Winterm™ 9000 Series XPE-Based Terminals
Quick Reference Guide

Issue: 071702

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Winterm™ 9000 Series XPE-Based Terminals Quick Reference Guide

Issue: 071702

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Wyse Technology Inc.
3471 North First Street
San Jose, CA 95134-1801

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FCC Statement

This equipment has been tested and found to comply with the limits for either Class A or Class B digital devices (refer to "Terminal Requirements Compliance"), pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

⊠ **Caution**

Changes or modifications not covered in this manual must be approved in writing by the manufacturer's Regulatory Engineering department. Changes or modifications made without written approval may void the user's authority to operate the equipment.

Terminal Requirements Compliance

FCC Compliance

The Models 9235LE and 9440XL terminals meet Class B requirements.

IEC/EN Compliance

The Model 9235LE and 9440XL terminals meet Class B requirements.

Canadian DOC Notices

Refer to the previous section, "Terminal Requirements Compliance," to find out to which terminal model each of the statements below refers.

Class A

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

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IEC/EN Notice

These products conform to the requirements of IEC950 and EN60950.

These products conform to requirements of EN55022 for Class A equipment or EN55022 for Class B equipment (refer to "Terminal Requirements Compliance").

⊠ **Caution**

For use with supplied power adaptor. Replace only with the same or equivalent type as recommended by the manufacturer.

Model 9235LE Terminals

For use with External Power Supply DVE Model DSA-0301-05 or certified equivalent model supplied by the manufacturer.

Model 9440XL Terminals

For use with External Power Supply Flytech/CARRY-I Model FT-8006A or certified equivalent model supplied by the manufacturer.

Noise Suppressor

A noise suppressor (ferrite bead) must be installed on the network cable of your terminal. This installation is necessary to maintain compliance with U.S. FCC B limits and European CISPR B EN55022 Class B limits. The noise suppressor is supplied by the manufacturer and is packed in your terminal's shipping carton.

Cable Notice

The use of shielded I/O cables is required when connecting this equipment to any and all optional peripheral or host devices. Failure to do so may cause interference and violate FCC and international regulations for electromagnetic interference.

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Introducing the 9000 Series XPE-Based Terminals

Winterm 9000 Series terminals use the Windows XP Embedded (XPE) operating system. These terminals provide thin-client access to applications, files, and network resources made available on machines hosting Citrix ICA and Microsoft RDP session services. Only the keyboard, mouse, audio/video, and display data are transmitted over the network between the terminals and session servers.

Terminal emulation software may be installed locally on special order. Other locally installed software permits remote administration of the terminals and provides local maintenance functions.

Winterm 9000 Series XPE-Based terminals currently include the Model 9235LE and the Model 9440XL.

About This Guide

This quick reference guide supplements the standard Windows XP and Windows XPE documentation supplied by Microsoft Corporation. The guide explains the differences, enhancements, and additional features provided by Wyse with the terminal. It does not attempt to describe the standard features found in Windows XP and Windows XPE.

XPE help can be accessed from the Microsoft Help and Support site:

http://support.microsoft.com/default.aspx

Server Environment Requirements

The terminal uses a variety of services accessed through the network. These include session and product support services as well as standard network services such as DHCP and DNS. The following session and support services are required:

Session Servers

Any of the following services must be available on the network to which your terminal is connected.

Citrix Independent Computing Architecture (ICA)

ICA servers and published applications can be made available on the network using either of the following services:

- Windows 2000 Server with Terminal Services and one of the following installed:
    - Citrix MetaFrame 1.8 (alone or with Service Packs 2 or 3 and FR1)
    - Citrix MetaFrame XP
- Windows NT 4.0 Terminal Server Edition with Citrix MetaFrame 1.8 installed.

Microsoft Remote Desktop Protocol (RDP)

RDP services are accessed by the Terminal Services Client application on the terminal. RDP can be made available on the network using any of the following services:

- Windows 2000 Server with Terminal Services installed
- Windows NT 4.0 Terminal Server Edition
- Windows XP Professional
- Windows .NET Server

Terminal Emulation Support

Third-party terminal emulation software optionally may be installed on the terminal to support computing on legacy platforms. Access to accounts on these machines is the responsibility of the terminal user. The terminal emulation software uses the Telnet protocol to communicate with the computing platform.

Support Servers

Rapport Remote Administration

The Wyse Rapport Administrative Software must be installed on a Windows NT 4.0 or Windows 2000 Server or workstation capable of logging on as administrator to a domain that provides specified network services, and which can access a software repository for your terminal. Refer to the Rapport documentation for instructions for installing Rapport and configuring the server environment. The Rapport Administrative Software accesses your terminal through the factory-installed Rapport Agent and Preboot Execution Environment (PXE) client utilities. PXE upgrade services and Virtual Network Computing (VNC) Viewer (see below) are built-in to Rapport.

Rapport for Workgroups is suitable for managing up to 250 client terminals. It is provided with the terminal without charge.

Rapport Enterprise Edition is designed to manage larger numbers (greater than 250) of client terminals. For information about obtaining or upgrading to Rapport Enterprise Edition contact Wyse Sales or Service (see "Ordering Information" in the front matter of this document).

Virtual Network Computing (VNC) Viewer

VNC Server is factory-installed on your terminal and is by default automatically launched on log-on. It allows the terminal to be operated/monitored ("shadowed") from a remote machine on which VNC Viewer is installed, primarily for troubleshooting and support purposes. The administrator may open a VNC Server dialog box that allows the password to be changed and properties to be set. An administrator wanting to shadow your terminal must run the VNC Viewer component on the remote machine (accessed either from the Rapport Remote Administration software or from a separate installation). The administrator using the VNC Viewer must know the password to the server component on your machine as well as your machine's IP address or valid DNS name. Refer to "WinVNC" in "Remote Administration and Firmware Upgrades" for information about VNC.

Model Summary

> ☑ **Note**
>
> Terminal data sheets, the product registration form, and information about Rapport Remote Administration Software are available through the Wyse Web site, http://www.wyse.com.

Model 9235LE

Model 9235LE is a small-footprint, modular XPE-based terminal (see Figure 1). The connections for power, the network, a monitor, and a keyboard are on the back panel of the terminal (the mouse plugs into the keyboard). The power push-button switch is on the top of the unit.

Figure 1   Model 9235LE Terminal

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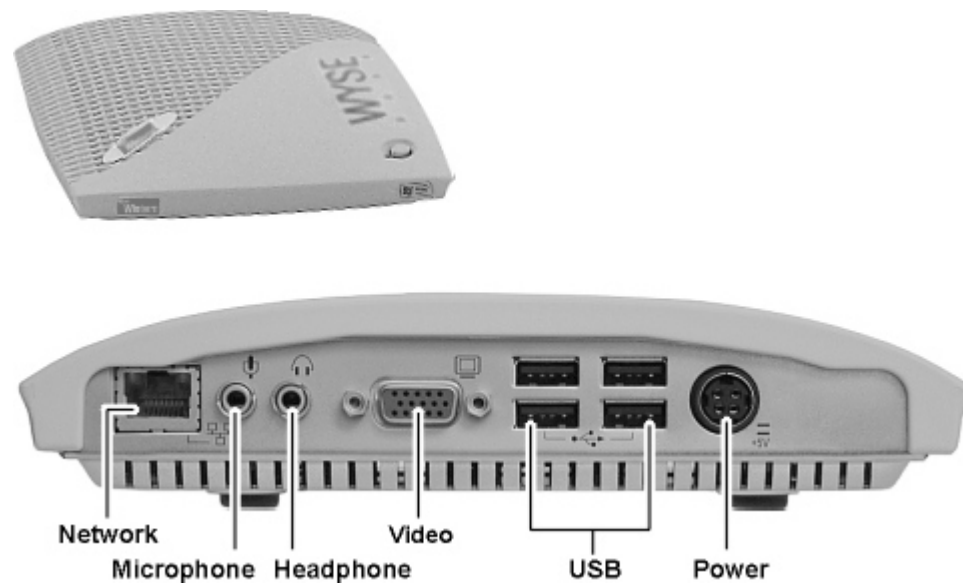
Model 9440XL

Model 9440XL is a small-footprint, modular XPE-based terminal (see Figure 2). The connections for power, the network, a monitor, keyboard, and mouse, serial and parallel devices, and USB peripherals are on the back panel of the terminal. A PCMCIA option slot is available if an ISA to PCI Riser/Extender card and a PCMCIA adapter are installed. The power push-button switch, four LED indicators, and audio connectors are on the front of the terminal.

Figure 2   Model 9440XL Terminal
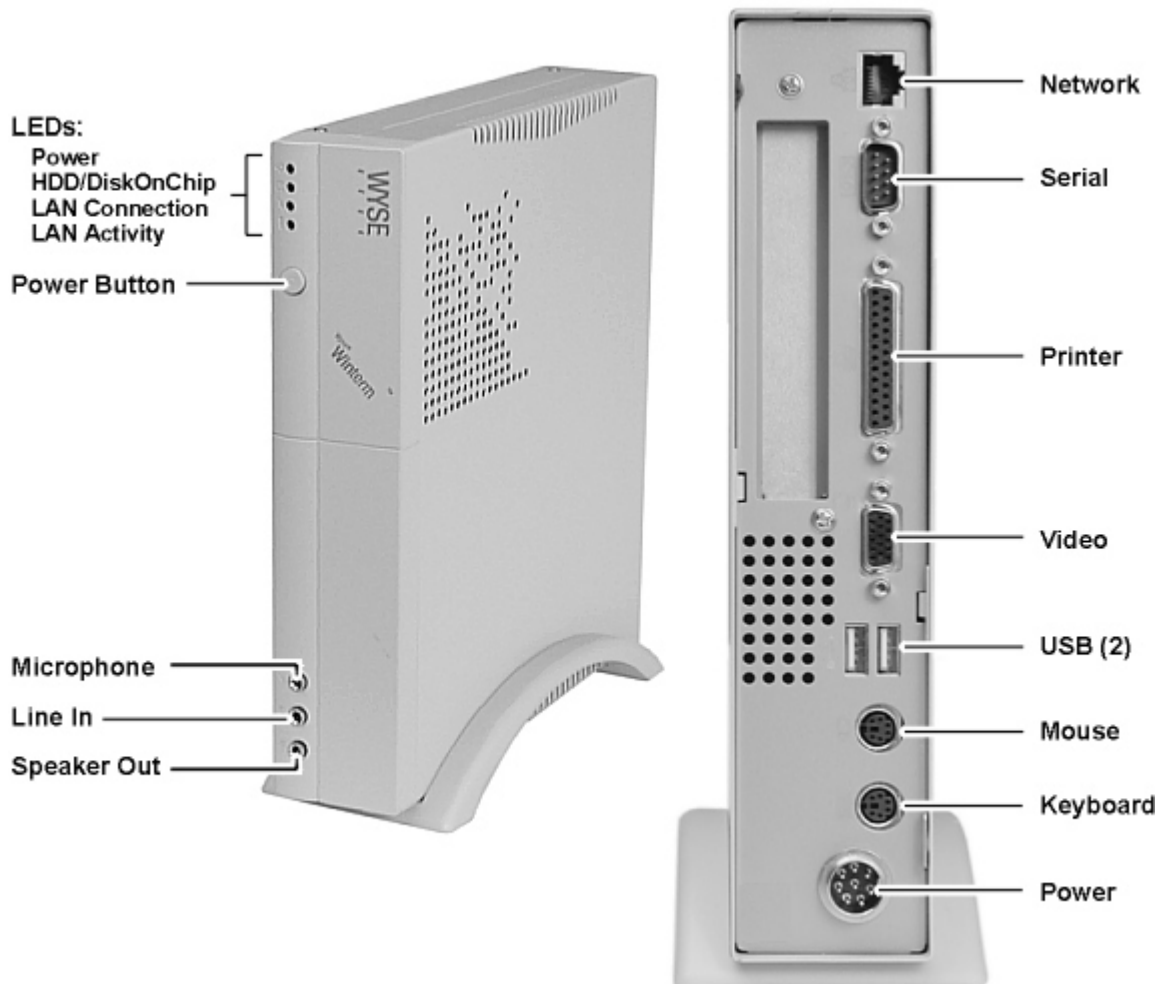
Mounting and Connecting the Terminal

The Quick Start Guide included in the shipping carton provides instructions for mounting and connecting the terminal. The terminal may be placed on a desktop, or it may be mounted on a wall using an optional wall-mount bracket available from Wyse Technology.

