LANClient Control Manager 3.0
User's Guide

Updated July 18, 2001

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

First Edition (July 2001)

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About The User's Guide

Introduction

This guide explains the capabilities of IBM's LANClient Control Manager Version 3.0. LCCM is licensed and available at no charge for use on IBM client systems. You must purchase the System Installation Tool Kit to obtain a license to use LCCM on non-IBM client systems.

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

This guide is organized as follows:

- Chapter 1, “Overview and Concepts”, contains an introductory overview of the purpose and features of LCCM. The various concepts relevant to LCCM are also discussed. It is important to understand the information discussed in this chapter to take full advantage of LCCM
- Chapter 2, “Installation", contains instructions on how to install and uninstall LCCM. Also included are instructions on how to run LCCM 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 LCMM console
- Chapter 4, “Working with LCCM”, describes the main functions and operations of LCCM
- Chapter 5, “Examples”, provides step-by-step instructions to familiarize users with LCCM's wizard features. These exercises are recommended for all LCCM users
- Chapter 6, “Advanced Administrative Topics”, discusses advanced administrative tasks such as the management of LCCM control files and the LCCM database
- Chapter 7, “Utilities”, contains instructions on how to use the utilities supplied with LCCM
- Chapter 8, “Troubleshooting, provides solutions to some basic LCCM questions and points out where to find on-line support
- Appendix A, "Error Messages", lists all the error messages generated by LCCM
- Appendix B, "Examples of User-Created Batch Files", contains examples and instructions for manually creating batch files within LCCM. These examples are only recommended for experienced LCCM users
- Appendix C, "Notices and Trademarks", contains information on all relevant Notices and Trademarks for LCCM

Who Should Read The Guide

This guide is intended to help network administrators understand the concepts and procedures of LCCM. 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 LCCM 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 LCCM.

If you are new to LCCM, 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 LCCM. This chapter will also help you become familiar with new terminology.
2. Download the LCCM 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 LCCM” to understand the basic functionality of LCCM.
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 LCCM:

- Context-sensitive help provided with LCCM. From the main window, select the **Help** menu and click the **Help Index**
- The LCCM home page is http://www.pc.ibm.com/us/desktop/lccm/index.html
- The compatibility and configuration guide lists compatibility of LCCM with client hardware, network adapters and operation systems. Please see http://www.pc.ibm.com/us/desktop/lccm/compat.html
- Last minute updates and changes are given in ReadMe files. Please visit http://www.pc.ibm.com/us/desktop/lccm/download.html
- Hints and Tips are given at http://www.pc.ibm.com/us/desktop/lccm/hints.html
- Subscribe to the LCCM 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 http://www.pc.ibm.com/us/desktop/lccm/esupport.html
- To purchase the System Installation Tool Kit to use LCCM on non-IBM client systems, please visit http://www.pc.ibm.com/ww/solutions/lcc/sit.html

Chapter 1. Overview and Concepts

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

- Remotely identify a computer 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 unattended installation of Windows 98, Windows NT, Windows 2000 and other 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

If you have IBM Netfinity Manager installed on your LCCM server and Netfinity Services running on the client computer, you can also:

- Remotely restart (reboot) a client computer that is already turned on in order to process changes to client software
- Remotely turn off (power-down) and turn on a client computer

LCCM 3.0 is licensed for use, at no fee, to deploy IBM client computers. For a per client fee, LCCM 3.0 is licensed to deploy non-IBM client computers.

Note: LCCM version 3.0 can recognize, link to, and control clients on directly attached LAN segments or across routers using the Preboot Execution Environment (PXE) protocol. LCCM version 3.0 will support both PXE 1.0 and PXE 2.0.

1.1 Changes in Version 3.0

LCCM 3.0 introduces the following changes and additions:

- The ability to run the LCCM server and the LCCM console on:
  - Windows 2000 Server plus Service Pack 2 or higher
  - Windows 2000 Advanced Server plus Service Pack 2 or higher
- The ability to run the LCCM console on:
  - Windows 2000 Professional plus Service Pack 2 or higher
- Support for new IBM systems and new IBM network and other adapters. Please see the LCCM Compatibility and Configuration Guide located at http://www.pc.ibm.com/us/desktop/lccm/compat.html for detailed information
- New version of IBM's Secure Data Disposal utility
- New version of IBM's DiffTool utility
- Client names can now be up to 11 characters long
- Resizable Progress and Errors window

- Improvements to the Profile Wizard:
  - Integration of IBM's Software Delivery Assistant (SDA) with LCCM
  - Improved partitioning options
  - Ability to save install directory
  - Removal of the 14-application limit
- IBM Hardware checking:
  - Enforces the use of IBM clients only in the free, i.e. Web downloadable version of LCCM
  - Per-client-fee version of LCCM available for managing non-IBM hardware
- Installation:
  - Use of latest InstallShield version
  - One-step install with no reboot required
  - Migration of an LCCM 2.5.1 Service Pack 4 server to another LCCM 3.0 server
  - Silent Installation available for typical and custom install
  - Separate install choice for Remote Share Point, making install in a Wide Area Network easier
  - Can install LCCM on top of itself
- DHCP and PXE:
  - New IBM PXE Service
  - IBM Intermediate Support Driver, IBM DHCP Service, and IBM BINL Service are removed
  - LCCM 3.0 supports PXE protocol only. RPL protocol is no longer supported
- Other changes:
  - Fixes to reported problems
  - Functional enhancements from all prior service packs and patches
  - Fixes from all prior service packs and patches
- Documentation:
  - New User's Guide (replaces the Training and Procedures Guide)
  - New Compatibility Guides

1.2 Supported Client Configurations

The target client configurations for LCCM 3.0 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 Internet at http://www.pc.ibm.com/us/desktop/lccm/compat.html. This guide will be updated as additional test cases are completed.

IMPORTANT: Before using LCCM 3.0, check the compatibility test results and browse the rest of the LCCM web site for additional information and tips concerning the installation and use of LCCM.

1.3 Supported Operating Systems

Operating systems can be easily installed on client computers using LCCM via wizard-generated profiles or manual profiles (see “Software Profiles” on page 13). There are few built-in LCCM restrictions on what you can do with a manual profile. Wizard-generated profiles are restricted to the following operating systems:

- Unattended install profiles
  - Windows NT 4.0 Workstation (with any service pack)
  - Windows NT 4.0 Server (with any service pack)
  - 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 98 (with any service pack)
  - Windows 98 Second Edition
  - Windows 95
  - Windows 95 OSR2
- Clone install profiles
  - Windows 98 (with any service pack)
  - Windows 98 Second Edition
  - Windows 95
  - Windows 95 OSR2

1.4 LCCM Components

LANClient Control 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 LCCM console is used to set up and initiate administration tasks on client computers, such as scanning a client, 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 LCCM console consists of the following major components:

- **Installation/Maintenance window**. This is the main window of the program, where you can view the various clients and profiles, assign clients to profiles, start or stop the scan operation, and start processing changes.
- **Progress and Errors window**. This window displays the status of events as clients 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 client computer, and specific questions (prompts) to display at the client computer during a scan process.

- **Individual Client Details notebook**. The information in this notebook is created automatically by the scan process for each client computer it detects. You can also create, copy, or modify the notebook manually. The notebook contains information about each client computer, such as the serial number, network address, key hardware installed, image assigned, and BIOS level. It also contains the values unique to each client computer that you use to personalize an image. You can also use this notebook to perform maintenance operations on client computers, 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 LCCM'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 client computer to use the profile
  - The name of the preload image batch file used to prepare the local hard disk of the client, 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 computers using this profile

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

- **Profile Wizard**. This wizard has the purpose of creating software profiles and automatically creating all the LCCM batch control files associated with this profile.
- **DiffTool Wizard**. The DiffTool is run on a donor computer and completes all the necessary processing that is required to create an image of additional software applications that can be included with an LCCM unattended install image.
- **Client Assignment Wizard**. This wizard has the purpose of ensuring that all of the substitution parameters for a particular client have values assigned to them prior to that client being processed by LCCM.
- **CloneIt Wizard**. The CloneIt Agent is run on a donor computer and completes all the necessary processing that is required to create a valid LCCM clone image for that computer (for example creating a compressed image of all the software on the client and transporting this to the LCCM Server).

The console is described in detail in Chapter 3, “An Overview of the Interface”. The wizards are described in Chapter 4, “Working with LCCM”.

Server

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

For Windows 2000 Server or Windows 2000 Advanced Server, LCCM 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 LCCM 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, clients can request configuration parameter values and bootable images from the server.

The PXE process consists of the client computer 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 LCCM 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 LCCM, the network bootstrap program is used to load operating systems and do additional maintenance tasks

Share Point

The (remote) share point is a local repository for the files that LCCM uses to run its tasks. It contains the following:

- LCCM DOS images and many other file packages (for example, Windows Installation images) used during LCCM processing.
- A TFTP server program (supplied by LCCM) used to download these files to LCCM clients.

In the simplest case, share point is on the same system as the LCCM server. In other cases, there may be many share points managed by a single LCCM server. In a Wide Area Network, a file server will normally be on each local area network that contains LCCM clients.

The share point can either be installed stand-alone or be on the same system as the LCCM Server.

Client

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

Bootstrap agent

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

- A second level bootstrap

- A custom bootable diskette image
- An LCCM 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 client system as directed by the LCCM server.

Universal Manageability Services (UMS)

The UMS may or may not be present on the client system after its production operating system is loaded and running. If present, it is used to perform the functions of shut down and restart to initiate service boots when the system is up and running. If it is not installed, you must find another way to shut down and restart systems. As an LCCM administrator, you can elect to disable the use of the UMS, and rely only on Wake-on-LAN (or optionally, manual power on).

1.5 Basic Operations

This section describes the client-focused operations you are likely to run with LCCM 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 LCCM”, describes in detail how to run these basic operations and how to make the necessary changes and additions to LCCM.

Scan Clients

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

Assign the Client

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

- **OS Clone Profiles**. If a client is assigned to an Operating System Clone profile, the server sets up a temporary operating system environment on the client; and then downloads one or more batch files. The client 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 client computer downloads only a short bootstrap load instruction from the server, which instructs the client to start from its own hard disk.
- **OS Install Profiles**. If a client is assigned to an Operating System Install profile, the process actually performs a complete unattended installation of a Windows operating system on the client. On subsequent restarts, the client computer downloads only a short bootstrap load instruction from the server, which instructs the client to start from its own hard disk.

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

Profiles are unique to the LCCM 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 LCCM 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 LCCM console, you can perform the following maintenance functions on your client computers:

- **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 Rapid Restore in the event of data corruption or virus infection. Rapid 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 LCCM'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 client computers. 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 LCCM, 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 LCCM.

Images

An image is the software stored on a server that is downloaded to a client computer during an operation. Images vary in size and in the type of software they provide to the client computer. 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 client computer.

Operating-System Unattended Install Images

The Operating System Unattended Install image is stored in a directory on your server referred to as the distribution 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 LCCM Server. These files include:

- Files from the Microsoft Windows CD
- Application files
- Batch files to control the LCCM 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 LCCM 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 clients.

BIOS Update Images

LCCM 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 Client Details notebook to update a client computer'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 client computer 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 Client Details notebook to copy these settings to the client computer 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 client. It may only be applied to a system that has an IBM ServeRaid adapter installed.

DOS Images

LCCM's basic paradigm is for the client computer 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 LCCM tasks may require different DOS images, and several DOS images are created when you install LCCM. If you have LCCM tasks that require a different DOS configuration than those provided in LCCM, you can modify those images or even create your own new images.

Batch Files

LCCM 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 239 for more details. This method is recommended for experienced LCCM users only.

The Profile Wizard will automatically create all the necessary batch files to configure your client computers for the successful installation of your operating systems and applications. This method is the preferred method for all LCCM 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 client computers use an identical set of software. This often is difficult to achieve, and once achieved, difficult to maintain. However, using software profiles in LCCM 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 client computers, thereby creating identical operating environments. As clients are added, the same image can be distributed to them. If the image is updated, all client computers currently assigned to that software profile can be automatically updated with the revised image. No user intervention is required at the client computer 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 (Remoteboot Profiles, Operating System Clone Profiles, and Operating System Install Profiles). The LCCM 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 LCCM 'Profile'. The purpose of the Profile Wizard is to create a profile that contains the various files that are necessary to enable the LCCM server to install a specified operating system and to configure the client-specific hardware and the user-specific parameters onto a client. 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 LCCM '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 LCCM control files yourself. This method is only recommended for experienced LCCM users.

Chapter 2. Installation

This chapter gives step-by-step instructions on how to install or upgrade LCCM. 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 LCCM 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 from LCCM 2.5.1**. Read this section if you are running an upgrade.
4. **Install LCCM 3.0**. Run a complete install of the LCCM 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: Review the installation notes for changes or tips at http://www.pc.ibm.com/us/desktop/lccm/index.html.

2.1 Validate Prerequisites

LCCM Server

- The minimum disk space requirement is 2 GB
- The minimum memory requirement is 128 MB of RAM
- One of the following
  - 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 your LCCM 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
  - 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
- If you plan to use IBM Netfinity Manager, you must install this on the Server. For more details, see the client prerequisites listed on page 16

LCCM Console

The LCCM console can be installed on an NT 4.0 Workstation or Server, Windows 2000 Professional, Windows 2000 Server, or Windows 2000 Advanced Server.

Remote Share Point

- The minimum disk space requirement is 2 GB
- The minimum memory requirement is 128 MB of RAM
- One of the following
  - 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
  - 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

Client

- When you assign a client to a software profile, make sure that the client's hard drive has sufficient space for the operating system and applications included in the profile
- PXE 0.99 or PXE 2.0 is supported

Client computer 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 LCCM can use IBM Netfinity Manager software to shut down and restart client computers before processing changes. The use of IBM Netfinity Manager is limited to client computers 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 LCCM is installed on
- Netfinity Services (Version 4.00.2 or greater) must be installed on each client computer you want to shutdown or restart
- IBM Netfinity Manager must know about the clients. To ensure IBM Netfinity Manager knows about all affected clients, 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_Clients").

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

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

Network Adapters

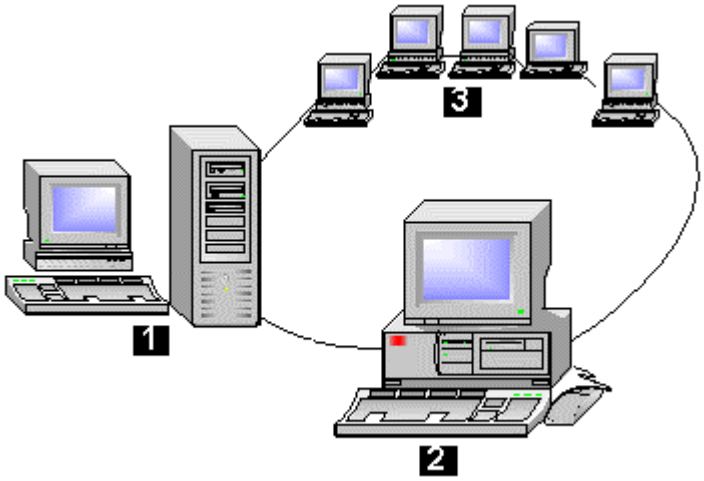
LCCM will automatically scan, configure, and recognize supported network cards only. For a list of supported network adapters and more information, review the LCCM Compatibility and Configuration Guide at http://www.pc.ibm.com/us/desktop/lccm/compat.html. To make LCCM recognize unsupported network adapters, see “Installing Network Drivers” on page 179.

2.2 Examine the Network Configuration

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

Single LAN Environment Example

The following illustration shows the typical LCCM single LAN environment. Routers are not supported in this environment.



1. LCCM server and console – LCCM is installed here. A keyboard and monitor attached to the server can be used to run LCCM from the server.
2. LCCM Console – A computer on the LAN on which the LCCM console is installed.

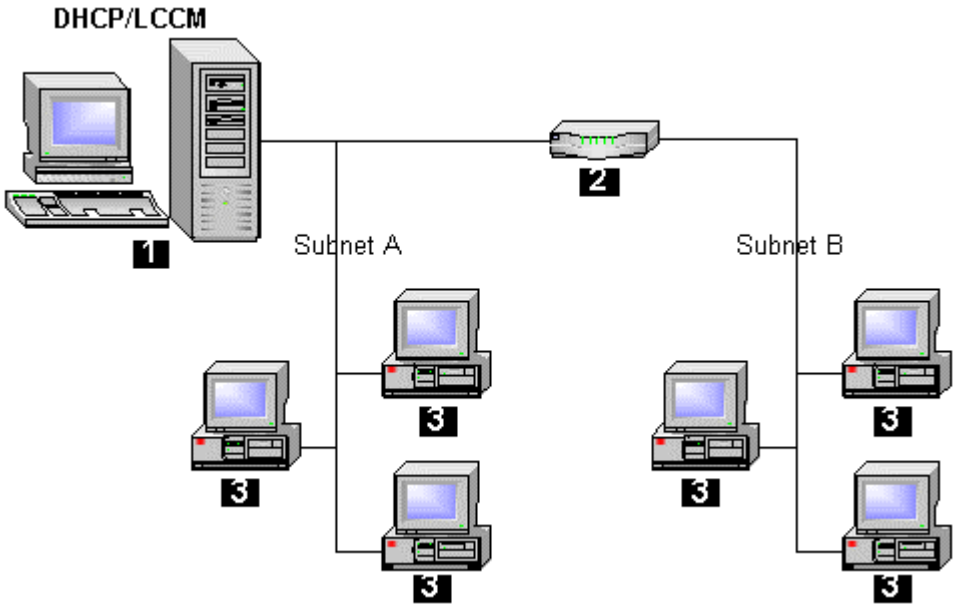
   Note: Only one console can be in use at any given time.

   ---

3. Client computers – These are PXE enabled computers connected to the LAN.

Routed Network Environment Example 1

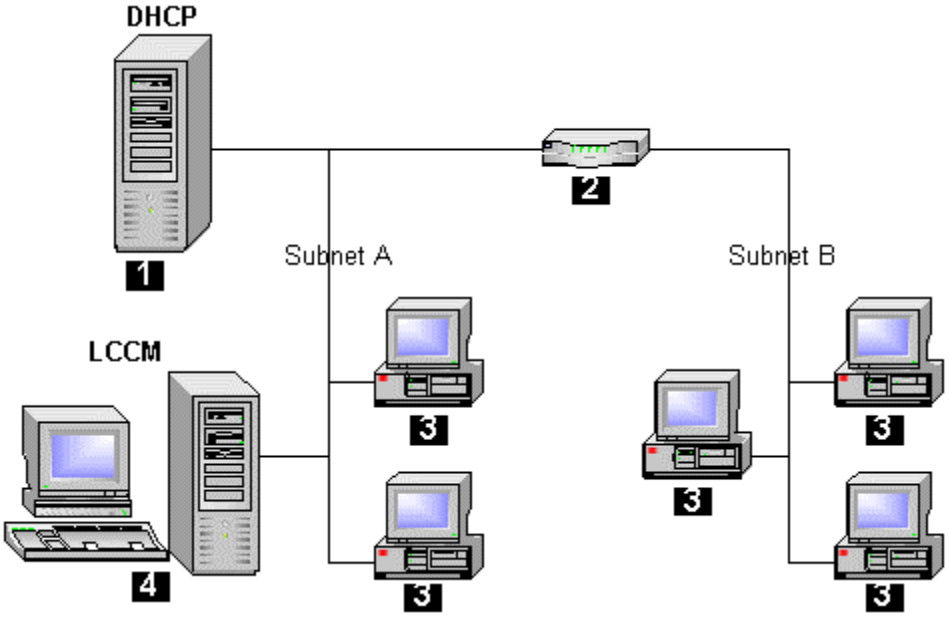
The DHCP server, LCCM server, and LCCM console are on the same system. The client computers boot and connect either locally (through the local network segment) or through one or more IP routers. The Internet Protocol (IP) router must support the BOOTP Relay Agent function.



1. DHCP server, LCCM server, and LCCM console on same system.
2. IP router (one or more).
3. PXE client computers.

Routed Network Environment Example 2

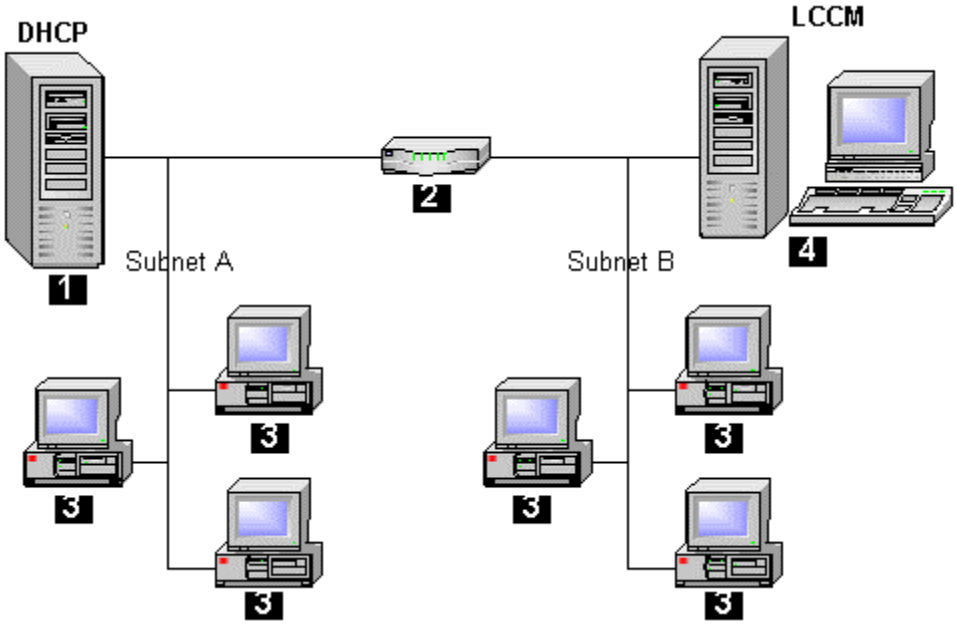
The DHCP server is installed on one system. The LCCM server and LCCM console are installed on another system. The client computers boot and connect either locally (through the local network segment) or through one or more IP routers. The Internet Protocol (IP) router must support the BOOTP Relay Agent function.



1. DHCP server.
2. IP router (one or more).
3. Client computers.
4. LCCM server and LCCM console.

Routed Network Environment Example 3

The DHCP server and LCCM server are on different computers separated by zero or more IP routers. The client computers receive configuration data either locally or through one or more IP routers and boot. The client computers 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. Client computers.
4. LCCM server and LCCM console.

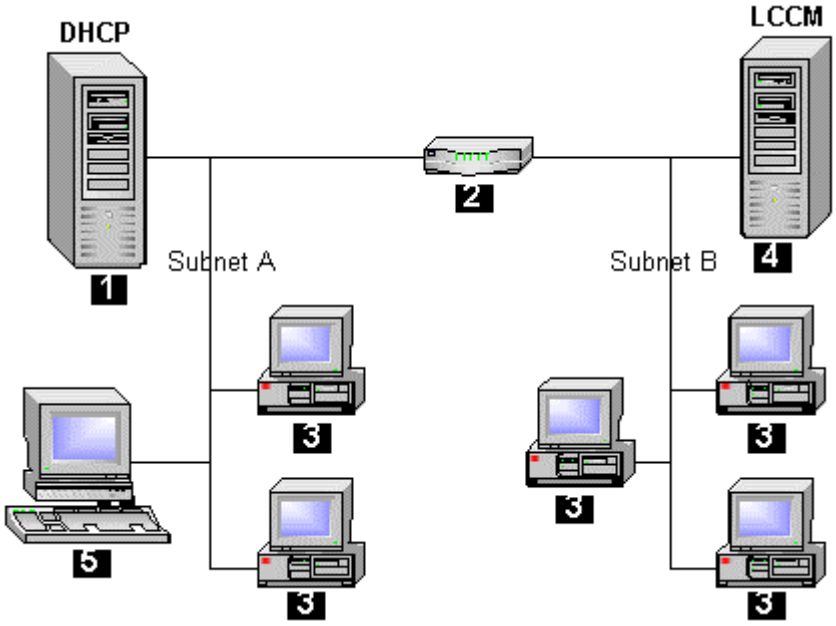
Proxy Address Resolution Protocol (ARP) allows 2 computers on different subnets to communicate even though they do not know about the existence of a router between them.

In the above environment, the DHCP server is on one subnet, the LCCM server is on the other subnet, and clients 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 LCCM PXE Service to reach clients on subnet A, and a BOOTP defined for the DHCP server to reach clients 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 LCCM in the configuration described above.

Routed Network Environment Example 4

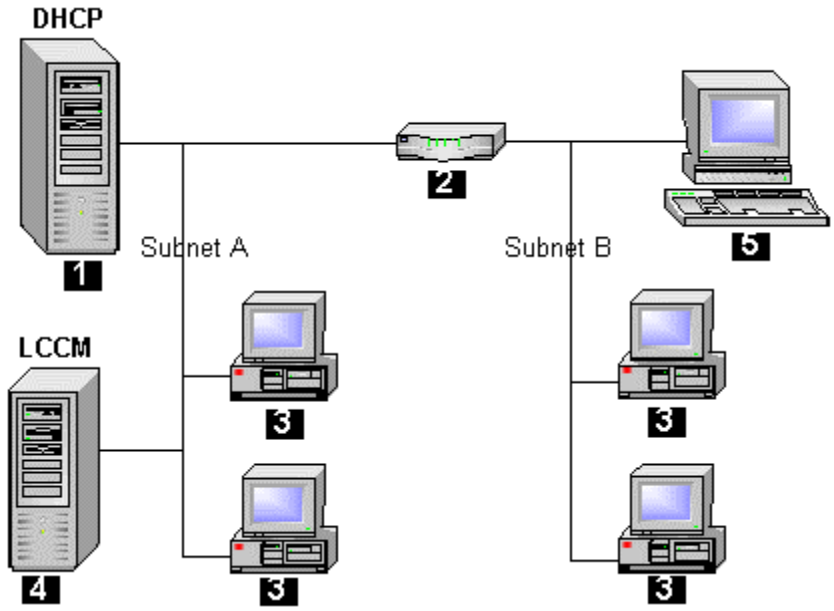
The DHCP server is separated from the LCCM server by one or more IP routers. The client computers receive configuration data (either locally or through one or more IP routers), boot, and connect (either locally or through one or more IP routers). The LCCM console connects to the LCCM server through one 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. Client computers.
4. LCCM server.
5. LCCM console.

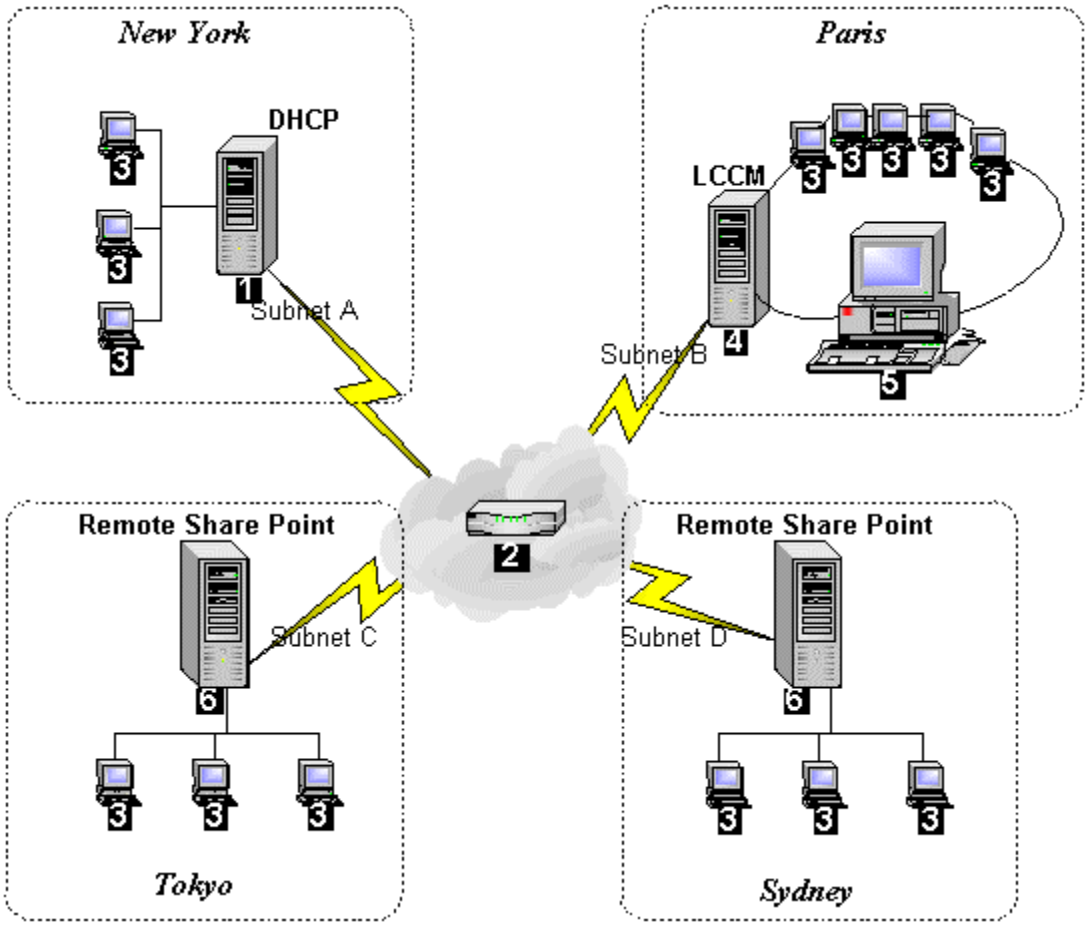
Routed Network Environment Example 5

The DHCP server and LCCM server are on the same LAN segment. The client computers 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 LCCM console connects to the LCCM server through one or more IP routers.



1. DHCP server.
2. IP router (one or more).
3. Client computers.
4. LCCM server.
5. LCCM console.

Wide Area Network Environment Example



1. DHCP server.
2. IP router (one or more).
3. Client computers.
4. LCCM server.
5. LCCM console.
6. Remote Share Point

2.3 Upgrading from LCCM 2.5.1

If you are upgrading from LCCM Version 2.5.1, you can migrate your data files to LCCM 3.0. These migration steps are part of the Install procedure described in the next section.

You can upgrade version 2.5.1 to version 3.0 on the same operating system, provided that you do not attempt to upgrade across languages. You can also upgrade LCCM 2.5.1 on a Windows NT 4.0 Server SP 4 or higher to LCCM 3.0 on a Windows 2000 Server SP 2 or on a Windows 2000 Advanced Server SP 2. If you have an older version of LCCM, you must first upgrade to 2.5.1 before you can upgrade to LCCM3.0.

If you made changes to NETWORK.LST, MACHINE.LST, VIDEO.LST, OPTIONS.TXT, or SCSI.LST in your LCCM 2.5.1 installation, you should save a private copy of those old files before continuing the LCCM 3.0 Installation. You may need to make equivalent changes to the new version of those files (for example if LCCM 3.0 does not contain built-in support for your adapters). The format of NETWORK.LST and MACHINE.LST has changed in LCCM 3.0. See “LCCM Control Files” on page 174 for details.

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

2.4 Install LCCM 3.0

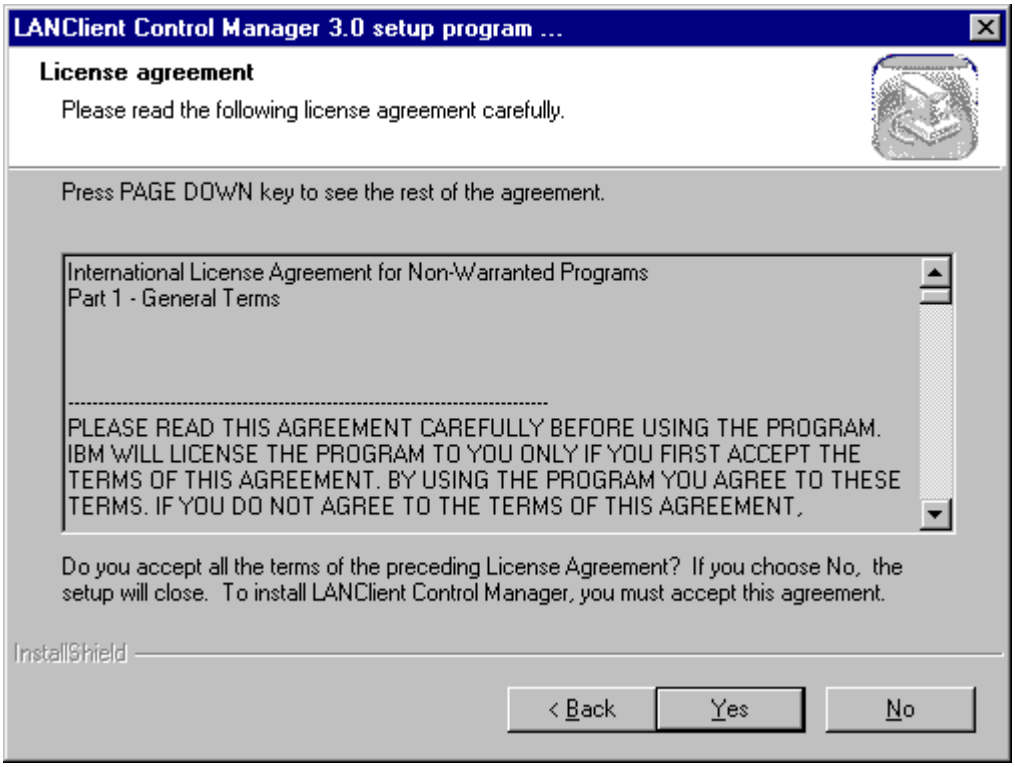
The Profile Wizard typically copies large amounts of data (e.g., operation system images and install directories) into subdirectories under the `<drive>:\LCCM` directory. You should consider your disk space requirements carefully before installing LCCM. You may want to consider installing LCCM somewhere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

This section describes an interactive install. Alternatively, you can run a silent install. See “Performing a Silent Install” on page 46.

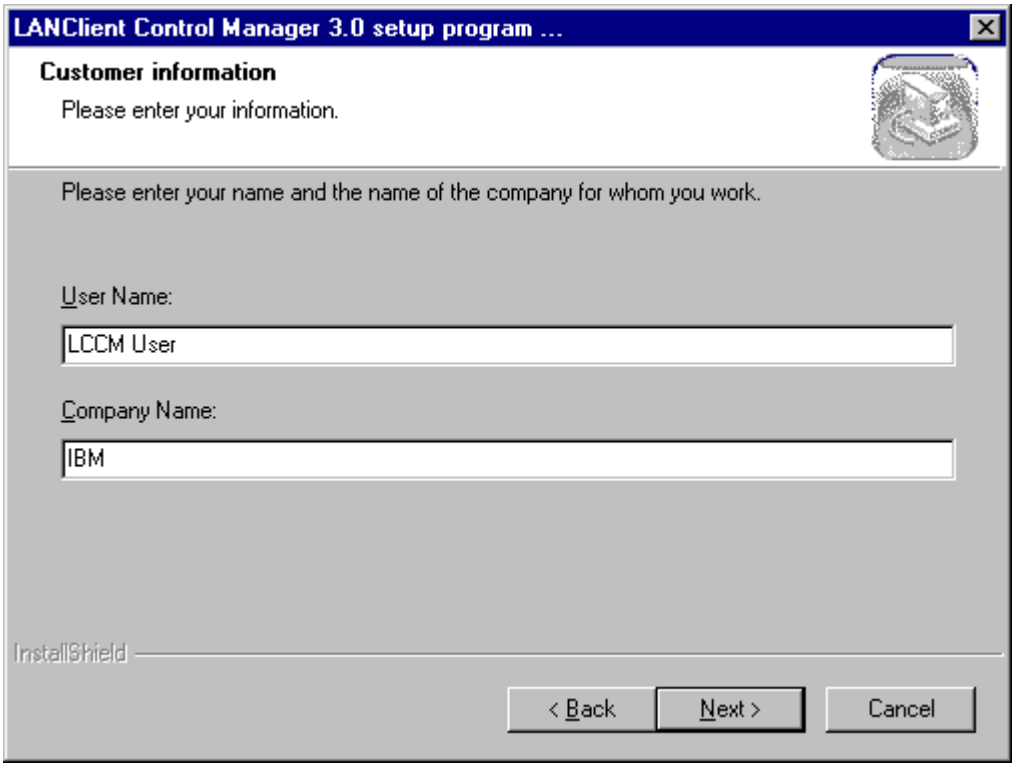
To install LCCM, do the following:

1. Log on to your server as a network administrator or equivalent.
2. Download the IBM LCCM compressed file from http://www.pc.ibm.com/us/desktop/lccm/download.html.
3. Run the **LCCM30.EXE** program that you downloaded from the Internet.
4. The LCCM Installation program will begin and the LCCM 3.0 Setup Welcome screen will be displayed. Click **Next** to continue with the setup program or **Cancel** to exit the program.

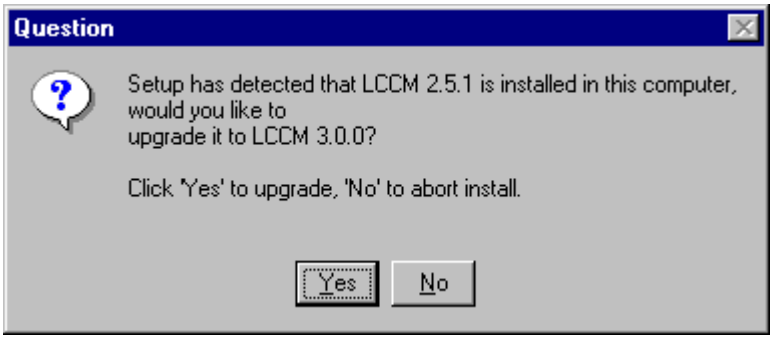
5. If you accept the terms and conditions of the license agreement, select **Yes** to continue with the setup program. Selecting **No** will cancel the setup program.

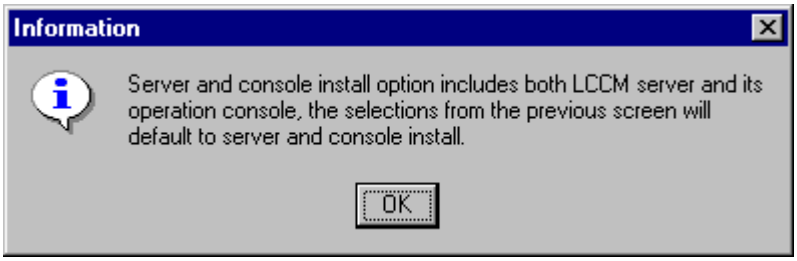


6. Enter your User Name and Company Name and click **Next**.

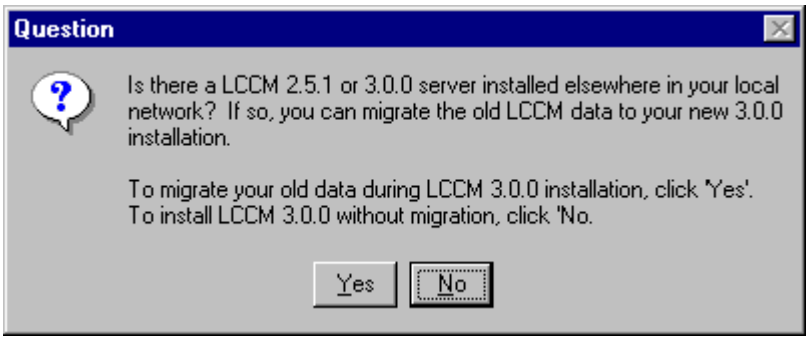


7. If you already have LCCM 2.5.1 installed on this server, you will be asked if you wish to upgrade to LCCM 3.0. Click **Yes** to continue or **No** to abort the install. You will be told that the LCCM 2.5.1 settings will be used. Click **OK**. The install will now jump to step 15 below.

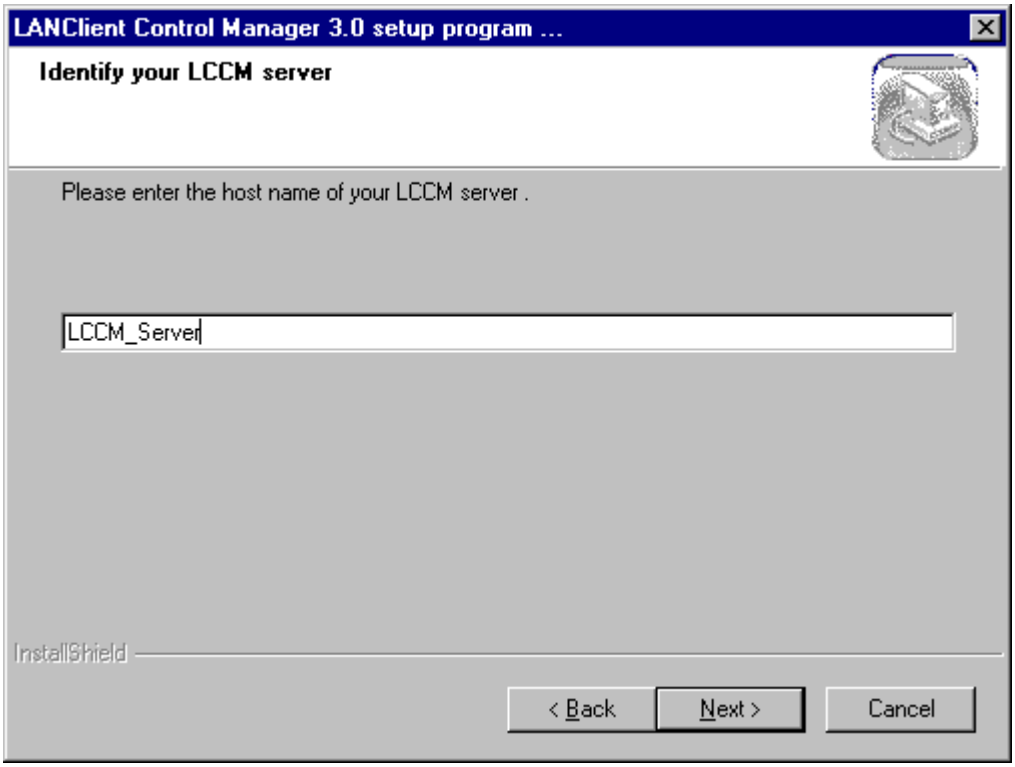




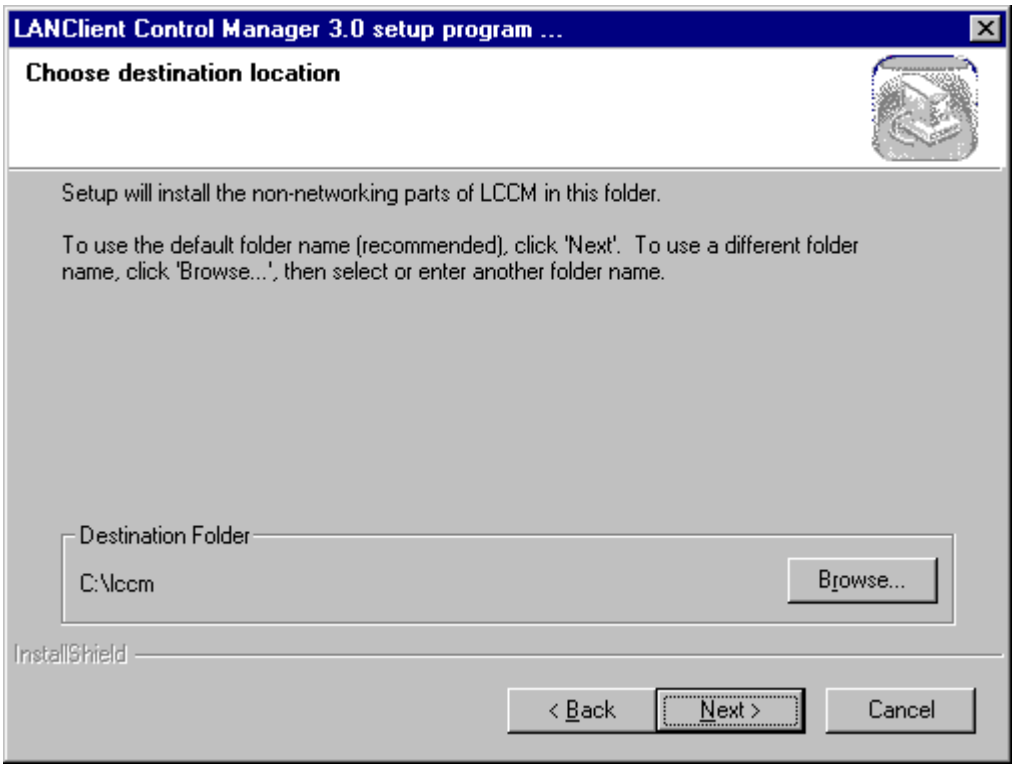
8. If you don't have LCCM 2.5.1 installed on this server, you will be asked if you have an LCCM 2.5.1 server on your network, and if you wish to migrate the LCCM 2.5.1 data (client files and profiles) to the new LCCM 3.0 installation. Click **Yes** to migrate this data, or **No** to continue installation without migration.



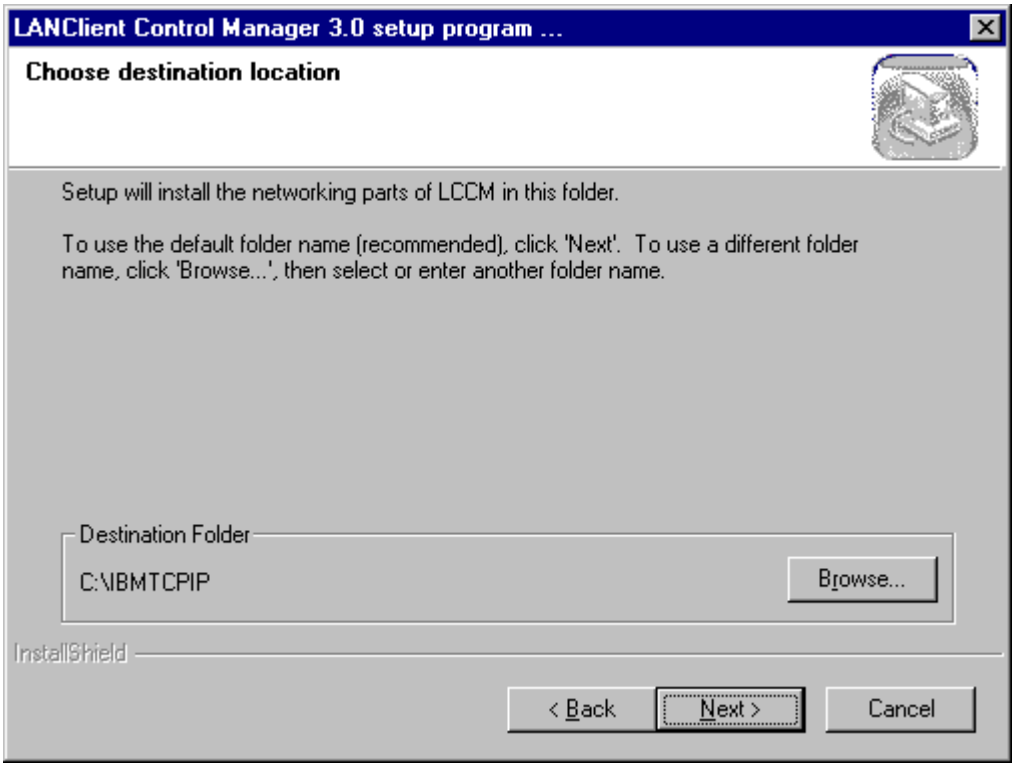
9. If you have chosen to migrate your LCCM 2.5.1 data in the previous step, enter the host name of the LCCM 2.5.1 server and click **Next**. You will not see this screen if you chose not to migrate data.



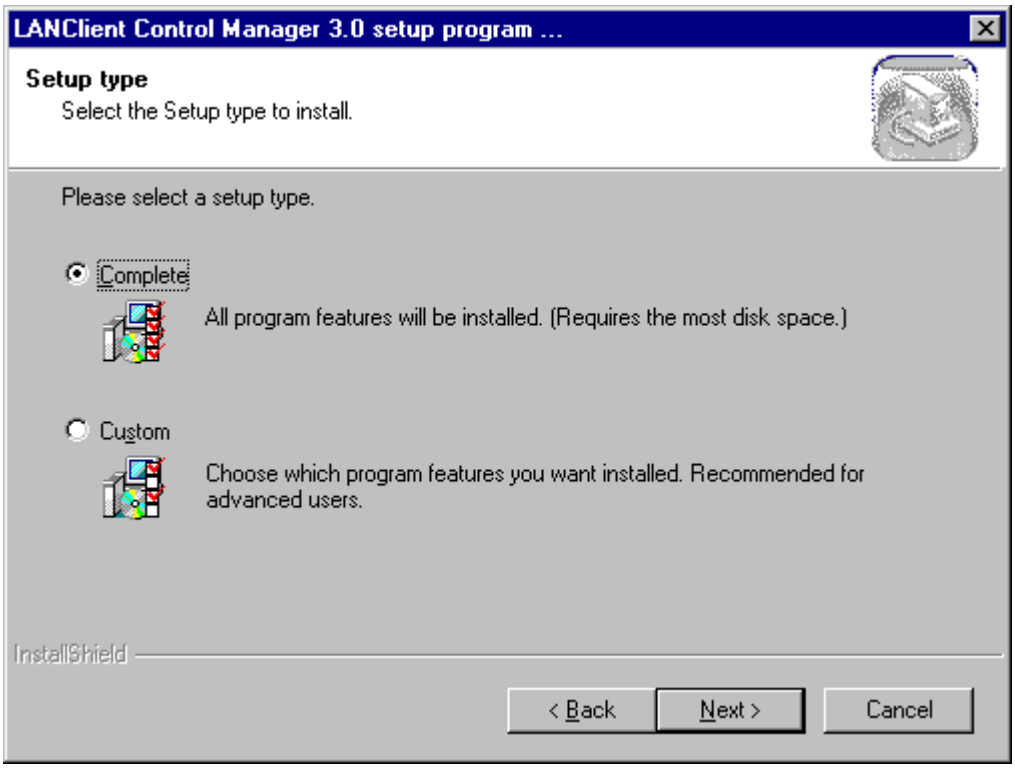
10. Select **Next** to accept the default folder name (recommended) for your LCCM installation, or click **Browse...** to choose a different location.



