

NetWare MIGRATION WIZARD 6

by Cheryl Walton

The Change Is Going to Do
You Good



To paraphrase a maxim, the only thing that doesn't change is change itself. Of course, some things change more quickly than others. As a network administrator, you are probably convinced that IT-related technologies change faster than just about anything, including the weather.

After all, you no sooner upgrade your company's network to take advantage of the latest technological advances and other (even better) enhancements emerge. For example, you may have recently upgraded users from excruciatingly slow PCs with 486-MHz microprocessors to state-of-the-art PCs with 1.5-GHz microprocessors. No sooner did you complete this upgrade than a prominent chipmaker announced an even faster 2.0-GHz microprocessor.

Although your company could go bankrupt deploying every new technology, you obviously need to be aware of technological advances and determine which advances will give your company a competitive edge. After all, if hardware and software vendors are doing their jobs correctly, the whole point of technological advances is to make companies such as yours more competitive.

In fact, hardware and software companies often work together to achieve this goal. For example, Novell worked with Compaq to provide hardware support for NetWare 6 technologies, which enhance NetWare's performance and scalability, thereby enabling companies to implement successful and competitive e-business technologies. As you may know, the core components of NetWare 6 are multiprocessor (MP) enabled, which improves NetWare's performance on servers that have two or more processors. (These are not the only enhancements in NetWare 6 that will help your company be more competitive. For more information, see "Six Reasons To Upgrade to NetWare 6" on p. 22.)

To help you manage all of your company's server hardware, Compaq also worked with Novell to develop the NDS Asset Collection Agent for Compaq Servers 1.0. This utility stores information about server hardware in Novell eDirectory. (For more information about the NDS Asset Collection Agent for Compaq Servers, see "A Better Way To Manage Hardware Assets" on p. 26.)

The Novell-Compaq alliance is just one example of how changes in operating system technologies often beget changes

in server technologies, and vice versa. Similarly, changes in operating system and server technologies beget changes in applications.

The result of this perpetual change is that to remain competitive, sooner or later your company will probably need to deploy an application that simply will not run on your present network operating system. Moreover, the more advanced operating system that supports this application will probably not run on your company's outdated hardware. You will eventually need to upgrade both your company's network operating system and hardware.

To paraphrase another maxim, no change—even a change for the better—comes without inconvenience. Although you may be looking forward to the results of these upgrades (such as increased network performance and availability of data), you are probably not looking forward to performing the upgrades. Fortunately, NetWare Migration Wizard 6.0 can simplify—and therefore minimize the inconvenience of—performing this task.

A WIZARD'S COMBO

NetWare Migration Wizard 6 is the most recent version of two separate Novell utilities, which help you migrate data from one server to another. Specifically, NetWare Migration Wizard 6 combines and updates the following two utilities: Novell Upgrade Wizard 3.1 and NetWare Migration Wizard 4.0.

Novell Upgrade Wizard 3.1 enables you to migrate your company's NetWare 3.x servers to NetWare 4.x and its NetWare 4.x servers to NetWare 5.x. NetWare Migration Wizard 4.0 enables you to migrate your company's Windows NT servers to NetWare 5.1.

NetWare Migration Wizard 6 runs on Windows 2000, 98, and NT workstations that are also running Novell client software. You can download NetWare Migration Wizard 6 free from <http://download.novell.com/sdMain.jsp>. After you install NetWare Migration Wizard 6, you can use this utility to make the following types of changes to your company's network:

Six Reasons To Upgrade to NetWare 6

NetWare Migration Wizard 6 makes upgrading your company's servers to NetWare 6 a snap. But, the question remains, why should you bother upgrading to NetWare 6 at all? There are plenty of reasons to take advantage of the new features available in the newest version of NetWare—all of which can mean a better bottom line to your company. Below are six bottom-line reasons for upgrading to NetWare 6:

- **Native File Access.** Workstations no longer have to run the Novell client. NetWare 6 enables Windows, Macintosh, and UNIX workstations to access NetWare servers using their native file protocols. (For more information about Native File Access, see "Native File Access Wanted: Client Software Need Not Apply," *Novell Connection*, Nov. 2001, pp. 6–26.)
- **iFolder.** With iFolder, users can access their critical files anytime, anyplace. Using iFolder, users can save a file to a folder on their desktop. iFolder encrypts that file and saves it to a server. The user can then access that file from a home computer or through a web browser. In addition, when the user makes changes to that document, those changes are then saved to the server. As a result, the file is always up-to-date. (For more information about iFolder, see "Novell iFolder: Your Data Where You Want It, When You Want It," *Novell Connection*, May 2001, pp. 6–20.)
- **iPrint.** Using iPrint, users can access a printer, no matter where those users are physically located. By simply pointing-and-clicking on the desired server, users can print to a printer anywhere on

your company's network. (For more information about iPrint, see "iPrint: Access a Printer From Anywhere," *Novell Connection*, Aug. 2001, pp. 6–13.)

- **Novell Remote Manager.** Finally, a web-based management utility is available for NetWare servers. Novell Remote Manager enables you to securely perform network management tasks such as managing volumes, servers, applications, and eDirectory via a web browser. (For more information about Novell Remote Manager, see "Novell Remote Manager: Remote Control for NetWare Servers," *Novell Connection*, Sept. 2001, pp. 14–29.)
- **Multiprocessing.** NetWare 6 is designed to take advantage of multiple processors on a single server. As a result, the network operating system and any applications running on the server run faster and more efficiently. (For more information about multiprocessing capabilities in NetWare 6, see "NetWare 6 and MP: Unraveling the Threads of Multiprocessing," *Novell Connection*, Mar. 2001, pp. 6–18.)
- **Reliability, Scalability, and Security.** As you are aware, NetWare is the most reliable, scalable, and secure network operating system. And, NetWare 6 is even better. NetWare 6 can scale horizontally and vertically, enabling you to add more servers, clusters, and users. In today's e-business environment reliability and security are key. NetWare 6 includes several enhancements to ensure that your company's NetWare servers are always available and are always secure.