⊠ **Caution**

Mount and connect the terminal only as directed in the Quick Start Guide (and in the wall-mount bracket instructions if used). Be sure that there is sufficient space around the terminal for ventilation. ***Follow all precautions listed in the Quick Start Guide***.

✔ **Note**

On the Model 9235LE the amber power LED may stay on for up to a minute after plugging power into the unit. The user should not press the power button to boot up until the amber light goes out.

The following items are provided in the box with each terminal and should be used with the installation:

- Keyboard and mouse (may or may not be included)
- Power cord (may or may not be included)
- Power supply
- Noise suppressor (ferrite bead)
- Desktop mounting stand (if required)
- Quick Start Guide

⊠ **Caution**

To ensure regulatory compliance, use only the power supply included in the shipping carton, or a Wyse-approved equivalent, with the terminal. Also, the noise suppressor (ferrite bead) included in the box with the terminal must be installed on the network cable as described in the accompanying instructions. Refer to the regulatory notices in the front matter of this document for details.

✔ **Note**

A 3-button wheel mouse may be used.

Extended XPE Features

The Winterm XPE-based terminal's operating system has extended features not found in standard Windows XP. With the exception of the Citrix Program Neighborhood and the Microsoft Terminal Server Client (Remote Desktop Connection Manager), and possibly a special-order terminal emulation application if installed, controls for extended XPE features are available only through an Administrator logon account.

Logging On

Automatic Log on

The default for the XPE-based terminal is automatic log on. The administrator can use the **Winlog** applet in the **Control Panel** to enable/disable auto logon and change the auto logon user name, password, and domain. Only the administrator logon account can change auto logon properties.

> **Note**
>
> To save the changes be sure to flush the write filter cache (at any time during the current boot session). See "Write Filter" in "Utilities and Settings" for information about the write filter and instructions for flushing the cache.

The **Log On to Windows** dialog box is bypassed if automatic log on is enabled. If you want to log on as a different user while autologon is enabled, log off while holding down the **Shift** key. This will cause the **Log On to Windows** dialog box to display and allow you to manually enter the log-on information.

Manual Log on

When automatic log on is not enabled (see above), upon terminal startup the **Log On to Windows** dialog box displays.

Type the log-on information in the **User Name** and **Password** text boxes:

- For a user log-on account, the factory-default user name and password are both **User** (enter in both text boxes).
- For an administrator log-on account, the factory-default user name and password are both **Administrator** (enter in both text boxes).

> **Note**
>
> Passwords are case sensitive but user names are not case sensitive.

> **Caution**
>
> For security purposes it is recommended that the passwords be changed from the defaults. An administrator can change passwords by typing **Ctrl**+**Alt**+**Del** to open the **Windows Security** dialog box and then selecting **Change Password.** The password can not be changed when logged-on as a user.

> **✓ Note**
>> The administrator may create additional user accounts by using the **User Manager** utility available through the **Control Panel**. However, due to local memory constraints, the number of additional users should be kept to a minimum. See "User Log on Accounts" for instructions.

Automatically Launched Utilities

Write Filter

Upon system boot the write filter utility is automatically launched. The write filter provides security and protects the flash memory from excessive write activity. The active/inactive status of the write filter is indicated by the color of the button in the system tray on the desktop task bar. See "Write Filter" in "Utilities and Settings" for information about the write filter.

> **✓ Note**
>> Changes made to the terminal configuration will be lost when the terminal is rebooted unless the write filter cache is flushed during the current boot session. See "Write Filter" in "Utilities and Settings" for instructions on how to flush the cache.

NetXClean

Upon system boot the NetXClean utility is automatically launched. NetXClean is a cleanup utility that keeps extraneous information from being stored on the local disk. See "NetXClean" in "Utilities and Settings" for information about this utility.

VNC Server

Upon terminal log on the Windows VNC Server utility is automatically launched. VNC allows the terminal's desktop to be accessed remotely for administration and support. Refer to "WinVNC" in "Remote Administration and Firmware Upgrades" for information about VNC.

Time Synchronization Utility

Upon log-in the dialog box for a time synchronization utility briefly displays. This feature may be defeated by the administrator (locally or remotely) if desired.

8

The XPE Desktop

User's Desktop

The desktop that appears for a user log-on (see Figure 3) is a classic Windows desktop, except that the only icons present on the default desktop are **Citrix Program Neighborhood**, **Remote Desktop Connection,** and **Internet Explorer**. These selections are also available from the **Start** menu. If the terminal emulator application is installed, it may be opened from the **Start** | **Programs** menu. The write filter status indicator is located in the task bar system tray.

✔ **Note**

> Links to remote ICA NFuse-published applications may also be listed on the **Start** menu and/or appear as icons on the desktop. Refer to the Citrix NFuse 1.6 server documentation for information and instructions.

For information pertaining to the functionality of the standard Windows XP desktop and **Start** menu items, refer to the applicable Microsoft documentation:

http://support.microsoft.com/default.aspx

(Search and navigate to the Windows XP Support Center.)

See '"Programs Menu Extended Selections" for Internet locations of the **Citrix Program Neighborhood** and **Remote Desktop Connection** help documents.

✔ **Note**

> The **Control Panel** available to a user through **Start** | **Settings** provides access to a limited set of resources for making Windows XP user preference settings. You must be logged on as administrator to access the extended set of system resources.

Figure 3   User's Desktop and Start Menu
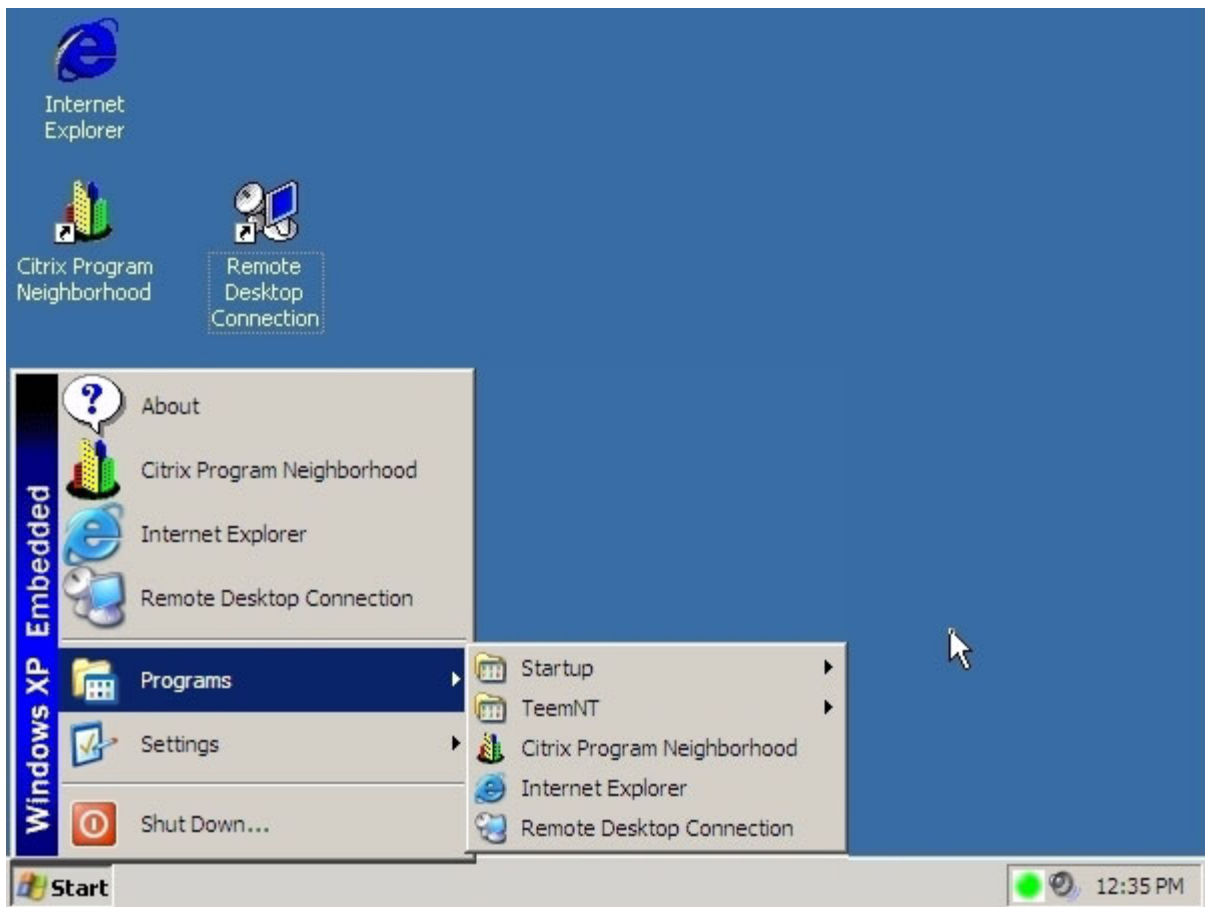
✔ **Note**

Right-clicking the mouse when the pointer is on the user's desktop background *does not* open a pop-up menu.

✔ **Note**

You may copy and paste text between remote session and the local computer by using standard copy and paste methods.

✔ **Note**

Figure 3 shows the Model 9440XL desktop; for the Model 9235LE the shown **Start** menu **ShutDown** listing is replaced with listings for logging off, restarting, and shutting down the terminal.

Administrator's Desktop

The desktop that appears for an administrator log-on (see Figure 4) is a classic Windows desktop. Icons present on the default administrator desktop are **My Computer**, **My Network Places**, **Citrix Program Neighborhood**, **Remote Desktop Connection**, and **Internet Explorer**. The three application selections are also available from the **Start** menu. If the terminal emulator application is installed it may be opened from the **Start | Programs** menu. The write filter status indicator and the VNC server icon are located in the task bar system tray. Extended resources available only to administrators may be accessed from the **Start** menu.