11. Select **Next** to accept the default folder name of IBMTCPIP (recommended) for the networking components of LCCM.



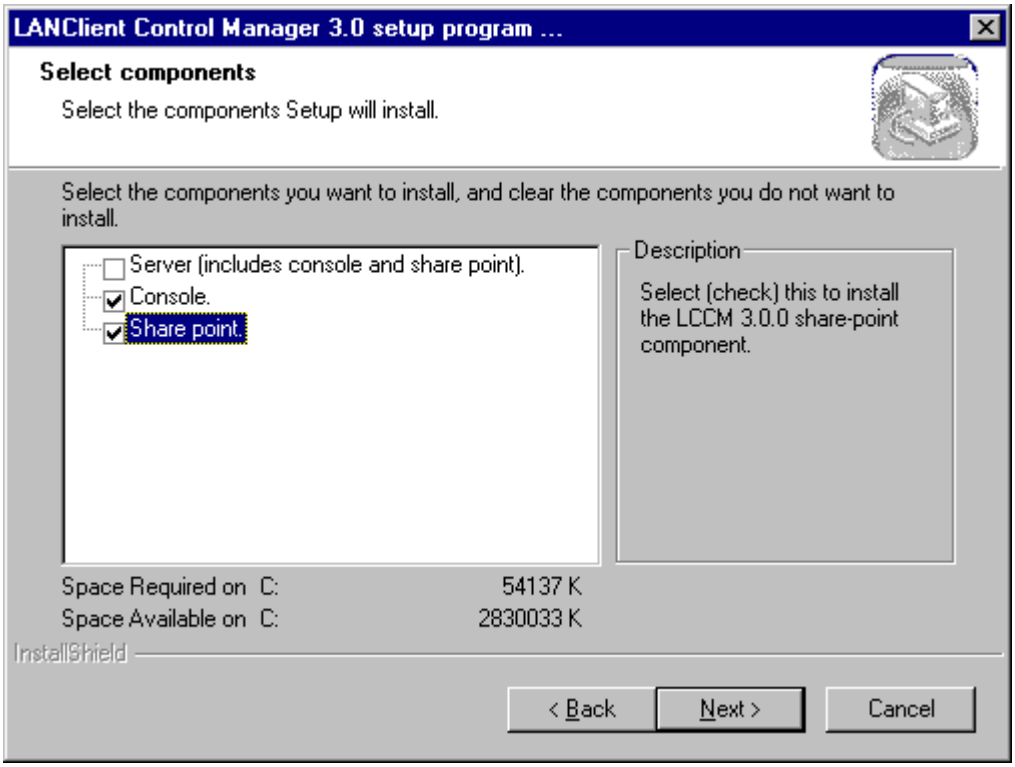
12. Select which type of installation you would like to do, Complete or Custom, then click **Next**.
    - **Complete.** This will install all LCCM components (server, console, and share point). You **MUST** choose this type of install whenever you install the LCCM server.
    - **Custom.** This will allow you to choose which LCCM components to install. You should choose this type of installation when you are installing a remote share point or a remote console, i.e. when you install these components on a different computer than the LCCM server. You can install these components remotely on one and the same computer or on different computers.



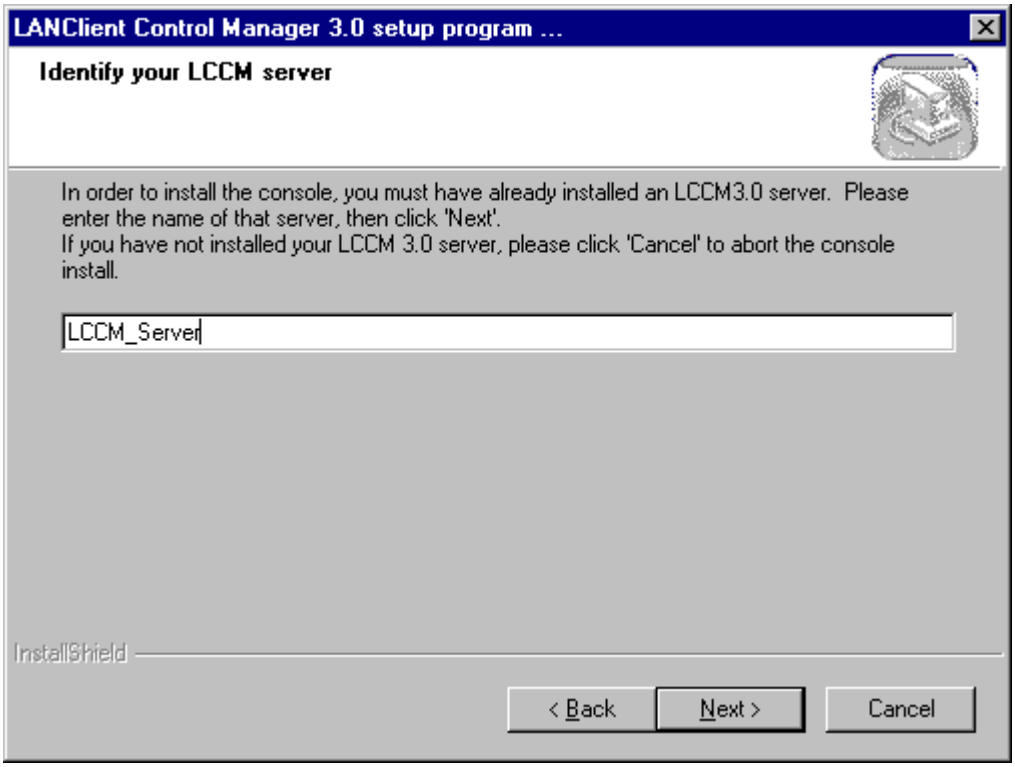
13. If you selected Custom installation in the previous step, you can now choose which components you wish to install:

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

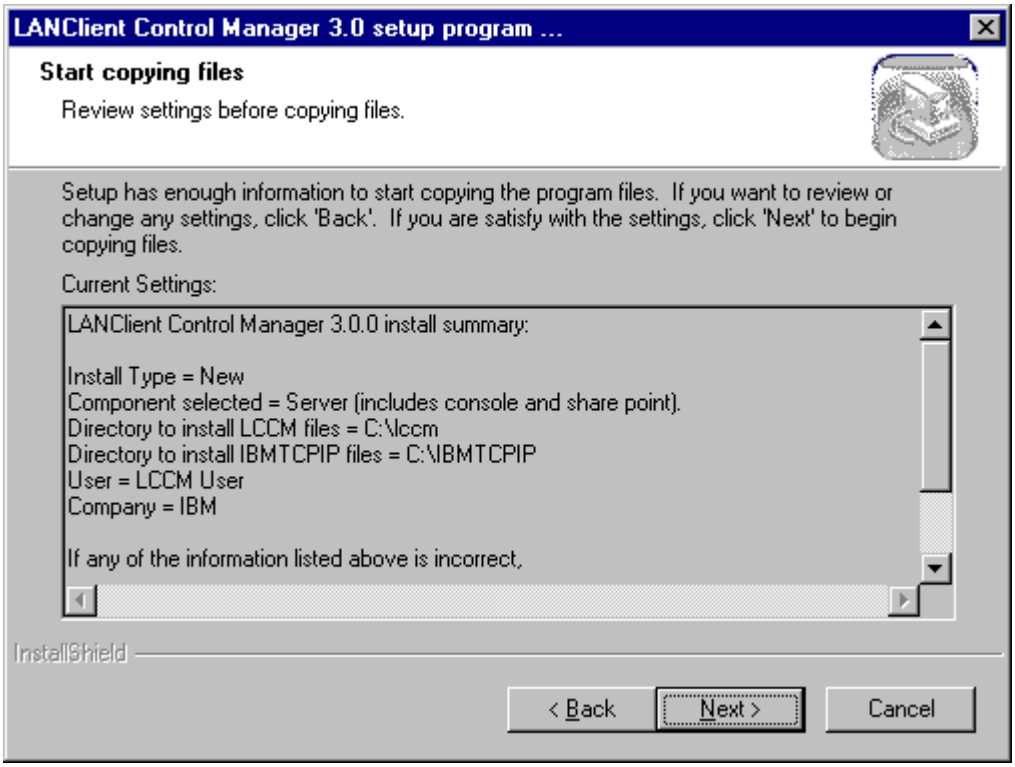
    If you select to install either the console or the remote share point (or both), but not the server, you must have an LCCM 3.0 server already running on your network.



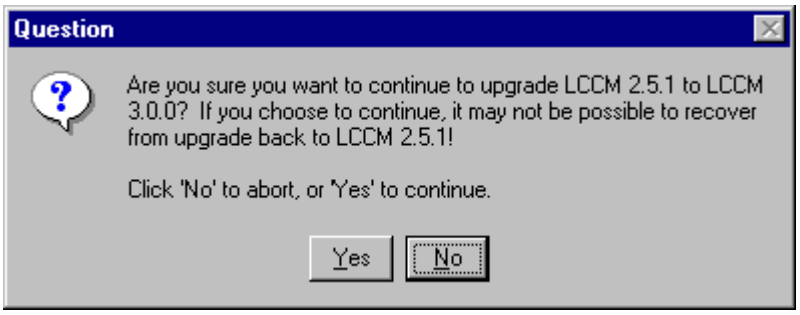
14. If you selected Custom installation, then selected to install the console, remote share point, or both, but did not select to install the LCCM 3.0 server, you must already have an LCCM 3.0 server installed. Enter the name of the server here and click **Next**.



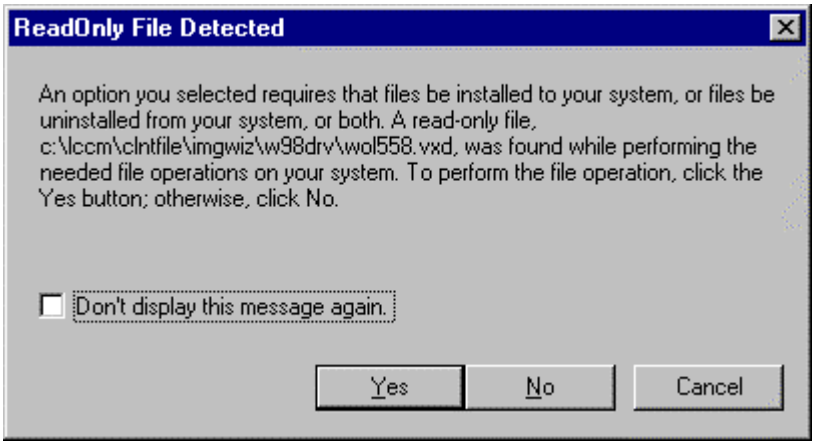
15. Review the setup information. If you would like to change any settings, click **Back**. Click **Next** to begin copying files.



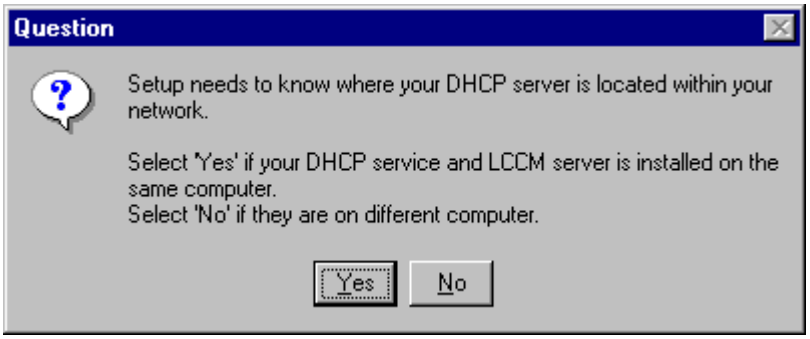
16. If you are performing an upgrade, you are asked to confirm before copying continues.



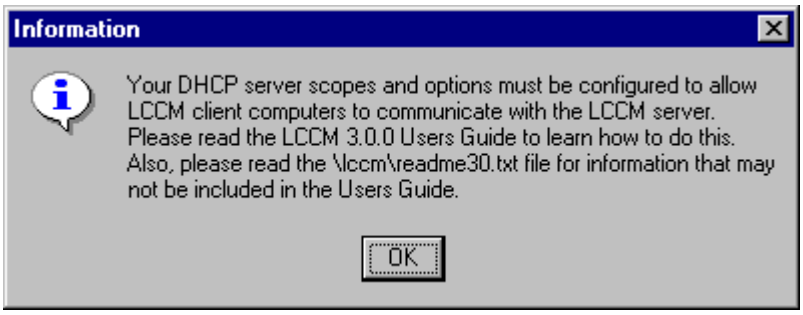
17. If you are performing an upgrade, you might receive a **ReadOnly File Detected** message. Click **Yes** to replace the file.



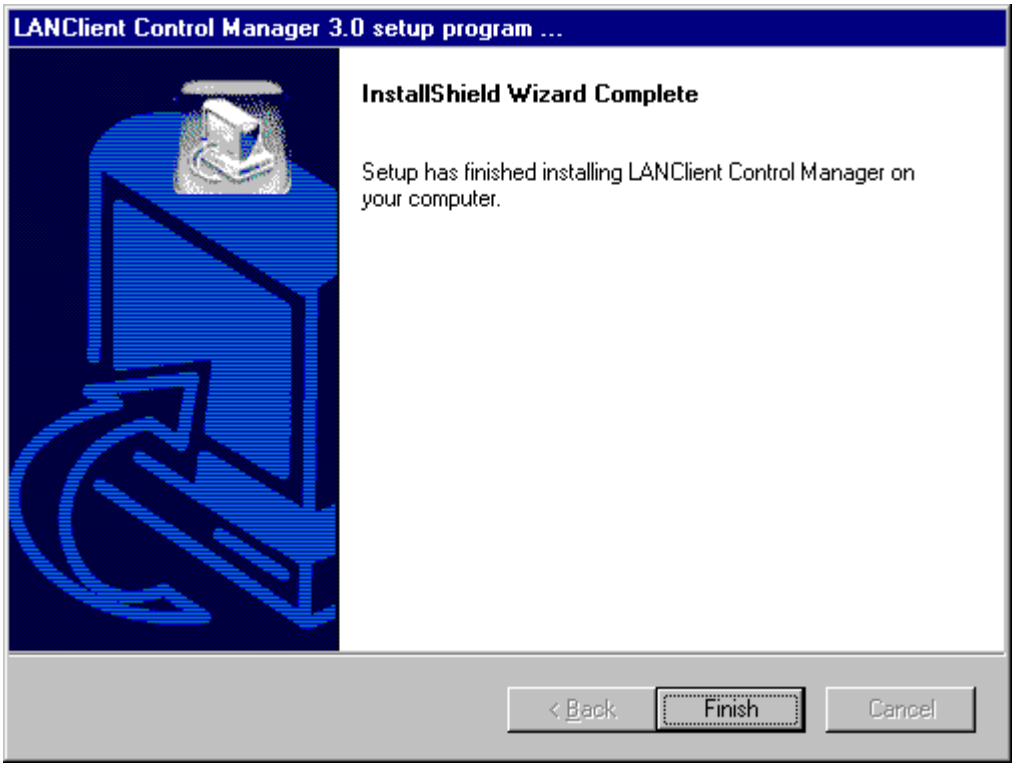
18. After all of the files have been copied, you will be prompted for the location of your DHCP server. Click **Yes** if your DHCP server is installed on the local machine, or click **No** if it is installed on another machine.



19. An informational screen appears reminds you to configure the DHCP Server.



20. Click **Finish** to close the setup program.



2.5 Configure the DHCP Server

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

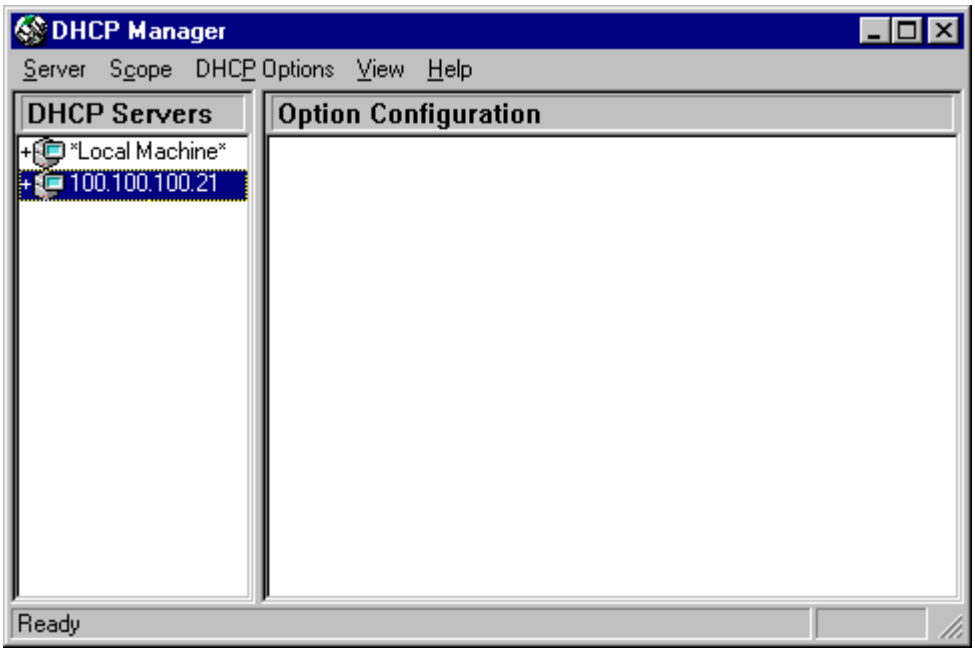
- DHCP scopes must be defined for each subnet that contains LCCM clients.
- DHCP option 3 must be configured in all cases.
- DHCP option 60 must be configured only when the LCCM server and the DHCP server are on the same computer.

You must perform this configuration on any DHCP server.

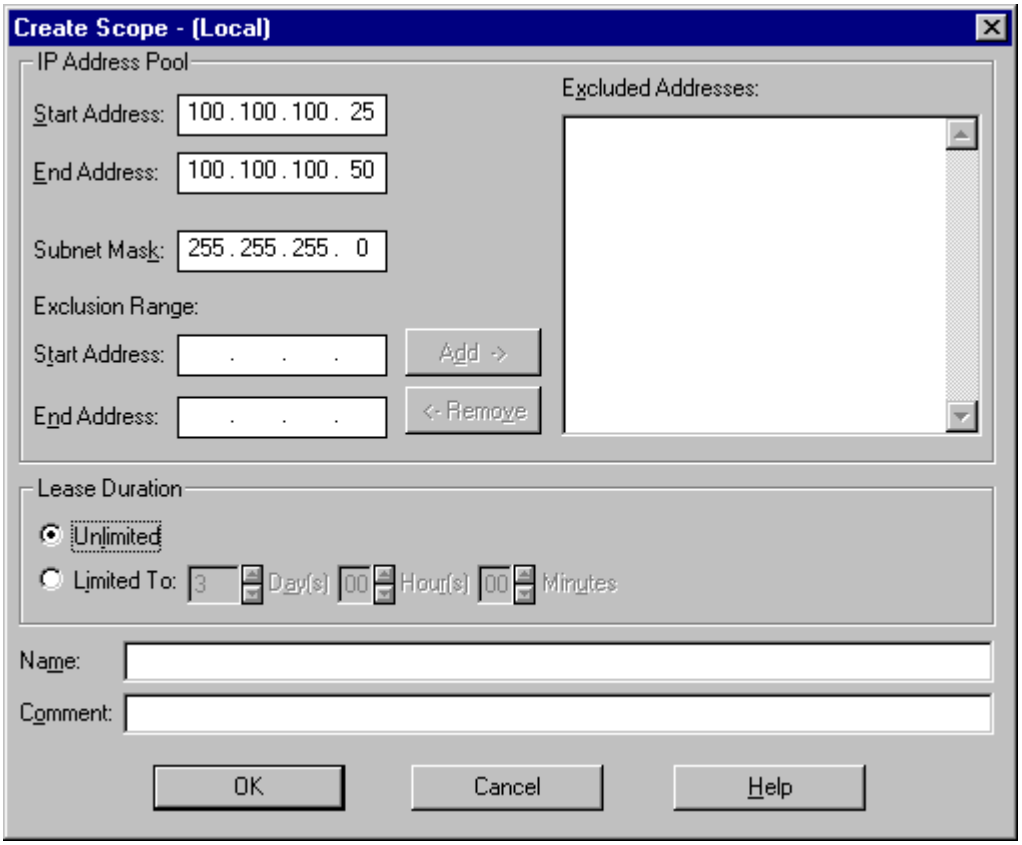
Using the Microsoft DHCP Server on Windows NT 4.0 Server

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**.

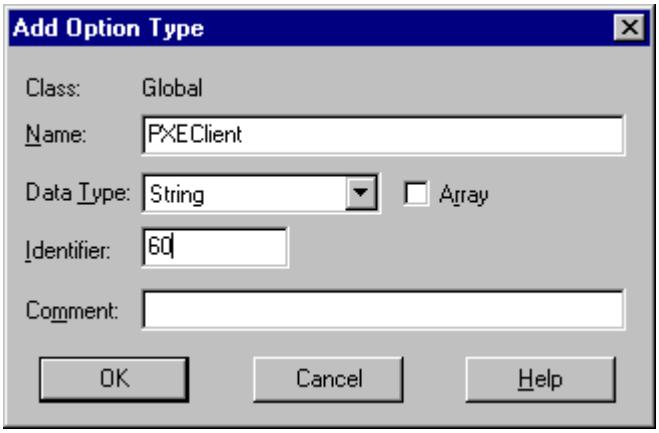


2. From the DHCP Manager, select **Local Machine**, and then from the menu, select **Scope** > **Create**. Under IP Address Pool, fill in the **Start Address**, **End Address**, and **Subnet Mask** fields for each scope that you need. Click **OK** to activate the scope.



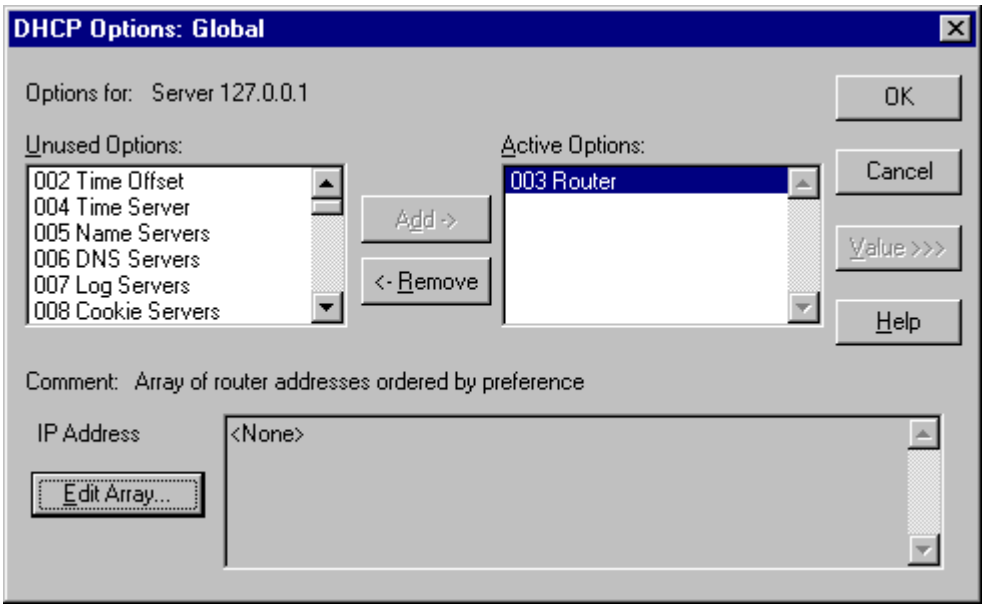
3. From the DHCP Manager menu, highlight the scope and select **DHCP Options** > **Defaults** > **New**.

   Fill in the **Name** field with "PXEClient", the **Data Type** field with "String", and the **Identifier** field with "60'.

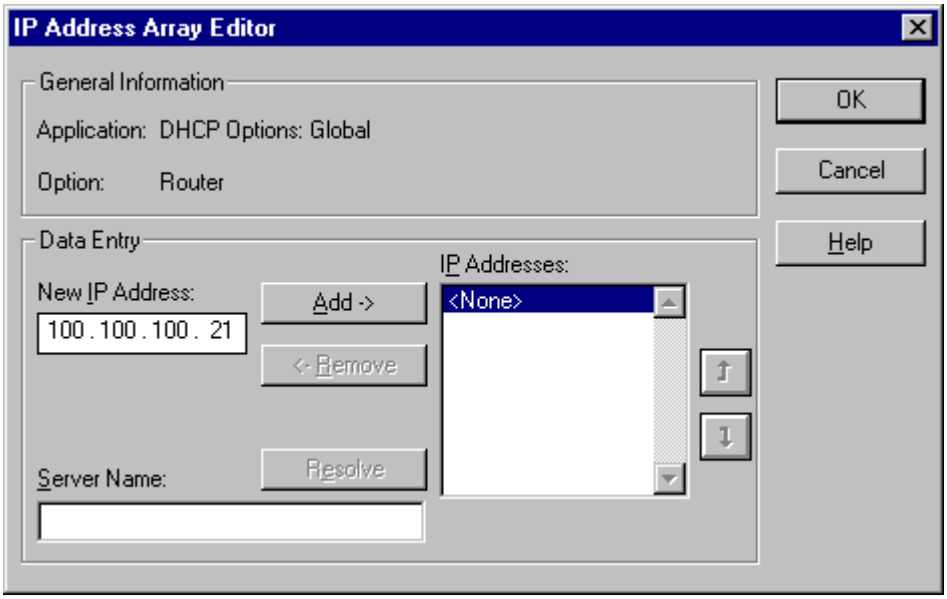


4. From the DHCP Manager menu, highlight the scope and select **DHCP Options** > **Global**.

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



   b) Click **Value**, then **Edit Array**. If your DHCP server and LCCM server are on the same subnet, then enter the IP address of your LCCM server and click **Add**. Otherwise, enter the IP address of your router and click **Add**.



5. If your DHCP server and LCCM 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 must first configure scopes using the DHCP Manager. In addition, you need to configure DHCP options using the Microsoft NETSH.EXE program or `<drive>:\LCCM\PXEDHCP.BAT` program.

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

1. Use the DHCP Manager, as described above in step 2, to configure scopes.
2. From a command window, run the following commands on the DHCP server:
   - If LCCM is installed on a Windows 2000 server that contains the DHCP server:

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

     netsh dhcp server set optionval 60 STRING PXEClient

     netsh dhcp server set optionval 3 IPADDRESS <your LCCM/DHCP server IP
     address>
     ```

   - If LCCM is installed on a Windows 2000 server and the DHCP server is installed on another computer in the same subnet:

     ```
     netsh dhcp server set optionval 3 IPADDRESS <your LCCM server IP
     address>
     ```

   - If LCCM is installed on a Windows 2000 server and the DHCP server is installed on another computer that is across a router(s):

     ```
     netsh dhcp server set optionval 3 IPADDRESS <IP address of LCCM
     server's router>
     ```

To configure the Microsoft DHCP server using PXEDHCP.BAT:

1. From a command window, change to the LCCM directory.
2. Run the command PXEDHCP.BAT

   The syntax of the command is:

   ```
   PXEDHCP location ipaddress
   ```

   `location` The location of the Microsoft DHCP service relative to the LCCM server.

   L = The DHCP service is on the LCCM server.

   S = The DHCP service is on a different server on the same subnet as the LCCM server.

   R = The DHCP service is on a different server on a different subnet than the LCCM server.

   `ipaddress` The IP address (dotted-decimal format only) as defined below:

   The IP address of the LCCM server, if location = L or if location = S.

   The IP address of the router for the subnet containing the LCCM server, if location = R.

Example:

```
pxedhcp S 10.0.0.241
```

2.6 Configure Routers

When a client 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 LCCM 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 client 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 LCCM server

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

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

- Subnet Directed-broadcast forwarding must be enabled.
- Spanning tree protocol for client ports must be disabled
- Proxy ARP forwarding must be enabled.
- The scope for the LCCM client 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 LCCM server, and at least one DHCP server that serves the LCCM client 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 LCCM will work in a routed environment. If your network policy will not allow any of these conditions to be satisfied, then LCCM 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 clients. 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 Installation Information

- If you are using a Primary Domain Controller (PDC), and a Backup Domain Controller (BDC) in Windows NT 4.0 Server, LCCM must only run from one of these servers at any one time. This is because only one LCCM session can run across your network at any one time, and as the LCCM 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 LCCM on a BDC, the PDC must be available, or the installation will hang

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

  a) From the Windows NT 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 Clients Across Routers

If you have Netfinity Services installed on a client computer which does not reside on the same subnet as your LCCM server (i.e., separated from your LCCM 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 clients 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

LCCM will function on a multi-homing server without additional configuration. The LCCM PXE Service and TFTPD Service detects which IP addresses are active at the time that service is started, and monitors 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 LCCM services work properly:

1. Make sure the LCCM is not processing or scanning clients.
2. Open the Services panel which should be located in the Control Panel folder.
3. Select the LCCM PXE Service and press Stop. Wait for the operation to complete.
4. With the LCCM 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, the LCCM 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 LCCM on a domain, which has a User Account Policy requiring a minimum password length, you can inform the **LCCM30.EXE** program to use a default password meeting this minimum password length before you install or upgrade LCCM3.0, or you can make this adjustment after installation.

If you still need to install LCCM3.0:

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 **LCCM30.EXE**.
3. Run **LCCM30.EXE** and follow the prompts on screen.

Note: Users of systems configured with LCCM 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 LCCM 3.0 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>:\LCCM` 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 LCCM PXE Service must be configured to pass these option to it's clients. Perform the following steps to configure the LCCM PXE Services:

1. Start the Registry Editor by choosing Start->Run... and entering "regedit".
2. Locate the following entry:

   `HKEY_LOCAL_MACHINE\SOFTWARE\IBM\LANClient Control Manager\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 LCCM 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 LCCM server in order to limit the number of users with network access to the computer, the NET use command will fail for LCCM clients.

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 client that is on the same subnet as your LCCM Server
- Scan a client that is on a different subnet from your LCCM Server

For more information on how to scan clients, see “Installation/Maintenance Window” on page 49, and “Scanning Clients” on page 79. If your tests are successful, you can proceed to the next chapter to start working with the LCCM Console. Alternatively, you can make modifications to your install as described below.

Modify LCCM defaults

If so desired, modify LCCM defaults and test the resulting install again. For more information on how to modify LCCM defaults, see “Defaults Notebook” on page 54.

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 Uninstalling LCCM

The following procedure permanently removes LCCM from your server. If you are upgrading from an earlier version of LCCM, do not use this procedure. Most of LCCM's components will be removed, but LCCM's program directory and some user-created files within this directory such as the Client and Profile databases will not be removed.

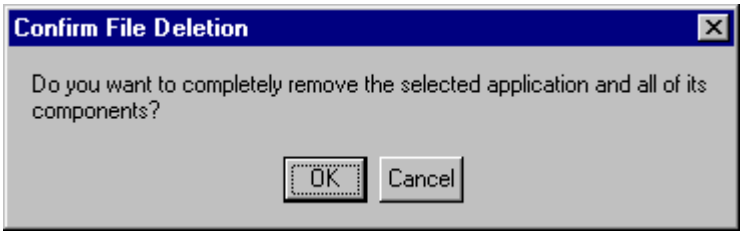
Perform the following from the administrator console, or at the computer on which you installed LCCM, to permanently remove LCCM:

1. From the Windows Desktop, click the **Start** button.
2. Select **Settings**.
3. Select **Control Panel**.
4. Select **Add/Remove Program Properties**.
5. Select **LANClient Control Manager**.
6. Click the **Add/Remove** button.
7. Click **Yes** to confirm your intention to remove LCCM.

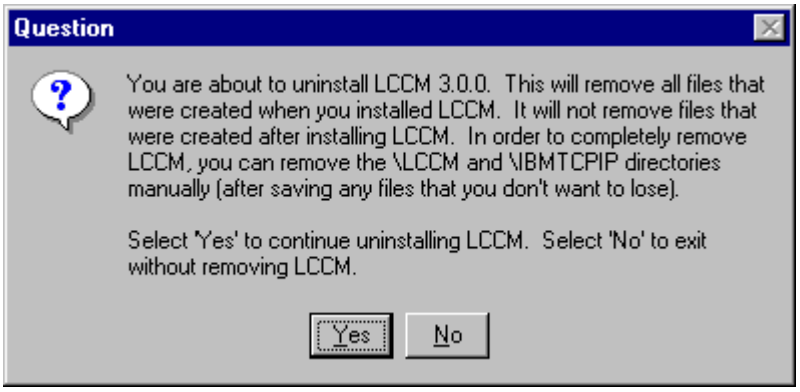
Alternatively, you can run the **LCCM30.EXE** program that you downloaded from the Internet:

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.

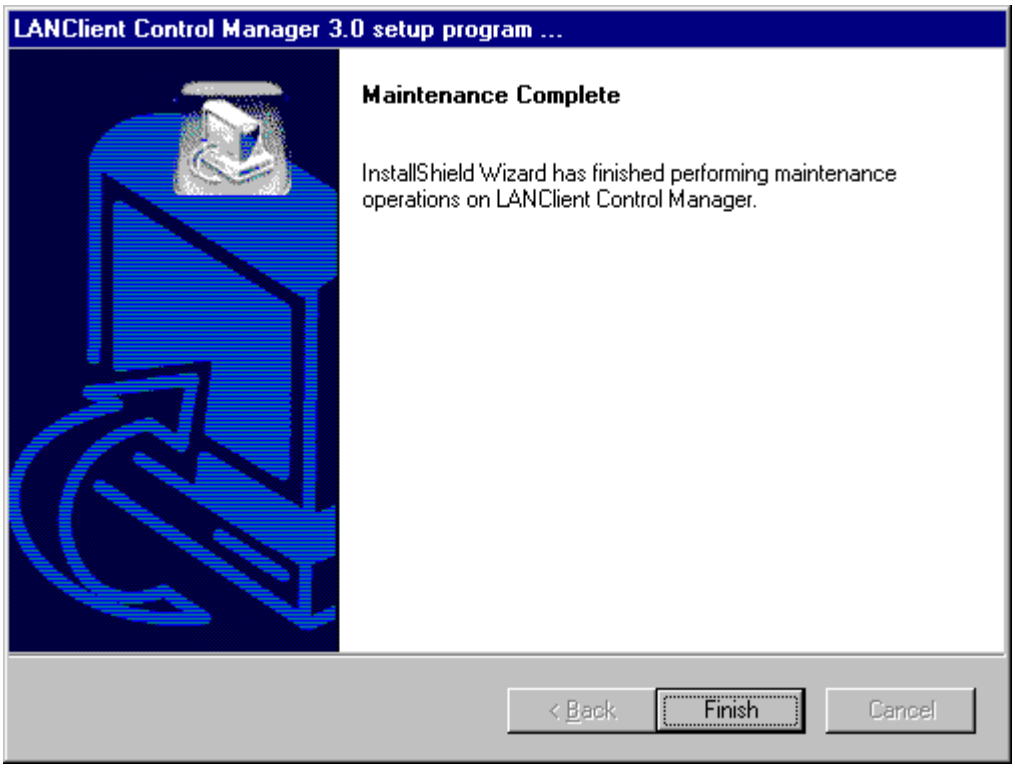


3. Click **Yes** to continue uninstalling.



4. Sometimes files may be in use and cannot be removed at that time. A message will be displayed. Click **Ignore** to continue with the uninstall and leave these files on your system, or click **Reboot** to continue with the uninstall, and these files will be removed when your system is rebooted.

5. Once the Setup program has completed uninstalling LCCM, click **Finish**.



Note: When you have uninstalled LCCM you may find that the program is still listed when you select **programs** from the start menu. This may happen occasionally if a previous LCCM 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 LCCM file that you downloaded from the World Wide Web.
- Any remaining files in the `<drive>:\LCCM` and `<drive>:\IBMTCPIP` directories.

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

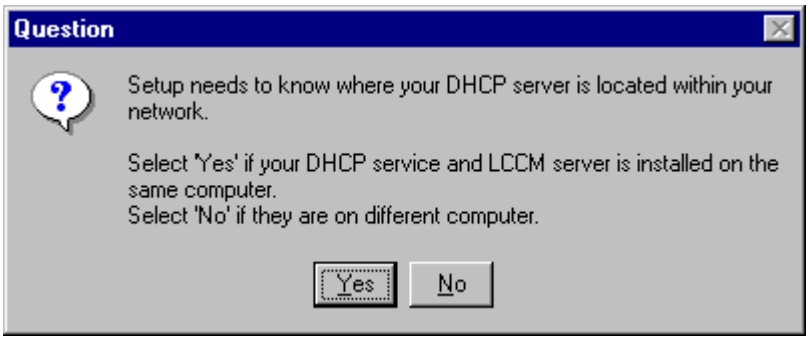
2.11 Reinstalling LCCM

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

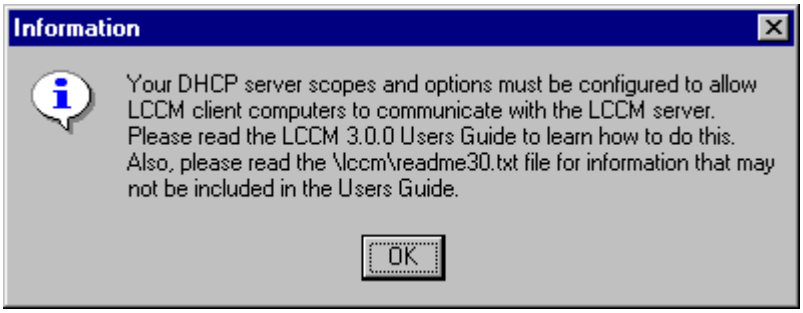
1. Run the **LCCM30.EXE** program that you downloaded from the Internet.
2. At the LANClient Control Manager Setup screen, click **Repair**, and then click **Next**.

3. Click **Yes** to continue with the re-install.

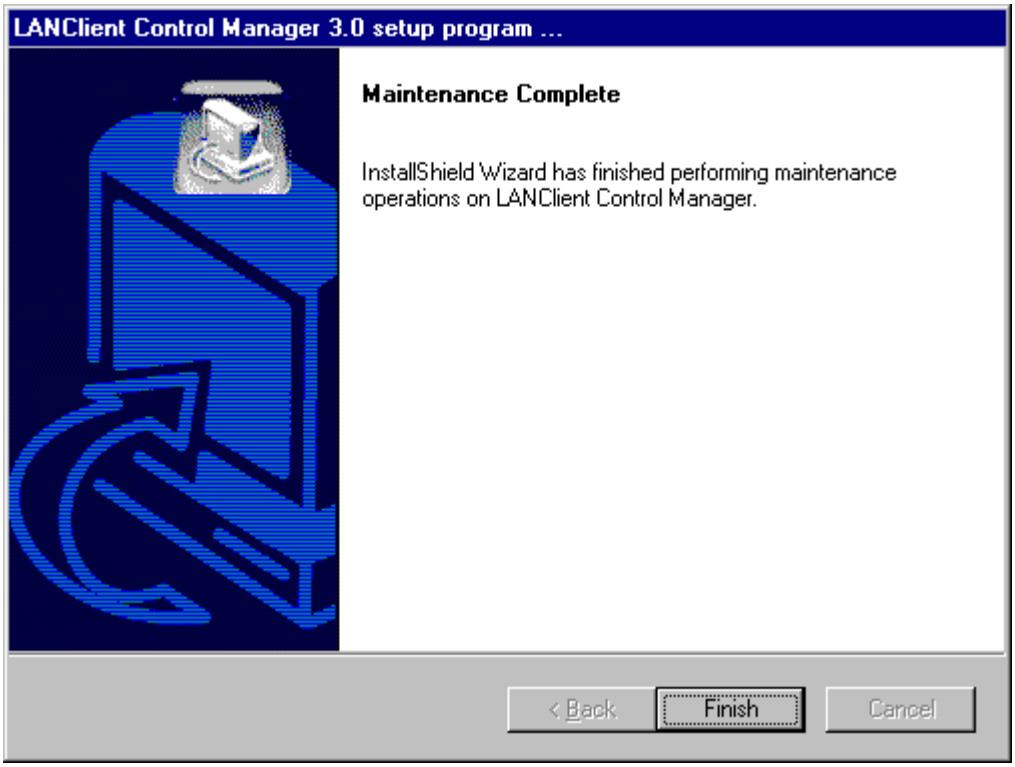
4. After all of the files have copied you will about the location of your DHCP server. Click **Yes** if your DHCP server is installed on the local machine, or click **No** if it is installed on another machine.



5. An informational screen appears reminds you to configure the DHCP Server.



6. Click **Finish** to close the setup program.



2.12 Modifying LCCM

Perform the following from the administrator console, or at the computer on which you installed LCCM, to modify LCCM components:

1. Run the **LCCM30.EXE** program that you downloaded from the Internet.
2. At the LANClient Control Manager Setup screen, click **Modify** to add or remove the LCCM 3.0 console or remote share point, then click **Next**.

Note: You cannot modify installed LCCM server components. If you are trying to repair a damaged component, please choose the 'Repair' option instead.

2.13 Performing a Silent Install

To run a silent install of LCCM you must extract the files from the **LCCM30.EXE** file that you downloaded from http://www.pc.ibm.com/us/desktop/lccm/download.html, 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 LCCM 2.5.1.

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

- If you have WinZip installed, right-click **LCCM30.EXE** and choose "**Extract to …**". Save the directory `Disk1` in the location of your choice.
- If you don't have WinZip installed, run **LCCM30.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 LCCM 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 setup 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 LCCM
  - The name of your company
  - The drive where the \LCCM 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
- Create a new setup.iss file by running `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 15 to configure the DHCP manager, configure routers, and so forth.

2.14 Migration

If you need to move the LCCM 3.0 server functionality to a new system, you can easily accomplish this by running the install program. You can migrate LCCM 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 LCCM 3.0”. In steps 8 and 9 you will be asked to locate the old LCCM server. The LCCM installation program will copy the necessary files to your new server, including client information, the software profiles, and all image files.

After the installation finishes, you should remember to power off the old LCCM server system so that it will not to interfere with the newly installed system. Also, make sure you proceed with step 5 on page 15 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 LCCM server created on the PDC. If you were to remove the old LCCM install, these user accounts will be removed along with everything else LCCM 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>:\LCCM\CLNTFILE` as well as the profile and client 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.

Chapter 3. An Overview of the Interface

This chapter gives you an overview of the LCCM Console. If you are new to LCCM, it will be easiest if you use the LCCM 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 LCCM

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

To start LCCM:

1. Click the **Start** button on the Windows task bar.
2. Select **Programs**.
3. Select **LANClient Control Manager**.

   The opening LCCM logo window appears. (If you prefer, you can uncheck the box that allows this window to display each time LCCM is started.)
4. Click **OK** to start the program.

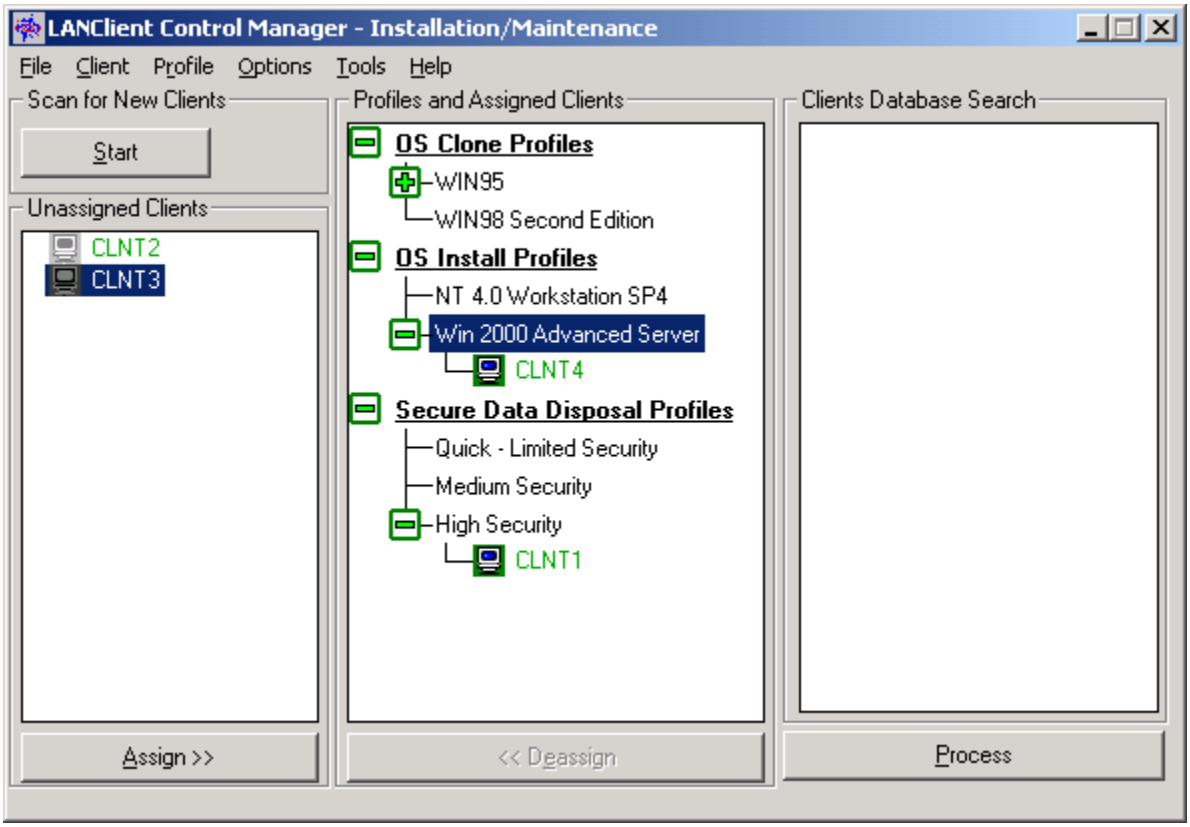
3.2 Installation/Maintenance Window

The Installation/Maintenance window is LCCM's main window. Using the buttons in this window, you can scan for new clients, assign and de-assign clients to and from specific profiles, and process client 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 clients immediately or initiate the Scheduler. Initiating the scheduler starts the client update at a scheduled day and time. For more information on the Scheduler, see "Individual Client Details – Scheduler Tab" on page 76.

The following illustration shows the Installation/Maintenance window. When you first start LCCM, you will not see new clients until you add them to the database. For more information, see "Scanning Clients" on page 79. You must also create software profiles before you can assign clients. For more information, see "Creating a Software Profile" on page 84.



Selecting Clients

You can select one client or multiple clients before performing a procedure in the Installation/Maintenance window. Clients can be selected in one of three ways:

- To select one client, click the client using the primary mouse button
- To select multiple clients, press and hold the CTRL key, click the individual clients using the primary mouse button, and release the CTRL key. Subsequent single clicks on individual clients while holding the CTRL key down toggle the selection state of that client
- To select a contiguous group of clients, click the first client in the group, hold the shift key, and then click the last client in the group. All clients between the two that you click are selected

Recognizing Clients within the Interface

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

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

To show configuration mismatches:

1. Select a client shown in red within the Profiles and Assigned Clients column.
2. Select **Client** from the menu.
3. Select **Show Mismatch**.

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

3.3 LCCM Processing

Changes made within LCCM 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 LCCM 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 LCCM running in order for the scheduled event to take place.

- **Upon Exiting**. When you attempt to exit from LCCM 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. LCCM 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 client batch files, one statement at a time. The easiest way to do this is to press the client's **F8** key as soon as the "Booting PC DOS" message appears on the client'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.

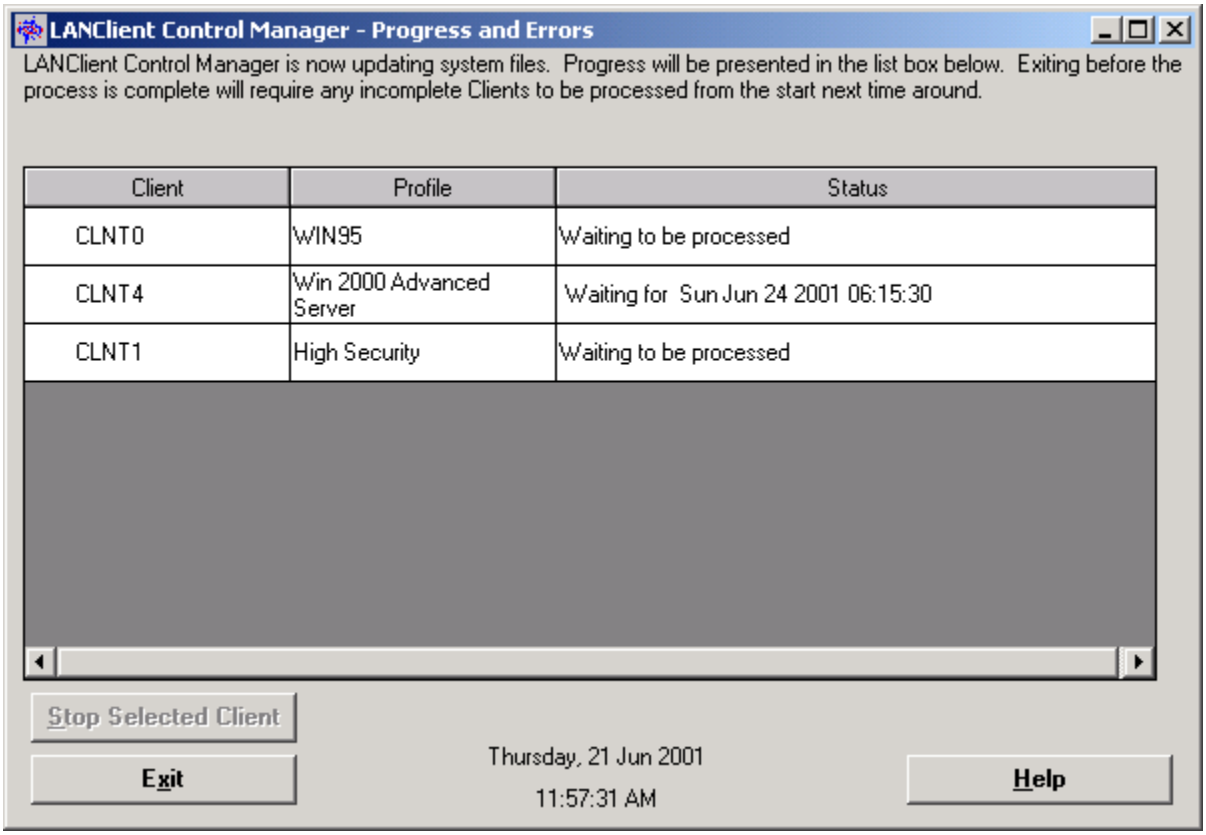
  Another technique is to add a "ctty con" statement to the beginning of your image batch file and a "pause" statement after each line. Then, run the image batch file on a donor computer until you find the error. Check the error code against the appropriate documentation for the program in the image batch 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>:\LCCM\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.

- **Client**. This lists the name that is assigned to each client
- **Profile**. This lists the software profile assigned to each client
- **Status**. The Status column indicates whether the client 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 clients 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 clients, or view the Individual Client Details notebook or Software Profile Details notebook for one client or software profile.

To stop the processing of specific clients:

1. Select the specific client in the client column.
2. Click the **Stop Selected Client** button to stop processing.

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

1. Click the Installation/Maintenance window to make it the active window.
2. Double-click a single software profile or client listed in the Profiles and Assigned Clients column.

Note: During processing, all changing of the Individual Client and Software Profile Details notebooks is disabled. It is not possible to view all parameters on the Parameters tab or Client 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 Client Details notebook or Software Profile Details notebook:

1. Click the Installation/Maintenance window to make it the active window.
2. Double-click a single client or software profile listed in the Profiles and Assigned Clients column.
3. On double-clicking a client that is currently being processed, you may be presented with a dialog box, which states “One or more selected clients 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 clients 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 client being processed.
6. Click **OK** to close the details notebook of the client or software profile that is not currently being processed.

To view parameters on the Client 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 Clients column.
3. You may be presented with a dialog box, which states “One or more clients 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 **Client 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.

