



Network Computing Devices, Inc.

**NCBridge Installation Manual for
Windows NT Environments**

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Manual Revision Status

Windows NT Installation

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Revision Status

	Pieces of the Puzzle	vii
Chapter 1	Installing the Software	
	Quick Start	1-2
	NCBridge installation	1-2
	NC terminal installation	1-2
	Media Contents	1-3
	Running SETUP.EXE	1-4
	Getting Started	1-4
	Setting the Installation Path	1-4
	Selecting Installation Options	1-6
	File Transfer	1-7
	Installation Completion	1-8
	Getting Acquainted	1-9
	Basic Installation	1-10
	Network Computer Worksheet	1-11
	Configuring Host Files	1-13
	Enabling NFS Access	1-13
	Powering on the Network Computer	1-14
	Booting the Network Computer	1-15
	Starting a Session with Launcher	1-18
	Opening a Telnet Session	1-19
	Closing a Telnet Window	1-20
	Using Setup	1-21
	Exiting Setup	1-23
Chapter 2	Making Choices	
	Configuration Strategies	2-3
	Booting Strategies	2-5
	File Access Strategies	2-9
	Host Connection Strategies	2-11
	ROM and Flash Memory Strategies	2-16
	Boot Host Check List	2-17
	File Host Check List	2-17
	Network Computer Check List	2-18
	What Next?	2-18
	Configuration Workbook	2-19
Chapter 3	Supporting a Centralized System	
	Enabling NFS	3-2
	Booting via NFS on a WinDD Server	3-2
	Configuring the Microsoft DHCP Server	3-3



Contents

Chapter 4

Local Clients

Starting Local Clients With xpsd	4-2
Starting the Analog Video Player	4-3
Starting the Audio Mixer	4-4
Starting the Audio Player.....	4-4
Starting the Authorization Key Manager.....	4-4
Starting a Cterm session	4-4
Starting the Digital Video Player.....	4-5
Starting a LAT session	4-6
Starting the Local Client Launcher	4-7
Starting local MWM	4-7
Starting a Serial Session for Port 0 and Port 1	4-7
Starting Setup.....	4-7
Starting a Telnet session.....	4-8
Starting WinDD.....	4-8
Starting the XIE Viewer	4-11
Starting Xlock	4-12
Starting local XP Window Manager	4-12
Starting Local Clients In The xp.cnf File.....	4-12
Starting Local Clients with rsh.....	4-12
Enabling rsh	4-13
Editing the .rhosts File.....	4-13
Starting Local Clients with rsh	4-14
Client Launcher.....	4-15
Configuring the Client Launcher.....	4-15
Downloading the Client Launcher	4-18
Using the Client Launcher	4-20
Authorization Key Manager	4-21
Setting Up SNMP	4-21
The authkey.dat File.....	4-22
Starting the Authorization Key Manager.....	4-22
Using the Authorization Key Manager Client.....	4-23
Setting up XIE	4-28
XIE Authorization.....	4-28
Enabling XIE.....	4-28
Setting up Xblink	4-29
Xblink Authorization	4-29
Enabling Xblink	4-29
Using Xblink	4-29
Setting Up the XPT/A Graphics Tablet.....	4-30
Touchscreen Calibration Client	4-31
Common Desktop Environment	4-33
Starting the Local TED/CDE Client	4-34

Chapter 5	Window Managers	
	Setting Up Local MWM	5-1
	Starting Local MWM	5-2
	Accessing MWM Configuration Files	5-2
	Accessing the MWM Resource Description File	5-2
	Accessing the MWM Defaults File	5-5
	Accessing Bitmap Files	5-7
	Specifying Virtual Key Bindings	5-7
	Setting up Virtual Desktop Panning	5-7
	Troubleshooting MWM	5-9
	Setting Up XP Window Manager	5-11
	Accessing the XPWM Defaults File	5-11
	Starting the XpressWare Window Manager	5-11
	Using XPWM	5-12
	Customizing XPWM	5-14
Chapter 6	Using Additional Fonts	
	How the X Server Builds the Font Database	6-2
	Resident and Boot Directory Fonts	6-4
	Installing Fonts	6-6
Chapter 7	Troubleshooting	



Contents

Preface

This manual presents installation and configuration information for the network computers. This manual is written for system and network administrators responsible for installing network computers in a distributed-computing environment. The procedures in this manual assume you are familiar with:

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

The following conventions and terminology is used in this manual.

- *Pointing*: use the mouse to position the pointer on an object on the display
- *Moving*: use the mouse to change the location of the pointer on the display
- *Clicking*: press and release a mouse button without moving the pointer
- *Dragging*: press and hold down a mouse button while moving the pointer
- *Releasing*: release the mouse button to complete a *dragging* action

Related Documentation

Network Computer Installation for UNIX — 9300845

Network Computer Installation for VMS — 9300846

Serial Xpress User — 9300834

The following documents are on the CD ROM included with NCBridge:

Network Computer Reference

Network Computer User

3270/3179G User

3270E/5250 User

In addition, System or Network Administration manuals for your computer are also helpful for information such as subnet mask, and broadcast addresses.

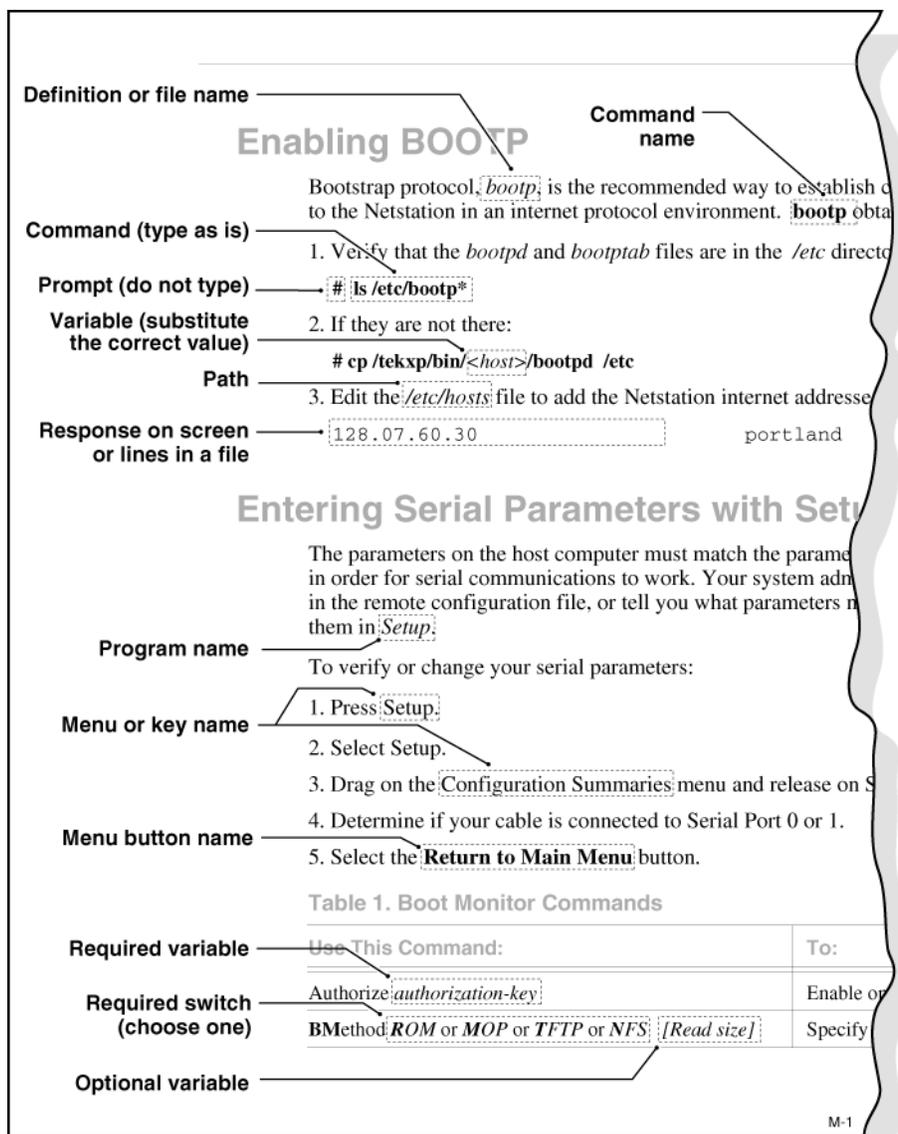


Figure 1 Typographical Conventions.

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 XpressWare 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, OpenLook 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.



Preface

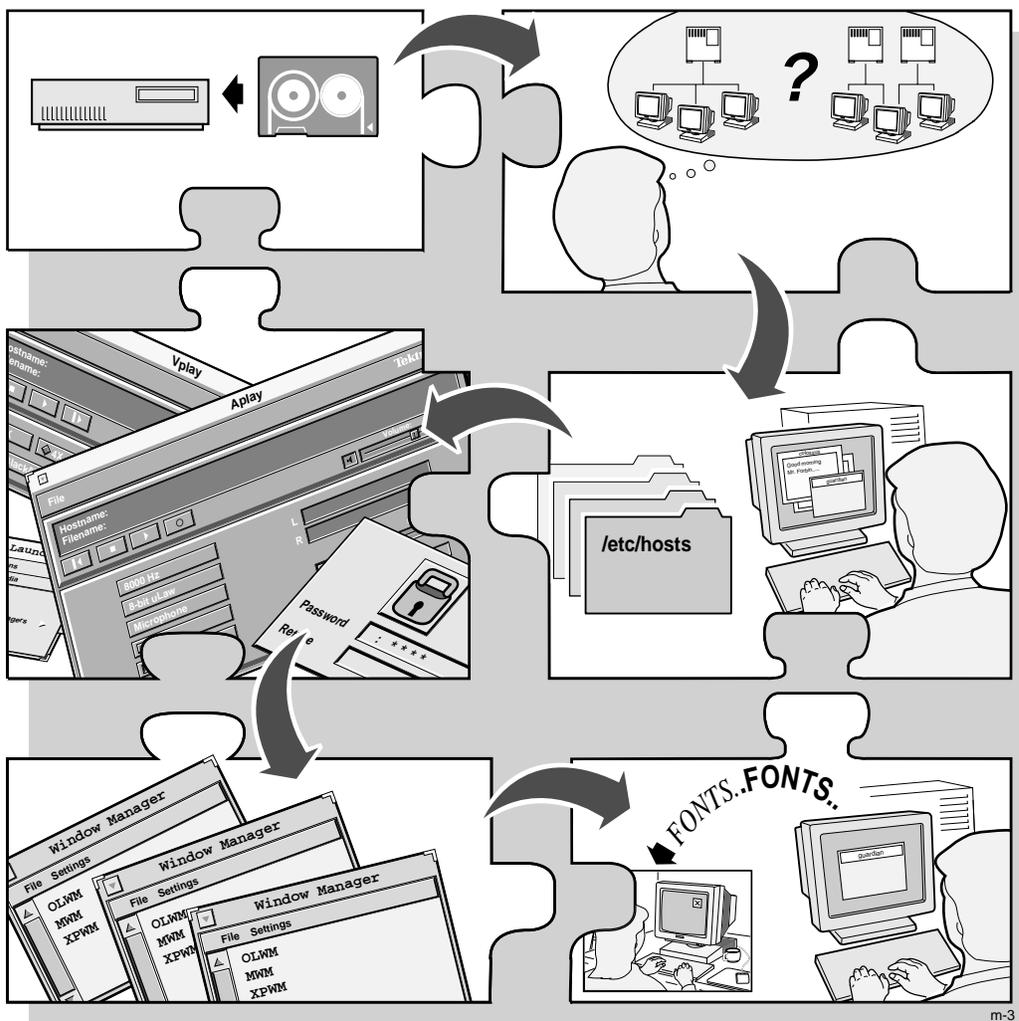
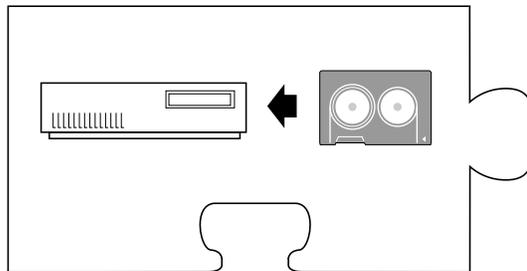


Figure 2 The System Configuration Process

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 manual provides detailed installation information but first, a quick-start list is provided as an overview. It is also useful for experienced users who don't need a lot of detail.



