NCD

NCBridge
Software

Windows NT Installation and Configuration Manual

Version 4.0

ii

Certifications

UL 1950, CAN/CSA C22.2 No. 950, IEC 950, FCC Class A, EN55022 (class A), EN50082-1, EN60950, C-Tick, VCCI, MPR II (monitors only), CE, Energy Star Compliant (both monitor and logic unit).

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Preface

This manual presents installation and configuration information for NCD NCBridge software and network computers. It is written for system and network administrators responsible for installing network computers in a distributed-computing environment. The procedures in this manual assume familiarity with:

- The operating system and administration of the intended host computer.
- The network protocols and concepts related to the local-area network (LAN).
- The X environment, including window managers and display managers.

The following conventions and terminology are used in this manual.

- *Pointing*:   Using the mouse to position the pointer on an object on the display.
- *Moving:*   Using the mouse to change the location of the pointer on the display.
- *Clicking:*   Pressing and releasing a mouse button without moving the pointer.
- *Dragging*:   Pressing and holding down a mouse button while moving the pointer.
- *Releasing:*   Releasing the mouse button to complete a *dragging* action.

Figure 1 on the next page illustrates the typographical conventions used in this manual.

Preface

Figure 1 Typographical Conventions

Map to the NCBridge Documentation

Table 1 presents the contents of the manuals in the NCBridge Network Computer Documentation set. These manuals are included on the *Documentation CD-ROM*.

Table 1 Available NCBridge Documentation

Manual Title	Contents
NCBridge User Manual	Provides information on using the network computer with NCBridge software.
NCBridge Reference Manual	Provides explanation of all NCBridge, Setup Main Menu, and Boot Monitor commands; plus Diagnostics, SNMP, Tek220 and Tek340 Emulators, Printing, Keyboard, CSLIP, and Scripting Language setup.
3270 User Manual	Provides information on using the OpenConnect 3270 emulator.
3270E/5250 User Manual	Provides information on using the TEEMX 3270E/5250 emulators.
NCBridge for UNIX Installation and Configuration Manual	Provides information for installing NCBridge on a UNIX server and explains how to configure the network computer to download and execute the NCBridge software.
NCBridge for VMS Installation and Configuration Manual	Provides information for installing NCBridge on a VAX VMS server and explains how to configure the network computer to download and execute the NCBridge software.
NCBridge for Windows NT Installation and Configuration Manual	(This manual) provides information for installing NCBridge on a Microsoft Windows NT server and explains how to configure the network computer to download and execute the NCBridge software.

System or Network Administration manuals for your computer are also helpful for looking up additional options, subnet masking, and broadcast addresses.

Discontinued Software Features

As NCD continues to add new features to make your NC hardware more valuable, we are forced to discontinue support for some of the older software features. The following is a list of features that were supported in NCBridge 3.2 and earlier software releases, but are not supported in NCBridge 4.0.

- Serial Xpress

- Local OpenLook Window Manager

- X Blink Extension

- Local 3179G Terminal Emulator

- Sun Audio Intercept Driver for Sun OS Environments

- XIE

- SIE

- Display PostScript and Acrobat Reader

- Flash Control Console Client

- Support for XP10 X terminals

Serial Xpress

Serial Xpress enabled a NC or X terminal to connect to a remote host and transmit X Windows data over an RS-232 cable, or indirectly over a phone line using modems. The NC can now be connected using PPP over an RS-232 connection, or connected to a DSL or ISDN connection using the standard network port to provide remote access to a host replacing the need for Serial Xpress.

Local OpenLook Window Manager

The local OpenLook window manager (OLWM) is a window manager for the X Window System that implements parts of the OPEN LOOK graphical user interface, original developed by Sun Microsystems, Inc. This feature was previously provided to allow the OLWM program to run as a local client on the Network Computer (NC) to help off load server resources. The OLWM window manager is still supported on the NCs under X Windows by simply running OLWM directly from a Sun host. OLWM is one of the standard window managers on Sun's Workstation products running Solaris. NCs still offer Local Motif (MWM) or (XPWM) window managers to use in place of OLWM where a local window manager is necessary.

Local 3179G Terminal Emulator

The local 3179G Terminal Emulation is no longer included. The local IBM 3179G Terminal Emulation included IBM3720 support along with special IBM Graphics functions (GDDM), including support for older IBM host graphics applications. The NC still offers support for IBM3270 Emulation.

Pieces of the Puzzle

Configuration is the key to the successful integration of network computers into your environment. System configuration is represented as a puzzle: each piece must be completed and integrated before the entire system configuration is complete. The configuration puzzle is illustrated in Figure 2.

Throughout this manual, the individual puzzle pieces are used to visually guide you through the system configuration process. As you complete each piece, you are one step closer to a centralized system. When the puzzle is complete, you have created a custom environment tailored to your computing resources, your applications, and your users' requirements. As an added bonus, the system is centrally administered, easy to maintain, and has the flexibility to adapt to your changing computing needs.

Chapter 1, *Installing the Software*, is the first step in the configuration process. This chapter describes how to load the network computer software onto your computer.

Chapter 2, *Making Choices*, helps you analyze your environment and select the best methods to configure your network computers and your environment. Strategies for using a centralized configuration, integrating additional network computers, and using Flash memory are also included.

Chapter 3, *Supporting a Centralized System*, provides the host specific procedures you need to implement your configuration decisions you made in Chapter 2. Refer to Chapter 2 for information on which procedures to perform.

Chapter 4, *Local Clients*, provides information about starting and using the NCBridge local clients. Local clients execute on the network computer instead of the host, thus reducing network traffic.

Chapter 5, *Window Managers*, provides information about the local window managers; Motif Window Manager, and XpressWare Window Manager.

Chapter 6, *Using Additional Fonts*, describes the procedures and utilities necessary to make your fonts available to the network computer.

Chapter 7, *Troubleshooting*, describes debugging methods and solutions to help troubleshoot your configuration.
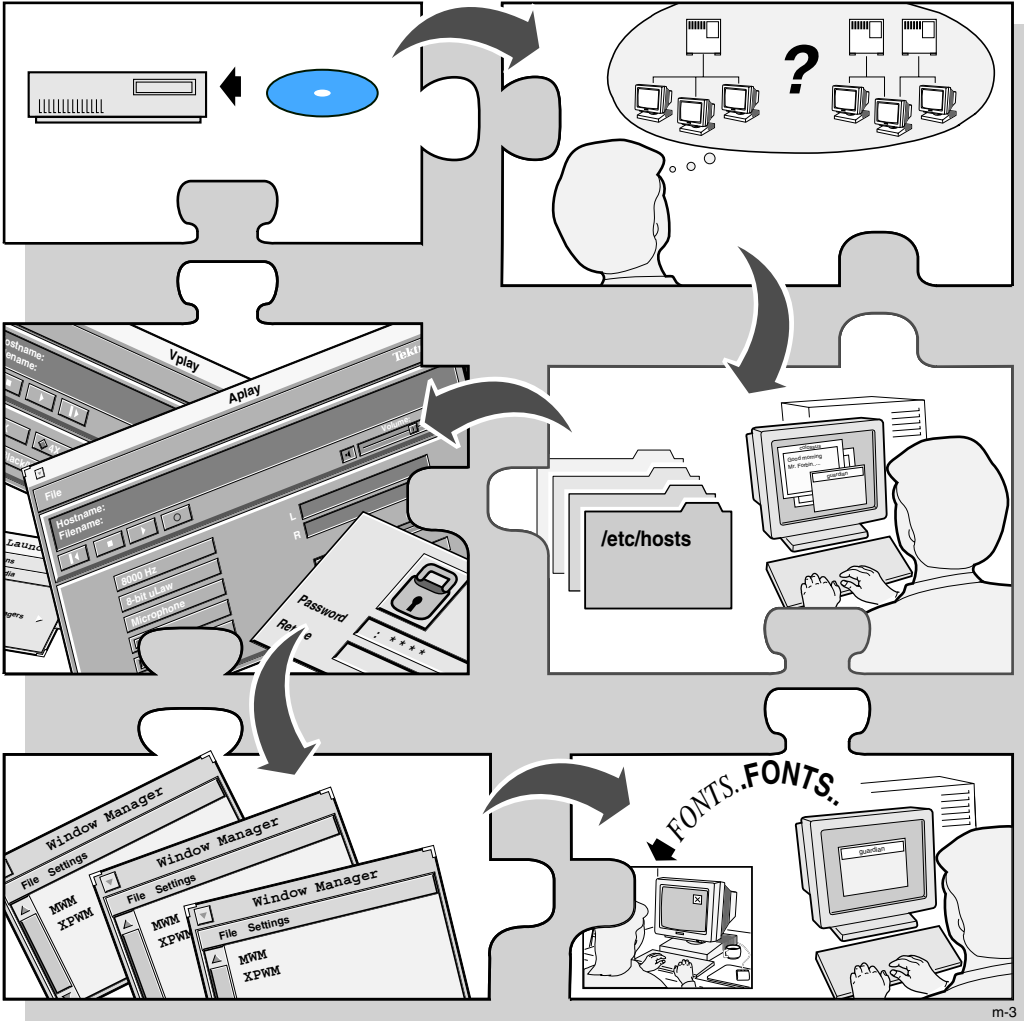
Figure 2 The System Configuration Process

Preface

Chapter **1**

Installing the Software
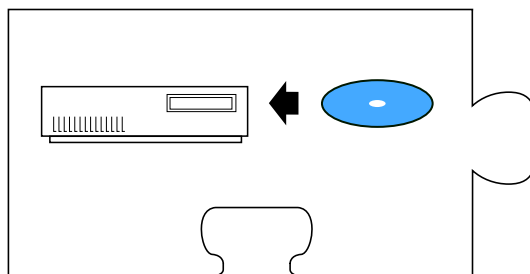
The first step is to install the network computer software on one or more hosts. The network computer plugs directly into the network, so you can install the software on one host or distribute it across different hosts on the same network.

The media contains all of the files you need to boot and configure your network computers. With *SETUP.EXE,* you can install everything or select only the files you need for your environment.

> *Note: You must be logged in as administrator to perform an installation. Refer to your NT documentation for information on setting up the administrator account to preserve file permissions. The administrator should have read, write, and execute privileges, but others only have read and execute.*

This chapter provides a quick-start list. The chapters that follow present detailed installation information.

Quick Start

The following steps provide an overview describing how to install NCBridge on the host and to configure an NC for operation. Details can be found in the remainder of this manual. Also see the *NCBridge Reference Manual* for more information.

NCBridge Installation

1. Log onto installation host.

2. Double-click on the My Computer icon on the desktop. An icon representing the CD-ROM should be present.

3. Insert the CD-ROM with the NCBridge software into the drive of the host.

4. The NCBridge installation wizard should begin to run. If not, select **View > Refresh** and then double-click the NCBridge CD icon.

Follow the on-screen instructions for installation.

NC Terminal Installation

1. Unpack the NC hardware and assemble it as described in the Installation Guide provided.

2. Turn on the NC.

3. When the boot screen appears, press the spacebar.

4. Set the following items:
   IA *<IP address of NC>*
   IH *<IP address of boot host>*
   IM *<subnet mask>*
   BP *</destination_folder/tekxp/boot/os.900>*
   IGate *<IP address of gateway host>*
   NVS (to save settings in NVRAM)
   B (to start boot process)

The network computer should boot for basic operation. Make custom changes to the installation, as desired.

Media Contents

The directory hierarchy is created relative to the destination folder. If the destination folder C:\NCBridge was selected at installation time, all files and folders are installed in that location. The *tekxp* directory is also created under the destination folder.

Throughout the NCBridge manuals, the install directory is assumed to be *tekxp*. Here are the *tekxp* directories:

- *tekxp\bin\nt* contains network computer utilities for the NT environment.

- *tekxp\boot* contains boot files, fonts and clients. Files that differ between models use a *.model* suffix. Refer to Table 1-1 for model information.

- *tekxp\boot\config* contains the network computer configuration files.

- *tekxp\boot\fonts* contains the supplied non-resident fonts.

- *tekxp\boot\<language_directory>\app-defaults* contains translated text for network computer clients.

- *tekxp\examples* contains examples such as *Xsession* and *bootptab*.

- *tekxp\man\nt* contains man pages for many of the included utilities.

- *tekxp\mgmt* contains a sample SNMP MIB file.

Running SETUP.EXE

These steps tell you how to perform a basic installation of the NCBridge software on the Windows NT host. For details about customizing the software, refer to the *NCBridge Reference Manual*, supplied on the Documentation CD-ROM.

Getting Started

1. Log onto the NT host where you are going to install the NCBridge software.

2. Open the My Computer icon by double-clicking it. This displays icons representing system resources, including the CD-ROM.

3. Insert the NCBridge CD-ROM into the drive. The CD-ROM device icon should be replaced by the NCBridge icon (the drive label should say NCBRIDGE_VERSION_ 4_0) and the installation wizard should begin. If this is not the case (and the NCBridge installation program does not start), select **View** > **Refresh** and double-click the NCBridge icon.

4. When the install programs executes, the NCBridge splash screen appears and the install wizard software loads. A Welcome dialog appears. Click **Next** on the on the Welcome dialog to proceed. Click **Cancel** at any time to abort the installation.

Setting the Installation Path

When the installation process begins, the Choose Destination Location dialog shown in Figure 1-1 appears. The Choose Destination Location dialog allows you to set the desired installation path. By default this path is `C:\NCBridge` or the existing NCBridge installation path. Clicking **Browse** brings up a file selector, shown in Figure 1-2, to help you navigate though your file system for a suitable destination location. Once the destination folder is set, click **Next** to proceed. You can revisit previous install dialogs by clicking **Back**.

If you have a current installation, your configuration files are saved for you. Be sure to check the new configuration files for any new commands, and add any applicable commands to your saved configuration files.

> *Note: **If you change the destination folder for installation, ensure
> the new path matches the Secure Read directory specified by
> the NCD TFTP applet, displayed in the Control Panel.***

If there is a previous installation in the current directory, the configuration files (*.cnf* and *.tbl* files) are preserved. The new configuration files are stored in the directory *<destination folder>\tekxp\config_date* where *date* is the format YMDHMS.
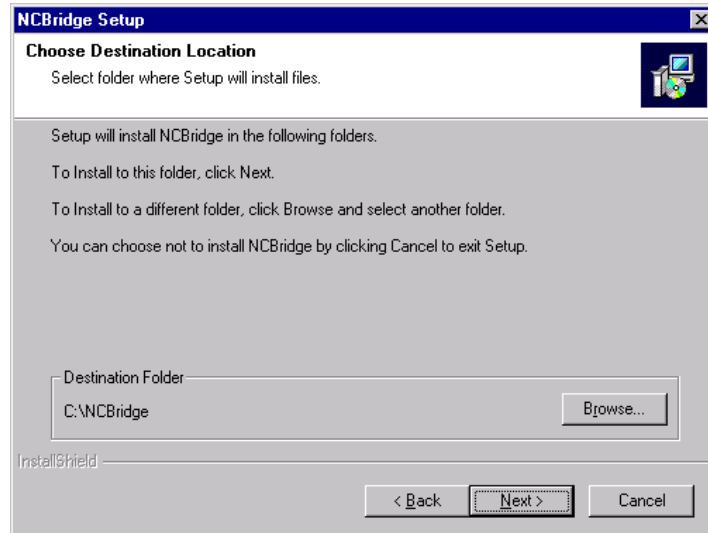
Figure 1-1 Choose Destination Dialog
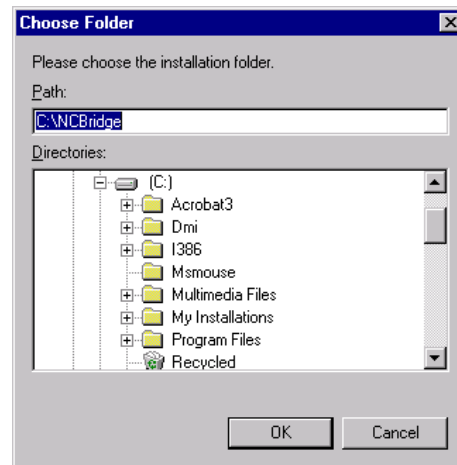
Figure 1-2 Selecting an Alternate Installation Location

Next, the Font Server Query dialog shown in Figure 1-3 asks if you want to use a font server.
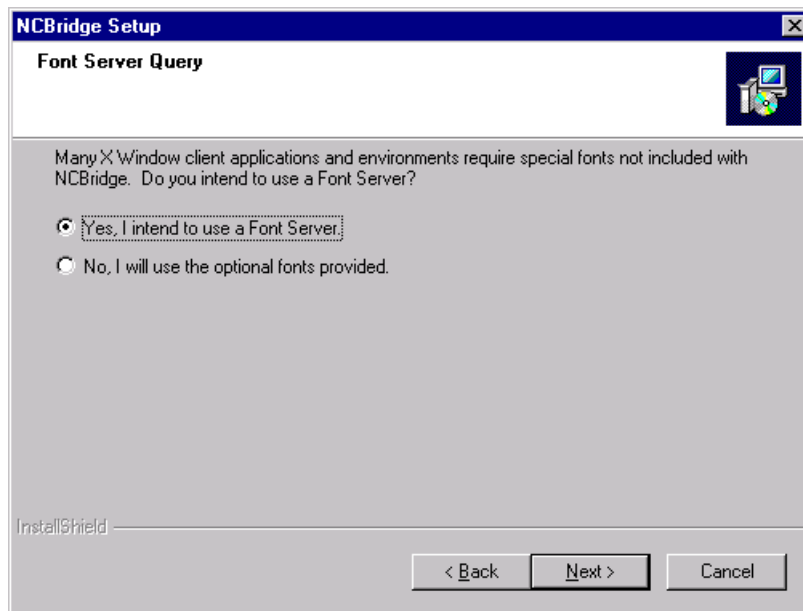
Figure 1-3 Font Server Query Dialog

If you indicate that you want to use a font server, the Font Server Specification dialog shown in Figure 1-4 appears.
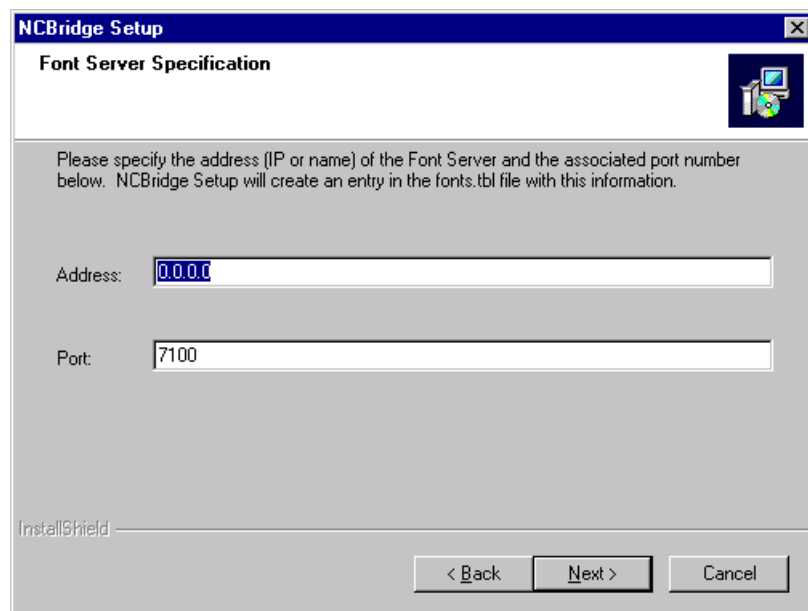
Figure 1-4 Font Server Specification Dialog

Enter the IP address or hostname of the font server and the port number in this dialog and click **Next**.

Selecting Installation Options

In the Setup Type dialog shown in Figure 1-5 you can choose between three software installation options:

- **Full** installs with all options. Recommended for most users.

- **Compact** quickly installs only those files necessary to boot and configure NCD network computers. These include the network computer boot files and configuration files. This is good for upgrading existing NCBridge installations.

