance** page.

4. Click the **Update BIOS Admin Password** check box.

5. In the field to the right of the Update BIOS Admin Password check box, do one of the following:

   ▪ To delete an existing BIOS administrator password, erase the current password and leave the field blank.

   ▪ To change an existing BIOS administrator password, erase the current password and enter in a new one.

6. Click **OK** to return to the Installation/Maintenance window.

7. Click **Process** to save and process the changes.

Temporarily Deleting the BIOS Administrator Password

In most environments, access to the BIOS settings on a system is restricted to authorized users only. This is also good policy for an RDM-enabled environment. For instance, if the startup sequence of the system is changed in the BIOS settings so that network is not the first device (or the first device after diskette drive), all control of the system from RDM is lost. Also, if the BIOS administrator password is changed at the system to a password that is different from the one defined within RDM, you cannot re-establish remote boot control.

However, if for some reason you want to temporarily delete the BIOS administrator password and grant access to a system to change the BIOS settings, you can use the following procedure. This procedure gives temporary access without giving the password to unauthorized users. It also does not require an authorized user to be present at the system to enter in or delete the password:

1. At the RDM console, follow the procedure given in "Change or Delete a BIOS Administrator Password" on page 156 to delete the BIOS administrator password.

2. Restart the selected system(s) so that the BIOS administrator password delete procedure takes effect.

3. At the RDM console, follow the procedure given in "Change or Delete a BIOS Administrator Password" on page 156 to change the BIOS administrator password.

4. At the system(s):

   a) Restart the computer again, and press **F1** (or the appropriate function key) to access the BIOS settings. Make the required BIOS changes.

   b) Exit from the configuration/setup utility. The system will restart and the BIOS administrator password will be enabled.

Upgrade the BIOS Level

The BIOS level of the system is part of the information collected during the scan process. You need to upgrade the BIOS level if updates to the BIOS function are required or if a change to the system's BIOS language is necessary.

If updates are required, IBM makes the new files available through bulletin board systems, publicly accessible servers, the World Wide Web, or similar means. BIOS updates are distributed as self-extracting executable (.EXE) files. The files can be identified by the format $xxJTnny.EXE$ for English and $xxJ2nny.EXE$ for Japanese, where xx denotes a two-letter system identifier and nny identifies the BIOS revision level (some BIOS updates use a different naming scheme). You should download the .EXE file and run it. The .EXE file will prompt you with instructions for creating an update diskette. In the following procedure, this diskette is referred to as the BIOS flash diskette.

Updating the BIOS level for a system is a two-step process. First, you must create a BIOS Update image from the BIOS flash diskette. Then, you apply this image to update the BIOS level for specific systems.

Create the BIOS Update Image

Follow these steps:

1. Write protect the BIOS flash diskette.

2. Insert the diskette into the diskette drive.

3. Select **Tools** from the menu bar of the Installation/Maintenance window.

4. Select **Import BIOS Flash Diskette**.

5. In the BIOS Flash Setup window, click the drop-down list and select the diskette drive letter. The diskette is read and its name (usually the volume label of the diskette) is displayed.

6. Accept the flash level name given or enter in a new name. This name is used by RDM to identify the BIOS level.

Note: If you change the level name generated from the BIOS flash diskette and download this to a system, the BIOS level shown on the BIOS setup screens of the system will not match the Current BIOS Level field on the Maintenance page of the Individual System Details notebook. This is because the BIOS program has the original level name embedded within the program code.

7. Select **Setup**. A new directory, named after the flash level, is created under the `<drive>:\RDM\CLNTFILE\BIOS` directory, and the contents of the diskette are copied.

8. If you are overwriting an existing directory, you are warned of this and given the option to **Cancel** or **Overwrite**.

9. Click **OK.**

Deploy the BIOS Update Image

To assign the BIOS level to systems:

1. Select the systems you want to update in the Installation/Maintenance window.

2. Access the Individual System Details notebook by doing one of the following:

   - Double-click one of the selected systems.

   - Select **System** and then **Configure**.

3. Select the **Maintenance** page.

4. In the BIOS Level box, select the level for the BIOS upgrade.

   Note: Only BIOS levels compatible with the computer's system board will be displayed in the BIOS Level field on the Individual System Details Maintenance page.

5. In the BIOS Language box, select the language for the BIOS upgrade.

6. Click the **Update BIOS** check box.

7. Select the Scheduler page of the Individual System Details notebook and verify the Scheduler information.

8. Click **OK** to return to the Installation/Maintenance window.

9. Click the **Process** button to save and process the changes.

BIOS updates are not made until the system's scheduled update time is reached and the system is switched off and restarted. If the BIOS update fails, an error code appears in the Progress and Errors Window. The meanings of the error codes vary depending on the BIOS level. To decipher the error codes:

1. Insert the appropriate BIOS flash diskette into the diskette drive.

2. At a command prompt, enter:

   `A:\CMOSUTIL /?`

   or

   `A:\SRCMOSxx /?`

   where `xx` is a two-letter model-specific designation.

A list is displayed containing the error codes and their meanings. Alternatively, on some BIOS flash diskettes, the error codes are also contained in the diskette's AUTOEXEC.BAT file.

Note: If the network adapter listed on the **Hardware** page of the **Individual System Details** notebook is "Unknown", RDM does not process a BIOS update and returns an error message. Make sure that the network adapter is properly recognized before attempting a BIOS update.

When RDM does a remote update of the BIOS level, it will execute either `LCREFLSH.BAT` or `FLASH2.EXE`, depending on what is on the BIOS disk. `LCREFLSH.BAT` will always be executed if it is present. Advanced users who understand the BIOS flash process may modify `LCREFLSH.BAT` to

customize this process. For additional details on what functions are available, consult the Readme file on the BIOS flash diskette.

Update the CMOS Settings

To update the CMOS settings, you must use the executables CMOSUTIL.EXE or SRCMOSxx.EXE (where xx will be two characters identifying the system board type). You will find these on the BIOS flash diskette that you used to upgrade the BIOS level (see page 157).

Updating the CMOS settings for a system is a two-step process. First, you must create the CMOS Settings Update image. Then, you apply this image to update the BIOS level for specific systems.

Create the CMOS Settings Update Image

You create a CMOS Settings Update Image on a donor computer, which has the correct BIOS level installed (i.e., the BIOS level on the donor computer must be the same as the BIOS level you just applied on the target system). Specifically, you execute the following steps on the donor computer:

1. Start the computer and access the Configuration/Setup Utility program. On many IBM computers, you can access this program by pressing F1 while the computer is starting up.

2. Change and save the desired settings as required. In particular, you should have "diskette" ahead of "network' in your alternate boot sequence.

3. Exit from the Configuration/Setup Utility program (saving your changes) and power off the computer.

4. Insert a DOS boot diskette in the donor computer's diskette drive.

5. Restart the donor computer via Wake on LAN. You can use the RDM wake tool to do this.

6. Use the CMOSUTIL.EXE or SRCMOSxx.EXE program to save the current settings of the donor computer to a file that you will name with the .CMS extension. Type:

    ```
    CMOSUTIL \path\file_name.CMS /capture
    ```

    or

    ```
    CMOSUTIL – s \path\file_name.CMS
    ```

    or

    ```
    SRCMOSxx \path\file_name.CMS /capture
    ```

    where `xx` is the two character system board identifier, and `path` is any accessible directory name of your choice.

    Note: For the CMOSUTIL utility, check the BIOS diskette for documentation on the exact format for capturing CMOS settings. This information should either be in README.TXT or CMOSUTIL.TXT.

    Give the file a unique name that you can identify later. For example, NO35DISK.CMS could be the name of a file that has settings that restrict system access to diskette drives.

7. Copy this file to the corresponding BIOS directory on your server which is named:

    ```
    C:\RDM\CLNTFILE\BIOS\Flash_BIOS_Name
    ```

    where the `Flash_BIOS_Name` directory is the name of the BIOS level on your donor computer (unless this was changed by the system administrator during the Import BIOS Flash Diskette process).

8. If you want to create another CMOS image that uses different settings, return to step 1 and repeat the procedure, saving the results to a different file name.

Deploy the CMOS Settings Image

Now you must apply the newly created image to the desired systems:

1. Select the systems you want to update in the Installation/Maintenance window.

2. Access the Individual System Details notebook by doing one of the following:

   - Double-click one of the selected systems.

   - Select **System** and then **Configure**.

3. Select the **Maintenance** page.

4. Use the **Browse** button to select the correct CMOS (.CMS) file for the systems, or enter the full path and file name directly into the field provided. If the **Browse** button (or the **Update CMOS with file** check box) is disabled, select the system's BIOS level in the **Level** drop-down list and uncheck the **Update BIOS** check box.

5. Check the **Update CMOS with file** check box.

6. Select the **Scheduler** page of the Individual System Details notebook and verify the Scheduler information.

7. Click **OK** to return to the Installation/Maintenance window.

8. Click the **Process** button to process these changes.

CMOS updates will not be made until the system's scheduled update time is reached and the system is powered off and restarted. If the CMOS setting's update fails, an error code appears in the Progress and Errors Window. The meanings of the error codes vary depending on the BIOS level. To decipher the error codes:

1. Insert the appropriate BIOS flash diskette into the diskette drive.

2. At a command prompt, enter:

   `A:\CMOSUTIL /?`

   or

   `A:\SRCMOSxx /?`

   where `xx` is a two-letter model-specific designation.

A list is displayed containing the error codes and their meanings.

When RDM does a remote update of the CMOS settings, it will execute `LCCMOS.BAT`, `CMOSUTIL.EXE`, or `SRCMOSxx.EXE`, depending on which file is in RDM's `RDM\CLNTFILE\BIOS\<xxJTxxx>` directory. `LCCMOS.BAT` will always be executed, if it is present; otherwise, the EXE file will be executed. The actual command that RDM runs is one of the following:

```
LCCMOS.BAT %CMOSFILE%

CMOSUTIL.EXE %CMOSFILE% /UPDATE /NOREBOOT /QUIET

SRCMOSNV.EXE %CMOSFILE% /UPDATE /NOREBOOT /QUIET
```

Advanced users who understand the CMOS process may modify (or create, if none existed on the BIOS flash diskette that was imported into RDM) `LCCMOS.BAT` to customize this process. For additional details on what functions are available, consult the Readme file on the BIOS flash diskette.

Note that the `CMOSUTIL.EXE` programs for different Netfinity or xSeries servers may require different command-line syntax. For example, to update CMOS with RDM on an xSeries 330 server, you must create an `LCCMOS.BAT` file (because the required syntax is different from what RDM uses by default). If you don't create this file, RDM will by default run this batch file (named `IMAGE.BAT`):

```
SET FLSH_MODEL=865451Y
SET FLSH_SERIAL=23M5447
SET FLSH_LANGUAGE=US
SET CMOSFILE=spider.cms
S:
CD\BIOS
CD TTJT29A
cmosutil.exe  %CMOSFILE% /UPDATE /NOREBOOT /QUIET
```

That file will fail, because it uses the wrong syntax for `CMOSUTIL.EXE`. To make CMOS updating with RDM work, create an `RDM\CLNTFILE\BIOS\<xxJTxxx>\LCCMOS.BAT` file like this one:

```
REM LCCMOS.BAT file created by the customer for xSeries 330 to override
REM the default syntax for CMOSUTIL.EXE.
cmosutil.exe /R %1
```

Then RDM will by default run this batch file, which will work properly:

```
SET FLSH_MODEL=865451Y
SET FLSH_SERIAL=23M5447
SET FLSH_LANGUAGE=US
SET CMOSFILE=spider.cms
S:
CD\BIOS
CD TTJT29A
LCCMOS.BAT %CMOSFILE%
```

Upgrade the Embedded Controller Level

Some IBM ThinkPads now include a hardware component called an Embedded Controller. The Embedded Controller level of a system is part of the information collected during the scan process and can be updated remotely by RDM. Updates to the Embedded Controller level can be found on a separate Embedded Controller diskette that accompanies the BIOS flash diskette.

Updating the Embedded Controller level for a system is a two-step process. First, you must create an Embedded Controller Update image from the Embedded Controller flash diskette. Then, you apply this image to update the Embedded Controller level for specific systems.

Create the Embedded Controller Update Image

Follow these steps:

1. Write protect the Embedded Controller flash diskette.

2. Insert the diskette into the diskette drive.

3. Select **Tools** from the menu bar of the Installation/Maintenance window.

4. Select **Embedded Controller Flash Setup**.

5. In the Embedded Controller Flash Setup window, click the drop-down list and select the diskette drive letter. The diskette is read and its name (usually the volume label of the diskette) is displayed.

6. Accept the flash level name given or enter in a new name. This name is used by RDM to identify the Embedded Controller level.

    Note: If you change the level name generated from the Embedded Controller flash diskette and download this to a system, the system Embedded Controller level shown on the Embedded Controller setup screens of the system will not match the Current Embedded Controller Level field from the Maintenance page of the Individual System Details notebook. This is because the Embedded Controller program has the original level name embedded within the program code.

7. Select **Setup**. A new directory, named after the flash level, is created under the `<drive>:\RDM\CLNTFILE\EC` directory, and the contents of the diskette are copied.

8. If you are overwriting an existing directory, you are warned of this and given the option to **Cancel** or **Overwrite**.

9. Click **OK.**

Deploy the Embedded Controller Update Image

To assign the Embedded Controller level to systems:

1. Select the systems you want to update in the Installation/Maintenance window.

2. Access the Individual System Details notebook by doing one of the following:

   - Double-click one of the selected systems.

   - Select **System** and then **Configure**.

3. Select the **Maintenance** page.

4. In the Embedded Controller Level dropdown list, select the level for the BIOS upgrade.

5. Click the **Update Embedded Controller** check box.

6. Select the Scheduler page of the Individual System Details notebook and verify the Scheduler information.

7. Click **OK** to return to the Installation/Maintenance window.

8. Click the **Process** button to save and process the changes.

Embedded Controller updates are not made until the system's scheduled update time is reached and the system is switched off and restarted.

4.11 Managing Power Restore Hard Drive Partitions

Power Restore is a backup/recovery mechanism that allows the backup of the primary partition of a system (when it is in a known good state). It copies the primary partition to a hidden partition on the system hard drive. In the case of a later failure due to a corrupted or missing file, Power Restore can restore the system's primary partition to the backed-up state. Up to two versions can be stored on a system at a given time.

Minimum Requirements of a Power Restore Partition

In most cases Power Restore will limit the systems to about half of their available hard disk space, as Power Restore creates a hidden partition roughly equal to the size of the primary partition. The exact requirements of a Power Restore partition depend on the file system used and whether a second partition is present or not. For details, see "Profile Wizard - Target Machine's Disk Setup" on page 107.

Unformatted Partitions on Drives

The existence of certain types of unformatted partitions on the drive or drives in a managed System will cause the Power Restore installation process to crash. The partition types that cause such a crash include all FAT (12, 16, or 32) partitions. To avoid this problem, either format these unformatted partitions or eliminate them.

Using Power Restore to Back Up your Boot Partition.

A Power Restore backup operation can be initiated in one of three ways:

▶ **Automatically, using the Profile Wizard**. The easiest and recommended method for creating a Power Restore partition is simply to enable the function on the Profile Wizard (see "Profile Wizard - IBM Power Restore Partition Setup" on page 106). The Power Restore partition will then be created on each system that is assigned to the profile, before downloading the image. After the image has been copied onto the system, an exact copy of the primary partition will be made to the hidden Power Restore partition.

▶ **Using the Individual System Details notebook**. By checking the **Power Restore** checkbox and enabling the **Backup partition** radio button. This will allow a Power Restore backup operation to be run from the RDM console. For more details, see "Individual System Details – Maintenance Tab" on page 86.

▶ **Locally**. The Power Restore partition can be created manually on the system using a bootable diskette or CD. Also, Power Restore can be invoked by pressing a function key while powering on the system. For more details, see "Using Power Restore Locally" on page 205.

To re-run a backup operation, create an additional backup version, or to make your backed up partition up-to-date, you can use either of the last two methods.

Note: If you are running a backup operation for the first time on a system with a Rapid Restore partition that was managed by LCCM 2.5.1 or 3.0, the Rapid Restore partition will be removed and replaced by the Power Restore backup.

Using Power Restore to Restore your Boot Partition

You can restore the system's primary partition from an existing backup, for instance when your primary partition is damaged. The Power Restore operation will completely overwrite the original primary partition, including all data that may reside there. This will recover the system to a known good state, but you will lose all changes that you made on your system after the last Power Restore backup.

You can restore the system's primary partition from an existing backup in two ways:

▶ **Using the Individual System Details notebook**. By checking the **Power Restore** checkbox and enabling the **Restore partition** radio button. For details, see "Individual System Details – Maintenance Tab" on page 86.

▶ **Locally**. The Power Restore partition can be restored manually on the system using a bootable diskette or CD. Also, Power Restore can be invoked by pressing a function key while powering on the system. For details, see "Using Power Restore Locally" on page 205.

Note: During backup, Power Restore automatically created a non-DOS partition on your system's hard disk, where it stored your backed up data. If you deleted this backup partition using FDISK, NT Disk Administrator or another disk administration tool, then the restore operation will fail.

4.12 Manage Deployment Source Files

During the creation of operating system deployment profiles, RDM requires the copying or creation of files to the RDM server. These files can be the source files from Windows OS install CDs needed for unattended installs, or they can be "image" files for PQ Image or CloneIt Agent clone operations. In any case, they can consume significant disk space. This utility guides you through the process of removing these files if they become unneeded.

> **Note**: This tool is limited to only removing deployment source files from the server. This tool does NOT manage deployment source files that are copied to a remote share point.

Removing Unneeded Deployment Source Files

To remove unneeded deployment source files:

1. Select **Manage Deployment Source Files** from the **Tools** menu.

2. Select the "type" of installation by clicking on the **Unattended install**, **Clone install using PQImage** or **Clone install using CloneIt Agent Image** option button.

3. Depending on which option button you choose, and on which unattended installations or clone operations you have previously defined, a number of items will appear in the **Operating Systems and Service Packs** listbox. You may see several items appear or you may see none appear.

4. Click on one of these items and a list of the profiles that are "dependent" on the files represented by the item will appear in the **Dependent Profiles** listbox.

> **Caution**: If you are using remote share point, this utility may incorrectly identify share point profiles as dependent on server deployment source files. In this case, in step 6 below, you should decline to delete profiles and manually delete the profiles that are applicable to the deleted server deployment source files.

5. When you click on the **OK** button, the files represented by the selected item will be deleted. During this process, a status dialog will appear with a progress bar indicating how much of the task is complete.

6. When the task is complete, the status dialog will disappear. If the item you selected had any dependent profiles, you will be prompted to confirm the deletion of each of them. You may elect not to delete them, but doing so may cause problems if you attempt to re-deploy any systems assigned to them.

4.13 RAID Direct Setup File Creation

For the unattended setup of RAID adapters, RDM requires a Raid Clone File or a RAID Direct Setup (RDS) File.   This tool allows you to specify the RAID setup and creates the corresponding RDS file. During each step of the RAID setup, the dialog will prevent you from assigning duplicate physical devices and also ensure that each logical drive meets minimum requirements for the desired RAID level.

Creating A RAID Direct Setup File

To create a RAID direct setup file:

1. Select **RAID Direct Setup File Creation** from the **Tools** menu.

2. Specify separate RAID Arrays by clicking the Add Array button.

3. Once an array is added (specified by a letter A-H), select the desired array to see the current configuration of the array and add or modify its setup.

4. To add physical devices click on the Add Devices button. This will bring up the Add Physical Device dialog that accepts the Channel and SCSI ID of the desired physical device.

5. To add logical drives click on the Add Drives buttons. This will bring up the Add Logical Drive dialog that accepts the desired size of the drive and the RAID level for the logical drive.

6. In order to designate Physical Devices as Hot Spares, click on the Add Hot Spare button and enter the Channel and SCSI ID of the physical device to use.

7. The combo box for Stripe Size: allows you to choose the RAID controller's stripe size and defaults to 8KB.

8. When all RAID settings are configured, click on the **OK** button and this will bring up a save file dialog to specify the file that will be created and can be later used with a RDM profile.

Before saving the RDS file, in order to edit any Physical Device, Logical Drive, or Hot Spare, right click and select the **Edit** option from the dropdown menu, or double-click on an item. In order to delete any Array or Physical Device, Logical Drive, or Hot Spare, right click and select the **Delete** option from the dropdown menu. For each dialog screen, if the **OK** button is disabled at any point it is because one or more choices have become invalid. The items that are causing the error will be marked with a * by their on the main setup screen.

By default, the RDS files will be saved in `<drive>:\RDM\CLNTFILE\RAID`. When creating a profile which configures ServeRAID, that directory is automatically searched for RDS files.

Chapter 5. Examples

These examples are provided to help you become more familiar with using the Profile Wizard, System Assignment Wizard, and CloneIt Agent Wizard. Each exercise gives a specific example of how to use RDM's wizards to create operating system and software profiles to which your systems can be assigned.

5.1 Unattended Install of Windows 2000 Server without Applications

This example remotely installs a Windows 2000 Server operating system image on a system that has a RAID adapter installed. For the purposes of this exercise, Windows 2000 Server operating system (including Service Pack 2) is used. This exercise uses the Profile Wizard and the System Assignment Wizard to:

  ▶ Set up a system.

  ▶ Add the system to the RDM database.

  ▶ Create a Windows 2000 operating system (including Service Pack 2) image.

  ▶ Create an RDM software profile for the Windows 2000 Server image.

  ▶ Transport the Windows 2000 Server operating system image to the server.

  ▶ Assign the system to the software profile using System Assignment Wizard.

  ▶ Download the Windows 2000 Server operating system image to the system.

Before you begin, you must have the following:

  ▶ A server attached to the LAN. The server must be functioning and have RDM 3.2 already installed.

  ▶ A Windows 2000 Server installation CD.

  ▶ Windows 2000 Server licenses.

  ▶ A system. This computer must have an RDM-supported network card installed and meet the minimum hardware requirements to run Windows 2000 Server.

Scan the System

The first step in this exercise is to connect your system to the LAN and scan it into RDM:

  1. Set up a system (i.e., connect the cables, etc.) and connect it to the LAN. This system will receive the Windows 2000 Server operating system image and will be referred to as the system throughout the remainder of this exercise.

  2. Start RDM and start the scan process by clicking on the **Start** button in the Installation/Maintenance window.

  3. Power on the system, and make sure it boots to the network (i.e., change its startup sequence, if necessary).

The system will run the RDM scan programs and then power off. A new system name will appear in the Installation/Maintenance window.

Create a Software Profile

The next step in this exercise is to create a software profile using the Profile Wizard:

1. From RDM's **Profile** menu select **Create New**.

2. Select the **Use the Profile Wizard** radio button and click **OK**.

3. At the Welcome to the Profile Wizard screen:

   a) Enter a profile name.

   b) Click the **Unattended install** radio button.

   c) Check **Do you want to keep the install directory?**

   d) Select the Windows 2000 Server operating system and Service Pack 2 from the drop-down lists and click **Next**.

4. If you see an Unattended Operating System Files Selection screen, check the **Use existing operating system files** checkbox, and click **Next**.

5. At the Supported International Language Selection screen, select the appropriate operating system language from the drop-down list and click **Next**.

6. At the RAID Adapter Setup screen, check the **Yes, the target systems have RAID adapters installed** box. Then either select a RAID setup file from the drop-down list or select your setup file by checking the **Copy new RAID setup file from …** box and selecting the **Have Disk …** button. Then click **Next**.

7. At the IBM Power Restore Partition Setup screen, click the **Yes, create a hidden local copy of the entire system image** radio button, and click **Next**. For more details on enabling Power Restore see "Profile Wizard - IBM Power Restore Partition Setup" on page 106.

8. At the Target Machine's Disk Setup screen, select the **Single partition using maximum available space** radio button, select the **NTFS** radio button and click **Next**. For details on the other partitioning options, see "Profile Wizard - Target Machine's Disk Setup" on page 107.

9. At the Profile Customization screen, enter a **Company Name**, a multi-user CD key (if appropriate), and click **Next**.

10. If you want to apply the settings and choices captured in an SMA image file, check the **Use System Migration Assistant** box. Click **Next** to continue.

11. At the Software Delivery Assistant screen, click **Next**.

12. At the Regional Settings screen, select the time zone for your system from the drop-down list and click **Next**.

13. At the Server Customization screen, select the **Standalone** radio button, select the **Select Server Licensing Method** appropriate to your network and click **Next**.

14. At the Networking screen, select the **Domain** radio button and enter the **Domain Name** of the RDM Server. Check the **NetBEUI** and **TCP/IP** check boxes under Network Protocols and click **Next**.

15. At the TCP/IP Configuration screen, select the **Configure TCP/IP settings manually** radio button, enter your subnet mask and default gateway IP addresses, and click **Next**.

16. At the Profile Summary screen, use the scroll bar to ensure the details for your software profile are correct (if not go back through the wizard to make any corrections), add a description for your profile, and click **Next**.

17. At the Image Building screen click the **Build images…** button.

18. Click **Yes** on the message box that appears (to copy the images used by your software profile).

19. At the Locate the Windows 2000 Setup File screen, insert your Windows 2000 Server CD and browse to `<CD drive>:\I386\WINNT` and click **Open**. When the Successfully finished copying 2000 Server dialog box is displayed, click **OK**.

20. The Profile Wizard is now ready to build Service Pack 2. Click **Yes** to continue, navigate to the directory that contains the unpacked Service Pack 2 files, and click **Open**. When the copying is done, click **OK**.

21. At the Profile Summary screen, "No more image files to build" will be displayed. Click **Finish**.

The profile that you have just created appears in the Profile and Assigned Systems column under OS Install Profiles within RDM's main Installation/Maintenance window.

<u>**Assign a system to a Software Profile**</u>

The next step in this exercise is to assign your system to the software profile you have created:

1. Highlight your system in the Unassigned Systems column, drag and drop it onto the software profile that you just created in the Profiles and Assigned Systems column under OS Install Profiles. This will automatically start the System Assignment Wizard.

2. At the System Assignment Wizard screen, click **Next**.

3. At the Registered User screen, enter a name for the registered user of your system and click **Next**.

4. At the Product ID screen, enter the Product ID for your Windows 2000 Server installation CD (if no default value is shown) and click **Next**.

5. At the Network Username screen, enter a default network user name for your system and click **Next**.

6. At the Description screen, enter a description for your system and click **Next**.

7. At the System Parameter Summary screen, ensure the details for your System are correct (if not, go back through the wizard to make any corrections) and click **Finish**.

8. To deploy Windows 2000 Server and Service Pack 2 to your system, click the **Process** button on the Installation/Maintenance window.

Note: If you use the Scheduler to set a specific day and time, you must still click the Process button and leave the RDM console running for the scheduled changes to take place. Clicking on the Process button places the scheduled changes in the processing queue of the Progress and Errors Window; when the specific day and time arrives, the scheduled changes are processed.

5.2 Unattended Install of Windows NT 4.0 Workstation with Applications

This example remotely installs a Windows NT 4.0 Workstation operating system image (including Service Pack 6) and additional applications on a system. Supported applications such as Universal Manageability Services, Netfinity Services and RDM 3.2 can be included. The example uses the Profile Wizard and the System Assignment Wizard to:

▶ Set up a system and a donor computer.

▶ Add the system to the RDM database.

▶ Create a Windows NT 4.0 Workstation operating system (including Service pack 6 and a Power Restore partition) image and additional applications.

▶ Create a software profile for the Windows NT 4.0 Workstation (including Service pack 6) image and additional applications.

▶ Transport the Windows NT 4.0 Workstation operating system (including Service Pack 6) and additional applications image to the RDM server.

▶ Assign the system to the software profile using System Assignment Wizard.

▶ Install the Windows NT 4.0 Workstation operating system (including Service Pack 6) and additional applications image on the system.

Before you begin, you must have the following:

▶ A server attached to the LAN. The server must be functioning and have RDM 3.2 installed.

▶ The Windows NT 4.0 Workstation CD-ROM.

▶ The Windows NT 4.0 Service Pack 6 CD-ROM.

▶ Licenses to operate Windows NT 4.0 Workstation.

▶ A donor computer that has the operating system already installed.

▶ A system. This computer must have an RDM-supported network adapter card installed and meet the minimum hardware requirements to run Windows NT 4.0 Workstation and your application. This example assumes a 20 GB hard drive.

Scan the Computers

The first step in this exercise is to connect your computers to the LAN and scan it into RDM. Do this as you did in the previous example.

Create a Software Profile

The next step in this exercise is to create a software profile using the Profile Wizard:

1. From RDM's **Profile** menu select **New Profile**.

2. Select the **Use the Profile Wizard** radio button and click **OK**.

3. At the Welcome to the Profile Wizard screen:

   a) Enter a profile name.

   b) Click the **Unattended install** radio button.

   c) Check the **Do you also want to install applications with this profile?** box.

   d) Select **Windows NT 4.0 Workstation** and **Service Pack 6** from the drop-down lists and click **Next**.

4. At the Unattended Operating System Files Selection screen, check the **Copy new operating system files** checkbox, enter a title for your operating system in the dialog box and click **Next**.

   Note: This example assumes that this is the first Windows NT 4.0 Workstation profile you have created. If you already have other profiles that use this operating system, you would normally not check this box.

5. At the RAID Adapter Setup screen, click **Next**.

6. At the IBM Power Restore Partition Setup screen, check the **Yes, create a backup image of the entire operating system** box and click **Next**.

7. At the Target Machine's Disk Setup screen, select the **Single partition using maximum available space** radio button, check the **Yes, install NTFS on all systems assigned to this profile** box and click **Next**.

8. At the Profile Customization screen, enter a company name. Click **Next**.

9. If you want to apply the settings and choices captured in an SMA image file, check the **Use System Migration Assistant** box. Click **Next** to continue.

10. At the Software Delivery Assistant screen, click **Next**.

11. At the Regional Settings screen, select the time zone for your system from the drop- down list and click **Next**.

12. At the Networking screen, check the **Do you want to login to an NT domain?** box. Enter the **NT Domain Name** of the RDM server and check the **TCP/IP** box under Networks Protocols**.**

13. At the TCP/IP Configuration screen, check the **Obtain IP addresses from a DHCP** box and click **Next**.

14. At the Application screen, click **Next**.

15. At the Windows NT 4.0 Workstation Application Selection screen, check the box for your additional application and click **Next**.

16. At the Profile Summary screen, ensure the details for your software profile are correct (if not go back through the wizard to make any corrections), add a description of your profile and click **Next**.

17. At the Image Building screen, click the **Image Building** button.

18. At the Dialog Box, click **Yes** to build the image of your software profile and additional application.

19. At the Locate the Windows NT 4.0 Setup File screen, insert your Windows NT 4.0 Workstation CD-ROM and browse to `<CD drive>:\I386\WINNT` and click **Open**. When the Successfully finished copying Windows NT 4.0 Server is displayed click **OK**.

20. The Profile Wizard is now ready to build Service Pack 6. Click **Yes** to continue.

21. At the Profile Summary screen "No more image files to build" will be displayed. Click **Finish**.

The profile that you have just created appears in the Profile and Assigned Systems column under OS Install Profiles within RDM's main Installation/Maintenance window.

Assign a system to a Software Profile

The next step in this exercise is to assign your computer to the software profile you have created:

1. Highlight your system in the Unassigned Systems column. Drag and drop it onto the software profile that you have created in the Profiles and Assigned Systems column under OS Install Profiles. This will automatically start the System Assignment Wizard.

