

Using Windows NT in NetWare Environments

An Overview

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The Microsoft® Windows NT™ operating system's open design and integrated networking allows it to access both Windows NT-based systems and Novell® NetWare® servers. This integrated networking, combined with the open architecture, makes Windows NT an ideal platform for building distributed applications.

Overview

The Microsoft® Windows NT™ operating system is the high-end operating system of the Windows™ family of operating systems. It's the advanced operating system that's designed to make the most of today's powerful machines.

Windows NT is powerful, reliable and open. It is a 32-bit operating system providing preemptive multitasking and high capacity. It's designed for non-stop performance with a built-in backup utility, and its open architecture allows it to support a broad range of applications and hardware.

While Windows NT includes the features necessary to build advanced solutions, its open design makes it easy for third party vendors to extend Windows NT to address a range of business requirements. One such requirement is consistent access to information stored in a variety of back-end systems. An example of this is Novell's support of NetWare® access on the Windows NT platform. Novell has created the *NetWare Client for Windows NT* which enables Windows NT to be a full in a NetWare network.

Windows NT in a NetWare Environment

Many customers who use NetWare today will also want to use Windows NT. These customers will be able to use Windows NT on their NetWare networks in two ways: as a workstation or client, and as an application server.

- *Desktop/client:* Windows NT can access NetWare file and print resources while concurrently accessing Windows-based systems and other services on heterogeneous systems.
- *Application server:* Windows NT makes a great server for client-server solutions. Client systems running the MS-DOS®, Windows or Windows NT operating systems can access NetWare and Windows NT-based servers concurrently.

Windows NT is Built for Networking

Windows NT was born to network. Microsoft's philosophy is that operating systems should include networking. After all, it should be as easy to access network resources as it is to access local resources. Just as Windows NT manages CPUs, disk drives, memory, the mouse and video cards, Windows NT also manages the network access to distributed applications and remote files and printers.

The networking checklist for Windows NT responds to customer requirements for power:

- Build it in
- Make it *open* to other networking
- Make it *easy* to use
- Be *reliable* for mission-critical applications
- Ensure *interoperability*

- Provide a great platform for distributed applications

Networking in Windows NT is a natural extension of the operating system, not an additional piece of software that has to be added on. This is true throughout the operating system including the user interface. For example, the file manager allows you to browse and connect to remote resources and set up printers remotely is as easy as locally. Network support in the Windows NT operating system is designed to run independent of the network vendor, so the same user interface and tools work with all networks that run on Windows NT.

Windows NT allows multiple protocols and network services to run simultaneously. Microsoft and Novell have worked together to make NetWare transports available on Windows NT systems. For example, you can concurrently access a client-server application using DCE compatible remote procedure calls over TCP/IP transports while browsing directories on a NetWare server over IPX/SPX.

An example of why this is important is when a user needs to access files on a NetWare server, but also wants to access server based applications running on Windows NT Advanced Server. In this situation, the user may also want to access files and printers running on other Windows NT-based systems. The desired configuration is shown in *Figure 1*.

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Figure 1: Windows NT-based Application Server and NetWare-based server being accessed concurrently by a Windows NT-based Workstation

While Windows NT includes integrated networking, its open design provides for transparent access to other networks such as NetWare. As shown in *Figure 2*, Windows NT can concurrently access files stored on Windows NT and NetWare.

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Figure 2: Concurrent access to Windows NT and NetWare Servers

How Windows NT supports NetWare

The Windows NT operating system allows Novell as well as other third party network vendors to support heterogeneous networks because of its open architecture. The architectural feature that enables Windows NT to work with NetWare is called the *multiple provider router*. The multiple provider router allows different kinds of file systems to run on Windows NT.

Windows NT supports various local file systems such as FAT and HPFS for compatibility with MS-DOS-based clients and Microsoft LAN Manager servers as well as the Windows NT File System (NTFS) to exploit the advanced capabilities of Windows NT. The same is true for remote file systems. While Windows NT includes support for Windows-based servers, it can also access other file servers such as NetWare.

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Figure 3: Access to multiple file systems through a common API

The key to the multiple provider router is that all file systems, whether FAT or NTFS based, local or remote are accessible through the same set of file system APIs

as part of the Win32™ API of Windows NT. Applications, including the file manager, make file system requests through the Win32 API. The multiple provider router ensures that requests are directed to the proper file system. Local files are sent to the local disk; remote requests to Windows-based servers are sent to the proper server by the Windows redirector; requests to NetWare-based servers are handled by the Novell's NetWare Requester for Windows NT and sent to the NetWare server.

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Figure 4: Access to multiple network redirectors through the multi provider router

Users can access network servers independent of the type of server. Because applications access all types of files through a single set of APIs any application can access any kind of server without effecting the user.

Why Windows NT and NetWare are a Great Combination

Windows NT and NetWare are a great combination for companies that have built their PC networks on NetWare, but want to add sophisticated Windows NT-based solutions to their computing environment. Windows NT desktops and application servers can be added to the existing NetWare networks without changing existing systems and configurations.

Microsoft and Novell realize that customers want the best of Windows and NetWare. Novell and Microsoft has focused on making NetWare accessible from all Microsoft operating systems including MS-DOS and all versions of Windows. Our efforts with Windows NT in particular highlight our commitment to helping customers integrate advanced solutions using Windows NT with the NetWare environment.

Networking with Microsoft Windows NT

A key component of the success of Windows NT will be its networking support. That's why we've made it full featured, reliable, easy to use and built-in. Networking with Windows NT permits interoperability with LAN Manager, Windows for Workgroups, NetWare and other third party network solutions.

The open architecture of Windows NT makes it easy to support other network services. Integrated networking, combined with the open architecture, makes the Windows NT operating system an ideal platform for building distributed applications.

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