- **Custom** allows you to choose specific packages for installation. This is recommended for advanced users. This installs only the options you select. By default, all options are pre-selected. To make your selection, click **Custom** and click **Next** to access the Select Components dialog.
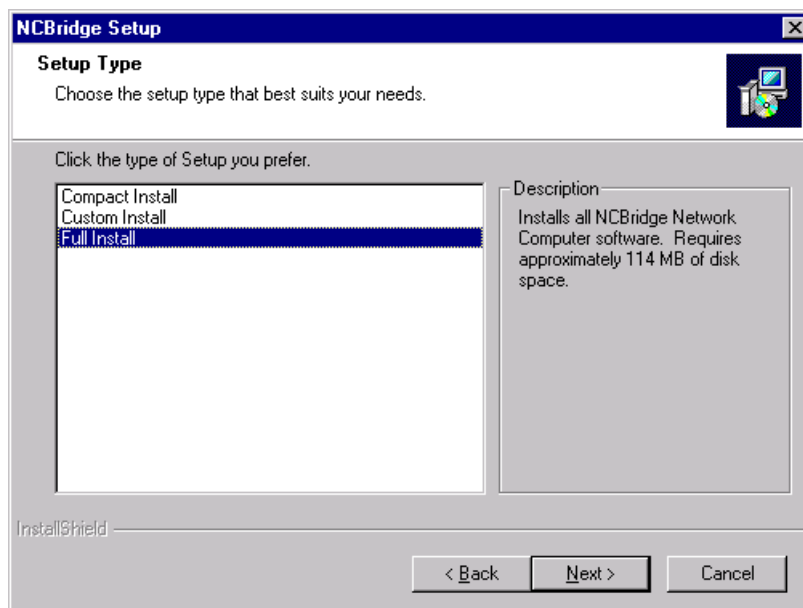
Figure 1-5 ISetup Type Dialog

If you select the Custom install option, the Select Components dialog shown in Figure 1-6 appears. A list of software components is shown with check boxes indicating the desired selections. Some components are comprised of subcomponents which can also be custom configured. Highlight a component and click **Change** to access subcomponent lists. If the **Change** button is disabled, then the component you have highlighted does not contain a configurable subcomponent list. After selecting the desired components for installation, click **Next** to begin the file transfer process.
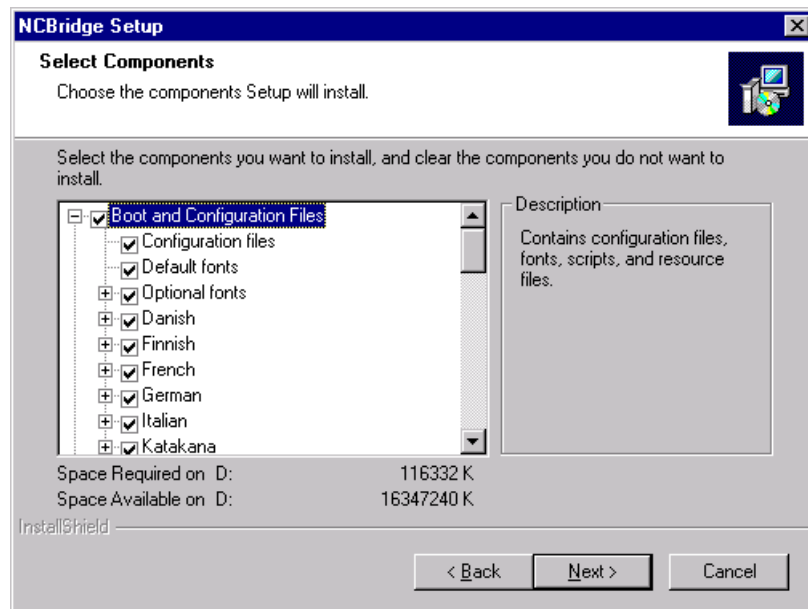
Figure 1-6 Select Components Dialog

If you select Compact Install or Full Install, the next dialog that appears lets you verify your installation settings before the installation begins. The Start Copying Files dialog shown in Figure 1-7 displays the setup type, destination directory, and font server settings. If the settings are not what you want, click the **Back** button to return to the Select Components dialog so you can change them.
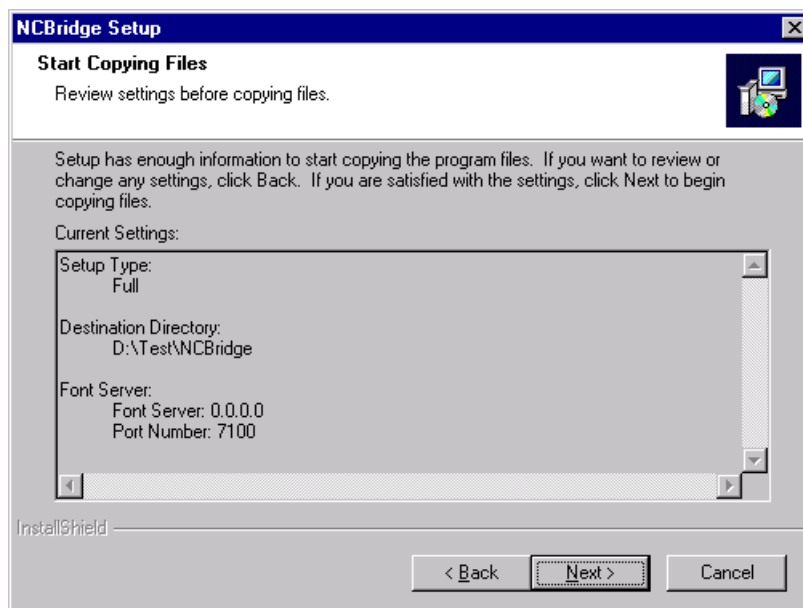
Figure 1-7 Start Copying Files Verification Dialog

If the settings are correct, click **Next** to start the transfer of NCBridge software from the CD-ROM to the destination directory on the server.

Installation Dialog (during the File Transfers)

The screen displays three file system status bar meters and a dialog box with a status bar. The status meters on the left indicate the transfer status of individual files, installation completion status, and overall disk usage. The status bar in the dialog window indicates the percentage of the installation completed.

Installation Completion

When installation finishes, the Setup Complete dialog shown in Figure 1-8 appears, stating that the installation of the NCBridge software is completed.
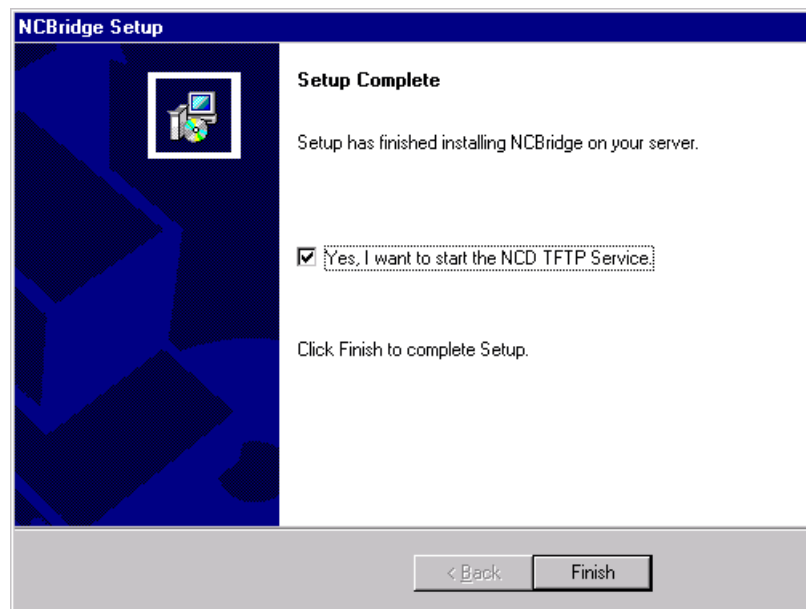
Figure 1-8 Setup Complete Dialog

This dialog asks if you want to start the NCD TFTP service. For more information about the TFTP boot method, see the *Boot Methods* topic on page 2-5. Click the checkbox to indicate whether you want or do not want the TFTP service to start at this point, then click **Finish** to exit from the NCBridge installation program.

Removing or Modifying An NCBridge Installation

The Welcome dialog shown in Figure 1-9 provides a convenient way to add, modify, or remove components of an existing NCBridge installation. To start the process, click **Start > Settings > Control Panel**. Click the **Add/Remove Programs** icon and select NCBridge from the list of installed programs. You may need to insert your NCBridge Installation CD in the CD-ROM drive.
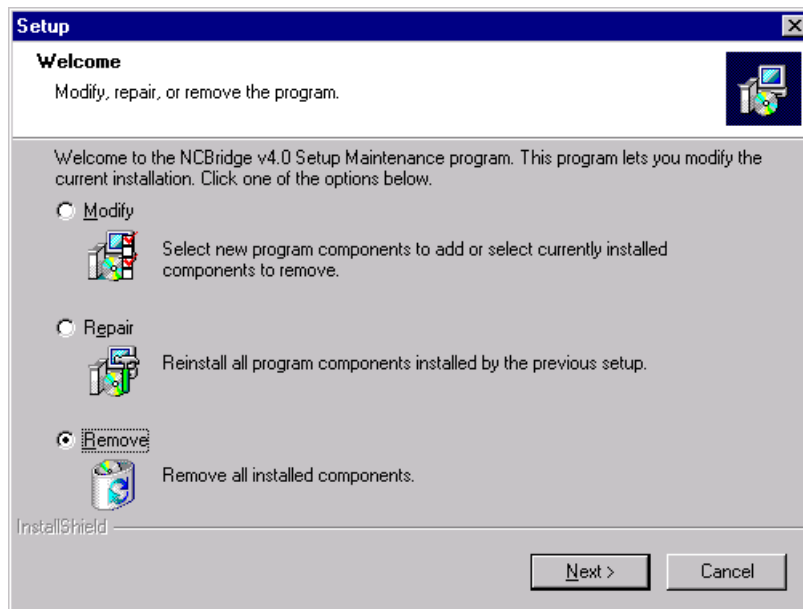
Figure 1-9 NCBridge Setup Maintenance Welcome Dialog

- Select **Modify** if you want to add components or remove currently installed components. The same dialog used during the original installation, the Select Components dialog (shown in Figure 1-6) appears. Indicate how you want to modify the NCBridge installation by clicking on the checkboxes to select or deselect the components you want, then click the **Next** button and the reinstallation process will proceed.

- Select **Repair** if you need to reinstall NCBridge.

- Select **Remove** to uninstall the NCBridge software.

Getting Acquainted

This section describes adding the first network computer to your system. It contains step-by-step procedures for performing a basic network computer installation. Follow the instructions in this section to become familiar with the network computer's network configuration parameters, *Boot Monitor*, and *Setup* utility. In addition to learning about the network computer, the procedures presented in this section lead you through the basic host configuration procedures for supporting network computers.

> *Note:* ***If you are familiar with network computers, skip to Chapter 2,
> Making Choices, for information on integrating network
> computers into your system.***

Basic network computer installation requires these steps:

- Configuring host files to support the network computer.

- Collecting information about your environment which is needed to boot the network computer.

- Using the *Boot Monitor* to enter network computer communication parameters and establish a host connection.

- Logging in through a Telnet session from the Client Launcher.

- Using *Setup* to enter the network computer configuration parameters.

After the basic network computer installation is complete, the network computer is able to:

- Locate the host on the network.

- Download the operating system, configuration, and font files.

- Apply configuration files residing on the host.

> *Note:* ***NT systems use backslashes (\) in their file paths. The
> network computer uses front slashes for internal file paths.
> When specifying path entries for the network computer, as in
> xp.cnf, Setup and other local clients, use front slashes (/)
> instead of the normal NT backslashes. NCBridge software
> translates between these two types of slashes as it accesses the
> NT server.***

Basic Installation

In a distributed computer environment, host computers perform a variety of functions. The *boot_host* sends the *boot_file* to the terminal, allowing it to function as an X display. The *font_host* contains the files defining the appearance of the various character fonts that can be displayed by the network computer. The network computer needs access to this host frequently in the course of a user session. The *login_host* is the host where the user's login account is found. The login host supplies a login window to the network computer, using some utility that provides login services.

Here is an example showing information about a sample environment:

Boot Host: Compaq Proliant running Windows NT
Boot Host Name: oregon   **IP Address:**   128.07.60.01
Network Computer Model: N916
Network Computer Name: portland   **IP Address:**   128.07.60.30
Netmask: 255.255.255.0
Gateway Address: 128.07.60.100
Broadcast Address: 128.07.60.255
Boot Method: tftp

If you are not familiar with the listed terms, consult your Windows NT System and Network Administration manuals.

For the examples in this section, it is assumed you have loaded NFS on your Windows NT system, and have enabled a mount point to the network computer information. Refer to your NFS manual for more information.

> *Note: NT systems use backslashes (\) in their file paths. The network computer uses forward slashes (/) for internal file paths. When specifying path entries for the network computer, as in xp.cnf, Setup and other local clients, use forward slashes instead of the normal NT backslashes. NCBridge software translates between these two types of slashes as it accesses the NT server.*

Network Computer Worksheet

Complete this worksheet prior to powering on the network computer. When completed, the information on this worksheet assists you in booting the network computer and performing other procedures.

1. Network computer model: NC_____

   Find this information on the network computer's serial number tag.

2. Network computer hardware address: ____:____:____:____:____:____

   Find this information on the network computer's serial number tag on the underside of the base unit.

3. Network computer name: _____

4. Network computer IP address: ____._____._____._____

5. Boot Path: _____*boot_directory*

   (/<boot_directory>/boot/<boot file> For example, /tekxp/boot/os.900)

Use Table 1-1 to determine your boot file.

Table 1-1 Boot Files

Boot File	Supported Network Computer Series
os.330	XP100D, XP330 Series (example: XP338)
os.350	XP100 Series, XP200 Series, XP350 Series, and XP400 Series (examples: XP117C, XP219, XP358)
os.500	NC200 and NC400 Series (example: NC200H, NC215)
os-tr.500	NC200 with Token Ring Option (example: N200TR)
os.900	NC900 Series (example: N916)

6. Boot Method: **tftp**

7. Subnet mask: ____._____._____._____ *ip_subnet_mask*

   Valid values are: (Class A) *255.0.0.0*, (Class B) *255.255.0.0*, or (Class C) *255.255.255.0*.

8. Boot Host:
   a. Host name: _____

   b. Host IP address: IP address: _____._____._____._____

9. Gateway on the network computer's subnet: ____.____.____.____

Configuring Host Files

This example shows how to configure the **nfs** (Network File Service) host utility to provide booting service.

Enabling NFS Access

In this example, NFS is used to download the network computer operating system, X server, configuration files, and resident fonts.

1. Add the *boot_directory* (*/tekxp/boot*) to be exported on the host. Export as *read only*. Refer to your NFS documentation for information on the name and location of the exports file.

2. Edit the *\%SYSTEMDRIVE%%SYSTEMROOT%\system32\drivers\etc\hosts* file and add the network computer name and address.

   ```
   128.07.60.30    portland
   ```

3. To enable the mount point immediately, open the **NFS** > **NFS Server** dialog. Click on **Exports**. Use the **Add** button to add and verify mount points.

4. Open **Main** > **Services** to verify NFS is running.

Powering on the Network Computer

Verify the physical installation of the network computer's cables, power cords, keyboard, mouse, and network connection with the pictorial installation sheet included in the packing box.

Turn on the network computer's power switch. On the first power-up, you must specify the keyboard you are using. The North American 101/102 or VT200 is selected by default (depending on the connected keyboard). Press Enter or Return to accept this keyboard. For a different keyboard or nationality, press the Spacebar to scroll through the list of available keyboards and press Enter or Return to select the appropriate one.

After specifying the keyboard, press the Enter or Return key again to display the `BOOT>` prompt.

The `BOOT>` prompt indicates that you are in the *Boot Monitor*. The *Boot Monitor* is a simple, command-line utility that provides an easy way to input boot commands. These boot commands set the parameters which describe the network computer in your network environment.

The *scoreboard* is an area in the upper right-hand corner of the boot screen. At this time, the scoreboard shows only default values. Use the scoreboard to verify the entries you make in the steps that follow.

Booting the Network Computer

To enter a boot command, type the command and its associated parameter after the BOOT> prompt. To complete an entry, press Enter. To see a list of the Boot Monitor commands, type **help** and press Enter.

> *Note: An "unrecognized command" error message and description appears on the screen if an invalid command is entered.*

The line numbers in the steps refer to lines on the network computer Worksheet (page 1-15) where you filled in the appropriate information. If you have not completed the Worksheet, do so now.

Using the *Boot Monitor*, perform the following steps:

1. Use the **iaddr** command to enter the network computer's IP address. (See Line 4.)

    BOOT> **iaddr** *ip_address*

2. Use the **bpath** command to enter the boot path. (See Line 5.)

    BOOT> **bpath** */<boot_directory>/boot/os.<model>*

3. Use the **imask** command to enter the subnet mask. (See Line 7.)

    BOOT> **imask** *ip_subnet_mask*

4. Use the **ihost** command to enter the boot host's IP address. (See Line 8b.)

    BOOT> ihost *ip_address*

5. Use the **igate** command to enter the IP address for a gateway host if the network computer is booting through a gateway. (See Line 9.)

    BOOT> **igate** *ip_address*

6. Use the **bmethod** command to specify TFTP as the boot method.

    BOOT> **bmethod tftp**

> *Note: Check the scoreboard to verify your entries. If there is an error, re-enter the command using the correct value.*

7. Use the **nvsave** command to save the values in nonvolatile memory.

   `BOOT>` **nvsave**

8. Use the **boot** command to initiate the boot process.

   `BOOT>` **boot**

If the network computer locates the host and boot files, a bar appears on the boot screen showing the percent of download complete. Once the network computer downloads all of the files required, a gray screen with an X-shaped cursor appears. If the boot process fails without error messages, you probably entered an incorrect parameter. Enter the appropriate command and parameter to correct the error. After correcting the error, execute the **nvsave** and **boot** commands. If booting fails again, refer to Chapter 7, Troubleshooting.

The *HostMenu* client appears. The *HostMenu* is designed to allow the user to connect to different types of login hosts, such as Unix or Windows NT.

If you want to use *xdm* to connect to a Unix host, click on the XDMCP button. The NC will broadcast an XDMCP message to all hosts. The hosts that respond to the broadcast message will be listed in the *HostMenu*. (See Figure 1-10.)

If you want to connect to a Windows NT host running Terminal Server Edition with Citrix MetaFrame, click on the WinDD button. This displays a list of Windows NT servers running Citrix MetaFrame software. Selecting one of these hosts will display the local WinDD ICA client with a login window.

.
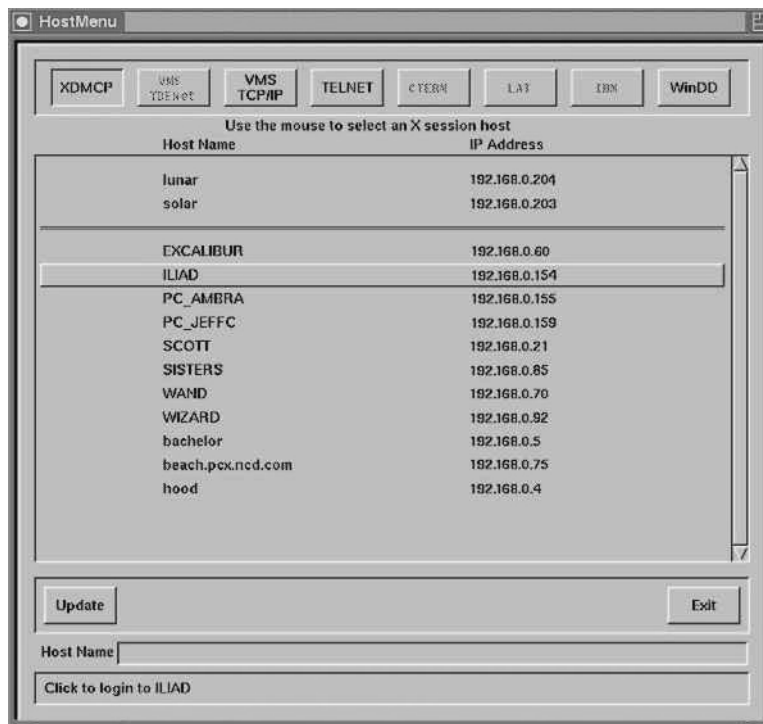
Figure 1-10 HostMenu Example

Starting a Session with Launcher

Client Launcher is used to start local clients by selecting a client from a menu. An arrow to the right of a *Client Launcher* entry indicates a submenu that contains additional local clients. As shown in Figure 1-11, selecting Host Connections displays a submenu listing available connections, such as *Telnet* or the *WinDD ICA Client*.

Figure 1-11 Example Client Launcher
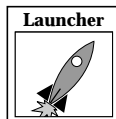
Press the SHIFT-Pause key to bring up the *Client Launcher*. The symbol in the left margin indicates a *Launcher* menu selection. If the *Launcher* is not present, press the SHIFT-Pause key or key sequence for your keyboard.

Table 1-2 Key Sequences for Displaying the Client Launcher

Keyboard Type	Press
101/102 with Setup	Setup key
Windows 95 or 101/102 with Pause	SHIFT-Pause
Sun keyboard	ALT-GRAPH-HELP
3270 keyboard	Right ALT-ExSel (The left ALT key does not work.)
LK401	F3 key
Unix keyboard	Alt-Graph

You can customize the Launcher client for your users through the
system.launcher file. Refer to the *Using the Client Launcher* section in
Chapter 4, Local Clients.

Opening a Telnet Session

Telnet provides a direct connection from the network computer to a host
computer. When Telnet is running, the network computer acts as a standard
VT102 terminal.

To open a Telnet session from *Launcher:*

1. Position the pointer on the Host Connections option to display the submenu.
   Select Telnet to open a Telnet window as Figure 1-12 shows.

```
Telnet>
```

Figure 1-12 Telnet Window Waiting for an Open Command
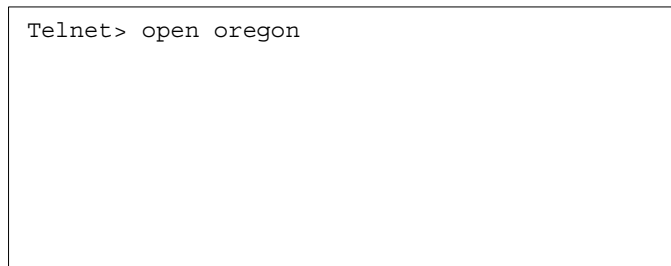
2. Use the mouse to position the pointer in the Telnet window. Type **h** and press
   Enter to see a list of Telnet commands.