2. At the System Assignment Wizard screen, click **Next**.

3. At the Registered User screen, enter the name of your system's registered user (this can be a person's name or the name of your company) and click **Next**.

4. At the Product ID screen, enter the Product ID for your Windows NT 4.0 Server installation CD-ROM and click **Next**.

5. At the Network Username screen, enter a Username for your system and click **Next**.

6. At the Description screen enter a description for your system and click **Next**.

7. At the System Parameter Summary screen, ensure the details for your System are correct (if not go back through the wizard to make any corrections) and click **Finish**.

> **Note**: If you want to specify the computer name for this system, open the Individual System Details notebook, and change the Name on the Details page.

8. To update your system click the **Process** button within RDM's main Installation/Maintenance window.

Note: If you use the Scheduler to set a specific day and time, you must still click the **Process** button and leave the program running for the scheduled changes to take place. Clicking on the Process button places the scheduled changes in the processing queue of the Progress and Errors Window; when the specific day and time arrives, the scheduled changes are processed.

5.3 CloneIt Agent Clone Install of Windows 98

This example remotely installs a Windows 98 operating system image and applications cloned from a donor computer to a system with an identical hardware setup. This example:

▶ Sets up a system and a donor computer.

▶ Adds the computers to the RDM database.

▶ Creates a Windows 98 donor image from the donor computer and transports the Windows 98 operating system image to the server.

▶ Creates a software profile for the Windows 98 image.

▶ Assigns the system to the software profile.

▶ Downloads the Windows 98 operating system image to the system.

Before you begin, you must have the following:

▶ A server attached to the LAN. The server must be functioning and have RDM 3.2 installed.

▶ A Window 98 unattended install profile on this server. This profile also installs all necessary applications.

▶ A system. This computer must have a network adapter card and meet the minimum hardware requirements to run Windows 98.

▶ A donor computer that is compatible with the new system you will be managing (for example, the hardware of both computers is identical).

▶ The appropriate number of licenses for Windows 98.

Scan the Computers

The first step in this exercise is to connect the system and the donor computer to the LAN and to scan them into RDM:

1. Set up two computers and connect them to the LAN. One computer will become the donor computer with Windows 98 already installed. The other computer will receive the Windows 98 operating system image and will be referred to as the system throughout the remainder of this exercise.

2. Start RDM and start the scan process by clicking the **Start** button in the Installation/Maintenance window.

3. Power on the computers, and make sure they boot to the network (i.e., change their startup sequence, if necessary).

Create the Clone Image

The next step is to install Windows 98 and to use CloneIt Agent to clone an image from the donor computer:

1. Install Windows 98 on the donor computer using an RDM Windows 98 unattended install profile.

2. Ensure that all required software is installed and functioning on the donor computer.

3. Shut down and restart the donor computer and allow it to fully restart.

4. Ensure that the Windows 98 operating system is the only application still running. Shut down all other running applications.

5. From the desktop, double-click the **Network Neighborhood** resource.

6. Double-click the name of the RDM server.

7. Logon to the domain with Domain Administrative rights.

8. From the list of shared folders displayed, double-click the **LCCM$ADM** share. This will open the RDM installation program directory.

9. Double-click **CloneItagent.exe**.

10. Click **OK** to begin the cloning process.

11. At the CloneIt Agent screen, click **Next**.

    a) At the Cloned Image Name screen, enter a name for your Cloned Image.

    b) At This Workstation, click **Next**.

    c) At the Begin Cloning screen, click **Finish** to start the cloning process.

    d) The Cloning in Progress screen will allow you to monitor the progress of the cloning process.

    e) At the Cloning Complete dialog box click **OK**.

Create a Software Profile

The next step in this exercise is to create a software profile using the Profile Wizard:

1. From RDM's **Profile** menu, select **Create New**.

2. Select the **Use the Profile Wizard** radio button and click **OK**.

3. At the Welcome to the Profile Wizard screen:

    a) Enter a profile name.

    b) Select the **Clone install using CloneIt Agent Image** radio button.

    c) Select Windows 98 from the operating system dropdown list and click **Next**.

4. At the Clone Image Selection screen, click **Next**.

5. The options available for the RAID Adapter Setup screen, the IBM Power Restore Partition Setup screen, the Target Machine's Disk Setup screen, the Profile Customization screen and the Networking screen will be determined by the software, hardware, and network configuration of the donor computer on which your software profile is to be based. The resulting clone image will be an exact copy of the donor computer's software, hardware, and network configuration. Therefore, click **Next** to progress through these screens, as the options on these screens will be grayed out and cannot be edited.

6. At the Profile Summary screen, ensure that the details for your software profile are correct (if not go back through the wizard to make any corrections), add a description of your profile and click **Finish**.

    Note: The resulting clone image will be an exact copy of the donor computer's software, hardware, and network configuration. If the details for your software profile are incorrect, you may have to create a new clone from another donor computer with the correct software, hardware, and network setup and configuration.

7. Ensure that the profile that you have just created appears in the Profile and Assigned Systems column under OS Clone Profiles within RDM's main Installation/Maintenance window.

Assign a system to a Software Profile

The next step in this exercise is to assign your system to the software profile you have created:

1. Highlight your system in the Unassigned Systems column, drag and drop it onto the software profile that you have created in the Profiles and Assigned Systems column under OS Clone Profiles. This will automatically start the System Assignment Wizard.

2. At the System Assignment Wizard screen, click **Next**.

3. At the Registered User screen, enter the name of your system's registered user (this can be a person's name or the name of your company) and click **Next**.

4. At the Product ID screen, enter the first part of the Product ID for your Windows 98 installation CD-ROM in the format displayed and click **Next**.

5. At the Product ID screen, enter the second part of the Product ID for your Windows 98 installation CD-ROM in the format displayed and click **Next**.

6. At the Network Username screen, enter a Network Username for your system and click **Next**.

7. At the Description screen, enter a description for your system and click **Next**.

8. At the System Parameter Summary screen, ensure that the details for your System are correct (if not go back through the wizard to make any corrections) and click **Finish**.

   Note: If you want to specify the computer name for this system, open the Individual System Details notebook, and change the Name on the Details page.

9. To update your system click the **Process** button within RDM's main Installation/Maintenance window.

Note: If you use the Scheduler to set a specific day and time, you must still click the Process button and leave the program running for the scheduled changes to take place. Clicking the Process button places the scheduled changes in the processing queue of the Progress and Errors Window; when the specific day and time arrives, the scheduled changes are processed.

5.4 PowerQuest Clone Install of Windows XP Professional

This example installs a Windows XP Professional operating system image and applications cloned from a donor computer to a system with an identical hardware setup. This example:

▶ Sets up and scans a system and a donor computer.

▶ Creates a Windows XP Professional donor image from the donor computer.

▶ Creates a software profile for the Windows XP Professional image.

▶ Assigns the system to the software profile.

▶ Downloads the Windows XP Professional operating system image to the system.

Before you begin, you must have the following:

▶ A server attached to the LAN. The server must be functioning and have RDM 3.2 installed.

▶ A Windows XP Professional unattended install profile on this server. This profile also installs all necessary applications.

▶ A system. This computer must have a network adapter card and meet the minimum hardware requirements to run Windows XP Professional.

▶ A donor computer that is compatible with the new system you will be managing (for example, the hardware of both computers is identical).

▶ The appropriate number of licenses for Windows XP Professional.

Scan the Computers

The first step in this exercise is to connect your system and donor computer to the LAN, and to scan them into RDM:

1. Set up two computers and connect them to the LAN. One computer will become the donor computer with Windows XP Professional already installed. The other computer will receive the Windows XP Professional operating system image and will be referred to as the system throughout the remainder of this exercise.

2. Start RDM and start the scan process by clicking the **Start** button in the Installation/Maintenance window.

3. Power on the computers, and make sure they boot to the network (i.e., change their startup sequence, if necessary).

Create the Clone Image

The next step is to install Windows XP Professional including all applications on the donor computer and to use the built-in profile Deploy Center to clone an image from the donor computer:

1. Install Windows XP Professional on the donor computer using an RDM Windows XP Professional unattended install profile. Optionally, prepare the donor computer to not use the new-style login screen. For details, see "Building the Donor Computer" on page 141.

2. Ensure that all required software is installed and functioning on the donor computer.

3. Highlight the donor computer on the Installation/Maintenance window and deassign the donor computer from the install profile. It will move to the Unassigned Systems panel.

4. Run the SysPrep utility on your donor computer to remove much of the unique information on the computer and shut it down.

5. Highlight your donor computer in the Unassigned Systems column on the Installation/Maintenance window, and drag and drop it onto the built-in profile Deploy Center.

6. Enter the clone image name and select the correct operating system. Click **OK**.

7. Click **Process** and start up the donor computer. The clone image will now be created.

8. When processing is complete, a checkmark will appear in front of the corresponding message in the Progress and Errors window.

Create a Software Profile

The next step in this exercise is to create a software profile using the Profile Wizard:

1. From the **Profile** menu on the Installation/Maintenance window, select **Create New**.

2. Select the **Use the Profile Wizard** radio button and click **OK**.

3. At the Welcome to the Profile Wizard screen:

   a) Enter a profile name.

   b) Select the **Clone install using PQ Image** radio button.

   c) Select Windows XP Professional from the operating system dropdown list and click **Next**.

4. At the RAID Adapter Setup screen, the IBM Power Restore Partition Setup screen, the Profile Customization screen, the Regional Settings screen, the Networking screen, and the TCP/IP configuration screen, enter the desired values and click **Next**.

5. At the Profile Summary screen, ensure that the details for your software profile are correct (if not go back through the wizard to make any corrections), add a description of your profile and click **Finish**.

6. Ensure that the profile that you have just created appears in the Profile and Assigned Systems column under OS Clone Profiles within RDM's main Installation/Maintenance window.

<u>**Assign a system to a Software Profile**</u>

The next step in this exercise is to assign your system to the software profile you have created:

1. Highlight your system in the Unassigned Systems column, drag and drop it onto the software profile that you have created in the Profiles and Assigned Systems column under OS Clone Profiles. This will automatically start the System Assignment Wizard.

2. At the System Assignment Wizard screen, click **Next**.

3. At the Registered User screen, enter the name of your system's registered user (this can be a person's name or the name of your company) and click **Next**.

4. At the Product ID screen, enter the first part of the Product ID for your Windows XP Professional installation CD-ROM in the format displayed and click **Next**.

5. At the Product ID screen, enter the second part of the Product ID for your Windows XP Professional installation CD-ROM in the format displayed and click **Next**.

6. At the Network Username screen, enter a Network Username for your system and click **Next**.

7. At the Description screen, enter a description for your system and click **Next**.

8. At the System Parameter Summary screen, ensure that the details for your System are correct (if not go back through the wizard to make any corrections) and click **Finish**.

    Note: If you want to specify the computer name for this system, open the Individual System Details notebook, and change the Name on the Details page.

9. To update your system click the **Process** button within RDM's main Installation/Maintenance window.

Note: If you use the Scheduler to set a specific day and time, you must still click the Process button and leave the program running for the scheduled changes to take place. Clicking the Process button places the scheduled changes in the processing queue of the Progress and Errors Window; when the specific day and time arrives, the scheduled changes are processed.

5.5 Creating an Image Blaster Clone Profile

The Profile Wizard can be used to create clone profiles that do the entire deployment, including personalizing each system for its new owner (i.e., with owner-unique configuration parameters that the RDM administrator enters via the System Assignment Wizard). However, some users may prefer that the owner enter the personalization parameters when booting the system for the first time. This example shows how to create a manual clone profile to deploy an arbitrary PowerQuest clone image onto systems without doing the personalization step.

The procedure shown in the current example can be used when the administrator does not wish to provide a SysPrep answer file or do additional processing (during RDM processing) on the image that is being transferred to the target system. This example:

▶ Creates the image.

▶ Creates the script.

▶ Creates the manual profile.

Create the image

To create the image, you can build the donor computer and create the donor image in the normal way. This can include running SysPrep, if desired, and also includes capturing the image via the built-in Deploy Center profile. For a detailed example of this step, see "PowerQuest Clone Install of Windows XP Professional" on page 174.

If you are using the built-in Deploy Center profile to capture the image of a donor computer that does not run Windows 2000 Professional, Windows 2000 Server, Windows 2000 Advancer Server, or Windows XP Professional, make sure to follow these steps:

1. Assign the donor computer to the built-in Deploy Center profile. On the window **Creating Clone Image**, select any operating system from the **Operating System** dropdown box. Enter an appropriate name in the **Clone Image Name** field. Click **OK**.

2. On the **Installation/Maintenance** window, click the **Process** button and wait for deployment to complete.

3. Go to the folder `<drive>:\RDM\CLNTFILE\PQIMAGES` and open the file `<name>.LPC` where `<name>` is the name of the clone image that you entered in step 1. Edit the value of the `OperatingSystem` field to a new value (e.g., WNT4Svr, or any value that you would like to use). This will prevent the Profile Wizard from listing this image as capturing the incorrect operating system (i.e., the operating system you selected in step 1) in the dropdown box on the **PowerQuest Clone Image Selection** window.

Create the Script

Manual profiles can execute up to two DOS scripts, one with an LCP extension, and one with an LCI extension. In this example, only an LCI file is used. This file, called `BLASTER.LCI`, should be created in a subdirectory under `<drive>:\RDM\CLNTFILE`, e.g. `\PROFILE\BLASTER\BLASTER.LCI`.

This is an example of this file:
```
@ECHO ON
REM Check if RAID is required
IF NOT "%RAID%"=="1" GOTO SKIPRAID

rem START_RAID
rem Not doing RAID yet
IF "%RAIDCONFIG%"=="2"  goto LOADTYPE2
%LCCMPATH%\dynaload %DOSPATH%\IPSRASPI.SYS /Q
GOTO CHKERROR
:LOADTYPE2
%LCCMPATH%\dynaload %LCCMPATH%\defaults\oem\textmode\IPSRASPI.SYS /Q
:CHKERROR
rem %LCCMPATH%\IPSSEND RESTORE 1 %LCCMPATH%\RAID\<file>.IPS NOPROMPT
rem END_RAID
rem if ERRORLEVEL 1 goto ERROR
GOTO END

:SKIPRAID

ECHO Running PutDIP.LCP to deploy PowerQuest image to target %CNAME%. >>
T:\%DIRNAME%.LOG
```

```
NET USE M: %LCSERVER%\PQImages
NET USE N: %LCSERVER%\PQID


N:

%LCCMPATH%\SCRUB3 /D=1 /L=1
%LCCMPATH%\LCBTRDEL 0 /S

IF EXIST PQImgCtr.EXE GOTO FULL

PQIDplyZ /CMD=N:\PQRESTR.SCR /IMG=M:\%LPRO_PQIMAGE% /ERR=T:\%DIRNAME%.ERR
/LOG=T:\%DIRNAME%.RUN
GOTO FINISH

:FULL
PQImgCtr /CMD=N:\PQRESTR.SCR /NRB /IMG=M:\%LPRO_PQIMAGE%
/ERR=T:\%DIRNAME%.ERR /LOG=T:\%DIRNAME%.RUN

:FINISH
ECHO PQDI command finished. >> T:\%DIRNAME%.LOG

IF ERRORLEVEL 2 GOTO ERROR
IF ERRORLEVEL 1 GOTO ERROR1
IF ERRORLEVEL 0 GOTO END

:ERROR
ECHO ERROR: Bad return code from PQImgCtr.EXE >> T:\%DIRNAME%.LOG
GOTO END

:ERROR1
ZERORC.COM

:END
ECHO Exiting BLASTER.LCI for system %CNAME%. >> T:\%DIRNAME%.LOG
```

Create the Profile

Now the profile needs to be created that will be used to execute BLASTER.LCI on or more target systems:

1. Determine the name of the PowerQuest clone image. This file has a PQI extension and needs to be located in the folder <drive>:\RDM\CLNTFILE\PQIMAGES, in order for the script contained in the file BLASTER.LCI to work. (This is the same folder that is used for images created with the built-in Deploy Center profile. For details, see "Location of PowerQuest Clone Images" on page 189.) If it is not located in this folder, copy it there now.

2. From the **Installation/Maintenance** window, select **Profile**, select **Create New**, and then select **Manually with the Profile notebook** on the window that appears. Click **OK**. The **Software Profile Details** notebook appears.

3. On the **Details** page, do the following:

   ▪ Enter "Image Blaster" in the **Name** field.

   ▪ Select the **Operating System Clone** radio button.

4. Click the **Minimum Hardware** tab and review the default values. No changes need to be made here:

- The **Network Adapter** field displays "[Any Adapter, Don't care]".

- The **Video Chipset** field displays "[Any Video – Don't Care]".

- The value 0 is entered in the **RAM** field.

- The value 0 is entered in the **Hard Disk** field.

5. Click the **Software** tab. In the **Final Image file name** field, use the **Browse** button to locate and select the file BLASTER.LCI. Leave the other fields on this page blank.

6. The script contained in BLASTER.LCI uses a parameter to determine the name of the PowerQuest image file. In order for this script to run successfully, this parameter needs to set. Click the **Parameters** tab and enter LPRO_PQIMAGE in the first field under **Name**. In the corresponding **Value** field, enter the name (**without** the path) of the image file that you found in step 1.

7. Click **OK** to save and close the notebook.

The new manual profile "Image Deploy" appears under **OS Clone Profiles** on the **Installation/Maintenance** window and is ready for use. For details on how to deploy a system using a PowerQuest Clone Profile, see "PowerQuest Clone Install of Windows XP Professional" on page 174.

Note: An alternate technique for step 5 to set a parameter on the **System Parms** page instead of the **Parameter** page in the **Software Profile Details** notebook. If you do this, you can use the same Profile for multiple images, and you can specify the image for each system via the System Assignment Wizard. This method is shown in a section on remote share points called "PowerQuest Clone" on page 182).

Chapter 6. Advanced Administrative Topics

6.1 Creating a RAID Setup File

When creating an unattended install software profile with the Profile Wizard, you have the option of enabling RAID and selecting a RAID setup file. To create a new RAID setup file, you can either use a donor computer to create a Raid Clone File or you can manually create a Raid Direct Setup file.

Creating a Raid Clone File

To create a new RAID setup file from a working ServeRAID configuration, you must:

1. Choose the donor computer that you are going to use for your RAID setup.
2. Boot from the "ServeRAID Configuration Disk" supplied with your Adapter (or download the latest version from the Internet). This will start the ServeRAID Configuration Utility.
3. Configure the RAID system if it is not already configured.
4. Select **Advanced Functions.**
5. Select **Backup IPS ServeRAID Config.**
6. Enter a name for your setup file.

A (.IPS) extension will be added automatically to the file to indicate that it is a ServeRAID clone file. For further information see ServeRAID Adapter Installation and Users Guide, Chapter 3 – Configuring the IBM ServeRAID Adapter.

Creating A Raid Direct Setup File

To create a new RAID setup file manually:

1. Go to the `<drive>:\RDM\clntfile\RAID` folder on the RDM server. Create the folder if it does not exist.
2. Using your favorite editor, create a file with a .rds extension, such as `raidcfg1.rds.`
3. Enter the following line as the first line in the file:

   `%LCCMPATH%\IPSSEND SETCONFIG 1 DEFAULT NOPROMPT`

4. Add as many IPSSEND CREATE command lines as necessary to create the desired configuration. Each IPSSEND CREATE command creates one logical drive on the ServeRAID adapter. For details, see "IPSSEND.EXE" on page 235.
5. After each IPSSEND CREATE line, add the following line:

   `if ERRORLEVEL 1 goto ERROR`

6. Save the .rds file.

In the Profile Wizard, you can select the .rds file as the RAID setup file during the creation of an unattended install or PowerQuest clone profile. You can use the same file for multiple profiles.

6.2 Using Remote Share Points

To use a remote share point after it has been installed and properly configured, you must manually copy files to the remote share point. The steps vary for unattended install and PowerQuest clone install.

Unattended Install

To use an unattended install profile which receives its installation files from a remote share point, you must copy the distribution share point from the RDM server to the same directory on your RDM share point. For instance, if you used the profile wizard to create an unattended install profile for Windows 2000 Advanced Server, you'll find the install files in the `<drive>:\RDM\CLNTFILE\W2KADV` directory. You must copy the entire `W2KADV` directory (including subfolders) to the same directory on your remote share point. For the other operating systems, see "Location of Unattended Install Directories" on page 188.

After copying the installation files, there are two ways to use a new distribution share point. You can either create a different profile for each distribution share point or you can modify a single profile whenever you want to change the distribution share point it uses.

To create a different profile for each distribution share point:

1. Create a new profile.

2. Create a copy of that profile.

3. Modify the **Distribution Share Point** field on the **Software** page of the copied profile's **Software Profile Details** notebook so that it points to the new distribution share point.

4. Assign systems to the appropriate profile, based on where the systems are located, and process them.

To modify a single profile whenever you want to change the distribution share point it uses:

1. Modify the **Distribution Share Point** field on the **Software** page of the profile's **Software Profile Details** notebook so that it points to the desired remote share point.

2. Assign the appropriate systems to the profile.

3. Process the systems.

4. Repeat these steps for a new distribution share point.

The remote share point as specified on the **Software** page of the **Software Profile Details** notebook must use the full UNC path `\\servername\LANC$$\sharepoint` where `LANC$$` has been automatically mapped by RDM to point to "`\RDM\CLNTFILE`".

PowerQuest Clone

To use the remote share point for PowerQuest clone, you must do the following:

1. Create a PowerQuest clone profile using the profile wizard.

2. Select the new profile and open the **Software Profile Details** notebook. Click the **System Parms** tab. Add a new parameter named `SPSERVER` and give it a default value equal to the RDM server's computer name prefixed with a double backslash (e.g. `\\MyRDMServer`).

3. Stay in the notebook and select the **Software** tab. Determine the name of the folder where details of this profile are stored. The folder will have the format `<drive>:\RDM\CLNTFILE\PROFILE\PROFnnn`, where `nnn` stands for a number such as 001. The changes described in the next step will be made to a file in this directory. Click **OK**.

4. Edit the file `<drive>:\RDM\CLNTFILE\PROFILE\PROFnnn\PROFnnn.LCP` file and find the line: `NET USE M: \\%LCSERVER%\PQImages`. Change this to: `NET USE M: \\%SPSERVER%\PQImages` (change is given in boldface).

5. Copy the appropriate PowerQuest clone image (PQI) file and its associated LPC file from the folder `<drive>:\RDM\CLNTFILE\PQImages` to the same location on the remote share point (i.e., preserve the directory structure). For details, see " Location of PowerQuest Clone Images" on page 189.

6. Assign the appropriate system(s) to the profile. The System Assignment Wizard will start. Fill in the appropriate values on the various pages until you are on the page for `SPSERVER`. Enter the remote share point's computer name prefixed with a double backslash (e.g. `\\MyRemoteSharePoint`). Finish the System Assignment Wizard and process the system(s).

Creating a Distribution Share Point Manually

If you use manual profiles (instead of wizard-generated profiles), you can still use different distribution share points. The below example is for unattended install profiles:

1. Set up a directory to act as your distribution share point as shown:

   `<drive>:\RDM\CLNTFILE\<name>`

   where "`\<name>`" is the directory of a specific distribution share point. You can give the distribution share point directory any name, as long as it is an 8.3-character name usable by DOS.

2. Create a subdirectory under your distribution share point directory for the operating system you want to install and name it `NT4SVR` for Windows NT 4.0 Server, `NTWKS` for Windows, `WIN95` for Windows 95 or Windows 95 OSR2, or `WIN98` for Windows 98, `W2KPROF` for Windows 2000 Professional, `W2KSVR` for Windows 2000 Server, or `W2KADV` for Windows 2000 Advanced Server.

3. From the Windows operating system CD, copy the contents (including sub-directories) of the appropriate directory to the corresponding directory in your distribution share point.

   For example to copy Windows NT 4.0 to your distribution share point:

   `XCOPY D:\I386\*.* C:\RDM\CLNTFILE\WINNT40\I386 /S /E /V`

   Where `WINNT40` is the name of the distribution share point directory you have created.

If you intend to run RDM from a remote computer, you must use the full path for specifying the distribution share point and the full path for specifying all other files and directories (as shown in the answer file and customization batch file paths shown in the Software page of the Software Profile Details notebook).

When you create a profile manually with a remote share point, supplying the full path to the distribution share point under the **Software** page of the **Software Profile Details** notebook and save the profile, the following message will be displayed:

> "The Distribution Share Point was not found or could not be accessed from the Remote Deployment Manager console. Do you wish to continue saving data?"

Click **Yes** to continue saving the profile.

6.3 Managing AIA-enabled Systems

If your computers contain Radio Frequency Identification (RFID) chips and are Asset Information Area (AIA) enabled, you can use AIA data fields with RDM. Data can be read from or written to an on-board Electronically Erasable Programmable Read Only Memory by RDM during the scanning and assigning of systems. Additionally, you can use these fields in RDM batch files.

For more information about the IBM Radio Frequency Identification (RFID) chip, and the Asset Information Area (AIA), access the following IBM Web Site http://www.ibm.com/desktop/assetid.

Scanning AIA data fields with RDM

You can use AIA data fields to process RDM profiles when the scan process first detects a system. The scan program will read the required data from the AIA. This data must be available on the system. Make sure that you specify no user prompts during the scan process. For more details, see "Defaults - Scan Tab" on page 71.

Each field in the system record can contain up to 256 characters. However, if the combined data exceeds 256 characters, it will be truncated without warning

Note: Field names, in capitals, are not transferred but given only as a guide in this sample. If any of these fields are omitted, the corresponding line will be omitted within RDM.

The field names (and sample values) are:

▶ **PRELOADPROFILE**. This information is added to the Requested Profile Name & Date fields on the Software page of the Individual System Details notebook (see page 85):

- `IMAGE=OS Clone Profile – 1`

- `IMAGEDATE=00000000`

▶ **OWNERDATA**. The Name, Department, Phone and Position field values from the OWNERDATA group on the system are joined to make a single RDM field. This information is added to the Contact field on the Details page of the Individual System Details notebook (see page 82):

- `OWNERNAME=John_Smith`

- `DEPARTMENT=Accounts`

- `PHONE_NUMBER=919 543 7454`

- `OWNERPOSITION=Manager`

▶ **OWNERDATA, LOCATION**. The location field value of the OWNERDATA group is added to the Location field on the Details page of the Individual System Details notebook (see page 82):

- `LOCATION=Room12, Floor 3`

▶ **USERDEVICE**. The five user-definable fields from the USERDEVICE group are joined to make a single RDM field and are added to the Comment field on the Details page of the Individual System Details notebook (see page 82):

- `ADDRESS = 3039 Cornwallis Rd`

- `CITY = RTP`

- `STATE = NC`

- `ZIPCODE = 27709`

- `AREA = West`

▶ **NETWORKCONNECTION**:

- IPADDRESS
- SUBNETMASK
- GATEWAY
- SYSTEMNAME (computer name)

Assigning Systems with Asset ID

You can set newly scanned systems to be automatically loaded with an existing image by checking the **Automatically assign and process newly scanned systems** box on the Scan page of the Defaults notebook (see page 71). Software profiles that you intend to deploy this way must not depend on RDM system parameters, as there will be no opportunity to set them. If auto-assign is enabled and a newly scanned system meets all the conditions and is assigned, processing will begin.

For the auto-assign process to work, the following conditions must be met on the system:

▶ The IMAGEDATE value must be set to 8 zeros, 00000000. If IMAGEDATE is non-zero, RDM assumes that a profile has already been deployed, and it will not re-deploy the profile.

▶ The requested IMAGE (profile name) must exist within RDM and match perfectly with the AIA requested profile. This is position sensitive, but not case sensitive.

▶ The system must meet all the hardware requirements of the profile.

If your system is equipped with the AssetID feature, RDM automatically updates the 'IMAGE' and 'IMAGEDATE' fields upon successful processing of the software profile.

Customizing RDM Batch Files

Two separate utilities, AIAREAD.EXE and LCCUSTOM.EXE, can be used together to customize batch files. The below example shows how they are used together to customize the Windows NT 4.0 answer file using parameters supplied both from RDM and the AIA area of the system. For more information, see "AIAREAD.EXE" on page 222 and "LCCUSTOM.EXE" on page 238.

At the administrator console, create a final image batch file,
`<drive>:\RDM\CLNTFILE\LCCUSTOM.LCI`, with the following content:

```
REM get asset ID user and network data into batch files

%LCCMPATH%\AIAREAD USERDEVICE /s > %LCCMPATH%\AIAUSER.BAT

%LCCMPATH%\AIAREAD NETWORKCONNECTION /s > %LCCMPATH%\AIANET.BAT

REM run the batch files to put the AIA data into the DOS environment

%LCCMPATH%\AIAUSER.BAT

%LCCMPATH%\AIANET.BAT

REM customize NT answer file with user data

%TARGET%

%LCCMPATH%\LCCUSTOM %TARGET%\ANSW1.TXT
```

Using AIAREAD to output the contents of the USERDEVICE and NETWORKCONNECTION data sections of the AIA area into two files, the `AIAREAD /s` parameter outputs these elements as DOS SET statements. Saving the output as a .BAT file will allow this data to be incorporated into the system profile parameters as a batch file process. An example of the contents of the AIANET.BAT file would be:

```
SET NUMNICS = 1

SET GATEWAY = 190.67.67.9
```

```
SET IPADDRESS = 199.67.67.0
SET SUBNETMASK = 255.255.255.0
SET SYSTEMNAME = JOHN_SMITHS_PC
SET LOGINNAME = JSMITH
```

Running the two batch files, AIAUSER.BAT and AIANET.BAT, will set environment variables in the system's active RAM. The environment variables already present for the system, from the Software Profile Details and Individual System Details notebooks, will be unaffected. These environment variables are made available for LCCUSTOM.

Running LCCUSTOM after the two batch files will edit the answer file using the environment variables that have been SET in the DOS environment during the processing of the AIAUSER.BAT and AIANET.BAT batch files. Additionally, parameters that have been specified within the Software Profile Details or Individual System Details notebooks for the system will also be available in the DOS environment, and will be swapped as normal.

Note: For the above to work correctly, edit the Windows NT 4.0 Answer file to include the correct environment variable names where appropriate.

Writing AIA Data

You can use AIAWRITE.EXE to write information to the AIA area. Any data can be written. Using the LCCUSTOM utility in conjunction with AIAWRITE allows a file to be customized in a single step, replacing all instances of environment variables in the file by their values. For more information, see "AIAWRITE.EXE" on page 223 and "LCCUSTOM.EXE" on page 238.

6.4 Startup Sequences on the System

Allow Local Hard Disk Startup

If you have a centralized system configuration and maintenance area from which you send pre-configured computers out to different areas of your organization, you can run RDM from a single server to configure your systems before disconnecting them from the LAN. RDM stores the system configuration details such that if the system requires maintenance or reconfiguration, the details are readily available.

Alternatively, if you just want local hard disk startup and disconnecting the computer from the LAN is not a requirement, you should change the CMOS settings using RDM (see "Update the CMOS Settings" on page 159).

To allow local hard disk startup for to-be-disconnected systems:

1. Scan the new system into the RDM database.

2. Assign the system to an operating system profile.

3. Process the system.

4. Disconnect the network cable from the system.

5. Restart the system and enter the Configuration/Setup utility program. (On many IBM computers, you must press **F1** to enter the program. If an administrator password has been set, type it in.) Within the Configuration/Setup utility program, change the startup sequence in one of the following ways:

- Select **Hard Disk Drive 0** as the first startup device.
- If you want to maintain the ability to start the computer from a diskette, select **Diskette Drive** as the first startup device and **Hard Disk Drive 0** as the second startup device.