For information pertaining to the functionality of the standard Windows XP desktop and **Start** menu items, refer to the applicable Microsoft documentation:

http://support.microsoft.com/default.aspx

(Search and navigate to the Windows XP Support Center.)

Extended selections are described in the following subparagraphs.

Figure 4   Administrator's Desktop and Start Menu
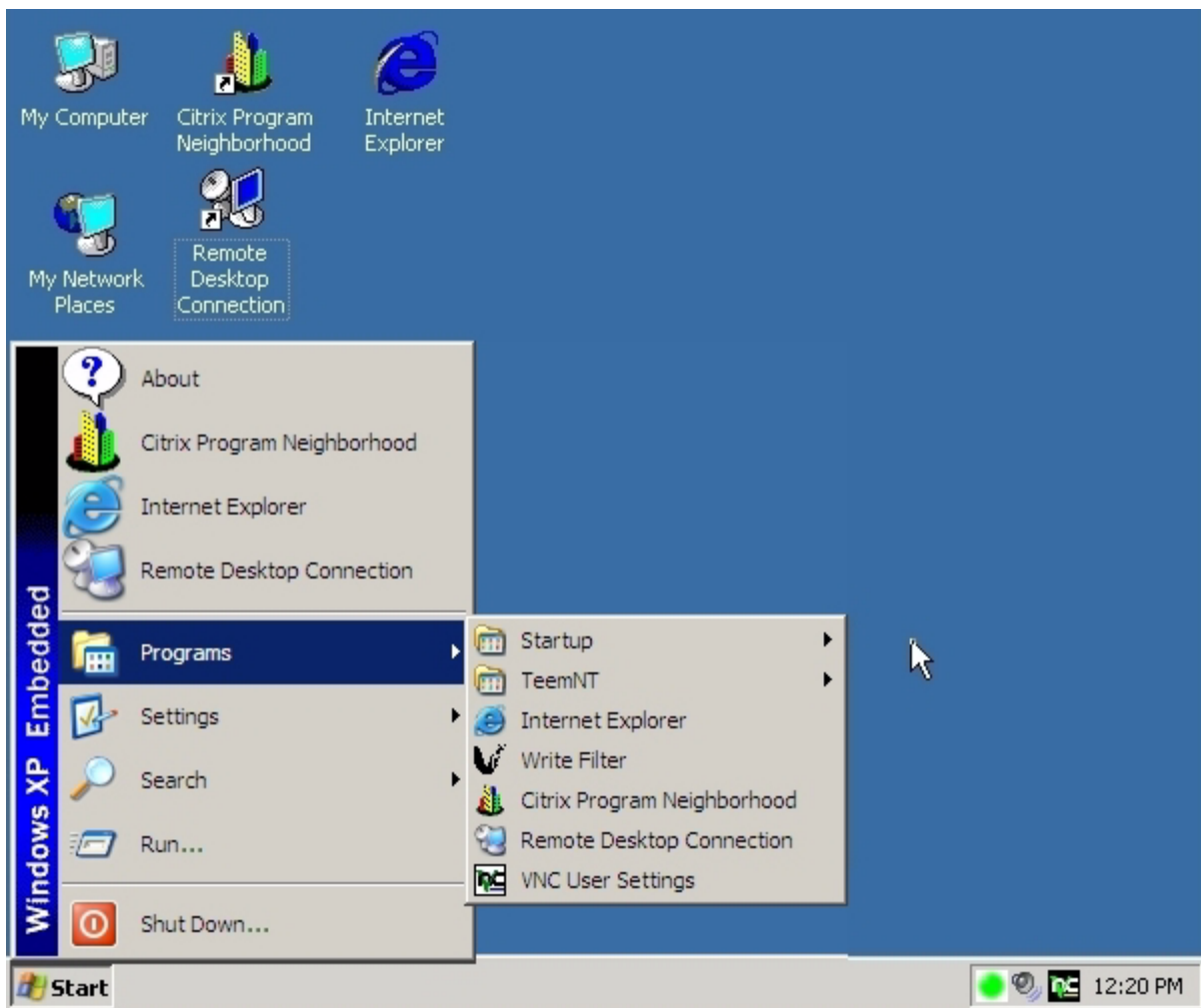
> **Note**
>
> Right-clicking the mouse when the pointer is on the administrator's desktop background opens a pop-up menu.

> **Note**
>
> Figure 4 shows the Model 9440XL desktop; for the Model 9235LE the shown **Start** menu **ShutDown** listing is replaced with listings for logging off, restarting, and shutting down the terminal.

About Dialog Box

Click on **About** in the **Start** menu to open the **About** dialog box (Figure 5). This dialog box displays general information about the terminal.

> **Note**
>
> Figure 5 is a typical **About** dialog box and is presented as an example only. The information in the dialog box will vary for different terminals and software releases.

Click on the **Installed Modules** command button to open a dialog box (see Figure 6) showing the list of modules that have been installed on the terminal.

Figure 5   About Dialog Box

Figure showing the "About Embedded XP" dialog box containing:

WYSE Technology Inc.

Website :   www.wyse.com

Product Name :   WT9400 Series

Product ID :   82503-OEM-0621203-00012

Version :   1.0
                                 (Build 240)

Windows XPE version :   5.01

MAC Address :   00806420657F

Serial Number :   ADD

Terminal H/W Rev. :   ADD

Flash Configuration   N/A

RAM Configuration :   187836 KB

Copyright 2000, WYSE TECHNOLOGY INC.
Copyright 2000, CITRIX SYSTEMS
Copyright 2000, MICROSOFT CORPORATION
Copyright 2000, NATIONAL SEMICONDUCTOR CORPORATION
Copyright 2000, AT&T RESEARCH LABS CAMBRIDGE
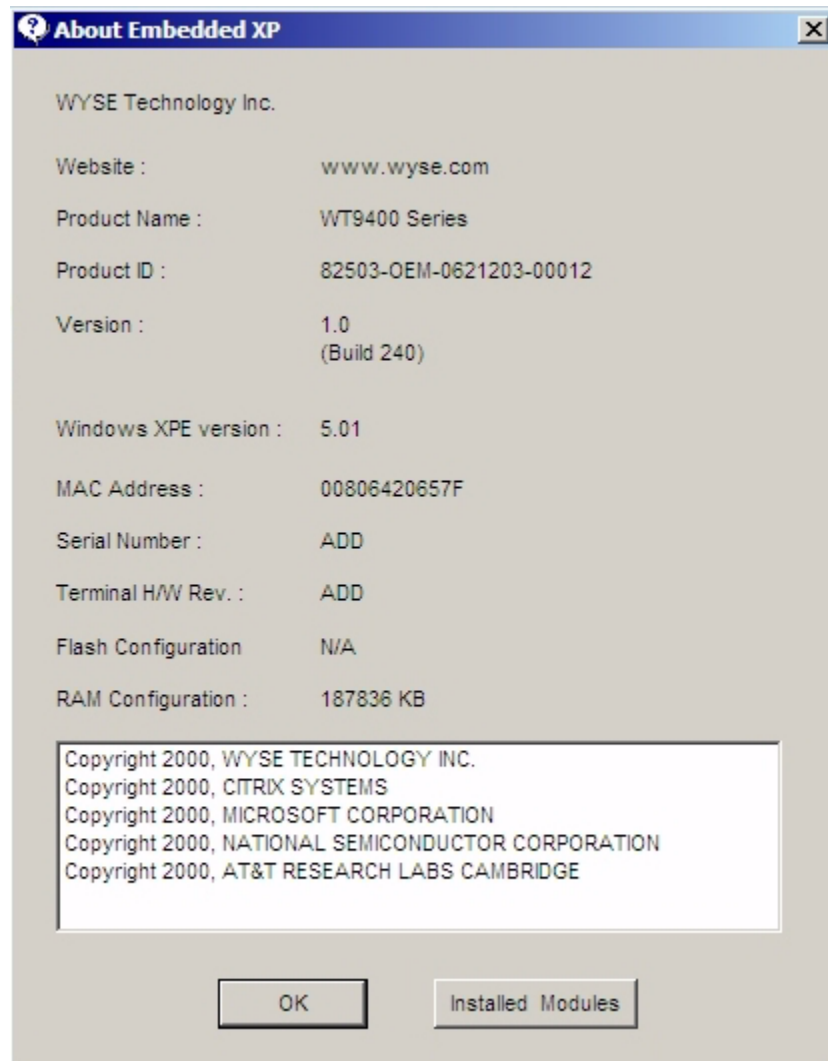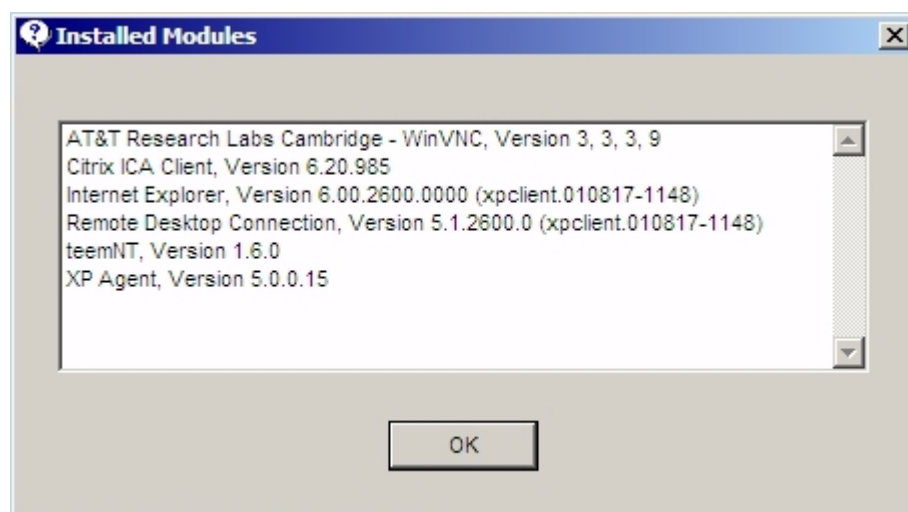
[OK]   [Installed Modules]

Figure 6   Installed Modules Dialog Box

Logging Off from, Restarting, and Shutting Down the Terminal

To log off from, restart, or shut down the terminal, click on the Task Bar **Start** button to open the **Start** pop-up menu (see Figures 3 and 4). On the Model 9440XL, select **Shut Down** from the **Start** menu to open a sub-menu; on the Model 9235LE, select the desired action from the **Start** menu.

> ☑ **Note**
> You may also log off or shut down using the **Windows Security** dialog box, which may be opened by using the **Ctrl**+**Alt**+**Del** key combination.

> ☑ **Note**
> If automatic log-on is enabled, when you log off (without shutting down) the terminal immediately logs on the default user. See "Logging On" for instructions for logging on as a different user.

