# Migration Options for OS/2 Warp Server for AS/400 and OS/400 Integration for Novell NetWare

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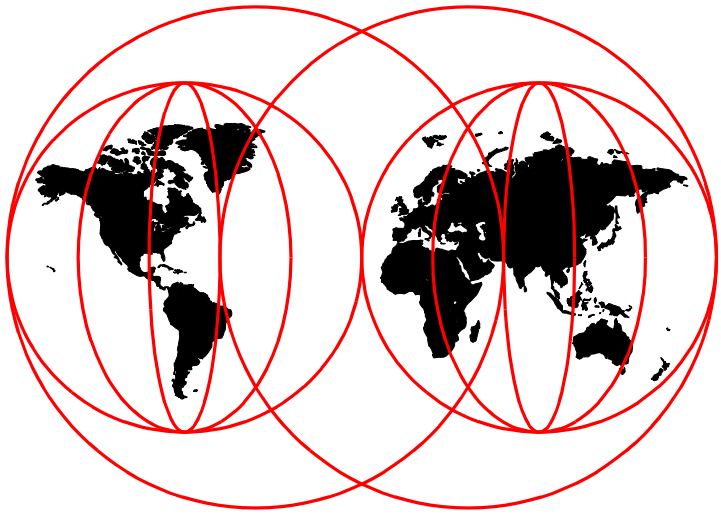

**International Technical Support Organization**

http://www.redbooks.ibm.com

REDP0020

October 1999

# Preface

The purpose of this redpaper is to explain the options that are available when migrating from the two AS/400 Integrated Netfinity Server based products: Warp Server and Novell NetWare to other solutions. It also attempts to define considerations you need to make when undertaking this migration.

This redpaper was created as part of a residency held in Rochester in October 1999. The redbook *Advantage AS/400 NetServer*, SG24-5196, was also produced during this residency. It can be found on the Web at: `http://www.redbooks.ibm.com`. This redbook is currently available as a redpiece. Expected release date is December 1999.

Further migration information is also referenced in Information APAR II11689. Informational APARs can be found at `http://as400service.ibm.com` under Tech Info and Databases.

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# Migration

IBM announced with V4R3 and V4R4 that the following licensed programs would not be available in future releases of OS/400 after V4R4M0:

- 5769SA3 IBM OS/400 Integration for Novell NetWare, Release V4R2M0
- 5769XZ1 OS/2 Warp Server for AS/400, Release V4R1M0

While 5769SA2 IBM Integration Services for FSIOP will be supported in the next OS/400 release, support for 5769SA2 will have an early end of currency. Therefore, it is better to discontinue using 5769SA2 to support an AS/400 system LAN Adapter configuration once 5769XZ1 and 5769SA3 are no longer used. See “Considerations for shared LAN adapters” on page 2 for options to migrate from using the IPCS LAN adapter as the AS/400 system LAN adapter.

Customers currently using either of the above products need to consider the file and print sharing strategy they may need to adopt in the near future. There are, of course, a number of options to be reviewed. These options are covered in this redpaper.

**Note**

This document refers to Windows NT4.0 and Windows 2000 collectively as *Windows Server*.

## Migration considerations

The decision to migrate from Warp Server and Novell NetWare onto other platforms depends on the limited support of the products listed previously and on the business requirement. The following list provides additional considerations and attempts to match the Integrated Netfinity Server and AS/400 NetServer options with customer needs:

- If you are looking to consolidate a number of Windows Servers onto a single AS/400 system, you can use AS/400 Integration for Windows Server on the Integrated Netfinity Server. Or, depending upon what you are migrating, you could use *several* Integrated Netfinity Servers. A Windows Server on the Integrated Netfinity Server is optimized for file sharing. You can read more about this option in *AS/400 Implementing Windows NT on the Integrated Netfinity Server*, SG24-2164.
- For optimal file sharing performance with a large number of users, you should also consider running Windows Server on the Integrated Netfinity Server.
- If you are migrating from OS/2 Warp Server or Novell NetWare on the older models of Integrated Netfinity Server (known as IPCS or FSIOP), then AS/400 NetServer may be a good option. We tell you how to plan for and perform the migration in *Advantage AS/400 NetServer*, SG24-5196.
- If you have a smaller number of users, or your users' file serving capabilities are light, AS/400 NetServer may be right for you. Even though Windows Server on the Integrated Netfinity Server provides easier administration than Windows Server on a standalone PC, administering all your file sharing requirements is even easier from an Operations Navigator interface. For further information, refer to *Advantage AS/400 NetServer*, SG24-5196.

- If you have an AS/400 system that has spare CPU capacity, then again, AS/400 NetServer may suit your requirements. Many customers have AS/400 systems sized for overnight batch runs and find they have spare capacity during the day. Here is an ideal opportunity for AS/400 NetServer.
- If you want file and print serving without needing to learn another operating system, then AS/400 NetServer is a good choice.
- If you have clients that use different language code pages, but need to share the same text file, AS/400 NetServer can meet your needs. In V4R4, AS/400 NetServer allows you to do file data text conversion on the fly. Using multiple file shares for the same AS/400 integrated file system directory allows you to specify different code page text conversion options for the same AS/400 integrated file system directory.

Our advice is that unless you clearly fall into one of the Integrated Netfinity Server suggested scenarios listed here, you should try AS/400 NetServer. There is no cost to you for trying it because AS/400 NetServer is integrated right into OS/400. There are clear advantages in the tight integration with AS/400 data and backup operations.

There is nothing to stop you from having a mixture of Integrated Netfinity Server and AS/400 NetServer file serving. You can place your application serving on an Integrated Netfinity Server, take advantage of the tight integration with OS/400, and use AS/400 NetServer for your file serving.

If you have Network Stations in your installation, or are considering their introduction, you can use an Integrated Netfinity Server to provide the Windows NT 4.0 Terminal Server Edition capabilities. You can use AS/400 NetServer for the file serving to again use the integration of data. You can read more about this in *Advantage AS/400 NetServer*, SG24-5196.

## The available options

There are a number of different options available for customers wishing to migrate from the Integrated Netfinity Server-based products that were listed previously. The following list identifies the key options:

- Migrate to AS/400 NetServer. Refer to “Migrating to AS/400 NetServer” on page 3.
- Migrate to Windows Server on the Integrated Netfinity Server. Refer to “Migrating to Windows Server on the Integrated Netfinity Server” on page 3.
- Migrate to Windows Server on a standalone PC. Refer to “Migrating to Windows Server on a standalone PC” on page 6.
- Migrate to Standalone PCs with either Warp Server or NetWare installed. Refer to “Migrating to standalone PCs” on page 8.

## Considerations for shared LAN adapters

The Integrated Netfinity Server on which Warp Server, Windows Server, and Novell NetWare run, can also perform as a LAN adapter for the AS/400 system providing a communications link between the network and OS/400. Many customers use the Integrated Netfinity Server for both purposes. This means that

considerations for these setups need to be addressed once the Integrated Netfinity Server based products are no longer needed or available.

For customers that have separate LAN cards in addition to their Integrated Netfinity Servers, this is not a problem. Once the Integrated Netfinity Server products are redundant, both the software *and* Integrated Netfinity Server can be removed from the AS/400 system. The separate LAN card can be used as the link for the AS/400 system onto the network.

For customers that still use the Integrated Netfinity Server as a LAN adapter, you can continue to use it in this fashion when running Windows Server on the Integrated Netfinity Server (see "Migrating to Windows Server on the Integrated Netfinity Server" on page 3). However, we do not recommend this. The options for resolving this issue are detailed here:

- If physical constraints allow, purchase a new LAN card.
- Depending on the system hardware environment, it may be possible to move the LAN card away from the Integrated Netfinity Server to be used separately. This feature may be available if the PCI based Integrated Netfinity Server is being used and any of the following LAN cards are installed:
  - device type 2723 - 10Mb Ethernet Card
  - device type 2724 - 4/16Mb Token Ring Card
  - device type 2838 - 10/100 Ethernet Card

Both of the above options depend on many physical constraints. We strongly recommend that you contact your hardware representative for further details.