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 *Network Computer Reference Manual* for more information.

NCBridge installation

1. Log on to 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 according to 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** *</installation_directory/teexp/boot/os.500>*
 - 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 current directory. For example, if you are at the root partition (\), the directory *teexp* is created. Throughout the manuals, the install directory is assumed to be *teexp*. Here are the *teexp* directories:

- *teexp\bin\nt* Contains network computer utilities for the NT environment.
- *teexp\boot* Contains boot files, fonts and clients. Files that differ between models use a *.model* suffix. Refer to Table 1-1 for model information.
- *teexp\boot\config* Contains the network computer configuration files.
- *teexp\boot\fonts* Contains the supplied non-resident fonts.
- *teexp\boot\<language_directory>\app-defaults* Contains translated text for network computer clients.
- *teexp\examples* Contains examples such as *Xsession* and *bootptab*.
- *teexp\man\nt* Contains man pages for many of the included utilities.
- *teexp\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 *Network Computer Reference Manual*, supplied on the CD-ROM.

Getting Started

1. Log in to the NT host on which you will 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_3_2') 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 will appear and the install wizard software will load. The user will be presented with a 'Welcome' dialog box. Click the 'Next' button on the 'Welcome' dialog to proceed. Click the 'Cancel' button at any time to abort the installation.

Setting the Installation Path

When the installation process begins, "Choose Destination Location" dialog box, show in Figure 1-1, will appear. The "Choose Destination Location" dialog box allows the user to set the desired installation path. By default this path is C:\NCBridge or the existing NCBridge installation path. Clicking the "Browse" button will bring up a file selector, shown in Figure 1-2, to help navigate through your file system for a suitable destination location. Once the destination folder is set, click the 'Next' button to proceed. The user can revisit previous install dialogs by clicking the 'Back' button.

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.*

Setting the Installation Path

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 *teexp/config_date* where *date* is the format YMDHMS.



Figure 1-1. "Choose Destination" Dialog Box

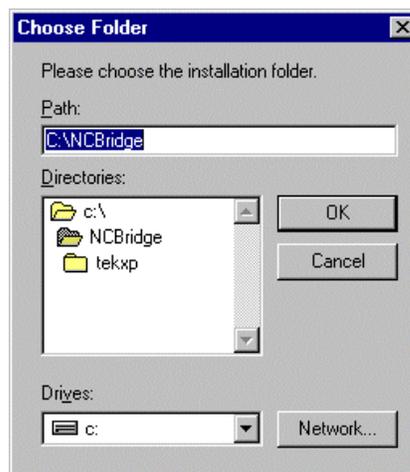


Figure 1-2. Selecting an Alternate Installation Location



Selecting Installation Options

In the "Setup Type" dialog box, the user can choose between three software installation options, shown in Figure 1-3:

- **Typical** — Program will be installed with the most common 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** — You may 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 the "Custom" radio button and click the "Next" button to access the "Select Components" dialog.

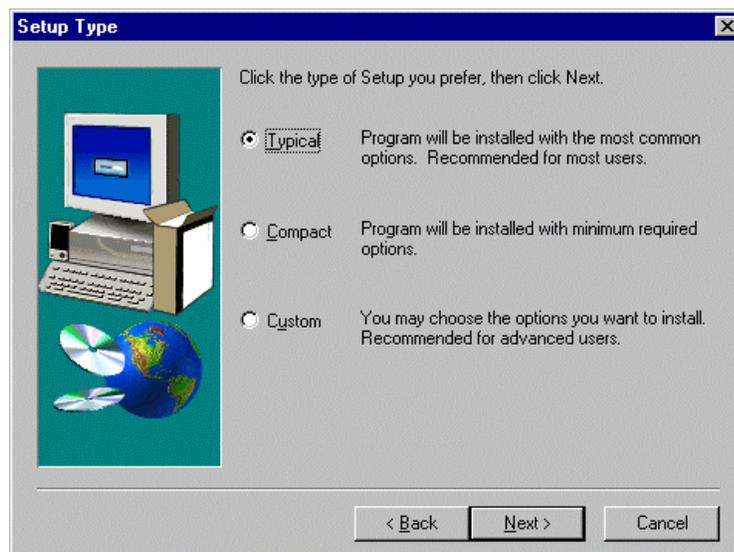


Figure 1-3. "Installation Options" Dialog Box

Unless you have selected the "Custom" install, clicking the "Next" button will start the transfer of NCBridge software from the CD-ROM to the destination location on the server.

If you have selected the 'Custom' install option, the "Select Components" dialog, shown in Figure 1-4, will appear. A list of software components is shown with check-boxes indicating the desired selections. Some components are comprised of sub-components which can also be custom configured. Highlight a component and click the 'Change' button to access sub-component lists. If the 'Change' button is disabled, then the component you have highlighted does not contain a configurable sub-component list. After selecting the desired components for installation, click the 'Next' button to begin the file transfer process.

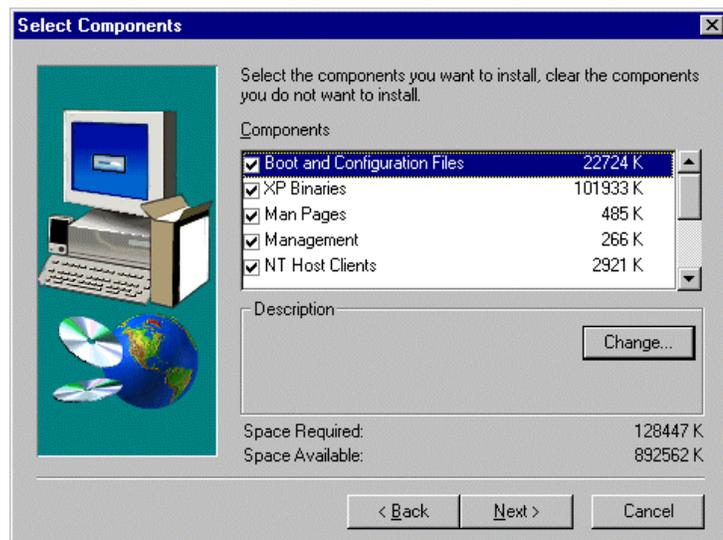


Figure 1-4. Custom Components Selections

File Transfer

The screen will display three file system status bar meters and a dialog box with a status bar. The three 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 is complete.



Installation Completion

When file transfer has completed, the "Setup Complete" dialog will appear. Installation of NCBridge software is now complete. Click the "Finish" button to exit the NCBridge installation program.

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.

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. By following the instructions in this section, you 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 for information on integrating network computers into your system.

These steps are performed during the basic network computer installation:

- Configure host files to support the network computer
- Collect information about your environment which is needed to boot the network computer
- Use the *Boot Monitor* to enter network computer communication parameters and establish a host connection
- Log in through a Telnet session from Client Launcher
- Use *Setup* to enter the network computer configuration parameters

After the basic network computer installation is complete, the network computer can:

- Locate the host on the network
- Download the operating system, configuration, and font files
- Apply configuration files residing on the host



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:	NC421H		
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 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.*

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.
3. Network computer name: _____
4. Network computer IP address: _____._____._____._____
5. Boot Path: _____ *boot_directory*
(/*<boot_directory>/boot/<boot file>* For example, /*tekxp/boot/os.330*)

Use Table 1-1 to determine your boot file.

Table 1-1 Boot Files.

Boot File	Supported Network Computer Series
os.10	XP10 Series (example: XP18)
os-tr.10	XP10 Token Ring Series (example: XP18T)
os.330	XP100D, XP330 Series (example: XP338)
ospex.330	XP338P
os.350	XP100 Series, XP200 Series, XP350 Series, and XP400 Series (examples: XP117C, XP219, XP358)
os.500	NC200 and NC400
os-tr.500	NC with Token Ring Option

6. Boot Method: **nfs 8192**
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.



Chapter 1 *Installing the Software*

8. Boot Host:
- a. Host name: _____
 - b. Host IP address: IP address: _____._____._____._____
9. Gateway on the network computer's subnet: _____._____._____._____

NOTE: Steps 10, 11, and 12 are only used when adding an network computer to a Token-Ring network. If the network computer does not have a Token-Ring interface, omit these items.

10. Locally-administered address(LAA): ____:____:____:____:____:_____
11. Maximum Transmission Unit (MTU): _____ *number*
Sets a maximum length of the information field of the frame. Valid numbers are: 516 or 1500 or 2052 or 4472 or 8144 or 11407 or 17800. The default is 1500.
12. Lanspeed: _____*rate*
Valid rates are: 4 or 16 (Mbps).

Configuring Host Files

The following host utility is configured for this example:

- **nfs** (Network File Service) to provide booting service

Enabling NFS Access

NFS is used in this example 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 `\winnt35\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 box. 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're using. By default, the North American 101/102 or VT200 is selected (depending on the connected keyboard). Press Enter or Return to accept this keyboard. If using 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 keyboard.

After specifying the keyboard, press the Return or Enter 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 plus 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 1-11) 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:

***NOTE:** The **lanspeed**, **mtu**, and **localaddr** commands are only used when adding a network computer equipped with a Token-Ring interface. Skip to Step 4 if you are installing an Ethernet network computer.*

1. Enter the **lanspeed** command. (See Line 12.)

A Lanspeed setting is required if you are installing the network computer on a Token-Ring network. There is no automatic default for **lanspeed**. Lanspeed can only be entered with the **lanspeed** command in the *Boot Monitor*.

>>> ***Disruption to the Token-Ring LAN may occur if you attempt to open communications with the wrong lanspeed setting.***

```
BOOT> lanspeed rate
```

2. Enter the **mtu** command. (See Line 11.)

If the **mtu** command is not entered, the default setting of 1500 is used. MTU can also be set in *Setup*.

```
BOOT> mtu number
```

3. Enter the **localaddr** command. (See Line 10.)

It is not essential that a locally-administered address be set. The **localaddr** command is optional.

```
BOOT> localaddr address
```



Chapter 1 *Installing the Software*

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

```
BOOT> iaddr ip_address
```

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

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

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

```
BOOT> imask ip_subnet_mask
```

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

```
BOOT> ihost ip_address
```

8. 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
```

9. Use the **bmethod** command to specify NFS as the boot method. The 8192 parameter represents an NFS read size.

