G10L-9830-0

LANClient Control Manager Version 2.0 for Windows NT Server

Training and Procedures Guide

LANClient Control Manager Version 2.0 for Windows NT Server

G10L-9830-0

Training and Procedures Guide

Note

Before using this information and the product it supports, be sure to read the information in Appendix B, “Notices and Trademarks” on page 175.

First Edition (April 1998)

Contents

About This User's Guide

This guide will help you become more familiar with IBM LANClient Control Manager Version 2.0. Included in the guide are procedures and training exercises that help explain the product.

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

This guide is organized as follows:

- Chapter 1, "Overview and Concepts of LANClient Control Manager," contains an introductory overview of the purpose and features of LANClient Control Manager. Also, the different concepts relevant to LANClient Control Manager are discussed. It is important to understand the information discussed in this chapter to take full advantage of LANClient Control Manager.
- Chapter 2, "Installing and Running LANClient Control Manager," contains instructions on how to install, start, and exit from LANClient Control Manager. Also included are instructions on how to run LANClient Control Manager from another workstation and how to uninstall the program.
- Chapter 3, "Working with the Interface," provides a graphical view of each screen provided by LANClient Control Manager and a description of each field.
- Chapter 4, "Procedures," provides step-by-step procedures to accomplish the tasks associated with LANClient Control Manager.
- Chapter 5, "Hybrid Remote Boot Training Exercises," contains detailed step-by-step exercises to create and distribute Hybrid and Hybrid-NT remote-boot images.
- Chapter 6, "Example Files," contains examples of the files you need to create or modify. These files are used to distribute Hybrid remote-boot images.
- Chapter 7, "Utilities Provided with LANClient Control Manager," contains a description of the key utility programs provided with LANClient Control Manager and provides information about how to use them.

Also included is a "Notices and Trademarks" section and an index.

Who Should Read this Guide

This guide is intended to help network administrators understand the concepts and procedures of LANClient Control Manager. Training exercises are provided to help administrators use the product.

To effectively use this guide, you should have an extensive knowledge of your LAN environment and Windows NT Server.

How to Use this Guide

As a source of general information, you can use this guide to help you understand the features, capabilities, interface, and concepts of LANClient Control Manager before installing the program. You can also use this information to assess the technical skills required to implement, use, and maintain the program.

For training, this guide is most effective when used in the following order:

1. Review Chapter 1, “Overview and Concepts of LANClient Control Manager” to become familiar with the overall concepts and capabilities of LANClient Control Manager. This chapter will also help you become familiar with new terminology.
2. Download the LANClient Control Manager program from the World Wide Web.
3. Use Chapter 2, “Installing and Running LANClient Control Manager” to ensure your server software meets the minimum requirements, including having remote-boot services installed.

   Note: Tips for installing remote-boot services are provided on the World Wide Web at `http://www.pc.ibm.com/us/desktop/lccm/index.html`.

   Then, install the program and start it.
4. While the program is running, read through Chapter 3, “Working with 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 you get a feel for using the interface.
5. Your next step depends on how you intend to use LANClient Control Manager:
   - If you will be using LANClient Control Manager to manage client workstations, but will not be developing Hybrid or Hybrid-NT remote-boot images, you can start using LANClient Control Manager by using the information in Chapter 4, “Procedures.”
   - If you will be developing Hybrid or Hybrid-NT remote-boot images, do the following:
     a. Read Chapter 7, “Utilities Provided with LANClient Control Manager” to become familiar with the utilities you will use to develop Hybrid and Hybrid-NT images.
     b. Go to Chapter 5, “Hybrid Remote-Boot Training Exercises” and select an exercise that most closely matches the type of Hybrid remote-boot image that you will be developing and distributing in your LAN environment.
     c. Complete the exercise step-by-step in the order presented.
     d. Upon successful completion of the exercise, you can either develop your own Hybrid or Hybrid-NT remote-boot image, or use Chapter 4, “Procedures” to start using LANClient Control Manager for any of the other LAN-management tasks.

A Word about Updating to Version 2.0

Batch files created for LANClient Control Manager Version 1.X require modification for use with Version 2.0 because of drive-mapping changes, variations between RPL and DHCP, and new utility programs. This guide provides instructions for converting batch files to use environment variables for drive mapping, thereby allowing the same batch file to be used in both a DHCP and RPL environment.

As part of the installation process, you will be given the opportunity to migrate your version 1.X database to the version 2.0 product.

Chapter 1. Overview and Concepts of LANClient Control Manager

Overview

LANClient Control Manager (LCCM) provides you with tools to simplify adding client workstations to an existing local area network (LAN). Once a client workstation is added to the LANClient Control Manager database, you can remotely install, maintain, and update software on the client workstations. Key features include:

- Automated search for new clients on the LAN
- Operating system and application program initial installation through the LAN
- Controlled client workstation startup through standard remote boot or LANClient Control Manager's enhanced *Hybrid remote-boot* function.
- Ability to update the BIOS or CMOS settings over the LAN

If you have Netfinity Manager installed on your LCCM server and Netinity Services running on the client workstation, LANClient Control Manager can also:

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

The ability of Netfinity to turn off a client workstation is directly related to the version of Netfinity and the operating system installed on the client workstation. The power-down capability of Netfinity is currently limited to client workstations running Windows 95.

Note: LANClient Control Manager version 2.0 can recognize, link to, and control clients on direct-attached LAN segments and across routers by supporting both the remote-program-load (RPL) protocol and the dynamic host configuration protocol (DHCP).

Changes in Version 2.0

Version 2.0 of LANClient Control Manager has been enhanced to include the following new features:

- **Dynamic Host Configuration Protocol (DHCP) support:** LANClient Control Manager provides remote boot support for clients configured for either the Remote Program Load (RPL) protocol or DHCP. The addition of DHCP support allows LANClient Control Manager to interact with client workstations across routers. Because of this enhancement, there have been some terminology changes:
  - Hybrid RPL images are now called hybrid remote-boot images
  - Hybrid-NT RPL images are now called hybrid-NT remote-boot images
  - Standard RPL images are now called standard remote-boot images.
  - The term RPL is now reserved for describing the actual RPL network protocol.
  - The term remote boot is used for describing the action of a client workstation starting up (booting) from the network server.
- **Repeat-event scheduler:** The scheduler allows you to schedule repeat events on a daily or weekly basis. For example, now you can launch routines to backup client-workstation data, run virus scan programs, or perform many other repetitive maintenance tasks unattended when the client workstation is normally off.

- **Integrated wake-up function:** This new function allows LANClient Control Manager to wake up newly installed clients for the scan operation when the MAC address is entered through the following sources:
  - Flat ASCII file
  - Keyboard (or device that simulates a keyboard)
  - Text cut-and-paste
  - Dynamic data exchange (DDE) application
- **IBM Radio Frequency Identification (RFID) Clients and Asset Information Area (AIA) Support:** LCCM can read AIA data stored on IBM workstations that incorporate the RFID chip and AIA data. Client workstations using the RFID chip can be automatically assigned to a selected LCCM profile when they are first detected by the Scan process, based on the contents of data fields stored in the AIA area.
- **LCPNPSN utility program:** A utility program which is run on a Windows 95 donor workstation to identify ISA plug-and-play adapter serial numbers and tag them in the registry. The LCPNPSN program is then run on the target client workstation as part of the image installation process, and the registry is updated to contain the correct plug-and-play serial numbers from the target client workstation.
- **LCCUSTOM utility program:** This utility program automates many of the client variables normally passed by the DEDITD command. The LCCUSTOM program is run during the LCI file process.
- **Import Client Database:** This utility allows you to import a client database into LCCM, appending it to the current client database. The client database must be in the form of a comma delimited .TXT file.
- **Database export:** This utility allows you to compile and export a detailed report on clients or profiles. Exported databases can be read on any application that reads a comma delimited file .TXT, such as Lotus 1-2-3.

Specified Operating Environment

The specified operating environments for LANClient Control Manager are those supported by the compatibility test results for a variety of hardware and software combinations. The test reports are accessible from the World Wide Web at `http://www.pc.ibm.com/us/desktop/lccm/index.html`. This web location will be updated as additional test cases are completed.

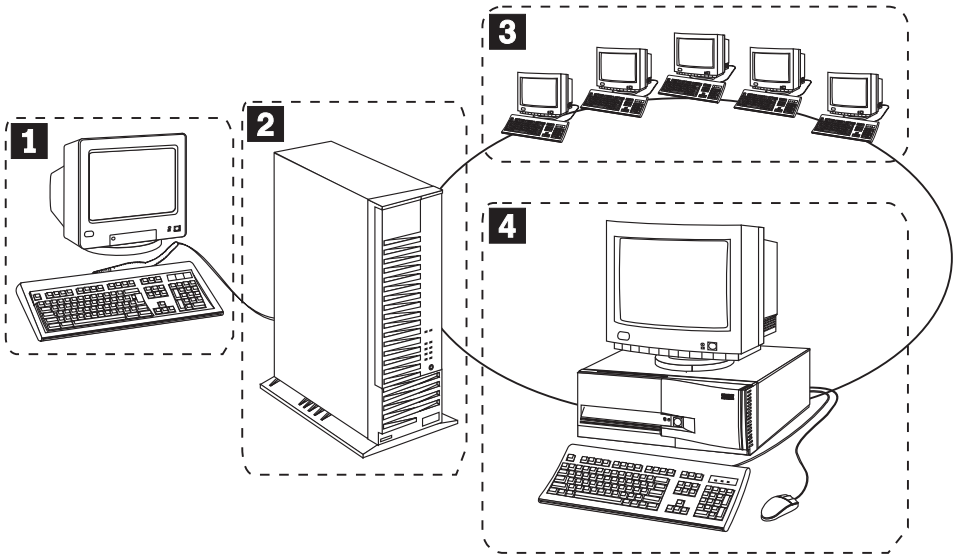
Important: Before using LCCM, check the compatibility test results and browse the rest of the LCCM website for additional information and tips concerning the installation and use of LCCM.

LANClient Control Manager Hardware Environments

This section shows examples of the various hardware configurations for using LANClient Control Manager in RPL and DHCP environments.

RPL Environment

The following illustration shows the typical LANClient Control Manager RPL environment. Routers are not supported in this environment. All clients workstations configured for the RPL protocol must be on the same LAN segment as the LCCM server.

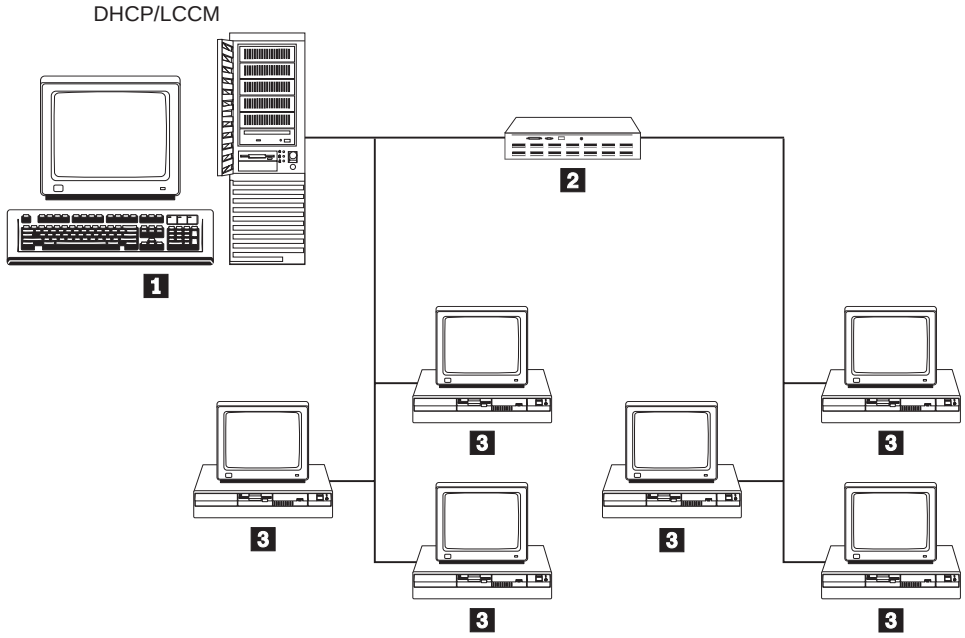


1. Server console - A keyboard and monitor attached to the server (optional).
2. Server - The LANClient Control Manager program is typically installed here. LANClient Control Manager can optionally be installed on a client workstation (administrator console).
3. Client workstations - These are workstations connected to the LAN. All client workstations to be managed by LANClient Control Manager must be enabled to support remote program load (RPL). For details, see “Installing New Client Workstations” on page 72.
4. Administrator console - A workstation on the LAN through which or on which LANClient Control Manager is installed.

DHCP Environment

The following illustrations show examples of how you can implement LANClient Control Manager in a DHCP environment. In each example, the internet protocol (IP) router must support the BOOTP Relay Agent function and operate both with and without Internet Group Management Protocol (IGMP) support for routing MTFTP multicasts.

DHCP Example 1: The DHCP server, LCCM server, and LCCM console is on the same system. The client workstations boot and connect either locally (through the local network segment) or through one or more IP routers.

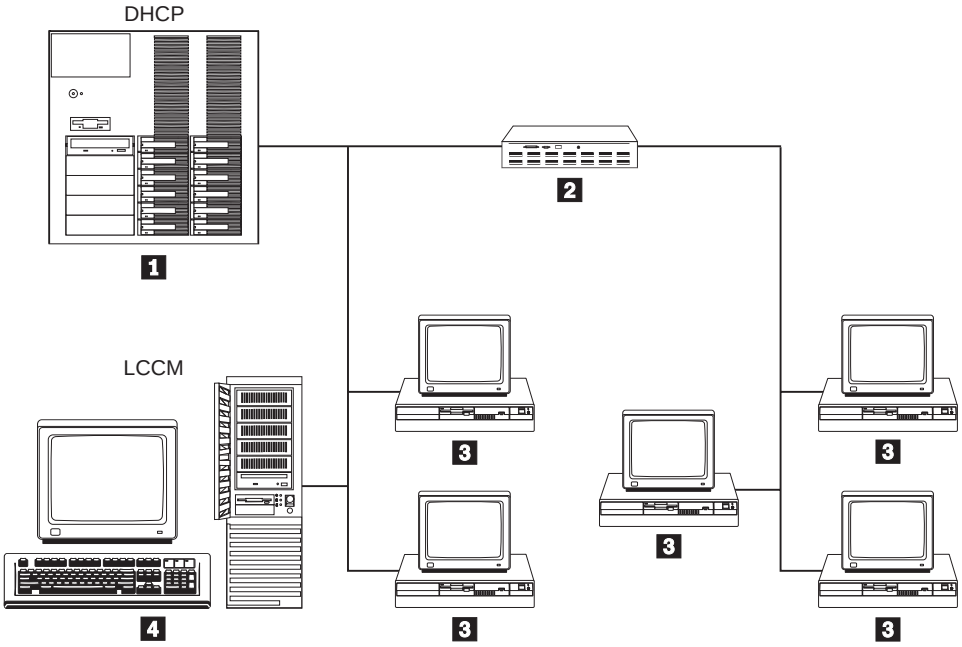


1 DHCP server, LCCM server, and LCCM console on same system.

2 IP router (one or more).

3 Client Workstations

DHCP Example 2: The DHCP server is on one system. The LCCM server and LCCM console are on another system. The client workstations boot and connect either locally (through the local network segment) or through one or more IP routers.



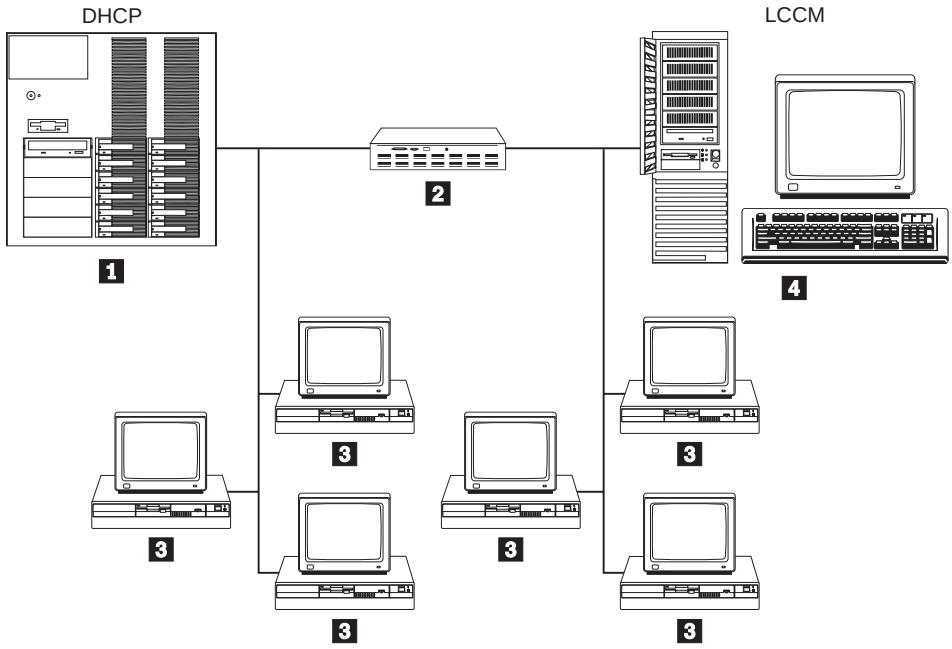
1 DHCP server

2 IP router (one or more).

3 Client Workstations

4 LCCM server and LCCM console

DHCP Example 3: The DHCP server is separated from the LCCM server and LCCM console by one or more IP routers. The client workstations receive configuration data (either locally or through one or more IP routers), boot, and connect (either locally or through one or more IP routers).



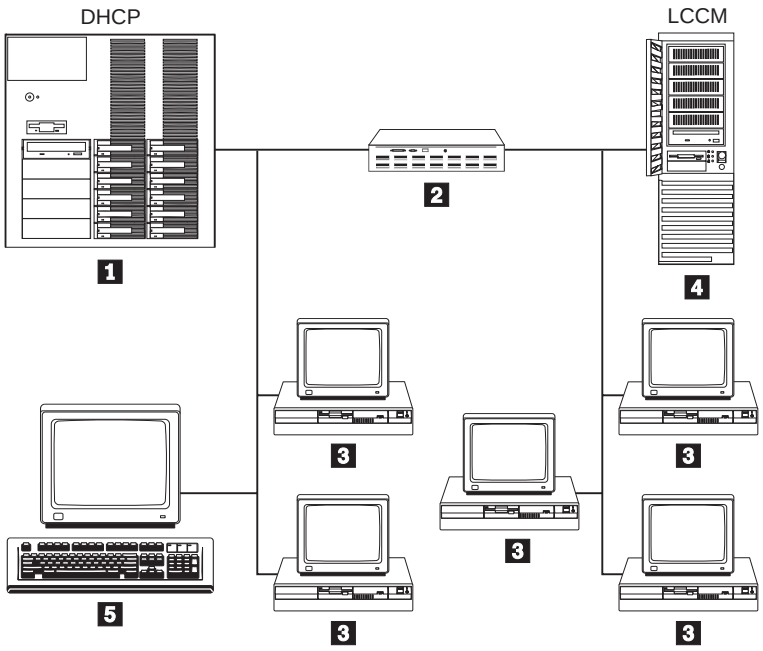
1 DHCP server

2 IP router (one or more).

3 Client Workstations

4 LCCM server and LCCM console

DHCP Example 4: The DHCP server is separated from the LCCM server by one or more IP routers. The client workstations 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.



1 DHCP server

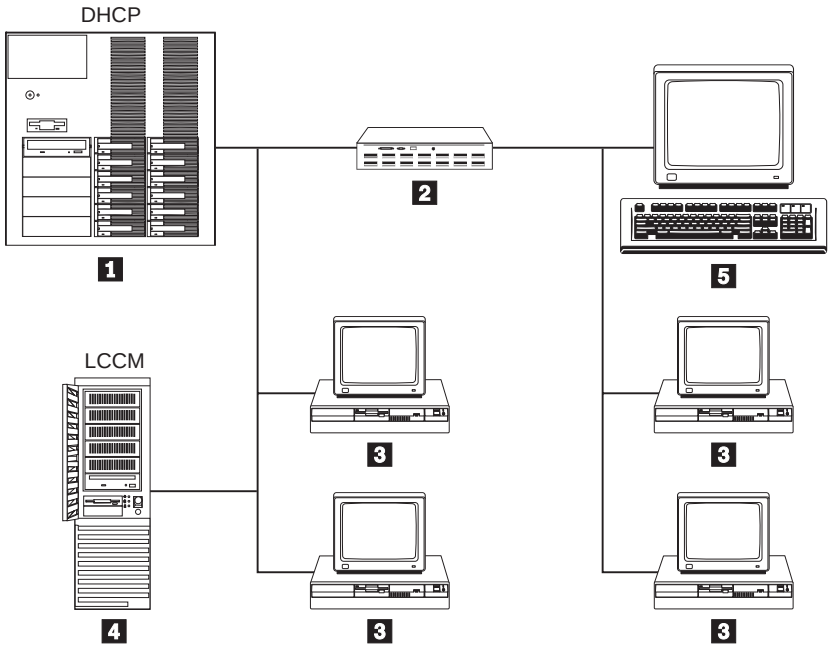
2 IP router (one or more).

3 Client Workstations

4 LCCM server

5 LCCM console

DHCP Example 5: The DHCP server and LCCM server are on the same LAN segment. The client workstations 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.

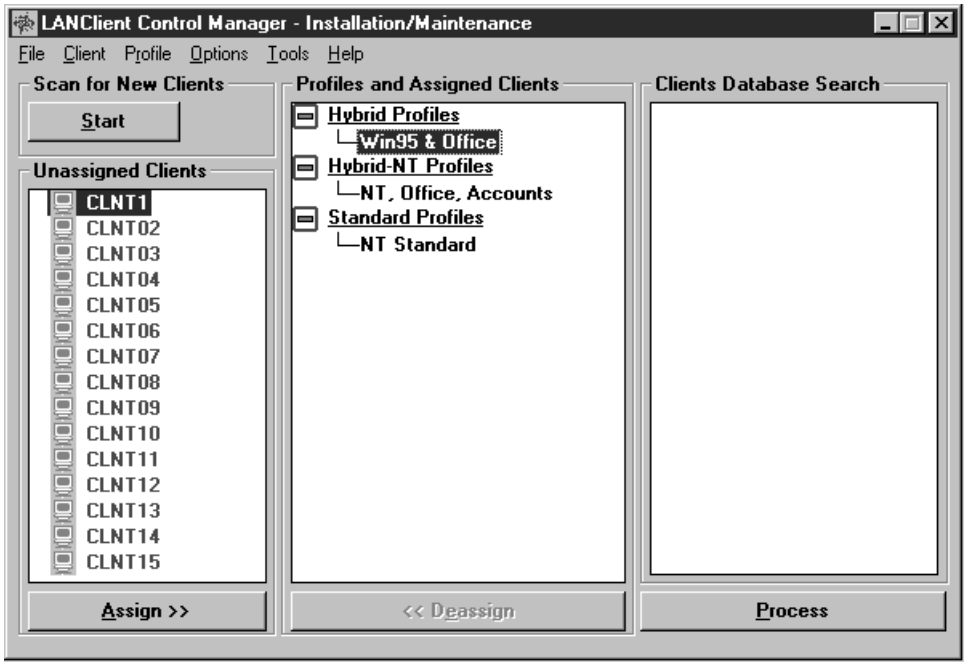


1. DHCP server
2. IP router (one or more).
3. Client Workstations
4. LCCM server
5. LCCM console

Basic Operation

LANClient Control Manager has a *scan* feature that automatically searches the LAN for new client workstations that are enabled for either RPL or DHCP. When it finds a new client workstation, LANClient Control Manager interrogates the client for information such as the serial number and network address. LANClient Control Manager assigns a name to the client and creates an Individual Client Details notebook for the new client. The Individual Client Details notebook contains the name of the client and the information that was detected during the scan. The name of the client appears in the *Unassigned Clients* list of the Installation/Maintenance window.

The following illustration shows the Installation/Maintenance window.



Once LANClient Control Manager 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 on the *Process* button, the client performs one of the following actions the next time it starts.

- If a *standard remote-boot* profile is assigned, the server downloads a standard remote-boot image to the client's memory. The client starts, carries out the instructions contained within the image, and is ready to run the software made available to it through the LAN.
- If a *Hybrid remote-boot* profile is assigned, the server sets up a temporary operating system environment on the client, 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 workstation downloads only a short bootstrap load instruction from the server, which instructs the client to start from its own hard disk.
- If a *Hybrid-NT* profile is assigned, process actually performs a complete unattended installation of Windows NT Workstation on the client. On subsequent restarts, the client workstation downloads only a short bootstrap load instruction from the server, which instructs the client to start from its own hard disk.

You can create and store a variety of images and profiles on the server. The software within each image depends on the tasks to be accomplished by you or the end user.

Note: Profiles are unique to the LANClient Control Manager program. You create a profile to identify the associated image that resides on the server or the batch files used to copy an image from the server. Information about each profile is created and stored in the *Software Profile Details* notebook, which is discussed later in this book.

Advantages of Hybrid Remote Boot

Hybrid remote boot provides you with a very powerful technique for controlling your networked clients. There are several advantages of assigning clients to a Hybrid remote-boot image rather than a standard remote-boot image. These advantages include:

- The network load associated with downloading the complete image from the server to every client at startup is decreased.
- End users never need to load software on to their client workstations.
- You do not need to take diskettes to the client workstation to update or repair end-user software.
- End users are discouraged from keeping unauthorized or unlicensed software on their workstations, because the administrator can clean the hard disk drive and reinstall all software at any time.
- Clients can be disabled from functioning if they are disconnected from the network. This is done by altering the primary startup sequence of the client BIOS. Also, you can control the BIOS administrator password, which prohibits end users from altering the startup sequence.

Note: If an emergency occurs that prevents your clients from connecting to the network, they can optionally start up from their hard disk drives. For more information, see “Allowing Local Hard Disk Startup” on page 101.

While the Hybrid remote-boot process is unique to LANClient Control Manager, it does not need any proprietary hardware, and does not use any nonstandard transactions over your LAN, so it is very unlikely to have any adverse effect on any LAN applications you already use.

If you currently use a software-distribution application over the LAN, it can probably be used with Hybrid remote boot to extend and improve your client control.

Use of Batch Files

You must create batch files to take full advantage of the capabilities of LANClient Control Manager. LANClient Control Manager uses batch files for the following tasks:

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

Examples of batch files for these and other tasks are provided in Chapter 6, “Example Files” on page 153. Also, the use of batch files is discussed in more detail later in this chapter.

Environment for Hybrid Remote Boot

Before LANClient Control Manager 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.

- IBM PC DOS 7 is loaded on the client (the DOS software is not copied to the hard disk of the client; it is resident only in memory).
- Drive C of the client is temporarily renamed drive D. However, LANClient Control Manager allows you to 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 workstation hard disk drive.
- The server *C:\LCCM_install_dir*\CLNTFILE directory is mapped as C:\LCCM from the client perspective. However, when creating batch files, you must use the predefined variable %LCCMPATH% to access the \CLNTFILE directory. This is the directory where all of the required utility programs are stored. For details on these utilities, see Chapter 7, “Utilities Provided with LANClient Control Manager” on page 159.

RFID Clients and Asset Information Area (AIA) Support

If you are using IBM workstations that incorporate the IBM Radio Frequency Identification (RFID) chip, and an Asset Information Area (AIA), you can use this stored AIA data with LCCM. The RFID chip is battery maintained and contains asset data specific to each client workstation.

Some of the benefits of RFID enabled clients are:

1. Asset Information about the client workstation is stored on-board and is available to applications controlled by the administrator.
2. An additional utility, LCCUSTOM, can be used to extract and incorporate AIA data (parameters), from the AIA area into batch files, replacing the need to use the DEDITD utility and LCCM Parameter pages for selected fields. See “Using RFID and AIA data with Clients” on page 103 for the list of available data fields onboard the RFID chip.

   Note: Parameters that are not stored in the AIA area, and that are still required to fully customize your batch files, can be taken from the Parameters pages of the Profile and Client notebooks. These parameters may be substituted by using either LCCUSTOM or DEDITD. For more information about LCCUSTOM, see “Passing Parameters with LCCUSTOM” on page 84.
3. Client workstations using the RFID chip can be automatically assigned to a selected LCCM profile when they are first detected by the Scan process, based on the contents of data fields stored in the AIA area. See “Defaults Notebook - Scan Page” on page 40 for the location on the LCCM interface.

To use RFID and AIA with LANClient Control Manager, see “Using RFID and AIA data with Clients” on page 103.

Interface Components

The interface of LANClient Control Manager 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 and 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 durations, the administrator password to assign to each client workstation, and specific questions (prompts) to display at the client workstation during a scan process.

- Individual Client Details Notebook

  The information in this notebook is created automatically by the scan process for each client workstation it detects. You can also create, copy, or modify the notebook manually. The notebook contains information about specific client workstations, such as the serial number, network address, key hardware installed, image assigned, and BIOS level. It also contains the personalization values unique to each client workstation that you use to personalize an image. You can also use this notebook to perform maintenance operations on client workstations, such as updating the BIOS code or updating the administrator password. A scheduler feature allows you to override the default scheduler and schedule a processing change at a specific date and time, or schedule a repeat event.

- Software Profile Details Notebook

  The information in this notebook is created by you. The Software Profile Details notebook contains information about the image that is associated with a specific profile. It contains:

  – A description of the profile contents.

  – Information about the minimum hardware required by a client workstation to use the image.

  – 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 personalization names and values common for all workstations using this profile.

The interface is described in greater detail in Chapter 3, “Working with the Interface” on page 31.

Concepts

The following conceptual information will help you understand the various elements used by LANClient Control Manager.

Images

An image is the software stored on a server that is downloaded to a client workstation during a remote-boot operation. Images vary in size and in the type of software they provide to the client workstation. The purpose and content of each image depends on the task that needs to be accomplished, as well as the method (standard or Hybrid remote boot) used to download the image from the server to the workstation.

Standard Remote-Boot Images

In general, a standard remote-boot image provides only enough function to enable the client workstation to start up and gain access to the network. For more information, see “Creating a Standard Remote-Boot Image” on page 79.

Hybrid Remote-Boot Images

A Hybrid remote-boot image contains the software designed to meet the needs of a specific end user, department, or group of end users that perform similar tasks. It consists of a complete operating system and a set of application programs. Multiple images can reside on a server, and the same image can be downloaded to multiple clients. The size of the image is limited only by the hard disk capacity of the client workstation that will be using it.

Note: A Windows NT Workstation image distributed from your server is called a Hybrid-NT remote-boot image. This image is stored in a directory on your server referred to as the *Distribution Sharepoint*. The method of creating and distributing a Hybrid-NT remote-boot image is somewhat different from other Hybrid remote-boot images because of the unique relationship between Windows NT Workstation and Windows NT Server. The Hybrid-NT remote-boot process actually performs a complete unattended installation of Windows NT Workstation. In contrast, other Hybrid remote-boot processes distribute a preinstalled image. For more information, see “Windows NT Workstation Image” on page 132.

BIOS Update Images

LANClient Control Manager can read the contents of a flash BIOS update diskette and store it as an image on the server. All flash BIOS images are kept in a sub-directory on the server. For more information, see “Creating a BIOS Update Image” on page 87. 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 remotely update a client workstation's BIOS level. For additional information about this procedure, see “Updating the BIOS Level” on page 97.

CMOS Update Images

The CMOS update image is a file that contains the BIOS settings that are set through the client workstation's Configuration/Setup utility program. You use a *donor workstation's* 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's directory. For more information, see “Creating a CMOS Settings Image” on page 89. 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 workstation's CMOS memory. All CMOS update files must be identified with a .CMS file extension. For more information about this procedure, see “Assigning Clients to a CMOS Settings Image” on page 98.

Batch Files

The Hybrid remote-boot process downloads and runs batch files on client workstations. These batch files copy the files of the assigned image from the server to the client workstation or carry out other tasks, such as preparing a client workstation's hard disk to accept data or modifying an image after it has been installed.

You must create the batch files to meet your specific needs. The more proficient you are at writing batch files, the more powerful LANClient Control Manager becomes as a network-management tool.

When creating batch files, keep a few rules in mind:

- Keep batch files as simple as possible.
- Test batch files on a donor workstation and spare client workstation in a controlled test environment before running them on an entire workgroup. This will help you find errors early in a controlled environment.

- Make sure that you understand drive mapping and that you develop your batch files from the client workstation's point of view using the redefined drive variables: %TARGET% for the client workstation drive and %LCCMPATH% for the appropriate server drive and directory.
- Ensure that you assign the appropriate file extensions for different types of batch files that you create.

Types of Batch Files

LANClient Control Manager's Hybrid remote-boot process uses batch files for various tasks. Each type of batch file has a unique file extension that is used to identify its purpose. The following are the types of batch files that can be used by the Hybrid remote-boot process:

- .LCP

  This is the preload image batch file. It is used to prepare a client workstation's hard disk before downloading the final image, usually by issuing a LCBTRDEL command to delete existing partitions and an FDISK command to re-partition the drive.

  The version of FDISK that ships with LANClient Control Manager allows the use of command-line arguments. Or, if you prefer, you can use response files. For additional information about supported FDISK parameters and FDISK response files, see Chapter 7, “Utilities Provided with LANClient Control Manager” on page 159.

- .LCI

  This is the final-image batch file. It is used to download the client workstation's final image from the server, usually by using the XCOPY or COPY commands. In some cases, the final image file also includes formatting commands, provides personalization attributes, and runs other programs provided by LANClient Control Manager to handle long file names and temporarily change system and hidden-file attributes.

  Also, .LCI is the required file extension for the customization batch file used with a Hybrid-NT remote-boot image used for the unattended installation of Windows NT Workstation image. This batch file is used to personalize the Windows NT answer file. For additional information, see “Editing the Windows NT Workstation Answer File” on page 143.

- .MNS

  This is the maintenance batch file. This batch file is similar in function to the final-image batch file, but is used specifically to copy additional or updated programs to an image already installed on a client workstation. If a particular end-user (for example, a department manager), requires more software than other end-users, you can install a common image, then use the maintenance batch file to add the additional software. Once the additional software and maintenance batch file are on the server, you can use the Maintenance page of the Individual Client Details notebook to install the additional software. This way, you will not have to recopy an entire image or develop a unique final-image batch file.

- .LCR

  This is the personality batch file. This batch file is used to ask LANClient Control Manager for specific information or product information for each client. If you intend to run various commands in order to personalize individual clients, use a personality batch file. When using a personality batch file, you specify the file name on the Software page of the Individual Client Details notebook. Therefore, the personalization is controlled at the client level, as opposed to the software profile level. For example, you can use this file to enable or disable selected software settings for a subset of clients using a common image.

A Word about Drive Mapping and Drive Variables

Because drive mapping assigns drive letters to directories and sub-directories of a server, keeping track of the drive letters and subdirectories can be a bit tricky. For this reason, LANClient Control Manager version 2 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 LANClient Control Manager before you create your batch files.

- `%LCCMPATH%` points to the *LCCM_install_dir*\CLNTFILE directory.
- `%TARGET%` points to the primary partition of the client 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 *LCCM_install_dir*\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 LANClient Control Manager is executing .LCP, .LCI, .LCR, or .MNS batch files. When developing your final-image batch file, the statement needed to copy the image to the client workstation would be:

```
XCOPY %LCCMPATH%\LCCM\WIN95\*.* %TARGET%\*.* /S
```

The backup batch files (.BAT) used to transport images from the donor workstation to the server are run outside of the Hybrid remote-boot process. Therefore, these variables cannot be used in the backup batch files; you must use the following drive designations:

- C:\LCCM points to the *LCCM_install_dir*\CLNTFILE directory.
- D: points to the primary partition of the client hard disk drive.

For additional examples of batch files and drive variables, see Chapter 6, “Example Files” on page 153.

Donor Workstations

The process of controlling workstations is much easier if you use a *donor* workstation to write and test your batch files before migrating the image to every client on the LAN. A donor workstation is a requirement for creating a CMOS image and developing a Hybrid remote-boot image.

The donor workstation must be compatible (feature-by-feature) with the client workstations you plan to use. In most cases, it is advisable that the donor workstation and target client workstations be identical models to ensure that the correct device drivers are present and configured correctly. Ensure that you have adequate access to a suitable client workstation to use as a donor for writing batch files and testing changes before you make these changes on the entire workgroup. You will find it much easier to find and fix problems on a single donor client before migrating new or changed batch files to every client on your LAN.

Software Profiles

In many organizations, there are people doing the same or similar job and using the same software to do it. From a support and maintenance point of view, it is very important that these client workstations use an identical set of software. This often is difficult to achieve, and once achieved, difficult to maintain. However, using software profiles in LANClient Control Manager helps solve this problem.

You use a software profile to define a set of software and distribute it as an image through the LAN to one or more client workstations, thereby creating identical operating environments. As clients are added, the

same image can be distributed to them. If the image gets updated, all client workstations currently assigned to that software profile can automatically be updated with the revised image at the next remote boot. No user intervention is required at the client workstation 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 Details notebook* for each image and give each notebook a descriptive name. Using the examples in the preceding list, the names Administrators and Bob's Marketing Team might be appropriate. When these notebooks are saved, the names appear in the Installation/Maintenance window. Each software profile is listed under the profile type (Standard Profiles, Hybrid Profiles, and Hybrid-NT Profiles). The administrator would then assign each marketing workstation to the profile named Bob's Marketing Team and each administrative assistant's workstation to the profile named Administrators. The next time these workstations are started, the appropriate images are downloaded and they are ready to use.