## How to migrate: Considerations

This section discusses considerations for each of the following migration options:

- AS/400 NetServer
- Windows Server on the Integrated Netfinity Server
- Windows Server on a standalone PC
- Standalone PCs using current file server software

### Migrating to AS/400 NetServer

The considerations when migrating from Warp Server and Novell NetWare to AS/400 NetServer are covered in the redbook *Advantage AS/400 NetServer*, SG24-5196.

### Migrating to Windows Server on the Integrated Netfinity Server

This migration solution is removes the need for Warp Server and Novell NetWare. For hardware prerequisites, refer to the redbook *Implementing Windows NT on the Integrated Netfinity Server*, SG24-2164.

#### Warp Server

This section covers the considerations for migration from Warp Server to WIndows Server on the Integrated Netfinity Server.

##### *File migration*

The file migration from Warp Server to NT or Windows 2000 on the Integrated Netfinity Server can be done using the Copy and Paste function within Windows

or at V4R3 and above using the AS/400 MOV and CPY commands to migrate files from QLANSRv to QNTC.

For customers with only one Integrated Netfinity Server, the data to be migrated must first be placed in a separate storage area so that the Warp Server NWSD can be deleted and the Windows Server NWSD can be created.

***Printer migration***
All former LAN attached printers used by Warp Server must be re-created on the print server in the Windows Server domain.

***Client migration***
File and print sharing with Windows Server supports the following clients: Windows 3.x, Windows 95/98, Windows NT Workstation, IBM OS/2, and Macintosh.

DOS LAN Services are required for Windows 3.x. Similar products are required for IBM OS/2 clients and for Macintosh. Windows 95/98 and NT use the Client for Microsoft Networks.

For client PCs not currently configured for TCP/IP, the TCP/IP protocol stack needs to be added and configured.

***User migration***
If the new Windows Server on the Integrated Netfinity Server is a Primary Domain Controller or Backup Domain Controller, then the following migration considerations apply.

There are two categories of Warp Server users to consider:

- AS/400 users who have had profiles propagated down to Warp Server
- Warp Server only users

There are also two options for where the new Windows Server on Integrated Netfinity Server can be installed:

- On the same AS/400 system as the Warp Server
- On another AS/400 system

The following list defines the suggested profile migration options:

- **Windows Server on Integrated Netfinity Server on the same AS/400 system as Warp Server**. Users that also have AS/400 profiles can be propagated down again to Windows Server. Former Warp Server-only users must be redefined on the new Windows Server either by creating an AS/400 user profile and propagating or by creating a Windows Server user profile.
- **Windows Server on Integrated Netfinity Server on a different AS/400 system.** All previous Warp Server users need to be redefined either by creating AS/400 user profiles and propagating or by creating Windows Server user profiles.

If the Windows Server on the Integrated Netfinity Server is a file server only, then the user creation cannot be done on this server. Therefore, no propagation from the AS/400 system is available, and all former Warp Server users must be redefined on the Primary Domain Controller (PDC) or Backup Domain Controller (BDC).

### *Migration using Migration Wizard*

A company called Lieberman & Associates provides a third-party solution to migrate IBM Warp Server to Windows NT using a migration wizard. For further information, refer to: `http://www.lanicu.com`

## Novell NetWare

This section covers considerations for migration from Novell NetWare to WIndows Server on the Integrated Netfinity Server.

### *File migration*

There are two options for file migration and these depend on whether the Enhanced Integration for NetWare (option 25 of the OS/400) has been installed. At V4R3 with Enhanced Integration installed, it is possible to use the MOV or CPY function for files from QNETWARE to QNTC. It is also possible to use the Windows Copy and Paste function from one mapped drive to another. At V4R2 or with no Enhanced Integration, the Copy and Paste function is the only option.