```
BOOT> bmethod tftp
```

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

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

```
BOOT> nvsave
```

11. 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 *TekHostMenu* client appears. The network computer broadcasts XDMCP requests to all hosts on its subnet by default. All hosts that respond to the XDMCP broadcasts appear on this list. If you set up *xdm* on your host according to the instructions presented earlier in this chapter, the host should be listed on the *TekHostMenu* list.

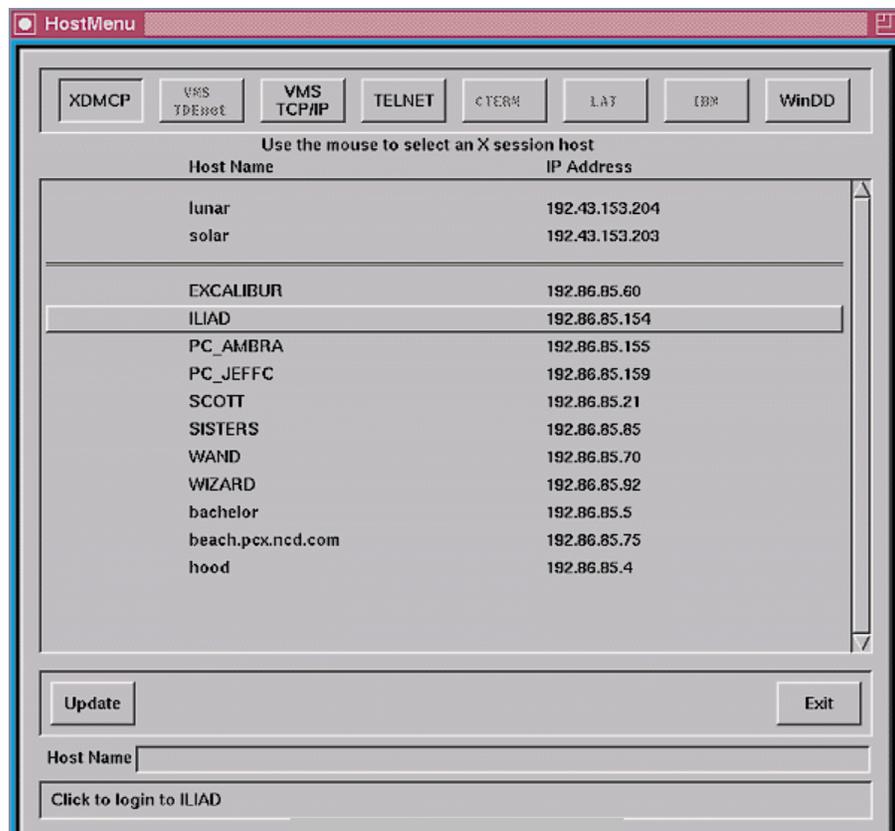


Figure 1-5 Example TekHostMenu.



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. In Figure 1-3, selecting Host Connections displays a sub-menu listing available connections, such as *Telnet* or *WinDD*.



Figure 1-6 Example Client Launcher.



- Press the Setup 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 Setup key or key sequence for your keyboard.

Table 1-2 Setup Key and Key Sequences.

Keyboard Type	Press
101/102 with Setup	Setup key
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 the *Local Clients* chapter.

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.



```
Telnet>
```

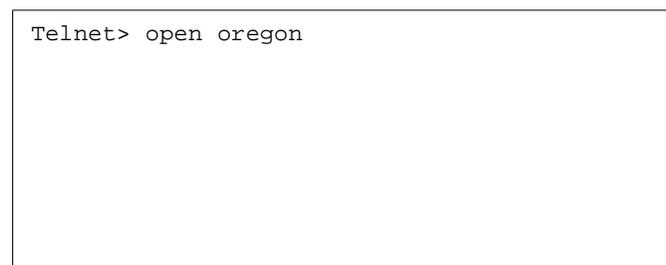
Figure 1-7 Telnet Window Waiting for an Open Command.

2. Use the mouse to position the pointer in the Telnet window. You can 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.



```
Telnet> open oregon
```

Figure 1-8 Telnet Open Command.



Once a connection is made (Figure 1-9), you can log in.

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

login:
```

Figure 1-9 Telnet Window with a Host Connection.

4. At the **login:** prompt, log in to the host computer by entering your user name:
login: *user_name*

5. At the **password:** prompt, enter your password:
password: *password*

Now that you are connected to the host, type the command plus 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 out of 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 1-7. The *Setup* main menu is made up of four different areas: Menu Bar, Menu Input, Function Bar, and Message Box.

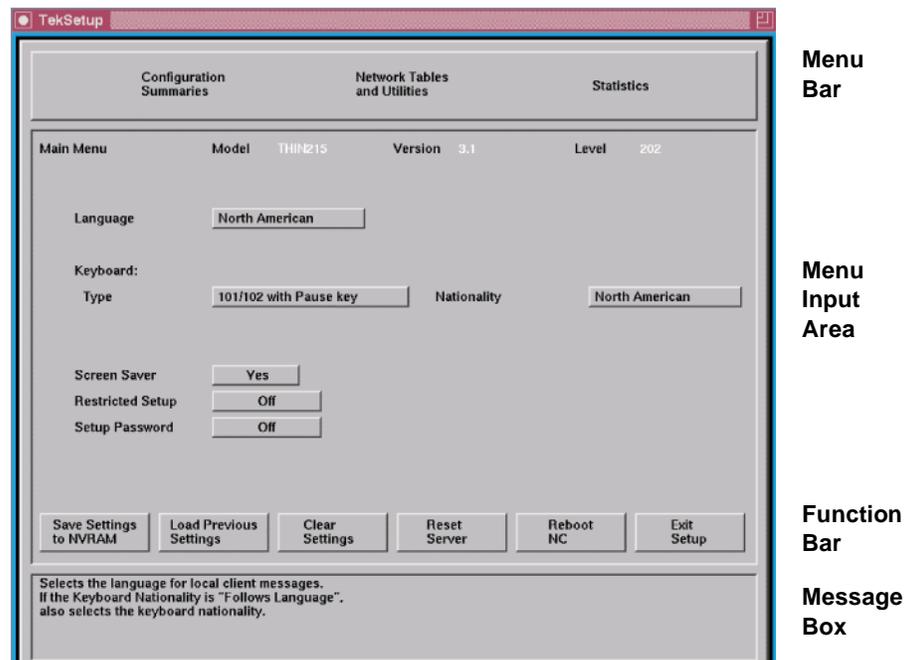


Figure 1-10 The *Setup* Main Menu.

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



Chapter 1 *Installing the Software*

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	<i>network_computer_name</i>
Default Telnet Host	<i>host_name</i>
Name Server 1	<i>ip_address of name server</i>
 - Click on **Return to Main Menu**.
2. Drag in the Configuration Summaries menu and release on *X Environment*.
 - Select the following:

Host Connect Method	TekHostMenu
---------------------	-------------
 - 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:

File System Name	<i>exported directory</i>
Local Directory	<i>local_directory</i>
Transfer Size	<i>read size for transferring files</i>
 - 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	<i>local_directory (from previous step)</i>
 - 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	<i>ip_address</i>
Host Name	<i>host_name</i>
 - 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 on the **Exit Setup** button.

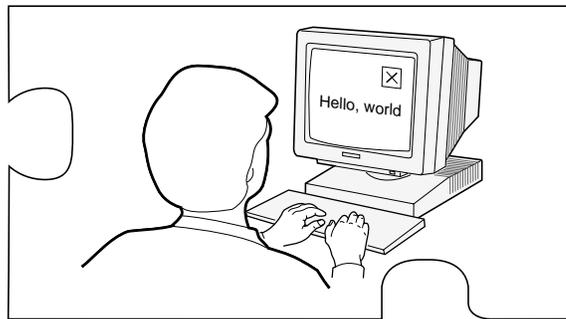
Once you have successfully completed a basic network computer installation, go on to Chapter 2 and develop a centralized administration scheme for a complete network computer installation.



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 Workbook is provided to assist you in this process.

At first glance, the Workbook resembles a tax form, but give it a try. The time you spend gathering information before you start is far less than the time to debug configuration later in the installation process. To use this chapter:

- Make a copy of the Workbook (page 2-19 to the end of this chapter). The Workbook follows the same organization as the remote configuration file (*xp.cnf*) to simplify implementing your choices.
- Read through the strategy sections beginning on the next page. 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.



Chapter 2 *Making Choices*

- When the Workbook is complete, continue on to the chapter *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 display 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 Network Computer 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**.

***NOTE:** NT systems only support NFS or ROM booting.*

- **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.
- **NFS** (Network File Service) can be used on 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* later in this chapter for more information.
- **MOP** (Maintenance Operation Protocol) is used on DECnet networks to download the boot files to the network computers. This is the default boot method if the network computer is not equipped with Flash Memory or the ROM options, and if the TDEnet option is enabled on the network computer.

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 58 to use *bootp* (BOOTstrap Protocol) or check Workbook line 59 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.

If you are going to use **MOP** as the boot method:

Check Workbook line 65 and Workbook line 66 for automatic booting.

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.
 - Easier to provide 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 their 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 NFS or ROM 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**, **NFS**, or **MOP**:

For **TFTP**, check Workbook line 28.

For **NFS**, check Workbook line 29.

For **MOP**, check Workbook line 30.

Check Workbook line 37 to boot from NVRAM instead of NETWORK.

Check Workbook line 42 to save the new method.

To optionally set secondary booting information:

Choose the secondary boot method to use, either **TFTP**, **NFS**, or **MOP**:

For **TFTP**, check Workbook line 32.

For **NFS**, check Workbook line 33.

For **MOP**, check Workbook line 34.

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**, **NFS**, or **MOP**:

For **TFTP**, check Workbook line 28. Ignore boot host and path settings.

For **NFS**, check Workbook line 29. Ignore boot path setting.

For **MOP**, check Workbook line 30. Ignore boot path setting.

Check Workbook line 42 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**, **DAP**, and **SXP**. 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.

***NOTE:** NT systems only support NFS file access.*

- **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.
- **SXP** is used to download files for a Serial Xpress connection.

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.

Check Workbook line 12 to use **DAP** as the primary file access method.

Check Workbook line 13 to use **SXP** 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 14 to use **NFS** as the secondary method.

Check Workbook line 15 to use **TFTP** as the secondary method.

Check Workbook line 16 to use **DAP** as the secondary method.

Check Workbook line 17 to use **SXP** 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 56 to enable **TFTP**.

Host Connection Strategies

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

- **TekHostMenu** 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.



TekHostMenu

TekHostMenu is the default connection method. Within the TekHostMenu 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 61 to enable **xdm** on the host.
Check Workbook line 43 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 44 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 45 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 46 to add TELNET host entries.
Check Workbook line 38 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 47 to add CTERM host entries.
Check Workbook line 39 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 47 to add IBM host entries.

- **WinDD** - this is a list of WinDD servers you specify in the *xp.cnf* file.
Check Workbook line 49 to add WinDD 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 18 to specify a direct host connection.

Check Workbook line 61 to enable **xDM** on the host.

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

Check Workbook line 19 to specify a direct host connection.