Chapter 2. Installing and Running LANClient Control Manager

Installing LANClient Control Manager

Important:

- When you are installing the LANClient Control Manager program on the server, you must always log on as a *network administrator or equivalent*.
- You can find the files for installing LANClient Control Manager at `http://www.pc.ibm.com/us/desktop/lccm/index.html` on the World Wide Web.
- If you are upgrading from LANClient Control Manager version 1.0 or 1.1, you must first uninstall the older version. For more information, see “Upgrading from Version 1.0 or 1.1” on page 21. After installing version 2, you must modify any of the following batch files you saved from version 1.0 or 1.1:
  - Preload-image batch files (.LCP)
  - Final-image batch files (.LCI)
  - Maintenance files (.MNS)

  For details on modifying these files, see “Modifying Batch Files from Version 1.X” on page 29.

Prerequisites

- The minimum software required is Windows NT Server 4.0.
- In most cases, it is in your best interest that the file system on your LCCM server be configured as NTFS so you can set permissions and ensure the security of your server directories.
- Windows NT Server 4.0 must be installed as follows:
  - The server's computer name cannot contain embedded spaces.
  - The DLC, NetBEUI and TCP/IP protocols must be installed. If you will be managing clients set up for RPL, the Remoteboot Service must also be installed and the Fix Security program run. You will verify this later in this chapter.
  - If you intend to use LANClient Control Manager to install Windows NT Workstation on your clients, you must have sufficient room to copy the Windows NT Workstation CD on to your server (approximately 80 MB). You also need sufficient room to store on this drive all other images you will be using. You will be able to calculate the total space you will require by adding together the space required by all the images you will be storing.
  - When processing or scanning, LANClient Control Manager requires two Windows NT licenses for each client workstation being processed concurrently. You will be asked to provide the number of licenses needed during the Windows NT Server installation.

    Note: You can limit the number of clients that will be processed at any single time within the LANClient Control Manager program. For more information, see “Defaults Notebook - Processing Page” on page 38. If you need to add additional licenses, use the Windows NT License Manager feature, which is accessible through the Administrator Tools (Common) program.
- The Remoteboot Service must be installed, started, and functioning correctly.
- Review the installation notes for changes or tips at `http://www.pc.ibm.com/us/desktop/lccm/index.html` on the World Wide Web.

Upgrading from Version 1.0 or 1.1

You must remove earlier versions of LANClient Control Manager before installing this version. To remove LANClient Control Manager to upgrade, do the following:

1. Save your existing databases and NETWORK.LST file:
   a. Create a temporary backup directory outside of the LANClient Control Manager directory structure.
   b. Locate the LANClient Control Manager installation directory on your server.
   c. Copy the following files to the temporary backup directory you created in 1a:
      - NETWORK.LST (file containing important configuration information about the network adapters used in your network)
      - LCCLIENT.DBS (client database)
      - LCPROF.DBS (profile database)
      - LCCLIENT.INI

      You can reuse these files after you reinstall the latest version of LANClient Control Manager. LANClient Control Manager version 2 contains an updated NETWORK.LST file that might contain information for network adapters that are not supported in your NETWORK.LST file. If you have a customized NETWORK.LST file, you might want to use your customized file with version 2, or modify the appropriate entries in the version 2 NETWORK.LST file to match your custom NETWORK.LST file. If you have no custom or reusable information in these files, you can delete them.
2. Uninstall all previous versions of LANClient Control Manager:
   a. From the Windows NT Desktop, click on the **Start** button.
   b. Select **Settings**.
   c. Select **Control Panel**.
   d. Select **Add/Remove Programs.**.
   e. Highlight LANClient Control Manager and click on the **Add/Remove** button.

      This process removes *most* of the LANClient Control Manager components from the server. The directory where you originally installed LANClient Control Manager and some user-created files within the directory will not be deleted.
   f. Copy the files that remain in the LANClient Control Manager installation directory into the temporary backup directory you created in 1a.
   g. Delete the original LANClient Control Manager installation directory.
3. Continue with “Installing LANClient Control Manager Version 2.”

Installing LANClient Control Manager Version 2

Important: If you are using a Backup Domain Controller, LANClient Control Manager must be installed on this controller, not on the Primary Domain Controller. The LANClient Control Manager databases are not automatically synchronized between the Primary and Backup Domain Controllers.

There are two ways to install the LANClient Control Manager program, typical or custom. A typical installation will install LCCM according to prearranged or assumed defaults, such as the Windows System directory being located in the WINNT directory. Choosing the custom installation process will step you through every decision that LCCM requires for a successful installation, while a typical installation will skip some steps. If you are installing LCCM for the first time, select **Custom** to familiarize yourself with the LCCM program.

To install a LANClient Control Manager program using the custom process:

1. Follow the instructions at `http://www.pc.ibm.com/us/desktop/lccm/index.html` on the World Wide Web to download and unpack LANClient Control Manager.
2. From the directory into which you downloaded and unpacked the LANClient Control Manager installation files, change to the NT folder and run the SETUP.EXE program. When the setup program begins, the Select Language window appears. Select the language in which to view the license agreement, then click on **Next**.
3. After reading the license agreement, select **I agree**. Selecting **Don't agree** will cancel the installation process.
4. If installing LCCM for the first time, a dialog box appears asking "Do you want to install DHCP Support?" If you are reinstalling or restarting the installation after the DHCP question has been answered, the next step to follow is step 9.
   - If you will be managing client workstations configured for DHCP Client, answer **Yes** to this question and continue with step 5.
   - If you will be managing only client workstations configured for the RPL protocol, answer **No** to this question and continue with step 8.
5. The Choose DHCP Support Directory dialog box appears. In most cases it is best to accept the default directory name shown.

   Note: If you change the default directory name shown, the directory name you assign in this step must match the directory name used for the DHCP Support Directory in step 7f and step 16 on page 23 of this procedure. Make a note of the directory name.

   Click on **Next** to create the directory.
6. An information dialog box appears prompting you to install the IBM intermediate support driver. Click on **OK**. The installation program terminates. This is normal.
7. Use the following procedure to install the IBM intermediate support driver:
   a. From the Windows NT desktop, click on the **Start** button.
   b. Select **Settings**.
   c. Select **Control Panel**.
   d. Double-click on **Network**.
   e. Click on the Protocols tab, click on **Add**, then click on **Have Disk**.
   f. In the Path box, type *C:\IBMTCPIP\WEDGE* or *Drive letter:\directory name\WEDGE* of the directory name you chose in step 5. Click on **OK**.
   g. The Select OEM Option box appears. **IBM Intermediate Support Driver** should be highlighted.

      Note: If **IBM Intermediate Support Driver** is not highlighted, you typed the wrong path in the previous step. Check the path and directory you selected in step 5, then try again.

      Click on **OK** to install the driver. You will be returned to the Network Setup window. Click on **Close**.
   h. Shut down and restart your server. The new driver will be installed when the server restarts.
8. From the directory into which you downloaded and unpacked the LANClient Control Manager installation files, run the SETUP.EXE program. The installation Welcome screen appears. Click on **Next**.
9. At the Installation Type prompt, select one of the following:

- If you are using the server's keyboard and monitor as the administrator console, select **Perform Server Installation**.
- If you are using a client workstation as the administrator's console, select **Perform Remote Workstation installation only**. This installs all required files on your LCCM server. You must be logged on to the administrator console with administrator privileges.
- If you want to run LANClient Control Manager from a client workstation, select **Perform Remote Workstation Installation only**. If you select this option, you must first install LANClient Control Manager on the server using the **Perform Server Installation** option.

Remember, you must be logged on with administrator privileges for any of these options.

10. Select type of installation. These instructions are for a custom installation. Select Custom and click **Next**
11. At the Choose LCCM Destination Directory dialog box, type the directory name where you want LANClient Control Manager to be installed. In most cases, it is best to accept the default directory of C:\LCCM. Click on **Next**.
12. At the Request Server Name prompt, ensure that the server name is correct. There must be no spaces in the servername.
13. The Confirm Windows System32 Directory dialog box appears requesting the directory path of the SYSTEM32 directory. Accept the default: click on **Next**.
14. The Request Server Name dialog box appears. Type the server name of the server on which you want to install LANClient Control Manager. Then, click on **Next**.
15. The Choose LCCM Environment dialog box appears. Select one of the following:
    - **DHCP Only**
    - **RPL Only**
    - **Both DHCP and RPL**

    If you selected **DHCP Only** or **Both DHCP and RPL**, click on **Next**, then continue with step 16.

    If you selected **RPL Only**, click on **Next**, then continue with step 18.
16. When you are prompted for the name of the DHCP Support directory, type in the directory name you selected in step 5 on page 22 of this procedure. (The default directory name is `C:\IBMTCPIP`.) Click on **Next**.
17. The Enter IP Address Scope prompts appear.
    a. Type the IP address of the TFTP server on which LANClient Control Manager is installed, then click on **Next**.
    b. A dialog box appears asking if you need to install the IBM DHCP Server. If a DHCP Server service is already installed on the server, select **No** then continue with step 18.

       If you selected **Yes**, then continue with step 17c
    c. Type the first IP address of your client group, then click on **Next.**.
    d. Type the last IP address of your client group, then click on **Next**.
    e. Type the subnet mask used by your client group, then click on **Next**.

    A dialog box appears asking if you have any further client scopes to enter. Continue until you have entered information identifying all client workstations configured for DHCP. When all DHCP identification has been entered, click on the **No** in this dialog box to continue.
18. At the Choose Server Type box, select the type of server on which you are installing LANClient Control Manager, then click on **Next**

- If you selected **Primary Domain Controller**, you will be asked to confirm the pathname of your RPL System Directory.
- If you selected **Backup Domain Controller**, you will be asked to select a *User name* and *Starting Number*. The defaults are *BDCK* and *1* respectively. You can change the defaults if you want. When you click on **Next**, 30 *NT user accounts* are created using your values. For example, if the default values are used, the NT user accounts are assigned the names LCCM1 through LCCM30. These NT user accounts are used as a temporary tracking mechanism during the scan process and any download processes. The maximum number of concurrent download operations is limited to 30. After you select the User name and Starting number, you are asked to confirm the pathname to your RPL System Directory.
- If you selected **Stand Alone Server**, you will not be prompted for any additional information.

The setup program installs all required components. Upon completion, the setup program will have installed the LANClient Control Manager program and following services.:

- IBM BINL Service
- IBM DHCP Service
- TFTPD - Trivial File Transfer Protocol Daemon

19. If you are upgrading from LANClient Control Manager version 1.0 or 1.1, do the following:
    a. Copy your existing databases (LCCLIENT.DBS and LCPROF.DBS) and the LCCLIENT.INI file from the temporary backup directory you created earlier into the LANClient Control Manager installation directory.
    b. Rename the NETWORK.LST file in the LANClient Control Manager installation directory to NETWORK.NEW.
    c. Copy the NETWORK.LST file from the temporary backup directory into the LANClient Control Manager installation directory.

       Note: LANClient Control Manager version 2 contains an updated NETWORK.LST file that might contain information for network adapters that are not supported in your old NETWORK.LST file. If you have a customized NETWORK.LST file, you might want to add the new line entries in the version 2 NETWORK.LST file (renamed to NETWORK.NEW) to your customized NETWORK.LST file. Make sure that all information that is required to be unique is not duplicated in another line entry. See “Understanding the NETWORK.LST File” on page 111 for additional information about modifying the NETWORK.LST file.
    d. Modify the following batch files you saved from version 1.0 or 1.1. For details on modifying these files, see “Modifying Batch Files from Version 1.X” on page 29.
20. If you installed LANClient Control Manager on a Backup Domain Controller, you must do the following:
    a. From the Windows NT Desktop, click on the **Start** button.
    b. Select **Programs**.
    c. Select **Administrative Tools**.
    d. Select **Server Manager**.
    e. Select **Computer**.
    f. Select **Synchronize with Primary Domain Controller**.

    This ensures that the NT user accounts you created in step 18 on page 23 are copied to the Primary Domain Controller.

LANClient Control Manager is now installed. Once LANClient Control Manager is installed, a listing for LANClient Control Manager is added within the program listing of the operating system.

For every type of adapter you are using on your LAN, a corresponding line entry must be contained in the file *LCCM_install_dir*\NETWORK.LST. This file is used by LANClient Control Manager to store information about network adapters on your LAN. The NETWORK.LST file contained in LANClient Control Manager version 2 contains line entries for all network adapters that were supported at the time this version was released. If you choose to use an unsupported adapter, you can install the required device drivers and update the NETWORK.LST file, but you do so at your own risk. See “Installing Network Adapter Device Drivers” on page 108 for instructions.

A list of supported adapters is provided at `http://www.pc.ibm.com/us/desktop/lccm/index.html` on the World Wide Web.

Under some circumstances, a client workstation can encounter a problem during a LANClient Control Manager process that results in a "hung" condition that requires the workstation to be restarted manually. To recover from this type of condition, a utility called WATCHDOG.EXE has been provided. The installation and setup of this utility is optional. For more information, see “WATCHDOG.EXE” on page 170.

Starting LANClient Control Manager

The following procedure is for starting LANClient Control Manager from the workstation on which it was installed.

Before starting the program, make sure that you are logged on to the network at the administrator console as a system administrator or equivalent. Any client workstations configured for the RPL protocol must be on the same LAN segment as the LCCM server.

To start LANClient Control Manager:

1. Click on the **Start** button within the Windows interface.
2. Click on **Programs**.
3. Click on the listing for LANClient Control Manager.
4. Click on **LANClient Control Manager**. The opening window appears. (If preferred, you can uncheck the box that allows this window to display each time LANClient Control Manager is started.) Click on **OK** to enter the program.

   For information about the various interface components, see Chapter 3, “Working with the Interface” on page 31.

Note: You can also run LANClient Control Manager from another workstation. For more information, see “Installing and Running LCCM from Another Workstation” on page 27.

Installing and Running LCCM from Another Workstation

LANClient Control Manager initially runs only on the workstation through which you installed it. However, while working with the program, you might need to run LANClient Control Manager from another client workstation connected to the LAN.

To install and run LANClient Control Manager from a workstation other than the one from which you installed the program to the server:

1. Run the program SETUP.EXE.
2. At the IBM Intermediate Support Driver prompt, select **No**.
3. At the installation prompt, select **Perform Remote Workstation installation only** and click on **Next**.
4. At the directory location prompt, choose the LCCM installed directory. This location is on the selected remote workstation. Click on **Next**.
5. The next prompt asks for the location of the Windows NT system directory on the selected remote workstation. Accept the default and click on **Next**.
6. At the Server Name prompt, type in the name of the server on which the main LCCM operating unit resides. Click on **Next**.

Important: If you intend to run LANClient Control Manager from a remote workstation, you must use the full UNC path for all files and directories specified in the LANClient Control Manager notebooks and associated batch files. For example:

*servername**sharename**directory**filename*

The following share is automatically created by LANClient Control Manager:

servername\LANC$$

where LANC$$ will point toward:

LCCM_install_dir\CLNTFILE\

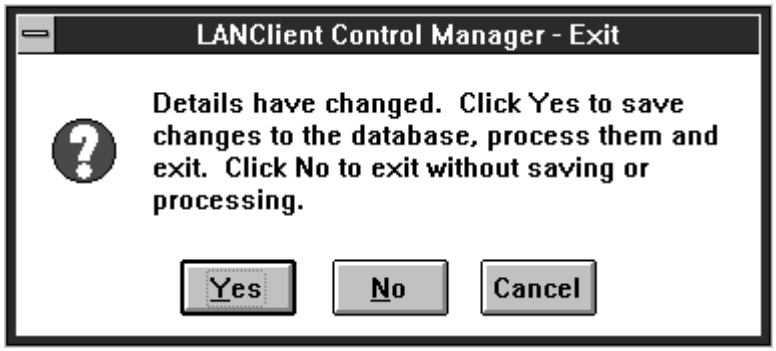
Exiting from LANClient Control Manager

To exit from the program:

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

If no details have changed, LANClient Control Manager automatically exits.

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



- Select **Yes** to *save* and *begin processing* the changes. The Progress and Errors window displays. While this process is running, you can perform no other action within the program.
- Select **No** to *discard all changes* that have been made. Any changes that were in the processing queue, including repeat events, will have to be re-entered after restarting the program.
- Select **Cancel** to *return* to the Installation/Maintenance window. No processing takes place.

Uninstalling LANClient Control Manager

The following procedure permanently removes LANClient Control Manager from your server. If you are upgrading to a later level of LANClient Control Manager, do not use this procedure; see “Upgrading from Version 1.0 or 1.1” on page 21.

To permanantly remove LANClient Control Manager, do the following from the administrator console, or at the workstation on which you installed LANClient Control Manager:

1. From the Windows NT Desktop, click on the **Start** button.
2. Select **Settings.**
3. Select **Control Panel.**
4. Select **Add/Remove Program Properties.**
5. Select **LANClient Control Manager.**
6. Click on the **Add/Remove** button. Most of the LANClient Control Manager components will be removed. The directory into which LANClient Control Manager was installed and some user-created files in this directory will remain.
7. Delete the LANClient Control Manager installation directory and its contents.

If you installed the IBM Intermediate Support Driver along with LCCM:

1. Follow the above instructions for removing the LCCM program.
2. Select **Network.** from the **Control Panel**.
3. Click on the protocols tab, select **IBM Intermediate Support Driver**, then click on **Remove**.
4. Click on **Close**.
5. Shut down and restart your server. The driver will be fully removed when the server restarts.

Modifying Batch Files from Version 1.X

Any batch file from version 1.0 or 1.1 with the following file extensions must be modified to work with version 2.0:

- .LCP
- .LCI
- .MNS

Version 2.0 provides built in variables to be used for mapped drives. These variables must be used in place of specific drive letters and paths.

Figure 1. Version 1.X to Version 2.0 Migration Values

Location	Version 1.X	Version 2.0
C:*LCCM_install_dir*\CLNTFILE (server directory)	C:\LCCM	%LCCMPATH%
D:\ (client hard disk)	D:	%TARGET%

In addition, the .LCP files require modification so they can run in either a RPL or DHCP environment. You can use the following example as a template. The lines shown in bold text determine the size and number of partitions on the client hard disk. These are the only lines that you might need to modify from the

example. In the example, the FDISK command will create a single 2GB (2048KB) partition and leave the rest of the hard disk unused. Refer to “FDISK.COM” on page 162 for instructions on modifying these lines.

```
@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
```

For an example of batch files that use these parameters, see Chapter 6, “Example Files” on page 153.

Chapter 3. Working with the Interface

Installation/Maintenance Window

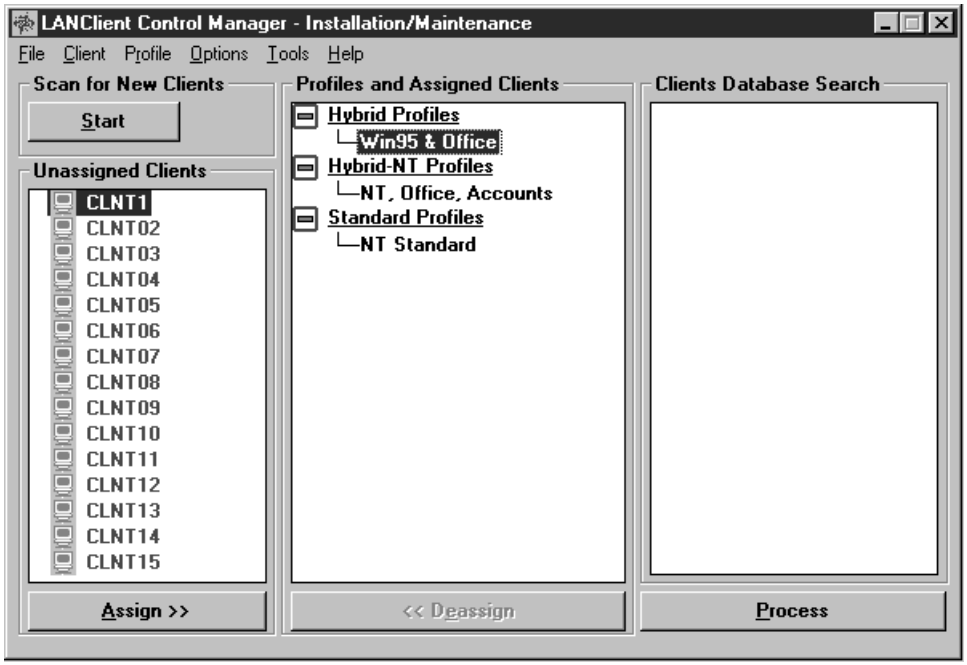
The main window within LANClient Control Manager is the Installation/Maintenance window. Each time the program is started, the Installation/Maintenance window is the first window to appear after the initial welcome window.

Using the available buttons in the Installation/Maintenance window, you can scan for new clients, assign and deassign clients to and from specific profiles, and process all changes. The additional menu bar at the top of the window provides access to all other functions within the program.

When moving within the Installation/Maintenance window and other windows of the program and when selecting items on the screen, you can use the mouse or keyboard (ALT key, ARROW keys, TAB key, ENTER key, and so on).

All actions you take within the program must end with the **Process** button. By clicking on the Process button, you save new information and either immediately change the permanent databases or initiate the Scheduler, which processes changes at a scheduled day and time. For more information on the Scheduler of the Defaults page, see “Defaults Notebook - Scheduler Page” on page 41. For more information on the Scheduler of the Individual Client Details notebook, see “Individual Client Details - Scheduler Page” on page 57.

The following illustration shows the Installation/Maintenance window. When you first start LANClient Control Manager, you will not see new clients until you add them to the database. For more information, see “Adding Client Workstations to the Database” on page 74. You must also create software profiles before you can assign clients. For more information, see “Creating a Software Profile” on page 91.



See “Managing Clients” on page 93 and “Managing Software Profiles” on page 91 for tasks associated with the program interface.

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 on the client using the primary mouse button.
- To select *multiple* clients, press and hold the Ctrl key, click on 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 toggles the selection state of that client on or off from the other clients.
- To select a *contiguous group* of clients, click on the first client in the group, hold the shift key, and then click on the last client in the group. All clients between the two that you click on 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.
- *Red* indicates that the client workstation does not match the minimum hardware requirements of the profile to which the client has been assigned.
- *Gray* indicates that the client currently has RPL or DHCP disabled.
- *Blue* text indicates that the client is selected.

Processing Changes Within LANClient Control Manager

Changes made within LANClient Control Manager are saved in a temporary database until you click on the Process button. This enables you to make multiple changes before starting to process them. This is done because processing might take some time if it involves assigning clients to Hybrid remote-boot profiles that require large downloads.

- For immediate changes:

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

- For scheduled changes:

  Once you click on 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, along with 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's console switched on and LANClient Control Manager running in order for the scheduled event to take place.

- On exiting LANClient Control Manager:

  If there are any processing changes in process or in the processing queue when you attempt to exit LANClient Control Manager, the exit information box displays giving you the opportunity to return to the program or exit. See “Exiting from LANClient Control Manager” on page 28 for more information.

Any errors that take place while an operation is being processed are displayed on screen. You will find these error messages in the Status column within the Progress and Errors window.

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

- By an image batch file

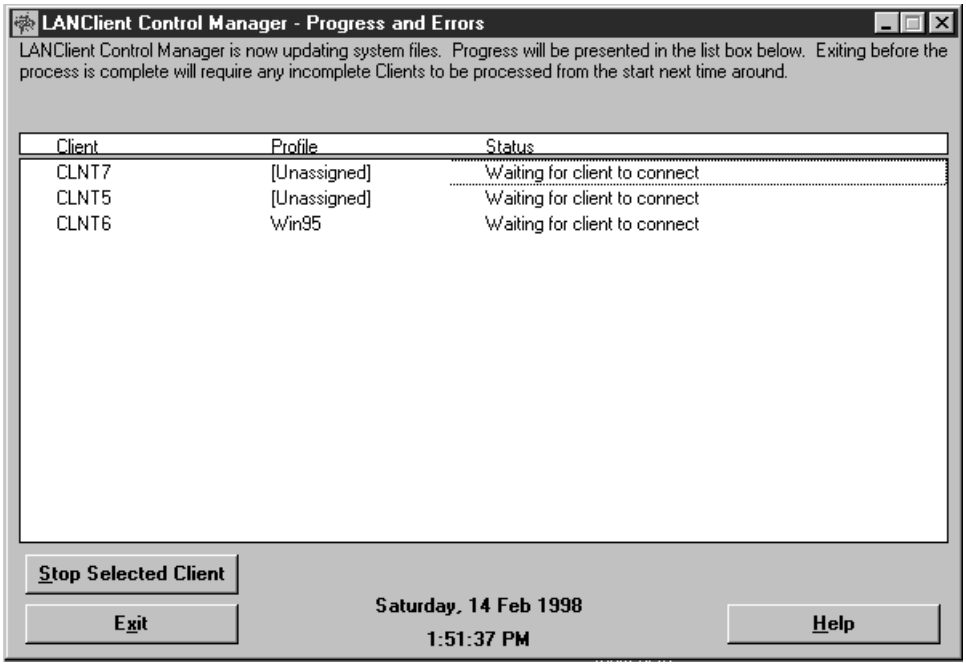
  Add a `ctty con` statement to the beginning of your image batch file and a `pause` statement after each line. Then, run the image batch file on a donor workstation until you find the error. Check the error code against the appropriate help file for the program in the image batch file that is not working. Correct the error and click on 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 its completion rather than breaking out of the batch file. Don't forget 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 press **Enter**. The directory containing the BIOS image is *LCCM_install_dir*\CLNTFILE\BIOS*BIOS_Flash_Name*.

Progress and Errors Window

The Progress and Errors window displays each time a processing change takes place. Processing changes can occur immediately after you click on the Process button or can be on a delayed schedule. For more information on scheduled changes, see “Defaults Notebook - Scheduler Page” on page 41 for information on the scheduler of the Defaults notebook or “Individual Client Details - Scheduler Page” on page 57 for information on the scheduler of the Individual Client Details notebook. The following is an example of the Progress and Errors window.



While the changes are processing, you can select specific clients in the list, and then click on the **Stop Selected Client** button to stop processing.

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.

Defaults Notebook

Whenever you need to change the default settings of the program, you must access the Defaults notebook.

To access the Defaults notebook:

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

   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 44.

   The Defaults notebook contains four pages of information:

   - General

     This page contains information about the BIOS administrator password, the client name, and the Remote Boot server name.

   - Processing

     This page contains information about the Hybrid Remote Boot process, the text editor, and the client restart function.

   - Scan

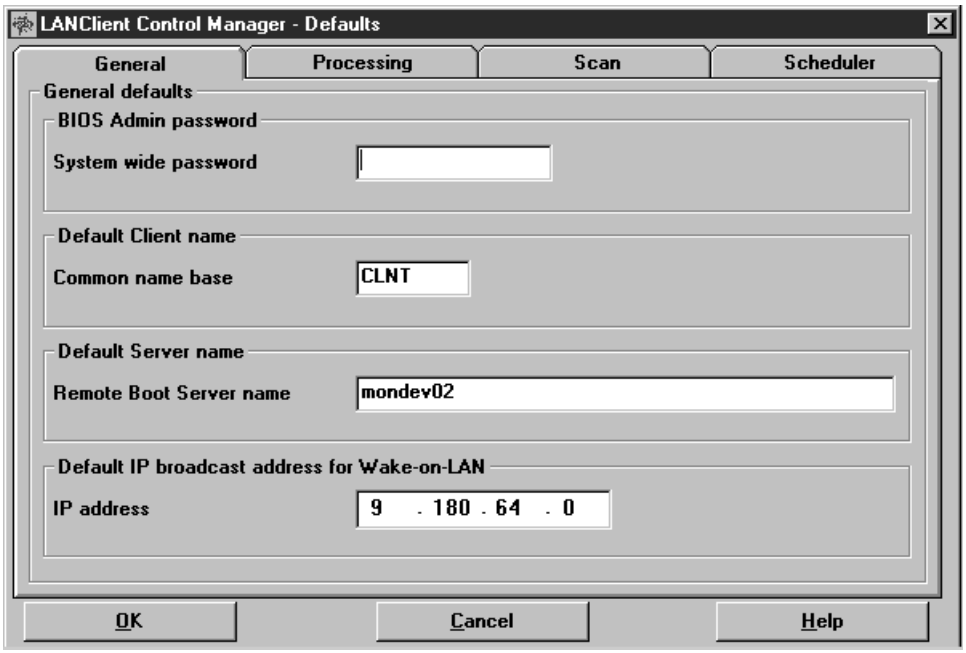
     This page contains information about the optional user prompts that appear each time a client workstation is discovered by the scan process.

   - Scheduler

     This page contains information about how and when changes are processed.

   To change to another page, click on the tab with the name of the information you want to view or change. All four categories, and the options within each one, are explained in this section.

Defaults Notebook - General Page



- BIOS Administrator Password

  The default value, if specified, is applied 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 pressed to process immediate changes and/or when scheduled jobs reach their set time on the processing queue.

  Notes:

  – 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.

  – Changing the default password does not affect the passwords of clients that have already been scanned. If you need to change the BIOS administrator password for clients that have already been created, you can do so by using the Maintenance page of the Individual Client Details notebook. For more information, see “Individual Client Details - Maintenance Page” on page 53.

  – The BIOS administrator password *code* is based on the positions of the keys, not the characters typed in. If any of your clients use a keyboard layout that is different from the keyboard layout you use to operate LANClient Control Manager (for example, a keyboard for another language), the BIOS password set through LANClient Control Manager 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. If the field is left blank, the password is disabled.

- Default Client Name

  Every client managed by LANClient Control Manager must be allocated a name that is unique on the network. When clients are generated by the scan process, a name is automatically allocated. This name is made up from the default client name base followed by an automatically generated number.

  The default client name base is an alphanumeric string with a maximum of eight 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 999. You can change the client name base if the default is not suitable.

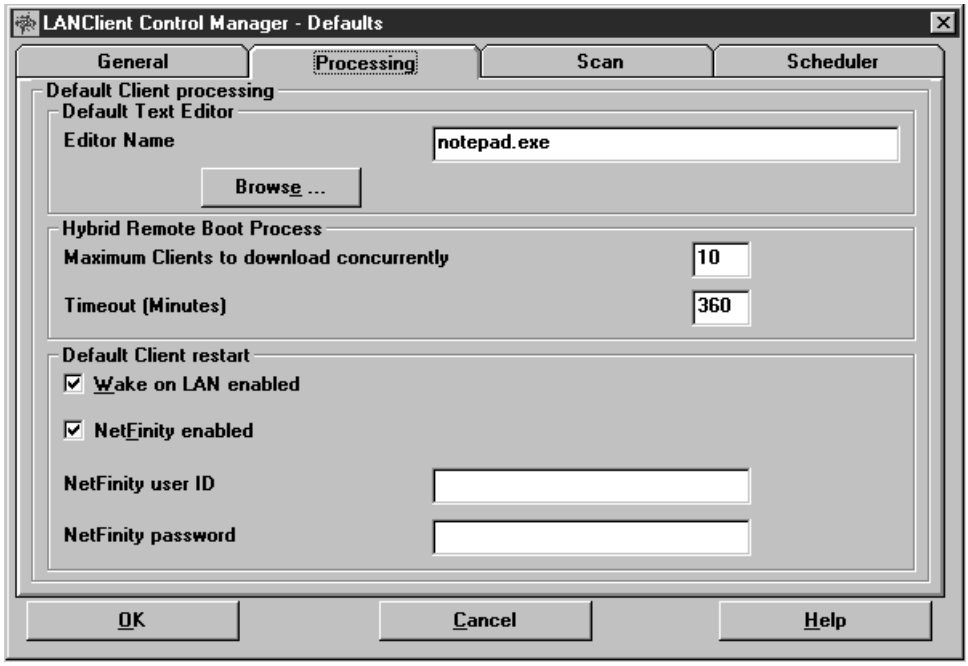
- Default Server Name

  This is the name of the server that controls the remote-boot process for your clients. Anyone using LANClient Control Manager must have administrator access privileges to this server. The default value is set during the installation of LANClient Control Manager. The server name might be preceded by a single backslash, double backslash, or no backslash. Changing the server name has no effect until you stop and restart LANClient Control Manager.

- 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. It may be overridden by the IP broadcast address for Wake-on-LAN that is available on the Hardware page of the Individual Client Details notebook. 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 the server, so this configuration is especially important if you are using a remote console.

Defaults Notebook - Processing Page



- Default Text Editor

  You can specify the editor you want to use when editing files within LANClient Control Manager. Use the Browse button to locate the editor of your choice, or type the name (path and file name) directly into the space provided.

- Hybrid Remote Boot Process

  Use the following fields to set limits for the Hybrid remote-boot process.

  – Maximum Clients to Download Concurrently

    This setting limits the number of clients that can download Hybrid 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 Hybrid 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 affects only the initial image download and not the number of clients that can operate in Hybrid 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 Hybrid remote-boot download is not completed in the specified time, an error code is returned and processing stops.

- Default Client Restart

Use the following fields to record restart options.

– Wake on LAN Enabled

Client workstations that are powered off can be powered back on by LANClient Control Manager. To power on client workstations, LANClient Control Manager sends a wake-up packet containing the media access control (MAC) address of the workstation in five second intervals across the network. When the network adapter of the client detects this address, it powers up the workstation. When LANClient Control Manager has detected that the client is awake and running, it stops sending the packet.

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.

Client workstation requirements for Wake on LAN:

- The workstation must be plugged into a live electrical socket.
- The network adapter must be enabled to support Wake on LAN.
- The workstation must have the BIOS Wake on LAN feature available and enabled.
- The network adapter must be properly cabled to the workstation system board or power supply.
- The workstation must be properly connected to the network.

– Netfinity Enabled

LANClient Control Manager can use the functions of the Netfinity Manager program to remotely shut down and restart workstations before processing changes. If you have Netfinity Manager installed on your server, check this box to enable its functions.

Note: The power-down capability of Netfinity is currently limited to client workstations running Windows 95.

Neither Netfinity Manager nor Netfinity Services is shipped with LANClient Control Manager. For Netfinity Manager to function correctly with LANClient Control Manager, you must have the following:

- Netfinity Manager, version 5.0 or greater, installed on the workstation or server on which you have installed LANClient Control Manager.
- Netfinity Services version 4.00.2 or greater (or Netfinity Manager version 5.0) installed on each client you want to remotely shut down or reboot through LANClient Control Manager.

Refer to the Netfinity Manager documentation for details on using these products.

– Netfinity User ID

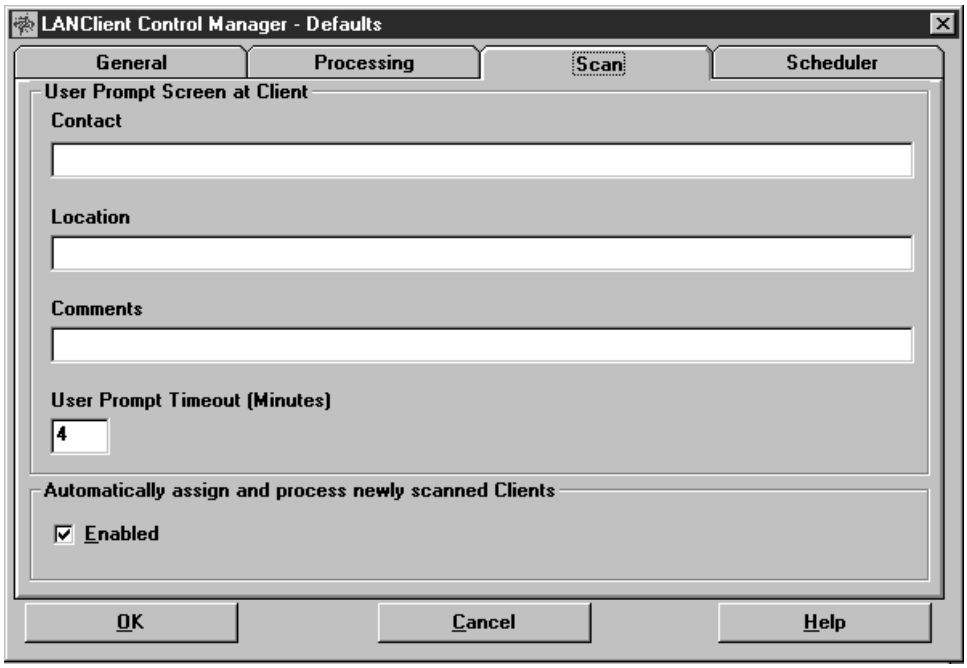
If you are using Netfinity Manager, enter the Netfinity Manager user ID here to enable LANClient Control Manager to issue Netfinity Manager commands, without being prompted for a logon.

– Netfinity Password

Enter your password for Netfinity Manager here.

Defaults Notebook - Scan Page

You can set LANClient Control Manager to ask specific questions of the end user or installer at each client workstation. These questions are asked onscreen at every new client workstation detected by the scan process. Displaying questions during the scan operation is optional. The Scan page of the Defaults notebook is shown below.



You can specify the questions that you want to ask concerning the following information:

- Contact
- Location
- Comments

You can ask any questions you like, and the answers are saved on the Details page of the Individual Client Details notebook. For more information, see “Individual Client Details Notebook” on page 44. The answers can be viewed or modified and optionally 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. You can manually enter the information into the Individual Client Details notebook later, if needed.

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.