For customers with only one Integrated Netfinity Server, the data to be migrated must first be placed in a separate storage area (which could be on another PC) so that the NetWare NWSD can be deleted and the Windows Server NWSD can be created.

### *Printer migration*

All former LAN-attached printers used by NetWare must be re-created on the print server in the Windows Server domain.

**Note**

AS/400 users can use these printers by creating Remote Output queues on the AS/400 system.

For third-party printing solutions, you should contact your third-party supplier.

### *Client migration*

File and print sharing with Windows Server supports the following clients: Windows 3.x, Windows 95/98, Windows NT Workstation, IBM OS/2, and Apple Macintosh.

The NetWare client together with the IPX protocol stack is no longer required and can be removed.

DOS LAN Services is required for Windows 3.x. Similar products are required for IBM OS/2 clients and for Apple Macintosh. Windows 95/98 and NT use the Client for Microsoft Networks.

For client PCs not currently configured for TCP/IP, the TCP/IP protocol stack needs to be added and configured.

### *User migration*

If the new Windows Server on the Integrated Netfinity Server is a PDC or BDC, the following migration considerations apply.

There are two categories of NetWare users to consider:

- AS/400 users who have had profiles propagated down to NetWare
- NetWare only users

There are also two options for where the new Windows Server on Integrated Netfinity Server can be installed:

- On the same AS/400 system as the NetWare Server
- On another AS/400 system

The following list defines the profile migration options:

- **Windows Server on Integrated Netfinity Server on the same AS/400 system as NetWare Server**: Users that also have AS/400 profiles can be propagated down again to the Windows Server. Former NetWare only users must be redefined on the new Windows Server either by creating an AS/400 user profile and propagating or by creating a Windows Server user profile.
- **Windows Server on Integrated Netfinity Server on a different AS/400 system**: All previous NetWare users will need to be redefined either by creating AS/400 user profiles and propagating or by creating Windows Server user profiles.

If the Windows Server on the Integrated Netfinity Server is a file server only, then the user creation cannot be done on this server. Therefore, no propagation from the AS/400 system is available, and all former NetWare users must be redefined on the PDC or BDC. For more information, refer to:
`http://support.microsoft.com/support/ntserver/migration/`

#### *Migration using Migration Wizard*

There is a utility provided by Windows NT called NWCONV.EXE, which migrates Novell NetWare across and onto a Windows NT platform. For further information, refer to: `http://support.microsoft.com/support/ntserver/migration/`

## Migrating to Windows Server on a standalone PC

This migration solution is intended to remove the need for Warp Server, Novell NetWare, and possibly the Integrated Netfinity Server altogether.

### Warp Server to Windows Server on a standalone PC

This section covers the considerations for migration from Warp Server on the Integrated Netfinity Server to a Windows Server standalone solution.

#### *File migration*

File migration from Warp Server to Windows Server can be done by using the Windows Copy/Paste functions. At V4R3 and above, migration can be done by using the AS/400 MOV and CPY commands to migrate files from QLANSRv to QNTC.

#### *Printer migration*

All former LAN-attached printers used by Warp Server must be re-created on the print server in the Windows Server domain.

#### *Client migration*

File and print sharing with Windows Server supports the following clients: Windows 3.x, Windows 95/98, Windows NT Workstation, IBM OS/2, and Apple Macintosh.

DOS LAN Services is required for Windows 3.x. Similar products are required for IBM OS/2 clients and for Apple Macintosh. Windows 95/98 and NT use the Client for Microsoft Networks.

For client PCs not currently configured for TCP/IP, the TCP/IP protocol stack needs to be added and configured.

### *User migration*

All former Warp Server users need to be redefined on the Windows Server. Unlike a Windows Server running on an Integrated Netfinity Server, there is no facility to propagate AS/400 users down to Windows Server on standalone PCs.