Check Workbook line 67 to enable DECwindows on the host.

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

Check Workbook line 20 to specify a direct host connection.

Check Workbook line 61 to enable **xDM** on the host.

If your user logs in to a Windows NT server:

Check Workbook line 20 to specify a direct WinDD host connection.

Check Workbook line 68 to install WinDD on the Windows NT server.



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 21 to specify **TELNET**.

Check Workbook line 38 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 22 to specify **CTERM**.

Check Workbook line 39 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 21 to specify a Telnet session.

If your user logs in to a DECnet node:

Check Workbook line 22 to specify a CTERM session.

If your user logs in to a LAT service:

Check Workbook line 23 to specify a LAT session.

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

Check Workbook line 24 to specify a Serial0 session.

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

Check Workbook line 25 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 27.



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 35 to read a host-based *xp.cnf* file with a network computer equipped with Flash Memory.

XP10 models equipped with the ROM (Read Only Memory) options can also read an *xp.cnf* file.

Check Workbook line 31 to read an *xp.cnf* file with an XP10 ROM model.

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 *Network Computer 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**, **NFS**, or **MOP** 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 36 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 55.



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:

- */etc/host* or *\winnt35\system32\drivers\etc\hosts* is needed on all hosts the network computer accesses.

Check Workbook line 62.

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

Check Workbook line 58.

What Next?

- Edit the *xp.cnf* file and implement any commands you checked on Workbook page 2-19 through page 2-32. 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 2-34.

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 2-35.

Configuration Workbook

To Do	<u>xp.cnf File</u>	<u>Setup Menu Paths</u>
—	<p>1. Enter one or more host address/names (NVRAM). ip_host_table _____ ip_host_table _____ ip_host_table _____ ip_host_table _____</p>	<p>Network Tables and Utilities ↓ Internet Host</p>
	<p>If you have additional hosts, fill out Workbook line 5.</p>	
	<p>.....</p>	
—	<p>2. Enter one or more node address/names (NVRAM). tde_host_table _____ tde_host_table _____ tde_host_table _____ tde_host_table _____</p>	<p>Network Tables and Utilities ↓ TDEnet Host</p>
	<p>If you have additional nodes, fill out Workbook line 6.</p>	
	<p>.....</p>	
—	<p>3. Enter one or more net address/gateway addresses (NVRAM). gateway_table _____ gateway_table _____ gateway_table _____ gateway_table _____</p>	<p>Network Tables and Utilities ↓ Gateway</p>
	<p>If you have additional hosts, fill out Workbook line 7.</p>	
	<p>.....</p>	
—	<p>4. Enter one or more file system name/local directories (NVRAM) along with the file transfer size (128 - 8192). nfs_table _____ nfs_table _____ nfs_table _____ nfs_table _____</p>	<p>Network Tables and Utilities ↓ NFS Mount</p>
	<p>Fill out Workbook line 57. Also, if you have additional NFS entries, fill out Workbook line 8.</p>	
	<p>.....</p>	



Chapter 2 Making Choices

To Do	xp.cnf File	Setup Menu Paths
— 5. Enter one or more host address/names (RAM).	ip_host_entry _____ ip_host_entry _____ ip_host_entry _____ ip_host_entry _____ Continue adding entries as needed.	Not available
— 6. Enter one or more node address/names (RAM).	tde_host_entry _____ tde_host_entry _____ tde_host_entry _____ tde_host_entry _____ Continue adding entries as needed.	Not available
— 7. Enter one or more net address/gateway addresses (RAM).	gateway_entry _____ gateway_entry _____ gateway_entry _____ gateway_entry _____ Continue adding entries as needed.	Not available
— 8. Enter one or more file system name/local directories (RAM) 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 57.	Not available

<u>To Do</u>	<u>xp.cnf File</u>	<u>Setup Menu Paths</u>
<p>— 9. Enter node name/LAT service tables (up to 20 services).</p> <p>lat_services_table _____</p> <p>lat_services_table _____</p> <p>lat_services_table _____</p> <p>Continue adding services up to 20.</p> <p>.....</p>		<p>Not available</p> <p>.....</p>
<p>— 10. Enter the file system name (for file_host_name) and the local directory (for file_path).</p> <p>file_access_1 <u>NFS</u></p> <p>file_host_name_1 _____</p> <p>file_path_1 _____</p> <p>Fill out Workbook line 4 and Workbook line 57.</p> <p>.....</p>		<p>Configuration Summaries</p> <p>↓</p> <p>Host File Access</p> <p>.....</p>
<p>— 11. Enter the host address or name and the file path.</p> <p>file_access_1 <u>TFTP</u></p> <p>file_host_name_1 _____</p> <p>file_path_1 _____</p> <p>Fill out Workbook line 56.</p> <p>.....</p>		<p>Configuration Summaries</p> <p>↓</p> <p>Host File Access</p> <p>.....</p>
<p>— 12. Enter the node address or name and the file path.</p> <p>file_access_1 <u>DAP</u></p> <p>file_host_name_1 _____</p> <p>file_path_1 _____</p> <p>Fill out Workbook line 64.</p> <p>.....</p>		<p>Configuration Summaries</p> <p>↓</p> <p>Host File Access</p> <p>.....</p>
<p>— 13. No host name or file path is used.</p> <p>file_access_1 <u>SXP</u></p> <p>Fill out Workbook line 63.</p> <p>.....</p>		<p>Configuration Summaries</p> <p>↓</p> <p>Host File Access</p> <p>.....</p>



Chapter 2 Making Choices

To Do

xp.cnf File

Setup Menu Paths

— 14. Enter the file system name (for file_host_name) and the local directory (for file_path).
file_access_2 NFS
file_host_name_2 _____
file_path_2 _____
Fill out Workbook line 4 and Workbook line 57.

Configuration Summaries
↓
Host File Access

— 15. Enter the host address or name and the file path.
file_access_2 FTP
file_host_name_2 _____
file_path_2 _____
Fill out Workbook line 56.

Configuration Summaries
↓
Host File Access

— 16. Enter the node address or name and the file path.
file_access_2 DAP
file_host_name_2 _____
file_path_2 _____
Fill out Workbook line 64.

Configuration Summaries
↓
Host File Access

— 17. No host name or file path is used.
file_access_1 SXP
Fill out Workbook line 63.

Configuration Summaries
↓
Host File Access

— 18. Enter the address or name of the XDMCP host.
host_connect_method XDMCP
xdmcp_connect DIRECT
xdmcp_server _____
Fill out Workbook line 61.

Configuration Summaries
↓
X Environment

<u>To Do</u>	<u>xp.cnf File</u>	<u>Setup Menu Paths</u>
—	19. 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 67.	Configuration Summaries ↓ X Environment
—	20. 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 61.	Configuration Summaries ↓ X Environment
—	21. host_connect_method TELNET Fill out Workbook line 38.	Configuration Summaries ↓ X Environment
—	22. host_connect_method CTERM Fill out Workbook line 39.	Configuration Summaries ↓ X Environment
—	23. host_connect_method LAT Fill out Workbook line 9.	Configuration Summaries ↓ X Environment
—	24. host_connect_method SERIAL0 Fill out Workbook line 40 and Workbook line 63.	Configuration Summaries ↓ X Environment



Chapter 2 Making Choices

To Do

xp.cnf File

Setup Menu Paths

— 25. host_connect_method SERIAL1
Fill out Workbook line 41 and Workbook line 63.

Configuration Summaries
↓
X Environment
.....

— 26. host_connect_method WINDD
Fill out Workbook line 49.

Configuration Summaries
↓
X Environment
.....

— 27. host_connect_method DISABLED

Configuration Summaries
↓
X Environment
.....

— 28. Enter the host address or name and path to the os file.
boot_method TFTP
boot_host_name _____
boot_path _____

Configuration Summaries
↓
Boot

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

```
select FAMILY=XP10 boot_path _____os.10
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
```

Fill out Workbook line 56.

To Do

xp.cnf File

Setup Menu Paths

— 29. Enter the NFS read size and the path to the os file.
boot_method NFS _____
boot_path _____
If you have multiple families of network computers, replace the boot_path command with the applicable select commands.
select FAMILY=XP10 boot_path _____os.10
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
Fill out Workbook line 57.

Configuration Summaries
↓
Boot

.....
— 30. 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=XP10 boot_path _____XP10_OS
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 _____NC200_OS
select FAMILY=NC400 boot_path _____os.500
Fill out Workbook line 64.

.....
Configuration Summaries
↓
Boot



To Do

xp.cnf File

Setup Menu Paths

- 31. If you have an XP10 series with a ROM card (not a Flash Memory card) you can optionally read an *xp.cnf* file during subsequent boots by specifying a host address or name and path to the *xp.cnf* file.

```
boot_method ROM
boot_host _____
boot_path _____
```

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

```
select FAMILY=XP10 boot_path _____os.10
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
```

.....

- 32. 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=XP10 boot_path _____os.10
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
```

Fill out Workbook line 56.

.....

Configuration Summaries



Boot

.....

Configuration Summaries



Boot

.....

To Do

xp.cnf File

Setup Menu Paths

33. 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=XP10 boot_path _____os.10
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
Fill out Workbook line 57.

Configuration Summaries
↓
Boot

34. Enter the path to the OS file.
boot_method_2 MOF _____
boot_path_2 _____
If you have multiple families of network computers, replace the boot_path command with the applicable select commands.
select FAMILY=XP10 boot_path _____XP10_OS
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 _____NC200_OS
select FAMILY=NC400 boot_path _____os.500
Fill out Workbook line 64.

Configuration Summaries
↓
Boot



Chapter 2 Making Choices

To Do

xp.cnf File

Setup Menu Paths

35. 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.

