

Novell NetWare support on IBM NAS

Jay Knott, 919-254-2514 Jknott@us.ibm.com

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Overview

Why customers want NetWare support on NAS products

As described in Microsoft literature...

"The most common use of the NetWare network operating system for Novell customers is as a file and print server. Customers who have used NetWare as the platform to host their file and print services have become accustomed to its interface from both a user and an administrator point of view and have built up an investment in NetWare file and print services.

However, many former NetWare users have found that Windows 2000 Server provides scalable file and print services as well or better than NetWare. In an effort to reduce the number of platforms they have to support, organizations are consolidating on the multipurpose Windows 2000 Server platform.

File and Print Services for NetWare version 5 (FPNW5) helps customers preserve their NetWare skill set while consolidating the number of platforms. This reduces hardware costs and simplifies file and print server administration by making Windows 2000 Server emulate a NetWare file and print server.

FPNW5 eases migrating to Windows 2000 Server by providing a NetWare user interface (UI) to a Windows 2000-based server; administrators and users see their same, familiar NetWare UI. Plus, the same single logon for clients is maintained without a need for any client configuration changes. For example, a client program that uses NetWare protocols and naming conventions needs no redirection or translation. Replacing a NetWare file and print server with a Windows 2000-based file and print server is completely transparent -- administrators and users still think they're using NetWare."

Note that only File Services is supported on the NAS products; The Microsoft End User License Agreement does not allow Print Services to be used.

What level of NetWare is supported

As it turns out, this question (which is often asked) is not really the exact question that is intended to be asked. NetWare is a network operating system, similar (but different) from Windows, UNIX or whatever, and is not a protocol or specification. So just like it doesn't exactly make sense to say "What level of SUN software is supported?" or "What level of Windows is supported?" is likewise isn't exactly correct to ask "What level of NetWare is supported?".

Instead, customers want to ask the following: "I want to replace my current NetWare version X servers with the NAS product. Using the Microsoft Services for NetWare component that is included in the IBM NAS product, what versions of what components of NetWare can the NAS product replace?". The answer is, "It depends", as explained in the next sections.

We cannot simply say "We support NetWare version... 4.x and 5.x and 6.x" for the following reasons:

- The IBM NAS products include preloaded software to emulate a NetWare 3.12 file server (in bindery emulation mode), thus appearing like a NetWare file server to NetWare clients and administrators. When clients communicate with this emulated file server function on our NAS, they communicate using IPX (TCP/IP or IP tunnelling is not supported to communicate with our NAS).
- The IBM NAS NetWare implementation appears as a NetWare 3.12 file server, which itself does not participate with NDS or eDirectory. However, various utilities (explained below) allow the IBM NAS to receive account and password information from NDS/eDirectory, as provided in later NetWare versions.
- NetWare versions 4, 5, and 6 have added many functions which are also provided by the IBM NAS products. So for many functions IBM NAS provides similar functions to these later versions of NetWare.
- While not near as popular, NetWare provides some functions beyond file server functions, but these are not supported on IBM's NAS products. Note that the IBM NAS products are not licensed for use as a Windows or NetWare print server.

- Be careful to not confuse NetWare client software levels versus NetWare server (IBM NAS) levels. The NetWare client and NetWare Server (IBM NAS) do not have to be at the same software level. Specifically, we have successfully tested NetWare 5.0 (and other...) clients attached to the IBM NAS products.

IBM NAS can replace a NetWare file server

An IBM NAS can be used instead of a NetWare file server. However, NetWare file servers, print servers, or applications servers cannot store their data on a NAS.

Specifically, NetWare file servers do not support storing their data on CIFS/NFS networked drives (such as our NAS products or other CIFS/NFS NAS products). Therefore, no NAS box can provide the storage "behind" or for the NetWare file server, but it can provide storage instead of the NetWare file server.

