

Session: 406170



AS/400 NetServer Setup & Usage

<http://www.ibm.com/servers/eserver/series/netserver/>

IBM @server iSeries

Carl Pecinovsky
csky@us.ibm.com

© Copyright IBM Corporation, 2001. All Rights Reserved.

This publication may refer to products that are not currently available in your country. IBM makes no commitment to make available any products referred to herein.

IBM @server. For the next generation of e-business.

Outline

IBM  server iSeries

- ✓ *Introduction - Welcome to the neighborhood*
- ✓ *What the end user sees*
- ✓ *Configuration*
 - *AS/400 NetServer side*
 - *PC side*
- ✓ *Administration*
 - *Setting up and using file shares*
 - *Setting up and using print shares*
 - *Managing NetServer activity*
- ✓ *What's new!*
- ✓ *Tips & Where to find information*
- ✓ *Conclusion*

IBM  server. For the next generation of e-business.

iSeries as a Total Server

IBM @server iSeries

→ AS/400 NetServer provides support focus for the first
Business in **B2B: Yours**

→ Version 4 Release 2 grew a key piece of AS/400 INTRANET support



IBM @server. For the next generation of e-business.

- The AS/400e server iSeries is the intuitive and comprehensive server. It is designed to get you up and running faster with many servers all in one; internet, database, application, file and print. It is easy to run, manage and grow.
- While much of the support for the Internet existed prior to V4R2, several servers were added that make it possible for the iSeries to provide enhanced support for the Intranet.

A Few iSeries Server Functions

DNS	Domain Name System
DHCP	Dynamic Client Addressing
SMB	Windows File Serving
Notes	Lotus Notes Server
HTTP	Web content serving

IBM  iSeries



IBM  For the next generation of e-business.

The first four items listed here are server functions added in V4R2 that cooperate to provide complete Intranet support by the iSeries.


- ▶ **DNS (Domain Name System):** This function enables the iSeries to resolve computer names to IP addresses used by the TCP/IP protocol. This support makes the network much friendlier and the administration of addresses can be done centrally on one iSeries.
- ▶ **DHCP (Dynamic Host Configuration Protocol):** This function removes the need to assign a fixed IP address to the majority of computers in your network. Some computers (Routers, DNS servers) should have fixed addresses because they are often used when configuring computers. Computers lease an IP address from the DHCP server for a period of time when they need TCP/IP, thus allowing you to have more users than addresses in a network.
- ▶ **SMB (Server Message Block):** The *AS/400 Support for Windows Network Neighborhood (AS/400 NetServer)* support allows you to share integrated file system directories and iSeries output queues with network clients. Microsoft Windows computers will now connect to the iSeries using TCP/IP and Client for Microsoft Networks. This connectivity takes place without any additional proprietary client software.
- ▶ **Notes (Lotus Notes Application):** The Lotus Notes Domino server provides support for e-mail, database, application, and other basic desktop office tools. On-line interactive reviews, and 20+ Domino applications offers a bundled solution that lets you smoothly run your business.
- ▶ **HTTP** is an example of internet file serving.

Welcome to the neighborhood

IBM  server iSeries

"AS/400 Support for Windows Network Neighborhood"

- **Who:** Windows NT 4.0, Windows 98, Windows 95, Windows for Workgroups, Windows NT Server 4.0 TSE, Windows 2000
 - ▶ With PTFs for some releases: Windows 2000, Windows NT Server 4.0 Terminal Server Edition (TSE)
- **What:** File and print serving
- **Where:** AS/400 NetServer is part of the base OS/400 Operating System
- **When:** Available in V4R2 and later
- **How:** AS/400 NetServer uses TCP/IP
- **Why:** Clients will not need additional software such as Client Access/400 to access iSeries / AS/400 files and printers

IBM  server. For the next generation of e-business.