```
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=XP10 boot_path _____os.10
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
```

.....

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

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

.....

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

```
determine_address_from NVRAM
```

.....

Configuration Summaries



Boot

.....

Configuration Summaries



Boot

.....

Configuration Summaries



Boot

.....

<u>To Do</u>	<u>xp.cnf File</u>	<u>Setup Menu Paths</u>
—	38. Enter the address or name of the default Telnet host. default_telnet_host _____	Configuration Summaries ↓ TCP/IP
—	39. Enter the address or name of the default CTERM node. default_cterm_host _____	Configuration Summaries ↓ TDEnet
—	40. 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
—	41. 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
—	42. save_current_settings	Not available



Chapter 2 Making Choices

To Do	<u>xp.cnf File</u>	<u>Setup Menu Paths</u>
—	43. Add an address or name for the XDMCP hosts to appear at the top of the TekHostMenu XDMCP list. xdmcp_menu_entry _____ xdmcp_menu_entry _____ xdmcp_menu_entry _____ Continue adding entries as needed.	Not available
—	44. Add an address or name for all <i>preferred</i> nodes to appear at the top of the TekHostMenu VMS TDEnet list. 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 TekHostMenu VMS TDEnet list. vms_menu_entry TDEnet _____ NOTPREF vms_menu_entry TDEnet _____ NOTPREF vms_menu_entry TDEnet _____ NOTPREF Continue adding entries as needed.	Not available
—	45. Add an address or name for all <i>preferred</i> nodes to appear at the top of the TekHostMenu VMS TCP/IP list. 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 TekHostMenu VMS TCPIP list. vms_menu_entry TCPIP _____ NOTPREF vms_menu_entry TCPIP _____ NOTPREF vms_menu_entry TCPIP _____ NOTPREF Continue adding entries as needed.	Not available

To Do

xp.cnf File

Setup Menu Paths

46. Add an address or name for all *preferred* hosts to appear at the top of the TekHostMenu 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 TekHostMenu 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.

.....

47. Add an address or name for all *preferred* nodes to appear at the top of the TekHostMenu 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 TekHostMenu 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.

.....

.....



Chapter 2 Making Choices

To Do

xp.cnf File

Setup Menu Paths

48. Add an address or name for all *preferred* IBM hosts to appear at the top of the TekHostMenu IBM list. Specify the emulator to use for the session (TEK220 or TEK340), the model (2, 3, 4, 5), and the protocol (TN or OCS).

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 TekHostMenu IBM list.

cterm_menu_entry _____ NOTPREF _____

cterm_menu_entry _____ NOTPREF _____

cterm_menu_entry _____ NOTPREF _____

Continue adding entries as needed.

Not available

49. Add an address or name for all *preferred* WinDD servers to appear at the top of the TekHostMenu 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).

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 TekHostMenu WinDD list.

windd_menu_entry _____ NOTPREF _____

windd_menu_entry _____ NOTPREF _____

windd_menu_entry _____ NOTPREF _____

Continue adding entries as needed.

Not available

<u>To Do</u>	<u>xp.cnf File</u>	<u>Setup Menu Paths</u>
— 50.	Add the name or address and configuration information for the WinDD server when the <i>host_connect_method</i> is set to WINDD. <i>windd_size</i> can be 640, 800, 1024, 1280). <i>windd_auto_connect</i> , <i>windd_auto_reconnect</i> , and <i>windd_entrybox</i> can be set as ENABLED or DISABLED. <i>windd_menubar</i> can be set as YES or NO. <i>windd_host_name</i> _____ <i>windd_size</i> _____ <i>windd_auto_connect</i> _____ <i>windd_auto_reconnect</i> _____ <i>windd_menubar</i> _____ <i>windd_entrybox</i> _____	Not available



Chapter 2 *Making Choices*

To Do

***.tbl Files**

Setup Menu Paths

— 51. Edit the *gateway.tbl* file and enter as many additional gateways as needed.

Network Tables and Utilities
↓
Gateway
.....

— 52. Edit the *hosts.tbl* file and enter as many additional hosts as needed.

Network Tables and Utilities
↓
Internet Host
.....

— 53. Edit the file *nodes.tbl* and enter as many additional nodes as needed.

Network Tables and Utilities
↓
TDEnet Host
.....

— 54. Edit the *nfs.tbl* file and enter as many additional NFS mounts as needed.

Network Tables and Utilities
↓
NFS Mount
.....

— 55. Edit the *fonts.tbl* file and enter the directory paths (Example: */tekxp/boot/fonts/misc*).

.....

Network Tables and Utilities
↓
Font Directory
.....

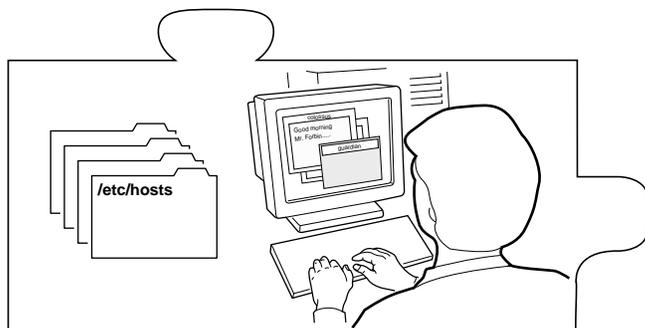
To Do	<u>Host Configuration Procedures</u>
___	56. Enable tftp on the host
___	57. Enable NFS on the host
___	58. Enable bootp on the host
___	59. Enable DHCP on the host (see Chapter 5)
___	60. Enable rarp on the host
___	61. Enable XDM on the host
___	62. Add network computer entries to <i>/etc/host</i> file
___	63. Set up Serial Xpress (see the <i>Serial Xpress User</i> manual)
___	64. Enable MOP on the host
___	65. Add the nodes to the NCP database
___	66. Create Proxy accounts on the host
___	67. Enable DECwindows on the host
___	68. Install WinDD on the Windows NT server.



Chapter 2 Making Choices

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 to be used for automatically determine 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*)
- *OPENLOOK Window Manager (OLWM)* must be started to use local OLWM (See Chapter 5: *Window Managers*)
- *ttys* must be set for 8-bit mode in *Tek220* sessions (Telnet, Cterm, or LAT)
- *XIE* must be enabled to run XIE applications (See Chapter 4: *Local Clients*)
- *XPT/A graphics tablet* must be configured on the host if it is used for input (See Chapter 4: *Local Clients*)



Enabling NFS

This section is an overview for enabling 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* (*/teexp/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 `\winnt35\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 box. Click on **Exports**. Use the **Add** button 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 box, click on **Users**. The two new users appear in the *Server Users* dialog box.
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 on **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 on **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

The following steps must be performed for the scope of NCD network computers to be managed and configured by the DHCP Server: **Local Machine**.

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 on the **New** button. 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 on the **New** button. 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, for example, */tekxp/boot/*
 - 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 then select the **Properties** button. In the new *Client Properties* window, select the **Options** button.

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 then click the Value button. 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, it is suggested that the scopes and/or leases defined to support the network computers contain following the *DHCP Options*:

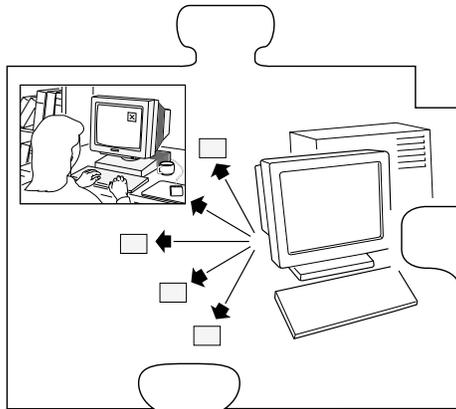
003	Router Gateway number
066	Boot server address/Primary boot host address
067	Boot file/Primary boot path



Chapter 3 Supporting a Centralized System

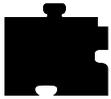
Chapter 4

Local Clients



This chapter describes various ways to start local client. Local clients are those applications that execute on the network computer, rather than on the host, thus reducing network traffic. *TekHostMenu*, *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 Intercept Driver and Server, Authorization Key Manager, XIE, XBlink, XPT/A Graphics Tablet, Touchscreen Calibration, and the Common Desktop Environment.



Chapter 4 Local Clients

The following local clients are available on the network computer:

Analog Video Player	Serial session
Audio Mixer	Setup
Audio Player	Telnet session
Authorization Key Manager	Touchscreen Calibration
Cterm session	WinDD
Common Desktop Environment (CDE)	XBlink
Digital Video Player	XIE Viewer
LAT session	Xlock client
Local Client Launcher	XP Window Manager (XPWM)
Motif Window Manager (MWM)	

NOTE: *MWM, LAT, Cterm, XIE, the Tek340 emulator, the Digital Video player, and CDE require an authorization key.*

Determining Local Client Versions

To see the version of any local client in the boot directory, use the UNIX **ident** command. For example, to see the version of *Setup* currently in use, enter **ident setup.350** (where 350 is the OS level you booted with). The version and level information displays. You can use this command for any of the local clients.

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:

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 \$HOME. This allows you to customize the MWM environment for an individual user.

NOTE: When starting local clients with **xpsh**, instead of entering the **-display** variable each time, you can set the environment variable **DISPLAY** to **nc_name:0**. Then when starting local clients with **xpsh**, enter **xpsh** and the local client only. For example:

```
xpsh tek220 -e cterm
xpsh tek340 -e telnet
xpsh mwm
xpsh tek220 -e llogin
xpsh tek220 -e tip tty0
xpsh tek340 -e tip tty1
xpsh xlock -mode 1
xpsh setup
```

To reduce the startup time for a local client started with **xpsh**, you can access the client through an NFS path. (For information about NFS, refer to the *Supporting a Centralized System* chapter for your host.) For example, if you mount **host_name:/tekxp/boot** to **/host_name/tekxp/boot** on your network computer, you can invoke MWM with the command:

```
xpsh /host_name/tekxp/boot/mwm
```

To start a local client using **xpsh**, enter the appropriate command below:

Starting the Analog Video Player

```
xpsh -display nc_name:0 xpvideo
```

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

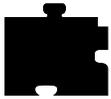
-encode specifies the encoding format. Specify either NTSC (National Television System Committee) or PAL (Phase Alternation Line-rate).

-source specifies the video source to which the video device is connected. Specify either COMPOSITE_1, COMPOSITE_2 or SVIDEO1.

-color specifies the color intensity of the video being played. Specify a number from -1000 to 1000. 0 is the default.

-bright specifies the color brightness intensity of the video being played. Specify a number from -1000 to 1000. 0 is the default.

-contrast specifies the color contrast intensity of the video being played. Specify a number from -1000 to 1000. 0 is the default.



-tint specifies the color tint of the video being played. Specify a number from -1000 to 1000. 0 is the default.

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
```

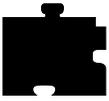
Resource settings can be specified for a Cterm session. Refer to the next section, *Specifying Client Resource Settings*.

Starting the Digital Video Player

xpsh -display nc_name:0 vplay

The following **vplay** options can be set 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 access 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.



Chapter 4 Local Clients

- 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 will not be in 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 will be 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 will 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*).

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 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

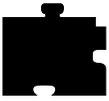
xpsh can start the WinDD client as needed. To start WinDD with **xpsh**, enter the following (where *nc_name* is the name or address of your network computer):

```
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 will be allowed to use the floppy device. NOTE: 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.



Chapter 4 Local Clients

-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 Xserver 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 will be 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 move, 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 the XIE Viewer

xpsh -display nc_name:0 xieview

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

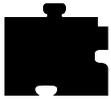
-ifg color specifies the color used as the foreground on bitonal images. The color specified must be in the network computer's *rgb.txt* file.

-ibg color specifies the color used as the background on bitonal images. The color specified must be in the network computer's *rgb.txt* file.

-cc color specifies the background color for the image window. The color specified must be in the network computer's *rgb.txt* file.

-fullpan True or False

If True, the image uses less memory when zoomed. If False, the image uses more memory when zoomed. When set to False, panning the image is faster. If there is not enough memory to view the entire zoomed image, only part of the image will be available when panning. The default is True.



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 *Network Computer 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 will be 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 RSDH 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:

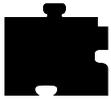
```
sierra judyl -vplay -aplay
```

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
```



Chapter 4 *Local Clients*

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.

NOTE: *rsh can start all the local clients that xpsh can start, except for the Remote Setup client.*

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, TekHostMenu, Lock Screen, Console, and Setup. Serial Port 0 and/or 1 are included if the network computer has serial ports. If Motif Window Manager, OPENLOOK Window Manager, 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 sub-menu 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 sub-menu is available with additional options. For example, if you have both Motif Window Manager and OPENLOOK Window Manager authorized, you could have a *Window Managers* entry on the Client Launcher menu that opens a second menu containing MWM and OLWM. You can use any name or description you like with the *f.menu* option, however it must end with the letters *menu*.