3. Type:

Telnet> **open** *hostname*

where *hostname* is the name or network address of the host as Figure 1-13 shows.
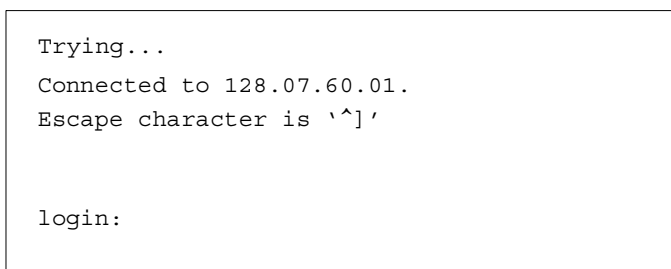
```
Telnet> open oregon
```

Figure 1-13 Telnet Open Command

Once a connection is made you can log in as Figure 1-14 shows.

```
Trying...
Connected to 128.07.60.01.
Escape character is '^]'


login:
```

Figure 1-14 Telnet Window with a Host Connection

4. At the **login:** prompt, enter your user name:

    login: *user_name*

5. When the **password:** prompt appears, enter your password:

    password: *password*

Now that you are connected to the host, type the command and its associated parameter after the # prompt. To terminate an entry, press Enter.

6. Set the display environment variable for the network computer by entering the following using the network computer's IP address:

   # **setenv DISPLAY** *<ip_address>*

7. If you run a window manager, type your normal command line. In this example, we are starting the Motif Window Manager.

   # **mwm &**

   If your window manager is available, your host environment appears.

Closing a Telnet Window

To close the Telnet window from the *Telnet>* prompt, type **quit** and press Enter. When you are ready to conclude the Telnet session, log off your host:

   # **exit**

then enter **quit** to close the Telnet window:

   Telnet> **quit**

Using Setup

Setup is a utility where you can add, modify, display, and save network parameters. Parameters can be saved in NVRAM, or written to a file.

The *Setup* main menu is illustrated in Figure 1-15. The *Setup* main menu is made up of four different areas: Menu Bar, Menu Input, Function Bar, and Message Box.
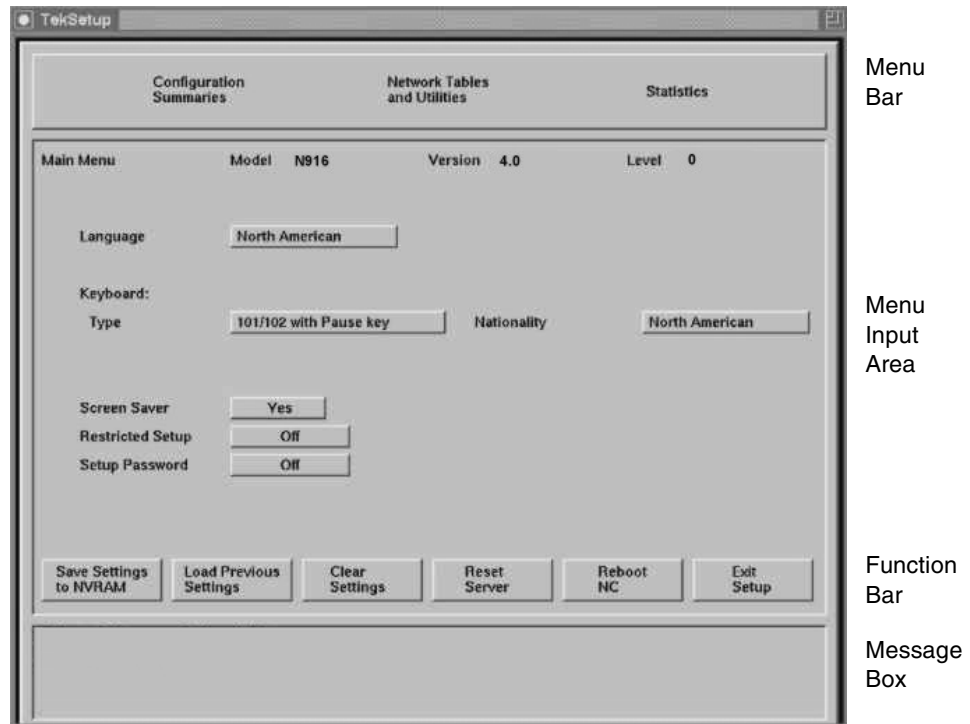
Figure 1-15 The Setup Main Menu

> *Note:* **The Setup window on your network computer may look different from this example based on your network computer model.**

To connect to a Unix host, use the following procedures to enter configuration parameters using *Setup*. After each typed entry, press Enter.

1. Drag in the Configuration Summaries menu and release on *TCP/IP*.

    - Enter the following:

    Network Computer Name   *network_computer_name*
    Default Telnet Host   *host_ name*
    Name Server 1   *ip_address of name server*

    - Click on **Return to Main Menu**.

2. Drag in the Configuration Summaries menu and release on *X Environment*.

    - Select the following:

    Host Connect Method   HostMenu

    - Click on **Return to Main Menu**.

3. Drag in the Network Tables and Utilities menu and release on *NFS Mount*. Click on **Add Table Entry**.

    - Add an entry for each directory exported in the */etc/exports* file:

    Note: Only four entries may be saved into NVRAM.

    File System Name   *exported directory*
    Local Directory   *local_directory*
    Transfer Size   *read size for transferring files*

    - Click on **Return to Main Menu**.

4. Drag in the Configuration Summaries menu and release on *Host File Access*.

    - Select the following:

    Primary File Access   NFS
    Primary Mount Path   *local_directory (from previous step)*

    - Click on **Return to Main Menu**.

5. Drag in the Network Tables and Utilities menu and release on *Internet Host*. Click on **Add Table Entry**.

   - Add your boot host and login host as follows:

     Host IP Address   *ip_address*
     Host Name   *host_name*

   - Click on **Return to Main Menu**.

6. Click on **Save Current Settings** to store the current settings in NVRAM.

Exiting Setup

When you are ready to exit Setup, click the **Exit Setup** button.

This completes the basic network computer installation process. Continue in Chapter 2, Making Choices, where you will develop a centralized administration scheme for a complete network computer installation.

Chapter 1   Installing the Software

Chapter **2**

Making Choices
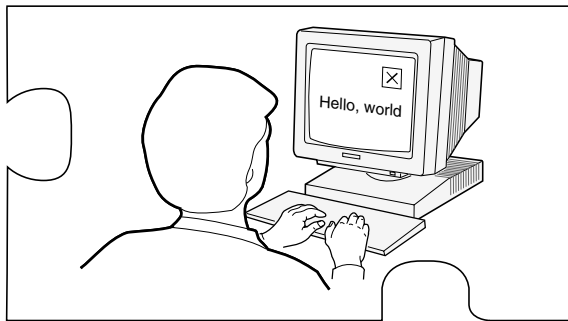
This chapter helps you collect and organize the information you need to create a centralized system, tailored to your environment. A configuration workbook is provided on page 2-21 to assist you in this process.

If used as intended, the Workbook provides a valuable record for future reference. The time you spend gathering information as you plan and set up your network computers may well save you hours later in case it becomes necessary to debug a configuration later in the installation process.

Planning Configurations

We suggest the following procedures to help you use of the content in this chapter profitably:

• Make a copy of the Workbook (page 2-21 to the end of this chapter). To make it easier to plan and set up your configuration choices, the Workbook follows the same organization as the remote configuration file (*xp.cnf)*.

• Read through the strategy sections beginning on page 2-3. The strategy sections are organized to help you analyze your environment and lead you through the decision-making process.

• As you make configuration choices, place a check mark on the Workbook line as directed, then fill in the requested information. Some lines in the Workbook direct you to other Workbook lines. Place a check mark on the new line and fill in the information. Whenever possible, entries have been filled in for you.

• After you complete a Workbook line, return to the strategy text where you left off.

• When the Workbook is complete, continue in Chapter 3, *Supporting a Centralized System* for your host type. Edit the files as needed to incorporate your configuration choices from the completed Workbook. When you edit a line in the *xp.cnf* file, it matches the line in your Workbook.

Configuration Strategies

System configuration is the key to successfully integrate network computers into your environment. With proper configuration, you can ensure your users a smooth transition to network computers with little or no disruption of their work.

Network computers run efficiently in a distributed-computing environment, where processing is shared by a number of networked host computers. This means applications competing for resources at any given time can be distributed across the system to maximize performance. Files can also be stored and transferred among the accessible computers to share mass storage resources.

The network computer typically connects directly to the network, so it can effectively communicate with any host on the network. The network computer receives files and displays information over the network and manages communications between processes running on the network computer and on the host.

In a distributed computer environment, host computers perform a variety of functions. The strategy sections refer to three types of hosts, although in reality the functions can be as distributed or consolidated as you choose.

A *boot host* contains the files necessary to boot the network computers. This includes the model-specific operating system files and *xp.cnf* file. These files are downloaded to the network computer via the specified *boot method*.

A *file host* contains additional configuration files, fonts, and optional host-specific utilities for the network computer. The network computer may frequently access this host during a user session. Files are downloaded to the network computer via the specified *file access method*.

A *login host* is the host where the user's login account is found. You can specify a host for each user, or allow the user to select from a list of hosts, depending on your *host connection method*. The login host supplies a login window to the network computer, using a utility that provides login services.

Chapter 2   Making Choices

The strategy sections discuss the basics required to configure and support a centralized system. To simplify this task, all of the network computer features are not covered. Once your initial configuration is working, you can enable additional features as needed.

> *Note: When you add a feature, perform the necessary host configuration to support the feature. Refer to Chapter 2 of the NCBridge Reference Manual for more information.*

These topics are discussed:

- Booting Strategies

  - Boot Methods

  - Automatic or Manual First Boot

  - Subsequent Boots

- File Access Strategies

  - File Access Methods

- Host Connection Strategies

- ROM and Flash Memory Strategies

- Boot Host Check List

- Network Computer Check List

- File Host Check List

- What Next?

Booting Strategies

On a system with many network computers, you might want to install the boot software on more than one host. Then you can either set up different network computers to boot and download files from different hosts, or set up all the network computers to boot from the first available host.

Boot Methods

The network computer uses the boot method to download the X server. Many of the other booting decisions in this section depend on the boot method you select. The boot methods are **TFTP**, **NFS**, **MOP**, and **ROM**.

> *Notes: NT systems only support TFTP, NFS, or ROM booting.*
>
> *NFS is not supplied with NCBridge. It is available from third party software vendors.*

- **TFTP** (Trivial File Transfer Protocol) can be used on TCP/IP networks. It is not as efficient as **NFS**, but can be made more secure. **TFTP** is the default method to boot network computers not equipped with TDEnet or the Flash Memory or ROM options.

  > *Note: During installation and setup, a dialog (shown in Figure 1-8) asks if you want to start the NCD TFTP service. If you leave the checkbox selected, TFTP starts; if you uncheck this box, the TFTP instructions in a Readme file appear. This Readme.txt file is located in the tekxp/fm/nt directory.*

- **NFS** (Network File Service) can be used to boot the NC from hosts supporting **NFS** (typically in a TCP/IP network). The advantage to **NFS** is faster booting and increased efficiency.

- **ROM** (Read-Only Memory) can be used with network computers equipped with Flash Memory or a ROM board. **ROM** is the default method to boot all network computers equipped with the Flash Memory or the ROM options. Refer to *ROM and Flash Memory Strategies* on page 2-16 for more information.

- **MOP** (Maintenance Operation Protocol*)* is used on DECnet networks to download the boot files to the network computers. See the *NCBridge VMS Installation Manual* for details.

Decide which boot method to use. Continue to the next pages to see how to implement the method you selected.

Automatic or Manual First Boot

For a first time boot, the network computers can boot automatically or manually, depending on how you configure your environment. This decision does not relate to ROM-based network computers.

Automatic means that the network computer determines boot parameters from the network and boots without operator intervention. In addition, with automatic booting you can implement a strategy where network computers can boot from the first available host.

Manual means that an operator would have to enter the boot parameters before the network computer could boot.

Implement the *manual* method if you are installing a single network computer. Use the *Boot Monitor* to enter the boot parameters. Implement your other Workbook selections with the *Setup* commands. Remember that *Setup* commands only affect the individual network computer.

Implement the *automatic* method if you are installing or planning to install more than one network computer, or want the network computers to boot from the first available host. Implement your other Workbook selections with the *xp.cnf* commands so they apply to each network computer.

For *automatic* booting:

> If you are going to use **TFTP** or **NFS** as the boot method:
> Check Workbook line 55 to use *bootp* (BOOTstrap Protocol) or check Workbook line 56 to use *DHCP* for automatic booting. A host that recognizes the network computer's hardware address responds with the following information: the network computer's Internet address, the boot server's Internet address, the name of the file to download, the subnet mask, and the primary gateway.

Subsequent Boots

The next boot decision determines how subsequent boots occur. There are three main strategies:

- Booting from a specific host, using parameters stored in NVRAM:

    - Controls which host is used. In the case of different workgroups on different hosts, each workgroup can have their own configuration.

    - Provides an easy way to create a fixed environment.

    - Provides a specific backup (secondary) boot.

- Booting from the first available host, using parameters obtained from the network:

    - The least-busy host responds to the boot requests.

    - Provides backup booting. Booting occurs as long as any host is responding.

- Booting from a specific host, using parameters obtained from the network:

    - Controls which host is used. In the case of different workgroups on different hosts, each workgroup can have its own configuration.

    - Easier to administer in a dynamic environment, where network computers, workgroups, and network addresses tend to migrate.

    - Easier to provide a consistent environment.

Decide which strategy to use. Continue to the next page to see how to implement the strategy you selected.

> *Note: NT systems only support TFTP or NFS booting.*

Booting from a specific host, using parameters stored in NVRAM:

For this method, specify all of the required information, change booting to NVRAM, and save it. You can specify a secondary boot in case the primary boot fails.

The network computer has already booted once. If the current boot parameters are acceptable, do not change the primary boot information. The network computer saves the current method, host, and path as the primary.

To change the primary booting information:

> Choose the primary boot method to use, either **TFTP** or **NFS**:
> For **TFTP**, check Workbook line 26.
> For **NFS**, check Workbook line 27.

> Check Workbook line 34 to boot from NVRAM instead of NETWORK.

> Check Workbook line 39 to save the new method.

To optionally set secondary booting information:

> Choose the secondary boot method to use, either **TFTP** or **NFS**:
> For **TFTP**, check Workbook line 28.
> For **NFS**, check Workbook line 29.

Booting from the first available host, using parameters obtained from the network:

Set up automatic booting (from the previous section) on every boot host. Add the information for *every* network computer to *every* boot host.

- You can explicitly set the boot method but obtain the remainder of the boot parameters from the network. For example, if you want to boot with **NFS instead of TFTP**. To change the default boot method:

> Choose the primary boot method to use, either **TFTP** or **NFS**:
> For **TFTP**, check Workbook line 26. Ignore boot host and path settings.
> For **NFS**, check Workbook line 27. Ignore boot path setting.

> Check Workbook line 39 to save the new method.

Booting from a specified host, using parameters obtained from the network:

Set up automatic booting (from the previous section) on every boot host. Add the information for the *specific* network computer to the *specific* boot host.

- You can change only the boot method. Follow the preceding check mark paragraphs for the *booting from the first available host* section.

File Access Strategies

File access determines how the network computer locates and downloads configuration and font files. As discussed in the *Configuration Strategies* section, you can have one or more file hosts.

The file access path you specify is actually the path to the configuration (*.tbl*) files. For fonts, the *fonts.tbl* file contains the actual paths to the files, not the actual fonts. This may be confusing at first, but makes sense if you think about it. Font files take up a lot of disk space. By having the configuration file point to the various locations, you can distribute fonts across disks, partitions, or different hosts, depending on your disk space.

Here are some considerations for a file host:

• The host may be frequently accessed during a user session.

• Font files use a lot of disk space, so make sure you only have the ones you need. Many of the fonts on the installation media are probably duplicates of your host computer's native fonts. If the X server can read your computer's native fonts, use them and only keep the unique fonts from the installation media.

• Place the files on a machine with enough room. This does not have to be the boot host; the files can be installed in any directory on any machine on the network accessible to the network computers.

• The entries in the *fonts.tbl* file use network computer memory, so only add the font directories your applications require.

File Access Methods

The file access method choices are similar to the boot method choices. The file access methods are: **TFTP, NFS**, and **DAP**. The method you select is dependent on your network type and how your users connect.

> *Note: When a file_path is requested, provide the path to the .tbl files. The default path is /tekxp/boot/config. In most cases, these entries are not required.*

If you do not enable any file access hosts or methods, the boot host and boot method are used by the network computer.

- **NFS** can be used on hosts supporting **NFS** (typically on a TCP/IP network). The advantage to **NFS** is downloading speed and efficiency.

- **TFTP** can be used on TCP/IP networks. It is not as efficient as **NFS**.

- **DAP** is used on DECnet networks to download files to the network computers. See the *NCBridge VMS Installation Manual* for details.

    Select a primary file access method:
    Check Workbook line 10 to use **NFS** as the primary file access method.
    Check Workbook line 11 to use **TFTP** as the primary file access method.

In addition, a secondary (backup) method can be enabled. The secondary information is only used if the primary method fails.

    Select a secondary file access method:
    Check Workbook line 13 to use **NFS** as the secondary method.
    Check Workbook line 14 to use **TFTP** as the secondary method.

> *Note: If the last method tried is NFS, the network computer automatically tries TFTP using the last file path specified. To take advantage of this feature, make sure TFTP is enabled.*

Check Workbook line 53 to enable **TFTP**.

Font Access Strategies

- Using a font server.

  The *xfs* font server is host-resident software that can perform all the tasks related to downloading fonts to NC terminals. The font server can provide access to more fonts than basic font service does and it can decrease the time it takes to display fonts. The font server reads both bitmap and outline font formats.

  Enter the desired font server on Workbook line 52.

- Using font paths.

  The NC supports reading of many font types. See Chapter 6, *Using Fonts*, for details.

  Enter desired font paths on Workbook line 52.

Host Connection Strategies

Host connection specifies how a user connects to their login host. There are several possibilities:

- **HostMenu** presents a list of hosts. The user uses the mouse to select a session type and login host (this is the default method). This is easy to use and provides flexibility for users who need access to multiple hosts.

- **Login Window to a Specific Host**. Displays a host login box where the user simply logs in to the host.

- **Session Window to a Specific Host**. Opens a session window and connects to the specific host. The user simply logs in.

- **Session Window with no Specified Host**. Opens a session window. The user would have to specify a host connection and then log in.

- **No connection method**. The user would have to start a session from the *Client Launcher* and then log in.

Pick the method that best fits your users and your environment.

HostMenu

HostMenu is the default connection method. Within the HostMenu interface, there are multiple lists of hosts available: **XDMCP**, **VMS** (both **TDEnet** and **TCP/IP** connections), **TELNET**, **CTERM**, **LAT, IBM** and **WinDD**. A user can pick the list to view, and then pick a host from that list. You can support as many of the lists as apply to your environment.

- **XDMCP** - this is a generated list based on hosts that respond to the network computer's **xdm** broadcast. **xdm** must be enabled on the host. Responding hosts can be optionally prioritized to appear at the top of the list.

  Check Workbook line 58 to enable **xdm** on the host.

  Check Workbook line 41 to optionally prioritize hosts on the list.

- **VMS TDEnet** - this is a list of entries you specify in the *xp.cnf* file. Use this list if you connect to DEC hosts running DECnet.

  Check Workbook line 42 to add VMS TDEnet host entries.

- **VMS TCP/IP** - this is a list of entries you specify in the *xp.cnf* file. Use this list if your users connect to DEC hosts running TCP/IP.

  Check Workbook line 43 to add VMS TCP/IP host entries.

- **TELNET** - this is a list of entries you specify in the *xp.cnf* file. In addition, the boot host and the default Telnet host (if defined) appears on the list. Use this list if your users connect to TCP/IP hosts via Telnet.

  Check Workbook line 44 to add TELNET host entries.

  Check Workbook line 36 to define a default TELNET host.

- **CTERM** - this is a list of entries you specify in the *xp.cnf* file. In addition, the boot host and the default CTERM host (if defined) appears on the list. Use this list if your users connect to DECnet hosts via CTERM.

  Check Workbook line 45 to add CTERM host entries.

  Check Workbook line 35 to define a default CTERM host.

- **LAT** - this is a generated list based on available LAT services.

  Check Workbook line 9 to start LAT services on the host.

- **IBM** - this is a list of IBM host entries you specify in the *xp.cnf* file.

  Check Workbook line 44 to add IBM host entries.

- **WinDD** - this is a list of Windows NT servers you specify in the *xp.cnf* file.

  Check Workbook line 46 to add Windows NT server entries.

Login Window to a Specific Host

This option uses a utility on the specified host to display a login box on the network computer. The method you select for this option is network and host connection dependent.

If your user logs in to a TCP/IP host on a TCP/IP network:

Check Workbook line 16 to specify a direct host connection.

Check Workbook line 58 to enable **xdm** on the host.

If your user logs in to a DECnet node in a DEC environment:

Check Workbook line 17 to specify a direct host connection.

Check Workbook line 63 to enable DECwindows on the host.

If your user logs in to a TCP/IP host in a DEC environment:

Check Workbook line 18 to specify a direct host connection.

Check Workbook line 58 to enable **xdm** on the host.

If your user logs in to a Windows NT server:

Check Workbook line 18 to specify a direct WinDD host connection.

Session Window to a Specific Host

This option can be used to display either a **TELNET** or **CTERM** session window on a defined host or node. The session you select for this option is host dependent.

If your user logs in to a TCP/IP host, specify the connect method to be TELNET, and define the default Telnet host:

Check Workbook line 19 to specify **TELNET**.

Check Workbook line 35 to define a default Telnet host.