The following utilities are affected by logging off, restarting, and shutting down the terminal:

- **Write Filter Cache** - See "Utilities and Settings" for information about the write filter. If you make changes to system configuration settings and want them to persist, you must flush the write filter cache during the current boot session. Otherwise the new settings will be lost when the terminal is shut down or restarted. The write filter cache contents are *not* lost when you simply log off and on again (as the same or different user); that is, you may flush the write filter cache after the new log on and still retain the changes. See "Write Filter Control Dialog Box" in "Control Panel Extended Selections" for instructions on how to flush the write filter cache.

  A **User** log-on account does not have cache flush privileges; this is a local or remote administrator function.

- **NetXClean Utility** - Refer to "NetXClean Utility" in "Utilities and Settings" for details about NetXClean. NetXClean is a cleanup utility that keeps extraneous information from being stored on the flash memory. Cleanup is triggered automatically on reboot, shut down, or user log off.

- **Power Management** - A "Monitor Saver," turns off the video signal to the monitor, allowing the monitor to enter a power-saving mode after a designated idle time. Parameters for this mode are available by right-clicking on the desktop background and selecting **Properties | Screen Saver** | **Power**.

- **Wake-on-LAN** - This standard XP feature allows the Rapport Administration Software to perform image updates and remote administration functions at any time. The terminal power must remain plugged-in for this to work.

- **Terminal Time** - After power off, clock time will not be lost as long as the power source remains plugged in. Clock time will be lost, however, if the power source is unplugged and the battery option is not installed. The local time utility may be set to synchronize the terminal clock to a time server automatically at a designated time or manually.

☑ **Note**

Correct time should be maintained because some applications may require access to local terminal time. The **Date and Time Properties** dialog box may be opened by clicking on the time area in the task bar or by double-clicking on the **Date and Time** icon in the **Control Panel**.

Programs Menu Extended Selections

Open the **Programs** menu by clicking on **Start | Programs**. Additional selections available on the **Programs** menu are:

Citrix Program Neighborhood

Opens the **Citrix Program Neighborhood** window (see Figure 7). This window, which also opens from a desktop icon, facilitates connections to remote applications running on ICA servers.

Documentation for the ICA client application is available from the Citrix Corporation Web site:

http://www.citrix.com/support (navigate to **Support | Product Documentation**)

**Figure 7   Citrix Program Neighborhood Window**
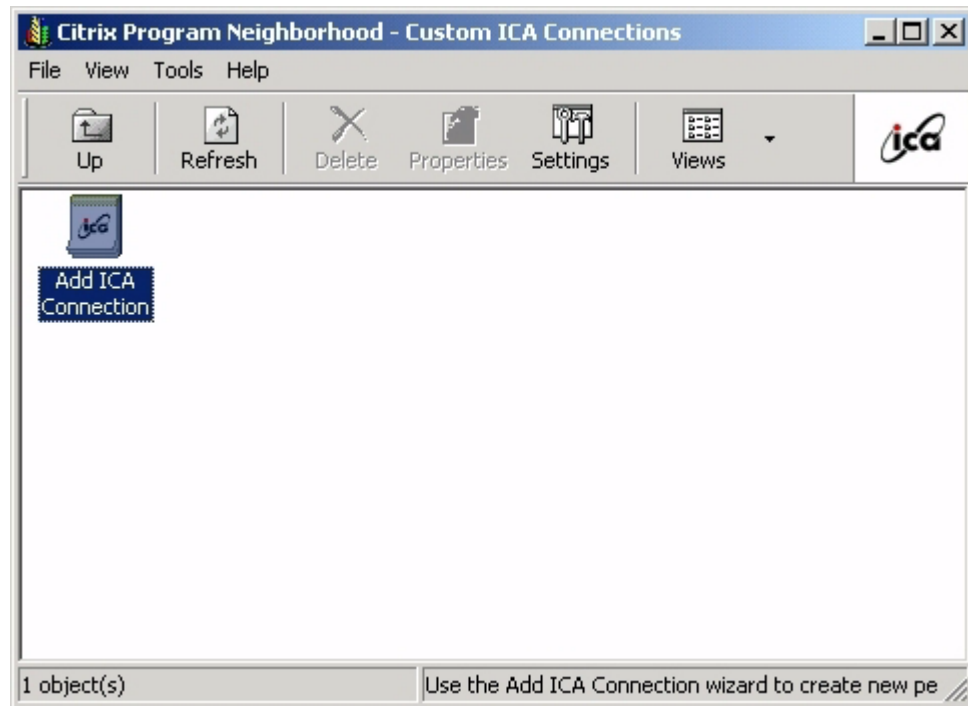
Remote Desktop Connection

This selection opens the **Remote Desktop Connection** dialog box (expanded view shown in Figure 8 obtained by clicking **Options** button). This dialog box, which also opens from a desktop icon, is used to establish connections to remote applications using RDP. See Microsoft documentation for a detailed explanation and instructions on how to use the **Remote Desktop Connection** dialog box:

http://www.microsoft.com (search for **Remote Desktop**)

Figure 8   Remote Desktop Connection Dialog Box (Expanded)
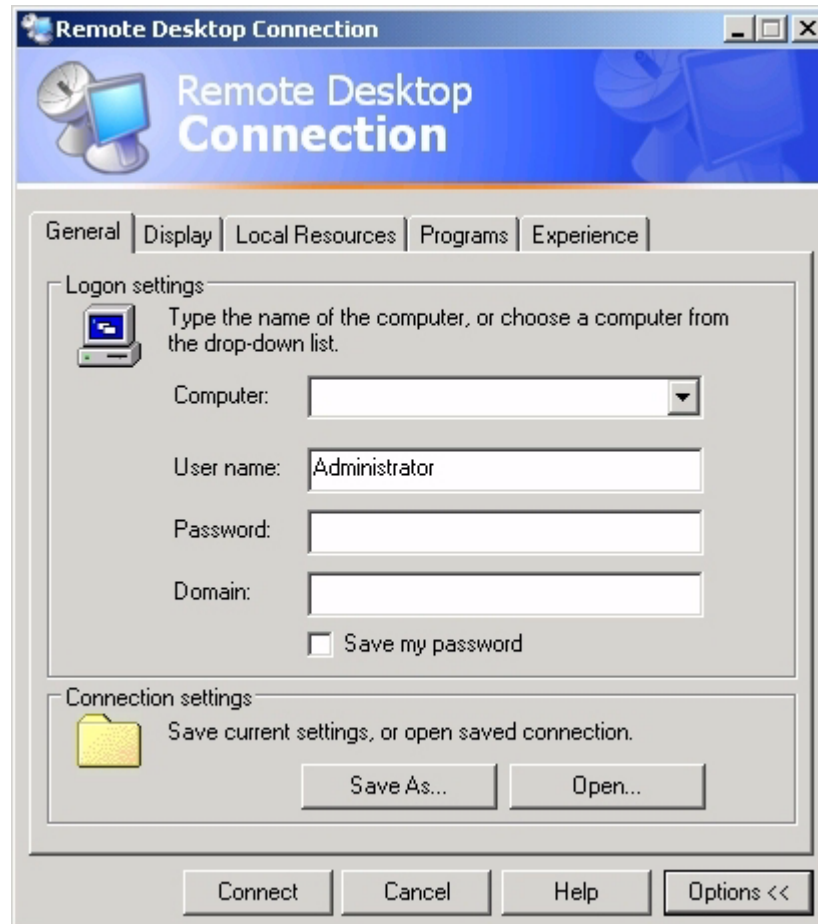
TeemNT

A terminal emulation application may be installed on the terminal as an option. Figure 9 shows the initial terminal emulation window. Refer to the terminal emulation documentation (supplied separately) for complete instructions. By default, a desktop icon is *not* installed.

Figure 9   Terminal Emulation Window
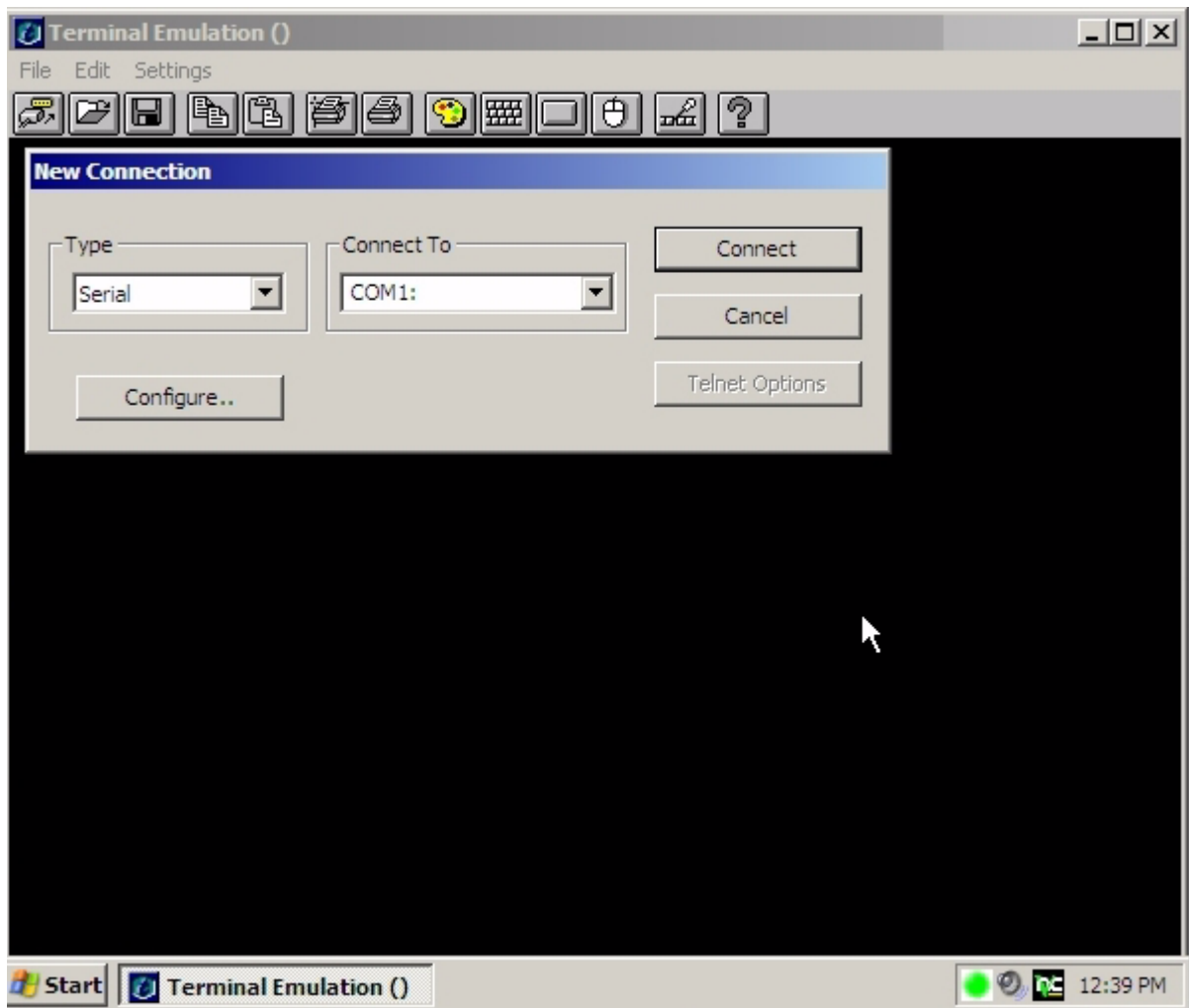
Internet Explorer

Version 6.0 of the Microsoft Internet Explorer browser is installed locally on the terminal (see Figure 10). The Internet options settings for the browser have been preselected at the factory to limit writing to flash memory. These settings prevent exhaustion of the limited amount of flash memory available and should not be modified. The user may access another browser through an ICA or RDP account if more browser resources are required. The local browser opens from the **Start** menu or from a desktop icon.