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 sub-menus 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 sub-menu, enter `ENDMENU` in uppercase letters.

In the following example, the Client Launcher menu contains the following entries: Sessions (displays a submenu of available session clients), Multimedia (displays a submenu), Console, TekHostMenu, Window Managers (displays a submenu), and Setup.

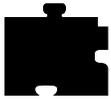
Example 4-1 Sample Client Launcher Configuration File.

```
# Configuration file for Client Launcher
#
MAINMENU
"Sessions"           f.menu SESSIONS
"Multimedia"        f.menu MULTIMEDIA
"Console"           f.exec "console"
"TekHostMenu"       f.exec "TekHostMenu"
"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"
"XIE Viewer"        f.exec "xieview"
"Audio Mixer"       f.exec "mixer"
ENDMENU

WINDOWS
"MWM"               f.exec "mwm"
"OLWM"              f.exec "olwm"
"XPWM"              f.exec "xpwm"
ENDMENU
```



Chapter 4 *Local Clients*

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 *Network Computer 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*:

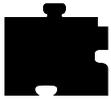
```
xpsh -display sierra:0 launcher -file\ /u1/user3/  
launch
```

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

Once the Client Launcher is downloaded, press the Setup key to display the Client Launcher main menu.

NOTE: To start the Client Launcher on a UNIX keyboard, press and hold the AltGraph key (three keys to the right of the space bar) and press the Help/Setup key (at the bottom left of the keyboard).

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

If the Client Launcher is iconified, pressing the Setup key displays it again (or the AltGraph and Help/Setup keys on a UNIX keyboard). 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 window managers, XIE, TDEnet, and the video player.

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 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 the following:

xpsh authkey

Using the Authorization Key Manager Client

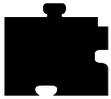
The Authorization Key Manager client can be started only with **xpsh**. When it starts, the window shown in Figure 4-2 appears.

The screenshot shows a window titled "Authorization Key Manager". Inside, there is a table with the following data:

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

Below the table, there are input fields for "Ethernet Address" and "Authorization Key", followed by "Add Entry" and "Delete Entry" buttons. At the bottom, there are four buttons: "Update Authkey", "Edit Broadcast List", "Save Authkey File", and "Exit".

Figure 4-2 Authorization Key Manager Window.



Chapter 4 *Local Clients*

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.

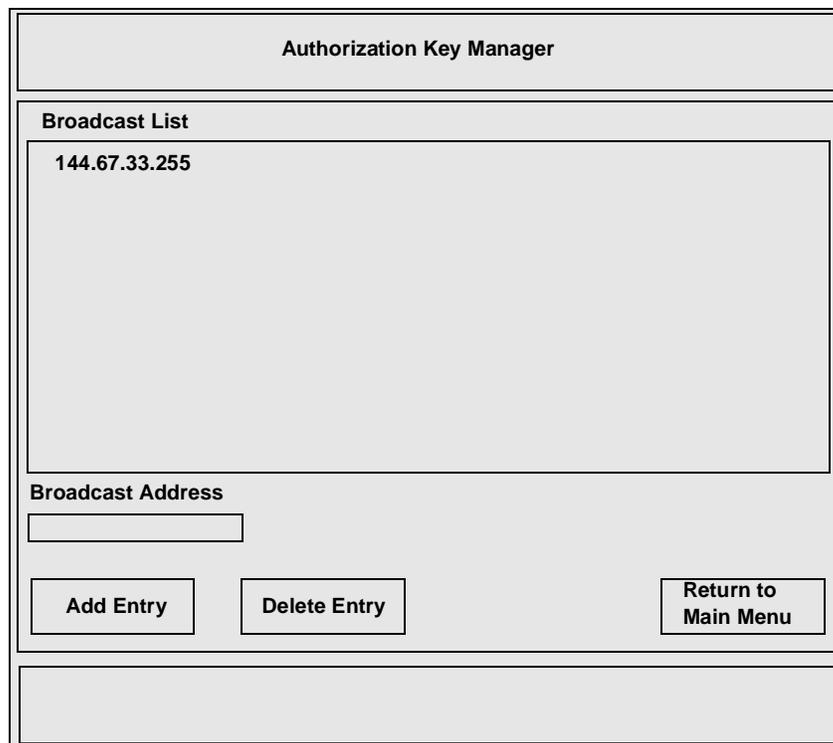
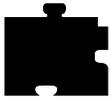


Figure 4-3 Edit Broadcast List Window.

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 4-5 appears.

The screenshot shows a window titled "Authorization Key Manager". Inside, there is a section titled "Save Authorization Key File". Under this section, there are three rows of input fields:

- "Access Method" with two buttons: "TFTP" and "NFS".
- "Host" with a single-line text input field.
- "File Name" with a single-line text input field.

At the bottom of the dialog, there are two buttons: "Save Authkey File" on the left and "Return to Main Menu" on the right.

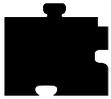
Figure 4-4 Save Authkey File Window.

Using the Authorization Key Manager Client

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.



Setting up XIE

X Imaging Extension (XIE) is a standard extension to the X11 Window System. XIE is a library of support routines to add image enhancements and display operations to applications. XIE programmer documentation is available from MIT.

The XIE server is a network computer option. If the XIE option is available and enabled, the XIE server is downloaded and attached to the network computer's X server. The XIE server requires approximately 400K of memory. XIE must be authorized for the network computer, and then enabled through *Setup* or the remote configuration file.

XIE Authorization

Use *Setup* to verify if XIE is authorized. There are two ways to verify XIE:

- Drag on Configuration Summaries and release on X Environment. If the Enable XIE option appears on the screen, XIE is authorized.
- Drag on Statistics and release on Options. If XIE is listed, it is authorized.

If XIE was factory-loaded, the authorization key is already entered and XIE should be available. If XIE was purchased separately, the authorization key must be entered at the network computer *Boot Monitor* with the **Authorize** command. See Chapter 4 *Boot Monitor* of the *Network Computer Reference* manual.

Enabling XIE

XIE can be enabled through *Setup* or in the remote configuration file. In *Setup*, drag on Configuration Summaries and release on *X Environment*. The Enable XIE option should be **Yes**. In the *xp.cnf* file, use *enable_xie*.

To automatically download XIE each time the network computer is booted, enable XIE and then use **Save Current Settings**. To download XIE on demand, enter *Setup* and enable it, but do not select **Save Current Settings**. As soon as it is enabled, XIE is downloaded.

To unload XIE from the server, enter *Setup* and disable it (use **Save Current Settings** if you previously saved XIE as enabled), then reboot the network computer.

Setting up XBlink

XBlink provides the ability to cause graphics primitives to blink using a set of dynamically loadable X extension functions. By modifying applications to call these functions, a graphic element, such as text or a line, can alternate colors to create a blinking affect. For example, to create the blink affect, a function could be called passing in blue/yellow and 500/500 milliseconds, and return index 5. If text is drawn with color index 5, then every 500 milliseconds the text would alternate between the colors blue and yellow.

The XBlink Extension is applicable only for PseudoColor, DirectColor and GrayScale visuals.

XBlink Authorization

XBlink must be authorized for use on a network computer. To use *Setup* to verify if XBlink is authorized, drag on Statistics and release on Options. If XBlink is listed, it is authorized.

If XBlink was factory-loaded, the authorization key is already entered and XBlink should be available. If XBlink was purchased separately, the authorization key must be entered at the network computer *Boot Monitor* with the **Authorize** command. See Chapter 4 *Boot Monitor* of the *Network Computer Reference* manual.

Enabling XBlink

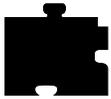
XBlink is enabled in the remote configuration file with the *enable_xblink* command. Uncomment the command in the *xp.cnf* file, set the parameter to YES, and reboot the network computer.

```
enable_xblink    YES
```

To unload XBlink from the server, comment out the *enable_xblink* command, or set its parameter to NO. Reboot the network computer.

Using XBlink

For details about the XBlink feature and its functions, refer to the *xblink* man page, documented in Appendix C of the *Network Computer Reference* manual.



Setting Up the XPT/A Graphics Tablet

The XPT/A graphics tablet provides a way to input graphics into your network computer applications. Using the graphics tablet with an appropriate network computer application, you can digitize and insert images, control cursor movements, and make menu selections.

NOTE: The network computer must have a serial port in order to connect the XPT/A Graphics Tablet

1. Install the graphics tablet using the procedure in the *XPT/A Graphics Tablet* manual.
2. Specify the device description file for each port that a device will be connected using either the remote configuration file or *Setup*:
 - In the remote configuration file, use the **input_ext_config_file_0** or **input_ext_config_file_1** command to specify the device description file. Refer to Chapter 2, *Remote Configuration* in the *Network Computer Reference* manual.
 - In *Setup*, drag on Configuration Summaries and release on Input Extension. Select the device connected to the appropriate port using the Device on Serial Port 0 or Device on Serial Port 1 option, and then select the core pointer using the Select Core Pointer Device option.

Touchscreen Calibration Client

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

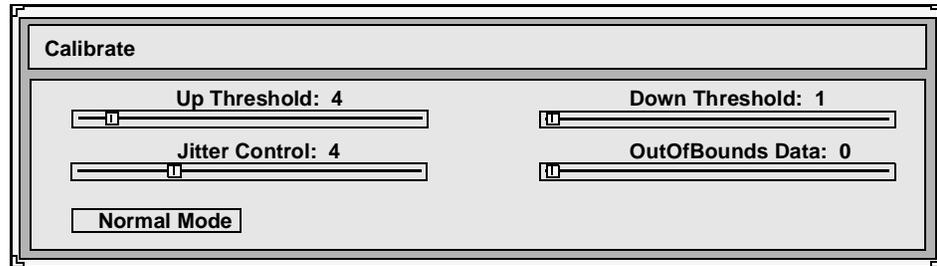


Figure 4-5 Calibration Client.

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 will not move the cursor.

The Calibration Client includes the following elements:

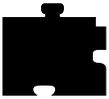
NOTE: *Not all elements are available on all touchscreen devices. Only those elements needed for your touchscreen appear.*

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



Chapter 4 *Local Clients*

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.

Common Desktop Environment

The Common Desktop Environment (CDE) is a collection of software standards which defines an integrated, standard, and consistent graphical user interface desktop environment.

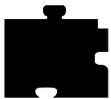
CDE enables the network computer user to interact with a common environment even though the network computer may be connected to a heterogeneous network. It gives the user a common way of accessing resources (printers, viewers, applications, etc.) that is independent of any particular host on the network. In addition, CDE allows some services, such as the window manager, to be run locally, thus reducing the load on the host.

The window manager component of TriTeal's CDE implementation, called TED, has been ported to NCD network computers. TED consists of two parts: one running on the host, the other, known as local TED/CDE, running on the network computer.

Requirements

The following requirements are needed to use local TED/CDE:

- You must have an appropriately licensed version of TED 4.0 running on your host. Contact TriTeal to acquire a copy of TED which supports local TED.
- TED requires the network computer to have at least 12 MB of RAM, although your usage of TED may require more memory
- The `/usr/dt/config/xfonts/C` directory must be accessible to the network computer. This directory contains a `fonts.alias` file used by CDE.
- A network computer authorization key is required to use local CDE



Starting the Local TED/CDE Client

To load the local **dtwm** window manager from **dtlogin**, each user must perform the following steps:

***NOTE:** Be sure that **tftp** is enabled on the server if you will be using it to load the fonts.*

1. Change directories to the */examples* directory.

```
cd <install_dir>/tekxp/examples
```

2. Execute the setup script for local TED:

```
# setup4localted
```

The setup script prompts you for the name of your host, the name of the network computer, the path to dtpeer, and the path to xps. For all but the network computer name, the script attempts to provide defaults. You can override these defaults.

