

# Users Guide

## **Client and Gateway Services for NetWare®**

**For the Windows NT™ 3.1 and Windows NT™ 3.1 Advanced Server operating systems**

**Microsoft Corporation**

Information in this document is subject to change without notice. Companies, names, and data used in examples herein are fictitious unless otherwise noted. No part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without the express written permission of Microsoft Corporation.

© 1994 Microsoft Corporation. All rights reserved.

Microsoft, MS, MS-DOS, XENIX, CodeView, and QuickC are registered trademarks and QBasic, Windows, Windows NT and Win32 are trademarks of Microsoft Corporation in the USA and other countries.

Alpha APX is a trademark of Digital Equipment Corporation.  
AppleTalk is a registered trademark of Apple Computer, Inc.  
Btrieve, Novell and NetWare are registered trademarks of Novell, Inc.  
Intel is a registered trademark of Intel Corporation.  
IRMA is a trademark of Digital Communications Associates.  
Lotus and Lotus Notes are registered trademarks of Lotus Development Corporation.  
MIPS is a registered trademark of MIPS Computer Systems Inc.  
NT is a trademark of Northern Telecom Limited in the USA and other countries.  
SAA is a trademark of International Business Machines Corporation.  
SQLBase is a registered trademark of Gupta Technologies, Inc.  
Tandy is a registered trademark of Tandy Corporation.

Part number 57698  
Printed in the United States of America.

# Contents

<b>Welcome</b>	<b>5</b>
How to Use This Manual	5
Documentation Conventions	6
<b>Chapter 1 Setting Up Connectivity Services and NWLink</b>	<b>7</b>
What are the Connectivity Services?	7
Preparing to Install Connectivity Services	8
Installing Connectivity Services	8
Configuring the NWLink IPX/SPX Compatible Transport Protocol	9
Specifying a Preferred NetWare Server	10
Managing IPX/SPX Routing on a Token Ring Network	10
Monitoring NetWare Performance	11
<b>Chapter 2 File and Print Gateways</b>	<b>13</b>
How a Gateway Works	13
Activating a Gateway	14
Activating a File Gateway	15
Setting Permissions for a Gateway Share	16
Activating a Print Gateway	19
<b>Chapter 3 Connecting to a NetWare Print Queue</b>	<b>20</b>
Connecting to a NetWare Printer Through Print Manager	20
Connecting to a NetWare Printer at the Command Prompt	20
Setting Printing Options	21
<b>Chapter 4 Connecting to a NetWare Volume or Directory</b>	<b>22</b>
Validating a NetWare Account	22
Selecting a Preferred Server	23
Connecting to a NetWare File Resource Through File Manager	23
Connecting to a NetWare File Resource at the Command Prompt	24
Managing Network Connections	25
Viewing Current Network Connections	25
Reestablishing Network Connections	25
Managing NetWare File Attributes	26
<b>Chapter 5 Running NetWare Utilities and NetWare-Aware Applications</b>	<b>27</b>
Supported NetWare Utilities	27
NetWare Utility Behavior Supplied by Windows NT Commands	27
NetWare-Aware Applications	28
Supported NetWare-Aware Applications	28
Requirements for Running NetWare-Aware Applications	29
Special Considerations for Individual NetWare-Aware Applications	30
<b>Chapter 6 Troubleshooting Connectivity Service</b>	<b>31</b>
Startup Problems	31
Connectivity Service Doesn't Start	31
Connectivity Service Starts, but Servers Can't Be Found	32
Connectivity Service Starts, but NetWare 4.x Servers Can't Be Seen	33
Connectivity Service Prompts for a Password at Each Logon	33
NetWare Login Scripts Are Not Running	33
Access Denied to a NetWare File Server	33

Application and Print Problems	34	
NetWare Print Queues Are Not Shown in Print Manager		34
Applications Are Not Working Correctly	34	
NetWare Map Utility Fails with a Memory Allocation Error		34
Other Network Problems	35	
Duplicate Computer Names	35	
Services or Subsystems Do Not Start	35	
Interoperability with Windows for Workgroups		35
Using the Last Known Good Configuration	35	
Using the Emergency Repair Disk	36	

# Welcome

Welcome to the NetWare® Compatible Client for Microsoft® Windows NT™.

With the NetWare Compatible Client (NCC), you can access file and print resources on a Novell® NetWare network from a Windows NT workstation or Advanced Server. By configuring a Windows NT Advanced Server as a NetWare Compatible Gateway, workstations without NetWare client software can connect to NetWare resources as if they were shared resources on the Windows NT Advanced Server.

This manual explains how to install, configure, use, and troubleshoot NCC. The manual assumes that you are familiar with the Microsoft Windows NT operating system. If you are not familiar with Windows NT, see your Microsoft Windows NT documentation set for any information you need.

## How to Use This Manual

This manual contains the following chapters and appendix:

### Chapter 1, Introduction

Explains what NCC is and how NCC makes communication possible between a Microsoft network and a NetWare network.

### Chapter 2, Setting Up NCC

Explains how to install and configure NCC, install the NWLink IPX/SPX Compatible Transport Protocol without NCC, run NCC without the Windows NT Workstation service, and monitor its performance once it is running.

### Chapter 3, NetWare Compatible Gateway for Files and Printers

Explains how to configure a Windows NT Advanced Server as a file or printer gateway so its client workstations can access NetWare file and print resources.

### Chapter 4, Connecting to a NetWare Print Queue

Explains how to connect directly to print resources on the NetWare network.

### Chapter 5, Connecting to a NetWare Volume or Directory

Explains how to connect to file resources on the NetWare network.

### Chapter 6, Running NetWare Utilities and NetWare-Aware Applications

Lists supported NetWare utilities and NetWare-aware applications and outlines the requirements for running them on a Windows NT computer. Also describes NetWare utilities whose functions are handled by Windows NT utilities.

### Chapter 7, Troubleshooting NCC

Explains how to diagnose problems in starting and running NCC, establishing connections to NetWare file and print resources, and setting up a file or print gateway.

# Documentation Conventions

This manual uses several type styles and special characters, described in the following list:

**bold** Represents commands, command options, and file entries. Type bold words exactly as they appear (for example, **net use**).

*italic* Introduces new terms and represents variables. For example, the variable *computername* indicates that you type the name of a workstation or a server.

ALL UPPERCASE Represents filenames and paths. (You can, however, type such entries in uppercase or lowercase letters, or a combination of the two.)

SMALL CAPITALS Represents keyboard names (for example, CTRL, ENTER, and F2).

[brackets] Encloses optional items in syntax statements. For example, [*password*] indicates that you can choose to type a password with the command. Type only the information within the brackets, not the brackets themselves.

## Chapter 1

# Setting Up Connectivity Services and NWLink

If part of your computer resources are on a Novell NetWare network, your Windows NT network will need to communicate and share resources with the NetWare network. With the connectivity services for NetWare, which include the Client Service for NetWare in Windows NT and the Gateway Service for NetWare in Windows NT Advanced Server, you can access NetWare file and print resources from your Windows NT computer. With the Gateway service on a Windows NT Advanced Server, you can enable a gateway to share NetWare file and print resources with Microsoft networking clients that have no NetWare client software.

This chapter explains what the connectivity services for NetWare are. It also describes procedures for installing and configuring connectivity services for Netware, which include Client Service for NetWare (Client Service) in Windows NT and Gateway Service for NetWare (Gateway Service) in Windows NT Advanced Server, for configuring the NWLink IPX/SPX Compatible Protocol (NWLink), and for monitoring performance once the connectivity services and NWLink are running.

