Payoff

For companies that require Windows NT clients to work in a NetWare environment, getting the configuration setup right can save network administrators time and expense and boost productivity by facilitating the NetWare connection.

Introduction

Novell's NetWare is an excellent Network operating system for facilitating shared file and print services. In comparison, some of the more robust features of Microsoft's Windows NT are its “crash proof” capability and its use as an application server.

A marriage of these two network operating systems can be accomplished through the use of Windows NT client workstations and servers connected to a NetWare-based local area network. However, when configuring a Windows NT platform to work on a Novell network, there are several variables that govern the network manager's ability to connect the platform into a NetWare environment.

Although Microsoft provides a reasonable level of documentation that describes the configuration process for making a Windows NT platform work on a NetWare network, certain hardware and software considerations are omitted. This article provides network managers and administrators with additional tips necessary to correctly configure their Windows NT platform to work in a NetWare environment and avoid countless hours of frustration.

NT Network Support

Windows NT includes built-in support for a variety of network protocols. Protocols directly supported in Windows NT version 3.51 include AppleTalk, data link control (DLC), NetBEUI, NWLink IPX/SPX, and TCP/IP. Because the focus of this article is on using Windows NT in a NetWare environment, the selection and use of the Windows NT NWLink IPX/SPX protocol is described here.

The NWLink IPX/SPX protocol was developed by Microsoft to provide compatibility with Novell's proprietary communications protocol Internet Packet Exchange/Sequenced Packet Exchange (IPX/SPX). NWLink IPX/SPX turns a Windows NT platform into a NetWare client workstation. The installation of the network adapter card and certain parameters can considerably facilitate the operation of NWLink IPX/SPX.

Network Adapter Card Configurations

Many network adapter cards are preinstalled in personal computers purchased after 1994. Although the PC is usually shipped with DOS and a version of Windows, such as Windows 3.11 or Windows for Workgroups, most organizations add Windows NT at a later date.

This means that certain configuration setup data in the network adapter card that enables the computer to be connected to a LAN may be hidden from view when first attempting to install Windows NT. Even if the PC and LAN adapter cards are correctly configured to obtain a network connection, it is easy to overlook several other important
adapter card settings needed to correctly install and configure NWLink IPX/SPX to work with the LAN adapter card. Thus, even before installing and configuring Windows NT, network administrators should examine and note the settings used with the network adapter card.

Many adapter card vendors provide a diagnostic program used to display and change configuration settings. Some of the configuration parameters worth checking are:

- Port (i.e., the I/O address used by an adapter card).
- IRQ (i.e., the interrupt request used by an adapter card).
- DMA (i.e., the Direct Memory Access channel, if direct memory access transfer is enabled).
- Slot (i.e., the expansion slot used by the adapter card).
- Frame type (i.e., the frame type bound to the adapter card).
- Node address (i.e., the locally or universally administered node address).

Different adapter cards require the use of different parameters, therefore only a subset of these parameters listed may be applicable for a particular network adapter card.

### Installing NWLink IPX/SPX

The installation of Microsoft's NWLink IPX/SPX program requires the user to be logged on as a member of the Administrator's group for the local computer. In other words, to install the IPX/SPX protocol, the user must first have an appropriate NT account. Once this is accomplished, the addition of networking capabilities to a Windows NT workstation is obtained by the selection of the “Network” option from the operating system's Control Panel window, which is accessed through the Main window.

Exhibit 1 illustrates the Network Settings window, which is considerably different from the Network window displayed under Windows 3.11 and Windows for Workgroups. Earlier versions of Windows did not allow users to directly add network software and adapter card support via a common window. Instead, the user had to use the File menu to run self-configuring programs that would operate as separate entities and provide little, if any, information on the network hardware and software already installed.

In Exhibit 2, the box labeled Installed Network Software provides a list of network software drivers previously installed or bundled with Windows NT. Similarly, the box labeled Installed Adapter Cards lists those adapter cards previously configured under Windows NT—in this case, a Madge Smart Ringnode adapter card. When running the Windows NT setup, the program automatically installs a computer browser, NetBIOS, and a driver to support the adapter card installed in the computer.

### Step-by-Step Adapter Card Setup

However, most people install Windows NT first to gain experience with its use, then later attempt to connect the NT platform to a Novell network, so the NWLink IPX/SPX software and the adapter card would not be configured at the outset. The steps necessary to install network software and a network adapter card are outlined next.

Most adapter cards are packaged with software drivers designed to support different operating systems, so first locate the diskettes distributed with the adapter card. To
add network adapter card support, click on the Add Adapter button in the Network Settings window (see Exhibit 1). This action results in the display of another dialog box. Exhibit 2 shows this dialog box after the author scanned through the list of cards for which Microsoft includes built-in drivers in NT.

**NT's Network Settings Window**

**Adding a Network Adapter Card**

**Tips for Using Adapter Cards Not Supported by NT.**

Because the Madge Networks Ringnode adapter card is not one of those on the list, the “Other” entry is selected from the pull-down list. Click on the Continue button after selecting “Other” as the network adapter card. Windows NT prompts the user to insert a diskette so the program can copy the appropriate files to the NT workstation's disk.

It is at this point that another common problem can occur that makes the installation of some network protocols a challenge. Several adapter card manufacturers distribute drivers for many operating systems on two diskettes. Those diskettes (which are typically labeled 1 and 2) also include a diagnostic program, text files, and other programs that are not applicable for use in a Windows NT environment.