The script creates the following directory:

```
$HOME/.dt/bin/<host_name>/<nc_name>
```

In this directory, the script creates a link to dtpeer called *dtwm*, and a link to **xps** called *xps*.

3. Logout and log back in.

When **dtsession** is run, the session manager loads the local **dtwm** and connects with the peer. If this fails, the default host **dtwm** is run.

4. Make sure the network computer's name is fully qualified on the host machine in the file */etc/hosts*. The entry should be this format:

```
<IP Address> <nc_name> <nc_name>.<domain_name>
```

For example,

```
134.62.10.199      twinkle      twinkle.tek.com
```

Troubleshooting

If you experience problems, do the following:

- To determine if local TED is locating the host, look for the following message in the Console:

Peer has been initialized and we can start dtwm.

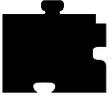
Numerous "Cannot open file:" messages appear in the Console window. Disregard these messages.

If local TED cannot locate the host, the following message appears:

No host entry for <hostname>

No socket.

- The **dt** peer waits for up to several minutes for the local **dtwm** to start. To confirm that you are using the local **dtwm**, check the Workspace Menu to see which **dtwm** was loaded. (Click on the right mouse button anywhere on the background to bring up the menu.) The *Restart Workspace Manager...* item should be grayed out.
- Make sure that the network computer name is defined in Setup's TCP/IP Configuration Menu
- The host must be included in Setup's Internet Host Table, or Domain Name Service (DNS) must be enabled and configured
- Make sure that */var/dt* is writable
- Look at the files *\$HOME/.dt/startlog* and *\$HOME/.dt/errorlog* for any suspicious messages and correct the indicated problems
- Make sure **ftfp** is enabled on the host
- The directory */usr/dt/config/xfonts/C* must be accessible
- Check the gateway and name server addresses
- Check that the network computer name and address do not conflict with others on the network

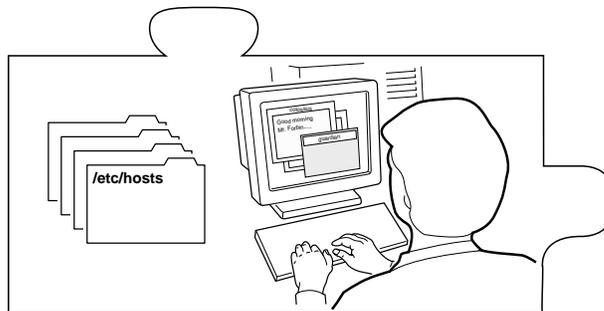


Chapter 4 Local Clients

Chapter 5

Chapter

Window Managers



This chapter describes the local window managers available on the network computer. These window managers are: Motif Window Manager (MWM), OpenLook Window Manager (OLWM), 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 \$HOME 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 */tekxp/man* 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 */teexp/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 *Network Computer Reference Manual*.

Starting MWM With the Client Launcher

The Client Launcher can be customized 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 sub-menu. 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 was 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. *\$HOME/\$LANG/.mwmrc*

3. `$HOME/.mwmrc`
4. `/usr/lib/X11/$LANG/system.mwmrc`
5. `/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, `/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
f.move	Starts an interactive move for a window



Table 5-1 MWM Functions. (Continued)

Function	Description
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_wmmenu	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
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 set;
otherwise
\$HOME/.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
\$HOME/.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;
\$HOME/\$LANG/Mwm, if it exists;
otherwise
\$HOME/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/\$LANG/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 `$HOME` directory, the `iconImage` resource can be set in your `$HOME/.Xdefaults` file as follows:

```
Mwm*program_name*iconImage: ~/star
```

Specifying Virtual Key Bindings

MWM reads the `$HOME/.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 `.mwmrc` 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 *.Xdefaults* 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:
 - Your DISPLAY environment variable may not be set correctly. The DISPLAY environment variable may be set to **unix:0**, as in a configuration file such as *\$HOME/.cshrc*. You may see output directed to your host display, instead of to the network computer.
 - 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 *Network Computer 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 in the **xpsh** environment.
 - 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 the file is accessed using TFTP, make sure you are using the version of **xpsh** included with the software version 6.1 or greater. If you are using an earlier version of **xpsh**, enter your hostname in the Internet host table.
- Do not kill an **xpsh** process that invoked MWM with a -9 (SIGKILL) signal. Neither MWM nor **xpsh** can clean up before they exit. Use kill -15 (SIGTERM) instead.
- 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.



Starting OLWM With The *xp.cnf* File

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

Starting OLWM With the Client Launcher

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

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

```
xpsh -access xpsh olwm
```

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 XpressWare 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 *Network Computer 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 sub-menu. 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* section 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 Motif Window Manager and OpenLook Window Manager. Figure 5-1 shows a sample XPWM window and its elements.

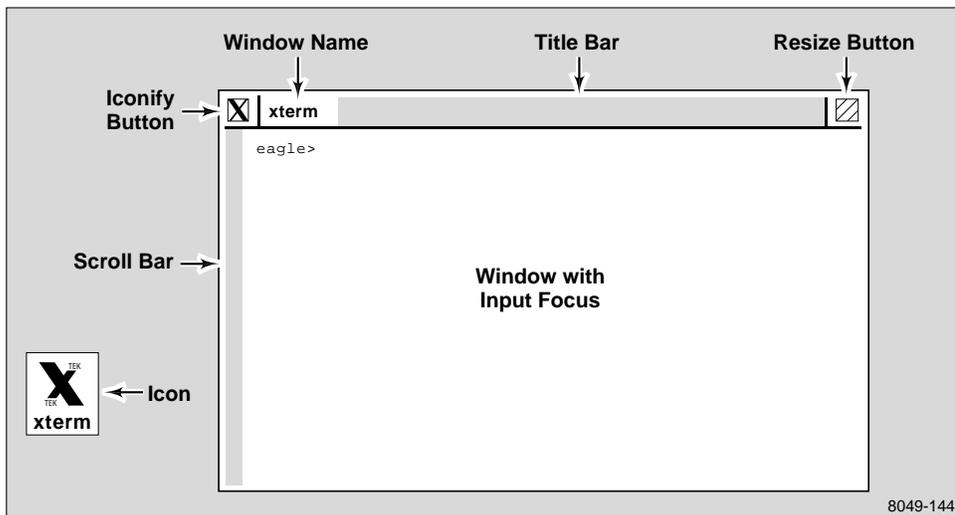


Figure 5-1 Elements of an XPWM Window

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
Un-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

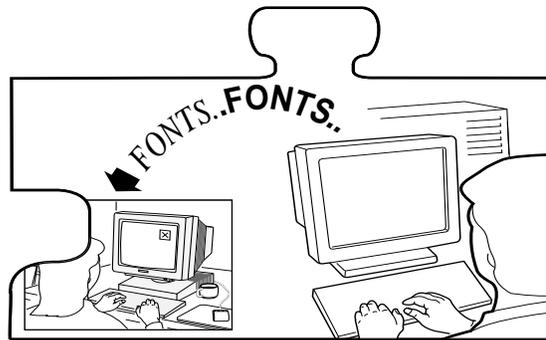
You can change the appearance of XPWM using the resource settings listed in Table 5-4. XPWM does not allow user-defined bindings or user-defined menus.

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 	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 	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 	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 Additional 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**, **DAP**, or **SXp**. Font files tend to be large; they do not have to be installed on the same disk as the boot files.

NOTE: *SXp is optional. Refer to your SXp User Manual for information on setting up SXp as a host access method.*

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.ttl* file.

If a *fonts.ttl* file is not found with the primary path, the X server searches the secondary path for a *fonts.ttl* 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.ttl* 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.



Resident and Boot Directory Fonts

Resident fonts (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 (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)
6x10	-misc-fixed-medium-r-normal--10-100-75-75-c-60-iso8859-1
6x13	-misc-fixed-medium-r-semicondensed--13-120-75-75-c-60-iso8859-1
6x13B	-misc-fixed-bold-r-semicondensed--13-120-75-75-c-60-iso8859-1
8x13	-misc-fixed-medium-r-normal--13-120-75-75-c-80-iso8859-1
8x13B	-misc-fixed-bold-r-normal--13-120-75-75-c-80-iso8859-1
9x15	-misc-fixed-medium-r-normal--15-140-75-75-c-90-iso8859-1
9x15B	-misc-fixed-bold-r-normal--15-140-75-75-c-90-iso8859-1
LucidaV2RT10	-bigelow & holmes-lucidav2-medium-r-normal-typewriter-16-100-100-100-m-80-iso8859-1
cursor	cursor

Table 6-2 Boot Directory Fonts.

Font	X Logical Font Description Name (XLFD)
term14_100	-bitstream-terminal-medium-r-normal--18-140-100-100-c-110-iso8859-1
term14_75	-dec-terminal-medium-r-normal--14-140-75-75-c-80-iso8859-1
luBS14	-b&h-lucida-bold-r-normal-sans-14-140-75-75-p-92-iso8859-1
luRS12	-b&h-lucida-medium-r-normal-sans-12-120-75-75-p-71-iso8859-1
helvB12	-adobe-helvetica-bold-r-normal--12-120-75-75-p-70-iso8859-1
olcursor	-sun-open look cursor-----12-120-75-75-p-160-sunolcursor-1
olgl12	-sun-open look glyph-----12-120-75-75-p-113-sunolglyph-1
LuciB10	-bigelow & holmes-lucida-bold-r-normal-serif-14-100-100-100-p-97iso2022_r_tek-1442r433
LuciBT10	-bigelow & holmes-lucida-bold-r-normal-typewriter-16-100-100-100-m-80iso2022_r_tek-1442r433

Table 6-2 Boot Directory Fonts. (Continued)

Font	X Logical Font Description Name (XLFD)
LuciRT10	-bigelow & holmes-lucida-r-normal-typewriter-16-100-100-100-m-80iso2022_r_tek-1442r433
techB14	-bitstream-terminal-bold-r-normal--18-140-100-100-c-110-dec-dectech
deccurs	decw\$cursor
decssess	decw\$session
fg-22	fg-22
timr10	-adobe-times-medium-r-normal-10-100-75-75-iso8859-1
timr24	-adobe-times-medium-r-normal--24-240-75-75-p-124-iso8859-1
luBS12	-b&h-lucida-bold-r-normal-sans-12-120-75-75-p-79-iso8859-1
LuciV2RT12	-bigelow & holmes-lucidav2-medium-r-normal-typewriter-21-120-100-100-m-100-iso8859-1
LuciV2NT12	-bigelow & holmes-lucidav2-medium-r-condensed-typewriter-21-120-100-100-m-100-iso8859-1
tekdw132	tekdw132
tekdw80	tekdw80
tekdwdbh80	tekdwdbh80
tekdwdht80	tekdwdht80
tekdwhb132	tekdwhb132
tekdwht132	tekdwht132
tktrm132	tktrm132



