NCD

Installation and Configuration Guide

NCD PC-Xware, Version 6.0

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About This Guide

This guide explains how to install NCD PC-Xware on a Microsoft Windows Server, with or without Terminal Services.

Chapter 1 Before You Begin
Describes the PC-Xware requirements, and explains how to prepare your system for installation.

Chapter 2 Installation and Configuration Concepts
Presents basic concepts that will help you perform installation and configuration tasks.

Chapter 3 Standard Installation
Explains how to install this product using standard installations.

Chapter 4 Configuration Procedures
Explains how to configure PC-Xware installation to meet the needs at your site, including how to set defaults for and how to set up fonts.

Appendix A Product Support
Explains how to get technical support for PC-Xware.

Appendix B Troubleshooting PC-Xware
Explains how to locate the source of a problem, solve some common problems, and check network connections.

Text Conventions

This guide uses the following text conventions:

>	Indicates movement through menu options. For example, the sequence for renaming the existing file is: **Options > Preferences**
directory or file	Indicates a directory or a file. For example: **c:\Program Files\ThinPATH**

program or utility	Indicates a program or utility. For example:
	Windows Explorer is ....
`Computer response`	Indicates information that displays on the screen. For example, the date command displays:
	`Monday May 18 03:05:12 PTD 1998`
`variable`	Indicates a variable for which you can substitute one or more parameter values, group names, or file names.
	`IP_Address Host_Name #comment`
user input	Indicates information you type. For example, to display characters in a 6 x 13 font, enter:
	`% xfd -fn 6x13`
`[option a|option b]`	Square brackets indicate command options; vertical bars separate each *option* within the square brackets. If you specify an option, choose only one value within the square brackets.

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Chapter 1
Before You Begin

This chapter explains how PC-Xware operates in today's stand-alone Windows PC environment and the Windows Terminal Services environment.

The PC-Xware Environment

Before you begin installation, you need to understand running PC-Xware on a standalone Windows PC or on a PC running Microsoft Windows with Terminal Services. This will help you make the right decisions during installation and to ensure the software is correctly installed and correctly licensed.

Standalone PC Environment

Under Windows XP and Windows 2000 Pro multiple users are supported but only one user session is allowed to run at a time. An additional feature in Windows XP is the ability to switch users leaving multiple user sessions running. PC-Xware supports Windows XP's multiple user sessions, allowing your X11 connections to stay active while switching between user sessions.
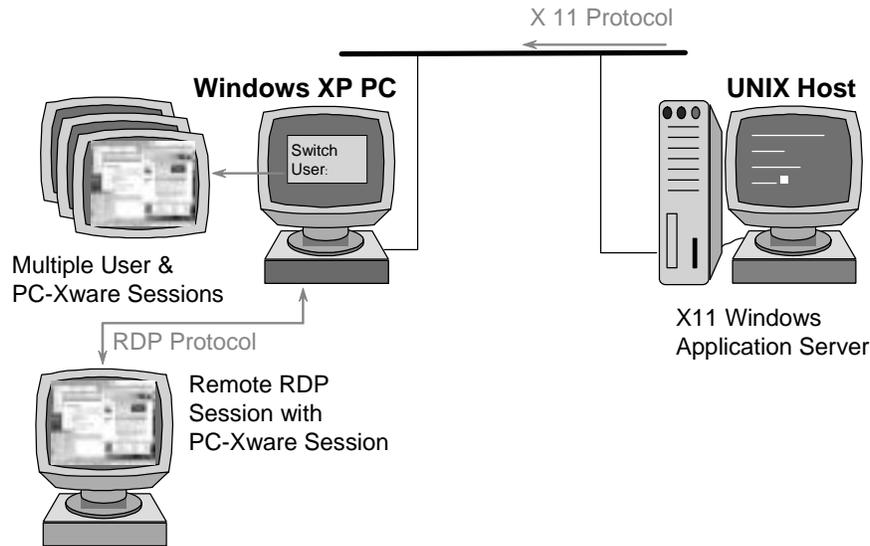
Windows XP PC

This is the PC where PC-Xware is installed. The user can views the X application running from the X application host. At the client display, the user can:

- Switch between Windows Sessions on the PC
- Connect to this PC with RDP to run a Windows session from another client device supporting RDP.
- Start PC-Xware under one or more Windows sessions.
- Use PC-Xware to start an X application
- Use the mouse and keyboard to send input to the X application.

X Application Host

This is a computer system (typically UNIX or Linux) on which the X applications are located.

The X application host may be any of the following (but is not limited to this list):

- A Linux OS host running X applications

- n   A Sun Solaris host running X applications
- n   An IBM AIX host running X applications
- n   A Hewlett-Packard HP/UX workstation running X applications