6. Save the settings and exit from the program.

Note: On many IBM computers, it is possible to use RDM's CMOS-update function to reset the startup sequence.

Using Dual Startup Sequences

With some IBM computers, you can specify two or three startup sequences within the Configuration/Setup utility program on the system. (Consult your IBM User Manual for specific details.)

The primary startup sequence is used to specify how the computer starts when you turn it on with the power switch. Many RDM users set this sequence as **Network** first and **Hard Disk** second (or **Diskette Drive** first, **Network** second and **Hard Disk** third). When the user powers on the system, the remote boot process connects and "shakes hands" with the system before allowing the system to continue starting up from its hard disk. This very brief process allows RDM to maintain control of the system at all times. If you have image downloads or maintenance procedures scheduled to run as soon as possible, the system is processed at this time. For more details, see "Individual System Details – Scheduler Tab" on page 89.

The second startup sequence is used to specify how the computer starts when the computer receives a wake-up packet over the LAN. On some IBM computers, this is called the Automatic Power On Startup sequence. You must enable Wake on LAN within the BIOS settings of the system and within the RDM interface before the second startup sequence will operate. You must also enable the Automatic Power on sequence within the BIOS settings and ensure it is set correctly. For details about enabling Wake on LAN within RDM, see "Defaults - Processing Tab" on page 69.

Each startup sequence has four or more possible startup devices. If the first startup device fails, the computer automatically attempts to start up from the second, third, and then fourth device. The startup devices are:

▶ Diskette drive.

▶ Network.

▶ Hard disk drive 0.

▶ CD-ROM drive.

Note: If you set the first startup device to network, but do not set the second, third, or fourth device, the system will not function when disconnected from the LAN.

Recommended Startup Sequences

There are several acceptable startup-sequence schemes that can be used effectively with RDM. Choose the one that best fits the way you want to use RDM.

▶ **Primary = network, alternate = network**. This configuration maximizes the management control that the RDM administrator has over the system. It enables the RDM scan function when you first power on the computer, and it enables ongoing remote management by RDM via Wake on LAN (if the computer has Wake on LAN enabled). A disadvantage is that after deployment, the system cannot boot to its hard drive unless the RDM server is turned on and RDM PXE Services is started. In other words, if the RDM server is down, your systems cannot boot.

▶ **Primary = hard drive, alternate = network**. This configuration enables ongoing remote management by RDM via Wake on LAN if the computer has Wake on LAN enabled. Also, the system can boot to its hard drive when the RDM server is down. A disadvantage is that it does not

enable the RDM scan function. You would have to do something manually to scan the computer such as entering the system's MAC address into the RDM Wake Tool before waking up the system, or - if your computer has this capability - after power on, pressing a key sequence that causes the system to boot to the network.

▶ **Primary = network**. If your computer does not have an alternate boot sequence, you must set its boot sequence this way in order to use it as an RDM system.

6.5 Unattended Install Directories

Location of Unattended Install Directories

When RDM performs an unattended install, the Profile Wizard creates a number of directories and files. Each unattended install performed by RDM will have an associated directory that will contain all the files associated with the installation. Associated directories will be created under `<drive>:\RDM\CLNTFILE` (where RDM is your program directory) and will be automatically named by RDM according to the operating system installed, as follows:

Operating System	Directory
Windows NT 4.0 Server	Nt4srv
Windows NT 4.0 Workstation	Nt4wks
Windows 98	W98
Windows 98 Second Edition	W98ED2
Windows 2000 Professional	W2kprof
Windows 2000 Server	W2ksrv
Windows 2000 Advanced Server	W2kadv
Windows XP Professional	Wxpprof

Removing Redundant Unattended Install Directories

The resultant unattended install directories can amount to hundreds of megabytes. Therefore, to save hard disk space, you can manually delete no longer needed unattended install directories found in `<drive>:\RDM\CLNTFILE` where the name of the unattended install directory will be Wxpprof, W2kprof, W2ksrv, W2kadv, Nt4srv, Nt4wks, W98, or W98ED2 according to the operating systems installed. If you upgraded to RDM 3.1, you might also have the install directories W95b and W95, related to Windows 95 OSR2 and Windows 95.

6.6 Clone Image Directories

Location of CloneIt Agent Clone Images

When the CloneIt agent is used to clone a system, it creates a number of directories and files. Each clone will have an associated directory that will contain all the files associated with the clone and referred to in

the clone control file. Associated directories will be created under `<drive>:\RDM\CLNTFILE` and will be named 'clonennn' where `nnn` is replaced with a unique 3-digit number, starting with 000. Control files (.LCC) will be created under `<drive>:\RDM\CLNTFILE` and will use the name you specified for your clone image during the cloning process. This is the clone image you select at the Clone Image Selection screen of the Profile Wizard.

Removing Redundant CloneIt Agent Clone Images

The resultant clone image directories can amount to hundreds of megabytes. Therefore, to save hard disk space you can manually delete no-longer-needed clone image directories found in `<drive>:\RDM\CLNTFILE\CLONEnnn\CLONE.LCZ`. You can also delete the accompanying (.LCC) control file found in `<drive>:\RDM\CLNTFILE`.

Location of PowerQuest Clone Images

When the Deploy Center is used to clone a system or when a PowerQuest image is imported, two files are created in `<drive>:\RDM\CLNTFILE\PQImages`. A (.LPC) control file is created, using the same name you specified for the clone image name during the cloning process. Among other things the control file has a reference to the actual image file, which, when created with Deploy Center, has the format `CLONEnnn.PQI`, where `nnn` is replaced with a unique 3-digit number, starting with 000. The image file will have the (.PQI) extension but might not have the same base name format when it was imported.

Removing Redundant PowerQuest Clone Images

The actual clone image can amount to hundreds of megabytes. Therefore, to save hard disk space you can manually delete no-longer-needed clone image files and the associated control files in `<drive>:\RDM\CLNTFILE\PQImages.`

6.7 RDM Control Files

NETWORK.LST

The `<drive>:\RDM\NETWORK.LST` file is one of the most important files contained in RDM. It is also the file that is most subject to change when you use a new type of network adapter, or even when you acquire a new batch of network adapters of an existing type. As the network administrator, you must have an understanding of the NETWORK.LST file in order to troubleshoot problems and make necessary changes. For a detailed example on how to add an unsupported network adapter, please see "Installing Network Drivers" on page 195.

Note: The ability to modify the NETWORK.LST file to add new types of adapters does not guarantee that all network adapters will work with RDM.

The purpose of the NETWORK.LST file is to identify all network-adapter models that will be supported in RDM. RDM uses this information to do the following:

▶ Determine the location of the correct network driver.

▶ Determine which DOS image to use during BIOS update and during general RDM processing.

▶ Determine how the system will be rebooted during a BIOS update.

Whenever you change this file, you must stop and restart the RDM console in order to enable your changes. Please edit this file with care. Semicolon positions and spacing are important.

> **IMPORTANT**: If you are migrating from LCCM 2.5.1, the format of the NETWORK.LST file has changed. LCCM 3.0, RDM 3.1, RDM 3.1.01 and RDM 3.2 do not use or support the RPL protocol. Therefore, the older RPL-related fields are no longer used. Also, the meanings of some of the other fields have changed. If you have modified your previous version of this file, you will need to make equivalent modifications to the RDM 3.2 version, using the new format.

An example of an entry in NETWORK.LST:

```
Brand X Ethernet adapter;54;7;!;8086122980863000;!!XN2S;
```

NETWORK.LST contains the following line types:

- ▶ Comment line - Any line beginning with a semicolon in column 1. These lines are ignored.
- ▶ Data line - Any line that is not a comment line.
  - ▪ Each line contains 9 fields, and each field must be followed by a semicolon (";").
  - ▪ Each record must begin and be contained on a new line.
  - ▪ Each line must end with a semicolon.
  - ▪ Invalid lines will be ignored by RDM.

Each data line contains the following field types:

Field 1	The name of the network adapter model. This name will appear in the RDM console's adapter lists, in the Software Profile Details, and in the Individual System Details notebooks.
	All characters from the start of the line until the first semi-colon (;) are used.
	This field is required.
	Example: `IBM Netfinity 10/100 Ethernet Security Adapter 2;`
Field 2	Unique record number. This must be a unique number within this file. You will find it easiest to keep this number sequential.
	For example, the first record is `1`, the second is `2`, etc.
Field 3	RDM's index to the network drivers. For example, 0 is the index to the Ethernet Windows NT 4.0 Intel drivers. To add a new adapter that uses the Intel unified drivers for Windows NT 4.0, set this field to 0.
Field 4	Not used. This field is ignored in RDM 3.1, but it must still exist in the file.
Field 5	Although you are working with Windows NT 4.0, this field must contain the value "OS2". This field is ignored in RDM 3.1, but it must still exist in the file.
Field 6	Not used. This field is ignored in RDM 3.1, but it must still exist in the file.
Field 7	16 characters long, this field describes the PCI vendor/device ID and the subsystem ID of the network adapter to which this line applies.
	This field is required and should not contain blanks.
	Example: `8086122980860040;`
Field 8	Not used. This field is ignored in RDM 3.1, but it must still exist in the file.
Field 9	4 characters long, this field controls the DOS images used during RDM processing

and how the system is rebooted during a BIOS update procedure. These images are named `PROFi`, where "`i`" is an alphanumeric character. This "`i`" character is used in flags 1 and 2 below. For more details, see "RDM DOS Images" on page 207.

This field (all 4 characters) is required and should not contain blanks.

This field contains four one-character flags:

Flag 1 - Defines the DOS image that is used during normal RDM processing (for example, operating-system deployment).

Flag 2 - Defines the DOS image that is used during an RDM BIOS update.

Flag 3 - Defines how the system will be rebooted during an RDM BIOS update.

   `2` = Reboot is performed by the BIOS update program. RDM includes a /R parameter on its FLASH2 command. RDM boots the computer a 2nd time to complete the process.

   `4` = Reboot is performed by RDM, and the BIOS update program does not reboot the computer. RDM completes the process without a 2nd boot.

Flag 4 - No longer used, and is reserved for future use.

Example: `XM2S;`

MACHINE.LST

The `<drive>:\RDM\MACHINE.LST` file allows you to override field 9 of your NETWORK.LST file (`CONFIG_MEM`). This file is subject to change when you want to override the RDM default for field 9 in NETWORK.LST. For example, your system may require a different memory configuration for your network card. You must specify in MACHINE.LST the combination of network card PNP/PCI ID and your system's model number for your new memory configuration in order to override the default memory configuration for your network card in NETWORK.LST. As the network administrator, you must have an understanding of the NETWORK.LST and MACHINE.LST file in order to troubleshoot problems and make necessary changes. In order to complete this procedure, you must access VIDEO.LST file provided by RDM.

Edit the MACHINE.LST file with care. The validity of the file is dependent on the position of the spaces and the semicolons within each line. All invalid lines are ignored. Any line beginning with a semicolon is a comment line. Lines that are not "comment" lines contain information unique to a specific type of network adapter, and semicolons delimit fields within these lines. Commas delimit multiple entries. Each line that is not a "comment" line must end with a semicolon.

Note: The ability to modify the MACHINE.LST and NETWORK.LST files to add new types of adapters does not guarantee that all network adapters will work with RDM.

The format of the line is:
`MODEL_NUMBER;PNP/PCI_ID;CONFIG_MEM;`
where:

Field 1   4-8 characters long, describing machine/model for example, `8595AK4`

Field 2   Optional. If a specific network card interacts differently with the same machine

Field 3   These are the settings used to call EMM386.EXE. This field contains four flags.

                 - Flag 1 can be X or N.

                 - Flag 2 can be X or N.

                 - Flag 3 can be 2 or 4.

                 - Flag 4 can be X, N, or S.

X. Use the CONFIGx.SYS file in the BINFILES\IBMDOS7 directory. This file uses EMM386.EXE.

N. Use the CONFIGn.SYS file in the BINFILES\IBMDOS7 directory. This file does not use EMM386.EXE.

S. Use the CONFIGs.SYS file in the BINFILES\IBMDOS7 directory. This file uses EMM386.EXE.

Flag 1 is used by the normal download process.

Flag 2 is used during the FLASH process.

Flag 3 sets the type of flash process to use.

 2 indicates reboot after flash (2 stage)

 4 indicates no reboot after flash.

 Under most conditions, set this flag to 2.

Flag 4 is used during the Scan process. This is an Optional flag.

Example:

These are the requirements:

▶ For the machine type 1234, use the process key `XN2S`.

▶ For the machine type 1234AJK, use the process key `NN2S`.

▶ For machine type 1234, with a network card with PCI/PNP id of AA99AA99, use the process key `NN4S`.

The resulting entries in MACHINE.LST are:

```
1234AJK;;NN2S;
1234;AA99AA99;NN4S;
1234;;XN2S;
```

Note that machine type 1234AJK would match with all lines and return the first matching line, that machine type 1234 would only match the last two lines, and that machine type 34 with network card AA99AA99 would match second line only.

VIDEO.LST

One of the items that the scan process collects is the PNP/PCI Identification number of the network adapter. If no match is found, the **Video Chipset** field on the Hardware page of the Individual System Details notebook will indicate that the adapter type is unknown. If the adapter type is unknown, you might not be able to assign a system to a profile.

The `<drive>:\RDM\VIDEO.LST` file allows RDM to automatically detect supported video adapters on your systems. The file is subject to change when you use a new type of video adapter, or even when you acquire a new batch of video adapters of an existing type.

Edit the VIDEO.LST file with care. The validity of the file is dependent on the position of the spaces and the semicolons within each line. All invalid lines are ignored. Any line beginning with a semicolon is a comment line. Lines that are not "comment" lines contain information unique to a specific type of network

adapter, and semicolons delimit fields within these lines. Commas delimit multiple entries. Each line that is not a "comment" line must end with a semicolon

---

Note: The ability to modify the VIDEO.LST file to add new types of adapters does not guarantee that all video adapters will work with RDM.

The format of a line is:

```
DESCRIPTION;PNP/PCI ID
```

where:

Field 1   This description will appear in the adapter card list of RDM. All characters from the start of the line until the semi-colon (;) will be used as the description.

Field 2   This is the PNP (Plug and Play) or PCI identifier for the adapter card.

                 PNP ID = 1st 7 digits of the PNP number.

                 PCI ID = 1st 8 digits of the PCI number.

Example 1: For the video adapter type S3 Trio 64/V+, enter this line
```
S3 Trio 64/V+ ;53338811;
```

Example 2: For the video adapter type Cirrus GD 5436/46 VGA, enter this line
```
Cirrus GD 5436/46 VGA;101300b8;
```

Example 3: For the video adapter type Matrox Millenium II PCI, enter this line
```
Matrox Millenium II PCI=102b0519;102b0519;
```

OPTIONS.TXT

The `<drive>:\IBMTCPIP\OPTIONS.TXT` file is located on the RDM server. This file tells the RDM server about the location of the remote share points. You must update this file manually every time you install a new remote share point. The size of the options.txt file is limited to 64K.

Each line in the file can have one the following syntax formats.

```
SUBNET;TFTP_SERVER_IP;

SUBNET;TFTP_SERVER_IP;PATH;

SUBNET;TFTP_SERVER_IP;;

# <Comments>
```

where

SUBNET   The IP address of the subnet that will be served by this share point. You can calculate this value by ANDing the IP address of any computer on the subnet with the subnet mask. Example: if the computer's IP address is 10.5.166.18 and the subnet mask is 255.255.240.0, then 10.5.160.0 is the value of SUBNET.

TFTP_SERVER_IP   The IP address of the computer that is the share point. Example: 10.5.168.92.

PATH   The case-sensitive path name, including the trailing backslash (Windows) or slash (Linux), of the directory on the share point that contains the TFTP server and the DOS images. Example: C:\IBMTCPIP\.

```
SUBNET;TFTP_SERVER_IP;
```

This format is used to locate the remote TFTP server – that is, the remote server where the share point is located. It is assumed that the DOS image files (PROFX, PROFS, and PROFN) are stored in the same subdirectory on the remote server as they were on the RDM server. The default directory during an RDM install is C:\IBMTCPIP\.

```
SUBNET;TFTP_SERVER_IP;PATH
```

This format is used to locate the remote TFTP server, when the path has a different name than the corresponding path on the RDM server. Complete the path with a backslash or slash depending on the remote server's operating system (e.g., Windows or Linux).

```
SUBNET;TFTP_SERVER_IP;;
```

This format is used to make the path blank. This is useful when the remote server is a Linux/Unix machine and the image files are in the /tftpboot directory.

`# Comment`   Any sentence that begins with a # is treated as a comment.

IMPORTANT: There should not be any spaces in the lines in the file. Any blank lines are ignored. If the syntax of a line is incorrect, then that particular line is ignored and the next line is scanned. When creating the OPTIONS.TXT file with a text editor program such as Notepad, press the Enter key at the end of every line, including the last one.

Example of an OPTIONS.TXT file:

```
# this line is a comment
9.42.0.0;9.42.2.1;C:\TEMP\;
9.52.0.0;9.52.1.2;;
10.2.0.0;10.2.5.6;
```

Each time you create a remote share point using the Custom option in the RDM install program, it will create a file named RSP<n>.LOF on the RDM server, where <n> is a 5-digit number (e.g., RSP00002.LOF). The LOF file contains a single line in the OPTIONS.TXT format. You should manually append that line to your existing OPTIONS.TXT file.

SCSI.LST

RDM supports the automatic deployment of machines with a SCSI card. All cards are supported in Windows 98 and Windows 2000. For Windows NT 4.0, supported SCSI cards are listed in the Compatibility and Configuration guide. In case you are using an unsupported SCSI card in Windows NT 4.0, you can add support by adding an entry to the `<drive>:\RDM\SCSI.LST` file. If your card is using a new driver, you must perform a few additional steps. For more information, see "Installing SCSI Drivers" on page 200.

Note: The ability to modify the SCSI.LST file to add new SCSI cards does not guarantee that these cards will work with RDM.

The purpose of the SCSI.LST file is to identify and support SCSI cards that are not supported by default in RDM. Cards supported by default are not listed here. Whenever you change this file, you must stop and restart the RDM console in order to enable your changes. Please edit this file with care. Semicolon positions and spacing are important.

An example of an entry in this file:

```
Some Company PCI SCSI Controller;9005008;1;
```

Each line contains the following field types:

Field 1   Name of the SCSI adapter card. All characters from the start of the line until the semi-colon (;) are used. This field is required

Field 2   PCI ID. This is the PCI identifier for the adapter card. The PCI ID is the first 8 digits of the PCI number. This field is required.

Field 3   RDM's unique index to the SCSI drivers, corresponding to the <i> in the SCSI<i>.LCA file, located in the `<drive>:\RDM\CLNTFILE\DEFAULTS` directory

6.8 Adding Device Drivers

Installing Network Drivers

Some network adapters that were not tested by IBM may work with RDM. The adapter must support the Wired for Management 2.0 standard, including the PXE 2.0 protocol, in a standards-based DHCP environment. To add an unsupported network adapter, you will first have to add a line to the NETWORK.LST file. For a detailed description of the fields in NETWORK.LST, see page 189. If your network adapter uses a new network driver, you will also have to copy and edit device-driver files. These steps are OS-dependent.

Update the NETWORK.LST file

In NETWORK.LST, add a new line to the bottom of the file:

▶ Field 1: Enter the adapter description.

▶ Field 2: Select a unique number that is not being used in the list.

▶ Field 3: If the adapter uses a device driver that is already included in RDM, use the index number that corresponds to this driver. For example, use 0 for an Intel Ethernet adapter. Look in the `<drive>:\RDM\CLNTFILE\DEFAULTS` directory for NETCRD<i>.LCA files for other currently supported drivers. If the adapter uses a new driver, enter a new index, e.g. 12.

▶ Field 4: Enter "`!`".

▶ Field 5: Enter "`OS2`".

▶ Field 6: Enter "`!`".

▶ Field 7: Enter the 16-digit PCI vendor/device ID (for example, `8086122980863000`). You can run the RDM utility IDVIEW.EXE to determine what to put in this field. See "IDVIEW.EXE" on page 234 for more information.

▶ Field 8: Enter "`!`".

▶ Field 9: Enter "`XN2S`" at first. Your testing will determine what flags are ideal for your adapter/machine combinations.

An example line could be:

```
My new Brand X Ethernet adapter;63;7;!;OS2;!;8086122980863000;!;XN2S;
```

To add a new Windows NT 4.0 network driver

If you entered a new index in Field 3 of NETWORK.LIST, your adapter uses a new driver. In Windows NT 4.0, install the new driver as follows:

- ▶ Create a new `<drive>:\RDM\CLNTFILE\DEFAULTS\NETCRD<i>.LCA` file, where <i> stands for the index number in Field 3. In the current example, the file would be NETCRD12.LCA. It is easiest to copy one of the existing files, such that you only need to edit the lines in the `[SelectedAdaptersSection]` paragraph.

- ▶ Change the comment line so that it describes your new adapter.

- ▶ Change the other line, using the `<name>` that is defined in your adapter's documentation and `the <your new drivers>` directory name of your choice. For example:

    `<name> = ETHERParamSection, \$OEM$\NET\<your new drivers>`

- ▶ Copy your new drivers into the following directory:

    `\RDM\CLNTFILE\DEFAULTS\OEM\NET\<your new drivers>`

    where `<your new drivers>` is the same directory name as used in the corresponding `<drive>:\RDM\CLNTFILE\DEFAULTS\NETCRD<i>.LCA` file.

To add a new Windows 2000 or XP network driver

Add the network drivers as follows:

- ▶ Copy your new drivers into the following directory:

    `\RDM\CLNTFILE\DEFAULTS\OEM\D1\DRV\N\<your new drivers>`

- ▶ Add the path `DRV\N\<your new drivers>` to the `OemPnPDriversPath` line in the default Windows 2000 answer file (W2K.LCA) or Windows XP Professional answer file (WXP.LCA) found in the `<drive>:\RDM\CLNTFILE\DEFAULTS` directory as well as in any answer files that have already been created (e.g., a PROFnnn.LCA file in a wizard-generated profile).

To install the Intel Proset utility

In order to install the Intel Proset utility on any system assigned to a given profile, you will need to modify the `\RDM\CLNTFILE\PROFILE\PROFnnn\OEM\C\LCCMBIN\client.bat` file for that profile. This file will contain two comment lines, as shown below. To install the Intel Proset utility on all systems assigned to the Profile, remove the REM from the 2nd line shown below.

> REM If you wish to use the Intel ProSet utility, remove the REM from the following line.
>
> REM IF EXIST c:\drv\n\ve\e100bnt5.sys c:\drv\n\ve\windows\proset2\proset.exe MsiPath=c:\drv\n\ve\windows\proset2 /qn

To add a new Windows 98 network driver

For Windows 98, you need to install network drivers using Microsoft's INF Installer. With INF Installer (Infinst.exe), network drivers are added to an existing Windows 98 installation point. When you install Windows 98 from this installation point, the added drivers will be installed as if they were part of the original Windows 98 Setup program. In other words, you need to add drivers after building the unattended install image.

When you run Infinst.exe, an .inf file is copied from your source (.e.g. diskette) into the appropriate unattended install directory `<drive>:\RDM\clntfile\W98\<lang>`, where `<lang>` stands for the particular language variation you are using (also see "Location of Unattended Install Directories" on page 188). After running Infinst.exe, you need to edit the copied file in the following ways:

- ▶ Delete the entire `[SourceDisksNames]` section.

- ▶ Delete the entire `[SourceDisksFiles]` section.

- ▶ Add the following line into the `[Version]` section:

    `LayoutFile = layout.inf, layout1.inf, layout2.inf`

In some cases you will need to copy more then one .inf file from your source. Run the INF installer again until all the necessary files are processed and make the described edits for all files.

For more information on the INF Installer, see:

- ▶ http://www.microsoft.com/technet/Win98/Reskit/Part1/wrkc03.asp.

- ▶ http://www.microsoft.com/TechNet/win98/technote/batch98.asp.

Note: Alternatively, you can use the procedure used for Windows 95 described next. If you do, use the w98diff.txt file instead of diff.txt, and copy drivers in the `W98drv` subdirectory instead of the `W95drv` subdirectory.

To add a new Windows 95 network driver

Note: In order to add Windows 95 or Windows 95 OSR2 drivers, you must have a good understanding of Win9X information (*.inf) files.

Add the network drivers as follows:

- ▶ Before you start, make sure you have the following files:
  - ▪ Win9X information file (*.inf), Win9X drivers, and other files associated with the adapter, located on the manufacturer's diskette/CD.
  - ▪ For Windows 95, the diff.txt file, located in the `<drive>:\RDM\clntfile\imgwiz` directory on the RDM server. For Window 95 OSR2, the osr2diff.txt file located in the same directory.

- ▶ Copy the Win9X drivers onto the RDM server in the `<drive>:\RDM\clntfile\imgwiz\W95drv` directory for Windows 95 or the `<drive>:\RDM\clntfile\imgwiz\osr2drv` directory for OSR2. Do not copy the INF (*.inf) file.

  IMPORTANT: If there are already files in this directory with the same name, overwriting it will disable the network drivers that use these files. Contact the manufacturer for support.

- ▶ Open the INF file and locate the section headed [Manufacturer]. From there find the correct manufacturer down in the file, and locate the device drivers you need. You can find the device driver you need by looking at the PCI vendor/network ID, which you also entered in Field 7 of your new line in NETWORK.LST. Copy these lines and paste them to the end of the diff.txt file. For example, you might find lines like this:

  ```
  %PCIE100B.DeviceDesc% = E100B.ndi, PCI\VEN_8086&DEV_1229&REV_01; Intel(R)
  PRO PCI Adapter

  %PCIE100B2.DeviceDesc% = E100B.ndi, PCI\VEN_8086&DEV_1229&REV_02;
  Intel(R) PRO PCI Adapter
  ```

- ▶ If you are adding multiple device drivers from different manufacturers, be sure to copy the various manufacturers sections into the diff.txt file in the same order as in the INF file.

- ▶ Now locate all the variables that the device drivers reference in the INF file and copy the corresponding sections to the diff.txt file. For example, in the above example, `E100B.ndi` is a variable, and there is a section below in the file with the header `[E100B.ndi]`. This section needs to be copied. Be aware that this section might use other variables, whose sections need to be copied, and so forth. Make sure that you have traced all the used variables and copied all the corresponding sections.

- ▶ Save and close the diff.txt file.

Now you are ready build a new image for the profile with the Profile Wizard. During the image building process, a new INF file is created using the information in the diff.txt file.

> **Note**: There is a maximum size limit to the INF file. This might cause the image building process to fail, creating INF files of 0 size. Contact Microsoft support for solutions.

Installing Windows NT 4.0 and Windows 2000 Video Drivers

In RDM 3.1, if the correct video driver is not found as part of the operating system during setup, Windows NT 4.0 and Windows 2000 defaults to using the standard "VGA Compatible Adapter" driver, which provides 640 by 480 resolution with 16 colors. However it is possible to manually extend the unattended installation to include the loading of specific video drivers for an individual profile and specifically set the desired resolution and color.

Limitations

In the case of Windows NT 4.0 where there is no Plug-n-Play functionality, the use of the software profile is limited to systems with a single video adapter. This is because you have to specify the adapter specifically in the answer file. However several drivers can support several different adapters. For example, these video adapters share the same driver:

- ▶ Matrox Millennium G200.
- ▶ Matrox Millennium II.

Similarly these adapters share the same driver:

- ▶ S3 86C911/86C924/86C928/86C928 PCI.
- ▶ S3 86C801/86C805/86C805I.
- ▶ S3 Vision864/964/866/868/968.
- ▶ S3 Trio32/Trio64/Trio64V+/Trio64V2.

With Windows 2000, since it is Plug-n-Play, this is not an issue because you merely add another driver to the operating system. 2000 setup will only use it if it finds a compatible device.

Making Changes to unattended setup for Windows NT 4.0

For more information refer to Microsoft technical article Q156655 "Install OEM Video Drivers w/ Windows NT 4.0 Unattended Setup".

When the Profile Wizard is used to create a Windows NT 4.0 unattended installation profile, it creates an unattended answer file in the `CLNTFILE\PROFILE\PROFxxx` directory associated with the profile. Then do the following:

1. In the Profile notebook, select the Software tab. The answer file will be called PROFxxx.LCA.

2. Change the `[Display]` section in this answer file so that it contains the following fields shown in this example:

```
[Display]
InfFile="CI546x.inf"
InfOption=" Cirrus Logic 546x 1.71a "
InstallDriver=1
BitsPerPel = 16
XResolution = 800
YResolution = 600
VRefresh = 60
AutoConfirm = 1
```

```
ConfigureAtLogon = 0
```

This example uses the Cirrus Logic 546x driver. You must change the `InfFile` and `InfOption` for your specific driver. The `InfFile` field defines which (.INF) file will be used to install the driver, and the `InfOption` field defines which option to install. The option must be one of the fields defined in the field referred to by the `[Manufacturer]` section. You should use values that are appropriate for your monitor in the `BitsPerPel`, `XResolution`, `YResolution`, and `VRefresh` fields.

You must copy the (.INF) file and all the necessary files to install the driver into a directory called `display` under the profile directory:

```
CLNTFILE\PROFILE\PROFxxx\OEM\DISPLAY
```

The contents of this directory will automatically be copied onto each system before the unattended installation commences.

Making Changes to unattended setup for Windows 2000

For more information refer to Microsoft technical article Q254078 "How to Add OEM Plug and Play Drivers to Windows 2000 Installations".

When the Profile Wizard is used to create a 2000 unattended installation profile, it creates an unattended answer file in the `CLNTFILE\PROFILE\PROFxxx` directory associated with the profile.

1. In the Profile notebook, select the Software tab. The answer file will be called PROFxxx.LCA.

2. Change the `[Display]` section in this answer file so that it contains the following fields shown in this example (do not put driver information here):

```
[Display]
BitsPerPel = 16
XResolution = 800
YResolution = 600
VRefresh = 60
AutoConfirm = 1
ConfigureAtLogon = 0
```

This example implies that the driver that will get installed will support these settings.

You must copy the (.INF) file and all the necessary files to install the driver into the following directory:

```
CLNTFILE\DEFAULTS\OEM\D1\DRIVERS\VIDEO\<MyVideoFolder>
```

`<MyVideoFolder>` can be any name of your choice. The contents of this directory will automatically be copied onto each system before the unattended installation commences. You must add this new path ("`DRIVERS\VIDEO\<MyVideoFolder>`") to the "`OemPnPDriversPath`" line in the PROFxxx.LCA file. You can also add it to the default Windows 2000 answer file (W2K.LCA) found in the `<drive>:\RDM\CLNTFILE\DEFAULTS` folder so all future profiles can use it as well.

Installing ISA Onboard Service Processor Device Drivers

If you intend to deploy a server system with an onboard Service Processor, you must load the appropriate device driver for that Service Processor.

To load the appropriate device driver:

1. Locate the profile directory corresponding to the server profile to which the service processor drivers will be added:

a) At the Installation/Maintenance window, highlight the profile in the profiles and assigned systems column.

b) From the **Profile** menu, select **Configure**.

Or

Double-click the profile.

c) Click the **Software** tab.

d) Locate the **Answer File** field. This field contains the directory name where the answer file is located.