This chapter covers the following topics:

- What are the connectivity services?
- Preparing to install connectivity services
- Installing connectivity services
- Configuring the NWLink IPX/SPX Compatible Transport Protocol
- Specifying a preferred NetWare server
- Managing IPX/SPX routing on a token ring network
- Monitoring NetWare performance

## What are the Connectivity Services?

To share resources between a Windows NT computer and a NetWare network, the two must use the same communication protocol. Windows NT includes an implementation of the internetworking packet exchange (IPX) and sequenced packet exchange (SPX) transport protocols used by NetWare networks. But a Windows NT computer must also be able to send NetWare core protocol (NCP) packets to request and receive file and print services. The connectivity services for NetWare, which include the Client Service for NetWare in Windows NT and the Gateway Service for NetWare in Windows NT Advanced Server, translate the server message block (SMB) packets used for Microsoft networking requests into the NCPs used by NetWare.

With the connectivity services, your Windows NT workstation can access files, directories, and printers on Novell NetWare servers. You can also run NetWare utilities and NetWare-aware applications from your Windows NT computer. In addition, with the Gateway Service for NetWare on your Windows NT Advanced Server computer, you can configure a gateway so that Microsoft networking clients - computers running Windows NT, Windows for Workgroups, or LAN Manager 2.x - do not need NetWare client software to access files and printers on NetWare servers.

With NWLink NetBIOS, a Microsoft-enhanced implementation of Novell NetBIOS, you can send and receive Novell NetBIOS packets between a NetWare server running Novell NetBIOS and a Windows NT computer, or between two Windows NT computers. Performance is significantly better if all computers are Windows NT computers, because of efficiencies in communication between computers that can use the enhancements.

The Microsoft implementations of the IPX, SPX, and Novell NetBIOS protocols can seamlessly coexist with other protocols on the same network adapter card. For example, a single network card on a Windows NT computer can receive IPX/SPX, TCP/IP, Microsoft NetBEUI, and AppleTalk® packets.

# Preparing to Install Connectivity Services

You should have the name of your preferred NetWare server available when you install connectivity services for NetWare.

---

**Important** Before you install a connectivity service, you must remove any existing NetWare redirectors, such as NetWare Services for Windows NT from Novell, and then restart your computer.

---

## To remove existing NetWare redirector installations

1. In Control Panel, choose the Network option.
2. In the Network Settings dialog box, select the existing NetWare redirector software in the Installed Network Software box.
3. Choose the Remove button.
4. When Windows NT asks you to confirm your choice, choose the Yes button.
5. In the Network Settings dialog box, choose the OK button.
6. Restart your computer for the changes to take effect.

You are now ready to install the connectivity service for your Windows NT computer.

# Installing Connectivity Services

You must be logged on as a member of the Administrators group for the local computer to install and configure the connectivity service for your Windows NT computer.

When you install the Client Service on your Windows NT computer or Gateway Service on your Windows NT Advanced Server computer, the NWLink transport protocol is also installed if it is not already on your computer.

## To install connectivity services

1. From Control Panel, choose the Network option.
2. When the Network Settings dialog box appears, choose the Add Software button.
3. In the Add Network Software dialog box, select Gateway Service for NetWare if you are using Windows NT Advanced Server or Client Service for NetWare if you are using Windows NT, and then choose the Continue button.
4. In the Windows NT Setup dialog box, enter the path where the connectivity service files are located, and then choose the Continue button.
5. In the Network Settings dialog box, choose OK.
6. When the NWLink IPX/SPX Protocol Configuration dialog box appears, specify the network adapter card you want to use to communicate with the NetWare network. By default, the frame type is 802.3. You can always change the settings later, as described in Configuring the NWLink IPX/SPX Compatible Transport Protocol later in this chapter.
7. To restart Windows NT so the changes take effect, choose the Yes button in the message that appears.

μ §An icon labeled GSNW is added to Control Panel when Gateway Service for NetWare is installed. When Client Service for NetWare is installed, the icon is labelled CSNW. The icon looks like the Network icon, except that one of the cable connectors is red.

The NetWare network is added to the first place in the network search order. For more information on the network search order, see Setting Network Provider Search Order in Chapter 5 of the *Windows NT System Guide*.

# Configuring the NWLink IPX/SPX Compatible



# Transport Protocol

After the NWLink software is installed on your computer, you can specify the network adapter card it will use and the frame type of your network. The default settings are optimized for most environments, but you can modify protocol parameters after installation if, for example, you want to bind the protocol to a different network adapter card.

## To configure the IPX protocol

1. In Control Panel, choose the Network option.
2. In the Installed Network Software box, select NWLink IPX/SPX Compatible Transport, and then choose the Configure button.
3. In the Adapter box of the NWLink IPX/SPX Protocol Configuration dialog box, select the name of the adapter card to which you want to bind the transport.

μ §

4. In the Frame Type box, specify the frame format for IPX/SPX packets on your network, and then choose OK. By default, the frame type is 802.3. If the network traffic on the specified adapter card uses a different frame type, click the down arrow in the Frame Type box and select the appropriate frame type.
5. In the Network Settings dialog box, choose OK.
6. Windows NT prompts you to restart the computer so that the changes take effect. Choose the Yes button to restart the computer.

If you choose the No button, you can continue to work, but your configuration changes do not take effect until the computer is restarted.

Additional tunable parameters are stored in the Registry. In most situations, you should not have to modify the defaults in the Registry. Description of the Registry parameters is beyond the scope of this chapter.

If your computer is on a token ring network, you can use the **IPXRoute** command line utility to further configure your computer. For more information, see *Managing IPX/SPX Routing on a Token Ring Network* later in this chapter.

## Specifying a Preferred NetWare Server

The first time you log on after the connectivity service is installed, you should specify the NetWare server you want your Windows NT computer to connect to by default when you log on. This NetWare server, which is referred to as the *preferred server*, validates your user credentials when you log on to the NetWare network and is queried for information you request about resources available on the NetWare network.

Although you do not have to specify a preferred server, it is a good idea, especially if you need to avoid logging on to NetWare servers that are limited to a small number of user connections.

### To specify a preferred server when the connectivity service is first installed

\* In the Select Preferred Server for NetWare dialog box, select the name of a server on the NetWare network or select <None> from the list provided, and then choose OK.

- Or -

Type a server name directly in the Server box, and then choose OK.

μ §

If you chose <None>, the connectivity service attempts to connect to the nearest available server each time you log on.

You can change your preferred server any time you are logged on. For information on changing the preferred server once your connectivity service is installed, see Chapter 4, Connecting to a NetWare Volume or Directory.

---

**Note** The preferred server setting affects only the account under which you are logged on when you make the setting. When other users log on, they are also prompted for a preferred server. If you later change your preferred server, other users are unaffected.

---

## Managing IPX/SPX Routing on a Token Ring Network

If your Windows NT computer is using the IPX/SPX protocol on a token ring network, each computer on the network has a source routing table that contains the address of each node on the network. When a computer receives an IPX/SPX broadcast packet or an IPX/SPX packet whose node address is not in its source routing table, by default the computer forwards the packet as a Single Route Broadcast frame.

You can modify or clear the source routing table, and you can change the default behavior of broadcast packets and packets with an unknown address, with the command line utility **ipxroute**. This utility provides the same functionality and has the same syntax as the **route** utility supplied by Novell for MS-DOS based NetWare clients.

The parameters for **ipxroute** are equivalent to those for the **route** utility supplied by Novell. The **ipxroute** syntax is as follows:

**ipxroute board=*n* [clear] [def] [gbr] [mbr] [remove=*xxxxxx*]**

**board=*n***

Specifies the network adapter card whose parameters you want to change.

**clear**

Clears the source routing table.

**def**

Forwards packets as All Routes Broadcast frames if their media access control (MAC) address is not in the source routing table.