Microsoft Terminal Services Environment

Microsoft Windows 2000 and 2003 Server, with Remote Administration or Terminal Services enabled, allows users to access server based Windows desktop sessions and applications and allows administrators to access the server from remote locations. PC-Xware fully functions under these environments by supporting multiple X11 server sessions. This sessions are then encapsulated in either the RDP or ICA protocols for display on remote Client Devices.
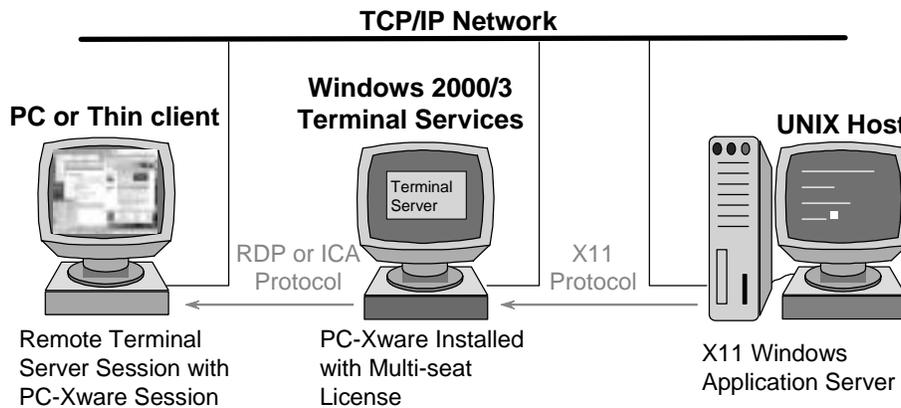
Client Display

This is the desktop where the user views the X application running from the X application host. At the client display, the user can:

- n   Log into the Windows Terminal Services server,
- n   Start PC-Xware,
- n   Use PC-Xware to start an X application, and
- n   Use the mouse and keyboard to send input to the X application.

Note   PC-Xware is *not* installed on the client display.

The client device may be (but is not limited to) any of the following:

n   A Thin Client

n   A Windows-based terminal

n   A PC running with an ICA client

n   A PC running with a RDP client

Windows Terminal Server

This is the computer system on which PC-Xware is installed. The Windows 2000 or 2003 server must have Terminal Services installed and running in the Remote Administration mode or full Terminal Services mode. Under full Terminal Services mode, PC-Xware is licensed for concurrent seats, being the maximum number of simultaneous running instances of PC-Xware. When in the Remote Administration mode, only a single PC-Xware license is require allowing up to two PC-Xware sessions. Running PC-Xware in this mode lets a user at the client-display view and interact with an X application that is running from the X application host without requiring them to install PC-Xware on the client.

The Microsoft Windows server can be running any of the following:

n   Microsoft Windows 2000 Server, Terminal Services enabled

n   Microsoft Windows 2003 Server, Terminal Services enabled

n   Citrix MetaFrame

n   Citrix WinFrame

X Application Host

This is a computer system (typically UINX or Linux) on which the X applications are located.

The X application host may be any of the following (but is not limited to this list):

n   A Linux OS host running X applications

n   A Sun Solaris host running X applications

n   An IBM AIX host running X applications

n   A Hewlett-Packard HP/UX workstation running X applications

Requirements

This section describes the hardware, software, and X application host requirements for the PC-Xware installation procedure.

Hardware Requirements

See your documentation for your operating system.

Software Requirements

Software	Requirements, version tested against
Standalone Operating Systems	Windows 2000 Pro, up to SP4 Windows XP Pro, up to SP2
Server Operating system	Microsoft Windows 2000 Server, up to SP4 Microsoft Windows 2003 Server, up to SP1 *and (optional)* Citrix WinFrame or MetaFrame
Network software	Installed and functional TCP/IP network software on the Windows PC or Server.

Windows Terminal Server Requirements

Host Attribute	Requirements
Memory	At least 24MB per user.

X Application Host Requirements

Host Attribute	Requirements
Login account	A login account on a host machine in your network.
protocol setup	*rexec*, *telnet*, *rsh*, *rlogin*, *GDM* or *XDM* protocol set up to support your multi-user NT server. You will select one of these when you create PC-Xware connections.
TCP/IP setup	TCP/IP hardware and software, including an Internet address or node name for your multi-user NT server. The multi-user NT server's name or address must be included in the host's name data file
X applications	X Window System Version 11 applications, such as *xterm*, *xclock*, or *konsole*.

Preparation

This section lists system and network information you must supply when installing and configuring PC-Xware. (Examples are in brackets.)

Authorization Data

Product License number

_____

Network Connections

X application host machine name or IP address

_____

rexec, *rsh*, *rlogin*, *telnet*, *GDM* or *XDM* capability

_____

Directory path to X applications

_____

Windows Terminal Server or Windows PC Internet address [Ex.:156.27.1.51]

_____

Windows Terminal Server or Windows PC name [Ex.:server_10]

_____

Chapter 2
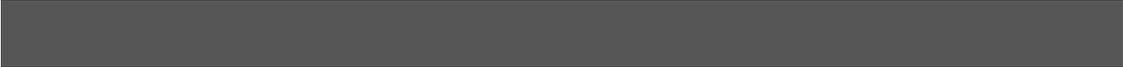
Installation and Configuration Concepts

This chapter presents concepts that will help you install NCD PC-Xware efficiently and configure it optimally for your environment and objectives.

Installation

Note   Since installation makes changes in a Windows server's registry, PC-Xware should be installed *only* by a system administrator.

