

Installing NetWare Client 32 for DOS/Windows

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NetWare Client 32 for DOS/Windows features an improved installation process, including both DOS-based and Windows-based installation programs. This AppNote provides an overview of the NetWare Client 32 Windows-based installation. It also lists the changes that the installation program makes to the workstation's configuration files and Windows support files.

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Introduction

NetWare Client 32 for DOS/Windows features an improved installation process, including both DOS-based (INSTALL.EXE) and Windows 3.1x-based (SETUP.EXE) installation programs. This AppNote provides an overview of installing NetWare Client 32. It also lists the changes that the installation program makes to the workstation's AUTOEXEC.BAT, CONFIG.SYS, STARTNET.BAT, NET.CFG, and Windows support files.

Installing NetWare Client 32 for DOS/ Windows

You can install NetWare Client 32 from either the DOS prompt (using the INSTALL.EXE program) or from within Windows (using the SETUP.EXE program). There are minor differences between the two programs. The explanation in this AppNote will focus on the Windows installation process; the differences in the DOS version are covered later in the AppNote.

Before you install the Client 32 software, ensure that your workstations meet the following hardware and software requirements:

- A 386 processor or higher
- MS DOS 5.x or PC DOS 5.x or above
- Windows 3.1 or Windows for Workgroups 3.11 (optional)
- A VGA or better graphics board and monitor
- A minimum of 4MB of memory (plan on at least 8MB if you run Windows)
- An XMS memory manager (HIMEM.SYS or equivalent)

Note: This AppNote covers how to install NetWare Client 32 on workstations running Windows 3.1. If you are running Windows for Workgroups 3.11, see the README file that comes with the Client 32 software for setup requirements.

Obtaining the NetWare Client 32 for DOS/ Windows Software

The NetWare Client 32 for DOS/Windows software is available for downloading from Novell's NetWire home page on the World Wide Web (WWW), and from NetWire on CompuServe.

From the NetWire WWW Home Page. As of April 20, 1996, you can find the NetWare Client 32 for DOS and Windows 3.1x software on the World Wide Web as follows (as always, this is subject to change at any time). Set your Web browser to <http://support.novell.com> to access the Novell NetWire home page. Then click on What's New (see Figure 1).

Figure 1: The NetWare home page on the World Wide Web.



 **WHAT'S NEW** *(Last Updated: 4/4/96)*
Minimum OS & NLM Update List, Service and Support Options

 **TECHNICAL INFORMATION DATABASE**
Search the same database information that our technicians use.

 **PRODUCT SUPPORT GROUP HOME PAGES**
Novell NetWare Client, Developer Support, GroupWare, Novell Labs

 **FILE UPDATES**
Files, Patches and Drivers for all Novell Products

 **CREATE PROBLEM/SOLUTION DOCUMENT**
Create a Technical Information Document (TID) for inclusion in the NSEPro, WWW and CompuServe.

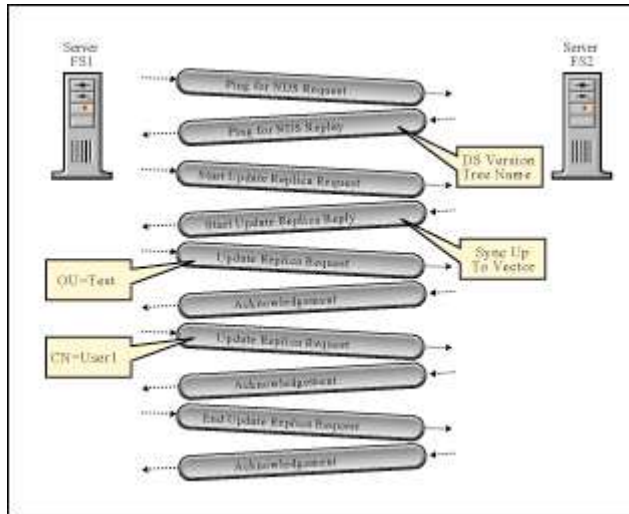
 **NOVELL PROGRAMS**
Novell Novell Labs, NASC, Novell Press, Software Piracy

On the What's New page, click on the line that says "Download Novell's 32-bit Client for Windows 95." This brings you to <http://netware.novell.com/home/client/client32/index.htm>, where you should see the heading NetWare Client 32 with the following two selections:

BETA NetWare Client 32 for DOS and Windows 3.1x BETA
NetWare Client 32 for Windows 95

Click on NetWare Client 32 for DOS and Windows 3.1x to go to the NetWare Client 32 for DOS/Win home page (see Figure 2).

Figure 2: The NetWare Client 32 for DOS/Windows home page.



From there, click on FILE UPDATES. Under the Program Files heading, select "Download NetWare Client 32 for DOS and Windows 3.1x." Scroll down to the Download Areas, where you can choose whether you want to download files for a network install or for a diskette install of Client 32. Click on your choice to begin the download process.

Note: The Updates heading contains links to patches and updates that are available. You should download these as well.

From NetWare on CompuServe. To access the NetWare Client 32 for DOS/Windows software on CompuServe, type GO NWCLIENTS at any CompuServe prompt. Then select "Download NW Client 32 for DOS/Win (Open Beta)" to download the software, along with any patches and updates.

Extracting the Files

The NetWare Client 32 for DOS/Windows files are contained in a self-extracting compressed file that creates a full subdirectory structure as it decompresses. The subdirectory structure should be similar to the following:

```
DOSWIN32 (or whatever name you give the parent directory)
  CLIENT32
  NIOS
  ADMIN
  SYSTEM
  WINDRV
  LANDRV32
  LANDRV16
  TCPIP
  SNMP
  TSA
  NLS
  UNICODE
```

Making Floppy Diskettes

The Client 32 software comes with a MAKEDISK.BAT file that allows you to place the Client 32 files onto floppy disks for installation purposes. To create diskettes, go to where you have extracted Client 32, such

as G:\APPS\DOSWIN32, and type MAKEDISK A: <Enter>. You will see a message similar to the following:

```
*****
This program makes NetWare Client 32 for DOS diskettes.
Make sure you have eight formatted diskettes.
Make sure you have a search drive mapped to your DOS utilities.
To exit at any time hit CTRL-C or CTRL-BRK.
*****
Please insert the first diskette into a:
Press any key to continue . . . .
```

If you have eight formatted diskettes ready and the DOS system directory set in your DOS PATH variable, begin the process by inserting the first diskette into the drive you specified and pressing a key to continue. (If you don't have the diskettes and the PATH variable ready, press Ctrl-C to exit. MAKEDISK uses the XCOPY command, so it must be able to find XCOPY.EXE. When you are ready, start the batch file over again.)