If your user logs in to a DECnet node, specify the connect method to be CTERM, and define the default CTERM host:

Check Workbook line 20 to specify **CTERM**.

Check Workbook line 36 to define a default CTERM host.

Session Window with No Specific Host

This option opens a session window. The user would have to open a host connection or service. Several sessions are available: **TELNET**, **CTERM**, **LAT**, **SERIAL0**, and **SERIAL1**. The session type you select is network and host connection dependent.

If your user logs in to a TCP/IP host:

Check Workbook line 19 to specify a Telnet session.

If your user logs in to a DECnet node:

Check Workbook line 20 to specify a CTERM session.

If your user logs in to a LAT service:

Check Workbook line 21 to specify a LAT session.

If your user logs in via a serial connection on their network computer serial port 0:

Check Workbook line 22 to specify a Serial0 session.

If your user logs in via a serial connection on their network computer serial port 1:

Check Workbook line 23 to specify a Serial1 session.

No Connection Method

You can have the network computer simply display the root weave and X cursor by disabling host connections. A user would have to start a session from the *Client Launcher*.

To disable host connections:

Check Workbook line 25.

ROM and Flash Memory Strategies

Reading Host-Based Remote Configuration Files

Network computers with Flash Memory can be set up to read an *xp.cnf* file on the host. Another strategy if you have space in Flash Memory, is to flash a version of *xp.cnf* to free the network computer from trying to find a host during the boot process.

Check Workbook line 32 to read a host-based *xp.cnf* file with a network computer equipped with Flash Memory.

Saving Your Configuration in Flash Memory

As you have worked through this chapter, you have selected the commands to implement in the configuration file. For RAM-based network computers, this configuration can either be saved in NVRAM, or loaded each time the network computer boots and reads the *xp.cnf* file. To take advantage of the Flash Memory option, you can flash all or part of your configuration.

This section provides the basic flash procedure. Refer to Chapter 2 of the *NCBridge Reference Manual* for the specific flash commands.

- Create a remote configuration file with the *do_flash* and appropriate *flash_feature* enabled. Change the *boot_method* to ROM (for subsequent boots). If you are not going to flash the remote configuration file, you may wish to set the network computer to read a host-based *xp.cnf* file.

- Boot only the network computers that you want to flash. Use **TFTP** or **NFS** as the boot method. You cannot flash a network computer that booted from Flash Memory (boot method **ROM**).

- Once flashing is complete, comment out the flash information in the *xp.cnf* file. Restore the *boot_method* settings as needed for your other network computers.

Enabling a Master Network Computer

A network computer equipped with Flash memory can be used as a master network computer to boot other network computers.

Check Workbook line 33 to enable or boot from a master network computer.

Boot Host Check List

Use this check list to verify that each boot host is completely configured:

- Boot software installed.
- *ip_host_table* and *ip_host_entry* commands added to the *xp.cnf* file.

  Check Workbook line 1.
- *gateway_table* and *gateway_entry* commands added to the *xp.cnf* file if the network computers are located on different subnets and require a gateway.

  Check Workbook line 3.
- Primary and Secondary (if used) boot method enabled.
- *xp.cnf* file configured.
- Supporting host processes enabled and running.

  Note: The _table (ip_host_table) commands store up to four entries in the network computer's NVRAM. Use them for the most frequently accessed hosts. The _entry (ip_host_entry) commands store all subsequent entries into RAM.

File Host Check List

Use this check list to verify that each file host is completely configured:

- Configuration and font files installed.
- *ip_host_table* and *ip_host_entry* commands added to the *xp.cnf* file.

  Check Workbook line 1.
- *gateway_table* and *gateway_entry* commands added to the *xp.cnf* file if the network computers are located on different subnets and require a gateway.

  Check Workbook line 3.
- Primary and Secondary (if used) file access method enabled.
- Font paths added to *fonts.tbl* file.

  Check Workbook line 52.

Seriald Provides Remote COM Support for Windows NT Applications

Seriald is a local daemon that executes on the network computer. It provides the ability for a Windows NT application to transmit and receive data to and from a peripheral device connected to a remote network computer serial port. Typical peripheral devices include printers, credit card readers, and PalmPilots. Figure 2-1 shows how peripheral devices, Windows NT servers running NCD ThinPATH Plus, and network computers running Seriald are connected.
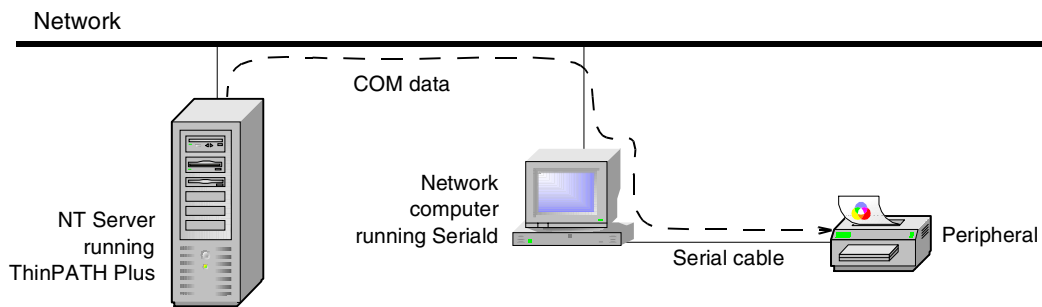
Figure 2-1 How Seriald Redirects Data to a Peripheral Device

Seriald interacts with the ThinPATH Plus software, which runs under Windows NT 4.0, Terminal Server Edition (TSE). ThinPATH Plus adds support for peripheral devices such as local printers.

For example, as an NT application transmits data to a standard COM port, ThinPATH Plus intercepts the data and redirects it to the network computer located on the network. Upon receiving the data, the Seriald daemon passes the data on to the network computer serial port where the peripheral device is connected.

Seriald provides several benefits. For example, Seriald makes it possible for an unmodified NT application to interact with a peripheral device connected to a remote network computer serial port. Seriald also provides the ability to synchronize the data on a PalmPilot with an application executing on an NT server.

By default, Seriald automatically starts when the network computer boots (restarts). You can use these two *xp.cnf* commands to control the Seriald daemon:

```
start    SERIALD   NO     # [YES | NO]
preload  SERIALD   PERM   # [NO | TEMP | PERM]
```

Refer to the *NCBridge Reference Manual* for details on how the *xp.cnf* commands work.

> *Note: ThinPATH Plus also supports redirection of audio and LPT data from an NT application to either a PC or a ThinSTAR Windows-based terminal; however, these features are not supported on the network computer at this time.*

For more information about the ThinPATH Plus software, see the Network Computing Devices, Inc. (NCD) website, *www.ncd.com*, under Products.

Network Computer Check List

Gather the following information for each network computer:

- Network computer model (to determine boot path)
- Network computer hardware address
- Network computer name
- Network computer network address

This list shows the various host files that need network computer information:

- *%SYSTEMDRIVE%%SYSTEMROOT%\system32\drivers\etc\hosts* is needed on all hosts the network computer accesses.

  Check Workbook line 59.

- *bootptab* file, if **bootp** is used, is needed on all boot hosts.

  Check Workbook line 55.

What Next?

- Edit the *xp.cnf* file and implement any commands you checked on Workbook page 2-21 through page 2-36. Or, if the majority of your check marked lines have a corresponding *Setup* menu item, you may wish to enter your information in *Setup* and use the Save Settings to File feature. Any remaining check marked items could be added to the created file.

- Edit any of the *.tbl* files you checked on Workbook page 2-35.

When you are done editing the configuration files, continue on to the chapter *Supporting a Centralized System* for your host type.

- Perform the host procedures you checked on Workbook page 2-36.

Configuration Workbook

To Do	**xp.cnf File**	**Setup Menu Paths**

___ 1. Enter one or more host address/names (NVRAM).

Network Tables and Utilities > Internet Host

```
ip_host_table _____   _____
ip_host_table _____   _____
ip_host_table _____   _____
ip_host_table _____   _____
```

If you have additional hosts, fill out Workbook line 5.

___ 2. Enter one or more node address/names (NVRAM).

Network Tables and Utilities > TDEnet Host

```
tde_host_table _____   _____
tde_host_table _____   _____
tde_host_table _____   _____
tde_host_table _____   _____
```

If you have additional nodes, fill out Workbook line 6.

___ 3. Enter one or more net address/gateway addresses (NVRAM).

Network Tables and Utilities > Gateway

```
gateway_table _____   _____
gateway_table _____   _____
gateway_table _____   _____
gateway_table _____   _____
```

If you have additional hosts, fill out Workbook line 7.

___ 4. Enter one or more file system name/local directories (NVRAM) along with the file transfer size (128 - 8192).

Network Tables and Utilities > NFS Mount

```
nfs_table _____   _____   _____
nfs_table _____   _____   _____
nfs_table _____   _____   _____
nfs_table _____   _____   _____
```

Fill out Workbook line 54. Also, if you have additional NFS entries, fill out Workbook line 8.

To Do	xp.cnf File	Setup Menu Paths

___ 5. Enter one or more host address/names (RAM).   Not available

    `ip_host_entry` _____ _____

    `ip_host_entry` _____ _____

    `ip_host_entry` _____ _____

    `ip_host_entry` _____ _____

    Continue adding entries as needed.

___ 6. Enter one or more node address/names (RAM).   Not available

    `tde_host_entry` _____ _____

    `tde_host_entry` _____ _____

    `tde_host_entry` _____ _____

    `tde_host_entry` _____ _____

    Continue adding entries as needed.

___ 7. Enter one or more net address/gateway addresses (RAM).   Not available

    `gateway_entry` _____ _____

    `gateway_entry` _____ _____

    `gateway_entry` _____ _____

    `gateway_entry` _____ _____

    Continue adding entries as needed.

___ 8. Enter one or more file system name/local directories (RAM)   Not available
    along with the file transfer size (128 - 8192).

    `nfs_entry` _____ _____ _____

    `nfs_entry` _____ _____ _____

    `nfs_entry` _____ _____ _____

    `nfs_entry` _____ _____ _____

    Continue adding entries as needed.
    Fill out Workbook line 54.

To Do	xp.cnf File	Setup Menu Paths

___ 9. Enter node name/LAT service tables (up to 20 services).

      `lat_services_table _____ _____`

      `lat_services_table _____ _____`

      `lat_services_table _____ _____`

     Continue adding services up to 20.

    Setup Menu Paths: Not available

___ 10. Enter the file system name (for file_host_name) and the local directory (for file_path).

      `file_access_1 `<u>`NFS`</u>

      `file_host_name_1 _____`

      `file_path_1 _____`

     Fill out Workbook line 4 and Workbook line 54.

    Setup Menu Paths: Configuration Summaries > Host File Access

___ 11. Enter the host address or name and the file path.

      `file_access_1 `<u>`TFTP`</u>

      `file_host_name_1 _____`

      `file_path_1 _____`

     Fill out Workbook line 53.

    Setup Menu Paths: Configuration Summaries > Host File Access

___ 12. Enter the node address or name and the file path.

      `file_access_1 `<u>`DAP`</u>

      `file_host_name_1 _____`

      `file_path_1 _____`

     Fill out Workbook line 60.

    Setup Menu Paths: Configuration Summaries > Host File Access

___ 13. Enter the file system name (for file_host_name) and the local directory (for file_path).

      `file_access_2 `<u>`NFS`</u>

      `file_host_name_2 _____`

      `file_path_2 _____`

     Fill out Workbook line 4 and Workbook line 54.

    Setup Menu Paths: Configuration Summaries > Host File Access

To Do	**xp.cnf File**	**Setup Menu Paths**

___	14. Enter the host address or name and the file path.
	    `file_access_2` <u>`TFTP`</u>
	    `file_host_name_2` _____
	    `file_path_2` _____
	Fill out Workbook line 53.
		Configuration
		Summaries >
		Host File Access

___	15. Enter the node address or name and the file path.
	    `file_access_2` <u>`DAP`</u>
	    `file_host_name_2` _____
	    `file_path_2` _____
	Fill out Workbook line 60.
		Configuration
		Summaries >
		Host File Access

___	16. Enter the address or name of the XDMCP host.
	    `host_connect_method` <u>`XDMCP_DIRECT`</u>
	    `xdmcp_connect` <u>`DIRECT`</u>
	    `xdmcp_server` _____
	Fill out Workbook line 58.
		Configuration
		Summaries >
		X Environment

___	17. Enter the node address or name.
	    `host_connect_method` <u>`VMS`</u>
	    `vms_autologin_transport` <u>`TDENET`</u>
	    `vms_autologin_tdenet_host` _____`::`
	Fill out Workbook line 63.
		Configuration
		Summaries >
		X Environment

___	18. Enter the host address or name.
	    `host_connect_method` <u>`VMS`</u>
	    `vms_autologin_transport` <u>`TCPIP`</u>
	    `vms_autologin_tcpip_host` _____
	Fill out Workbook line 58.
		Configuration
		Summaries >
		X Environment

To Do	xp.cnf File	Setup Menu Paths
___	19. `host_connect_method TELNET` Fill out Workbook line 19.	Configuration Summaries > X Environment
___	20. `host_connect_method CTERM` Fill out Workbook line 20.	Configuration Summaries > X Environment
___	21. `host_connect_method LAT` Fill out Workbook line 21.	Configuration Summaries > X Environment
___	22. `host_connect_method SERIAL0` Fill out Workbook line 22.	Configuration Summaries > X Environment
___	23. `host_connect_method SERIAL1` Fill out Workbook line 23.	Configuration Summaries > X Environment
___	24. `host_connect_method` <u>WINDD</u> Fill out Workbook line 24.	Configuration Summaries > X Environment
___	25. `host_connect_method DISABLED`	Configuration Summaries > X Environment

To Do	xp.cnf File	Setup Menu Paths

___ 26. Enter the host address or name and path to the os file.

    `boot_method `<u>`TFTP`</u>

    `boot_host_name _____`

    `boot_path _____`

If you have multiple families of network computers, replace the boot_path command with the applicable select commands.

    `select FAMILY=XP100 boot_path _____os.350`

    `select FAMILY=XP330 boot_path _____os.330`

    `select FAMILY=XP350 boot_path _____os.350`

    `select FAMILY=NC200 boot_path _____os.500`

    `select FAMILY=NC400 boot_path _____os.500`

    `select FAMILY=NC900 boot_path _____os.900`

Fill out Workbook line 53.

Setup Menu Path: Configuration Summaries > Boot

___ 27. Enter the NFS read size and the path to the os file.

    `boot_method `<u>`NFS`</u>` _____`

    `boot_path _____`

If you have multiple families of network computers, replace the boot_path command with the applicable select commands.

    `select FAMILY=XP100 boot_path _____os.350`

    `select FAMILY=XP330 boot_path _____os.330`

    `select FAMILY=XP350 boot_path _____os.350`

    `select FAMILY=NC200 boot_path _____os.500`

    `select FAMILY=NC400 boot_path _____os.500`

    `select FAMILY=NC900 boot_path _____os.900`

Fill out Workbook line 54.

Setup Menu Path: Configuration Summaries > Boot

To Do	**xp.cnf File**	**Setup Menu Paths**

___ 28. Enter the path to the OS file.

```
boot_method MOP
boot_path _____
```

If you have multiple families of network computers, replace the boot_path command with the applicable select commands.

```
select FAMILY=XP100 boot_path _____XP350_OS
select FAMILY=XP330 boot_path _____XP330_OS
select FAMILY=XP350 boot_path _____XP350_OS
select FAMILY=NC200 boot_path _____XP500_OS
select FAMILY=NC400 boot_path _____XP500_OS
select FAMILY=NC900 boot_path _____NC900_OS
```

Fill out Workbook line 60.

Configuration Summaries > Boot

___ 29. Enter the host address or name and path to the os file.

```
boot_method_2 TFTP
boot_host_name_2 _____
boot_path_2 _____
```

If you have multiple families of network computers, replace the boot_path command with the applicable select commands.

```
select FAMILY=XP100 boot_path _____os.350
select FAMILY=XP330 boot_path _____os.330
select FAMILY=XP350 boot_path _____os.350
select FAMILY=NC200 boot_path _____os.500
select FAMILY=NC400 boot_path _____os.500
select FAMILY=NC900 boot_path _____os.900
```

Fill out Workbook line 53.

Configuration Summaries > Boot

To Do	**xp.cnf File**	**Setup Menu Paths**

___ 30. Enter the NFS read size and the path to the os file.

```
boot_method_2 NFS _____
boot_path_2 _____
```

If you have multiple families of network computers, replace the boot_path command with the applicable select commands.

```
select FAMILY=XP100 boot_path _____os.350
select FAMILY=XP330 boot_path _____os.330
select FAMILY=XP350 boot_path _____os.350
select FAMILY=NC200 boot_path _____os.500
select FAMILY=NC400 boot_path _____os.500
select FAMILY=NC900 boot_path _____os.900
```

Fill out Workbook line 54.

Configuration Summaries > Boot

___ 31. Enter the path to the OS file.

```
boot_method_2 MOP
boot_path_2 _____
```

If you have multiple families of network computers, replace the boot_path command with the applicable select commands.

```
select FAMILY=XP100 boot_path _____XP350_OS
select FAMILY=XP330 boot_path _____XP330_OS
select FAMILY=XP350 boot_path _____XP350_OS
select FAMILY=NC200 boot_path _____XP500_OS
select FAMILY=NC400 boot_path _____XP500_OS
select FAMILY=NC900 boot_path _____NC900_OS
```

Fill out Workbook line 60.

Configuration Summaries > Boot

To Do	xp.cnf File	Setup Menu Paths

__ 32. If you have a Flash Memory card you can optionally read an *xp.cnf* file during subsequent boots by specifying a boot method other than ROM (either MOP, TFTP or NFS) and a host address or name and path to the *xp.cnf* file.

Configuration Summaries > Boot

```
boot_method_2 _____
boot_host_2 _____
boot_path_2 _____
```

If you have multiple families of network computers, replace the boot_path command with the applicable select commands.

```
select FAMILY=XP100 boot_path _____os.350
select FAMILY=XP330 boot_path _____os.330
select FAMILY=XP350 boot_path _____os.350
select FAMILY=NC200 boot_path _____os.500
select FAMILY=NC400 boot_path _____os.500
select FAMILY=NC900 boot_path _____os.900
```

__ 33. Set booting to be from a flash-equipped master network computer. Use the name or address of the master network computer.

Configuration Summaries > Boot

```
boot_method TFTP
boot_host _____
boot_path /rom/os.<model>
select TERMINAL NAME=__ enable_tftp_daemon YES
```

__ 34. Set booting to be from values stored in NVRAM, instead of values obtained from the network.

Configuration Summaries > Boot

```
determine_address_from NVRAM
```

__ 35. Enter the address or name of the default Telnet host.

Configuration Summaries > TCP/IP

```
default_telnet_host _____
```

To Do	xp.cnf File	Setup Menu Paths
__	36. Enter the address or name of the default CTERM node. `default_cterm_host` _____	Configuration Summaries > TDEnet
__	37. Enter the parameters for Serial port 0. `data_bits_0` _____ `stop_bits_0` _____ `parity_0` _____ `flow_control_0` _____ `baud_rate_0` _____	Configuration Summaries > Peripheral Ports
__	38. Enter the parameters for Serial port 1. `data_bits_1` _____ `stop_bits_1` _____ `parity_1` _____ `flow_control_1` _____ `baud_rate_1` _____	Configuration Summaries > Peripheral Ports
__	39. save_current_settings	Not available
__	40. Add an address or name for the XDMCP hosts to appear at the top of the HostMenu XDMCP list. `xdmcp_menu_entry` _____ `xdmcp_menu_entry` _____ `xdmcp_menu_entry` _____ Continue adding entries as needed.	Not available

To Do	xp.cnf File	Setup Menu Paths

__ 41. Add an address or name for all *preferred* nodes to appear at the top of the HostMenu VMS TDEnet list.

Not available

```
vms_menu_entry TDEnet _____ PREF
vms_menu_entry TDEnet _____ PREF
vms_menu_entry TDEnet _____ PREF
```

Add an address or name for all other nodes to appear on the HostMenu VMS TDEnet list.

```
vms_menu_entry TDEnet _____ NOTPREF
vms_menu_entry TDEnet _____ NOTPREF
vms_menu_entry TDEnet _____ NOTPREF
```

Continue adding entries as needed.

__ 42. Add an address or name for all *preferred* nodes to appear at the top of the HostMenu VMS TCP/IP list.

Not available

```
vms_menu_entry TCPIP _____ PREF
vms_menu_entry TCPIP _____ PREF
vms_menu_entry TCPIP _____ PREF
```

Add an address or name for all other nodes to appear on the HostMenu VMS TCPIP list.

```
vms_menu_entry TCPIP _____ NOTPREF
vms_menu_entry TCPIP _____ NOTPREF
vms_menu_entry TCPIP _____ NOTPREF
```

Continue adding entries as needed.

To Do	xp.cnf File	Setup Menu Paths

___ 43. Add an address or name for all *preferred* hosts to appear at the top of the HostMenu TELNET list. Specify the emulator to use for the session (TEK220 or TEK340).

Network Tables and Utilities > Internet Host

```
telnet_menu_entry _____ PREF _____
telnet_menu_entry _____ PREF _____
telnet_menu_entry _____ PREF _____
```

Add an address or name for all other hosts to appear on the HostMenu TELNET list. Specify the emulator to use for the session (TEK220 or TEK340).

```
telnet_menu_entry _____ NOTPREF _____
telnet_menu_entry _____ NOTPREF _____
telnet_menu_entry _____ NOTPREF _____
```

Continue adding entries as needed.