### *Migration using Migration Wizard*

A company called Lieberman & Associates provides a third-party solution to migrate IBM Warp Server to Windows NT using a migration wizard. For further information, refer to: `http://www.lanicu.com`

## Novell NetWare to Windows Server on a standalone PC

This section covers the considerations for migration from Novell NetWare on the Integrated Netfinity Server to a Windows Server standalone solution.

### *File migration*

There are two options for file migration. These options depend on whether the Enhanced Integration for NetWare option of the OS/400 has been installed. At V4R3 and above with Enhanced Integration installed integrated file system, it is possible to use the MOV or CPY function for files from QNETWARE to QNTC. It is also possible to use the Windows Copy/Paste function from one mapped drive to another. At V4R2 or with no Enhanced Integration, the Copy and Paste function is the only option.

There is a utility provided by Windows NT called NWCONV.EXE, which migrates Novell NetWare across and onto a Windows NT platform. For further information, refer to: `http://support.microsoft.com/support/ntserver/migration/`

### *Printer migration*

All former LAN-attached printers used by NetWare must be re-created on the print server in the Windows Server domain.

**Note**

AS/400 users can use these printers by creating Remote Output queues on the AS/400 system.

For third-party printing solutions, you should contact your third-party supplier.

### *Client migration*

File and print sharing with Windows Server supports the following clients: Windows 3.x, Windows 95/98, Windows NT Workstation, IBM OS/2, and Macintosh.

The NetWare client together with the IPX protocol stack is no longer required and can be removed.

DOS LAN Services is required for Windows 3.x. Similar products are required for IBM OS/2 clients and for Macintosh. Windows 95/98 and NT use the Client for Microsoft Networks.

For client PCs not currently configured for TCP/IP, the TCP/IP protocol stack needs to be added and configured.

#### *User migration*

All former NetWare users need to be redefined on the Windows Server. Unlike Windows Server running on an Integrated Netfinity Server, there is no facility to propagate AS/400 users down to Windows Server on standalone PCs. For more information, refer to: `http://support.microsoft.com/support/ntserver/migration/`

## Migrating to standalone PCs

This migration solution effectively maintains the current business setup but moves away from the Integrated Netfinity Server.

### Warp Server

This section covers the considerations for migration from Warp Server on the Integrated Netfinity Server to a Warp Server standalone solution.

#### *PDC, BDC or SERVER?*

To allow data migration from the Integrated Netfinity Server-based Warp Server to a standalone PC, it may be necessary to add another PC into the domain. There are effectively three different types of Warp Servers in a domain:

- Domain Controller
- Backup Domain Controller
- Server only

The responsibilities of this new PC will depend on the current setup. If the Warp Server on the Integrated Netfinity Server is a server only or a Backup Domain controller, then it may be possible to add the new PC as a server only and migrate the data across.

If the Integrated Netfinity Server Warp Server is a PDC, then, at the very least, the new PC must be a Backup Domain Controller. This allows propagation of the Domain Controller Database so that the new PC can assume Primary responsibilities when the Integrated Netfinity Server is varied off.

#### *File migration*

File migration can be done using the Copy and Paste PC functions from the Warp Server on the Integrated Netfinity Server to other servers within the domain. If QLANSRv is available, AS/400 MOV and CPY command can be used to migrate files. Aliases specified on the Integrated Netfinity Server-based Warp Server need to be recreated on the new servers. The authorities of the migrated files and directories need to be investigated after completion to ensure that there are no authority problems.

#### *Printer migration*

The printer objects and aliases will need to be moved or recreated on the new Warp Server (or another existing Warp Server in domain).

### *Client considerations*

If the same aliases are recreated on the new servers to reference the same data, then no client configuration is required.

## Novell NetWare

If you prefer to continue to use NetWare, you can use the NetWare Enhanced Integration to integrate your remote NetWare servers with your AS/400 system.