Once the copy process is complete for the first diskette, follow the on-screen prompts to remove the diskette, label it, and insert the next diskette. Proceed to insert the diskettes one by one, naming them as directed on the screen, until you have all of them named. When this process is completed, you will have a set of working diskettes for installing Client 32, labelled as follows:

```
Disk 1 DOS
Disk 1 WIN
Disk 2
Disk 3
Disk 4
Disk 5 LAN Drivers
Admin 1
Admin 2
```

To run the Windows-based Client 32 installation program from the floppy diskettes, place Disk 1 WIN into drive A . From Windows' Program Manager (or equivalent), choose File | Run, and type A:SETUP.EXE. To run the DOS-based installation program, place Disk 1 DOS into drive A or B, change to that drive, and type INSTALL <Enter>.

Installing Client 32 from the Network

The remainder of this AppNote assumes you are performing the Client 32 installation procedure from a network drive. The instructions assume you have extracted the Client 32 files and subdirectory structure onto a network drive.

Note: If you want to perform the client installation on your machines without user intervention, you can use Client 32's Automatic Client Update (ACU) feature. In order for the ACU process to work, the parent directory you create for the Client 32 files must match the one specified in the ACU login script. For more information, see the AppNote entitled "Upgrading Network Workstations with Automatic Client Update (ACU)" in this issue.

Running the Client 32 Windows-based SETUP Program

To give you an overview of the installation process, the following explanation covers installing Client 32 from within Windows from a network drive. First, go into Windows' Program Manager and select Run from the File pull-down menu. In the Command Line box, type the full directory path up to and including the Client 32 SETUP.EXE file (for example, L:\COMMON\DOSWIN32\SETUP.EXE). Then click on OK.

The initial screen for the NetWare Client 32 Installation program is displayed. Click on Continue. After reading the license agreement screen, click on Yes to proceed.

The first screen of consequence is the Directory Locations screen. Here you specify what your target directory is for the Client 32 software and where the files for Windows will go (see Figure 3).

Figure 3: Specify your destination directory locations.

The screenshot shows the LANalyzer for Windows interface. The top window displays a table of network traffic. Below it, a detailed view of an NCP request is shown.

No.	Source	Destination	Layer	Summary	Interpacket Time	Size	Relative Time	Er
1	FS1	FS2	ncp	Req Ping for NDS	0 μs	67	0 μs	
2	FS2	FS1	ncp	Rply Ping for NDS	290 μs	115	290 μs	
3	FS1	FS2	nds	Req Start Update Replica	11 ms	191	11 ms	
4	FS2	FS1	nds	Rply Start Update Replica	12 ms	103	23 ms	
5	FS1	FS2	nds	Req Update Replica (OU=Test)	22 ms	187	45 ms	
6	FS2	FS1	nds	Rply Update Replica	963 μs	79	46 ms	
7	FS1	FS2	nds	Req Update Replica (CN=user1)	18 ms	523	64 ms	
8	FS2	FS1	nds	Rply Update Replica	10 ms	79	74 ms	
9	FS1	FS2	nds	Req End Update Replica	17 ms	195	91 ms	
10	FS2	FS1	nds	Rply End Update Replica	15 ms	71	106 ms	

```

Network: 01 01 B9 5D ----> 01 01 B9 5F
Node:    00-00-00-00-00-01 ----> 00-00-00-00-00-01
Socket:  0x4023 ----> NCP
ncp: ===== NetWare Core Protocol =====
NCP Request: Ping for NDS
Request Type: 0x2222 (Request)
Sequence Number: 209
Connection Number Low: 3
Task Number: 0
Connection Number High: 0
Function Code: 104
Subfunction Code: 1
Version: 0
Request Flags: 0x0002000E
  
```

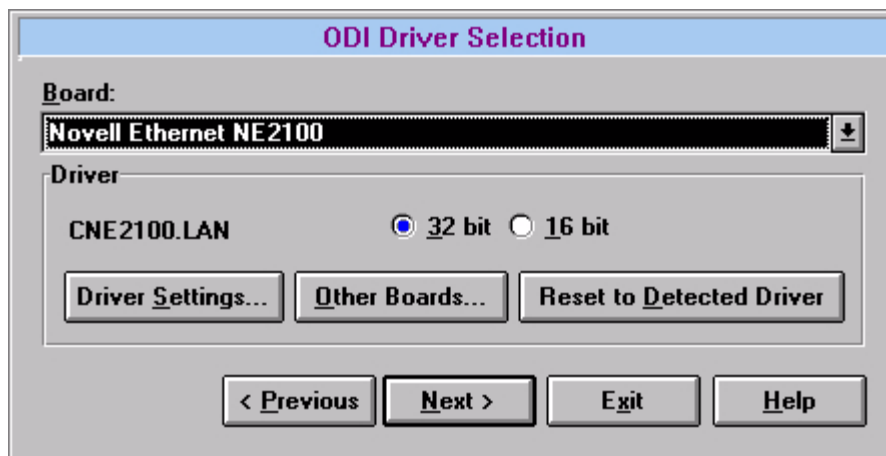
The Target Directory is where the Client 32 files will be copied on the workstation; Windows Directory is where the Windows files are located. For a new installation, the defaults are C:\NOVELL\ CLIENT32 for the Target Directory and wherever Windows loaded from for the Windows Directory (C:\WINDOWS in the above example). You can choose different Target and Windows directories by typing in different directory

locations. Or click on the "..." button to the right of the entry boxes to browse your drives and select another directory. Click on the *Next>* button to continue.

Selecting a LAN Driver

In the Windows installation procedure, you next see the ODI Driver Selection screen (see Figure 4).

Figure 4: The network board/LAN driver configuration screen.



Note: This part of the installation is slightly different when running the DOS-based INSTALL.EXE. See the subheading "What's Different in the DOS Install" later in this AppNote for details.

The installation program checks to see if you are already running on a network. If you are, it selects an appropriate LAN driver for the currently-installed network board. The installation program also talks to the loaded NIOS or LSL to find out which NET.CFG file was used when loading the previous client software. Once it knows which file to use, the install program parses that NET.CFG for pertinent information on network board settings, TCP/IP and NetWare/IP information, and information about SNMP or TSA configurations. This information is then used to build a new NET.CFG file that is placed in the target directory, along with the new Client 32 software.

If the workstation is not currently attached to the network, the installation program looks in the following three locations on the local hard drive for an existing NET.CFG file:

- The current Target Directory
- NOVELL\CLIENT32
- NWCLIENT

If the program can't find a NET.CFG, you will need to type in all of the configuration information when prompted.

Automatic Board/Driver Selection. In the Board entry box, you will see a selection matching the network board you have installed. Under the Driver section of the window is the LAN driver for that board. Client 32

supports the C-code 32-bit .LAN drivers that come with the client software, some assembly-based 32-bit .LAN drivers that ship with NetWare 4.1, and the 16-bit .COM drivers that ship with Client 32 or that work with the NetWare DOS Requester software. (See the "LAN Drivers for Client 32" subheading in the "NetWare Client 32 for DOS/Windows: Architecture and Features Overview" AppNote in this issue for a discussion of the various types of LAN drivers that are available for use with Client 32.)