Installation

This involves installing and configuring PC-Xware entirely on a standalone PC with Windows XP or 2000 Professional. PC-Xware can also be installed on a Windows 2000 or 2003 Server PC with or without Terminal Services enabled. PC-Xware supports all of these

configurations. Please see Chapter 1 for more information. Windows XP, Windows 2000 or 2003 server (a multi-user NT PC server) supports multiple PC-Xware sessions either localy or from remote PC clients as shown in the following figure.
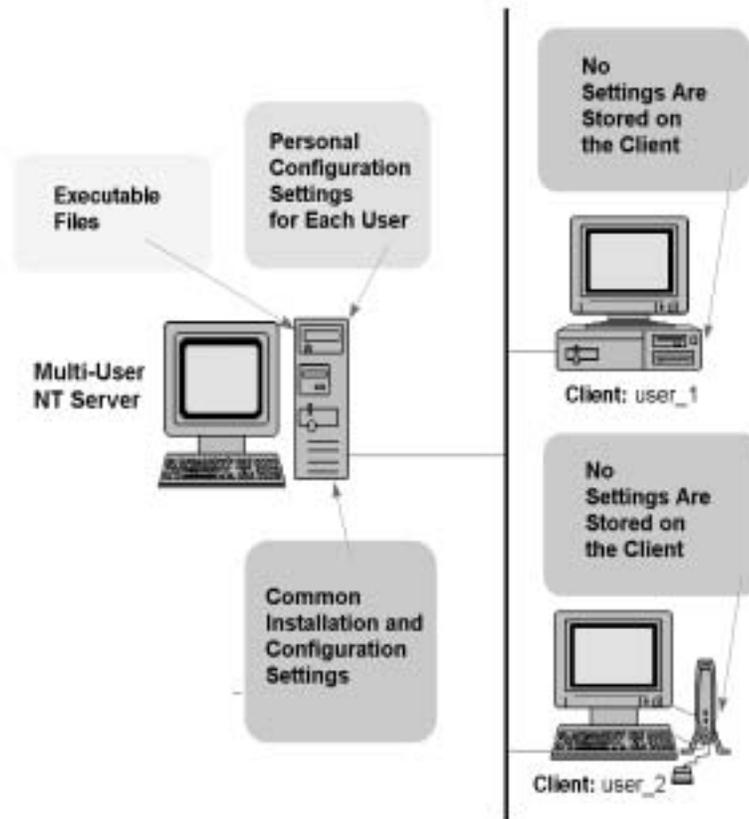
Installation of PC-Xware under Windows 2000 or 2003 Terminal Services offers all users connecting with RDP or ICA the same ability to run UNIX or Linux applications without installing PC-Xware on their own PC. If you choose to run PC-Xware on Windows servers with Terminal Services installed, a PC-Xware license is required for each user.

Font Options in PC-Xware

PC-Xware is based on X 11 release 6. Because of this, Xware supports and supplies a series of standard PCF (portable compiled format) X server fonts.

Xware can also use several other font types including ASCII bitmap distribution format (BDF) and native Microsoft Windows fonts. Xware can add fonts or substitute fonts automatically when an application requests a missing font.

During standard installations, you can modify the set of fonts PC-Xware will use. This procedure is covered in "Customizing Xware Fonts" on page 4-1.

If applications you run on your host machines use fonts that are not provided by PC-Xware, you can copy the needed fonts to your Windows server and use PC-Xware's *Font Tool* to compile them into a format PC-Xware can read. For more information on the *Font Tool*, see the *NCD PC-Xware User's Guide*.

Terminal Services Configuration

Under Windows 2000 and 2000 Server, Windows XP, and Windows 2003 Server, PC-Xware will automatically install to support multiple user logins as enabled by Terminal Services.

Note   Before you use PC-Xware, you should note that PC-Xware requires that each user have a **My Document** or home directory, and that the path to this directory must be specified in "Local Users and Groups" under the Computer Management utility on the server.

Display Number and Multi-User Support

PC-Xware supports multiple concurrent users by providing a different display number for each instance of PC-Xware. The display numbers are referenced by:

```
display:n
```

where `display` is the name or IP address of the multi-user Windows server that is to receive the X application's output, and `:n` is the display number associated with the user's client display.

Note   The display number *must* be preceded by a colon.

PC-Xware begins assigning numbers with display:1. Each new instance of PC-Xware gets the next available display number.

While most users will not have to set the display number, it can be set on a per-user basis by setting the following environment variable in a user's environment:

```
set XWARE_DISPLAY=:n
```

This forces n to be used as the display number if n is not already in use. n can be any number from 0 to 127.

Note   If the display number you choose is already in use, you will not be able to make any X connections.

Configuration and Connection Files

PC-Xware maintains configuration, Start menu additions and connection files on a per-user basis. Connection files contain login, X application, and X application host information. Each user must have a home or a **My Documents** directory. The first time a configuration change or new connection is made, PC-Xware automatically creates an PC-Xware directory under the user's home directory and sets up the appropriate registry entries. Each subsequent time a configuration change or new connection is made, that information is stored in the **My Documents\PC-Xware** directory. The files in a user's **My Documents\PC-Xware** directory are then used each time that user invokes PC-Xware.

Common Configuration and Connection Files

PC-Xware lets the administrator set up common configurations. These can be common Start menu items (under All Users) or connections that can be accessed by all users. These common files can be created and maintained only by using the **/common** command-line switch with **cfgui.exe** and **conwiz.exe**.

Creating Common Configurations and Connections
Common configurations and connections can be created only by someone with administrator privileges.

n   To create a generic configuration file that is shared by all PC-Xware users, run the PC-Xware configuration program with the **/common** switch:

```
cfgui.exe /common
```

This stores a **changes.usr** file in the common PC-Xware directory. They can then be modified or deleted only by someone with administrator privileges. See the *NCD PC-Xware User's Guide* for more information.

> **Note**   Running the configuration program with the **/common** switch is the only way to add a license key for a copy of PC-Xware. This is the method used when adding a production license key after using an evaluation key.

Configurations in a common configuration file are applied to all users before each user's personal configuration is applied. Personal configurations can override common configurations.

n   To create connections that apear in the start menu for all users, run the PC-Xware Connection Wizard with the **/common** switch:

```
conwiz.exe /common
```

This stores the connections in the common PC-Xware connections directory and under the All users Start menu directory. Connections created in this way will appear to all users.