**gbr**

Forwards general broadcast packets, those addressed to the broadcast address (FFFFFFFFFFFF), as All Routes Broadcast frames.

**mbr**

Forwards multicast broadcast packets, those addressed to a multicast address (C000xxxxxxx), as All Routes Broadcast frames.

**remove=*xxxxxx***

Removes the specified node address from the source routing table.

---

**Note** The **ipxroute** utility changes these parameters only for the current Windows NT session. When you log off, the settings are lost. To permanently change NWLink parameters, you must set them in the Registry. For further information, see the online Help topic Tuning Network Adapter Parameters.

The **ipxroute** utility is installed with the NWLink IPX/SPX Compatible Transport Protocol only if the protocol is bound to a token ring network card.

---

## Monitoring NetWare Performance

You can monitor the performance of the connectivity service and the NWLink NetBIOS using Performance Monitor. For a detailed explanation of Performance Monitor, see Performance Monitor in the *Windows NT System Guide*.

**To monitor Gateway Services or NWLink NetBIOS with Performance Monitor**

1. In the Administrative Tools group, choose Performance Monitor.
2. From the Edit menu, choose Add To Chart.
3. In the Computer list in the Add To Chart dialog box, select the computer you want to monitor.

μ §

4. In the Object list, select the process you want to monitor, Gateway Service for NetWare, Client Service for NetWare, or NWLink NetBIOS.
5. In the Counter list, select the counters you want to monitor for the selected process, and then choose the Add button.  
For information about a counter, select the counter and then choose the Explain button.
6. When you have added all the counters you want to a particular chart, choose the Done button.

## Chapter 2

# File and Print Gateways

Microsoft networks and NetWare networks use different communications protocols for passing requests from clients to servers. Microsoft networking clients use server message block (SMB) protocol to perform remote requests to Microsoft networking servers, while NetWare clients use NetWare core protocol (NCP) to communicate with NetWare networking servers.

For clients of the Microsoft network that need access to NetWare resources but cannot use multiple protocols, you can configure a Windows NT Advanced Server computer as a file or print gateway. A gateway is also useful for Microsoft networking clients that are using Microsoft Remote Access Service, or on networks on which you want to limit IPX/SPX traffic or on which you are migrating to the Transport Control Protocol/Internet Protocol (TCP/IP). A gateway on a Windows NT Advanced Server computer can connect to NetWare resources and share them with clients of the Microsoft network.

This chapter covers the following topics:

- How a gateway works
- Enabling a gateway
- Activating a file gateway
- Setting permissions for a gateway share
- Activating a print gateway

## How a Gateway Works

The Gateway Service for NetWare on a Windows NT Advanced Server computer acts as a translator between the server message block (SMB) protocol used by the Windows NT network and the NetWare core protocol (NCP) used by the NetWare network. With a file gateway, for example, clients of a Windows NT Advanced Server computer can access files on NetWare servers without having to load additional NetWare connectivity components.

All file access over the gateway is done by sharing drives that are redirected to NetWare volumes or directories. The file gateway uses a NetWare account on the Windows NT Advanced Server computer to create a validated connection to the NetWare server. This connection appears on the Windows NT Advanced Server computer as a redirected drive. When you share the redirected drive, it becomes like any other shared resource on the Microsoft network.

For example, you can connect the Windows NT Advanced Server computer to a NetWare directory called \\NW4\SYS\DATA, which becomes drive Z: on the Windows NT Advanced Server computer. If the name of the Windows NT Advanced Server computer is THOR and the Z: drive is given the share name DATA\_USERS, a Microsoft networking client can access the NetWare directory by connecting to \\THOR\DATA\_USERS. The Microsoft networking client is unaware that this shared resource is part of the NetWare network.

Once the gateway connection is established, it is not disconnected unless the computer is turned off or the Windows NT administrator disconnects the shared resource or disables the gateway. Logging off the Windows NT Advanced Server computer does not, by itself, disconnect the gateway.

---

**Note** A gateway enabled on a Windows NT Advanced Server computer seamlessly integrates the Microsoft network with file and print resources on the NetWare network. Because requests from Microsoft networking clients are being processed through the Windows NT Advanced Server, access over the gateway is slower than direct access from the client to the NetWare network. For Microsoft networking clients that require frequent access to NetWare resources, Windows NT with the Client Service for NetWare or Windows for Workgroups with the client software supplied by Novell is a better solution. On a Windows for Workgroups computer, loading the necessary network protocols in high memory preserves valuable conventional memory for application software.

---

## Activating a Gateway

Before you can enable a gateway on a Windows NT Advanced Server computer:

- \* You must have a user account on the NetWare network with the necessary rights for the resources you want to access.
- \* The NetWare server must have a group named NTGATEWAY with the necessary rights for the resources you want to access.
- \* The NetWare user account must be a member of the NTGATEWAY group.

By controlling membership in the NTGATEWAY group, the NetWare administrator can control which Windows NT Advanced Server computers can be gateways to the NetWare server, and what kind of access to what files each user account has.

The NetWare administrator has total control over whether the gateway allows access to files and print queues on the NetWare server. With a gateway, the network administrator can control access to NetWare network resources either over the gateway or directly on the NetWare network:

- \* On the Windows NT Advanced Server computer acting as a gateway, the administrator can restrict access by limiting which networking users or groups have access to gateway shares. Using multiple share restrictions through a gateway, the Windows NT administrator can control which networking users and groups can access files through the gateway.
- \* On the NetWare file server, the NetWare administrator must create a special gateway group, NTGATEWAY. Using NTGATEWAY, the administrator can set trustee rights on the directories and files to which users and groups are allowed access through the gateway. There is no auditing of gateway access.

### To make a NetWare server available to a gateway account

1. Use the NetWare **syscon** utility to create the NTGATEWAY group account on the NetWare file server.
2. Use **syscon** to create a NetWare user account with the name and password you will use to log on from the Windows NT Advanced Server computer.
3. Add the gateway account to the NTGATEWAY group.
4. Establish trustee rights for the NTGATEWAY group.

For detailed information on the **syscon** utility and NetWare user accounts and trustee rights, see your NetWare documentation.

To activate the file gateway on the Windows NT Advanced Server computer, you must specify the NetWare volume or directory. Volumes, directories, and print queues are represented in Windows NT by their

universal naming convention (UNC) names. However, NetWare syntax is also supported.

UNC names begin with two backslashes (\\) followed by the remote (in this case, NetWare) server name, and then the names of the volume or directory points on the server separated by single backslashes.

For example, if the file server named NW4 contains the THOR volume on which there is a directory WINAPPS\WORD, the UNC name for the directory is \\NW4\THOR\WINAPPS\WORD.

#### **To enable a gateway**

1. In Control Panel on the Windows NT Advanced Server computer that is to be the gateway, choose the GSNW option.
2. In the Gateway Service for NetWare dialog box, choose the Gateway button.
3. In the Configure Gateway dialog box, select the Enable Gateway check box.

μ §

4. In the Gateway Account box, type the name of your gateway account on the NetWare file server. Type the password for the gateway account in both the Password and Confirm Password boxes.

## **Activating a File Gateway**

To activate a file gateway, you must have previously enabled a gateway on your Windows NT Advanced Server computer, as described in the previous section.

### **To activate a file gateway**

1. In Control Panel on the Windows NT Advanced Server computer that is to be the gateway, choose the GSNW option.
2. In the Gateway Service for NetWare dialog box, choose the Gateway button.
3. In the Configure Gateway dialog box, choose the Add button to create a NetWare share for Microsoft networking clients.
4. In the New Share dialog box, type the information about the redirected share, and then choose OK.