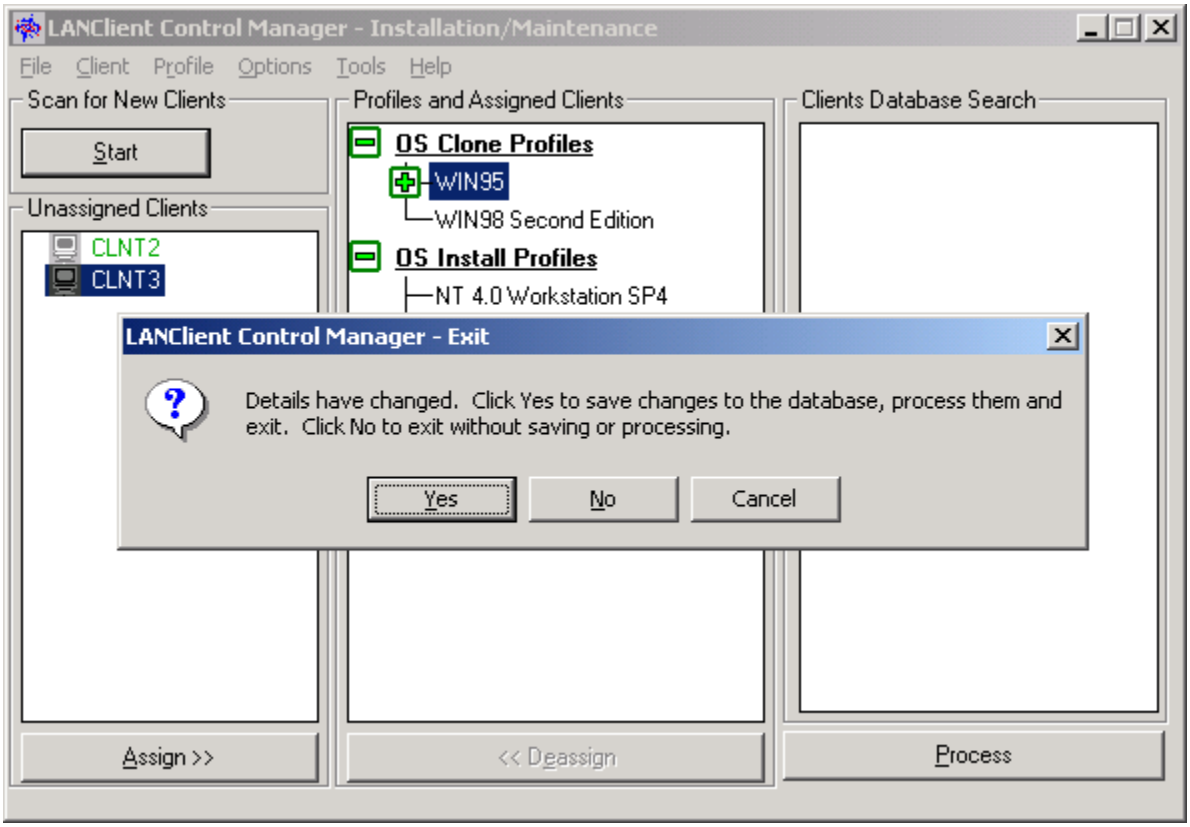
3.4 Exiting LCCM

To exit from the program:

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

If no details have changed, LCCM automatically closes.

If details have changed but have not been processed, the following message window displays.



3. 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.
4. 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.
5. Select **Cancel** to return to the Installation/Maintenance window. No processing takes place.

3.5 Defaults Notebook

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

1. Select **Options** from the menu of the Installation/Maintenance window.
2. Select **LANClient Control Manager Defaults**. The Defaults notebook opens.

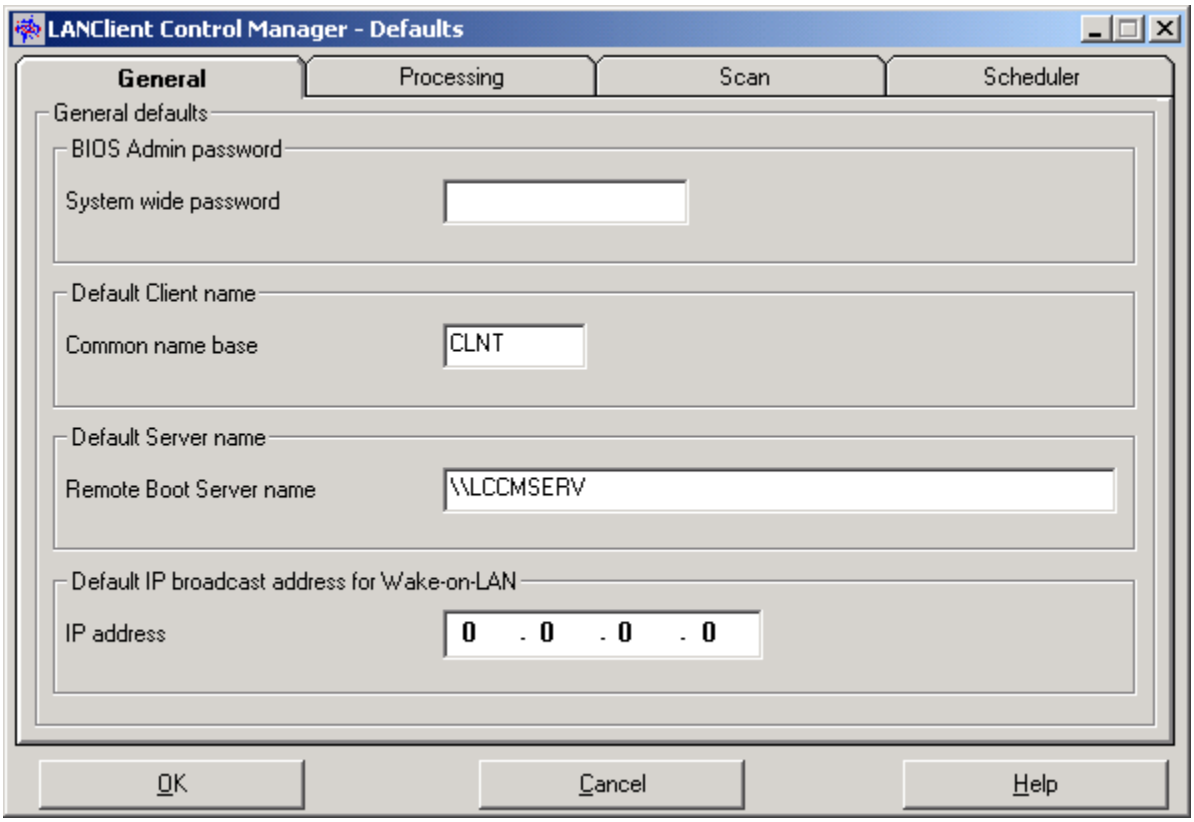
The Defaults notebook has four tabs:

- **General**. This page contains information about the BIOS administrator password, the client naming scheme, and the remote boot server name
- **Processing**. This page contains information about the remote boot process, the text editor, and the client restart function
- **Scan**. This page contains information about the optional user prompts that appear each time that the scan process discovers a client computer
- **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 Client Details notebook. For more information, see “Individual Client Details Notebook” on page 68.

Defaults - General Tab



- **BIOS Admin password**. The default value, if specified, is assigned to all new clients 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 clients when you scan them in. The default password is then applied to all new clients 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 147.
- **Default Client name**. Every client managed by LCCM must be allocated a name that is unique on the network. When the scan process generates clients, a name is automatically allocated. This name consists of the default client name base followed by an automatically generated number. The

default client name base is an alphanumeric string with a maximum of seven characters. The string must start with an alpha character. The actual client name generated is the name base followed by a decimal number from 1 to 9999. You can change the client name base if the default is not suitable

- **Default Server name**. This is the name of the LCCM server that controls the remote boot process for your clients. Anyone using LCCM must have administrator access privileges to this server. The default value is set during the installation of LCCM. 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 LCCM
- **Default IP broadcast address for Wake-on-LAN**. This field is the default IP address used to send wake-up frames to any client that does not have a wake-up address automatically configured. Valid IP broadcast addresses must be entered before LCCM can awaken clients. It may be overridden by the IP broadcast address for Wake-on-LAN that is available on the Individual Client Details – Hardware Tab page (see page 70).

  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 client 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 client on that subnet
`A`	is 0xFFFFFFFF