AS/400 NetServer gives the iSeries/AS/400 the same core file and print sharing support provided by Windows NT and Windows 95 based platforms. All of these systems can now connect to AS/400 NetServer for file and print serving *without* additional software such as Client Access/400. Client Access will still provide the majority of AS/400 client/server functions (terminal emulation, ODBC, data transfer, etc.).

In V4R5, the client support was extended to include Windows 2000 and Windows NT Server 4.0 Terminal Server Edition (TSE). This support is also available for V4R3 and V4R4 through a set of PTFs.

- In V5R1, core support was extended to provide iSeries domain logon capability to select clients. There is a separate presentation covering this support.
- Also in V5R1, note that Windows for Workgroups client is out of service.

AS/400 NetServer is part of the base OS/400 operating system in V4R2. It is activated by default when the QSERVER subsystem is started in V4R2/V4R3, and by default as a TCP/IP server in V4R4 and later.

Why AS/400 NetServer?

IBM @server iSeries

- **Eliminate cost of administering multiple servers**
 - ▶ Uses iSeries user profiles and security
 - ▶ OS/400 is single point for software maintenance
- **Reduce cost of PC software and maintenance**
 - ▶ Standard Windows user interface, no retraining required
- **No special hardware required**
 - ▶ Uses iSeries processor, disk and LAN adapters
- **Simple, graphical administration and operations**
 - ▶ Managed with AS/400 Operations Navigator
 - ▶ Point and click access to iSeries files and printers

IBM @server. For the next generation of e-business.

- Note: Even when using an INS (Integrated Netfinity Server) and AS/400 NetServer, this integrated file serving solution still keeps the technology to maintain on the same box so that the cost of extra space and hardware is reduced.

AS/400 NetServer Vs. Client Access/400

IBM @server iSeries

→ AS/400 NetServer

- ▶ Doesn't require proprietary client software
- ▶ May share directories with read only access
- ▶ Can share individual directories, better iSeries security control
- ▶ AS/400 NetServer can be hidden from the Windows Network Neighborhood by setting the browse interval property parameter to zero
- ▶ AS/400 NetServer can hide shares from the network by ending them with a \$

→ Client Access

- ▶ Has many functions not available in Windows, such as 5250, ODBC, data transfer, etc.
- ▶ No concept of "shares", always makes all of IFS available

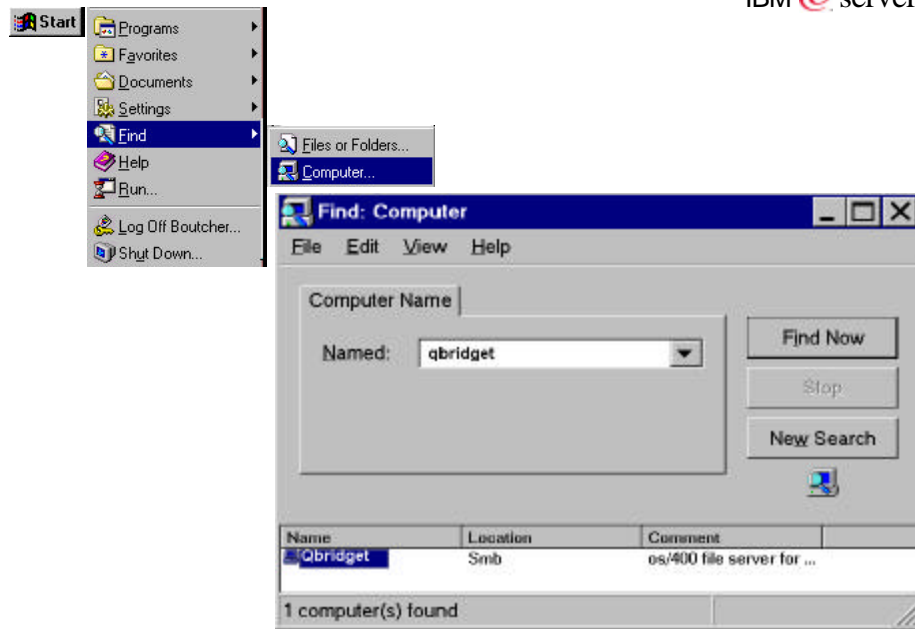
IBM @server. For the next generation of e-business.