### **μ §**

Windows NT Advanced Server creates a connection to the NetWare resource you specify in the Network Path box, assigns it the redirected disk drive you specify in the Use drive box, and creates a share on the Microsoft network using the share name you specify in the Share Name box.

If the connection fails with an Access Denied message from the NetWare server, be sure that you entered your account name and password correctly in the Configure Gateway dialog box. If you did, you may not have a valid account on the NetWare server, or your account may not be a member of the NTGATEWAY group. It is also possible that your account or the NTGATEWAY group has insufficient trustee rights to access the specified NetWare volume or directory.

## **Setting Permissions for a Gateway Share**

If you want to control user access, you can set permissions for the share when you create it, or later if your needs change. You can set permissions on a NetWare resource shared through a gateway using either File Manager or the Gateway Service. For information on setting permissions with File Manager, see File Manager in the *Windows NT Advanced Server System Guide*.

### **To set permissions for a gateway share using the Gateway Service**

1. In Control Panel, choose the GSNW option.
2. In the Gateway Service for NetWare dialog box, choose the Gateway button.
3. From the list of gateway shares provided in the Configure Gateway dialog box, select the share whose permissions you want to set, and then choose the Permissions button.

If the Permissions button is dimmed, the gateway may be disabled. If the Enable Gateway check box is cleared, enable the gateway as described earlier in this chapter.

In the Access Through Share Permissions dialog box, you can add groups and users, change the permissions for the listed groups and users, and remove a group or user from the permissions list.

### **μ §**

4. To add a user to the list of authorized share users, choose the Add button in the Access Through Share Permissions dialog box.

The Add Users And Groups dialog box displays the groups on the computer or in the domain shown in the List Names From box. You can display users, find the users in a group, or find the domain to which a group or user belongs.



Local groups are shown for the computer or domain whose name is followed by an asterisk (\*). You can select another domain from the List Names From box. Domains are listed only if your computer is a member of a domain on a Windows NT network. The domains shown have a trust relationship with your computers domain.

μ §

5. To display the names of users on the selected computer or domain, choose the Show Users button.
6. To view the members of a group, select the group and choose the Members button.  
The Local Group Membership dialog box appears, listing the groups members. For Windows NT Advanced Server domains, global groups that are members of a local group appear in the list.  
To see a global groups users, select the group name from the list and choose the Members button in the Local Group Membership dialog box. To add the group to the list in the Add Users And Groups dialog box, choose the Add button in the Local Group Membership dialog box.
7. To add a group or user, you must know the domain to which the groups or users account belongs. For Windows NT Advanced Server domains, choose the Search button to find the domain of a group or user. When the Find Account dialog box appears, type the name of the group or user in the Find User Or Group box, and specify the domains you want to search. Then choose the Search button. To include the groups or users in the Add Users and Groups dialog box, select them in the Search Results box and choose the Add button.

8. To add groups or users to the list, select them in the Names box and choose the Add button, or double-click the name of the group or user. Or you can type the names of groups and users in the Add Names box. Separate names with a semicolon.  
If the account of the group or user is not located on the computer or domain shown by the List Names From box, you must specify the location. Type the computer or domain name followed by the group or user name, and separate the names with a backslash, for example, **sales\anniep**. You can type the name without waiting for Windows NT to list groups in the Names box.
9. If you are adding users or groups to a permissions list, select from the Type Of Access box the permission for the groups or users shown in the Add Names box.
10. Choose the OK button.
11. In the Configure Gateway dialog box, choose the OK button.
12. In the Gateway Service for NetWare dialog box, choose the OK button.

For information about setting permissions with File Manager, see Setting Permissions Through Shared Directories in Chapter 4 of the *Windows NT Advanced Server System Guide*.

## Activating a Print Gateway

A print gateway functions much like the file gateway described earlier in this chapter: once you have enabled the Gateway Service on a Windows NT Advanced Server computer, the NetWare printer appears on the Windows NT network like any other shared printer. Print jobs sent to the print gateway are redirected to the corresponding NetWare print queue. You configure a NetWare print gateway through Print Manager.

To configure a print gateway, a gateway must be enabled. All access to NetWare printers is in the context of the user account used to enable the gateway. For more information, see Activating a Gateway earlier in this chapter.

### To configure a NetWare print gateway

1. From the Windows NT Advanced Server computer that is to serve as a gateway, connect to a NetWare print queue using Print Manager, as described in Chapter 4, Connecting to a NetWare Print Queue.
2. In Print Manager, select the printer icon or window for the print queue.
3. From the Printer menu, choose Properties, or choose the Properties button on the toolbar.
4. In the Printer Properties dialog box, select the Share This Printer On The Network check box.  
Print Manager creates a share name in the Share Name box for the printer, using MS-DOS naming conventions. This allows MS-DOS based computers to connect to the printer. If you edit the share name and the Windows NT network has clients that are running MS-DOS, be sure to follow MS-DOS naming conventions.
5. In the Location box, type a description of the printers location to let network users know where their documents will be printed.
6. Choose the OK button.  
Once the queue is shared, networking clients can access the print queue.

Microsoft networking clients can connect to the shared NetWare print queue as they would to any Windows NT printer. For example, if the print queue is shared on a Windows NT Advanced Server computer named WIN\_NT under the share name HP4SI, users can specify `\\win_nt\hp4si` in the Connect To Printer dialog box. Users can also browse for the printer. The printer is listed by its universal naming convention (UNC) name in the Shared Printers box. For information on the universal naming convention, see Activating a Gateway, earlier in this chapter.

## Chapter 3

# Connecting to a NetWare Print Queue

If your Windows NT computer has the Gateway Service for NetWare or Client Service for NetWare, you can establish a connection to a NetWare print queue through Print Manager or from the command prompt.

This chapter covers the following topics:

- Connecting to a NetWare printer through Print Manager
- Connecting to a NetWare printer at the command prompt
- Setting printing options

## Connecting to a NetWare Printer Through Print Manager

To print to a NetWare print queue, connect to it using Print Manager. If the NetWare network is first in the network search order for print providers (the default), the list of servers on the NetWare network is displayed automatically in the Shared Printers box.

### To connect to a NetWare print queue using Print Manager

1. From the Printer menu, choose Connect To Printer, or choose the Connect Printer button on the toolbar.
2. In the Connect To Printer dialog box, select a printer from the Shared Printers box, or type the name of a computer and print queue in the Printer box.  
For NetWare networks, the Shared Printers box shows servers and print queues. Double-click a server name to display or hide its print queues. When you select a print queue in the Shared Printers box, Print Manager fills in the Printer box.  
When you type the name of a print queue directly in the Shared Printers box, precede the computer name with two backslashes (\), and separate the computer name from the print queues name with a single backslash (\). For example, type `\\win_nt\hp4si`.  
NetWare syntax cannot be used because there is no syntax for print queues.
3. Choose the OK button.
4. If a printer driver is not available locally for a NetWare print queue, Print Manager prompts you to install a printer driver. Choose the OK button to continue.
5. In the Select Driver dialog box, select the appropriate driver for the printer in the Driver box.
6. In the Windows NT Setup dialog box, type the directory and path where Windows NT printer drivers are stored, and then choose the Continue button.  
Windows NT installs the driver and displays a printer window for the connected print queue.

Be sure to set the correct printer options once the appropriate driver has been loaded. You can now print to the NetWare print queue just as you would to a Windows NT printer.

## Connecting to a NetWare Printer at the Command Prompt

If you are running an application that writes directly to a predefined port, you can use the **net use** command as you would use the NetWare **capture** utility to associate the NetWare print queue with the port. For example, to redirect output from LPT1 to the NetWare print queue called MEMOS on the server named NW4, type:

```
net use lpt1 \\nw4\memos
```

This statement is equivalent to the NetWare **capture** command, where the syntax would be **capture Q=memos S=nw4 L=1**.