NetWare function equivalents on IBM NAS

NetWare operating system versions after 3.12 have added additional functions -- mainly in the applications server, internet, and management areas. There also are some enhancements and potential differences between file serving functionality of NetWare 3.12 and later versions of NetWare. Here are some known examples of similarities and differences (this list may not be complete):

NetWare functions after NetWare 3.12 that are also on the IBM NAS:

- NDS (NW4) and eDirectory (NW5) provide consolidated authentication for the NetWare network and they replace the bindery services used in NetWare 3 and NetWare 2. Instead of logging on to individual servers, with eDirectory you log on only once to gain access to all the network resources you are authorized to use. A similar function is provided in Windows environments using a domain controller or Active Directory. Using synchronization services (such as MSDSS, DSMN or Novell Account Management) software, the accounts/password information can be automatically updated between NDS/eDirectory and the Windows domain controller and Active Directory.
- NetWare hierarchical tree directory structure (NW4.0) -- similar but not identical in Windows
- FTP Services for NetWare (NW4)
- AppleTalk File Protocol (NW3)
- File compression (NW4) and very large disk volumes (NW5)
- HTTP via Netscape FastTrack Server for NetWare (NW4), or NetWare Multimedia Server support (NW5) or via NetWare Enterprise Web Server (NW5)
- NFAP allows NFS & CIFS clients to communicate with a NetWare file server (NW6)
- CIFS (NW6)
- Disk mirroring (NW3)
- Novell Certificate Server (NW5)
- Secure Sockets Layer (NW4)
- Novell Target Service Agents (NW4) and Storage Management Services (NW4) for data backup and restore
- iFolder file synchronization (NW6) -- similar but not identical to Windows Dfs
- Interoperation with DNS, DHCP, others
- Journaling file system (NW4) -- NTFS version 5 on IBM NAS is a journaling file system

The IBM NAS products do not provide the following items

- NCP over IP support -- IBM NAS supports NCP access over IPX only
- Clustering support and fail-over -- IBM NAS provides clustering and failover for CIFS, NFS, HTTP, FTP, but not NetWare. When a node failure occurs, from a (non-NetWare) Windows perspective, the

volumes fail-over to the surviving node. However, from a NetWare client perspective, the two nodes simply appear as two separate servers (that share the same storage units) and if one fails, then those volumes are not accessible from the NetWare clients.

- IBM NAS cannot provide NetWare print server functions -- this is not allowed in the IBM NAS license.
- IBM NAS cannot run NetWare applications on NAS -- this is both a technical limitation, plus the IBM NAS license does not allow it to be as a general-purpose server.
- Novell provides server replication via Novell Replication Services. IBM recommends the NSI DoubleTake product when a NAS replication solution is desired. Note that NetWare failover to the replicated NAS or server is not supported.

IBM NAS product provides many additional functions that are not currently offered on NetWare

The IBM NAS product provides many file server functions that are not provided by NetWare. Microsoft has written a white paper comparing the advantages of Windows NT and Windows 2000 versus NetWare version 5. However, note that this paper is comparing Windows NT and 2000 native file server capability versus NetWare 5, and is not comparing Microsoft FPNW5 emulation on NAS versus "real" NetWare. This white paper is located at

<http://www.microsoft.com/windows2000/server/evaluation/compare/NDSandNWcomp/default.asp>

NetWare Authentication with IBM NAS

MSDSS (Windows 2000), DSMN (Windows NT) and Novell Account Management are all able to synchronize individual accounts from NetWare domains and Windows domains. In all cases, a Windows domain controller is required.

A given subdirectory on a given server can have "permissions" set that allow individuals or groups to have access (read-only, read/write, whatever). Regardless of whether a customer has a Windows environment (with Active Directory) or a Novell environment (with eDirectory), in both cases to setup the permissions to a given subdirectory on a given server or NAS, the administrator will have to navigate the file structure tree and "right click" (or equivalent in NetWare) to set the permissions for a given individual or group.

Account Synchronization for NetWare clients running on Microsoft domains

In general, NetWare clients are run on top of Windows workstations. Customers typically install either the Microsoft Client for Netware or the Novell Client for NetWare on top of a Windows 9x, Windows NT, Windows 2000, or Windows XP workstation.