Clients that have are Radio Frequency Identification chip (RFID) and Asset Information Area (AIA) can use this option. You can set AIA enabled, newly scanned clients to be automatically loaded with an existing image by checking this box. Existing LCCM Profiles that you intend to download at this time MUST NOT depend on LCCM client parameters as there will be no opportunity to set them for newly scanned clients.

If auto-assign is enabled and a newly scanned client meets all the conditions and is assigned, processing will begin. Any outstanding processing that has been set up manually will also begin at this time.

For this process to work, the following conditions must be met:

1. The IMAGEDATE from the AIA must be all zeros. This is an LCCM requirement to ensure that a profile has not already been loaded.
2. The requested IMAGE (profile name) must exist within LCCM and match perfectly (case sensitive) with the AIA requested profile.
3. The client must meet the hardware requirements of the profile.

For more information on this function, see “Using RFID and AIA data with Clients” on page 103.

Defaults Notebook - Scheduler Page

In the Defaults notebook, the Scheduler allows you to specify the day and time that LANClient Control Manager begins processing the changes that have been made.

Important:

- The Scheduler of the Defaults notebook is overridden by the Scheduler of the Individual Client Details notebook. For more information, see “Individual Client Details - Scheduler Page” on page 57.
- Use the Scheduler 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, the client workstations are immediately restarted in the middle of the working day. Also, if you set the Scheduler to update client workstations during an overnight process, be sure to warn end users who might be running overnight processing that their workstations will be shut down at the specified time and that any end-user processing jobs in progress at that time will be terminated.

- Default Schedule
  - As soon as possible

    If you select this button, the changes begin processing as soon as you click on the Process button in the Installation/Maintenance window.
  - Set day and time

    Setting day and time enables LANClient Control Manager to process the changes unattended during the day and time of your choice.

    Note: If you use the Scheduler to set a specific day and time, you must still click on 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.
- 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 by clicking on the Process button.
    - Select day

      Selects 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 by clicking on the Process button.
  - 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 allows you to set the time by an alternative method:

  - The primary mouse button sets the minute.
  - The secondary mouse button sets the hour.

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 one of the listings of the Installation/Maintenance window.
2. Select **Client** from the menu bar.
3. Select **Configure** from the list.

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** from the list.

The Individual Client Details notebook contains the following pages:

- Details

  This page contains important details about the client, such as name, address, and serial number.
- Hardware

  This page contains information about the hardware of the client.
- Software

  This page contains details of the client's assignment to a software profile.
- Maintenance

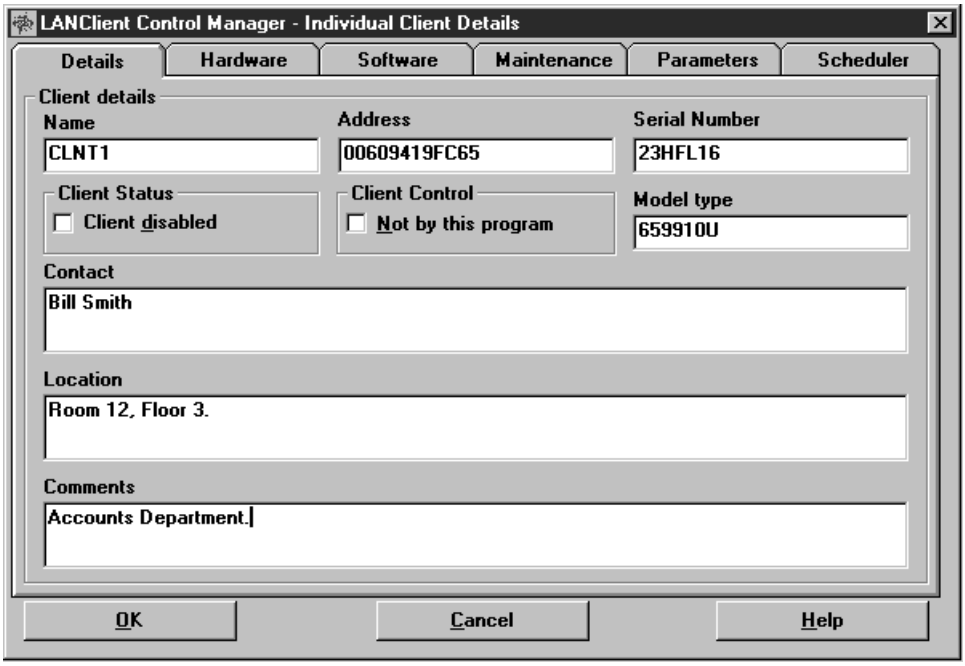
  This page allows you to enter information about various maintenance procedures for the client, such as BIOS, CMOS, and administrator password updates.
- Parameters

  This page is used to personalize information within a Hybrid remote-boot image for the client.
- Scheduler

  This page allows you to control when scheduled changes will take place for the client.

Individual Client Details - Details Page

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, the name is generated by LANClient Control Manager. If you manually create a client, you must type the name here. The name must be unique and cannot be modified while configuring multiple clients.

- Address

  This is the 12-digit, hexadecimal, universally administered address (UAA) of the network adapter installed in the client workstation. This address is set by the manufacturer of the network adapter. This address is also referred to as the media access control (MAC) address or network interface card (NIC) by some manufacturers.

  For more information, see “Client Address” on page 46.

- Serial Number

  This is the client serial number that is collected during the scan process or manually entered when a client is created by you.

- Client Status

  This field indicates whether or not RPL or DHCP is enabled for the client. If the Client Disabled box is selected, the client cannot start by means of a RPL or DHCP.

- Client Control

  This field indicates whether this client is being controlled by this LANClient Control Manager program or another program. If you mark the Not by this program checkbox, 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 LANClient Control Manager program. The controlling program can be LANClient Control Manager running on another server or some other remote-management program.

- Model Type

This field shows the type and model number of the client workstation. This information is collected during the scan process.

- Contact, Location, and Comment

  This information is typically entered by the end user or installer during the scan process if questions were specified on the Scan page of the Defaults notebook. For more information, see “Defaults Notebook - Scan Page” on page 40. You can change or update these fields as needed.

Client Address

The 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 type it in this field.

The client address *must* match the network address (MAC, UAA, or NIC address) that is permanently assigned to the client's network adapter. You can change this field, but do so only under the following conditions:

- You are creating a new client without using the scan process
- The network adapter for an existing client has been changed for any reason (for example, if it develops a fault).

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. The format varies depending on the type of network adapter. For examples, see:

- “Network Address for IBM Token Ring Adapter (RPL)”
- “Network Address for IBM Ethernet Adapter (RPL)”

Alternatively, some network adapters have their addresses printed on labels attached to the adapters. Also, if the network subsystem is integrated with the system board of the workstation, the network address might be accessible through the Configuration/Setup Utility program.

Network Address for IBM Token Ring Adapter (RPL): When the client attempts to start up from the network, the client screen displays information about the RPL process. The following example is a typical RPL display for an IBM token-ring adapter. The network adapter address follows the prefix *AA*. In this example, the adapter address is 0004AC8140D7.

```
ET–00:00:22
ID–166
BU–0000
AA–0004AC8140D7
AL–00 0B00 P322AB
BL–C41876M
MM–DA00 11
SR–DC00 16
OP–0000 04 S
RQ–0008
```

Network Address for IBM Token Ring Adapter (DHCP): When the client attempts to start up from the network, the client screen displays information about the DHCP process. The display is like a typical DHCP display for an IBM token-ring adapter. The network adapter address still follows the prefix *AA*.

Network Address for IBM Ethernet Adapter (RPL): When the client attempts to start up from the network, the client screen displays information about the RPL process. The following example is a typical RPL display for an IBM Ethernet adapter. The network adapter address follows the prefix *RPL-ROM-ADR:*. In this example, the network adapter address is 1000 5ABA AE2D.

```
RPL Protocol ROM v1.03 (930311)
IBM LAN Adapter for Ethernet  MLID v1.20 (930311)
(C) IBM, NSC, 1993.  All Rights Reserved.
RPL-ROM-ADR: 1000 5ABA AE2D
RPL-ROM-IRQ: 5
RPL-ROM-PIO: 0280
RPL-ROM-FFC: 10
```

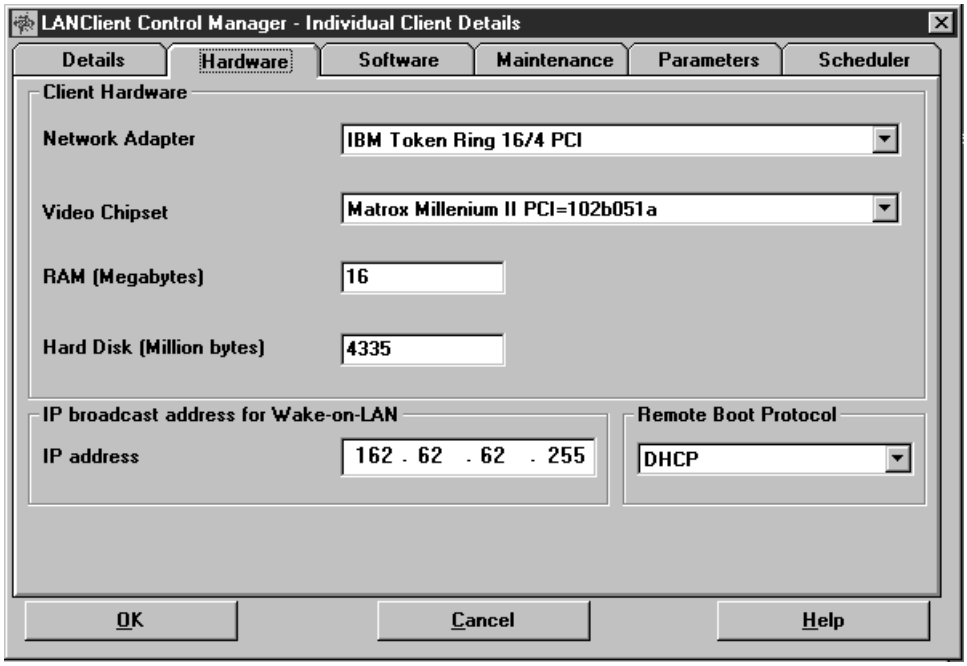
Network Address for IBM Ethernet Adapter (DHCP): When the client attempts to start up from the network, the client screen displays information about the DHCP process. The following is an example of a typical DHCP client display for an IBM 100/10 Etherjet adapter. The network adapter address is 00 6094 A5 BB BB.

```
Intel LANDesk (R) Service Agent, version 0.99b
Copyright (c) 1997 Intel Corporation, All rights reserved.

DHCP MAC ADDR: 00 6094 A5 BB BB
IP ADDR: 9.180.64.36
TFTP....
```

Individual Client Details - Hardware Page

The Hardware page of the Individual Client Details notebook contains details about the installed hardware of each client. LANClient Control Manager 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 type is selected from a drop-down list. If the adapter your client is using is not shown on the list, select **Unknown**.

- Video Chipset

  The video chipset installed in the client is selected from a drop-down list. If the video subsystem your client is using is not shown in the list, select **Unknown**.

- 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.

- IP broadcast address for Wake-on-LAN

  This field is the IP address used to send wake-up instructions to any client that does not have a wake-up address automatically configured. RPL and DHCP clients created from the **Client** -> **Create** -> **New** menu item, and machines woken by the **Tools** -> **Wake** menu item do not have wake up addresses automatically configured. DHCP clients created by the Scan process, or from the **Client** ->**Create** -> **Copy** menu item from an original DHCP client created by the scan process, will have their wake-up address automatically configured.

  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

instructions are sent as MAC level broadcast packets on the LAN to which the client is attached. Wake-up instructions are sent by the console, not the server, so this configuration is especially important if you are using a remote console.

If your network does not use subnets, or all 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 network uses subnets and your clients are not on a LAN that forms part of 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.

Note: Your network routers must be configured to forward subnet directed broadcasts.

Create a subnet directed broadcast address: To create the subnet directed broadcast address for a client:

1. Open the calculator program supplied with NT and change it to include scientific notation.
2. Enter the subnet mask value into the calculator and click on **AND**.
3. Enter the client IP address and click on **=**. This gives you the subnet value.
4. Clear the values on the calculator, then enter again the subnet mask value. Click on **XOR**.
5. Enter the value 255 and click on **=**. This gives you the host value.
6. Clear the values on the calculator. Enter the subnet value and click on **OR**.
7. Enter the host value and click on **=**. This final result is the subnet directed broadcast for your particular client.

Multiple Client Edit: If you select a multiple group of clients for editing, and the clients have different IP addresses in this field, the field will be displayed as [**].[**].[**].[**]. If you overwrite this field with a valid IP address, all the clients in the selected group will be forced to use the new value. If you make a mistake, and before you click on OK, enter a single left-bracket character (" [") to reset each client in the group to their original IP address.

- Remote Boot Protocol

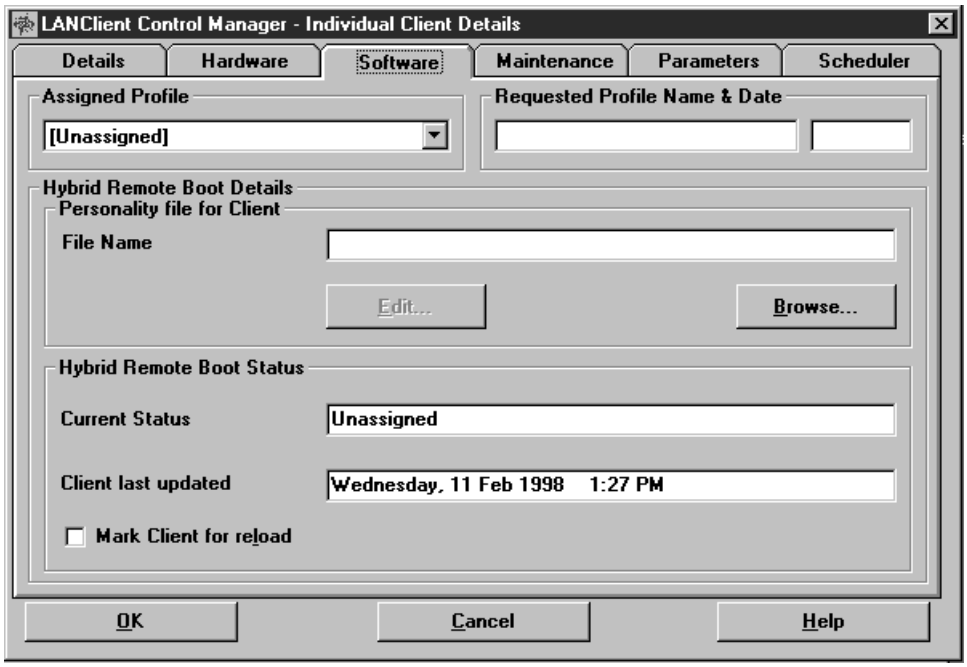
  This field displays the client workstation network protocol detected by LCCM during scan. This field is selectable.

  Important: After changing the protocol, LCCM will not change the protocol at the client workstation. Therefore, LCCM will not process a client with an incorrectly designated network protocol. After changing the protocol designation in this field, remember to change the network protocol driver at the client workstation.

Individual Client Details - Software Page

The Software page of the Individual Client Details notebook is used to set up the details of a client's assignment to a software profile. The contents of this page vary depending on the remote-boot profile type that is selected in the Profile for Client field.

Hybrid Remote-Boot Profile for Client



If you select a Hybrid profile from the drop-down list in the Profile for Client field, the following fields are available:

- Assigned Profile

  Select the appropriate software profile for the client workstation. If there are no software profiles are created, the default, **Unassigned**, is selected.

- Requested Profile Name & Date

  For client workstations equipped with a Radio Frequency Identification (RFID) chipset. LCCM reads the EEPROM fields designated by RFID for software profile names and dates. If the client has been scanned and detected, LCCM will then process the software profile listed in this field as though it had been assigned and processed manually through the LCCM interface. For more information on RFID, refer to the IBM website:

  `http://www.ibm.com/pc/us/desktop/assetid/`

  Important: When flashing the RFID EEPROM with the software profile name and date, remember that the profile name is CASE SENSITIVE.

- Personality file for Client

  You can specify a personality batch file for Hybrid remote-boot clients by using the **Browse** button to select a file. Once a file is selected, click on the **Edit** button if you want to edit the file. A personality batch file allows you to customize an image 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 83 or if you need to pass more parameters than the LANClient Control Manager interface provides for

This field cannot be selected for multiple clients.

- Hybrid 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 of image on next boot

  You can force a reload of software to a Hybrid remote-boot 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 by checking the *reload* box and asking the user to restart the workstation.

Hybrid-NT Remote-Boot Profile for Client

If you select a Hybrid-NT profile from the drop-down list in the Profile for Client field, the following fields are available:

- Assigned Profile

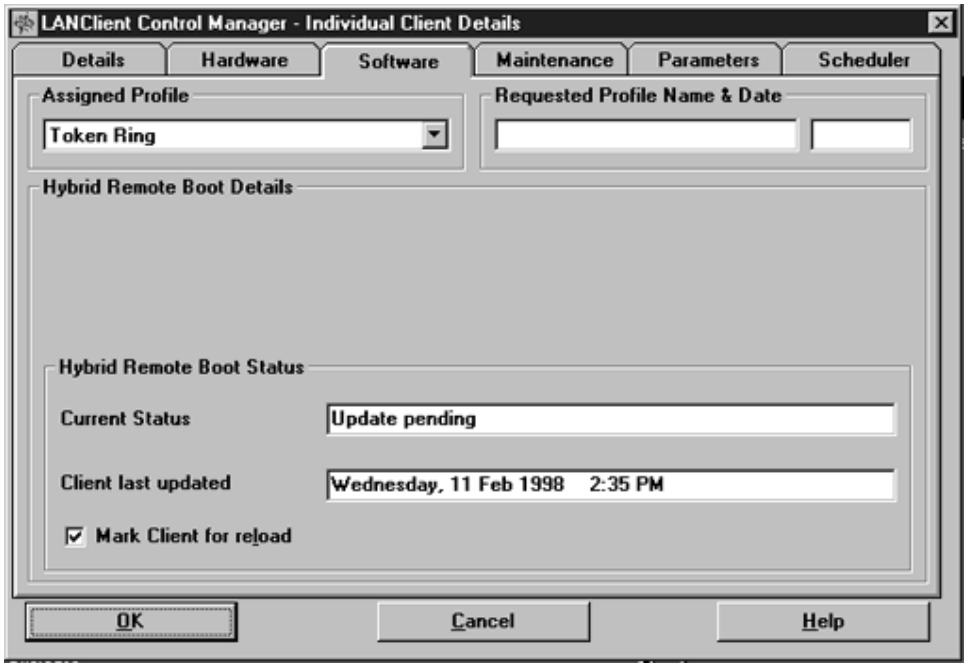
  Select the appropriate software profile for the client workstation. If there are no software profiles are created, the default, **Unassigned**, is selected.

- Requested Profile Name & Date

  For client workstations equipped with a Radio Frequency Identification (RFID) chipset.

- Hybrid 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 of image on next boot

You can force a reload of software to a Hybrid remote-boot 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 by checking the *reload* box and asking the user to restart the workstation.

Standard Remote-Boot Profile for Client

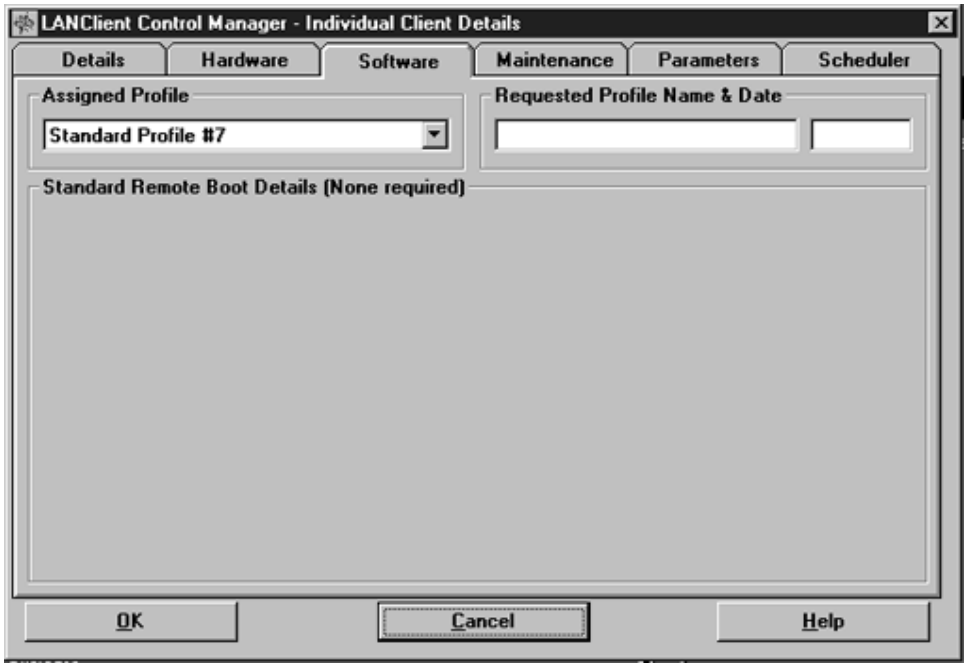
If you select Standard Remote Boot from the drop-down list in the Profile for Client field, the following fields are available:

- Assigned Profile

  Select the appropriate software profile for the client workstation. If there are no software profiles are created, the default, **Unassigned**, is selected.

- Requested Profile Name & Date

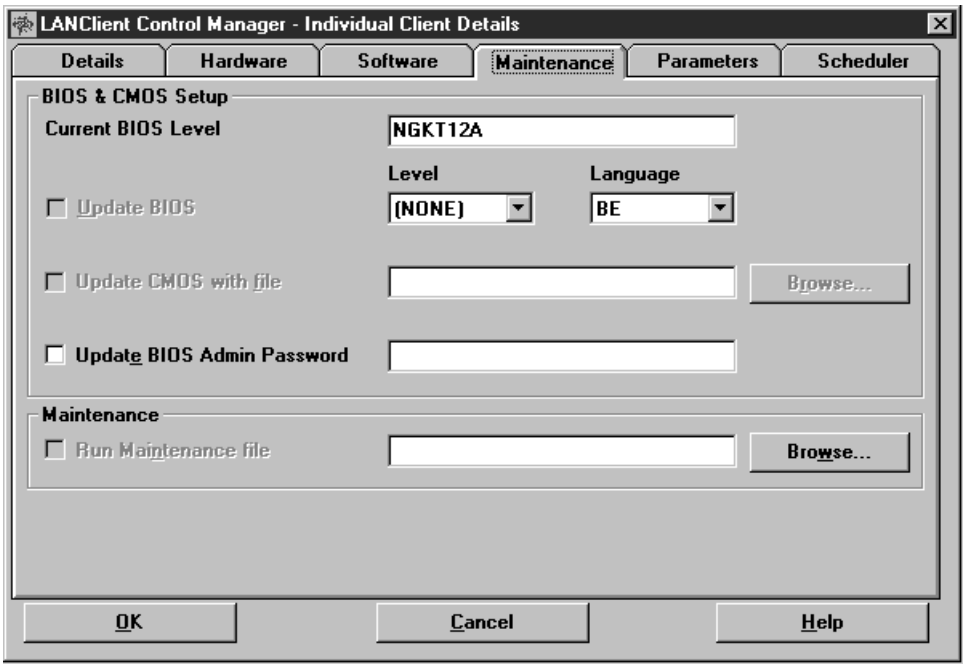
  For client workstations equipped with a Radio Frequency Identification (RFID) chipset.



See “Creating a Software Profile” on page 91 for information on how software profiles are created.

Individual Client Details - Maintenance Page

The Maintenance page of the Individual Client Details notebook allows you 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 starts, instead of downloading the Hybrid remote-boot bootstrap or standard remote-boot image, the selected procedure runs. The following fields are available on the Maintenance page:

- Current BIOS Level

  The current BIOS level is determined by the scan process. If the BIOS has been updated, this field contains the name of the BIOS level currently installed in the client. This information will not match the level as reported by the BIOS setup screens of the client if you have changed the default level name detected during the Read BIOS Flash Diskette process. For more information, see “Updating the BIOS Level” on page 97.

- 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.

  – Language

    Select the BIOS language from the drop-down list.

- Update CMOS with file

  Select this box to update the client CMOS settings. Type in 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 “Assigning Clients to a CMOS Settings Image” on page 98 for more information.

- Update BIOS Admin Password

Select this box to set or change the client BIOS administrator password. You can type in the new password or delete the current password. The password will be updated the next time this client is processed. Refer to “Changing the BIOS Administrator Password for Service” on page 102 for more information.

- Run Maintenance file

  Select this box to run a maintenance batch file.

  A maintenance batch file is a 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.

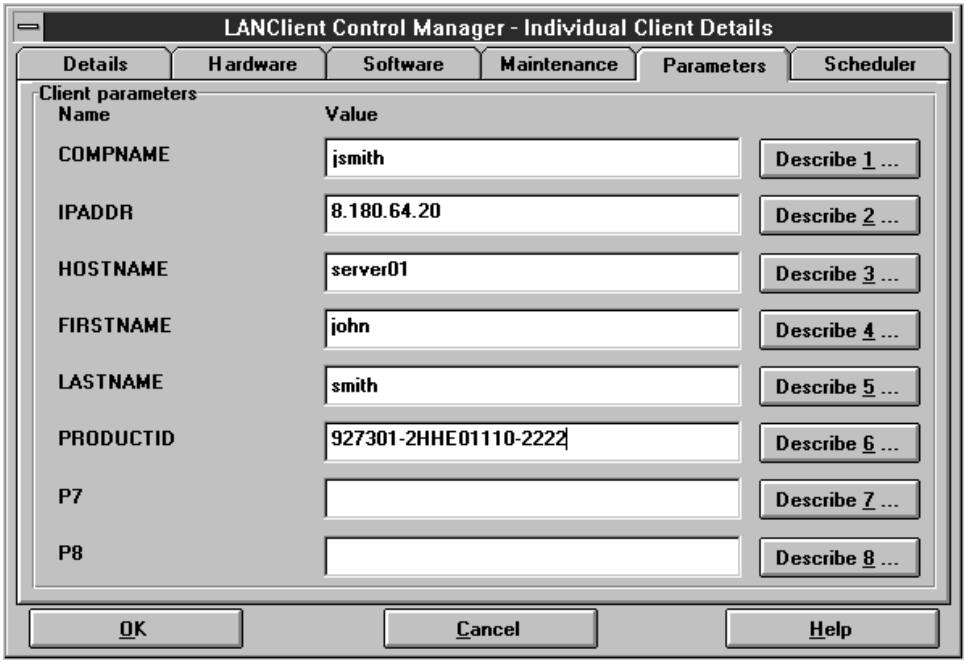
  If you select a maintenance batch file to run and check the Run Maintenance file box, the next time the client starts, instead of downloading the Hybrid remote-boot bootstrap or standard remote-boot image, a maintenance bootstrap is loaded on to the client and the specified batch file is run. When the batch file completes, 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 type in 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.

Individual Client Details - Parameters Page

The Parameters page is used to personalize a Hybrid remote-boot image to contain information for an individual client. The values you specify on this page are passed to Hybrid remote-boot image batch files. The parameter values specified on this page are *unique* for each client using this profile.

Before you can specify parameter *values* on this page, you must first specify the corresponding parameter *names* in the Client Parameters page of the Software Profile Details notebook and assign the client to that profile. **Do not process the assignment until you fill in the values on this page.**

For more information, see "Passing Parameters to Image Batch Files" on page 83 and "Software Profile Details - Client Parameters Page" on page 69.



The following fields are available on this page:

- Name

  The parameter names (COMPNAME, IPADDR, HOSTNAME, and so on) are taken from the Client Parameters page of the Software Profile Details notebook. See "Software Profile Details - Client Parameters Page" on page 69 for more information. You cannot edit the names from the Individual Client Details notebook

- Value

  The Value fields allow you to 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) as automatic responses to Parameter requests embedded within these files.

- Describe

  When you press the Describe button, a text box displays the parameter description entered in the corresponding Description text-edit box of the Profile Client Parameters page. You cannot edit this information from within the Individual Client Details window.

Using the preceding illustration as an example, in a batch file that has the line:

```
DEDITD /R /N0 c:\lancli\LANCLI.reg dummy_IPAddr %IPADDR%
```

the value returned would be:

```
9.180.64.20
```

For additional information about using DEDITD, see “DEDITD” on page 160

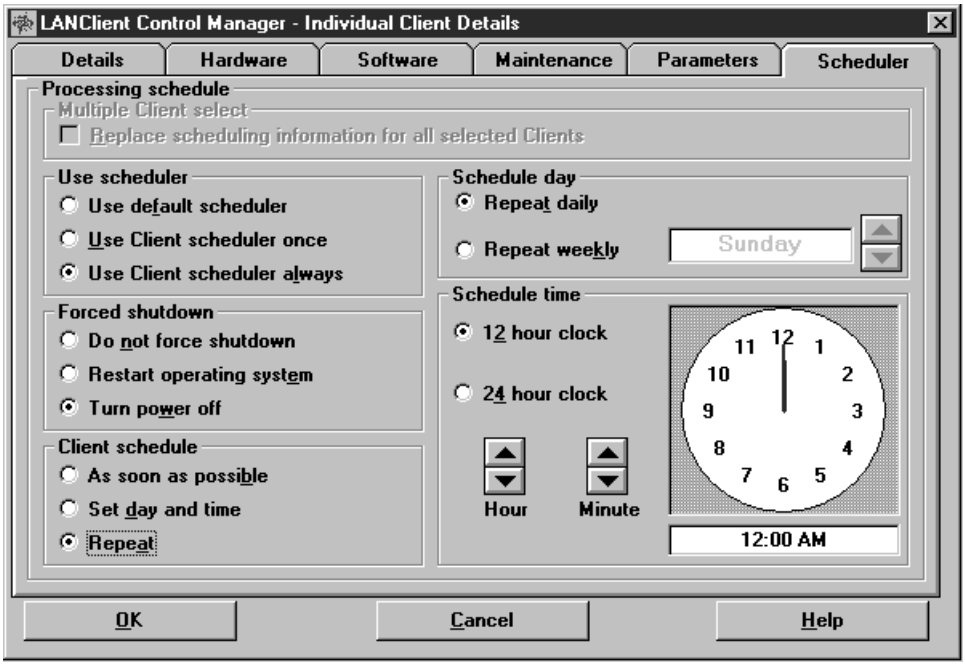
Important: Be careful when reassigning clients to new software profiles. The parameter values from this page must match those requested from any .LCI files, .MNS files, or .BAT files that the client uses in the new software profile.

Individual Client Details - Scheduler Page

The Scheduler page allows you to specify the date and time that LANClient Control Manager begins processing the changes that have been made to the selected clients. (For more information on processing changes, see “Processing Changes Within LANClient Control Manager” on page 34.) This page specifies the day and time that changes to the clients are performed. Scheduled changes are placed on the list of actions to be taken in the Progress and Errors window after the Process button is selected. You must select the Process button to start scheduled jobs.

You can schedule one-time events, such as a hybrid remote-boot download, or repeat events, such as a hard disk backup, on a daily or weekly basis.

Important: Use the Scheduler 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, the client workstations are restarted in the middle of the working day. Also, if you set the Scheduler to update client workstations during an overnight process, warn end-users who might be running overnight processing jobs of their own that their workstations will be shut down at the specified time and that any end-user processing jobs in progress at that time will be terminated.



- Multiple Client Select

  This box is disabled and grayed unless multiple clients are selected. When multiple clients are selected and this box is selected, this schedule will be used for all selected clients.

- Use Scheduler

  There are three options for Use Scheduler:

  – Use Default Scheduler

    If this option is selected, all functions on this page are disabled and the Scheduler of the Defaults notebook is used.

  – Use Client scheduler once

If this option is selected, the schedule information on this page is used for the next client process only, and then the client reverts to using the Scheduler of the Defaults notebook.

– Use Client scheduler always

If this option is selected, the schedule information on this page is retained and used for all future processes.

- Forced Shutdown

LANClient Control Manager uses Netfinity Manager software to remotely shut down and restart client workstations before processing changes. The power-down capability of Netfinity is currently limited to client workstations running Windows 95. The following requirements must be met before a forced shutdown will function correctly:

– Netfinity Manager (version 5.0 or greater) must be installed on the workstation or server on which you have LANClient Control Manager installed.

– Netfinity Services (version 4.00.2 or greater) or Netfinity Manager (version 5.0 or greater) must be installed on each client workstation you want to shut down or restart.

– Netfinity Manager must know about the clients. To ensure Netfinity Manager knows about all affected clients, you must perform the following procedure:

1. Start Netfinity Manager from your administrator console.
2. From the main window of Netfinity Manager, select Remote System Manager.
3. Open a new group and give it a name (for example, "All_Clients").
4. From the Netfinity Manager System pull-down menu, select Discover Systems. The clients appear in the group window as they are discovered.

For more information on the Default Client Restart, see “Defaults Notebook - Processing Page” on page 38.

There are three forced-shutdown options:

– Do not force shutdown

If the client workstation is still operating when the scheduled process time arrives, the workstation will not be shut down and restarted. The remote-boot download takes effect the next time the end-user restarts the client workstation.

– Restart operating system

Take care when selecting this option. If the client workstation is on when the scheduled time arrives, the workstation is restarted through Netfinity, even if it is processing a job. Any jobs in process are terminated and any unsaved data is lost.

– Turn power off

The Wake on LAN feature must be enabled in the Processing page of the Defaults notebook. If the Turn power off option is selected, the client workstation will be powered off through Netfinity 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 on the Process button in the Installation/Maintenance window.

– Set day and time

Setting a day and time enables LANClient Control Manager to process the changes unattended, during the day and time of your choice.

Note: If you use the Scheduler to set a specific day and time, you must still click on 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, and when the specific day and time arrives, the scheduled changes are processed.

– Repeat

Selecting Repeat allows you to 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. By selecting Repeat, the selections in the Schedule day section change from Next 24 hours and Select day to Repeat daily and Repeat weekly.

Note: If you use the Scheduler to set a repeat event, you must still click on the Process button and leave the program running for the scheduled event to take place. Clicking on the Process button places the repeat event in the processing queue of the Progress and Errors window, and when the specific day and time arrives, the repeat event takes place.

– Day and Time

The day and time fields are available only if you have selected the Set Day and Time or Repeat button. Select these fields using the following values:

- Schedule day

  • Next 24 hours

    Processing takes place as soon as the specified time is reached after the scheduled job is placed in the processing queue by clicking on the **Process** button.

  • Select Day

    Selects the desired day to process the changes. Processing takes place as soon as the specified day and time is reached after the scheduled job is placed in the processing queue by clicking on the **Process** button.

  The fields change to weekly events by selecting the Repeat button. Select these fields using the following values:

  • Repeat daily

    Processing takes place as soon as the specified time is reached after the scheduled job is placed in the processing queue by clicking on the **Process** button. 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 is reached after the scheduled job is placed in the processing queue by clicking on the **Process** button. LCCM will continue to process the assigned task every subsequent week at the assigned day and time.

- Schedule 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 allows you to set the time by an alternative method.

- The primary mouse button sets the minute.
- The secondary mouse button sets the hour.

Software Profile Details Notebook

Information about each software profile is managed in the Software Profile Details notebook. This notebook displays when you edit configuration details of an existing software profile or when you create a new software profile.

For more information on managing software profiles, such as creating, viewing, or editing profiles, see “Managing Software Profiles” on page 91. Also, for general information on software profiles, see “Software Profiles” on page 16.

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

- Double-click on an existing software profile within the Installation/Maintenance window.
- Create a new software profile. For more information, see “Creating a Software Profile” on page 91.
- Select an existing software profile within the Installation/Maintenance window. Then, from the menu bar, choose Profile then Configure.

The Software Profile Details notebook contains the following pages:

- Details

  This page contains the profile name, profile type, and a description of the software.

- Minimum Hardware

  This page contains information about the hardware required for the specific software profile.

- Software

  This page contains fields which identify the image to be downloaded to clients.

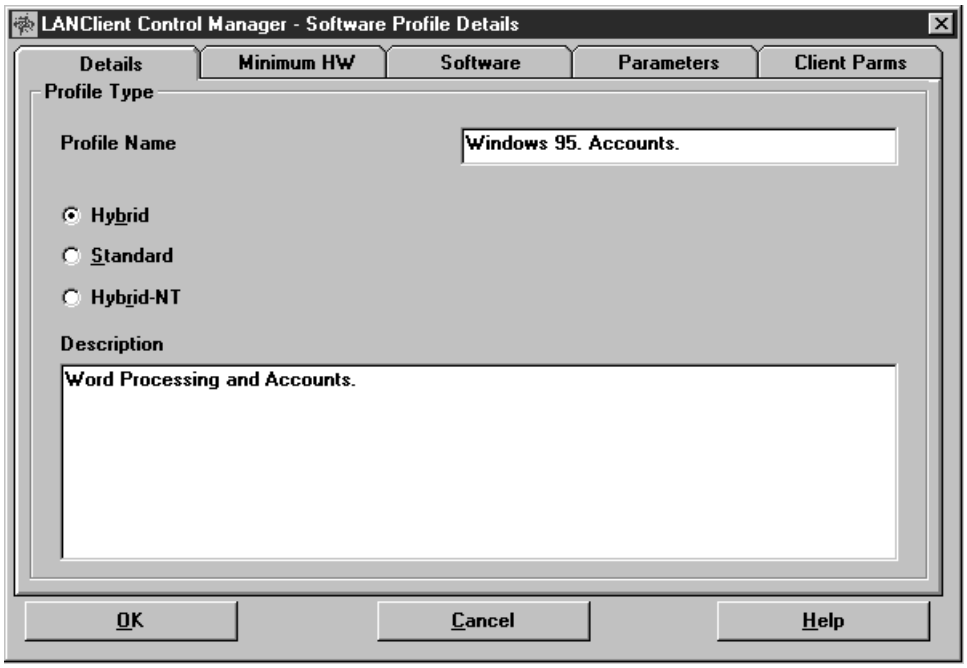
- Parameters

  This page contains information about custom parameters that are common for all clients assigned to the software profile.