After you have redirected output using the **net use** command, you can use the **copy** command to send files that don't require formatting to the printer. For example:

```
copy myfile.txt lpt1
```

You can also copy the file directly to the print queue. For example:

```
copy myfile.txt \\nw4\memos
```

## Setting Printing Options

Printing options are already set for the user logged on to Windows NT, and these same options can be set for NetWare print queues. The printing defaults are to suppress form feed, to print a banner (blank page) between documents, and to notify you when your document is finished printing. You can change these options by changing the configuration of your connectivity service.

---

**Note** Settings in the connectivity service affect all NetWare print queues you are using from your Windows NT computer. The options are equivalent to settings available through the NetWare **capture** utility.

---

### To set printing options

1. In Control Panel, choose the GSNW or CSNW option.
2. In the Print Options box of the Client Service for NetWare or Gateway Service for NetWare dialog box:
  - \* To instruct the printer not to eject a page after printing a document, clear the Add Form Feed check box.
  - \* To stop notification when your document has been printed, clear the Notify When Printed check box
  - \* To stop printing a banner page before your document prints, clear the Print Banner check box.

μ §

3. Choose the OK button when the printing options are as you want them.

## Chapter 4

# Connecting to a NetWare Volume or Directory

When Gateway Service for NetWare or Client Service for NetWare is installed on your Windows NT computer, you can connect to volumes and directories on NetWare file servers using File Manager or the **net** command at the command prompt. You can print to NetWare print queues by connecting to the print queue in Print Manager or by using the **copy** command at the command prompt.

This chapter covers the following topics:

- Validating a NetWare account
- Selecting a preferred server
- Connecting to a NetWare file resource through File Manager
- Connecting to a NetWare file resource at the command prompt
- Managing network connections
- Managing NetWare file attributes

## Validating a NetWare Account

You must have an account on the NetWare server before you can use its files, applications, or print queues. The NetWare server account contains your credentials, which are your username and password.

By default, Windows NT supplies the username and password you used when you log on to Windows NT as the credentials it sends to the NetWare server. Because you are prompted to supply your username and password on the NetWare server only if they are different from those on the Windows NT computer, it is best to keep your username and password the same on both the Windows NT and NetWare networks. Maintaining the same username and password also makes it easier for network administrators to coordinate user accounts.

### To change your password on a NetWare server

1. At the command prompt, use the **net use** command to connect to the NetWare servers SYS volume.
  - Or -
  - From the Disk menu in File Manager, choose Connect Network Drive command, and connect to the NetWare servers SYS volume.
2. At the command prompt, change to the drive for the NetWare server, and then make the PUBLIC directory the current directory. For example, type **n:**, and then type **cd \public**.
3. At the command prompt, type the **setpass** command. If the server on which you want to change your password is different from the one on the current drive, type **setpass** and the server name. For example, to change your password on the server named NWSERVER, type:  
**setpass nwservers**
4. When you are prompted, type your old password, then the new password, and then retype the new password to confirm it.
5. If you are connected to other NetWare servers that also use your old password, they are listed, and you are asked if you want to change your password on these servers as well. Type **y** and press Enter to change the additional passwords.
  - Or -
  - Type **n** and press Enter to leave the passwords as they are.

If you want to change your password on more than one server, connect to all affected servers before running the **setpass** command.

The **setpass** command is a NetWare utility supported by Windows NT. For a complete list of supported

NetWare utilities, see Supported NetWare Utilities in Chapter 6.

## Selecting a Preferred Server

When your connectivity service is installed, you can specify a preferred NetWare server, the one to which the Client or Gateway Service connects your Windows NT computer by default when you log on, or you can specify no preferred server. If your needs or the networks configuration change later, you can change your preferred NetWare server at any time.

### To specify a preferred NetWare server

1. From Control Panel, choose the GSNW or CSNW option.
2. When the Gateway Service for NetWare or Client Service for NetWare dialog box appears, in the Select Preferred Server box select a server from the list provided, or type the name of a NetWare server directly into the box, and then choose OK.
3. If your password on the NetWare server is different from that on the Windows NT computer, enter your NetWare password at the prompt, and then choose OK.

The next time you log on, the connectivity service connects to the NetWare server you specify as the preferred one.

---

**Note** The preferred server setting affects only the account under which you are logged on when you make the setting. When other users log on, they are also prompted for a preferred server. If you later change your preferred server, other users are unaffected.

---

## Connecting to a NetWare File Resource Through File Manager

With File Manager, you can browse and connect to resources on both the Windows NT and NetWare networks. Once you are connected to a NetWare volume, you can drag and drop directories and files to move and copy them between your Windows NT computer and NetWare servers.

The list of servers on the NetWare network is displayed automatically in the Shared Directories box. The servers, volumes, and directories are displayed in a tree structure. Both volumes and directories are represented by the shared directory icon. Choose an item to expand the list; for example, choose a directory to display its subdirectories.

The NetWare server validates you before it allows you to see directories in a NetWare volume you select. Windows NT displays the Enter Network Credential dialog box so that you can provide a username and a password for the server if the server cannot validate you.

On a NetWare network, you can type the server name in the Path box and choose the OK button if you know the name of a server and need to see the names of its volumes. Preface the server name with two backslashes (\\). Windows NT adds the name of the servers first volume directory to the Path box and displays all the servers volumes in the Shared Directories box.

You can type a network path in the Path box. On NetWare networks, you can type the name using either universal naming convention (UNC) or NetWare syntax. For information about UNC syntax, see Activating a Gateway in Chapter 3.

### To connect to a NetWare drive using File Manager

1. From the Disk menu, choose Connect Network Drive, or choose the Connect Drive button on the toolbar.
2. File Manager displays the first free drive letter in the Drive box. You can accept the displayed drive letter for the connection or choose another in the Drive box.
3. In the Path box, select or type a network path.  
If you have connected to the volume or directory before, select the path from the list displayed by the Path box. The Path box displays the previous 10 paths.  
Or, you can use the Shared Directories box to select a network path.
4. You are connected by default under the username and password you used to log on. If you want to connect under a different username, type it in the Connect As box.
5. Choose the OK button. If a password is required, Windows NT displays the Enter Network Password dialog box where you can type the password.

## Connecting to a NetWare File Resource at the Command Prompt

You can use the **net view** command to display file servers and volumes on a NetWare network.

### To display a list of NetWare file servers

- \* At the command prompt, type the following syntax:

**net view /network:nw**

### To display volumes on a specific NetWare file server

- \* At the command prompt, type the following syntax:

**net view \\nwserver\_name /network:nw**

where *nwserver\_name* is the name of the NetWare file server. Be sure to precede the server name with two backslashes (\\).

If the **net view** command is used without the **/network:nw** switch, the servers and shares on your Windows NT or LAN Manager network are displayed by default.

You can use the **net use** command from the command prompt to connect to NetWare file servers and print queues. To connect, you can use the same command syntax you use to connect to shares on a Microsoft network.

You cannot use the **net use** command to create a gateway, because redirections made using either this command or File Manager are properties of the user who was logged on at the time of creation. If the user logs off, the connection is terminated. The gateway connection is disconnected only if the computer is turned off or if an administrator disables the gateway.

The **net** command for connecting to NetWare file servers is equivalent to the **map** NetWare command on MS-DOS based NetWare workstations.

### To connect to a NetWare volume

\* At the command prompt, type the **net use** command, specifying the shared directory with either its UNC or NetWare name:

**net use drive:** *\\computer\directory | \\computer:volume\directory*

For example, to connect to the directory \DATA\MYDATA on the THOR volume on a server named NW4 using the G drive, type:

**net use g:** *\\nw4\thor\data\mydata*

---

**Tip** To use the next available drive letter when connecting to the volume, replace the drive letter with an asterisk (\*).