For NetWare clients (from Novell or Microsoft) running on a Windows workstations that use Windows NT or Windows 2000 domain based authentication (using domain controllers) then by hitting Control-Alt-Delete on the NetWare Client, both the NetWare password and the Windows password can be simultaneously changed. (Note however that any password changes made not using the NetWare client (e.g., admin tools) will not be registered via both NetWare and Windows.)

For NetWare clients running on top of Windows 9x workstations, users cannot change both their Netware and Windows passwords via Control-Alt-Delete.

Account Synchronization using MSDSS and Windows 2000 Active Directory

Microsoft Directory Synchronization Services (MSDSS) is a component of Services for Netware (SFN) which is how IBM's NAS (and Windows 2000 Advanced Server) provide NetWare support. MSDSS synchronizes accounts (and in some cases, passwords) between Microsoft Active Directory and Novell eDirectory.

Using MSDSS, the authentications provided by the NetWare NDS/eDirectory or bindery functions can be synchronized with those stored in the Windows Active Directory and domain controller, via two options:

- Reverse Synchronization -- The customer continues to manage the accounts contained on the NetWare NDS/eDirectory or bindery. As new accounts are created, MSDSS reverse synchronization creates accounts within Active Directory. **However, if the password is changed in the NDS/eDirectory, it is not updated in the Active Directory.**
- Forward Synchronization -- The customer manages the authentications from the Windows Active Directory. MSDSS creates accounts in the NetWare NDS/eDirectory. Changes to passwords in Active Directory are updated in NDS/eDirectory

Active Directory is required to use MSDSS -- you cannot use an NT4 domain controller with the MSDSS that comes with our NAS, and you cannot use MSDSS to synchronize to the local Security Accounts Manager (SAM) on the NAS. The MSDSS component is available on the Supplemental CDROM that is shipped with the NAS product.

Account Synchronization using DSMN and a Windows NT Domain Controller

If a customer does not have Active Directory but has a NT4 domain controller, then the customer can use DSMN (which is the NT4 version of MSDSS, so to speak) for synchronization.

The restrictions for DSMN are similar to MSDSS above.

An NT4 domain controller is required to use DSMN -- you cannot use DSMN to synchronize to the local Security Accounts Manager (SAM) on the NAS. The DSMN component is available on the Supplemental CDROM that is shipped with the NAS product.

Account synchronization using Novell Account Management program

Novell offers "Novell Account Management" program that will also provide eDirectory to Active Directory synchronization, and is similar in this specific regard to MSDSS.

Novell Account Management has the following prerequisites:

- eDirectory (included with Novell Account Management program)
- Microsoft domain controller, and Active Directory must be enabled
- Novell Client 3.3 for Windows 95 or 98. Novell Client 4.8 or higher for Windows NT, 2000, or XP. May also work with the Microsoft NetWare client, but Novell recommends the Novell NetWare client.

Novell presales support is available at 1-888-321-4CRC(4272) (7am - 5pm MST)

Client Access License requirements

The Microsoft End User License Agreement states...

"Client Access License ("CAL") Requirements. In the event that you are accessing or using the Product with an electronic device that also accesses or utilizes a Windows 2000 or Windows NT Server in connection with your use of the Product, you must acquire CALs as required by the terms of the license agreement for such Windows 2000 or Windows NT Server product(s). Please consult the license agreements accompanying such software. By way of example, if an electronic device is used by a user who directly or indirectly utilizes the Windows 2000 Server Integrated Sign-On Service or receives credentials from the Windows 2000 Directory Services, and such device accesses the Product, you must still acquire a Windows 2000 Server CAL for that device as required by the Windows 2000 Server license."

Note: The NAS operating system is called "Windows Powered" and while is very similar to the other Windows products, it is not branded as "Windows 2000" nor "Windows NT" Server product. Microsoft has previously indicated that no CALs are required to access the NAS (but of course do not relieve the customer from the requirement for CALs if they are otherwise required). Note that for MSDSS Reverse Synchronization and for Novell Account Management, the NetWare clients receive their authentications

from NDS/eDirectory and not directly or indirectly from Active Directory or the Windows domain controller (instead, Active Directory gets authentication information from NDS/eDirectory).