2. Take note of the directory name where the answer file is located (1d above). This should be of the form `<drive>:\RDM\clntfile\profile\PROFXXX`, where `XXX` denotes the profile number.

3. Create directory `OEM\SERVPROC` within the profile directory. The OEM directory will already have been created.

4. Copy the device driver files and setup program from the diskette to directory `OEM\SERVPROC`.

5. Modify the file named cmdlines.txt (This file is in Microsoft INF format and is located in the OEM directory) by adding ".`\SERVPROC\setup /q`" beneath the section titled `[Commands]`.

The Service Processor drivers will install unattended during Graphics Mode Setup.

Note: This procedure is relevant only to the ISA onboard Service Processor found on the following servers: Netfinity Series 5000 : Model 8659, Series 5500 : Model 8660, Series 5500 M10 : Model 8661 and Series 5500 M20 : Model 8662.

Installing OEM Devices with Windows 95, Windows 95 OSR2 and Windows 98

Windows 95, Windows 95 OSR2 and Windows 98 do not have an OEM install feature similar to Windows NT 4.0. If you have a non-IBM device that is on Windows 95, Windows 95 OSR2, or Windows 98 hardware compatibility list, then the device can be auto detected by the Windows operating system. Alternatively you can edit the answer file (.LCA) which you can find at `<drive>:\RDM\CLNTFILE\DEFAULTS\XXXX.LCA` and, for example, add the line "`netcards=<pnp ID#>`" to install a network adapter card.

Installing SCSI Drivers

To add an unsupported SCSI adapter, you will first have to add a line to the SCSI.LST file. For a detailed description of the fields in this file, see page 194. If your SCSI adapter uses a new driver, you will also have to copy and edit device-driver files. You cannot use the existing drivers associated with the SCSI cards supported by default in RDM. Therefore, if this is your first new unsupported SCSI card, you will definitely have to add a new driver. If you are adding an additional card, which uses the same driver, you can re-use the driver by adding the corresponding index number in SCSI.LST.

To install a new adapter that requires a new driver, do the following:

▸ Add an entry to SCSI.LST. In Field 3, enter a new index number. If this is the first unsupported card that you are adding, enter any number, e.g. "0".

▸ Copy your new driver files into the following directory:

`\RDM\CLNTFILE\DEFAULTS\OEM\TEXTMODE\`

▸ Create a new `<drive>:\RDM\CLNTFILE\DEFAULTS\SCSI<i>.LCA` file, where <i> stands for the index number in Field 3. In the current example the file would be SCSI0.LCA. It is easiest to copy and edit one of the existing files, such as the ULTRA.LCA file.

▶ Change the comment line under `[MassStorageDrivers]` so that it describes your new adapter.

▶ Below `[OEMBootFiles]`, add all the filenames of the driver files you copied into the `\TEXTMODE` directory.

6.9 Managing the RDM Database

The RDM Database, stored as a `<drive>:\RDM\LCCLIENT.DBS` file, contains a record of all the unassigned and assigned systems known to RDM. You can export this database and append this database by important another file, as is described below. Software profiles are stored in a separate database and can be exported for visual inspection.

Import a Systems database

With RDM, you can import new systems into the Systems database. By importing a systems database, you can use this database as a way of waking up (using Wake on LAN) individual or groups of systems without using the scan feature. This import feature allows other tools to provide the data to RDM. Alternatively, you can import an exported database created by RDM (see page 202 for details).

When you import, you append to the existing database. If a system that is being imported already exists in the database, it will not be added and an error will be recorded in LCERROR.LOG. To import:

1. From the menu, select **File**, then **Import** and **Append to Systems Database.** A browse box will appear.

2. Select the .TXT file that you want to import.

Note: When you have selected your .TXT file to import, the original LCCLIENT.DBS file is renamed as LCCLIENT.BAK automatically. If you make a mistake, or damage your database in some way, the original database can be recovered by renaming the LCCLIENT.BAK file to LCCLIENT.DBS.

To create a database import file, several rules must apply:

▶ The file must contain a single header.

▶ System details always follow the header.

▶ End each field with a comma. The comma is optional for the last field in each line.

▶ End each line (including the last line) with a carriage return/line feed (i.e., press the Enter key).

▶ Any string values must be enclosed within double quotation marks.

▶ Save the file as a text file (.TXT).

The following is a listing of valid header fields that can be imported into RDM. These fields are not case sensitive but must be labeled exactly as shown.

MODEL	System model number. 15 alphanumeric characters limit.
NCARD	Network card type. 16 hexadecimal characters limit. Must also be listed in the NETWORK.LST file.
VCARD	Video card type. 8 hexadecimal characters limit. Must also be listed in the VIDEO.LST file.
CONTACT	Contact information field. Field is usually identified during the scanning for new system's process. Limit is 255 ASCII characters.
LOCATION	Location information field. Field is usually identified during the scanning for new system's process. Limit is 255 ASCII characters.

COMMENTS	Comments information field. Field is usually identified during the scanning for new system's process. Limit is 255 ASCII characters.
RAMSIZE	The amount of RAM on the system. Values are listed in 1 million byte increments up to a maximum of 32767 MB. Do not embed commas in this field.
DISKSIZE	The size of the primary hard disk on the system. Values are listed in 1-Megabyte increments up to a maximum of 2147483647 MB. Do not embed commas in this field.
LANGUAGE	The numeric equivalent of the BIOS language. See the field "LANGUAGE" in the Systems databases export function for the language definition key.
BIOSLEVEL	The level of BIOS present on the system. Limited to 8 alphanumeric characters
CLIENT_TYPE	Network card protocol used by the system. One character only (0=RPL, 1=DHCP).
NETWORKNAME	Limit is 11 characters. For example, SYS09. Alphanumeric only.
SERIALNUMBER	Computer serial number. Limit is 15 characters. Alphanumeric only.
PROFILE_NAME	The name of the profile you wish assigned to this system. Limited to 64 ASCII characters. Leaving this field blank forces the system into the "unassigned" system column.
NETWORKADDRESS	12 hexadecimal characters (exactly).
LCCM_CONTROLLED_STATUS	Does RDM control this system? One character only (0=RDM Controlled system, 1=Not by this program).
CLIENT_PARAM_VALUE_1 to CLIENT_PARAM_VALUE_24	System parameter values. Limited to 24 ASCII characters each

Export a Database

The Database Export function can export the systems database or the profiles database, creating a comma-delimited text (.TXT) file format. The imported file can be used for reference and information purposes.

To export a database:

1. Select **File** and **Export** from the menu. You will be given the option to export a systems or a profiles database.

2. Select either **Systems** or **Profiles**.

3. Save the export file. The default file name is LCCLIENT.TXT for the systems database and LCPROF.TXT for the profiles database.

    NOTE: RDM does not allow spaces in the filename or pathname.

A detailed explanation of all the fields in both databases is given in the next section.

Database Fields

Systems database

The following table details the contents of the RDM Systems database. Not all systems will have every field filled with data.

Valid	1=valid record, 2=deleted, 3=changed, 4=new record
Lastupdated	0=never been updated, 1=has been updated
Networkaddress	MAC address
Networkname	RDM system name (for example, SYS01)
Bootstatus	0=system not disabled, 1=system disabled
Biospassword	system BIOS password
Serialnumber	system serial number
Model	type of computer; model number
Location	location; see system variables
Contact	contact; see system variables
Comments	comments; see system variables
Ncard	network card type
Vcard	video card type
Ramsize	amount of system RAM
Disksize	size of system's hard disk
profile_name	profile assigned to system; see software
Personalization	0=no personalization, 1=use extra personalization; status of personalization check box
date_time.tim_hour	System last updated (hour)
date_time.tm_sec	System last updated (second)
date_time.tm_mday	System last updated (date)
date_time.tm_mon	System last updated (month)
date_time.tm_year	System last updated (year)
date_time.tm_wday	System last updated (day of the week); 0=Sunday to 6=Saturday
date_time.tm_yday	System last updated (numerical day in a year);0 to 365
date_time.tm_idst	System last updated (using daylight savings time); 0=not daylight savings time, 1=daylight savings time
Biosimage	Path and file name of system BIOS
Bioslevel	System BIOS level
Language	Numerical identification of the BIOS language. Key: 0=BE; 1=BR; 2=CE; 3=CF; 4=DK; 5=FR; 6=GR; 7=IT; 8=JP; 9=LA; 10=NL; 11=NO; 12=PO; 13=SF; 14=SG; 15=SP; 16=SU; 17=SV; 18=UK; 19=US
Cmosupdatefile	Path and file name of system CMOS update
Errorcode	last error code from system processing; 0=no errors
Maintainfile	Path and file name of system maintenance file
Restart	System shutdown for scheduled processing; 0=do not force shutdown, 1=restart operating system, 2=power off/restart
client_scheduled	System processing schedule; 0=as soon as possible, 1=scheduled

	date/time, 2=repeat
Schedule	System Scheduler defined; 0=default schedule, 1=one time System Scheduler, 2=use System Scheduler always
Scheddayoption	0=next 24 hours, 1=specified day; if client_scheduled=1, then 0=repeat daily, 1=repeat weekly
Schedtimeoption	Type of Scheduler clock; 0=12-hour clock, 1=24-hour clock
Schedule_days	Day of the week selected by the Event Scheduler; 0=Sunday to 6=Saturday
Schedule_hours	Hour of the day selected by the Event Scheduler
Schedule_minutes	Minutes of an hour selected by the Event Scheduler
lccm_controlled_status	RDM control of system; 0=yes, 1=no
client_type	system protocol; 0=RPL, 1=DHCP
client_param_value_1 to client_param_value_24	System parameters

Profiles database

The following table details the contents of the RDM Profiles database. Not all profiles will have every field filled with data.

Valid	Validity of Profile record created in the Profiles database; 1=valid record, 2=deleted, 3=changed, 4=new record
Type	Profile type; 0=standard remote boot, 1=Operating System Clone, 2=unattended install, 3=no profile
Name	Profile name
Ncard	Specific network card type
Vcard	Specific video card type
Ramsize	Amount of system RAM required
Disksize	Amount of system's hard disk space required
Userpreload	Preload check box status; 0=do not use preload, 1=use preload
Personalization	Personalization check box status; 0=do not use personalization file, 1=use personalization file
dos_fileload	File name of standard remote boot image
Preload_image	File name of preload image
Answerfile	File name of Operating System unattended install answer file
final_image	File name of final image
nt_source	Operating System unattended install distribution share point
Client_clone	Standard remote boot name
Description	Profile description
prof_param_name_1 to prof_param_name_24	Profile parameter names
prof_param_value_1 to prof_param_value_24	Profile parameter values
prof_param_describe_1 to prof_param_describe_24	Profile parameter descriptions
Client_param_name_1 to client_param_name_24	System parameter values

```
Client_default_value_1 to client_default_value_24          System parameter values
Client_param_describe__1 to client_param_describe_24       System parameter
                                                           descriptions
```

6.10 Using Power Restore Locally

Power Restore can be run remotely using RDM. Alternatively, it can be run locally using a bootable diskette or CD, or it can be invoked by pressing the F11 key during power on. The latter option requires installing IBM Boot Manager. In both methods you will have access to a Power Restore menu from which you can choose to backup or restore a particular version. Finally, it is also possible to locally run a scripted program that will create a Power Restore partition and backup the primary partition. The latter method will be discussed first.

Creating a Power Restore Backup

To run the scripted program that creates a Power Restore backup, you must first create a bootable diskette or CD:

1. Create a bootable DOS diskette from a computer running Windows 98 or Windows 98 Second Edition, or follow the instructions in "Building DOS 7.1 Boot Diskettes" on page 208 to create a IBM PC DOS 7.1 diskette.

2. If you created the bootable DOS diskette from Windows 98 or Windows 98 Second Edition, find and copy the files `HIMEM.SYS` and `RAMDRIVE.SYS` from the computer to diskette.

3. Copy the files in `<drive>:\RDM\ClntFile\Diskettes\Migration` on the RDM server to diskette.

4. (Optional) If you are making a bootable CD, use software that supports the creation of a bootable CD based on the diskette you just created.

To create a Power Restore backup:

1. On the system, make sure that the startup sequence is set to booting from diskette or CD (whatever is applicable). For details, see "Startup Sequences on the System" on page 186.

2. Boot the system from the bootable source and wait while a backup is created. This process is finished when the computer has been shut down. Remove the diskette.

3. (Optional) Change the startup sequence back to the original configuration.

Running Power Restore Using a Diskette or CD

To run Power Restore in this fashion, you must first create the bootable diskette or CD:

1. Create a bootable DOS diskette from a computer running Windows 98 or Windows 98 Second Edition, or follow the instructions in "Building DOS 7.1 Boot Diskettes" on page 208 to create a IBM PC DOS 7.1 diskette.

2. If you created the bootable DOS diskette from Windows 98 or Windows 98 Second Edition, find and copy the files `HIMEM.SYS` and `RAMDRIVE.SYS` from the computer to diskette.

3. Copy the files in `<drive>:\RDM\ClntFile\Diskettes\PowerRestore` on the RDM server to diskette.

4. (Optional) If you are making a bootable CD, use software that supports the creation of a bootable CD based on the diskette you just created.

To run Power Restore using the Bootable Diskette or CD:

1. On the system, make sure that the startup sequence is set to booting from diskette or CD (whatever is applicable). For details, see "Startup Sequences on the System" on page 186.

2. Boot the system from the bootable source and wait until the Power Restore menu appears.

3. From the menu, select the Power Restore operation you want to perform. For details on the various options, see "Individual System Details – Maintenance Tab" on page 86. Wait until the selected operation has completed.

4. (Optional) Change the startup sequence back to the original configuration.

Invoking Power Restore During Startup

To run Power Restore in this fashion, you must first install the IBM Boot Manager:

1. From a computer running Windows 98, or Windows 98 Second Edition, format a diskette with system files.

2. Copy the files `HIMEM.SYS` and `SYS.COM` from the computer to diskette.

3. Copy the files in `<drive>:\RDM\ClntFile\Diskettes\BootManager` on the RDM server to diskette.

4. (Optional) If you are making a bootable CD, use software that supports the creation of a bootable CD based on the diskette you just created.

5. On the system, make sure that the startup sequence is set to booting from diskette or CD (whatever is applicable). For details, see "Startup Sequences on the System" on page 186.

6. Boot the system from the bootable source. Wait while the computer starts up, the partition table is changed, the computer restarts, files are installed, the partition table is restored, and the computer is shut down.

7. Remove the bootable diskette or CD and, if applicable, change the startup sequence back to the original configuration. On some operating systems, you might be asked to reboot the system the first time after installing IBM Boot Manager.

To invoke Power Restore during startup, do the following:

1. Boot the system. At the Power Restore prompt, press the F11 key.

2. Wait until the Power Restore menu appears.

3. From the menu, select the Power Restore operation you want to perform. For details on the various options, see "Individual System Details – Maintenance Tab" on page 86. Wait until the selected operation has completed.

6.11 Installing Multiple PDC's in Windows NT 4.0

To install multiple Primary Domain Controllers (PDC's) onto multiple domains in Windows NT 4.0, do the following:

1. Create a Windows NT 4.0 Server (including Service Pack 4) software profile using the Profile Wizard. Select your own domain.

2. At the Installation/Maintenance window:

    a) Select **Configure** from the **Profile** menu.

    b) Click the System Parameters tab.

    c) Enter a new parameter **LCLI_NTDOMAIN** under the Name column at the next available field and click **OK**.

3. From Windows NT 4.0's Explorer, double-click the (.LCA) file associated with the profile you have created (which you will find at `<drive>:\RDM\CLNTFILE\PROFILE\PROF000\PROF000.LCA` where `000` represents the consecutive number allocated to each (.LCA) file, for example, the first profile will be associated with prof000.lca, the second profile will be associated with prof001.lca, etc.), and change the entry at line 33 from **LCPRO_NTDOMAIN** to **LCLI_NTDOMAIN**. Save your changes and close the file.

4. Assign your systems to the profile you have created using the System Assignment Wizard. At the NTDOMAIN Parameter page (now added to the System Assignment Wizard), enter the name of the domain to which you want your system to belong.

5. Once your system has been assigned, you can repeat step 4 to assign multiple systems to multiple domains.

6. At the Installation/Maintenance windows click **Process** to update your systems.

6.12 RDM DOS Images

RDM's basic paradigm is for the system to boot to the network, download a DOS image and a few batch files to a virtual floppy drive (A:), boot DOS, and then run the batch files. Different kinds of RDM tasks may require different DOS images, and several DOS images are created when you install RDM. If you have RDM tasks that require a different DOS configuration than those provided in RDM, you can modify those images or even create your own new images.

RDM provides IBM DOS 7.1 for most of its images. DOS 7.1 is a special version of IBM DOS 7.0 (also called IBM DOS 2000) that contains modifications to make it compatible with the FAT32 file system. RDM also provides IBM DOS 7.0 for tasks that are incompatible with DOS 7.1. Each DOS image used by RDM is named PROF<i> where <i> is a single alphanumeric character that distinguishes that image from the others (also see "NETWORK.LST" on page 189). You can find the DOS image characteristics in the AUTOEXEC.BAT file in the `<drive>:\IBMTCPIP\IMAGES\PROF<i>.DIR` directory. Additional characteristics are given in the `\IBMTCPIP\IMAGES\MKIMAGES.BAT` file

The following images are provided in RDM:

▶   `PROFD` is an IBM DOS 7.0 image used for debugging DOS programs.

▶   `PROFM` is an IBM DOS 7.1 image used for RDM BIOS updating for Point-of-Sale computers (has no HIMEM.SYS).

▶   `PROFN` is an IBM DOS 7.1 image used for BIOSS update processing (has no EMM386).

▶   `PROFS` is an IBM DOS 7.1 image used for the RDM Scan function.

- ▶ `PROFT` is an IBM DOS 7.1 image that uses IBMFE.DOS (instead of NDIS.DOS, the universal NDIS driver). It can be used for general RDM processing.

- ▶ `PROFX` is an IBM DOS 7.1 image used for general RDM processing.

- ▶ `PROF3` is an IBM DOS 7.1 image that uses the 3Com DOS driver for the 3C905C adapter (instead of NDIS.DOS, the universal NDIS driver). It can be used for general RDM processing.

RDM uses the following files to create its DOS images:

- ▶ `<drive>:\IBMTCPIP\IMAGES\BASEIMG` - This is the basic IBM DOS 7.1 core image file that is used to build most of the RDM images.

- ▶ `<drive>:\IBMTCPIP\IMAGES\BASEIMG.BCK` - This is the basic IBM DOS 7.0 core image file.

- ▶ `<drive>:\IBMTCPIP\IMAGES\MKIMAGES.BAT` - This program rebuilds all of RDM's DOS images.

- ▶ `<drive>:\IBMTCPIP\IMAGES\BPDISK.EXE` - This program does an in-memory creation, modification, and content display of a DOS boot-image file.

6.13 Building DOS 7.1 Boot Diskettes

In some cases it may be desirable to run some of the RDM utilities from local diskettes rather than remotely from RDM. The following procedure can be used to build bootable DOS 7.1 Diskettes:

1. Format a 1.44MB floppy with a blank label using the RDM DOS 7.1 Format Utility:

```
cd <drive>:\RDM\CLNTFILE
format a: /U /V:""
```

2. Extract the core files from BASEIMG using the following commands:

```
cd <drive>:\IBMTCPIP\IMAGES
bpdisk -d BASEIMG -O IBMBIO.COM,A:\IBMBIO.COM
bpdisk -d BASEIMG -O IBMDOS.COM,A:\IBMDOS.COM
bpdisk -d BASEIMG -O COMMAND.COM,A:\COMMAND.COM
bpdisk -d BASEIMG -O DOS\HIMEM.SYS,A:\HIMEM.SYS
bpdisk -d BASEIMG -O DOS\RAMDRIVE.SYS,A:\RAMDRIVE.SYS
```

6.14 Installing IBM Director Agent

RDM supports IBM Director Agent, a common system management agent based on Tivoli's Management Agent, IBM Director technologies and Intel's LANDesk Client Manager. IBM Director Agent integrates into other management applications (like Microsoft's SMS and Intel's LANDesk Management Suite) that will run on IBM and other manufacturers' desktops, mobile systems and servers.

IBM Director Agent consists of four capabilities:

- ▶ Hardware Features and Settings – contains information about the basic hardware, audio, I/O ports, input devices, memory, drives, video and network settings.

- ▶ General System Information – contains software and operating system information, user information and an error log.

- ▶ Proactive Policy Enforcement – contains events, alarms and responses, along with a number of manageability extension features.

- ▶ Advanced Management Utilities – contains manageability extensions like SMART Reaction, Asset ID, hardware inventory and other tools.

Note: RDM typically supports built-in install of the current version of IBM Director Agent only. When a new release becomes available, RDM will be modified (if necessary) to support the new release.

IBM Director Agent Requirements

- ▶ Processor: Pentium 200 or higher.

- ▶ Memory: 32 MB RAM minimum, 64 MB recommended for full install.

- ▶ Internet Explorer 4.01 or later is required.

Known Issues

- ▶ On Windows XP Professional, if you build an unattended install profile with IBM Director Agent and select the option **Web Based Remote Control** on the **Profile Wizard – Selecting IBM Director Agent Components** page (see page 122), this component will not be installed correctly. It is recommended that you build the profile without this option. You can add this component locally on a system using the IBM Director Agent install CD after this system has been deployed.

- ▶ In order to build an unattended install profile with IBM Director Agent that includes SNMP support, you must select the option **SNMP access and trap forwarding** on the **Profile Wizard – Selecting IBM Director Agent Components** page (see page 122). After you have created the profile with the Profile Wizard, you must edit the (.LCA) file for this profile, located in `<drive>:\RDM\CLNTFILE\PROFILE\PROFnnn.LCA`, where nnn stands for a number. To determine the correct file, go to the **Parameters** page of the profile's **Software Profile Details** notebook.

  For Windows NT 4.0 Server, add the following information to the (.LCA) file:

  ```
  [Network]
  InstallServices = SelectedServicesList


  [SelectedServicesList]
  SNMP = SNMPParameters


  [SNMPParameters]
  ```

  For Windows 2000 Server, Windows 2000 Advanced Server, and Windows XP Professional, add the following information to the (.LCA) file:

  ```
  [NetOptionalComponents]
  SNMP = 1


  [SNMP]
  ```

- ► There are a number of other known issues specific to IBM Director Agent. Some of these are listed here. For more information, see the IBM Director Agent's Troubleshooting and User's Guides on the release CD:
  - ▪ After installing IBM Director Agent with Windows NT 4.0 Workstation, Windows NT 4.0 Server, Windows 2000 Professional, Windows 2000 Server, Windows 2000 Advanced Server, or Windows XP Professional, the first user to log on to the system MUST have administrator privileges, so that it can finish configuring the system.
  - ▪ IBM Director Agent does not support some machines. If this seems like a problem, check the MASTER.INI file in the install directory and check if the four-digit machine model number exists anywhere in the list. If it does, the machine is supported. If the model number is not present in MASTER.INI, IBM Director Agent does not support that machine and cannot be installed.

Installing IBM Director Agent on Windows NT

Installation of IBM Director Agent 3.1 requires a version of MSVCRT.DLL that is not present in Windows NT Workstation or Windows NT Server. Microsoft provides a file, **VC6RedistSetup_enu.exe**, which can be used to update MSVCRT.DLL to a version that can be used by the IBM Director Agent installation program. This file is needed by RDM in order to complete an unattended installation of the IBM Director Agent with Windows NT 4.0:

1. Download **VC6RedistSetup_enu.exe** from the Microsoft web site. Search for Knowledge Base Article Q259403 to find a link to that file.

2. Move or copy **VC6RedistSetup_enu.exe** to `<drive>:\RDM\CLNTFILE\VC6REDIS\`.

RDM should automatically copy this file to the client and use it to update MSVCRT.DLL.

6.15 Adding Applications Manually

The recommended way of adding an application to an unattended software profile is to use the application's silent install option. The switches used in the command will vary, depending on what application you install. Refer to your application's documentation for this information.

The following procedure for using the silent install command with RDM uses Microsoft Internet Explorer 5.x as an example application:

1. Use the Profile Wizard to create an unattended install profile for a Windows operating system.

2. Put the Internet Explorer 5.x install directory (the directory that contains IE5SETUP.EXE) into an appropriate RDM directory. Copy it from the Internet Explorer 5.x CD. Choose one of the following locations:
   - ▪ `<drive>:\RDM\CLNTFILE\PROFILE\PROFnnn\OEM\C\IE5.x` -- This directory will apply only to the PROFnnn profile. RDM will automatically copy this directory to the systems.
   - ▪ `<drive>:\RDM\CLNTFILE\DEFAULTS\OEM\C\IE5.x` -- This directory will apply to all profiles, regardless of which application you are installing. RDM will automatically copy this directory to the systems.

3. Modify (or create) the `<drive>:\RDM\CLNTFILE\PROFILE\PROFnnn\RUNAPPS.INI` file by adding the line:

   ```
   Program1=C:\IE5.x\IE5SETUP.EXE /Q /R:N
   ```

   where

`/Q`	Specifies a quiet "hands-free" mode. The user is prompted for information that isn't specified.

/R:N	Suppresses restarting the computer after installation. If you suppress restarting, your program should take care of restarting the computer. Internet Explorer is not configured correctly until the computer is restarted.

4. Modify the sequence numbers of the `ProgramN=...` lines of the file RUNAPPS.INI so that they are numbered in sequence and so that the `Num=N` statement matches the last `ProgramN` line.

Sample RUNAPPS.INI file (that also installs IBM Universal Manageability Services):

```
[Run0]

Program1=C:\IE5.x\IE5SETUP.EXE /Q /R:N

Program2=C:\Install\UMS\EN\setup;.exe -s

Program3=\\M568207B\LANC$$\imgwiz\utils\pchecker.exe ins0432.mp

Num=3
```

You should logon to the system (the first time) as Administrator to allow Internet Explorer 5.x to complete its installation. You can delete the C:\IE5.x directory from the system later.

6.16 Creating a Donor Computer Profile

Use the following procedure to establish a LAN connection between the donor computer and the RDM server. When you establish the connection, you have read/write access to the server and can transport files from the donor computer.

After creating the donor computer profile, you can use it repeatedly to transport files from any donor computer.

To create a donor computer profile:

1. Use a text editor to create a final image batch file (.LCI) containing the following lines:

    ```
    Pause

    Pause
    ```

2. Save the file and give it a name of your choice. Ensure that the file name has a (.LCI) file extension. In this example, `DONORBT.LCI` is used.

3. Copy the `DONORBT.LCI` file into the following directory:

    ```
    <drive>:\RDM\CLNTFILE
    ```

4. Create a Software Profile Details notebook for `DONORBT.LCI`:

    a) From the Installation/Maintenance menu, select **Profile**, select **Create New**, and then select **Manually with the Profile notebook**.

    b) On the Details page:

    − Enter **Donor Boot** in the Profile Name field.

    − Select the **Operating System Clone** radio button.

    c) On the Minimum Hardware page, accept the default values:

- Select **Any Adapter, Don't care** from the drop-down menu of the Network Adapter field.
- Select **Any Video – Don't Care** from the drop-down menu of the Video Chipset field.
- Enter 0 in the **RAM** field.
- Enter 0 in the **Hard Disk** field.

  d) On the Software page, in the Final Image File Name field, use the **Browse** button to locate the `DONORBT.LCI` file, then select it. Leave the other fields on this page blank.

  e) Click **OK** to save and close the notebook.

To assign the image to the donor computer:

1. Scan the computer (see "Use the Scan Feature" on page 91).

2. Within the Installation/Maintenance window, assign the donor computer to the Donor Boot profile and click the **Process** button.

3. If your donor computer has Wake on LAN enabled, RDM will automatically power on the donor computer; otherwise you will have to power on the donor computer manually. A hybrid remote boot takes place on the donor computer and establishes a LAN connection.

4. From the donor computer keyboard, press **CTRL+C** to escape from the hybrid remote boot. The LAN connection remains active, and a command prompt appears.

5. Enter "`net logoff`" and press Enter.

6. Enter "`net logon`" and press Enter.

7. Enter your **user ID** and **password**, when prompted. You must log on as the network administrator. You now have read/write access to the appropriate server drive. It is very important that you understand the operating system environment now present at the donor. Assuming that the donor computer's primary partition is FAT16 or FAT32:

   - The donor computer C: drive is its hard disk. Any statements in your backup batch file `DONORBT.LCI` that refer to the donor computer hard disk must use drive letter C.

   - The donor computer A: drive is the virtual floppy drive from which DOS was booted on the donor computer.

   - The donor computer D: drive is a RAM drive.

   - The environment now present at the donor computer, might affect the other drive letters and paths used in your backup batch file.

8. Now you can run whatever commands you wish from the donor computer.

Once you have created a Donor Computer profile, you can use it repeatedly to transport files from any donor computer. For example, if your donor computer has a Windows 95 operating system, the Donor Computer profile can transport the complete Windows 95 operating system. If another donor computer has a Windows 95 operating system and MS Word installed, the Donor Computer profile can transport the complete Windows 95 operating system and MS Word.

6.17 Using Alternative Methods for Transporting Images

XCOPY is one method of transporting images from the donor computer to the server and from the server to the system. Unfortunately, XCOPY has limitations with long file names, file attributes, and the number of characters that can be used in a path. Furthermore, files transported with XCOPY are full size (no

compression), which adds extra traffic on the LAN. You can avoid some of these limitations by using backup and restore programs.

The following examples show two methods of using the DOS version of the PKZIP program to transport an image from a donor computer to a server and from a server to the system. Other archive and backup/restore programs might have similar capabilities and can be used to achieve the same result.

EXAMPLE 1: Using PKZIP as the transport method to the server:

1. Install a licensed copy of PKZIP and PKUNZIP in the "`\RDM\CLNTFILE`" directory or one of its subdirectories, where LCCM is your RDM program directory.

2. Create the donor computer and test it thoroughly.

3. Create a directory under `C:\RDM\CLNTFILE` for your zip file.

4. Use the following PKZIP command in your backup batch file to compress (ZIP) the image into a single .ZIP file residing on the server.

   `%LCCMPATH%\path_1\PKZIP %LCCMPATH%\path_2\W95EXMP1.ZIP -r -P %TARGET%\*.*`

   where:

   - `%LCCMPATH%` is the server drive (e.g., `C:\RDM\CLNTFILE`).

   - `path_1` is the path to the directory on the server containing PKZIP (RDM).

   - `path_2` is the path to the directory you created for the image (the directory you created in step 3).

   - W95EXMP1.ZIP is the name of the ZIP file to be created.

   - `C:` is the active partition of the donor computer.

Note that you must be aware of how the drives are mapped during the donor boot process and make sure to use the correct paths.

Note: PKZIP attributes are case sensitive. You might want to use a different parameter for compression based on the load this method puts on your LAN. For very large images, you might have to run PKZIP against smaller portions of the image by using list files. Refer to the PKZIP documentation for information about PKZIP attributes and the use of list files.

When you run your backup batch file from the donor computer, a single .ZIP file is created on the server.

EXAMPLE 2: Using PKUNZIP as the transport method to the system:

In your final image batch file, include the following line in place of the XCOPY statement:

`%LCCMPATH%\path_1\PKUNZIP -d %LCCMPATH%\path_2\W95EXMP1.ZIP %TARGET%`

where:

- ▶ `%LCCMPATH%` is the path to the server "`RDM\CLNTFILE`" directory.

- ▶ `path_1` is the path to the directory on the server containing PKZIP.