---

The error message "The password is invalid for \\server\_name\volume\_name[directory\_name...]" means that the username and password you supplied when you logged on to Windows NT were not validated by your preferred server. To connect under a valid username and password, use the following **net use** command with the switch and syntax shown:

**net use drive:** *\\computername\sharename /user:username password*

- Or -

**net use drive:** *\\computer:volume\directory /user:username password*

For example, to connect as **anniep** with the password **marshmallow** to the directory \DATA\MYDATA within the THOR volume on a server called NW4 using the G drive, type:

**net use g:** *\\nw4\thor\data\mydata /user:anniep marshmallow*

If you prefer to be prompted for a password, replace the password with an asterisk (\*). When you type your password at the prompt, it is not displayed on the screen.

## Managing Network Connections

When the connectivity service is running, you can manage connections to the NetWare network just as you manage connections on the Microsoft network. You can view and manage active connections and define persistent connections with the **net use** command.

### Viewing Current Network Connections

When you type the **net use** command without any parameters, you can list the current network connections.

<b>Status</b>	<b>Local</b>	<b>Remote</b>	<b>Network</b>
--	E:	\\NW4\SYS	Novell
OK	F:	\\WIN_NT\DROOT	Microsoft Windows™
--	H:	\\NETWARE40\THOR\APPS	Novell

### Reestablishing Network Connections

You must indicate when you create connections that they are to be reestablished if you want a users profile to establish network connections.



To make connections persistent, check the Restore At Logon box when making connections from File Manager. Or if you are creating the connection from the command line, be sure to use the **/persistent** switch with the **net use** command.

For example, type **net use /persistent:yes**.

Administrator-defined logon scripts can also be used in addition to the **net use** command with the **/persistent** switch. For more information about logon scripts, see User Manager in the *Windows NT System Guide*.

## Managing NetWare File Attributes

NetWare file attributes are not exactly the same as those on Windows NT. The following file rights mappings are applied when a NetWare file is opened by Gateway Services.

	<u>Windows NT file attributes</u>	<u>NetWare file attributes</u>
R (Read Only)	RO, DI (Delete Inhibit), RI (Rename Inhibit)	
A (Archive)	A	
S (System)	Sy	
H (Hidden)	H	

Gateway Services does not support mapping to the following NetWare file attributes: RW (Read/Write), S (Shareable), T (Transactional), P (Purge), RA (Read Audit), WA (Write Audit), and CI (Copy Inhibit).

When you copy a file from an Microsoft networking client to the NetWare file server via Gateway Services, the RO, A, Sy, and H file attributes are preserved.

You can use the NetWare utilities, such as **filer** and **rights**, from a Windows NT Server computer with an activated gateway to set attributes that are not supported by the Windows NT-to-NetWare file rights mapping. For more information about other supported utilities, see Chapter 6, Running NetWare Utilities and NetWare-Aware Applications.

## Chapter 5

# Running NetWare Utilities and NetWare-Aware Applications

Windows NT has a collection of 32-bit graphical network and user management tools, including User Manager, Server Manager, and User Profile Editor. You can share Windows NT resources using File Manager, Print Manager, or the command line. NetWare, by contrast, includes a set of 16-bit command-line utilities for managing and sharing resources.

With Windows NT Server and Gateway Services for NetWare (Gateway Services), you can run many of the NetWare utilities from the command prompt. Other functions of the NetWare utilities are provided through the Windows NT management tools.

In addition, Windows NT supports many NetWare-aware applications.

This chapter lists the supported NetWare utilities and explains the Windows NT utilities that you can use to manage NetWare networks. It also lists supported NetWare-aware applications and describes the files you must have in order to run them.

## Supported NetWare Utilities

Windows NT supports many of the NetWare utilities, so you can manage the NetWare network from a Windows NT computer. Some NetWare utilities are not supported, but you can perform their functions with Windows NT utilities. Some additional files supplied either with Windows NT or with NetWare may be required by some utilities. For detailed information, see Requirements for Running NetWare-Aware Applications later in this chapter.

Windows NT supports the following MS-DOS-based NetWare utilities:

<b>chkvol</b>	<b>help</b>	<b>rconsole</b>	<b>setfts</b>
<b>colorpal</b>	<b>listdir</b>	<b>remove</b>	<b>slist</b>
<b>dspace</b>	<b>map</b>	<b>revoke</b>	<b>syscon</b>
<b>flag</b>	<b>ncopy</b>	<b>rights</b>	<b>tlist</b>
<b>flagdir</b>	<b>ndir</b>	<b>security</b>	<b>userlist</b>
<b>fconsole</b>	<b>pconsole</b>	<b>send</b>	<b>volinfo</b>
<b>filer</b>	<b>psc</b>	<b>session</b>	<b>whoami</b>
<b>grant</b>	<b>pstat</b>	<b>setpass</b>	

---

**Note** If you run a utility (such as **rconsole** on 3.1x NetWare servers) outside of the SYS:PUBLIC directory, the utility may ask for the SYS\$MESSG.DAT file. The SYS\$MESSG.DAT file is located in the SYS:PUBLIC directory. You can avoid this message by adding SYS:PUBLIC to your path.

---

## NetWare Utility Behavior Supplied by Windows NT Commands

The Windows NT **net use** command or File Manager can be used to perform the same functions as the NetWare **attach**, **login**, and **logout** utilities. The Windows NT **net view** command can be used to perform the same function as the NetWare **slist** utility. For more information about the **net use** and **net view** commands and File Manager, see Connecting to a Network File Resource at the Command Prompt in Chapter 5.

The **net use** command also supplies similar functionality to the **capture** command for printing when MS-DOS-based and Windows-based applications require printing to a specific port. In addition, Print Manager can be used to connect to NetWare print queues. For more information about printing, see Connecting to a NetWare Printer Through Print Manager in Chapter 4.

## NetWare-Aware Applications

NetWare-aware applications behave on Windows NT as if they were on a NetWare resource. Not all NetWare-aware applications are supported by Windows NT, and of those that are supported, many require special files supplied either with NetWare or with Windows NT.

## Supported NetWare-Aware Applications

The NetWare-aware applications shown in the following table are supported. The applications were tested on Intel®, MIPS®, and Digital Alpha AXP™ platforms. Following the table are descriptions of the services and files required for these applications to be supported.

### MS-DOSBased NetWare-Aware Applications

<u>Application</u>	<u>Version</u>	<u>Prerequisites</u>
to the NetWare SAA™ Gateway Attachmate Extra! for MS-DOS	3.1	Batch files
to the Attachmate 3270 Gateway Attachmate Extra! for Windows	3.1	Batch files
to the NetWare SAA Gateway Attachmate Extra! for Windows	3.5	TSR
to the Attachmate 3270 Gateway DCA IRMA™ LAN for MS-DOS	3.5	TSR
to Novells SAA Btrieve® requester	2.1.0	None
(BREQUEST.EXE)	6.10a	TSR
Gupta SQLBase® for NetWare systems	5.1.3	Btrieve support NWIPXSPX.DLL, NETWARE.DRV, and NWNETAPI.DLL
		Must be connected to a NetWare server prior to loading
		Runs only on an Intel platform
Lotus® Notes®, SPX connectivity option	3.0	Must be connected to a NetWare server prior to loading TBMI2 on MIPS and Alpha AXP NWIPXSPX.DLL, NETWARE.DRV, and NWNETAPI.DLL
NetWare 3270 LAN Workstation for Windows	1.2	Runs only on an Intel platform

## Requirements for Running NetWare-Aware Applications

The following files and services may be required in order for MS-DOSbased NetWare utilities and NetWare-aware applications to be supported.