Figure 10   Internet Explorer Window

VNC User Settings

This selection is available to administrators only and opens the **WinVNC: Current User Properties** dialog box (Figure 11). It appears in the administrator's **Start** | **Programs** menu and an icon is available in the administrator's system tray only.

The **WinVNC: Current User Properties** dialog box allows entry of the VNC log-on password (the default password is **Wyse**) and selection of parameters for the VNC server utility installed on your terminal.

VNC server allows the terminal to be operated/monitored ("shadowed") from a remote machine on which VNC Viewer is installed. VNC is intended primarily for support and troubleshooting purposes.
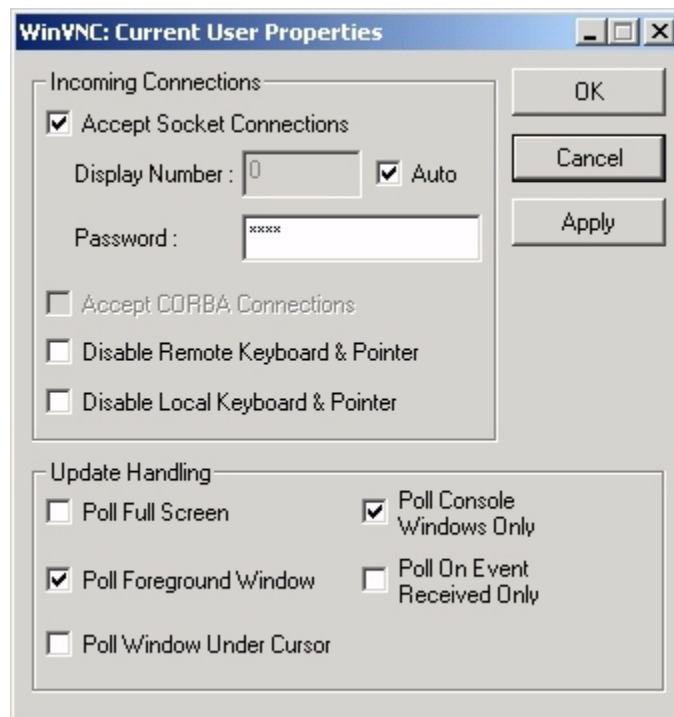
See "WinVNC (Windows VNC)" in "Remote Administration and Firmware Upgrades" for instructions.

> ✅ **Note**
>
> Hovering the mouse pointer over the **VNC** icon on the task bar pops up the terminal's current IP address.

Figure 11   WinVNC: Current User Properties Dialog Box

Write Filter

This selection is available to administrators only and opens the **Write Filter Control** dialog box (Figure 12). The dialog box may be opened from **Control Panel** | **Administrative Tools**. This dialog box is used to query the cache, flush the cache, view the status of the write filter, and disable/enable the write filter.

The system tray on the task bar contains a color icon that indicates the status of the write filter. Green indicates that the write filter is active, and red indicates that the write filter is inactive.

See "Write Filter" in "Utilities and Settings" for detailed information about the write filter.

Figure 12   Write Filter Control Dialog Box
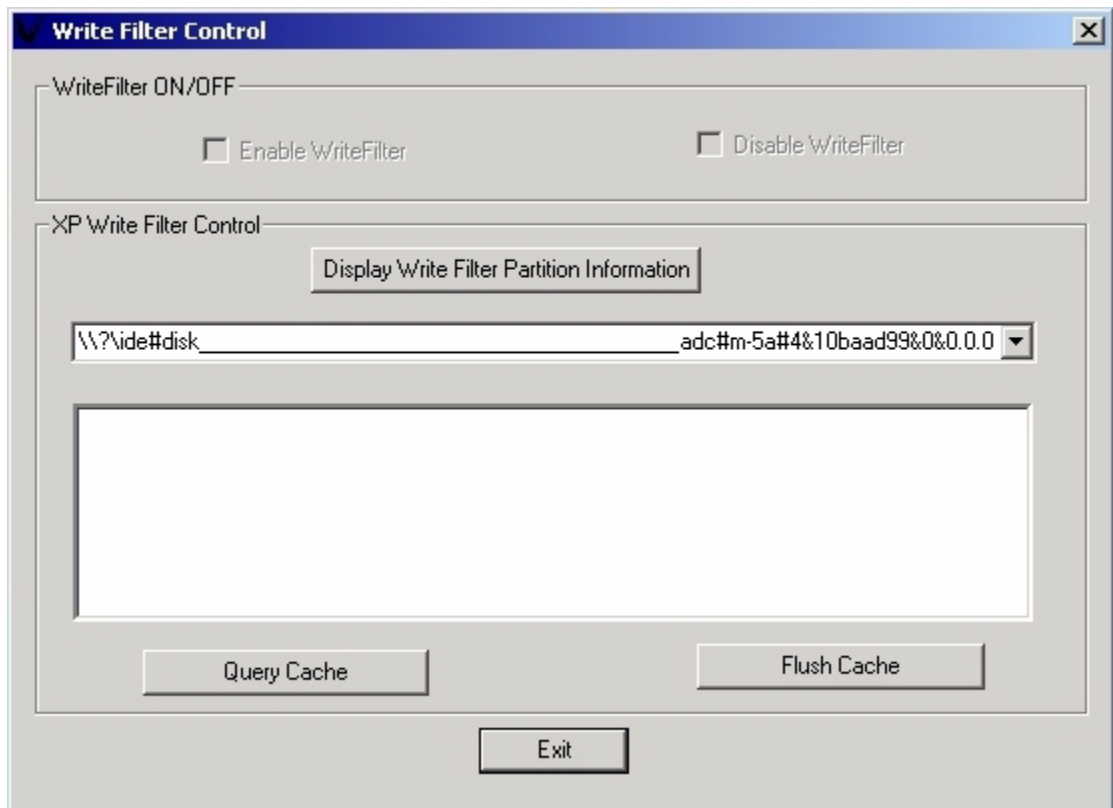
Control Panel Extended Selections

The **Control Panel** window (the administrator's control panel is shown in Figure 13) is accessed by clicking on **Start** on the task bar and selecting **Settings** | **Control Panel**.

Figure 13   Administrator's Control Panel Window (Classic View/List)
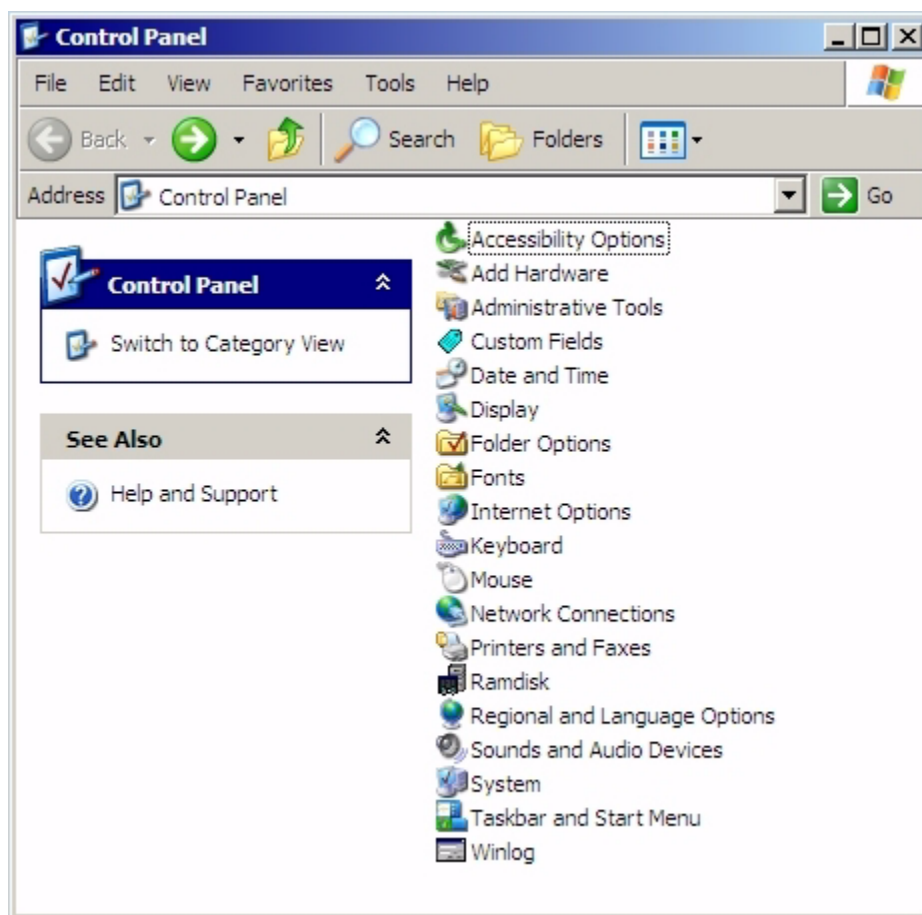
Extended selections available on the administrator's **Control Panel** are discussed in the following subparagraphs.

Ramdisk

The RAM disk is volatile memory space set aside for temporary data storage. It is the Z drive shown in the **My Computer** window.

The following items are stored on the RAM disk:

- Browser Web page cache
- Browser history
- Browser cookies
- Browser cache
- Temporary Internet files
- Print spooling
- User/system temporary files

The RAM disk also may be used for temporary storage of other data (e.g., roaming profiles) at the administrator's discretion (see "Local Drives" in "Utilities and Settings").

Use the **Ramdisk Configuration** dialog box (see Figure 14) to configure the RAM disk size. If you change the size of the RAM disk, you will be prompted to restart for changes to take effect, but to permanently save the change be sure that the write filter cache has been flushed during the current boot session before restarting.

Figure 14   Ramdisk Configuration Dialog Box
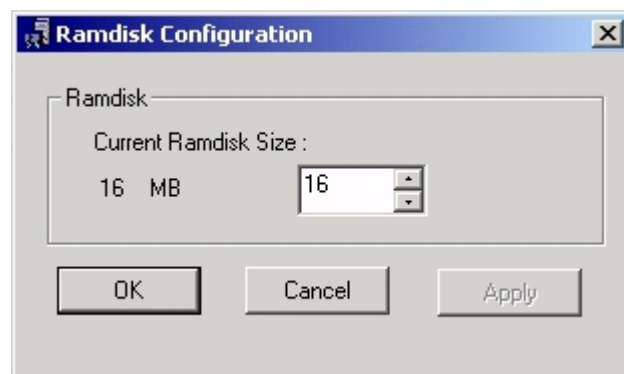
✓ Note

Default RAM disk size may vary, depending on the terminal model and installed memory size. The maximum Ramdisk size that can be set is 30 MB, the minimum is 2 MB.