If the installation program can find a 32-bit driver to match your installed board, you will see the board and LAN driver listed in the ODI Driver Selection window. If it cannot find a 32-bit driver match in its list of certified LAN drivers, the installation program will prompt you to load a driver from another location (such as drive A).

If you are using a 32-bit .LAN driver, you should have an .LDI (LAN Driver Initialization) file to go with the driver. This file contains valid settings that the driver can use, as well as other information provided by the manufacturer about the driver. Client 32 reads the driver information (including the filename itself) from within the .LDI file, so the .LDI filename must match the name designated inside the .LDI for it to work.

If you are using a 16-bit LAN driver, you should have an .INS file that contains configuration information about the 16-bit .COM driver.

Selecting a Third-Party LAN Driver. If the board and driver you are using is not listed but you have the driver and support file, click on the Board entry box and select "User Supplied Driver" from the resulting list. Select if the driver is 32-bit or 16-bit, and then click on the *Next>* button. You will see the ODI Driver Path window, where you must enter the full directory path and filename of the ODI driver you are using.

Note: If your board's LAN driver didn't come with an .LDI or .INS file, contact the board manufacturer to obtain one.

You will then see the Select a Board window with a list of boards to choose from. Select the correct board and click on *OK*. You will then be returned to the ODI Driver Selection window with User Supplied Driver in the Board entry box and the name of the driver under the Driver entry. Click on *Next>* to go to the next screen.

Setting Additional Options

As shown in Figure 5, the installation program next displays the Additional Options window, where you specify whether you want to install support for the following:

- TCP/IP and/or NetWare/IP
- Simple Network Management Protocol (SNMP) and a Host MIB
- A Target Service Agent (TSA) for NetWare's Storage Management Services (SMS)

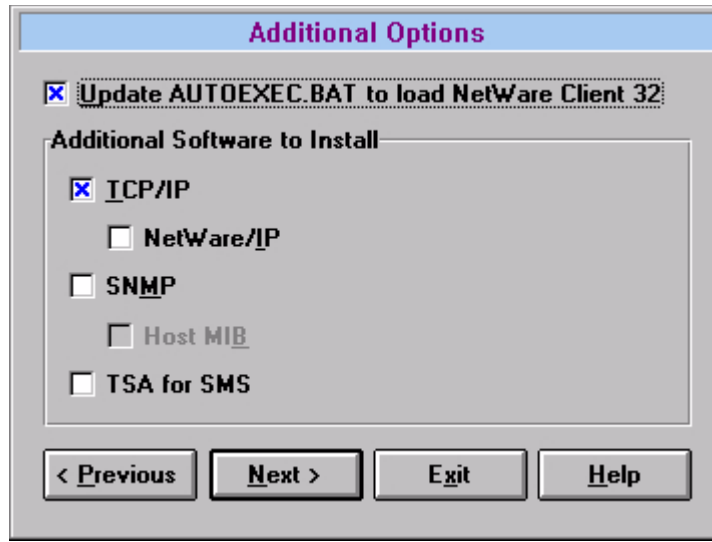
Note: The Windows-based installation program assumes you are installing Client 32 support for both DOS and Windows, so these options are not listed in the Additional Options window.

Updating the AUTOEXEC.BAT. The first entry specifies whether you want the installation program to update the AUTOEXEC.BAT so that it will load NetWare Client 32. To do this, the installation program adds these two lines to the AUTOEXEC.BAT file:

```
PATH C:\NOVELL\CLIENT32\;%PATH%
@CALL C:\NOVELL\CLIENT32\STARTNET
```

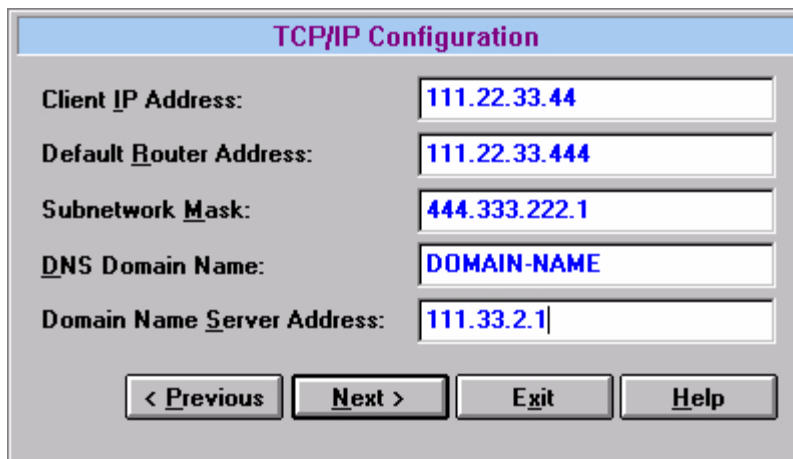

The call to the STARTNET.BAT file is placed at the bottom of the AUTOEXEC.BAT file. If you want to place this call somewhere else, either allow the installation program to make the changes, then move the @CALL line using a text editor, or unclick the "Update AUTOEXEC.BAT..." option and manually perform the deed.

Figure 5: The Additional Options window.



TCP/IP Configuration. If your workstation was already set up for TCP/IP connectivity, the TCP/IP box will already be selected. With this option selected, you will see the TCP/IP Configuration window when you click on *Next>* to proceed (see Figure 6). Here you need to fill in the information about Client IP address, router address, subnetwork mask, and DNS domain name.

Figure 6: The TCP/IP Configuration window.



If your TCP/IP information is contained in an existing NET.CFG file in the current Target Directory, in C:\NOVELL\CLIENT32, or in C:\NWCLIENT, the installation program will read the TCP/IP settings and place them into the TCP/IP Configuration window for you. However, if your TCP/IP settings are in a NET.CFG file in some other directory, you will have to type in the TCP/IP information manually. Note that you cannot supply more than one router address on the Default Router Address line, but you can add additional addresses later.

Note: If you change the TCP/IP configuration in INSTALL, the BIND statements in the TCPIP section of the NET.CFG file are not updated. You'll need to make the changes manually.

If the workstation's TCP parameters are dynamically determined by programs such as BOOTP, DHCP, or RARP, leave the screen blank and move on. If you put spaces in the address slots, the installation program won't pull the information into its proper places. Simply proceed to the next screen.

NetWare/IP Configuration. If you have selected to install support for NetWare/IP, you will see the NetWare/IP Configuration windows after you have completed the information in the TCP/IP window and clicked on the *Next>* button. Fill in the NetWare/IP Domain Name, the IP address of the Preferred DSS, and the Nearest NWIP Server address for workstation access. Click on the *Next>* button to proceed to the next installation supplement that you have chosen, or to the actual Client 32 installation portion of the program.

SNMP Configuration. If you have selected to install support for configuring SNMP, you will see a window similar to the one in Figure 7.

Figure 7: The SNMP Configuration window.