What the End User Sees

IBM @server. For the next generation of e-business.

"Find Computer" - Connecting to AS/400 NetServer

IBM  server iSeries



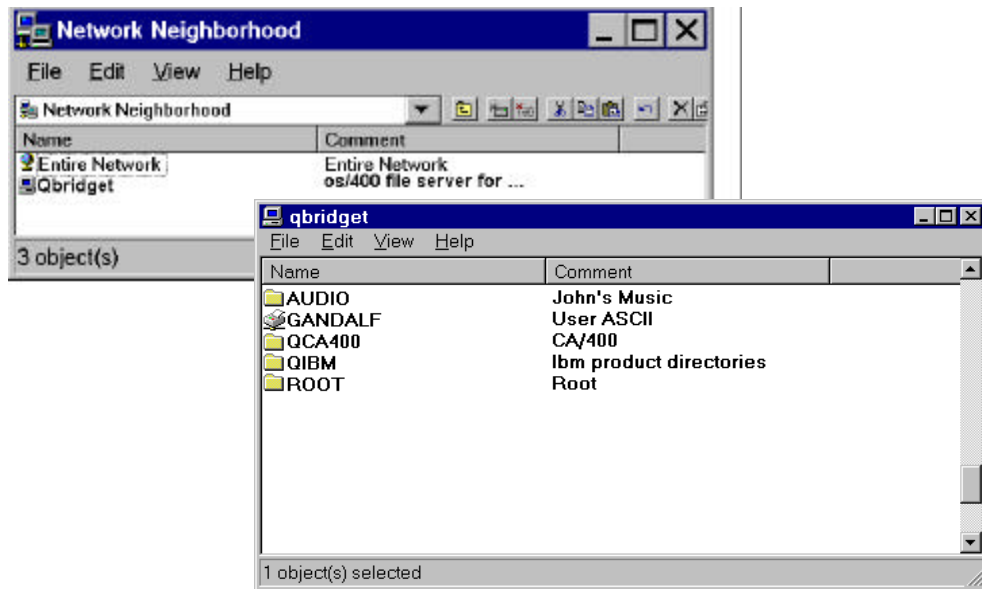
IBM  server. For the next generation of e-business.


Using the "Find Computer" shown on this page, enables you to find an iSeries in a network just as if you were looking for a file on your desktop client.

From a Windows 2000 client, you would right-click on "My Network Places", and then select "Search for computers..."

Network Neighborhood and AS/400 NetServer "Shares"

IBM  server iSeries



IBM  server. For the next generation of e-business.

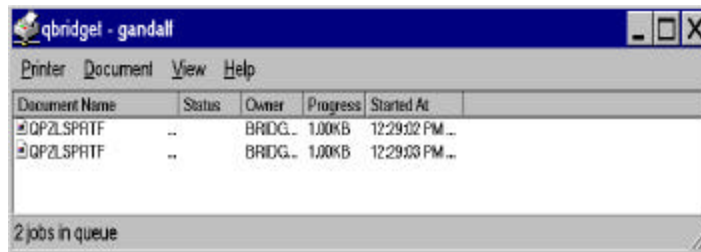
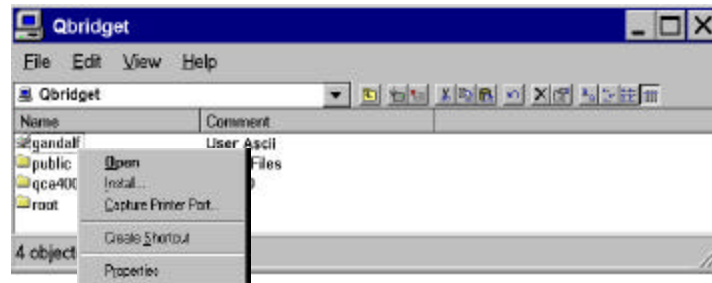
AS/400 NetServer may also appear in the "Windows Network Neighborhood" but this depends on your network TCP/IP configuration. "Find Computer" is more likely to work in all environments.