Custom Fields

The **Custom Fields** dialog box (see Figure 15) is available from the **Control Panel**. It allows entry of configuration strings for use by the Rapport Remote Administrative Software (see "Remote Administration and Firmware Upgrades").

The strings may contain information about the location, user, administrator, and other unspecified information. Refer to the Rapport documentation for instructions on the need and use of custom fields information.

Click on the **Change** button in the dialog box to transfer the custom fields information to the Windows registry. The information is then available to the Rapport Client Manager.

To permanently save the information, flush the write filter cache during the boot session in which the registry entries are made or changed.

Figure 15   Custom Fields Dialog Box
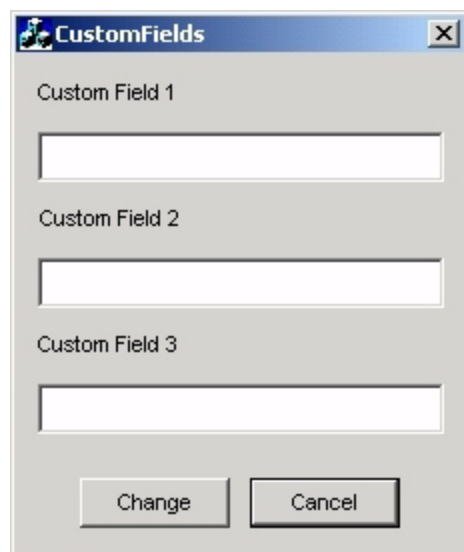
Regional and Language Options

Keyboard language selection is made through the **Regional and Language Options** selection in the **Control Panel**. The following keyboard languages are supported:

Arabic	Hebrew	US International
Belgian French	Italian	Czech
Brazilian (ABNT)+A34	Italian (142)	Hungarian
Canadian Eng. (Multi)	Japanese	Romanian
Canadian Fr (Multi)	Korean	Slovak
Canadian French	Latin American	Polish (214)
Danish	Norwegian	Polish (Programmers)
Dutch	Portuguese	Russian
English (UK)	Spanish	Turkish-F
English (US) (default)	Spanish Variation	Turkish-Q
Finnish	Swedish	Greek
French	Swiss French	Croatian
German	Swiss German	Slovenian
	Thailand	Chinese

☑ **Note**

An IEPC keyboard is required for any language other than **English (US)**. The keyboard layouts are different for each of the languages listed above.

Administrative Tools

Click on the **Administrative Tools** icon in the **Control Panel** to open a window containing administrative tool selections.

Write Filter

This selection opens the **Write Filter Control** dialog box (Figure 12). The dialog box may also be opened from the administrator's **Start** | **Programs** menu. This dialog box is used to query the cache, flush the cache, view the status of the write filter, and disable/enable the write filter. See "Write Filter" in "Utilities and Settings" for detailed information about the write filter.

Services

The **Services** selection opens the **Services** window (see Figure 16), which lists the services installed on the terminal. Of particular interest are **VNC Server** and **Client Cleanup** (NetXClean), either of which may need to be stopped or restarted by the terminal administrator as discussed in "Utilities and Settings" in this document.

☑ **Note**

These two services *cannot* be stopped or started using the **Task Manager**.

Other Administrative Tools

Other tools in this window that may be of use to an administrator are:

User Manager - See "User Profiles."

Winlog - Used for changing the autologon user.

Figure 16   Services Window
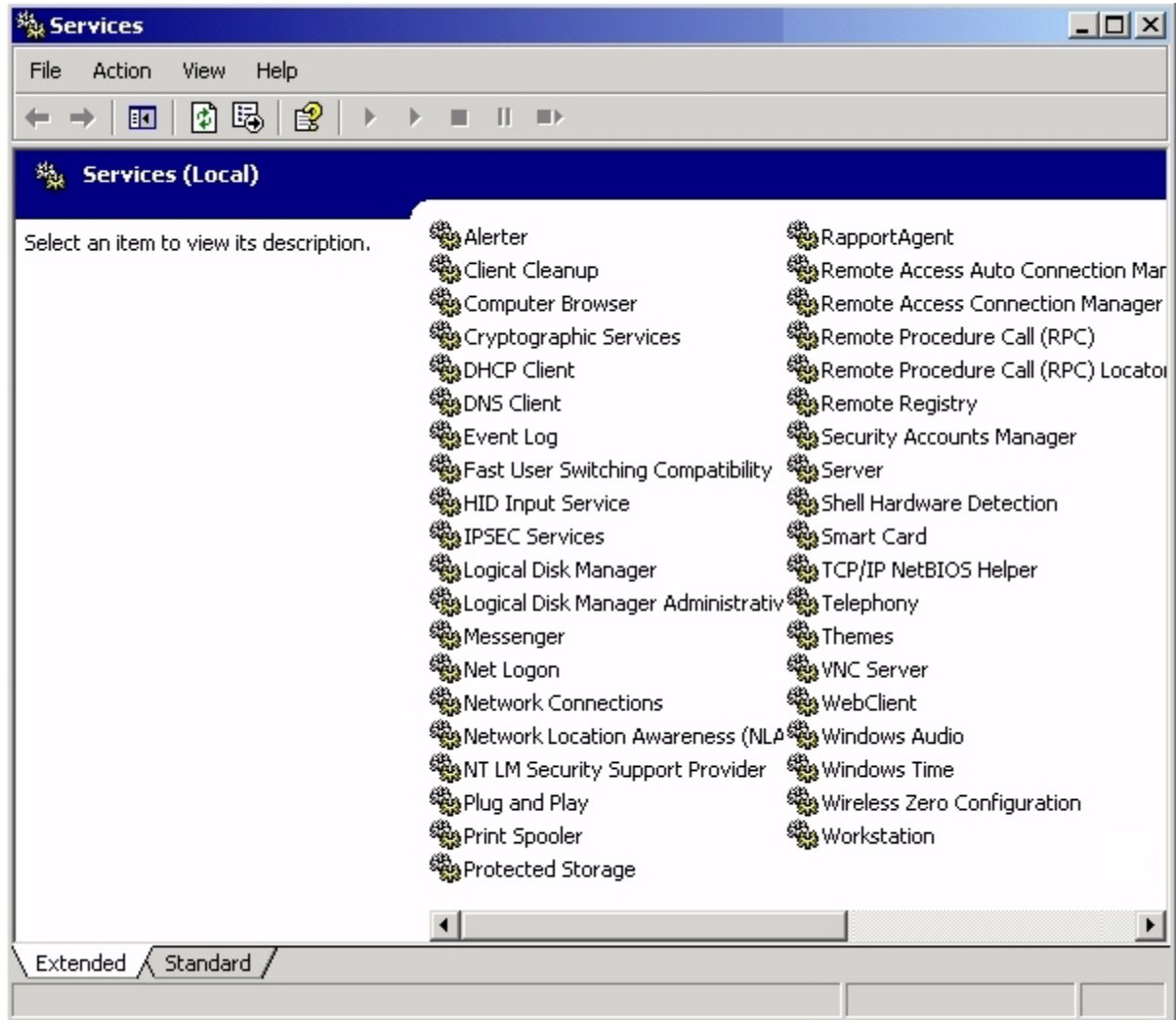
VNC User Settings

This selection opens the **WinVNC: Current User Properties** dialog box (Figure 11). An administrator also may open this dialog box through an icon in the task bar system tray and also from the **Start** | **Programs** menu.

See "WinVNC (Windows VNC)" in "Remote Administration and Firmware Upgrades" for instructions.

Peripherals

Depending on the ports available on the terminal (see "Model Summary"), the terminal can provide services through a USB port, the serial port, or a PCMCIA card plugged-in to the back of the terminal, as long as the appropriate software is installed. Factory-installed software is described in the following subparagraphs. Add-ons for other services, as they become available, may be installed using the Rapport Remote Administrative software (discussed in "Remote Administration and Firmware Upgrades").

USB to Serial Converter Cable

Use this procedure to determine the port assigned to a device connecting to the terminal through a USB to serial converter cable.

> ✔ **Note**
>
> Only up to two USB to serial converters may be used at one time.

1. Connect a printer or other device to the serial port of the converter cable. *Do not connect the USB end of the converter cable to the terminal at this time.*

2. Open the **Device Manager** window (**Control Panel** | **System** | **Hardware Tab** | **Device Manager**).

3. A **Ports (COM & LPT)** listing may or may not be present, depending on the terminal model and whether a device driver was previously installed to a port. If the listing is present, expand it so that ports presently used are displayed.

4. Plug the USB end of the converter cable into the terminal.

5. The **Ports (COM & LPT)** listing will appear if not already present. Under the **Ports (COM & LPT)** listing, a new COM port will appear for the new connection. Note which COM port number is assigned to the new connection.

6. Continue the installation procedure for the connected device, using the discovered port number when prompted. Use manufacturer's procedures for other devices such as a serial touch screen.

Printers

A universal print driver is installed on the terminal to support text-only printing to a locally-connected printer. To print full text and graphics to a locally connected printer, install the driver provided by the manufacturer and follow the manufacturer's instructions. Be sure to flush the write filter cache to save the installation. Printing to network printers from ICA and RDP applications can be achieved through print drivers on the servers.

> ✔ **Note**
>
> Printing to a locally-connected printer from an ICA or RDP session using the server's print drivers produces full text and graphics functionality from the printer. To do this, you must have the print driver installed on the server and the text only driver installed on the terminal (see "Adding Printers - Using the Generic Text Only Print Driver").

Adding Printers - Using the Generic Text Only Print Driver

1. Connect the printer to the parallel port.

2. Choose **Printers and Faxes** from the **Start** | **Settings** menu.

3. Double click on **Add a printer**. This opens the **Add Printer Wizard**.

4. Click on **Next** in the first panel of the wizard.

5. Select the **Local printer attached to this computer** radio button.

6. Make sure that the **Automatically detect and install my Plug and Play printer** check box is *not* selected.

7. Click on **Next**.

8. Select the **Use the following port:** radio button.

9. Select the appropriate port from the drop-down list and click on **Next**.

10. Choose the **Manufacturer** and **Model** of the printer and click on **Next**.

11. Use the assigned default name or other name for the printer and click on **Next**.

12. Select the **Do not share this printer** radio button and click on **Next**.

13. Choose whether to print a test page or not and click on **Next**.

14. Click on **Finish**.

15. The installation will complete and a test page will print if this option was chosen.

Using the Manufacturer's Print Drivers

Install the driver provided by the manufacturer and follow the manufacturer's instructions. Be sure to flush the write filter cache to save the installation.

Audio

Audio may be redirected from applications to the audio jacks on the terminal. The level must be controlled externally (such as by a 600-ohm potentiometer control) and a power booster is required to drive speakers. The volume can be adjusted using the sound icon in the task bar system tray. You can single-click on this icon to open the master volume control, or double-click to open the volume control application dialog box.