Modifying Common Connections
Common connections can be modified only by someone with system administrator privileges. See the documentation for your operating system for instructions.

Personal Configuration and Connection Files

PC-Xware lets individual users set up personal configurations and connections. Personal configurations and connections are available to a single user only. They can override common connections and configurations.

Note   Any time that a user runs PC-Xware Configuration or the Connection Wizard without the **/common** switch, the configuration changes and connections are created for that user only.

n   When a user changes PC-Xware's configuration, a PC-Xware folder is created in that user's home directory. The configuration file (changes.usr) is then stored in this **My Documents\PC-Xware** folder and used for that user only.

n   When a user creates a connection, a folder is created in that user's home directory. The connection file is then stored in this **My Documents\PC-Xware\Connects** folder and used for that user only. The connection is also added to the Start> Programs > PC-Xware Connections menu.

Custom Configurations and Connections for Groups of Users

System administrators can create configurations and connections that will be available to specific groups of users. See your operating system's documentation for more information about how to create groups of users with common privileges and profiles.

NCD PC-Xware Installation and Configuration Guide

Chapter 3
Standard Installation

This chapter gives step-by-step instructions for a standard installation of NCD PC-Xware.

Starting the Installation Program

To start the installation program:

1. Log on as administrator at the Windows server's console.
2. Download the software from the ThinPATH Systems web site per the Certificate of Purchase information you received on purchasing the product.
3. Execute the *setup* program.

Standard Installation Procedure

The following figure shows the sequence of choices you make when installing PC-Xware on a Windows server.

1. Log on as administrator and run the ***setup*** program, as explained in "Starting the Installation Program" on page 3-25. The program announces itself and prompts to click "Next."

2. Select whether you agree with the licensing terms or not. If you agree, the "Next" button becomesa available.

    Note   From this and successive dialogs, you can back up and change information by clicking the *Previous* button.

3. The "PC-Xware Registration" screen prompts you for the User Name, Company Name and License Key. The License Key is provided on the "Certificate of Purchase" or is available via email when downloading evaluation software.

4. On the "Setup Type" screen, select between a *Complete* and a *Custom* installation, depending on the control you want over the components installed. The destination folder for the software can also be specified. The default location is <system Drive>\Program Files\ThinPATH\PC-Xware 6. Click "Next."

    Note   If you specify a nonexistent directory, the ***setup*** program will create it.

5. If you selected *Custom* in Step 4, the "Select Features" dialog appears. It lists the components available for installation, each with its own check box. Check the boxes of products you want to install; uncheck the rest. Options include Fonts and Utilities. Available and required disk space for the selected components is displayed.

6. On the "PC-Xware Default Host" screen, provide a host name or IP address of an an X application host on the network and a default telnet connection will be made for that host. If you prefer to define connections explicitly after you start PC-Xware, leave this entry blank to create a generic ***telnet*** connection instead. You will then be asked for the name of an X application host each time you use this ***telnet*** connection

7. An installation summary dialog appears, displaying the settings you made in the preceding dialogs. Clicking on *Back* will take you to any settings that need to be changed.

When you are satisfied with the settings, click *Next*. **Setup** performs the installation as specified and displays an InstallShield Wizard Complete screen. Click *Finish* to exit the Setup utility.

Removing an Installation

This section explains how to remove user-specific information or a standard PC-Xware installation from a Windows server.

Note   No instances of PC-Xware can be running during an uninstall. The uninstall program will provide a warning if the xncd.exe program is running.

Removing User-Specific Configuration Information

Follow these steps to remove user-specific configuration information:

1. At the multi-user NT server's console, log on as the user whose configuration you want to remove

2. Run **xwunuser.exe**.

Note   There is no feedback from this utility. It will silently remove the user-specific directories and registry entries.

xwunuser.exe can be included in login scripts. See your operating system for information about creating login scripts.

Removing a Standard Installation

> **Note**   You must remove all user-specific configuration infor-
> mation *before* you remove the PC-Xware installation.

Follow these steps to remove a standard installation:

1. Log on as administrator at the Windows server's console.

2. Start the uninstall program: select
   My Computer Ÿ **Control Panel** Ÿ **Add/Remove Programs**.

   Click on PC-Xware, and then on the *Add/Remove* button.

3. The uninstall program will ask whether you want to continue. Click
   Yes.

Chapter 4
Configuration Procedures

This chapter gives step-by-step instructions on configuring installation options for NCD PC-Xware.

Customizing PC-Xware Fonts

Standard Fonts

PC-Xware includes most of the freely distributed fonts available at the time of product release. When you select the default (typical) installation components, the font directories contain the components shown in the following table.

Component	Directory	Contents	
Misc fonts	misc	Contains a variety of critical and obscure fonts. The most notable fonts in this directory are:	
		cursor	Fonts used by Xware and many X applications for cursors.
		6x13	The default fixed-width font. The **fonts.ali** file in the **misc** directory sets the "fixed" alias to this font when you install PC-Xware.

Component	Directory	Contents	
Misc fonts	misc	7x14 8x16 12x24	Full ISO fixed-width fonts, meaning that these fonts define all 256 character values for international use. Most PC-Xware fonts are full ISO fixed-width fonts.
		fonts.ali	Aliases of non-existent fonts to existing fonts. When Xware is installed, the **fonts.ali** file contains entries for fixed, variable, and other commonly requested fonts.
75 DPI fonts	75dpi	Contains lower-resolution fonts required by most X applications.	
Windows fonts	mswin	Accesses Microsoft Windows fonts.	