- Client Parameters

  This page contains information about custom parameters that are unique to individual clients assigned to the software profile.

Software Profile Details - Details Page



The Details page contains the following fields:

- Profile 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.

- Hybrid

  Select this button if the profile will be using the Hybrid remote-boot process to download either a Windows 95 image or a DOS/Windows image to the client's hard disk.

- Standard

  Select this button if the profile will be downloading a standard remote-boot image to the client's memory.

- Hybrid-NT

  Select this button if the profile will be used to perform an unattended Windows NT Workstation installation (with or without applications) on the client's hard disk, using a Windows NT Server Distribution Sharepoint (an area on your server where the \I386 directory from the Windows NT Workstation CD has been copied).

- Description

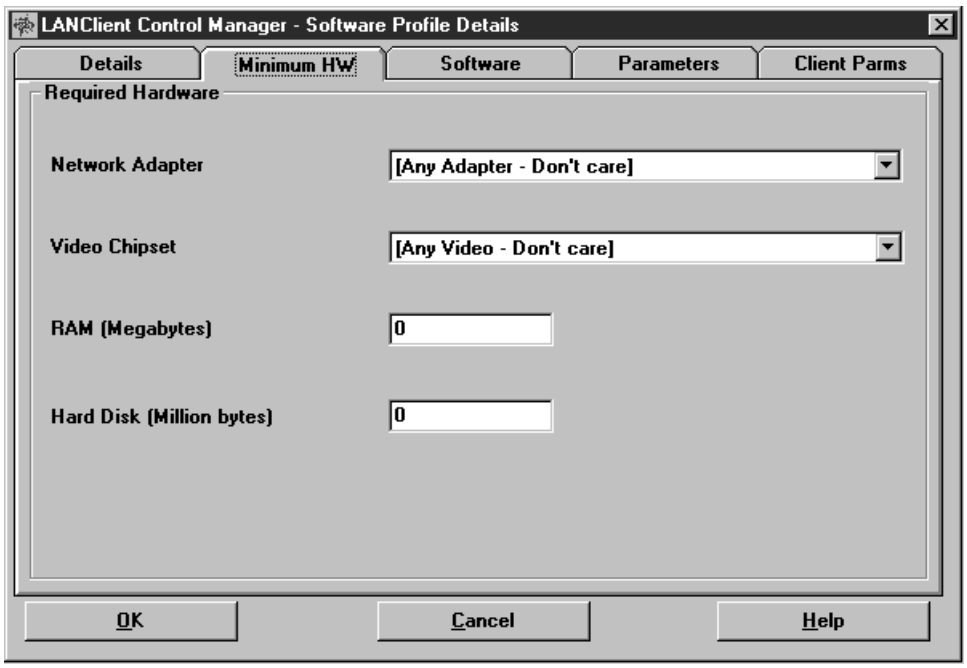
  Use this space to write a description of the software profile. For example, for a standard remote-boot image, you can describe the contents of the image, or for a Hybrid remote-boot image, you can describe what the various batch files will do.

Software Profile Details - Minimum Hardware Page

The Minimum Hardware page contains the following fields:

- Network Adapter

  Select a network adapter from the list available. An example is shown in the following illustration.



  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 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 RAM required to download and use the software controlled by this profile. If you enter a value of zero, LANClient Control Manager ignores the minimum RAM requirements. The memory specified is in units of 1 048 576 bytes.

- Hard Disk

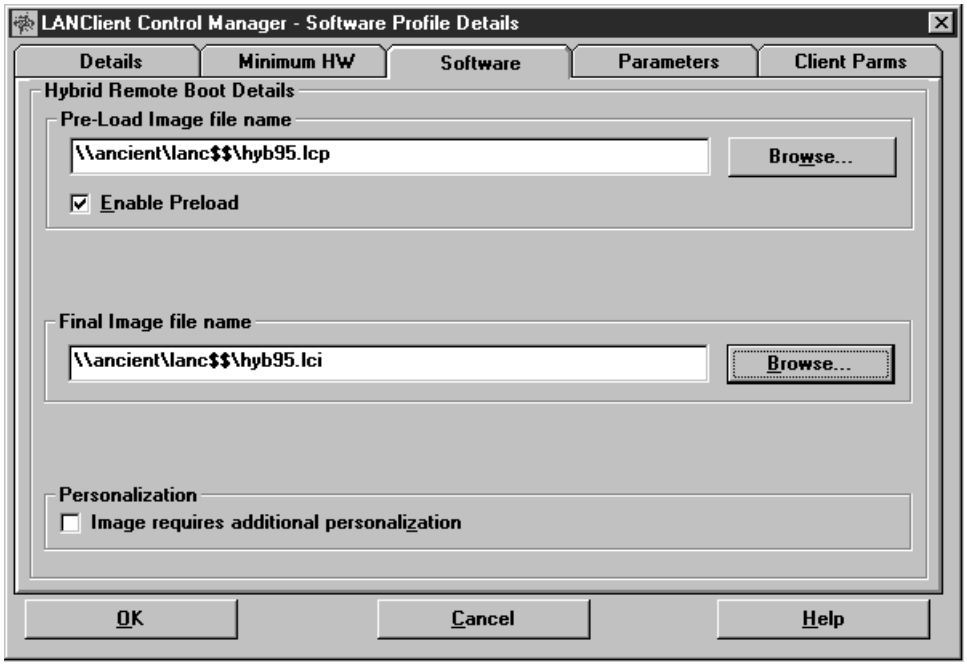
  Enter the minimum amount of hard disk space required to download and use software controlled by this profile. If you enter a value of zero, LANClient Control Manager ignores the minimum hard disk requirements. The hard disk space is specified in units of 1 000 000 bytes.

Software Profile Details - Software Page

The appearance of this screen is directly related to the type of remote-boot process selected in the Details page of this notebook. See “Software Profile Details - Details Page” on page 62 for more information.

Hybrid Remote-Boot Details

If you selected the Hybrid button on the Details page, you can specify the file names for the preload and final-image batch files.



- Preload Image
  - File Name

    Type in 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.

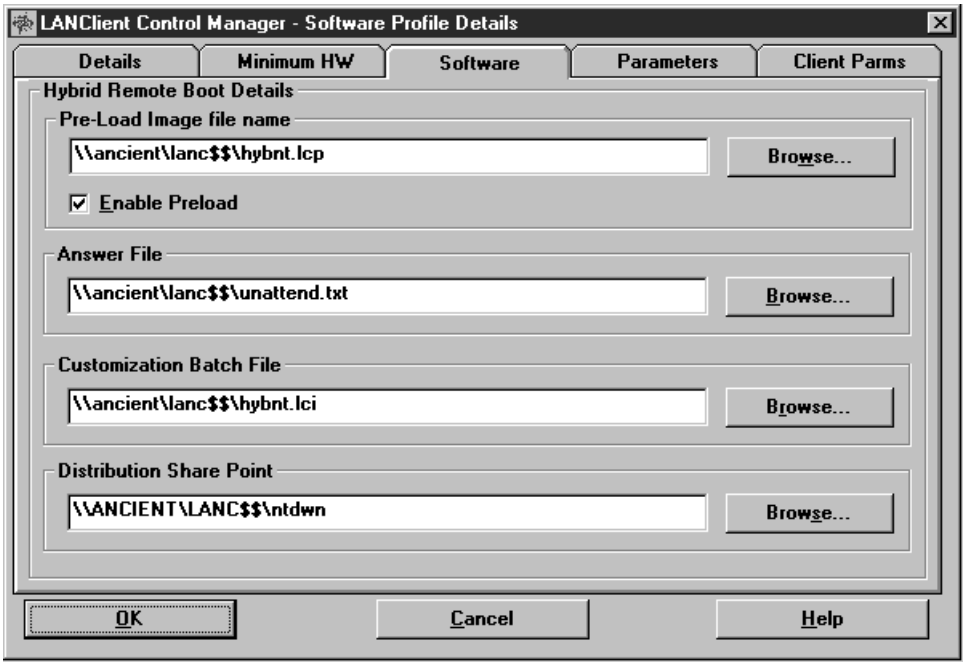
    The preload-image batch file specifies the actions to be performed at the client before downloading the final image. The preload-image batch file is normally used to run FDISK on a new client workstation. You must create the preload-image batch file yourself. A single preload-image batch file can be used by multiple clients and multiple software profiles.
  - 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

  Type in 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 must create the final-image batch file yourself. A single final-image batch file can then be used by multiple clients.

Hybrid-NT Remote-Boot Details

The Hybrid-NT remote-boot process is used only to perform an unattended installation of Windows NT Workstation from a Windows NT Server.



If you selected the Hybrid-NT button on the Details page of this notebook, you can specify the following:

- Preload Image file name

  Type in 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. In the case of a Hybrid-NT remote-boot operation, the client workstation hard disk is automatically formatted before downloading and installing the Windows NT Workstation files. Therefore, use a preload-image batch file only if you want to change the partition configuration of the client workstation hard disk before the automatic formatting of drive C (for example, if you need to partition the hard disk into two separate partitions). You must write the preload-image batch file yourself to meet your specific requirements. 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 156.

- Answer File

  The answer file allows you to create a set of responses that will be passed to the Windows NT Workstation installation process to allow seamless unattended installation. A sample answer file (UNATTEND.TXT) is shipped with LANClient Control Manager.

- Customization Batch File

  The customization batch file is one you must write. It will run the program DEDITD.EXE (supplied with LANClient Control Manager). DEDITD.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 Parameters page of the Individual Client Details notebook.

- Distribution Sharepoint

The Distribution Sharepoint is the directory on your server under which you copied the \I386 directory and its contents from the Windows NT Workstation installation CD. Use the **Browse** button to locate the sharepoint.

Important:

- The Distribution Sharepoint must always be specified using the full UNC path:

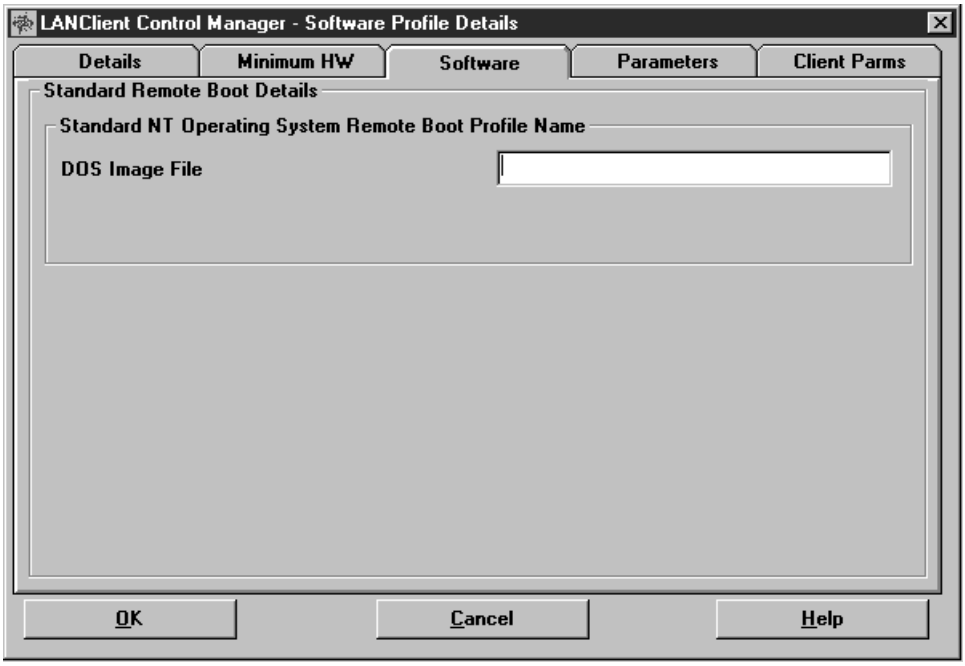
  servername\LANC$$*sharepoint*

  where LANC$$ has been automatically mapped by LANClient Control Manager to point toward *LCCM_install_dir*\CLNTFILE. The Sharepoint directory must always reside under the \CLNTFILE directory.

- If you intend to run LANClient Control Manager from a remote workstation, you must also use the full UNC path for specifying all other files and directories (as shown in the answer file and customization batch file paths shown in the illustration on page 65).

Standard Remote-Boot Details

If you selected the Standard button on the Details page, you can specify the DOS image file name (standard remote-boot image file name).



Type in the name of your standard remote-boot image file. For more information on creating a standard remote-boot image, see “Creating a Standard Remote-Boot Image” on page 79.

Software Profile Details - Parameters Page

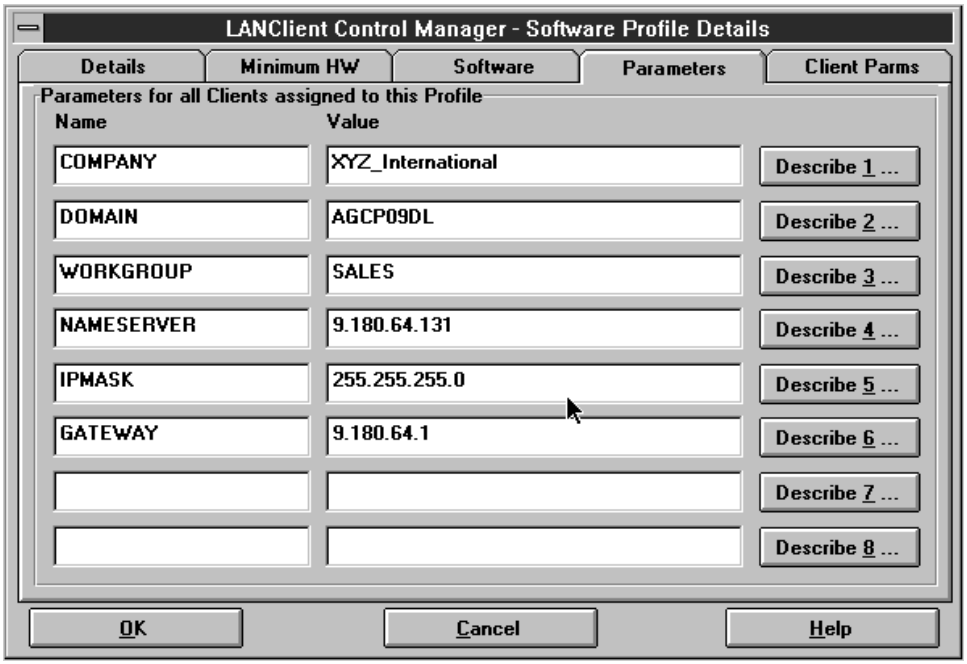
This page specifies a group of named parameters that are passed to the Hybrid remote-boot final-image batch file. The parameter values specified on this page are *common* for each client using this profile.

Note: If you have parameters that need to be unique for each individual client, you must enter them in the Client Parameters page of this notebook. For more information, see “Software Profile Details - Client Parameters Page” on page 69.

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 a percentage (%) sign. For example, in the following 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 (no spaces are permitted). This is the value that is passed to final-image batch files for the parameter names specified in the corresponding Name field. In the previous illustration, "XYZ_International" is returned as a value to a final-image batch file that had a %COMPANY% parameter specified.

- Describe

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

For an example of batch files that use these parameters, see Chapter 6, “Example Files” on page 153.

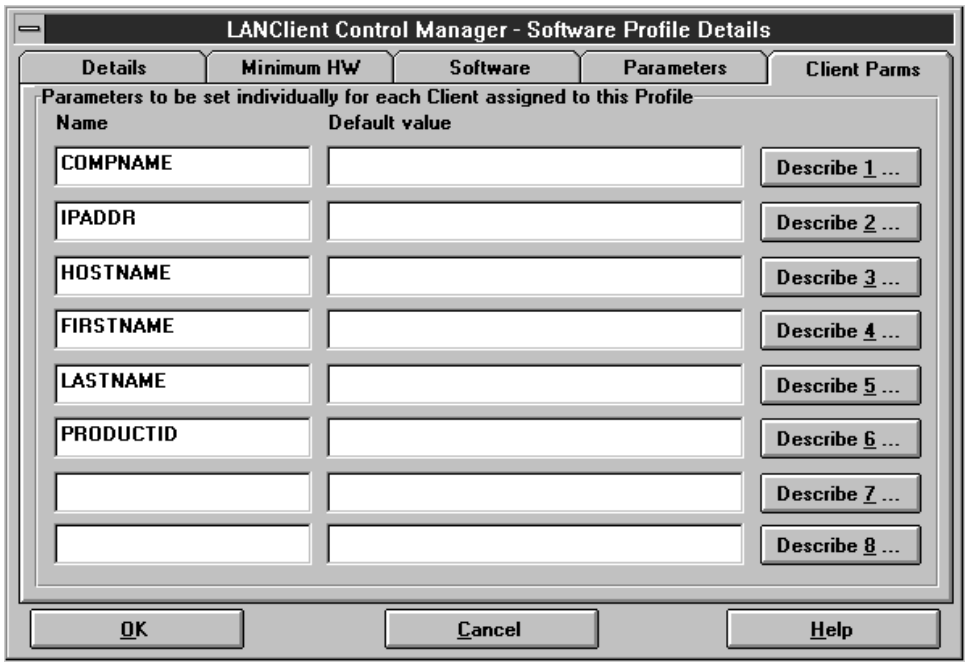
Software Profile Details - Client Parameters Page

This page specifies a group of named parameters that are passed to Hybrid remote-boot final-image batch files. The parameters specified on this page are *unique* for each client using this profile.

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 a percentage (%) sign. For example, in the following illustration, the first parameter name (COMPNAME) would be written in an image batch file as %COMPNAME%. The names specified on this page are passed to the Parameters page of the Individual Client Details notebook, where unique values can be provided for each individual client.



- Default Value

  In most cases, the default values can be left blank because unique 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 (no spaces are permitted). The default value is passed to the Parameters page of the Individual Client Details notebook (where it can be overwritten, if necessary). Remote-boot image batch files that request client parameters take the value from the Parameters page of the Individual Client Details notebook.

  In the illustration shown, %NAME is a reserved value that has special characteristics. Like any other values specified on this page, %NAME is passed to the Parameter page of the Individual Client Details notebook; but unlike other values, it automatically picks up the unique name of the client (from the Name field on the Details page of the Individual Client Details notebook) and passes it to any batch file that has the parameter name %COMPNAME%. See “Individual Client Details - Details Page” on page 45 and “Parameter Exceptions” on page 85 for more information.

- Describe

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

Additional Help

When you are running LANClient Control Manager, you can find onscreen help by doing one of the following:

- Press **F1**.
- Select **Help** from the menu bar of the Installation/Maintenance window.

Chapter 4. Procedures

Adding Clients

This section provides instructions for setting up client workstations so that they can be used with LANClient Control Manager. Instructions for adding new client workstations to the LANClient Control Manager database are also provided.

Installing New Client Workstations

Objective: To install new client workstations that can be used with LANClient Control Manager.

The following instructions describe the general steps for installing new client workstations for use with LANClient Control Manager. You might need to refer to the documentation that comes with each workstation for specific instructions.

To install new client workstations:

1. Verify that each workstation contains one of the following:
   - Integrated Ethernet or token-ring subsystem
   - Ethernet or token-ring adapter with integrated RPL function
   - Ethernet or token-ring adapter with optional RPL ROM chip (module)

   Note: The network subsystem (adapter or integrated controller) must support the remote-boot function in either a RPL or DHCP environment. If you purchase a network adapter that does not support the remote-boot function, you must purchase an additional RPL read-only memory (ROM) or electronically-erasable read-only memory (EEPROM) chip for that adapter. For more information, contact the manufacturer of the adapter.
2. Set up the workstations according to the manufacturer's instructions.
3. Connect network cables to the workstations and to network receptacles.
4. Turn on each workstation and enter the Configuration/Setup Utility program. To access the Configuration/Setup Utility program on many IBM workstations, you must press F1 while the workstation is starting up.
5. The relevant settings within the Configuration/Setup Utility program must be enabled for RPL or DHCP.
   a. If there is a **Network Boot** (or equivalent) option, choose RPL or DHCP (depending on your environment) for this setting.

      Note: Some IBM workstations with an integrated Ethernet subsystem have an **Ethernet Support** category in the Configuration/Setup Utility program. This category is usually under the **Devices and I/O Ports** category listed on the main menu. Within the **Ethernet Support** category is the **Network Boot** option. Ensure that RPL or DHCP is selected for this option. For more details, see the documentation that comes with the IBM workstation.

      If you are using an optional network adapter, you might have to reflash the adapter EEPROM or run a utility program to enable it for RPL or DHCP. For more details, see the documentation that comes with the network adapter.

   b. Do one of the following:
      - In the startup sequence menu, select **network** as the first startup device and **hard disk 0** as the second startup device.
      - If you want to be able to start the computer from a diskette, in the startup sequence menu, select the **diskette drive** as the first startup device, **network** as the second startup device, and **hard disk 0** as the third startup device.

Note: Some IBM workstations might already be enabled to start up from the network. For more information, see the documentation that comes with the workstation.

Some IBM workstations might also have a dual startup sequence. The first sequence is the primary startup sequence of the workstation and determines the order in which the client workstation looks for startup devices when it has been started manually from its power switch. The second sequence is the Automatic Power On startup sequence, and it determines the order in which the client workstation looks for startup devices when it has been started over the network using the Wake on LAN feature. In the automatic Power-On sequence, **Network** must be listed as the first startup device and **hard disk 0** must be listed as the second startup device. For more information about using the second sequence, see “Using Dual Startup Sequences” on page 102. For more details on setting the startup sequences, see the documentation that comes with the IBM workstation.

c. On each workstation that supports the Wake on LAN function, set Wake on LAN to enabled.

6. Save any changes you made and exit the Configuration/Setup Utility program.
7. Restart each client workstation.
8. Do one of the following:
   - If you plan to create a wake-up database for the scan operation, record the network addresses and give them to the network administrator. For additional information about creating a wake-up database, see “Creating a Wake-up Database” on page 74.
   - If you plan to automatically scan new clients into the LANClient Control Manager database, set the appropriate values in the Defaults notebook. For more information, see “Setting Specific Defaults Prior to Scanning.” If you have already set the values in the Defaults notebook, see “Using the Scan Feature” on page 76.
   - If you plan to add a new client to the LANClient Control Manager database by manually creating an Individual Client Details notebook, see “Adding a New Client Manually” on page 77.

Setting Specific Defaults Prior to Scanning

Objective: To set specific defaults of LANClient Control Manager so that each newly scanned client workstation is assigned the appropriate values.

This section is directly related to the scan feature of LANClient Control Manager. If you plan to manually add clients to the LANClient Control Manager database, this section does not apply. For more detailed information on all the fields within the defaults notebook, see “Defaults Notebook” on page 36.

To set defaults specific to the scan process:

1. Select **Options** from the menu bar of the Installation/Maintenance window.
2. Select **LANClient Control Manager Defaults**.
3. Enter the appropriate information in the following fields:
   - General page - BIOS administrator password
   - General page - Common base name
   - Scan page - All fields

If you change the BIOS administrator password, keep the following rules in mind:

- The default BIOS administrator password is assigned to new client workstations only during the scan process. If the default BIOS administrator password is set or changed after the client has been scanned, the password is not assigned.

- Changing the default BIOS administrator password does not affect the passwords of clients that have already been added to the LANClient Control Manager database. In the Individual Client Details notebook, the BIOS administrator password can be changed for clients that have already been created. For more information see “Individual Client Details - Maintenance Page” on page 53.
- The BIOS administrator password code is based on the positions of the keys, not the characters typed in. If any of your clients use a different-language keyboard or a keyboard layout different from the keyboard you use to interact with LANClient Control Manager, the BIOS administrator password might not be recognized when typed in from the client keyboard. Ensure that you use only characters that occur in the same position on all keyboards used. If the field is left blank, the password is disabled.

What to do next:

- After you have set the default settings, continue with “Adding Client Workstations to the Database.”

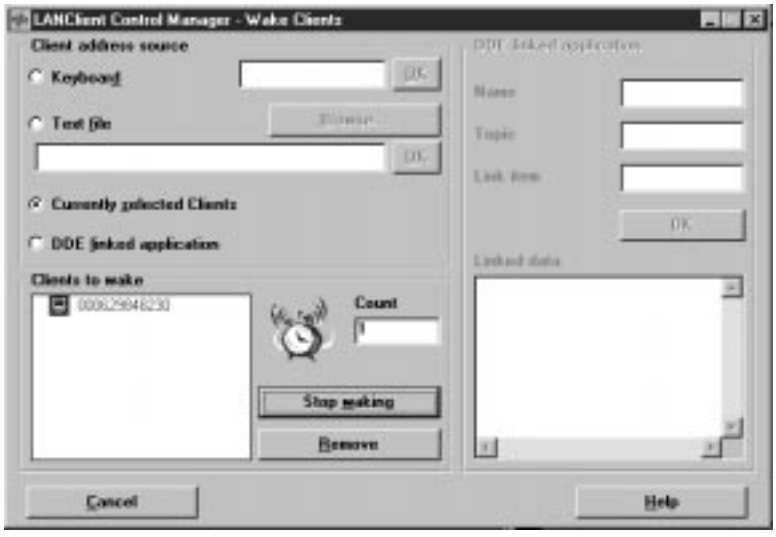
Adding Client Workstations to the Database

Objective: To add a new client workstation to the LANClient Control Manager database using one of the following methods:

- Automatically, by waking up the client workstations remotely and using the *scan* feature. See “Creating a Wake-up Database” for details.
- Automatically, by turning on the clients manually and using the *scan* feature. See “Using the Scan Feature” on page 76 for details.
- Manually, by making entries in the Individual Client Details notebook. See “Adding a New Client Manually” on page 77 for details.

Creating a Wake-up Database

You can introduce new clients to LCCM through the Wake Clients function. The Wake Clients function allows client workstations to be remotely switched on using only power and LAN connectors, without having to access the power switch. When clients have been started by this function, normal LANClient Control Manager processing can take place, allowing any type of download, diagnostic or maintenance function to be carried out on these clients.



The client address source is used to enter MAC addresses into the LANClient Control manager program without using the Scan function. From the Wake Clients screen, clients can be started. A valid MAC

address is any 12 character hexadecimal string, not case sensitive, delimited by whitespace characters, commas, single or double quotes, forward or back slashes. The delimiters do not have to match.

Client Address source: When you choose the source, all clients found will be displayed in the Clients to Wake box. Choose one of the sources listed below:

- *Keyboard.* If the Keyboard option is selected, the text field is enabled. This is the default on entering this dialog. If a string is typed in, followed by an enter, 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 which simulates the keyboard to continue to type in strings without hanging the input. The text field is also enabled for standard 'paste' operation which allows input from most other sources.
- *Text File.* When Text file is selected, the Browse button is enabled. The user may either type in the path name of a file followed by the Enter key, or use the browser to select a file. The file is read, parsed, and any valid MAC address is added to the list of Clients to wake. The Addresses found text field is reset to zero when file is selected and 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 Currently selected clients is selected, the MAC addresses of any clients currently selected in the Assigned clients, Unassigned clients, and Search results fields are added to the list of clients to wake. If more, or different, clients are subsequently selected, and the Wake dialog is brought back into focus, the newly selected clients are added to the list.
- *DDE linked application.* If DDE Linked Application is selected, the DDE Linked Application sub-panel is enabled with the fields initialized to the last values used. Upon installation the fields are blank. When the OK button is pressed, the link specified by the content of the Name, Topic, and Item fields is opened and the linked 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 radio button is deselected, or the specification of the DDE link is changed and the OK button pressed again.

Clients to wake: The list of addresses to be woken is displayed as a scrolling list which is continuously updated by adding addresses (in upper case) to the bottom of the list as they are recognized. The Count field tracks the number of clients currently in the list. The other buttons in the Clients to wake section are:

- *Start Waking / Stop Waking.* When the Start waking button is pressed, it changes to Stop Waking. All the clients on the list are issued with magic packets every 5 seconds. This process can run concurrently with adding addresses to the list from any of the processes above, and with the Scan process. When the button is pressed again, the waking process is stopped.
- *Remove.* You may select one or more addresses from the list and press the Remove button. This may be done concurrently with reading addresses from file or from an external application.

DDE Linked Application: This section will allow you to link a database program to LCCM and use the functions of that program to read-in clients to LCCM. 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 123W. The linked application must support DDE windows functions.
- *Topic.* In the case of LANClient Control Manager, the DDE Topic will be the spreadsheet filename, for example, LCCM.WK4.
- *Link Item.* Enter the row and column numbers that are to be linked, for example a1..c20. Click on **OK** to link the application.

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

Using the Scan Feature

Before you begin:

- Ensure that the client workstations you want to add are installed correctly. For details, see “Installing New Client Workstations” on page 72.

  Important: The new client workstations being scanned must be turned on prior to or during the scan process. You can turn on the client workstations manually, or you can create a wakeup database and turn on the clients remotely. The scan feature does not wake up new client workstations that are turned off. For details about waking up the clients remotely, see “Creating a Wake-up Database” on page 74.

- Ensure that the desired values are set in the Defaults notebook. For details, see “Setting Specific Defaults Prior to Scanning” on page 73.

- If you have set the defaults (on the Scan page of the Defaults notebook) to collect user data when the new client workstation is scanned, ensure that someone is at each client workstation to answer the questions.

To start the scan process:

1. At the administrator console, start LANClient Control Manager, then start the scan process by clicking on the **Start** button in the Installation/Maintenance window.

   The following actions occur:

   a. The text on the button changes to **Stop** and the scan icon becomes animated to indicate that a scan is in progress.

   b. The scan function collects details about new clients that have been attached to the network since the last scan operation and for which no details are currently recorded in the Clients database of LANClient Control Manager. The details collected from a scan include:

      - Network address
      - Type and model number
      - Serial number
      - Amount of random access memory (RAM) installed
      - Hard disk drive capacity
      - Video adapter or chipset

   c. If you have set the Defaults notebook to ask questions about the client workstation, onscreen prompts display at the client workstation, and an end-user response is required. If a timeout period has been set, the prompts must be answered within the allotted time or else the processing will continue without collecting the end-user input.

   d. 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.

   e. Each new client workstation is placed in the Unassigned Clients list of the Installation/Maintenance window.

      Note: If the scan process cannot locate the clients, see “Installing Network Adapter Device Drivers” on page 108 to ensure the correct device drivers are installed and the NETWORK.LST is configured correctly.

2. To stop the scan process, click on the **Stop** button. All client workstations that were properly installed are now added to the LANClient Control Manager database.

Note: An optional method for scanning is to start the scan process, go to the client workstations and install them, and then turn on each workstation. By doing this, you, as the installer, can personally address any prompts that have been set for an end-user response.

This optional method might be preferable if you are using end-user prompts, because you can answer the prompts as soon as you are finished installing the client, and only one trip is required. If you are not using prompts, you just plug in the client, switch it on, and proceed to the administrator console of the program. As an alternative to switching on the clients manually, you can use a wake-up database to wakeup the clients remotely. For more information, see “Creating a Wake-up Database” on page 74.

The Process button is disabled until the scan process is stopped.

What to do next:

- If you have already created software profiles, assign each client to one of your choosing. For more information, see “Assigning Clients to Software Profiles” on page 93.
- If an appropriate software profile does not exist, create it. For more information, see “Creating a Software Profile” on page 91.

Adding a New 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.

Before you begin, collect the following information for each new client workstation:

- Network address (see “Client Address” on page 46 for more details)
- Serial number (see the documentation provided with the client workstation for more details)

To manually add a new client:

1. Select **Client** from the menu bar of the Installation/Maintenance window.
2. Select **Create new**.
3. 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
4. After you have entered the appropriate information, select **OK**.
5. Select the **Process** button in the Installation/Maintenance window.

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.

To create a new client from a copy of an existing client:

1. Click on an existing client from the Installation/Maintenance window.
2. Select **Client** from the menu bar.
3. Select **Create copy**.
4. When the Individual Client Details notebook appears, 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.

5. After you have entered the appropriate information, select **OK**.
6. Select the **Process** button in the Installation/Maintenance window.

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 Clients to Software Profiles” on page 93.
- If an appropriate software profile does not exist, create it. For more information, see “Creating a Software Profile” on page 91.

Working with Images

This section contains instructions for creating the image and batch files that you use with LANClient Control Manager.

Creating a Standard Remote-Boot Image

Objective: To create a standard remote-boot image for use with LANClient Control Manager.

LANClient Control Manager uses a standard remote-boot image to start up client workstations without the use of the local hard disk drives of the workstations. For more information on images, see “Images” on page 13.

The standard remote-boot image is created using the Microsoft Windows NT Remoteboot Manager program. You need to use the Remoteboot management tools of Windows NT to do this, as LANClient Control Manager does not provide these functions. You must refer to your Windows NT documentation for full information on creating a standard Remote Boot client.

To create the image:

1. Create a Standard Windows NT remote-boot client. For additional information, refer to your *Windows NT Server Installation Guide* produced by the Microsoft Corporation, or the *Windows NT Workstation Resource Kit* produced by Microsoft Press.
2. For each client using this profile:
   a. Use the scan function to locate new clients as required. If you cannot locate clients using the Scan function, see “Installing Network Adapter Device Drivers” on page 108.
   b. Ensure that the each new client workstation is set up correctly for remote boot. (For details see “Installing New Client Workstations” on page 72.)
   c. Stop Scan if it is running.
   d. Restart the client workstations.

To create the software profile:

1. Return to the LANClient Control Manager interface.
2. Select **Profile**.
3. Select **Create New**. A blank Software Profile Details notebook appears.
4. On the Details page:
   a. Type the name of the new profile.
   b. Click on the Standard radio button.
5. On the Software page, type the image file name in the DOS Image File field. This is the same profile name you created within Remoteboot Manager.
6. Enter all other required information on all pages in the notebook. For additional information, see “Software Profile Details Notebook” on page 61 and “Passing Parameters to Image Batch Files” on page 83.
7. When you are finished entering the information, select **OK** to save the information and close the notebook.

To assign a client to the profile and process the changes:

1. In the Installation/Maintenance window, assign clients to the new software profile. For additional information, see “Assigning Clients to Software Profiles” on page 93.
2. Click on the **Process** button to save changes to the LANClient Control Manager database and begin processing.

Creating a Hybrid Remote-Boot Image

Objective: To create a Hybrid remote-boot image and the associated batch files that are used to transport the image and prepare it for use.

For general information on images, see “Images” on page 13.

The following procedure contains general instructions for creating a Hybrid remote-boot image. For detailed information, see Chapter 5, “Hybrid Remote-Boot Training Exercises” on page 119.

To create a Hybrid remote-boot image:

1. Create the image (operating system, applications, and so on) on a donor workstation 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 sub-directories 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, sub-directories, and files.

   If you encounter this problem, perform one of the following:

   - Cut down the length of the directory structure involved. For example, when copying a new final image from a donor workstation to your server, copy the files to a top level directory on your server (instead of a directory under the LANClient Control Manager directory). Make sure this top level directory has a short name (for example \DW59HYB1).
   - Use another program for copying files between your server and your clients (for example, PKZIP from PKWARE Incorporated). For more information, see “Using Alternative Methods for Transporting Images” on page 82.

   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 161 and “DOSLFNBK.EXE” on page 160.
3. Transport the image to the server. For more information on copying files from the donor workstation to the server, see “Using a Donor Workstation Startup Image” on page 81.
4. Create batch files with the appropriate file name extensions.
   a. If you choose, you can create a preload-image batch file with the .LCP file name extension.

      This batch file is used to partition the hard disk on the client before the final image is downloaded. The preload-image batch file executes a program such as FDISK.

      When you use the FDISK command, you can either create a response file or use command-line arguments in your preload-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 162.

   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. You might need to 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.

What to do next:

- Create the software profile. For more information on creating the software profile, see “Creating a Software Profile” on page 91.
- To find examples of creating Hybrid remote-boot images, see Chapter 5, “Hybrid Remote-Boot Training Exercises” on page 119.

Using a Donor Workstation Startup Image

Use the following procedure to create and assign a donor workstation startup image. This procedure establishes a LAN connection between the donor workstation and the LCCM server. When you establish the connection, you have read/write access to the server and can transport the image from the donor workstation.

After creating the donor workstation startup image and profile, you can use it over and over to transport images from any donor workstation.

To create a donor workstation startup image and profile:

1. Use a text editor to create a final-image batch file (.LCI) by typing the following:

   ```
   pause
   pause
   ```

2. Save the file and name it any name you want, but make sure it has an .LCI file extension. For the purpose of this discussion, we will call this file DONORBT.LCI.
3. Copy the DONORBT.LCI file into the following directory:

   LCCM_install_dir\CLNTFILE

4. Create a Software Profile Details notebook for DONORBT.LCI:
   a. Within the Installation/Maintenance window, select **Profile** and then select **Create New**.
   b. On the Details page:
      1) Type **Donor Boot** in the Profile Name field.
      2) Click on the Hybrid radio button.
   c. On the Minimum Hardware page:
      1) Select the donor workstation network adapter from the drop down menu of the Network Adapter field.
      2) Select **Any Video - Don't Care** from the drop down menu of the Video Chipset field.
      3) Type **0** in the RAM field.
      4) Type **0** in the Hard Disk field.
   d. On the Software page, in the Final Image File Name field, use the Browse button to find the DONORBT.LCI file, then select it. Leave the other fields on this page blank.
   e. Select **OK** to save and close the notebook.