The screenshot shows the 'SNMP Configuration' dialog box. It features a title bar with the text 'SNMP Configuration'. Below the title bar, there are three text input fields: 'Workstation Name' containing 'My Station', 'Workstation Location' containing 'At My Desk', and 'Contact Name' containing 'SNMP Wizard @ 415 677-3998'. Underneath these fields is a section titled 'Trap Target Addresses:'. This section contains two columns of text input fields. The left column is labeled 'IPX Addresses' and contains the text '10101013:801B1677536'. The right column is labeled 'IP Addresses (Needs TCP/IP):' and is currently empty. Between these two columns are two buttons: 'Add...' and 'Remove'. At the bottom of the dialog box, there are four buttons: '< Previous', 'Next >', 'Exit', and 'Help'.

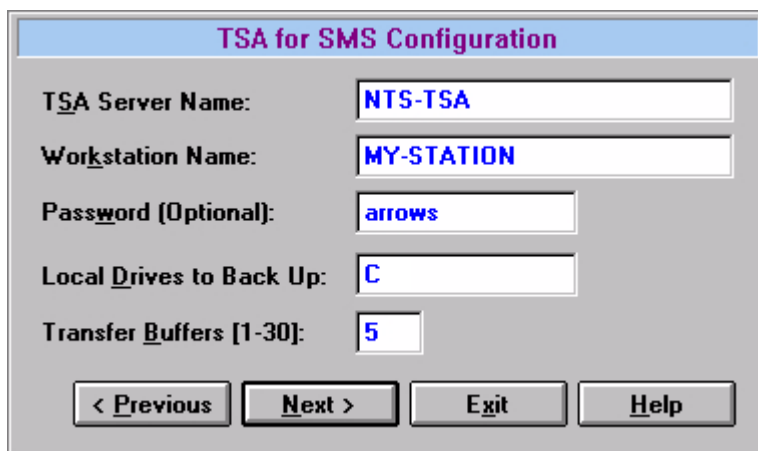
In this window, you need to fill in the Workstation Name, which identifies the computer; the Workstation Location, which describes the location of the computer (in 80 characters or less); and the Contact Name so you know who is supporting this computer. You also need to fill in the network addresses of the SNMP

management consoles for the Trap Target Addresses. If the SNMP console is running on IPX, type in the IPX addresses needed in the IPX window. If the console is running on IP, type in the appropriate addresses in the IP window (you will need to be running TCP/IP to communicate appropriately to IP consoles).

If you have selected to install support for host resources for the MIB (Management Information Base), the next window allows you to add local devices, such as a printer or modem, to that database. Click on the *Add* button, type in the information that you want to include, and click *OK*. Then in the Directory Level to Search from Root entry, type the number of directories away from the root directory you want the SNMP agent to scan for installed software. If you want SNMP to scan for additional paths that are more level away than you designated earlier, put those in under the Additional Search Paths field. Click *Add*, type in the directory that you want SNMP to inventory, and click *OK*. Once you are finished, click the *Next>* button to move to the next installation supplement screen or to the actual Client 32 installation portion of the program.

TSA Configuration. If you selected support for the Target Service Agent (TSA) for Storage Management Services (SMS), you will see the TSA for SMS Configuration window, similar to the one in Figure 8.

Figure 8: Setting up TSA for SMS support.



TSA for SMS Configuration	
TSA Server Name:	NTS-TSA
Workstation Name:	MY-STATION
Password (Optional):	arrows
Local Drives to Back Up:	C
Transfer Buffers [1-30]:	5
< Previous	
Next >	
Exit	
Help	

In this screen, you first select the backup server that is running the `tsa_sms.nlm` for SBACKUP or equivalent backup software. Then enter a name for your workstation. This can be any name that identifies your workstation and is different from all other workstations in your office or on the network. It's best to keep these names simple, yet unique.

The third entry allows you to (optionally) set up a password for SBACKUP access. Be sure to coordinate any passwords you set here with the network administrator so that he or she will know which password to use to access the workstation when running the SBACKUP procedure.

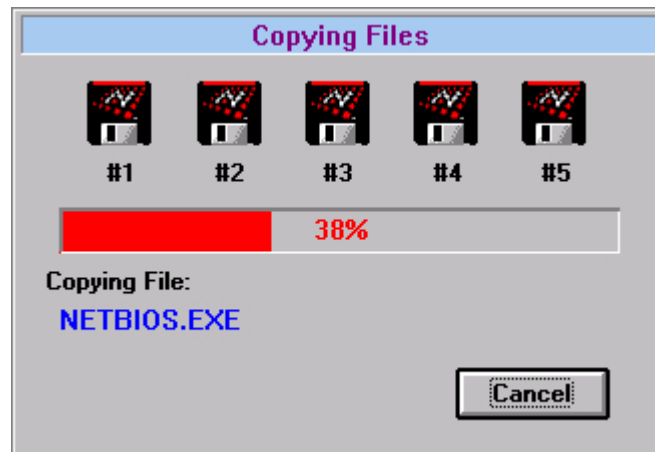
The *Local Drives to Back Up* entry lets you specify the local hard disk drives you want to back up. Click in this field or press <Enter> to see a list of local disk drives that you can select from (at least drive C should be selected). Just the drive letters should be entered (no colons or slashes), separated by spaces or commas.

The *Transfer Buffers* entry can be set from 1 to 30 buffers. Each buffer matches the size of the network protocol you are running and is memory reserved for storing data before it is sent over the network. If you are using Ethernet, each buffer adds about 1.5KB; if you are using Token Ring, it is 4KB per buffer. If you want to speed up file transfers, set this number between 5 and 10.

Copying the Client 32 Files

Once you have set the additional options, the installation program begins copying the files for install Client 32 software to the workstation. Figure 9 shows the screen that is displayed while the files are being copied.

Figure 9: The actual installation process.



Once the process is completed, you can either reboot your computer so the installation will take effect, or you can return to Windows or to DOS so you can then reboot.

What's Different in the DOS Install

There are a couple of important differences between the two installation programs. The first difference is that after you read the license agreement, you see a screen that allows you to select which installation options you want. In the DOS-based installation program, the Client 32 for DOS and Client 32 for Windows options are selected by default, but you can unselect them if you need to. The additional options are the same ones you see the Windows-based installation's Additional Options window shown in Figure 5.

Customize Windows Support

If you choose to install support for Windows, the DOS version allows you to add customized support for Windows, which involves country codes, as well as shared Windows support for network administrators (see Figure 10).

Figure 10: The Customize Support for Windows screen.

Customize Support for Windows

Country codes determine the time and date display format and other locale specific information.

Do you plan to use more country codes than the one currently running on your machine? (Y/N): No

For network administrators only: Do you want to set the shared Windows path? (Y/N): Yes

Enter the path to the shared Windows directory:

G:\APPS\WINSHARE_

The drive to this path must be mapped and you must have rights to create files and directories in this path.