Optional Fonts

The next table shows optional fonts you can install through the *setup* program, via a custom installation.

Component	Directory	Contents
100 DPI fonts	100dpi	Fonts for higher resolution displays
Open Look fonts	xol	Fonts commonly used by OpenLook X applications
DEC 75 DPI fonts	dec75	75 dpi fonts used by DECWindows applications
DEC 100 DPI fonts	dec100	100 dpi fonts used by DECWindows applications
HP fonts	hp	Fonts used by HP VUE applications
Kanji	kanji	Japanese-language fonts
Hungul	hangul	Korean-language fonts
Hanzi Guobiao	hanzi	Chinese-language fonts

To modify the set of fonts available to PC-Xware through the installation program, follow these steps:

1. Run the *setup* program, as described in "Starting the Installation Program" on page 3-1.
2. At the Welcome dialog, select *Modify* and click *Next*.
3. The PC-Xware Registration screen should be complete with User and Company information along with License Code. Click *Next*.

4. The Select Features dialog lists all the fonts you can choose, each with its own check box. Check the boxes of the fonts you want to add. Uncheck those that you don't need. Click *Next*.

5. The Start Copying Files dialog lists the current settings. Click *Next* if they are correct and the modification begins, otherwise click *Back* and correct the settings them.

Multi-user Configuration

Restricting Configuration and Connections

Users can be restricted from making changes to configurations or connections by using Windows security to restrict access to **cfgui.exe** and **conwiz.exe**. See your operating system's documentation for more information.

Restricting Connections with Shared Passwords

You can insert passwords into certain *rexec*, *rlogin*, and *telnet* connections at the time you create the connection. Anyone can use such a connection, since they don't need to supply the password.

Connections with shared passwords may create a security concern on some systems. In this case, the system administrator may want to run **nopasswd.exe** to prevent users from creating these connections.

Note The changes made by **nopasswd.exe** are permanent. If you want to allow connections with shared passwords again, you must reinstall PC-Xware.

Restricting *rsh* Connections to X Application Hosts

By default, users are allowed to create connections that use the *rsh* protocol. If the fact that *rsh* connections do not require passwords is viewed as a security concern, the system administrator can turn off *rsh* connections by running **norsh.exe**.

Note   The changes made by **norsh.exe** are permanent. If you want to allow **rsh** connections again, you must reinstall PC-Xware.

Manually Started X Applications

To manually start an X application on the X application host (for example, when you use a terminal emulator such as *telnet* or *rlogin* to reach the X application host), you must do the following:

1. Go to the PC-Xware Configuration dialog and look on the Information tab.

2. Look for your Windows server's name and/or IP address and its display number. Set the DISPLAY environment variable in your *telnet* or *rlogin* window to point to these values.

   If your Windows server is server_1 and your display number is 4, for example, you would type the following to manually set your display:

   ```
   setenv DISPLAY server_1:4   (C shell)
   ```

      or

   ```
   DISPLAY=server_1:4;export DISPLAY   (K or Bourne shell)
   ```

3. Type the path and name of the X application. For example:

   ```
   /usr/bin/x11/xterm
   ```

Note   If you use a terminal emulator (such as **telnet** or **rlogin**) to reach the X application host, you might want to create a login script to perform the steps above. See Chapter 7 in the *NCD PC-Xware User's Guide* for more instructions.
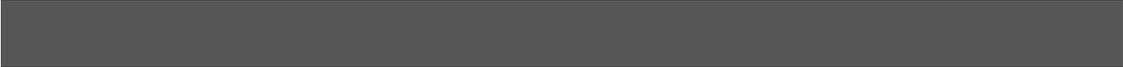
Glossary

application	A program for a specific purpose, such as accounting or word processing. (See also *X application*.)
client	A program that depends to some extent on the services of another program or system, termed a *server*. (See also *X client*.)
client display	In the context of PC-Xware, a display on a client device (such as a Windows-based terminal or workstation) that displays an X application running on an X application host. See also *X application host* and *multi-user NT server*.
configuration	In the context of PC-Xware, the ability to customize the way PC-Xware looks and performs network communications tasks. Accomplished through PC-Xware's Configuration dialog.
connection	A named set of instructions that automatically establish connectivity between your multi-user NT server and a host machine. Some connection types can be defined to perform additional initialization tasks and to start X applications. See *Connection Wizard*.
Connection Wizard	A sequence of dialogs that step you through the process of creating new connections. See *connection*.

daemon	A system process that acts without the user requesting it. Certain connection protocols require their own daemons running on the host computer. Meeting this requirement is typically a system administrator's responsibility.
default	A function dependent parameter assigned when you do not "specify" a value.
display manager	A client used to start and manage X sessions. (See also *X display manager*.)
DNS	Domain Name Server. An optional network utility serving as a centralized name-to-IP address mapping service.
Ethernet	An industry standard for specifying non-serial network communications.
font server	A program that provides X fonts and scalable X fonts to X servers on the network.
graphical user interface	Software that facilitates the interaction between the computer and the user. Often abbreviated as "GUI."
GUI	See *graphical user interface*.
host	A computer system which provides a set of services for a remote system.
IP address	Internet protocol address. The address identifying a module on a network using TCP/IP protocol.
local terminal emulator	See *terminal emulator*.
local window manager	A program that runs on the multi-user NT server, providing window manipulation services, such as positioning and resizing.
multi-user NT server	In the context of PC-Xware, a PC running Microsoft Windows with Terminal Services and with PC-Xware installed. This makes it possible for multiple users to run PC-Xware simultaneously. See also *client display* and *X application host*.
NCDware	NCD's software for network computers.