You can download the articles mentioned above from www.ncmag.com/past. ●

- Migrate only hardware
- Migrate operating system and hardware
- Migrate Windows NT servers to NetWare

The specific type of change that NetWare Migration Wizard 6 enables you to make depends on the type of server from which you want to migrate data. This server is called the *source server*.

For example, you can perform a hardware-only migration for source servers that are running NetWare 6, 5.1, and 5.0. NetWare Migration Wizard 6 also performs the following types of hardware-plus-operating system migrations:

- NetWare 4.2 and 4.11 source servers to NetWare 6, 5.1, or 5.0
- NetWare 5.0 source servers to NetWare 6 or 5.1
- NetWare 5.1 source servers to NetWare 6

In addition, NetWare Migration Wizard 6 enables you to migrate NetWare 3.2 and 3.11 source servers to existing (as opposed to new) NetWare 6, 5.1, 5.0, 4.11, and 4.2 servers. Similarly, you can migrate

data on Windows NT 4 and 3.51 servers to existing NetWare 6, 5.1, 5.0, 4.2, and 4.11 servers. (NetWare 3.11 and 3.2 servers are hereafter simply called NetWare 3 servers; NetWare 4.11 and 4.2 servers are called NetWare 4 servers; NetWare 5.0 and 5.1 servers are called NetWare 5 servers; and Windows NT 3.51 and 4 servers are called Windows NT servers.)

Ditch That Old Hardware

If you have upgraded an operating system on server hardware that barely meets the minimum requirements of the new operating system, you know why you may want to ditch that old hardware: namely, poor performance. For example, suppose you used the NetWare 6 installation program to upgrade a NetWare 4 server that has a Pentium II processor. Furthermore, suppose that like its processor, this server's memory and other hardware requirements barely meet the minimum requirements for NetWare 6.

Although the old server ran NetWare 4 like a dream, it runs NetWare 6 like a s-l-o-w turtle. After all, Novell recommends that you run NetWare 6 on a server that has at least two Pentium III (700-MHz)

processors. NetWare 6's MP-enabled components can then use the two processors to perform at top speeds. (For more information about MP-enabled components in NetWare 6, see "NetWare 6 and MP: Unraveling the Threads of Multiprocessing," *Novell Connection*, Mar. 2001, pp. 6–18. You can download this article from www.ncmag.com/past.) To improve this server's performance, you must upgrade its hardware.

Of course, with NetWare Migration Wizard 6, you do not need to upgrade an older operating system on the same server hardware before you upgrade that hardware. You can perform an operating system upgrade and a hardware upgrade at the same time.

A Migration With a Destination

Whether you use NetWare Migration Wizard 6 to upgrade a server's operating system and hardware or simply its hardware, you must first install the NetWare operating system on the new server hardware—which is called the *destination server*. For example, if you plan to perform a hardware-only upgrade on an existing NetWare 6 source server, you

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A Better Way to Manage Hardware Assets

As a directory architect for Compaq, Drue Reeves often finds himself answering the following question: Why would Compaq provide a product that stores information about server hardware in Novell eDirectory?

The product in question is Compaq's NDS Asset Collection Agent for Compaq Servers 1.0, which, as Reeves explains, is the first and only product of its kind. "No other OEM [original equipment manufacturer] provides a product like NDS Asset Collection Agent for Compaq Servers," Reeves asserts. (For brevity's sake, NDS Asset Collection Agent for Compaq Servers is henceforth called *NDS Asset Collection Agent*.)

When asked this question, Reeves always gives the following answer: Information about a company's hardware should be included in eDirectory for the same reasons that other types of information are included in eDirectory. Namely, because information in eDirectory is highly available, easily accessible, and secure.

As you know, information in eDirectory is highly available because eDirectory is a distributed database. When hardware information is stored in eDirectory, that information is available even when the server to which the information pertains is unavailable. Furthermore, if you have access rights, you can use Novell's ConsoleOne to access this information from anywhere on your company's network. eDirectory also keeps this information securely beyond the reach of unauthorized users.

WHY YOU NEED TO BE IN THE KNOW

As a network administrator, you have a number of reasons for needing information about your company's server hardware. For example, you probably inventory server hardware regularly because it is a valuable company asset. You also need information about server hardware so that you can perform regular maintenance and upgrades. In addition, you need information about your company's server hardware to manage nonroutine events, as you did when you managed your company's year 2000 transition.

NDS ASSET COLLECTION AGENT: AT A WEB SITE NEAR YOU

Although NDS Asset Collection Agent was not available to help you prepare for the year 2000 transition, it is available today. NDS Asset Collection Agent is free to all Compaq ProLiant customers. To download and try NDS Asset Collection Agent on your company's network, visit www.compaq.com/manage/novell_integration.html.

JUST THE FACTS, MAN

The NDS Asset Collection Agent includes both server- and client-based components. The server-based components support any ProLiant server that is running Compaq Insight Management Agents for Servers 4.6 or later. (Compaq Insight Management Agents are NetWare Loadable Modules [NLMs] that are included with ProLiant servers.) These servers must also be running NDS 8.0 or later (which runs on NetWare 5.0 and later).

The NDS Asset Collection Agent includes the following server-based components:

- **CPQDSLIB.NLM.** The CPQDSLIB.NLM is an eDirectory helper library, which the CPQDS.NLM uses to perform its tasks.
- **CPQDS.NLM.** The CPQDS.NLM is the workhorse of the NDS Asset Collection Agent server-based components.

The first time you run CPQDS.NLM on a server in your company's network, this NLM extends the eDirectory schema to include information about server hardware. Specifically, CPQDS.NLM uses Compaq auxiliary classes to extend the Server object to include attributes that describe virtually every device that is (or can be) attached to your company's ProLiant servers. (Because this NLM extends the eDirectory schema, you should run CPQDS.NLM first on a server that is running a read-write or master replica of the [Root] partition.)