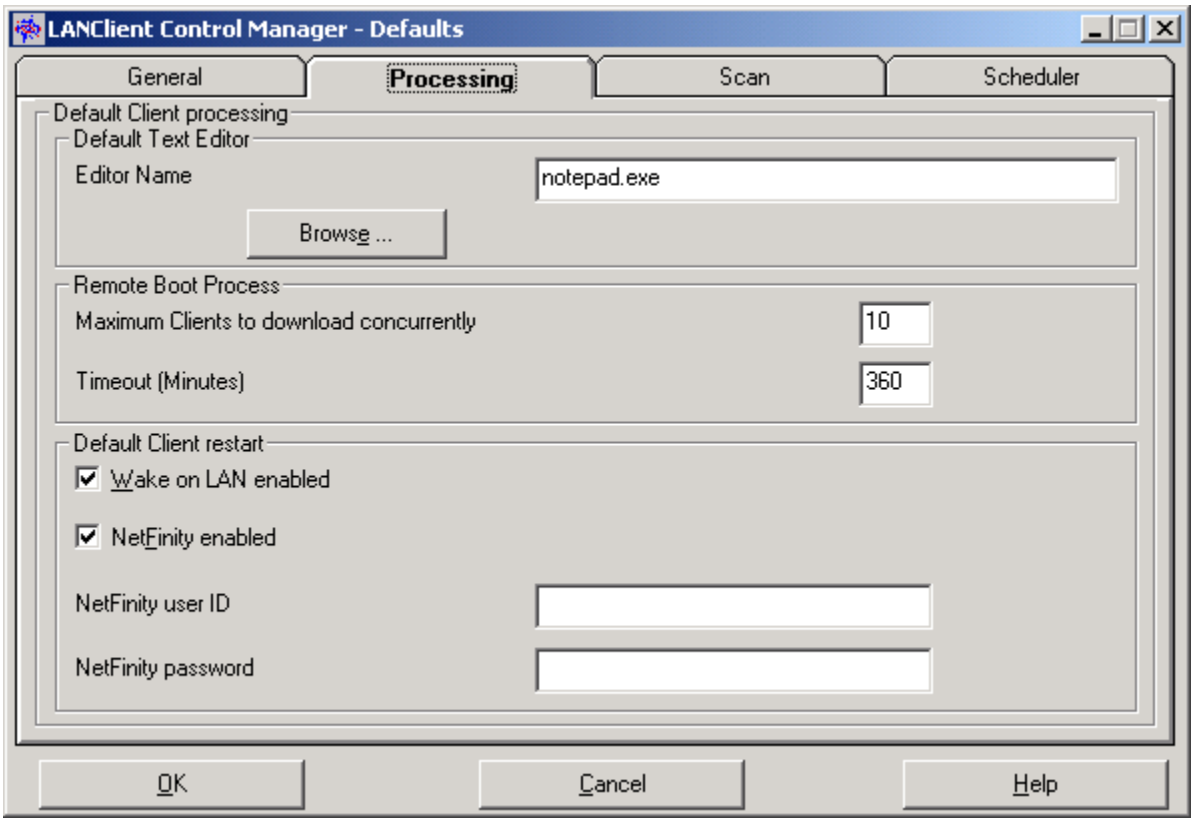
  For example, if

  ```
  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 LCCM. 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 Clients to download concurrently.** This setting limits the number of clients that can download remote boot images at the same time. For example, if you specify 10 for this limit, and if more than 10 clients 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 30) by creating a text file named `<drive>:\LCCM\LCCM.INI` that contains the line:

    ```
    PROCESSCONCURRENT=n
    ```

    where n is an integer no larger than 30.

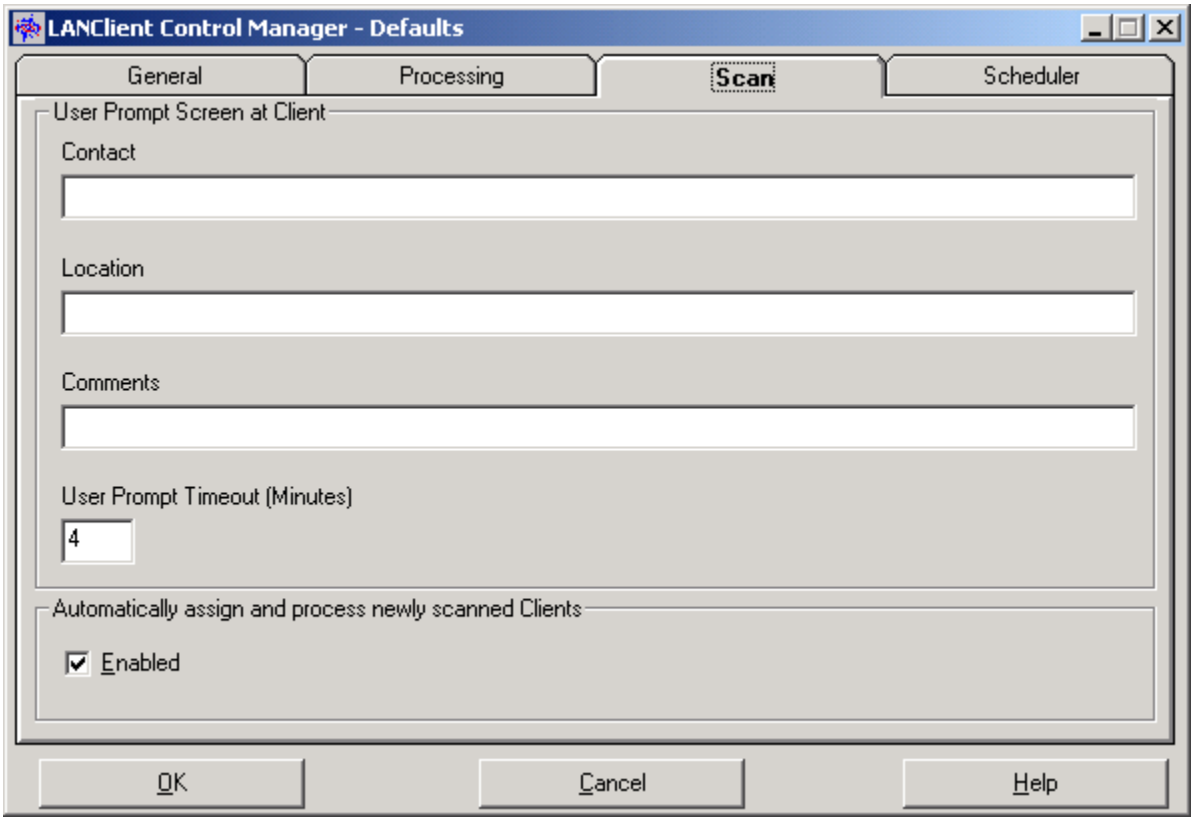
    Note: This setting affects only the number of concurrent downloads and not the number of clients that can operate in remote boot mode once download is complete.

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

- **Default Client restart**. Use the following fields to record restart options:
  - **Wake-on-LAN enabled**. Client computers that are powered off can be powered on by LCCM. To power on client computers, LCCM sends a wake-up packet containing the media access control (MAC) address of the computer in seven-second intervals across the network. When the network adapter of the client detects this packet, it powers on the computer

    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**. LCCM can use the functions of IBM Netfinity Manager to remotely shut down and restart computers 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 computers see the Forced Shutdown section of “Individual Client Details – Scheduler Tab“ on page 76.
  - **Netfinity user ID**. If you are using IBM Netfinity Manager, enter the IBM Netfinity Manager user ID here to enable LCCM 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:

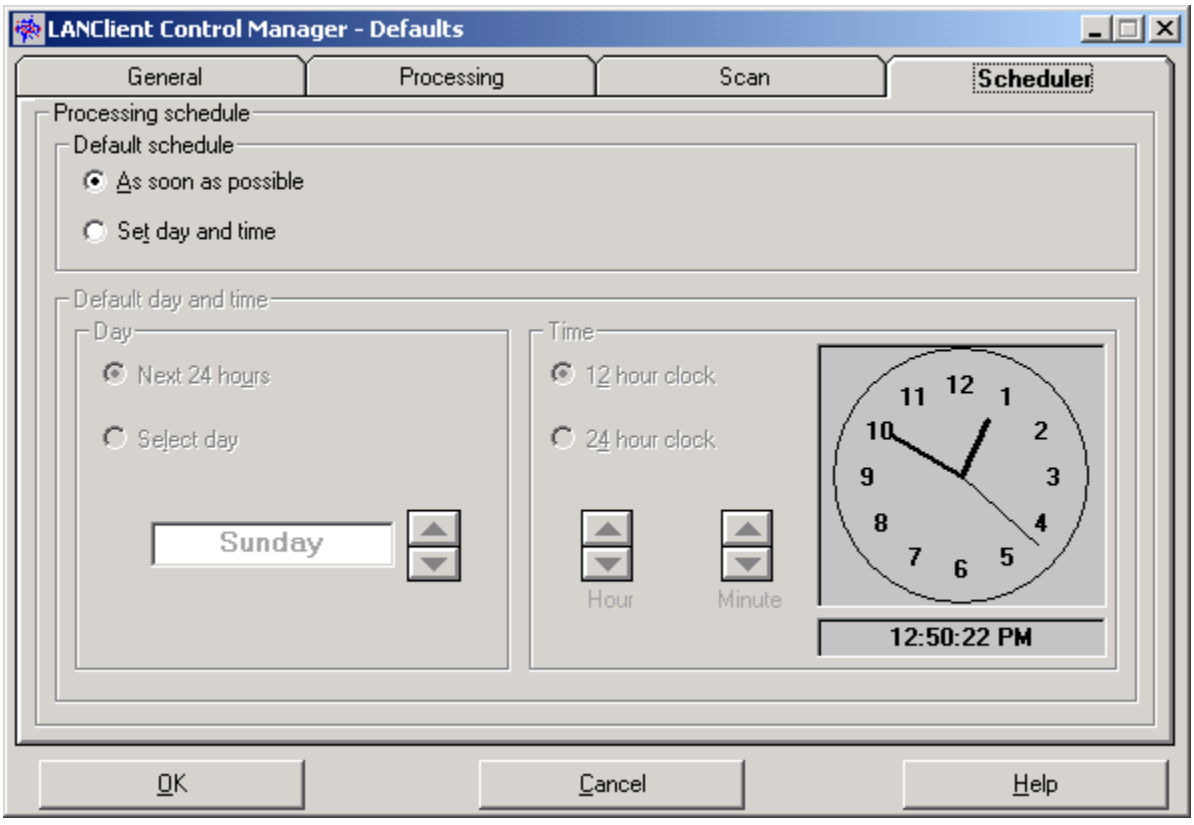
- **User Prompt Screen at Client**. You can set LCCM to ask specific questions of the end user or installer at each client computer. These questions are asked on-screen at every new client computer detected by the scan process. Displaying questions during the scan operation is optional and only occurs 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 LCCM administrator. The answers are saved on the Details page of the Individual Client Details notebook. They can be viewed, edited, and used as the value to display in lists of clients. If you do not specify any user prompts, the scan process completes without end-user input, and the values in the Individual Client Details notebook are left blank, except in the case where your client 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 Clients**. Enable this option if your computers contain Radio Frequency Identification (RFID) chips and are Asset Information Area (AIA) enabled. For more information on this function, see “Managing AIA-enabled Client Computers” on page 165.

Defaults - Scheduler Tab



In the Defaults notebook on the Scheduler page, you can specify the day and time that LCCM 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 Client Details notebook.

- Use the schedulers for the Defaults notebook and the Individual Client 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 Client Details notebook Scheduler, the client computers are immediately restarted in the middle of the working day. Also, if you set the Scheduler to update client computers during an overnight process, be sure to warn end users who might be running overnight processing that their computers 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 LCCM 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 LCCM control files accordingly.

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

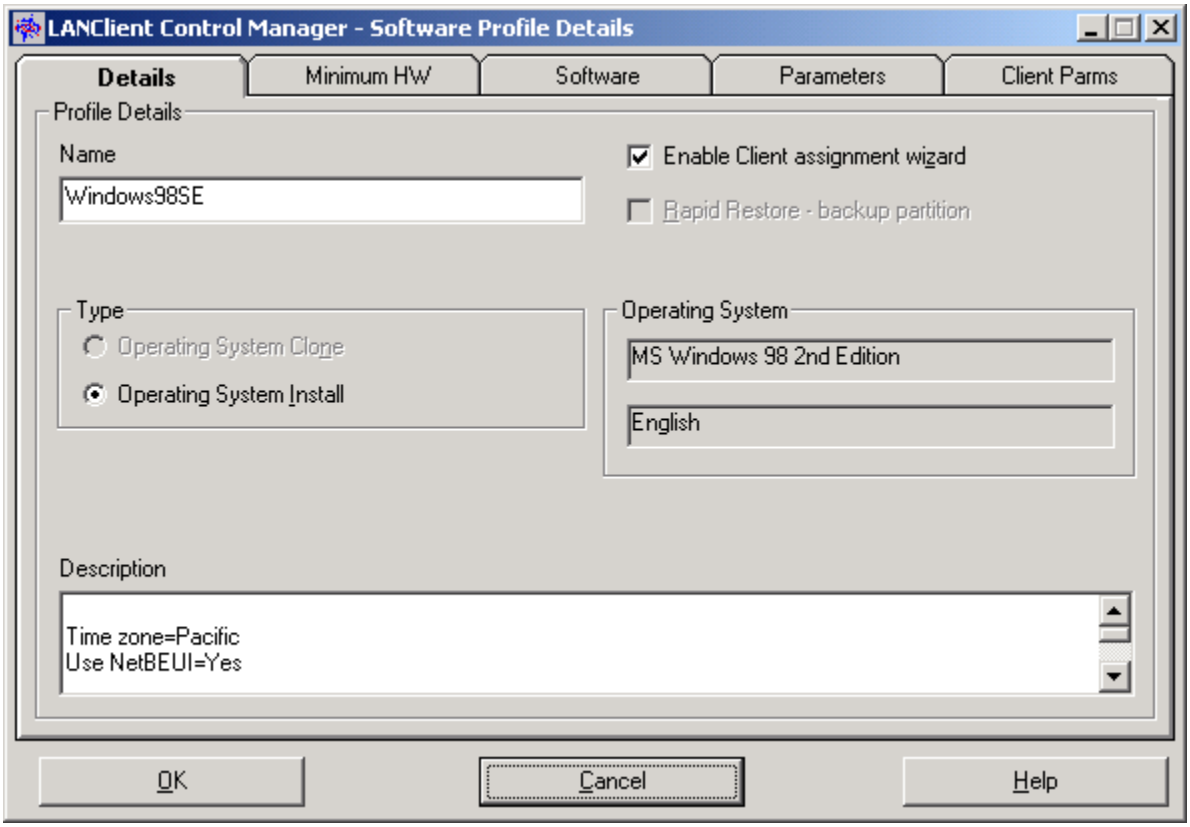
- Double-click an existing software profile within the Installation/Maintenance window

- 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 clients
- **Parameters**. This page contains information about parameters that are common for all clients assigned to the software profile
- **Client Parms**. This page contains information about parameters that are unique to individual clients assigned to the software profile

Software Profile Details – Details Tab

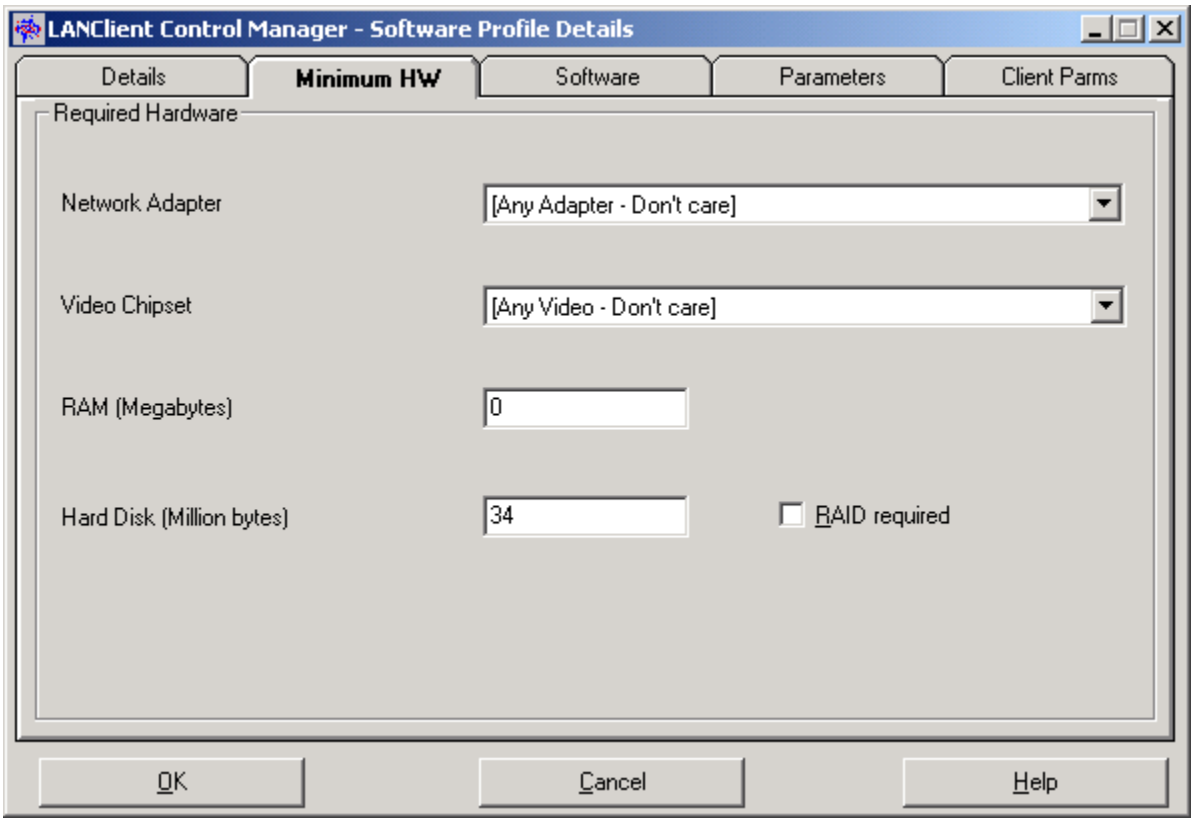


The Details page contains the following fields:

- **Name**. The name of each software profile must be unique. Give the profile a descriptive name that identifies the group of clients 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 download a Windows image to the client hard disk
  - **Operating System Install**. Select this button if the profile will be used to perform an unattended operating system installation (with or without applications) of Windows
- **Description**. Use this space to write a description of the software profile

- **Enable Client Assignment Wizard**. For the wizard to start automatically when a client is assigned to a particular software profile, this box must be checked. For more details, see “Customizing Clients Using the Client Assignment Wizard” on page 117
- **Rapid Restore – backup partition**. Check this box to enable a Rapid Restore Backup. For more details, see “Managing Rapid Restore Hard Drive Partitions” on page 151
- **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:

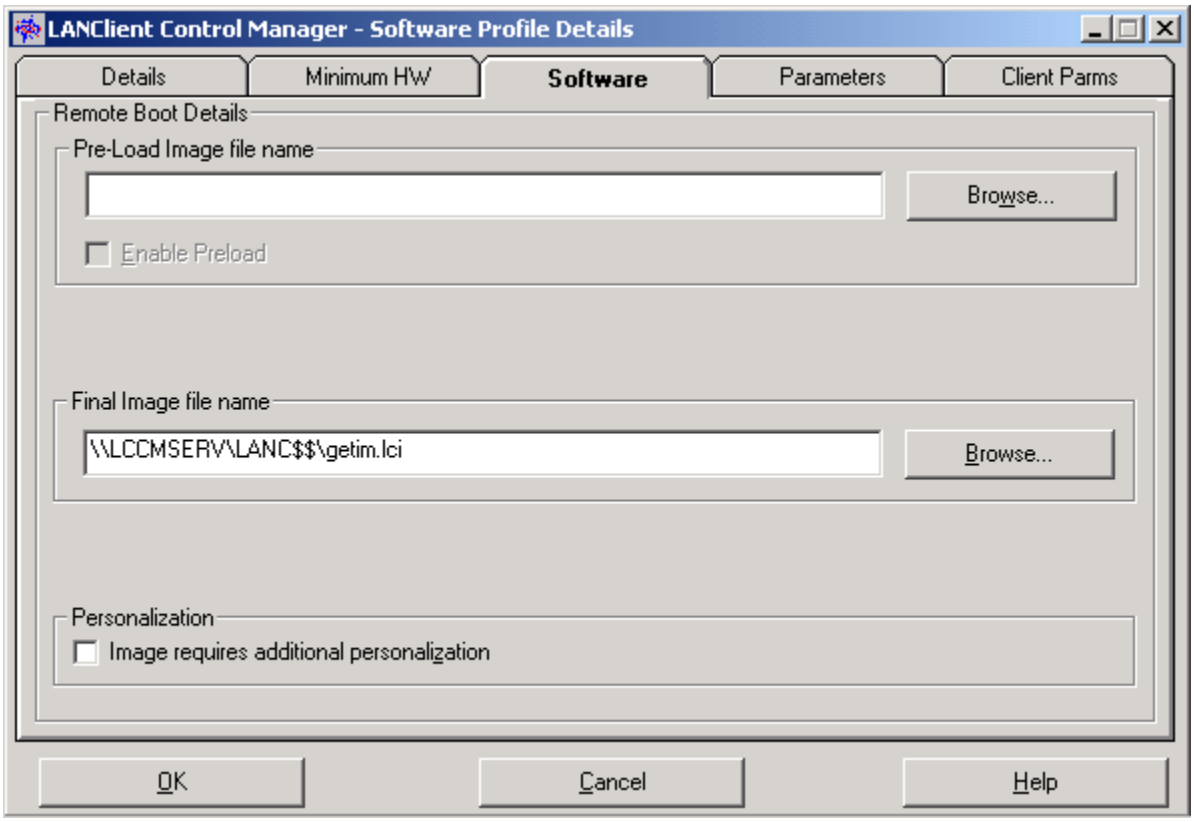
- **Network Adapter**. Select a network adapter from the drop-down list. If your adapter is not on the list, or if the clients assigned to this profile will be using a variety of network adapters, choose **Any Adapter – Don't Care**. This setting allows the image to be installed on any client
- **Video Chipset**. Select a video chipset from the drop-down list available. If your video chipset is not on the list, or if the clients 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 client
- **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, LCCM 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, LCCM ignores the minimum hard disk requirements insofar as it will not declare a client 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 91

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



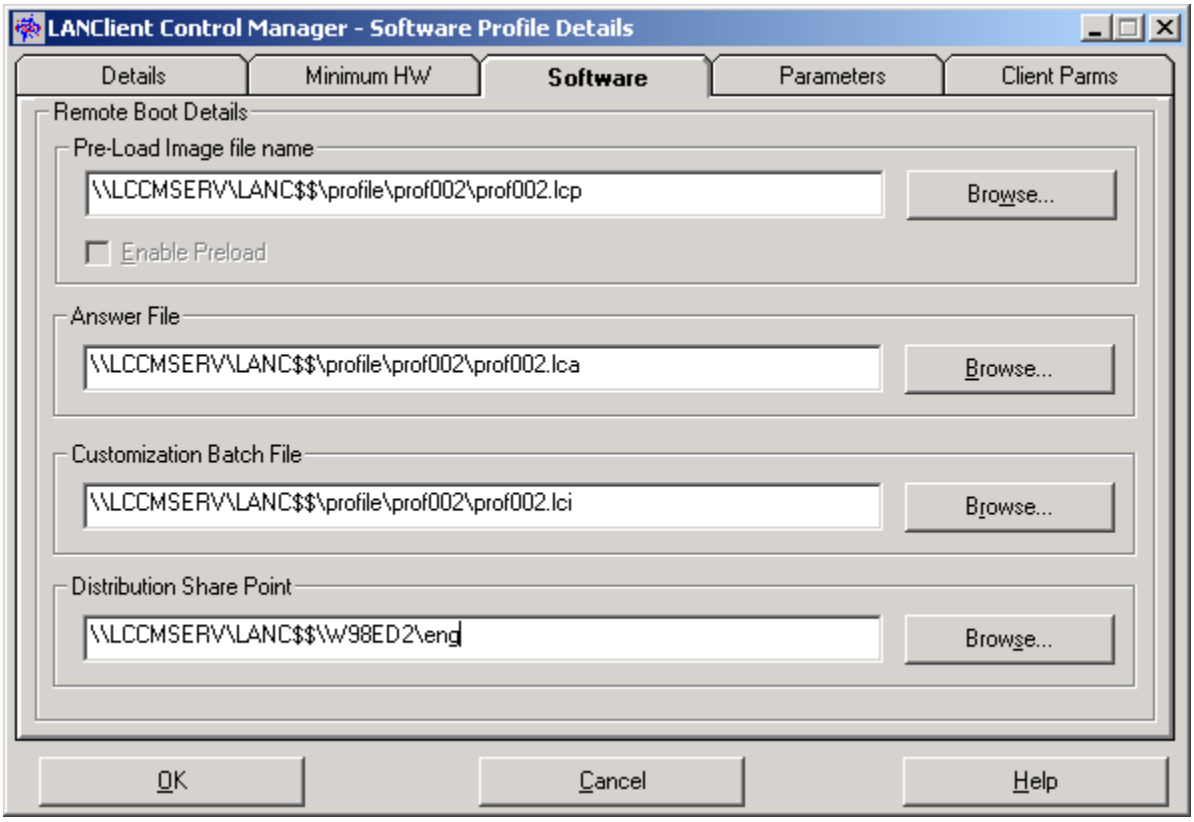
If you enabled the Operating System Clone radio button on the Details tab, the following options will be displayed:

- **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 client before downloading the final image. The preload image batch file is normally used to run FDISK on a new client computer. You must create the preload image batch file yourself. Multiple clients 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 client. Uncheck this box to disable the specified preload image batch file from being downloaded to the client
- **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 LCCM's Profile Wizard to automatically create the file. For more information, see Chapter 4, “Working with LCCM”
- **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 Client Details window. For more details, see “Individual Client Details – Software Tab” on page 72

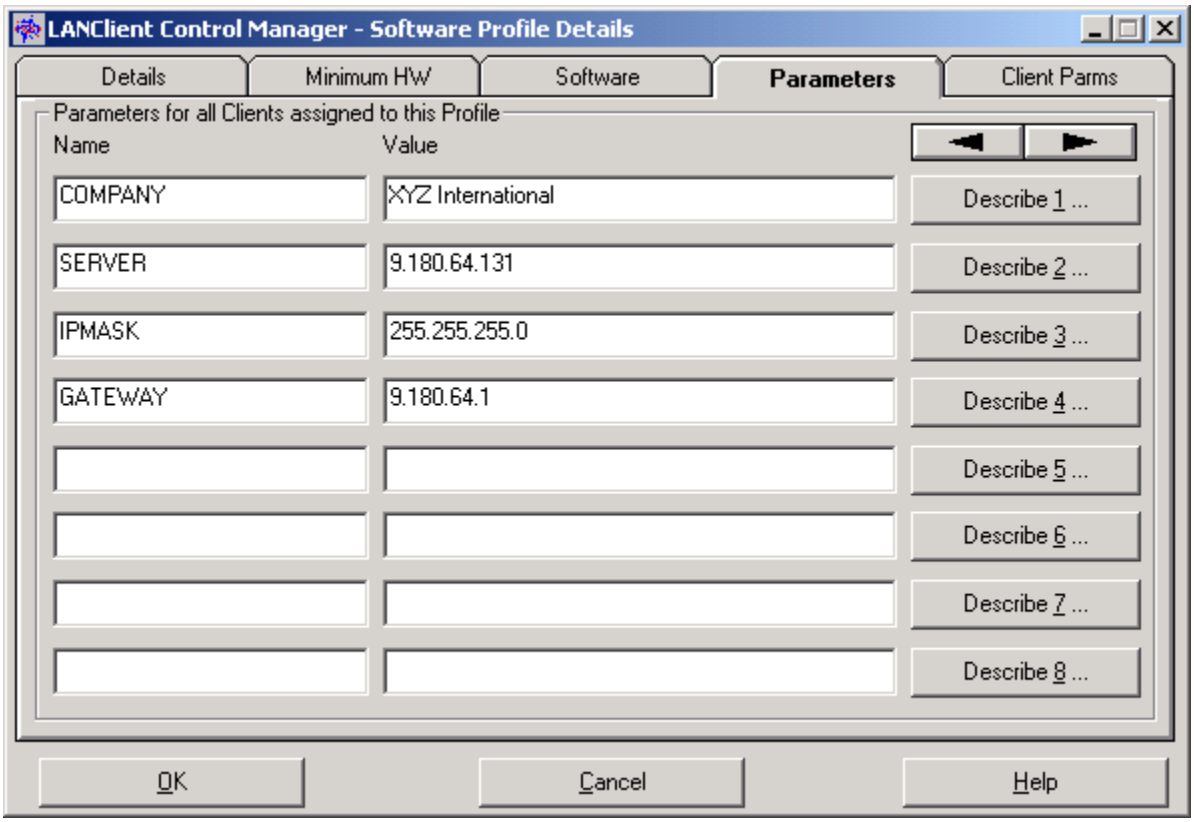
Operating System Install



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 client 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 LCCM'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 242
- **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 LCCM
- **Customization Batch File**. You can write the customization batch file yourself or use LCCM's Profile Wizard to automatically create the file. It will run the program LCCUSTOM.EXE (see page 211). 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 Client Parms page of the Individual Client Details notebook
- **Distribution Share Point**. The distribution share point is the directory on your server, 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 more details, see “Share Points” on page 169 and “Location of Unattended Install Directories” on page 172.

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 clients 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.

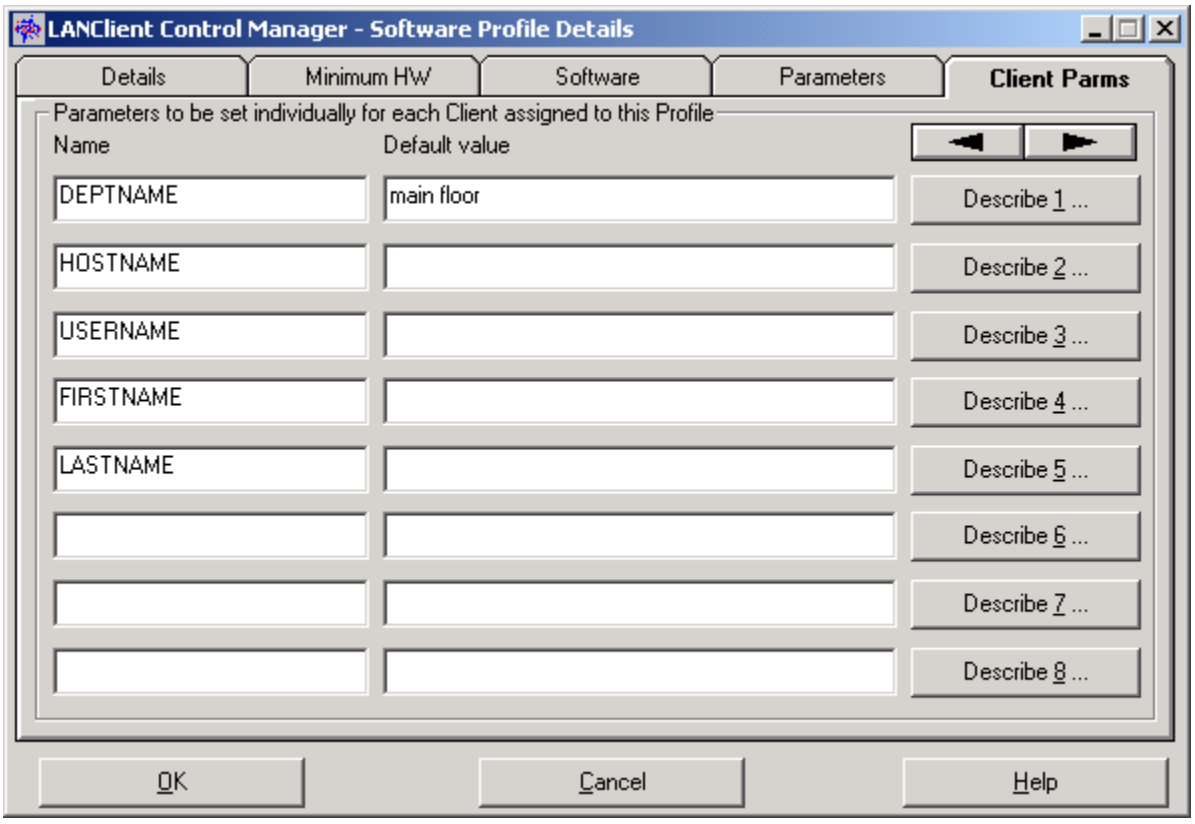
Note: To define parameters whose values can be specified on a per-client basis, you must enter them in the Client Parms page of this notebook. For more information, see “Software Profile Details – Client Parms Tab” on page 66.

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 the LCCM LCCUSTOM.EXE or DEDITD.EXE program 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 LCCM'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 – Client 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 client 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 Client Details notebook, where unique values can be provided for each individual client
- **Default Value**. The default values can be left blank because actual values will be defined in the Parameters page of the Individual Client 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 Client Details notebook where it can be overwritten. Batch files that request client parameters take the values from the Parameters page of the Individual Client 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 LCCM's Profile Wizard to create your software profiles, the Profile Wizard will automatically enter the correct parameters into the Clients 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 Client Parms page of the Software Profile Details notebook or the Parameters page of the Individual Client 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 Client 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 LCCM will automatically create the following environment variable SET statements in the final image batch file IMAGE.BAT for your profile:

- `SET LCCMCONTACT=<client_contact_string>`

  Where `client_contact_string` is the value taken from the Contact field in the Details page of the Individual Client Details notebook.

- `SET LCCMLOCATION=<client_location_string>`

  Where `client_location_string` is the value taken from the Location field in the Details page of the Individual Client Details notebook.

- `SET LCCMCOMMENTS=<client_comments-string>`

  Where `client_comments_string` is the value taken from the Comments field in the Details page of the Individual Client Details notebook.

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

Profile Wizard

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

- `LPRO_`
- `LCLI_`

3.7 Individual Client Details Notebook

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

To access the notebook for an existing client:

1. Select a client (or multiple clients) in the Installation/Maintenance window.
2. Select **Client** from the menu.
3. Select **Configure**.

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

To create a new Individual Client Details notebook:

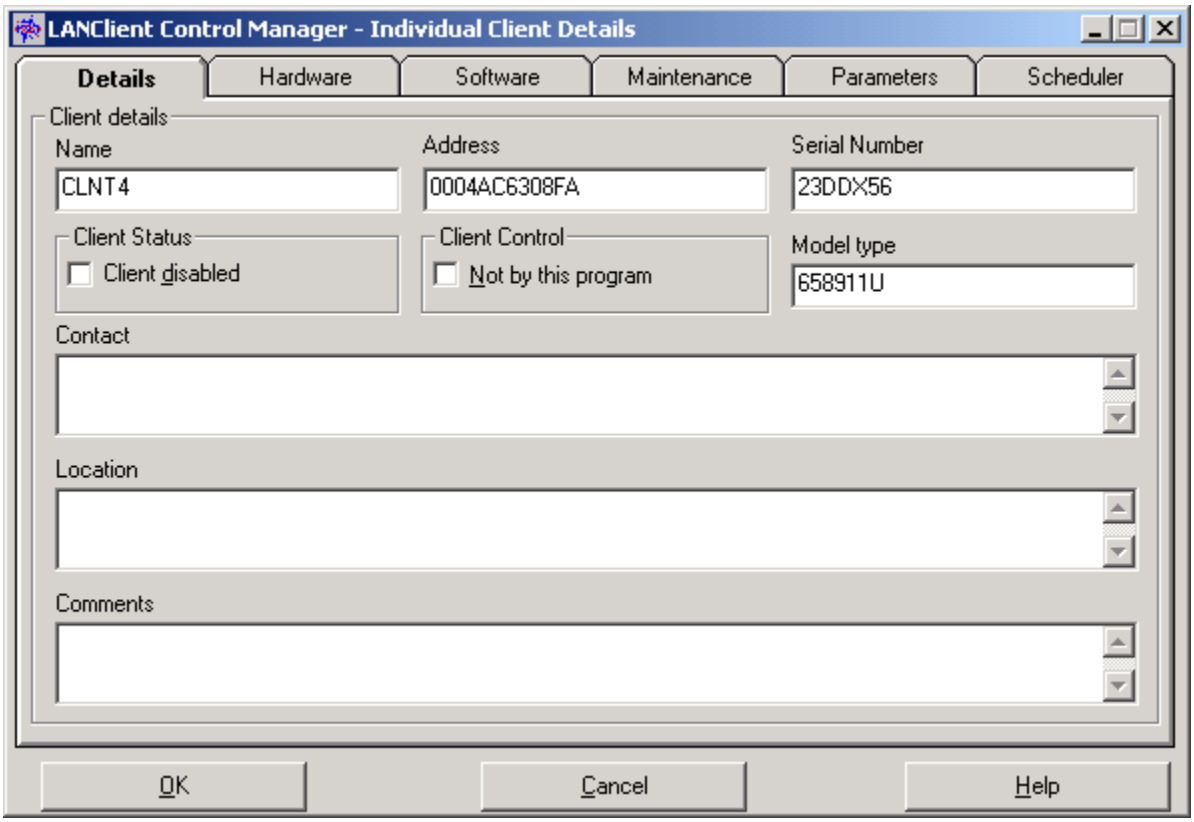
1. Select **Client** from the menu bar.
2. Select **Create New**.
3. Fill in the appropriate fields on the notebook pages.

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

The Individual Client Details notebook has the following tabs:

- **Details**. You can use this page to view details about the client. For example: name, address, and serial number
- **Hardware**. You can use this page to view information about the client hardware
- **Software**. You can use this page to view details of the client's assignment to a software profile
- **Maintenance**. You can use this page to enter information about various maintenance procedures for the client, such as BIOS, CMOS, and administrator password updates
- **Parameters**. You can use this page to personalize information within a remote boot image for the client
- **Scheduler**. You can use this page to control when scheduled changes will take place for the client.

Individual Client Details – Details Tab



The Details page of the Individual Client Details notebook contains information that identifies the client:

- **Name**. If the client is created automatically by the scan process, LCCM generates the name. If you manually create a client, 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 clients. This name becomes the computer name after an LCCM operating-system deployment, so you may want to change the name before deployment. The LCCM 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 in the client computer. 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 client network adapter MAC addresses or client address, is normally collected during the scan process. If you create a client without using the scan process, you must get the network address from the client and enter it in this field. Also, when the network adapter for an existing client has been changed (for example, if the old one developed a fault), you can enter the new address here

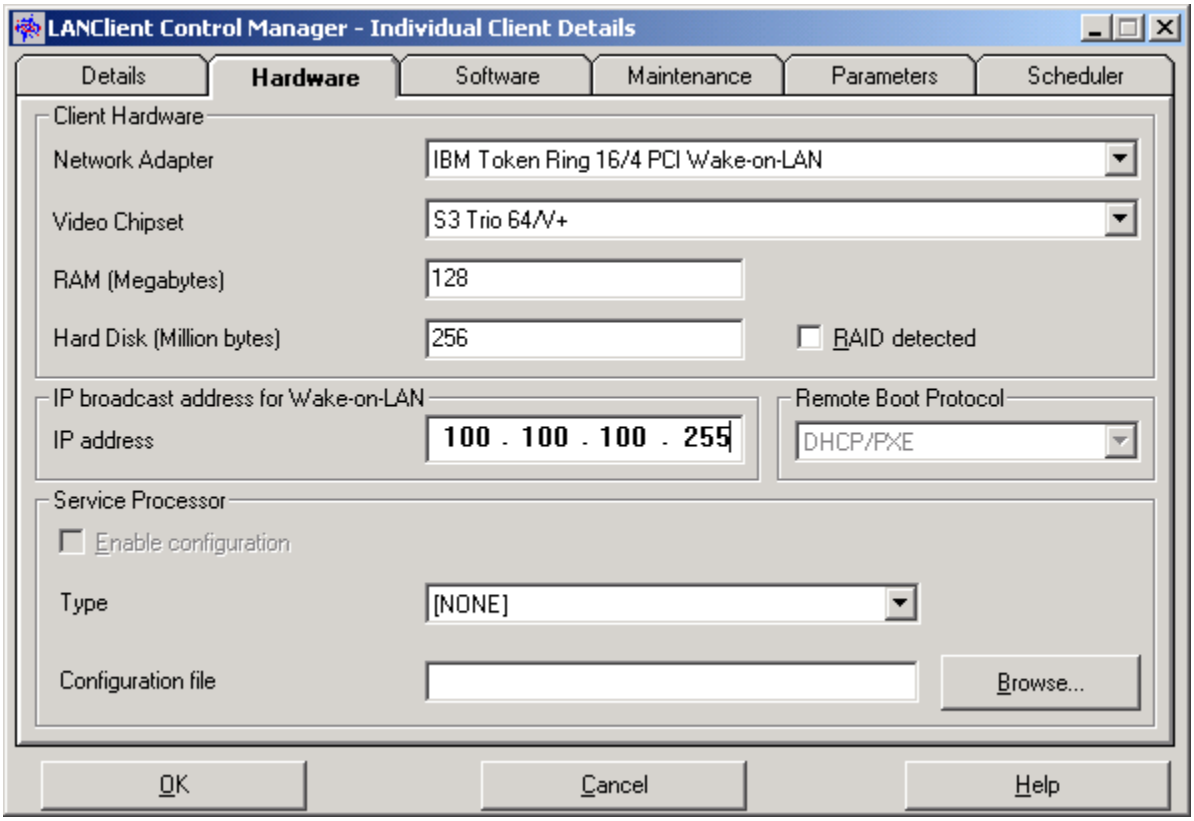
  To find the network address for a client, turn on the client and let it attempt to start up from the network. The address is displayed on the screen along with other information. Alternatively, some network adapters have their addresses printed on labels attached to the adapter's bracket. If the network 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 client serial number that is collected during the scan process or manually entered when you create a client
- **Client Status**. If the **Client disabled** checkbox is selected, the client cannot start via LCCM using PXE

- **Client Control**. This field indicates whether this LCCM program or another program is controlling this client. If you enable the **Not by this program** check box, it indicates that the client is controlled by another program and the scan operation is the only operation that can be performed on that client by this LCCM program. The controlling program can be LCCM running on another server or some other remote management program
- **Model Type**. This field shows the machine type and model number of the client computer. 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 client computer has a Radio Frequency Identification (RFID) chip and is Asset Information Area (AIA) enabled. For more details, see “Managing AIA-enabled Client Computers” on page 165. The actual meanings and uses of these fields are completely up to the LCCM administrator. You can change or update these fields at any time:

- **Contact**
- **Location**
- **Comments**

Individual Client Details – Hardware Tab



The Hardware page of the Individual Client Details notebook contains details about the installed hardware of each client. LCCM uses this information to ensure that a new client meets the hardware requirements for a specific software profile. The client 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

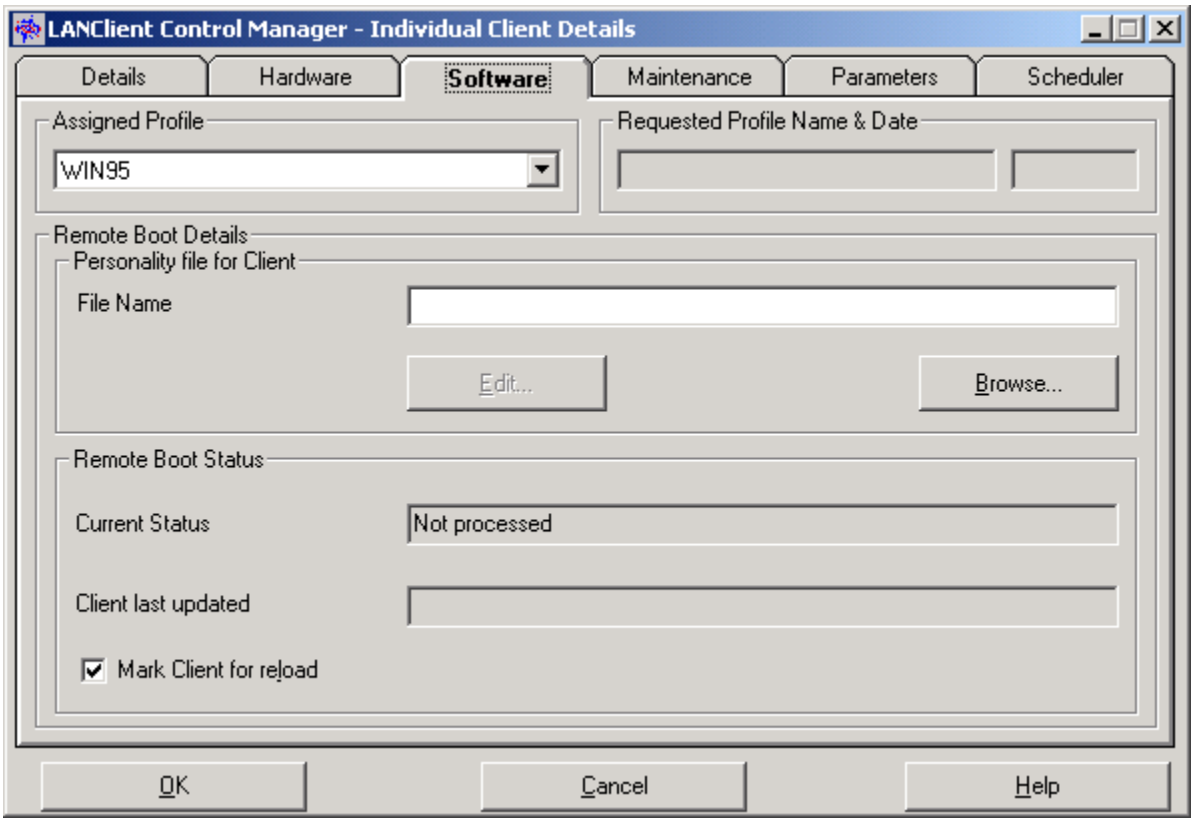
- **Video Chipset**. As with the Network Adapter this Video Chipset is the one that the scan process identified. It is strongly recommended that you do not change this setting
- **RAM**. This field displays the amount of installed random access memory (RAM). The amount specified is in units of 1,048,576 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 client computer. 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 client

  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 client 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 clients 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 clients 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 clients. To determine the IP broadcast address for a client, see “Defaults - General Tab” on page 55
- **Remote Boot Protocol**. This field displays the client computer network protocol detected by LCCM during the scan process. This field is grayed out and cannot be changed because LCCM 3.0 supports only PXE
- **Service Processor**. If your client computers have service processors installed, the scan process will search for service processor items and the respective fields will be completed with valid components that the scan process has found:
  - **Enable configuration**. The Enable configuration check box must be checked for LCCM to fully implement your service processor on your client computer
  - **Type**. The scan process scans the service processor and fills in this box. It is strongly recommended that you do not change this setting
  - **Configuration file**. The configuration file that shows up in this box is the default service processor initialization file SERVPROC.INI supplied with LCCM 3.0. Use the **Browse** button if you want to select another service processor configuration file

  Note: The default configuration file SERVPROC.INI supplied with LCCM 3.0 has no default values. For this file to reflect your server network configuration, you must edit SERVPROC.INI, using Notepad. Please read the warning and comments within this file.

Individual Client Details – Software Tab



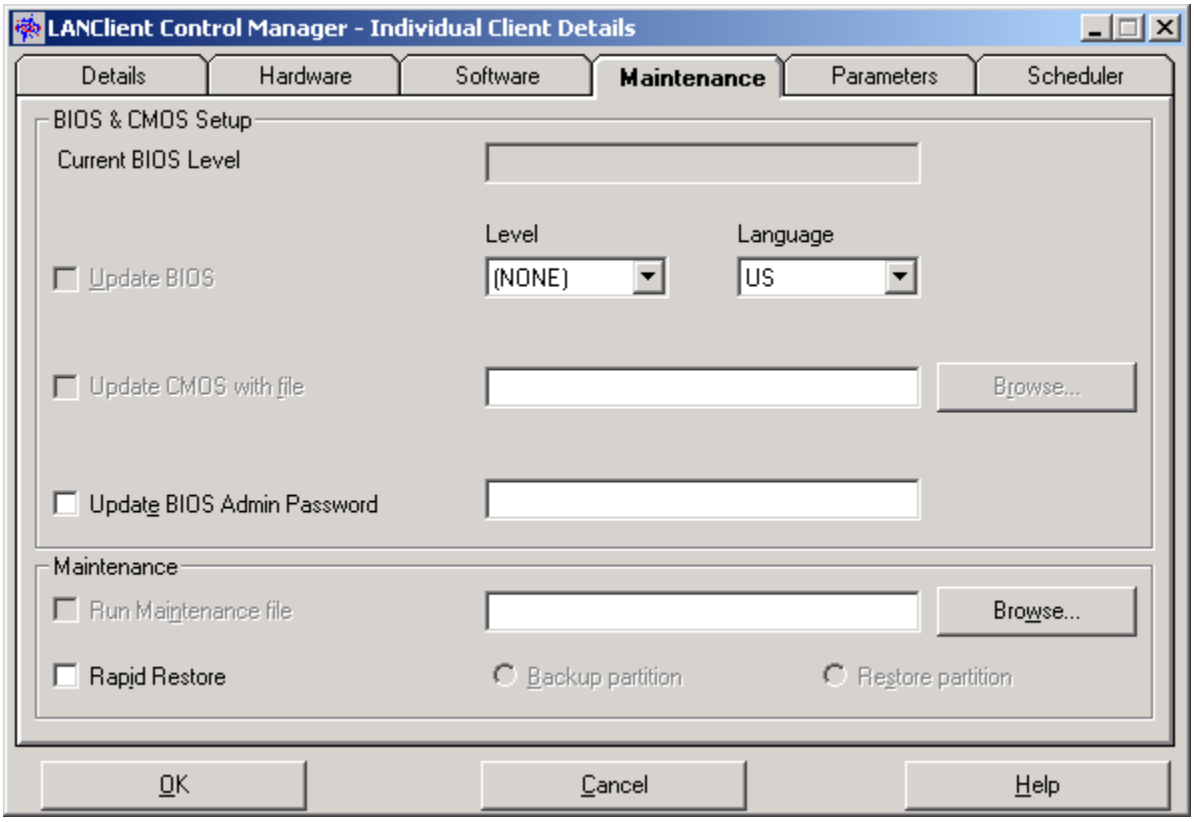
The Software page of the Individual Client Details notebook is used to set up the details of a client assignment to a software profile:

- **Assigned Profile**. Select an appropriate software profile from the drop-down list for the client computer (If there are no software profiles created, the default, **Unassigned**, is selected). If you assign a client to a profile using the Installation/Maintenance window, this field is filled in automatically
- **Requested Profile Name & Date**. For client computers equipped with a Radio Frequency Identification (RFID) or Asset ID chipset, LCCM 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 58 and “Managing AIA-enabled Client Computers” on page 165
- **Personality file for Client**. (Only for clients assigned to Operating-System Clone profiles.) You can specify a personality batch file for Operating-System Clone clients 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 client 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 193, or to pass more parameters than the LCCM interface provides for. This field cannot be selected for multiple clients
- **Remote Boot Status**:
  - The **Current Status** and **Client last updated** fields are for informational purposes only. You cannot enter data into these fields
  - **Mark Client for reload**. You can force a reload of the software profile on the client at its next startup by clicking on the reload check box. This is useful if the software on the client 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 computer. The profile will be deployed only if the reload box is checked.

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

Individual Client Details – Maintenance Tab



The Maintenance tab of the Individual Client Details notebook is used to specify various actions to maintain and update the client. If you select any of the Update or Run boxes, the next time the client is processed, the selected procedure runs. The following fields are available on the Maintenance page:

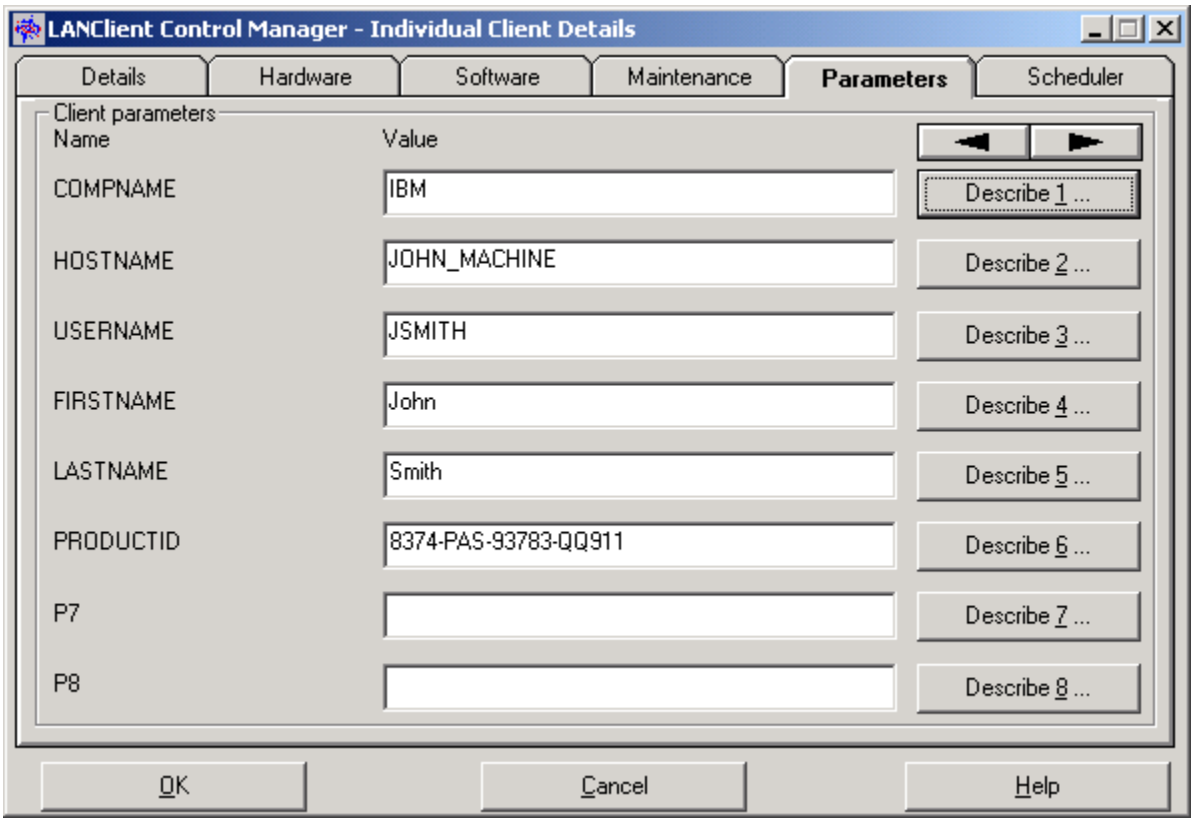
- **Current BIOS Level**. The scan process determines the current BIOS level. This field contains the name of the BIOS level currently installed in the client. This name will not match the level as reported by the BIOS setup screen of the client if you changed the default level name detected during the Read BIOS Flash Diskette process. For more information, see “Upgrade the BIOS Level” on page 148
- **Update BIOS**. Select this box to update the client 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**. Select this box to update the client CMOS settings. Enter the name of the file, or search for a file by selecting the **Browse** button. The file extension for CMOS-update files is (.CMS). The CMOS settings will be updated the next time this client is processed. Refer to ”Update the CMOS Settings” on page 150 for more information

- **Update BIOS Admin Password**. Select this box to set or change the client BIOS administrator password. You can enter the new password or delete the current password. The password will be updated the next time this client is processed. Refer to “Managing BIOS/CMOS Settings” on page 147
- **Run Maintenance file**. Select this box to run a maintenance batch file. If your maintenance file is not found or the client 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 client the next time the client 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 client starts, instead of the operating system clone remote boot bootstrap or remote boot image being downloaded, a maintenance bootstrap is loaded on to the client and the specified batch file is run. When the batch file completes running, the client restarts and normal operation continues. You can use this process to update a single application on the client 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
- **Rapid Restore**. Enable Rapid Restore to create a backup of your client's primary partition when it is in a known good state, or to restore the client’s primary partition from an existing backup. For more details, see “Managing Rapid Restore Hard Drive Partitions” on page 151:
  - **Backup partition**. Select this option to create your Rapid Restore Backup
  - **Restore partition**. Select this option to restore your client's primary partition from an existing backup partition

Individual Client Details – Parameters Tab



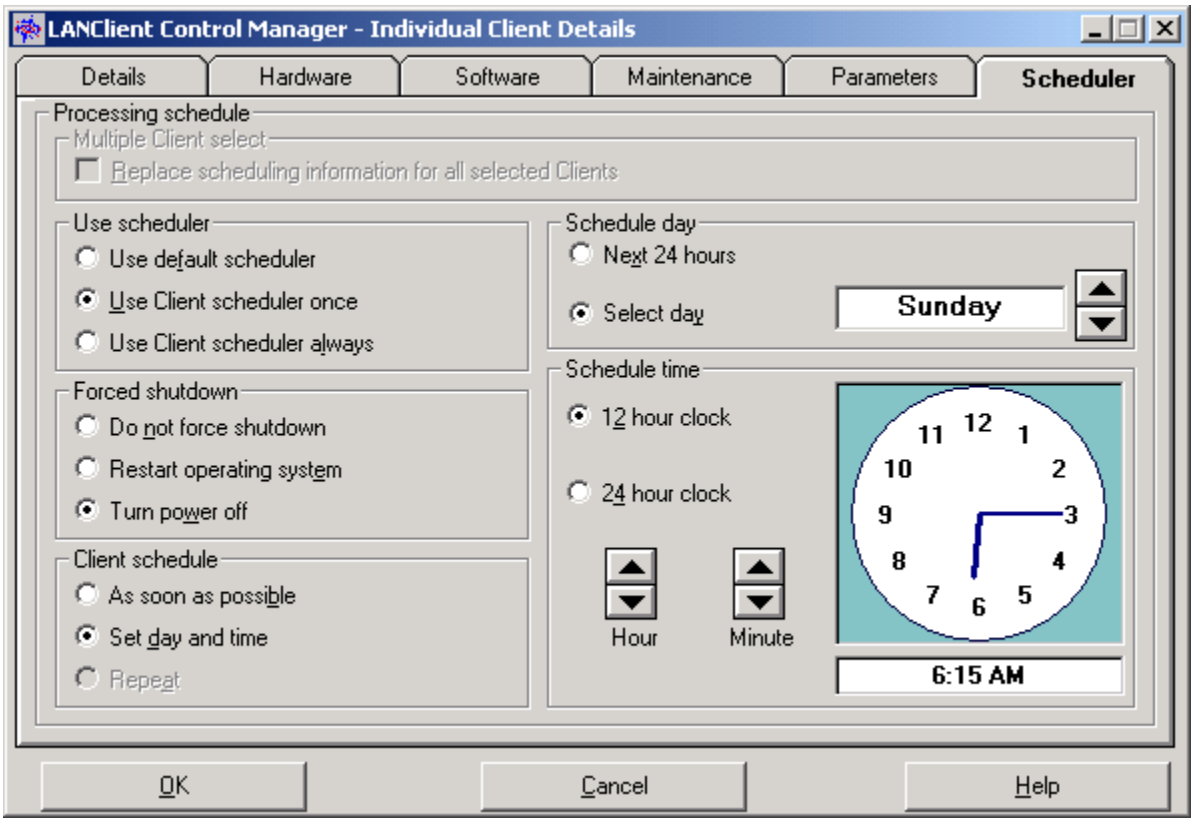
The Parameters tab is used to personalize an image to contain information for an individual client. There are up to 24 possible parameter names and values available for each client. Use the left and right arrow buttons to navigate between the 3 pages of possible parameters. The values you specify here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

The following fields are available:

- **Name**. These names are used as variables in the various LCCM batch files. They are taken from the Client 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 LCCM 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 - Client Parameters page. You cannot edit this information from within the Individual Client Details window

Note: Be careful when reassigning clients 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 client uses in the new software profile. If the new profile has different parameters, you will need to change their values.

Individual Client Details – Scheduler Tab



The Scheduler page is used to specify the date and time that LCCM begins processing the changes that have been requested for the selected computers. 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 computers 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 “LCCM Processing” on page 51.

Use the Scheduler for the Individual Client 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 client computers are restarted in the middle of the working day. Also, if you set the Scheduler to update client computers 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 computers 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 Client select**. This box is grayed and not checked unless you selected multiple clients. If you have selected multiple clients and this box is checked, this schedule will be used for all selected clients

- **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 Client Scheduler once**. If this option is selected, the schedule information on this page is used for the next client process only. Thereafter the client reverts to using the Scheduler of the Defaults notebook
  - **Use Client 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 client computer is still operating when the scheduled process time arrives, the computer will not be shut down and restarted. The remote boot download takes effect the next time the end-user restarts the client computer, or via Wake-on-LAN if the client 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 client computer is operating when the scheduled time arrives, the computer 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 client computer 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 Client scheduler once** or **Use Client scheduler always** is selected under Use Scheduler.

- **Client 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, LCCM 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 Client schedule section is available only if you have selected the **Use Client 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. LCCM 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. LCCM 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 LCCM

In this chapter the more common LCCM operations will be described. You'll learn how to scan clients, how to create software profiles, how to assign clients, and how to use the various wizards provided with LCCM. Advanced LCCM functionality will be described in Chapter 6, "Advanced Administrative Topics".

4.1 Scanning Clients

This section provides step-by-step instructions for setting up client computers for use with LCCM and adding these to the LCCM database.

Set Defaults Prior to Scanning

Prior to running your first scan procedure, you want to set specific defaults for LCCM so that each scanned client computer is assigned the appropriate values. For more information, see "Defaults Notebook" on page 54. 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 LCCM console, click **Start** to scan for new clients.
2. Make sure that the hardware setup of your client computer is correct, i.e. everything is connected and plugged in
3. The new client computers being scanned must be turned on so that they boot to the network during the scan process. You can turn on the client computers manually (recommended), or you can turn on the clients remotely using the LCCM Wake Tool. For details about waking up the clients remotely, see "Waking up Clients Remotely" on page 80. The scan feature does not wake up computers.
4. If the client computer is properly configured, it will boot to the network with the PXE protocol. If this doesn't happen, see "Scan Feature Troubleshooting" on page 82.
5. If you have set the defaults on the Scan page of the Defaults notebook to collect user data when the new client computer 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 client detected during the scan operation.