To assign the image to the donor workstation:

1. Within the Installation/Maintenance window, assign the donor workstation to the Donor Boot Image profile and click on the **Process** button.

2. Restart the donor workstation. A Hybrid remote boot takes place on the donor workstation and establishes a LAN connection.
3. From the donor workstation keyboard, press **Ctrl** + **C** to escape from the Hybrid remote boot. The LAN connection remains active, and a command prompt appears.
4. Type `net logoff` and press **Enter**.
5. Type `net logon` and press **Enter**.
6. Type 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. The donor workstation hard disk is now drive D. Any statements in your backup batch file that refer to the donor workstation hard disk must use drive letter D. The environment now present at the donor workstation might affect the other drive letters and paths used in your backup batch file. For more details, see Chapter 6, "Example Files" on page 153.

Once you have created a Donor Boot Image profile, you can use it over and over again to transport images from any donor workstation.

Using Alternative Methods for Transporting Images

Most of the examples and training exercises in this guide use XCOPY as the method of transporting images from the donor workstation to the server and from the server to the client workstation. Specific examples of using XCOPY are located in Chapter 5, "Hybrid Remote-Boot Training Exercises" on page 119. When looking over these procedures, you might notice that 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 or a program such as PKZIP.

The following examples show two methods of using the DOS version of the PKZIP program to transport an image from a donor workstation to a server and from a server to the client workstation. 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 mechanism to the server:

1. Install a licensed copy of PKZIP and PKUNZIP in the `\LCCM_install_dir\CLNTFILE` directory or one of its sub-directories.
2. Create the image on the donor workstation and test it thoroughly.
3. Use the following PKZIP command in your backup batch file to compress (ZIP) the image into a single .ZIP file residing on the server.

   `C:\path_1\PKZIP C:\path_2\W95EXMP1.ZIP -r -P D:\*.*`

   where:

   - *C:* is the server drive
   - *path_1* is the path to the directory on the server containing PKZIP
   - W95EXMP1.ZIP is the name of the ZIP file to be created
   - *path_2* is the path to the directory you created for the image
   - *D:* is the active partition of the donor workstation

   Because the backup batch file is run outside of the Hybrid remote-boot process, you cannot use the drive variables %TARGET% and %LCCMPATH%. Therefore you must be aware of how the drives are mapped during the donor-boot process and use the correct path. During the donor-boot process, C:\LCCM is mapped to the server `LCCM_install_dir\CLNTFILE` directory, and the primary partition of donor workstation hard disk is assigned as D:.

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 workstation, a single .ZIP file is created on the server.

Example 2: Using PKUNZIP as the transport mechanism to the client:

In your final-image batch file, include the following line instead of the XCOPY statement:

```
%LCCMPATH%\path_1\PKUNZIP -d %LCCMPATH%\path_2\W95EXMP1.ZIP %TARGET%
```

where:

- %LCCMPATH% is the path to the server *LCCM_install_dir*\CLNTFILE directory.
- *path_1* is the path to the directory on the server containing PKZIP.
- W95EXMP1.ZIP is the name of the ZIP file
- *path_2* is the path to the directory on the server for W95EXMP1.ZIP
- %TARGET% is the client workstation active hard disk partition.

When the final-image batch file is run, the single compressed file on the server is unzipped on the client hard disk. For a complete example, see “Final-Image Batch File - Windows 95 Image” on page 158.

Passing Parameters to Image Batch Files

Parameters can be replaced automatically within image batch files and within the Windows NT Workstation answer file (UNATTEND.TXT) using LANClient Control Manager. This is done during the image download process. In this way, you only need to create one generic image batch file for each software profile. The LANClient Control Manager utility program DEDITD.EXE is used to replace parameters. For additional information about the Windows NT procedure, see “Editing the Windows NT Workstation Answer File” on page 143.

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 LANClient Control Manager, 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 percentage 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. For additional information, see “Software Profile Details Notebook” on page 61.

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/Configure** or double-click on the selected profile.

   c. Click on 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. In the Installation/Maintenance window, select the profile you are working with.

b. Select **Profile/Configure** or double-click on the selected profile.

   Click on the **Client Parms** tab.

c. 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. There are only three possible values you can enter at this stage. For additional information, see “Parameter Exceptions” on page 85 and “Software Profile Details - Client Parameters Page” on page 69.

d. Click on the **OK** button to save the changes to the Software Profile Details notebook.

e. If you have not yet assigned clients to this profile, you must do this now. For additional information, see “Assigning Clients to Software Profiles” on page 93.

f. In the Installation/Maintenance window, select the first client using this software profile. The Individual Client Details notebook is displayed. For additional information, see “Selecting Clients” on page 33.

g. 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.

h. Enter the Values for the available parameters. There are three parameter exceptions you can also specify as values on this page. For more details, see “Parameter Exceptions” on page 85 and “Individual Client Details - Parameters Page” on page 55.

i. Go back to step 4f 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 to do 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. For additional information, see “Selecting Clients” on page 33.

   - If this is a new final image and you have followed all the above steps, simply click on 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 Default notebook), then click on 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 checkbox in the Software page of the Individual Client Details notebook.
   - If this is a maintenance image, check the Run maintenance file checkbox in the Maintenance page of the Individual Client Details notebook.

Passing Parameters with LCCUSTOM

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 DEDITD utility. LCCUSTOM is more powerful than DEDITD, in that it not only substitutes the environment variables of a batch file based on parameters supplied from LCCM Client and Profile parameter pages, but it also substitutes environment variables from parameters stored in a text file (which DEDITD cannot do).

Variables within files must be enclosed within '%' characters, 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.

When using LCCUSTOM.EXE, keep in mind that:

1. A value set in variable_file takes precedence over a value for the same variable SET in the DOS command line environment.
2. 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 Answerfile.
3. LCCUSTOM can replace DEDITD for the most common purposes replacing all occurrences of a parameter with its value throughout a file. DEDITD may still be required for more specialized file modifications.
4. LCCUSTOM does not use the current directory for work files, so can be run from a read-only directory.
5. LCCUSTOM modifies 1 line at a time. The maximum line length is 8Kb. Lines that are longer than 8Kb may not be fully converted.

Parameter Exceptions

There are three character strings that are reserved for specific purposes when used as parameter values. If any of the reserved character strings are used as a value in either the Client Parameters page of the Software Profile Details notebook or the Parameters page of the Individual Client Details notebook, the character string picks up a preexisting value from the Details page of the Individual Client Details notebook.

Each of the following character strings picks up the values specified in the associated fields in the Details page of the Individual Client Details notebook.

- %CNAME%

  This character string yields the name of the client.

- %CADDRESS%

  This character string yields the address of the network adapter or network subsystem.

- %CSERIAL%

  This character string yields the serial number of the client.

Creating a Hybrid-NT Remote-Boot Image

Objective: To create a Windows NT Workstation image and the associated files that are used to prepare the image for unattended installation.

LANClient Control Manager works in conjunction with the distribution features built into Windows NT 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 Server and editing the Windows NT Workstation answer file (UNATTEND.TXT) is required in order to perform this procedure. For additional information see “Editing the Windows NT Workstation Answer File” on page 143 and the following training exercises:

- “Installing Windows NT Workstation Without Applications” on page 132
- “Installing Windows NT Workstation With Applications” on page 139

Note: In order to achieve 100% unattended installation of Windows NT Workstation, all adapters and devices installed in or attached to the client workstation must support unattended installation. Some adapters and devices that do not support unattended installation will prompt the user at the

client workstation for additional information or files during the Windows NT Workstation installation process. If you are unable to achieve 100% unattended installation, 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 a Hybrid-NT remote-boot image:

1. Set up a directory to act as your Distribution Sharepoint as shown:

   C:\LCCM_inst_dir\CLNTFILE*Dist_Sharepoint*

   where *C:\LCCM_inst_dir*\ is the drive and directory where LANClient Control Manager is installed and *Dist_Sharepoint* is the directory of a specific sharepoint.

   You can name the distribution sharepoint directory any name you want.

2. Create a sub-directory under your Distribution Sharepoint directory and name it I386.

3. From the Windows NT Workstation CD, copy the contents of the I386 directory and all of its sub-directories to the I386 directory in your Distribution Sharepoint. For example:

   XCOPY D:\I386*.* C:*LCCM_inst_dir*\CLNTFILE\WINNT40\I386 /S /E /V

4. Create the following two directories to set up the directory structure for network device drivers:

   - *C:\LCCM_install_dir*\CLNTFILE*Dist_Sharepoint*\I386\OEM
   - *C:\LCCM_install_dir*\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. Next, copy the Windows NT device driver and OEMSETUP.INF file from each network adapter device driver diskette into the appropriate network directory.

6. Edit the Windows NT answer file, UNATTEND.TXT to assign "dummy" parameter names, set unattended installation options, and set up network adapter information. (See “Editing the Windows NT Workstation Answer File” on page 143 for details.)

7. If you need to partition the client's hard disk into more than one partition, create a preload-image batch file. If you intend to use the client's hard disk as a single partition, a preload-image batch file is not needed. By default, Windows NT will format that entire client hard disk as a single partition.

8. Create the customization batch file using DEDITD commands to assign variables to the dummy names you used in the answer file. (See “Editing the Windows NT Workstation Answer File” on page 143 for details.)

What to do next:

Create the Hybrid-NT Software Profile for the Windows NT Workstation image. See “Creating a Software Profile” on page 91.

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 values 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).

Creating a BIOS Update Image

Objective: To create a BIOS flash image to update the BIOS level of specific client workstations on your LAN.

The BIOS level of the client is part of the information collected during the scan process. (For more details on the information collected during a scan, see “Using the Scan Feature” on page 76.) It might be necessary to upgrade the BIOS level because of:

- Improvements to BIOS function
- A need to change client workstation BIOS language
- Updates to the BIOS

If updates are required, the new files are made available by IBM through bulletin board systems, publicly accessible servers, the World Wide Web, or similar means. The BIOS updates are distributed as self-extracting executable (.EXE) files. You download them to your hard disk, and run the .EXE file. The .EXE file will prompt you with instructions for creating the update diskette. For the purposes of the following procedure, this diskette is referred to as the BIOS flash diskette.

In LANClient Control Manager, updating the BIOS level for a client is a two-step process. First, you must create an image from the BIOS flash diskette. You do this through the Installation/Maintenance window of LANClient Control Manager. Once an image is created, you can perform the second step, which is using the Individual Client Details notebook to update the BIOS level for specific clients. For more information on this second step, see “Updating the BIOS Level” on page 97.

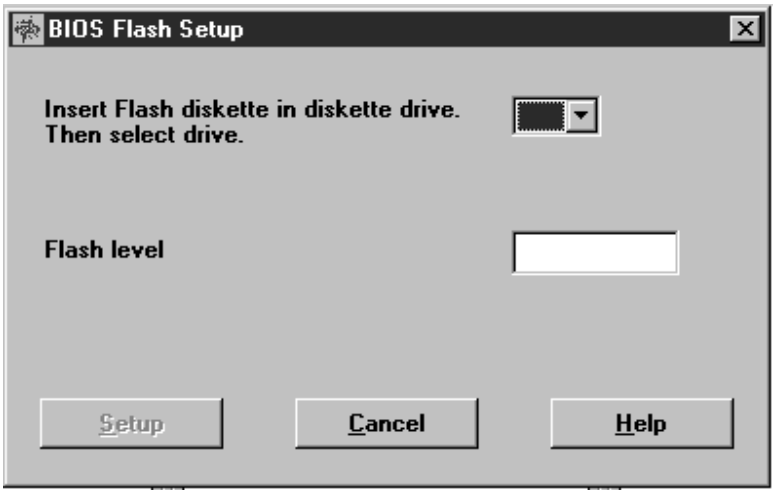
Important: Write-protect the BIOS flash diskette before performing this procedure.

To create an image from a BIOS flash diskette:

1. Insert a BIOS flash diskette into the diskette drive.
2. Select **Tools** from the menu bar of the Installation/Maintenance window.
3. Select **Read BIOS flash diskette**.
4. In the BIOS Flash Setup window, select the diskette drive letter.

   The diskette is read and the flash level displayed. (The flash-level name is the volume label of the diskette. The first two characters of the name are unique to the system. The third and fourth characters identify the flash BIOS routine. The fifth and sixth, with sometimes an additional seventh, characters identify the revision level).
5. Accept the flash-level name given or type in a new name. (In most cases, you should accept the default name.) This name is used by LANClient Control Manager 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 workstation 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.



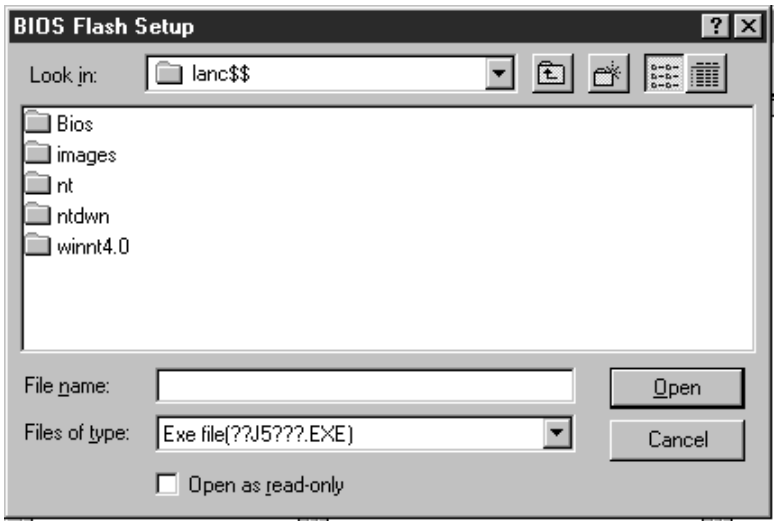
6. Select **Setup**.
7. A new directory, named after the flash level, is created under the *LCCM_install_dir*\CLNTFILE\BIOS directory, and the contents of the diskette are copied.
8. If you are overwriting an existing directory, you are warned of this and given the option to **Cancel** or **Overwrite.**

To assign this BIOS update image to different client workstations, see “Updating the BIOS Level” on page 97.

Note: If you update the BIOS on a client workstation using LANClient Control Manager, you will have access to all BIOS levels on the first update occasion only. Thereafter, only compatible BIOS levels will be displayed in the BIOS Level field on the Individual Client Details Maintenance page.

Using UNPACK.EXE.

If you intend to alter your client's Power-On, or BIOS Administrator Passwords using LCCM, you should use this option to search your BIOS Flash Diskette for a group of packed files that are supplied for this purpose (on selected IBM systems only).



The currently supported systems that will make use of the UNPACK.EXE option, are:

- Z PRO IntelliStation (Type:68889, Model:12Z)
- PC 300 PL (Type:6862, Model:10Z)

The UNPACK.EXE menu item opens a file browser to search for a file, such as:

```
xxJ5nnx.exe

where xx is a two letter system identifier code,
and nnx identifies the BIOS level.
```

When a file is selected it will be unpacked into the correct Flash BIOS directory on your server. The following errors may be returned when you attempt to change your client password using LCCM, on systems that use the UNPACK.EXE file option:

```
 0  completed successfully
 20 EEPROM not accessible
 21 Function not supported
 24 Config data file not found
 23 Definition file for system not available
 32 SRCMOS.exe not found
```

If this file is not shipped with your BIOS Flash diskette, you may still use LCCM to change the client power-on or BIOS Administrator passwords in the normal manner. Check the LCCM Web page for an updated list of supported systems.

Creating a CMOS Settings Image

Objective: To create a CMOS settings image to use with different client workstations on your LAN.

CMOS is a small block of data that contains the BIOS configuration settings of a client workstation. You might want to create different CMOS images depending on the needs of the end-user 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.

Before you begin:

You must download the BIOS update diskette that matches the BIOS level you are using. IBM often provides updates that you can download from a bulletin board system (BBS) or the World Wide Web. From the new BIOS update diskette, you must use the CMOSUTIL.EXE or SRCMOSxx.EXE (where "xx" will be two characters identifying the system board type). You will find the CMOSUTIL, or SRCMOSxx program on the Flash BIOS diskette where you obtained this BIOS level, in the *LCCM_install_dir*\CLNTFILE\BIOS\BIOS_Flash_Name directory, or in the original Internet download file. program.

To create a CMOS settings image:

1. At a donor workstation:
   a. Start up the workstation and access the Configuration/Setup Utility program. On many IBM workstations, you can access this program by pressing F1 during the power-on self-test (POST).
   b. Change and save the desired settings as required.
   c. Exit from the Configuration/Setup Utility program and restart the workstation. Ensure that the workstation starts up and functions properly.
2. Use the CMOSUTIL.EXE program to save the current settings of the donor workstation to a file that you will name with the .CMS extension.
   a. To run the CMOSUTIL or SRCMOSxx program and save the settings to a file, type:

```
CMOSUTIL \path\file_name.CMS /create
or,
SRCMOSxx \path\file_name.CMS /create
     where xx is the two character system board identifier
```

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 workstation's access to diskette drives.

b. Copy this file to the corresponding BIOS directory on your server which is named:

C:\LCCM_install_dir\BIOS*Flash_BIOS_Name*

where the *Flash_BIOS_Name* directory is the name of the BIOS level on your donor workstation (unless this was changed by the system administrator during the Read BIOS Flash Diskette process).

3. If you want to create another CMOS image that uses different settings, go back to step 1 and repeat the procedure, saving the results to a different file name.

Note: If the BIOS load to the client fails, an error code will be returned to the Progress and Errors window.

To assign this CMOS image to client workstations, see “Assigning Clients to a CMOS Settings Image” on page 98.

Managing Software Profiles

Objective: To create, view, edit or delete software profiles.

When managing software profiles, you use the Software Profile Details notebook for the specific software profile.

For specific information on the components of the Software Profile Details notebook, see “Software Profile Details Notebook” on page 61.

Creating a Software Profile

You can create a profile by entering new information, or you can create a copy from a similar, existing profile. The latter method saves time because you do not have to reenter duplicate information.

To create a new software profile:

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, type the information for the new software profile. Make certain that you type a Profile Name on the Details page, and select the correct type of remote-boot profile: Standard, Hybrid, or Hybrid-NT. For more information, see “Software Profile Details Notebook” on page 61.
4. Click on **OK** to save the new profile and return to the Installation/Maintenance window.

To create a software 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. Type a unique Profile Name in the Details page.

   If necessary, edit any other fields that are different from the original software profile.
5. Click on **OK** to save the new profile and return to the Installation/Maintenance window.

Viewing or Editing an Existing Software Profile

To view or edit an existing software profile:

1. Double-click on the software profile within the Installation/Maintenance window, or highlight the software profile, select **Profile** from the menu bar, and then select **Configure**. The Software Profile Details notebook appears.
2. Do one of the following:
   - To view the description of the software profile, select the **Details** page. Click on other pages to view different fields.
   - To edit the software profile, modify the appropriate fields of the various pages of the notebook. For more information, see “Software Profile Details Notebook” on page 61.
3. Click on the **OK** button to return to the Installation/Maintenance window.

Note: 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 of image on the next boot checkbox on the Software

page of the Individual Client Details notebook. Keep in mind that by checking this checkbox, the entire image will be reinstalled on the selected client.

Deleting a Software Profile

To delete an existing software profile:

1. Select the software profile within the Installation/Maintenance window.
2. Select **Profile** from the menu bar.
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.
5. Click on the **Process** button to save and process the changes.

Managing Clients

Objective: To manage client settings through the LANClient Control Manager interface.

The procedures in this section are specific to the interface (screens) of LANClient Control Manager. For most of the procedures, you must access the Individual Client Details notebook. For specific information on the components of the Individual Client Details notebook, see “Individual Client Details Notebook” on page 44.

For most of the procedures in this section, you must select (click on) clients from the listings within the Installation/Maintenance window. By selecting a single client, you can make changes for that client only. By selecting multiple clients, you can make changes for all clients selected. When making changes for multiple clients, not all fields are available for editing. Fields not available for editing are grayed out. For information on selecting multiple clients within the Installation/Maintenance window, see “Selecting Clients” on page 33.

Assigning Clients to Software Profiles

Important: In order for the changes to take place, you must always click on the Process button after assigning software profiles to clients.

To assign clients to software profiles:

1. Select the software profile within the Installation/Maintenance window.
2. Select the clients to be assigned in the Unassigned Clients box.
3. Click on the **Assign** button. The clients appear listed below the software profile you selected.

   Note: 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 Page” on page 55.
4. Click on the **Process** button to save and process the changes.

You can bypass using the **Assign** button by using the drag-and-drop method. To do this, select the clients you want to assign, then drag and drop them on to the desired software profile. Next, click on the **Process** button to save and process the changes.

You can also reassign clients to new software profiles within the Assigned Clients and Profiles box. To do this, select the clients within the Assigned Clients and Profiles box. Next, select a new software profile, and then click on the **Assign** button. (You can also drag and drop the clients on to the new software profile.) Remember, you must click on the **Process** button for any change to take effect.

After the changes are processed, the new software profile takes effect the next time the client workstation restarts (or as soon as the change is applied if the client is already waiting to start up). If the software profile is a Hybrid remote-boot profile, the software is downloaded on to the hard disk drive of the client and then the client restarts. Any subsequent restarts are made from the hard disk until the client is assigned to a new profile or the software profile is changed.

Deassigning Clients from Software Profiles

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

Note: If a client is left in the Unassigned Clients box after the changes are processed (clicking on the Process button), the client workstation will not be able to start up normally. The client workstation will stop at the RPL or DHCP screen. If the client has a RPL or DHCP bybass mechanism (such as the **Home** key used by some IBM Personal Computer models), the end user can bypass the RPL or DHCP screen and start the client workstation from its own hard disk. On models that do not have a RPL or DHCP bypass mechanism, the only method of starting an unassigned client workstation from its own hard disk is to modify the startup sequence and remove Network as a startup device.

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 on the **Deassign** button.
3. Click on the **Process** button to save and process the changes.

Temporarily Disabling a Client

Note: A disabled client appears gray within the listings of the Installation/Maintenance window.

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 on one of the selected clients.
   - Select **Client** from the menu bar, and then select **Configure**.
3. Select the **Details** page.
4. Click on the **Client Disabled** check box.
5. Click on **OK** to return to the Installation/Maintenance window.
6. Click on the **Process** button to save and process the changes.

Deleting a Client

To delete one or more clients:

1. Select a client or multiple clients within the Profiles and Assigned Clients box.
2. Select **Client** from the menu bar.
3. Select **Delete**.
4. Click on the **Process** button to save and process the changes.

Showing Client Mismatches

The function to *show mismatches* is available only to clients that have been assigned to software profiles. Clients that have configuration problems (mismatches) appear in red within the Installation/Maintenance window. Any 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 box.
2. Select **Client**.
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.

Selecting How Clients are Displayed

You can customize how clients are displayed within the boxes of the Installation/Maintenance window. You can list them by any of the following values:

- Name
- Network Address
- Serial Number
- Contact
- Location
- Comment

To select how clients are displayed:

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

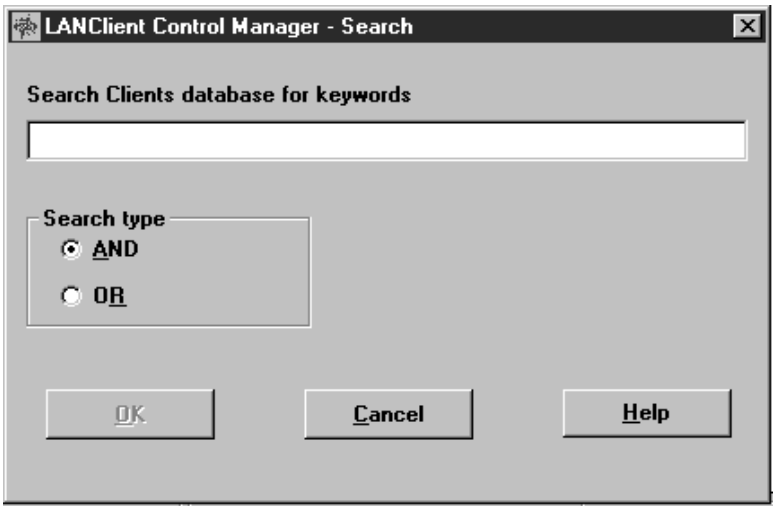
Note: The default attribute for displaying clients is Name. Of the options provided by LANClient Control Manager, only Name and Network Address are guaranteed to be unique. Location or Contact might be more useful, depending on your organization.

Searching for Specific Clients

You can perform a database search for any alphanumeric values (text and numbers) stored in LANClient Control Manager 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). (For more information about these fields, see “Individual Client Details Notebook” on page 44.)

To perform a search on existing clients:

1. Select **Tools** from the menu bar in the Installation/Maintenance window.
2. Select **Search for Client**. The following window appears.



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 typed in.
   - **OR** - finds occurrences that match any of the keywords typed in.
5. Select **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.

Modifying an Existing 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 on the selected client.
   - Select **Client**, then select **Configure.**
3. Edit the desired fields of the different pages. For more details, see “Individual Client Details Notebook” on page 44.
4. Click on **OK** to return to the Installation/Maintenance window.
5. Click on the **Process** button to save and process the changes.

Forcing an Image Reload at Next Startup

This procedure forces an image reload on to 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 can save time by reloading the entire software profile.

To set a forced 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 on a selected client.
- Select **Client** from the menu bar, then select **Configure.**

3. After the Individual Client Details notebook appears, select the **Software** page.
4. Click on the checkbox for **Mark Client for reload**.
5. Click on **OK** to return to the Installation/Maintenance window.
6. Click on the **Process** button to save and process the changes.

Changing or Deleting a BIOS Administrator Password

You can change or delete a BIOS administrator password that has already been assigned to one or more client workstations.

To change or delete a BIOS administrator password:

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 on a selected client.
   - Select **Client** from the menu bar, then select **Configure.**
3. Select the **Maintenance** page.
4. Click on 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 type in a new one.
6. Click on the **OK** button to return to the Installation/Maintenance window.
7. Click on the **Process** button to save and process the changes.

Updating the BIOS Level

If you need to create an image before updating the BIOS level, see “Creating a BIOS Update Image” on page 87.

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 on one of the selected clients.
   - Select **Client** from the menu bar, then select **Configure.**
3. Select the **Maintenance** page.
4. In the BIOS **Level** box, select the level for the BIOS upgrade.
5. In the BIOS **Language** box, select the language for the BIOS upgrade.
6. Click on the **Update BIOS** check box.

7. Select the **Scheduler** page of the Individual Client Details notebook and verify the scheduler information. For details, see “Individual Client Details - Scheduler Page” on page 57.
8. Click on **OK** to return to the Installation/Maintenance window.
9. Click on the **Process** button to save and process the changes.
10. The Progress and Errors window displays. BIOS updates are not made until the client workstations are switched off and restarted, or the client's scheduled update time is reached.

    Note: 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:

    a. Insert the appropriate BIOS flash diskette into the diskette drive.

    b. At a command prompt, enter:

    ```
    A:\CMOSUTIL /?

    or,

    A:\SRCMOSxx /?
    where xx is a two-letter model specific designation
    ```

    A list appears containing the error codes and their meanings.

Assigning Clients to a CMOS Settings Image

Note: If you change the client's CMOS data, you must use a CMOS level that is compatible with the client's BIOS level.

Before assigning a CMOS settings image with LANClient Control Manager, you must create the image and put it on the server. For more details, see “Creating a CMOS Settings Image” on page 89.

To assign clients to a CMOS settings 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 on one of the selected clients.
   - Select **Client** from the menu bar, then select **Configure.**
3. Select the **Maintenance** page.
4. Use the **Browse** button to select the correct CMOS (.CMS) file for the clients, or type in the full path and file name directly into the field provided.
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. For more details, see “Individual Client Details - Scheduler Page” on page 57.
7. Click on **OK** to return to the Installation/Maintenance window.
8. Click on the **Process** button to process these changes.

   The Progress and Errors window displays. CMOS updates will not be made until the client workstations are switched off and restarted, or the client's scheduled update time is reached.

   Note: If the CMOS settings 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:

   a. Insert the appropriate BIOS flash diskette into the diskette drive.

b. At a command prompt, type:

```
A:\CMOSUTIL /?

or,

A:\SRCMOSxx /?
where xx is a two-letter model specific designation
```

A list appears containing the error codes and their meanings.

Assigning Clients 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 on one of the selected clients.
   - Select **Client** from the menu bar, then select **Configure.**
3. Select the **Maintenance** page.
4. Use the **Browse** button to select the correct maintenance file, or type in the full path and file name directly into the field provided (beside the Run Maintenance file check box).
5. Check the **Run Maintenance file** check box.
6. Select the **Scheduler** page of the Individual Client Details notebook and verify the scheduler information. For details, see “Individual Client Details - Scheduler Page” on page 57.
7. Click on **OK** to return to the Installation/Maintenance window.
8. Click on the **Process** button to process these changes.

Scheduling a Repeat Event

You can use LANClient Control Manager 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 reinstalling the image):

1. Create a maintenance-image file (.MNS) containing the commands required to 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. Mark the Run Maintenance File checkbox.
   b. Use the **Browse** button in the Maintenance panel select the maintenance-image file you created in step 1.
4. On the Scheduler page:
   a. Click on the **Use client scheduler always** radio button.
   b. Click on the **Repeat** radio button.
   c. Click on either the **Daily** or **Weekly** radio button.

If you selected Repeat weekly, then select the day of your choice by clicking the up or down arrows within the Schedule day section.

5. Click on **OK**.
6. In the Installation/Maintenance window, Click on 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, unmark the Run Maintenance File checkbox.
3. Click on OK.
4. On the Installation/Maintenance window, click on the **Process** button.

In some situations, such as a classroom, you might need to reinstall the complete image (operating system and applications) upon the completion of a course such that it is ready to be used by the next group of students.

To use the repeat scheduler to reinstall the complete image:

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 checkbox.
3. On the Scheduler page:
   a. Click on the **Use client scheduler always** radio button.
   b. Click on the **Repeat** radio button.
   c. Click on either the **Daily** or **Weekly** radio button.

      If you selected Repeat weekly, then select the day of your choice by clicking the up or down arrows within the Schedule day section.
4. Click on **OK**.
5. In the Installation/Maintenance window, Click on the **Process** button.

Managing Settings at the Client Workstation

Objective: To manage workstation settings by changing information in the Configuration/Setup Utility program of each client workstation.

To perform the procedures in this section, you must access the Configuration/Setup Utility program of the client workstation. The settings you choose in these procedures directly affect how LANClient Control Manager performs.

Allowing Local Hard Disk Startup

If you have a centralized client-configuration and maintenance area from which you send preconfigured workstations out to different areas of your organization, you can run LANClient Control Manager from a single server to configure your clients, set them to start up from the hard disk, and disconnect them from the LAN. LANClient Control Manager stores the client-configuration details such that if the client workstation comes back in for maintenance or reconfiguration, the details are readily available.

To allow local hard disk startup for clients:

1. Install the new client workstation. For more information, see “Installing New Client Workstations” on page 72.
2. Scan the new client workstation into the LANClient Control Manager database. For more information, see “Using the Scan Feature” on page 76.
3. Assign the client to a Hybrid Remote Boot profile and process. For more information, see “Assigning Clients to Software Profiles” on page 93.
4. Go to the client workstation, and shut it down.
5. Reconfigure the startup sequence:
   a. Disconnect the network cable from the client workstation.
   b. Restart the client workstation and enter the Configuration/Setup utility program. (On many IBM workstations, 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** as the first startup device.
      - If you want to maintain the ability to start the workstation from a diskette, select **diskette drive** as the first startup device and **hard disk drive** as the second startup device.
   c. Save the settings and exit the program.

If you need to reload, or perform any other maintenance actions from LANClient Control Manager, set the startup sequence so that **network** is the first startup device and **hard disk** is the second startup device. Or, if you also want the ability to start the client workstation locally from a diskette, set the startup sequence so that **diskette drive** is the first startup device, **network** the second startup device, and **hard disk** the third startup device. This allows the client to perform a remote boot at next startup.

Using Dual Startup Sequences

Some IBM workstations allow you to specify two startup sequences within the Configuration/Setup utility program on the client workstation. (Consult your IBM workstation user manual for specific details.)

When using LANClient Control Manager, the first startup device of the first startup sequence must be *network* and *hard disk* second (or *diskette drive* first, *network* second, and *hard disk* third). When the user switches on the client workstation, the Hybrid remote-boot process connects and "shakes hands" with the client before allowing the client to continue starting up from its hard disk. This is a very brief process that allows you to maintain control of the client workstation 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 (see the Scheduler page of either the Defaults notebook or the Individual Client Details notebook).

The second startup sequence is used to specify how the workstation starts up when LANClient Control Manager issues a *wake-up packet* over the LAN. On some IBM workstations this is called the Automatic Power-On Startup sequence. You must enable Wake on LAN within the BIOS settings of the client workstation and also within the LANClient Control Manager 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 LANClient Control Manager, see “Defaults Notebook - Processing Page” on page 38.

Each startup sequence has four possible startup devices. If the first startup device fails, the workstation automatically attempts to start up from the second, third, and then fourth device. The startup devices are:

- Diskette Drive
- Network
- Hard Disk Drive
- CD 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. The command for starting client workstations remotely is specified in the Scheduler page of the Individual Client Details notebook. Use this function to schedule clients to be switched on automatically and processed at any time during a seven-day period, or to schedule a repeat event to take place on a daily or weekly basis. For more information, see “Individual Client Details - Scheduler Page” on page 57.

Changing the BIOS Administrator Password for Service

The client workstation BIOS settings can be password protected to help prevent unauthorized users from changing settings, such as the startup sequence. In most IBM workstations, the BIOS settings are normally accessed by pressing F1 while the workstation is starting up.

The BIOS administrator password can be set or disabled in the Maintenance page of the Individual Client Details notebook by checking the Update BIOS Admin Password checkbox and adding or removing a value in the **BIOS Password** field. If this field is left blank, the password is disabled. Remember, after changing or disabling the password, you must click on the **Process** button in the Installation/Maintenance window for the change to take effect.

In most environments, the BIOS program on a client is to be accessed by an authorized user only. If you follow the steps below, it is not necessary to tell anyone else the password or to have the administrator present at the client workstation to type in or disable the password.

1. Ensure that a trained or authorized user is at the client workstation, ready to make the changes.
2. At the server, disable the BIOS password for the client.

3. At the client, restart the workstation so that the change takes effect.
4. At the server, enable the BIOS password.
5. At the client:
   a. Restart the workstation again, and press **F1** to access the BIOS settings. Make the required BIOS changes.
   b. Exit from the BIOS settings utility. The client will restart and the BIOS password will be enabled.

Note: Ensure that only authorized users are given access to BIOS settings. 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 LANClient Control Manager is lost. If the BIOS password is changed at the client to a password that is different from the one defined within LANClient Control Manager, you cannot reestablish Hybrid remote-boot control.

The BIOS administrator password *code* is based on the positions of the keys, not the characters typed in. If any of your clients use a different language keyboard or a keyboard layout different from the keyboard you use to interact with LANClient Control Manager, the BIOS administrator password might not be recognized when typed in from the client keyboard. Ensure that you use only characters that occur in the same position on all keyboards used. If the field is left blank, the password is disabled.

Using RFID and AIA data with Clients

On AIA enabled workstations, data can be read/written to an onboard EPROM (through a third-part device), and used with LCCM. You can use AIA data fields to initiate LCCM created profiles when a client workstation is first detected by the Scan process, based on the contents of the data. Additionally, LCCUSTOM can be used to extract and incorporate AIA data (parameters) from the AIA area into batch files, replacing the need to use the DEDITD utility and LCCM Parameter pages for selected fields.

- **Supported Systems:**

  ```
  Z PRO IntelliStation (Type:68889, Model:12Z)
  PC 300 PL (Type:6862, Model:10Z)
  ```

- **AIA fields that can be used by LCCM are:**

```
OWNERDATA
                  OWNERNAME
                  DEPARTMENT
                  LOCATION
                  PHONE_NUMBER
                  OWNERPOSITION

NETWORKCONNECTION
                  IPADDRESS
                  SUBNETMASK
                  GATEWAY
                  SYSTEMNAME (computername)

PRELOADPROFILE
                  IMAGE (profile name)
                  IMAGEDATE (profile download date)

USERDEVICE (5 user definable fields)

                  For example:

                  ADDRESS=3039 Cornwallis Rd
                  CITY=RTP
                  STATE=NC
                  ZIPCODE=27709
                  AREA=WEST
```

To use AIA data fields with LCCM:

1. Read selected AIA information at Scan time and add to the new client record.

   On AIA enabled clients, the Scan program will read data from the AIA. This data must be available on the client, and no User Prompts at Scan should be specified during the scan process. See “Defaults Notebook - Scan Page” on page 40 for more information about User Prompts.

   IMPORTANT: Each fields in the client record can contain up to 256 characters. However, if the combined data exceeds 256 characters, it will be truncated without warning.

   Here is a sample of LCCM read AIA fields:

   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.

   a. **PRELOADPROFILE**

      This information is added to the Profile Name and date fields on the Software page of the Individual Client Details notebook.