For example, CPQDS.NLM extends the Server object to include attributes for describing ProLiant servers' ROM, such as the ROM date, family, and revision. In addition, these attributes enable NDS Asset Collection Agent to integrate with other Compaq management products, such as Compaq Insight Manager XE and Compaq Remote Insight Lights-Out Edition.

Note. Insight Manager XE is a web-based tool that enables you to monitor and manage groups of ProLiant servers, clustered servers, and Compaq client computers. Remote Insight Lights-Out Edition is a Peripheral Component Interconnect (PCI) board that enables you to securely deploy and manage ProLiant servers remotely using a standard web browser. For more information about these and other Compaq server management products, visit www.compaq.com/products/servers/management.

After the CPQDS.NLM extends the eDirectory schema, it gathers information about the server upon which it is running by making Simple Network Management Protocol (SNMP) calls to the Compaq Insight Management Agents that are also running on that server. The CPQDS.NLM then writes the information it obtains from these agents in the server's Server object.

After performing this task, the CPQDS.NLM becomes non-resident in the server's memory. That is, this NLM does not continuously update hardware information stored in the Server object. To update this information, you must execute the CPQDS.NLM again by unloading and then loading this NLM.

If you want to refresh this information at regular intervals, however, you can use the CRON.NLM utility to automatically execute CPQDS.NLM. The CRON.NLM utility is a Novell scheduling utility that runs continuously as a background process.

NOW YOU SEE IT

To view the information that the CPQDS.NLM stores in the Server object, you can use the NDS Asset Collection Agent client component: CPQMGR.JAR. As you probably guessed, this component is a snap-in module for ConsoleOne.

You can install the NDS Asset Collection Agent client component on any client computer that is running Novell Client Services 5.2 or later and ConsoleOne 1.2d or later. When you install the NDS Asset Collection Agent client component, CPQMGR.JAR adds a Compaq Server Information Tab to the ConsoleOne Properties page. This tab enables you to access and view information about Compaq ProLiant servers running NDS Asset Collection Agent. ●

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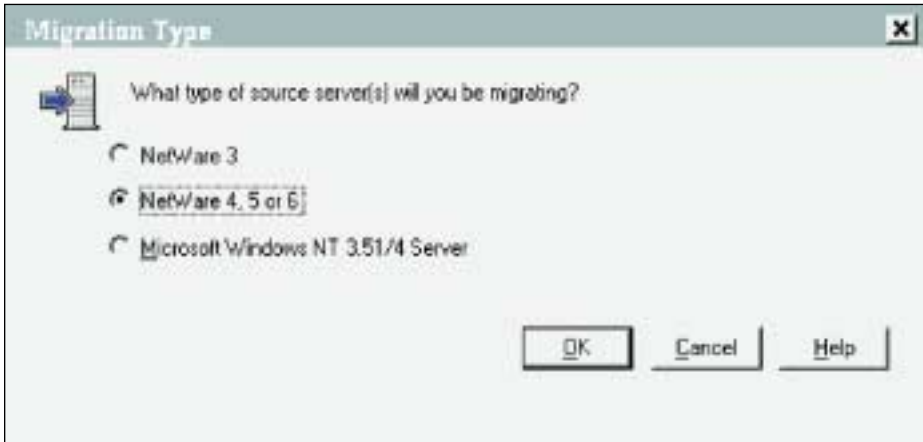


Figure 1. NetWare Migration Wizard 6 enables you to create projects for migrating data from NetWare 6, 5, 4, 3, or Windows NT source servers. The source server you select determines the type of migration that NetWare Migration Wizard 6 can perform.

use the NetWare 6 installation program to install NetWare 6 on the destination server. In this case, you use the Pre-Migration option to install NetWare 6.

The Pre-Migration option installs NetWare 6 with only the products that NetWare Migration Wizard 6 requires to accomplish its task, such as Storage Management Services (SMS). (SMS is software that provides backup, restore, and data migration capabilities for NetWare servers.) NetWare Migration Wizard 6 uses SMS to establish a connection between the source server and the destination server. Through SMS, NetWare 6 reads data from the source server and copies that data to the destination server. The Pre-Migration option also pre-

pare the destination server to receive this data from the source server.

If you plan to upgrade a NetWare 4 server to NetWare 5 on new hardware, you install NetWare 5 on that new hardware. Because the NetWare 5 installation programs do not include a Pre-Migration option, you use the New Server option to install this destination server and de-select all products except SMS.

In either case, you give the destination server a temporary name and install the destination server in its own temporary eDirectory tree on your company's network. This server's temporary name and the name of its temporary eDirectory tree must not duplicate the names of the source server and the No-

vell Directory Services (NDS) or eDirectory tree in which the source server resides. (NetWare Migration Wizard 6 supports all versions of NDS and eDirectory. For the remainder of this article, both NDS and eDirectory are called eDirectory.)

Although you give the destination server a temporary name, the volumes you create on this server must bear the same names as the volumes you intend to migrate from the source server. These volumes must also be at least the same size as the volumes on the source server.

In addition, you must ensure that source and destination servers use the same network protocol. For example, if the source server is a NetWare 4 server that uses IPX, you must bind the IPX protocol to the destination server.

The destination server also needs at least two—and preferably three—available user licenses. NetWare Migration Wizard 6 uses one user license to establish a connection via SMS between the source and destination server. NetWare Migration Wizard 6 uses a second user license to establish its own connection with the destination server.

Because NetWare may take a few moments to release a user license after you log out, Novell recommends that you also have an extra user license on the destination server. You may need this extra license if you log out of the destination server to perform a quick task and then immediately log back in.