7. Each new client computer is placed in the Unassigned Clients list of the main window.

The scan function collects details about new clients that boot to the network during the scan operation and for which no details are currently recorded in the LCCM client 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

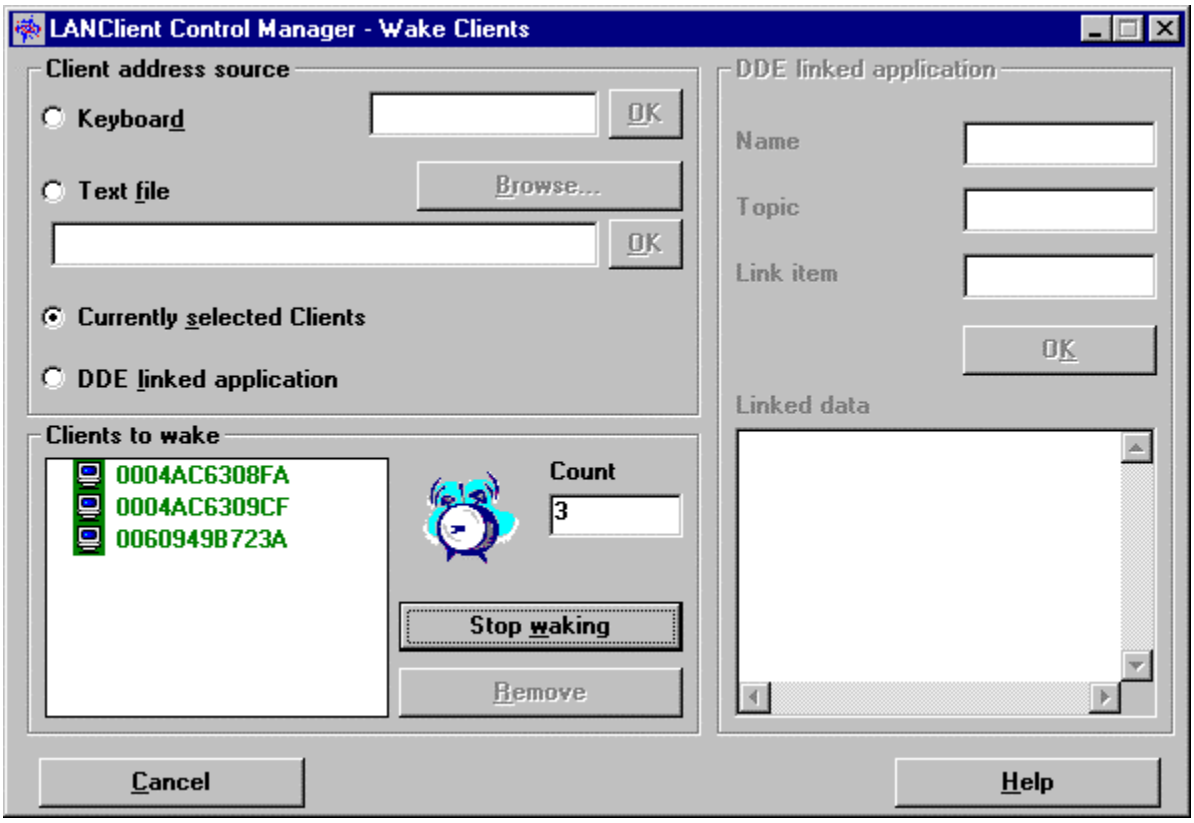
To stop the scan process, click the **Stop** button. All client computers that were properly setup are now added to the LCCM database.

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

Waking up Clients Remotely

Using the Wake Clients function, you can remotely power on computers 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 computer remotely. It can also be used while the LCCM 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 LCCM to wake clients.
2. Select **Tools** > **Wake** > **Client** to display the Wake Clients window.



The following fields are displayed:

- **Client address source**: The information in the client address source fields is used to identify MAC addresses of the computers you want to wake up. Clients can be started from the Wake Clients 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 clients found will be displayed in the Clients 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 **Clients 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 **Clients 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 Clients**. If selected, the MAC addresses of any clients currently selected in the Profiles and Assigned Clients, Unassigned Clients, or Clients Database Search fields in the LCCM Installation/Maintenance window are added to the list of clients to wake. If additional clients are selected in the Installation/Maintenance window, and the Wake Clients window is brought back into focus, these clients are added to the list
- **DDE linked application**. This functionality is used to promote information to link a database program to LCCM and use the functions of that program to read in clients to LCCM. 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

- **Clients 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 clients currently in the list
  - **Start waking / Stop waking**. When the **Start waking** button is clicked, it changes to **Stop waking**. At this point the clients 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 client computer did not boot to the network, you must change your settings:

1. Check the LCCM Compatibility Guide for information about your computer and its network adapter. The guide is available on the LCCM web site at http://www.pc.ibm.com/us/desktop/lccm/compat.html.
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 client computer. 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 LCCM
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 LCCM. If so, then download the appropriate driver or BIOS update from the IBM web site and follow the instructions. Then reboot the client computer.

Note: If the scan process still cannot locate the clients, make sure that the NETWORK.LST file is configured correctly and that your network is properly configured for LCCM operation. Refer to “NETWORK.LST” on page 174 and Chapter 8, "Troubleshooting” for more information.

Adding a Client Manually

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

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

Create a New Client

1. Before you begin, collect the Network address for each client computer you're planning to add manually.
2. Select **Client** from the menu of the Installation/Maintenance window.
3. Select **Create New**.
4. When the Individual Client Details notebook opens, enter information in the relevant fields. To create a new client, at a minimum you must record the following client information in the Details page:
   - A unique client 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 Client

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

1. Before you begin, collect the Network address for each client computer you're planning to add manually.
2. Click an existing client from the Installation/Maintenance window.
3. Select **Client** from the menu bar.
4. Select **Create Copy**.
5. When the Individual Client Details notebook opens, all fields have been copied except those from the Details page. Enter information in the Details page for the new client, and alter any other relevant information. The client name and network address must be entered and must be unique for the new client 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 client to the appropriate software profile. For more information see "Assigning Client" on page 116.
- 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 LCCM 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 LCCM'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 LCCM'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 LCCM 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.

Software Profile Types

You can create two types of software profiles with the Profile Wizard: clone install and unattended install. Depending on the type of install, you can install different operating systems. See “Supported Operating Systems” on page 7 for a list of the Profile Wizard’s supported operating systems for unattended or clone profiles.

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. Also, the hardware setup of the client computers 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 Unattended Install option gives you more flexibility in creating the software profile. Also, it doesn’t have the same restrictions on the hardware setup of the client computer as the Clone install option. However, when you install new client computers, 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 LCCM's copies of the necessary install files, any Service Packs required, and images of all the applications you want to install. The wizard copies the images for unattended install profiles onto the LCCM Server’s local share point. For more information, see “Location of Unattended Install Directories” on page 172.

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.

LCCM 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, LCCM 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 the first screen). 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.

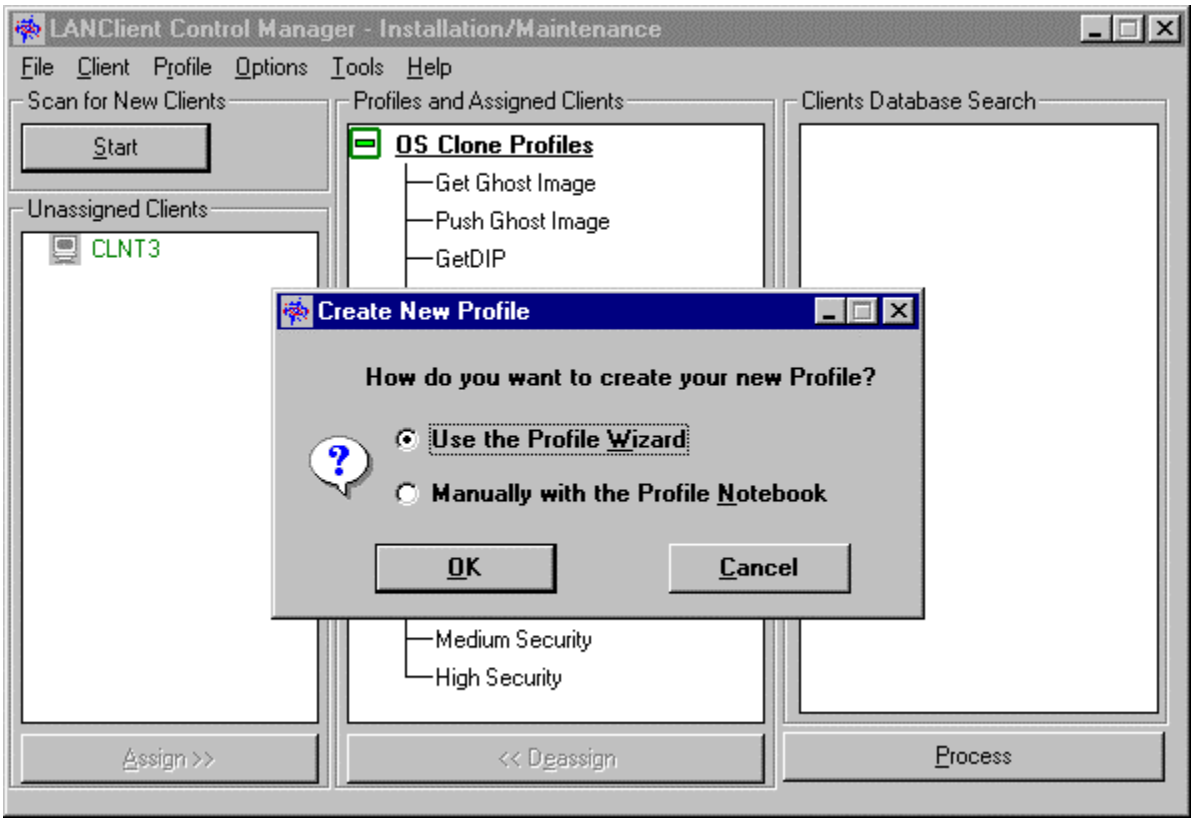
The **Cancel** button will always be available. When selected, it will abort the creation of the profile, after your confirmation. The wizard application allows you to perform system functions like clearing disk space

without canceling the wizard operation. However, you must complete or cancel the wizard before you are allowed to perform any other action within the LCCM console.

Running the Profile Wizard

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

Profile Wizard – Create New Profile



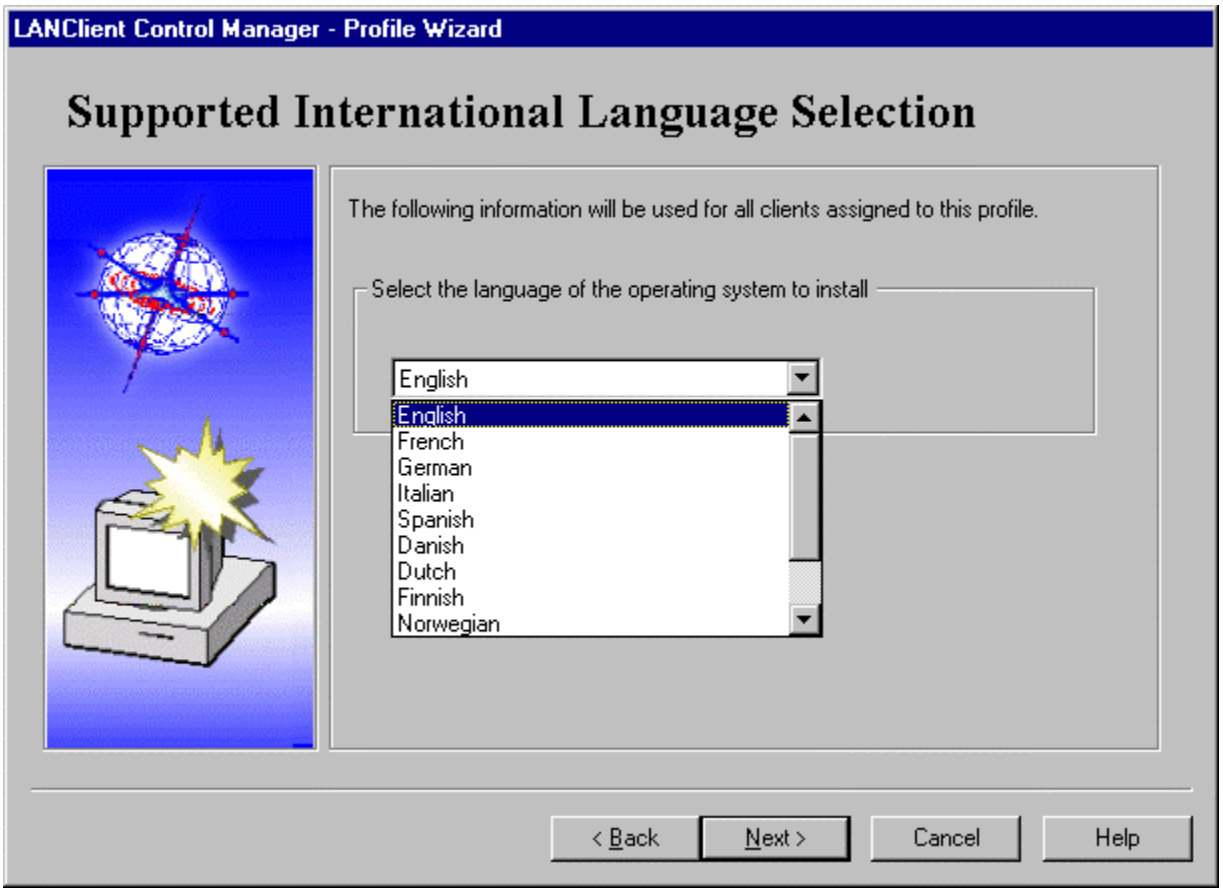
When you choose the **New Profile** menu option within the LCCM console, you will be presented with a dialog asking how you wish to create the profile. Two radio buttons will provide the choices of **Use the Profile Wizard** or **Manually with the Profile Notebook**. The default will be to use the wizard. The dialog box will have two buttons: **OK** and **Cancel**. **OK** starts the selected method of profile creation. **Cancel** returns you to the console screen 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 LCCM 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. LCCM 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 105 for more details
  - **Do you want to keep the install directory?** Checking this option will ensure that the install directory, which is copied from the Microsoft Windows CD, will not be erased after the unattended install image is built. If not checked, this install directory will be erased after the unattended install image has been built. (See page 112for more details.)
- **Clone Install**. Allows the installation of a complete operating-system clone image. LCCM 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 client computer 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 7

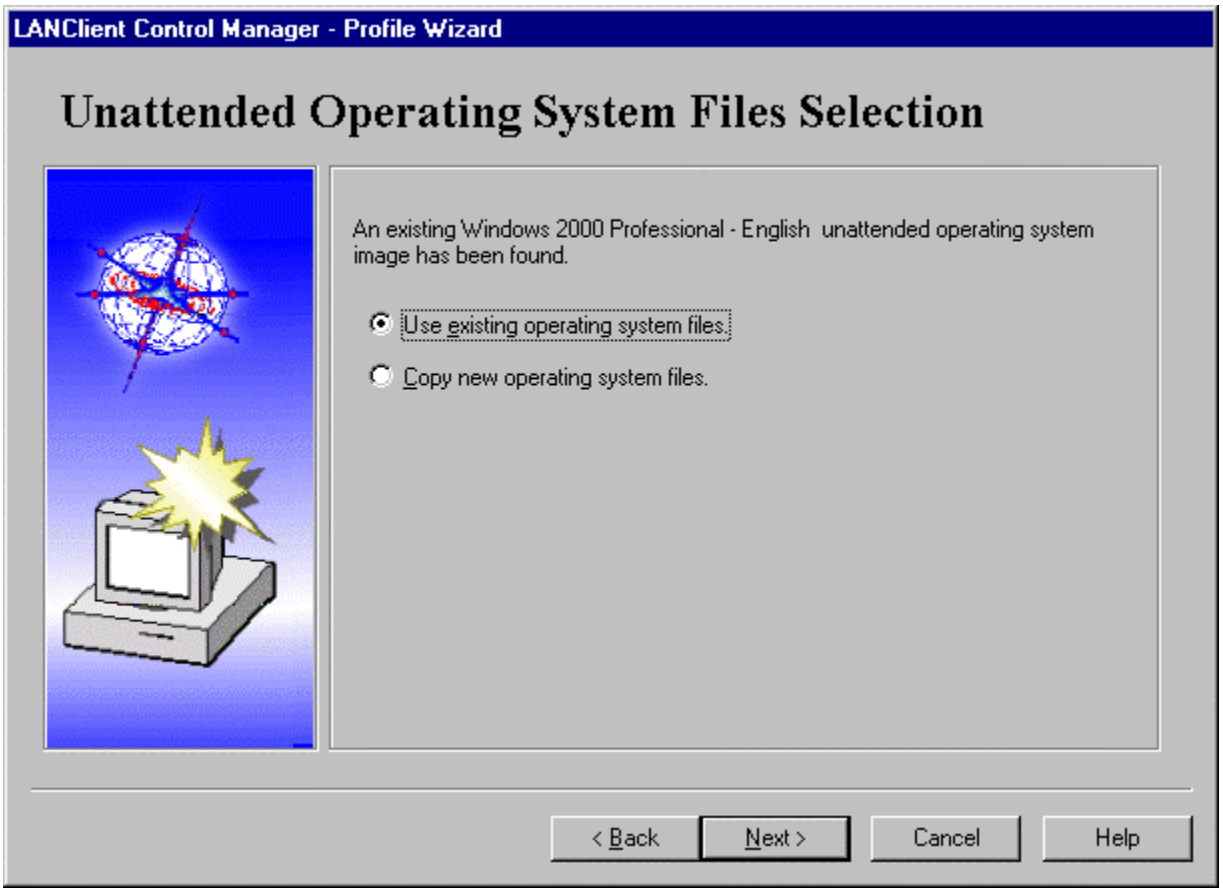
Profile Wizard - Supported International Language Selection



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 clients assigned to the profile.

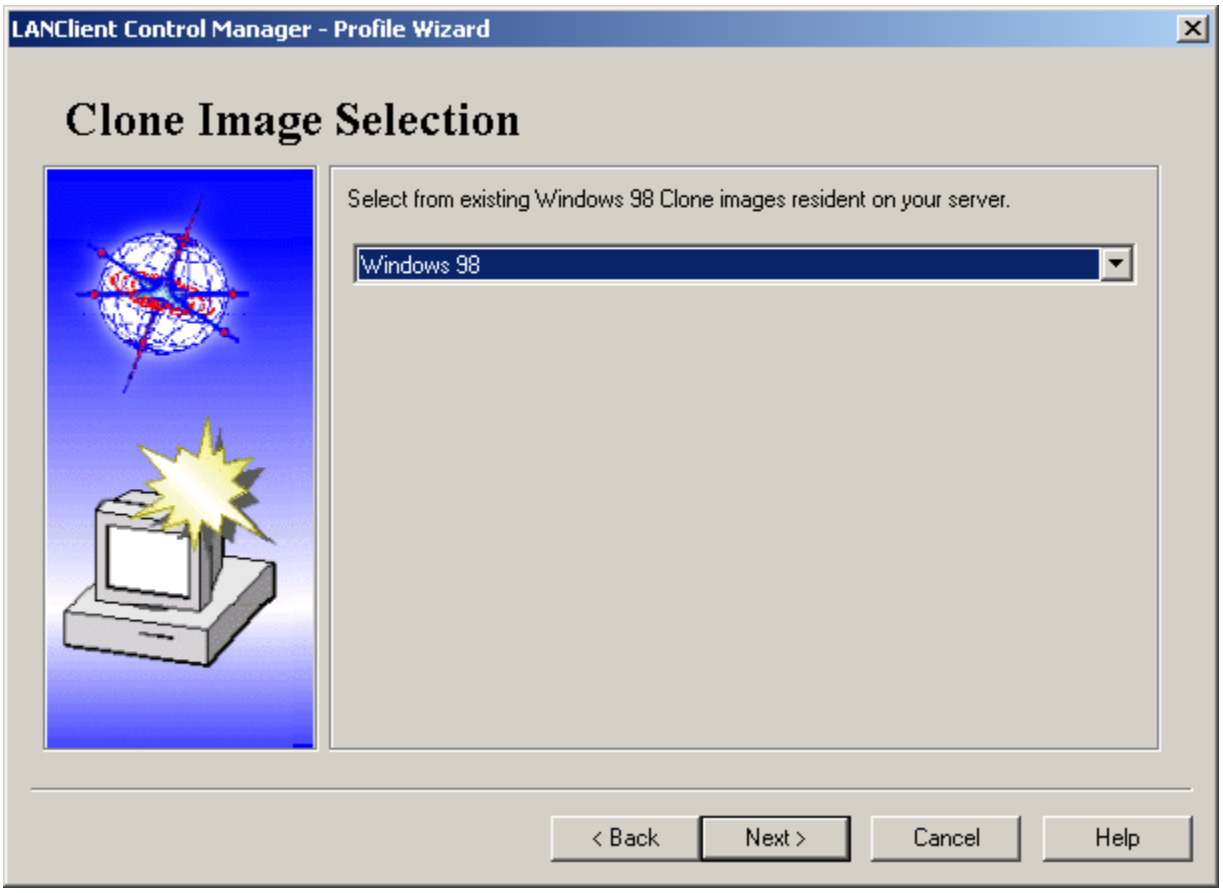
Profile Wizard - Unattended Operating System Files Selection



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 your LCCM 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 - Clone Image Selection

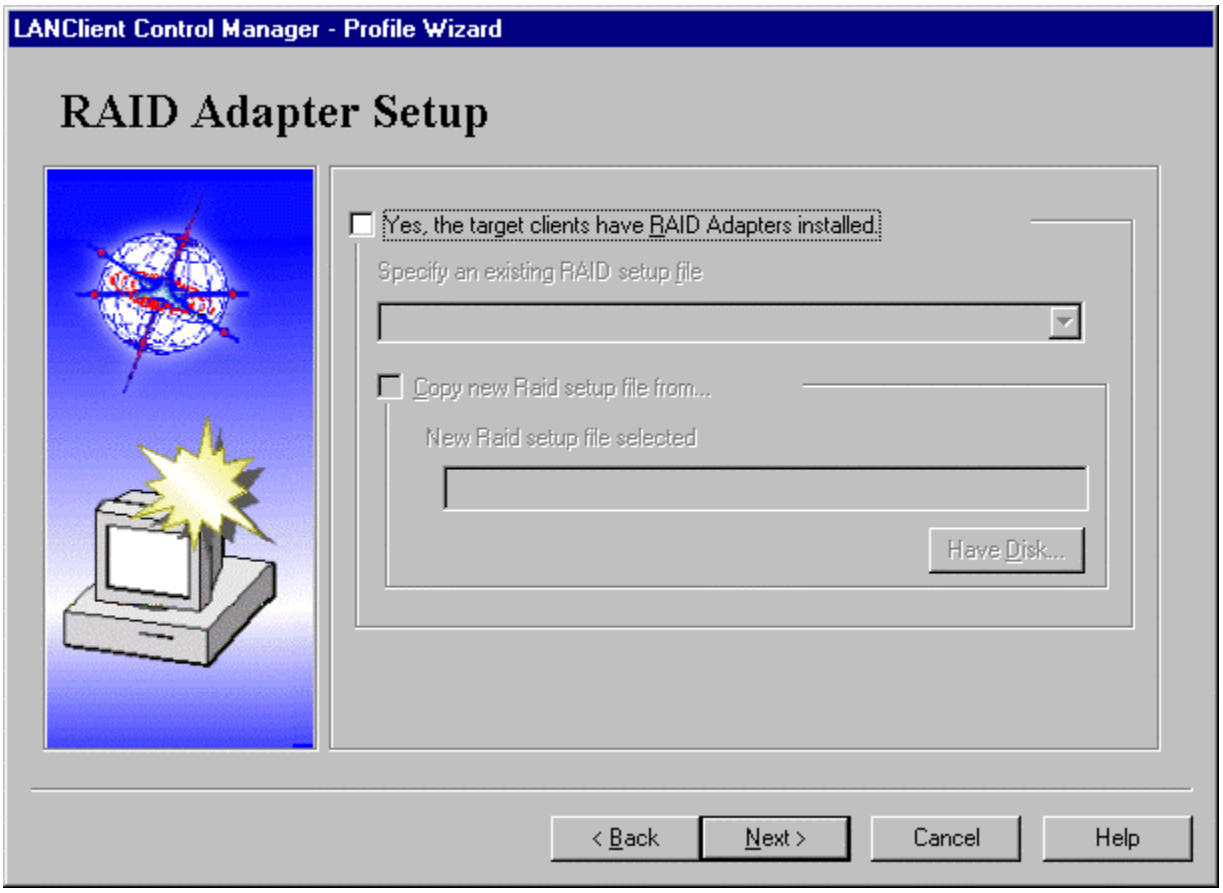


Note: You will only see this screen if you selected the Clone Install option on the **Profile Wizard – Welcome to the Profile Wizard** screen.

The Clone Image Selection screen allows you to select existing 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 this Profile Wizard and use the CloneIt Agent (see “Adding Clone Images Using the CloneIt Agent Wizard” on page 126). 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



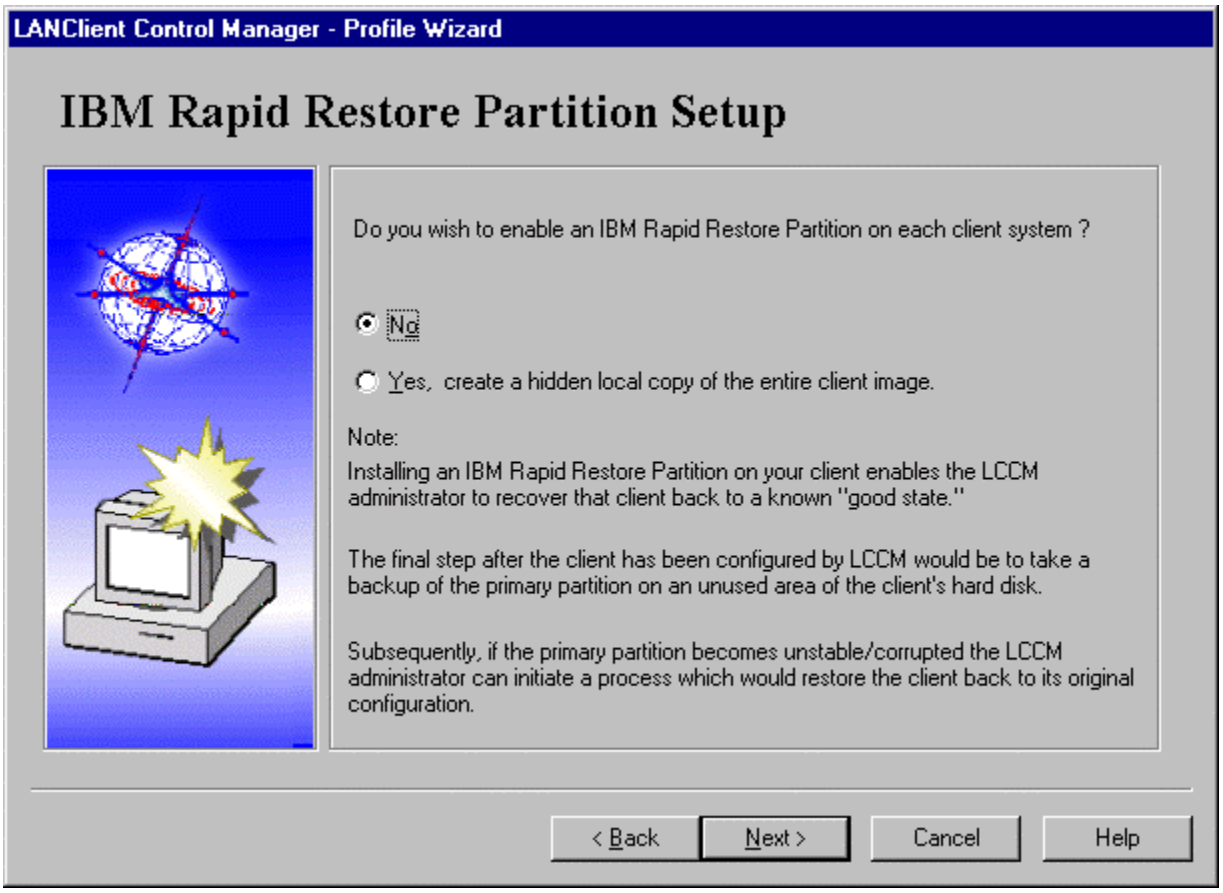
Note: This screen, if shown, will be grayed out if you selected the Clone Install option on the **Profile Wizard – Welcome to the Profile Wizard** screen.

The RAID Adapter Setup screen allows you to enable RAID. Check the **Yes, the target clients have RAID Adapters installed** box if appropriate and select an existing RAID setup file from the drop-down list. If your target clients 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 client to the profile.

If the RAID setup file you want to use is not visible, or if none is available, you must select the "Copy new RAID setup file from..." box and "Have Disk" button. This allows you to select the correct filename and path of the RAID setup files to be taken from donor computers with the appropriate RAID Adapter configuration.

To create a RAID Setup File, see “Creating a RAID Setup File” on page 185.

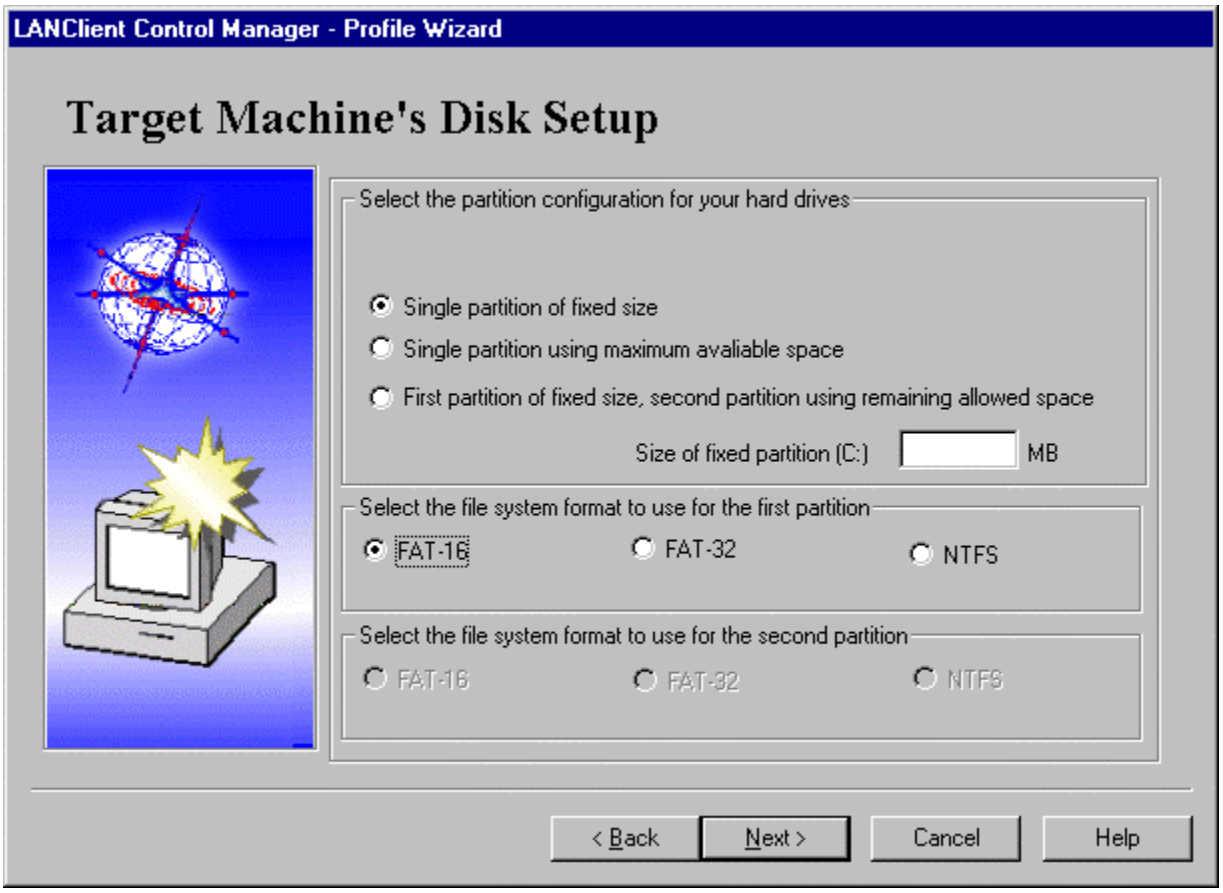
Profile Wizard - IBM Rapid Restore Partition Setup



Note: This screen will be grayed out if you selected the Clone Install option on the **Profile Wizard – Welcome to the Profile Wizard** screen.

The IBM Rapid Restore Partition Setup screen allows you to enable the use of IBM's Rapid 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 Rapid Restore Hard Drive Partitions” on page 151.

Profile Wizard - Target Machine's Disk Setup



Note: This screen will be grayed out if you selected the Clone Install option on the **Profile Wizard – Welcome to the Profile Wizard** screen.

The Target Machine's Disk Setup screen allows you to specify the hard drive partition(s) on your client computers. 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 client 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 Client Details – Hardware Page, in the hard disk field.

- **Single partition using maximum available space**. The actual space that LCCM allocates depends on the operating system, file system, and whether or not a Rapid 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

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

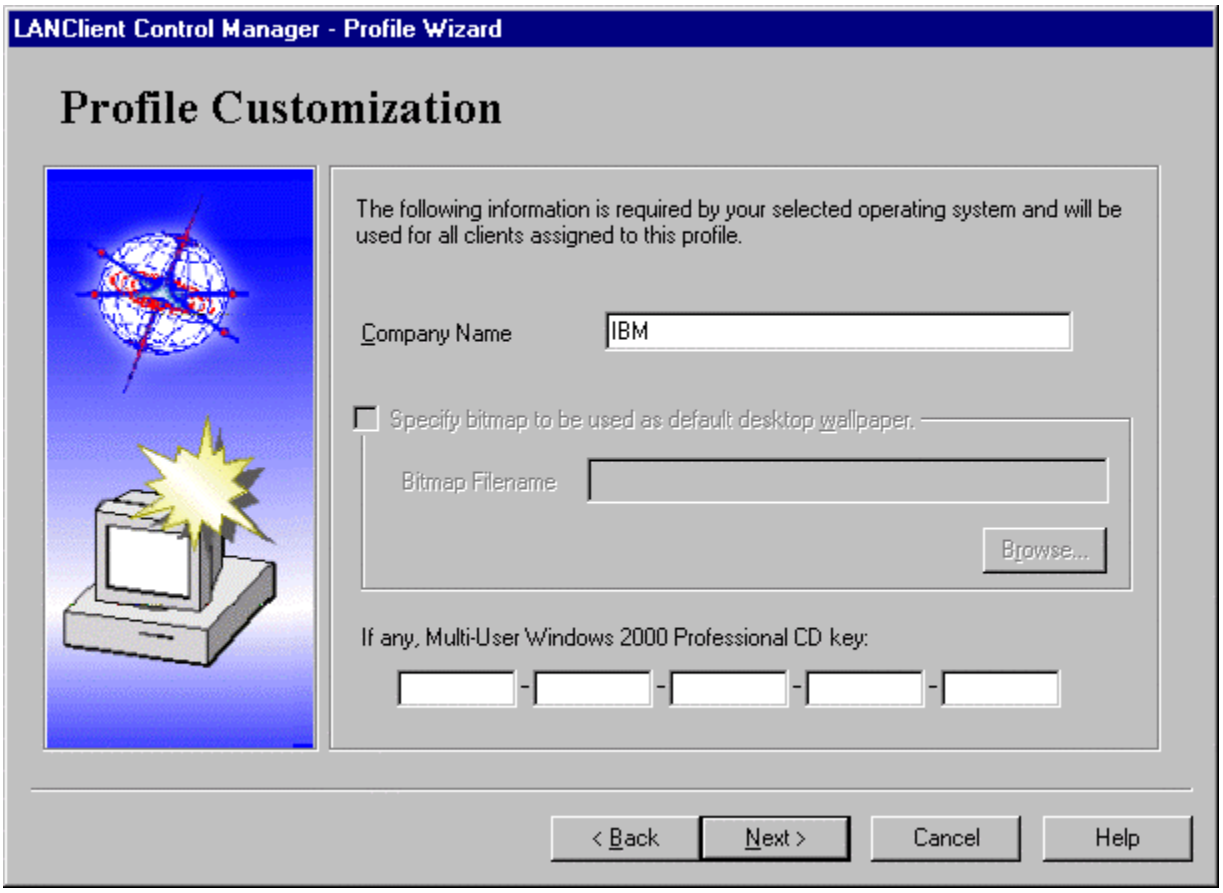
- **FAT16**. This option ensures that your profile will install FAT16
- **FAT32**. This option ensures that your profile will install FAT32
- **NFTS**. This option ensures that your profile will install NTFS

The following maximum partition sizes apply:

- FAT16 is a format option for all Windows operating systems. The maximum partition size of all partitions, including the Rapid Restore partition, is 2 GB
- FAT32 is not a format option with Windows 95 and Windows NT 4.0 Server and Workstation. For the other operation systems, there are few LCCM restrictions on partition size. The he following maximums apply:
  - If you don't use Rapid 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 Rapid Restore with a single partition, the size of the Rapid 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 Rapid Restore partition
  - If you use Rapid Restore with two partitions, the size of the Rapid 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 Rapid Restore and first partitions
- NTFS is a format option with Windows NT 4.0 Server and Workstation, and Windows 2000 Professional, Server, and Advanced Server. The following maximums apply:
  - For Windows NT 4.0, if you select **Single partition using maximum available space** and you don't use Rapid Restore, the maximum size is 7.8 GB. In all other cases, the maximum partition size of the first, second, and Rapid Restore partition is 2 GB
  - For Windows 2000, there are few LCCM restrictions on partition size. NTFS has the same restrictions as FAT32

Note: If you chose to enable the Rapid Restore partitioning setup on the previous screen, Rapid Restore will automatically create a hidden partition on your client's hard disk. For more information, see "Managing Rapid Restore Hard Drive Partitions" on page 151.

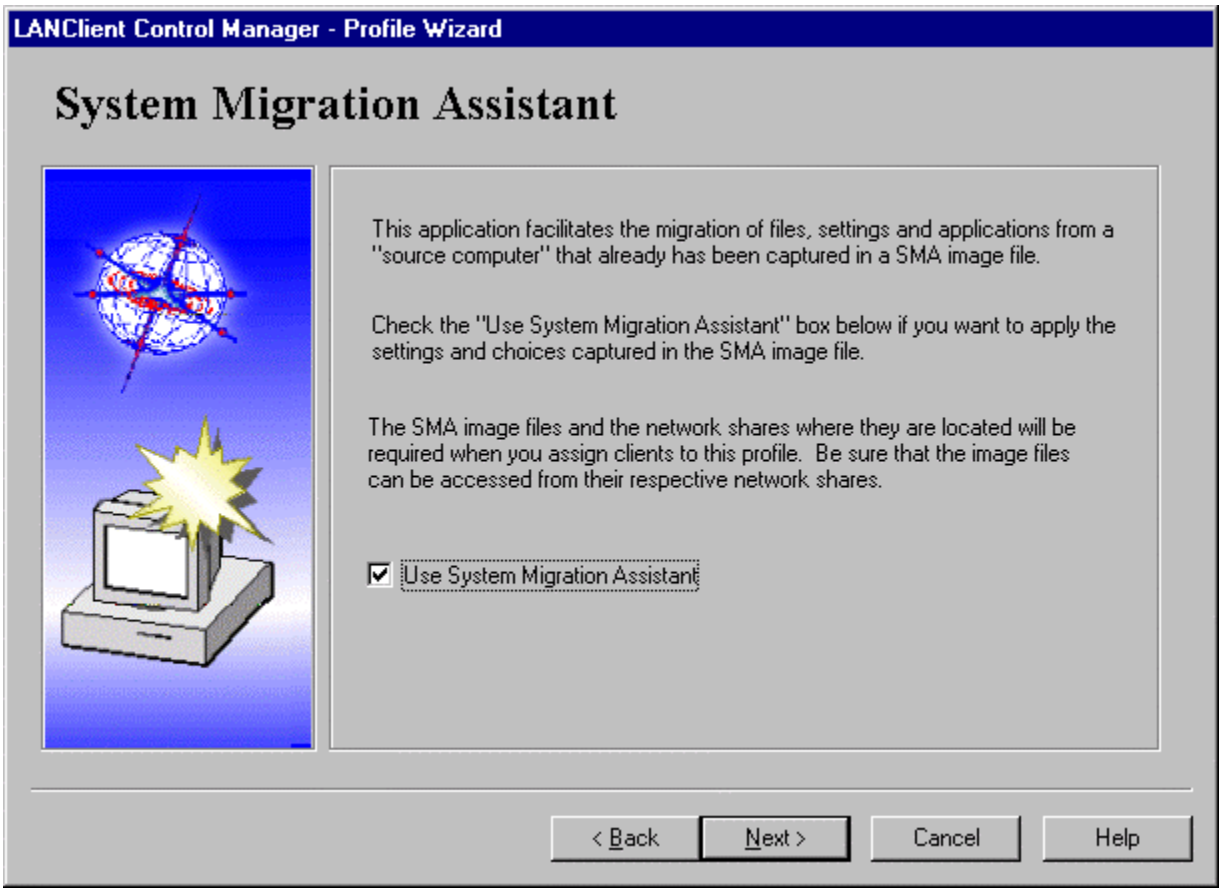
Profile Wizard - Profile Customization



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 clients 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.

The IBM System Migration Assistant (SMA) can replicate applications, Windows desktop and personality settings, connectivity settings, files, folders, and registry to another computer. These files and settings must be captured in a SMA image file from a source computer before they can be migrated to a new target computer.

If you have an SMA image file and want to apply it to clients 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 clients to this profile.

The SMA image file must have been created with the same version of SMA that LCCM uses to deploy it. LCCM uses the file `<drive>:\LCCM\CLNTFILE\IMGWIZ\UTILS\TARBAT.EXE` from SMA 2.2. This means that you must create your SMA image files with SMA 2.2. If a future SMA release becomes available, you will need to replace this file with the new SMA version in order to enable integration of the new SMA version with LCCM.

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

Note: Some SMA personality settings are specific to the user that is logged on when the settings are captured. These include "Wallpaper", "Colors", "Desktop Icons", and all other settings that have to do with desktop appearance. These settings will not transfer to the client target system. However, all connectivity settings and data files should transfer without problems.

Profile Wizard - Software Delivery Assistant

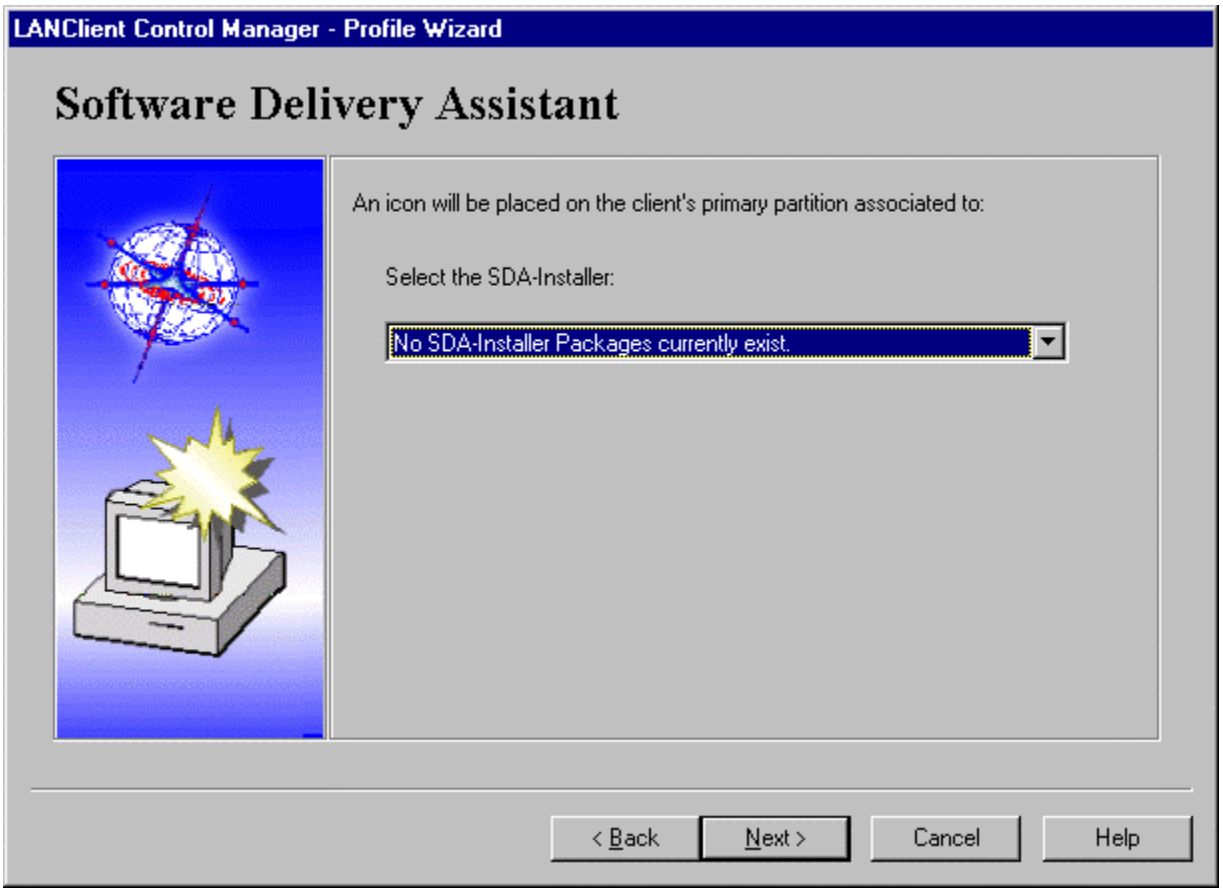
Note: You will only see this screen if you selected the Unattended Install option on the **Profile Wizard – Welcome to the Profile Wizard** screen.

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 client system and that an icon will be placed on the desktop pointing to the SDA Installer.

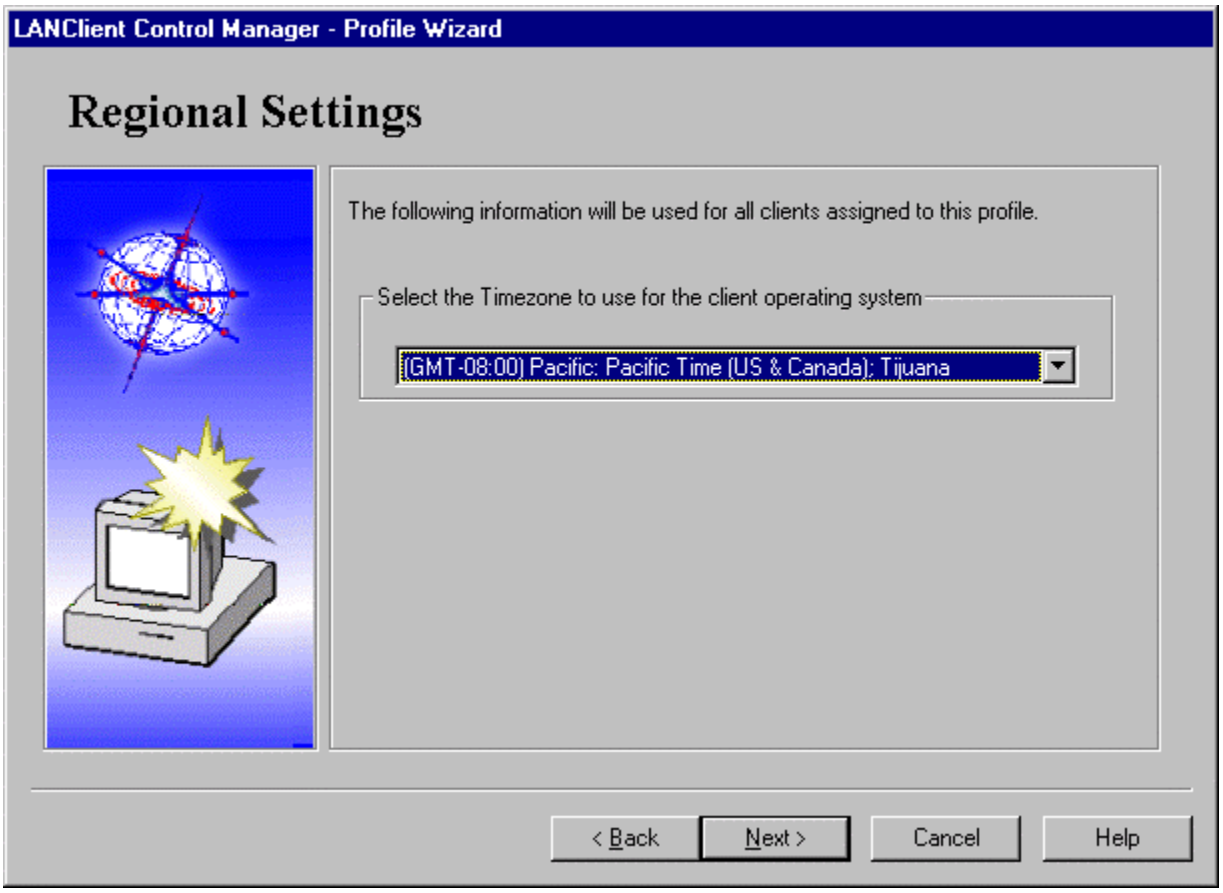
Profile Wizard – SDA Installer



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>:\lccm\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 LCCM directory (see “SDAPACK.BAT” on page 221 for details).

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

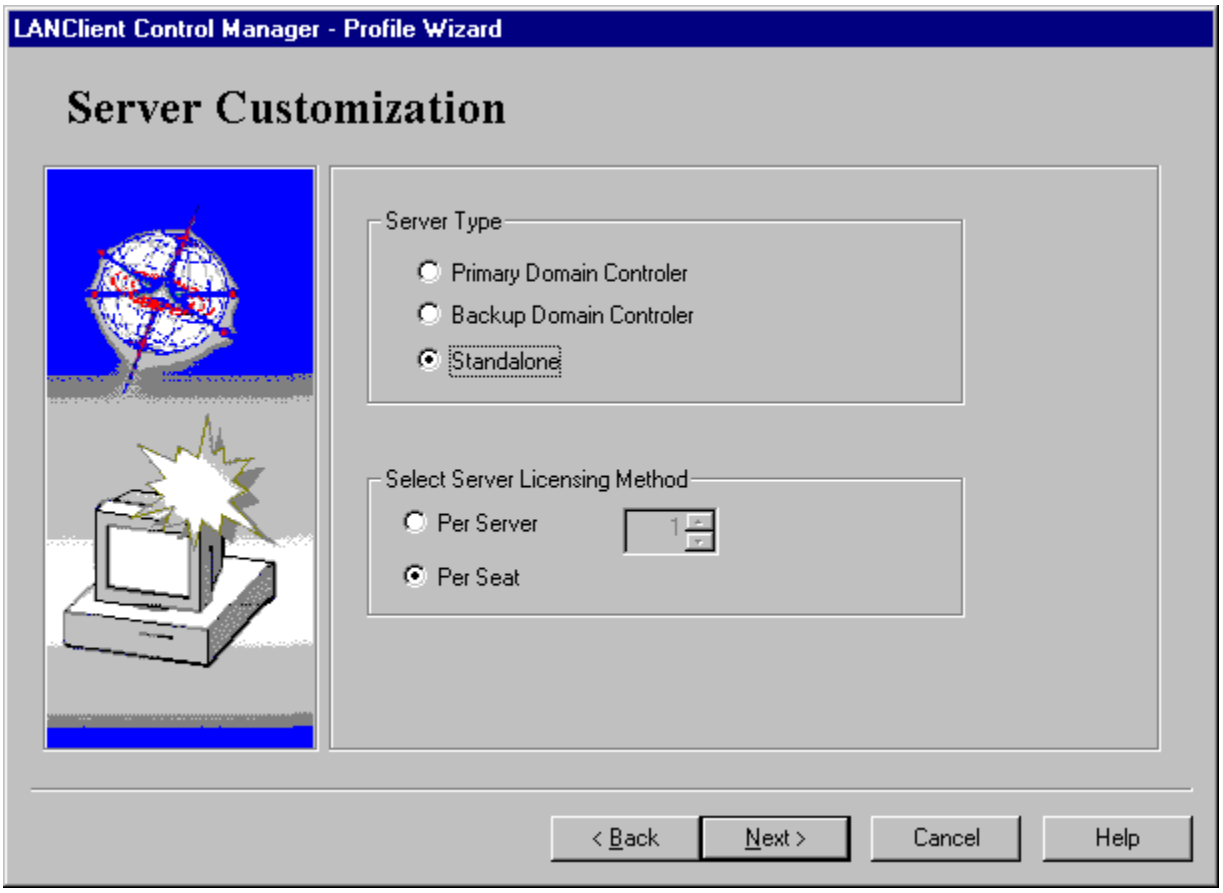
Profile Wizard - Regional Settings



Note: You will only see this screen if you selected the Unattended 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.

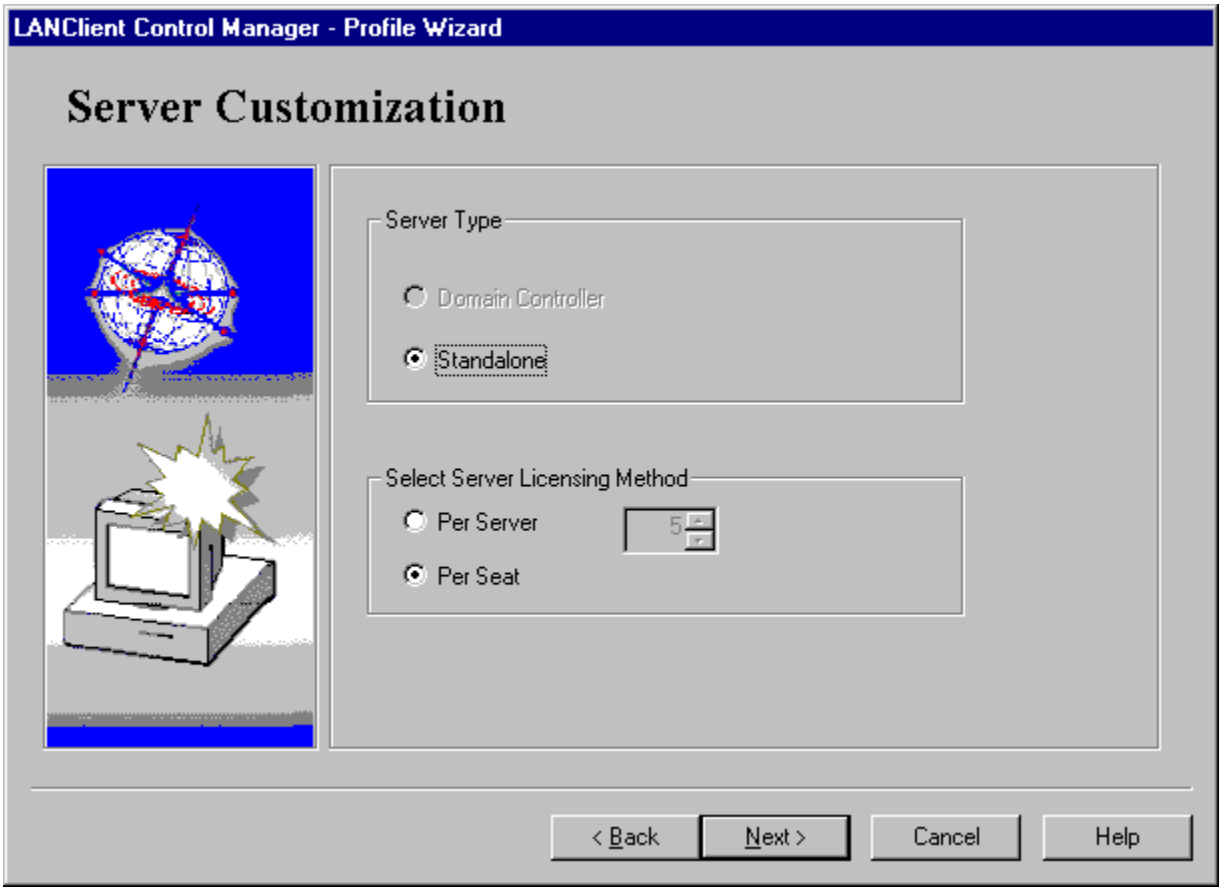
Profile Wizard - Server Customization



Note: You will only see a Server Customization screen if you selected the Unattended Install option on the **Profile Wizard – Welcome to the Profile Wizard** screen and are creating a server software profile.

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

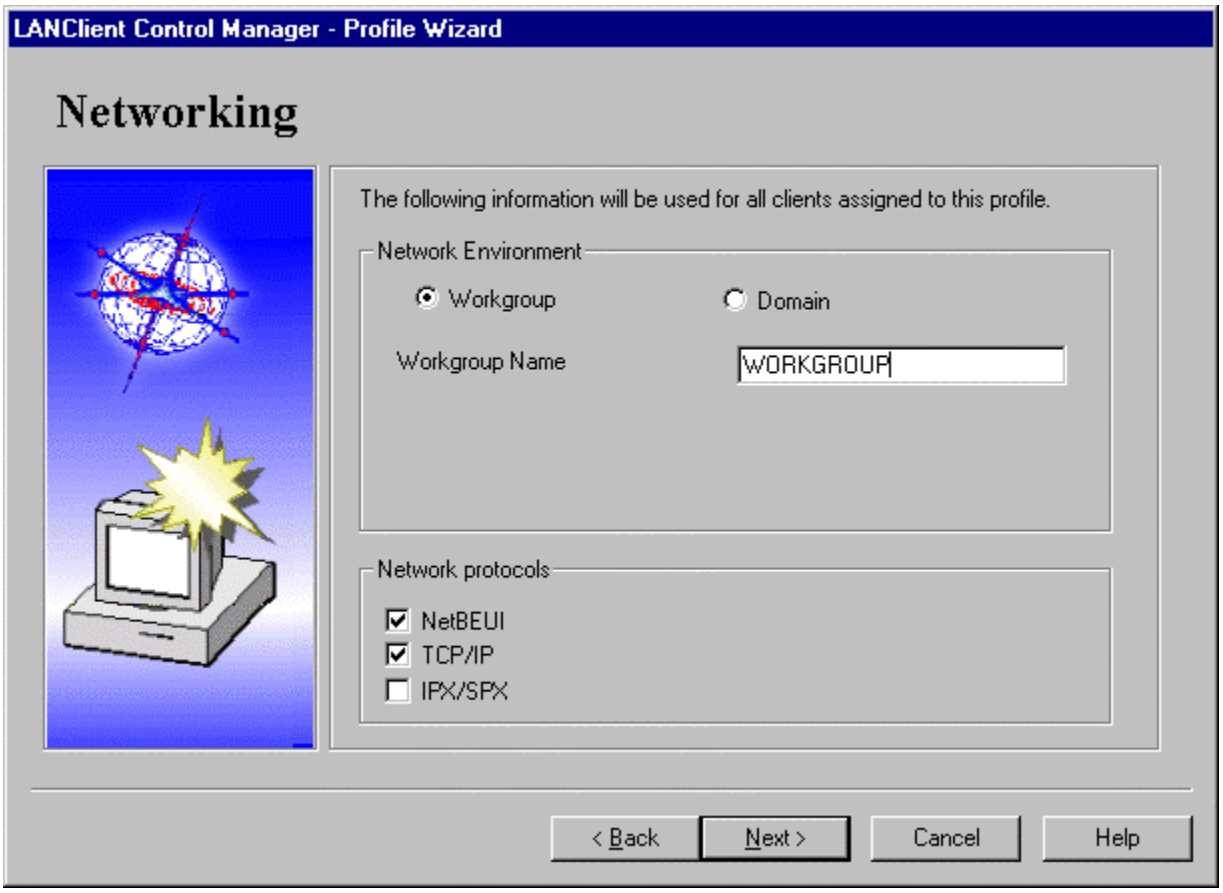
- **Server Type**:
  - **Primary Domain Controller (PDC)**
  - **Backup Domain Controller (BDC)**
  - **Standalone**
- **Select Server Licensing Method**:
  - **Per Server**. If you select this option, you must also enter the number of client licenses you have purchased for this server
  - **Per Seat**



For Windows 2000 Server and Windows 2000 Advanced Server, you will see this screen:

- **Server Type**:
  - **Domain Controller**
  - **Standalone**
- **Select Server Licensing Method**:
  - **Per Server**. If you select this option, you must also enter the number of client licenses you have purchased for this server
  - **Per Seat**

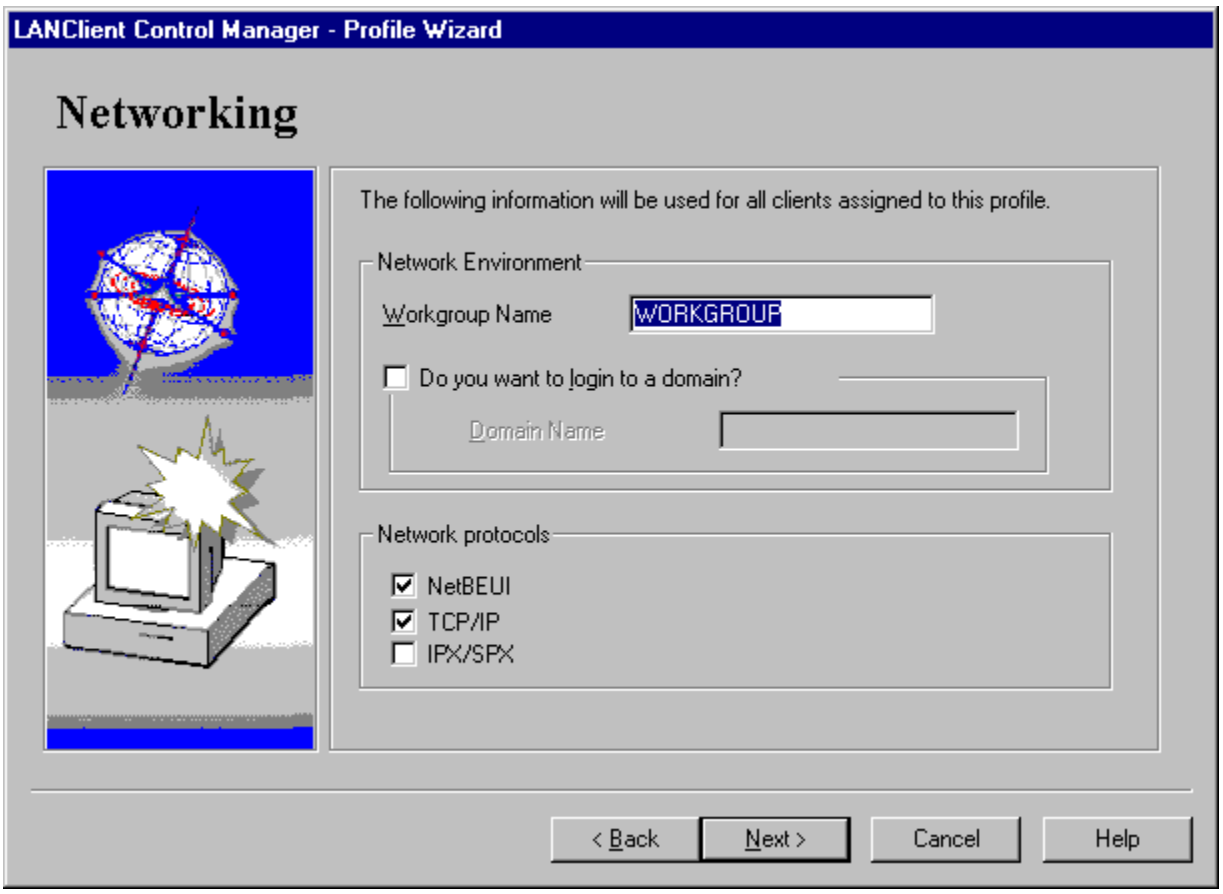
Profile Wizard - Networking



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

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

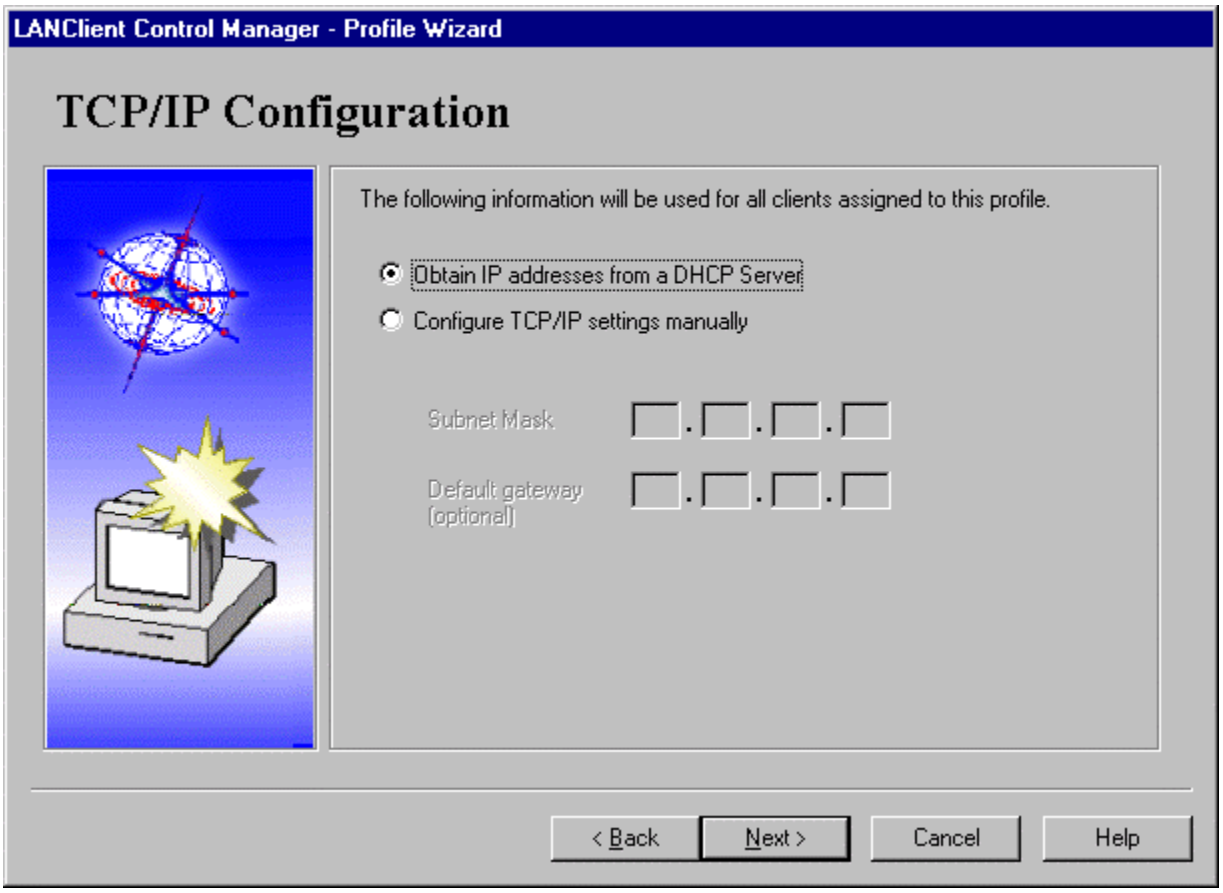
- **Network Environment**. To join a workgroup, select the **Workgroup** radio button and enter the workgroup name. To join a domain, select the **Domain** radio button and enter the domain name
- **Network Protocols**:
  - **NetBEUI** is a non-routable protocol for use within peer-to-peer networks
  - **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 display the following difference:

- **Network Environment**. For these operating systems the client 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

Profile Wizard- TCP/IP Configuration

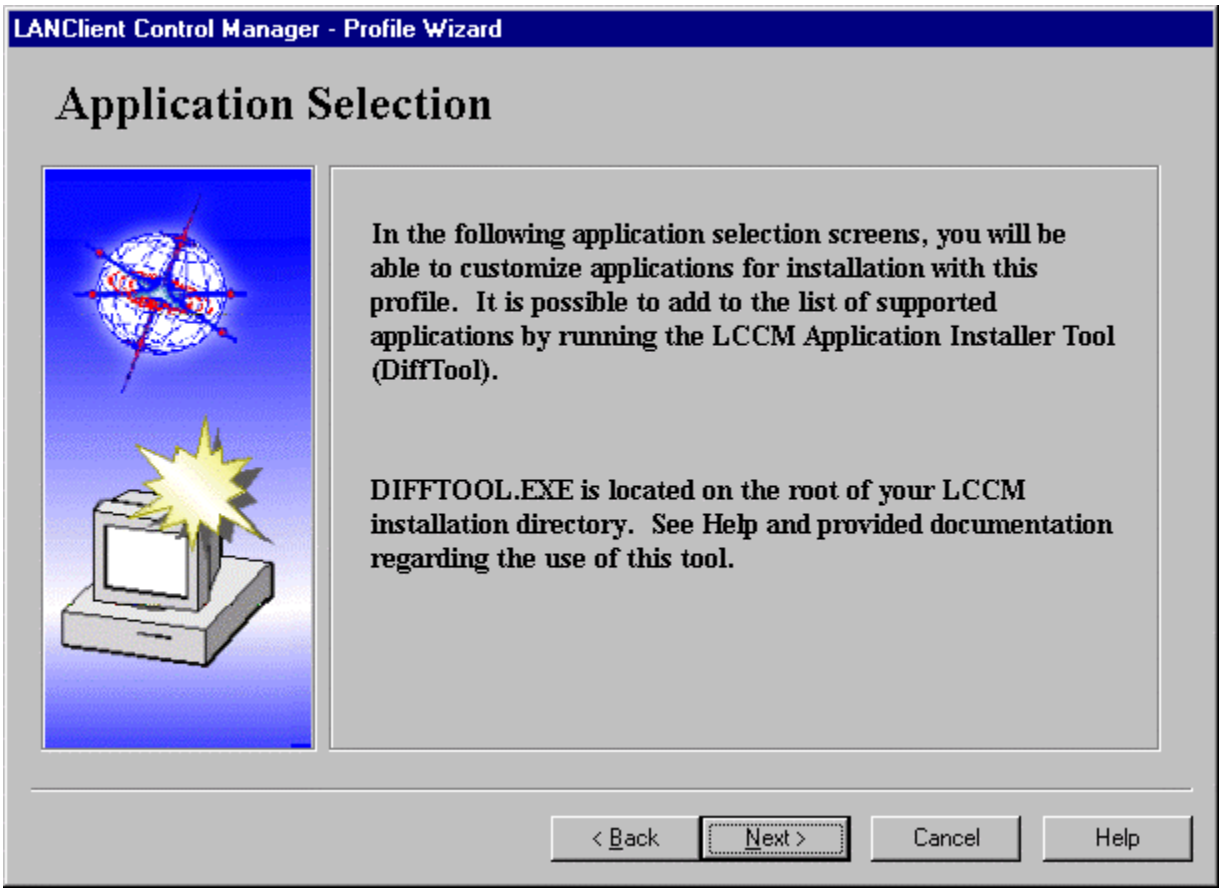


Note: You will only see this screen if you selected the Unattended Install option on the **Profile Wizard – Welcome to the Profile Wizard** screen.

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 client computers:

- **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 client computers
- **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

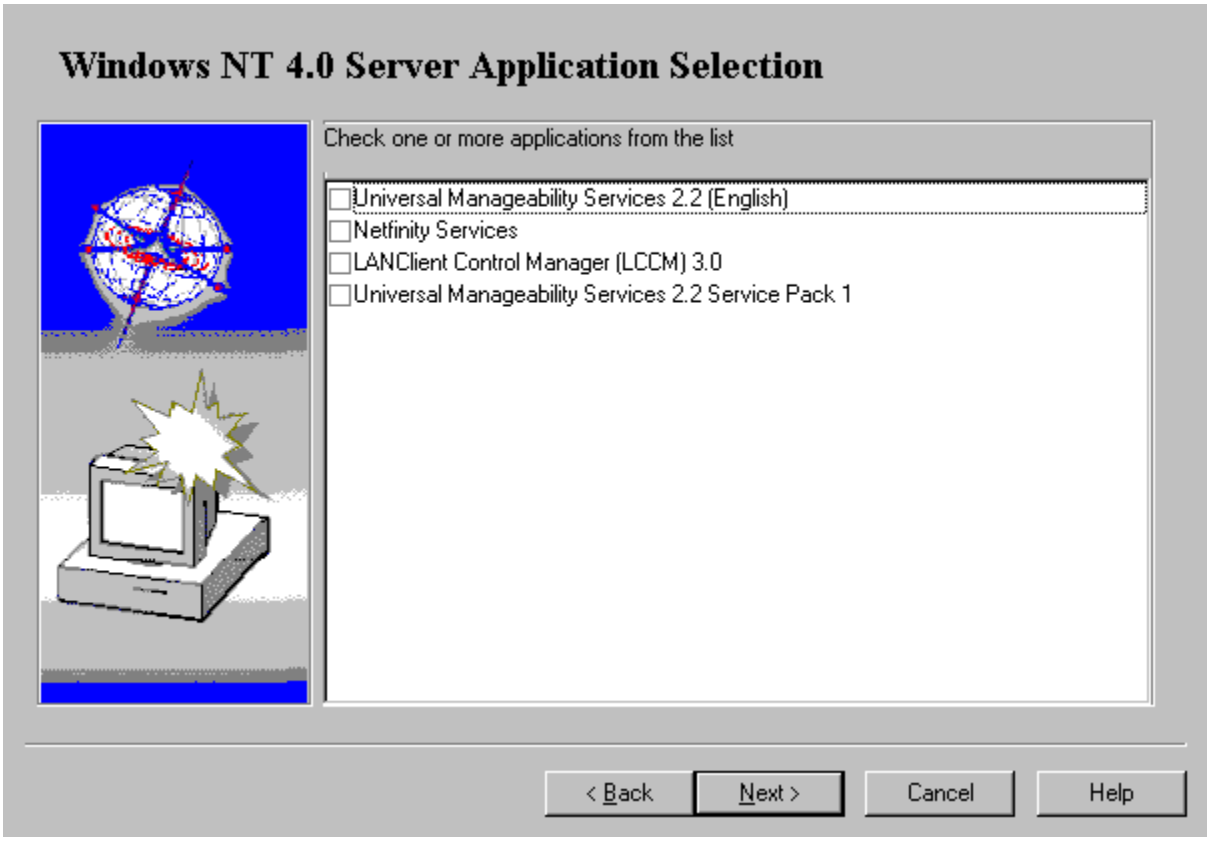
Profile Wizard - Application Selection



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?**

The Application Selection screen briefly describes LCCM's DiffTool program. For more information, see “Adding Applications Using the DiffTool Wizard” on page 132). Click **Next** to select and configure the applications that will be deployed by this profile.

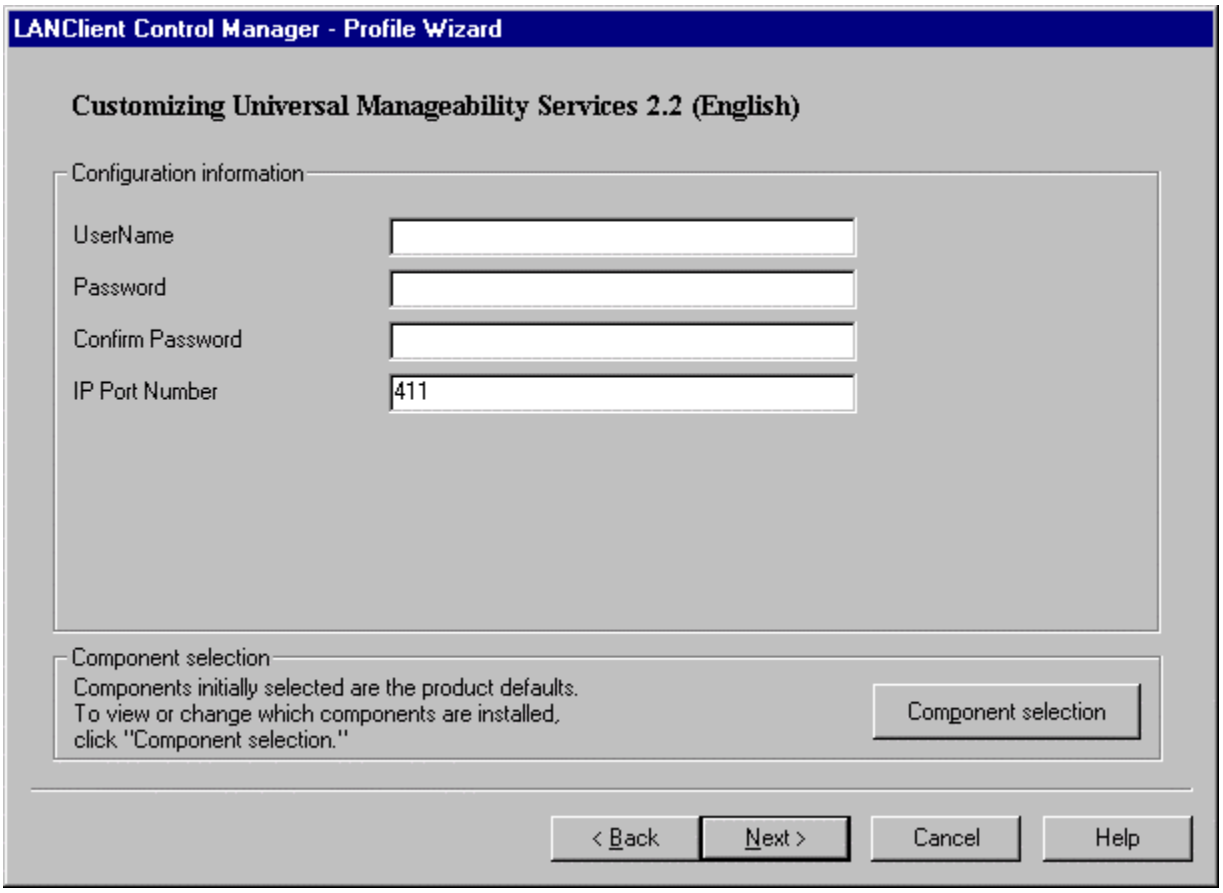
Profile Wizard - Windows Application Selection



The Windows Application Selection screen allows you to choose which applications the profile will deploy by selecting the appropriate boxes. This screen can include applications that are installed in the following ways:

- **Standard Unattended install options**. LCCM will install these applications using their own silent install program. Setting up their install is done as part of profile creation. You must obtain and unpack their install directories in advance, since you will be asked for their location later in the Profile Wizard. It is not possible to add other applications of this type to the list:
  - **Universal Manageability Services 2.2 (English)**. Please see “Installing Universal Manageability Services (UMS)” on page 167 for more information
  - **Universal Manageability Services 2.2 Service Pack 1**. This option is only available if you also select Universal Manageability Services 2.2 (English)
  - **Netfinity Services**. This option is only available for Windows 95, Windows 98, Windows 98 Second Edition, Windows NT 4.0 Server, and Windows NT 4.0 Workstation
  - **LANClient Control Manager (LCCM) 3.0**. This option is only available for Windows NT 4.0 Server, Windows 2000 Server, and Windows 2000 Advanced Server
- **DiffTool install options**. If you have created DiffTool images of additional applications that can be installed on the target operating system, they will appear in this list

Profile Wizard - Customizing Universal Manageability Services

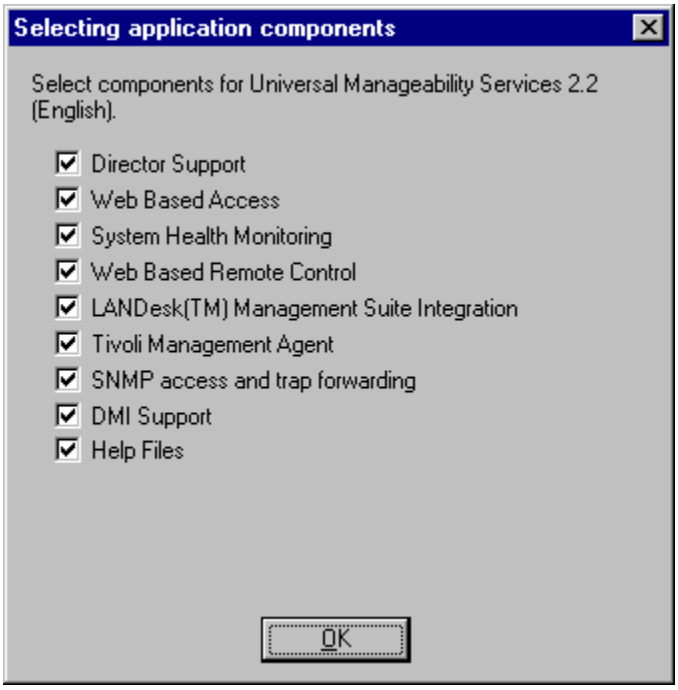


Note: You will only see this screen if you selected the first UMS option on the **Profile Wizard – Windows Server Application Selection** screen.

The Customizing Universal Manageability Services screen allows you to enter UMS configuration information:

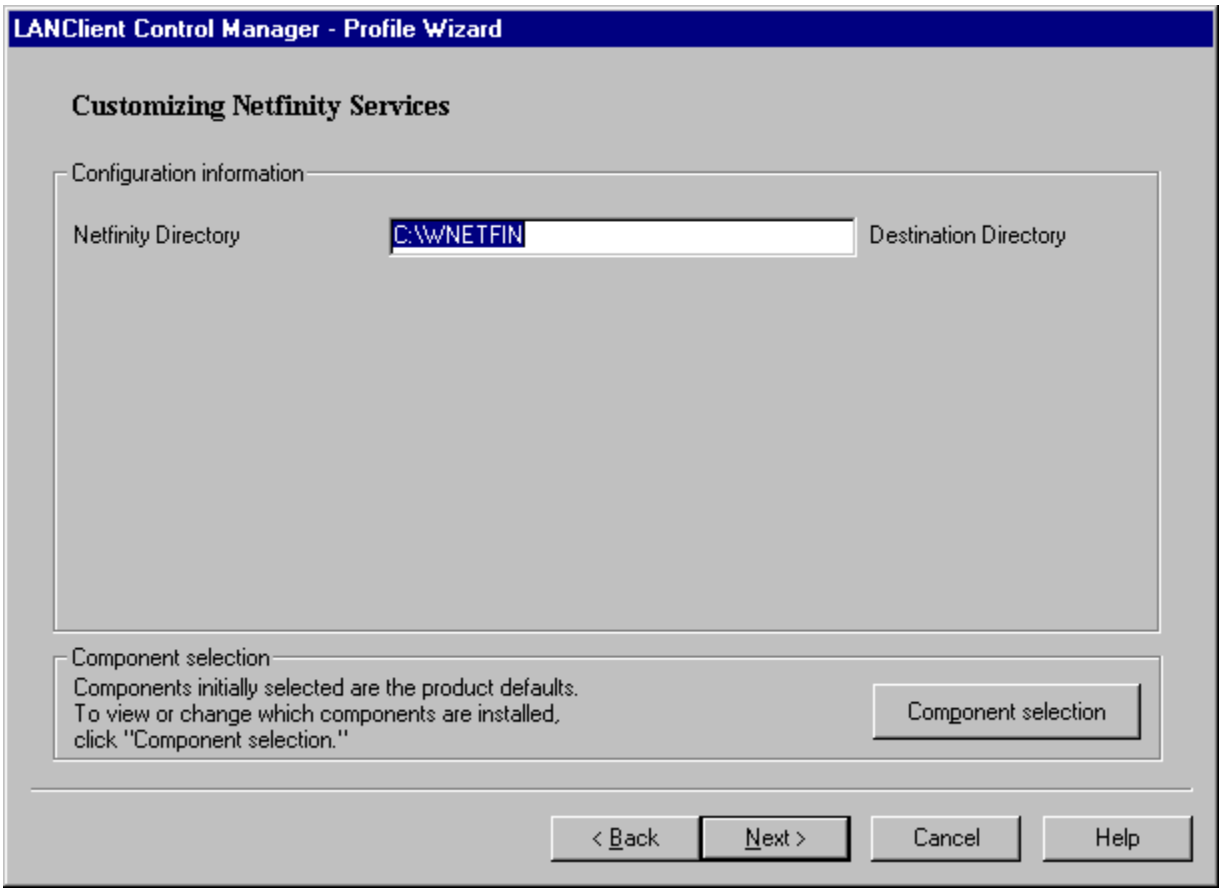
- **UserName**. Allows you to enter a User Name
- **Password**. Allows you to enter a password for UMS
- **Confirm Password**. Allows you to re-enter your password for confirmation
- **IP Port Number**. Allows you to enter the IP Port Number
- **Component Selection**. This option allows you to change the components that are installed. If you do not make alterations, product defaults will be used.

Profile Wizard – Selecting Universal Manageability Services Components



Note: You will only see this screen if you clicked the **Components Selection** button on the previous screen.

Profile Wizard – Customizing Netfinity Services

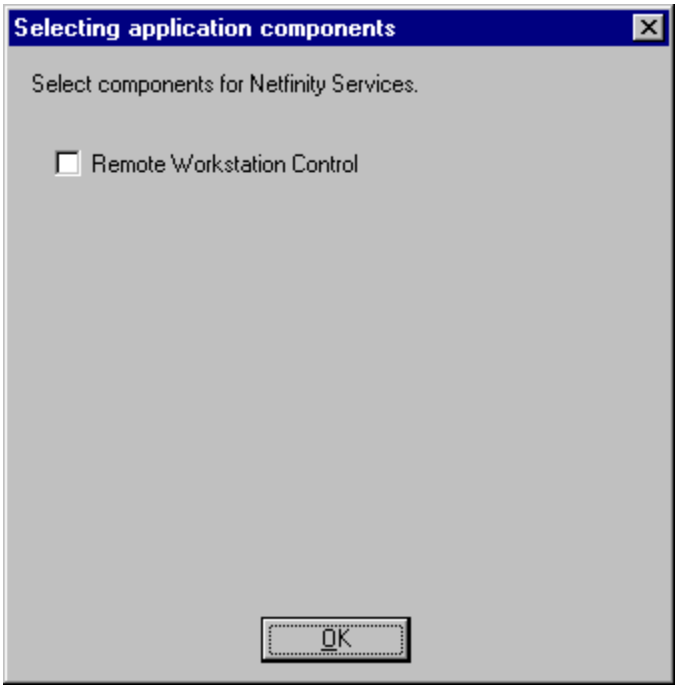


Note: You will only see this screen if you selected the appropriate option on the **Profile Wizard – Windows Server Application Selection** screen.

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.

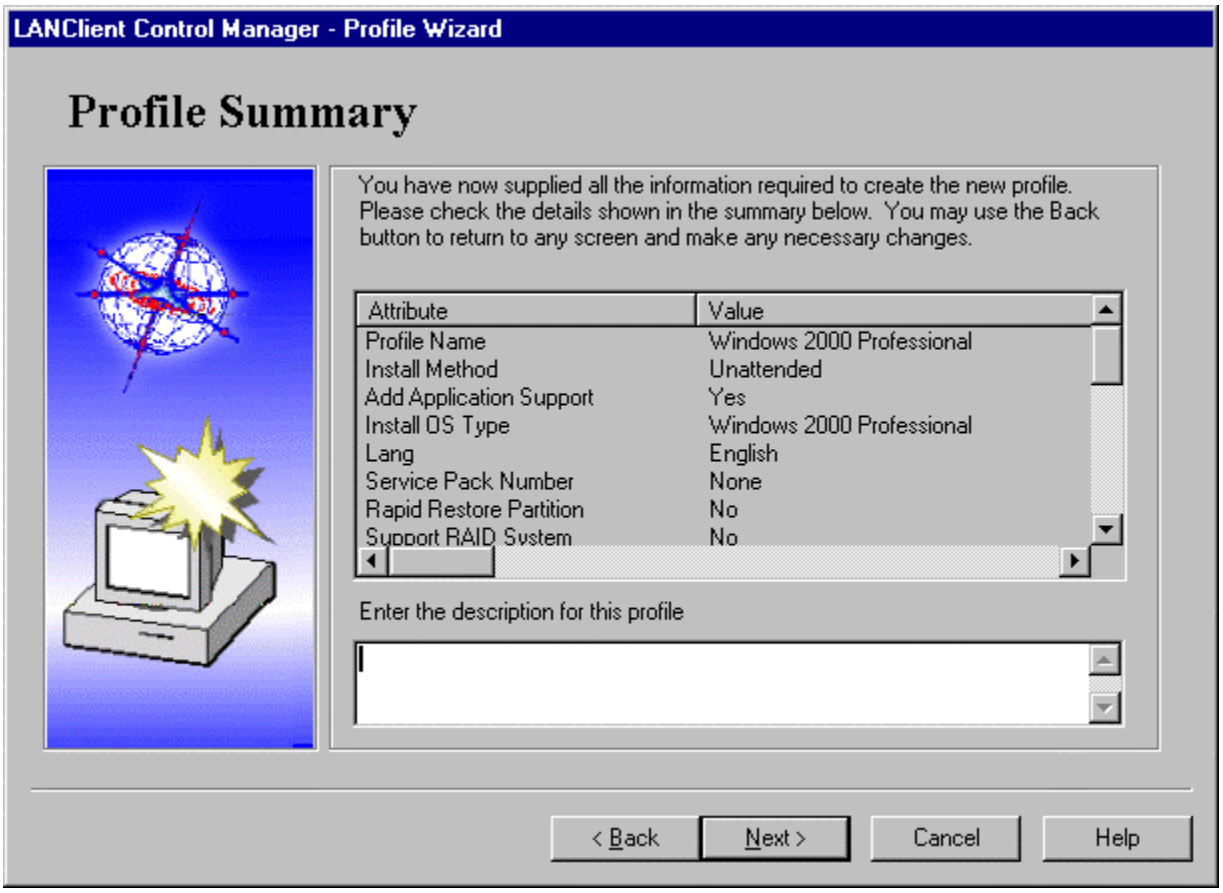
Profile Wizard – Selecting Netfinity Service Components



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

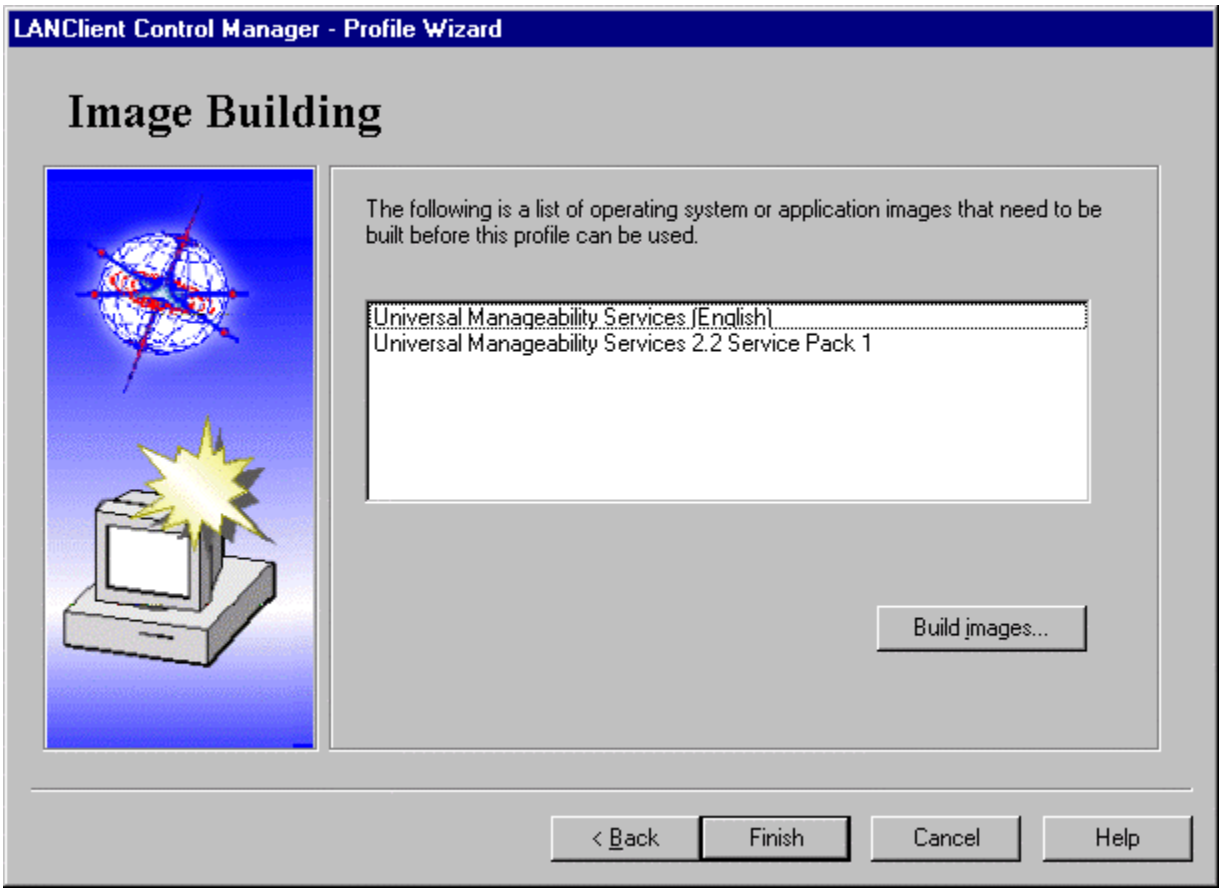


The Profile Summary screen gives a summary of the current profile. To make any changes, you must go back through the Profile Wizard.

If the window contains a **Next** button, it means that the wizard needs to copy some operating system or application images into the standard LCCM 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 LCCM 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.

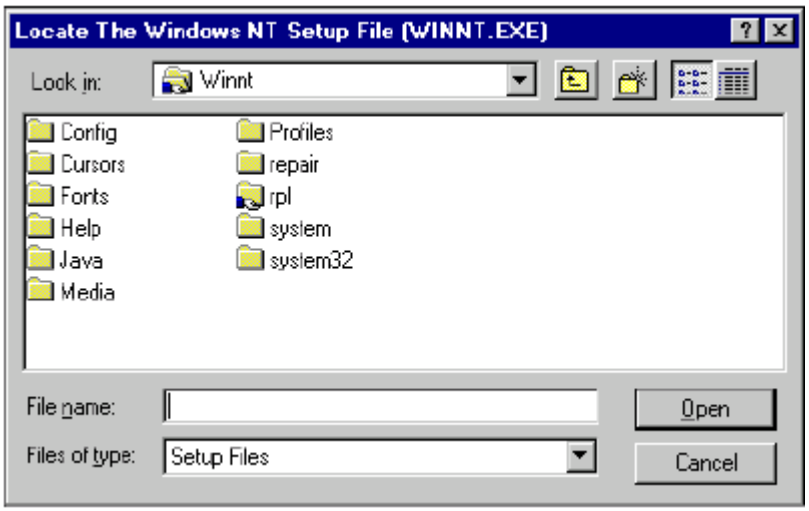
Profile Wizard - Image Building



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.

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 172).

Creating a Software Profile Manually

To create a software profile manually instead of with the Profile Wizard, there are two alternative methods:

Create a profile from scratch:

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, i.e. Operating System Clone or Operating System Install. For more information, see “Software Profile Details Notebook” on page 60.
4. Click **OK** to save the new profile and return to the Installation/Maintenance window.

Create a profile from a copy of an existing profile:

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.

Create an image

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 95/98 clone images. To create a clone image using this method, see “Adding Clone Images Using the CloneIt Agent Wizard” on page 126.
- Manually. These methods, described here, are only recommended for experienced LCCM users.

Method A: Adding Clone Images using XCOPY

To create a 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 LCCM 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 clients. For more information, see “Using Alternative Methods for Transporting Images” on page 192.
- 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 209 and “DOSLFNBK.EXE” on page 200.

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 190.
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 client 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 202.

   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 client to transport all required software from a directory on the server to the hard disk of the client. 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 LCCM can deploy. Please consult that program’s documentation for more information.

Method C: Create an Operating System Unattended Install Image

LCCM works in conjunction with the distribution features built into Windows NT or 2000 Server and provides the ability to pass individual client parameter values to a common NT answer file instead of using the Windows .UDF file for each individual client.

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 in or attached to the client computer must support unattended installation. Some adapters and devices do not support unattended installation and will prompt the user at the client computer 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:\LCCM\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:\LCCM\CLNTFILE\WINNT40\I386 /S /E /V`
4. Create the following two directories to set up the directory structure for network device drivers:
   - `C:\LCCM\CLNTFILE\Dist_Sharepoint\I386\$OEM$`
   - `C:\LCCM\CLNTFILE\Dist_Sharepoint\I386\$OEM$\NET`
5. Under the `$OEM$\NET` directory, create a directory for each type of network adapter that your clients will be using.
6. Next, copy the Windows NT device driver and OEMSETUP.INF file from each network adapter device driver diskette into the appropriate network directory.
7. Edit the Windows NT answer file, UNATTEND.TXT, to assign "dummy" parameter names to set unattended installation options and to set up network adapter information.
8. If your client'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:\LCCM\CLNTFILE`. Enable the pre-load image batch file within the Software page of the Software Profile Details notebook. If your client'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:\LCCM\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 clients using the profile (for example, the organization name).
- Fill in the Client Parameter page with the parameter names you used in the customization batch file that will have values unique to each individual client (for example, the Windows NT product identification number from the Certificate of Authenticity).

4.3 Assigning Client

You can assign clients to software profiles using the Client Assignment Wizard, which is the preferred method for all LCCM users, or you can assign clients manually, which is recommended only for experienced LCCM users. Both methods are described in this section.

To assign clients to Software Profiles:

1. Select the software profile profile in the **Profiles and Assigned Clients** column in the Installation/Maintenance window.
2. Select one or more clients in the **Unassigned Clients** column.
3. Click the **Assign** button. The clients appear listed below the software profile you selected.