### *Additional server considerations*

There are no additional server considerations. Any new servers added to the Organization Unit appear straight away. The NetWare DSMaint can be used for the migration of data. For further information on DSMaint, refer to: `http://support.novell.com`

### *File migration*

It may be necessary to add a new PC server into the NetWare environment to take the place of the NetWare Server on the Integrated Netfinity Server. File migration can be done by using the Copy and Paste function. The authorities of the migrated files and directories need to be investigated after completion to ensure that there are no authority problems.

### *Printer migration*

The printer object should remain unaffected. The print server and printer queues may need to be modified since they both refer to a volume that may be nonexistent after the NetWare Server on the Integrated Netfinity Server is removed.

### *Client considerations*

The user information has to be modified so that the users' home directory on the new server is referenced instead of the old location. Any permanent drive mappings to the old server also need to be updated to reference the files and directories migrated onto the new server. Any users setup to log onto a preferred server may need to be updated to reflect another server if the current preferred server is NetWare on the Integrated Netfinity Server.

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# Related publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this redbook.

## International Technical Support Organization publications

For information on ordering these ITSO publications see “How to Get ITSO Redbooks” on page 14.

- *AS/400 Implementing Windows NT on the Integrated Netfinity Server*, SG24-2164
- *Advantage AS/400 NetServer*, SG24-5196 (Currently available as a redpiece. Expected release date is December 1999)

## Redbooks on CD-ROM

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| CD-ROM Title | Collection Kit Number |
|---|---|
| System/390 Redbooks Collection | SK2T-2177 |
| Networking and Systems Management Redbooks Collection | SK2T-6022 |
| Transaction Processing and Data Management Redbooks Collection | SK2T-8038 |
| Lotus Redbooks Collection | SK2T-8039 |
| Tivoli Redbooks Collection | SK2T-8044 |
| AS/400 Redbooks Collection | SK2T-2849 |
| Netfinity Hardware and Software Redbooks Collection | SK2T-8046 |
| RS/6000 Redbooks Collection (BkMgr Format) | SK2T-8040 |
| RS/6000 Redbooks Collection (PDF Format) | SK2T-8043 |
| Application Development Redbooks Collection | SK2T-8037 |
| IBM Enterprise Storage and Systems Management Solutions | SK3T-3694 |

## Sites on the Web

These publications are also relevant as further information sources:

- Lieberman & Associates: `http://www.lanicu.com`
- Microsoft migration: `http://support.microsoft.com/support/ntserver/migration/`
- Novell support: `http://support.novell.com`
- AS/400 service: `http://as400service.ibm.com`

## How to Get ITSO Redbooks

This section explains how both customers and IBM employees can find out about ITSO redbooks, CD-ROMs, workshops, and residencies. A form for ordering books and CD-ROMs is also provided.

This information was current at the time of publication, but is continually subject to change. The latest information may be found at `http://www.redbooks.ibm.com/`.

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- **Redbooks Web Site on the World Wide Web**

  `http://w3.itso.ibm.com/`

- **PUBORDER** – to order hardcopies in the United States
- **Tools Disks**

  To get LIST3820s of redbooks, type one of the following commands:

  ```
  TOOLCAT REDPRINT
  TOOLS SENDTO EHONE4 TOOLS2 REDPRINT GET SG24xxxx PACKAGE
  TOOLS SENDTO CANVM2 TOOLS REDPRINT GET SG24xxxx PACKAGE (Canadian users only)
  ```

  To get BookManager BOOKs of redbooks, type the following command:

  ```
  TOOLCAT REDBOOKS
  ```

  To get lists of redbooks, type the following command:

  ```
  TOOLS SENDTO USDIST MKTTOOLS MKTTOOLS GET ITSOCAT TXT
  ```

  To register for information on workshops, residencies, and redbooks, type the following command:

  ```
  TOOLS SENDTO WTSCPOK TOOLS ZDISK GET ITSOREGI 1998
  ```

- **REDBOOKS Category on INEWS**
- **Online** – send orders to: USIB6FPL at IBMMAIL or DKIBMBSH at IBMMAIL

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