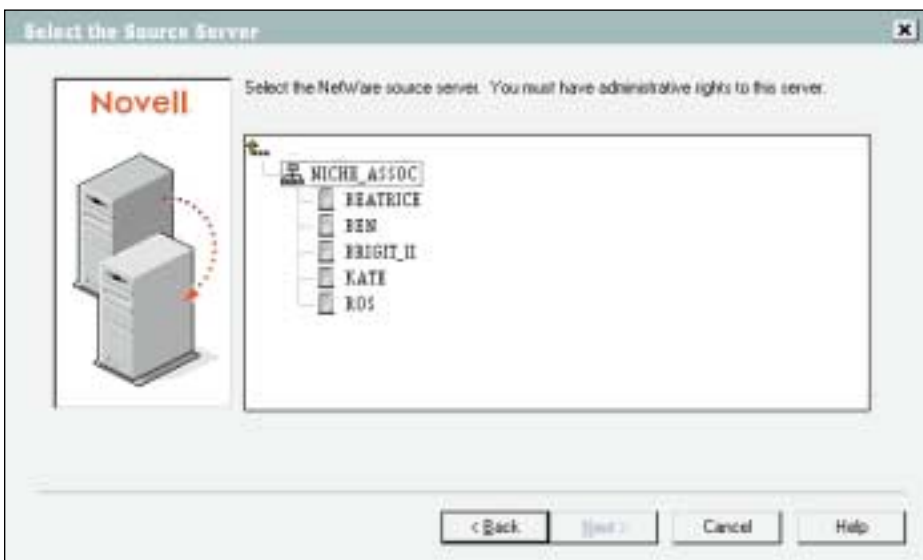


Figure 2. NetWare Migration Wizard 6 searches the eDirectory tree that you specify and then displays the servers that are located within this tree. The source server—the server from which you want to migrate data—should be among these servers.

Success Is Hanging on Your Tree

After you prepare the destination server, you can use NetWare Migration Wizard 6 to migrate data from a source server to the destination server. Before you do, however, you should make sure that the eDirectory tree in which this source server resides is healthy. Because this type of migration process affects your company's eDirectory tree, the success of this process can hinge on the overall health of that tree. (For information about preparing your company's NDS tree for an upgrade, see "Stepping Up to NetWare 5.1: Preparing the NDS Tree for an Upgrade," *Novell Connection*, Oct. 2000, pp. 20–30. You can download this article from www.ncmag.com/past.)

You should also perform a complete backup of the source server before you migrate the data running on that server.

MAKING CHANGES ONE PROJECT AT A TIME

To migrate data from NetWare 6, 5, or 4 source servers (or any type of source server that NetWare Migration Wizard 6 supports), you create a project that defines this migration. (See Figure 1 on p. 28.) For example, to migrate data from a NetWare 5 source server to a NetWare 6 destination server, you create a project that identifies the particular NetWare 5 source server from which you want to migrate data. (See Figure 2 on p. 28.) This project also identifies the NetWare 6 destination server to which you want to migrate this data. (See Figure 3 on p. 30. For step-by-step instructions for creating projects, see "Creating a Project Fit for a Wizard," on p. 34.)

After you create a project for this migration, NetWare Migration Wizard 6 displays the Project Window for this type of migration. The Project Window for migrating data from NetWare 6, 5, or 4 source servers enables you to perform the following tasks:

- Copy volumes
- Edit configuration files
- Begin NDS migration
- Finish NDS migration

A Process That Speaks Volumes

When you select Copy Volumes, NetWare Migration Wizard 6 displays a list of the volumes residing on the source server. You can migrate all of the volumes on this list, or you can migrate individual volumes. To select individual volumes, highlight the volume, and then click either Yes or No, depending on whether or not you want to migrate that volume.

Alternately, you can opt to migrate some volumes now and some later. In other words, Novell product manager Derek Dobson explains, "You can migrate everything at once, or you can do it in steps." (You can also restore the source server's volumes to the destination server using your company's backup software and the source server's pre-migration backup.)

This flexibility can simplify the task of migrating data from NetWare 6, 5, or 4 source servers. For example, suppose you want to migrate the bulk of the data on a particular source server during regular business hours. Further suppose you want users to have access to the files they need during the migration process.

Although NetWare Migration Wizard 6 does not migrate open files, you can migrate all of the volumes on the source server during the day—even volumes containing files that users may have open. NetWare Migration Wizard 6 migrates the files on these volumes that are not open and stores a record of all migrated files in its internal database.

Later, after users have closed their files and gone home, you can run NetWare Migration Wizard 6 and select either the Open an Existing Project or Open Last Project option from the NetWare Migration Wizard Startup menu. You can then select Copy Volumes in the NetWare Migration Wizard 6 Project Window and select the volumes that users were using during the initial migration process.

You then click the Migrate bar. Because NetWare Migration Wizard 6 stored a record of the files migrated initially, it migrates only the files on the selected volumes that were not included in that initial migration.

Regardless of when you migrate a par-

ticular volume, NetWare Migration Wizard 6 backs up the file and directory trustee rights that are associated with that volume before beginning the migration process. NetWare Migration Wizard 6 stores these backup files on both the source and destination servers.

As NetWare Migration Wizard 6 migrates directories and files, it may prompt you to resolve errors or warnings. For example, NetWare Migration Wizard 6 warns you if it cannot establish a connection between the source and destination servers. (This problem may occur if the source server is using the IPX protocol and IPX filtering is enabled on the destination server.)