4. Customize each client's information by using the Client Assignment Wizard or manually, whatever you prefer. Using the Client 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 client computer restarts (or as soon as the change is applied if the client 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 clients you want to assign, then drag and drop them (using the primary mouse button) onto the desired software profile. You can also reassign clients to new software profiles within the **Profiles and Assigned Clients** box. To do this, use the drag-and-drop method for each client (not for multiple clients).

Customizing Clients Using the Client Assignment Wizard

The Client Assignment Wizard is a program that asks you to fill in a series of client parameters for a particular client when it is being assigned to an LCCM profile. The purpose of the Client Assignment Wizard is to ensure that any mandatory client parameters are filled in before the client is processed. If the parameter values are not correctly entered, then the client will fail when it is being processed.

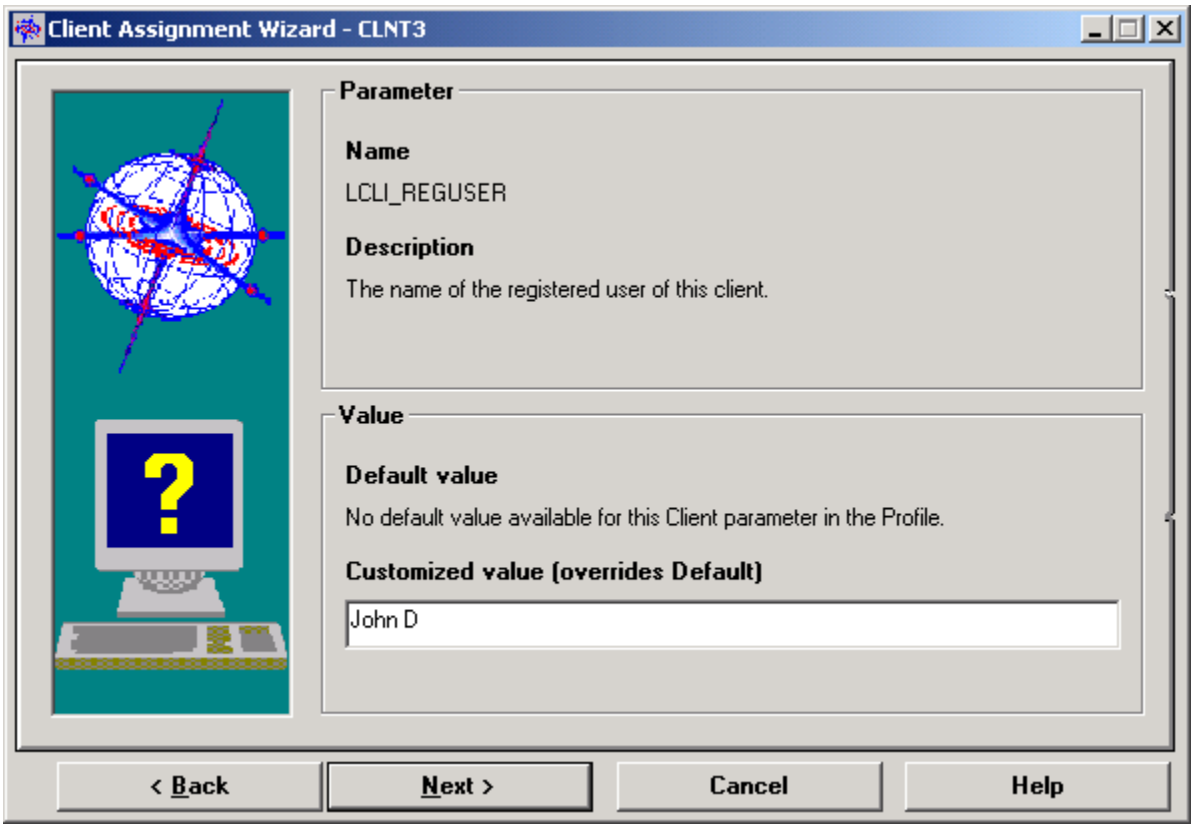
Unless it is disabled in the profile notebook, the wizard will start automatically when clients are associated to a profile. The wizard consists of several screens designed to make assigning clients as easy as possible. There is one wizard window for each parameter listed on the Client Parms page of 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.

Client Assignment Wizard - Client Assignment

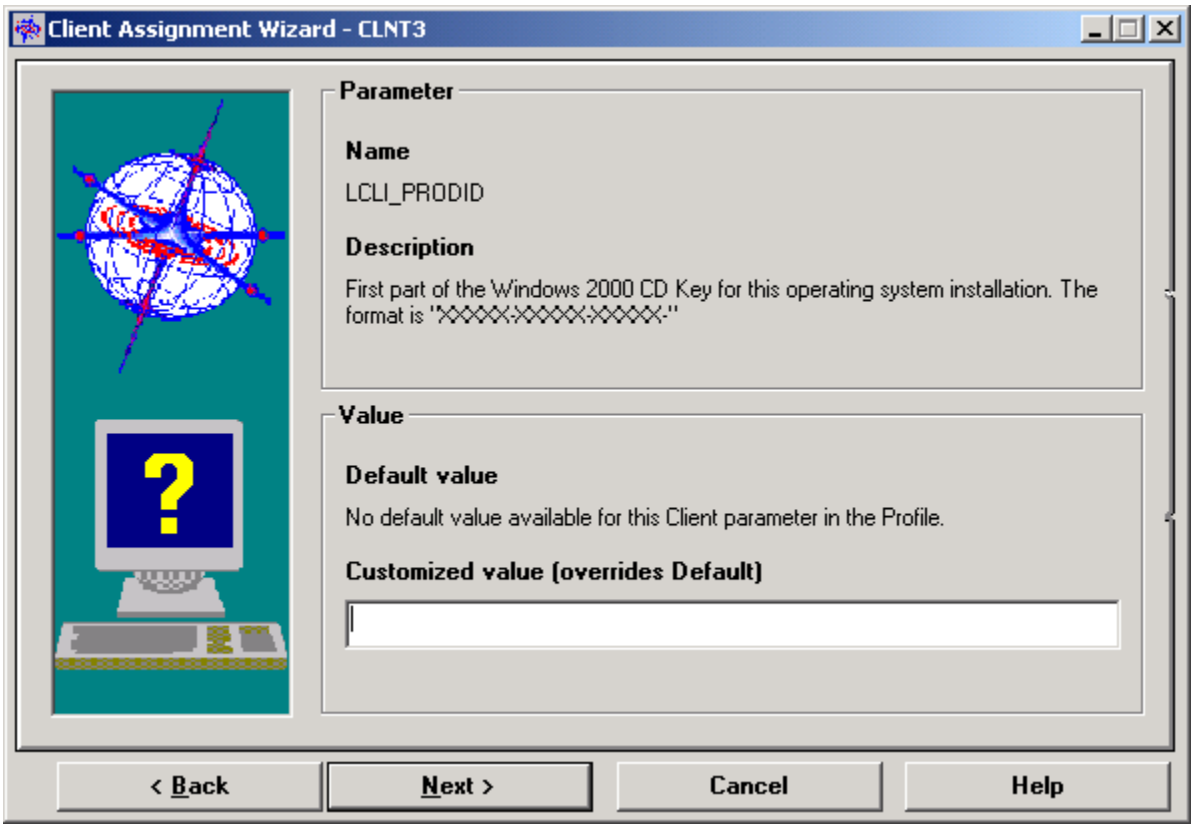
The Client Assignment Wizard screen identifies the existing profile name and client name to which your scanned client is to be assigned. Click **Next** to continue.

Client Assignment Wizard - Registered User



In the space provided under **Customized value**, enter the name of the person who will use this client, and click **Next**.

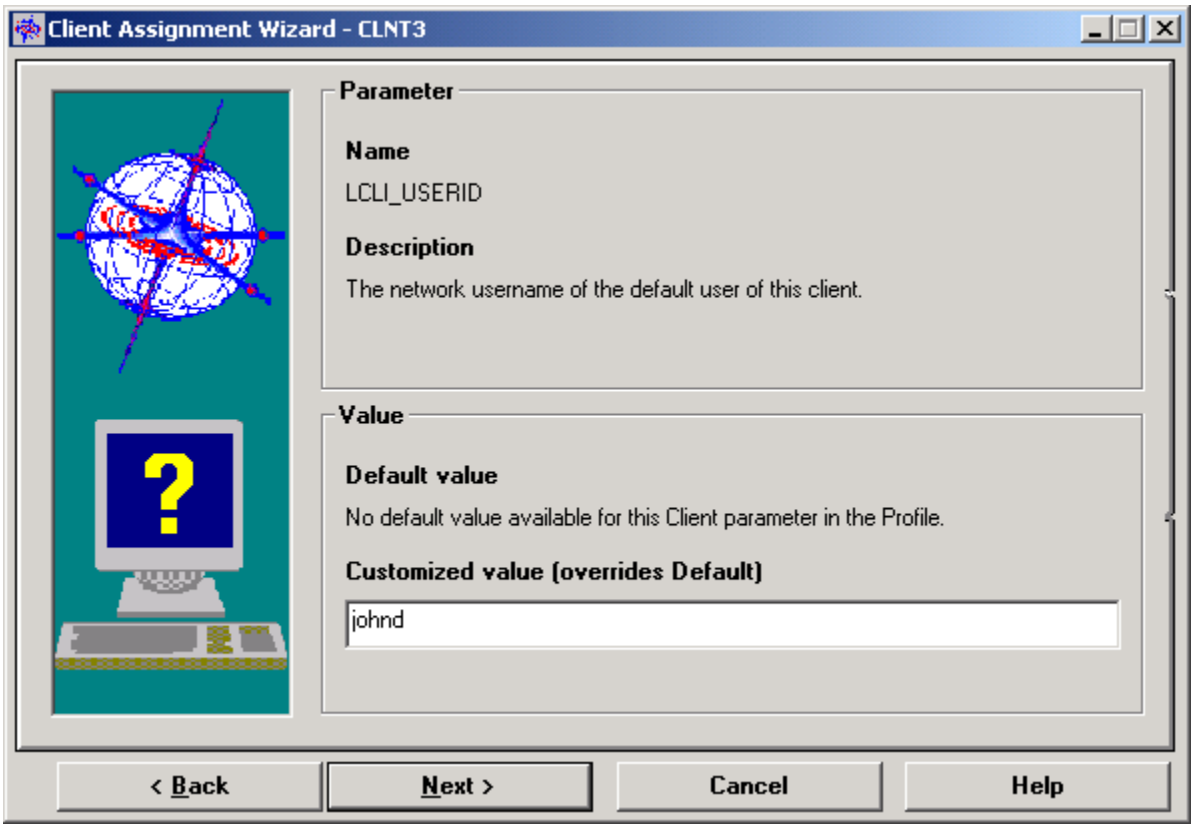
Client Assignment Wizard - Product ID



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.

Client Assignment Wizard - Network Username



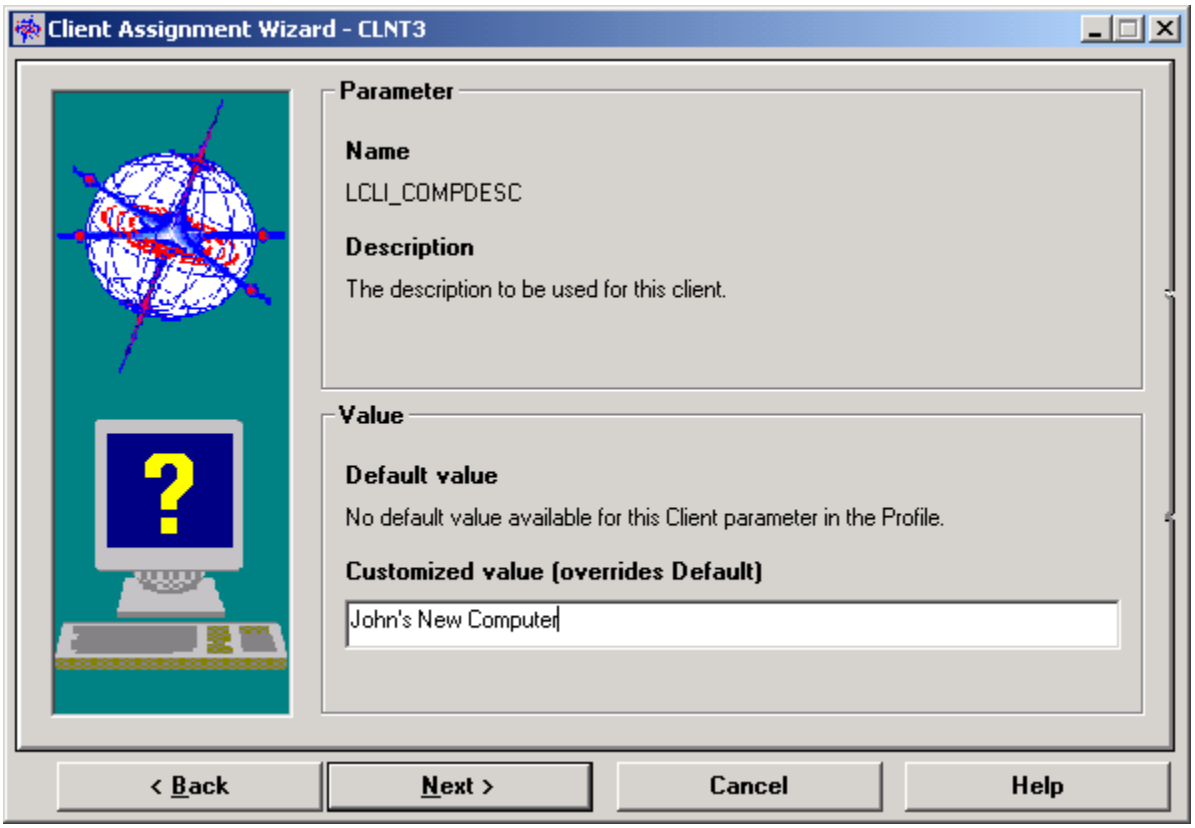
In the space provided, specify a network username for your client. The default value is a blank field. Click **Nex**t to continue.

When the profile to which you are assigning your client is an 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. Once you have finished assigning your client to your profile and you have updated your client computer, you will be prompted to enter a password for your client computer's Administrator account. 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.

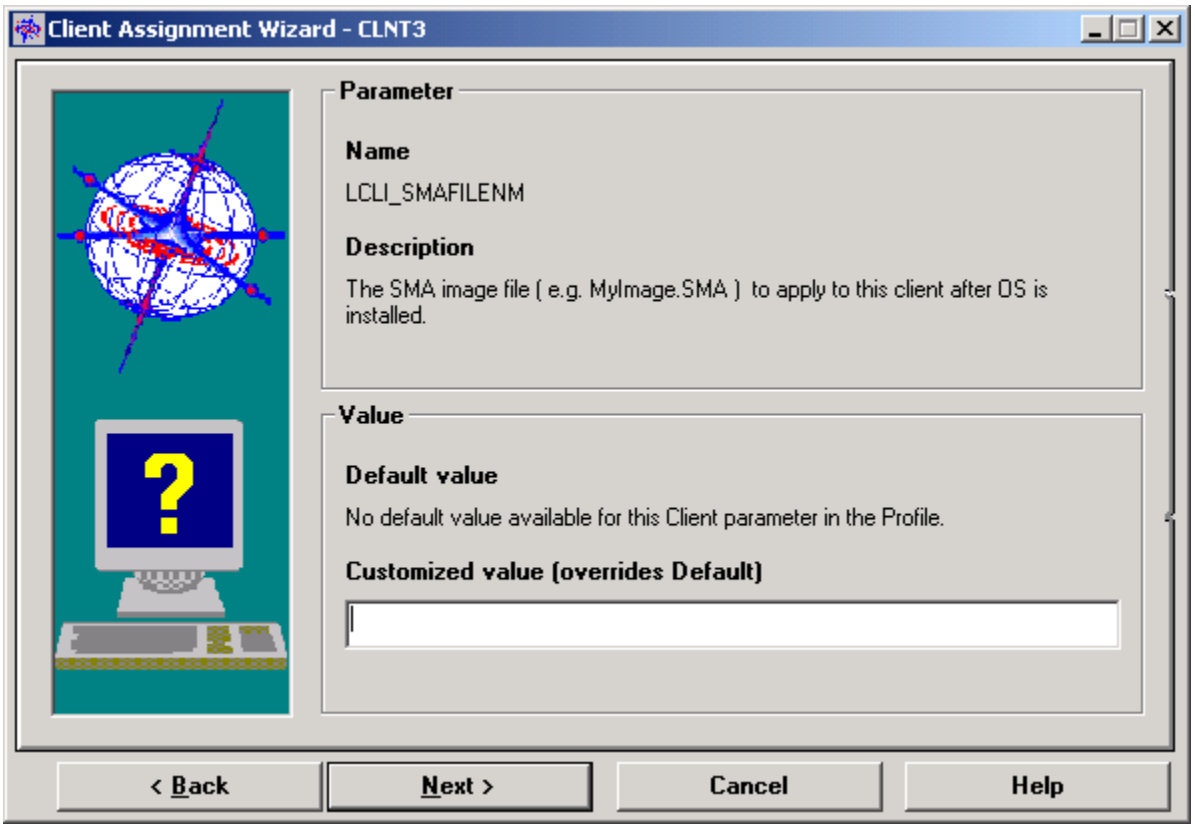
After logging onto your server you can manually create a user account for a new username via Windows NT's User Manager or the similar Window 2000 function.

Client Assignment Wizard - Description



The Description screen allows you to give a description of a client. Click **Nex**t to continue.

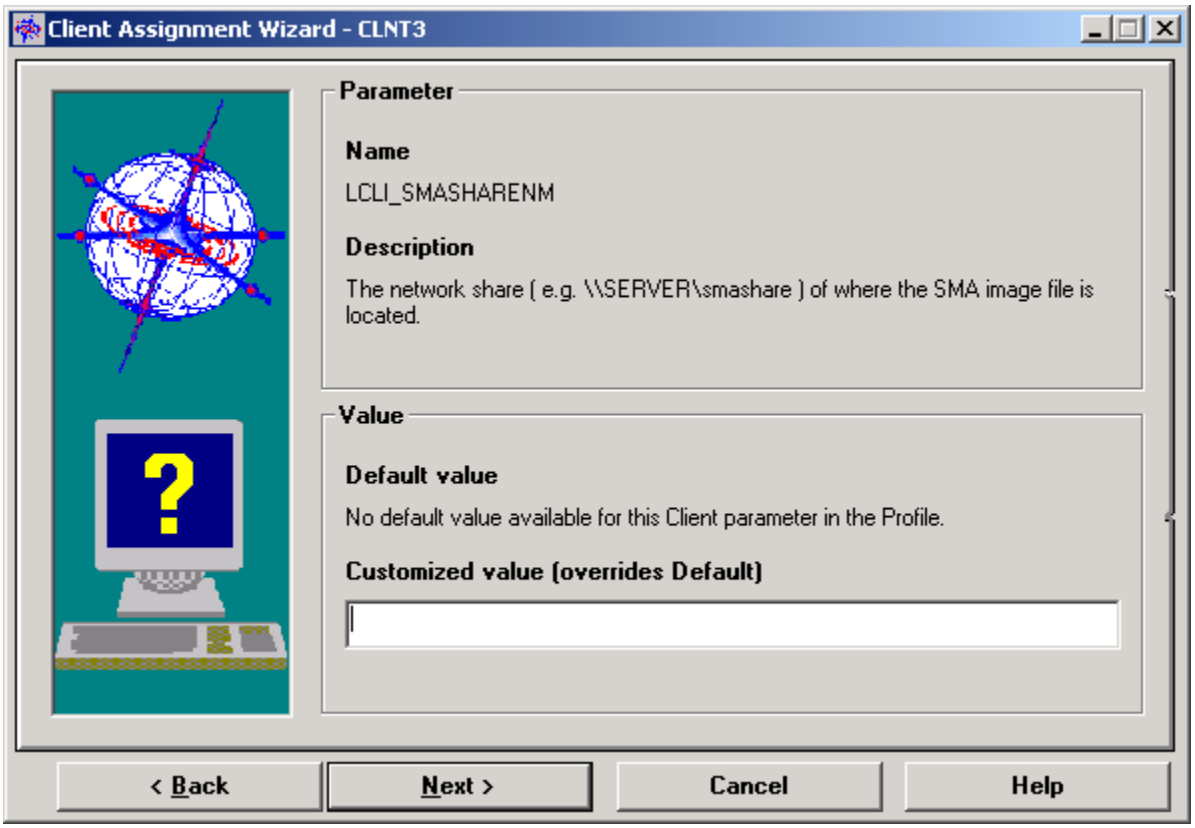
Client Assignment Wizard - SMA Filename



Note: You will only see this screen if the client 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 client.

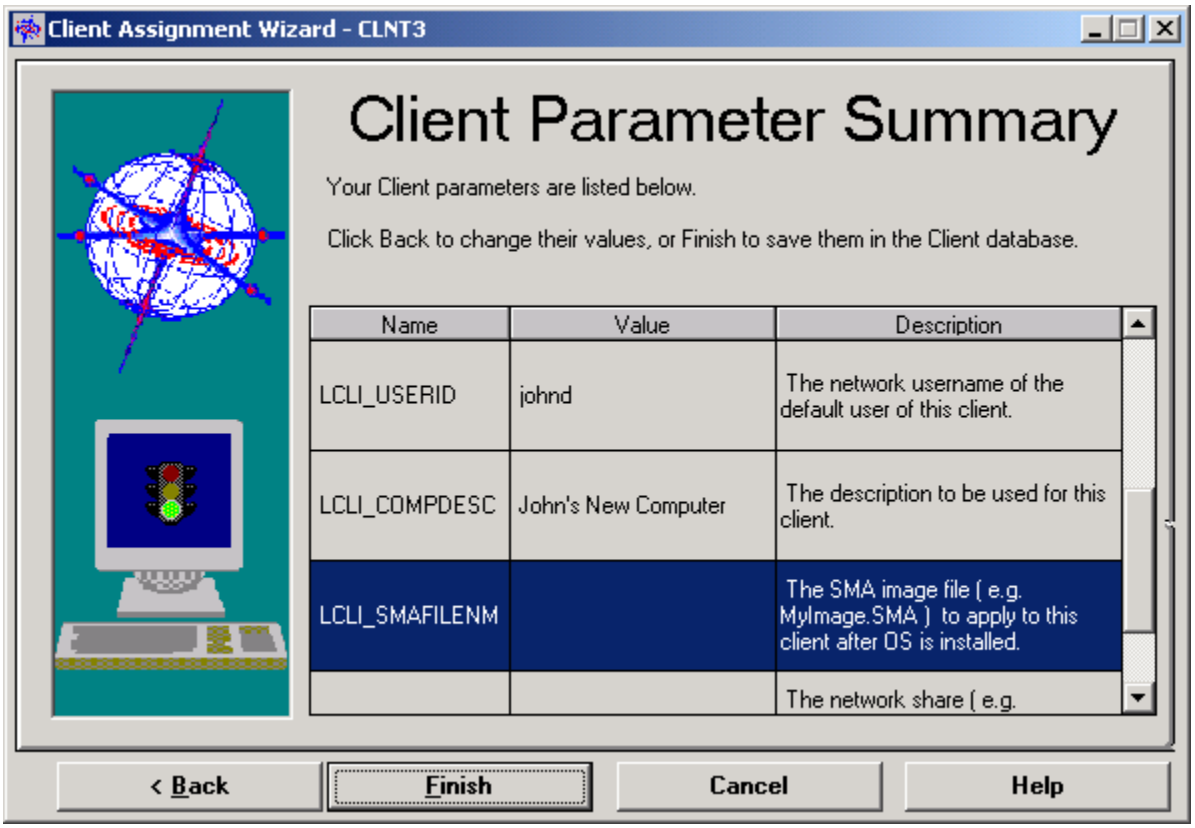
Client Assignment Wizard - SMA Network Share



Note: You will only see this screen if the client 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 client.

Client Assignment Wizard - Client Parameter Summary



The Client Parameter Summary screen provides you with a summary of your client. Changes cannot be made on this screen; it is for information and verification purposes only. To make changes, you must go back through the Client Assignment Wizard making any necessary changes as required. Once this is complete, click **Finish** to start the client assignment process.

Note: Highlighted lines indicate that no values have been entered to override default values.

Customizing Clients Manually

The Client Assignment Wizard is used by default. To assign the client to a profile manually, you must disable the default setting by unchecking the **Enable Client Assignment Wizard** box on the General page of the Software Profile Details notebook.

If the client requires additional personalization at the individual client level (for example, a user ID, password, or IP address), open the Individual Client Details notebook for each newly assigned client and fill in the values for each name listed on the Parameters page. For details, see “Individual Client Details – Parameters Tab“ on page 75.

What To Do Next?

In the previous sections of this chapter you have learned how to scan clients, create unattended install and clone install software profiles, and assign clients. At this point you are acquainted with the core set of operations. The remainder of this section describes other common LCCM functions. Sections 4.4and 4.5 describe how to add images that can be selected during the creation of a new software profile using the Profile Wizard. Section 4.6 describes the secure data disposal profile.

4.4 Adding Clone Images Using the CloneIt Agent Wizard

When you create an operating system clone install software profile using the Profile Wizard, you select an appropriate clone image from a list of available images on the **Profile Wizard - Clone Image Selection** screen (see page 90). The CloneIt Agent Wizard allows you to create a clone image by making an exact copy of a donor client computer. It creates the new image and copies the compressed image file to the LCCM server so that it can be used to install duplicate cloned images onto other clients with identical hardware as the donor computer. (For more details on directory locations, see “Clone Image Directories” on page 172.)

The CloneIt Agent Wizard currently supports the following computer platforms:

- Windows 95
- Windows 95 OSR-2
- Windows 98
- Windows 98 Second Edition

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 client computer that you want to use as the donor for the clone profile.
2. Connect the new donor client to a LAN that can be accessed by the LCCM Server.
3. Make a thorough check to ensure that all the required application software is installed and working correctly on the donor client, and that the network connection is operating properly.
4. Shut down and restart the donor client.
5. Allow the donor client 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 client, 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**.

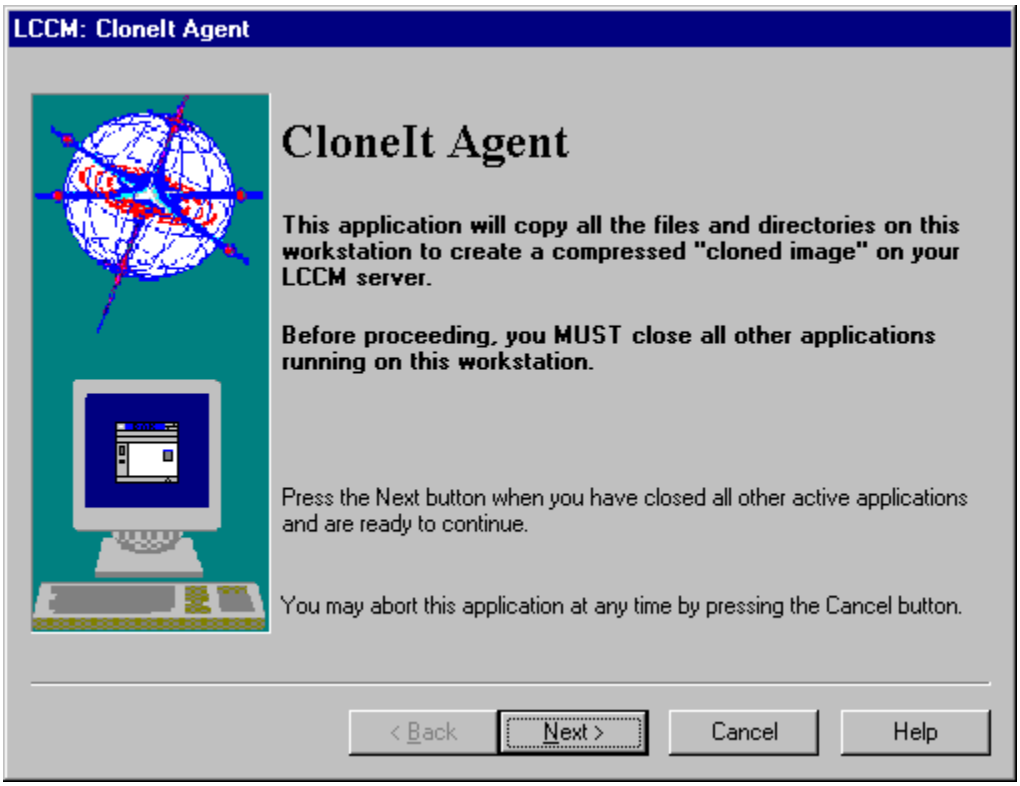
Run the CloneIt Agent Wizard

To start the wizard from the donor computer:

1. Make sure you are logged onto the domain with **Domain Administrative** rights.
2. From the Windows desktop, double-click the **Network Neighborhood** resource and then **Entire Network**. A list of available servers will be displayed.
3. Look for the name of your LCCM Server, and double-click it. A list of "shares" will be displayed for this server.
4. Double-click the share **LANC$ADM**. This will open the LCCM program installation directory.
5. Double-click CloneItAgent.exe.

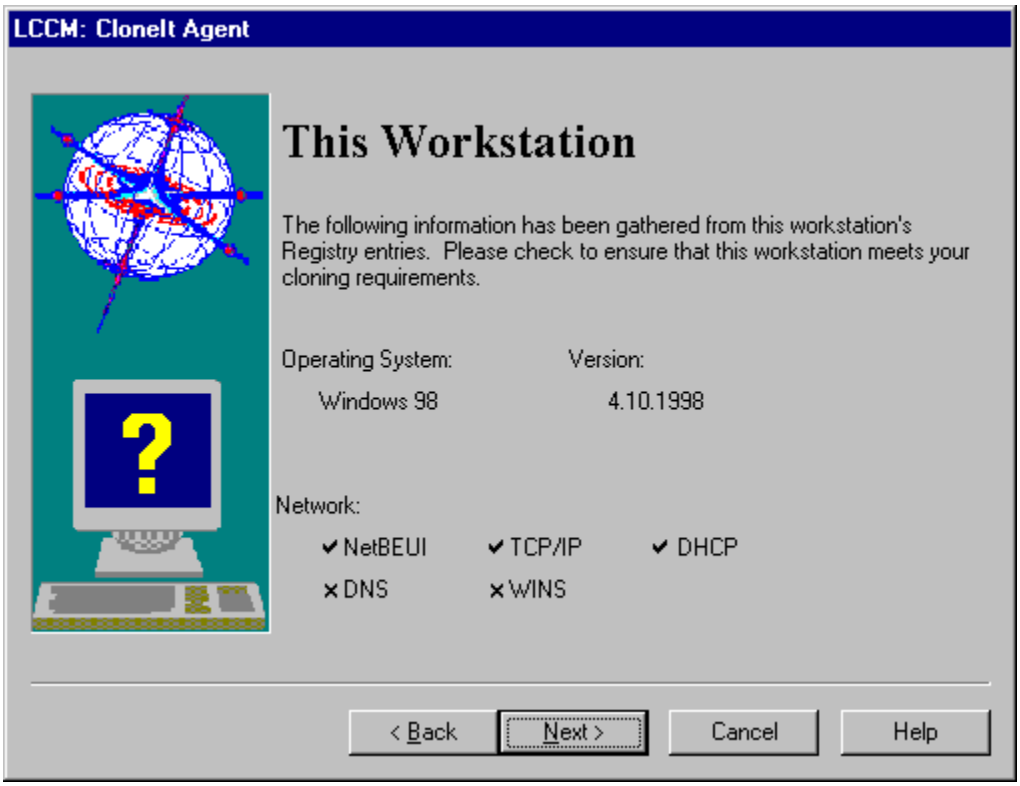
Click **OK** to begin the Cloning process. An easy to use CloneIt Agent Wizard will begin on the client. Follow the simple on-screen instructions to create the clone.

CloneIt Agent Wizard - CloneIt Agent



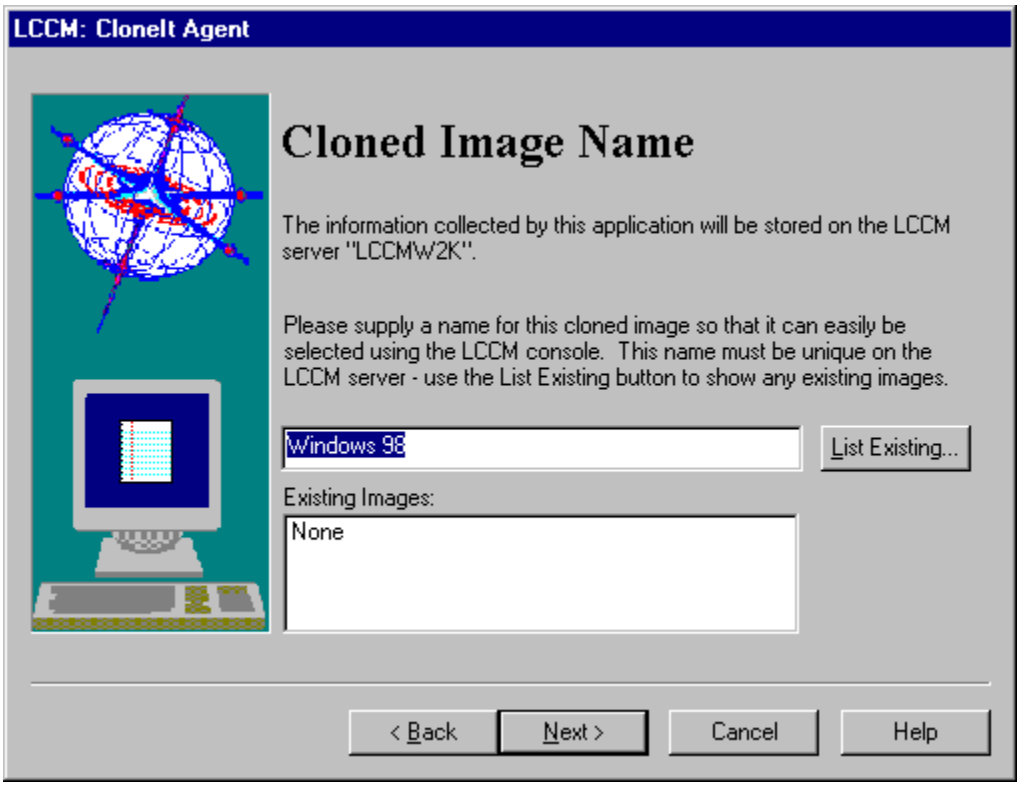
The CloneIt Agent screen provides a description of the CloneIt process. Click **Next**.

CloneIt Agent Wizard - This Workstation



The Workstation screen gives details from the donor computer's registry. Verify these details, then click **Next**. If the details do not meet your requirements, you should cancel at this stage.

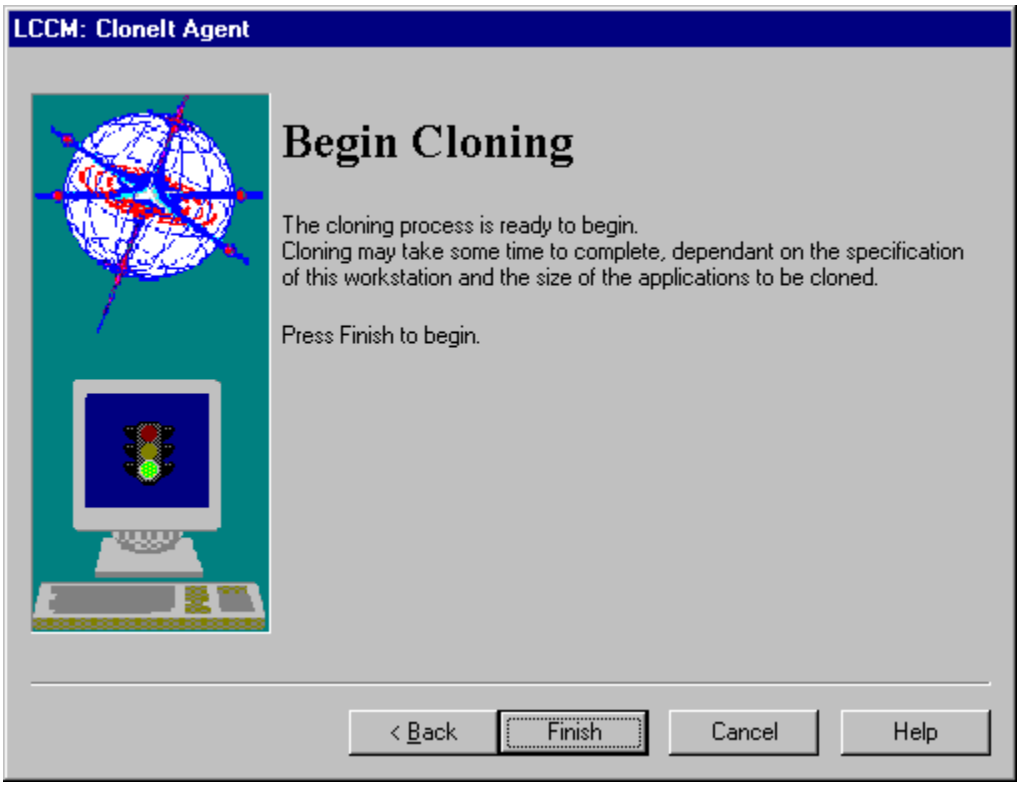
CloneIt Agent Wizard - Cloned Image Name



The Cloned Image Name screen indicates the LCCM 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.

4.5 Adding Applications Using the DiffTool Wizard

When you create a new unattended install software profile using the Profile Wizard, you are given the option to install additional applications on the **Profile Wizard - Application Selection** screen (see page 105). UMS, Netfinity Services and LCCM 3.0 are standard options. You can add other options here by using the DiffTool Wizard. This wizard will create an image of the desired application and store it in the LCCM master repository `<drive>:\LCCM\CLNTFILE\APP\DIFF`. LCCM then includes it as an option on the abovementioned screen.

There are three steps to using DiffTool:

1. Run the first part of the DiffTool Wizard, Pre-Application Installation.
2. Install the desired application (one or more) on the donor computer.
3. Run the second part of the DiffTool Wizard, Post-Application Installation.

Note: The amount of disk space required for DiffTool to perform its tasks is approximately 10 to 20 megabytes. This is in addition to the space required for the application you are installing.

The application image created by DiffTool can only be installed on client computers with the same operating system as the donor computer. For instance, an application image built on a Windows 98 donor computer can only be installed on clients running Windows 98. If you need to install an application on various computers with different operating systems, you will need to create multiple images built on donor computers with these operating systems.

Applications that have been tested with LCCM 3.0 are listed as follows (it is expected that DiffTool will work with other applications that are not on this list):

- QuickBooks 4.0 by Intuit
- IBM Universal Manageability Agent 2.2
- IBM Director
- WinFax 8.0
- Microsoft Office 97 Professional
- Microsoft Office 2000 Professional
- Microsoft Visual J++
- Peachtree Accounting
- Microsoft Visual C++
- ACT 3.0
- Jana Contact Manager
- Rational Visual Test 4.0
- IBM Visual Age PL1
- Norton Utilities
- Great Plains Dynamics
- Netscape Navigator 4.0
- Smart Business Professional
- Lotus Smartsuite 97

- Lotus Notes 4.53
- Cheyenne Backup
- Announcements 3.0, by Parsons Technology
- Microsoft Project
- Microsoft Team Manager

IBM's DiffTool is similar to Microsoft's SysDiff Tool, but is more general and supports more environments. Both of these are compared below:

FUNCTION	DIFFTOOL	SYSDIFF
Supports Windows 2000	Yes	Yes
Supports Windows NT	Yes	Yes
Supports Windows 95	Yes	No
Supports Windows 98	Yes	No
Graphical User Interface	Yes	No
Handles Shared DLL's	Yes	No
Integrated with LCCM 3.0	Yes	No

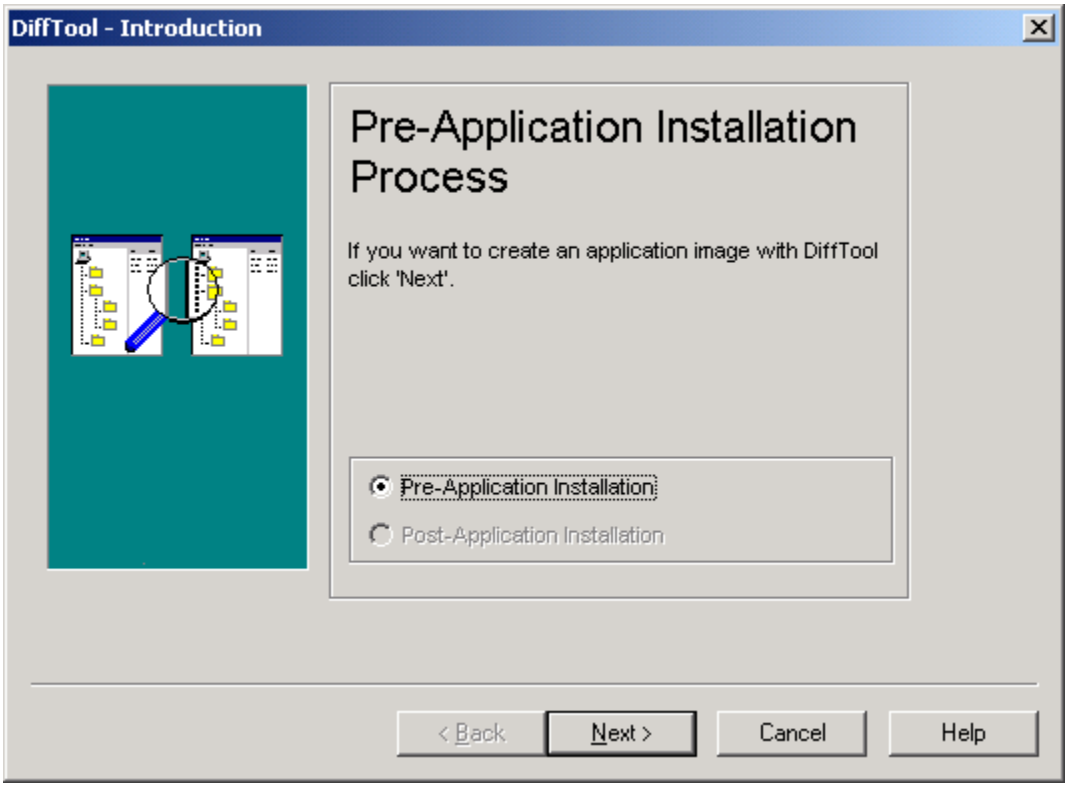
Start the DiffTool Wizard

Start the wizard from the donor computer:

1. From the Windows Desktop, double-click the **Network Neighborhood** resource. A list of available servers will be displayed.
2. Look for the name of your LCCM Server, and double-click it. A list of NT "shares" will be displayed for this server.
3. Double-click the share **LANC$ADM**. This will open the LCCM program installation directory.
4. Double-click **DiffTool.exe** to begin the installation process. An easy-to-use DiffTool Wizard will begin on the client. Follow the on-screen instructions to install your applications.

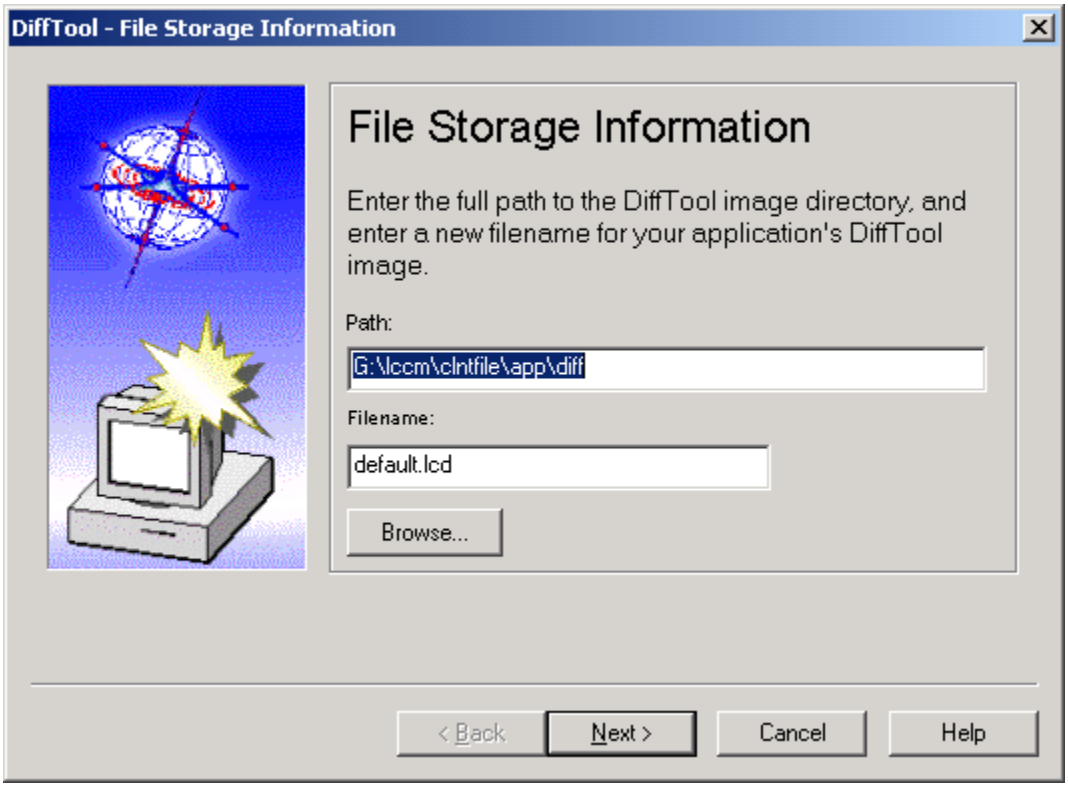
Run DiffTool, Pre-Application Installation

DiffTool Wizard - Introduction



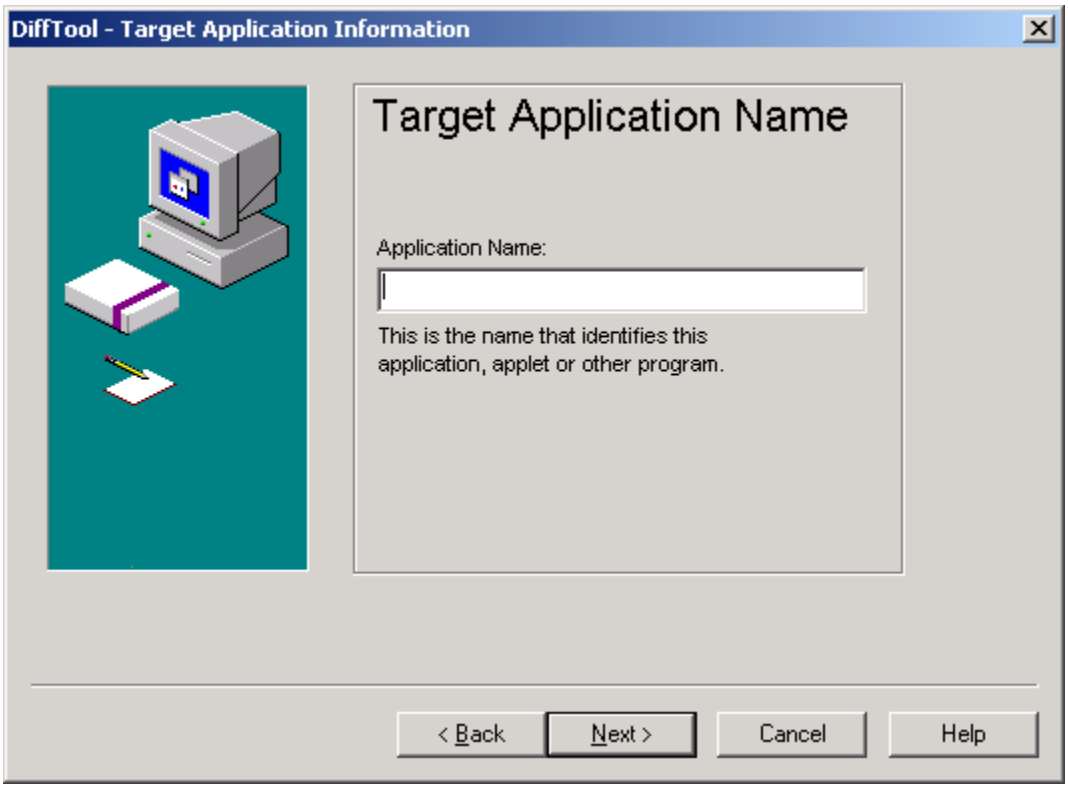
When you run the first part of the DiffTool wizard on the donor computer, this window will be shown. Pre-Application Installation is the only choice available in the wizard. It will already be selected for you. Click **Next** to continue.

DiffTool Wizard – File Storage Information



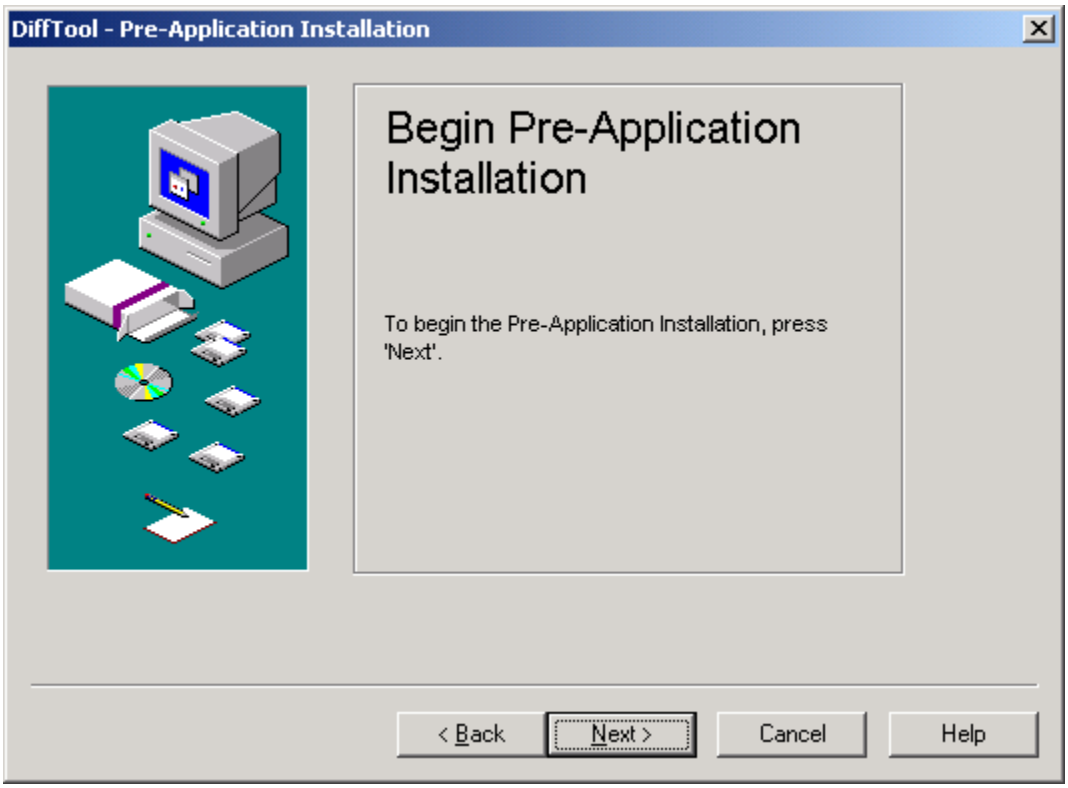
DiffTool will create an output file default.lcd that records the differences that occur on a system as a result of installing an application. Accept the defaults or use the **Browse** button to make changes. The file must have a .LCD extension, and must be located on the LCCM server in the `<drive>:\LCCM\CLNTFILE\APP\DIFF` directory. Click **Next** to continue.

DiffTool Wizard - Target Application Information



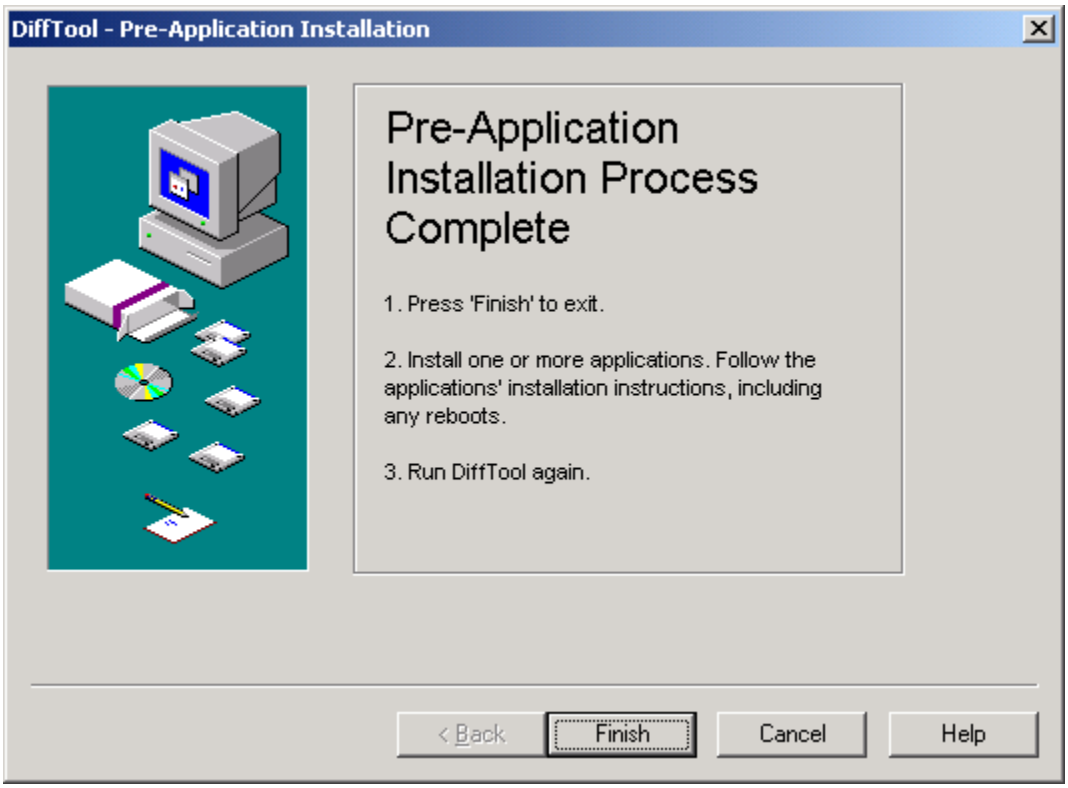
Enter the name of the application in the space provided. Whatever you enter in this box will be used by LCCM to identify this application and it will be included in the list of DiffTool Applications in the master repository once you have added it there. Click **Next** to continue.

DiffTool Wizard - Begin Pre - Application Installation



Click **Next** to begin the Pre-Application Installation process. A message will inform you that the process may take several minutes. When the process is complete, the wizard will automatically advance to the next screen.

DiffTool Wizard - Application Installation Complete



The Finished Pre-Application Installation screen informs you that this phase of the process is complete. Click **Finish** to exit the DiffTool Wizard and continue on to Step 2, Install an Application.

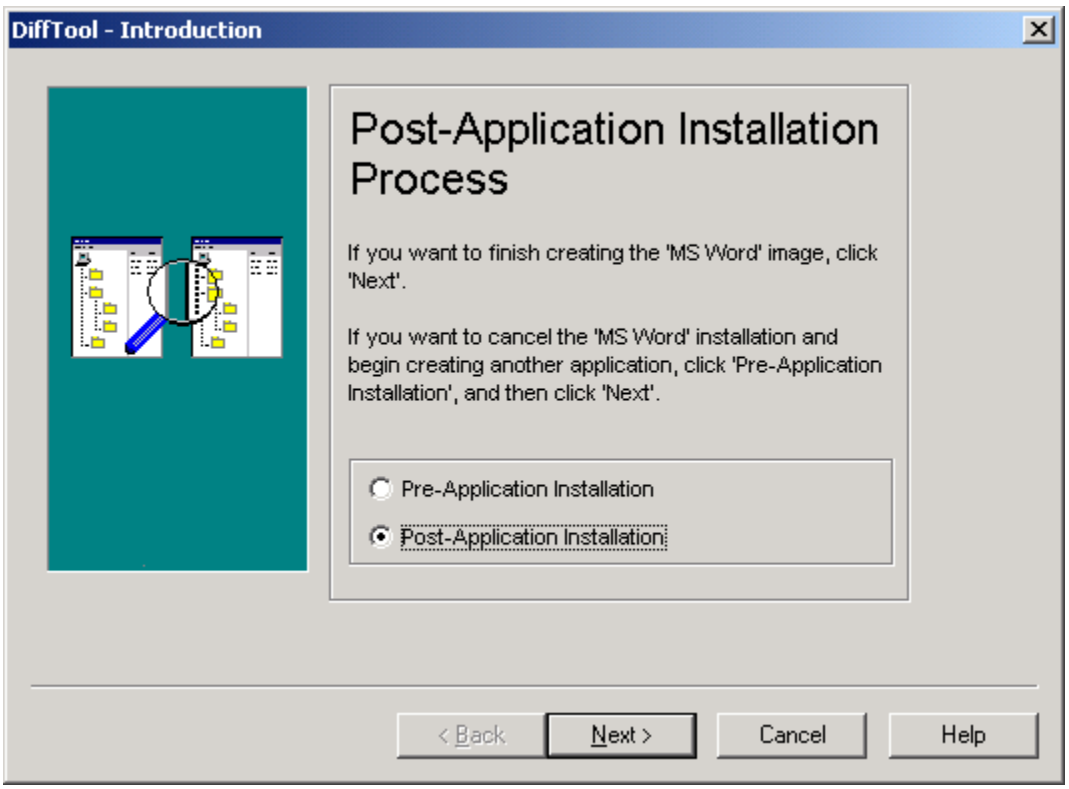
Install the Application

On your donor client, now install the application you want to have DiffTool copy for later deployment. Follow the installation instructions that came with the application, and reboot the machine if the installation program instructs you to do so. Once installation is complete, continue to Step 3, Post-Application Installation.

Run DiffTool, Post-Application Installation

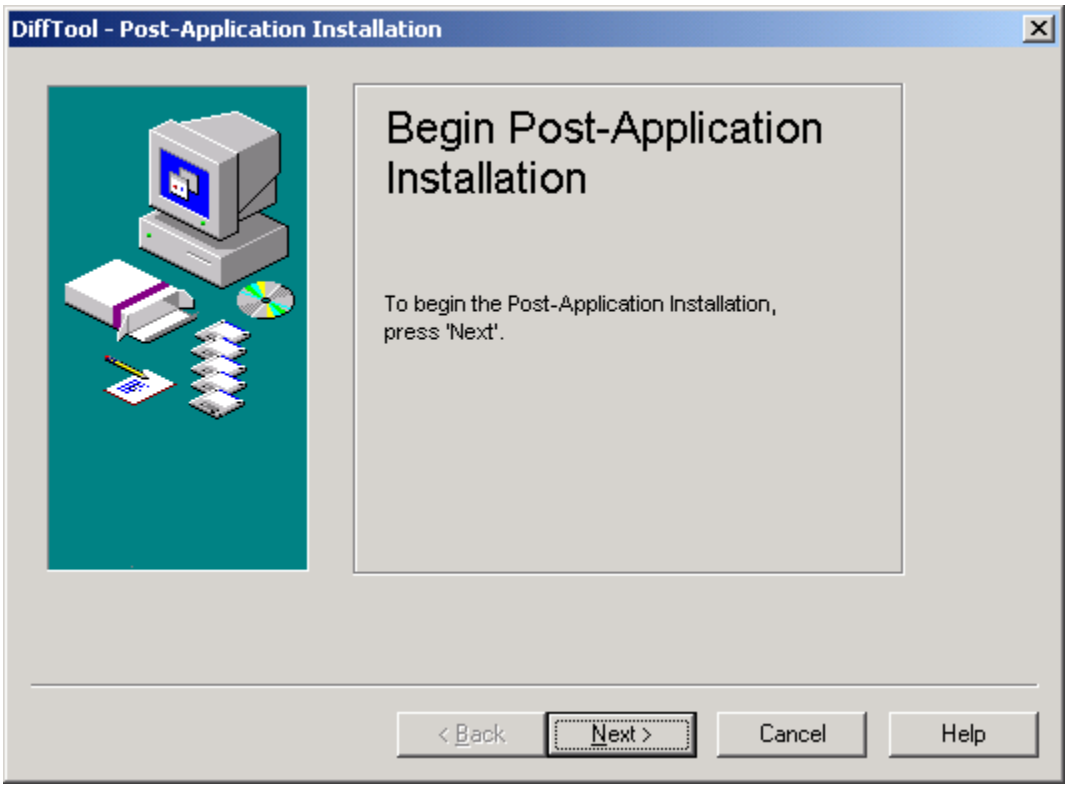
Run the DiffTool Wizard a second time.

DiffTool Wizard - Introduction



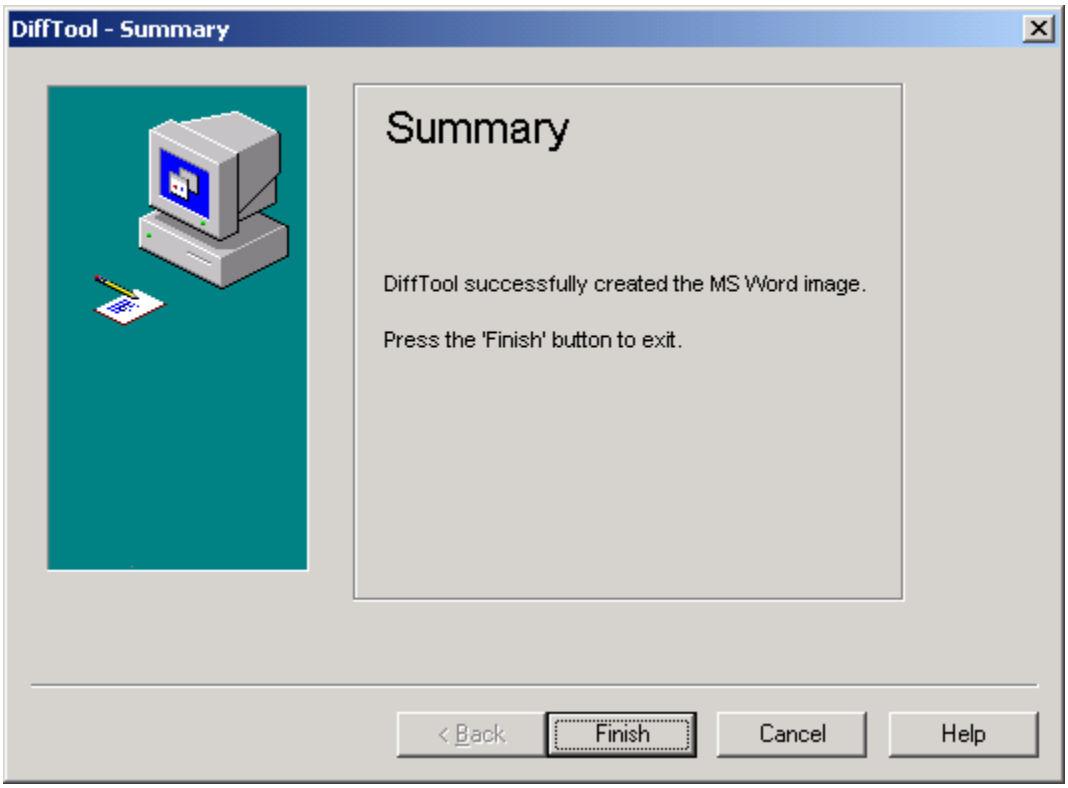
In the Introduction screen, choose Post-Application Installation to continue copying your application (if you choose Pre-Application Installation, the files you have just created with this wizard will be deleted, and DiffTool will start over, creating new Pre-Application Installation snapshot files). Click **Next** to continue.

DiffTool Wizard - Begin Post-Application Installation



Click **Next** to begin the Post-Application Installation process. A message will inform you that the process may take several minutes. When the process is complete, the wizard will automatically advance to the next screen.

DiffTool Wizard - Summary



The Summary screen informs you that DiffTool has completed the process. To exit the DiffTool Wizard, click **Finish**.

4.6 The Secure Data Disposal Profile

The Secure Data Disposal tool is a utility for performing a low-level erase of hard drives on a client. 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.

To successfully dispose of a client, drag the client onto the particular level of the Secure Data Disposal tree, within the Profiles and Assigned Clients box, then click **Process**. A warning dialog box will be presented asking if you are sure that you want to proceed and that the client data will be erased once processed. Once the data is erased the client is available for re-deployment and can be assigned to another LCCM profile.

4.7 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 60.

   Modifications to an existing profile will not take effect on a client already assigned to this profile unless you check the **Mark client for reload** checkbox on the Software page of the Individual Client Details notebook. If you check this box, the entire image will be reinstalled on the selected client.
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 clients assigned to the deleted software profile are placed in the Unassigned Clients list of the Installation/Maintenance window.

4.8 Managing Clients

Deassign a Client from a Software Profile

Deassigning a client from a software profile changes an assigned client into an unassigned client. After you de-assign a client, the client appears in the **Unassigned Clients** box.

To deassign one or more clients from a Software Profile:

1. Select a client or multiple clients within the Profiles and Assigned Clients box.
2. Click the **Deassign** button.

IMPORTANT: If a client whose primary startup sequence is "network" is left in the **Unassigned Clients** box after the changes are processed (clicking the **Process** button), the client computer will not be able to start up normally. The client computer will stop or loop at the PXE screen. If the client 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 client computer from its own hard disk. On models that do not have a PXE bypass mechanism, the only method of starting an unassigned client computer 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 Client

To temporarily disable a client from starting:

1. Select a client or multiple clients within the Profiles and Assigned Clients box.
2. Access the Individual Client Details notebook by doing one of the following:
   - Double-click one of the selected clients.
   - Select **Client** from the menu, and then select **Configure**.
3. Select the **Details** page.
4. Check the **Client 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 client appears gray in the Installation/Maintenance window.

Note: To disable a client before downloading, uncheck the **Mark client for reload** checkbox in addition to checking the **Client Disabled** checkbox.

Delete a Client

To delete one or more clients:

1. Select a client or multiple clients anywhere in the Installation/Maintenance window.
2. Select **Client** from the menu bar.
3. Select **Delete**.

Select how Clients are Displayed

You can customize how clients 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 clients are displayed:

1. Select **Options** from the menu of the Installation/Maintenance window.
2. Select **Display Clients By**.
3. Select a value from the list that appears.

Note: The default attribute for displaying clients is Name. Of the options provided by LCCM, only Name and Network Address are guaranteed to be unique. Location or Contact might be more useful, depending on your organization.

Search Specific Clients

You can perform a database search for any alphanumeric values (text and numbers) stored in LCCM that might help you identify individual clients or groups of clients. For example, you can locate clients 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 Client Details notebook (or combinations of these values).

To perform a search on existing clients:

1. Select **Tools** from the menu in the Installation/Maintenance window.
2. Select **Search For Client**.
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 Clients Database Search box of the Installation/Maintenance window. You can then select, edit, copy, or delete individual clients or groups of clients from this window.

Edit a Client

To modify an existing client:

1. Select a client in the Installation/Maintenance window.
2. Access the Individual Client Details notebook by doing one of the following:
   - Double-click the selected client.
   - Select **Client** 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 clients at the next client startup. You might want to use this procedure if the software on the client 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 client or group of clients within the Installation/Maintenance window.
2. Access the Individual Client Details notebook by doing one of the following:
   - Double-click a selected client.
   - Select **Client** and then **Configure** from the menu.
3. After the Individual Client Details notebook appears, select the **Software** page.
4. Click the checkbox for **Mark Client 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 clients to a maintenance image:

1. **Select** the clients you want to update in the Installation/Maintenance window.
2. Access the Individual Client Details notebook by doing one of the following:
   - Double-click one of the selected clients.
   - Select **Client** 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). LCCM 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 Client 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 LCCM 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 Client Details notebook for a client or group of clients 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 Client 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 Client Details notebook for a client or group of clients.
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 Client Details notebook for a client or group of clients on which you want to reinstall the image.
2. On the Software page, check the **Mark client for reload** check box.
3. On the Scheduler page:
   a) Click the Use Client 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.

4.9 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. LCCM 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 client has been scanned, the password will not be applied to that client. For more details, see “Defaults - General Tab” on page 55
- Changing the default password does not affect the passwords of clients that have already been scanned. To change the BIOS administrator password for clients 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 clients use a keyboard layout that is different from the keyboard layout you use to operate LCCM (for example, a keyboard for another language), the BIOS password set through LCCM might not be recognized when typed on the client 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 client computer. 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 clients access to their diskette drives, while restricting diskette-drive access for other clients. If you update the CMOS settings, you must make sure that these changes are compatible with the client's BIOS level. For more information, see page 150.

Change or Delete a BIOS Administrator Password

The BIOS administrator password can be set or disabled on the Maintenance page of the Individual Client Details notebook (see page 73). You can change or delete a BIOS administrator password that has already been assigned to one or more client computers. To do so:

1. Select the clients you want to update in the Installation/Maintenance window.
2. Access the Individual Client Details notebook by doing one of the following:
   - Double-click a selected client.
   - Select **Client** 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 Disable the BIOS Administrator Password

In most environments, access to the BIOS program on a client is restricted to authorized users only. This is also good policy for an LCCM-enabled environment. If the startup sequence of the client 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 client from LCCM is lost. If the BIOS password is changed at the client to a password that is different from the one defined within LCCM, you cannot re-establish remote boot control.

However, if for some reason you want to temporarily disable the BIOS password and grant access to a client computer 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 doesn't require an authorized user to be present at the client computer to enter in or disable the password:

1. At the server, disable the **BIOS password** for the client.
2. At the client, restart the computer so that the change takes effect.
3. At the server, enable the **BIOS password**.
4. At the client:
   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 client will restart and the BIOS password will be enabled.

Upgrade the BIOS Level

The BIOS level of the client 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 client computer'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 client 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 clients.

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** files.
5. Select **Read BIOS Flash Diskette**.
6. 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.
7. Accept the flash level name given or enter in a new name. This name is used by LCCM to identify the BIOS level.

Note: If you change the level name generated from the BIOS flash diskette and download this to a client, the client BIOS level shown on the BIOS setup screens of the client computer will not match the Current BIOS Level field from the Maintenance page of the Individual Client Details notebook. This is because the BIOS program has the original level name embedded within the program code.

8. Select **Setup**. A new directory, named after the flash level, is created under the `<drive>:\LCCM\CLNTFILE\BIOS` directory, and the contents of the diskette are copied.
9. If you are overwriting an existing directory, you are warned of this and given the option to **Cancel** or **Overwrite**.
10. Click **OK.**

IMPORTANT: For LCCM to process BIOS updates for IBM's Netfinity 7000, Model 86/51:
Rename the file CD0_CD0_.BAT in your `<drive>:\LCCM\CLNTFILE\BIOS\<biosid>` directory to LCREFLSH.BAT
After your BIOS Image has been updated, refer to your update diskette's README.TXT. This will provide you with instructions on how to manually add the BIOS Model Number and Serial Number that LCCM requires to process your BIOS update.

Deploy the BIOS Update Image

To assign the BIOS level to clients:

1. Select the clients you want to update in the Installation/Maintenance window.
2. Access the Individual Client Details notebook by doing one of the following:
   - Double-click one of the selected clients.
   - Select **Client** 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 client system board will be displayed in the BIOS Level field on the Individual Client 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 Client 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 client computer's scheduled update time is reached and the client computer 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.

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 148). Alternatively, you will find this on your LCCM server in the `<drive>:\LCCM\CLNTFILE\BIOS\<bios>` directory.

Updating the CMOS settings for a client 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 clients.

Create the CMOS Settings Update Image

You create a CMOS Settings Update Image on a donor computer, which has the correct BIOS level installed. 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 LCCM 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

   ```
   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.