___ 44. Add an address or name for all *preferred* nodes to appear at the top of the HostMenu CTERM list. Specify the emulator to use for the session (TEK220 or TEK340).

Network Tables and Utilities > TDEnet Host

```
cterm_menu_entry _____ PREF _____
cterm_menu_entry _____ PREF _____
cterm_menu_entry _____ PREF _____
```

Add an address or name for all other nodes to appear on the HostMenu CTERM list. Specify the emulator to use for the session (TEK220 or TEK340).

```
cterm_menu_entry _____ NOTPREF _____
cterm_menu_entry _____ NOTPREF _____
cterm_menu_entry _____ NOTPREF _____
```

Continue adding entries as needed.

To Do	xp.cnf File	Setup Menu Paths

___ 45. Add an address or name for all *preferred* IBM hosts to appear at the top of the HostMenu IBM list. Specify the emulator to use for the session (TEK3270), the model (2, 3, 4, 5), and the protocol (TN or OCS). *Note, the Teemx emulator is not yet supported in the HostMenu.*

Not available

```
ibm_menu_entry _____  PREF _____ __ ____
ibm_menu_entry _____  PREF _____ __ ____
ibm_menu_entry _____  PREF _____ __ ____
```

Add an address or name for all other IBM hosts to appear on the HostMenu IBM list.

```
cterm_menu_entry _____  NOTPREF _____ __ ____
cterm_menu_entry _____  NOTPREF _____ __ ____
cterm_menu_entry _____  NOTPREF _____ __ ____
```

Continue adding entries as needed.

___ 46. Add an address or name for all *preferred* Windows NT servers to appear at the top of the HostMenu WinDD list. Specify the window size to use for the session (640, 800, 1024, 1280), whether to reconnect after a session log off (NORECONNECT, RECONNECT), and whether to display the menubar (MENUBAR, NOMENUBAR).

Not available

```
windd_menu_entry _____  PREF __ _____ _____
windd_menu_entry _____  PREF __ _____ _____
windd_menu_entry _____  PREF __ _____ _____
```

Add an address or name for all other WinDD servers to appear on the HostMenu WinDD list.

```
windd_menu_entry _____  NOTPREF __ _____ ____
windd_menu_entry _____  NOTPREF __ _____ ____
windd_menu_entry _____  NOTPREF __ _____ ____
```

Continue adding entries as needed.

To Do	xp.cnf File	Setup Menu Paths
__	47. Add the name or address and configuration information for the Windows NT server when the *host_connect_method* is set to WINDD. *windd_size* can be 640, 800, 1024, 1280). *windd_auto_connect*, *windd_auto_reconnect*, and *windd_entrybox* can be set as ENABLED or DISABLED. *windd_menubar* can be set as YES or NO. `windd_host_name` _____ `windd_size` _____ `windd_auto_connect` _____ `windd_auto_reconnect` _____ `windd_menubar` _____ `windd_entrybox` _____	Not available
__	48. Edit the *gateway.tbl* file and enter as many additional gateways as needed.	Network Tables and Utilities > Gateway
__	49. Edit the *hosts.tbl* file and enter as many additional hosts as needed.	Network Tables and Utilities > Internet Host
__	50. Edit the file *nodes.tbl* and enter as many additional nodes as needed.	Network Tables and Utilities > TDEnet Host

To Do	*.tbl Files	Setup Menu Paths
___	51. Edit the *nfs.tbl* file and enter as many additional NFS mounts as needed.	Network Tables and Utilities > NFS Mount
___	52. Edit the *fonts.tbl* file and enter the directory paths (Example: */tekxp/boot/fonts/misc* or *tcp/192.43.153.204:7100*).	Network Tables and Utilities > Font Directory

_____

_____

_____

_____

To Do	Host Configuration Procedures
___	53. Enable tftp on the host.
___	54. Enable NFS on the host.
___	55. Enable bootp on the host.
___	56. Enable DHCP on the host (see Chapter 5).
___	57. Enable rarp on the host.
___	58. Enable XDM on the host.
___	59. Add network computer entries to */etc/host* file.
___	60. Enable MOP on the host.
___	61. Add the nodes to the NCP database.
___	62. Create Proxy accounts on the host.
___	63. Enable DECwindows on the host.

Chapter **3**

Supporting a Centralized System
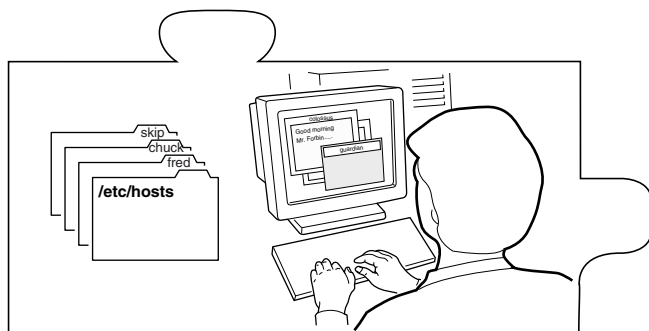
This chapter contains procedures for setting up the necessary operating system support files. Use the Workbook in Chapter 2 to determine the procedures needed.

Your environment and the features you enable dictate the operating system tasks. You must be root to modify the host files.

- *NFS* directories must be exported if **NFS** is used for booting or file access.

- DHCP must be configured so it automatically determines configuration information over the network.

- Several *Local Clients* are available and can be started with *xpsh* or the *Client Launcher* (See Chapter 4, *Local Clients*).

- *Local Motif Window Manager (MWM)* must be started to use local MWM (See Chapter 5, *Window Managers*).

Enabling NFS

This section is an overview that describes how to enable NFS on your NT host if NFS is used as the *boot_method* or *file_access_method*. Refer to your NFS documentation for specifics on installing and setting up NFS on your host.

1. Add the *boot_directory* (*\tekxp\boot*) to be exported on the host. Export as *read only*. Refer to your NFS documentation for information on the name and location of the exports file.

2. Edit the *%SYSTEMDRIVE%%SYSTEMROOT%\system32\drivers\etc\hosts* file and add the network computer name and address.

   ```
   128.07.60.30     portland
   ```

3. To enable the mount point immediately, open the **NFS** > **NFS Server** dialog. Click **Exports**. Press **Add** to add and verify mount points.

4. Open **Main** > **Services** to verify NFS is running.

Booting via NFS on a WinDD Server

To enable a WinDD server to be an NFS boot host:

1. On the WinDD server, log in as the local **administrator**.

2. Open the *Administrative Tools* > *User Manager for Domains* window.

3. Create two new users, assigning each a password. For example, boot1 and boot2.

4. Choose **File** > **Run** and enter *nfs.exe*. In the NFS Server dialog, click **Users**. The two new users appear in the Server Users dialog.

5. Select the first user and enter the password in the **User Password** field. Enter **0** in the **User ID** field, and **1** in the **Group ID** field. Click **Modify**.

6. Select the second user, and enter the password in the **User Password** field, **0** in the **User ID** field, and **0** in the **Group ID** field. Click **Modify**.

You can now boot from the WinDD server.

Configuring the Microsoft DHCP Server

> *Note:*   ***If the DHCP is not properly configured, multiple network computers could be assigned the same IP address.***

The Microsoft DHCP Server provides boot configuration information for NCD network computers after you add two new NCBridge *DHCP Options* (or *vendor tags*) to the DHCP server. If DHCP is not on your NT server:

- Install the Microsoft DHCP Server on the application server. For online installation help, refer to *WindowsNT Help > Additional Networking Services for Windows NT Server > TCP/IP > Installing and Configuring DHCP Servers.*

- Reboot the system after installing DHCP. The DHCP Server is automatically started.

The *DHCP Manager* administers the DHCP server. It is available through the *Network Administration* program group. Initially, the **Local Machine** entry is predefined and there are no *scopes* nor *DHCP Options* defined. When the first scope is created, the DHCP Options are created in the *Registry*.

Creating the NCBridge Scope

To set up the scope of NCD network computers you plan to manage and configure with the DHCP Server: **Local Machine**, you must do the following:

1. Open the *Network Administration* group from the *Program Manager*.

2. Open the *DHCP Manager* icon.

3. Create the scope of the NCBridge IP addresses. You must provide at least the start and end range of addresses and the subnet mask. Online help for creating scopes can be found in the *DHCP Manager Help*.

4. Select **DHCP Options** > **Defaults**.

5. Click **New**. Add the following information to create the 066 (boot server address) vendor tag:

   Name: Boot Server address

   Data Type: String

   Identifier: 066

   Comment: (This is an optional, user-defined field.)

   When complete, click **OK** to create the option.

6. To define the default value of the string, select the *066 Boot Server* entry in the *Option Name* entry box. The current value of the string should display as an empty box. If you are using NFS to boot the network computer, select the box and enter the IP address of the Boot Server, in this case, the IP address of **Local Machine**.

7. Click **New**. Add the following information to create the 067 (boot file) vendor tag:

   Name: Boot File

   Data Type: String

   Identifier: 067

   Comment: (This is an optional, user-defined field)

   When complete, click **OK** to create the option.

   *Note: **For steps 5 and 7, the identifiers do not need to be created when running Windows NT 4.0 Server and Terminal Server Edition.***

8. It may be appropriate to leave the default value of this option as a blank string and define it either at the scope or client lease level. If there is only a single os file to service any DHCP Server request, you can define it as the default string value. To define the value of the string at the DHCP Option: Default value, select the *067 Boot File* entry in the *Option Name* entry box. The current value of the string should display as an empty box. If you are using NFS to boot the network computer, select the box and enter the NFS path of the appropriate boot file directory for the network computer model, *\tekxp\boot* for example.

   - To define the values of the *DHCP Options* at the **Scope** level, select a scope from the *DHCP Servers* column, then select **DHCP Options** > **Scope**.

   - To define the values of the *DHCP Options* at the **Client Lease** level, select the *Scope* where the *Client Lease* entry can be found. Select **Scope** > **Active Leases**. Select the *Client Lease* entry and click **Properties**. In the new *Client Properties* window, select **Options**.

     *Note: **If the option is not an** Active Option**, select it from the** Unused Options **list and use the** Add **button to make it an** Active Option**. Select the Option in the** Active Options **List and click** Value**. The current value shows up in the value box at the bottom which you can then edit. Click** OK **to accept any changes.***

9. For NFS booting of NCD network computers, we suggest that the scopes and/or leases defined to support the network computers contain the following *DHCP Options*:

   003   Router Gateway number

   066   Boot server address/Primary boot host address

   067   Boot file/Primary boot path

Chapter 3   Supporting a Centralized System

Chapter **4**

Local Clients
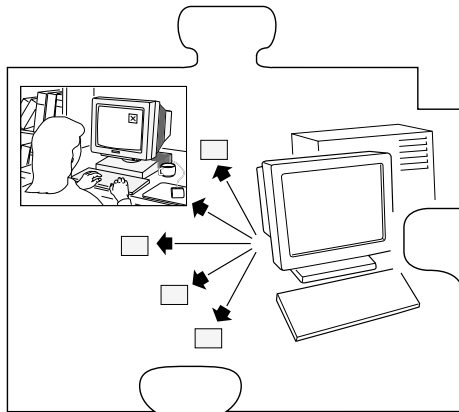
This chapter describes various ways to start a local client. Local clients are those applications that execute on the network computer, rather than on the host, thus reducing network traffic. *HostMenu*, *Telnet*, *Cterm*, and *Setup* are examples of local clients. Local clients can be started with **xpsh**, the remote configuration file (*xp.cnf*), with **rsh**, or with the *Client Launcher*.

This chapter also describes the Client Launcher, Audio Server, Authorization Key Manager, and Touchscreen Calibration.

Chapter 4   Local Clients

The following local clients are available on the network computer:

- Audio Mixer
- Audio Player
- Authorization Key Manager
- Cterm session
- Digital Video Player
- LAT session
- Local Client Launcher
- Motif Window Manager (MWM)
- Netscape NC Navigator

- Serial session
- Setup
- Teemx 3270E/5250 Emulators
- Telnet session
- Touchscreen Calibration
- WinDD ICA client
- Xlock client
- XP Window Manager (XPWM)

*Note: **Netscape NC Navigator, MWM, LAT, Cterm, Teemx emulators, and the Tek340 emulator require an authorization key. All NC900 products are shipped with an authorization key for Netscape NC Navigator and Tek340 emulator loaded.***

Starting Local Clients with xpsh

xpsh is a host program used to download local clients to a network computer. It is a two-way communication mechanism between the host program (**xpsh**) and the local daemon (*xpshd*). **xpsh** sends information to the network computer specifying which local clients to download, and **xpsh** receives local client error messages and exit information from the network computer. **xpsh** can download and start local clients.

Starting a client using **xpsh** enables the client to run locally instead of from the host. The host environment, client name, and arguments are sent to the local network computer. For example, using **xpsh** to download MWM enables access to files in %HOMEDRIVE%%HOMEPATH%. This allows you to customize the MWM environment for an individual user.

> *Notes:* ***When starting local clients with xpsh, -display*** *nc_name***:0**
> ***must be used from Windows NT. If there is an ICA***
> ***connection to an NT Terminal Server host, the NT***
> ***environment variable "CLIENTNAME" can be used to start***
> ***local clients. For example:***
>
> ***xpsh -display %CLIENTNAME%:0.0 mwm***
>
> ***Then when starting local clients with xpsh, enter*** **xpsh** ***and the***
> ***local client only. For example:***
>
> ***xpsh -display nc_name:0.0 -access xpsh netscape***
> ***xpsh -display nc_name:0.0 tek220 -e cterm***
> ***xpsh -display nc_name:0.0 tek340 -e telnet***
> ***xpsh -display nc_name:0.0 -access xpsh mwm***
> ***xpsh -display nc_name:0.0 tek220 -e llogin***
> ***xpsh -display nc_name:0.0 tek220 -e tip tty0***
> ***xpsh -display nc_name:0.0 tek340 -e tip tty1***
> ***xpsh -display nc_name:0.0 xlock -mode 1***
> ***xpsh -display nc_name:0.0 setup***
> ***xpsh -display nc_name:0.0 -access xpsh teemx***

To start a local client using **xpsh**, enter the appropriate command as explained in the preceding note and in the topics that follow.

Starting the Audio Mixer

xpsh -display *nc_name:0* `mixer`

Starting the Audio Player

xpsh -display *nc_name*:0 `aplay`

The following options can be set on the **xpsh** command line:

-h   *host* specifies the host name or address on which the audio file resides. The host must be entered in the network computer's Internet Host Table in *Setup*. This host displays in the Audio Player's File Information area.

-f   *filename and path* specifies the audio file name and its entire path. This file displays in the Audio Player's File Information area.

-a   *access method* specifies the access method used to access the audio file. Available access methods are **tftp**, **nfs**, and **dap**.

-v   *volume level* specifies the volume level to use when playing the audio file. Specify a number between 0 and 100, with 0 indicating no volume, and 100 indicating the loudest volume setting.

-p   when used with the **-h**, **-f**, **-a**, and **-v** options, the specified file plays without opening the Audio Player. The entire file plays and cannot be interrupted.

Starting the Authorization Key Manager

xpsh `authkey`

The network computer reads the *authkey.dat* file when booting and updates the network computer and authorization key information. (Be sure that SNMP is available and enabled.)

Starting a Cterm Session

A Cterm session can be started with a Tek220 or Tek340 emulator.

xpsh -display *nc_name:0* tek220 -e cterm
xpsh -display *nc_name:0* tek340 -e cterm

Resource settings can be specified for a Cterm session. Refer to the next section, *Specifying Client Resource Settings*.

Starting the Digital Video Player

Note: Not available on NC900 Series.

xpsh -display *nc_name:0* `vplay`

You can set the following **vplay** options on the **xpsh** command line:

-h   *host* specifies the host name or address on which the video file resides. The host must be entered in the network computer's Internet Host Table in *Setup*. This host displays in the Video Player's File Information area. When Multicasting, **-h** specifies the IP address. The port number displays in the Video Player's Addr/Port Information area.

-f   *filename and path* specifies the video file name and its entire path. This file displays in the Video Player's File Information area. When Multicasting, **-f** specifies the port number. The address displays in the Video Player's Addr/Port Information area.

-a   *access method* specifies the method used to access the video file. Available access methods are **tftp**, **nfs**, **dap,** and Multicast. NFS is the preferred file access method for faster and more accurate data transfer rates required by the player. In addition, there is a 16MB limit on files transferred with TFTP.

-v   *volume level* specifies the volume level to use when playing the video file. Specify a number between 0 and 100, with 0 indicating no volume, and 100 indicating the loudest volume setting.

-m   (Mute) specifies that the video file plays with no sound.

-c   (Color) specifies that the video file displays in color (used only if the video was recorded in color).

-nc   (No Color) specifies that the video file displays in greyscale images.

-brightness *n*   sets the brightness level of the video file. Specify a number between -50 and +50.

-contrast *n*   sets the contrast level of the video file. Specify a number between -50 and +50.

-b   (Big) specifies that the video file displays in a frame four times the size of the original file.

-p   (Playonly) when used with the options above, the specified file plays without showing the Video Player. The entire file plays and cannot be interrupted.
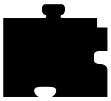
-all   (Play All; software player only) plays all frames in a video file. Frame scheduling is ignored and the audio is not put into sync.

-title   "*string*" — assigns a title for the vplay windows.

-propcmd
creates properties that allow other clients to send command strings to the Video Player. These properties cannot be changed or modified and are used to control the Video Player from another client that you create. For details about the properties, see the **vplay** man page.

-BUFSIZE *n*
(Hardware Player only) specifies the size of the Video Player's memory buffer (in kilobytes). The value defaults to 1024 and can not be set lower than 1 kilobyte. If the value specified is greater than available memory when trying to play a file, the Video Player reduces its buffer to the available memory.

-CHKSIZE *n*
(Hardware Player only) specifies that the Video Player's memory buffer is divided into "chunks", measured in kilobytes. The network fills the chunks, and the Video Player empties them as they are accessed. The default is 32, which divides the buffer into 32 kilobyte chunks. If the chunk size is set to a number larger than the buffer size, the chunk size is truncated to one half the buffer size. The chunk size cannot be set less than 1 kilobyte.

-CHKDELAY *n*
(Hardware Player only) specifies the time delay (in milliseconds) that the Video Player waits following each read request that fills a chunk.

-chan *n*
(Multicast only) specifies an index into an array of available Multicast channels. Do not use with the **-h**, **-f**, **-a**, or **-text** options.

-text "*string*"
(Multicast only) specifies the channel string to be displayed by the Video Player. Do not use with the **-chan** option.

Starting a LAT Session

A LAT session can be started with a Tek220 or Tek340 emulator.

xpsh -display *nc_name:0* `tek220 -e llogin`
xpsh -display *nc_name:0* `tek340 -e llogin`

Resource settings can be specified for a LAT session. Refer to the next section, *Specifying Client Resource Settings*.

Starting the Local Client Launcher

```
xpsh -display nc_name:0 launcher
```

The following options can be added to the **xpsh** command line when starting the Client Launcher:

-auto configures the Client Launcher with the automatic default settings even if a configuration file exists.

-file *filename* configures the Client Launcher using a user-defined configuration file.

Starting Local MWM

xpsh -display `nc_name:0 mwm`

Note: **If both MWM version 1.1** *and* **MWM version 2.0 are authorized, the 2.0 version starts. In this case, to start version 1.1, use** `mwmv1` **instead of** `mwm` **in the command.**

Starting Local Netscape NC Navigator

All NCD Network Computers come authorized to run the local Netscape NC Navigator browser which ships with NCBridge. Additional memory may be required, however.

NCD recommends that the network computer have at least 48MB of system memory for running the local browser. You can start the local browser in either kiosk mode (see the *Kiosk Mode* topic in the *NCBridge Reference Manual*) or by using **xpsh**. For example, after logging in, use one of these commands to start the local browser:

> **xpsh -display** *displayname:0.0* `-access xpsh netscape`

> **xpsh -display** *displayname:0.0* `-access xpsh netscape_lite`

These commands assume that **xpsh** is in the user's search path. The default location is `C:\NCBridge\tekxp\bin\nt`. You must use the **-display** *displayname:0.0* command line option, where "displayname" is the IP address or hostname of the NC. If connected to an NT host using the local ICA client, use "**-display** %CLIENTNAME%:0.0". See both the *NCBridge User Manual* and the *NCBridge Reference Manual* for additional details on running the local browser.

> *Notes: **The time required to start the local browser can be significantly reduced by preloading it during the boot process. Prior to NCBridge 4.0, the browser was automatically preloaded. NCBridge 4.0 does not preload the browser. The administrator must specify the preloading of the browser in the xp.cnf file.***
>
> ***When using local Netscape, the NC must be configured to boot using NFS. When booting via TFTP, local Netscape takes about 5 to 10 minutes to start.***

Starting a Serial Session for Port 0 and Port 1

A serial session can be started with a Tek220 or Tek340 emulator for port 0 or port 1.

> **xpsh -display** *nc_name:0* `tek220 -e tip tty0`

> **xpsh -display** *nc_name:0* `tek340 -e tip tty1`

Starting Setup

xpsh -display *nc_name:0* `setup`

A network computer's *Setup* and Console window can also be started and displayed on a remote network computer or host using **xpsh**. Once started, you can use *Setup* to configure network computer settings, establish communication connections, and monitor network computer operations.