Esc=Go Back Enter=Edit/Select F10=Save/Continue Alt-F10=Exit

Country Codes. The first question asks if you plan to use more than one set of country codes. If you answer No, INSTALL copies only one set of Unicode files into the \NLS subdirectory under the \NOVELL\CLIENT32 and \WINDOWS directories. This saves installation time and disk space. Otherwise, INSTALL will copy all of the Unicode tables to the \NLS subdirectories.

The DOS INSTALL program uses the `COUNTRY=CountryName` parameter in the config.sys file to decide which set of Unicode files to copy. If there is no COUNTRY parameter specified, the DOS Requester defaults to ENGLISH as its primary table selection and places only the *.001 Unicode files in the \NOVELL\CLIENT32 and \WINDOWS directories (unless specified otherwise).

Below is a list of the three-digit numerical extensions for Unicode files (each country is assigned a specific extension):

- 001 = US English and Canadian English
- 002 = Canadian French
- 031 = Netherlands
- 032 = Belgium
- 033 = France
- 034 = Spain
- 039 = Italy
- 041 = Switzerland
- 044 = United Kingdom
- 045 = Denmark
- 046 = Sweden
- 047 = Norway
- 049 = Germany
- 061 = Australia

081 = Japan
351 = Portugal
358 = Finland

Language support for DOS is not handled by the Unicode files. The *NWLanguage* DOS variable placed in the startnet.bat file defines the language in which you see the DOS utilities, errors, and other messages displayed. The following is a list of the languages that will be available for NetWare:

ENGLISH
FRANCAIS
DEUTSCHE
ITALIANO
ESPANOL

Shared Windows Directory. The second question under the "Customize Support for Windows" screen is for network administrators who have set up a shared Windows directory using the `SETUP /A` option when they installed Windows on a network drive. This only needs to be done once for all users who will access the shared copy of Windows. Users can then run `SETUP /N` to set up individual files (about 300 KB) either locally or in a personal Windows directory on the network (such as `G:\USERS\ED\WINDOWS`), while they access the shared Windows directory on the network for the rest of Windows.

The question that you see is "Do you want to set the shared MS Windows path?" with the default of NO. If you choose "Yes," you will be asked to enter the path to the shared directory, such as `G:\APPS\WINSHARE`. You must have rights to create files and directories in the path specified.

With the proper directory path in place, the Client 32 INSTALL program copies the necessary files that are shared into the selected directory. Then INSTALL modifies only the .INI files that are copied locally or in the personal Windows directory of those users who have run the `SETUP /N` command and that Client 32 finds in the workstation's local Windows directory.

When you are finished, press <F10> to save your changes and return to the INSTALL window.

Additional DOS Installation Options

Configuring SNMP Parameters. The Configure SNMP Parameters screen for DOS is fuller than the one in the Windows install program (see Figure 11).

Figure 11: The Configure SNMP Parameters screen.

Configure SNMP Parameters

```

Enable Monitor Community: SPECIFIED
Monitor Community:
Enable Control Community: OFF
Control Community: PUBLIC
Enable Trap Community: SPECIFIED
Trap Community: PUBLIC
User Name: SUZANNE MORLEY X893
Workstation Location: BUILDING 2
Net Supervisor: SUZANNE@COMPANY.COM
Enable Trap Message: OFF
  
```

Hit the Enter key to bring up a listbox of valid values for the SNMP Enable Monitor Community.

Esc=Go Back Enter=Edit/Select F10=Save/Continue Alt-F10=Exit

The DOS Install allows you to enable a monitor community, for which you can select any community, specify a particular community, or turn off the monitor community option. If you choose Any or Specified, you will need to specify from which monitor community you wish to have this workstation monitored. You can also enable a control community, which you can select any control community, specify a particular community, or turn off the control community option. If you choose Any or Specified, you will need to specify from which control community you wish to have this workstation monitored (PUBLIC is the default).

You can also enable a trap community, which you can specify a particular trap community or turn off the trap community option. If you choose Specified, you will need to specify from which trap community you wish to have this workstation monitored. The User Name entry is the same as the Windows Workstation Name entry, and the Net Supervisor entry is the same as the Contact Name entry in Windows.

In the Configure HOSTMIB Parameters, the DOS install separates the different printer, modem, and tapedrive names into their own entries. Simply fill in the blanks according to what the workstation has for resources and continue. The Directory Search Depth and Directory Search Path entries correspond to Window's Directory Level To Search from Root and Additional Search Paths entries.

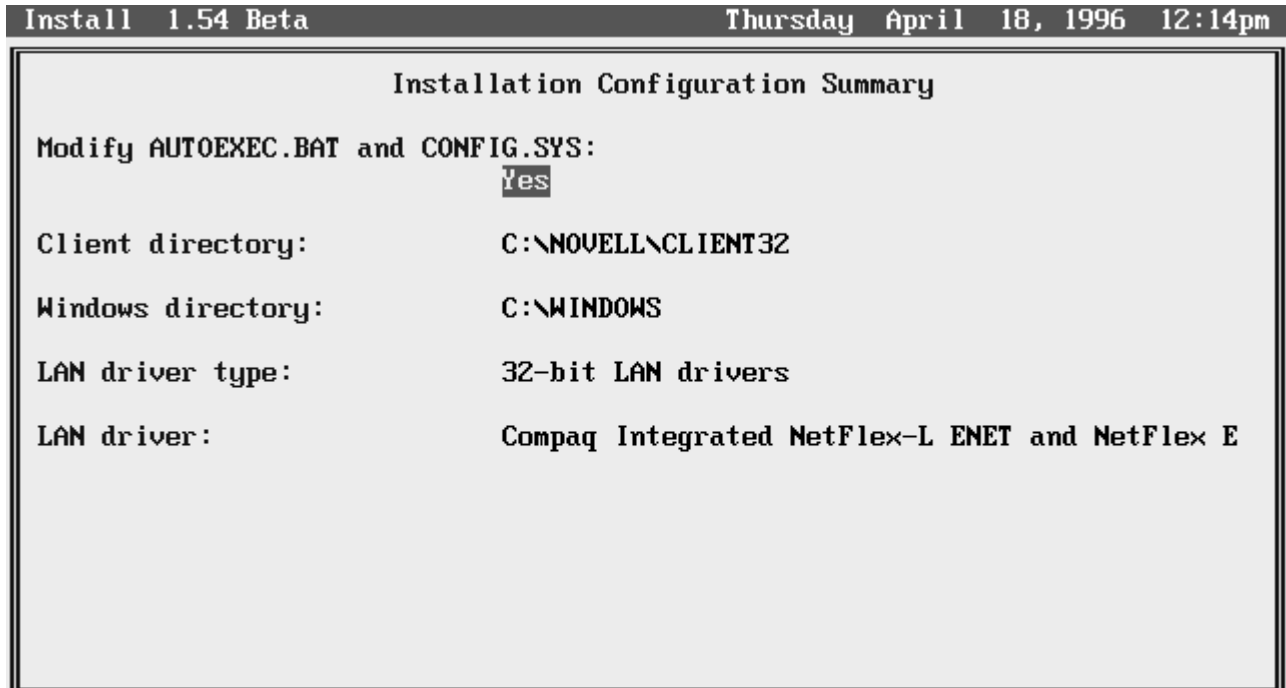
LAN Board/Driver Selection. The last difference between the two install methods is that the DOS Install program selects the LAN driver last, whereas the Windows Setup program performs this function first. However, the functionality of auto-detecting boards and drivers is the same for both versions. INSTALL looks for an installed network board and automatically selects a 32-bit .LAN driver for the board if it finds one in its list of certified drivers. It then displays the Installation Configuration Summary screen, which is explained below.