- ▶ `path_2` is the path to the directory on the server for W95EXMP1.ZIP.

- ▶ W95EXMP1.ZIP is the name of the ZIP file.

- ▶ `%TARGET%` is the system active hard disk partition.

When you have assigned a system to this profile, the final image batch file is run and the single compressed file on the server is unzipped on the system's hard disk. For a complete example, see "Final Image Batch File - DOS/Windows Image" on page 276.

6.18 Passing Parameters to Image Batch Files

Parameters can be replaced automatically within image batch files and within the Windows NT 4.0 Workstation answer file (UNATTEND.TXT) using RDM. This is done during the image download process. One generic image batch file is associated with each software profile. The RDM utility program DEDITD.EXE is used to replace parameters.

1. Create the image batch file

    If you have not already done so, create the image batch file you will be working with. This can be any type of batch file used with RDM, for example, a final image batch file (.LCI) or a maintenance file (.MNS). In your image batch file, create environment variables ("dummy" entries, enclosed within percent signs) where parameter values are required. For example, `%USERNAME%`.

2. Create a Software Profile

    If this is a new image, create a new software profile.

3. Set up the parameters common to all systems as follows:

    a) In the Installation/Maintenance window, select the profile you are working with.

    b) Select **Profile** and then **Configure** or double-click the selected profile.

    c) Click the **Parameters** tab.

    d) Enter the parameters that are common to all systems using this software profile. The Name fields must correspond to names you have given to parameters used in your batch files. Within the batch files, the parameter names must be enclosed within percentage (%) signs.

4. Set up the parameters that are unique for each system as follows:

    a) Click the **System Parms** tab.

    b) Enter the names of each parameter. These names will be copied automatically into the Parameters page of the Individual System Details notebook for every system assigned to this software profile. For additional information, see Parameter Exceptions, below, and "Software Profile Details – System Parms Tab" on page 79.

    c) Click **OK** to save the changes to the Software Profile Details notebook.

    d) If you have not yet assigned systems to this profile, you must do this now.

    e) In the Installation/Maintenance window, select the first system using this software profile. The Individual System Details notebook is displayed.

    f) From the Individual System Details notebook, select the Parameters page. The available parameters (copied from the System Parms page of the Software Profile Details notebook) are displayed.

        Enter the Values for the available parameters. You can also specify three parameter exceptions as values on this page.

    g) Repeat the last steps for all systems. Continue until you have assigned parameters for each system.

5. Select the Image For Load (or Reload).

    You must now select the image to be loaded on the system. There are several ways of doing this, depending on what type of image you are working with. You can load the image on to a single system, a group of systems, or all systems using this software profile.

- If this is a new final image and you have followed all the above steps, click the **Process** button to begin downloading the image, or specify a scheduled time and day for the download to take place (you can do this through the Scheduler of the Individual System Details notebook or the Defaults notebook); then, click the **Process** button.

- If this is an update to a final image that has already been assigned to a system, check the **Mark System for reload** check box in the Software page of the Individual System Details notebook.

- If this is a maintenance image, check the **Run maintenance file** check box in the maintenance page of the Individual System Details notebook.

Some character strings are reserved for specific purposes when used as parameter values. For details, see "Parameter Conventions" on page 80.

6.19 Unattended Install of Windows NT 4.0 Terminal Server

To create an unattended install profile for Windows NT 4.0 Terminal Server Edition, you must create and modify an unattended install profile of Windows NT 4.0 Server. The following procedure will create an unattended profile for Windows NT 4.0 Terminal Server Edition with Service Pack 6:

1. Using the Profile Wizard, create an unattended install profile for Windows NT 4.0 Server Service Pack 6. Make sure that the profile name reflects that this profile will be used for Windows NT 4.0 Terminal Server Edition. However, when building the Windows NT 4.0 Server image, make sure to use the installation files for Windows NT 4.0 Server.

2. Select the new profile and open the **Software Profile Details** notebook. Select the **Software** tab and determine the name of the folder where details of this profile are stored. The folder will be named `<drive>:\RDM\CLNTFILE\PROFILE\PROFnnn`, where `nnn` stands for a number such as 001. The changes described in the following steps will be made in this directory.

3. Go to `<drive>:\RDM\CLNTFILE\PROFILE\PROFnnn\OEM\C\LCCMBIN`. Using your favorite editor, create a file named `TSTAG1.TXT` in that directory. Make sure that the file contains some text.

4. Edit the file `<drive>:\RDM\CLNTFILE\PROFILE\PROFnnn\OEM\C\LCCMBIN\CLIENT.BAT`, making the changes shown below in boldface:

```
@echo off
title "RDM - CLIENT.BAT Processing. Please wait..."
change user /install
if not exist c:\lccmbin\nul goto END
net start workstation 2> c:\lccmbin\log.txt
net use * /d /y
net use /p:no s: \\<server>\LANC$$ /u:<server>\lccmuser "LCCM2.6KirkGnk"
if not exist c:\lccmbin\tstag1.txt goto FINISH
if not exist S:\VC6REDIS\VC6REDISTSETUP_ENU.EXE goto skip_vc6
if exist c:\tmp_vc6 goto cleanup_dir
mkdir C:\tmp_vc6
S:\VC6REDIS\WINTDIST.EXE
S:\VC6REDIS\VC6REDISTSETUP_ENU /Q /T:C:\tmp_vc6
c:\tmp_vc6\vcredist.exe /q /r:n
s:\lcreboot.exe
goto end
:cleanup_dir
rmdir /s /q c:\tmp_vc6
:skip_vc6
s:\imgwiz\utils\appsinst.exe "c:\lccmbin\runapps.ini"
goto EXIT
:FINISH
s:\imgwiz\utils\flowctrl.exe 0
goto END
:EXIT
if exist c:\lccmbin\tstag1.txt del c:\lccmbin\tstag1.txt
s:\lcreboot.exe
:end
change user /execute
```

5. Edit the file `<drive>:\RDM\CLNTFILE\PROFILE\PROFnnn\profnnn.LCA`, and add the following lines

```
[TerminalServerDesktops]
Quantity = 5
```

You may want to adjust the number of desktops as needed. Important: make sure that there is a carriage return after the last line.

6. Copy the Windows NT 4.0 Terminal Server Edition installation files to the shared folder `<drive>:\RDM\CLNTFILE\NT4SRV\ENGTS` (this example assumes English), so that the folder `NT4SRV` contains the installation files needed to install Windows NT 4.0 Terminal Server as well as the installation files needed to install Windows NT 4.0 Server.

7. On the **Software** page of the **Software Profile Details** notebook, adjust the **Distribution Share Point** to reflect where you copied the installation files for Windows NT 4 Terminal Server Edition – (e.g., change `\\<server>\LANC$$\NT4SRV\eng` to `\\<server>\LANC$$\NT4SRV\ENGTS`)

8. To install Windows NT 4.0 Terminal Server Edition with the proper version of Service Pack 6, you must also do the following:

   a) Copy the Windows NT 4.0 Terminal Server Edition Service Pack 6 installation files to the shared folder `<drive>:\RDM\CLNTFILE\DEFAULTS\MASTERSP\ENG\SP6TS\I386`.

   b) Edit the file `<drive>:\RDM\CLNTFILE\PROFILE\PROFnnn\AU.BAT` and search for the reference to the original service pack – that is, `<drive>:\RDM\CLNTFILE\DEFAULTS\MASTERSP\ENG\SP6\I386`. Replace the string `SP6` with `SP6TS`.

9. Copy the ATAPI.SYS file from the Windows NT 4.0 Terminal Server Edition Service Pack 6 directory into the Windows NT 4.0 Terminal Server Edition install directory. That is, copy `<drive>:\RDM\CLNTFILE\DEFAULTS\MASTERSP\ENG\SP6TS\I386\ATAPI.SYS` to `<drive>:\RDM\CLNTFILE\NT4SRV\ENGTS\ATAPI.SYS`.

6.20 Unattended Install of Director 4.0 Agent

If you intend to use Director 4.0 for a BladeCenter system, you will probably want to install the Director 4.0 Agent when installing Windows on each Blade. The following instructions outline the steps necessary to do this.

1. Use the RDM profile wizard to create an operating-system profile that does not include applications.

2. Once the profile is complete, open its Software Profile Details window and select the Software tab to identify the profile location.

   NOTE: in the example given below the profile location is: prof014

   `\\<RDMServer>\LANC$$\profile\prof014`

3. Once you've obtained the profile location, close the Software Profile Details window and open the Windows Explorer.

4. Access the `client.bat` file for editing of the profile you've just created. This file is located at:

   `C:\RDM\clntfile\profile\prof014\OEM\c\LCCM\bin`

5. Add the following two lines to this file just before the line that reads
   `s:\imgwiz\utils\flowctrl.exe 0`

   ```
   cd /d s:\app\agent40
   start /wait iss.exe /s /v" /qn RSP="s:\app\agent40\diragent.rsp"" /w
   ```

   NOTE: the /qn specifies a silent install. If the user wishes to run an unattended install, substitute /qb in its place. This will show the user more information during the install, but it does not require any user intervention.

6. Create an "agent40" subdirectory, and copy the contents of the i386 directory from your Director 4.0 agent image to this directory:

```
C:\RDM\clntfile\app\agent40
```

At this point you are ready to assign systems to this profile, and the unattended install of Director 4.0 Agent will complete during the final stages of `client.bat`.

If you want to customize the options for how the Director Agent installs, modify the "diragent.rsp" file in the agent40 folder. However, the "RebootIfRequired" parameter must be equal to "N", so that it doesn't force a reboot. RDM will shut down the system when the installation is finished.

6.21 Configuring LSI RAID

The Raid Direct Setup tool only allows for configuration of RAID on a ServeRAID system. In order to configure the LSI RAID, you will need to use the procedure outlined below.

1. Boot the system, and notice the LSI SCSI startup messages, after POST.

2. You will be presented with a table that reports the SCSI hardware:

    ```
    Spinning up the device!  HBA 0, ID 0, LUN 0
    Spinning up the device!  HBA 0, ID 1, LUN 0

    HBA ID LUN VENDOR   PRODUCT             REV INT13 CYL/ HD/SEC
    --- -- --- -------- ---------------- -------- ----- ------------
     0  1  0   IBM-ESXS ST336732LC    FN     B84G   81h 1024/255/63
     0  2  0   IBM-ESXS ST336732LC    FN     B84G   83h 1024/255/63
     0  7  0   LSILogic LSI1030[   402]  1000E00
     0  8  0   IBM      48P7098a S320  1     1

    LSI Logic Corp. MPT Boot ROM Successfully installed!
    ```

    For a given row in the table, the SCSI ID is the value in the ID column, and the Channel number is the value in the HBA column + 1. The SCSI hard drives will have data under the INT13 and the CYL/HD/SEC columns. For this example table, there are SCSI drives at Channel 1, SCSI ID 0 and Channel 1, SCSI ID 1.

3. The `lsi_smpl.rds` file needs to be modified to match the hardware configuration of the system you would like to configure. In order to do this, first go to the `c:\rdm\clntfile\RAID` directory and create a copy of the `lsi_smpl.rds` and name it something that you will remember (e.g., `LSICUSTM.RDS`).

4. Modify the new file (`LSICUSTM.RDS`) with the specific SCSI drive configuration that was discovered in steps 2. The original line that creates the RAID array is the following:

    ```
    %RAMDSK%\cfg1030 CREATE 1 LOGICALDRIVE NEWARRAY MAX 1  1 0  1 1
    ```

    This statement creates a logical drive of maximum size and RAID level 1 across the SCSI drives on Channel 1, SCSI ID 0 and Channel 1, SCSI ID 1.

5. If you have an additional drive and would like to configure it as a Hot Spare, then add a line to your RDS file like the following (assumes other drive is Channel 1, SCSI ID 3):

    ```
    cfg1030 SETSTATE 1 1 3 HSP
    ```

6. Create an Unattended Install profile, using the Profile Wizard. When presented with the option to configure RAID, select the customized RDS file from step 4. Then complete the profile with your desired settings.

7. Assign each system to the newly created profile, and select the Process button to initiate the deployment.

6.22 Integrating a Windows Service Pack

Follow this procedure to update your Windows 2000 image with a Service Pack.

Important: After following this procedure, you should **not** select a service pack in the Profile Wizard, when creating the unattended install profile.

These instructions assume that you are updating the Windows 2000 Server image and have used the default install paths. You can use a similar procedure for Windows 2000 Advanced Server, Windows 2000 Professional, and Windows XP Professional. Modify the paths accordingly for different operating-systems or install paths.

1. Locate the RDM operating-system path (i.e., `C:\RDM\CLNTFILE\W2KSRV`).

2. Under `C:\RDM\CLNTFILE\W2KSRV`, the operating-system installation files will be in a subdirectory named like the language (i.e., "eng" for the English language version of that operating-system). Rename this directory to "i386" (remember what the old name was, so you can restore it later).

3. At a command prompt switch to the Windows Service Pack's `i386\update` directory.

4. To update your Windows 2000 Server image, run the following command:

   ```
   update -s:C:\RDM\CLNTFILE\W2KSRV
   ```

5. Rename the "i386" directory back to it's original name (i.e., "eng").

You are now ready to deploy the operating-system with the Service Pack integrated.

Chapter 7. Utilities

Most of the utilities described in this section are found in the `<drive>:\RDM\CLNTFILE` directory, where LCCM is your RDM program directory. Location exceptions are noted. Most of the utilities run under DOS only.

7.1 ADDDOM.BAT

The `<drive>:\RDM\ADDDOM.BAT` file is used to configure the RDM server, and must be run on the RDM server only. Do not run this batch file on any domain controller unless both of the following are true:

▶   That domain controller is also the RDM server.

▶   You are deploying systems into a domain other than the one that is controlled by the RDM server.

The syntax of the command is:

```
ADDDOM [P] domain1 [domain2 ...]
```

where

`P`   PXE support. This parameter is required.

`domain`   The names of the domains into which you are deploying systems. The domains should
                be listed on the command line. Domain names should be separated by single spaces.
                The RDM server's domain **must** be specified, whether or not other domains are also
                specified.

You must have established any necessary trust relationships beforehand. Trust relationships are only necessary if systems deployed in the target domain will need to access domain resources in the RDM server's domain during deployment (for example, if the distribution share point has been changed and is on a domain resource, rather than on the RDM server). On a simple RDM installation, where the only share point is on the RDM server, there should be no need to establish trusts or to specify target domains, though ADDDOM.BAT must always be run on the RDM server, specifying the RDM server domain on the command line.

Messages are logged to LCCMDOM.LOG. We suggest that you examine LCCMDOM.LOG to be sure that the RDM server correctly enables all target domains for service. The reason for failure to enable any domain will be in this file.

A common situation is to deploy Windows NT 4.0 or Windows 2000 workstations and servers as members of a domain and to deploy Windows 95 and Windows 98 workstations that will log on to a domain. In some cases, you will need to do some manual configuration on your servers to make this work. The following three configurations can be discerned:

▶   Configuration 1: RDM is installed on a Primary Domain Controller (PDC) or on a Backup Domain
    Controller (BDC). The target computers are deployed into the same domain as that of the RDM
    server. In this case, no manual configuration is needed.

▶   Configuration 2: RDM is installed on a Stand Alone (SA) server. The target computers are deployed
    into the same domain as that of the RDM server. In this case, you should use LCCMPREP.EXE
    and ADDDOM.BAT as described below.

▶   Configuration 3: RDM is installed on a PDC, BDC, or SA. The target computers are deployed into a
    different domain from that of the RDM server. In this case, you should use LCCMPREP.EXE and
    ADDDOM.BAT as described below, and you will need to modify the LCA file for each appropriate

profile and may need to establish trust relationships between the RDM server's domain and the target domains.

The procedures are as follows:

▶ Configuration 2 and configuration 3: On a domain controller for the domain(s) into which you wish to deploy systems, run the RDM utility LCCMPREP.EXE.

▶ Configuration 3: Establish a trust relationship between the RDM domain (as the trusting domain) and each target domain (as the trusted domain).

Trust relationships are only necessary if systems deployed in the target domain will need to access domain resources in the RDM server's domain during deployment (for example, if the installation files share point has been changed and is on a domain resource, rather than on the RDM server).

On a standard RDM installation, where all share points are on the RDM server, there should be no need to establish trusts or to specify target domains to the ADDDOM.BAT file, except as noted below.

▶ Configuration 2 and configuration 3: Run the RDM utility ADDDOM.BAT on the RDM server, specifying the RDM server's domain for processing. You may specify other domains, if the necessary trust relationships have been established.

ADDDOM.BAT must always be run on the RDM server, specifying the RDM server domain on the command line.

▶ Configuration 3: Add the following line to the `[Network]` section of the LCA file for the appropriate RDM profile.

```
CreateComputerAccount=<username>,<password>
```

This account does not have to be an administrator account. We would suggest that you create an account for this special purpose. The only right that the account needs is "Add Workstations to Domain". This will limit security exposure.

7.2 AIAREAD.EXE

Use the AIAREAD.EXE utility to read the contents of the Asset Information Area (AIA) of the Radio Frequency Identification (RFID) chip. This chip is battery-maintained and contains asset data specific to each system. This program runs under DOS only.

The syntax of the command is:

```
AIAREAD group [field] [/f=file] [/a] [/s]] [/x] [/p=prefix],
```

where

group   The name of the device group.

field   The name of the field to read (default is all fields).

file   The name of the file to sent output results to (default is `stdout`).

/a   Append the file (default is overwrite file).

/s   Format output as SET statements. For example, "`SET name=value`" (default is "`name=value`").

/x   Exclude fields that are null strings or zero values.

/p   Prepend "`prefix`" to the name of each field.

Example 1: You want to display one of the AIA fields at the system.

At the system, execute the following command line:

```
AIAREAD ownerdata
```

The system displays:

```
OWNERNAME=jim smith
DEPARTMENT=219
LOCATION=Room 315
PHONE_NUMBER=3765
OWNERPOSITION=Manager
```

Example 2: You want to create a .BAT file that will SET variables in RAM on a system.

At the system, execute the following command line:

```
AIAREAD /s ownerdata > OWNER.BAT
```

The created OWNER.BAT file would contain these lines:

```
SET OWNERNAME=jim smith
SET DEPARTMENT=219
SET LOCATION=Room 315
SET PHONE_NUMBER=3765
SET OWNERPOSITION=Manager
```

7.3 AIAWRITE.EXE

Use this program to input contents to the Asset Information Area (AIA) of the Radio Frequency Identification (RFID) chip. This chip is battery maintained and contains asset data specific to each system. This program runs under DOS only.

The syntax of the command is:

```
AIAWRITE group {field1=[value1]...[fieldn=[valuen]]|/f=file}
```

where

group   The name of the device group.

fieldn   The name of the field to write.

valuen   The value to assign to `fieldn`. For the USERDEVICE group, a blank value means delete this field, if the field already exists, or create a field with a NULL value if the field does not exist. For all others it means assign a zero or null value.

file   The name of the file from which to get field/value pairs. Each line in this file contains one field/value pair, separated by "=".

Example:

```
AIAWRITE USERDEVICE AREA=SOUTH
```

7.4 BPDISK.EXE

This is a boot image creation and modification program. It is located in the `<drive>:\IBMTCPIP\images` directory. It can be used to create, restore, and modify boot images without the need for a diskette drive. Using BPDISK, you can do the following:

▶ Insert or extract single files or complete subdirectories from a boot image.

▶ Create optimized boot images which only allocate the actual storage space occupied by the included files.

▶ Create boot images of all common DOS diskette formats, including 1.2-, 1.44-, and 2.88-megabyte images.

▶ Write DOS batch files which create or update multiple boot images.

The syntax of the command is:

```
BPDISK       -d file [-v] [-D | -T file | -F dsize,bsec | -E |
             -I dst[,[@]src] | -i dir | -O src[,[@]dst] | -o dir |
             -R file | -M dir | [-P dsize]
```

where

`-d file`	The filename of the boot image. It can be an existing image or an image that should be created.
`-D`	Show a recursive directory listing of all files in the boot image identified by the –d option.
`-T file`	Display the contents of a file in the boot image defined by the –d option.
`-F dsize,bsec`	This option formats a new boot image. The name of the boot image is defined with the –d option or by the environment variable BPDISK. If the boot image already exists, it will not be overwritten.
	The first argument, dsize, specifies the format of the boot image. It is one of the following: 320, 360, 640, 720, 1200, 1440, or 2880. Initially, BPDISK will not allocate the space needed for the complete boot image; it will do this later, when files are copied into the boot image.
	The second argument, bsec, points to a file or drive which holds the boot sector and the system files for the boot image.
	The 2 arguments must be separated by a comma.
`-P dsize`	Enlarge (pad) an existing image by dsize kilobytes. It is useful for creating space into which a program may write files into the boot image, which is a RAM drive at run time.
`-I dst[,src]`	This option copies a file into an existing boot image.
	The first argument, dst, is the name of the file in the boot image.
	The second argument, src, is the name of the file to be copied. If the second argument is omitted, then the name of the dst file, with the directory path removed, is used; in this case, the source file must be in the current directory.
`-i dir`	Copy all files (recursively) from directory dir into the boot image. If you want to copy all files from the current directory, use a "." (dot) as the argument.
`-O src[,dst]`	This is similar to the –I option, but it copies out of the boot image. It copies

file src from the boot image to file dst.

-o dir	This is similar to the –i option, but it copies out of the boot image. It copies all files (recursively) from the boot image to directory dir.
-E file	Delete a file from the boot image.
-C	Erase all files from the boot image.
-M dir	Create a new subdirectory, dir, in the boot image.
-v	Give more technical information about BPDISK operations. It can be used together with other options or alone.

7.5 BSEDIT.EXE

This program backs up or restores the active boot sector.

The syntax of the command is:

```
BSEDIT /f=filename /d={A|C|D} /m={R|W} [/v]
```

where

/f=filename	The file to read the boot sector from or write the boot sector to.
/d	Device (i.e., drive letter) containing the boot sector to read or write. Possible drives are A, C, or D.
/m	Two possible values:
	R - Read the boot sector from the device and write to the specified file (this is the default)
	W - Write the boot sector contained in the specified file to the device.
/v	Verbose switch - if present, diagnostic output is displayed.

Example: The following command line makes a copy of the boot sector into a file.

```
BSEDIT /f=copy.bb /d=C /m=r
```

Note: This utility correctly handles FAT32 and FAT boot partitions.

7.6 CHKPART.COM

This program checks the partition for a specified feature on the first fixed disk drive on the computer. If the feature is found, it returns an error level of 1. If the feature is not found, it returns an error level of 0. It is located in various locations, including in `<drive>:\RDM\CLNTFILE\PQID`.

The syntax of the command is:

```
CHKPART {/R | /H | /F | /D}
```

where

/R	Checks for the existence of a Rave-style Rapid Restore partition on the drive.
/H	Checks for the existence of an Deploy Center-style Power Restore partition on the drive.
/F	Checks for the existence of a FAT32-style primary partition other than the first partition on the drive.
/D	Checks for a volume whose label is IBM_SERVICE on the drive.

7.7 DEDITD.EXE

Use the DEDITD.EXE utility to replace, insert, or append strings within text files.

The syntax of the command is:

```
DEDITD [/I[L]A | /I[L]B | /R | /AE | /AS] [/N=number] target [search] replace
```

where

/IA, /IB	Insert After, Before search.
/ILA, /ILB	Insert in the line After, Before search.
/R	Replace search with target throughout the file.
/AE, /AS	Append or replace to a line at the End or Start of the file.
/N=number	Perform an action the indicated number of times. The default is to do it once, as in /N1
number	Perform action this number of times. /N0 inserts/replaces all occurrences.
target	Full path and name of the text file to edit.
search	Optional string to search for.
replace	String to substitute/append on search string.

Example: The following line replaces the first 5 occurrences of the string LOADHIGH in the file: C:\AUTOEXEC.BAT with the string LOAD.

```
DEDITD /R /N5 C:\AUTOEXEC.BAT LOAADHIGH LOD
```

7.8 DISKDOS.EXE

Save (read) and restore (write) the boot record using the DISKDOS utility.

The syntax of the command is:

```
DISKDOS [/V] /F=filename /D=drive [/R={R|W}]
```

where

/V	For debugging output.

```
/F=filename          File to read/write from/to.
/D=drive letter      Logical drive to read/write.
/R                   R for read, W for Write
```

7.9 DOSLFNBK.EXE

Use the DOSLFNBK utility to back up and restore Windows long file names so that DOS archive programs can save and restore Windows installations. By default, the long file name records in the named directory and sub-directories are saved to or restored from a file called BACKUP.LFN, but another file name can be specified.

The syntax of the command is:

```
DOSLFNBK drive:directory [options]
```

where

```
/F file name    Backup to this file (default .LFN extension)..
/L              List contents of backup file.
/R              Restore from existing backup.
/S              Skip directory.
/V              Give running status report.
/D file name    Write a detailed debugging log to file name.
target          Full path and name of the text file to edit.
search          Optional string to search for.
replace         String to substitute/append on search string.
```

The /S parameter can be used if you want to back up and restore several directory trees separately. By doing this, an installation image can be divided into several separate archives that can be restored optionally.

7.10 DYNALOAD.COM

This program uses the DYNALOAD utility to load a device driver dynamically after the boot process has completed.

DYNALOAD is part of PC-DOS 7 and is used in batch files to load a device driver dynamically after the boot process has completed. RDM automatically uses DYNALOAD to load ServeRAID drivers (when needed) to download the RAID configuration to your ServeRAID adapter. To use DYNALOAD to load another device driver within your batch files, refer your PC-DOS 7 documentation.

7.11 FAT32.EXE

This program allows access to FAT32 disk partitions from PC-DOS. This is a "terminate and stay resident" (TSR) program.

The syntax of the command is:

`FAT32 [/S]`

where

`/S`   Display the current status of FAT32 support.

If a hard disk has been partitioned using FDISK32.EXE (so that partitions greater than 2047MB can be supported) it is necessary to load the FAT32 TSR so that these partitions can be accessed. However, the FORMAT32.COM command can use FAT32 partitions without the FAT32 TSR. See "FDISK32.EXE" on page 231 for an example of the use of FORMAT32.COM and FAT32.EXE.

7.12 FDISK.COM

The FDISK command is used to partition a hard disk and prepare it for a format operation. When using FDISK, start from a known disk configuration by deleting all partitions. The utility LCBTRDEL.EXE resets the hard disk to a known state by deleting the master boot record.

Note: RDM is currently restricted to managing systems with a maximum of two DOS drives. You can create more partitions, but no more than two can be primary or logical DOS drives.

The version of FDISK that is provided with RDM can be used with command-line arguments or a response file. Using command-line arguments provides more flexibility and can provide standardized partition sizes regardless of the hard disk capacity.

Typically, within RDM the required keyboard input to the FDISK.COM command is provided by a redirected file:

`%LCCMPATH%\FDISK < %TMPPATH%\LCFDISK.DAT`

The LCFDISK.DAT file is prepared using the LCFDISK2.EXE utility.

FDISK Command-Line Arguments

You can use DOS FDISK command-line arguments in RDM batch files as an alternative to creating binary response files.

The syntax for the DOS FDISK command is:

`[d:][path]FDISK d [/PRI:m] | [/EXT:n ] | [/LOG:o]`

where

`d:`   The drive on which the FDISK program is located.

`path`   The path to the directory of specified drive where the FDISK program is located.

`d`   The drive (1 or 2) on which the FDISK operation is to be performed.

`/PRI:m`   The size of the primary DOS partition to create (in MB).

| `/EXT:n` | The size of the extended DOS partition to create (in MB). |
| `/LOG:o` | The size of the logical drive to create (in MB) in the extended partition. |

PC DOS can handle a maximum of two partitions: one primary and one extended. The maximum primary partition size recognized by PC DOS is 2048MB. The maximum extended partition size is 8064MB. The largest logical drive that can be contained within the extended partition is 2048MB, but you can have multiple logical drives. If you specify a partition size that is larger than the amount of available disk space, the FDISK command will create a smaller partition to use whatever amount of disk space is available. Therefore, you can create a single preload image batch file specifying the /EXT:8064 parameter and use it on any system regardless of the hard disk capacity.

Note: Be aware that the LCBTRDEL utility program provided with the RDM program numbers the first physical hard disk drive as 0 and the second physical drive as 1. The DOS FDISK command numbers the first physical hard disk as 1 and the second physical drive as 2.

Example 1: You have a single 5GB hard disk and you want to partition it as follows:

▶ 2GB primary partition.

▶ 2GB extended partition.

▶ 1GB unused.

Your preload image batch file (.LCP file) would look like the following:

```
%LCCMPATH%\LCBTRDEL 0 /S

%LCCMPATH%\FDISK 1 /PRI:2048 /EXT:2048 /LOG:2048
```

If you use this same preload image batch file on a system with a 3GB hard disk, the result would be a 2GB primary partition and a 1 GB Extended partition.

Example 2: You have a single 5GB hard disk and want to partition it to have a 2GB primary partition and a 3GB extended partition containing two logical drives (2GB and 1GB respectively).

Your preload image batch file (.LCP file) would look like the following:

```
%LCCMPATH%\LCBTRDEL 0 /S

%LCCMPATH%\FDISK 1 /PRI:2048 /EXT:3076 /LOG:2048

%LCCMPATH%\FDISK 1 /LOG:1024
```

Response Files for the FDISK Command

Two response files are provided by RDM to run the FDISK command unattended.

▶ LC5050FD.DAT contains the responses for FDISK to process a disk with no partitions defined and to create one primary and one secondary partition, each taking 50% of the disk space.

IMPORTANT: If the size of the systems's hard disk is 4GB or greater, you cannot use LC5050FD.DAT. LC5050FD.DAT creates a primary DOS partition that is 50% of the hard disk space, and this partition cannot exceed 2GB.

▶ LCFDISK.DAT contains the responses for FDISK to process a disk with no partitions defined and to create a single partition, 100% of available disk space.

The following shows the sequence of responses found in the LC5050FD.DAT file:

ENTER	Create DOS partition.
ENTER	Create primary DOS partition.
N ENTER	Do not use all disk space.
50% ENTER	Use 50% of disk space.
ESC	Return to FDISK Options.
ENTER	Create DOS partition.
2 ENTER	Create extended DOS partition.
ENTER	Use maximum available space.
ESC	Go to create logical DOS drives.
ENTER	Use all available space.
ESC	Return to FDISK options.
2 ENTER	Set active partition.
1 ENTER	Partition 1.
ESC	Return to FDISK options.
ENTER	Reboot.

The most likely variation would be to create one or more partitions of fixed size. To do this, change the text **50%** to the size of the partition required.

You can easily modify one of the existing response files as follows:

1. Copy the LC5050FD.DAT file provided with RDM under a new name. Make sure you keep the .DAT extension.
2. Open the newly created response file using WordPad or NotePad. Not all of the characters will be readable.
3. Locate the 50%.
4. Change the 50 to any value from 1 to 100. Do not change any other characters. The value you choose will determine the percentage of the hard disk that will be used for the primary partition.
5. Save and close the file.

If you want to create your own response file you must first go through the FDISK procedure to partition the hard disk and write down every keystroke you use. Be sure to include the final keystroke to restart the computer. Next, use an editor to prepare a binary file with the ASCII codes for the keystroke characters. (ENTER is 13 decimal, 0D hex. ESC is 27 decimal, 1B hex.)