      ```
      IMAGE=Hybrid Profile - 1
      IMAGEDATE=00000000
      ```

   b. **OWNERDATA**

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

      ```
      OWNERNAME=John_Smith
      DEPARTMENT=Accounts
      PHONE_NUMBER=919 543 7454
      OWNERPOSITION=Manager
      ```

   c. **OWNERDATA**

The location field value of the OWNERDATA group is added to Location field on the Details page of the Individual Client Details notebook.

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

d. **USERDEVICE**

The 5 user-definable fields from the USERDEVICE group are joined and added to Comment field on the Details page of the Individual Client Details notebook.

```
ADDRESS = 3039 Cornwallis Rd
CITY = RTP
STATE = NC
ZIPCODE = 27709
AREA = West
```

2. Automatically assign clients to a requested profile from data stored in the AIA at Scan time.

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. Existing LCCM Profiles that you intend to download at this time 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.

IMPORTANT: Any outstanding processing that has been set up manually will also begin at this time.

For the auto-assign process to work, the following conditions must be met:

a. The IMAGEDATE from the AIA must be set to 8 zeros, "00000000". This is a check to ensure that a profile has not already been loaded.

b. The requested IMAGE (profile name) must exist within LCCM and match perfectly with the AIA requested profile. This is case and position sensitive.

c. The client must meet all the hardware requirements of the profile.

3. Read AIA data using the AIAREAD utility.

The AIAREAD utility allows you to customize batch files that access the AIA data at image download time. This utility extracts specific fields from the AIA data and sets environment variables which are then used to customize installations.

The syntax of AIAREAD.EXE:

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

where:

group   The name of the device group.
field   The name of the field to read (default is all fields).
file    Name of file to output results to (default is stdout).
/a      Append the file (default is overwrite file).
/s      Output formatted as SET statements.
         e.g. '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
```

An example of executing AIAREAD USERDEVICE would return the values:

```
ADDRESS = 3039 Cornwallis Rd
CITY = RTP
STATE = NC
ZIPCODE = 27709
AREA = West
```

Executing AIAREAD USERDEVICE AREA would then return the value:

```
Area = West
```

4. Use LCCUSTOM and AIAREAD to customize LCCM batch files.

   AIAREAD and LCCUSTOM can be used together to customize batch files. LCCUSTOM can replace DEDITD for most common purposes, replacing all occurrences of a parameter with its value throughout a file. DEDITD may still be required for more specialized file modifications.

   In this example, AIAREAD and LCCUSTOM is used together to customize the Windows NT Answerfile using parameters supplied both from LCCM and the AIA area of the client workstation.

   Note: Remember, this process will work only on RFID enabled IBM worstations.

   a. At the administrator's console, create a final-image batch file 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 AID 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
      ```

   b. Save this file in the CLNTFILE directory of LCCM as:

      ```
      LCCUSTOM.LCI
      ```

      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 and Individual Client Details notebooks, will be unaffected. These environment variables are made available for LCCUSTOM.

      LCCUSTOM follows the the two batch files to edit the Windows NT answerfile. LCCUSTOM will edit the answerfile 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, 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, the Windows NT Answerfile should be edited to include the correct environment variable names where appropriate.

   c. Write AIA data using the AIAWRITE utility.

      The AIAWRITE utility allows you to write information to the AIA area. Any data can be written, but LCCM specific data, such as the Profile Installation date will be used specifically by LCCM. Using

the LCCUSTOM utility in conjunction with AIAWRITE allows a file to be customized is a single step replacing all instances of environment variables in the file by their values.

The syntax of AIAWRITE.EXE:

```
    AIAWRITE group [field1=[value1]..[fieldn=[valuen]]]/f=file,

 where:

 group   The name of the device group.
 fieldn  The name of the field to write
 valuen  The value to assign to fieldn.  For the USERDEVICE group,
         a blank value means delete this field, if the field already
         exists, or create a field with a NULL value if the field does
         not exist.  For all others it means assign a zero or null value.
 file    Name of file to get field/value pairs from.  Each line in
         this file contains one field/value pair, separated by '='.
```

To change the value of the previously read AIA field, AREA, you would execute the line:

```
AIAWRITE USERDEVICE AREA=SOUTH
```

For more information about the IBM Radio Frequency Identification (RFID) chip, and the Asset Information Area (AIA), access the following IBM website:

`http://www.ibm.com/desktop/assetid`

Installing Network Adapter Device Drivers

Objective: To install device drivers for new network adapters in client workstations that will be managed by LANClient Control Manager.

In order to complete this procedure, you must access the NETWORK.LST file provided by LANClient Control Manager. This file is located in the following directory:

LCCM_install_dir\NETWORK.LST

Note: For detailed procedures on enabling the remote-boot to function with various device drivers, refer to the World Wide Web at

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

The information on the World Wide Web will be updated for all supported network adapters.

Important: You must perform steps 8 and 9 on page 109 (editing the NETWORK.LST file) to ensure that the NETWORK.LST file contains the correct line entries for all adapters you are using on your network, even if you are installing network adapters that have built-in device-driver support in Windows NT Server. The only exceptions to this are:

- IBM EtherJet ISA 10BASE-T Wake on LAN Adapter
- Integrated Crystal 10BASE-T controller
- Intel® EtherExpress PRO/100 Adapter with Wake on LAN
- Integrated Intel 82557-based 10/100 PCI Ethernet
- IBM 100/10 EtherJet PCI Adapter with Wake on LAN
- IBM Auto Wake ISA Token-Ring Adapter
- IBM PCI Wake on LAN Token Ring Adapter

If you are using an adapter that does not have built-in device driver support in Windows NT Server, you must carry out all of the following steps. Consult your Windows NT Server documentation for a list of supported device drivers.

To install the device drivers for network adapters:

1. Install the network adapter into the workstation. Consult your workstation's documentation for instructions on installing adapters.
2. Insert the network adapter device-driver diskette into the server diskette drive.
3. Locate the correct DOS NDIS device driver to be used.

   Note: IBM cannot supply you with specific information for finding the appropriate device driver because adapter manufacturers use different methods for storing their device drivers on diskette. You might find the device driver name supplied as a parameter in the PROTOCOL.INI, PROTOCOL.SMP or *.SMP files on the diskette. The device driver is normally stored in a \DOS sub-directory. Consult the diskette's README or SETUP text files (if supplied) for information that will help you locate the correct file.

4. Copy the device driver from the diskette to:

   remote_boot_services_directory\BBLOCK\NDIS

5. Make a new directory named:

   remote_boot_services_directory\BBLOCK\NETBEUI*new_adapter_name*

6. Copy the files DOSBB.CNF and PROTOCOL.INI from:

   remote_boot_services_directory\BBLOCK\NETBEUI\IBMTOK

to:

remote_boot_services_directory\BBLOCK\NETBEUI*new_adapter_name*

Note: These files are used as templates for your new adapter.

7. Edit the DOSBB.CNF and PROTOCOL.INI in your *new_adapter_name* directory. Substitute the correct device driver name in the DOSBB.CNF file and supply the correct driver information in the PROTOCOL.INI file. Consult the README file supplied with the adapter driver and your Windows NT documentation for details about the settings used in PROTOCOL.INI.
8. Load the file NETWORK.LST into an editor. This file is located in:

   LCCM_install_dir\NETWORK.LST
9. Edit the NETWORK.LST file by doing one of the following:
   - If you are using new adapters, add one line for each new adapter.
   - If you are updating an existing adapter, check that the entry is correct.

   Important: Edit the NETWORK.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. Each non-comment line contains information unique to a specific type of network adapter. Fields within a non-comment line are delimited by semicolons. Field 8 can contain more than one entry; multiple entries are delimited by commas. Each non-comment line must end with a semicolon.

   The format of the line is:

```
DESCRIPTION;X;Y;BOOT_BLOCK;OS2_BOOT_REC;DEVICE_DRIVER;PNP_PCI_ID;SCAN_ON_OFF;CONFIG_MEM;
```

where:

DESCRIPTION (field 1) This is the description of the network adapter that appears in the Network Adapter field on the Hardware page of the Individual Client Details notebook. All characters from the start of the line until the semicolon (;) are used as the description.

X (field 2) This is a unique and sequential number within in the NETWORK.LST file. Each non-comment line must have a unique number. Zero is not a valid number.

Y (field 3) This field is reserved by the program. You MUST set this field to the same value as field 2.

BOOT_BLOCK (field 4) This field contains the directory name that contains the information used to build the DOS boot record for the adapter. Assuming LCCM is installed on the C drive, the directory named here is located under the C:\WINNT\RPL\BBLOCK\NETBEUI directory. The directory named in this field contains the DOSBB.CNF and PROTOCOL.INI files. If you added new adapter device drivers, you created this directory in step 5 on page 108 of this procedure.

OS2_BOOT_REC (field 5) Although you are working with Windows NT, this field must contain the value OS2.

DEVICE_DRIVER (field 6) This field points to the location of the NDIS DOS device driver for the network adapter. The path specified here is relative to the Windows NT remoteboot directory (\WINNT\RPL\). Therefore, if the entry in this field is BBLOCK\NDIS\IBMTOK.DOS the full path would be C:\WINNT\RPL\BBLOCK\NDIS\IBMTOK.DOS

PNP_PCI_ID (field 7) This field contains the PNP (Plug'n'Play) or PCI ID for the network adapter.
- PNP ID = First 7 digits of the PNP number
- PCI ID = First 8 digits of the PCI number

This field can contain a single hexidecimal number. See “IDVIEW.EXE” on page 171 for information about viewing these ID numbers.

SCAN_ON_OFF (field 8) This field contains the first six digits of the MAC address followed by either =1 or =0. This field is used during the scan process to identify the network adapter type and load the correct device drivers. Multiple entries are permitted in this field.
IMPORTANT: The =1 and =0 are used to enable or disable certain adapter types in the case of a conflict during a scan operation. See the following note for more details.

CONFIG_MEM (field 9) 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 indicates to use the CONFIGx.sys file in
      the BINFILES\IBMDOS7 directory.  This
      file uses EMM386.EXE.
    N indicates to use the CONFIGn.sys file in
      the BINFILES\IBMDOS7 directory.  This
      file does not use EMM386.EXE.
    S indicates to 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 4.
Flag 4 is used during the Scan process.  This
       is an optional flag.
```

Note: If the first six digits of the MAC addresses of two or more adapters are identical, it might not be possible for Windows NT to detect what type of adapter is attempting the remote boot. When a new client is scanned, the only adapter information available to the network software is the 12-digit MAC address, where the first six digits of the MAC address identify the adapter type. Currently, different adapter manufacturers might assign identical MAC address types to different adapters.

If you are using a limited number of adapter types on your LAN, you might not encounter a problem, but if an identification conflict does occur, you must switch off conflicting adapter types during the scan process and only allow one (conflicting) type during each scan. This limitation only affects the scan process. Up to five addresses can be specified with an =0 (off) or =1 (on).

The following is an example of the lines listed within the NETWORK.LST file. It is not the complete NETWORK.LST file.

```
IBM Token Ring 16/4;2;2;LCIBMTOK;OS2;BBLOCK\NDIS\IBMTOK.DOS;244d000;08005A=1,0004ac=1;XN4;
IBM EtherJet ISA;3;3;LCCRYST;OS2;BBLOCK\NDIS\ENDS2ISA.DOS;244d101;002035=0;XN2;
IBM Token Ring WOL16/4;5;5;LCIBMWOL;OS2;BBLOCK\NDIS\IBMTOKW.DOS;244d107;0004acf4=1;XN4;
IBM Token Ring 16/4 PCI;6;6;LCIBMTRP;OS2;BBLOCK\NDIS\IBMTRP.DOS;1014003e;0004ac=0,000629=1;NN4;
Intel 10/100 PCI Ethernet;7;7;LCINTEL;OS2;BBLOCK\NDIS\E100B.DOS;80861229;00aa00=1,00a0c9=1;NN4;
```

Understanding the NETWORK.LST File

The NETWORK.LST file is one of the most important files contained in LANClient Control Manager. 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. You, as the network administrator, must have an understanding of the NETWORK.LST file in order to troubleshoot problems and make necessary changes.

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 LANClient Control Manager.

If LANClient Control Manager does not recognize a client workstation that is properly configured for remote boot, or responds inappropriately, the trouble is most likely in the NETWORK.LST file.

When a properly-configured RPL client is turned on, it broadcasts a FIND frame over the LAN every 2 seconds. Each FIND frame contains the 12 character hexadecimal MAC address of the network adapter. MAC addresses are typically assigned in blocks to particular types of network adapters. Therefore, it is possible to identify the type of network adapter from the MAC address.

When LANClient Control Manager performs a scan operation, it uses the MAC address from the FIND frame and compares it to the information in field 8 (SCAN_ON_OFF) of the NETWORK.LST file. If the first six digits of the MAC address match the information in field 8, and the second portion of field 8 is a "1" (network adapter enabled), LANClient Control Manager uses the information in field 4 (BOOT_BLOCK) and field 6 (DEVICE_DRIVER) to build a remote-boot image to send to the client. If the first six characters of the MAC address do not match the information in field 8, LANClient Control Manager does nothing and the client workstation continues to broadcast the FIND frame.

Sending a remote-boot image to the client workstation does not guarantee a successful scan or remote boot operation. If the client hangs during the scan process, the probable cause is that LANClient Control Manager incorrectly identified the network card and sent the wrong device drivers to the client. Do a sanity check on the NETWORK.LST file as follows:

1. Locate the line that contains the first six characters of client MAC address (in field 8).
2. Ensure that field 1 of that line correctly identifies the network adapter. If the description is not correct, the address in field 8 might have been incorrectly typed. Check to see if the address is duplicated in another line. If it is duplicated in another line:
   - The MAC address might be incorrect in one of the lines.
   - You might have more than one adapter type using the same first six characters in the MAC address. This could cause a conflict that requires you to temporarily disable the conflicting adapter type during the scan operation by changing the "=1" to "=0" in field 8.
3. Ensure that the directory name listed in field 4 actually exists under the `C:\WINNT\RPL\BBLOCK\NETBEUI` directory and that it contains the DOSBB.CNF and PROTOCOL.INI files.
4. Open the DOSBB.CNF file and make sure that it contains the correct device driver name.
5. Open the PROTOCOL.INI file and make sure that it contains the correct device driver information. You might have to consult the README file supplied on the network adapter device driver diskette and the Windows NT documentation for details about the settings used in the PROTOCOL.INI file.

After the correct device drivers are successfully loaded at the client worktation, the client logs in to the LCCM server. Next, the scan process begins on the client workstation. The scan process collects information about the client workstation and returns that information to the server.

One of the items that the scan process collects is the PnP ID/PCI Identification number of the network adapter. If the high-order portion of the MAC address was not sufficient to completely identify the network adapter, a final comparison is done using field 7 (PNP_PCI_ID) of the NETWORK.LST file. If no match is found, the Network Adapter 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.

To check the PnP ID or PCI identification number, you can use the IDVIEW.EXE utility program provided with LANClient Control Manager. See “IDVIEW.EXE” on page 171 for details.

Importing a Client Database

LANClient Control Manager allows you to import some, but not all, data fields into the Client database. By importing a client database, you can use this database as a way of waking up (using Wake-onLAN) individual or groups of client workstations without using the scan feature. Also, this import feature allows other tools to provide the data to LCCM, such as a manufacturing packing list.

Note: You can import an exported database created by LCCM. To export a client database from LCCM, see “Exporting a Database” on page 114.

To create 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).

To import a database into LCCM:

1. From the menu bar, select **File** -> **Import** -> **Append to Clients Database** A browse box will appear.
2. Select the .TXT file that you wish 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 corrupt your database in some way, the original database can be recovered by renaming the lcclient.bak file to lcclient.dbs.

   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 workstation 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 clients process. Limit is 255 ASCII characters.

   LOCATION Location information field. Field is usually identified during the scanning for new clients process. Limit is 255 ASCII characters.

   COMMENTS
   Comments information field. Field is usually identified during the scanning for new clients process. Limit is 255 ASCII characters.

   RAMSIZE The amount of RAM in the client workstation. Values are listed in 1 million byte increments up to a maximum of 32767 Megabytes. *Do not embed commas in this field.*

   DISKSIZE The size of the primary hard disk in the client workstation. Values are listed in 1 Megabyte increments up to a maximum of 2147483647 Megabytes. *Do not embed commas in this field.*

   LANGUAGE
   The numeric equivalent of the BIOS language. See the field "LANGUAGE" in the Client database export function on page 116 for the language definition key.

   BIOSLEVEL
   The level of BIOS present on the client workstation. Limited to 8 alphanumeric characters.

   CLIENT_TYPE
   Network card protocol used by the client workstation. One character only (0=RPL, 1=DHCP).

   NETWORKNAME
   Limit is 8 characters. For example, CLNT09. Alphanumeric only.

SERIALNUMBER
Workstation 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).

CLIENT_PARAM_VALUE1 to CLIENT_PARAM_VALUE8
Client parameter values. Limited to 24 ASCII characters each.

LCCM_CONTROLLED_STATUS
Does LCCM control this client? One character only (0=LCCM Controlled client, 1=Not by this program).

Exporting a Database

The Database Export function creates a detailed database on clients or profiles. You can use the Database Export functions to export your Client or Profile databases to any application that can read a .TXT comma delimited file format. This file format can easily be imported into most spreadsheet programs, database applications, or word processors. The imported file can be used for reference and information purposes.

There are two Database Export options available:

1. Client database.
2. Profile database.

Note: An exported Client Database can be imported back in to LCCM, appending itself to the existing database. See “Importing a Client Database” on page 112 for more information.

To export a LANClient Database:

1. Select **File** -> **Export**. You will be given the option to export a Clients or Profiles database.
2. Select either Clients or Profiles.
3. Save the export file. The default filename is LCCLIENT.TXT for the client database and LCPROF.TXT for the profile database.

   When you have saved the file you will be able to import it into any spreadsheet, database, or word processing application that is capable of reading a comma delimited (.TXT) file.

Reading a database report

This example shows a client database being imported into Lotus 1-2-3. To read the database file:

1. From Lotus 1-2-3, select **File** -> **Open**.
2. Select the Lotus 1-2-3 File Open Type as **Text, (.TXT)**.
3. A Text File Options box will be displayed. Check "Start new column at each" and select **comma**.

   To import the file directly into the current workbook, check the Combine with current workbook checkbox and click on the Combine button to import the file.

Client Database Report Fields

The following table details the contents of the LANClient Control Manager 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 (ex. CLNT01)

bootstatus 0=client not disabled, 1=disable client box selected; client disabled

biospassword
client BIOS password

serialnumber
client workstation serial number

model type of computer; model number

location location; see client variables on page 113

contact contact; see client variales on page 113

comments comments; see client variables on page 113

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 checkbox

date_time.tm_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 filename 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 filename of client CMOS update

errorcode last errorcode from client processing; 0=no errors

maintainfile
Path and filename 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

client_param_value1 to client_param_value8
Client parameters

lccm_controlled_status
LCCM control of client; 0=yes, 1=no

client_type Client protocol; 0=RPL, 1=DHCP

The following table details the contents of the LANClient Control Manager Profile database. Not all clients will have every field contained 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 remoteboot, 1=Hybrid, 2=Hybrid-NT, 3=no profile

name Profile name

ncard
Specific network card type

vcard
Specific video card type

ramsize
Amount of client RAM need

disksize Amount of client hard disk space needed

userpreload
Preload checkbox status; 0=do not use preload, 1=use preload

personalization
Personalization checkbox status; 0=do not use personalization file, 1=use personalization file

dos_fileload
Filename of standard remoteboot image

preload_image
Filename of preload image

answerfile
Filename of Hybrid-NT answerfile

final_image
Filename of final image

nt_source Hybrid-NT distribution sharepoint

client_clone
Standard remoteboot name

description
Profile description

prof_param_name_1 to prof_param_name_8
Profile parameter names

prof_param_value_1 to prof_param_value_8
Profile parameter values

prof_param_describe_1 to prof_param_describe_8
Profile parameter descriptions

client_param_name_1 to client_param_name_8
Client parameter values

client_param_values_1 to client_param_values_8
Client parameter values

client_param_describe_1 to client_param_describe_8
Client parameter descriptions

Chapter 5. Hybrid Remote-Boot Training Exercises

Introduction

The training exercises are provided to help you become more familiar with the Hybrid remote-boot process. Each exercise gives a specific example of how to create image batch files and how to use them with LANClient Control Manager.

Important: The terms and conditions of the IBM International Program License Agreement for LANClient Control Manager do not grant any license to install, copy, or use any application software or operating system software mentioned in this guide that is not shipped as part of LANClient Control Manager. Always ensure that you have obtained suitable licenses for any software you intend to use with LANClient Control Manager. When using the exercises in this chapter, keep the following information in mind:

- The environment automatically created for a Hybrid remote-boot operation is created on the client workstation during the download process. For more information, see “Environment for Hybrid Remote Boot” on page 12.
- XCOPY Considerations

  The way LANClient Control Manager uses software profiles provides a great deal of flexibility. If you have your own preferred methods of copying programs and data to clients, you can probably adapt this method to LANClient Control Manager. For example, the exercises in this section use XCOPY for copying files (with the exception of the Windows 95 exercise, which uses PKZIP because the depth of the directory structure exceeds XCOPY limitations). You can also use another archive program, like PKZIP, to transport the files. For more information, see “Using Alternative Methods for Transporting Images” on page 82.
- Example Files

  Example files for all exercises are provided in Chapter 6, “Example Files” on page 153.
- Utility Programs

  The utility programs you must use to perform the exercises in this chapter are provided by LANClient Control Manager. Some of the utilities might not be necessary for the task you are trying to perform or you might choose to use them differently from how they are used in these exercises. For more information on the utility programs, see Chapter 7, “Utilities Provided with LANClient Control Manager” on page 159. You can find these utilities in the *LCCM_install_dir*\CLNTFILE directory.

DOS/Windows Image

This exercise remotely installs a DOS/Windows image on a client workstation. The image can also contain other applications, but for the purposes of this exercise, DOS and Windows are the only software specifically mentioned.

Note: As part of this exercise, you create a text file called MOCKINI.TXT. This file is modified during the Hybrid RPL download process using the parameter-passing feature provided by LANClient Control Manager. The only purpose of this text file is to give you hands-on experience using parameter-passing techniques. In an actual work situation, you can use these same parameter-passing techniques to modify .INI files or any other text-based files that require client-specific information, such as domain names, gateway addresses, user ID's, IP addresses, and so on.

Objective: This exercise:

- Sets up a client workstation
- Adds the client workstation to the LANClient Control Manager database
- Creates a DOS/Windows image
- Transports the DOS/Windows image to the server
- Assigns the client workstation to the software profile
- Downloads the DOS/Windows image to the client workstation

Before you begin, you must have the following:

- A server attached to the LAN. The server must be functioning and have LANClient Control Manager already installed.
- The LANClient Control Manager Defaults notebook must be set up with the proper default information. For details, see “Setting Specific Defaults Prior to Scanning” on page 73.
- A donor workstation that is compatible with the new client workstation you will be managing.
- A donor boot startup image as described in “Using a Donor Workstation Startup Image” on page 81. You will assign this image to the donor workstation in step 8 on page 122.
- Three licenses for DOS and Windows.
- A client workstation. This workstation must have a network adapter and meet the minimum hardware requirements to run DOS and Windows.

To install a DOS/Windows image:

1. Install two client workstations and attach them to the LAN. (For details, see “Installing New Client Workstations” on page 72.) One client workstation will become the donor workstation. The other will receive the image and will be referred to as the client workstation throughout the remainder of this exercise.
2. Start LANClient Control Manager and scan for the new donor and client workstations. (See “Using the Scan Feature” on page 76 for details.)
3. Install DOS and Windows on the donor workstation. You can also install additional applications at this time.
4. Create the directory C:\LANCLI on the donor workstation.

5. Copy the following utility programs to the C:\LANCLI directory:

   - DISKDOS.EXE
   - LCATTRIB.EXE
   - DEDITD.EXE

   You can find the utility programs in the *LCCM_install_dir*\CLNTFILE directory.

6. Create a text file for modification. This is the file that will be modified using the parameter-passing techniques.

   a. Create the text file with the following contents only:

   ```
   REM Sample File for LCCM Exercise

   [Common data]
   OrgName = dummy_Org

   [Individual data]
   FullName = dummy_Username
   JoinDomain = dummy_Domain
   NetworkAddress = dummy_Caddress
   ```

   Note: The format of this file simulates an .INI file. Normally, you would edit an existing .INI file (or other text-based file) and replace existing values with "dummy" names. The "dummy" names will be referenced in the final-image batch file you create later in this exercise. When the image is downloaded, the customization batch file will replace the dummy names with values that are common to the organization and and values that are unique to the individual client.

   b. Save the file on the donor workstation as:

   ```
   C:\LANCLI\MOCKINI.TXT
   ```

7. At the donor workstation, create and save a backup batch file.

   a. Use a text editor to create a backup batch file that has the following content:

   ```
   %TARGET%
   CD \
   \LANCLI\DISKDOS /F=%TARGET%\LANCLI\DOS7.BB /D=%TARGET% /R=R
   \LANCLI\LCATTRIB %TARGET%\ /A /S
   %LCCMPATH%
   MD DOS70
   CD DOS70
   XCOPY %TARGET%\*.* %LCCMPATH%\DOS70\.*.* /S /E
   %TARGET%
   CD \
   \LANCLI\LCATTRIB %TARGET%\ /R /S
   ```

   The backup batch file will be used to prepare the image, transport it to the server, then restore the image on the donor workstation to its original condition (as it was before the batch file was run). For an explanation of the commands used in the backup batch file, see “Backup Batch File - DOS/Windows Image” on page 154.

   b. Save the backup batch file on the donor workstation as:

   ```
   D:\LANCLI\BACKUP.BAT
   ```

8. Assign the donor workstation to the donor boot startup image. Next, connect the donor workstation to the network and establish a connection to the LCCM server as described in the procedure “Using a Donor Workstation Startup Image” on page 81.

9. On the donor workstation, change the directory to the local-disk root directory (drive D).

10. Run the backup batch file by changing to the LANCLI directory and typing `BACKUP.BAT`. This command transports the image from the donor workstation to the server.
11. At the administrator console, after the image has been transported to the server, stop the donor boot process within the Progress and Errors window by selecting the client and then clicking the **Stop Selected Client** button.
12. Create a preload-image batch file.

    Note: Creating a preload-image batch file is an optional step for LANClient Control Manager. A preload-image batch file is needed only if you want to partition the hard disk of the client workstation before installing the image.

    a. Use a text editor to create a preload-image batch file that has the following content:

    ```
    @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
    ```

    For an explanation of the commands used in the preload-image batch file, see “Preload-Image Batch File” on page 156 and “FDISK.COM” on page 162.

    Important: The size of the primary partition cannot exceed 2048 MB (2 GB). For additional information about FDISK command-line arguments, maximum partition sizes, and maximum logical drive sizes, see “FDISK.COM” on page 162.

    b. Save the preload-image batch file on your LCCM server as:

    `\`*`LCCM_install_dir`*`\CLNTFILE\FAT_PR.LCP`

    Note: This file can have any name you want, but the extension must be .LCP. The name FAT_PR.LCP will be used throughout the remainder of this exercise.
13. At the administrator console, create a final-image batch file.

    Note: The final-image batch file runs on the client from a DOS network start up when the Hybrid remote-boot download is processed.

    a. Use a text editor to create a final-image batch file that has the following content:

    ```
    %LCCMPATH%\FORMAT %TARGET% < %LCCMPATH%\FORMAT.DAT
    XCOPY %LCCMPATH%\DOS70\IBMBIO.COM %TARGET%\
    XCOPY %LCCMPATH%\DOS70\IBMDOS.COM %TARGET%\
    XCOPY C:\LCCM\DOS70\*.* D:\ /S /E /V
    %TARGET%
    CD \
    \LANCLI\DISKDOS /F=%TARGET%\LANCLI\DOS7.BB /R=W /D=%TARGET%
    \LANCLI\LCATTRIB %TARGET%\ /R /S
    %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%
    ```

    For an explanation of the commands used in the final-image batch file, see “Final-Image Batch File - DOS/Windows Image” on page 157.

    b. Save the final-image batch file on the server as:

LCCM_install_dir\CLNTFILE\DOS70.LCI

Note: This file can have any name you want, but the extension must be .LCI. The name DOS70.LCI will be used throughout the remainder of this exercise.

14. Create a Software Profile Details notebook for your DOS/Windows image.

    a. At the Installation/Maintenance window of LANClient Control Manager, select **Profile** from the menu bar, then select **Create New**. This opens the Software Profile Details notebook.

    b. On the Details page:

    - Type DOS_WIN_Test in the Profile Name field.

      Note: You can name the profile any name you want. The profile name DOS_WIN_Test will be used throughout the remainder of this exercise.

    - Click on the Hybrid radio button.
    - In the Description field, type a description such as:

      ```
      Exercise profile
      DOS 7.0 with Windows 3.X
      ```

    c. On the Minimum HW page:

    - Select the appropriate adapter for the client workstation 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.
    - Type **0** in the RAM field.
    - Type **0** in the Hard Disk field.

    d. On the Software page, use the browse button to find:

    - In the Preload Image File Name field:

      FAT_PR.LCP

    - In the Final Image File Name field:

      DOS70.LCI

    Also, ensure that the Enable Preload box is selected.

    e. On the Parameters page, set up the following parameter names:

    ```
    Names      Values
    =====      ======
    ORGNAME    Type in your company name
    ```

    Note: The values on this page are common for all clients using this profile.

    f. On the Client Parameters page, set up the following parameter names:

    ```
    Names     Values
    =====     ======
    USERNAME  - Leave Blank -
    DOMAIN    - Leave Blank -
    ```

    Note: The names used on this page are passed to the Parameters page of the Individual Client Details notebook for each client assigned to this profile. Although you use %CADDRESS% in your final-image batch file, you do not need to specify it on this page. %CADDRESS% is a special value that picks up the contents of the Address field from the Details page of the Individual Client Details notebook. For additional information about other special parameters, see “Parameter Exceptions” on page 85.

g. Select **OK** to save and close the notebook.

15. Assign the client to the new software profile (DOS_WIN_Test), but DO NOT PROCESS THE CHANGES UNTIL INSTRUCTED TO DO SO IN A LATER STEP OF THIS EXERCISE. (For instructions on assigning clients, see “Assigning Clients to Software Profiles” on page 93.)
16. Open the Individual Client Details notebook for the new client assigned to this profile. (See “Modifying an Existing Client” on page 96 for details.)
    a. On the Parameters page, set up the values for the following names:

```
Names       Values
=====       ======
USERNAME    Type in the end user's name
DOMAIN      Type in the domain name (or some text to represent
            a domain name).
```

    b. Select **OK** to save and close the notebook.
17. Click on the Process button in the Installation/Maintenance window to begin processing.
18. Turn on the client workstation.

    If you used a preload-image batch file, the client hard disk is partitioned first. Next, the hard disk is formatted, and the image is downloaded to the client hard disk and is customized for that specific client. The next time the client is started, it starts DOS/Windows from its own hard disk.

    If you open the MOCKINI.TXT file at the client workstation, you will see that the dummy parameters have been replaced with the parameters defined in the LANClient Control Manager notebooks.

    Additional clients can be assigned to the same profile. However, before processing the additional assignments, edit the Individual Client Details notebook for each new client and modify the Parameters page as described in this exercise.

Windows 95 Image

This exercise remotely installs a Windows 95 image on a client workstation.

Objective: This exercise:

- Sets up a client workstation and donor workstation
- Adds the client workstation to the LANClient Control Manager database
- Creates a Windows 95 donor image on the donor workstation
- Modifies the Windows 95 Registry to accept personalization values
- Creates a software profile for the Windows 95 image
- Transports a Windows 95 image to the server
- Assigns the client workstation to the software profile
- Modifies the Individual Client Details notebook for personalized parameter values
- Downloads the Windows 95 image to the client workstation
- Modifies the Windows 95 Registry to match parameters assigned by the Individual Client Details notebook
- Restarts the client workstation to startup Windows 95 from the client hard disk

Before you begin, you must have the following:

- A server attached to the LAN. The server must be configured with the correct server software, and the server or another client workstation must have LANClient Control Manager already installed.
- The LANClient Control Manager Defaults notebook must be set up with the proper default information. For details, see “Setting Specific Defaults Prior to Scanning” on page 73.
- The Windows 95 installation CD.
- Access to Windows 95 documentation, specifically information about the Registry.
- A client workstation. This workstation must have a network adapter and meet the minimum hardware requirements to run Windows 95.
- A donor workstation that is compatible with the new client workstation you will be managing.
- A donor boot startup image as described in “Using a Donor Workstation Startup Image” on page 81. You will assign this image to the donor workstation in step 8 on page 128.
- The appropriate number of licenses for Windows 95.
- Licensed copies of PKZIP and PKUNZIP installed in the *LCCM_install_dir*\CLNTFILE directory.

To install a Windows 95 image:

1. Install two client workstations and attach them to the LAN. (For details, see “Installing New Client Workstations” on page 72.)

   One client workstation will become the donor workstation. The other will receive the Windows 95 image and will be referred to as the client workstation throughout the remainder of this exercise.

2. Start LANClient Control Manager and scan for the new client workstations. (See “Using the Scan Feature” on page 76.)

3. Install Windows 95 on the donor workstation using the Windows 95 installation CD.

   Keep track of all questions asked during the installation that deal with the user name, workgroup, product ID, and so on. The attributes, related to these questions, will be modified later in this exercise using the parameter-passing method.

4. On the donor workstation create a directory named LANCLI on drive C.

5. Copy the following utilities programs to the C:\LANCLI directory:

   - DISKDOS.EXE
   - LCATTRIB.EXE
   - DEDITD.EXE

- DOSLFNBK.EXE

You can find these programs in the server's *LCCM_install_dir*\CLNTFILE directory.

6. Create a backup of the Windows 95 Registry.

   Note: This file is used later in this exercise to restore the donor workstation back to a working client workstation.

   a. In the Windows 95 interface, click on **Start**.

   b. Select **Run**.

   c. Type `REGEDIT` in the field provided and select **OK**. The Registry menu appears. Make sure that the top-level folder (in the upper left of the window) is the My Computer folder.

   d. Select **Registry.**

   e. Select **Export Registry File.**

   f. In the Save in field, select drive C from the pull-down menu and select the Windows folder from the directory menu.

   g. Select the **All** radio button in the Export range section.

   h. Type `PRIMARY.REG` in the File name field and select **Save**.

7. Modify the Windows 95 Registry with dummy values.

   Note: A good working knowledge of the Windows 95 Registry is required. Any errors in the Registry might prevent the workstation from functioning properly. Record all steps you take when editing the Registry.

   a. Select **Edit**.

   b. Select **Find**. Search for the Value name that identifies either a common or unique parameter for a client workstation.

      An example of the Value name of a common parameter is:

      Workgroup This parameter identifies the workgroup to which the client workstation is connected.

      An example of the Value name of a unique client parameter is:

      ProductId This parameter identifies the Windows 95 license product identification number. Each client workstation must have its own ProductId.

      Note: Always start a search for a new attribute at the top of the Registry file (the My Computer folder).

   c. When an attribute is found, click the right mouse button, then select **Modify** from the pop-up menu.

   d. In the Edit String dialog box, the Value Data string is highlighted. Change this value to a dummy value and select **OK**.

      Use the following lists to add dummy values to the Registry.

```
COMMON PARAMETERS

Search                Replace
for Value Name        Value data with
==============        ===============
Domain                dummy_DomName
Workgroup             dummy_Wkgrp
NameServer            dummy_NameServ
IPMask                dummy_IPMask
DefaultGateway        dummy_DefGate
RegisteredOwner       dummy_RegName

UNIQUE CLIENT PARAMETERS

Search                Replace
for Value Name        Value data with
==============        ===============
ComputerName          dummy_CName
IPAddress             dummy_IPAddr
HostName              dummy_Hname
ProductID             dummy_IDNum
username              dummy_user
```

When other applications are added to Windows 95, the Registry changes. These changes have common and unique attributes for each client workstation. If other applications are included in the donor image, consider the following:

- Search the Registry for the application program names, or part of the program name.
- Some programs use the same first starting characters to begin the name of their .DLL or .EXE entries, search for these starting characters.

e. After you have modified the Registry with dummy statements, select **Registry** from the menu bar.

f. Select **Export Registry File**.

g. In the Save in field, select drive C from the pull-down menu and select the Windows folder from the directory menu.

h. Select the **All** radio button in the Export range section.

i. Type `CLONE.REG` in the File name field and select **Save**.

You now have two Registry files: PRIMARY.REG, which contains the original values, and CLONE.REG, which contains dummy values.

8. Assign the client to the donor-boot profile and establish a connection to the LCCM server as described in the procedure “Using a Donor Workstation Startup Image” on page 81.
9. At the donor, change the directory to the local-disk root directory (drive D).
10. Create the Windows 95 backup image batch file to prepare the Windows 95 image and transport it to the server.

```
%TARGET%
CD \
\LANCLI\DISKDOS /F=%TARGET%\LANCLI\W95BT /D=%TARGET% /R=R
\LANCLI\LCATTRIB %TARGET%\ /A /S
\LANCLI\DOSLFNBK %TARGET%\
%LCCMPATH%
MD WIN95
CD WIN95
%LCCMPATH%\PKZIP %LCCMPATH%\WIN95\WIN95.ZIP -r -P %TARGET%\*.*
%TARGET%
CD \
\LANCLI\LCATTRIB %TARGET%\ /R /S
```

11. Save the batch file as `BACKUP.BAT` on the donor workstation.
12. Copy the file AUTOEXEC.BAT to the LANCLI directory.
13. Add the following line to the end of the AUTOEXEC.BAT file in the root directory:

    ```
    %LCCMPATH%\LANCLI\REGISTRY.BAT
    ```

14. Create the file REGISTRY.BAT with the following content:

    ```
    C:
    CD\WINDOWS
    REGEDIT /L:C:\WINDOWS\SYSTEM.DAT /R:C:\WINDOWS\USER.DAT /C CLONE.REG
    CD\
    DEL AUTOEXEC.BAT
    COPY C:\LANCLI\AUTOEXEC.BAT C:\
    ```

15. Run the BACKUP.BAT file. The donor image is transported to the LCCM server. You are now finished with the donor workstation. You can use REGEDIT in the C:\WINDOWS directory to restore the donor Registry with the file PRIMARY.REG.
16. Go the administrator console, and create a preload-image batch file.