NetWare Migration Wizard 6 also logs the files and directories that it migrates successfully in a success log. Likewise, if NetWare Migration Wizard 6 cannot migrate a particular file or directory, it logs that file or directory in an error log. After NetWare Migration Wizard 6 has completed the task of migrating volumes, you can view these

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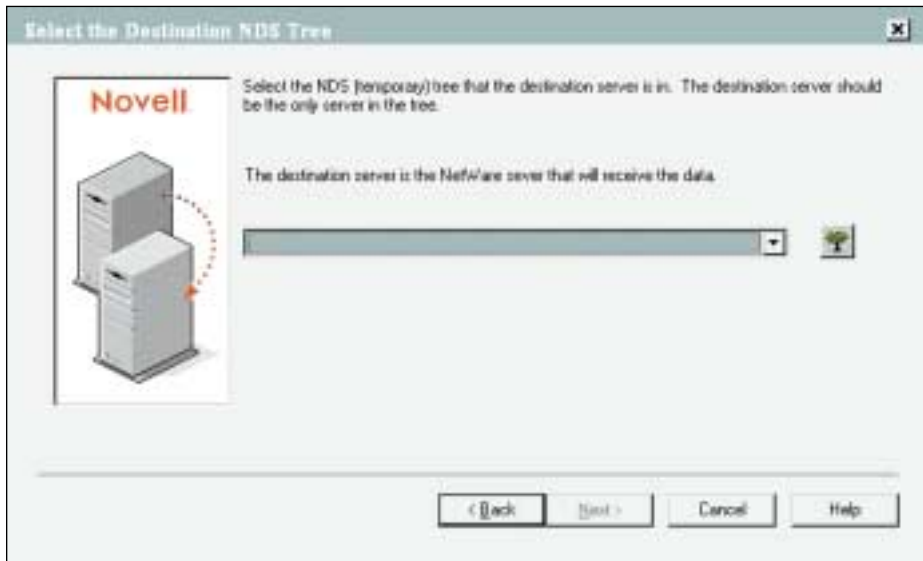


Figure 3. Before you migrate data from a NetWare 6, 5, or 4 source server, you must install the destination server into a temporary eDirectory tree. This server should be the only server in that temporary eDirectory tree. When creating a project to migrate these servers, you select this temporary eDirectory tree and then select the destination server in that eDirectory tree.

logs by selecting them in the Migration Completion screen.

Side-By-Side Comparison

NetWare Migration Wizard 6 does not migrate directories from the source server's SYS volume if those directories also exist on the destination server's SYS volume. Doing so would overwrite files that the destination server's operating system needs. (You can, however, migrate these directories from the source server's SYS volume to the destination server's SYS:MIG directory.)

Of course, you may want the configuration files on the destination server to contain information that exists in the source server's configuration files. The Edit Configuration Files task enables you to edit configuration files on the destination server so that the information contained therein matches information in the source server's configuration files.

When you select the Edit Configuration Files option in the Project Window, NetWare Migration Wizard 6 displays the Compare Configurations dialog box, which contains a list of the configuration files that reside on the source and destination servers. Using this list, you can compare the contents of configuration files on the destination server with the contents of corresponding configuration files on the source server.

The Edit Configuration Files task also enables you to copy information from the

source server's files to the corresponding files on the destination server. For example, suppose the AUTOEXEC.NCF file on the source server includes a LOAD command that loads a special NLM and you want the AUTOEXEC.NCF file on the destination server to also load this NetWare Loadable Module (NLM): You select the AUTOEXEC.NCF file from the list. NetWare Migration Wizard 6 then displays the contents of the AUTOEXEC.NCF file running on the source server and the contents of the AUTOEXEC.NCF file running on the destination server. You then copy the LOAD command from the source server's AUTOEXEC.NCF file and paste this LOAD command in the destination server's AUTOEXEC.NCF file.

When you finish copying the information, you close the Compare Configurations dialog box. NetWare Migration Wizard 6 records these changes in its internal database and then returns you to the Project Window.

Not a Case of Mistaken Identity

You select the Begin NDS Migration task in the Project Window only after you have successfully migrated all of the volumes that you want to migrate and you have edited the configuration files that you want to edit. This task represents the trickiest of all NetWare Migration Wizard 6 processes: the process of migrating the eDirectory database from the source server to the destination server. This process

overwrites the eDirectory database running on the destination server with the database running on the source server.

Before executing this process, NetWare Migration Wizard 6 prompts you to verify that your company's eDirectory tree is healthy. To reiterate, an unhealthy tree could cause the migration process to fail.

You are also given the option of extending the source server's eDirectory schema to include objects and attributes for the default applications running on the destination server. If you don't take NetWare Migration Wizard 6 up on this option, you may not be able to use these applications after the migration is completed.

For example, suppose you are migrating data from a NetWare 4 source server to a NetWare 6 destination server and this destination server will be the first NetWare 6 server in your company's eDirectory tree. Since the schema in your company's eDirectory tree doesn't include all of the schema extensions for NetWare 6 default applications, you need to extend this schema. (You can extend the schema on your company's eDirectory tree either during the migration process—using this NetWare Migration Wizard 6 option—or before you begin the migration process. Either way, you must have Admin rights to the [Root] of the eDirectory tree to extend the eDirectory schema.)

If the source server contains Novell International Cryptographic Infrastructure (NICI) configuration files, you are also prompted to manually copy these files from a diskette to the destination server before you begin the eDirectory migration process. You perform this task manually to maintain the security of the server's private keys.

After you have taken all of the necessary steps to prepare for the eDirectory migration process, NetWare Migration Wizard 6 accesses the eDirectory databases that are running on the source and destination servers. NetWare Migration Wizard 6 then identifies potential problems that could occur during the eDirectory portion of the upgrade process and displays these potential problems in its Migrate NDS Verification Results screen.

Of course, you must resolve these problems before you click the Migrate button, which signals NetWare Migration Wizard 6 to start migrating the eDirectory database from the source to