### NWIPXSPX.DLL

Many applications that are written for 16-bit Windows and are NetWare-aware require NWIPXSPX.DLL from Novell. If you have previously used the application under Microsoft Windows 3.x and are using the same computer for Windows NT, NWIPXSPX.DLL exists on your system. If you start the application and the application cannot find this file, check your path by typing **path** at the command prompt. Verify that a copy of the NWIPXSPX.DLL can be found. If not, obtain a copy of NWIPXSPX.DLL from Novell, and copy it to the \WINNT\SYSTEM32 directory.

If you are running these applications on either the MIPS or Digital Alpha AXP platforms, you will need to obtain NWIPXSPX.DLL from Novell. Copy NWIPXSPX.DLL to the \WINNT\SYSTEM32 directory.

If you need to copy NWIPXSPX.DLL to your Windows NT Server computer or modify your path statement, you must log off and then log back on to Windows NT for the changes to take effect.

### Special Requirements for MIPS and Alpha AXP Platforms

If the NetWare-aware application requires NWIPXSPX.DLL, you must have a copy of TBMI2.COM in \WINNT\SYSTEM32 to run the application on the MIPS and Digital Alpha AXP platforms.

In AUTOEXEC.NT, insert the following line immediately after the line that refers to **vwipxspx**:

```
lh winnt\system32\tbmi2.com
```

Save the change to AUTOEXEC.NT, and then log off and log back on to your Windows NT Server computer.

### NETWARE.DRV, NWNETAPI.DLL, and NWCALLS.DLL

NetWare-aware applications that use the NetWare application programming interface (API) to send and receive NetWare core protocol (NCP) packets might require NETWARE.DRV and either NWNETAPI.DLL or, for more recent versions of NetWare, NWCALLS.DLL.

NETWARE.DRV is installed in the \WINNT\SYSTEM32 directory when you install NWC. If you have previously used a NetWare-aware application on the same computer using an MS-DOSbased version of Windows, NWNETAPI.DLL or NWCALLS.DLL is probably already installed on your computer. If your application cannot find NWNETAPI.DLL or NWCALLS.DLL, make sure the appropriate file is installed on your computer and is in your computers search path. If you are running the application on the Digital Alpha AXP or MIPS platform or you cant locate one of these .DLL files on your computer, contact Novell to obtain a copy of the appropriate file, and then install it in your \WINNT\SYSTEM32 directory. If you cannot load your NetWare-aware application with the version of NETWARE.DRV installed with NWC, replace NETWARE.DRV with the corresponding file supplied by Novell, dated 10/27/92 with a file size of 126,144 bytes.

If you copied any of these files to your Windows NT Server computer or modified your path statement during the current Windows NT work session, you must log off and then log back on for the changes to take effect.

## Special Considerations for Individual NetWare-Aware Applications

If you do not have a preferred server and you have not connected to any NetWare server, you must first create a connection to a NetWare server. For more information about connecting to NetWare servers, see Chapter 5, Connecting to a NetWare Volume or Directory.

### Btrieve

If you are running MS-DOS-based or 16-bit Windows-based applications that require the Btrieve requester, BREQUEST.EXE, you must modify the AUTOEXEC.NT file located in \WINNT\SYSTEM32 so the applications can find the Btrieve requester. Find the location of BREQUEST.EXE on your computer and append location information in the AUTOEXEC.NT file.

For example, if BREQUEST.EXE is located in the C:\BTRIEVE directory, append this line following sections in AUTOEXEC.NT:

```
lh c:\btrieve\brequest.exe
```

Then log off and log back on to Windows NT for the change to take effect.

### Attachmate Extra! Extended for MS-DOS

If Extra! batch files are run from a console window, make the first line of the batch files **command /c** so that the Extra! hot keys work after Extra! has initialized.

### Attachmate Extra! for Windows IPX/SPX Connectivity

Attachmate Extra! for Windows requires IPXINTFC, a terminate-and-stay-resident (TSR) utility. This TSR must be loaded by AUTOEXEC.NT prior to the DOSX TSR being loaded.

For example, suppose Attachmate Extra! for Windows has been installed in the C:\EXTRAWIN subdirectory. In AUTOEXEC.NT, make sure the following three lines are in the order shown following sections:

```
lh c:\extrawin\ipxintfc  
REM Install DPMI support  
lh winnt\system32\dosx
```

Log off and log back on to Windows NT for the changes to take effect.

## Chapter 6

# Troubleshooting Connectivity Service

This chapter describes ways of troubleshooting various problems that can arise while installing, starting, and running the connectivity services for NetWare, which include the Gateway Service for NetWare on Windows NT Advanced Server computers and the Client Service for NetWare on other Windows NT computers.

The chapter discusses problems in these areas:

- Startup problems
- Access problems
- Application and print problems
- Other network problems

## Startup Problems

Many common startup problems are caused by improper installation of the network adapter card or the connectivity software itself. The first things to check are that the network card is installed and configured correctly and that any existing installations of NetWare redirectors, such as Novells NetWare Services for Windows NT, have been removed.

To correct the configuration of your network card or to remove a NetWare redirector, use the Network option in Control Panel. For more information, see Chapter 2, Setting Up Connectivity Services and NWLink.

This section discusses some common problems that might occur while installing or starting the Gateway Service or Client Service.

## Connectivity Service Doesn't Start

### To verify that the connectivity service has started

1. In Control Panel, choose the Services option.
2. If the status of Gateway Service for NetWare or Client Service for NetWare is not Started, select it and choose the Start button. If the service is already started, check the System Log in Event Viewer.

### To check the System Log

1. In the Administrative Tools group of Program Manager, choose Event Viewer.
2. In the Source column of the Event Viewer System Log dialog box, look for events from Service Control Manager or NWLinksys.
3. Double-click the appropriate log entry for more details about the event.
4. In the Event Details dialog box, look for one of the messages described following this procedure.
5. In the Event Details dialog box, choose the Close button.
6. From the Log menu, choose Exit.

Source	Message	Recommended action
	Service Control Manager or Client Service for NetWare terminated with the following error: The system cannot find the specified file.	Gateway Service for NetWare  The connectivity service was not installed properly. Use the Network option in Control Panel to remove and reinstall the connectivity service. For information on installing the connectivity service, see Chapter 2.
Service Control Manager	The NWLink service depends on the NWLinksys services which failed to start because of the following error: The system cannot find the file specified.	The NWLink IPX/SPX Compatible Transport Protocol was not installed properly. Use the Network option in Control Panel to reinstall NWLink. For more information about installing transports, see Chapter 3 of the <i>Windows NT Installation Guide</i> .
NWLinksys	Error binding to adapter card <i>cardname</i> .	Your adapter card may be malfunctioning, or its settings may be incorrect. If your adapter card is not malfunctioning and the NWLink protocol is bound to the correct card, use the Network option in Control Panel to verify the adapter card settings. For information on configuring the NWLink protocol, see Chapter 2.

## Connectivity Service Starts, but Servers Can't Be Found

You may not be able to see NetWare servers because you may be using an incorrect frame type for the servers. View the network adapter load line in the NetWare servers AUTOEXEC.NCF file to verify that you are using the correct frame type for the server. For example, suppose a servers network adapter load line is:

```
load 3C503 FRAME=ETHERNET_802.3 NAME=ETH
BIND IPX TO ETHERNET=52
```

The server is bound to a 3Com 503 ethernet adapter that will accept the raw 802.3 frame format.

You can use the Network option in Control Panel to see the frame type you have set for your adapter card.