If INSTALL cannot find a 32-bit LAN driver match, you will see a prompt asking if you want a 32-bit or 16-bit LAN driver. Choose the type of driver you have, and then specify where the driver is located as prompted (A:\ is the default path). Insert the diskette containing the LAN driver you want to load, or specify the directory where the LAN driver and .LDI or .INS files are located.

Installation Configuration Summary Screen

After you have configured everything else, you will see the Installation Configuration Summary screen (see Figure 12).

Figure 12: The Installation Configuration Summary screen.



If you answer No, the changes will be written to AUTOEXEC.NEW and CONFIG.NEW in the destination directory.

Esc=Go Back Enter=Edit/Select F10=Save/Continue Alt-F10=Exit

The first line in the Installation Configuration Summary screen, Modify AUTOEXEC.BAT and CONFIG.SYS, is set to Yes by default. If you keep the default setting, the INSTALL program will make changes to these configuration files.

In the AUTOEXEC.BAT file, the INSTALL program adds these two lines:

```
PATH C:\NOVELL\CLIENT32\;%PATH%
@CALL C:\NOVELL\CLIENT32\STARTNET
```

By default, the INSTALL program creates a \NOVELL\CLIENT32 directory at the root of drive C and places the NetWare Client 32 files in that directory. It then places the Unicode files in the \NLS subdirectory, and the proper *.MSG (message) files in the \NLS\ENGLISH subdirectory (or the subdirectory that corresponds to the language you selected). INSTALL also adds the CLIENT32 directory to the DOS PATH, and then AUTOEXEC.BAT calls the STARTNET.BAT file to load the client software.

INSTALL checks the following two settings in the CONFIG.SYS file:

Files = 35
Buffers = 20

If the settings are already higher than these minimum values, they will not be affected. Because the NetWare Client 32 for DOS/Windows does not use DOS's internal tables as the NetWare DOS Requester does, it ignores the LASTDRIVE parameter and the /E: environment space settings on the SHELL line in CONFIG.SYS.

The NetWare Client 32 for DOS/Windows requires DOS to be loaded into the High Memory Area (HMA). Be sure to include the DOS=HIGH command in the CONFIG.SYS file. If you selected Windows support, INSTALL also makes some changes to the WIN.INI, PROGRAM.INI, and SYSTEM.INI files, as covered under the "Changes to Windows Support Files" subheading.

The screen also displays the directory to which the client files will be copied and the Windows directory. You can change these defaults if you need to.

The next two lines indicates which type of LAN driver (32-bit or 16-bit) and network board were automatically selected for the network interface board found in the workstation.

After making changes or accepting the selections, press <F10> to continue. INSTALL will copy the files to the designated directories. Once the files are copied, INSTALL prompts you to reboot the workstation.

Changes to the Workstation's Configuration Files

In both installation programs, the installation procedure tries to read current information from whatever NET.CFG file the NIOS or LSL is using. It then uses that information to build a new NET.CFG that is copied into the C:\NOVELL\CLIENT32 directory. The installation program also creates a STARTNET.BAT file that is placed in the C:\NOVELL\CLIENT32 directory. The following sections describe these changes in more detail.

Changes to the STARTNET.BAT File

Depending on what type of LAN drivers and protocols you are loading, the STARTNET.BAT will look similar to the following (this example loads both IPX and TCP/IP protocols and support NLMs):

```
SET NWLANGUAGE=ENGLISH
C:\NOVELL\CLIENT32\NIOS.EXE
LOAD C:\NOVELL\CLIENT32\LSLC32.NLM
LOAD C:\NOVELL\CLIENT32\CMSM.NLM
LOAD C:\NOVELL\CLIENT32\ETHERTSM.NLM
LOAD C:\NOVELL\CLIENT32\CNE2000.LAN FRAME=ETHERNET_802.2 INT=3 PORT=300
RETRIES=5
LOAD C:\NOVELL\CLIENT32\CNE2000.LAN FRAME=ETHERNET_II INT=3 PORT=300
RETRIES=5
LOAD C:\NOVELL\CLIENT32\TCPIP.NLM
LOAD C:\NOVELL\CLIENT32\IPX.NLM
LOAD C:\NOVELL\CLIENT32\CLIENT32.NLM
```

The first line in STARTNET.BAT sets the language variable for the workstation to English (since the NetWare Client 32 for DOS/Windows is language-aware). The first module to be loaded is NIOS.EXE, then the client-based NLMs and LAN drivers. Note that after NIOS loads, the command format changes to match the way NLMs are loaded on a NetWare server. You use the same syntax as in the server's

AUTOEXEC.NCF file, with LOAD and UNLOAD commands used to initialize and uninstall NLMs and NetWare LAN drivers.

The NetWare Client 32 LSL module (LSLC32.NLM) is loaded after NIOS, followed by the C-based Media Support module (CMSM.NLM). The STARTNET.BAT file then loads the topology support module for your network. The network topology in this example is Ethernet, so the ETHERTSM.NLM module is loaded for Ethernet support.

Next, the STARTNET.BAT file loads the CNE2000.LAN driver, which is a C-based version of the NE2000.LAN server driver. Note that 32-bit drivers do not use NET.CFG for configuration settings such as frame type, interrupt, I/O port, and retries. These settings are specified in the LOAD command. (The entire command should be on the same line in the batch file, or it should be no more than 128 characters long per line.)

If needed, you can load the LAN driver for multiple frame types and bind IPX to each of them. In this example, the CNE2000.LAN driver is loaded twice to bind the board to the two frame types needed for IPX and TCP/IP communications. However, the NetWare Client 32 does not have built-in router code as the NetWare server does.

After loading the CNE2000.LAN driver and specifying the configuration settings, the STARTNET.BAT file loads the transport protocols TCPIP.NLM and IPX.NLM in this example. The last module loaded is the NetWare Client 32 Requester itself (CLIENT32.NLM).