To access a network computer's *Setup* from a remote network computer or host using C shell, enter:

setenv `TEKSETUP_DISPLAY` *display_device*`:0`

xpsh `-display` *nc*`:0 setup`

If using a different type of shell tool, enter:

xpsh -display *nc:0* `-xpenv "TEKSETUP_DISPLAY=`*display_device*`:0" setup`

where *nc* is the remote network computer whose *Setup* and Console window is accessed, and *display_device* is the network computer or host where *Setup* is to display. Use IP addresses if the remote network computer does not know the host name of the display device (set up in the Internet Host Table in *Setup*).

To access a network computer's Console window from a remote network computer, first display the remote NC *Setup* window on your NC as described earlier in this topic. Then click the Network Tables and Utilities button and select Console from the drop-down menu to open the Console window.

If the network computer user currently has *Setup* started, it is not accessible remotely via **xpsh**. Likewise, if a remote network computer or host has *Setup* open via **xpsh**, it is not available to the network computer user.

Note: To prevent other users from accessing your network computer's Setup and resetting the server, set enable_access_control to Yes (in either the xp.cnf file or in Setup).

Starting Teemx 3270E/5250 Emulators

xpsh -display *nc_name*:0 `teemx`

See the *Teemx 3270E/5250 User Manual* on the Documentation CD-ROM for details.

Starting a Telnet Session

A Telnet session can be started with a Tek220 or Tek340 emulator.

xpsh -display *nc_name:0* `tek220 -e telnet`
xpsh -display *nc_name:0* `tek340 -e telnet`

Resource settings can be specified for a Telnet session. Refer to the next section, *Specifying Client Resource Settings*.

Starting WinDD

xpsh can start the WinDD ICA client as needed. To start the WinDD ICA client with **xpsh**, enter the following (where *nc_name* is the name or address of your network computer):

xpsh -display *nc_name*:0 `windd [options]`

The following *options* can be set on the **xpsh** command line:

-display *nc*:**0**
    Specifies the *nc* name or address to display the WinDD local client.

-c   Auto-connect to the first application server in the application server list. If there are no application servers in the list, this option is ignored and the client window is displayed.

-nc Do not auto-connect to an application server. (Default)

-d   Displays the menu bar and the internal borders. (Default)

-nd Does not display the menu bar or the internal borders. For example, this allows a 1280x1024 WinDD window to fully display on a 1280x1024 monitor (minus windows manager decorations).

-e   Enables the *Application Server* edit field window so that users can add application servers to the application server list. (Default)

-ne Disables the *Application Server* edit field window so that users are not allowed to add application servers to the application server list.

-floppy
Allows supported host versions of WinDD to use its local floppy drive as a network connected drive for the Application Server. Only the first host client to specify this option is allowed to use the floppy device. Note, this is for host clients (with local floppy drive) only.

-no_floppy_cache
Disables use of local floppy write cache. This is a fail-safe option to ensure the entire file has been updated in the event a user suddenly ejects a disk mechanically (when disks are ejected via the GUI button, that process flushes the cache so no information is lost).

-geometry *<geometry>*
Standard X11 geometry option, <WidthxHeight+X+Y>.

-h *<application server>*
Adds the named application server(s) to the application server list. Multiple application servers can be added to the list by listing them separated by spaces.

-help
Displays a brief help list on the available WinDD command-line options.

-initprog *<prog>* [**-initdir** *<dir>*]
Specifies the application to execute upon application server login. The login session is terminated when the application is terminated.

Prog specifies the application and can also specify its path (up to 259 characters) and parameters. The program path and name are written consecutively (and not separated by a space) when they are both specified in *prog*. A space separates the program name and its parameters. These parameters are program specific and can specify program settings or data files to invoke on execution. *Dir* specifies the path of the executable program.

-keysym_only
Specifies that all NCD network computer keyboards are supported with keysym translations within WinDD.

-local_numlock
Specifies that WinDD manages the state of the Num_Lock independent of any X server support.

-no_auto_numlock
    Specifies that WinDD does not control the Num_Lock setting.

-login *<username>* [-**pass** *<passwd>*] [**-domain** *<domainname>*]
    Specifies the application server user account login name, login
    password, and domain. These values are used for user account
    verification.

    When using a WinDD client and connecting to a WinDD application
    server, your username, password, domain, initial program, and initial
    directory are encrypted as they are sent across the network.

    Username, *password*, *domainname*, *dir*, and *prog* are not viewable or
    changeable from the WinDD configuration window.

-r   Reconnect to the application server after log off.

-nr Does not reconnect to the application server after log off. (Default)

-version
    Displays the WinDD version in use. (If the license is 8019, this option
    also prints *For evaluation purposes only*.)

-x   Exits the WinDD client upon logging out of, or disconnecting from, the
    application server.

-nx Does not exit the WinDD client upon logging out of, or disconnecting
    from, the application server. (Default)

-force_xcursor
    Specifies that monochrome pointers within the WinDD desktop are to
    be implemented using X cursors. Some monochrome pointers are xor'd
    with the underlying desktop. When this switch is specified, it is no
    longer xor'd, as X cursors do not support that mode.

    *Note: The force_xcursor feature is intended to compensate for
    workstations that do not have a particularly high
    performance X server. Consider using this option if the
    pointer flashes when moved, or poor performance is
    observed entering text in dialog boxes. Using this switch
    improves user interactivity. The only side effect is the
    pointer is displayed in a single color.*

Starting Xlock

xpsh -display *nc_name*:0 xlock -mode <*mode*>

where <*mode*> is an optional setting. If set to 1, *Xlock* locks the keyboard only. If set to 0, *Xlock* locks the keyboard and the screen. If a mode setting is not given, *Xlock* locks the keyboard and the screen by default.

A password is required to use the *Xlock* client. The same password is used throughout the entire session. If while using *Xlock* you forget the password, you must reboot the network computer or reset the server (in *Setup*) to clear the password and unlock the keyboard and screen.

Starting Local XP Window Manager

xpsh -display *nc_name*:0 xpwm

Starting Local Clients in the *xp.cnf* File

Using the *start* and/or *preload* commands in the remote configuration file (*xp.cnf*), you can determine which local clients are downloaded and/or started at boot time. The specified clients are loaded into the network computer's memory and remain there until started. Even after closing the client, it remains in RAM so that it can be restarted again. For information about starting local clients from the remote configuration file, refer to the *start* and *preload* commands in Chapter 2, *Remote Configuration* in the *NCBridge Reference Manual*.

Starting Local Clients with rsh

rsh is a host program used to download local clients to a network computer. **rsh** sends information to the network computer specifying which local clients to download, however, unlike **xpsh**, **rsh** does not receive local client error messages and exit information from the network computer.

Security for **rsh** is set through the *.rhosts* file. If user security is not set in the *.rhosts* file, then users are able to access all local clients. The *rshd_security* command in the remote configuration file (*xp.cnf*) is used to determine whether users can override the security features set by the system administrator.

Enabling rsh

Before starting local clients with rsh, you must first enable it. To do this, use the *start* command with the parameter RSHD in the remote configuration file (*xp.cnf*):

start   RSHD   Yes

Editing the *.rhosts* File

The *.rhosts* file is used to authenticate user requests to execute local clients. Entries are either positive or negative, depending on the permissions you want to give users. Positive entries enable user to access the specified local clients; negative entries deny access. The entries should include the hostname, username and client name. The order of entries within the files is important. If the file contains both positive and negative entries, the entry that appears first takes precedence.

Examples

For example, the entry below allows user judyl access to the Setup and Client Launcher clients while logged into the host Sierra:

sierra   judyl   +setup   +launcher

If you do not list specific clients, then all clients are available to the specified user:

sierra   judyl

A negative entry means that the client is not available to the user, but all other clients are. For example, user judyl cannot access the Digital Video Player or the Audio Player, but can access any of the other available clients:

sierra   judyl   -vplay   -aplay

You can also use the positive and negative specification for hostname and usernames. In the following example, user paulb can access all clients from any remote host:

+   paulb

In the next example, any user from any host can access the Setup and Launcher clients:

+   +   +setup   +launcher

In the final example, user davidb is not allowed access to the Setup and Xlock clients from any host:

> **+**   **-davidb**   **+setup**   **+xlock**

For details about the *.rhosts* file, refer to the rhosts man page for your host.
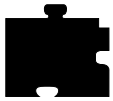
Starting Local Clients with rsh

rsh uses the same local client options as **xpsh**. When using **rsh** to start clients, you do not enter the **-display** environment variable, and you must use the network computer name instead of an address. For example, to start Setup with **rsh**:

> **rsh** *nc_name* `setup`

For details about starting local clients using **rsh**, refer to the *Starting Local Clients with xpsh* section earlier in this chapter and substitute **rsh** for **xpsh** and omit the **-display** environment variable and the **:0** in all examples.

> *Notes: rsh can start all the local clients that xpsh can start, except the Remote Setup client, Navio, Netscape, Netscape_Lite, and Teemx.*
>
> *Remote setup implies that the Setup screen from an NC is displayed on another X server device over the network.*

Client Launcher

The local Client Launcher allows users to start local clients by simply selecting a client from a menu using the mouse. Figure 4-1 shows a sample Client Launcher menu. The Client Launcher can be configured automatically using default options, or with a customized configuration file. It can be downloaded to the network computer using the remote configuration file (*xp.cnf*) or using **xpsh**.

Figure 4-1 Client Launcher Menu

Configuring the Client Launcher

There are two ways to configure the Client Launcher: default automatic configuration, or with a specific configuration file. When the Client Launcher is started, if a user-defined configuration file is not specified, it first searches for a *system.launcher* configuration file. (A sample *system.launcher* file is located in *\tekxp\boot\config*.) If that file is not found, it configures automatically.

Automatic Configuration

If there is no configuration file present, the Client Launcher automatically configures and includes the following clients by default: Telnet, HostMenu, Lock Screen, Console, and Setup. Serial Port 0 and/or 1 are included if the network computer has serial ports. If Motif Window Manager (MWM), TDEnet, LAT, or Tek340 are authorized, they are included as well. The Audio and Video players are included if authorized and if the required hardware is present.

Configuration Files

The configuration files are accessed when the Client Launcher starts, and are used to determine which clients are available to users. There are two different types of configuration files:

* The *system.launcher* file configures multiple network computers so that the clients available on the Client Launcher are the same for all who use the file. This allows a system administrator to control which clients are available to users.

* A user-defined configuration file customizes the Client Launcher for a user.

To create a configuration file:

1. Create a new file, naming it either *system.launcher* for a system-wide configuration file, or whatever you like for a user-defined file, for example, *launch*. A sample *system.launcher* file is located in *\tekxp\boot\config*.

2. Move the new file to the same directory where the *xp.cnf* file is located. (The default location is *\tekxp\boot\config*.)

3. In the file, use a text editor to enter the main Client Launcher menu name in uppercase letters.

4. On subsequent lines, enter each of the clients and submenu names (if used)
   in double quotation marks to include on the Client Launcher followed by the
   f.exec or f.menu option:

   f.menu specifies that a submenu is available with additional options. For
   example, if you have both Motif Window Manager (MWM) and
   XP Window Manager (XPWM) authorized, you could have a
   Window Managers entry on the Client Launcher menu that opens a
   second menu containing MWM and XPWM. You can use any
   name or description you like in the Client Launcher file with the
   f.menu option; however, it must end with the string "MENU", for
   example:

   ```
   #"Window Managers  f.menu WMMENU

   . . .

   #WMMENU

   #"mwm"                 f.exec "mwm"

   #"XPWM"                f.exec "xpwm"

   #ENDMENU
   ```

   f.exec specifies a local client to start immediately upon selecting it. Enter
   the client name exactly as you would on the **xpsh** command line,
   usually with all lower case letters and with double quotation marks.
   For example, "telnet", "console", "setup", and "mwm".

   The order in which you enter clients and submenus in the configuration file
   determines the order they appear on the Client Launcher.

5. On the last line of the main menu, enter ENDMENU in uppercase letters.

6. Create the submenus, if used, by entering the submenu name in all uppercase
   letters. On subsequent lines, list the clients to include followed by f.exec
   option in the same manner described in Step 4.

7. On the last line of each submenu, enter ENDMENU in uppercase letters.

The Client Launcher menu in Example 4-1 contains the following entries:
Sessions (displays a submenu of available session clients), Multimedia
(displays a submenu), Console, HostMenu, Window Managers (displays a
submenu), and Setup.

Example 4-1 Sample Client Launcher Configuration File

```
# Configuration file for Client Launcher
#
MAINMENU
"Sessions"            f.menu SESSIONS
"Multimedia"          f.menu MULTIMEDIA
"Console"             f.exec "console"
"HostMenu"            f.exec "HostMenu"
"Host Connection"     f.menu HOSTMENU
"Window Managers"     f.menu WINDOWS
"Setup"               f.exec "setup"
"Exit"                f.exec "quit"
ENDMENU

SESSIONS
"Serial 0"            f.exec "tip -e tip tty0"
"Telnet 220"          f.exec "xterm -e telnet"
"Telnet 340"          f.exec "tek340 -e telnet"
ENDMENU

MULTIMEDIA
"Audio Player"        f.exec "aplay -v 50"
"Digital Video"       f.exec "vplay -v 50"
"Audio Mixer"         f.exec "mixer"
ENDMENU

WINDOWS
"MWM"                 f.exec "mwm"
"XPWM"                f.exec "xpwm"
ENDMENU

HOSTMENU
"Netscape Lite"       f.exec "netscape_lite"
ENDMENU
```
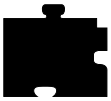
In the previous example, the f.exec option immediately starts a client or session, and the f.menu option specifies that a submenu is to appear. The word ENDMENU specifies the end of the menu options.

The main Client Launcher menu contains the MAINMENU entries of the configuration file. When Sessions or Window Managers is selected, the appropriate submenu displays.

Downloading the Client Launcher

The Client Launcher can be downloaded using the remote configuration file (*xp.cnf*) or with **xpsh**.

Downloading Using the *xp.cnf* File

The *start* command in the *xp.cnf* file can be set to automatically download and start the Client Launcher when the network computer boots. For information about the *start* command and available parameters, refer to Chapter 2, *Remote Configuration* in the *NCBridge Reference Manual*.

Downloading with xpsh

When downloading and starting the Client Launcher using **xpsh**, the following options can be set:

* **-auto** configures the Client Launcher with the automatic default settings even if a configuration file exists.

* **-file filename** configures the Client Launcher using a user-defined configuration file.

* **-geometry *x, y*** configures the position of the Client Launcher. A positive entry (+x, +y) orients from the upper left corner of the display. A negative entry (-x, -y) orients from the lower right corner of the display.

Examples

The following example downloads and starts the Client Launcher with automatic configuration on the network computer *sierra*:

> **xpsh -display** *sierra:0* `launcher -auto`

The following example downloads and starts the Client Launcher with automatic configuration on the network computer *sierra* and positions it 30 pixels from the lower right corner:

> **xpsh -display** *sierra:0* `launcher -auto -geometry -30-30`

The following example downloads and starts the Client Launcher, configuring its contents using a user-defined file named *launch* on the network computer *sierra*:

> **xpsh -display** *sierra:0* `launcher -file\ /u1/user3/launch`

The following example downloads and starts the Client Launcher, configuring its contents using the *system.launcher* file on the network computer *rocky*:

xpsh -display *rocky:0* `launcher`

The following example starts the Client Launcher with the automatic configuration using the **start** command in the *xp.cnf* file:

start `launcher -auto`

Using the Client Launcher

Press the Shift and Setup keys simultaneously to display the Client Launcher main menu.

When the Client Launcher is started, it searches for configuration information in the following order:

- In a user-defined configuration file, if specified.

- The *system.launcher* configuration file.

- If neither configuration file is found, the Client Launcher automatically configures by listing all default and authorized clients.

To open a client listed on the Client Launcher, simply position the mouse pointer on the client name and click the mouse button once. To open a submenu, position the mouse pointer on the menu name. The submenu displays to the right of the Client Launcher main menu (refer to Figure 4-2). Position the mouse pointer an item in the submenu and click the mouse button once.

If the Client Launcher is iconified, pressing the Shift and Setup keys simultaneously displays it again. This is especially useful if the Client Launcher icon is hidden under other open files.

Authorization Key Manager

The Authorization Key Manager enables a system administrator to easily update the authorization keys of several network computers. Authorization keys are used to authorize special options used on the network computer, such as Motif window manager, TDEnet (DECnet), and Teemx 3270E emulator.

Instead of entering each network computer's authorization key one at a time, you can update and maintain them from a central file. The Manager reads the *authkey.dat* file, which contains the authorization keys for those network computers you want to update with new options. When the file is read, those network computers listed in the *authkey.dat* file are updated with a new key.

How the Authorization Key Manager Works

The Authorization Key Manager uses SNMP to query specific broadcast addresses and network computers listed in the *authkey.dat* file, or in the Authorization Key Manager client. Those network computers are then assigned a new authorization key, also listed in the *authkey.dat* file. Therefore, you must have and enable SNMP.

Setting Up SNMP

In the *xp.cnf* file, use the *snmp_comm_list* command to set the community list to **public** and to allow read and write permissions:

snmp_comm_list   "host"   public   RW

where "host" is the host that performs the GET and SET operations when querying the subnet, public is the community string, and RW indicates read and write permissions.

The *authkey.dat* File

The *authkey.dat* file is located in *\tekxp\boot\config* by default and is empty. Edit the file to contain the broadcast address to query, the network computers to update, and the new authorization keys. The following parameters are used in the *authkey.dat* file:

broadcast   specify the broadcast address to query using SNMP.

terminal   for each network computer you want to update with a new authorization key, enter its hardware address.

authorization key   For each network computer, enter the authorization key. Each network computer must have a unique authorization key.

The example below shows a sample *authkey.dat* file:

```
broadcast  144.67.33.255
terminal   08:00:34:94:33:EJ  JAB(4%>3+[=T;fjqc
terminal   08:46:22:69:47:32  AK)&AMB@.?JTOR&]\
terminal   08:42:90:00:31:69  Jk%3+=]klw\jvv<?!
terminal   08:47:35:69:21:21  Uu$^qvuIi#=/>1GLq
```

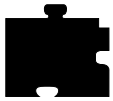## Starting the Authorization Key Manager

You can update authorization keys automatically with the *xp.cnf* file (and the *authkey.dat* file), or you can open the Authorization Key Manager client. The client provides a user interface where you can enter and delete authorization key and network computer information before updating the authorization keys.

Updating the Authorization Key When Booting

To automatically update authorization keys when booting, edit the *xp.cnf* file to uncomment the *update_authkey* command. The network computer reads the *authkey.dat* file when booting and updates the network computer and authorization key information. (Be sure that SNMP is available and enabled.)

Starting the Authorization Key Manager Client with xpsh

Use **xpsh** to open the Authorization Key Manager client as shown in Figure 4-1. The client's interface allows you to add and delete information from the *authkey.dat* file, and to force the *authkey.dat* file to be read without having to reboot the network computer.

To start the client with **xpsh**, enter this command:

> **xpsh** authkey

Using the Authorization Key Manager Client

The Authorization Key Manager client can be started only with **xpsh**. When it starts, the window shown in Figure 4-2 appears.

Authorization Key Manager			

NComputer List

Ethernet	Authorization Key	IP Address	Status
08:00:34:94:33:EJ	JAB(4%>3+[=T;fjqc		None
08:46:22:69:47:32	AK)&AMB@.?JTOR&]\		None
08:42:90:00:31:69	Jk%3+=]klw\jvv<?!		None
08:47:35:69:21:21	Uu$^qvuli#=/>1GLq		None

Ethernet Address	Authorization Key		
		Add Entry	Delete Entry
Update Authkey	Edit Broadcast List	Save Authkey File	Exit

Figure 4-2 Authorization Key Manager Window

The Authorization Key Manager window shows the ethernet addresses and authorization keys as listed in the *authkey.dat* file. Before updating authorization keys, you can add and delete information in this window. This information is read in addition to the entries in the *authkey.dat* file. The following topics are discussed:

- Adding and Deleting Network Computer Information

- Editing the Broadcast List

- Updating Authorization Keys

- Saving the *authkey.dat* File

Adding and Deleting Network Computer Information

The Authorization Key Manager window contains network computer information necessary for updating authorization keys. If you have information in the *authkey.dat* file, it displays in this window.

- To delete an entry, select the information to delete with the mouse and it prefills in the **Ethernet Address** and **Authorization Key** fields. Then select **Delete Entry**.

- To add an entry, enter its ethernet address in the **Ethernet Address** field, and its new authorization key in the **Authorization Key** field and select **Add Entry**.

To apply your changes to the *authkey.dat* file, refer to *Saving the Authkey File*.