ncdwm	NCD's local window manager program. (See also *local window manager.*)
network	In the most general sense, any system of computers connected in a way that enables communication between them. Often used to refer to non-serially connected systems. (See also *Ethernet.*)
OPEN LOOK	A graphical user interface specification developed by Sun Microsystems
PCF	Portable compiled format. An X server font format supported by PC-Xware.
PPP	Point-to-Point Protocol; a communication protocol for transmitting information over telephone lines.
protocol	A set of rules used in the exchange of information between computer systems.
remote configuration	A method of configuring PC-Xware, such as changing operational parameters from another machine.
rexec	Remote execution. A UNIX protocol which runs on networked computers and permits response to a request containing a valid user name, password, and command from another machine. It requires a remote execution server (often called an ***rexec*** daemon) to be running on the target computer.
rlogin	Remote login. A UNIX protocol that establishes a remote login session on a host from a terminal. In the case of a Windows server running PC-Xware, the login prompt is displayed on PC-Xware's terminal emulator. The **.rhosts** directory in your home directory on the Windows server contains a list of hostnames to which you can connect without using a password.
rsh	Remote shell. A UNIX protocol which runs on networked computers and permits response to a request containing a valid user name and command from another machine. It differs from ***rexec*** protocol in that no password is required. It requires a remote execution server (often called an ***rsh*** daemon) to be running on the target computer.

server	A system that provides a specific set of services (such as input or display) to a client program or system. Also a device on a network providing a service, such as a boot server or a print server. (See also *X server.*)
session	See *X session*.
Session Manager	The DECwindows client used to control DECwindows sessions.
TCP/IP	See *Transmission Control Protocol/Internet Protocol*.
telnet	The Internet standard protocol for remote terminal connection services.
taskbar	The region on a Microsoft Windows desktop that shows the Start menu and any iconified processes. When PC-Xware is running on the Windows NT Server platform, the PC-Xware Services icon is displayed in the status area of the taskbar.
terminal emulator	A client used to emulate the function of a terminal. *Xterm*, the standard X terminal emulator, emulates a VT102 terminal. PC-Xware's local client terminal emulators (*telnet* and *rlogin*), emulate a VT320 terminal.
Transmission Control Protocol/Internet Protocol (TCP/IP)	Two networking protocols commonly used for communication over local area networks.
What's This? help	A form of online help you can get about items in dialogs that have a **?** icon at the right end of the dialog banner. Click on the **?**. The cursor becomes a **?** shape. Move the cursor to the item of interest in the dialog and click.
window manager	An application that allows you to manipulate the cosmetic features of the windows displayed on the screen, and the mechanisms for moving, sizing, and iconifying them. (See also *X Window window manager.*)
X	See *X Window*.

X application	An application or other program implementing X Window protocol. In most cases, interchangeable with X client. (See also *X server.*)
X application host	A computer system on which an X application is running. See also *client display* and *multi-user NT server.*
X client	An X Window System application program that is dependent on the services of an X server program. In most cases, interchangeable with X application. (See also *X server.*)
X 11 release 6 (X11R6)	The release of the X Window system that is implemented by NCD in PC-Xware.
X display manager	A protocol that provides automatic X protocol connection to a specified host when an X server starts or restarts. Also called XDM.
X server	The software that provides display services for clients and handles keyboard and pointer input. (See also *X client*.)
X session	All the processing that goes on from the time you log in to use the X Window System until you log out.
X terminal	A display monitor, keyboard, base containing processors, and a mouse. The X terminal processors are dedicated to running the X server.
X Window	A network-based graphical window system that lets you interact with applications running on multiple hosts.
X Window window manager	A special X application that provides window management capabilities. Unlike other X applications, you can run only one window manager at a time on a given display. (See also *window manager.*)
XDM	See *X display manager.*
xterm	The standard X terminal emulator. (See also *terminal emulator.*)

Glossary
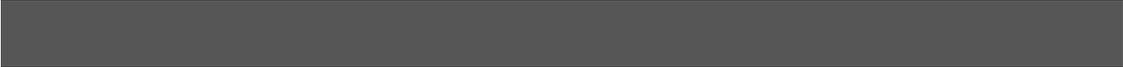
Appendix A
Product Support

Support for NCD PC-Xware is provided by ThinPATH Systems, Inc. This appendix explains how to contact the product support staff. Before you request product support for this roduct, please return your product registration card.

Note If you purchased your product from an distributor or a value-added reseller (VAR), ask that distributor or reseller whether they provide product support before you contact ThinPATH Systems directly.

When you encounter a technical problem or have a question, consult PC-Xware's online documentation and online help. If you cannot find an answer or a solution in the documentation, contact ThinPATH System's Product Support.

Email support for PC-Xware is free during regular business hours for 30 days after purchase. Beyond 30 days, please contact ThinPATH Systems, Inc. at the telephone numbers below in "World-wide Product Support" for information about support contracts:

If you prefer, you can get the latest information on PC-Xware support on the World Wide Web at this address:

```
http://www.tp-sys.com/support
```

Contacting Product Support

World-wide Product Support

If you need direct technical assistance, do one of the following:

n   Send your world-wide support request via e-mail to:

```
support@tp-sys.com
```

See "Electronic Mail Support" below for further instructions.

n   Follow the international dialing instructions appropriate for your location. Then call one of the following numbers and ask for Product Support:

Americas/Asia

ThinPATH Systems, USA   971-404-3285

Europe/Middle East/Africa

GM3 GmbH, Germany   +49 7264 2069-0

Electronic Mail Support

To contact ThinPATH Systems, Inc. via e-mail, send a mail message to:

```
support@tp-sys.com
```

Please fill out the template supplied below, "Information Required by Product Support" on page A-50, and include it in the email.