Utilities and Settings

Write Filter

The write filter provides a secure environment for thin-client computing. It does this by protecting the terminal from undesired flash memory writes (flash memory is where the operating system and functional software components reside). The write filter also extends the life of the terminal by preventing excessive flash write activity. It gives the appearance of read-write access to the flash by employing a cache to intercept all flash writes and returning success to the process that requested the I/O.

The intercepted flash writes stored in cache are available as long as the terminal remains active but will be lost when the terminal is rebooted or shut down. To preserve the results of writes to the registry, favorites, cookies, etc., the contents of the cache can be transferred ("flushed") to the flash on demand by the Rapport Remote Administration Software or manually using the **Write Filter Control** dialog box (see Figure 12) available from the **Control Panel** | **Administrative Tools** | **Write Filter** selection or through the **Start** menu. After the write filter has flushed the cache, all future writes during the current boot session are written to the flash, with no further caching until a reboot occurs. The write filter may also be enabled/disabled through the command line or through the **Write Filter Control** dialog box. The enabled/disabled status of the write filter is displayed on the green/red button icon on the task bar system tray (green indicates that the write filter is active, and red indicates that the write filter is inactive).

The administrator should periodically check the status of the cache. The terminal should be rebooted if the cache is more than eighty percent full.

☑ **Note**

When administering the terminal for permanent changes, to avoid flash corruption it is strongly recommended flushing the write filter cache immediately following a fresh reboot before making permanent modifications to the system. Do not flush the cache if the terminal has been used in the current boot session.

☒ **Caution**

The write filter cache should never be flushed if it is eighty-percent or more full.

The write filter can be manipulated through the command line or the **Write Filter Control** dialog box, as follows:

Write Filter Command Line Control

☑ **Note**

Command line arguments cannot be combined.

☒ **Caution**

Terminal Administrators should use NT file security to prevent undesired usage of these commands.

Start | **Run** | **Open** Command Line:

- · **wtflush.exe** with no arguments - Brings up the **Write Filter Control** dialog box (Figure 12). This dialog box also may be accessed through the **Start** | **Programs** menu or via the **Administrative Tools** selection in the **Control Panel**. See the following description of the dialog box.

- · **wtflush.exe \f** - Flushes the cache and disables the write filter until the next boot. The write filter status icon is red.

- · **wtflush.exe \d** - Flushes the cache and disables the write filter; the write filter stays disabled after the boot and must be enabled manually either through the dialog box or through the command line. The write filter status icon stays red while disabled.

- · **wtflush.exe \e** - Write filter enabled after the next boot. After enabling the write filter you must reboot. You do not need to flush the cache first since the write filter is currently disabled. The write filter status icon is green when the write filter is enabled.

☑ **Note**

Flush and disable (**\f** and **\d** arguments) open and automatically close a DOS command window during the process. However, the flush could take up to several minutes to complete after the window closes. Because the DOS window does not stay open long enough to view the results, you should open the **Write Filter Control** dialog box to determine if flushing has completed.

☑ **Note**

The write filter status icon on the task bar system tray turns red immediately when the cache flush operation is started, although the flush action may take up to several minutes to complete.

☒ **Caution**

Do not attempt to flush the cache while the cache is currently being flushed.

If you open a **MS-DOS Prompt** window (by entering **command** in the **Run** dialog), append "**.exe**" to the **wtflush** command: **wtflush.exe**, **wtflush.exe \f**, **wtflush.exe \d**, and **wtflush.exe \e**.

Write Filter Control Dialog Box

The **Write Filter Control** dialog box is shown in Figure 12. It can be opened either through the command line (**wtflush**) or via the **Administrative Tools** selection in the **Control Panel**. The controls in this dialog box function as follows:

- • The **Write Filter Enable/Disable** check boxes are disabled until the **Display Write Filter Partition Information** button is clicked.

- • Click on the **Display Write Filter Partition Information** button to enable the **WriteFilter Enable/Disable** check boxes.

- • Select the **Disable WriteFilter** check box to flush the cache and disable the write filter (the WFilterPartition1 key value is set to 0). The write filter status icon in the desktop system tray turns red. The write filter stays disabled after boot. To re-enable the write filter, select the **Enable WriteFilter** check box and reboot.

- Select the **Enable Write Filter** check box to set the write filter to be enabled after reboot (the WFilterPartition1 key value is set to the platform default). The write filter status icon in the task bar system tray is green when the write filter is enabled.

✔ **Note**

The drop-down list box located just below the **Display Write Filter Partition Information** button should never be used for any reason and has no value to the user.

- Click the **Flush Cache** button to flush the cache and turn off the write filter; the write filter status icon turns red and the write filter remains off until the next boot.
- When the cache is flushed by clicking the **Flush Cache** button or selecting the **Disable Write Filter** check box, all controls are disabled (grayed-out) until the flush completes.
- Once the cache has been flushed, clicking on the **Flush Cache** button causes the following message to display:

  DeviceIoControl IOCTL_WFILTER_MODE_QUERY failed
- Click on the **Query Cache** button to display a cache status report.

NetXClean Utility

NetXClean keeps extraneous information from being stored in flash memory. NetXClean is a service that runs constantly in the background and operates only on the flash memory. Cleanup is triggered on either service startup or user logoff.

NetXClean performs the cleanup invisibly and no user input is necessary.

If a flush of the write filter cache puts junk in flash directories that must be kept clean, or allows junk to continue being written to flash after the write filter cache is flushed (until a reboot occurs), NetXClean prevents garbage files from building up and filling the free space in the flash. This is particularly important when multiple users have logon rights to a terminal because memory space can be used up quickly by locally stored profiles and temporary caching of information.

Function Summary

NetXClean performs the following TweakUI functions:
- Clears Run history at log on
- Clears Document history at log on
- Clears Find Files history at log on
- Clears Find Computer history at log on
- Clears Internet Explorer history at log on
- Clears Last User at log on
- Clears Selected Items Now

NetXClean purges certain directories, files, and profiles. It uses a configuration file to determine which directories and files to purge, and which profiles to not purge. The selections are made by the manufacturer and should not be changed without manufacturer supervision.

Regardless of the configuration file selections, NetXClean does not clean up the following directories or any parent to these directories:

- The Windows directory
- Windows System subdirectory
- The current directory the service is installed in

NetXClean will not delete these profiles:

- Administrator
- All Users
- Default User
- The profile of the last user who logged on

Local Drives

Drive Z

Drive Z is onboard volatile memory (**Ms-ramdrive**) on the logic board of the terminal. Because drive Z is volatile memory, it is recommended that you do not use this drive to save data that you want to retain. See "Ramdisk" for Ramdisk configuration instructions. See also "Domain Participation," below, for information about using the Z drive for roaming profiles.

Drive C and Flash

Drive C is onboard non-volatile flash memory. It is recommended that you avoid writing to drive C. Writing to drive C reduces the size of the flash. If flash size is reduced to below 3 MB, the terminal will become unstable.

☒ **Caution**

If flash memory size is reduced to 2 MB, the terminal's image will be irreparably damaged and it will be necessary for you to contact an authorized service center to repair the terminal. It is recommended that 3 MB be left unused.

The write filter (if ACTIVE) protects the flash from damage and presents an error message if the cache is overwritten. However, if this occurs you will not be able to flush the write filter cache and any terminal configuration changes still in cache will be lost.

✔ **Note**

Refer to "NetXClean Utility" for its role in keeping the flash memory clean.

Items that are written to the write filter cache (or directly to the flash if the write filter has been flushed) during normal operations are:

- Favorites
- Created connections
- Delete/edit connections

Saving Files

⊠ **Caution**

The terminal uses an embedded operating system with a fixed amount of flash memory. It is recommended that you save files that you want to keep on a server rather than on your terminal. Be careful of application settings that write to the C drive, which resides in flash memory (in particular, many applications by default write cache files to the C drive on the local system). If you *must* write to a local drive, change the application settings to use the Z drive. The default configuration settings mentioned below in "User Logon Accounts" minimize writing to the C drive for factory-installed applications.

✔ **Note**

Also see descriptions of the write filter and the need to flush the cache to permanently save configuration data.

Mapping Network Drives

You can map network drives if you log on as either **Administrator** or **User**. To keep the mappings after the terminal is rebooted you must:

1. Select the **Reconnect at logon** check box

and

2. Flush the write filter cache during the current boot session

Since a user log-on can not flush the write filter cache, the mappings can be retained by logging off the user (*do not* shut down or restart) and logging back on as Administrator, and then flushing the cache.

A remote home directory also may be assigned by using a user manager utility or by other means known to administrators.

Domain Participation

Joining to a Domain

As an administrator you may join the terminal to a domain through the **Computer Name Changes** dialog box, accessed through **Control Panel** | **System** | **Computer Name** | **Change** button.

⊠ **Caution**

Exercise caution when joining to a domain – the profile downloaded at log on could overflow the cache or flash memory. To protect the flash, it is suggested that the write filter be enabled when joining to a domain.

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Roaming Profiles

Write roaming profiles to the C drive. The profiles need to be limited in size and will not be retained when the terminal is rebooted.


✔ **Note**

For roaming profiles to work and be downloaded, there must be sufficient flash space available. In some cases it may be necessary to remove software components to free up space for roaming profiles.

WinPing Utility

The **WinPing** window (Figure 17) is opened by typing **WinPing** in the **Run** menu (opened from the **Start** menu). The **WinPing** window is used to launch the Windows Ping diagnostic utility and view the results from pinging.

Windows Ping (Packet InterNet Groper) is a diagnostic tool familiar to administrators. It sends an echo request to a network host. The host parameter is either a valid host name or an IP address. If the host is operational and on the network, it responds to the echo request. The default is to send 5 echo requests and then stop if no response is detected. WinPing sends one echo request per second and calculates round trip times and packet loss statistics, and displays a brief summary on completion.

Figure 17   WinPing Window
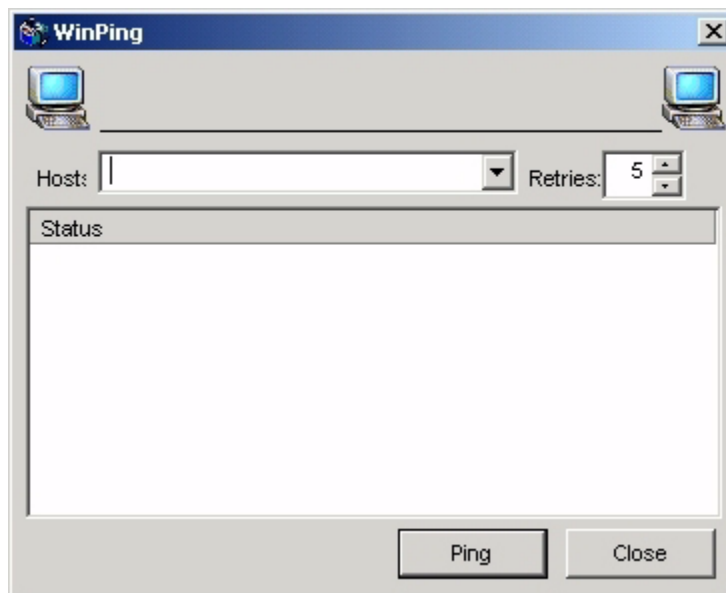
WinPing can be used to:

- Determine the status of the network and various hosts.
- Track and isolate hardware and software problems.
- Test, measure, and manage networks.
- Determine the IP address of a host if only the host name is known.