Editing the Broadcast List

The Authorization Key Manager searches the specified broadcast address for those network computers that match the ethernet addresses listed in the *authkey.dat* file. To view and or edit the broadcast list, select the **Edit Broadcast List** button. The window shown in Figure 4-3 appears.
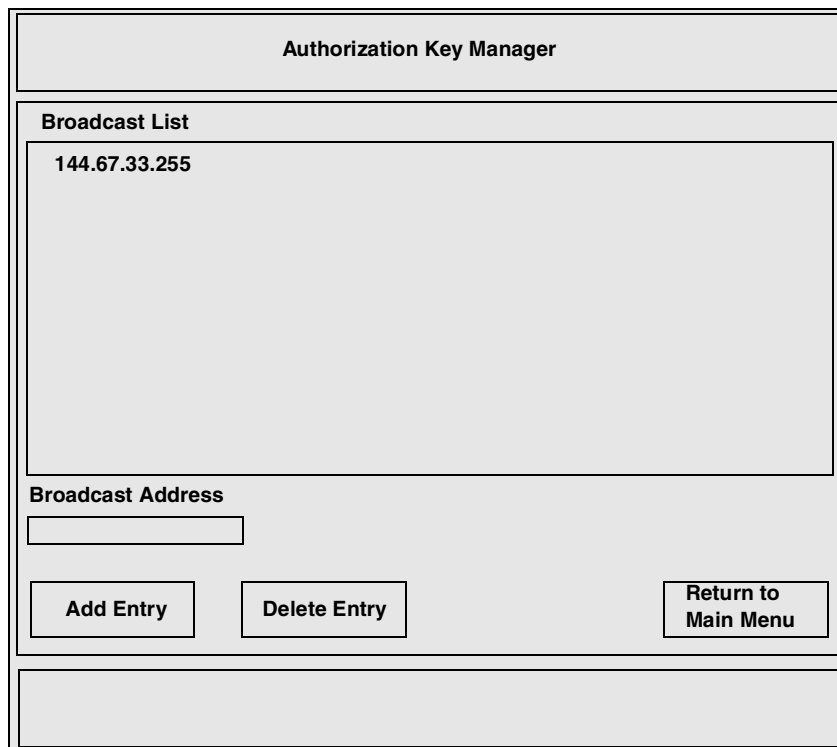
Figure 4-3 Edit Broadcast List Window

This window lists the broadcast addresses that the Authorization Key Manager client searches when updating authorization keys. You can add and delete information in this window. Information in this window is read in addition to the entries in the *authkey.dat* file.

• To add a broadcast address, enter the address in the **Broadcast Address** field and select **Add Entry**.

• To delete an address, select the address to delete with the mouse, and then select **Delete Entry**.

To apply your changes to the *authkey.dat* file, refer to *Saving the Authkey File*.

Updating Authorization Keys

When the correct information is in the Authorization Key Manager window, select the **Update Authkey** button. The authorization keys are updated for those network computers listed.

The update status for each network computer is displayed as either Successful or Unreachable. If the status is Unreachable, check that you entered the correct ethernet and authorization key information. Make sure also that you have SNMP enabled.

Saving the Authkey File

After making changes to the ethernet addresses, authorization key, or broadcast information, you can save those changes to the *authkey.dat* file. To save changes, select **Save Authkey File**. The window shown in Figure 4-4 appears.

Figure 4-4 Save Authkey File Window

1. Select the access method for saving the information to the file: NFS or TFTP.

   *Note: **If you use TFTP as the access method, the file authkey.dat
   must already exist and have world write permissions.***

2. Enter the host name on which the *authkey.dat* file is located.

3. Enter the path and file name to which the information is to be saved.

4. Select the **Save Authkey File** button to save the information in the
   Authorization Key Manager client to the *authkey.dat* file.

5. Select **Return to Main Menu** to exit the Save Authkey File window.

Touchscreen Calibration Client

The Trident Touchscreen Calibration Client enables you to calibrate the touchscreen. The Calibration Client is shown in Figure 4-5.
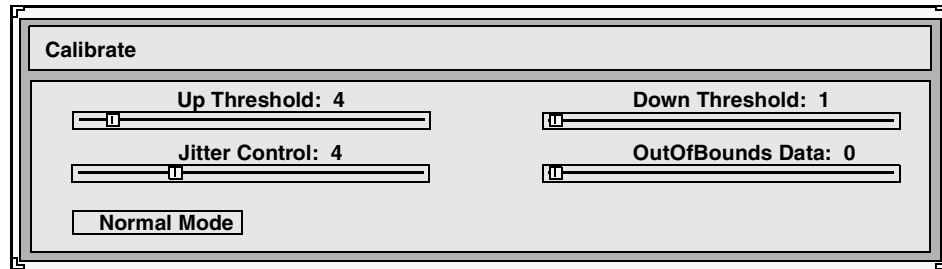

Figure 4-5 Calibration Client

To invoke the Calibration Client, first map it to a keysym using the *keysym_action_entry* command. For example, to invoke the client with the F1 key, enter the following in the *xp.cnf* file:

keysym_action_entry   F1   TOUCH_CALIBRATE ALL

Touchscreen jitter can be controlled with the *touchSc_Jitter* command:

touchSc_Jitter   4   # touch screen jitter control

In this example, the **4** indicates that a change of less than 5 pixels when touching the screen does not cause the cursor to move.

The Calibration Client includes the following elements:

> *Note: Not all elements are available on all touchscreen devices.*
> *Only those elements needed for your touchscreen appear.*

Up Threshold controls the touch up threshold

Down Threshold controls the touch down threshold

Jitter Control controls the jitter and SAW touchscreen pressure threshold

OutOfBounds Data controls the out of bounds data

Normal Mode controls the different touch modes. The available modes are:

- Normal Mode: user touching the screen generates a button press; user dragging his finger generates a button press motion (like pressing the mouse button and dragging the mouse), user lifting his finger generates a button release event.

- Point Mode: user touching the screen generates a button press and release event immediately.

- Tap Mode: allows the touchscreen to operate like a mouse. The user touching the screen generates a motion event allowing the user to drag the cursor around the screen (like moving the mouse). Lifting his finger from the screen and touching the screen again within a predefined time limit (about 1/4 second) causes a button press event (like pressing a mouse button). The user can now move his finger around the screen causing button press motion events (like pressing the mouse button and moving the mouse simultaneously). Removing his finger from the screen generates a button release event (like releasing the mouse button).

- Release Mode: creates motion events as the user touches the screen and drags his finger. When the user removes his finger, a button press event is generated, followed immediately by a button release event.
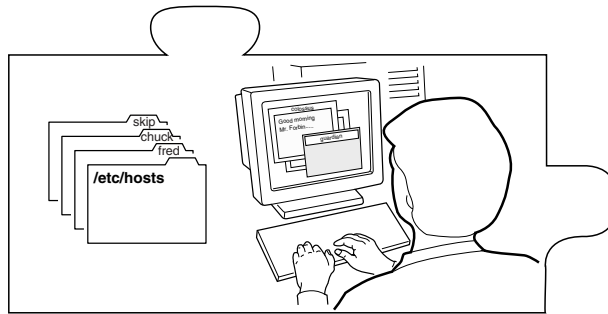
Window Managers

This chapter describes the local window managers available on the network computer. These window managers are: Motif Window Manager (MWM) and XP Window Manager (XPWM).

Setting Up Local MWM

Starting local Motif Window Manager (MWM) from your host allows MWM to access the configuration and resource files in a standard location, for example, the *%HOMEDRIVE%%HOMEPATH%* directory. It also allows you to customize the window manager menus and to define menu selections that include host commands. For detailed information about MWM configuration, refer to the MWM man page located in the *C:\NCBridge\tekxp\man\nt* directory by default.

Starting Local MWM

Enter the following command in the user's session start up file.

xpsh -display *displayname***:0.0 mwm**

This assumes that **xpsh** is in your search path. The default search path is */tekxp/ bin/<host>*. You need not specify **-display** *displayname:***0.0** if you have set the DISPLAY environment variable.

> *Note: You can also start local MWM using the remote configuration file or the Client Launcher. However, these methods do not allow MWM access to the system-level and user-level customization files on your host.*

Starting MWM with the *xp.cnf* File

The *start* and *preload* commands in the *xp.cnf* file can be used to start MWM. For details about these commands, refer to Chapter 2, *Remote Configuration* in the *NCBridge Reference Manual*.

Starting MWM with the Client Launcher

You can customize the Client Launcher to include those clients that you use most often. If authorized, MWM is listed on the Client Launcher by default as part of the Window Managers submenu. To start MWM, move the mouse pointer to MWM and click the mouse button. For information about the Client Launcher, refer to the *Client Launcher* section in Chapter 4, *Local Clients*.

Accessing MWM Configuration Files

When starting local MWM using **xpsh**, using the **-access xpsh** command-line option enables local MWM to access full resource and file access as if it were started from a host. For example, the following line starts local MWM and accesses system-level and user-level customization files on the host:

```
xpsh -access xpsh mwm
```

Accessing the MWM Resource Description File

MWM searches for a resource description file in this order:

1. The value of the MWM configFile resource

2. *%HOMEDRIVE%%HOMEPATH%/.mwmrc*

3. */usr/lib/X11/system.mwmrc*

4. */usr/lib/X11/system.mwmrc*

If MWM does not find a resource description file in one of the above locations, it defaults to a language-specific defaults file under the boot directory, typically, *C:\NCBridge\tekxp\boot\<language>\system.mwmrc*. The *<language>* variable is determined by the **language** command in the remote configuration file, or in *Setup*. To see the current language setting, enter *Setup* and look at the **Language** option. A sample *system.mwmrc* file is located in *\tekxp\examples\mwm*.

Creating a Local MWM Resource Description File

You can copy the *system.mwmrc* file to your home directory and then modify the file to customize your Motif environment. Table 5-1 shows the functions you can add to the file.

Table 5-1 MWM Functions

Function	Description
f.beep	Causes a beep.
f.cci	Controls the placement and naming of client-command interface (CCI) commands generated by applications.
f.circle_down	Moves the top window to the bottom of the window stack.
f.circle_up	Moves the bottom window to the top of the window stack.
f.exec or !	Executes the following shell command.
f.focus_color	Sets the colormap focus to a window.
f.focus_key	Sets the keyboard input focus to a window.
f.goto	Moves the root window to a specified location.
f.kill	Kills an application and its window.
f.lower	Moves a window to the bottom of the window stack.
f.maximize	Maximizes a window.
f.menu	Activates the named menu. This function can be used to create cascading and Popup Menus.
f.minimize	Iconifies a window.

Table 5-1 MWM Functions (continued)

Function	Description
f.move	Starts an interactive move for a window.
f.next_cmap	Installs the next colormap.
f.next_key	Moves the keyboard input focus to the next window in the window stack.
f.nop	Does nothing.
f.normalize	Causes an icon or a maximized window to be displayed at its normal size.
f.normalize_and_raise	Causes an icon or a maximized window to be displayed at its normal size and raised to the top of the window stack.
f.pack_icons	Reorganizes the icons according to the current icon placement policy.
f.pan	Moves the root window a specified amount.
f.pass_keys	Toggles the use of special key bindings.
f.post_wmenu	Posts the Window Menu.
f.prev_cmap	Installs the previous colormap in the list of colormaps for the window with the colormap focus.
f.prev_key	Moves the keyboard input focus to the previous window in the window stack.
f.quit_mwm	Exits the window manager without exiting the X Window System.
f.raise	Raises a window to the top of the window stack.
f.raise_lower	If obscured, raises a window to the top of the window stack; otherwise, lowers it to the bottom of the window stack.
f.refresh	Redraws all the windows on the screen.
f.refresh_win	Redraws a single window.
f.resize	Starts an interactive resize for a window.
f.restart	Stops and restarts the window manager.
f.restore	Restores an iconified window to its previous state.
f.restore_and_raise	Restores an iconified window to its previous state and raises it to the top of its stack.
f.screen	Moves a pointer to a specific screen.
f.send_msg	Sends a client message to the application.

Table 5-1 MWM Functions (continued)

Function	Description
f.separator	Draws a separator in a menu pane.
f.set_behavior	Restarts the window manager with the default behavior or reverts to any custom behavior.
f.title	Inserts a title in a menu pane.
f.track_pan	Continuously moves the root window in the direction of the mouse.

Accessing the MWM Defaults File

MWM is configured from its resource database. This database is built from the following sources, listed in the order that MWM accesses them.

1. MWM command-line options.

2. File specified by the XENVIRONMENT environment variable, if it is set, otherwise:
   %HOMEDRIVE%%HOMEPATH%/.Xdefaults-terminal_name, if it exists.

   These values do not override the existing values in the database.

3. RESOURCE_MANAGER root window property, if it is set, otherwise:
   %HOMEDRIVE%%HOMEPATH%/.Xdefaults, if it exists.

   The RESOURCE_MANAGER is typically set with the **xrdb** command. These values do not override the existing values in the database. An example *.Xdefaults* file is shown in Example 5-1.

4. The user's application specific *app-defaults* file:

   %HOMEDRIVE%%HOMEPATH%/Mwm, if it exists, otherwise:
   %HOMEDRIVE%%HOMEPATH%/Mwm

   The actual location of this file depends on the XUSERFILESEARCHPATH and XAPPLRESDIR environmental variables. These values do not override the existing values in the database.

5. The application's specific app-defaults file:

   /usr/lib/X11/app-defaults/Mwm, if it exists, otherwise:
   /usr/lib/X11/app-defaults/Mwm

   The actual location of this file depends on the XFILESEARCHPATH environmental variable. These values do not override the existing values in the database.

   If none of the above application specific *app-defaults* files are found, MWM defaults to a language-specific defaults file from the boot configuration directory, typically, */tekxp/boot*. The language is specified by the **Language** command in the remote configuration file (*xp.cnf*), or in *Setup*. To see the current language setting, enter *Setup* and look at the **Language** option.

Example 5-1 Example .Xdefaults File

```
! For the monochrome (or 4 bit plane=16 color/grey) device,
! decorations are shaded with pixmaps.The window title is
! reverse video to improve visibility.
#if PLANES > 4
Mwm*menu*background              #d4d8e8
Mwm*menu*foreground:             Black
Mwm*background:                  #7c8498
Mwm*foreground:                  #fce089
Mwm*activeForeground:            #ffff00
Mwm*activeBackground:            #9db5cd
#else
Mwm*bitmapDirectory:             /usr/include/X11/bitmaps
Mwm*bottomShadowColor:           Black
Mwm*topShadowColor:              White
Mwm*activeBottomShadowColor:     Black
Mwm*activeTopShadowColor:        White
Mwm*background:                  Black
Mwm*client*backgroundPixmap:     flipped_gray
Mwm*activeBackground:            White
Mwm*activeBackgroundPixmap:      gray
Mwm*foreground:                  White
Mwm*client*foregroundPixmap:     flipped_gray
Mwm*activeForeground:            Black
Mwm*activeForegroundPixmap:      gray
Mwm*iconImageBackground:         Black
Mwm*iconImageForeground:         White
Mwm*iconImageBottomShadowPixmap:flipped_gray
Mwm*iconImageTopShadowPixmap:    flipped_gray
#endif
Mwm*buttonBindings:              DefaultButtonBindings
Mwm*clientDecoration:            all
Mwm*clientAutoPlace:             True
Mwm*frameBorderWidth:            5
Mwm*iconAutoPlace:               True
Mwm*iconClick:                   False
Mwm*iconBoxGeometry:             6x1+0-0
Mwm*iconDecoration:              image label
Mwm*iconFrameBorderWidth:        20
Mwm*iconPlacement:               bottom left
Mwm*iconPlacementMargin:         10
Mwm*interactivePlacement:        False
Mwm*keyBindings:                 DefaultKeyBindings
Mwm*passSelectButton:            True
Mwm*resizeBorderWidth:           8
Mwm*showFeedback:                all
Mwm*systemButtonClick:           False
Mwm*systemMenu:                  DefaultRootMenu
Mwm*useIconBox:                  True
Mwm*windowMenu:                  DefaultWindowMenu
Mwm*cleanText:                   True
Mwm*saveUnder:                   True
```

Accessing Bitmap Files

The MWM iconImage and bitmapDirectory resources are used to specify paths to bitmap files. The default value for bitmapDirectory is the */usr/include/X11/ bitmaps* directory. To access a bitmap file *star* in your *%HOMEDRIVE%%HOMEPATH%* directory, the iconImage resource can be set in your *%HOMEDRIVE%%HOMEPATH%/.Xdefaults* file as follows:

Mwm*program_name*iconImage: ~/star

Specifying Virtual Key Bindings

MWM reads the *%HOMEDRIVE%%HOMEPATH%/.motifbind* file, if it exists, to install a virtual key bindings property on the root window. Example motif bindings files are installed in the */tekxp/examples/mwm* directory by default.

Setting Up Virtual Desktop Panning

The Virtual Desktop Panning feature is available with MWM 2.0. This section provides an example of how you can modify your *.Xdefaults* and *.mwmrc* files to activate virtual panning in MWM. The MWM functions f.pan, f.goto, and f.track_pan need to be bound either to keys or to mouse buttons.

Editing the *.mwmrc* File for Virtual Desktop Panning

Add the following to your *.mwmrc* file to use virtual panning. Make sure that the name of the button bindings match the name given for the resource value Mwm*buttonBindings in your *.Xdefaults* file.

```
Buttons             MyButtonBindings
{
<Btn2Down>          root      f.menu GotoMenu
Meta<Btn1Down>      root      f.track_pan
}

Keys                MyKeyBindings
{
Meta<Key>Up      window|root    f.pan      0,-100
Meta<Key>Down    window|root    f.pan      0,100
Meta<Key>Left    window|root    f.pan      -100,0
Meta<Key>Right   window|root    f.pan      100,0
}
```

To set up a menu that lets you quickly switch to different locations on the virtual desktop, enter the following. Then restart MWM.

```
Menu            GotoMenu
{
Up-Left         f.goto          1500,1100
Up              f.goto          0,1100
Up-Right        f.goto          -1500,1100
Left            f.goto          1500,0
Home            f.goto          0,0
Right           f.goto          -1500,0
Down-Left       f.goto          1500,-1100
Down            f.goto          0,-1100
Down-Right      f.goto          -1500,-1100
}
```

Editing the *.Xdefaults* File for Virtual Desktop Panning

Add the following to your *.Xdefaults* file to keep MWM from moving all your windows back to the visible part of the screen at startup:

```
Mwm*positionOnScreen:       False
```

Note that it is important to set the positionOnScreen resource to False because MWM automatically repositions all off-screen windows back to the display screen on restart.

To set up a menu to go to preset positions on the virtual canvas, add the following lines:

```
Mwm*GotoMenu*numColumns:     3
Mwm*GotoMenu*packing:        PACK_COLUMN
Mwm*GotoMenu*orientation:    HORIZONTAL
Mwm*GotoMenu*alignment:      ALIGNMENT_CENTER
```

For consistency with the *.mwmrc* file, add the following lines:

```
Mwm*buttonBindings:          MyButtonBindings
Mwm*keyBindings:             MyKeyBindings
```

To prevent the client and icon windows from moving, add the following lines:

```
Mwm*XBiff*iconPinned:        True
Mwm*XBiff*clientPinned:      True
Mwm*iconPinned:              True
```

Troubleshooting MWM

This section contains some information on possible solutions to correct some common MWM problems:

- If MWM does not come up at all:

  - You did not specify the NC name correctly in the **-display** command line option. Recheck the value, for example:

    xpsh -display *displayname***:0.0 xpwm**

  - Your local MWM authorization key may not be entered. To check your enabled options, press Setup. Drag on Statistics and release on Options. If mwm is not there, enter the correct authorization key at the *Boot Monitor*. Refer to Chapter 4, *Boot Monitor* of the *NCBridge Reference Manual*.

  - If you start MWM with **xpsh** and it fails to execute clients from the MWM menus, make sure that the path to the client is correct.

  - Check the console window for a message indicating that there is not enough memory to run MWM. Increase the amount of available memory if necessary.

- If you customize a file which is read by local MWM but the changes are not reflected when you run MWM:

  - Make sure the customized file has world read permissions.

- If your keyboard has neither a Meta key nor an Alt key, use the **xmodmap** command to display and modify the values of mapped keys, including the key mapped to **mod1**, which MWM uses for Meta or Alt.

Setting Up XP Window Manager

XP Window Manager (XPWM) is a local window manager available with the network computer. XPWM provides a basic window manager that uses a minimum amount of network computer memory.

Accessing the XPWM Defaults File

XPWM is configured from its resource database. This database is built from the following sources, listed in the order that XPWM accesses them (the last setting takes precedence over the first).

1. RESOURCE_MANAGER root window property, if it is set.

   The RESOURCE_MANAGER is typically set with the **xrdb** command. These values do not override the existing values in the database.

2. The application's specific app-defaults file:

   /usr/lib/X11/<language>/app-defaults/xpwm

3. XPWM default values.

Starting the XP Window Manager

XPWM can be started with **xpsh**, from the remote configuration file (*xp.cnf*), or from the Client Launcher.

Starting XPWM with xpsh

Enter the following command in the user's session start-up file.

> **xpsh -display** *displayname***:0.0 xpwm**

This assumes that **xpsh** is in your search path. The default search path is */tekxp/ bin/<host>*.

> *Note: You need not specify* **-display** *displayname***:0.0** *if you have set the DISPLAY environment variable.*

Starting XPWM with the *xp.cnf* File

The *start* and *preload* commands in the *xp.cnf* file can be used to start XPWM. For details about these commands, refer to Chapter 2, *Remote Configuration*, in the *NCBridge Reference Manual*.

Starting XPWM with the Client Launcher

The Client Launcher can be customized to include those clients that you use most often. The XPWM is listed on the Client Launcher by default as part of the Window Managers submenu. To start XPWM, move the mouse pointer to XPWM and click the mouse button. For information about the Client Launcher, refer to the *Client Launcher* topic in Chapter 4, *Local Clients*.