Web Support

ThinPATH Systems' World Wide Web site provides updates, product information, technical notes, and the KnowledgeBase, containing technical information for PC-Xware. You may also submit a support request or comment.

The ThinPATH Systems, Inc. web site is located at:

```
http://www.tp-sys.com
```

Information Required by Product Support

When you call ThinPATH Systems, Inc. Product Support, they will need the following information:

- Personal information
  - Your name, title, and company
  - Your telephone number, fax number, e-mail address, and mailing address
- Windows server hardware information
  - Server manufacturer/CPU type
  - Number of CPUs
  - CPU clock speed
  - Storage device
  - Network card(s)
  - Bus architecture
  - RAM
  - CD-ROM drive type
  - Manufacturer/model
- Product version and serial numbers
- Operating environment
  - Client protocols and devices in use
  - Xware version and patch level
  - Windows operating system
  - Service packs/hotfixes
  - Number of configured concurrent users
  - Applications in use
- X application host information
  - X application host operating system and version level

- Window manager and version

- Language

- Other application information

n   A description of the problem or symptom

n   Step-by-step instructions that will allow ThinPATH Systems, Inc.
    Product Support to reproduce the problem
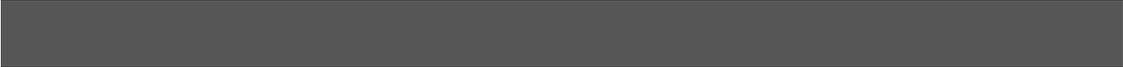
Appendix B
Troubleshooting PC-Xware

This chapter contains information that will help you troubleshoot problems with NCD PC-Xware. Topics include:

n   How to determine where your problem is located.

n   Solutions for some common problems.

n   How to troubleshoot connections.

Determining Where Your Problem Is Located

When you encounter a problem with PC-Xware, your first step should be to determine where in the PC-Xware environment the problem is located.

The Nature of an PC-Xware Connection

As discussed in The PC-Xware Environment on page 1-1, there are three layers that compose an PC-Xware connection:

n   The client display

n   The Windows server

n   The X application host

These layers are shown in the figure below:
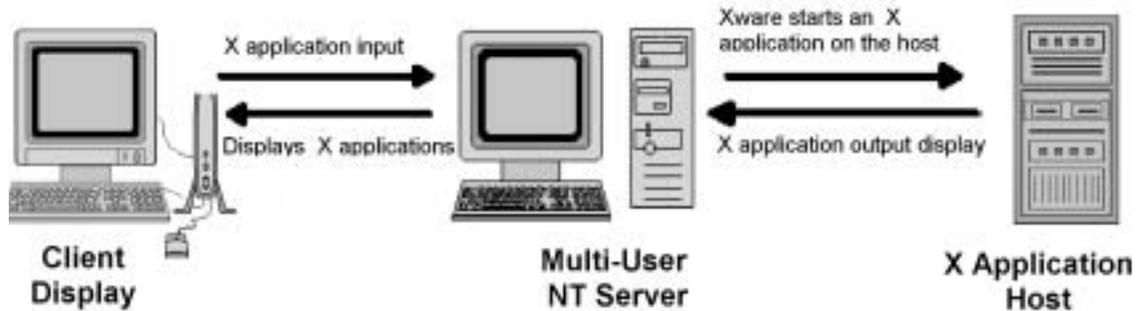
To diagnose a problem, you need to determine which device or which of the connections between the layers is the source of the problem. The connections are:

n   The connection between the X application host and the Windows server.

n   The connection between the Windows server and the client display.

Starting the Diagnosis

To determine which of these connections is involved in the problem, try to duplicate the problem at the Windows server's console.

n   *If you can't duplicate the problem at the console*, the trouble is probably with the client device—the computer system where you view the client display—or with the connection between the client display and the Windows server.

n   *If you can duplicate the problem on the console*, the trouble is not with the client device, but probably is somewhere in the Windows server's configuration or on the X application host.

For information on solving problems with specific connections, see Checking the Network Connection on page B-56

Solutions for Common Problems

X Application Doesn't Appear on Your Client Display

Check the Configuration Information tab to see if you are using the correct display number. To see this tab, click on the Configuration icon in the PC-Xware program group, and then click on the Information tab.

You'll see your display number about halfway down the Information window. The window also shows the name and/or IP address for your unit.

For example, the Display environment variable or *-display* X application command could be:

win-server: 2

Someone Else's X Application Appears on Your Client Display when using Microsoft Terminal Services

When you start an PC-Xware session, PC-Xware automatically assigns a display number to your client display. This number identifies your instance of PC-Xware to X applications and tells these applications where they should display themselves.

If another user's X application appears on your screen, that user has set their display number to 0 or set it to the same value that is assigned to your client display. In either case, try to identify the person who started the application that you are seeing on your screen, and ask them to confirm that they have set their display number correctly.

Troubleshooting Connections

Checking the Network Connection

PC-Xware and the UNIX host require two separate connections to communicate. You must configure your network software to allow both the Windows server and the host to initiate connections.