A preload image batch file (.LCP file) using the LC5050FD.DAT response file looks similar to the following:

```
ctty con
%LCCMPATH%\LCBTRDEL 0 /S
%LCCMPATH%\INTER.EXE FDISK < %LCCMPATH%\LC5050FD.DAT
```

Additional ready-made response files and other supplemental files are available at the RDM home page.

7.13 FDISK32.EXE

This program allows hard disk partitions larger than 2047Mb to be created.

The syntax of this command is exactly the same as FDISK.COM.

Example: The following command line will create a primary partition of size 4096Mb.

```
FDISK32 1 /PRI:4096
```

As with FDISK.EXE, the machine must be re-booted after changes have been made to the partition table before it can be used. After a re-boot, the following command line can be used to prepare the partition for use:

```
FORMAT32 C:
```

Finally, before using any other PC-DOS commands the FAT32 TSR must be loaded thus:

```
FAT32
```

Typically, within RDM the required keyboard input to the FDISK32.EXE command is provided by a redirected file:

```
%LCCMPATH%\FDISK32 < %TMPPATH%\LCFDISK.DAT
```

The LCFDISK.DAT file is prepared using the LCFDISK2.EXE utility.

7.14 FIRSTACT.EXE

This program sets the first partition on the first fixed disk drive as the active (or bootable) partition. It is located in `<drive>:\RDM\CLNTFILE\PQID`.

The syntax of the command is:

```
FIRSTACT
```

7.15 FORMAT.COM

This program prepares a disk partition for use with PC-DOS.

The syntax for this command is:

```
FORMAT drive: [/V[:label]] [/Q] [/U] [/F:size] [/B | /S] [/C]
FORMAT drive: [/V[:label]] [/Q] [/U] [/T:tracks /N:sectors] [/B | /S] [/C]
FORMAT drive: [/V[:label]] [/Q] [/U] [/1] [/4] [/B | /S] [/C]
FORMAT drive: [/Q] [/U] [/1] [/4] [/8] [/B | /S] [/C]
```

where

`drive`	Specifies the drive to format.
`/V[:label]`	Specifies the volume label.
`/Q`	Performs a quick format.
`/U`	Performs an unconditional format.
`/F:size`	Specifies the size of the floppy disk to format (such as 160, 180, 320, 360, 720, 1.2, 1.44, 2.88).
`/B`	Allocates space on the formatted disk for system files.
`/S`	Copies system files to the formatted disk.
`/T:tracks`	Specifies the number of tracks per disk side.
`/N:sectors`	Specifies the number of sectors per track.
`/1`	Formats a single side of a floppy disk.
`/4`	Formats a 5.25-inch 360K floppy disk in a high-density drive.
`/8`	Formats eight sectors per track.
`/C`	Revert to less conservative handling of bad blocks.

Example: The following command line prepares the primary partition on a drive:

```
FORMAT C:
```

Note: This is the standard PC-DOS FORMAT.COM.

Typically, within RDM the required keyboard input to the FORMAT.COM command is provided by a redirected file:

```
%LCCMPATH%\FORMAT %TARGET% < %LCCMPATH%\FORMAT.DAT
```

7.16 FORMAT32.COM

This program prepares a FAT32 disk partition for use with PC-DOS.

The syntax for this command is:

```
FORMAT32 drive: [/V[:label]] [/Q] [/AUTOTEST]
```

where

`drive`	Specifies the drive to format.
`/V[:label]`	Specifies the volume label.
`/Q`	Performs a quick format.
`/AUTOTEST`	Run FORMAT without prompts.

Example: The following command line prepares the primary partition on a drive:

```
FORMAT32 C:
```

Note: FORMAT32.COM should only be used to format FAT32 partitions, that is, partitions that were created by FDISK32.EXE.

Typically, within RDM the required keyboard input to the FORMAT32.COM command is provided by a redirected file:

```
%LCCMPATH%\FORMAT32 %TARGET% < %LCCMPATH%\FORMAT.DAT
```

Response File for the FORMAT Command

The FORMAT command can be used to define areas of the hard disk that can receive and store data. A response file is provided with RDM to run the FORMAT command unattended.

FORMAT.DAT contains the responses for FORMAT to create DOS FAT16-based tracks and sectors within the specified partition.

IMPORTANT: The FORMAT command prompts the user to define a volume label as a part of its process. RDM will not create a bootable partition if a volume label is named.

Example: The following sequence of responses is found in the FORMAT.DAT file:

y ENTER   Format existing partition

ENTER   No volume label assigned

Do not create variations of this response file.

7.17 GETRAMD.COM

This program sets the error level to a value based on the drive letter assigned to the RAM drive (if one exists). The error level is set to 0 if no RAM drive is found or to 1 through 24 for drive letters C: through Z:. It is located in `<drive>:\RDM\CLNTFILE\DISKETTES\MIGRATION`.

The syntax of the command is:

```
GETRAMD
```


7.18 HDDSIZE.EXE

This utility creates a file that contains a statement of the form

```
    SET HDDSIZE=<value>
```

where `<value>` is the size of the first hard drive, in megabytes. Wizard-generated profiles use this program to ensure that the correct hard-drive size is used during an operating-system deployment (e.g., in case someone replaced the hard drive without scanning the computer again).

The syntax is:

```
HDDSIZE /DHCP /F=<filename>
```

where

/DHCP   Implies that the system was remote booted using the PXE and DHCP protocols. This parameter is required.

<filename>   Is the name of the batch file (created by HDDSIZE.EXE) that sets the environment
                      variable HDDSIZE. This utility determines the hard drive size of a system. Wizard-
                      generated profiles use this program while a software profile image is being downloaded.

7.19 HIDEPART.EXE

This program "hides" or "un-hides" the selected partition or partitions on the first fixed disk drive. It is
located in `<drive>:\RDM\CLNTFILE\PQID`.

The syntax of the command is:

`HIDEPART {/P | /F | /L | /A}  {/H | /U}  [/D}]`

where

You must specify one of the following four parameters:

/P   The Power Restore partition on the drive.

/F   The first partition on the drive.

/L   The last partition on the drive.

/A   All partitions on the drive.

You must specify one of the following two parameters:

/H   Hide the partition(s).

/U   Un-hide the partition(s).

/D   Show debugging output. This parameter is optional.

7.20 IDVIEW.EXE

This program identifies Plug and Play and PCI devices on a specific system. This utility is located in the
`<drive>:\RDM\UTILITIES` directory.

This information is useful when adding new video adapter and network adapter details to RDM or editing
the NETWORK.LST or VIDEO.LST file.

To run the program, enter "IDVIEW" at a DOS command prompt, and click **Enter**. The program displays
any Plug and Play or PCI devices that it detects. The following is an example of the output:

```
   PCI Vendor/Device ID     SubSys     Card Class
   ----------------------------------------------
    80867190                00000000   Host/PCI Bridge
    80867191                00000000   PCI/PCI Bridge
    80867110                00000000   PCI/ISA Bridge
    53338811                00000000   VGA Compatible Controller
    80861229                101401F1   Ethernet Controller
    53338904                00000000   VGA Compatible Controller

   PnP ID's Detected
   -----------------
   0E63E82
```

7.21 IPSSEND.EXE

Use the IPSSEND utility to perform tasks on an IBM ServeRAID Adapter. These tasks include viewing the current configuration, rebuilding a dead drive, initializing and/or synchronizing logical drives, plus many more. Also, IPSSEND can be used to create arrays and logical drives for ServeRAID controllers. This functionality is described in more detail here.

To create arrays and logical drives for ServeRaid Controllers, you use the CREATE option. You must enter the channel and SCSI ID of the physical drives to define an array. You must enter the logical drive size and the RAID level for the logical drive. When you enter MAX as the size on the command line, the maximum size of the logical drive is calculated automatically. If there is free space in an existing array, you can create additional logical drives for that array.

The syntax of the command with the CREATE option is:

```
IPSSEND CREATE <Controller> LOGICALDRIVE <Options> <Size> <RAIDLevel>
<Channel> <SCSI ID> [<Channel> <SCSI ID>] NOPROMPT
```

where

<Controller>	Indicates the ServeRAID controller number (1 to 12).
LOGICALDRIVE	Indicates you are creating a logical drive.
<Options>	Enter one of the following:
	▶ The keyword NEWARRAY indicating that you are creating a new array and a new logical drive.
	▶ A valid array ID (A - H) of an existing array.
<Size>	Enter one of the following:
	▶ The keyword MAX to create the maximum size for the array.
	▶ The size in megabytes (MB) of the logical drive.
<RAIDLevel>	The RAID level for the logical drive (0, 1, 1E, 5, 5E)
<Channel>	Enter the channel number for the device (1 to 4). You must provide <Channel> and <SCSCI ID> at least once. However, you can repeat these parameters in a single command up to 16 times.
<SCSI ID>	Enter the SCSI ID of the device (0 to 15). You must provide <Channel> and <SCSCI ID> at least once. However, you can repeat these parameters in a single command up to 16 times.
NOPROMPT	Overrides the user prompt. The parameter is optional.

Note: You cannot create RAID level-x0 logical drives with the IPSSEND CREATE function.

After the logical drive is created, a quick initialization is done. The quick initialization process initializes (writes zeroes on) the first 1024 sectors (0.5 MB) of the logical drive. If you assign RAID level-5 or RAID level-5E to the logical drive and the ServeRAID controller supports the auto-synchronization feature, the logical drive automatically synchronizes in the background. If the controller does not support the auto-synchronization feature, you can use the IPSSEND SYNCH function to synchronize the RAID level-5 or RAID level-5E logical drives. After synchronization, the logical drives are available for storing data.

To find out more about other IPPSEND options, run the utility with no command-line parameters. A list of available functions and their specific parameters is provided. If you run the utility with a specific function, but without its required parameters, help for that function is displayed. For more information, see the README.TXT on the supplemental diskette supplied with your IBM ServeRAID Adapter.

7.22 LCATTRIB.EXE

This program backs up or restores hidden and system-file attributes that are not transferred using (DOS) XCOPY.

LCATTRIB.EXE saves the attributes in a file and resets them. The file is saved in the current working directory. Back them up on your donor computer before transporting the image. Restore them on the target system after the image has been received.

The syntax for the command is:

```
LCATTRIB drive:directory [options]
```

where

Directory	Full path of directory to start from.
/S	Recurse sub-directories.
/A	Alter file attributes.
/R	Restore file attributes.

Example: To back up the attributes for drive C, enter:

```
LCATTRIB C: /A /S
```

Example: To restore attributes for drive C, enter:

```
LCATTRIB C: /R /S
```

7.23 LCBTRDEL.EXE

Use the LCBTRDEL.EXE utility to delete the master boot record of a physical disk drive. This action destroys all partitions on the disk and, for normal purposes; all data saved on it. Use this utility only if you want to partition the disk using FDISK or FDISK32.

The syntax of the command is:

```
LCBTRDEL n /S
```

where n is the disk drive number (0 is the first hard drive, 1 is the second hard drive, etc.) and /S is a safety flag to prevent accidental use.

After using LCBTRDEL.EXE, you would normally call FDISK or FDISK32.

7.24 LCCLEND.EXE

This Win32 program completes the processing of a system after a CloneIt Agent clone image has been downloaded.

The syntax for the command is:

```
LCCLEND [clone.lcc] /CHANGES=changes.reg [/DELETE=c:\RDM]
[/RESTORE=c:\autoexec.bak] [/WAIT[=60]] [/VERBOSE]
```

where

`clone.lcc`	Clone control file for this image - required for FAT32 clones.
`/C=changes.reg`	File containing changes to Registry.
`/D=c:\RDM`	Delete this directory (containing temporary RDM files).
`/R=c:\autoexec.bak`	Restore the named backup of AUTOEXEC.BAT
`/W[=60]`	Wait for 60 (default) seconds before starting processing.
`/V`	Verbose switch - if present, diagnostic output is displayed.

Only the first letter (or more) of a parameter is necessary.

Typically, this utility is added to a system's AUTOEXEC.BAT to complete the clone download processing.

Example: The following line will add a LCCLEND to the end of an AUTOEXEC. When the AUTOEXEC.BAT is run, this will apply the changes contained in NEW.REG and replace the AUTOEXEC.BAT with BACKUP.BAT.

```
echo C:\LCCLEND /C=C:\NEW.REG /R=C:\BACKUP.BAT>> %TARGET%\AUTOEXEC.BAT
```

7.25 LCCLONE.EXE

This program restores the contents of a CloneIt Agent clone image file.

The syntax for this command is:

```
LCCLONE clone.LCZ [/START=C:\] [/EMPTYDIR=empty.dir] [/NET=S:
/DOSBOOT=clone.BB] [/VERBOSE]
```

```
LCCLONE clone.LCC [/START=C:\] [/EMPTYDIR=empty.dir] [/DOSBOOT] [/VERBOSE]
```

where

`clone.LCZ`	Name of the compressed clone image.
`clone.LCC`	Name of the clone control file.
`/S=C:\`	Extract the compressed files to "`C:\`" (default is current directory).
`/E=empty.dir`	Recreate empty directories listed in EMPTY.DIR file.
`/N=drive:`	RDM utilities are on network drive `<drive:>`
`/D[=clone.BB]`	Update the boot sector with information in clone.BB. If an `.LCC` file is specified, the name of the boot sector file is optional.
`/V`	Verbose switch - if present, diagnostic output is displayed.

Only the first letter (or more) of a parameter is necessary.

Example:

The following line will restore the clone defined by the control file `%CLONEFILE%` to the drive specified as `%TARGET%` including writing the boot sector information.

`%LCCMPATH%\LCCLONE %LCCMPATH%\%CLONEFILE% /S=%TARGET%\ /D`

Typically, within RDM, the LCCLONE.EXE command is called from an `.LCI` file.

7.26 LCCMEND.EXE

This program signals to the server that a system has reached end of a phase of processing.

The syntax for this command is:

`LCCMEND result`

where

`result`   The DOS error level to return to server (0 means success)

Typically, within RDM, this is called in the main control batch file _LCCMD.BAT. It is not normally necessary to change these.

7.27 LCCMPREP.EXE

The `<drive>:\RDM\LCCMPREP.EXE` utility prepares the target domain into which systems will be deployed. It is run on a domain controller for the target domain. This creates the user and group accounts necessary for RDM systems to be correctly validated and to be installed into that domain.

The syntax for the command is:

`LCCMPREP [/P]`

7.28 LCCUSTOM.EXE

The LCCUSTOM.EXE utility substitutes DOS environment variables with values within batch files. In most cases, the LCCUSTOM utility can be used to replace the older DEDITD.EXE utility. LCCUSTOM is more powerful than DEDITD, in that it cannot only substitute the environment variables of a batch file based on parameters supplied from RDM System and Profile parameter pages, but it can also substitute environment variables from parameters stored in a text file (which DEDITD cannot do).

Variables within files must be enclosed within % characters (e.g., as they are in RDM batch files). If a string enclosed within % characters is the name of an environment variable, the string, including the % characters, will be replaced by the actual value of the environment variable.

The syntax for the command is:

`LCCUSTOM infile [=outfile] [variable_file] [/v]`

where

infile	The name of the file to be modified.
outfile	Optional. The name of the modified copy of the file. If omitted or set to "=", the infile is modified.
variable_file	Optional. A file containing variables to be modified. If used, outfile must be specified as "=".
/v	Optional. Verbose output for debugging.

When using LCCUSTOM.EXE, note the following:

▶ A value set in variable_file takes precedence over a value for the same variable set in the DOS command line environment.

▶ Environment variables within the output file can be given a blank value. For example, the statement SET USERNAME= would remove the parameter %USERNAME% completely from a Windows NT 4.0 answer file.

▶ LCCUSTOM can replace DEDITD for the most common purposes, replacing all occurrences of a parameter with its value throughout a file. DEDITD might still be required for more specialized file modifications.

▶ LCCUSTOM does not use the current directory for work files, so it can be run from a read-only directory.

▶ LCCUSTOM modifies one line at a time. The maximum line length is 8KB. Lines that are longer than 8 KB may not be fully converted.

Example: Use LCCUSTOM to edit the Windows NT 4.0 unattended installation answer file.

1. Edit the answer file, UNATTEND.TXT, to include environment variables:

```
; Sample Windows NT 4.0 Workstation answer file for use
; with RDM.
[Unattended]
OemPreinstall = yes
OemSkipEULA = yes
NoWaitAfterTextMode = 1
NoWaitAfterGUIMode = 1
FileSystem = LeaveAlone
ExtendOEMPartition = 0
ConfirmHardware = no
NtUpgrade = no
Win31Upgrade = no
TargetPath = *
OverwriteOemFilesOnUpgrade = no
KeyboardLayout = "US-International"
[UserData]
```

```
     OrgName = "%COMPANY%"

     Fullname="%USERNAME%"

     Computername = %CNAME%

     ProductId="%PRODUCTID%"

     [GuiUnattended]

     OemSkipWelcome = 1

     OEMBlankAdminPassword = 1

     TimeZone = "(GMT) Greenwich Mean Time"

     [Display]

     ConfigureAtLogon = 0

     BitsPerPel = 8

     XResolution = 640

     YResolution = 480

     VRefresh = 60

     AutoConfirm = 1

     [Network]

     InstallAdapters = SelectedAdaptersSection

     InstallProtocols = ProtocolsSection

     InstallServices = ServicesSection

     JoinDomain = "%DOMAIN%"

     [SelectedAdaptersSection]

     ibmtok = IBMTOKParamSection, \$OEM$\NET\IBMTOK

     [IBMTOKParamSection]

     IOBaseAddress = 1

     NetworkAddress = %CADDRESS%

     [ProtocolsSection]

     NBF = NBFParamSection

     [NBFParamSection]

     [ServicesSection]
```

2. Create a variable file.

   For the purpose of this example, save this file as LCCM_NT.BAT.

   ```
   SET COMPANY=IBM

   SET PRODUCTID=AG94949-87243

   SET DOMAIN=AMD0012
   ```

Note: You can still use the parameter pages of the Details and Individual System Details notebooks to enter parameters for the system. These will be placed in the DOS environment by RDM when the image is downloaded and will be swapped within batch files by the LCCUSTOM utility, in a similar manner to DEDITD. The environment variables CNAME, CADDRESS, and CSERIAL are

always present in the remote boot environment at the system, and therefore do not have to be specified by the user.

3. Create a final image batch file.

   During the remote boot process, the unattended answer file is always renamed as ANSW1.TXT; therefore, you must use this name as the output file name in your batch files. Save the batch file below using a unique name within the `<drive>:\RDM\CLNTFILE` directory. Specify this batch file as the final image batch file for your required Operating System unattended install Remote Boot profile.

   The following line in the batch file (which should be entered on a single line) would create the file ANSW1.TXT, from the UNATTEND.TXT file:

```
SET USERNAME=JOHN_SMITH %LCCMPATH%\LCCUSTOM %LCCMPATH%\UNATTEND.TXT
%TARGET%\ANSW1.TXT %LCCMPATH%\LCCM_NT.BAT
```

   It will replace the variables (names between % signs) with real values.

```
OrgName = IBM

Fullname=JOHN_SMITH

Computername = SYS10

ProductId=AG94949-87243

JoinDomain=AMD0012

NetworkAddress = 006094A5BBBB
```

7.29 LCFDISK2.EXE

This program creates a keystroke input file for FDISK.COM or FDISK32.EXE.

The syntax for this command is:

```
LCFDISK2 /FILE=out.dat {[/PRI=nnnn] | [/ALL] | [/RESTORE]} [/2MAX] /DHCP
[/VERBOSE]
```

where

`/FILE=out.dat`   The full path and name of the keystroke input file that is created. This parameter is required.

At least one of the `/PRI`, `/ALL`, and `/RESTORE` parameters must be specified:

`/PRI=nnnn`   Create a first partition of fixed size, measured in MB.

`/ALL`   Use all of the remaining disk space for a partition. If this parameter is used in conjunction with the `/PRI` parameter, it refers to the second partition. If it used without this parameter, it refers to the primary partition.

`/RESTORE`   Make sure that there is sufficient space for a Power Restore partition. If this parameter is used in conjunction with only the `/PRI` parameter, it will check whether the first partition is not too big and return an error when there is insufficient space for a Power Restore partition. If the parameter is used in combination with the /PRI and /ALL parameters, the second partition will use the disk space not taken by the first and Power Restore partitions. If this parameter is used without either parameter, the primary partition will be of maximum size while allowing enough space for a Power Restore

partition. This parameter cannot be used in conjunction with only the /ALL parameter.

/2MAX   Assume that the second partition uses a different file system than the first. This parameter is optional and can be used only if the /PRI and /ALL parameters are both specified.

/DHCP   Specifies whether this command is being run under PXE. This parameter is required.

/VERBOSE   Verbose switch - if present, diagnostic output is displayed.

Only the first letter (or more) of a parameter needs to be specified.

In order for this command to be run successfully, you must also set the following environment variables:

- ► LCCMDISKSIZE. This valuable denotes the size of the hard drive measured in MB, e.g. SET LCCMDISKSIZE=4096.

- ► LCCMFAT32. This Boolean variable takes 0 and 1 as possible values, e.g. SET LCCMFAT32=0. If set to 1, it will assume FAT32 for the primary partition. If it set to 0, it will assume FAT16. NTFS is not an option. If the /2MAX parameter is used, the file system not used for the primary partition will be used for the second partition.

Note: Minimum and maximum size restrictions imposed by FAT16 and FAT32 also apply. For details, see "Profile Wizard - Target Machine's Disk Setup" on page 107.

Example: To create a command file that will create a primary partition of 4096 MB and ensures that there is enough space for a Power Restore partition, enter:

```
SET LCCMDISKSIZE=10000
SET LCCMFAT32=1
LCFDISK2 /F=TEST.DAT /PRI=4096 /R /DHCP
```

If the disk size were too small, LCFDISK2 would have returned an error.

This command file can then be used with FDISK thus:

```
FDISK < TEST.DAT
```

Example: To create a command file that will create a primary partition of maximum size and ensures that there is enough space for a Power Restore partition, enter:

```
SET LCCMDISKSIZE=4096
SET LCCMFAT32=1
LCFDISK2 /F=TEST.DAT /R /DHCP
```

The size of the primary partition will be 1939 MB.

Typically, within RDM, the LCFDISK2 command is generated from the responses given in the Profile Wizard.

7.30 LCNETSEL.EXE

This program appends the appropriate [SelectedAdaptersSection] to an existing Windows NT 4.0 unattended answer file.

The syntax for this command is:

```
LCNETSEL unattended.txt [/VERBOSE]
```

where

`unattended.txt`   Full path of the existing answer file

`/VERBOSE`   Verbose switch - if present diagnostic output is displayed

This command makes use of the LCCMNETWK environment variable set during RDM processing. This variable will contain the number used to identify a system's network card within the NETWORK.LST file. The NETCRD*n*.LCA file, where *n* is the network adapter's number, from the Defaults directory will be appended to the given answer file.

Typically, within RDM, the LCNETSEL command is used within the internal batch files that are responsible for building a Windows NT 4.0 unattended install image prior to the installation.

7.31 LCPNPSN.EXE

This program identifies and flags Plug and Play serial numbers in the Windows 95 exported registry of the donor computer and substitutes the correct Plug and Play serial numbers on the target system.

Windows 95 identifies each Plug and Play adapter by its serial number and PNP ID. When an image is transported from a donor computer to the server, then transported to a target system, Windows 95 identifies each Plug and Play adapter installed on the target system as a new device (because of the different serial number) and adds a default configuration for each Plug and Play adapter. For example, if a network setup was created on the donor computer for a Plug and Play network adapter, Windows 95 does not transfer this setup to the network adapter installed on the target system.

To remedy this problem, you must use the LCPNPSN utility program. LCPNPSN is run on the donor computer to identify and flag serial numbers in the Windows 95 registry, then run on the target system to substitute the correct serial numbers in the registry.

To read the Plug and Play serial numbers on the donor computer, the syntax of the command is:

```
LCPNPSN /S /F=filename
```

where

S   is the save attribute.

filename   is the name of the exported registry file.

LCPNPSN supports up to eight Plug and Play adapters. For each Plug and Play adapter found, the LCPNPSN program searches the exported registry for key entries under the "HKEY_LOCAL_MACHINE\Enum\ISAPNP" branch that match the serial number of the adapter. The serial number is then replaced by the string "%LCCMpnpid", where "pnpid" is the first 7 hexadecimal digits of the PNP ID. The last digit is dropped.

To substitute the Plug and Play serial numbers on the target system, the syntax of the command is:

```
LCPNPSN /R /F=filename
```

where

`R`   is the restore attribute and

`Filename`   is the name of the exported registry file.

During the restoration process, the LCPNPSN program constructs a table of the IDs and serial numbers for all Plug'n'Play adapters installed on the target system. The program then searches the exported registry for the string "`%LCCMpnpid`" and replaces the string with the serial number that corresponds to the PnP ID.

7.32 LCUNCSPL.EXE

This program splits the contents of an environment variable containing a UNC path. The output is in the form of batch file SET statements.

The syntax for this command is:

```
LCUNCSPL.EXE %unc_env% env1 env2
```

where

`unc_env`   The name of the environment variable containing a UNC path.

`env1`   The name of an environment variable to output the server and share name part of the contents of `unc_env`.

`env2`   The name of an environment variable to output the remainder of the contents of `unc_env`.

Example 1: The following line will split the contents of the environment variable LCSHAREPT.

```
LCUNCSPL %LCSHAREPT% SHARENAME DIRECTORY
```

Assuming that `LCSHAREPT` contained "`\\SERVER\LANC$$\DIR1\DIR2`", the following will be output:

```
set SHARENAME="\\SERVER\LANC$$"
set DIRECTORY="DIR1\DIR2"
```

Typically, this output is redirected to a batch file, which is then executed to set these variables, as is shown in **Example 2:**

```
%LCCMPATH%\LCUNCSPL %LCSHAREPT% SHARE DIR > %TMPPATH%\SETUNC.BAT
call %TMPPATH%\setunc.bat
```

7.33 MERGEINI.EXE

This program merges two (.INI) or (.INF) files together.

The syntax of the command is:

```
MERGEINI file1 file2
```

The contents of file1 are merged with the contents of file2 and the results written to file2.

7.34 MIGRATE.EXE

This program analyzes the first fixed disk drive on the computer and generates batch files. When run, the batch files will migrate a PC over from having a Rave-style Rapid Restore partition to having an Deploy Center-style Power Restore partition. It is located in `<drive>:\RDM\CLNTFILE\PQID`.

The syntax of the command is:

```
MIGRATE {/L | /D}
```

where

/L   The migration/installation is being run from the RDM console.

/D   The migration/installation is being run from a bootable diskette or CD-ROM

7.35 PCHECKER.EXE

This "process checker" program, located in the `<drive>:\RDM\CLNTFILE\IMGWIZ\UTILS` directory, checks whether a process is still running on a system. It checks whether the process is present and exits when that process ends.

The syntax of the command is:

```
PCHECKER  process_name
```

where

`process_name` is the name of the process

7.36 POWEROFF.COM

This program powers off the computer. It is located in various locations, including in `<drive>:\RDM\CLNTFILE\DISKETTES\FULLIC`.

The syntax of the command is:

```
POWEROFF
```

7.37 PR.EXE

This program acts as a front end for the Deploy Center technology used in Power Restore. It can be run in interactive or batch mode. In the interactive mode, the user can determine via the GUI whether to save an image of the primary partition on the first fixed disk drive to an image file, or to restore the primary partition from an image file and which image file to use. `PR.EXE` normally runs in a graphical mode (640 x 480 x 256 color). If this mode is not supported, it will run in a character mode. The program is stored inside `PQDIL.EXE`, a self-extracting PKZIP executable located in the `<drive>:\RDM\Clntfile\PQID` folder.

The syntax of the command is:

```
PR    {/I | /P | /V |
       /S {/A | /B | /O | /N} |
       /R {/A | /B | /O | /N}} {/D} |
       /R /M }
```

where

You must specify one of the following five parameters:

/I	Run in interactive mode with the ability to save to both the "A" and "B" image files.
/P	Run in interactive mode with the ability to save only to "B" image file.
/V	Display partition table information (also available by clicking on the "Info" button when running in "interactive" mode).
/S	Run PR.EXE in "batch" mode, saving an image of the primary partition on the first fixed disk drive to the specified image file.
/R	Run PR.EXE in "batch" mode, restoring the primary partition on the first fixed disk drive from the specified image file.

If you use the /S parameter, you must also specify one of the following four parameters:

/A	Save to the "A" image file plus save a copy of the Master Boot Record.
/B	Save to the "B" image file plus save a copy of the Master Boot Record.
/O	Save to the older of the "A" and "B" image files, if both exist, plus save a copy of the Master Boot Record.
/N	Save to the newer of the "A" and "B" image files, if both exist, plus save a copy of the Master Boot Record.

If you use the /R parameter, you must also specify one of the following five parameters:

/A	Restore from the "A" image file plus, by default, restore the Master Boot Record from the backup copy.
/B	Restore from the "B" image file plus, by default, restore the Master Boot Record from the backup copy.
/O	Restore from the older of the "A" and "B" image files, if both exist plus, by default, restore the Master Boot Record from the backup copy.
/N	Restore from the newer of the "A" and "B" image files, if both exist plus, by default, restore the Master Boot Record from the backup copy.

/M   Restore *only* the Master Boot Record from the backup copy *without* restoring the boot partition.

If you use the /R parameter with the /A, /B, /O or /N parameter, you can also optionally specify the following parameter:

/D   Restore *only* the partition *without* restoring the Master Boot Record from the backup copy

7.38 PRLAST.COM

This program sets the Power Restore partition (if one exists) to be the last partition defined in the Master Boot Record on the first fixed disk drive of the computer. It is located in `<drive>:\RDM\CLNTFILE\PQID`.

The syntax of the command is:

```
PRLAST
```

7.39 REBOOT.COM

This program causes a system to reboot.

The syntax for this command is:

```
REBOOT
```

There are no command line parameters.

This command will cause a system running the DOS environment to reboot immediately.

7.40 SCRUB3.EXE

The SCRUB3 utility is part of RDM's Secure Data Disposal tool. This program runs as a command under the system's DOS operating system. It permanently erases all data on one or more hard disk drives that are installed on the system. Therefore, it is a potentially dangerous utility. **We strongly recommend that you do not use this utility manually**. Instead, you should use the built-in profiles to run this program.

The syntax of this command is:

```
SCRUB3 [/?] | [[/Q=NO] /D=<drive> /L=<level> ]
```

where

/Q=NO   This parameter causes the program to display a maximal number of messages on STDOUT. It is intended to be used for "in the field" debugging only, and a customer should normally not use this parameter. If present, this parameter should be the first (i.e., leftmost) parameter.

/D=<drive>   Use this parameter to indicate which hard drive on the system needs to be erased. The value <drive> is the hard disk drive number of the drive that you want to erase, with 1 being the first hard disk drive, 2 the second hard disk drive, etc. Use ALL to erase all hard disk drives. There is no default value for this parameter. This parameter is required.

/L=\<level\>   The value \<level\> is the security level of the disposal operation. It must be one of the following values:

/L=1   Limited security. The Master Boot Record, the last 2 sectors on the drive, and the first 100 sectors on each partition are overwritten with a 0x0000 pattern (i.e., each pair of bytes on the sector is overwritten with this pattern). This operation is very fast. The hard disk drive will not be usable via standard I/O methods. However, this is not a secure operation in an absolute sense, since it leaves most of the partitions on the hard drive unchanged.

/L=2   Medium security. All sectors on the drive are overwritten 1 time with a 0x0000 pattern (i.e., each pair of bytes on the sector is overwritten with this pattern). This operation is relatively slow, since it involves many write operations. Actual speed depends on the size and speed of the target hard disk drives.