User Log on Accounts

Creating a New User Account

⊠ **Caution**

Be sure to flush the write filter cache during the current boot session in which a new account is created.

You must be logged-on as administrator to create user accounts, which you can do locally or remotely via VNC.

Due to local flash/disk space constraints, the number of additional users should be kept to a minimum.

New user accounts may be created by the **User Manager** utility, accessed through **Control Panel** | **Administrative Tools**.

User Profiles

A new user profile will be automatically configured from a template based on the default user or administrator access settings in the registry, browser profiles, and ICA and RDP initial settings. If the default user or administrator profile settings are changed from those set at the factory, the changed settings are automatically applied to the new user profile.

For the new user to match the characteristics of the default user, the administrator must create the user in the User group and also add the new user to the administrator group. The default user is in both groups; otherwise the new user will not be able to add a local printer. While the user is in the administrator group, he is still locked-down in what he can do.

To create the user:

1. Log in as administrator.

2. Open the **Administrative Tools** window (**Start | Settings | Control Panel (Classic view) | Administrative Tools**).

3. Double-click on **User Manager** to open the **Local Users and Groups** window.

4. Double-click the **Users** folder to view the contents in the right pane.

5. Click **Action** in the menu bar and select **New User** in the drop-down menu. This opens the **New User** dialog box.

6. Type in the user name and password, and select the attributes you want.

7. Click on the **Create** command button, then click on the **Close** command button.

8. In the **Local Users and Groups** window, select (highlight) the **Users** folder in the left pane.

9. In the right pane, double click the name of the user just created. This opens the [**user name**] **Properties** tabbed dialog box.

10. Open the **Member Of** tab dialog.

11. Click the **Add** command button. This opens the **Select Groups** dialog box.

12. Type **Administrators** in the field labelled **Enter the object names to select**. This will enable the **Check Names** command button.

13. Click the **Check Names** command button, then click **OK**.

14. The newly created user will now be a member of both the Administrators and Users groups and should match the privileges of the default user account.

15. Flush the cache to retain this change.

⊠ **Caution**

Because of the limited size of the flash memory, it is strongly recommended that other applications available to the new and existing users be configured to prevent writing to the local file system. For the same reason, it is also recommended that *extreme care be exercised when changing configuration settings of the factory-installed applications.*

Remote Administration and Firmware Upgrades

Rapport Administrative Software

Rapport is a full-featured remote administration tool set available from Wyse Technology. It accesses the terminal through the Rapport Agent, PXE, and VNC server utilities installed on the terminal. Rapport allows the terminal administration functions (including firmware upgrades) to be performed without requiring an administrator to visit the individual terminal sites.

For specific information on using Rapport, consult the Rapport help documentation.

For local custom fields that may be accessed by Rapport, refer to "Custom Fields" in "Control Panel Extended Selections".

Add-on Modules

If it is desired to install an add-on module, an administrator must use the built-in Rapport packages for administering the terminal. Disable the write filter and enable the write filter as needed to save the changes.

Firmware Upgrades

Intel's Preboot Execution Environment (PXE) is a protocol that defines interaction between TCP/IP, DHCP and TFTP to enable a client to download a preboot environment from a server.

PXE client is installed on the terminal and the PXE server component is part of the Rapport Administrative Software suite.

✔ **Note**

Citrix ICA auto update does not function for the ICA client installed on the terminal; updates are implemented through the standard firmware upgrade process.

WinVNC (Windows VNC)

Windows VNC (WinVNC) Server is installed locally on the terminal. It allows the terminal to be operated/monitored ("shadowed") from a remote machine on which VNC Viewer is installed. VNC is intended primarily for support and troubleshooting purposes.

VNC Server starts automatically as a service at terminal startup. The service may be stopped/started by using the **Services** window (opened from the **Administrative Tools** selection on the **Control Panel)**.

✔ **Note**

Be sure to flush the write filter during the current boot session if you want to permanently save the state of the service.

VNC Server Properties Settings

The **WinVNC: Current User Properties** Dialog Box (Figure 11) is available from the administrator's **Start | Programs** menu. It may be opened by the administrator by clicking on the **VNC** icon in the task bar system tray. The default password in this dialog box is "**Wyse**".

☒ **Caution**

The default password permits a remote administrator to configure a new or reset terminal from a remote location rather than making a personal appearance at the terminal site. For security, this password should be changed as soon as possible upon receipt of the terminal.

Before a client computer can access your terminal:

1. You must furnish the IP address or valid DNS name of your terminal to the user (the terminal remote administrator) of the machine from which your desktop is to be viewed.

    · The IP address can be obtained from the **Local Area Connection Status** dialog box (accessed through **Start** | **Settings** |**Control Panel** | **Network Connections** | **Local Area Connection | Support** tab).

2. You must have entered a password for the administrator to use into the **WinVNC: Current User Properties** dialog box (see Figure 11).

✔ **Note**

The options that may be set using the check boxes in this dialog box are self-explanatory; refer to the VNC Web site for details.

VNC Viewer Setup and Operation

VNC Viewer software must be installed on the shadowing computer.

- VNC Viewer is included as a component of the Rapport Administrative Software suite.
- If another machine is to be used to access your terminal, the VNC Viewer software for Unix/Linux and Win32 (Windows 95 and Windows NT) is available at no charge and can be downloaded for installation on the remote machine from:

   http://www.uk.research.att.com/vnc/

Complete instructions for setting up and using VNC are available at the VNC site.

The user of the shadowing computer must know the IP address/name and the password set up on your terminal (the host). The shadowing computer operator may log on to your terminal as follows:

1. Start the VNC Viewer program; this will open the **Connection Details** dialog box.

2. If the network is slow, press the **Options...** button to open the **Connection Options** dialog box. Check the **Restrict Pixels to 8-bit** box (this will increase speed at the expense of display quality). Press **OK** to return to the **Connection Details** dialog box.

3. In the **VNC server** field, type the IP address or valid DNS name of the host terminal, followed by a colon and 0. For example:

   snoopy:0

   or

   132.237.16.238:0

4. Press **OK**.

5. This will open the **VNC Authentication** dialog box. Type the password of the host terminal (see above) and press **OK**.

6. The host terminal desktop will be displayed in a separate window on your desktop. Use your mouse and keyboard to operate the remote terminal just as you would if you were operating it locally.

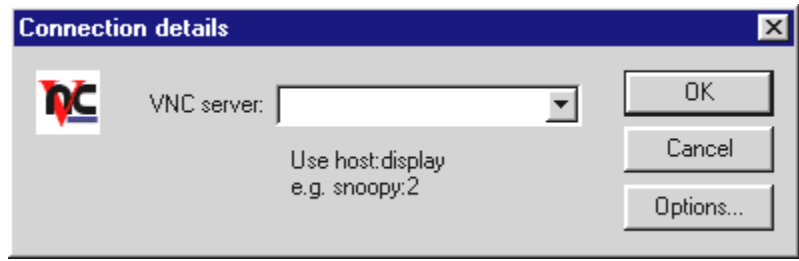**Figure 18   VNC Connection Details Dialog Box**

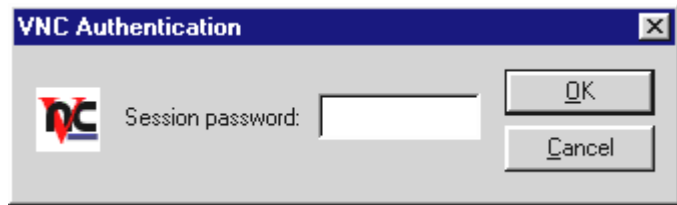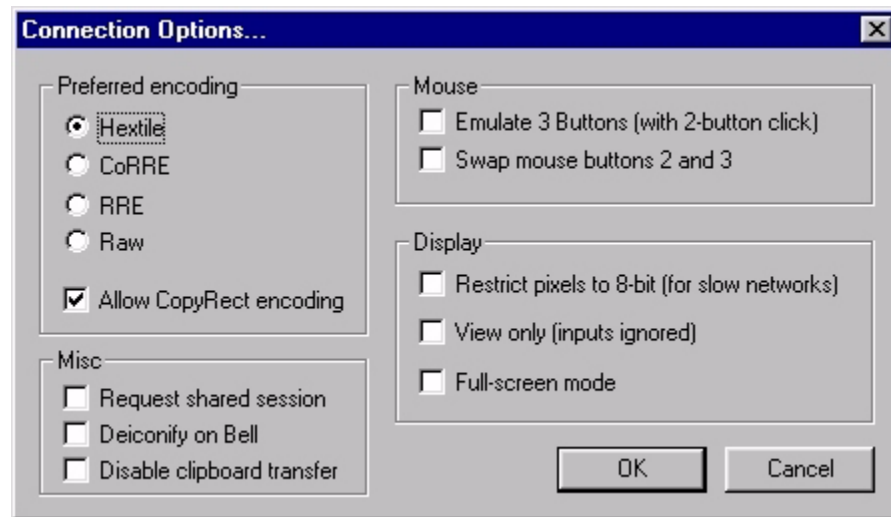**Figure 19   VNC Authentication Dialog Box**

Figure 20   VNC Connection Options Dialog Box

✅ **Note**

This dialog box may vary for different VNC software releases.

Table 1   VNC Connection Options Dialog Box Selections

Selection	Description
Preferred encoding radio buttons	Normally the VNC viewer requests CopyRect, Hextile, CoRRE and RRE in that order. The selection alters this behavior by specifying the encoding method to be used before any of the others is tried.
Check boxes:	
Allow CopyRect encoding	When selected, VNC viewer informs the VNC server it can cope with CopyRect encoding.
Deiconify on Bell	Often a beep will sound because you are being notified of something such as e-mail arriving or a compilation finishing. This selection causes a minimized VNC viewer to be restored when the bell character (escape sequence) is received.
Swap mouse buttons 2 and 3	Generally selected by left-handed persons.
Restrict pixels to 8-bit (for slow networks)	Trade-off of color depth for transmission speed.

Table 1   VNC Connection Options Dialog Box Selections, Continued

Selection	Description
Request shared session	When you make a connection to a VNC server, all other existing connections are normally closed. This option requests that they be left open, allowing you to share the desktop with someone already using it.
View only	Select this if you only want to monitor the desktop of the remote terminal but do not want to operate it using the keyboard and mouse.
Disable clipboard transfer	Clipboard changes caused by cutting or copying at either the viewer of server are normally transferred to the other end. This option disables clipboard transfers.
Emulate 3 Buttons (with 2-button click)	Users with a two-button mouse can emulate a middle button by pressing both buttons at once if this option is selected.
Full-screen mode	Causes the connection to start in full-screen mode.

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