Example STARTNET.BAT for 16-bit LAN Driver. If you select a 16-bit LAN driver, different network connectivity modules are loaded in the STARTNET.BAT file:

```
SET NWLANGUAGE=ENGLISH
C:\NOVELL\CLIENT32\NIOS.EXE
C:\NOVELL\CLIENT32\N16ODI.COM
C:\NOVELL\CLIENT32\NESL.COM
C:\NOVELL\CLIENT32\NE2000.COM
LOAD C:\NOVELL\CLIENT32\LSLC32.NLM
LOAD C:\NOVELL\CLIENT32\PC32MLID.NLM
LOAD C:\NOVELL\CLIENT32\IPX.NLM
LOAD C:\NOVELL\CLIENT32\CLIENT32.NLM
```

N16ODI.COM is a 16-bit shim module that prevents driver locking when the 16-bit driver talks to the 32-bit components above it, and vice versa. NESL.COM is the NetWare Embedded Support Layer module that allows calls for PCMCIA and Plug-and-Play hardware to get to the driver. The NE2000.COM driver reads its configuration parameters from the NET.CFG file, as in the previous 16-bit NetWare clients. PC32MLID.NLM is a shim for connecting 16-bit LAN drivers into the 32-bit client.

Changes to the NET.CFG File

Because 32-bit LAN drivers read their configuration information from STARTNET.BAT, this changes which information is read from the NET.CFG file. Below is an example NET.CFG file for Client 32 using a 32-bit driver:

```
Link Driver NE2000
(NOTE: 32-bit driver settings are found in the STARTNET.BAT file, and the settings below are
ignored.)
```

```

Frame Ethernet_II
Frame Ethernet_802.2
Protocol IPX E0 ETHERNET_802.2

NetWare DOS Requester
First Network Drive = F
NETWARE PROTOCOL = NDS, BIND
Preferred Server = NRD
Preferred Tree = NOVELL_INC
NAME CONTEXT = "NR.ESD.SALES.NOVELL"
CONNECTIONS = 16
PRINT HEADER = 100
PRINT TAIL = 100

Protocol IPX
IPX SOCKETS 40

Protocol TCPIP
PATH TCP_CFG C:\WINDOWS
IP_ADDRESS 111.222.332.44 LAN_NET
IP_NETMASK 111.222.333.4
IP_ROUTER 111.22.33.444
BIND CNE2000 #1 ETHERNET_II LAN_NET
ip_address n.n.n.n PPP_NET
Bind NCOMX #1 PPP PPP_NET

```

Client 32 for DOS/ Windows reads the NET.CFG file a little differently than the NetWare DOS Requester does. For example, the Link Driver entries are not used for the 32-bit IPX.NLM. Instead, the NetWare Client 32 uses the driver settings specified in the LOAD command, as shown in the example STARTNET.BAT file. Therefore, 32-bit LAN drivers do not look at the information in NET.CFG.

The TCPIP.NLM, on the other hand, does look in the NET.CFG for the TCP/IP information found under the Protocol TCPIP heading. (The frame type is read from the STARTNET.BAT file when the LAN driver initializes.) If you are loading TCP/IP, you should check the IP address to ensure that it is correct. Also, make sure that the LAN driver name in the BIND line under Protocol TCPIP matched the LAN driver name that is configured in STARTNET.BAT's LOAD command.

The NetWare Client 32 for DOS/Windows also changed the IPX Sockets entry under the Protocol IPX heading in the NET.CFG file. You can change a number of other NET.CFG parameters as well. These are covered in the AppNote entitled "Setting NET.CFG Parameters through the NWSETUP Utility" in this issue.

Changes to the Windows Support Files

If you allow the Client 32 installation program to include Windows support, the program modifies the progman.ini, win.ini and system.ini files, but keeps copies of the originals with a *.OLD extension. The changes you see here depend on how much NetWare support you are already using.

PROGMAN.INI. Changes to progman.ini are the addition of a NW.GRP line to the [Groups] heading and placing that group in the Order line.

WIN.INI. The only change to win.ini is the addition of a LOAD NWPOPUP.EXE line under the [Windows] heading.

NETWARE.INI. If you enable the Hot-key aspect, the only change to netware.ini is the addition of a HotKeyEnabled=1 line under the [options] heading. This file is empty until you enable a Hot-key.

SYSTEM.INI. Changes to the system.ini file are as follows:

```
[boot]
network.drv=NETWARE.DRV

[boot.description]
network.drv=Novell NetWare (v4.0)

[386Enh]
network=*VNETBIOS,VNETWARE.386
```

The Windows-based installation for Client 32 removes all instances of DOSNET, VTCPIP.386, and VIPX.386. Setup then removes the Device=VTCPIP.386 line from the [386 Enh] section. The installation program does nothing with VNETBIOS. If the line is already in the workstation's SYSTEM.INI file, it will still be there once the Client 32 installation is complete.

If you are using a 16-bit LAN driver rather than a 32-bit LAN driver, Setup appends the following line in the [386 Enh] section:

```
Device = VLANINT.386
```

For Windows for Workgroups 3.11 workstations, Client 32 setup adds the following line to the [boot] section:

```
secondnet.drv=netware.drv
```

Setup also adds the following line to the [boot.description] section:

```
secondnet.drv=Novell NetWare (v4.0)
```

Files Copied to the Workstation

The exact files that are copied to the Client 32 workstation depend on which Client 32 support options you selected during installation. The list below was generated after installing Client 32 with DOS and Windows support, plus all of the additional options you can choose within the installation process: TCP/IP, NetWare IP, SNMP, and TSA. The example below is for a workstation with an NE2000 network board, so other LAN drivers are not shown.

This listing is based on the first Beta release of the NetWare Client 32 for DOS/Windows. Some of the dates, times, and file sizes will undoubtedly change in subsequent releases of the NetWare Client 32 for DOS/Windows software.

Files Copied to C:\NOVELL\CLIENT32 and Below

```
Directory of C:\NOVELL\CLIENT32
AUTOEXEC NEW          1,129 02-01-96   4:51p
CLIENT32 NLM          452,864 03-21-96  11:11a
CMSM NLM              56,993 03-11-96   2:32p
CNE2000 LAN           13,147 02-13-96  11:07a
CNE2000 LDI           10,980 01-05-96   1:26p
CONFIG NEW            1,060 02-01-96   4:51p
DOSNP EXE             10,773 03-18-96   3:40p
```