/L=3   High security. All sectors on the drive are overwritten 4 times with the following patterns (in this order): a random pattern, the bitwise complement of that random pattern, a different random pattern, and a 0x0000 pattern (i.e., each pair of bytes on the sector is overwritten with these patterns). This operation is quite slow, and it takes 4 times as long as a /L=2 operation.

There is no default value for this parameter. The /L parameter is required.

/?   This parameter causes the program to display a concise description of its execution syntax on STDOUT and then to terminate execution. If you run SCRUB3.EXE with no parameters, it will display this same output. The /? parameter causes all other parameters to be ignored.

Examples:

SCRUB3 /L=1 /D=ALL

Overwrites the Master Boot Record, the first 100 sectors of each partition, and the drive's last 2 sectors on every hard disk drive installed on the system. The pattern used for the write operation is 0x0000. None of the data on any of the drives can be accessed with standard methods. However, most of the data on these drives can be read successfully by a program that uses low-level BIOS read functions.

SCRUB3 /Q=NO /D=2 /L=2

Overwrites every sector on hard disk drive number 2 with a pattern of 0x0000. None of the other hard disk drives installed on the system is changed. Debug messages are displayed in the command window (i.e., on STDOUT), along with all the standard messages that this program produces.

SCRUB3 /D=ALL /L=3

Overwrites every byte on every sector of every hard disk drive installed on the system 4 times. None of the data on any of the drives is recoverable. This is not the normal way to run SCRUB3.EXE. It takes an extremely long time to run. However, overwriting 4 times provides good protection from attempts to recover data with specialized sensitive electronic equipment.

SCRUB3 /D=ALL /L=2

Overwrites every byte on every sector of every hard disk drive installed on the system with 0x00. None of the data on any of the drives is recoverable. This is the normal way to run SCRUB3.EXE.

During execution of the last example, SCRUB3 displays the following output on the computer monitor:

```
IBM Secure Data Disposal Utility v2.0 (LCCM v3.1)

Licensed Materials - Property of IBM
C) Copyright IBM Corp. 1999, 2000  All Rights Reserved.
```

```
     Number of hard drives found: 1
     Processing drive 1:

     Writing sectors for Secure Data Disposal
     0%                              50%                              100%
     ████████████████████████████████████████████████████████████████
     Writing signature on scrubbed drives.

     Processing drive 1:

     Total program execution time (minutes): 25.4333

     IBM Secure Data Disposal Utility
     Return code ..... 0
     Execution Complete.
```

The hard disk drives are modified based on what parameters the user specified on the command line. A record of the SCRUB3 processing is written on the master boot record of each scrubbed hard drive. If the computer is then booted to its hard drive, that signature is displayed on the computer's monitor. The following is an example of the SCRUB3 signature:

```
     IBM Secure Data Disposal Utility v2.0
     IBM Remote Deployment Manger 3.1
     Date and time of execution ... 07/12/01 15:27:40
     Command executed ............. S:\SCRUB3.EXE /D=ALL /L=1
```

7.41 SDAPACK.BAT

During the creation of an unattended install software profile using the Profile Wizard, the option is available to enable an SDA-Installer from the presented dropdown list. This requires the creation of a self-extracting zip file which is located in the LANC$$\SDAImages (<drive>:\RDM\clntfile\SDAImage) directory. The zip files contain SDA-Installer directories. They can be created using the <drive>:\RDM\SDAPACK.BAT script.

For example, the user has an SDA-Installer directory with the full path name of:

X:\sdaInstalls\SDA install9

In order to create the self-extracting zip file and put it in the correct directory, the user would type the following at a command prompt:

C:\RDM\sdapack "SDA install9" X:\sdaInstalls

A self-extracting zip file with the name "SDA install9.exe" would be placed in the LANC$$\SDAImages directory.

Note: If the non-network component of RDM is installed in a directory other than C:\RDM, the user must manually edit the SDAPACK.BAT script and change the value of the LCCMINST variable.

Any file with a .exe extension that is placed in the SDAImages directory will appear in the SDA Installation selection list. No validation is done to verify that the .exe file is an compressed SDA-Installer directory. The DAPACK.BAT script does validate that the SDA-Installer directory contains a file named SWSelect.exe, which should indicate that the directory was created by SDA.

7.42 SENDSLIM.EXE

This program sends a service processor command file to the system processor.

The syntax of the command is:

```
SENDSLIM outfile.PKT
```

Note: The command file must be generated using the SERVPROC.EXE utility (see below).

7.43 SERVPROC.EXE

This program generates a service processor command file from a plain text INI file.

The syntax of the command is:

```
SERVPROC infile.INI outfile.PKT
```

Note: The input (.INI) file must be in the correct format. Please see the supplied SERVPROC.INI file.

7.44 SETERROR.COM

This program sets the error level to whatever positive integer value is included on the command line. It is located in `<drive>:\RDM\CLNTFILE\PQID`.

The syntax of the command is:

```
SETERROR value
```

where

`value`   A non-negative integer value from 0 to 32,767.

7.45 SLEEP.EXE

This program causes processing to halt for a specified number of seconds.

The syntax of the command is:

```
SLEEP seconds
```

7.46 WAIT.EXE

This program waits for a specified file to be deleted.

The syntax of the command is:
```
WAIT filename
```

7.47 WINWAKE.EXE

This program powers on systems remotely using Wake on LAN.

`<drive>:\RDM\UTILITIES\WINWAKE.EXE` is a stand-alone program that uses the Wake on LAN feature to power on systems remotely. The MAC addresses (addresses of the network adapters) of the systems can be specified either on the command line or in an INI file. Either the TCP/IP protocol or the IPX protocol must be installed and configured on the local computer for WINWAKE.EXE to work.

The syntax for the command to use MAC addresses from an INI file is:
```
WINWAKE [/D delay] /F filename
```
The syntax for the command to specify MAC addresses on the command line is:
```
WINWAKE [/D delay] address1 [address2 [...]]
```
where

`address1, address2, ...`	12-hexadecimal-digit MAC addresses.
`delay`	Delay in milliseconds between transmission of packets (default is 1 ms).
`filename`	INI file containing MAC addresses.

The INI file can contain individual MAC addresses and ranges of MAC addresses. Specify individual MAC addresses, one per line, at the beginning of each line, as follows:
```
001122334455
```
Specify ranges of MAC addresses by their beginning and ending addresses, as follows:
```
001122334455-001122334466
```
A sample WAKEUP.INI file is provided with WINWAKE.EXE.

Note: WINWAKE can only wake up computers on the same subnet as the computer on which you run WINWAKE.

Chapter 8. Troubleshooting

This chapter contains a compilation of answers to Frequently Asked Questions about RDM, as well as workarounds to known networking problems in an RDM environment. If you can't find what you are looking for here, consult the other documentation as well as the various forms of support. For more information, see "Further Reference" on page 2.

8.1 Installation

When I try to install RDM, I get a message: "Cannot find LCCMINST.DLL. Please run setup from the installation directory."

The RDM server can only be installed on Windows NT 4.0 Server, Windows 2000 Server, Windows 2000 Advanced Server, Windows 2000 Professional, Windows XP Professional, and Windows NT 4.0 Workstation. If you are not using one of these operating systems, you cannot install RDM 3.1. Specifically RDM 3.2 **cannot** be installed on **any version of Windows 9x or Windows Me.** For details, see "Validate Prerequisites" on page 17.

How can I uninstall RDM from the Remote Console without breaking the RDM server?

This is not a problem in RDM 3.1, and there are no special procedures required. Just use the Windows Add/Remove Programs function in the normal way. (Prior to LCCM 3.0, this required that you physically disconnected the remote console from the network before uninstalling LCCM.)

Can anyone tell me where I can download the System Installation Tool Kit? The Web site says it is available from the download site, but I cannot see it there.

You cannot download the System Installation Tool Kit (SITK). To purchase the SITK license and CD, please contact your IBM marketing representative and/or visit http://www.pc.ibm.com/ww/solutions/lcc/sit.html.

8.2 Routers, Networks, and Domains

How can I use RDM in a mixed Token-Ring and Ethernet network?

This is not a problem in RDM 3.1, and there are no special procedures required. (Before LCCM 3.0, only one specific configuration was supported, with additional requirements on the token-ring adapter firmware.)

RDM can't see systems on the other side of my router. Why?

When a system first attaches to the network using PXE, it sends out DHCPDISCOVER messages requesting an IP address and a boot file. The DHCPDISCOVER message is a UDP broadcast message,

and as such, will not normally be forwarded by the router. If the router does not forward them, RDM will not see them.

It is possible to configure the router to forward such messages. On a Cisco router, you would use an "`IP helper-address`" configuration command on the router interface to which a system is attached. On an IBM router, you would use an "`enable bootp forwarding`" configuration command. These commands instruct the router to forward the messages related to DHCP to the RDM server.

Another possibility is that when the IP scope was specified for a system subnet, a gateway address was not specified. If a system receives a DHCPOFFER in response to the DHCPREQUEST, the system needs to know a gateway address to which it can send the REQUEST message.

To successfully use RDM in a routed environment, the following conditions need to be satisfied:

1. Subnet Directed-broadcast forwarding must be enabled.

2. Proxy ARP forwarding must be enabled.

3. The scope for the RDM system subnet must have a correct router entry for the subnet.

4. BOOTP/DHCP forwarding must be enabled. The destination addresses must include the address of the RDM server, and at least one DHCP server that serves the RDM system subnet. If you are using the IBM DHCP server, this may be the same server. The destination address may either be the network address of the servers, or their individual fixed IP addresses.

These are the **absolute minimal conditions that must be satisfied** before RDM will work in a routed environment. If your network policy will not allow any of these conditions to be satisfied, then RDM cannot be used in the environment.

Please check your router documentation for the necessary configuration commands.

We want to use RDM in a routed environment using our UNIX DHCP server. How can we update the systems without making an IP-helper entry at the routers?

If you want to use RDM in a routed environment, you must set a helper-address to the RDM Server from every router to which RDM systems will be connected. There is NO way around the restriction: the Proxy DHCP packet must be received for PXE to function. That is part of the specification for PXE.

Why is performance so slow on our network?

This has usually been observed when parts of the network have been forced to 100 Mbps, full-duplex mode in an attempt to speed network operations. Please leave all network components to auto-negotiate their connection parameters. RDM is a DOS-based product with no DOS extenders, and so always works in half-duplex mode. If the network components are left to take care of it, they usually do a great job of running the network at the best speed, especially if the network consists of components that are communicating in different modes at different times.

Sometimes you can circumvent this kind of performance problem by using your network adapter's native DOS device driver instead of the Intel Universal NDIS driver that RDM normally uses. To do this, you need to do the following:

1. Create a new DOS image that uses the native driver.

2. Force the new DOS image to be used instead of the standard PROFX DOS image.

For example, the PROFT and PROF3 DOS images (created when you install RDM) use a native Intel and a 3Com driver, respectively. You can force the use of a different DOS image by adding lines to the \RDM\MACHINE.LST file.

Another reason for slow performance may simply be that your network components are ill behaved. Some network adapters' default settings are just naturally not as fast as others', even if they appear to be

configured the same: Switches can easily fall into loops, or induce excessive chatter if not carefully configured.

RDM is installed on a member server in a domain. How can I deploy computers into a different domain?

A common situation is to deploy Windows NT 4.0 or Windows 2000 workstations and servers as members of a domain and to deploy Windows 95 and Windows 98 workstations that will log on to a domain. In some cases, you will need to do some manual configuration on your servers to make this work.

- ▶ Configuration 1: RDM is installed on a Primary Domain Controller (PDC) or on a Backup Domain Controller (BDC). The target computers are deployed into the same domain as that of the RDM server. In this case, no manual configuration is needed.

- ▶ Configuration 2: RDM is installed on a Stand Alone (SA) server. The target computers are deployed into the same domain as that of the RDM server. In this case, you should use LCCMPREP.EXE and ADDDOM.BAT as described in Chapter 7, "Utilities".

- ▶ Configuration 3: RDM is installed on a PDC, BDC, or SA. The target computers are deployed into a different domain from that of the RDM server. In this case, you should use LCCMPREP.EXE and ADDDOM.BAT as described in Chapter 7, "Utilities", and you will need to modify the .LCA file for each appropriate profile and may need to establish trust relationships between the RDM server's domain and the target domains.

On the RDM *server*, I get this error: The RDM PXE Service cannot use IP:port 10.111.222.33:4011. On the *system* I get this error: PXE-E55: ProxyDHCP service did not reply to request on port 4011.

The system is not receiving the BINL response. There are 2 known reasons this might happen:

1. Another PXE service (e.g., Remote Installation Service, Network Station Manager, etc.) is running on your network. Please install RDM on a network in which it is the only PXE service that is running.

2. If your server has a network adapter that you are not using, you must disable it; otherwise your network address does not correctly bind to port 4011. Either configure the other network adapter with a network address or disable it. Once that is done, run a `netstat -an` and be sure that port 4011 is bound to the correct address. If port 4011 is bound to 0.0.0.0, you will get the failure that you have mentioned.

I am attempting to reconfigure an RDM server running Windows NT 4.0 Server SP6a to communicate with Microsoft DHCP server on a Windows 2000 Server. On the RDM Server I had to add PXEClient support (Option 60). I thought that I also have to add that support to the Windows 2000 Server. How do I do this?

In the original configuration that you describe, the DHCP server was on the same server as the RDM server. In the new configuration, you have moved the DHCP server only to a Windows 2000 Server. The DHCP Server and RDM server are now no longer on the same server. Therefore, option 60 must not be added to the Microsoft DHCP server on Windows 2000 server. For details, see "Using Microsoft DHCP Server on Windows 2000 Server or Advanced Server" on page 38.

I am having problems getting new computers to do a PXE remote boot. I get this error: PXE-E53 No Boot file name received.

The following is happening:

- ▶ I am getting a DHCP lease from a Microsoft DHCP server, not located on the RDM server.
- ▶ The network card was setup to boot to the network.
- ▶ I am getting a message saying "PXE-E53 No Boot filename received. Loading the boot image failed."
- ▶ I have set the PXEClient option in the Microsoft DHCP server.
- ▶ I am not crossing a router.

In the configuration that you have described, option 60 should NOT be set on the DHCP server. For details, see "Configure the DHCP Server" on page 35.

How should I set up the boot order in my network-adapter settings in order to get my systems to boot to the network?

When you configure your network adapter settings (e.g., by pressing the Ctrl+S keys simultaneously during initilization), the setup can be misleading. Even though you want the computers to boot to the network, you usually must configure the adapter to "Try local drives first, then network" (or equivalent).

When I try to process my system after assigning it to a profile, I get NTSTS error messages.

When I try to process my system after assigning it to a profile, I get the following error messages:

```
NTSTS Initialization started
NTSTS 0023: A bad parameter value is given for "GATEWAYADDR" in the NTSTS
section of Protocol.ini
NTSTS Initialization failed
IBM DOSLAN Services Driver v5.0 ...

You were logged on but you have not been validated by a server.
Therefore, you may not have permissions to use some network resources ...

NBU0032 Can't open network driver Error 2102
```

Processing then stops. How can I get my systems to process correctly?

The NTSTS driver cannot gracefully deal with a null string for the gateway address. Your problem is that you are using a 3rd party DHCP server, and have a blank router entry. You must provide a router entry, even if it is invalid. The best thing is to do if you actually do not have a router on the segment, is to use the RDM server as the router address, though any address will do, even if there is nothing with that address on the network. Even `0.0.0.0` for the router option will allow you to successfully process systems in the described environment.

At the end of a deployment, I get a command-line window (on the system) with 2 "Invalid drive specification" messages in the window.

The network driver was not correctly installed on the system. Be sure that you are installing the correct device driver for the network adapter in the system (e.g., have you recently installed a different network adapter, after the system was already scanned?). To deploy newer machines, download and install RDM.

RDM wizard-generated profiles will install the correct drivers. If you use manual profiles, it is your responsibility to copy the driver files to the correct folders.

When I try to process a system, I get the error message "*Error 54: Network is busy*" and processing stops at the system.

This is a misleading message, and usually indicates a connectivity problem that may have nothing to do with the network being busy.

It has been observed to happen very frequently when RDM is being used in a network that uses switches rather than hubs for connectivity. You need to disable the Spanning Tree Protocol on any switch ports that are directly connected to systems. The Spanning Tree Protocol can remain enabled on any ports that are connected to other switches or routers. Spanning Tree Protocol is an inter-switch routing protocol that is not understood by systems, so there is no penalty to disabling it on system ports.

8.3 RDM Server

How can I control multiple RDM servers from the single remote console?

Starting RDM 3.1, an initialization window will appear during startup, allowing you to enter the RDM server that you want to work with. This functionality is not available in earlier versions. For more information, see "Starting RDM" on page 61.

How many systems can one RDM server handle?

Performance of the RDM console becomes an issue when you have about 1200 systems on a single server. If you have more systems, you should use multiple RDM servers.

When I scan for my systems, why won't RDM wake them up?

Before or during the scan process, you must turn on the system manually and force a network boot (either via keystrokes or by setting the primary boot sequence to be *network)*.

RDM wakes a system by sending a wake-up packet to the system's media access control (MAC) address. At the time a scan process is initiated, RDM has no knowledge of the MAC address; RDM discovers the MAC address during the scan process. Therefore, Wake on LAN is not part of the scan function.

RDM 3.2 can wake up a system manually before scan if you enter the computer's MAC address into the Wake Systems window of RDM. This window is accessed through the Tools selection on the main menu bar. But it is usually easier just to power on the system manually.

If I store more than one image greater than 300MB in the `\RDM\CLNTFILE` folder, I get an error message.

If I store more than one image greater than 300MB in the \RDM\CLNTFILE directory, I get the following error message sequence on the system:

```
Bad Command or File Name
Invalid device request writing device C
Abort, Retry, Fail?
```

After entering 'F' :

```
Intermediate file error during pipe
C>
```

After entering any command on the command line

```
File allocation table bad, drive C.
```

How can I avoid this?

You can avoid this problem by storing your images in a subfolder **under** the `\RDM\CLNTFILE` directory. Do not store your images in the `\RDM\CLNTFILE` itself. If you are storing images as zipped files, you can store more than one image in a subdirectory. However, if you are storing the image as a collection of files, you must create a separate subdirectory for each image. Also, by creating different subdirectories, you will avoid overwriting files from one image to another.

8.4 System Management

The network adapter is 'Unknown' on the Hardware tab of the Individual System Details notebook

If the Network Adapter field on the Hardware page of an Individual System Details notebook shows a value of "Unknown", it means that there is no entry for that computer's network adapter in the `\RDM\NETWORK.LST` file. You may be able to circumvent this problem easily:

1. Create a bootable DOS diskette.

2. Copy <drive>:`\RDM\UTILITIES\IDVIEW.EXE` onto that diskette.

3. Boot DOS from that diskette on your target computer.

4. Run IDVIEW. The output will contain a line that identifies your network adapter.

5. With a text editor, add a new line to `\RDM\NETWORK.LST`. Use the values from IDVIEW for field 7:

- If you know that RDM already contains network drivers for your adapter, just copy an existing line for an adapter that uses those drivers to the end of the NETWORK.LST file. Then change field 2 (unique record number) to the next unused value, and change field 7 to the new value shown by IDVIEW.EXE.

- If RDM does not contain network drivers for your adapter, and if you don't need network drivers for that adapter (e.g., if you are not going to do native Windows install with RDM on that system), then just copy the last NETWORK.LST line to the end of the NETWORK.LST file. Then change field 2 (unique record number) to the next unused value, change field 7 to the new value shown by IDVIEW.EXE, and change field 1 to an appropriate network adapter name.

- If you need to add network drivers, follow the instructions in "Installing Network Drivers" on page 195.

My systems just keep rebooting, and cannot attach to the RDM server. Why?

Make sure that your systems are either assigned to a profile or have an RDM maintenance task scheduled. If neither of these is true, then there is nothing for RDM to do with them, so RDM cannot let them attach to the server.

If this happens on all systems (e.g., even during the RDM scan process), your DHCP Service or router is probably configured incorrectly.

How can I make a system boot from the local operating system instead of booting off the network?

The only way to do what you want is to change the primary startup sequence in the CMOS to the way you want the system to act. You can do it as part of the system deployment (on most IBM computers) by using the CMOS update facility to change the CMOS as needed. (You could also do this as a separate Maintenance procedure). There is NO way to remotely do it without modifying the boot sequences.

While it is possible to do this on many network adapters by changing a setting in the network adapters' configuration, you have to be at the system in order to do so. Of course, if the adapter has a DOS-based configuration utility that is not too resource-hungry, you might be able to do this as an RDM maintenance procedure. This is not possible on any of the currently officially supported network adapters.

How can I make a system reboot, instead of powering down, at the end of a deployment?

To prevent RDM from powering off its systems, create a file `<drive>:\RDM\LCCM.INI` on the RDM server that contains the following line:

```
SHUTDOWN=NO
```

Note that this means that RDM systems will **never** power down - **this is an all-or-nothing proposition**. You can also use the program
`<drive>:\RDM\CLNTFILE\DISKETTES\POWERRESTORE\POWEROFF.COM`.

The installation of IBM Boot Manager was interrupted and left the system in a non-bootable state.

If the installation of IBM Boot Manager on a local system is interrupted, it might leave the computer in a non-bootable state. Follow these steps to repair the computer:

1. Boot the PC with a DOS boot diskette.

2. Replace the DOS boot diskette with the IBM Boot Manager Installation diskette.

3. From the DOS prompt, run the following commands:

   ```
   HIDEPART A U
   HIDEPART L H
   ```

4. Remove the IBM Boot Manager Installation diskette and reboot the PC.

The installation of Power Restore was interrupted and left the system in a non-bootable state.

If the installation of Power Restore on a local system is interrupted, it might leave the computer in a non-bootable state. Follow these steps to repair the computer:

1. Boot the PC with a DOS boot diskette.

2. Replace the DOS boot diskette with the Power Restore Installation diskette.

3. From the DOS prompt, run the following commands:

   ```
   HIDEPART A U
   HIDEPART L H
   ```

4. Remove the Power Restore Installation diskette and reboot the PC.

How can I get more than 11 characters in the NetBIOS names for my systems?

Inside the RDM GUI, the computer name is limited to 11 characters (no more can be entered). (Prior to LCCM 3.0, there was a limit of 8 characters.)

If you need a longer name for a system, you can use the following workaround:

1. Create a User Parameter called `nbname` (for example) and set it to the desired value in the system notebook or System Assignment Wizard.

2. Edit the .LCA file for the profile, and change `%CNAME%` to `%NBNAME%`, and save the file.

You can now deploy the system, and its NetBIOS name will be whatever is in the System Parameter `nbname` field.

The RDM server name can be any standard NetBIOS name (that is, 15 valid characters).

If you also want the full NetBIOS name to be shown in the RDM GUI, you will have to change the default display to one of the user fields (Contact, Location or Comments), and then put the NetBIOS name in the appropriate field. You change the display method from the Options menu.

How can I have RDM store system information, so I can update the system's BIOS and deploy images at a later date, but have it boot locally for now?

There are 2 alternatives:

▶ Create a manual profile with an empty .LCI file and no .LCP file, and deploy the system to the profile.

▶ Assign the system to its final profile, but do **NOT** process it yet. Then go to the Software page of the System notebook, and uncheck the box marked **Mark System for reload**. Go to the Maintenance page and make sure none of the checkboxes is checked. Click **OK** and reprocess the system.

How can I enable Power Restore backup on a currently unassigned system without re-installing the operating system?

If you want to use Power Restore to back up an unassigned system without re-installing the system's operating system, simply assign the system to a profile, and (if appropriate) run through the System Assignment Wizard. After the system has been assigned, double-click the system and go to the **Maintenance** tab of its **Individual System Details** notebook. On this page make sure that the **Power Restore** checkbox is checked and the **Backup Partition** radio button is selected. Then click the **Software** tab and uncheck the **Mark System for reload** checkbox. Click OK to finish.

The fields I want to use on the Maintenance page of the Individual System Details notebook are disabled. How do I enable them?

Sometimes the fields on the system's **Maintenance** page are disabled, even when they are valid for that system. First, make sure that your system is assigned to a profile (everything on the **Maintenance** page except BIOS Update requires that the system be assigned to a profile). Then try the following procedure, which may work around the problem: Go to the **Details** page and check, and then uncheck, the "system disabled" box. Then go back to the **Maintenance** page. The fields may now be enabled.

I sometimes notice a SYS0006 error message on systems being deployed. Yet they still seem to complete processing OK.

It is safe to ignore this message, which sometimes occurs on a `NET START RDR` statement. It is caused by insufficient memory, and once the message is displayed, about 70 kilobytes are freed, allowing the following `NET LOGON` command to run successfully.

8.5 Software Profile Processing

When I deploy Windows NT 4.0 (Server or Workstation) with a static IP address that contains a zero in the 2nd or 3rd octet, I get a dialog box that says the IP address is invalid.

This problem has been fixed in the Tcpcfg.dll (may also be called Tcpcfg.dl_) file contained in Windows NT 4.0 Service Pack 2.0 and later service packs. To work around this issue:

1. On the LCCM server, rename the Tcpcfg.dll/Tcpcfg.dl_ file to Tcpcfg.org. This file is located in the \RDM\CLNTFILE\NT4WKS\ENG and \RDM\CLNTFILE\NT4SRV\ENG (or the appropriate language) directories.

2. Copy the Tcpcfg.dll/Tcpcfg.dl_ file from the latest service pack into the \RDM\CLNTFILE\NT4WKS\ENG and/or \RDM\CLNTFILE\NT4SRV\ENG directories.

When I deploy Windows NT 4.0 (Server or Workstation) on a system that contains 4 gigabytes of RAM, I get a stop message 0x0000003f NO_MORE_SYSTEM_PTES error.

This problem is documented in Microsoft knowledge base article Q160392. The workaround is to remove 2 gigabytes of the physical RAM, run the deployment with RDM (including service pack 3 or higher), and then reinstall the physical RAM.

When I enter a remote share point in the Software Profile Details notebook, I get an error message.

When I enter a remote share point in the **Distribution Share Point** field on the **Software** page of the **Software Profile Details** notebook, I get the following error message: "The Distribution Share Point was not found or could not found or could not be accessed from the Remote Deployment Manager console. Do you wish to continue saving data?"

Diagnose the problem in the following way:

1. Make sure that the remote share point is properly installed and configured as described in "Installing RDM Components" on page 46.

2. Make sure that you have network access to the remote share point from the RDM server and that the remote share point's computer name is properly resolved (for instance by running the command `ping <computer_name>`). A number of factors might cause network access failure. One likely cause is that DNS is improperly configured or not available. Consult your network administrator to resolve the issue.

3. Make sure that there is a security relationship between the RDM server and the remote share point (i.e., the RDM Administrator has security access to the remote share point). Security access failure might be caused by a number of factors, such as the remote share point not being part of the same domain. Consult your network administrator to resolve the issue.

If your connectivity to the remote share point is working properly, you will still get an error message when you have not copied the appropriate files to the remote share point computer before creating the profile that uses those files. In this case, just ignore the error. After creating the profile, copy the appropriate files to the remote share point. The profile should work properly.

My hard drive is larger than 4GB. Why doesn't RDM partition it in the way that I specify?

System deployment of Windows NT 4.0 using RDM is still subject to the limitations of Windows NT 4.0 installation options: the installation is behaving as designed by the operating system vendor.

Your options for using the entire hard drive during an RDM deployment of Windows NT 4.0 are the following:

1. Single partition using maximum available space. This will make your boot partition fill the entire disk (up to the approximately 7,800-megabyte Windows NT 4.0 limit).

2. Fixed size, 2000-megabyte partition plus a second partition using maximum allowed space. After deployment with RDM, use a program like PowerQuest's PartitionMagic to expand the second partition to the full size of the drive space.

The initial "maximum allowed space" for installing Windows NT 4.0 under RDM is approximately 2040 megabytes. This is due to the limitations of the DOS formatting program. The expansion to use the full drive under NTFS is actually done as a separate conversion operation by the Windows NT 4.0 setup program.

During an unattended installation with Windows 98 Second Edition, when Windows tries to logon to complete the installation, only the letters "SER" are in the user name field. If I prepend "lccmu" to the User Name, then the login finishes and so does the installation. How do I fix this?

This happens if the *LCLI_REGUSER* field in a wizard-generated profile has more than 20 characters in it.

For now, we suggest you limit this field to 20 characters, and then run REGEDIT.EXE automatically from within the CLIENT.BAT file to increase the length of the string in the registry.

If you do a manual interactive installation of Windows 98SE, the dialog box for this field allows you to enter as many as 29 characters; but only the first 24 characters get displayed on the system property sheet, even though all 29 are actually in the registry entry.

During an unattended install, Microsoft Office 2000 Premium does not install correctly

This is an intermittently occurring problem. Microsoft Office 2000 premium is not supported in RDM 3.1.

During an unattended install, Netfinity Services will not install on Windows 98 Service Pack 1

This is a known restriction with the unattended install in RDM 3.1. You can solve this problem by creating a software profile that installs Netfinity Services on Windows 98 without a service pack, on Windows 98 Second Edition, or on another operating system of your choice.

During an unattended install, the system hangs after a successful format

This problem occurs infrequently. During an unattended install, the system's drive is formatted successfully, but then the system hangs and the operating system is not being installed. To resolve this problem, cancel processing, and process again.

How can I use RDM with third-party imaging products?

Beginning with RDM 3.1, a lite version of PowerQuest® Deploy Center is included in RDM. You can use this capability without installing any other imaging product. You can also upgrade this capability to use the full-function version of the PowerQuest tool.

The file LCCMGH.PDF will show you how to setup RDM for use with Symantec GHOST® in unicast mode. No other specific instructions are given.

When I try to process a system, I get the error message "*Error 71*" and processing stops at the system. If I then log on manually, as an administrator, I can continue processing.

This is a Windows networking message, and means that you do not have sufficient connection rights to the RDM server. Naturally, administrators are not subject to such restrictions, which is why you can connect as an administrator. It is usually because Windows NT 4.0 Server was installed on the RDM server by blindly accepting all the defaults. This means that Windows NT 4.0 Server was installed with zero licenses. Use the Windows NT License Manager on the RDM server to set the correct number of licenses that have been purchased from the license vendor. The License Manager is located in the Control Panel applet.

8.6 RDM Databases

When I try to export the systems or profiles database, I get an error message

If you export a systems or profiles database, and use spaces in the filename or pathname, you will get an error message. RDM does not allow the use of spaces here. Please try again without spaces.

Appendix A. Error Messages

Error, Bad Return Code from Attempted BIOS Password Change

A BIOS password change was attempted on the system, but an Error Code has been returned by the update program.

On the original BIOS flash diskette, or in the `<drive>:\RDM\CLNTFILE\BIOS\BIOS_Flash_Name` directory, you will find a help file containing the error code and a description of the error. Alternatively, enter the name of your BIOS password update program, adding "/? | MORE" to the end of the command line.

Error, Bad Return Code from Attempted BIOS Update

A BIOS update was attempted on the system, but an Error Code has been returned by the BIOS update program.

On the original BIOS flash diskette, or in the `<drive>:\RDM\CLNTFILE\BIOS\BIOS_Flash_Name` directory, you will find a help file containing the error code and a description of the error. Alternatively, enter the name of your BIOS update program, adding "/? | MORE" to the end of the command line.