Installing Fonts

The installation media provides *fonts.dir* and *fonts.alias* 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 *
```

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

```
# mkfontdir myfonts
```

NOTE: A modified version of */tekxp/src/mkfontdir* reads inverted SNF files. You must make the utility before you can use it.

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 must exist, even if it is empty.

Refer to the **mkfontdir** man page 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 `\teexp\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 Additional 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 #
<i>Boot host does not respond</i>	7-2
<i>Network computer does not respond to a ping</i>	7-3
<i>Duplicate IP address message</i>	7-3
<i>Network computer can not locate os file</i>	7-3
<i>Network computer can not locate .tbl files</i>	7-4
<i>Network computer can not locate font files</i>	7-4
<i>TekHostMenu does not display any xdm hosts</i>	7-4
<i>xdm login window does not appear</i>	7-5
<i>xdm login window reappears instead of starting session</i>	7-5
<i>Control-C does not cause an interrupt</i>	7-5



Chapter 7 Troubleshooting

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*.
- Use the **ps** command on the boot host to verify the supporting daemon(s) are running. The daemons may include: *inetd*, *nfsd*, *tftpd*, *bootpd*, and *rarpd*.
- If you are booting from **NVRAM**, use the network computer *Boot Monitor* to verify 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 */etc/hosts*, */etc/ethers*, *bootptab*, 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, such as */etc/ethers*, *bootptab*, and change entries in the ARP table (**arp** command). The network administrator should flush the ARP table in the router.

Network computer can not 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. For Silicon Graphics hosts, the secured boot path should not have a leading slash. For other UNIX hosts, the secured boot path should have a leading slash.
- Verify that you are using the correct *os* file (*os.10*, *os.330*, or *os.350*), and that it has world read permission. Use **chmod** command to change permission.
- On Hewlett-Packard hosts, verify that tftp is set up properly. On some Hewlett-Packard hosts, there must be a tftp entry in the password file. The secure directory is specified in the password file as if it were a home directory. Also, if tftp is in the *inetd.sec* file, make sure the network computer is listed as an authorized device.



Chapter 7 Troubleshooting

Network computer can not 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 can not locate font files

- Follow the previous procedures for *Network computer can not 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.

TekHostMenu does not display any xdm hosts

- Use the `ps` command to verify that the `xdm` daemon is running on the host.
- Check the Host Connect Method with *Setup*. Drag on Configuration Summaries and release on X Environment. Verify that the Host Connect Method is set to *TekHostMenu*.
- Verify that the `xdm-error` and `xdm-pid` files have world write permission in the `xdm-config` file.

xdm login window does not appear

- Use the **ps** command to verify that the **xdm** daemon is running on the host.
- Check the Host Connect Method with *Setup*. Drag on Configuration Summaries and release on X Environment. Verify that the Host Connect Method is set to *XDMCP Direct*, and that the log in host is specified.
- Verify that the *xdm-error* and *xdm-pid* files have world write permission in the *xdm-config* file.

xdm login window reappears instead of starting session

- Verify that the X startup file contains a valid session control client. Ensure that either the system-wide *Xsession* (or *Xinitrc* on Sun hosts) or users *.xsession* (or *.xinitrc* on Sun hosts) file ends with a client that is not running in the background. Verify the path to the session control client.

To correct the problem, try using *failsafe* mode: When the **xdm** login window appears, type in user name and password and press the F1 key (instead of Enter). If nothing happens, then the failsafe feature is not enabled on that host, and you must log in by another method.

- Verify that the session control client is executable. Use the **chmod** command, if necessary, to make the session control client executable. Try using *failsafe* mode to correct the problem.
- The X startup file may not be executable. Use the **chmod** command, if necessary, to make the X startup file executable. Try using *failsafe* mode to correct the problem.
- Environmental variables may not be set. Verify that the X startup file sets any environmental variables that are required by the session control client. Try using *failsafe* mode to correct the problem.

Control-C does not cause an interrupt

- Set the interrupt variable in each user's *.cshrc* (c shell) or *.profile* (Bourne shell) file. Use the format:

```
stty intr '^C'
```



Chapter 7 Troubleshooting

A

- Analog Video Player
 - starting with xpsd 4-3
- Audio Mixer
 - starting with xpsd 4-4
- Audio Player
 - starting with xpsd 4-4
- authkey.dat file 4-22
- Authorization Key Manager 4-21
 - setting up SNMP 4-21
 - starting with xpsd 4-4

B

- Baud rate 2-29
- Boot
 - directory fonts 6-4
 - from master Netstation 2-17
 - host 2-3
 - host check list 2-17
 - methods 2-5
 - strategies 2-5
- Boot Monitor Commands 1-15
 - about the Boot Monitor 1-14
 - bmethod 1-16
 - boot 1-15
 - bpath 1-16
 - iaddr 1-16
 - igate 1-16
 - ihost 1-16
 - imask 1-16
 - lanspeed 1-15
 - localaddr 1-15
 - mtu 1-15
 - NVSAVE 1-15

- Boot screen 1-14
- boot_host_name 2-24
- boot_method 2-24
- boot_path 2-24, 2-25, 2-26, 2-27, 2-28
- Booting
 - automatic 2-6
 - first boot 2-6
 - from a specific host 2-7
 - from first available host 2-7
 - manual 2-6
 - subsequent boots 2-7
- bootp
 - automatic booting 2-6

C

- CDE 4-33
- Check List
 - boot host 2-17
 - file host 2-17
 - Netstation 2-18
- Client Launcher 1-18, 4-15
 - Configuring 4-15
 - downloading the launcher 4-18
 - starting the Client Launcher 4-20
 - Starting with xpsd 4-7
- Common Desktop Environment 4-33
 - starting 4-34
- Configuration choices and strategies 2-1
- Configuration Files
 - font path table 6-1
- Console, remote 4-7
- Cterm 2-12, 2-14
 - starting a cterm session 4-4
- cterm_menu_entry 2-31
- Custom Installation 1-6



Index

D

DAP

- font access 6-1

Data bits 2-29

default_cterm_host 2-29

default_telnet_host 2-29

determine_address_from 2-28

DHCP 3-3

Digital Video Player

- starting with xps 4-5

Directory heirarchy 1-3

Distributed computing 2-3

Documentation v

E

Emulators

- Tek220 4-4

- Tek340 4-4

F

File Access Methods

- TFTP, NFS, DAP, SXP 2-10

File Access Strategies 2-9

File heirarchy 1-3

File Host 2-3

- check list 2-17

file_access_1 2-21

file_host_name_1 2-21

file_path_1 2-21

Flash Memory 2-16

- strategies 2-16

Flow control 2-29

Font

- boot directory 6-4

DAP access 6-1

database 6-2

fonts.alias file 6-3

fonts.dir file 6-3

installing 6-6

mkfontdir command 6-6

NFS access 6-1

resident 6-4

setting up 6-1

tftp access 6-1

fonts.alias 6-3

fonts.dir 6-3

G

gateway_entry 2-20

gateway_table 2-19

Graphics Tablet 4-30

H

Host

- boot 2-3

- connection strategies 2-11

- file 2-3

- file host considerations 2-9

- login 2-3

host_connect_method 2-23

HostMenu 2-12

I

IBM host connection 2-12

ibm_menu_entry 2-32

- Installation
 - example 1-10
 - media contents 1-3
 - Options 1-6
- ip_host_entry 2-20
- ip_host_table 2-19
- L**
- LAT 2-12, 2-14
 - starting a LAT session 4-6
- lat_services_table 2-21
- Launcher 1-18
- Local clients 4-1
 - starting with rsh 4-12
 - starting with xps 4-2
- Locking the Network computer 4-12
- Login
 - host 2-3
 - window 2-13
- M**
- Manual
 - mouse terminology v
 - terminology used v
 - typographical conventions v
- Master Netstation 2-17
- Media
 - about 1-1
 - contents 1-3
- mkfontdir 6-6
- MOP 2-5, 2-10
- Motif Window Manager
 - bitmap files 5-7
 - configuration files 5-2
 - defaults file 5-5
 - resource description file 5-2
 - starting a local session 4-7
 - starting MWM 5-2
 - troubleshooting 5-9
 - virtual key bindings, specifying 5-7
- Mouse Buttons v
- N**
- Netstation
 - checklist 2-18
- Network computer
 - Booting 1-15
 - Power on 1-14
- NFS
 - Enabling 3-2
 - Enabling a WinDD server 3-2
 - font access 6-1
 - using 2-5, 2-10
- nfs_table 2-19, 2-20
- P**
- Parity 2-29
- Q**
- Quick Start 1-2
- R**
- Related documentation v
- Remote Configuration
 - reading from ROM or Flash Memory 2-16
- Remote Configuration Commands
 - update_authkey 4-23



Index

Resident fonts
 table of resident fonts 6-4
ROM 2-5, 2-16
 booting 2-5
 strategies 2-16
RSH
 starting local clients 4-12

S

save_current_settings 2-29
Scoreboard 1-14
Serial 0, Serial 1 2-14
 starting a serial session 4-7
Session window 2-14
Setup
 exiting 1-23
 key 1-18
 main menu 1-18
 starting with xpsh 4-7
 window 1-21
Setup key 1-18
Setup Program 1-4
setup.exe 1-4
Starting local XP Window Manager 4-12
Stop bits 2-29
Strategies
 configuration 2-3
 file access 2-9
 Flash Memory 2-16
 for booting 2-5
 host connection 2-11
 ROM 2-16

SXp
 font access 6-1
 method 2-10

T

TCP/IP 2-12
tde_host_entry 2-20
tde_host_table 2-19
TDEnet 2-12
Tek220 emulator 4-4
Tek340 emulator 4-4
Telnet 1-19, 2-12, 2-14
 closing 1-20
 default host 1-22
 opening 1-19
 starting a Telnet session 4-8
telnet_menu_entry 2-31
tftp
 font access 6-1
 using 2-5, 2-10
Token-Ring
 adding a Network computer to 1-15

V

vms_autologin_tdenet_host 2-23
vms_autologin_transport 2-23
vms_menu_entry 2-30

W

WinDD

- host connection 2-13

- starting a session 4-8

WinDD Server

- booting from 3-2

windd_auto_connect 2-33

windd_auto_reconnect 2-33

windd_entrybox 2-33

windd_host_name 2-33

windd_menu_entry 2-32

windd_menubar 2-33

windd_size 2-33

- starting the Audio Mixer 4-4

- starting the Audio Player 4-4

- starting the authorization key manager 4-4

- starting the client launcher 4-7

- starting the Digital Video Player 4-5

- starting the XIE Viewer 4-11

- starting Xlock 4-12

- starting XPWM 4-12

XPT/A Graphics Tablet 4-30

X

X Imaging Extension (XIE) 4-28

XBlink feature 4-29

XDMCP 2-12

xdmcp_connect 2-22

xdmcp_menu_entry 2-30

xdmcp_server 2-22

XIE 4-28

XIE Viewer

- starting with xpsh 4-11

Xlock function 4-12

XPSH

- starting a LAT session 4-6

- starting a serial session 4-7

- starting Cterm 4-4

- starting local clients 4-2

- starting MWM 4-7

- starting Setup 4-7

- starting Telnet 4-8

- starting the Analog Video Player 4-3



Index

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