## Connectivity Service Starts, but NetWare 4.x Servers Can't Be Seen

The connectivity service supports NetWare 4.x bindery emulation. Be sure that the bindery context you set for your NetWare server directory includes the Windows NT users you want to have access to the servers. You can view and set your bindery context on NetWare 4.x servers either by loading the SERVMAN NetWare Loadable Module (NLM) and then viewing and setting the SET BINDERY CONTEXT parameter. Or you can type **set** at the command prompt to view the Miscellaneous SET parameters. For more information, see your NetWare 4.x server documentation.

## Connectivity Service Prompts for a Password at Each Logon

The connectivity service prompts for a password for your preferred server after you log on to Windows NT because the user name and password for your NetWare preferred server differs from your Windows NT password. If you don't want to be prompted for your preferred server password, make your NetWare preferred server and Windows NT passwords the same. You can change your password using the **setpass** command at the command prompt. For more information about **setpass**, see Validating a NetWare Account in Chapter 5.

## NetWare Login Scripts Are Not Running

The connectivity service does not support the NetWare scripting language. However, Windows NT does have its own logon scripts. For information on Windows NT logon scripts, see User Manager in the *Windows NT System Guide*.

## Access Denied to a NetWare File Server

By default, the connectivity service uses the credentials used for preferred server authentication to access other NetWare servers. In order to see files on NetWare servers for which you have access, synchronize your credentials on all the NetWare servers. You can synchronize your credentials using the **setpass** command at the command prompt, as described in Validating a NetWare Account in Chapter 5.

If you do not want to use the same credentials for each NetWare server, type your username for the NetWare server in the Connect As box in the Connect Network Drive dialog box in File Manager. You will be prompted for your password for the server.

If you do not want to synchronize your NetWare credentials on all servers, at the command prompt type:

```
net use drive: \\nwserver_name\volume_name /user:username password
```

If access is denied when you are trying to configure a Windows NT Advanced Server computer as a file or print gateway, your user account on the NetWare network may not be a member of the NTGATEWAY group, or your account or the NTGATEWAY group may not have sufficient trustee rights. For information on setting up the NTGATEWAY group and assigning trustee rights on the NetWare server, see your NetWare documentation.



## Application and Print Problems

### NetWare Print Queues Are Not Shown in Print Manager

In Print Manager, when you click the NetWare server where your print queues are located, no queues are shown because your credentials on the NetWare print server do not match those on your preferred server. The connectivity service uses your preferred server credentials to access the print queue server.

If you do not see any print queues, verify that you can see NetWare servers in File Manager. If not, verify that the connectivity service is started, as described in *Connectivity Service Doesn't Start* earlier in this chapter.

To see the print queues on NetWare servers to which you have access, you must create an authenticated connection to the server. Synchronize your credentials on all the NetWare servers using the **setpass** command at the command prompt, as described in *Validating a NetWare Account* in Chapter 5.

If you do not want to synchronize your NetWare file server credentials with your preferred server credentials, at the command prompt type:

```
net use port: \\nwserver_name\queue_name /user:username password
```

For more information about printing, see *Connecting to a NetWare Print Queue Through Print Manager* in Chapter 4.

### Applications Are Not Working Correctly

To make sure the application is supported in this release, see the list in Chapter 6, *Running NetWare Utilities and NetWare-Aware Applications*. Supported applications include some MS-DOS-based and 16-bit Windows-based NetWare-aware applications. Some of the utilities that ship with NetWare 2.2, 3.11, or 3.12 are also supported.

### NetWare Map Utility Fails with a Memory Allocation Error

The default environment for 16-bit programs is too small to accommodate the mapping table created by the NetWare **map** utility. You need to designate COMMAND.COM as the permanent command interpreter for the Command Prompt window and reset the default environment size allocated to the window. An environment of 4,096 bytes is large enough to accommodate the NetWare utility, the mapping table, and the command interpreter.

To make these changes to the environment, enter this line in CONFIG.NT:

```
shell=%systemroot%\system32\command.com /e:4096
```

This line causes COMMAND.COM to be the command interpreter for the window as long as it remains open or until you issue another **shell** command, and it permanently allocates 4,096 bytes to 16-bit programs you run in the window.

## Other Network Problems

This section briefly describes other network problems that could affect your ability to install or run the connectivity service. For more network troubleshooting information, see the troubleshooting chapter in the *Windows NT System Guide*. See also the NETWORK.WRI file in your \WINNT directory.

If network problems persist, use Event Viewer from the Administrative Tools group to review the System Log information generated during startup. Details in the System Log will reveal possible interrupt conflicts or other driver problems.

## Duplicate Computer Names

Each computer on a network must have a unique name. If you specify a computer name that is the same as another computer on the network or the same as a workgroup or a domain, the network will not start when you run Windows NT.

## Services or Subsystems Do Not Start

If services or subsystems do not start properly, use the Services or Devices icons in Control Panel to check their status. You can try to start services using the Services option and start a device with the Devices option. Also, check the System Log in Event Viewer for entries related to the problem.

## Interoperability with Windows for Workgroups

When setting up your network, check the following items to ensure smooth interoperability between Windows NT and Windows for Workgroups.

- \* If you log on to a Windows for Workgroups computer whose workgroup name is the same as the name of a Windows NT Advanced Server domain, and if the user name and password are not valid for the domain, browsing will not be available. If you want to browse the domain, log on with a user name and password that are valid in the domain.
- \* Guest accounts should remain enabled on domain controllers. Instead of removing guest accounts to restrict access to certain services, simply remove any unwanted guest account rights in User Manager.
- \* Avoid duplicate user names on different domains. If a user name is duplicated across different domains, logging on will produce different results on the Windows NT network and the Windows for Workgroups workstation.

## Using the Last Known Good Configuration

If you encounter difficulty starting Windows NT, you may choose to start Windows NT using the Last Known Good Configuration.

1. Start your computer and select Windows NT or Windows NT Advanced Server from the boot loader menu (if it does not start automatically).
2. As soon as the screen clears and the words OS Loader appear on the screen, hold down the space bar. Windows NT displays the Configuration Recovery menu, which asks you to choose either Current Startup Configuration or Last Known Good.
3. To restore the last working system configuration, choose Use Last Known Good Configuration. Configuration changes are lots if they were made since your system was last started successfully.

## Using the Emergency Repair Disk

If your system files are corrupt and you are unable to recover the previous startup configuration (Last Known Good), you can use the Emergency Repair disk to restore your system to its initial setup state. To repair a Windows NT installation, you must use the Emergency Repair disk specifically created for that installation during Windows NT Setup.

If your system becomes corrupt but you do not have the Emergency Repair disk created during installation, you must reinstall Windows NT from the original installation disks.

### **To restore Windows NT with an Emergency Repair disk on an x86-based computer**

1. Start Setup using the original Setup floppy disks or CD-ROM. (For example, insert Setup Disk #1 of the original Windows NT installation disks in drive A and start the computer.)
2. In the first text-based Setup screen, type **r** to indicate that you want to repair your Windows NT files.
3. Follow the instructions on the screen, inserting the Emergency Repair disk in drive A and providing any other Windows NT Setup disks as requested.
4. When the final message appears, remove the Emergency Repair disk from drive A, and then press CTRL+ALT+DEL to restart your computer.

### **To restore Windows NT with an Emergency Repair disk on a RISC-based computer**

1. Start the Windows NT Setup Program as instructed in your manufacturer-supplied documentation. (How you start Windows NT Setup depends on the type of RISC-based computer you are installing on.)
2. In the first text-based Setup screen, type **r** to indicate that you want to repair your Windows NT files.
3. Follow the instructions on the screen, inserting the Repair disk in drive A if Repair asks for it.
4. When the final message appears, remove the Repair disk, and then press ENTER to restart your computer.

For more information about using your Repair disk, see Chapter 12 in the *Windows NT System Guide*.