Error, Bad Return Code from Attempted CMOS Update

A CMOS update was attempted on the system, but an Error Code has been returned by the CMOS update program.

On the original BIOS flash diskette, or in the `<drive>:\RDM\CLNTFILE\BIOS\BIOS_Flash_Name` directory, you will find a help file containing the error code and a description of the error. Alternatively, enter the name of your CMOS update program, adding "/? | more" to the end of the command line.

Error, Bad Return Code from the Final Image File

A program within your Final Image File has failed with a bad return code.

Run the image batch file on a donor computer until you find the error. Check the error code against the appropriate help file for the program in the image batch file, which is not working. Correct the error and click the **Process** button again.

Error, Bad Return Code from the Maintenance File

A program within your Maintenance File has failed with a bad return code.

Run the maintenance file on a donor computer until you find the error. Check the error code against the appropriate help file for the program in the maintenance file, which is not working. Correct the error and click the **Process** button again.

Error, Bad Return Code from the Personality File

A program within your Personality File has failed with a bad return code.

Run the personality file on a donor computer until you find the error. Check the error code against the appropriate help file for the program in the personality batch file, which is not working. Correct the error and click the **Process** button again.

Error, Bad Return Code from the Preload Image

A program within your Preload Image batch file has failed with a bad return code.

Run the preload image batch file on a donor computer until you find the error. Check the error code against the appropriate help file for the program in the preload image batch file, which is not working. Correct the error and click the **Process** button again.

Error, Cannot Access BOOTCONF.SYS file

The system is trying to edit the BOOTCONF.sys file on the LAN server but is unable to access it.

Check that the server is running and that the network connection is OK.

Error, Cannot Find CMOS Image

RDM was unable to find the CMOS image.

Check that you have specified the correct file name and that the path and specified file exists. Check that the server is running and that the network connection is OK.

Error, Cannot Find Diagnostics Image.

RDM was unable to find the Diagnostics image.

Check that you have specified the correct file name and that the path and specified file exists. Check that the server is running and that the network connection is OK.

Error, Cannot Find DOS Image

RDM was unable to find the DOS image specified.

Check that you have specified the correct path name and that the path and the required file exist. Check that the server is running and that the network connection is OK.

Error, Cannot Find Maintenance Image

RDM was unable to find the Maintenance image.

Check that you have specified the correct file name and that the path and specified file exists. Check that the server is running and that the network connection is OK.

Error, Cannot Find Reflash

The system was unable to find the BIOS flash image file specified on the Hardware form of the RDM Details.

Check that you have specified the correct file name and path and that the specified file exists. Check that the server is running and that the network connection is OK.

Error, Cannot Find the Client's Personality File

The system was unable to find the personality file specified on the Software form of the RDM Details.

Check that you have specified the correct file name and path and that the specified file exists. Check that the server is running and that the network connection is OK.

Error, Cannot Find the Final Image File

The system was unable to find the final image file specified in the software profile.

Check that you have specified the correct file name and path and that the specified file exists. Check that the server is running and that the network connection is OK.

Error, Cannot Find the Preload File

The system was unable to find the preload image file specified in the software profile.

Check that you have specified the correct file name and path and that the specified file exists. Check that the server is running and that the network connection is OK.

Error, Cannot Make Client Directory

The system requires a directory for itself on the server before processing but it has been unable to create this.

Check that the server is running and that the network connection is OK. Check that the server name specified in the RDM's Default form is correct.

Error, Changing Donor Registry

Failed to create a file containing the list of changes to donor Registry.

Consult the online help for more information on how to solve this problem.

Error, Client Timed Out

The system has failed to complete a part of the process within the time out limit stated in the system defaults.

Please check that the system is OK. If there are no problems, increase the time out limit through the Systems Default function.

Error, Creating Directory during Cloning

Failed to create directory on the RDM server to store CloneIt Agent clone information. This may occur it you have insufficient privileges on the server.

Consult the online help for more information on how to solve this problem.

Error, Disk Configuration Save Failed

Failed to obtain this machine's disk configuration.

Consult the online help for more information on how to solve this problem.

Error, Failure to Compress Donor Image

Failed to create compressed image of donor computer. This may occur if there are active applications on the donor.

Consult the online help for more information on how to solve this problem.

Error, Failure to Copy Boot

Failed to copy boot information.

Consult the online help for more information on how to solve this problem.

Error, Failure to Create Backup Filename

Failed to create backup of long filename information.

Consult the online help for more information on how to solve this problem.

Error, Image Disk Size Failed

Failed to store the compressed image of this machine on the server free space.

Consult the online help for more information on how to solve this problem.

Error, Incorrect Operating System

This application can only be run under the Windows 95 and 98 operating systems.

This application will now terminate

Error, Insufficient Disk Space

Insufficient free disk space on the server to clone an image. This machine could require up to n KB to hold its image. Free some disk space on the server and try again.

This application will now terminate.

Error, Insufficient Privileges

Insufficient privileges to run this process. You must be logged in as an Administrator to perform the cloning operation.

This process will now terminate.

Error, RDM Server not Located

This application has been unable to locate the RDM server. Please type the name of the server in the following text box.

Note: Choosing Cancel will cause this application to terminate.

Error, Name Already in Use

A CloneIt Agent clone already uses the given name.

Please try another name.

Error, No Network Adapter Card

Could not detect this machine's network adapter card. This may be because the network is not installed properly or does not use 32 bit drivers. It is not possible to clone this machine until its network adapter card can be detected.

This process will now terminate.

Error, Not RDM server

The server supplied does not seem to be a RDM server.

Please verify that you have entered the server name correctly.

Error, Reading Clone Control File

There was a problem reading the Clone Control File <file>. It has not been possible to validate the given clone name.

Please correct the problem with the file <file>.

Error, Reading During Cloning

It was not possible to read information from this computer's Registry. This may occur if you have insufficient privileges to run this process.

Consult the online help for more information on how to solve this problem.

Error, Registry Backup Failed

Failed to backup donor registry.

Consult the online help for more information on how to solve this problem.

Error, Rename of Client Named Directory Failed

The renaming of the system failed.

Check that the server is running and that the network connection is OK.

Error, This workstation has existing WINNT.INI

This machine has an existing WINNT.INI file. Typically, this is used by an installation program for processing at the next reboot.

This process will now terminate. Please reboot the machine before attempting to clone it.

Error, This workstation has old COMCTL32.DLL

This workstation has an old version of CMCTL32.DLL installed. You must upgrade this by running PRECLONE.EXE before this workstation can be cloned.

This application will now terminate.

Error, Unable to Write Flags for this Client

This message occurs when the user is actively looking at one of the temporary files created for system processing while the system is being processed. RDM is unable to delete these files and therefore, it fails with this message.

Error, Unknown Problem during Cloning

An unknown or unexpected problem caused the cloning process to terminate.

Please contact Technical Support.

Error, Unknown Registry Error

Unknown error while trying to read computer's Registry.

Please contact Technical Support.

This process will now terminate.

Error, Writing During Cloning

Problem writing information to the Clone Control File.

Consult the online help for more information on how to solve this problem.

PXE-T01: File not Found

This message can be seen during normal operation (such as during a remote boot of the system) and does not necessarily indicate a problem that would hinder RDM operation. If there appear to be problems

with RDM working with a system, and normal troubleshooting does not resolve those problems, you should note all of the messages that appear on the system when reporting the issue to IBM support.

WARNING SU-015, Setup Has Detected a Windows NT File System

Full Message: Setup has detected a Windows NT file system partition on your hard disk. Files on this partition will not be available when you use Windows 95.

This message occurs when assigning systems, which previously used the NTFS file system, to a software profile installing Windows 95, Windows 98, or Windows 98 Second Edition. Click OK to continue, and the system assignment process will complete without any problems. Your drive size and file system type should be correct.

Appendix B. Examples of User-Created Batch Files

The files in this section are provided as examples that can be used with RDM. These examples are only recommended for use by experienced RDM users.

Comments (REM statements) are provided to help explain the overall function of each example and the specific utilities that are used. In most cases, each comment applies to the line of code that follows it.

Environment for Operating System Clone Remote Boot

Before RDM can run the various batch files, it must set up a temporary operating system environment at the system. It is important that you understand this environment before you develop any batch files. This information is

- ▶ IBM PC DOS 7.1 is loaded on the system (the DOS software is not copied to the hard disk of the system; it is resident in memory only).

- ▶ Drive C of the system is temporarily renamed drive D. However, with RDM you can use predefined variables in the batch files to minimize the confusion associated with drive mapping. %TARGET% is the variable used to identify the primary partition of the system's hard disk drive.

The server C:\RDM\CLNTFILE directory is mapped as %LCCMPATH%. Therefore throughout this document paths, directories and subdirectories will be in the form of <Drive Letter>:\DIRECTORY NAME\SUBDIRECTORY NAME\FILENAME as appropriate (for example, C:\RDM\CLNTFILE\). However, when creating batch files, you must use the predefined variable %LCCMPATH% to access the CLNTFILE directory. This is the directory where all the system utility programs are stored. For details see Chapter 7, "Utilities".

A Word about Drive Mapping and Drive Variables

Because drive-mapping assigns drive letters to directories and subdirectories of a server, keeping track of the drive letters and subdirectories can be difficult. For this reason, RDM has built-in variables to use as drive designators in preload image batch files (.LCP), final image batch files (.LCI), personalization batch files (.LCR), and maintenance batch files (.MNS). It is very important that you understand the concepts of drive mapping and understand the use of the drive variables built into RDM before you create your batch files.

- ▶ "%LCCMPATH%" points to the RDM server's RDM\CLNTFILE directory.

- ▶ "%TARGET%" points to the primary partition of the system's hard disk drive.

For example, assume you have created a Windows 95 image for Bob's marketing team and placed it under the server's <drive>:\RDM\CLNTFILE\WIN95 directory. In your (.LCP), (.LCI), (.LCR), and (.MNS) batch files, you would use the string %LCCMPATH%\WIN95 to point to this directory, and %TARGET% to point to the system's hard disk.

These predefined variables are valid anytime RDM is executing (.LCP), (.LCI), (.LCR), or (.MNS) batch files. When you develop your final image batch file, the statement to copy the image to the system would be:

```
XCOPY %LCCMPATH%\WIN95\*.* %TARGET%\*.* /S
```

The backup batch files (.BAT) used to transport images from the donor computer to the server are run outside of the remote boot process. Therefore, these variables cannot be used in the backup batch files; you must use the following drive designations:

- ▶ C:\RDM\CLNTFILE

► `D:` points to the primary partition of the system's hard disk drive.

Donor Computers

The process of controlling computers is much easier if you use a donor computer to write and test your batch files first, then migrate the image to every system on the LAN. A donor computer is a requirement for creating a CMOS image and developing a clone image.

The donor computer must be compatible (feature-by-feature) with the systems you plan to use. In most cases, it is advisable that the donor computer and the target system are identical models to ensure that the correct device drivers are present and configured correctly. Ensure that you have adequate access to a suitable system for use as a donor for writing batch files and testing changes before you make these changes on the entire network. You will find it much easier to find and fix problems on a single donor computer first. Then migrate new or changed batch files to every computer on your LAN.

Backup Batch File - DOS/Windows Image

```
REM    Your donor computer should be connected to the
REM    network and server where RDM
REM    has been installed.
%TARGET%
CD \

REM    Save the boot record to a file using DISKDOS.EXE.

\LANCLI\DISKDOS /F=%TARGET%\LANCLI\DOS7.BB /D=%TARGET% /R=R

REM    Change all files to be normal files with read/write
REM    access using LCATTRIB.EXE. This is necessary because
REM    the batch files use XCOPY to transport the files.
REM    All attributes are saved to a file.

\LANCLI\LCATTRIB %TARGET%\ /A /S

REM    Create the directory on the server into which you will
REM    store the image. Then, change into that directory.

%LCCMPATH%
MD DOS70
CD DOS70

REM    Use XCOPY to transport the contents of the donor computer
REM    hard disk to the directory you created on the server.

XCOPY %TARGET%\*.* %LCCMPATH%\DOS70\*.* /S /E

REM    Restore the hidden and system file attributes on the donor
REM    computer using LCATTRIB.EXE.

%TARGET%
CD \
\LANCLI\LCATTRIB %TARGET%\ /R /S
```

Backup Batch File - Windows 95 Image

```
REM    Your donor computer should be connected to the
REM    network and server where RDM
REM    has been installed. You also must have the program
REM    PKZIP.


D:
CD \

REM    Save the boot record to a file using DISKDOS.EXE.

\LANCLI\DISKDOS /F=%TARGET%\LANCLI\W95BT /D=%TARGET% /R=R

REM    Change all files to be normal files with read/write
REM    access using LCATTRIB.EXE. The attributes are saved
REM    in a file.

\LANCLI\LCATTRIB %TARGET%\ /A /S

REM    Save the long file names using the utility DOSLFNBK..
REM    Copying files to the client is done from a DOS startup,
REM    and since DOS does not recognize long file names, it is
REM    necessary to back up and restore them.

\LANCLI\DOSLFNBK %TARGET%\

REM    Create the directory on the server into which you will
REM    store the image. Then, change to that directory.

%LCCMPATH%
MD WIN95
CD WIN95

REM    Use PKZIP (or another archive program) to transport the
REM    Windows 95 image to the directory you created on the
REM    Windows NT 4.0 Server.

%LCCMPATH%\PKZIP %LCCMPATH%\WIN95\WIN95.ZIP -r -P %TARGET%\*.*

REM    Restore the hidden and system file attributes on the
REM    donor computer using LCATTRIB.EXE.

%TARGET%
CD \
\LANCLI\LCATTRIB %TARGET%\ /R /S
```

Preload Image Batch File

```
REM    This file deletes all existing partitions and creates
REM    a single 2GB partition. The remainder of the hard disk
REM    is unused. LCBTRDEL deletes the original disk
REM    partitions. This file can be used in either a PXE
REM    or RPL environment. The RPL environment requires the
REM    use of INTER.EXE; the PXE environment does not.
```

```
@echo off
%LCCMPATH%\LCBTRDEL 0 /S
IF "%CDWNTYPE%"=="0" GOTO RPL
%LCCMPATH%\FDISK 1 /PRI:2048
GOTO NEXT
RPL
%LCCMPATH%\INTER.EXE %LCCMPATH%\FDISK 1 /PRI:2048
:NEXT
```

The INTER.EXE, FDISK.COM, and LCBTRDEL.EXE files are supplied with RDM. These files are automatically downloaded to the system during the remote boot process. To create additional partitions, or a partition of a different size, see Chapter 7, "Utilities".

Final Image Batch File - DOS/Windows Image

During the remote boot process, drive C of the system is renamed to drive D and the server `\RDM\CLNTFILE` directory is mapped as `C:\RDM`. To minimize the confusion associated with drive mapping, RDM has two built-in variables for use in the final image batch file:

▶ `%LCCMPATH%` points to the server `\RDM\CLNTFILE` directory.

▶ `%TARGET%` points to the primary partition of the system's hard disk.

After the image is installed and the system restarted, the system's hard disk is named drive C, as normal.

```
REM    The following FORMAT command is required only if you are
REM    using a preload image batch file. Otherwise, it is
REM    optional.

%LCCMPATH%\FORMAT %TARGET% < %LCCMPATH%\FORMAT.DAT

REM    Transport the image from the server to the client
REM    computer, but copy IBMBIO.COM and IBMDOS.COM
REM    first to ensure they are positioned correctly.

XCOPY %LCCMPATH%\DOS70\IBMBIO.COM %TARGET%\
XCOPY %LCCMPATH%\DOS70\IBMDOS.COM %TARGET%\
XCOPY %LCCMPATH%\DOS70\*.* %TARGET%\ /S /E /V

REM    Set the boot record at the system
REM    using DISKDOS.EXE.

%TARGET%
CD \
\LANCLI\DISKDOS /F=%TARGET%\LANCLI\DOS7.BB /R=W /D=%TARGET%

REM    Restore the hidden and system file attributes at the
REM    system using LCATTRIB.EXE.

\LANCLI\LCATTRIB %TARGET%\ /R /S

REM    If passing parameters is required, type in lines using
REM    the DEDITD.EXE utility. For details, see
```

```
REM

%TARGET%
CD \
\LANCLI\DEDITD /R /N0 %TARGET%\LANCLI\MOCKINI.TXT dummy_Org %ORGNAME%
\LANCLI\DEDITD /R /N0 %TARGET%\LANCLI\MOCKINI.TXT dummy_Username %USERNAME%
\LANCLI\DEDITD /R /N0 %TARGET%\LANCLI\MOCKINI.TXT dummy_Domain %DOMAIN%
\LANCLI\DEDITD /R /N0 %TARGET%\LANCLI\MOCKINI.TXT dummy_Caddress %CADDRESS%
```

Final Image Batch File - Windows 95 Image

```
REM    The variable %TARGET% points to the client hard disk.
REM    The variable %LCCMPATH% points to the server
REM    RDM\CLNTFILE directory.

The following FORMAT command is required only if you are
REM    using a preload image batch file. Otherwise, it is
REM    optional.

FORMAT %TARGET% < %LCCMPATH%\FORMAT.DAT

REM    Use PKUNZIP to transfer the files to the
REM    client as it unpacks the "zipped" image.

%TARGET%
CD \
%LCCMPATH%\PKUNZIP -d %LCCMPATH%\WIN95\WIN95.ZIP %TARGET%

REM    Use DOSLFNBK to restore long file names on the client.

\LANCLI\DOSLFNBK %TARGET%\ /R

REM    Use DISKDOS to restore the boot record on the client.

\LANCLI\DISKDOS /F=%TARGET%\LANCLI\W95BT /R=W /D=%TARGET%

REM    Use LCATTRIB to restore the hidden and system
REM    attributes on the client.

\LANCLI\LCATTRIB %TARGET%\ /R /S

REM    USE DEDITD to modify the working copy of the registry
REM    file (CLONE.REG). The environment variables, for example
REM    %WORKGROUP%, are set up as parameters in RDM.

REM    Software Profile parameters (common):

CD \WINDOWS
%TARGET%\LANCLI\DEDITD /R /N0 CLONE.REG dummy_DomName %DOMAIN%
%TARGET%\LANCLI\DEDITD /R /N0 CLONE.REG dummy_Wkgrp %WORKGROUP%
%TARGET%\LANCLI\DEDITD /R /N0 CLONE.REG dummy_NameServ %NAMESERVER%
%TARGET%\LANCLI\DEDITD /R /N0 CLONE.REG dummy_IPMask %IPMASK%
%TARGET%\LANCLI\DEDITD /R /N0 CLONE.REG dummy_DefGate %GATEWAY%
%TARGET%\LANCLI\DEDITD /R /N0 CLONE.REG dummy_RegName %REGNAME%
```

```
REM   Software Profile parameters (unique to client):

%TARGET%\LANCLI\DEDITD /R /N0 CLONE.REG dummy_CName %COMPNAME%
%TARGET%\LANCLI\DEDITD /R /N0 CLONE.REG dummy_IPAddr %IPADDR%
%TARGET%\LANCLI\DEDITD /R /N0 CLONE.REG dummy_Hname %HOSTNAME%
%TARGET%\LANCLI\DEDITD /R /N0 CLONE.REG dummy_IDNum %PRODUCTID%
%TARGET%\LANCLI\DEDITD /R /N0 CLONE.REG dummy_user %USERNAME%
```

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Glossary

Asset ID. If you are using IBM computers that incorporate the IBM Asset ID chip and an Asset Information Area (AIA), you can use this stored AIA data with RDM. The Asset ID chip is battery maintained and contains asset data specific to each system.

Computers using the Asset ID chip can automatically be assigned to a selected RDM profile when they are first detected by the Scan task. This is based on the contents of data fields stored in the AIA area.

Asset Information Area (AIA). On AIA-enabled computers, data can be read and written to an onboard Electronically Erasable Programmable Read Only Memory (EEPROM), and used with RDM. You can use AIA data fields to process RDM profiles when the scan process first detects a system.

BAT file. A file that contains a batch program (i.e., a set of commands).

Dynamic Host Configuration Protocol (DHCP). DHCP allows you to manage your network centrally and automate the assignment of Internet Protocol (IP) addresses to the system at boot time. The DHCP client and server are socket applications that are used to provide automatic configurations of various TCP/IP protocol components. The server is configured with scopes that are the ranges of IP addresses to be assigned to systems along with additional configuration information.

DHCP uses the concept of a "lease" or amount of time that a given IP address will be valid for a computer. The lease time can vary depending on how long a user is likely to require the Internet at a particular location. Using very short leases, DHCP can dynamically reconfigure networks in which there are more computers than there are available IP addresses.

Since DHCP is based on TCP/IP, it is a routable protocol and can therefore be used in the WAN environment. The DHCP protocol significantly helps network administrators to assign TCP/IP parameters automatically and therefore, simplify network administration.

Image. An image is the software stored on a share point that is downloaded to a system during an operation. Images vary in size and in the type of software they provide to the system. The purpose and content of each image depends on the task to be accomplished, as well as the method used to download the image from the share point to the system.

LCA file. Answer file associated with an unattended-install software profile.

LCC file. Control file created by CloneIt Agent.

LCI file. Final image batch file. It contains the second set of DOS commands that are run on a system when a software profile is processed.

LCP file. Preload image batch file. It contains the first set of DOS commands (usually FDISK) that are run on a system when a software profile is processed. RDM will reboot the system after the LCP file runs.

LCR file. Personalization batch file. It contains a set of commands that are run on a system to set values that are specific to that computer (e.g., IP Address).

LPC file. Control file created by Deploy Center or when importing a PowerQuest image.

Magic packet. A bit sequence that is sent to a particular computer in order to wake it up (i.e., power it on). It starts with 12 F characters followed by the MAC address of the system repeated eight times. When you initiate RDM processing, the RDM server sends magic packets to wake up the systems for which it has work scheduled.

MNS file. Maintenance batch file. It contains a set of DOS commands that are run on a system to perform a user-defined task.

PQI file. PowerQuest image file created by Deploy Center.

Preboot DOS agent. The preboot DOS agent is a DOS operating system with a communications stack that is booted from the network by the bootstrap agent. The preboot DOS agent performs actions on a system as directed by the RDM server.

Preboot Execution Environment (PXE). PXE is an industry standard client/server interface that allows networked computers that are not yet loaded with an operating system to be configured and booted remotely. PXE is based on Dynamic Host Configuration Protocol (DHCP). Using the PXE protocol, clients can request configuration parameter values and bootable images from the server.

The PXE process consists of the system initiating the protocol by broadcasting a DHCPREQUEST containing an extension that identifies the request as coming from a client that uses PXE. The server sends the client a list of boot servers that contain the operating systems available. The client then selects and discovers a boot server and receives the name of the executable file on the chosen boot server. The client downloads the file using Trivial File Transfer Protocol (TFTP) and executes it, which loads the operating system.

Redundant Array of Independent Disks (RAID). RAID is way of storing the same data in different places (thus, redundantly) on multiple hard disks. By placing data on multiple disks, I/O operations can overlap in a balanced way, improving performance. Since multiple disks increase the mean time between failure (MTBF), storing data redundantly also increases fault-tolerance.

Share Point. The share point is a local repository for the files that RDM uses to run its tasks. It contains the following:

▶ PXE bootstrap images, RDM DOS images and many other file packages (for example, Windows Installation images) used during RDM processing.

▶ A TFTP server program (supplied by RDM) used to download these files to RDM systems.

In the simplest case, the share point is on the same system as the RDM server. In other cases, there may be many share points used by a single RDM server. In a Wide Area Network, a share point will normally be on each local area network that contains RDM systems.

The share point can be installed either stand-alone or with an RDM console. The RDM server always contains a share point.

Transmission Control Protocol/Internet Protocol (TCP/IP). TCP/IP is the suite of communications protocols developed for internetworking that encompasses both network layer and transport layer protocols.

While TCP and IP specify two protocols at specific protocol layers, TCP/IP is often used to refer to the entire protocol suite based upon these, including Telnet, File Transfer Protocol (FTP), and User Datagram Protocol (UDP).

Trivial File Transfer Protocol (TFTP). TFTP is a simple form of the File Transfer Protocol (FTP). TFTP uses the User Datagram Protocol and provides no security features. It is often used by servers to boot diskless workstations, X-terminals, and routers.

Wake on LAN. Technology developed by IBM that allows LAN administrators to remotely power up systems. The following are the essential components of the Wake on LAN setup:

- ▶ Wake on LAN enabled network interface card (NIC).
- ▶ Power supply which is Wake on LAN-enabled.
- ▶ Cable which connects NIC and power supply.
- ▶ Software which can send a magic packet to the system.

If the system has the first three of the above components, the system is called a Wake on LAN-enabled system. Even though a system may be powered off, the NIC keeps receiving power from the system's power supply to keep it alive. A network administrator sends a magic packet to the system through some software, for example, RDM or Netfinity Director. The NIC on the system detects the magic packet and sends a signal to the power supply to turn it on. This process is also called *waking up the system*. Using RDM, this process can be scheduled for individual systems. Wake on LAN and RDM together make it very easy for LAN administrators to deploy software on individual systems on a scheduled basis.

Index

A

ADDDOM.BAT, 221
Adding Applications, 111, 120, 210
Address Resolution Protocol, 24
AIA, 72, 83, 183, 184, 185, 186, 222, 223, 283
AIAREAD.EXE, 185, 222
AIAWRITE.EXE, 186, 223

B

Backup Domain Controller (BDC), 44, 114, 115
batch file
   backup, 274, 275
   customization, 88
   examples, 273
   final image, 79, 88, 213, 276, 277
   general information, 15
   maintenance, 88
   passing parameters, 214
   preload image, 9, 12, 76, 77, 229, 230, 273, 276, 277
BIOS, 14, 63, 86, 153, 155, 157, 161, 260, 265
boot, 22, 23, 24, 25, 26, 43
bootp, 43, 254
BPDISK.EXE, 224
BSEDIT.EXE, 225

C

changes in version 3.2, 5
CHKPART.COM, 225
clone image
   location of, 188, 189
   removing, 189
clone images
   CloneIt Agent, 144
   PowerQuest, 140
CloneIt Agent Wizard, 9, 145
CMOS, 14, 63, 86, 156, 159, 259, 265, 266, 274
console, 48

D

Debugging Errors, 63
DEDITD.EXE, 78, 88, 226
Defaults notebook, 66, 71, 92, 185
DHCP, 10, 22, 23, 24, 25, 26, 35, 43, 254
DISKDOS.EXE, 226, 274, 276
donor computer, 129, 211, 274
DOS Images, 207, 208
DOSLFNBK.EXE, 227
drive mapping, 273, 276
dual startup sequence, 187
DYNALOAD.COM, 227

E

Embedded Controller, 87, 161

F

FAT32.EXE, 228
FDISK.COM, 129, 228, 231
FDISK32.EXE, 231, 233
FIRSTACT.EXE, 231
flash diskette, 86, 157, 159
FLASH2.EXE, 158
FORMAT.COM, 231, 232
FORMAT.DAT, 232, 233, 276, 277
FORMAT32.COM, 232, 233

G

GETRAMD.COM, 233

H

hard disk startup, 186
HDDSIZE.EXE, 233
HIDEPART.EXE, 234

I

IBM Director, 71, 208
IBM Director Agent, 11, 120, 121, 126, 208
IDVIEW.EXE, 234
image reload, 154
images, 14, 126, 212, 283
individual System Details notebook, 14, 71, 72, 77, 79, 80, 81, 140, 153, 154, 156, 192, 214, 215
Installation/Maintenance window, 61, 62, 65, 85, 131, 153, 154, 157, 159, 161
installing RDM, 17, 28, 57
installing RDM components, 46
INTER.EXE, 230
IP Address, 67, 68, 69, 84
IPSSEND.EXE, 235

L

LCATTRIB.EXE, 236, 274, 276
LCBTRDEL.EXE, 228, 236
LCCLEND.EXE, 236
LCCLONE.EXE, 237, 238
LCCMEND.EXE, 238
LCCMOS.BAT, 160
LCCUSTOM.EXE, 77, 78, 88, 185, 186, 238, 239
LCFDISK2.EXE, 228, 231, 241
LCNETSEL.EXE, 243
LCPNPSN.EXE, 243
LCREFLSH.BAT, 158
LCUNCSPL.EXE, 244

licenses, 1, 114, 115

M

MACHINE.LST, 28, 191, 192
maintenance file, 87, 154, 214, 215, 266
MERGEINI.EXE, 245
MIGRATE.EXE, 245
modifying RDM components, 46
multi-homing, 44

N

Netfinity Services, 12, 19, 44
network configuration, 17, 21
NETWORK.LST, 28, 96, 189, 191, 194, 195, 201, 234, 243
NTFS, 18, 108, 262

O

OEM Devices, 200
operating environments, 15
operating system files, 102, 127
OPTIONS.TXT, 28, 193, 194

P

parameter exceptions, 80, 214
passwords
    assigning BIOS administrator password, 92
    modifying BIOS administrator password, 86, 155, 156, 265
    password policy, 44
    setting BIOS administrator password, 67
    setting Netfinity Manager password, 71
    setting Windows user password, 135
PCHECKER.EXE, 245
personality batch file, 85
Power Restore, 75, 87, 106, 108, 162, 205, 241
POWEROFF.COM, 245
PR.EXE, 246
pre-load image batch file, 129, 130
primary domain controller (PDC), 44, 114, 115, 207, 255
PRLAST.COM, 247
Profile Wizard, 9, 97, 98
Progress and Errors window, 64, 66, 89, 158
proxy ARP, 24, 43
proxy DHCP, 24
PXE, 5, 10, 43, 253
PXEDHCP.BAT, 38, 42

R

RAID, 14, 76, 105, 150, 181
REBOOT.COM, 247
remote share point, 10, 19, 27, 33, 48, 77, 182, 262
repairing RDM, 52
RFID, 72, 83, 85, 183, 184, 222, 223
router, 43, 253

S

scanning systems, 12, 91
Scheduler, 9, 62, 66, 72, 73, 81, 89, 90, 155, 215
SCRUB3.EXE, 247
SCSI.TXT, 28
SDAPACK.BAT, 112, 249
secure data disposal, 13, 150
SENDSLIM.EXE, 250
service processor, 250
SERVPROC.EXE, 250
SETERROR.COM, 250
share point, 10, 77, 130, 183
SLEEP.EXE, 250
Software Delivery Assistant (SDA), 111, 112
software profile
    assigning systems to, 131
    creating manually, 128, 183
    deleting, 151
    editing, 151
Software Profile Details notebook, 16, 73, 140, 151, 214
SRCMOSxx.EXE, 160
Stand-Alone Servers, 10
SysPrep, 141
System Assignment Wizard, 9, 75, 131
System Migration Assistant (SMA), 110
systems
    Asset ID, 185
    assigning, 131
    assigning to software profiles, 131
    cloning, 140, 144
    de-assigning from software profiles, 152
    deleting, 152
    disabling, 152
    displaying, 153
    managing, 152
    modifying, 153
    recognizing, 62
    scanning, 257
    scanning, 71, 91
    searching, 153
    selecting, 62
    startup settings, 186
    waking, 92
systems database
    exporting, 201, 202
    report fields, 202

T

TCP/IP Configuration, 118

U

unattended install directories, 188
uninstalling RDM, 53

V

VIDEO.LST, 28, 191, 192, 193, 201

W

WAIT.EXE, 251

Wake-on-LAN, 19, 67, 70, 84, 90, 95, 187, 251, 257, 285

WINWAKE.EXE, 251