    Note: This is an optional step for LANClient Control Manager. A preload-image batch file is needed only if you want to partition the client hard disk drive before installing the image.

    Using a text editor, create a preload-image batch file with the following content:

    ```
    @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
    ```

    For an explanation of the commands used in the preload-image batch file, see “Preload-Image Batch File” on page 156 and “FDISK.COM” on page 162.

    Important: The size of the primary partition cannot exceed 2048 MB (2 GB). For additional information about FDISK command-line arguments, maximum partition sizes, and maximum logical drive sizes, see “FDISK.COM” on page 162.

17. Save the preload-image batch file as:

    LCCM_install_dir\CLNTFILE\PRELOAD.LCP

18. Use a text editor to create a final-image batch file. The batch file will download the Windows 95 image to the client, replace the dummy values in the CLONE.REG file with parameters defined within

the LANClient Control Manager's Client Details notebook, and merge the CLONE.REG file back into Windows 95's Registry.

```
%LCCMPATH%\FORMAT %TARGET% < %LCCMPATH%\FORMAT.DAT
%TARGET%
CD \
%LCCMPATH%\PKUNZIP -d %LCCMPATH%\WIN95\WIN95.ZIP %TARGET%
%TARGET%
CD \
\LANCLI\DOSLFNBK %TARGET%\ /R
\LANCLI\DISKDOS /F=%TARGET%\LANCLI\W95BT /R=W /D=%TARGET%
\LANCLI\LCATTRIB %TARGET%\ /R /S
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%
%TARGT%\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%
```

19. Save the final-image batch file as:

    LCCM_install_dir\CLNTFILE\WIN95.LCI

20. At the Installation/Maintenance window of LANClient Control Manager, do the following:
    a. Select **Profile** from the menu bar.
    b. Select **Create New**. This opens the Software Profile Details notebook.

21. On the Details page:
    - Type `WIN95_Test` in the Profile Name field.

      Note: The remainder of this exercise refers to the software profile as WIN95_Test.
    - Click on the Hybrid radio button.
    - Type `Windows 95 Operating System` in the Description field.

22. On the Minimum HW page:
    - 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.
    - Type **0** in the RAM field.
    - Type **0** in the Hard Disk field.

23. On the Software page, use the browse button to find:
    - In the Preload Image File Name field:

      `PRELOAD.LCP`
    - In the Final Image File Name field:

      `WIN95.LCI`

    Ensure that the Enable Preload box is also selected.

24. On the Parameters page, set up the following parameter names:

```
Names         Values
=====         ======
DOMAIN        Type in the domain name
WORKGROUP     Type in the workgroup
NAMESERVER    Type in the machine's nameserver
IPMASK        Type in the IP mask
GATEWAY       Type in the default gateway
REGNAME       Type in the registered owner (network administrator)
```

Note: The values on this page are common for all clients using this profile.

25. On the Client Parameters page, set up the following parameter names:

```
Names         Values
=====         ======
COMPNAME      - Leave Blank -
IPADDR        - Leave Blank -
HOSTNAME      - Leave Blank -
PRODUCTID     - Leave Blank -
USERNAME      - Leave Blank -
```

Note: The names used on this page are passed to the Parameters page of the Individual Client Details notebook for each client assigned to this profile. For additional information about other special parameters, see “Parameter Exceptions” on page 85.

26. Select **OK** to save and close the notebook.
27. Assign the client to the new software profile, but DO NOT PROCESS THE CHANGES UNTIL INSTRUCTED TO DO SO IN A LATER STEP OF THIS EXERCISE. (For more information, see “Assigning Clients to Software Profiles” on page 93.)
28. Open the Individual Client Details notebook for the new client assigned to this image (See “Modifying an Existing Client” on page 96 for details.)
    a. On the Parameters page, setup the values for the following names:

```
Names         Values
=====         ======
COMPNAME      Type in the client's computer name
IPPADDR       Type in the client workstation's IP address
HOSTNAME      Type in the client workstation's network name
PRODUCTID     Type in the Windows 95 Product ID number
USERNAME      Type in the user's name
```

    b. Select **OK** to save and close the notebook.
29. Click on the **Process** button in the Installation/Maintenance window to begin processing.
30. Turn on the client workstation.

    If you used a preload-image batch file, the client hard disk is partitioned. Next, the hard disk is formatted, and the image is downloaded to the client hard disk and is customized for that specific client. The next time the client is started, it starts Windows 95 from its own hard disk.

    Additional clients can be assigned to the same profile. However, before processing the additional assignments, edit the Individual Client Details notebook for each new client and modify the Parameters page as described in this exercise.

Windows NT Workstation Image

There are two exercises in this section:

- To perform a Windows NT Workstation installation without additional application software see "Installing Windows NT Workstation Without Applications."
- To perform a Windows NT Workstation installation with additional application software see "Installing Windows NT Workstation With Applications" on page 139.

The benefit of maintaining control of the download and distribution process through LANClient Control Manager is the flexibility you gain by having the ability to pass individual client parameter values to the Windows NT UNATTEND.TXT file instead of using the Windows NT .UDF file for each individual client.

Installing Windows NT Workstation Without Applications

This exercise remotely installs a Windows NT Workstation image on a client workstation using a server running Windows NT Server software and LANClient Control Manager. Some experience with Windows NT Server is required to complete this exercise. Before starting this exercise, review the information in "Editing the Windows NT Workstation Answer File" on page 143.

Objective: This exercise:

- Sets up a client workstation
- Adds the client workstation to the LANClient Control Manager database
- Installs a Windows NT Workstation image on your server and sets up a Distribution Sharepoint
- Edits a Windows NT answerfile for unattended installation
- Creates a preload-image batch file to set up multiple partitions on the client hard disk (optional)
- Creates a customization batch file to pass personalized parameters to the answerfile
- Creates a software profile for the Windows NT Workstation image (including personalized parameter values)
- Assigns the client workstation to the software profile
- Modifies the Individual Client Details notebook for personalized parameter values
- Downloads the Windows NT Workstation image to the client workstation

Before you begin, you will need the following:

- A server attached to the LAN. The server must be configured with Windows NT Server software and either the server or another client workstation must have LANClient Control Manager already installed.
- The LANClient Control Manager Defaults notebook must be set up with the proper default information. (For details, see "Setting Specific Defaults Prior to Scanning" on page 73.)
- The Windows NT Workstation CD
- Two licenses for Windows NT Workstation
- A client workstation. This workstation must have a network adapter installed and meet the minimum hardware requirements to run Windows NT Workstation.
- Access to the *Windows NT Workstation Resource Kit* and documentation.
- The device driver diskette for the network adapter installed in the client workstation.

To install Windows NT without additional applications:

1. Install your client workstation and attach it to the LAN. (See “Installing New Client Workstations” on page 72 for details.)
2. Start LANClient Control Manager and scan for new client workstations. (See “Using the Scan Feature” on page 76 for details.)
3. Use the following procedure to copy the required files and directories from the Windows NT Workstation CD to the appropriate directory on your server. This will become your Distribution Sharepoint.

   a. From a command prompt, type:

      `CHDIR C:\LCCM_install_dir\CLNTFILE`

      where: *C:\LCCM_install_dir* is the drive and directory where LANClient Control Manager is installed.

      Then, press Enter.

   b. Type:

      `MKDIR WINNT40`

      Then, press Enter.

   c. Type:

      `MKDIR WINNT40\I386`

      Then, press Enter.

   d. Insert the Windows NT CD into the CD-ROM drive.

   e. Type:

      `XCOPY D:\I386\*.* C:\LCCM_install_dir\CLNTFILE\WINNT40\I386 /S /E /V`

      where: *D:* is the CD-ROM drive letter.

      Then, press Enter.

      Note: Only the files and directories from \I386 and below need to be copied from the CD.

      Important: The WINNT40 directory on your server is now the Windows NT Distribution Sharepoint for the software profile you will create in this exercise. Any other Windows NT Distribution Sharepoints that you create for use with LANClient Control Manager must also reside under:

      `C:\LCCM_install_dir\CLNTFILE\`

4. Use the following procedure to create the required directory structure for network adapter device drivers.

   Note: For IBM PC 300 GL workstations with integrated Ethernet (Crystal EtherStreamer subsystems), in place of steps 4 through 6, use the procedure on the LANClient Control Manager home page at:

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

   to update the answer file for unattended installation. Use the answer file UNATTEN1.TXT as a base file to work from and save it in the *LCCM_install_dir*\CLNTFILE directory as MYPROF.TXT. If the file UNATTEN1.TXT was not provided with your copy of LANClient Control Manager, you can download it from the World Wide Web at the address given above.

   a. Type:

      `CHDIR C:\`*`LCCM_install_dir`*`\CLNTFILE\WINNT40\I386`

      Then, press Enter.

   b. Type:

      `MKDIR \$OEM$`

      Then, press Enter.

   c. Type:

      `MKDIR \$OEM$\NET`

      Then, press Enter.

5. Create a sub-directory under the `\$OEM\NET` directory for each type of network adapter installed in the client workstations that will be receiving the image. You can give the sub-directories any name you want.

   Into each of the new sub-directories, copy the .SYS file and the OEMSETUP file for Windows NT from the network adapter device driver diskettes. Ensure you copy only the files that support Windows NT. For example, if your client is using an IBM Token Ring 16/4 Auto ISA Network Adapter, you must create a sub-directory under the OEM\NET directory to place the device driver for this adapter. Give the directory a recognizable name, such as \IBMTOK. Into the OEM\NET\IBMTOK directory, copy the following files from the \NT directory of the device driver diskette that was supplied with the adapter:

   - OEMSETUP.INF
   - IBMTOK4.SYS

   Note: For IBM PCI Token Ring and Intel 10/100 adapters, copy the following files into the sub-directories:

   - All .HLP files
   - All .DLL files

   Make a note of each network adapter type and the directory name you created for each network adapter. You will need this information in step 6c on page 135 of this exercise.

6. Edit the Windows NT answerfile, UNATTEND.TXT.

   Note: In the following steps, you will be modifying the Windows NT answerfile so you can perform unattended installations in your network environment. You will also assign specific character strings to certain fields within the answerfile so you can use LANClient Control Manager variables to personalize the image when it is downloaded. It is important that you have some basic working knowledge of editing answerfiles before performing the following steps. For details, see “Editing the Windows NT Workstation Answer File” on page 143.

To simplify this exercise, you will use a sample answerfile (UNATTEND.TXT) provided by LANClient Control Manager in the following directory:

C:\LCCM_install_dir\CLNTFILE

In an actual work situation, you might use one of the answerfiles (UNATTEND.TXT) provided by Windows NT and modify it as needed; for example, the one located in the directory:

C:\LCCM_install_dir\CLNTFILE\WINNT40\I386

a. Using a text editor, open the UNATTEND.TXT file located in the following directory of your server:

   C:\LCCM_install_dir\CLNTFILE

b. Locate the following fields:

```
[UserData]
OrgName = "dummy_Org"
Fullname = "dummy_Username"
ComputerName = dummy_Client
ProductId = dummy_Id

[Network]
JoinDomain = dummy_Domain

[IBMTOKParamSection]
NetworkAddress = dummy_Caddress
```

   Normally, you would have to edit the file and replace the default names for these parameters with "dummy" names. The sample file provided by LANClient Control Manager already has the dummy names in it. These dummy names will be referenced in the customization batch file that you will create in a later step. When the image is downloaded, the customization batch file will replace the dummy names with values that are unique to each individual client.

c. If your clients are using a network adapter or subsystem other than a Token Ring 16/4 Auto ISA Network Adapter or an integrated Crystal Ether Streamer subsystem, edit the answerfile to add the appropriate information.

   Note: The [SelectedAdaptersSection] and [adapter_directoryParamSection] sections relate directly to the network device driver directory you set up within your Distribution Sharepoint earlier in this exercise. Refer to “Editing the Windows NT Workstation Answer File” on page 143, and the *Windows NT Workstation Resource Kit* for additional information.

d. Name the file MYPROF.TXT and save it in the following directory:

   C:\LCCM_install_dir\CLNTFILE

   This file can have any name you want, but the extension must be .TXT. The name MYPROF.TXT will be used throughout the remainder of this exercise.

7. Create a preload-image batch file.

   Note: This step is required only if you want more than one partition on the client's hard disk. If a preload-image batch file is not used, Windows NT will use the client's entire hard disk as a single partition.

   a. Using a text editor, create a preload-image batch file that contains the following contents only:

```
@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
```

For an explanation of the commands used in the preload-image batch file, see “Preload-Image Batch File” on page 156 and “FDISK.COM” on page 162.

Important: The size of the primary partition cannot exceed 2048 MB (2 GB). For additional information about FDISK command-line arguments, maximum partition sizes, and maximum logical drive sizes, see “FDISK.COM” on page 162.

b. Name the file PRELOAD.LCP, and save it in the following directory:

C:*LCCM_install_dir*\CLNTFILE

Note: This file can have any name you want, but the extension must be .LCP. The name PRELOAD.LCP will be used throughout the remainder of this exercise.

8. Create a customization batch file.

Note: The following steps describe how to create a batch file that will use variables to replace parameters within the answerfile. By doing so, you can use the same answerfile with multiple clients and get customized responses for each individual client. The variables (%CNAME%, %USERNAME%, %PRODUCTID%, %DOMAIN%, and %CADDRESS%) used in the batch file correlate to the variables you will use in later steps when you create a Software Profile Details notebook and edit the Individual Client Details notebook. For a more detailed explanation, see “Editing the Windows NT Workstation Answer File” on page 143.

a. Using a text editor, create a customization batch file that contains the following contents only:

```
%TARGET%
%LCCMPATH%\DEDITD /R /NO %TARGET%\ANSW1.TXT dummy_Client %CNAME%
%LCCMPATH%\DEDITD /R /NO %TARGET%\ANSW1.TXT dummy_Username %USERNAME%
%LCCMPATH%\DEDITD /R /NO %TARGET%\ANSW1.TXT dummy_Id %PRODUCTID%
%LCCMPATH%\DEDITD /R /NO %TARGET%\ANSW1.TXT dummy_Domain %DOMAIN%
%LCCMPATH%\DEDITD /R /NO %TARGET%\ANSW1.TXT dummy_Caddress %CADDRESS%
%LCCMPATH%\DEDITD /R /NO %TARGET%\ANSW1.TXT dummy_Org %ORGNAME%
```

Note: When the answerfile is downloaded to the client, it is automatically renamed as ANSW1.TXT, regardless of what you actually named it. Therefore, within the customization batch file, the only valid name for an answerfile is ANSW1.TXT. The dummy names and the text within the % signs are case sensitive.

b. Name the file MYPROF.LCI and save it in the following directory:

C:\LCCM_install_dir\CLNTFILE

Note: This file can have any name you want, but the extension must be .LCI. The name MYPROF.LCI will be used throughout the remainder of this exercise.

9. At the Installation/Maintenance window of LANClient Control Manager, do the following:

a. Select **Profile** from the menu bar.

b. Select **Create New**. This opens the Software Profile Details notebook.

10. On the Details page:

- Type `Windows_NT_WS_Test` in the Profile Name field. This name is used throughout the remainder of this exercise.

- Click on the Hybrid-NT radio button.
- In the description field, type a description, such as:

  ```
  Windows NT Workstation Version 4.0
  No applications
  Includes customization
  ```

11. On the Minimum Hardware page:
    - Select **Any Adapter - Don't Care** from the drop-down menu of the Network Adapter field.
    - Select **Any Video - Don't Care** form the drop-down menu of the Video Chipset field.
    - Type **16** in the RAM field.
    - Type **300** in the Hard Disk field.
12. On the Software page, use the Browse button for each field to locate the following files:

    Note: Do not specify a name for the preload image file unless you actually created a preload-image batch file earlier in this exercise.

    - Preload Image File Name:

      servername\LANC$$\PRELOAD.LCP

    - Answer file:

      servername\LANC$$\MYPROF.TXT

    - Customization Batch File:

      servername\LANC$$\MYROF.LCI

    - Distribution Sharepoint:

      servername\LANC$$\WINNT40

13. On the Parameter's page, set up the following parameter names:

    ```
    Names       Values
    =====       ======
    ORGNAME     Type in the name of your company
                or organization
    ```

    Note: The values on the Parameters page are constants that are the same for all clients assigned to this profile.

14. On the Client Parameters page, set up the following parameter names and values

    ```
    Names       Values
    =====       ======
    USERNAME    - Leave Blank -
    PRODUCTID   - Leave Blank -
    DOMAIN      - Leave Blank -
    ```

    Note: The names and values assigned on this page are passed to the Parameters page of the Individual Client Details notebook for each client assigned to this profile. Although you used the values %CNAME% and %CADDRESS% in your customization batch file, you do not need to specify them on this page. %CNAME% and %CADDRESS% are special values that pick up the contents of the Name and Address fields from the Details page of each Individual Client Details notebook.

15. Click on the **OK** button to save and close the notebook.

16. Assign the client to the new software profile, but DO NOT PROCESS THE CHANGE UNTIL INSTRUCTED TO DO SO BY A LATER STEP IN THIS EXERCISE. (For more information, see “Assigning Clients to Software Profiles” on page 93.
17. Open the Individual Client Details notebook for the new client assigned to this image (For more information, see “Modifying an Existing Client” on page 96.)
    a. On the Parameters page, setup the values for the following names:

```
Names       Values
=====       ======
USERNAME    Type in a user's name.
PRODUCTID   Type in the Product Identification
            number from the Windows NT Certificate
            of Authenticity (COA).
DOMAIN      Type in the Domain to be used by the
            client workstation.
```

    b. Click on the **OK** button to save and close the notebook.
18. Click on the **Process** button on the Installation/Maintenance window.
19. Turn on the client workstation.

The primary partition of the client workstation's hard disk is formatted automatically, and the Windows NT Workstation image is downloaded to the hard disk of the client workstation. The next time the client workstation is started, it starts Windows NT Workstation from its own hard disk.

Additional workstations can be assigned to the same image. However, before processing the additional assignments, edit the Individual Client Details notebook for each new client and modify the Parameters page as described in this exercise.

Installing Windows NT Workstation With Applications

Objective: To remotely install Windows NT Workstation with application programs that are not part of Windows NT Workstation.

Before you begin:

- The procedures in this exercise use the SYSDIFF.EXE program provided with the *Windows NT Workstation Resource Kit.* Review the information in the *Windows NT Workstation Resource Kit* so that you are familiar with the SYSDIFF.EXE program.
- This exercise uses Lotus SmartSuite as the application programs. You can substitute other software. Make sure you have an adequate number of licenses for the application programs you intend to distribute.
- You will need two Windows NT Workstation licenses for each additional client workstation you add to the LAN in this exercise. Two licenses are needed during the download process. When the download is complete, only one license is required. You can minimize the number of required licenses by editing the Processing page of Defaults notebook to limit the number of clients that can download the image concurrently. See “Defaults Notebook - Processing Page” on page 38 for details.

To install Windows NT with additional applications:

1. Complete all of the steps in “Installing Windows NT Workstation Without Applications” on page 132.
2. After the Windows NT image has been downloaded to the client, test the client to ensure Windows NT is operating correctly. This client workstation will be referred to as the donor workstation throughout the remainder of this exercise.
3. Copy the SYSDIFF.EXE program from the *Windows NT Workstation Resource Kit CD* to the root directory of the donor workstation.
4. Create the SYSDIFF.INF file on the root directory of the donor workstation. This file is necessary for developing the base NT image file. It includes and excludes certain files and directories for the proper operation of SYSDIFF.EXE. The basic SYSDIFF.INF file is as follows:

```
[Version]
Signature = $chicago$
;
; General notes for file/dir exclusion sections:
;
; *: refers to all drives.
; ?: refers to the drive with the system on it.
; :: is substituted with %systemroot%
;

[ExcludeDrives]
;
; The first character on each line is the drive letter
; of a drive to exclude.
;
d
e
```

```
[ExcludeDirectoryTrees]
;
; Each line is a fully-qualified path of a tree to
; be excluded. The directory and all of its subtrees
; are excluded.
;
*:\recycled
*:\recycler

[ExcludeSingleDirectories]
;
; Each line is a fully-qualified path of a directory to be
; excluded. The directory's subdirs are NOT excluded.
;
::\system32\config

[ExcludeFiles]
;
; Each line is a fully-qualified path of a file to be excluded.
; If it does not start with x:\ then we assume it's a filename part
; for a file to be excluded wherever it is found.
;
*:\pagefile.sys
ntuser.dat
ntuser.dat.log

[IncludeFilesInDir]
;
; Each line in here is a fully qualified path of a directory
; whose files are all to be included in a diff (marked as
; added/changed). Use this if you want to include files in the diff
; that might not have actually been changed.
;

[ExcludeRegistryKeys]
;
; Each line indicates a single registry key to be excluded.
; Subkeys of this key are not excluded.
;
; The first field is one of HKLM or HKCU
; The second field is the subkey, which must NOT start with a \.
;

[ExcludeRegistryTrees]
;
; Each line indicates a registry key and subkeys to be excluded.
;
; The first field is one of HKLM or HKCU
; The second field is the subkey, which must NOT start with a \.
;

[ExcludeRegistryValues]
;
; Each line indicates a registry value entry to be excluded.
;
; The first field is one of HKLM or HKCU.
; The second field is the subkey, which must NOT start with \.
; The third field is the value entry name.
;
```

5. From the root directory of the donor workstation, run the SYSDIFF.EXE program using the following command:

   `SYSDIFF /SNAP NTBASE.DIF`

   This command takes a snapshot of Windows NT Workstation as it is currently installed on the donor workstation. NTBASE.DIF is the name used in this exercise for the file that will contain this snapshot.

   Ensure that the donor workstation is of the same general type as the destination workstations, and that the %SYSTEMROOT% is the same on both the source and destination, for example C:\WINNT40.

6. Install Lotus SmartSuite on the donor workstation.

7. From the root directory of the donor workstation, run the SYSDIFF program again using the following command:

   `SYSDIFF /DIFF NTBASE.DIF LOTDIF.DIF`

   This command creates a difference file called LOTDIF.DIF, which contains all of the files for Lotus SmartSuite including the initialization file settings and registry file settings.

   Note: This file can have any name you want, but the extension must be .DIF. The name LOTUS.DIF will be used throughout the remainder of this exercise.

8. At the server console, create a sub-directory called LOTUS under the OEM directory of your Distribution Sharepoint.

   *C:**LCCM_install_dir*\CLNTFILE\WINNT40\I386\OEM\LOTUS

   Note: This sub-directory can have any name you want. The name LOTUS will be used for this sub-directory throughout the remainder of this exercise.

9. Copy the LOTDIF.DIF file from the donor workstation to the LOTUS sub-directory in your Distribution Sharepoint.

10. Copy the SYSDIFF.EXE program from the donor workstation to the following directory:

    *C:**LCCM_install_dir*\CLNTFILE\WINNT40\I386

11. From the command line of your server's console, run SYSDIFF.EXE:

    *C:**path_1*\SYSDIFF /INF /M *C:**path_2*\LOTDIF.DIF *C:**path_3*\I386

    where:

    - *path_1* is *LCCM_install_dir*\CLNTFILE\WINNT40\I386\
    - *path_2* is *LCCM_install_dir*\CLNTFILE\WINNT40\I386\OEM\LOTUS\
    - *path_3* is *LCCM_install_dir*\CLNTFILE\WINNT40\

    SYSDIFF.EXE reads the .INF file and unpacks the contents according to the directory structure on the donor workstation. It creates two other files:

    - CMDLINES.TXT
    - LOTDIF.INF

    These are used when files are copied down to the client workstation. CMDLINES.TXT contains the command line that reads the LOTDIF.INF file and executes the file downloading process described by the LOTDIF.INF file.

12. Install one or more additional client workstations on the LAN. (For more information, see “Installing New Client Workstations” on page 72.)

13. Start LANClient Control Manager and Scan for new client workstations. (For more information, see “Using the Scan Feature” on page 76.)

14. Assign the clients to this software profile (Windows_NT_WS_Test), but DO NOT PROCESS THE CHANGE UNTIL INSTRUCTED TO DO SO BY A LATER STEP IN THIS EXERCISE. (For more information, see “Assigning Clients to Software Profiles” on page 93.)
15. Open the Individual Client Details notebook for each new client assigned to this image. (For more information, see “Individual Client Details Notebook” on page 44.)
    a. On the Parameters page, setup the values for the following names:

```
Names       Values
=====       ======
USERNAME    Type in a user's name.
PRODUCTID   Type in the Product Identification Number
            from the Windows NT Certificate of
            Authenticity (COA).
DOMAIN      Type in the Domain to be used by the
            client workstation.
```

    b. Click on the **OK** button to save and close the notebook.
16. Click on the **Process** button on the Installation/Maintenance window.
17. Turn on the client workstation.

The client workstation's hard disk will be formatted automatically and the Windows NT Workstation image (including Lotus SmartSuite) will be downloaded to the hard disk of the client workstation. The next time the client workstation is started, it will start Windows NT Workstation from its own hard disk.

Additional workstations can be assigned to the same image. However, before processing the assignment, edit the Individual Client Details notebook for each new client and modify the Parameters page as described in this exercise.

Installing NT with Service Pack 3

You cannot install Windows NT Service Pack 3 during an unattended installation process with the same procedures for adding applications. You may add Service Pack 3 alone or with other applications to NT with this procedure.

At the administrator's console:

1. Copy the Service Pack 3 compressed file, NT4SP3_I.EXE, into the sharepoint OEM directory.
2. Extract the compressed file within the OEM directory with the command line:

```
NT4SP3_I /x
```

3. Create or edit the CMDLINES.TXT file to include:

```
[Commands]
"update /u /z"
```

   Note: Be sure to contain the update command and options within quotation marks.
4. Edit your unattend.txt file to include the option:

```
[Unattended]
oempreinstall=yes
```

5. Install Windows NT through LCCM as usual.

For more information about Service Packs, consult the Microsoft Knowledge Base Website at:

`http://www.microsoft.com`

Editing the Windows NT Workstation Answer File

The instructions in this section give a walk through of editing the sample answer file supplied with LANClient Control Manager and the subsequent steps required to use the answer file with LANClient Control Manager. By following the steps in this section, you will be able to develop a fully functional unattended Windows NT Workstation installation process. The complete UNATTEND.TXT answer file supplied by the Microsoft Corporation has many more features than those discussed in this section. It is important that you read Chapter 2 and Appendix A of the *Windows NT Workstation Resource Kit*, produced by Microsoft Press, before continuing. The Resource Kit also has a utility program included (SETUPMGR.EXE), which allows you to fully customize the unattended answer file using a graphical user interface.

Note: The terms and conditions of the IBM Program License Agreement for LANClient Control Manager do not grant any license to install, copy, or use Windows, Windows 95, Windows NT Workstation, DOS, or any other program that is not part of LANClient Control Manager. Ensure that you have obtained suitable licenses for any software you use with LANClient Control Manager.

A sample answer file, UNATTEND.TXT, is supplied with LANClient Control Manager. You can find this file in the *LCCM_install_dir*\CLNTFILE directory. Use this answer file as a base template to work from. The information that typically needs to be modified is in sections such as `[UserData]` or `[Network]`. You must also include an `[adapter_directoryParamSection]` for each adapter you are using on your network. In the sample answer file provided, the `[IBMTOKParamSection]` will locate the client's network adapter device driver and information file in the directory:

`\`*`LCCM_install_dir`*`\CLNTFILE\WINNT4.0\I386\$OEM$\NET\IBMTOK`

where: *LCCM_install_dir* is the directory where LANClient Control Manager is installed.

The instructions for this are detailed in “Installing Windows NT Workstation Without Applications” on page 132.

Important: If you are working with clients that have not been attached to the Windows NT domain, LANClient Control Manager will automatically create a Computer Account for these clients. However, you must include the JoinDomain line in the Network section of the answer file for this to be possible. The Computer Account name created within Windows NT will be the same name as the client name used by LANClient Control Manager, for example CLNT_5.

There are other areas in the answer file that you might want to modify. These depend on the type of network you are running and the applications being used. The following steps give a walk through of the entire procedure.

1. Edit the answer file.
   a. Edit the sample answer file provided by LANClient Control Manager. You can use either a text editor or the utility program SETUPMGR.EXE supplied with the *Windows NT Workstation Resource Kit*, produced by Microsoft Press.
   b. Identify the parameters that you want to customize. (It might be possible for you to use the answer file using the dummy values already given).

c. Rename any additional parameters that you want to replace with variables, by changing the given parameter name to `dummy_`*`YourParameterName`*. Using this type of naming convention makes these parameters stand out from the rest, and standardizes the naming convention for variable parameters that will be used by LANClient Control Manager. Make all other required changes.

The full answer file provided by LANClient Control Manager is as follows:

```
; Sample NT Workstation Answer file for use
; with LANClient Control Manager.

[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 = "dummy_Org"
Fullname="dummy_Username"
Computername = dummy_Client
ProductId="dummy_Id"

[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 = dummy_Domain

[SelectedAdaptersSection]
ibmtok = IBMTOKParamSection, \$OEM$\NET\IBMTOK

[IBMTOKParamSection]
IOBaseAddress = 1
NetworkAddress = dummy_Caddress

[ProtocolsSection]
NBF = NBFParamSection

[NBFParamSection]

[ServicesSection]
```

Important: The following are important settings that must be used in the UNATTEND.TXT answer file in order to ensure that the installation can be completed without end-user intervention at the client:

```
[Unattended]
OemPreinstall = yes :  This needs to be set to yes if
                       you are installing, either new network
                       drivers, or applications and files that
                       are not part of the base NT.
OemSkipEula = yes :  This needs to be set to yes in order
                       to skip displaying the Microsoft end user
                       license agreement (EULA) section.
NoWaitafterTextMode = 1 :  This must be set to 1 so the
                       client automatically reboots after the
                       text mode setup and file copy.
NoWaitAfterGuiMode = 1 :  This must be set to 1 so the
                       client automatically reboots after
                       graphical user interface (GUI) setup.
```

d. Save the answer file using a new file name and a .TXT file extension. For the purpose of this discussion, we saved the answer file as:

   servername\LANC$$\MYPROF.TXT

   Important: If you intend to run LANClient Control Manager from a remote workstation, you must use the full UNC path when specifying files and directories within LANClient Control Manager, for example:

   *servername**sharename**directory**filename*

   The following share is automatically created by LANClient Control Manager to point toward *LCCM_install_dir*\CLNTFILE:

   servername\LANC$$

2. Create a customization batch file.

   a. Create a customization batch file that uses the DEDITD utility program provided with LANClient Control Manager (see “DEDITD” on page 160 for details). By using DEDITD commands in the customization batch file, you can replace parameters in the answer file with client-specific parameter values when the answer file is downloaded to each client. Parameter values are taken from the Software Profile Details notebook and the Individual Client Details notebook. In this way, you dynamically create a unique answer file for each client during the download process. Your customization batch file should look something like the following:

```
REM The unattended answer file UNATTEND.TXT (or whatever
REM file name you specify as the answer file in the
REM Software page) is automatically renamed as ANSW1.TXT
REM when it is copied down to the client.  You must
REM always specify the answer file file name as ANSW1.TXT
REM in this batch file when using the DEDITD.EXE utility.
REM During the remote-boot process, the client hard disk
REM and server hard disk are temporarily remapped.
REM The variable %TARGET% points to the client hard disk.
REM The variable %LCCMPATH% points to the server
REM LCCM_install_dir\CLNTFILE directory.
%TARGET%
%LCCMPATH%\DEDITD /R /NO %TARGET%\ANSW1.TXT dummy_Client %CNAME%
%LCCMPATH%\DEDITD /R /NO %TARGET%\ANSW1.TXT dummy_Username %USERNAME%
%LCCMPATH%\DEDITD /R /NO %TARGET%\ANSW1.TXT dummy_Id %PRODUCTID%
%LCCMPATH%\DEDITD /R /NO %TARGET%\ANSW1.TXT dummy_Domain %DOMAIN%
%LCCMPATH%\DEDITD /R /NO %TARGET%\ANSW1.TXT dummy_Caddress %CADDRESS%
%LCCMPATH%\DEDITD /R /NO %TARGET%\ANSW1.TXT dummy_Org %ORGNAME%
```

Important:

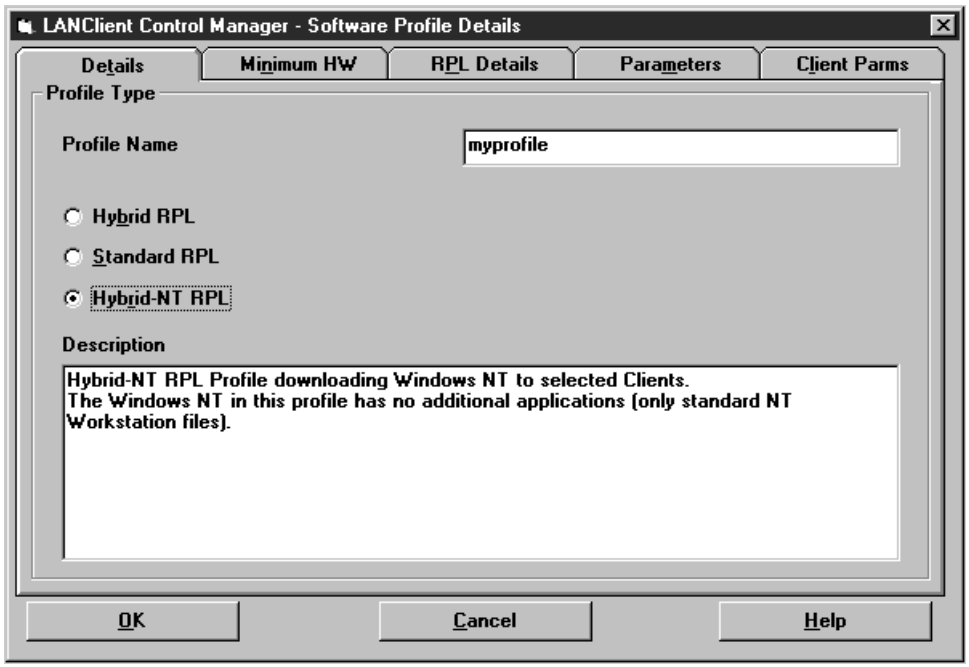
- The unattended answer file, UNATTEND.TXT (or whatever file name you specified as the answer file in the Software page of the Software Profile Details notebook), is automatically renamed as ANSW1.TXT when it is copied to the client. Therefore, you must specify the answer file name as ANSW1.TXT in the customization batch file.
- During the download process, the client hard disk and server hard disk are remapped. Within the batch file, use the following variables:
  - %TARGET% points to the primary partition of the client hard disk.
  - %LCCMPATH% points to the server *LCCM_install_dir*\CLNTFILE directory.
- There are three parameter exceptions that you do not have to specify within the Software Profile Details notebook or the Individual Client Details notebook. LANClient Control Manager automatically passes these special parameters during the download process to any batch files that have the following values specified:
  - %CNAME% will be replaced automatically by the client name.
  - %CADDRESS% will be replaced automatically by the client network address.
  - %CSERIAL% will be replaced automatically by the client workstation serial number. %CSERIAL% is not shown in the example answer file, but you can include it in your own answer file if you need to.