The diskette labels do not, however, explain which disk to use with Windows NT. Only by reading through the manual included with the adapter card can the network administrator determine that the programs required to be used with Windows NT are located in the directory WINNT; however, the manual also fails to note which disk contains the WINNT directory and appropriate files in the directory.

If an adapter card falls into this category and two or more diskettes are packaged with the adapter, first determine the diskette and the directory on the diskette containing the required Windows NT files. This step will save you considerable time and frustration. For example, if a network administrator were using the Madge Smart Ringnode adapter card and inserted disk 1 into drive A in response to the Windows NT prompt, not only are the required files not located there (they are on disk 2) but, in addition, the operating system software will not prompt the user to insert a second disk. Instead, it will prompt the user to insert three of the 22 diskettes included with Windows NT in an attempt to locate network adapter driver software on the Microsoft distribution diskettes. Since you are installing an adapter in the “Other” category, the required drivers will not be located, and any attempt to correctly add the network adapter will fail.

**A Walk Through a Vendor-Specific Setup.**

Once the user enters the correct diskette and specifies the appropriate directory for an adapter card that is not directly supported by Windows NT, it is more than likely that a vendor-specific setup menu comes up next. Although a few vendors provide self-configuration modules; others require the Windows NT user to manually enter several key hardware configuration parameters.

**Exhibit 3** illustrates the Madge Smart Ringnode Setup window that is displayed after the user has inserted the correct disk and drive. The values displayed for the IRQ Level, I/O Loc/Slot, Direct Memory Access Channel, and MaxFrameSize represent default values that may or may not be appropriate.
Madge Smart Ringnode Setup Window with Default Parameters

Running a diagnostic program (if one is furnished by the adapter card manufacturer) before using the Windows NT Network Settings window should provide the correct settings that enable the adapter card's setup program to be correctly configured to match the settings used when the adapter card was originally installed under DOS or a different version of Windows. Otherwise, an inappropriate IRQ level or another incorrect parameter will prevent Windows NT from working in a network environment.

Unfortunately, an incorrect setup parameter that does not match the current adapter card configuration does not generate an appropriate and meaningful error message.

Adding Network Software

Once the adapter card parameter settings are adjusted, the appropriate software can be added through the Network Settings window. In comparison to the potential problems that can be encountered when adding an adapter card that is not directly supported by built-in Windows NT software, the selection of network software is a relatively simple process.

To install NWLink IPX/SPX, select the Add Software button from the Network Settings window. The resulting display is the Add Network Software window. From that window (see Exhibit 4), select the NWLink IPX/SPX Compatible Transport option, which is a built-in software module. Select the Continue button from the Add Network Software window, then the OK button from the Network Settings window.

Installing NWLink IPX/SPX through the Add Network Software Window

Once the protocol software is installed, the next step is to configure NWLink IPX/SPX to associate a network adapter and frame type used on the network with the protocol. Because, for purposes of this example, a Madge Ringnode adapter was previously installed, that card would be selected to be bonded to the transport protocol.

To select the frame type, Windows NT supports an auto-detect feature that allows NWLink to check the frames being passed to the network adapter card the protocol is bound to. Alternately, the network administrator can select from IEEE 802.2, 802.3, and 802.5 frame types.

After the adapter and frame type are selected, Windows NT prompts the user to restart the computer so that the network changes made can take effect.

Connecting to a NetWare Server

Upon restarting the computer, you are ready to initiate network operations. For readers not familiar with the use of Windows NT as a NetWare client, Exhibits 5 and 6 illustrate the connection of a computer using the Microsoft operating system to a NetWare server.

Network Access through File Manager's Disk Menu
Connect Network Drive Window Initiates a Connection to a NetWare Server

Access to a network drive is accomplished through the Disk menu from the File Manager window. Among the options in that menu is the Connect Network Drive option. When this option is highlighted (see Exhibit 5), the NWLink IPX/SPX client software displays a list of known servers. The network administrator can then select a preferred server as well as a drive letter for the first network drive, a path to a particular directory, and the user ID needed to establish a connection to the selected server.

Exhibit 6 illustrates the Connect Network Drive window after the selected server was double-clicked. This window is used to initiate a connection to a desired NetWare server. Here, the SYS directory is selected as the path on the server. Clicking the OK button enables the Windows NT computer to access a specific directory on a NetWare server, in effect converting the Windows NT computer into a client on a NetWare network.

Conclusion

Although the installation of NWLink IPX/SPX is relatively straightforward, the configuration and operation of many adapter cards under Windows NT can be time-consuming, especially if using adapter cards beyond the few Windows NT provides direct support for. Remember, many vendors now charge for support, either requiring calls on a 900 telephone number or asking for a credit card, so the tips presented here can save network administrators time, frustration, and expense.

Author Biographies

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Gilbert Held is director of 4-Degree Consulting, a Macon GA-based high-tech consulting group. He is an internationally recognized author and lecturer. He has written more than 40 books and 300 technical articles and received numerous awards for excellence in technical writing.
Program Manager - GILSPC\gxheld

Control Panel

Settings  Help

Network Settings

Computer Name: GILSPC

Workgroup: WDRKGROUP

Add Network Software

Network Software: NWLink IPX/SPX Compatible Transport

Select the software component you want to install; use <Other> if you have a disk from the vendor.

Description: Madge Smart Ringnode Driver
Connect Network Drive...