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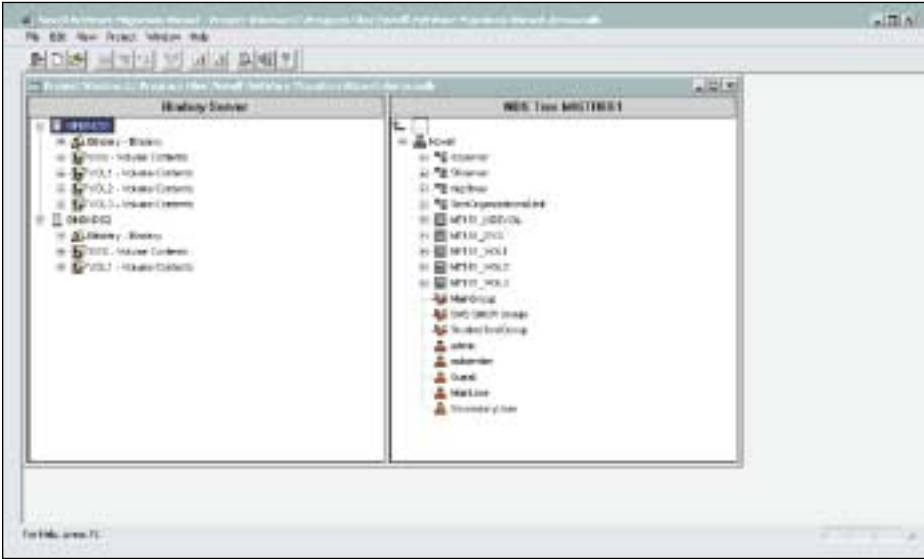


Figure 4. When you create a project to migrate data from one or more NetWare 3 source servers, NetWare Migration Wizard 6 enables you to model that migration in the NetWare Migration Wizard 6 Project Window.

the destination server. During the migration process, NetWare Migration Wizard 6 modifies the AUTOEXEC.NCF file on the destination server in the following ways:

- Changes the name of the destination server to the name of the source server
- Changes the time zone of the destination server to the time zone of the source server
- Changes the destination server's server ID to the source server's server ID
- Stores the source server's default time-server in the destination server's AUTOEXEC.NCF file

Finally, NetWare Migration Wizard 6 changes the destination server's bindery context to the source server's bindery context. In other words, NetWare Migration Wizard 6 replaces the destination server's identity with the source server's identity. After completing this task, NetWare Migration Wizard 6 shuts down the source server and restarts the destination server, which now occupies the source server's place in your company's network.

Crossing the Finish Line

Because the Begin NDS Migration task makes changes to your company's eDirectory tree, the Finish NDS Migration task prompts you to make sure those changes

were effective. You are asked to verify that the destination server has taken over the source server's identity, that all licenses are installed correctly, and that the eDirectory tree is still synchronized.

Note. To check the synchronization status of your company's eDirectory tree, run the DSREPAIR utility on a server that contains a Read-Write or Master replica of eDirectory. You then run Report Synchronization Status and Time Synchronization options in the DSREPAIR utility.

After you ensure that your company's eDirectory tree is healthy, you click the Continue button. NetWare Migration Wizard 6 then uses the backup files stored on the destination server to restore trustee rights to the files on this server. NetWare Migration Wizard 6 also updates the Volume objects in the eDirectory tree.

MOVING FROM NETWARE 3

Migrating data from NetWare 3 source servers can be significantly more complicated than migrating data from NetWare 6, 5, or 4 servers. First, when you migrate data from a NetWare 3 source server, you migrate that data to a destination eDirectory tree rather than to a single destination server. Therefore, you can split the data running on this NetWare 3 source server between any of the Server and container objects in the destination eDirectory tree.

To further complicate matters, NetWare Migration Wizard 6 enables you to include more than one NetWare 3 source server in a single migration project. Unlike Novell Upgrade Wizard 3.1, which enables you to migrate only one NetWare 3 server per project, NetWare Migration Wizard 6 can migrate an unlimited number of NetWare 3 servers in a single project.

NetWare Migration Wizard 6 also enables you to migrate individual directories and individual User and Group objects to the destination eDirectory tree. In contrast, with Novell Upgrade Wizard 3.1, you must migrate an entire volume to a single destination server. Furthermore, you must migrate the entire bindery to a single container.

To help you figure out what data goes where, the Project Window for performing migrations from NetWare 3 source servers contains a split screen view you use to model your migration. On the left side of this view, NetWare Migration Wizard 6 displays the volumes and bindery objects running on the NetWare 3

NT Permissions to NetWare Rights	
NT Special Permission	NW Right
FILE_ALL_ACCESS	ALL
DELETE	DELETE and FILE SCAN
WRITE_DAC	ACCESS CONTROL and FILE SCAN
WRITE_OWNER	ACCESS CONTROL and FILE SCAN
FILE_READ_DATA	FILE_SCAN and READ
FILE_WRITE_DATA	ACCESS CONTROL and WRITE and CREATE and MODIFY
FILE_EXECUTE	FILE_SCAN and READ

Figure 5. When you opt to migrate file permissions from Windows NT to NetWare, NetWare Migration Wizard 6 maps those permissions to NetWare permissions.

Matchmaker

The Project Window in NetWare Migration Wizard 6 enables you to merge NetWare 3 and Windows NT User objects with eDirectory User objects: You simply drag User objects from NetWare 3 and Windows NT source servers and drop these objects onto User objects in the destination eDirectory tree. NetWare Migration Wizard 6 also gives you the option of streamlining this task.

For example, after you create a project to migrate data from NetWare 3 source servers, NetWare Migration Wizard 6 asks you if you want it to find NetWare 3 bindery and eDirectory User objects that have the same name. If you select Yes, NetWare Migration Wizard 6 searches User objects in the destination eDirectory tree and in the source NetWare 3 binderies. NetWare Migration Wizard 6 then displays the Matching User List, which contains two lists of usernames. The left-hand list contains bindery usernames, and the right-hand list contains matching eDirectory usernames.

You can then review these names to ensure that the bindery username and the eDirectory username represent the same user.

If these two usernames represent the same person, you leave this list unchanged. If these two usernames do not represent the same person, you can select a different eDirectory username from the dropdown list that appears in the NDS User Name column. If a bindery User object has no corresponding eDirectory User object, you select Don't Merge from this drop-down menu.

When you click Finish, NetWare Migration Wizard 6 merges the bindery objects represented by the usernames on the left of the list with the eDirectory User objects represented by the usernames on the right side of the list.