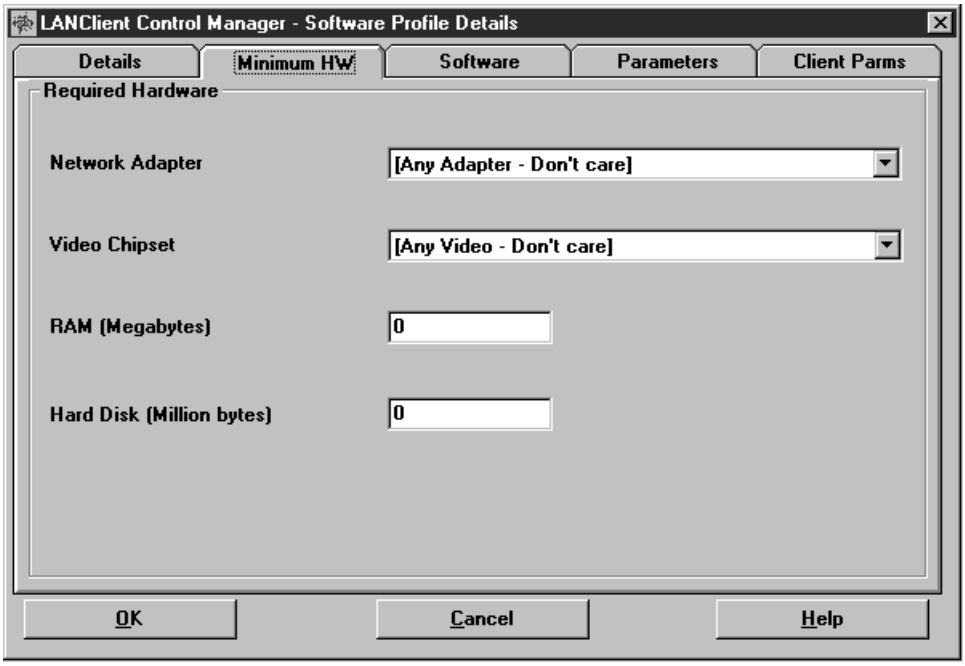
b. Save the file using a unique name and .LCI suffix. For the purpose of this discussion, we saved the customization batch file as:

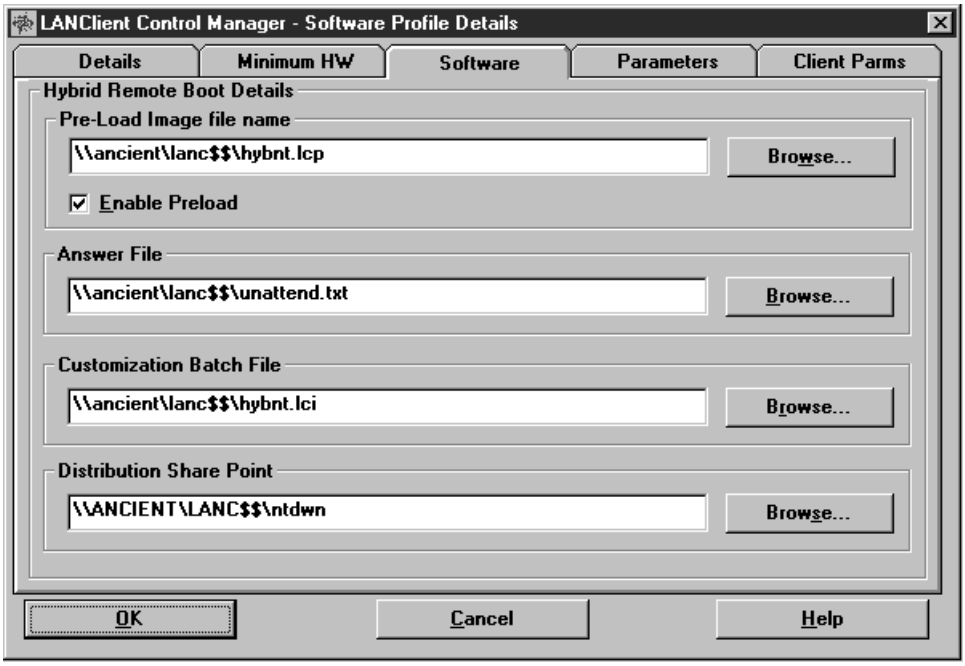
```
\\servername\LANC$$\MYPROF.LCI
```

3. Create a Hybrid-NT Software Profile.

a. From LANClient Control Manager, create a new Hybrid-NT Software Profile. Enter all required information in the Software Profile Details notebook. The following illustrations show an example of how to fill in each page.







Important:

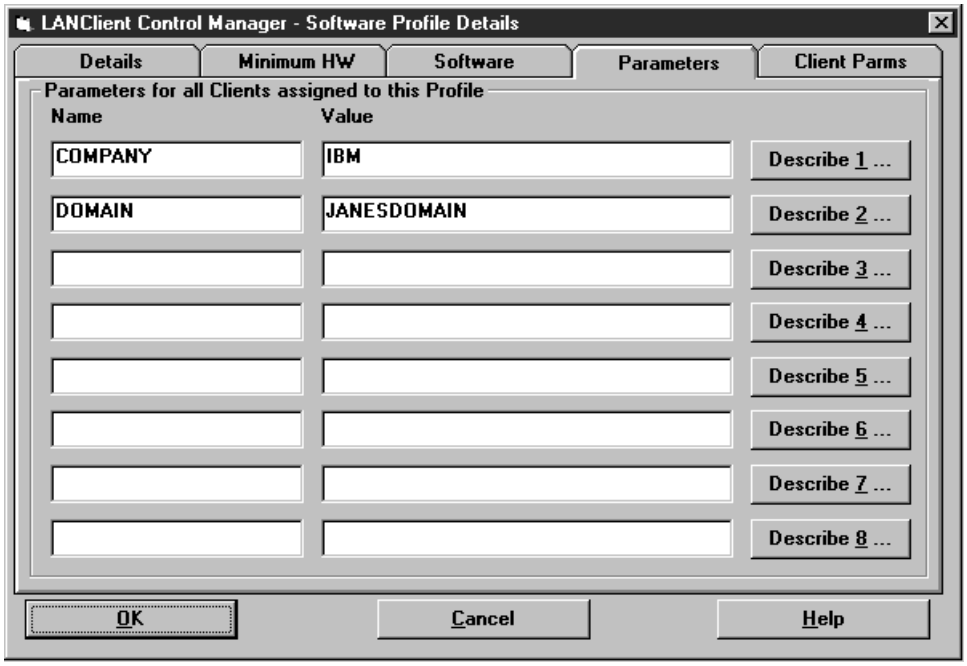
- The Distribution Sharepoint MUST ALWAYS be specified using the full UNC path:

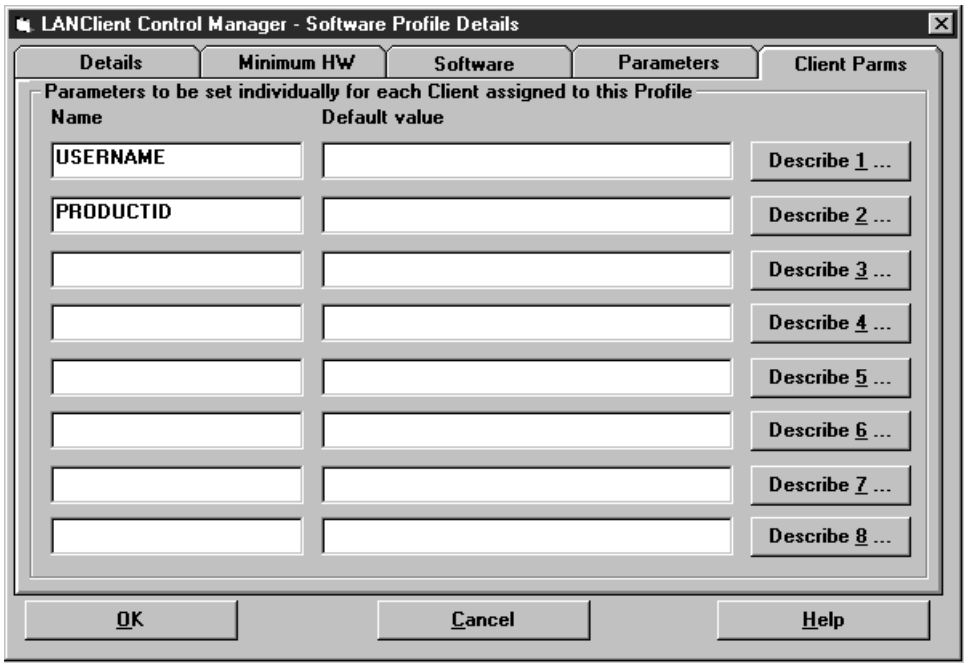
  servername\LANC$$*sharepoint*

  (where LANC$$ has been automatically mapped by LANClient Control Manager to point toward *LCCM_install_dir*\CLNTFILE). The Sharepoint directory must always reside under the \CLNTFILE directory.

- If you intend to run LANClient Control Manager from a remote workstation, you must also use the full UNC path for specifying all other files and directories (as shown in the answer file and customization batch file paths).

- The first stage of the Hybrid-NT download involves an automatic format of the client hard disk. If you want to partition the client hard disk in any configuration other than using the entire hard disk as a single partition, you must create a preload-image batch file (.LCP file) to do this. For information on creating two or more partitions on a client hard disk prior to the formatting procedure, see “Preload-Image Batch File” on page 156. If you create a preload-image batch file, you must specify the preload-image batch file name in the Preload Image File Name field on the Software page of the Software Profile Details notebook. Otherwise, leave the field blank as shown in the example screen.



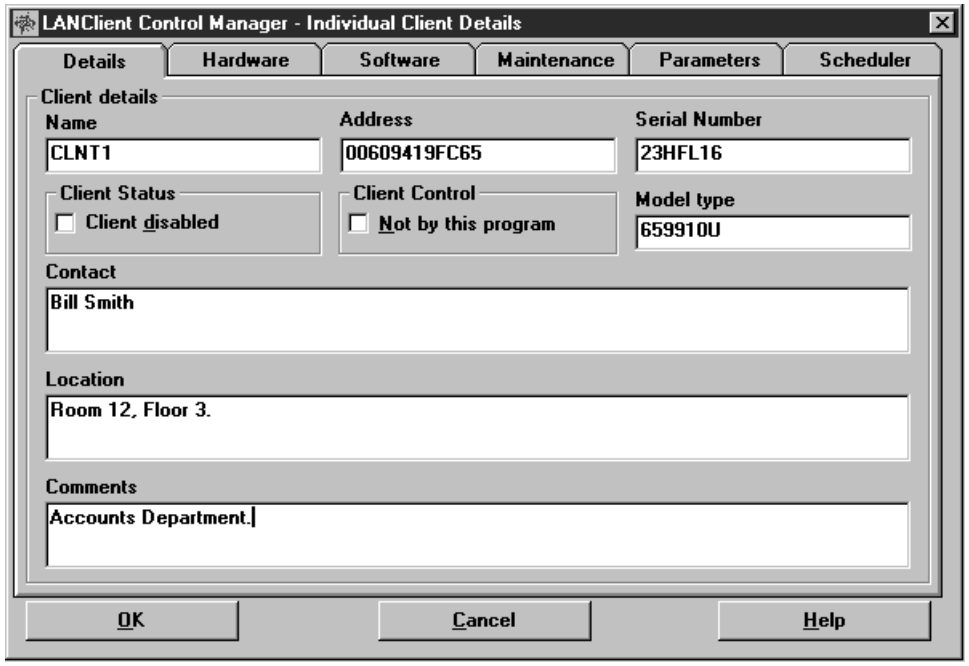


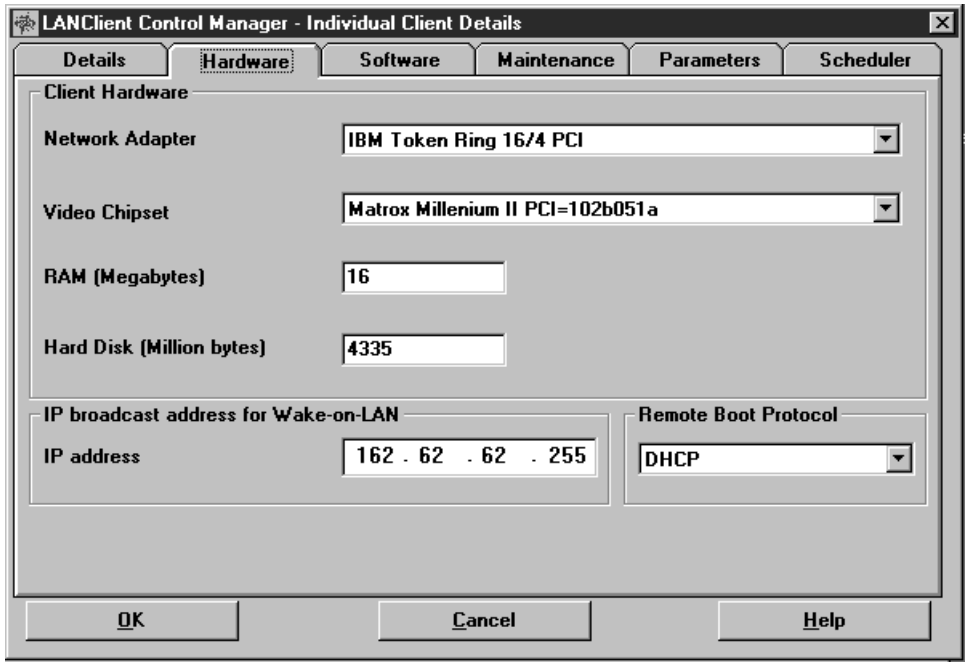
b. Save this new Software Profile by clicking on OK.

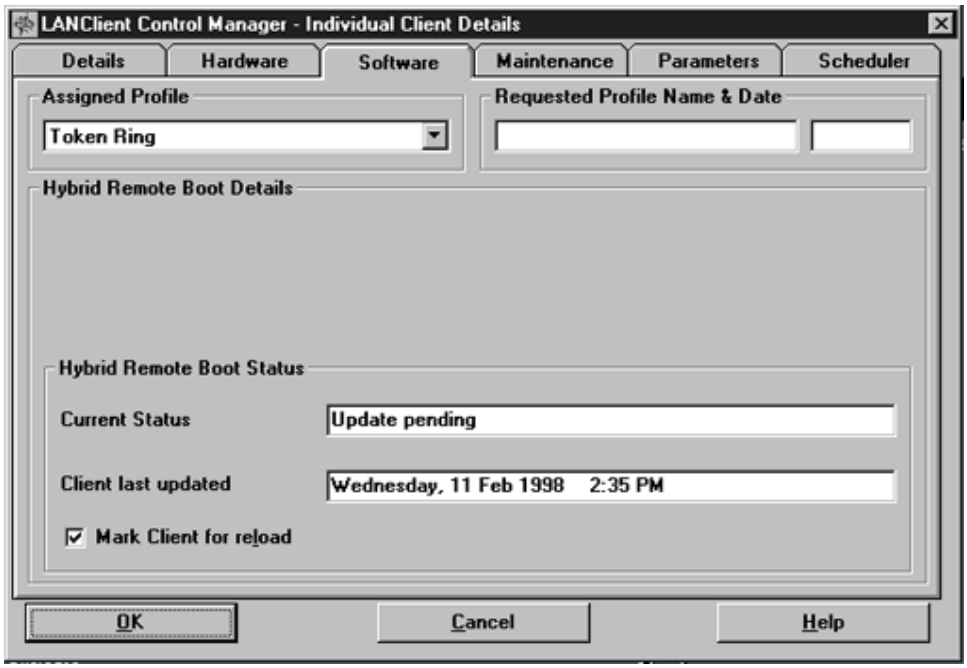
4. Assign the clients to the profile.

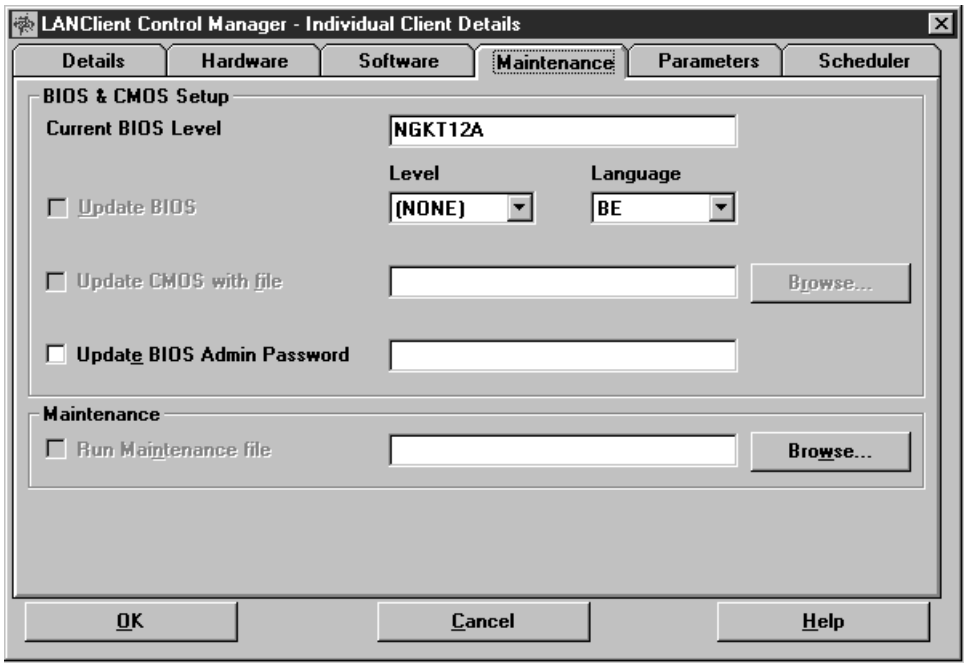
a. From LANClient Control Manager, assign clients to the new Software Profile, but do not process the change.

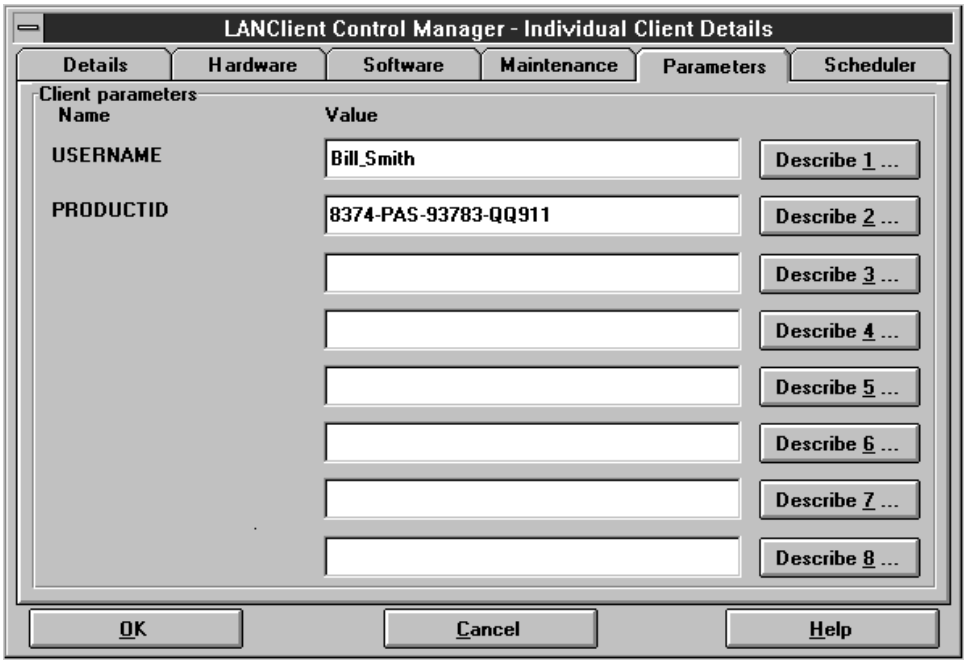
b. Open the Individual Client Details notebook for each new client assigned to the profile and enter all required information on the Parameters page and Scheduler page. The following illustrations show an example of how to fill in these pages.

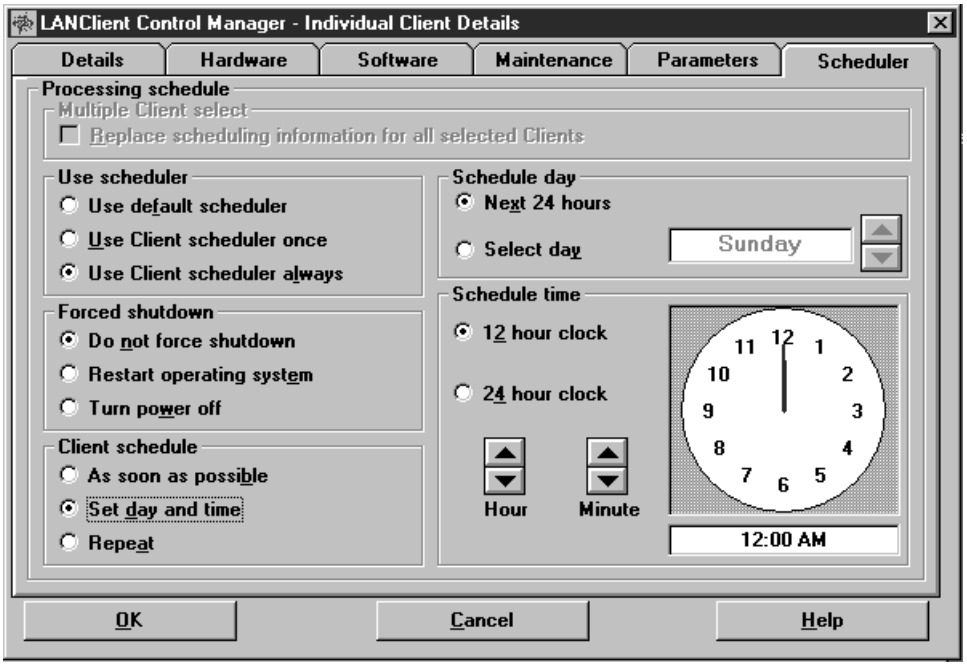





LANClient Control Manager - Individual Client Details
Details
Hardware
Software
Maintenance
Parameters
Scheduler
Assigned Profile
Token Ring
Requested Profile Name & Date
Hybrid Remote Boot Details
Hybrid Remote Boot Status
Current Status
Update pending
Client last updated
Wednesday, 11 Feb 1998 2:35 PM
Mark Client for reload
OK
Cancel
Help


LANClient Control Manager - Individual Client Details
Details
Hardware
Software
Maintenance
Parameters
Scheduler
BIOS & CMOS Setup
Current BIOS Level
NGKT12A
Level
Language
Update BIOS
(NONE)
BE
Update CMOS with file
Browse...
Update BIOS Admin Password
Maintenance
Run Maintenance file
Browse...
OK
Cancel
Help





As you complete each notebook, click on the **OK** button to save the changes.

5. From the Installation/Maintenance window, click on the **Process** button to begin downloading the Hybrid-NT remote-boot image to the selected clients.

The client hard disk will automatically be formatted at the first stage of this process.

The answer file (*servername*\LANC$$\MYPROF.TXT) is then downloaded to each client, where individual client customization takes place. Our given example would customize the answer file on CLNT_5 in the following manner:

```
[UserData]
OrgName = IBM
Fullname=TEST_USER
Computername = CLNT_5
ProductId=28395-OEM-0005187-69370

[Network]
InstallAdapters = SelectedAdaptersSection
InstallProtocols = ProtocolsSection
InstallServices = ServicesSection
JoinDomain = JANESDOMAIN

[IBMTOKParamSection]
IOBaseAddress = 1
NetworkAddress = 08005AD2B118
```

The Hybrid-NT remote-boot image will then be copied down to the client. After the setup process has completed the client workstation will automatically restart.

Chapter 6. Example Files

Introduction

The files in this section are provided as examples that can be used with LANClient Control Manager. You can also find these examples in the exercises section of this guide.

Comments 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. Comments are marked by REM statements.

Backup Batch File - DOS/Windows Image

```
REM  Your donor workstation should be connected to the
REM  network and server where LANClient Control Manager
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 workstation
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  workstation using LCATTRIB.EXE.

%TARGET%
CD \
\LANCLI\LCATTRIB %TARGET%\ /R /S
```

Backup Batch File - Windows 95 Image

```
REM  Your donor workstation should be connected to the
REM  network and server where LANClient Control Manager
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.EXE.
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 workstation 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 2 GB 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 DHCP
REM  or RPL environment.  The RPL environment requires the
REM  use of INTER.EXE; the DHCP 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 LANClient Control Manager. These files are automatically downloaded to the client during the Hybrid remote-boot process. To create additional partitions, or a partition of a different size, see “FDISK.COM” on page 162 for variations of the FDISK command-line arguments.

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's *LCCM_install_dir*\CLNTFILE directory is mapped as C:\LCCM. To minimize the confusion associated with drive mapping, LANClient Control Manager has two built-in variables for use in the final-image batch file:

- %LCCMPATH% points to the server *LCCM_install_dir*\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  workstation, 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 workstation
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 workstation 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  "Passing Parameters to Image Batch Files" on page 83.

%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_install_dir\CLNTFILE directory.

REM  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%
```

Chapter 7. Utilities Provided with LANClient Control Manager

Utilities Used in Image Batch Files

All of the utilities described in this section, with the exception of FDISK, are found in the *LCCM_install_dir*\CLNTFILE directory.

DEDITD

Objective: To use the DEDITD.EXE utility that replaces, inserts, or appends strings within text files.

The syntax of the command is:

```
DEDITD /I[L]A | /I[L]B | /R | /AE | /AS [/Nnumber] target [search] replace
```

Options for the command are:

```
/IA|B      Insert after, before search
/ILA|B     Insert in the line after, before search
/R         Replace search with target throughout the file
/AE|S      Append replace to a line at the end or start of the file
/N         Perform an action
           (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
```

For 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 LOADHIGH LOAD
```

DISKDOS.EXE

Objective: To 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]
```

Options for this command are:

```
/V              For debug output
/F=filename     File to read/write from/to
/D=drive letter Logical drive to read/write
/R=R|W          R for read, W for Write
```

DOSLFNBK.EXE

Objective: To use the DOSLFNBK utility to back up and restore Windows 95 long file names so that DOS archive programs can save and restore Windows 95 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]
```

Options for the command are:

```
/F file name    Back up to this file (default .LFN extension)
/L              List contents of backup file
/R              Restore from existing backup
/S directory    Skip directory
/V              Give running status report
/D file name    Write a detailed debugging log to file name
```

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.

LCATTRIB.EXE

Objective: To back up and restore 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 present working directory. Restore them on your donor workstation after transporting the image. Restore them on the target client workstation after the image has been received.

The syntax for the command is:

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

Options for the command are:

```
directory       Full path of directory to start from
/S              Recurse sub-directories
/A              Alter file attributes
/R              Restore file attributes
```

For example, to back up the attributes for drive C, type:

```
LCATTRIB C: /A /S
```

To restore attributes for drive C, type:

```
LCATTRIB C: /R /S
```

LCBTRDEL.EXE

Objective: To 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.

The syntax of the command is:

```
LCBTRDEL n /S
```

where n is the disk drive number and /S is a *safety* flag to prevent accidental use.

After using LCBTRDEL.EXE, you would normally call FDISK.

FDISK.COM

The FDISK command is used to partition a hard disk and prepare it for a format operation. When using FDISK, you should 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. For more details, see "LCBTRDEL.EXE."

Note: LANClient Control Manager is currently restricted to managing client workstations 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 LANClient Control Manager can be used with command-line arguments or a response file. For information about creating, using, or modifying a response file, see "Response Files for the FDISK Command" on page 163. Using command-line arguments is the preferred method because it provides more flexibility and can provide standardized partition sizes regardless of the hard disk capacity.

FDISK Command-Line Arguments

You can use DOS FDISK command-line arguments in LANClient Control Manager 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]
```

The options 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 workstation regardless of the hard disk capacity.

Note: Be aware that the LCBTRDEL utility program provided with the LANClient Control Manager 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.

In the following examples, the lines in the batch files that are shown in bold type are the FDISK command lines. The batch file is designed to work in both a RPL and DHCP environment. The INTER.EXE command is required in the RPL environment, but not in the DHCP environment. LANClient Control Manager determines the environment and uses the appropriate FDISK command line.

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:

```
@echo off
%LCCMPATH%\LCBTRDEL 0 /S
IF "%CDWNTYPE%"=="0" GOTO RPL
%LCCMPATH%\FDISK 1 /PRI:2048  /EXT:2048 /LOG:2048
GOTO NEXT
:RPL
%LCCMPATH%\INTER.EXE %LCCMPATH%\FDISK 1 /PRI:2048 /EXT:2048 /LOG:2048
:NEXT
```

If you use this same preload-image batch files on a client workstation with a 3GB hard disk, the result would be a 2GB primary partition and a 1MB 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 2 logical drives (2GB and 1GB respectively).

Your preload-image batch file (.LCP file) would look like the following:

```
@echo off
%LCCMPATH%\LCBTRDEL 0 /S
IF "%CDWNTYPE%"=="0" GOTO RPL
%LCCMPATH%\FDISK 1 /PRI:2048  /EXT:3076 /LOG:2048
%LCCMPATH%\FDISK 1 /LOG:1024
GOTO NEXT
:RPL
%LCCMPATH%\INTER.EXE %LCCMPATH%\FDISK 1 /PRI:2048 /EXT:3076 /LOG:2048
%LCCMPATH%\INTER.EXE %LCCMPATH%\FDISK 1 /LOG:1024
:NEXT
```

Response Files for the FDISK Command

Two response files are provided by LANClient Control Manager 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 workstation hard disk is 4 GB 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 2 GB.

- 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 you just have to 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 LANClient Control Manager 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 workstation. 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 like 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 through the World Wide Web at:

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

Response File for the FORMAT Command

The FORMAT command can be used to define areas of the hard disk which can receive and store data. A response file is provided with LANClient Control Manager 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.

The following example is the sequence of responses found in the FORMAT.DAT file:

```
y ENTER      Format existing partition
ENTER        No volume label assigned
```

There are no recommended variations to this response file.

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 DEDITD utility. LCCUSTOM is more powerful than DEDITD, in that it can not only substitute the environment variables of a batch file based on parameters supplied from LCCM Client and Profile parameter pages, but it can also also substitute environment variables from parameters stored in a text file (which DEDITD cannot do).

Variables within files must be enclosed within '%' characters, 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]
```

The options 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, keep in mind that:

1. A value set in variable_file takes precedence over a value for the same variable SET in the DOS command line environment.
2. 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 Answerfile.
3. LCCUSTOM can replace DEDITD for the most common purposes replacing all occurrences of a parameter with its value throughout a file. DEDITD may still be required for more specialized file modifications.
4. LCCUSTOM does not use the current directory for work files, so can be run from a read-only directory.
5. LCCUSTOM modifies 1 line at a time. The maximum line length is 8Kb. Lines that are longer than 8Kb may not be fully converted.

Example: Use LCCUSTOM to edit the Windows NT Unattended Install Answerfile

1. Edit the answerfile to include environment variabels.

```
; Sample NT Workstation Answerfile for use
; with LANClient Control Manager.

[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.DAT.

```
SET COMPANY=IBM
SET PRODUCTID=AG94949-87243
SET DOMAIN=AMD0012
```

Note: You can still use the parameters pages of the Software Profile and Individual Client Details notebooks to enter parameters for the client. These will be placed into the DOS environment by LCCM at image download time and will be swapped within batch files by the LCCUSTOM utility, in a similar manner to DEDITD. Remember too, that 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 answerfile is always renamed as ANSW1.TXT, therefore you must use this name as the output filename in your batch files. Save the batch file below using a unique name, within the *LCCM_Install*\CLNTFILE directory. Specify this batch file as the final image batch file for you required Hybrid-NT Remote-boot profile.

   ```
   SET USERNAME=JOHN_SMITH
   %LCCMPATH%\LCCUSTOM %LCCMPATH%\UNATTEND.TXT %TARGET%\ANSW1.TXT %LCCMPATH%\LCCM_NT.DAT
   ```

   The above batch file would create the file ANSW1.TXT, from the UNATTEND.TXT file, with the following lines modified using LCCM_NT.DAT:

   ```
   [UserData]
   OrgName = IBM
   Fullname=JOHN_SMITH
   Computername = CLNT_10
   ProductId=AG94949-87243

   [Network]
   InstallAdapters = SelectedAdaptersSection
   InstallProtocols = ProtocolsSection
   InstallServices = ServicesSection
   JoinDomain = AMD0012

   [IBMTOKParamSection]
   NetworkAddress = 006094A5BBBB
   ```

LCPNPSN.EXE

Objective: To identify and flag Plug'n'Play serial numbers in the Windows 95 exported registry of the donor workstation and substitute the correct Plug'n'Play serial numbers on the target client workstation.

Windows 95 identifies each Plug'n'Play adapter by its serial number and PnP ID. When an image is transported from a donor workstation to the server, then transported to a target client workstation, Windows 95 identifies each Plug'n'Play adapter installed in the target client workstation 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 workstation for a Plug'n'Play network adapter, Windows 95 does not transfer this setup to the network adapter installed in the target client workstation.

To remedy this problem, you must use the LCPNPSN utility program. LCPNPSN is run on the donor workstation to identify and flag serial numbers in the Windows 95 registry, then run on the target client workstation to substitute the correct serial numbers in the registry.

To read the Plug'n'Play serial numbers on the donor workstation, the syntax of the command is:

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

where S is the *save* attribute and *filename* is the name of the exported registry.

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 %LCCM*pnpid*, where *pnpid* is the first 7 hexidecimal digits of the PnP ID. The last digit is dropped.

To substitute the Plug'n'Play serial numbers on the target client workstation, the syntax of the command is:

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

where R is the *restore* attribute and *filename* is the name of the exported registry.

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 workstation. The program then searches the exported registry for the string %LCCM*pnpid* and replaces the string with the serial number that corresponds to the PnP ID.

AIAREAD.EXE

Objective: To use the AIAREAD.EXE utility to output 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 workstation.

Note: This utility will work only with IBM client workstations that are RFID/AIA enabled.

The syntax of the comman is:

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

Options for the command are:

```
group   The name of the device group.
field   The name of the field to read (default is all fields).
file    Name of file to output results to (default is stdout).
/a      Append the file (default is overwrite file).
/s      Output formatted as SET statements. e.g.. '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 workstation.

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
```

AIAWRITE.EXE

Objective: 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 workstation.

Note: This utility will work only with IBM client workstations that are RFID/AIA enabled.

The syntax of the command is:

```
AIAWRITE group field1=[value1]..[fieldn=[valuen]]]/f=file,
```

Options 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    Name of file to get field/value pairs from.  Each line in
        this file contains one field/value pair, separated by '='.
```

Other Utilities

The utilities provided in this section can be found in the LCCMTEMP\UTILS directory.

WATCHDOG.EXE

There might be circumstances where LANClient Control Manager clients encounter problems in completing a download from the server. Typically, this happens when a client has started to scan, and the scan is stopped at the server before the client has completed the scan process. This can also happen during the execution of a software profile download if processing is stopped or another server error occurs. In these circumstances, the client is stopped at an error condition, and manual intervention would normally be required.

To recover from these situations, a utility is provided by LANClient Control Manager that performs a *watchdog* type function for the client.

The watchdog program reboots the client after the default time (3 minutes) has expired. The default time can be overridden by issuing a command within any batch file used by LANClient Control Manager.

The watchdog utility consists of two programs:

- WATCHDOG.EXE

  A DOS-device driver that monitors the timer and reboots the client when the timeout expires. The driver sets an initial timeout value of 3 minutes.

- WDSET.EXE

  A DOS program that sets a new value in minutes for the timeout period of the watchdog timer.

To use the watchdog utility under the Windows NT platform, you must add the following line to the end of the DOSBB.CNF file for each adapter that you are using.

```
DRV  BBLOCK\WATCHDOG.EXE
```

Place the WATCHDOG.EXE file in the directory *RPL*\BBLOCK, where *RPL* is the directory that the Remoteboot service was installed to.

Place the WDSET.EXE file in the *RPL*\RPLFILES\BINFILES\IBMDOS7 directory.

WINWAKE.EXE

Objective: To power on clients remotely using Wake on LAN.

WINWAKE.EXE is a standalone 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 workstation 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 [...]]
```

Options for the command are:

```
address1, address2, ...    12 hexadecimal digit MAC addresses
delay                      Delay between transmission of packets in
                           milliseconds (default is 1 ms.)
filename                   INI file containing MAC addresses
```

The INI file can contain individual MAC addresses and ranges of MAC addresses. Individual MAC addresses are specified one per line, at the beginning of the line as follows:

```
001122334455
```

Ranges of MAC addresses are specified by their beginning and ending addresses as follows:

```
001122334455-001122334466
```

A sample WAKEUP.INI file is provided with WINWAKE.EXE.

IDVIEW.EXE

Objective: To identify Plug'n'Play and PCI devices in a specific client workstation.

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

To run the program, type `IDVIEW` at a DOS prompt, then press **Enter**.

The program displays any Plug'n'Play or PCI devices that it detects. The following is an example of the output.

```
PCI Vendor/Device ID     Card Class
---------------------------------
 80867030                Host/PCI Bridge
 80867000                PCI/ISA Bridge
 101300B8                VGA Compatible Controller

PnP ID's Detected
-----------------
0E63E93
244D000
```

Appendix A. Assistance

LCCM Support Form

Support for IBM LANClient Control Manager is provided via e-mail for registered users only. Response time varies on support queries. You may access the support form through your web browser at this IBM website:

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

LCCM Users Forum

For new and advanced users of LCCM, an LCCM Forum website is available. This Forum is monitored by IBM personnel and will discuss and answer many of the common questions relating to LCCM and its implementation. The Forum is accessible from the LCCM home page at:

`http://www.pc.ibm.com/us/desktop/lccm/`

Appendix B. Notices and Trademarks

Notices

References in this publication to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Subject to IBM's valid intellectual property or other legally protectable rights, any functionally equivalent product, program, or service may be used instead of the IBM product, program, or service. The evaluation and verification of operation in conjunction with other products, except those expressly designated by IBM, are the responsibility of the user.

IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
500 Columbus Avenue
Thornwood, NY 10594
U.S.A.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact IBM Corporation, Department 80D, P.O. Box 12195, 3039 Cornwallis, Research Triangle Park, NC 27709, U.S.A. Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

Trademarks

The following terms are trademarks of the IBM Corporation in the United States or other countries or both:

IBM	LANClient Control Manager
IntelliStation	Streamer
Netfinity	Wake on LAN

Microsoft, Windows, Windows NT, and MS are trademarks or registered trademarks of Microsoft Corporation.

Intel is a trademark or registered trademark of Intel Corporation.

Other company, product, and service names may be trademarks or service marks of others.

Index

F

H

I

L

M

N

T

U

V

W

Printed in U.S.A.

March 1998

G10L-9830-0