ETHERTSM	NLM	14,411	03-11-96	3:40p
FDDITSM	NLM	14,624	03-11-96	3:51p
HOSTMIB	NLM	54,909	01-26-96	9:15a
IPX	NLM	113,726	03-19-96	9:09a
LGNW3116	DLL	199,970	01-25-96	4:12p
LOGINW31	DLL	558,080	01-26-96	12:10p
LOGINW31	EXE	4,544	02-14-96	10:54a
LSL	COM	18,356	01-10-96	12:16p
LSLC32	NLM	18,571	02-27-96	10:31a
N16ODI	COM	8,959	02-27-96	2:39p
NBIHW	CFG	32	04-09-96	6:18a
NE2000	COM	23,505	11-27-95	3:05p
NE2000	INF	18,336	11-14-95	2:45p
NE2000	LAN	7,841	10-02-95	2:41p
NESL	COM	9,696	01-10-96	1:51p
NET	BNW	406	02-08-96	6:09p
NET	CFG	327	02-23-96	1:37p
NETBIOS	EXE	24,514	09-01-95	11:49a
NIOS	DRV	7,680	12-21-95	7:03a
NIOS	EXE	239,392	03-13-96	2:18p
NMR	NLM	11,448	01-30-96	5:06p
NWICFG	NLM	3,611	01-26-96	9:08a
NWIP	NLM	51,506	03-18-96	8:01a
PC32MLID	LAN	31,509	02-27-96	12:45p
PCNTNW	LAN	21,005	11-16-94	2:20a
PCNTNW	LDI	9,778	04-01-96	9:13a
PDOSETH	COM	22,961	02-27-96	2:09p
PDOSFDDI	COM	23,054	02-27-96	2:09p
PDOSMLID	NLM	12,110	02-27-96	8:05p
PDOSTOK	COM	23,667	02-27-96	2:09p
PHASERS	WAV	11,114	12-01-94	3:14p
README	TXT	13,476	03-21-96	1:38p
READSNMP	TXT	36,700	06-21-94	6:08p
SAMPCFG	WRI	6,016	05-01-95	8:03a
SNMP	NLM	53,712	01-07-96	2:32p
SNMPIPX	NLM	8,257	01-07-96	2:58p
SNMPUDP	NLM	6,414	01-07-96	2:52p
SPX_SKTS	NLM	38,223	01-24-96	1:30a
SROUTE	NLM	9,339	02-27-96	12:13p
STARTNET	ALL	590	04-01-96	2:27p
STARTNET	BAT	290	04-01-96	2:35p
STARTNET	BNW	122	02-08-96	6:09p
TCPIP	NLM	208,362	03-19-96	3:39p
TOKENTSM	NLM	16,439	03-11-96	3:50p
TSASMS	COM	21,403	03-07-96	2:40p
WINSOCK	DLL	62,464	03-19-96	3:39p
WLIBSOCK	DLL	46,266	10-01-95	5:07p

Directory of C:\NOVELL\CLIENT32\NLS

(no files)

Directory of C:\NOVELL\CLIENT32\NLS\ENGLISH

CMSM	MSG	3,275	02-27-96	10:13a
ETHERTSM	MSG	913	03-11-96	3:40p
FDDITSM	MSG	925	02-27-96	11:55a
HOSTMIB	MSG	1,095	12-11-95	3:59p
LOGIN	DAT	56,832	01-05-96	3:13p
LOGIN	MSG	11,511	01-12-96	8:16a
LOGINW31	HLP	22,263	10-09-95	11:19a
LSL	MSG	3,596	01-10-96	12:14p
LSLC32	MSG	2,048	02-27-96	10:31a
NESL	MSG	1,134	01-10-96	1:50p
NWCFGDW	HLP	161,881	03-15-96	4:26p
NWMSGDW	HLP	148,536	02-16-96	1:32p
PC32MLID	MSG	6,217	02-27-96	12:44p
PDOSMLID	MSG	1,694	02-27-96	8:05p
SETUP	HLP	148,766	03-21-96	9:57a
SNMP	MSG	3,816	07-20-95	5:46p
SNMPIPX	MSG	970	08-16-95	10:11a
SNMPUDP	MSG	817	08-16-95	2:59p
TCPIP	MSG	4,437	03-19-96	3:38p
TOKENTSM	MSG	985	02-27-96	11:44a

Directory of C:\NOVELL\CLIENT32\TCP

(no files)

Additional .HLP and MSG files also added to the \ENGLISH directory, depending on which installation options you select.

Files Copied to C:\WINDOWS and Below

Directory of C:\WINDOWS\SYSTEM

CALWIN16	DLL	102,213	03-06-96	9:20a
CLNWIN16	DLL	63,641	03-05-96	9:40p
CLXWIN16	DLL	7,011	02-21-96	11:43p
CTL3D	DLL	20,976	06-13-95	9:03a
CTL3D32	DLL	26,624	09-16-95	12:30a
CTL3DV2	DLL	27,632	09-09-95	3:15a
LOCWIN16	DLL	58,435	02-21-96	5:44p
NCPWIN16	DLL	138,275	03-06-96	3:53a
NETWIN16	DLL	175,861	03-06-96	11:37a
NWCALLS	DLL	147,856	02-14-96	12:56p
NWGDI	DLL	119,792	01-16-96	4:48a
NWIPXSPX	DLL	41,088	01-09-96	2:17p
NWLOCALE	DLL	43,440	02-14-96	7:33a
NWNET	DLL	225,392	02-14-96	4:39p
NWPSRV	DLL	279,770	01-26-96	10:55a
NWDRVLGO	BMP	52,744	01-11-96	1:22a
NWPOPUP	EXE	17,776	03-18-96	8:52a
NWPSRV	DLL	279,770	01-26-96	10:55a
NWUSER	EXE	5,232	01-16-96	4:57a
PRTWIN16	DLL	279,260	03-08-96	7:39p
TLI_SPX	DLL	52,837	12-13-95	11:24a
TLI_WIN	DLL	15,713	08-07-95	4:56p
VLANINT	386	9,377	06-23-95	1:18p

VNETWARE	386	15,670	11-08-95	9:23a
NETWARE	DRV	159,344	03-26-96	4:07p

Directory of C:\WINDOWS\NLS

(This example used the English default.)

000_UNI	001	722	01-11-96	4:59p
1252_UNI	001	727	01-11-96	4:51p
1253_UNI	001	727	01-11-96	4:59p
1254_UNI	001	722	01-11-96	4:59p
1255_UNI	001	722	01-11-96	4:59p
1257_UNI	001	722	01-11-96	4:59p
874_UNI	001	727	01-11-96	4:48p
949_UNI	001	20,085	02-16-96	2:46p
UNI_000	001	1,235	01-11-96	4:59p
UNI_1252	001	1,017	01-11-96	4:48p
UNI_1253	001	985	01-11-96	4:59p
UNI_1254	001	1,076	01-11-96	4:59p
UNI_1255	001	1,108	01-11-96	4:59p
UNI_1257	001	869	01-11-96	4:59p
UNI_874	001	699	01-11-96	4:48p
UNI_949	001	34,395	02-16-96	2:46p
UNI_COL	001	665	01-11-96	4:51p
UNI_MON	001	2,361	01-11-96	4:47p

Directory of C:\WINDOWS\NLS\ENGLISH

LOGIN	DAT	57,856	03-07-96	12:15p
LOGIN	MSG	11,588	03-08-96	2:30p
LOGINW31	HLP	41,141	03-05-96	11:02a
NETWARE	HLP	493,121	03-05-96	8:33a

Additional .HLP and MSG files also added to the \NLS and \NLS\ENGLISH directories, depending on which installation options you select.