Using XPWM

You use XPWM much like any other window manager. The windows have many of the same elements as the Motif Window Manager. Figure 5-1 shows a sample XPWM window and its elements.
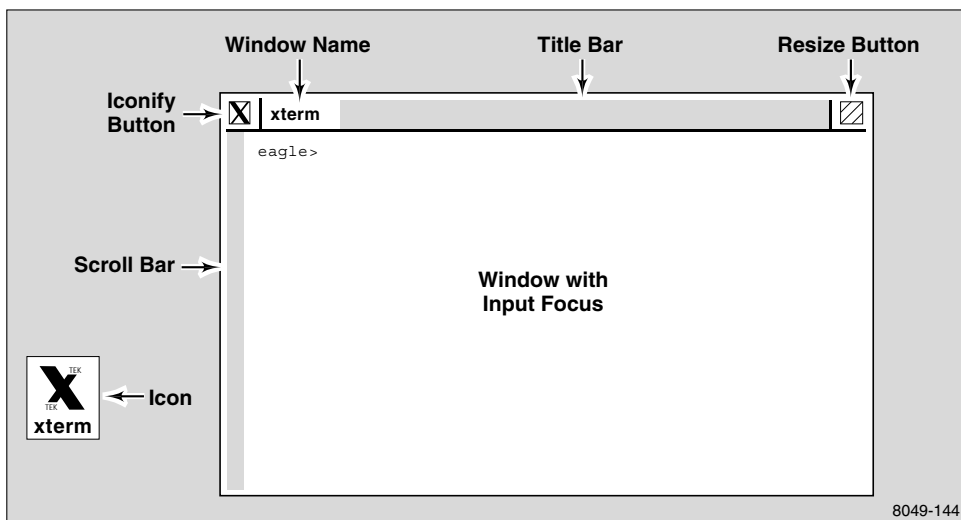
Figure 5-1 Elements of an XPWM Window

You can move and resize windows using either the mouse alone, or the commands located on the XPWM menu. Table 5-2 shows the mouse interface.

Table 5-2 Working With XPWM Windows

To	Do This
Move a window	Position the mouse pointer on the title bar, click and drag the window to the new position.
Resize a window	Click on the Resize button and drag the window to the new size.
Make a window active	Position the mouse pointer on the title bar and click.
Iconify a window	Click on the Iconify button.
De-iconify a window	Click on the window's icon.
Raise a window to the top	Position the mouse pointer in the window and click.

To access the XPWM menu, position the mouse pointer outside of a window, and click. First select a command, and then move the mouse pointer to the window you want the command to affect. Table 5-3 shows the commands available on the XPWM menu.

Table 5-3 XPWM Menu Commands

Command	Description
Iconify	Iconify a window.
Resize	Resize a window.
Move	Move a window.
Raise	Move a window to the top of other windows.
Lower	Move a window behind other windows.
Icon Manager	Open the icon manager, which lists the open windows and applications on the screen.
Kill	Close a window and any processes running in the window.
Delete	Close a secondary window, such as a dialog box for an application.
Restart XPWM	Exit and restart the XpressWare Window Manager. Open windows and processes will remain while the window manager restarts.
Exit XPWM	Exit the XpressWare Window Manager.

Customizing XPWM

You can change the appearance of XPWM using the resource settings listed in Table 5-4. XPWM does not allow user-defined bindings or user-defined menus.

Table 5-4 XPWM Resource Settings

Resource	Description
xpwm.IconForeground <color>	Specifies foreground color of icons.
xpwm.IconBackground <color>	Specifies background color of icons.
xpwm.IconFont <font>	Specifies the font used with icon names.
xpwm.TitleForeground <color>	Specifies the foreground color of the title bar.
xpwm.TitleBackground <color>	Specifies the background color of the title bar.
xpwm.TitleFont <font>	Specifies the font used in the title bar.
xpwm.MenuForeground <color>	Specifies the foreground color of the XPWM menu.
xpwm.MenuBackground <color>	Specifies the background color of the XPWM menu.
xpwm.MenuFont <font>	Specifies the font used in the XPWM menu.
xpwm.BorderWidth <integer>	Specifies the width of the border around the windows.
xpwm.BorderColor <color>	Specifies the color of the borders around the windows.
xpwm.BorderHighlightColor <color>	Specifies the border highlight color.
xpwm.IconPosition <position>	Specifies the icon position.
xpwm.InteractivePlacement <state>	Specifies whether placement is interactive or static (true/false).
xpwm.InputFocus <method>	Specifies the method used by the mouse to activate a window. Enter either click or point.

Chapter **6**

Using Fonts
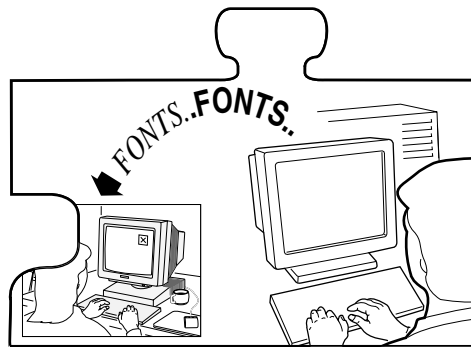
This chapter describes how to set up fonts on the host to support entries added in the remote configuration file and the *fonts.tbl* file. The network computers use PCF format as standard, but can read SNF, SCF, SNF.Z, PCF, PCF.Z, PCFZ, BDF, DECW$FONT, and many compressed formats.

The font access method is specified in the remote configuration file. The network computer can access fonts via **TFTP, NFS**, or **DAP**. Font files tend to be large; they do not have to be installed on the same disk as the boot files.

If you use **NFS** as the file access method, the fonts can be placed anywhere in the host file system, with NFS directories and exports set accordingly. Use an *nfs_table* command or add an *nfs.tbl* entry, and enable NFS access.

How the X Server Builds the Font Database

At boot time, the X server builds a font database based on the following sequence of events:

1. The X server searches the primary path for a *fonts.tbl* file.

   If a *fonts.tbl* file is not found with the primary path, the X server searches the secondary path for a *fonts.tbl* file. The secondary path is used if the primary path is not specified. Primary and secondary paths are specified in either the remote configuration file or in *Setup*. If fonts are not found through the primary or secondary paths, the X server searches the boot host and the boot method.

   In this example, the primary file path for the configuration files is *\tekxp\boot\fonts* on the host *arizona*, accessed with **NFS**. The *file_host_name* is not needed for NFS, but is specified as a null string to ensure a correct path.

   ```
   ip_host_table    "128.07.60.12" "arizona"
   file_access_1    NFS
   file_host_name_1 ""
   file_path_1      "/tekxp/boot/fonts"
   ```

   In this example, the secondary file path for the configuration files is *\usr\tekxp\boot\fonts*, where *\usr\tekxp\boot\fonts* is an exported directory from the host *oregon* and accessed through NFS. The *file_host_name* is not needed for NFS, but is specified as a null string to ensure a correct path.

   ```
   file_access_2    NFS
   file_host_name_2 ""
   file_path_2      "/usr/tekxp/boot/fonts"
   ```

   This example assumes that you have an entry similar to the following in the *nfs.tbl* file:

   arizona: /tekxp/boot/fonts /tekxp/boot/fonts

   oregon:/usr/tekxp/boot/fonts/usr/tekxp/boot/fonts

2. When the X server finds a *fonts.tbl* file, it searches the directories listed in this file for *fonts.dir* and *fonts.alias* files. The X server uses the information in the *fonts.dir* and *fonts.alias* files to search for specific font files. The X server rejects the path unless it finds both *fonts.dir* and *fonts.alias* files.

   Note: Once the fonts.tbl *file is found, the X server ignores* file_path_1 *and* file_path_2 *when searching for specific font files.*

   The *fonts.dir* file maps file names to an X logical font descriptive name (XLFD); the *fonts.alias* file lists alternative names for the XLFD font names. A typical entry for *fonts.dir* is:

   ```
   5x8.snf -misc-fixed-medium-r-normal--8-80-75-75-c-50-
   iso8859-1
   ```

   Typical entries for *fonts.alias* are:

   ```
   FILE_NAMES_ALIASES
   5x8 -misc-fixed-medium-r-normal--8-80-75-75-c-50-iso8859-1
   ```

3. The network computer resolves font paths in this order:

   a. Primary access and font path.

   b. Secondary access and font path.

   c. Boot host and boot method.

   Access can be a host if using TFTP or DAP as the access method, or a mount point if using NFS. If not resolved, the font path is rejected.

4. Resident fonts are always available unless explicitly removed with the **xset fp-** command. Refer to Table 6-1 for the list of resident fonts.

   Note: xset is located in \NCBridge\tekxp\bin\nt\xset.

Resident and Boot Directory Fonts

Resident fonts, listed in Table 6-1, are loaded with the X server, and are always available unless preceded by a *fonts.dir* or *fonts.alias* file entry. Boot directory fonts, listed in Table 6-2, are loaded from the installation media into the directory *\tekxp\boot*.

Table 6-1 Resident Fonts

Font	X Logical Font Description Name (XLFD)
TekDefault	-adobe-helvetica-bold-r-normal--14-140-75-75-P-82-iso8859-1
LucidaV2RT10 (TekFixed)	-bigelow & holmes-lucidav2-medium-r-normal-typewriter-16-100-100-100-m-80-iso8859-1
cursor (TekCursor)	cursor

Table 6-2 Boot Directory Fonts

Font	X Logical Font Description Name (XLFD)
6x13	-misc-fixed-medium-r-semicondensed--13-120-75-75-c-60-iso8859-1
6x10	-misc-fixed-medium-r-normal--10-100-75-75-c-60-iso8859-1
6x13B	-misc-fixed-bold-r-semicondensed--13-120-75-75-c-60-iso8859-1
tdwht132	tekdwht132
8x13	-misc-fixed-medium-r-normal--13-120-75-75-c-80-iso8859-1
9x15	-misc-fixed-medium-r-normal--15-140-75-75-c-90-iso8859-1
8x13B	-misc-fixed-bold-r-normal--13-120-75-75-c-80-iso8859-1
9x15B	-misc-fixed-bold-r-normal--15-140-75-75-c-90-iso8859-1
tdwhb132	tekdwhb132
decsess	decw$session
tdwdhb80	tekdwdhb80
LuV2RT12	-bigelow & holmes-lucidav2-medium-r-normal-typewriter-21-120-100-100-m-100-iso8859-1
LuV2RT14	-bigelow & holmes-lucidav2-medium-r-normal-typewriter-22-140-100-100-m-120-iso8859-1
olcursor	-sun-open look cursor-----12-120-75-75-p-160-sunolcursor-1

Table 6-2 Boot Directory Fonts (continued)

Font	X Logical Font Description Name (XLFD)
luRS12	-b&h-lucida-medium-r-normal-sans-12-120-75-75-p-71-iso8859-1
tdwdht80	tekdwdht80
LuciB10	-bigelow & holmes-lucida-bold-r-normal-serif-14-100-100-100-p-97-iso2022_r_tek-l442r433
7x13euroB	-misc-fixed-bold-r-normal--13-120-75-75-c-70-fcd8859-15
techB14	-bitstream-terminal-bold-r-normal--18-140-100-100-c-110-dec-dectech
tekdw80	tekdw80
fg-22	fg-22
ibm2412	ibm2412
ibm2413	ibm2413
ibm1307	ibm1307
ibm1108	ibm1108
ibm1205	ibm1205
ibm1313	ibm1313
ibm2510	ibm2510
ibm1207	ibm1207
ibm1104	ibm1104
ibm2612	ibm2612
ibm1209	ibm1209
deccurs	decw$cursor
ibm2508	ibm2508
ibm1006	ibm1006
ibm1111	ibm1111
LuV2NT12	-bigelow & holmes-lucidav2-medium-r-condensed-typewriter-21-120-100-100-m-100-iso8859-1
ibm0504	ibm0504
ibm1408	ibm1408
ibm2116	ibm2116
ibm0505	ibm0505
ibm2011	ibm2011

Table 6-2 Boot Directory Fonts (continued)

Font	X Logical Font Description Name (XLFD)
ibm0404	ibm0404
ibm1508	ibm1508
ibm1616	ibm1616
ibm0502	ibm0502
ibm1608	ibm1608
ibm1609	ibm1609
luBS14	-b&h-lucida-bold-r-normal-sans-14-140-75-75-p-92-iso8859-1
ibm0707	ibm0707
ibm0604	ibm0604
ibm2108	ibm2108
luBS12	-b&h-lucida-bold-r-normal-sans-12-120-75-75-p-79-iso8859-1
ibm0605	ibm0605
ibm0606	ibm0606
ibm1406	ibm1406
ibm0703	ibm0703
ibm1511	ibm1511
ibm0904	ibm0904
ibm0907	ibm0907
ibm0805	ibm0805
ibm0806	ibm0806
ibm0808	ibm0808
ibm1813	ibm1813
ibm0909	ibm0909
ibm1807	ibm1807
ibm2816	ibm2816
olgl12	-sun-open look glyph-----12-120-75-75-p-113-sunolglyph-1
tis1212	tis1212
tis2412	tis2412
tis2424	tis2424
tis4812	tis4812

Table 6-2 Boot Directory Fonts (continued)

Font	X Logical Font Description Name (XLFD)
tis4824	tis4824
tis1210	tis1210
tis2410	tis2410
tis1203	tis1203
tis2416	tis2416
tis4816	tis4816
tis1205	tis1205
tis2405	tis2405
tis1206	tis1206
tis2406	tis2406
tis2414	tis2414
tis4814	tis4814
tis2407	tis2407
tis4807	tis4807
tis2408	tis2408
tis4808	tis4808
tis1408	tis1408
tis2012	tis2012
tis1610	tis1610
tis2010	tis2010
tis3210	tis3210
tis1616	tis1616
tis2020	tis2020
tis3216	tis3216
tis1605	tis1605
tis3205	tis3205
tis2006	tis2006
tis1608	tis1608
tis3208	tis3208
tis1410	tis1410

Table 6-2 Boot Directory Fonts (continued)

Font	X Logical Font Description Name (XLFD)
tis1404	tis1404
tis1416	tis1416
tis1405	tis1405
tis1414	tis1414
tis1407	tis1407
tis4012	tis4012
LuciRT10	-bigelow & holmes-lucida-medium-r-normal-typewriter-16-100-100-100-m-80-iso2022_r_tek-l442r433
tis4010	tis4010
tis4020	tis4020
tis4006	tis4006
tis2810	tis2810
tis2816	tis2816
tis2805	tis2805
tis2814	tis2814
tis5614	tis5614
tis2807	tis2807
tis2808	tis2808
tis2828	tis2828
tis5628	tis5628
tm14_100	-bitstream-terminal-medium-r-normal--18-140-100-100-c-110-iso8859-1
timR24	-adobe-times-medium-r-normal--24-240-75-75-p-124-iso8859-1
timR10	-adobe-times-medium-r-normal--10-100-75-75-p-54-iso8859-1
helvB12	-adobe-helvetica-bold-r-normal--12-120-75-75-p-70-iso8859-1
tktrm132	tktrm132
LuciBT10	-bigelow & holmes-lucida-bold-r-normal-typewriter-16-100-100-100-m-80-iso2022_r_tek-l442r433
7x13euro	-misc-fixed-medium-r-normal--13-120-75-75-c-70-fcd8859-15
tis704	tis704
tis603	tis603

Table 6-2 Boot Directory Fonts (continued)

Font	X Logical Font Description Name (XLFD)
tis606	tis606
tis708	tis708
tm14_75	-dec-terminal-medium-r-normal--14-140-75-75-c-80-iso8859-1
tis810	tis810
tis805	tis805
tekdw132	tekdw132

Font Server Information

Refer to Chapter 11, *Using Fonts,* in the *NCBridge for Unix Installation Manual* for font server information.

Installing Fonts

The installation media provides *fonts.dir* files for each font directory listed in
Table 6-3, although you may have to add the names of these directories to the
fonts.tbl file. To install additional PCF, SCF, SNF or other directly supported
fonts:

1. Make a directory for your font files, for example, *myfonts.*

2. Copy the additional fonts in the *myfonts* directory.

3. If the fonts are compressed (ending in *.Z*), you can uncompress them for
   faster reading, or leave them compressed to save disk space. To use
   uncompress:

   # **uncompress** *

   *Note: You must perform the uncompress command on a Unix host
   and copy the files to the Windows NT host.*

4. Run **mkfontdir** to create a *fonts.dir* file. Enter:

   # **mkfontdir** *myfonts*

   Note: mkfontdir is found in the C:\NCBridge\bin\nt directory.

5. Use an editor to create the *fonts.alias* file. You can include the keyword
   FILE_NAMES_ALIASES to indicate you are mapping the file name to the
   alias. Add the aliases and the font logical names to the file.

   Note: The fonts.alias file should exist, even if it is empty.

   Refer to the **mkfontdir** man page in the *C:\NCBridge\tekxp\man\nt* directory
   for more information.

6. Edit *\tekxp\boot\fonts\fonts.tbl* and add the new font path.

Table 6-3 lists the font directories in the *\tekxp\boot\fonts* directory.

Table 6-3 Font Directories Available on the Installation Media

Directory	Source, Contents, Application
misc	Cursor and character fonts, MIT miscellaneous fonts.
100dpi	X Consortium distribution for 100 dot-per-inch fonts. Some fonts contain eight-bit multinational character sets.
75dpi	X Consortium distribution for 75 dot-per-inch fonts. Some fonts contain eight-bit multinational character sets.
tek100dpi	Tektronix-distributed Lucida fonts.
oldx11	X Consortium distribution fonts, including fonts released prior to X Version 11, Release 3.
openlook	OPEN LOOK applications fonts.
japanese	Japanese fonts.
Speedo	Speedo fonts from Bitstream, Inc.
Type1	Courier (typewriter) font from IBM Corporation.

Chapter 6   Using Fonts

Chapter 7

Troubleshooting

This chapter contains information to help solve problems when booting and using your network computer. Table 7-1 lists identified problems and the page numbers to locate possible solutions.

Table 7-1 Possible Problems

Problem	Page
Boot host does not respond	7-2
Network computer does not respond to a ping	7-3
Duplicate IP address message	7-3
Network computer cannot locate os file	7-3
Network computer cannot locate .tbl files	7-4
Network computer cannot locate font files	7-4

Boot host does not respond

- Verify that the boot host is configured to support the boot method you selected. Supporting host files may include *inetd.conf, bootptab, exports, hosts,* and *ethers.*

- Under Control Panel > Services, make sure the TFTPD service is started.

- If you are booting from **NVRAM**, use the network computer *Boot Monitor* to verify that the correct values are assigned for the following commands:

    - Network computer IP address (**iaddr**) or node number (**dnode**)

    - Boot host IP address (**ihost**)

    - Subnet mask (**imask**)

    - Gateway address (**igate**)

    - Boot method (**bmethod**)

    - Boot path (**bpath**)

    - Boot from (**bafrom** set to **NVRAM**)

- If you are booting from **NETWORK**, use the network computer *Boot Monitor* to verify the correct values are assigned for the following commands:

    - Boot method (**bmethod**)

    - Boot from (**bafrom** set to **NETWORK**)

- Use the network computer *Boot Monitor* to **ping** the boot host. If the host does not respond, use the **ifconfig** command on the host to verify the host's subnet mask and gateway address. The **ifconfig** command is also used to change the subnet mask and gateway address if necessary.

- If the host has an ethernet switch, make sure it is set to the proper position for thicknet or thinnet.

Network computer does not respond to a ping

• Verify that the network computer is booted.

• Use the network computer *Boot Monitor* **report** command to check the network computer's ethernet switch or jumper setting. If it is incorrect, refer to the pictorial physical installation guide for your network computer model.

Duplicate IP address message

This can indicate two different problems: either there are two devices using the same IP address, or there is a mismatch between the ethernet and IP addresses in the host files or in the router ARP tables.

• To determine if there are two devices using the same IP address, go to a different device and ping the duplicate IP address. If two responses come back, change the IP address on one of the devices. Be sure to save the new address. You may also have to change supporting files on the host, such as *%SYSTEMDRIVE%%SYSTEMROOT%\system32\drivers\etc\hosts* and change entries in the ARP table (**arp** command) to ensure the correct ethernet and IP addresses are used.

• If the network computer is using the same IP address as a previous device (that has been removed from the network), then the problem is a mismatch between the ethernet and IP addresses. To correct this situation, change the files where the ethernet and IP addresses are used and change entries in the ARP table (**arp** command). The network administrator should flush the ARP table in the router.

Network computer cannot locate os file

• Verify that the boot path is specified correctly and matches the actual file location on boot host. If using secure **tftp**, the secure directory should not be specified as part of the boot path.

• Verify that you are using the correct *os* file (*os.330*, *os.350,os.500,* or *os.900*), and that it has world read permission.

Network computer cannot locate .tbl files

Verify the primary and secondary file hosts, access methods, and paths:

- If you are debugging a centralized system, or if the network computer is not booted, check the primary and secondary file_access, file_host_name, and file_path entries in the *xp.cnf* file.

- If the network computer is booted, use the Console window to see the host, method, and path the network computer tried. Use the Left and Right mouse buttons to scroll through the window. You can also use *Setup* to view the host file access information.

- Verify that the appropriate daemon is running on the host for the specified access method.

- Verify that the *.tbl* files are in the proper location and have world read permission. If you are using secure **tftp**, ensure that the *.tbl* files are in the secure directory. If the *.tbl* files are not in the secure directory, either move them to the secure directory or use NFS to download them.

Network computer cannot locate font files

- Follow the previous procedures for *Network computer cannot locate .tbl files* to verify that the network computer is locating the *fonts.tbl* file.

- Verify that the *fonts.tbl* file specifies the correct paths to the font directories. If NFS is used, the full pathname to the NFS mount point must be specified if NFS is used.

- Verify that the *fonts.dir* and *fonts.alias* files exist and are readable.

- Verify that the *fonts.dir* and *fonts.alias* files contain the correct paths to the actual font files.

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