   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 a client computer access to diskette drives.
7. Copy this file to the corresponding BIOS directory on your server which is named:

   ```
   C:\LCCM\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 Read 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 client computers:

1. Select the clients you want to update in the Installation/Maintenance window.
2. Access the Individual Client Details notebook by doing one of the following:
   - Double-click one of the selected clients.
   - Select **Client** and then **Configure**.
3. Select the **Maintenance** page.

4. Use the **Browse** button to select the correct CMOS (.CMS) file for the clients, 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 client'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 Client 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 client computer's scheduled update time is reached and the client 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.

4.10 Managing Rapid Restore Hard Drive Partitions

Rapid Restore is a backup/recovery mechanism that allows the backup of the primary partition of a client (when it is in a known good state). It copies the primary partition to a hidden partition on the client hard drive. In the case of a later failure due to a corrupted or missing file, Rapid Restore can restore the client's primary partition to the backed-up state.

Minimum Requirements of a Rapid Restore Partition

Rapid Restore will limit the clients to about half of their available hard disk space, as Rapid Restore creates a hidden partition equal to your primary partition plus 1 cylinder for administrative overhead. Ensure that your primary partition occupies less than half the physical hard disk space on your client. The physical size of the extra disk cylinder will vary according to the type of hard drive your clients are using.

Use Rapid Restore to Back Up your Boot Partition.

A Rapid Restore partition can be created in one of three ways:

- **Automatically, using the Profile Wizard**. The easiest and recommended method for creating a Rapid Restore partition is simply to enable the function on the Profile Wizard (see "Profile Wizard - IBM Rapid Restore Partition Setup" on page 92). The Rapid Restore partition will then be created on each client that is assigned to the profile, before downloading the image. After the image has been copied onto the client, an exact copy of the primary partition will be made to the hidden Rapid Restore partition
- **Using the Individual Client Details notebook**. By checking the **Rapid Restore** checkbox and enabling the **Backup partition** radio button. This will allow a Rapid Restore backup operation to be

run from the LCCM console. For more details, see “Individual Client Details – Maintenance Tab“ on page 73

- **Manually**. The Rapid Restore partition can be created manually on the client, using the RAVE.EXE program. For more details, see “RAVE.EXE” on page 217

To re-run a backup operation and make your backed up partition up-to-date, you can use either of the last two methods.

Use Rapid Restore to Restore your Boot Partition

You can restore the client’s primary partition from an existing backup, for instance when your primary partition is damaged. The Rapid Restore operation will completely overwrite the original primary partition, including all data that may reside there. This will recover the client to a known good state**,** but you will lose all changes that you made on your client after the last Rapid Restore backup.

You can restore the client’s primary partition from an existing backup in two ways:

- **Using the Individual Client Details notebook**. By checking the **Rapid Restore** checkbox and enabling the **Restore partition** radio button. For more details, see “Individual Client Details – Maintenance Tab“ on page 73.
- **Manually**. The partition can be restored manually using the RAVE.EXE program. For more details, see “RAVE.EXE” on page 217.

Note: During backup, Rapid Restore automatically created a non-DOS partition on your client'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.

4.11 Startup Sequences on the Client Computer

Allow Local Hard Disk Startup

If you have a centralized client configuration and maintenance area from which you send pre-configured computers out to different areas of your organization, you can run LCCM from a single server to configure your clients before disconnecting them from the LAN. LCCM stores the client configuration details such that if the client computer 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 LCCM (see “Update the CMOS Settings” on page 150).

To allow local hard disk startup for to-be-disconnected clients:

1. Scan the new client computer into the LCCM database.
2. Assign the client to an operating system profile.
3. Process the client.
4. Disconnect the network cable from the client computer.
5. Restart the client computer 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 LCCM'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 client computer. (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 LCCM 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 client computer, the remote boot process connects and "shakes hands" with the client before allowing the client to continue starting up from its hard disk. This very brief process allows LCCM to maintain control of the client computer at all times. If you have image downloads or maintenance procedures scheduled to run as soon as possible, the client is processed at this time. For more details, see "Individual Client Details – Scheduler Tab" on page 76.

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 client computer and within the LCCM 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 LCCM, see "Defaults - Processing Tab" on page 57.

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 client will not function when disconnected from the LAN.

Recommended Startup Sequences

There are several acceptable startup-sequence schemes that can be used effectively with LCCM. Choose the one that best fits the way you want to use LCCM.

- **Primary = network, alternate = network**. This configuration maximizes the management control that the LCCM administrator has over the client computer. It enables the LCCM scan function when you first power on the computer, and it enables ongoing remote management by LCCM via Wake on LAN (if the computer has Wake-on-LAN enabled). A disadvantage is that after deployment, the client cannot boot to its hard drive unless the LCCM server is turned on and LCCM PXE Services is started. In other words, if the LCCM server is down, your clients cannot boot.
- **Primary = hard drive, alternate = network**. This configuration enables ongoing remote management by LCCM via Wake on LAN if the computer has Wake-on-LAN enabled. Also, the client can boot to its hard drive when the LCCM server is down. A disadvantage is that it does not

enable the LCCM scan function. You would have to do something manually to scan the computer such as entering the client's MAC address into the LCCM Wake Tool before waking up the client, or - if your computer has this capability - after power on, pressing a key sequence that causes the client 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 LCCM client.

Chapter 5. Examples

These examples are provided to help you become more familiar with using the Profile Wizard, Client Assignment Wizard, DiffTool Wizard and CloneIt Agent Wizard. Each exercise gives a specific example of how to use LCCM's wizards to create operating system and software profiles to which your client computers 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 client computer 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 Client Assignment Wizard to:

- Set up a client computer
- Add the client computer to the LCCM database
- Create a Windows 2000 operating system (including Service Pack 2) image
- Create an LCCM software profile for the Windows 2000 Server image
- Transport the Windows 2000 Server operating system image to the server
- Assign the client computer to the software profile using Client Assignment Wizard
- Download the Windows 2000 Server operating system image to the client computer

Before you begin, you must have the following:

- A server attached to the LAN. The server must be functioning and have LCCM 3.0 already installed.
- A Windows 2000 Server installation CD
- Windows 2000 Server licenses
- A client computer. This computer must have an LCCM-supported network card installed and meet the minimum hardware requirements to run Windows 2000 Server.

Scan the Client

The first step in this exercise is to connect your client computer to the LAN and scan it into LCCM:

1. Install a client computer (i.e., connect the cables, etc.) and connect it to the LAN. This client computer will receive the Windows 2000 Server operating system image and will be referred to as the client computer throughout the remainder of this exercise.
2. Start LCCM and start the scan process by clicking on the **Start** button in the Installation/Maintenance window.
3. Power on the client computer, and make sure it boots to the network (i.e., change its startup sequence, if necessary).

The client computer will run the LCCM scan programs and then power off. A new client 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 LCCM'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 clients 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 Rapid Restore Partition Setup screen, click the **Yes, create a hidden local copy of the entire client image** radio button, and click **Next**. For more details on enabling Rapid Restore see “Profile Wizard - IBM Rapid Restore Partition Setup” on page 92.
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 93.
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 client operating 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 your LCCM 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 Clients column under OS Install Profiles within LCCM's main Installation/Maintenance window.

Assign a client to a Software Profile

The next step in this exercise is to assign your client computer to the software profile you have created:

1. Highlight your client computer in the Unassigned Clients column, drag and drop it onto the software profile that you just created in the Profiles and Assigned Clients column under OS Install Profiles. This will automatically start the Client Assignment Wizard.
2. At the Client Assignment Wizard screen, click **Next**.
3. At the Registered User screen, enter a name for the registered user of your client 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 client and click **Next**.
6. At the Description screen, enter a description for your client and click **Next**.
7. At the Client Parameter Summary screen, ensure the details for your Client 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 client computer, 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 LCCM 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 client computer. Supported applications such as Universal Manageability Services, Netfinity Services and LCCM 3.0 can be included. The example uses the Profile Wizard, the DiffTool Wizard and the Client Assignment Wizard to:

- Set up a client and a donor computer
- Add the client computer to the LCCM database
- Create additional applications using DiffTool
- Create a Windows NT 4.0 Workstation operating system (including Service pack 6 and a Rapid 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 LCCM server
- Assign the client computer to the software profile using Client Assignment Wizard
- Install the Windows NT 4.0 Workstation operating system (including Service Pack 6) and additional applications image on the client computer

Before you begin, you must have the following:

- A server attached to the LAN. The server must be functioning and have LCCM 3.0 installed.
- The Windows NT 4.0 Workstation CD-ROM
- The Windows NT Service Pack 6 CD-ROM
- Licenses to operate Windows NT 4.0 Workstation
- A donor computer that has the operating system already installed
- A client computer. This computer must have an LCCM-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 LCCM. Do this as you did in the previous example.

Add an application for Unattended Install using DiffTool

The next step in this exercise is to add the application located on your donor computer for Unattended Install using DiffTool:

1. Ensure that the operating system is installed and functioning on the donor computer.
2. Shut down and restart the client computer and allow it to fully restart.
3. Ensure that the Windows operating system is the only application still running. Shut down all other running applications.
4. From the Windows Desktop double-click the **Network Neighborhood** resource.
5. Double-click the name of your LCCM server.
6. Logon to the domain with domain administrative rights.
7. From the list of NT "shares" displayed double-click the **LCCM$ADM** share. This will open the LCCM installation program directory.
8. Double-click **difftool.exe** to begin the installation process. Pre-Application Installation is the only choice available in this wizard screen. It will already be selected for you. Click **Next** to continue.
9. In the File Storage Information screen, accept the default settings. Click **Next** to continue.
10. In the Target Application Information screen, enter the name of the application in the space provided. Whatever you enter in this box will be used by LCCM to identify this application and it will be included in the list of DiffTool Applications in the master repository, once you have added it there. Click **Next**.
11. Click **Next** to begin the Pre-Application Installation process. A message will inform you that the process may take several minutes. When the process is complete, the wizard will automatically advance to the next screen.

12. The Finished Pre-Application Installation screen informs you that this phase of the process is complete. Click **Finish** to exit the DiffTool Wizard.
13. On your donor client, now install the application you want to have DiffTool copy for later deployment. Follow the installation instructions that came with the application, and reboot the machine if the installation program instructs you to do so.
14. Once installation is complete, run the DiffTool Wizard a second time, by double-clicking **difftool.exe**. In the Post-Application Installation Process screen, choose Post-Application Installation to continue copying your. Click **Next**.
15. Click **Next** on the following screen to begin the Post-Application Installation process. A message will inform you that the process may take several minutes. When the process is complete, the wizard will automatically advance to the next screen.
16. The Summary screen informs you that DiffTool has completed the process. To exit the DiffTool Wizard, click **Finish**.

Create a Software Profile

The next step in this exercise is to create a software profile using the Profile Wizard:

1. From LCCM'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 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 Rapid Restore Partition Setup screen, check the **Yes, create a backup image of the entire operating system** box and click **Next**.

   When enabled, Rapid Restore will limit the clients to almost half of their available hard disk space. This example assumes that the client computer's hard drive is 20 GB. By selecting a maximum-sized C: partition (see step 7), the client will wind up with a 7.8-GB C: drive, an approximately 7.8-GB hidden Rapid Restore partition, and approximately 4.4 GB of unused space. For more information, see “RAVE.EXE” on page 217.
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 clients 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 client operating 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 your LCCM 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 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 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 Clients column under OS Install Profiles within LCCM's main Installation/Maintenance window.

Assign a client 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 client computer in the Unassigned Clients column. Drag and drop it onto the software profile that you have created in the Profiles and Assigned Clients column under OS Install Profiles. This will automatically start the Client Assignment Wizard.
2. At the Client Assignment Wizard screen, click **Next**.
3. At the Registered User screen, enter the name of your client'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 client and click **Next**.
6. At the Description screen enter a description for your client and click **Next**.
7. At the Client Parameter Summary screen, ensure the details for your Client 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 client, open the Individual Client Details notebook, and change the Name on the Details page.

8. To update your client computer click the **Process** button within LCCM'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 A Clone Install of Windows 98

This example remotely installs a Windows 98 operating system image and applications cloned from a donor computer to a client computer with an identical hardware setup. This example:

- Sets up a client computer and a donor computer
- Adds the client computer to the LCCM database
- Creates a Windows 98 donor image from the donor computer
- Creates a software profile for the Windows 98 image
- Transports the Windows 98 operating system image to the server
- Assigns the client computer to the software profile
- Downloads the Windows 98 operating system image to the client computer

Before you begin, you must have the following:

- A server attached to the LAN. The server must be functioning and have LCCM 3.0 installed
- The Windows 98 installation CD-ROM
- A client computer. 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 client computer 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 your client computer and donor computer to the LAN, scan them into LCCM, install Windows 98 and use CloneIt Agent to clone an image from the donor computer:

1. Install 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 client computer throughout the remainder of this exercise.
2. Start LCCM and start the scan process by clicking the **Start** button in the Installation/Maintenance window.

Create the Clone Image

1. Install Windows 98 on the donor computer using an LCCM Windows 98 unattended install profile.
2. Connect the donor computer to the LAN to which your LCCM server belongs.
3. Ensure that all required software is installed and functioning on the donor computer.
4. Shut down and restart the donor computer and allow it to fully restart.
5. Ensure that the Windows 98 operating system is the only application still running. Shut down all other running applications.
6. From the Windows Desktop, double-click the **Network Neighborhood** resource.
7. Double-click the name of your **LCCM server**.
8. Logon to the domain with Domain Administrative rights.
9. From the list of NT "shares" displayed, double-click the **LCCM$ADM** share. This will open the LCCM installation program directory.

10. Double-click **CloneItagent.exe**.
11. Click **OK** to begin the cloning process.
12. 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 LCCM'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** radio button.
    c) Select the radio button applicable to the operating system you wish to install for this profile (in this case Windows 98) and click **Next**.
4. At the Clone Image Selection screen, click **Next**.
5. The options available for the RAID Adapter Setup screen, the IBM Rapid Restore Partition Setup screen, the Target Machine's Disk Setup screen, the Profile Customization screen and the TCP/IP Configuration 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 Clients column under OS Clone Profiles within LCCM's main Installation/Maintenance window.

Assign a client to a Software Profile

The next step in this exercise is to assign your client computer to the software profile you have created:

1. Highlight your client computer in the Unassigned Clients column, drag and drop it onto the software profile that you have created in the Profiles and Assigned Clients column under OS Clone Profiles. This will automatically start the Client Assignment Wizard.
2. At the Client Assignment Wizard screen, click **Next**.
3. At the Registered User screen, enter the name of your client'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 client and click **Next**.
7. At the Description screen, enter a description for your client and click **Next**.
8. At the Client Parameter Summary screen, ensure that the details for your Client 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 client, open the Individual Client Details notebook, and change the Name on the Details page.

9. To update your client computer click the **Process** button within LCCM'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.

Chapter 6. Advanced Administrative Topics

6.1 Managing AIA-enabled Client Computers

If your computers contain Radio Frequency Identification (RFID) chips and are Asset Information Area (AIA) enabled, you can use AIA data fields with LCCM. Data can be read from or written to an on-board Electronically Erasable Programmable Read Only Memory by LCCM during the scanning and assigning of clients. Additionally, you can use these fields in LCCM 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 LCCM

You can use AIA data fields to process LCCM profiles when the scan process first detects a client computer. The scan program will read the required data from the AIA. This data must be available on the client. Make sure that you specify no user prompts during the scan process. For more details, see “Defaults - Scan Tab” on page 58.

Each field in the client 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 LCCM.

The field names are:

- PRELOADPROFILE

  This information is added to the Requested Profile Name & Date fields on the Software page of the Individual Client Details notebook (see page 72).