Similarly, when you migrate data from a Windows source server, NetWare Migration Wizard 6 asks you if you want it to find Windows Domain and eDirectory User objects that have the same name. When you select this option, NetWare Migration Wizard 6 searches the destination eDirectory tree and the source Windows Domain for matching usernames. NetWare Migration Wizard 6 then displays the Matching User List, which contains Domain usernames on the left-hand side and corresponding eDirectory usernames on the right-hand side of that list. To merge these user objects you follow the procedure outlined above. ●

source servers. The right side of this view displays the destination eDirectory tree. (See Figure 4.)

To model this type of migration project, you drag items from the left side of this split view and drop them on objects in the right side. For example, suppose user Velma has a User object in the source server's bindery and a User object in the destination eDirectory tree. You can drag Velma's bindery User object from the left side of this split view and drop it onto Velma's eDirectory User object on the right side.

When you drop a bindery User object onto an eDirectory User object, NetWare Migration Wizard 6 merges these objects. (NetWare Migration Wizard also includes a utility that streamlines the process of merging bindery User objects with corresponding eDirectory User objects. For more information about this utility, see "Matchmaker.")

You can also drag User objects from the source server's bindery to existing container objects in the eDirectory tree. In fact, you can even use NetWare Migration Wizard 6 to create container objects for bindery User objects. You can then drag bindery User objects into these container objects.

When you do, NetWare Migration Wizard 6 creates eDirectory User objects for these users, converting bindery properties and attributes to eDirectory properties and attributes. NetWare Migration Wizard 6 can also apply a template ob-

ject to these newly created User objects, which can simplify the process of including properties and attributes that aren't included in bindery objects.

Of course, you can also drag volumes or directories from the source NetWare 3 servers and drop them on volumes or directories in the destination eDirectory tree. NetWare Migration Wizard 6 then prompts you to verify that the destination volumes and directories contain sufficient memory to accommodate these migrated volumes and directories.

It Looks Like Reality, But It's Not—Yet

The split screen view in the Project Window makes it seem as if NetWare Migration Wizard 6 is actually moving these volumes and directories from NetWare 3 source servers to the destination eDirectory tree. Similarly, it appears as if objects that you have moved, merged, and created exist in the destination eDirectory tree. However, this is not the case.

NetWare Migration Wizard 6 does not actually migrate, merge, or create anything until you click Migrate to begin the migration. If you aren't pleased with the way you have migrated User objects or data, you can undo it and try something else.

To undo a particular action, you reverse that action. For example, suppose you have merged a bindery User object with a User object in the eDirectory tree and now realize that these objects do not

belong to the same user. In this case, you would drag that User object back to the bindery on the NetWare 3 source server.

Time To Make a Commitment?

When you click Migrate, however, NetWare Migration Wizard 6 makes everything that appears in the Project Window a reality. For example, if you have merged a bindery User object with an eDirectory User object, NetWare Migration Wizard 6 actually changes the eDirectory User object.

Specifically, NetWare Migration Wizard 6 copies the attributes and values in the bindery User object to the eDirectory User object. However, NetWare Migration Wizard 6 does not overwrite attributes and values that already exist in the eDirectory User object—even if the values for those attributes are blank or zero.

For example, suppose the Login Restrictions attribute in the VJones eDirectory User object is blank, indicating that VJones has no login restrictions. Further suppose that the VJones User object in the bindery has a value, meaning that this User object does have login restrictions.

When NetWare Migration Wizard 6 merges these two objects, it does not overwrite the blank value in the eDirectory Login Restrictions attribute with the bindery value. The resulting eDirectory User object has no login restrictions.

In contrast, Novell Upgrade Wizard

Creating a Project Fit for a Wizard

Before NetWare Migration Wizard 6 can actually migrate data from source servers to destination servers, you must create a project that identifies those particular servers. (A source server is a server from which NetWare Migration Wizard 6 migrates data; a destination server is a server that receives that data.)

You take the following steps to create a project:

1. Install NetWare Migration Wizard 6 on a Windows NT, 2000, 98, or NT computer that is running Novell client software. By default, the installation program places Migration Wizard 6 in the Program Files/Novell/NetWare Migration Wizard directory and in the Windows Start menu under Programs>Novell>NetWare Migration Wizard>NetWare Migration Wizard.
2. Start NetWare Migration Wizard 6 from the Start menu.
3. Select Create a new project; then click OK.
4. Select one of the following types of source servers:
 - a. NetWare 3
 - b. NetWare 4, 5, or 6
 - c. Microsoft Windows NT 3.51/4 server
 Then click OK. (See Figure 1 on p. 28.)
5. If you are not certain you have performed all of the premigration setup tasks correctly, click View Setup Tasks. When you click this bar, NetWare Migration Wizard 6 launches your computer's default browser and takes you to Novell's online documentation for NetWare Migration Wizard 6. If you are

certain that you've performed these setup tasks correctly, click Next.

6. In the space provided, type a name for this project. NetWare Migration Wizard 6 saves this project on your computer's hard drive. You can either accept the default location (C:\Program Files\Novell\NetWare Migration Wizard) or browse to a different location.
7. Click Next. NetWare Migration Wizard 6 saves this project in the location you selected and searches your company's network for eDirectory or NDS trees.
8. Select the eDirectory or NDS tree in which the source server resides, then click Next. NetWare Migration Wizard 6 then searches this tree and displays the servers located within the tree.
9. Depending upon the type of project you are creating, select one or more source servers. (When you are migrating from NetWare 3, you may select an unlimited number of source servers.) Click Next. (See Figure 2 on p. 28.)
10. Select the eDirectory tree in which the destination server (or servers) resides. When you are migrating from NetWare 6, 5, or 4 source servers, this tree is the temporary tree into which you have installed the destination server. When you are migrating from NetWare 3 or Windows NT, this tree is an existing tree. Click Next. (See Figure 3 on p. 30.)
11. If you are migrating from NetWare 6, 5, or 4 source servers, select the destination server from this tree, and click Next. The destination server should be the only server in this tree. ●

3.1 does overwrite attributes with blank or zero values. With Novell Upgrade Wizard 3.1, the resulting eDirectory object would have login restrictions.