Client Display-to-Windows Server Connection

To identify the source of a connection difficulty, try using different protocols to connect to the Windows server. For example, if other client devices on your network run a different client protocol from the client device with the problem, see if the client displays on the other client devices are behaving the same way. If one protocol exhibits the problem and the others don't, then see that protocol's documentation for troubleshooting information.

Windows Server-to-X Application Host Connection

If you have a problem with an X application that shows up at the Windows server's console when attempting to display on a Terminal Services connection, try to run the X application on an X terminal or PC that is running PC-Xware or a similar X server product.

n   If the problem shows up on the X terminal or PC, the trouble is probably an X application host issue that's unrelated to the instance of PC-Xware running on the Windows server.

n   If the problem *does not* show up on the X terminal or PC, the trouble may be with the connection to the X application host.

Network software products usually include utilities that test the connection from the Windows server to the host (although not all products contain the same utilities). The utilities listed in the table below are probably included in your network software. The descriptions are specific to Microsoft TCP/IP on Windows.

Utility	Microsoft TCP/IP Description
ping	Sends and receives data packets to verify the connection on ICMP networks. Run *ping* from the Windows directory via the **Start Ÿ Run** dialog. **Example**: ping `<machine name>`
telnet	Opens a terminal emulation window to a host. Run *telnet* from the Windows directory via the **Start Ÿ Run** dialog. **Example**: telnet `<machine name>`

To test the Windows server-to-X application host connection, run *ping* to the X application host, connect to the X application host with Windows *telnet*, and verify that the respective daemon for the connection method desired is running. If you cannot run *ping* or connect with *telnet*, check your network stack and protocol settings.

If the problem persists at the Windows server, confirm that the display listed on the PC-Xware Configuration Information tab is the same display you are using to make the X connection. See the topic, X Application Doesn't Appear on Your Client Display on page B-55 for more information.

X Application Host-to-Windows Server Connection

Every X application uses an X application host-to-Windows server connection. This connection is the path that the X Window System protocol uses to reach PC-Xware, and it exists while the X application is open. The X application host-to-Windows server connection is harder to check than the Windows server-to-X application host connection because the X application host initiates the connection and the Windows server accepts it.

To test the X application host-to-Windows server connection, use the network server utilities (for example, *tftpd* or *ftpd*) that came with your Windows server's network software package.

XDM Connections

Verify that PC-Xware knows the correct name or address for your Windows server in the PC-Xware **Configuration** Ÿ **Information** tab.

Reconfiguring Microsoft TCP/IP

Microsoft TCP/IP is a Winsock-compatible TCP/IP network. By default, Microsoft TCP/IP gets the Windows server's IP address automatically from the network via DHCP or PPP. You must reconfigure Microsoft TCP/IP if your environment does not use DHCP or PPP, or if it allocates unchangeable (static) IP addresses for machines.

Specifying a Static IP Address

The procedure for specifying a static IP address on a Windows Server:

   a   Select **Start** Ÿ **Settings** Ÿ **Control Panel** Ÿ **Network**. Click the Protocols tab.

   b.   Select *TCP/IP Protocol* from the installed network components list.

   c.   Click *Properties*. The TCP/IP Properties dialog displays.

   d.   Click the IP Address tab.

   e.   Choose *Specify an IP address*, and enter the IP address. The subnet mask address is filled in automatically.

   f.   Enter the IP address of the default gateway.

g. Click *OK*.

Name Resolution

Microsoft TCP/IP can handle name resolution using Domain Name Service (DNS), automatic IP addressing, or a hosts file.

Domain Name Service (DNS)

When DNS is used to resolve names, PC-Xware gets the name of the Windows server from the Host Name field on the DNS tab. (This is true whether DNS is used alone or with an automatic IP addressing method such as DHCP or PPP.) This name replaces the $DISPLAY variable used in *rsh* and *rexec* application command lines. For example:

```
/usr/bin/X11/xterm -display $DISPLAY
```

ⁿ   To set DNS information on the Windows Server platform:

1. Select **Start** Ÿ **Settings** Ÿ **Control Panel** Ÿ **Network**. Click the Protocols tab.

b. Select *TCP/IP Protocol* from the installed network components list.

c. Click *Properties*. The TCP/IP Properties dialog displays.

d. Click the DNS tab.

e. Enter the name of the Windows server in the Host Name field.

f. Enter the name of the TCP/IP domain in the Domain field.

g. Enter the IP address of your network's DNS server in the DNS Search Order field.

h. Click *Add*.

i. Click *OK*.

Automatic IP Addressing or Hosts File

Microsoft TCP/IP can be configured to get the Windows server's IP address automatically from the network via DHCP or PPP. Alternatively, you can set up your Windows server to use a hosts file to resolve names into IP addresses. In this case, that tile is named **HOSTS** and is located in the **Windows** directory.

Whether you use automatic IP addressing or a hosts file, PC-Xware gets the Windows server's name from the Computer Name field of the Identification tab in **Start** Ÿ **Settings** Ÿ **Control Panel** Ÿ **Network**. This

name and the display number replace the $DISPLAY variable used in
rsh and *rexec* application command lines. For example:

```
/usr/bin/X11/xterm -display $DISPLAY
```

Troubleshooting

If you have difficulty using PC-Xware with Microsoft TCP/IP:

1. Check the Network Software line on the PC-Xware **Configuration** Ÿ
    Information tab. Verify that the Winsock listed has the correct
    vendor name and version number.
2. If you have multiple **winsock.dll** files on your Windows server,
    rename all of these files except for the one you intend to use.