  ```
  IMAGE=OS Clone Profile - 1
  IMAGEDATE=00000000
  ```

- OWNERDATA

  The Name, Department, Phone and Position field values from the OWNERDATA group on the client are joined to make a single LCCM field. This information is added to the Contact field on the Details page of the Individual Client Details notebook (see page 69).

  ```
  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 Client Details notebook (see page 69).

  ```
  LOCATION=Room12, Floor 3
  ```

- USERDEVICE

  The five user-definable fields from the USERDEVICE group are joined to make a single LCCM field and are added to the Comment field on the Details page of the Individual Client Details notebook (see page 69).

  ADDRESS = 3039 Cornwallis Rd

  CITY = RTP

  STATE = NC

  ZIPCODE = 27709

  AREA = West

- NETWORKCONNECTION

  IPADDRESS

  SUBNETMASK

  GATEWAY

  SYSTEMNAME (computer name)

Assigning Clients with Asset ID

You can set newly scanned clients to be automatically loaded with an existing image by checking the **Automatically assign and process newly scanned clients** box on the Scan page of the Defaults notebook (see page 58). Software profiles that you intend to deploy this way must not depend on LCCM client parameters, as there will be no opportunity to set them. If auto-assign is enabled and a newly scanned client 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 client:

- The IMAGEDATE value must be set to 8 zeros, 00000000. If IMAGEDATE is non-zero, LCCM assumes that a profile has already been deployed, and it will not re-deploy the profile.
- The requested IMAGE (profile name) must exist within LCCM and match perfectly with the AIA requested profile. This is position sensitive, but not case sensitive.
- The client must meet all the hardware requirements of the profile.

If your system is equipped with the AssetID feature, LCCM automatically updates the 'IMAGE' and 'IMAGEDATE' fields upon successful processing of the software profile.

Customizing LCCM 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 answer file using parameters supplied both from LCCM and the AIA area of the client computer. For more information, see "AIAREAD.EXE" on page 196 and "LCCUSTOM.EXE" on page 211.

At the administrator console, create a final image batch file, <drive>:\LCCM\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 client 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 client's active RAM. The environment variables already present for the client, from the Software Profile Details and Individual Client 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 Client Details notebooks for the client 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 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 197 and “LCCUSTOM.EXE” on page 211.

6.2 Installing Universal Manageability Services (UMS)

LCCM supports IBM Universal Manageability Services (UMS), a common client management agent based on Tivoli's Management Agent, IBM Director technologies and Intel's LANDesk Client Manager. The UMS 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.

UMS 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: LCCM typically supports built-in install of the current version of UMS only. When a new release of UMS becomes available, LCCM will be modified (if necessary) to support that new UMS release.

UMS 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

- After installing UMS with Windows NT or Windows 2000, the first user to log on to the system MUST have administrator privileges, so that UMS can finish configuring the system.
- Unattended install fails on Japanese, Chinese Traditional, and Chinese Simplified because UMS attempts to overwrite files. To continue and finish the setup, click the "No to all" button every time a window pops up. This will happen several times, but the install will finish and work correctly.
- Some machines are not supported by UMS. If this seems like a problem, check the MASTER.INI file in the UMS 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, UMS does not support that machine and cannot be installed.
- In order to perform an unattended installation of UMS that includes SNMP support, you must select SNMP support when building the client profile, then edit the (.LCA) file for each profile, located in `<drive>:\LCCM\CLNTFILE\PROFILE\PROFxxx.LCA` (for example, PROF001.LCA).

  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 and Advanced Server, ad the following information to the (.LCA) file:

```
[NetOptionalComponents]
SNMP = 1


[SNMP]
```

- UMS DMI support defaults to Desktop as the type of information to be returned. To change this option in the profile to either Server or Mobile, edit the file SETUP.ISS located in <drive>:\LCCM\CLNTFILE\PROFILE\PROFxxx\UMS\EN (or appropriate language directory). In the file SETUP.ISS, you will find the following lines:

  ```
  ;DMI machine type
  ;Options:     Server
  ;       Mobile
  ;       Desktop
  [DMI]
  DMIType=Desktop
  ```

  Change the line DMIType-Desktop to either DMIType=Server or DMIType=Mobile, depending on the information you want to have returned.

- UMS is not supported in Windows 95a.

6.3 Installing Multiple PDC's in Windows NT

To install multiple Primary Domain Controllers (PDC's) onto multiple domains in Windows NT, 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 Client 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's Explorer, double-click the (.LCA) file associated with the profile you have created (which you will find at <drive>:LCCM\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 clients to the profile you have created using the Client Assignment Wizard. At the NTDOMAIN Parameter page (now added to the Client Assignment Wizard), enter the name of the domain to which you want your client to belong.
5. Once your client has been assigned, you can repeat step 4 to assign multiple clients to multiple domains.
6. At the Installation/Maintenance windows click **Process** to update your clients.

6.4 Share Points

LCCM's share point is a repository for the files that LCCM uses to run its tasks. In the simplest case, there is only one share point, and it is on the LCCM server. All files are downloaded from that share point to the LCCM clients. In the more general case (i.e., a Wide Area Network), there are share points at

remote locations as well as on the LCCM server. Files are downloaded from a “nearby” share point to the LCCM clients. The reason for having remote share points is to minimize the network traffic by making large downloads come from a local-to-the-client server.

There are two distinct parts to an LCCM share point: the DOS image files (we’ll call this the *remote TFTP server*) and the Windows install image files (we’ll call this the *distribution share point*).

The remote TFTP server is used to send the DOS images to the LCCM clients. These approximately 2-megabyte files are downloaded several times (via a TFTP *get* command issued from the client computer) during an LCCM process.

The distribution share point is used to send the large Windows install images to the LCCM clients. These files, often involving hundreds of megabytes of data, are downloaded once (via a NETBIOS command) during an LCCM process.

Creating a remote share point

The easiest way to create a remote share point is to use the LCCM install program first, and then to perform some manual steps. Here is the procedure:

1. On your remote computer, run the LCCM30.EXE install program. Perform a **Custom** install, and select **Share point** as the only component you want to install. Enter the LCCM server name, the IP address of the share point’s subnet, and the IP address of the share point in the appropriate places.
2. On the LCCM server, add a line to the OPTIONS.TXT file (create a new file if this is your first remote share point). There will be a file RSP<n>.LOF on the server that contains this line in the correct format. For more details, see “OPTIONS.TXT” on page 178.
3. The **LCCM30.EXE** install program has already set up the needed groups and permissions on the remote share point, but you still must manually copy files to your distribution share point. Basically, you should just copy the distribution share point from your LCCM server to the same directory on your LCCM share point. For example, 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>:\LCCM\CLNTFILE\W2KADV` directory. Just copy the whole `W2KADV` directory (including subfolders) to the same directory on your remote share point. So you wind up with a `\LCCM\CLNTFILE\W2KADV` directory on both the LCCM server and the remote share point.

Using a remote share point

Once you have done steps 1 and 2 in the above procedure, the new remote TFTP server will begin to be used for all LCCM clients on the remote share point’s subnet. There is nothing else to do unless you need to create or modify a DOS image. In that case, you should change the DOS image manually on your LCCM server and then copy the changed files to the same directory on your remote TFTP server.

After you have done the last step in the above procedure, there are two ways to use a new distribution share point. You can 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 entry 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 clients to the appropriate profile, based on where the clients are located.

To modify a single profile whenever you want to change the distribution share point it uses:

1. Modify the Distribution Share Point entry on the Software page of the copied profile's Software Profile Details notebook so that it points to the original distribution share point.
2. Assign the appropriate clients to the profile.
3. Repeat the previous 2 steps for the new distribution share point.

In any case, the distribution share point must always be specified on the Software page of the profile's Software Profile Details notebook using the full UNC path `\\servername\LANC$$\sharepoint` where `LANC$$` has been automatically mapped by LCCM to point to "`\LCCM\CLNTFILE`". The share point directory should always reside under the `CLNTFILE` directory.

The distribution share point must always be specified using the full UNC path `\\servername\LANC$$\sharepoint` where `LANC$$` has been automatically mapped by LCCM to point toward `\LCCM\CLNTFILE`. The share point directory must always reside under the `CLNTFILE` directory.

Creating a Distribution Share Point Manually

If you use manual profiles (i.e., instead of wizard profiles), you can still use different distribution share points.

1. Set up a directory to act as your distribution share point as shown:

   `<drive>:\LCCM\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 to your distribution share point:

   ```
   XCOPY D:\I386\*.* C:\LCCM\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 LCCM 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 LANClient Control Manager console. Do you wish to continue saving data?"

Click **Yes** to continue saving the profile.

6.5 Unattended Install Directories

Location of Unattended Install Directories

When LCCM performs an unattended install, the Profile Wizard creates a number of directories and files. Each unattended install performed by LCCM will have an associated directory that will contain all the files associated with the installation. Associated directories will be created under <drive>:\LCCM\CLNTFILE (where LCCM is your program directory) and will be automatically named by LCCM 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 95	W95
Windows 95 OSR2	W95b
Windows 2000 Professional	W2kprof
Windows 2000 Server	W2ksrv
Windows 2000 Advanced Server	W2kadv

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>:\LCCM\CLNTFILE where the name of the unattended install directory will be W2kprof, W2ksrv, W2kadv, Nt4srv, Nt4wks, W98, W95b or W95 according to the operating system installed.

6.6 Clone Image Directories

Location of Clone Images

When the CloneIt agent is used to clone a client computer, 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>:\LCCM\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>:\LCCM\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 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>:\LCCM\CLNTFILE\CLONEnnn\CLONE.LCZ. You can also delete the accompanying (.LCC) control file found in <drive>:\LCCM\CLNTFILE. This is the clone image you specified during the

cloning process and the clone image you selected at the Clone Image Selection screen of the Profile Wizard.

6.7 LCCM DOS Images

LCCM's basic paradigm is for the client computer 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 LCCM tasks may require different DOS images, and several DOS images are created when you install LCCM. If you have LCCM tasks that require a different DOS configuration than those provided in LCCM, you can modify those images or even create your own new images.

LCCM 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. LCCM also provides IBM DOS 7.0 for tasks that are incompatible with DOS 7.1. Each DOS image used by LCCM is named PROF<i> where <i> is a single alphanumeric character that distinguishes that image from the others (also see “NETWORK.LST” on page 174). 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 LCCM:

- `PROFD` is an IBM DOS 7.0 image used for debugging DOS programs
- `PROFM` is an IBM DOS 7.1 image used for LCCM 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 LCCM 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 LCCM processing
- `PROFX` is an IBM DOS 7.1 image used for general LCCM 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 LCCM processing

LCCM 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 LCCM 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 LCCM'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

6.8 LCCM Control Files

NETWORK.LST

The `<drive>:\LCCM\NETWORK.LST` file is one of the most important files contained in LCCM. 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 179.

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 LCCM.

The purpose of the NETWORK.LST file is to identify all network-adapter models that will be supported in LCCM. LCCM 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 LCCM processing.
- Determine how the client will be rebooted during a BIOS update.

Whenever you change this file, you must stop and restart the LCCM 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 does 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 LCCM 3.0 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 LCCM.

Each data line contains the following field types:

Field 1 — The name of the network adapter model. This name will appear in the LCCM console's adapter lists, in the Software Profile Details, and in the Individual Client 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 — LCCM'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 LCCM 3.0, but it must still exist in the file.

Field 5 — Although you are working with Windows NT, this field must contain the value "OS2". This field is ignored in LCCM 3.0, but it must still exist in the file.

Field 6 — Not used. This field is ignored in LCCM 3.0, 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 LCCM 3.0, but it must still exist in the file.

Field 9 — 4 characters long, this field controls the DOS images used during LCCM processing and how the client computer 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 “LCCM DOS Images” on page 173.

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 LCCM processing (for example, operating-system deployment).

Flag 2 - Defines the DOS image that is used during an LCCM BIOS update.

Flag 3 - Defines how the client computer will be rebooted during an LCCM BIOS update.

`2` = Reboot is performed by the BIOS update program. LCCM includes a /R parameter on its FLASH2 command. LCCM boots the computer a 2nd time to complete the process.

`4` = Reboot is performed by LCCM, and the BIOS update program does not reboot the computer. LCCM completes the process without a 2nd boot.

Flag 4 - No longer used, and is reserved for future use.

Example: `XM2S;`

MACHINE.LST

The `<drive>:\LCCM\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 LCCM default for field 9 in

NETWORK.LST. For example, your client computer 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 client computer'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 LCCM.

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 LCCM.

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 Client Details notebook will indicate that the adapter type is unknown. If the adapter type is unknown, you might not be able to assign a client to a profile.

The `<drive>:\LCCM\VIDEO.LST` file allows LCCM to automatically detect supported video adapters on your client computers. 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 LCCM.

The format of a line is:

```
DESCRIPTION;PNP/PCI ID
```

where:

Field 1	This description will appear in the adapter card list of LCCM. 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 ‘n’ 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 your LCCM server. This file tells the LCCM 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, i.e. 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 LCCM server. The default directory during an LCCM 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 LCCM 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 LCCM install program, it will create a file named RSP<n>.LOF on the LCCM 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

LCCM supports the automatic deployment of machines with a SCSI card. All cards are supported in Windows 98 and 2000. For NT 4.0, supported SCSI cards are listed in the Compatibility and Configuration guide. In case you are using an unsupported SCSI card in NT 4.0, you can add support by adding an entry to the `<drive>:\LCCM\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 185.

Note: The ability to modify the SCSI.LST file to add new SCSI cards does not guarantee that these cards will work with LCCM.

The purpose of the SCSI.LST file is to identify and support SCSI cards that are not supported by default in LCCM. Cards supported by default are not listed here. Whenever you change this file, you must stop and restart the LCCM 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	LCCM's unique index to the SCSI drivers, corresponding to the <i> in the SCSI<i>.LCA file, located in the `<drive>:\LCCM\CLNTFILE\DEFAULTS` directory

6.9 Adding Device Drivers

Note: Unless otherwise stated, ‘NT’ refers to Windows NT 4.0 Workstation or Server and ‘2000’ refers to Windows 2000 Professional, Server, or Advanced Server. ‘Unattended Installation’ refers to an unattended installation using a profile generated by the Profile Wizard.

Consult Microsoft documentation for how to properly edit unattended answer files.

Installing Network Drivers

Some network adapters that were not tested by IBM may work with LCCM. 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 174. 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 LCCM, use the index number that corresponds to this driver. For example, use 0 for an Intel Ethernet adapter. Look in the `<drive>:\LCCM\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 LCCM utility IDVIEW.EXE to determine what to put in this field. See “IDVIEW.EXE” on page 207 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 NT 4.0 network driver

If you entered a new index in Field 3 of NETWORK.LIST, your adapter uses a new driver. In NT 4.0, install the new driver as follows:

- Create a new `<drive>:\LCCM\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:

  ```
  \LCCM\CLNTFILE\DEFAULTS\OEM\NET\<your new drivers>
  ```

  where `<your new drivers>` is the same directory name as used in the corresponding `<drive>:\LCCM\CLNTFILE\DEFAULTS\NETCRD<i>.LCA` file.

To add an new Windows 2000 network driver

Add the network drivers as follows:

- Copy your new drivers into the following directory:

  ```
  \LCCM\CLNTFILE\DEFAULTS\OEM\D1\DRIVERS\NET\<your new drivers>
  ```

- Add the path `DRIVERS\NET\<your new drivers>` to the `OemPnPDriversPath` line in the default Windows 2000 answer file (W2K.LCA) found in the

<drive>:\LCCM\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 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>:LCCM\clntfile\W98\<lang>, where <lang> stands for the particular language variation you are using (also see "Location of Unattended Install Directories" on page 172). 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>:\lccm\clntfile\imgwiz directory on your LCCM server. For Window 95 OSR2, the osr2diff.txt file located in the same directory
- Copy the Win9X drivers onto your LCCM server in the <drive>:\lccm\clntfile\imgwiz\W95drv directory for Windows 95 or the <drive>:\lccm\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 and Windows 2000 Video Drivers

In LCCM 3.0, if the correct video driver is not found as part of the operating system during setup, NT/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 NT where there is no Plug-n-Play functionality, the use of the software profile is limited to clients 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 an NT 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 client 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 client 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>:\LCCM\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 client 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 clients 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 <LCCM_DIR>\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. 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>:\LCCM\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 178. 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 LCCM. 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:

  `\LCCM\CLNTFILE\DEFAULTS\OEM\TEXTMODE\`
- Create a new `<drive>:\LCCM\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

6.10 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 (or IPS 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. Select **Advanced Functions.**
4. Select **Backup IPS ServeRAID Config.**
5. Enter a name for your configuration file.

Note: An (.IPS) extension will be added automatically to the file to indicate that it is a ServeRAID configuration file. For further information see ServeRAID Adapter Installation and Users Guide, Chapter 3 – Configuring the IBM ServeRAID Adapter.

6.11 Managing the LCCM Database

The LCCM Database, stored as a `<drive>:\LCCM\LCCLIENT.DBS` file, contains a record of all the unassigned and assigned client computers known to LCCM. 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 Client Database

With LCCM, you can import new clients into the Client database. By importing a client database, you can use this database as a way of waking up (using Wake-on-LAN) individual or groups of client computers without using the scan feature. This import feature allows other tools to provide the data to LCCM. Alternatively, you can import an exported database created by LCCM (see page 187 for details).

When you import, you append to the existing database. If a client 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 Clients 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.
- Client details always follow the header.
- End each field with a comma, except for the last field, which signifies the end of each client record.
- 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 LCCM. These fields are not case sensitive but must be labeled exactly as shown.

MODEL	Client computer model number. 15 alphanumeric characters limit.
NCARD	Network card type. 8 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 client's process. Limit is 255 ASCII characters.
LOCATION	Location information field. Field is usually identified during the scanning for new client's process. Limit is 255 ASCII characters.
COMMENTS	Comments information field. Field is usually identified during the scanning for new client's process. Limit is 255 ASCII characters.
RAMSIZE	The amount of RAM in the client computer. 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 in the client computer. 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 Client databases export function for the language definition key.
BIOSLEVEL	The level of BIOS present on the client computer. Limited to 8 alphanumeric characters
CLIENT_TYPE	Network card protocol used by the client computer. One character only

	(0=RPL, 1=DHCP).
NETWORKNAME	Limit is 8 characters. For example, CLNT09. Alphanumeric only.
SERIALNUMBER	Computer serial number. Limit is 15 characters. Alphanumeric only.
PROFILE_NAME	The name of the profile you wish assigned to this client. Limited to 64 ASCII characters. Leaving this field blank forces the client into the "unassigned" client column.
NETWORKADDRESS	12 hexadecimal characters (exactly).
LCCM_CONTROLLED_STATUS	Does LCCM control this client? One character only (0=LCCM Controlled client, 1=Not by this program).
CLIENT_PARAM_VALUE_1 to CLIENT_PARAM_VALUE_24	Client parameter values. Limited to 24 ASCII characters each

Export a Database

The Database Export function can export the client database or the profile 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 Client or a Profile database.
2. Select either **Clients** or **Profiles**.
3. Save the export file. The default file name is LCCLIENT.TXT for the client database and LCPROF.TXT for the profile database.

NOTE: LCCM 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

Client Database

The following table details the contents of the LCCM Client database. Not all clients 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	LCCM client name (for example, CLNT01)
Bootstatus	0=client not disabled, 1=client disabled
Biospassword	client BIOS password
Serialnumber	client computer serial number
Model	type of computer; model number
Location	location; see client variables
Contact	contact; see client variables
Comments	comments; see client variables

Ncard	network card type
Vcard	video card type
Ramsize	amount of client RAM
Disksize	size of client hard disk
profile_name	profile assigned to client; see software
Personalization	0=no personalization, 1=use extra personalization; status of personalization check box
date_time.tim_hour	Client last updated (hour)
date_time.tm_sec	Client last updated (second)
date_time.tm_mday	Client last updated (date)
date_time.tm_mon	Client last updated (month)
date_time.tm_year	Client last updated (year)
date_time.tm_wday	Client last updated (day of the week); 0=Sunday to 6=Saturday
date_time.tm_yday	Client last updated (numerical day in a year);0 to 365
date_time.tm_idst	Client last updated (using daylight savings time); 0=not daylight savings time, 1=daylight savings time
Biosimage	Path and file name of client BIOS
Bioslevel	Client 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 client CMOS update
Errorcode	last error code from client processing; 0=no errors
Maintainfile	Path and file name of client maintenance file
Restart	Client shutdown for scheduled processing; 0=do not force shutdown, 1=restart operating system, 2=power off/restart
client_scheduled	Client processing schedule; 0=as soon as possible, 1=scheduled date/time, 2=repeat
Schedule	Client Scheduler defined; 0=default schedule, 1=one time Client Scheduler, 2=use Client 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	LCCM control of client; 0=yes, 1=no
client_type	client protocol; 0=RPL, 1=DHCP

client_param_value_1 to client_param_value_24	Client parameters

Profile Database

The following table details the contents of the LCCM Profile 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 client RAM required
Disksize	Amount of client 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	Client parameter values
Client_default_value_1 to client_default_value_24	Client parameter values
Client_param_describe__1 to client_param_describe_24	Client parameter descriptions

6.12 Adding Applications Manually

The recommended way of adding an application for an unattended install software profile is by using the DiffTool Wizard prior to running to Profile Wizard. Another way to add 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 LCCM 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 LCCM directory. Copy it from the Internet Explorer 5.x CD. Choose one of the following locations:
   - `<drive>:\LCCM\CLNTFILE\PROFILE\PROFnnn\OEM\C\IE5.x` -- This directory will apply only to the PROFnnn profile. LCCM will automatically copy this directory to the client computers.
   - `<drive>:\LCCM\CLNTFILE\DEFAULTS\OEM\C\IE5.x` -- This directory will apply to all profiles, regardless of which application you are installing. LCCM will automatically copy this directory to the client computers.
3. Modify (or create) the `<drive>:\LCCM\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 client (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 client computer later.

6.13 Creating a Donor Computer Profile

Use the following procedure to establish a LAN connection between the donor computer and the LCCM 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>:\LCCM\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 79).
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, LCCM 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.

6.14 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 client computer. 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 client computer. 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 "`\LCCM\CLNTFILE`" directory or one of its subdirectories, where LCCM is your LCCM program directory.
2. Create the donor computer and test it thoroughly.
3. Create a directory under `C:\LCCM\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:\LCCM\CLNTFILE`)
   - `path_1` is the path to the directory on the server containing PKZIP (LCCM)
   - `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 client:

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 "LCCM\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 client computer active hard disk partition

When you have assigned a client to this profile, the final image batch file is run and the single compressed file on the server is unzipped on the client hard disk. For a complete example, see “Final Image Batch File - DOS/Windows Image” on page 243.

6.15 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 LCCM. This is done during the image download process. One generic image batch file is associated with each software profile. The LCCM 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 LCCM, 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 clients 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 clients 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 client as follows:

   a) Click the **Client Parms** tab.

   b) Enter the names of each parameter. These names will be copied automatically into the Parameters page of the Individual Client Details notebook for every client assigned to this software profile. For additional information, see Parameter Exceptions, below, and “Software Profile Details – Client Parms Tab“ on page 66.

   c) Click **OK** to save the changes to the Software Profile Details notebook.

   d) If you have not yet assigned clients to this profile, you must do this now.

   e) In the Installation/Maintenance window, select the first client using this software profile. The Individual Client Details notebook is displayed.

   f) From the Individual Client Details notebook, select the Parameters page. The available parameters (copied from the Client 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) Go back to step 4f above and select the next client. Continue until you have assigned parameters for all clients.

5. Select the Image For Load (or Reload).

   You must now select the image to be loaded on the client. 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 client, a group of clients, or all clients 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 Client 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 client, check the **Mark Client for reload** check box in the Software page of the Individual Client Details notebook.
   - If this is a maintenance image, check the **Run maintenance file** check box in the maintenance page of the Individual Client Details notebook.

Some character strings are reserved for specific purposes when used as parameter values. For details, see “Parameter Conventions” on page 67.

Chapter 7. Utilities

Most of the utilities described in this section are found in the `<drive>:\LCCM\CLNTFILE` directory, where LCCM is your LCCM program directory. Location exceptions are noted. Most of the utilities run under DOS only.

7.1 ADDDOM.BAT

The `<drive>:\ADDDOM.BAT` file is used to configure the LCCM server, and must be run on the LCCM 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 LCCM server.
- You are deploying clients into a domain other than the one that is controlled by the LCCM 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 clients. The domains should be listed on the command line. Domain names should be separated by single spaces. The LCCM 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 clients deployed in the target domain will need to access domain resources in the LCCM 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 LCCM server). On a simple LCCM installation, where the only share point is on the LCCM server, there should be no need to establish trusts or to specify target domains, though ADDDOM.BAT must always be run on the LCCM server, specifying the LCCM server domain on the command line.

Messages are logged to LCCMDOM.LOG. We suggest that you examine LCCMDOM.LOG to be sure that the LCCM 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: LCCM 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 LCCM server. In this case, no manual configuration is needed.
- Configuration 2: LCCM is installed on a Stand Alone (SA) server. The target computers are deployed into the same domain as that of the LCCM server. In this case, you should use LCCMPREP.EXE and ADDDOM.BAT as described below.
- Configuration 3: LCCM is installed on a PDC, BDC, or SA. The target computers are deployed into a different domain from that of the LCCM 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 LCCM 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 clients, run the LCCM utility LCCMPREP.EXE.
- Configuration 3: Establish a trust relationship between the LCCM domain (as the trusting domain) and each target domain (as the trusted domain).

  Trust relationships are only necessary if clients deployed in the target domain will need to access domain resources in the LCCM 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 LCCM server).

  On a standard LCCM installation, where all share points are on the LCCM 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 LCCM utility ADDDOM.BAT on the LCCM server, specifying the LCCM 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 LCCM server, specifying the LCCM server domain on the command line.
- Configuration 3: Add the following line to the `[Network]` section of the LCA file for the appropriate LCCM 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 client computer. This program runs under DOS only.

The syntax of the command is:

```
AIAREAD group [field] [/f=file] [/a] [/s]] [/x] [/p=prefix],
```

Parameters for the command are:

`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 client.

At the client, execute the following command line:

```
AIAREAD ownerdata
```

The client 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 client computer.

At the client, 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 client computer. This program runs under DOS only.

The syntax of the command is:

```
AIAWRITE group {field1=[value1]...[fieldn=[valuen]]|/f=file}
```

Parameters for the command are:

`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]
```

The case sensitive parameters for the command are:

`-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 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
```

7.7 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}]
```

Parameters for the command are:

`/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

7.8 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]
```

Parameters for the command are:

`/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.

7.9 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. LCCM 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.

7.10 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]
```

The parameter for the command is:

`/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 205 for an example of the use of FORMAT32.COM and FAT32.EXE.

7.11 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: LCCM is currently restricted to managing client computers 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 LCCM 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 LCCM 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 LCCM 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]
```

Parameters for the command are:

`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 client computer regardless of the hard disk capacity.

Note: Be aware that the LCBTRDEL utility program provided with the LCCM 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 client computer 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 LCCM 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 client computer 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 LCCM 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 on the Internet at:

http://www.pc.ibm.com/us/desktop/lccm/index.html

7.12 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 LCCM 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.

7.13 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]
```

Parameters for the command are:

`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 LCCM the required keyboard input to the FORMAT.COM command is provided by a redirected file:

```
%LCCMPATH%\FORMAT %TARGET% < %LCCMPATH%\FORMAT.DAT
```

7.14 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]
```

Parameters for the command are:

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 LCCM 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 LCCM 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. LCCM 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.

7.15 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 client 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 client computer. LCCM wizard-generated profiles use this program while a software profile image is being downloaded.

7.16 IDVIEW.EXE

This program identifies Plug ‘n’ Play and PCI devices in a specific client computer. This utility is located in the `<drive>:\LCCM\UTILITIES` directory.

This information is useful when adding new video adapter and network adapter details to LCCM or editing the NETWORK.LST or VIDEO.LST file.

To run the program, type "IDVIEW" at a DOS command line, and click **Enter**. The program displays any Plug ‘n’ Play or PCI devices that it detects. The following is an example of the output:

```
PCI               Card Class
Vendor/Device ID

80867030          Host/PCI Bridge
```

```
80867000          PCI/ISA Bridge
101300B8          VGA Compatible
                  Controller

PnP ID's
Detected

0E63E93

244D000
```

7.17 IPSSEND.EXE

Use the IPSSEND utility to perform tasks on an IBM ServeRAID Adapter remotely. These tasks include viewing the current configuration, rebuilding a dead drive, initializing and/or synchronizing logical drives, plus many more.

To install the utility on Windows NT or 2000:

1. Insert the supplemental diskette supplied with your IBM ServeRAID Adapter into the primary floppy drive.
2. Make a directory on your hard drive. Enter:

   ```
   MD \IPSADM
   ```
3. Copy the files from the floppy drive onto your hard drive. Enter:

   ```
   COPY A:\NT\IPSSEND.EXE \IPSADM
   ```
4. Change into the directory you created. Enter:

   ```
   CD \IPSADM
   ```
5. Run the utility. Enter:

   ```
   IPSSEND
   ```

The IPSSEND utility runs from an operating system command line. Type '`IPSSEND`' and press Enter while in the proper directory to run the utility.

When you run the utility with no command-line parameters, a list of available functions and their specific parameters is provided. All functions require a minimum set of parameters to execute the command. If you run the utility with a specific function, but without its required parameters, specific help for that function is displayed.

For more information, see the README.TXT on the supplemental diskette supplied with your IBM ServeRAID Adapter.

7.18 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 client computer after the image has been received.

The syntax for the command is:

```
LCATTRIB drive:directory [options]
```

Parameters for the command are:

`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
```

7.19 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.

7.20 LCCLEND.EXE

This Win32 program completes the processing of a client machine after a clone image has been downloaded.

The syntax for the command is:

```
LCCLEND [clone.lcc] /CHANGES=changes.reg [/DELETE=c:\lccm]
[/RESTORE=c:\autoexec.bak] [/WAIT[=60]] [/VERBOSE]
```

Parameters for the command are (only the first letter of parameter is necessary):

`clone.lcc`	Clone control file for this image - required for FAT32 clones.
`/C=changes.reg`	File containing changes to Registry.
`/D=c:\lccm`	Delete this directory (containing temporary LCCM 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.

Typically, this utility is added to a client machine'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
```

7.21 LCCLONE.EXE

This program restores the contents to a cloned 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]
```

Parameters for the command are (only the first letter of parameter is necessary):

`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:	LCCM 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.

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 LCCM, the LCCLONE.EXE command is called from an .LCI file.

7.22 LCCMEND.EXE

This program signals to the server that a client has reached end of a phase of processing.

The syntax for this command is:

```
LCCMEND result
```

The parameter for the command is:

result The DOS error level to return to server (0 means success)

Typically, within LCCM, this is called in the main control batch file _LCCMD.BAT. It is not normally necessary to change these.

7.23 LCCMPREP.EXE

The <drive>:\LCCM\LCCMPREP.EXE utility prepares the target domain into which clients will be deployed. It is run on a domain controller for the target domain. This creates the user and group accounts necessary for LCCM clients to be correctly validated and to be installed into that domain.

The syntax for the command is:

```
LCCMPREP [/P]
```

7.24 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 LCCM Client 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 LCCM 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]
```

Parameters for the command are:

`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 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 unattended installation answer file.

1. Edit the answer file, UNATTEND.TXT, to include environment variables:

```
; Sample NT 4.0 Workstation answer file for use
; with LCCM.
[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 Client Details notebooks to enter parameters for the client computer. These will be placed in the DOS environment by LCCM 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 client, 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>:\LCCM\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 = CLNT10
   ProductId=AG94949-87243
   JoinDomain=AMD0012
   NetworkAddress = 006094A5BBBB
   ```

7.25 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] [/RESTORE] [/ALL] /DHCP [/VERBOSE]
```

Parameters for the command are (only the first letter of parameter is necessary):

`/F=out.dat`	Full path of the output file.
`/P=nnnn`	Create a primary partition of size nnnn MB.
`/R`	Allow space for a Rapid Restore partition.

/A	Use all of the remaining disk space as a single partition.
/D	Specify if this command is being run under PXE. This parameter is required.
/V	Verbose switch - if present, diagnostic output is displayed.

Example: To create a command file that will create a primary partition of 512MB and allow space for a Rapid Restore partition, enter:

```
LCFDISK2 /F=TEST.DAT /P=512 /D
```

This command file can then be used with FDISK thus:

```
FDISK < TEST.DAT
```

Typically, within LCCM, the LCFDISK2 command is generated from the responses given in the Profile Wizard.

7.26 LCNETSEL.EXE

This program appends the appropriate [SelectedAdaptersSection] to an existing Windows NT unattended answer file.

The syntax for this command is:

```
LCNETSEL unattended.txt [/VERBOSE]
```

Parameters for the command are (only the first letter of parameter is necessary):

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 LCCM processing. This variable will contain the number used to identify a client computer'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 LCCM, the LCNETSEL command is used within the internal batch files that are responsible for building a Windows NT unattended install image prior to the installation.

7.27 LCPNPSN.EXE

This program identifies and flags Plug ‘n’ Play serial numbers in the Windows 95 exported registry of the donor computer and substitutes the correct Plug ‘n’ Play serial numbers on the target client computer.

Windows 95 identifies each Plug ‘n’ 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 client computer, Windows 95 identifies each Plug ‘n’ Play adapter installed in the target client computer as a new device (because of the different serial number) and adds a default configuration for each Plug ‘n’ Play adapter. For example, if a network setup was created on the donor computer for a Plug ‘n’ Play network adapter, Windows 95 does not transfer this setup to the network adapter installed in the target client computer.

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 client computer to substitute the correct serial numbers in the registry.

To read the Plug ‘n’ Play serial numbers on the donor computer, the syntax of the command is:

```
LCPNPSN /S /F=filename
```

`S`	is the save attribute.
`filename`	is the name of the exported registry file.

LCPNPSN supports up to eight Plug ‘n’ Play adapters. For each Plug ‘n’ 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 ‘n’ Play serial numbers on the target client computer, the syntax of the command is:

```
LCPNPSN /R /F=filename
```

`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 in the target client computer. 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.

7.28 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
```

Parameters for the command are:

`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 in the following example.

Example 2:

```
%LCCMPATH%\LCUNCSPL %LCSHAREPT% SHARE DIR > %TMPPATH%\SETUNC.BAT
call %TMPPATH%\setunc.bat
```

7.29 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.

7.30 PCHECKER.EXE

This “process checker” program, located in the `<drive>:\LCCM\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

7.31 RAVE.EXE

The Rapid Restore program can be run manually with `<drive>:\LCCM\CLNTFILE\RAVE.EXE`. You must first create a DOS boot diskette and copy the RAVE.EXE program onto the diskette. Do not use AUTOEXEC.BAT or CONFIG.SYS on this diskette, and do not use HIMEM.SYS or SMARTDRV.EXE, as they will not improve Rapid Restore's performance.

To create a DOS boot diskette using IBM DOS 7, from the command line type the following:

```
FORMAT A: /s
```

To create a DOS boot diskette using Windows 95, Windows 95 OSR2 or Windows 98 do the following:

1. Insert a diskette into your floppy disk drive.
2. From Windows Desktop, double-click **My Computer**.
3. Right click the **$3^{1/}_{2}$ Floppy** icon.
4. Select **Format**.
5. Select the **Capacity** for your diskette from the drop-down list.
6. Enable the **Full** radio button from Format type. This will erase any data on your diskette.
7. Check the **Copy system files** from Other options.
8. Click **Start**.

Note: You cannot create a DOS boot diskette using Windows NT 4.0 Server or Workstation. Therefore use one of the above methods to create your DOS boot diskette.

The syntax of the command is:

```
RAVE [/b|/DATA|/MBR|/ALL|/d|/v|/t] [/i] [/f]
```

Parameters for the command are:

`/b`	Backup master boot record and primary partition data.
`/DATA`	Restore primary partition data only.
`/MBR`	Restore master boot record only.
`/ALL`	Restore master boot record and primary partition data.
`/d`	Delete existing RAVE partition.
`/v`	View partition table.
`/t`	Test for existing backup. 1 returned if not found.
`/i`	Interactive mode (default = non-interactive).
`/f`	Force backup, deleting any existing backup.

Examples: Your client has a 1.2GB hard drive, which has a 500MB primary partition. You want the entire partition backed up to a hidden Rapid Restore partition:

```
RAVE /b /i
```

You want to restore the partition when running Rapid Restore manually on the client

```
RAVE /DATA /i
```

Enter `RAVE` with no parameters to see a full description of all parameters.

IMPORTANT: Always run Rapid Restore after creating, modifying or deleting partitions. Otherwise the created extended partition including any **data** will be removed by subsequent restore operations, unless the **`/DATA`** parameter is used (restore data sectors only).

7.32 REBOOT.COM

This program causes a client to reboot.

The syntax for this command is:

```
REBOOT
```

There are no command line parameters.

This command will cause a client machine running the DOS environment to reboot immediately.

7.33 SCRUB3.EXE

The SCRUB3 utility is part of LCCM's Secure Data Disposal tool. This program runs as a command under the LCCM client computer's DOS operating system. It permanently erases all data on one or more hard disk drives that are installed on the client computer. 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] { /H=<drive> | /H=ALL } /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.

`/H=<drive>` Use this form of the /H parameter if you want to erase only one hard drive that is installed on the client computer. The value <drive> is the hard disk drive number of the drive that you want to erase. 1 is the first hard disk drive, 2 is the second hard disk drive, etc. There is no default value for this parameter. The /H parameter is required.

`/H=ALL` Use this form of the /H parameter if you want to erase all hard disk drives that are installed on the client computer. There is no default value for this parameter. The /H 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 /H=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 client computer. 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 /H=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 client computer 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 /H=ALL /L=2
```

Overwrites every byte on every sector of every hard disk drive installed on the client computer with 0x00. None of the data on any of the drives is recoverable. This is the normal way to run SCRUB3.EXE.

```
SCRUB3 /H=ALL /L=3
```

Overwrites every byte on every sector of every hard disk drive installed on the client computer 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.

During execution, SCRUB3 displays the following output on the computer's monitor (i.e., on STDOUT):

```
Secure Data Disposal Utility v2.0 (LCCM v3.0)

Licensed Materials - Property of IBM
C) Copyright IBM Corp. 1999, 2000 All Rights Reserved.
Writing sectors for Secure Data Disposal
0%                          50%                          100%
```


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 LANClient Control Manger 3.0
```

```
Date and time of execution ... 07/12/01 15:27:40
Command executed ..... S:\SCRUB3.EXE /D=ALL /I=1
```

7.34 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>:\lccm\clntfile\SDAImage`) directory. The zip files contain SDA-Installer directories. They can be created using the `<drive>:\LCCM\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:\lccm\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 LCCM is installed in a directory other than C:\LCCM, 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.

7.35 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).

7.36 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.

7.37 **SLEEP.EXE**

This program causes processing to halt for a specified number of seconds.

The syntax of the command is:

```
SLEEP seconds
```

7.38 **WAIT.EXE**

This program waits for a specified file to be deleted.

The syntax of the command is:

```
WAIT filename
```

7.39 WINWAKE.EXE

This program powers on clients remotely using Wake-on-LAN.

`<drive>:\LCCM\UTILITIES\WINWAKE.EXE` is a stand-alone program that uses the Wake-on-LAN feature to power on clients remotely. The MAC addresses (addresses of the network adapters) of the clients 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 [...]]
```

Parameters for the command are:

`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 LCCM, as well as workarounds to known networking problems in an LCCM 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 LCCM Installation

When I try to install LCCCM, I get a message: "Cannot find LCCMINST.DLL. Please run setup from the installation directory."

LCCM can only be installed on Windows NT 4.0 Server, Windows 2000 Server, or Windows 2000 Advanced Server. If you are not using one of these operating systems, you cannot install LCCM 3.0. Specifically LCCM 3.0 **cannot** be installed on **any version of Windows 9x or Windows Me.**

How can I uninstall LCCM from the Remote Console without breaking the LCCM server?

This is not a problem in LCCM 3.0, and there are no special procedures required. Just use the Windows Add/Remove Programs function in the normal way. (In prior versions of LCCM, this required that you physically disconnect the remote console from the network before uninstalling LCCM. But this is not a problem in LCCM 3.0.)

How can I use LCCM in a mixed Token-Ring and Ethernet network?

This is not a problem in LCCM 3.0, and there are no special procedures required. (In prior versions of LCCM, only one specific configuration was supported, with additional requirements on the token-ring adapter firmware.)

8.2 Using Routers with LCCM

LCCM can't see clients on the other side of my router. Why?

When a client 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, LCCM 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 client 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 LCCM server.

Another possibility is that when the IP scope was specified for a client subnet, a gateway address was not specified. If a client receives a DHCPOFFER in response to the DHCPREQUEST, the client needs to know a gateway address to which it can send the REQUEST message.

To successfully use LCCM 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 LCCM client 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 LCCM server, and at least one DHCP server that serves the LCCM client 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 LCCM will work in a routed environment. If your network policy will not allow any of these conditions to be satisfied, then LCCM cannot be used in the environment.

Please check your router documentation for the necessary configuration commands.

We want to use LCCM in a routed environment, and using our UNIX DHCP server. How can we update the clients without making an IP-helper entry at the routers?

If you want to use LCCM in a routed environment, you must set a helper-address to the LCCM Server from every router to which LCCM clients 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.

8.3 LCCM Operations

How can I control multiple LCCM servers from the single remote console?

If you want to be able to view the clients and profiles of two or more LCCM servers from a single remote console, you must force the console to ask for the LCCM server whose clients you wish to view. You do this with the following steps:

1. Delete the file LCCLIENT.INI on the remote console.
2. Start the remote console. It will ask for the LCCM server name.
3. Enter the LCCM server name whose clients you wish to view. LCCM will synchronize the console with the correct server.

How many clients can one LCCM server handle?

Performance of the LCCM console becomes an issue when you have about 1200 clients on a single server. If you have more client computers, you should use multiple LCCM servers.

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. LCCM 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.

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.

When I scan for my clients, why won't LCCM wake them up?

Before or during the scan process, you must turn on the client manually and force a network boot (either via keystrokes or by setting the primary boot sequence to be *network)*.

LCCM wakes a client by sending a wake-up packet to the client's media access control (MAC) address. At the time a scan process is initiated, LCCM has no knowledge of the MAC address; LCCM discovers the MAC address during the scan process. Therefore, Wake-on-LAN is not part of the scan function.

LCCM 3.0 can wake up a client manually before scan by inputting the computer's MAC address into the Wake Clients window of LCCM. This window is accessed through the Tools selection on the main menu bar. But it is usually easier just to power on the client manually.

My LCCM clients just keep rebooting, and cannot attach to the LCCM server. Why?

Make sure that your client computers are either assigned to a profile or have an LCCM maintenance task scheduled. If neither of these is true, then there is nothing for LCCM to do with them, so LCCM cannot let them attach to the server.

If this happens on all client computers (e.g., even during the LCCM scan process), your DHCP Service or router is probably configured incorrectly.

How can I have LCCM store the information on a client, so I can update the 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 client to the profile.
- Assign the client to its final profile, but do **NOT** process it yet. Then go to the Software page of the Client notebook, and uncheck the box marked **Mark Client for reload**, and then process the client.

How can I make a client 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 client to act. You can do it as part of the client deployment (on most IBM computers) by using the LCCM CMOS update facility to change the CMOS as needed. (You could also do this as a separate Maintenance procedure in LCCM 3.0). 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 client in order to do so. Of course, if the client adapter has a DOS-based configuration utility that is not too resource-hungry, you might be able to do this as an LCCM maintenance procedure. This is not possible on any of the currently officially supported network adapters.

How can I make an LCCM client reboot, instead of powering down, at the end of a deployment?

To prevent LCCM from powering off its clients, create a file `<drive>:\LCCM\LCCM.INI` on your LCCM server that contains the following line:

```
SHUTDOWN=NO
```

Note that this means that LCCM clients will **never** power down - **this is an all-or-nothing proposition**. You can of course write your own utility to power down the client whenever you wish.

LCCM 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: LCCM 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 LCCM server. In this case, no manual configuration is needed.
- Configuration 2: LCCM is installed on a Stand Alone (SA) server. The target computers are deployed into the same domain as that of the LCCM server. In this case, you should use LCCMPREP.EXE and ADDDOM.BAT as described in Chapter 7, "Utilities".
- Configuration 3: LCCM is installed on a PDC, BDC, or SA. The target computers are deployed into a different domain from that of the LCCM 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 LCCM server's domain and the target domains.

My hard drive is larger than 4GB. Why doesn't LCCM partition it in the way that I specify?

Client deployment of Windows NT using LCCM is still subject to the limitations of Windows NT installation options: the installation is behaving as designed by the operating system vendor.

Your options for using the entire hard drive during an LCCM deployment of Windows NT 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 NT limit).
2. Fixed size, 2000-megabyte partition plus a second partition using maximum allowed space. After deployment with LCCM, 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 under LCCM 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 setup program.

How can I get more than 11 characters in the NetBIOS names for my clients?

Inside the LCCM 3.0 GUI, the computer name is limited to 11 characters (no more can be entered). (Prior versions of LCCM had a limit of 8 characters.)

If you need a longer name for a client, you can use the following workaround:

1. Create a User Parameter called `nbname` (for example) and set it to the desired value in the client notebook or Client Assignment Wizard.
2. Edit the .LCA file for the profile, and change `%CNAME%` to `%NBNAME%`, and save the file.

You can now deploy the client, and its NetBIOS name will be whatever is in the Client Parameter `nbname` field.

The LCCM 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 LCCM 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.

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.

When I try to export the client or profile database, I get an error message

If you export a client or profile database, and use spaces in the filename or pathname, you will get an error message. LCCM does not allow the use of spaces here. Please try again without spaces.

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 LCCM 3.0.

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 LCCM 3.0. 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 client hangs after a successful format

This problem occurs infrequently. During an unattended install, the client's drive is formatted successfully, but then the client hangs and the operating system is not being installed. To resolve this problem, cancel processing, and process again.

After applying a Windows 98 Service Pack 1 with SMA software profile to a client computer, the SMA personality settings are not being updated

This problem is specific to Windows 98 with Service Pack 1. It can be easily resolved by using Windows 98 Second Edition or another operating system of your choice.

Appendix A. Error Messages

Error, Bad Return Code from Attempted BIOS Password Change

A BIOS password change was attempted on the client, but an Error Code has been returned by the update program.

On the original BIOS flash diskette, or in the `<drive>:LCCM\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 client, but an Error Code has been returned by the BIOS update program.

On the original BIOS flash diskette, or in the `<drive>:\LCCM\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 client, but an Error Code has been returned by the CMOS update program.

On the original BIOS flash diskette, or in the `<drive>:LCCM\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 client 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

LCCM 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.

LCCM 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

LCCM 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

LCCM 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 client was unable to find the BIOS flash image file specified on the Hardware form of the LCCM 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 client was unable to find the personality file specified on the Software form of the LCCM 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 client 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 client 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 client 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 LCCM'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 client has failed to complete a part of the process within the time out limit stated in the system defaults.

Please check that the client 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 LCCM server to store 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, LCCM Server not Located

This application has been unable to locate your LCCM 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 LCCM 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 LCCM server

The server supplied does not seem to be a LCCM 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 client 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 client processing while the client is being processed. LCCM 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 client) and does not necessarily indicate a problem that would hinder LCCM operation. If there appear to be problems with

LCCM working with a client, and normal troubleshooting does not resolve those problems, you should note all of the messages that appear on the client 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 clients which previously used the NTFS file system to a Windows 95 (FAT 16 file system) software profile. Click OK to continue, and the client 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 LCCM. These examples are only recommended for use by experienced LCCM 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 LCCM can run the various batch files, it must set up a temporary operating system environment at the client. 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 client (the DOS software is not copied to the hard disk of the client; it is resident in memory only).
- Drive C of the client is temporarily renamed drive D. However, with LCCM 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 client-computer hard disk drive.

The server `C:\LCCM\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:\LCCM\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 client 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, LCCM 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 LCCM before you create your batch files.

- "`%LCCMPATH%`" points to the LCCM server's `LCCM\CLNTFILE` directory.
- "`%TARGET%`" points to the primary partition of the client computer'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>:\LCCM\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 client hard disk.

These predefined variables are valid anytime LCCM 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 client computer 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:\LCCM\CLNTFILE`

- `D:` points to the primary partition of the client 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 client 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 client computers you plan to use. In most cases, it is advisable that the donor computer and target client computers are identical models to ensure that the correct device drivers are present and configured correctly. Ensure that you have adequate access to a suitable client computer 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 client first. Then migrate new or changed batch files to every client on your LAN.

Backup Batch File - DOS/Windows Image

```
REM   Your donor computer should be connected to the
REM   network and server where LCCM
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 LCCM
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 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 LCCM. These files are automatically downloaded to the client 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 client is renamed to drive D and the server `\LCCM\CLNTFILE` directory is mapped as `C:\LCCM`. To minimize the confusion associated with drive mapping, LCCM has two built-in variables for use in the final image batch file:

- `%LCCMPATH%` points to the server `\LCCM\CLNTFILE` directory.
- `%TARGET%` points to the primary partition of the client hard disk.

After the image is installed and the client restarted, the client 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 client computer
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   client computer 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   LCCM\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 LCCM.

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 LCCM. The Asset ID chip is battery maintained and contains asset data specific to each client.

Computers using the Asset ID chip can automatically be assigned to a selected LCCM 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 LCCM. You can use AIA data fields to process LCCM profiles when the scan process first detects a client computer.

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 network client 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 clients 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 client computer during an operation. Images vary in size and in the type of software they provide to the client computer. 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 client computer.

LCA file. Answer file associated with an unattended-install software profile.

LCC file. Control file created by CloneIt Agent.

LCD file. File used by DiffTool to record the differences that occur on a system as a result of installing applications.

LCI file. Final image batch file. It contains the second set of DOS commands that are run on a client computer 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 client computer when a software profile is processed. LCCM will reboot the client computer after the LCP

file runs.

LCR file. Personalization batch file. It contains a set of commands that are run on a client computer to set values that are specific to that computer (e.g., IP Address).

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 client computer repeated eight times. When you initiate LCCM processing, the LCCM server sends magic packets to wake up the client computers for which it has work scheduled.

MNS file. Maintenance batch file. It contains a set of DOS commands that are run on a client computer to perform a user-defined task.

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 client system as directed by the LCCM 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 client computer 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 LCCM uses to run its tasks. It contains the following:

- PXE bootstrap images, LCCM DOS images and many other file packages (for example, Windows Installation images) used during LCCM processing.
- A TFTP server program (supplied by LCCM) used to download these files to LCCM clients.

In the simplest case, the share point is on the same system as the LCCM server. In other cases, there may be many share points used by a single LCCM server. In a Wide Area Network, a share point will normally be on each local area network that contains LCCM clients.

The share point can be installed either stand-alone or with an LCCM console. The LCCM 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.

Universal Manageability Services (UMS). The UMS may or may not be present on the managed system after its production operating system is loaded and running. If present, it is used to perform the functions of shut down and restart to initiate service boots when the system is up and running. If not, you must find another way to shut down and restart systems. As an LCCM administrator, you can elect to disable the use of the UMS, and rely only on Wake-on-LAN (or optionally, manual power on).

Wake-on-LAN. Technology developed by IBM that allows LAN administrators to remotely power up client computers. 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 client

If the client system has the first three of the above components, the client is called a Wake-on-LAN-enabled client. Even though a client 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 client through some software, for example, LCCM or Netfinity Director. The NIC on the client detects the magic packet and sends a signal to the power supply to turn it on. This process is also called *waking up the client*. Using LCCM, this process can be scheduled for individual clients. Wake-on-LAN and LCCM together make it very easy for LAN administrators to deploy software on individual clients on a scheduled basis.

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