Faster! Faster!

NetWare Migration Wizard 6 performs the task of migrating data from NetWare 3 source servers faster than Novell Upgrade Wizard 3.1 performs these tasks. As you know, NetWare Migration Wizard 6 performs this task by using SMS to establish server-to-server connections between source and destination servers. NetWare Migration Wizard 6 then migrates data directly from source servers to destination servers.

In contrast, Novell Upgrade Wizard 3.1 first moves data from the source server to the workstation upon which the wizard is running. Novell Upgrade Wizard 3.1 then pushes this data to the destination server—obviously a more time-consuming approach to performing this task.

SEEING YOUR WAY OUT OF WINDOWS

Of course, when you make changes to your company's network in the name of progress, you aren't always migrating data from one NetWare server to another (bet-

ter, faster) server running a more recent version of NetWare. Sometimes progress means migrating data from one type of network operating system to another.

Because you probably manage both NetWare and Windows servers, no one knows better than you do the reasons why you might want to migrate data from Windows to NetWare. After all, through experience you know that NetWare is more reliable than Windows. You also know that Windows networks are not as scalable as NetWare networks are.

Because Windows domains do not scale well, you must often create multiple domains and then create trust relationships between these domains so that users have access to the resources they need. As a result, Windows networks are also harder to manage than NetWare networks are.

As Novell software test engineer Stuart Smith observes, managing these trust relationships can be "a tricky thing." In fact, Smith adds, managing trust relationships can be "really quite ugly."

Like Migrating From NetWare 3, Almost

Many of the steps that you take when you use NetWare Migration Wizard 6 to

migrate data from a Windows NT source server are similar to the steps you take when you migrate data from NetWare 3 source servers. For example, when you perform this type of migration, you select a destination eDirectory tree, as you do when you migrate information from NetWare 3 source servers.

You also model this type of migration in the NetWare Migration Wizard 6 Project Window by dragging objects from a source Windows server and dropping them in the destination eDirectory tree. For example, you can drop Windows shares and folders in directories residing on one or more NetWare 6, 5, or 4 servers.

Just as the migration process leaves NetWare 3 servers virtually as they were before the migration, this process leaves Windows servers virtually unchanged. (When migrating data from NetWare 3 source servers, NetWare Migration Wizard 6 creates entries in the NetWare 3 bindery to track the migration process. These entries do not affect the performance of the NetWare 3 server.)

When migrating data from Windows servers, NetWare Migration Wizard 6 writes the names of the Windows users and groups that it migrates into the NT

Registry of the Primary Domain Controller. NetWare Migration Wizard 6 associates these names with the names of the corresponding eDirectory users and groups. However, these registry entries have no effect on the Windows server.

Furthermore, when you perform either type of migration, NetWare Migration Wizard 6 automatically verifies that you have modeled a successful migration before it actually performs that migration. In either case, NetWare Migration Wizard 6 informs you when it finds conditions that may affect the success of the migration project.

For example, if you drop a Windows folder on a NetWare directory that does not have sufficient space to accommodate that folder, the NetWare Migration Wizard 6 verification process warns you of this condition. You can then either add more memory to the destination NetWare directory or migrate the Windows folder to a larger directory.

NetWare Migration Wizard 6 also merges Windows domain User and Group objects with existing eDirectory User and Group objects. Once again, NetWare Migration Wizard 6 does not overwrite the attributes of these eDirectory objects with attributes from the source Domain. In addition, you can opt to have NetWare Migration Wizard 6 search for eDirectory User objects that have the same usernames as do Domain user objects. (For more information about this option, see "Matchmaker" on p. 33.)

Dwelling on Differences

Despite these and other similarities, however (and as you might expect), migrating data and users from Windows servers is substantially different from migrating data and users from NetWare 3 servers. For example, because Windows servers do not run SMS, NetWare Migration Wizard 6 cannot use SMS to establish a server-to-server connection between source and destination servers.

Instead, NetWare Migration Wizard 6 must read information from the source Windows server and write that information to the destination eDirectory tree. In other words, when you perform this type of migration, NetWare Migration Wizard 6 transfers information from Windows servers to NetWare servers in much the same way that Novell Upgrade Wizard 3.1 transfers data from NetWare 3 servers to NetWare 5 and 4 servers. To

speed up this process, you can run NetWare Migration Wizard 6 on the server you want to migrate.

In addition, NetWare Migration Wizard 6 cannot migrate passwords for domain User objects as it migrates passwords for bindery objects. You must assign passwords for newly created users after NetWare Migration Wizard 6 has migrated user accounts from Windows to NetWare.

When you are migrating information from a Windows server, NetWare Migration Wizard 6 also gives you the option of migrating file permissions. Because Windows file permissions are not the same as NetWare file permissions, NetWare Migration Wizard 6 maps Windows permissions to NetWare permissions when it migrates these permissions. (See Figure 5 on p. 32.)

When you are migrating information from NetWare 3 servers, in contrast, NetWare Migration Wizard 6 does not give you the option of migrating file permissions. Instead, NetWare Migration Wizard 6 automatically migrates trustee rights to NetWare 3 directories and volumes.

CONCLUSION

You may have noticed Novell's catch phrase—The Power To Change—which is displayed on Novell's web site and incorporated in Novell's marketing messages. You may also have noticed that the theme song accompanying Novell's television commercials is "Changes" by David Bowie.

If you have, you probably assumed—and rightly so—that this catch phrase and theme song refer to Novell's Net services software. After all, Net services software is designed to give your company the power to change its business to e-business.

However, the first step toward moving your company's business to e-business possibly entails upgrading your company's network operating system and hardware. NetWare Migration Wizard 6 can give you the power to make that particular change easier than you may have imagined it could ever be. As a network administrator, that's the kind of power to change that could make you want to sing (with David Bowie, of course).

Cheryl Walton works for Niche Associates, a technical writing and editing firm. ●

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