For further information on NAS license issues, consult the Microsoft End User License Agreement that ships with the IBM NAS products.

File permissions and file attributes

Both Windows and NetWare have the concept of file permissions such as "read, write" etc, however the selection of permissions is not identical. For example, Microsoft Windows has "list folder contents" as a possible permission, but NetWare does not have a direct equivalent. Therefore, the permission settings available via the IBM Windows-based NAS are not identical to those available for NetWare and instead such options are mapped to similar (but not identical) options on the corresponding file system. For the majority, this difference is minor.

Likewise, both Windows and NetWare have the concept of file attributes such as "read-only, hidden, system, archive," however the specific file attributes are not identical. Therefore, these attributes are mapped to similar (but not identical) options on the corresponding file system. For the majority, this difference is minor.

File migration to NAS

Files can be moved (migrated) from the original NetWare (3.x, 4.x, and 5.x) servers to the MS-based NAS using the FMU File Migration Utility (a component of MS Services for NetWare). Here is a chart from the Netmigrat.doc document (slightly updated) from Microsoft's website below indicating what migration services are available:

The NetWare clients would continue to authenticate with the NDS/eDirectory or bindery functions on a NetWare server in the network.

| NetWare Element | NetWare Versions | Microsoft Migration Tool available? | Tool Name |
|----------------------------|------------------|-------------------------------------|-----------|
| Files/Folders | NetWare 3.x | Yes | FMU |
| | NetWare 4.x | Yes | FMU |
| | NetWare 5.x | Yes | FMU |
| Directory Service Accounts | NetWare 3.x | N/A | (no) |
| | NetWare 4.x | Yes | MSDSS |
| | NetWare 5.x | Yes | MSDSS |
| F/P Servers | NetWare 3.x | Yes | FPNW5 |
| | NetWare 4.x | Partial | FPNW5 |
| | NetWare 5.x | Partial | FPNW5 |
| NLMs / Applications | NetWare 3.x | No | N/A |
| | NetWare 4.x | No | N/A |
| | NetWare 5.x | No | N/A |

Note: The FMU component is not be pre-installed on the NAS, but it is available on the Supplemental CDROM that is shipped with the NAS product.

Migrating all NetWare components to an IBM NAS

Alternatively, if desired a customer could decide to migrate his entire NetWare to Windows as follows:

- Migrate all NetWare files to the MS-based NAS (could use the FMU utility mentioned above)
- Migrate all print server function and database/applications to general purpose Windows servers
- Use Windows clients without the NetWare communications agent
- Use the Windows authentication functions. Note: If (non-NAS) general purpose servers and if Active Directory, domain controller, etc are used, then the customer would need to have a CAL for those clients using the general purpose servers.
- Note that not all functions can be directly migrated to Windows (see above)

Doing so would allow a transition from the existing NetWare configuration to a Windows configuration, and position the customer to take advantage of advanced Windows functions as described in the Win2000 & NT4 versus NetWare 5.doc above.

The Microsoft white paper "NetWare to Windows 2000 Server Migration Planning Guide" may be helpful. Note that this document discusses migrating not only file server functions, but database/applications/etc functions as well. As discussed above, only file server functions could be migrated to our NAS product. this white paper is located at

<http://www.microsoft.com/windows2000/techinfo/planning/incremental/netmigrate.asp>

Other NetWare related documents on the Microsoft website may also be helpful.

Windows 2000 Services for NetWare components

Microsoft provides the following Services for NetWare components as part of their Windows 2000 Advanced Server operating system. However, these items are not generally needed nor supported by IBM on our NAS products:

- CSNW Client Services for NetWare -- if installed on a Windows 2000 client this function provides access to NetWare file and print services from that Windows client.
- GSNW Gateway Services for NetWare -- this is in effect a "protocol converter" so that Windows clients can pass-thru to NetWare servers. The IBM NAS provides file serving instead of a NetWare server.

Disclaimer

This document intends to give a brief solution overview, and is not intended as a detailed design document.

This document is dependent on information obtained from multiple sources. IBM does not warrant the accuracy or completeness of that information contained in this document.