In order to display AS/400 NetServer shares double click on AS/400 NetServer accessed through either "Find Computer" or "Windows Network Neighborhood." Remember that "Windows Network Neighborhood" is also available through "Windows Explorer", so AS/400 NetServer shares could be explored as well.


The AS/400 NetServer support follows the paradigm of other PC servers such that some resources (directories, printers) are "shared" with the network. Here is an example of AS/400 NetServer shared resources. The shared resources are created with names that may or may not be the same as the actual directory or output queue name.

Working with Printers and Output Queues

IBM  server iSeries



Printer status window

IBM  server. For the next generation of e-business.

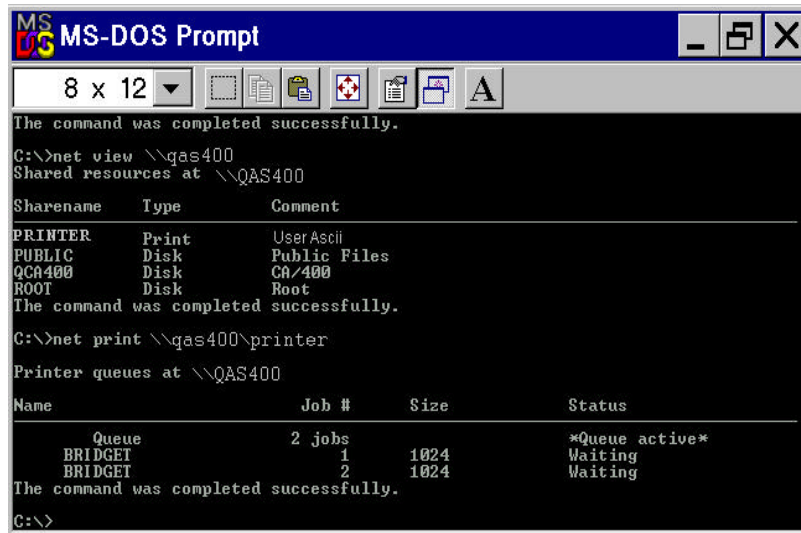
On this page, we are accessing the AS/400 NetServer shares through "Find Computer". When using a network printer, you must install a printer on the desktop client. Double clicking on the printer share icon causes the "Install" option to run. When you define the printer, you will need to specify the network path to the printer. Also, AS/400 NetServer can be configured to supply the type of the printer driver needed for the actual printer causing the client to automatically define the printer using that driver.

Once the printer is installed, you may submit print jobs to it and then work with those print jobs. When you work with print jobs for a AS/400 NetServer share, you are actually working with the spooled files on the iSeries output queue. For example, you may Pause, Resume, or Purge a printer, and you may Pause, Resume, or Cancel a print job.


Note: Client Access and Operations Navigator have the ability (above and beyond AS/400 NetServer) to change the properties of a print job spooled to an iSeries output queue. Also, AS/400 NetServer limits the number of jobs you can work with to the first 350 when using an AS/400 print share.

Accessing from DOS Windows

IBM  server iSeries



```
MS-DOS Prompt
8 x 12
The command was completed successfully.
C:\>net view \\qas400
Shared resources at \\QAS400
Sharename      Type           Comment
-----
PRINTER        Print          User Ascii
PUBLIC         Disk           Public Files
QCA400         Disk           CA/400
ROOT           Disk           Root
The command was completed successfully.
C:\>net print \\qas400\printer
Printer queues at \\QAS400
Name           Job #    Size    Status
-----
Queue          2 jobs
BRIDGET        1        1024    Waiting
BRIDGET        2        1024    Waiting
The command was completed successfully.
C:\>
```

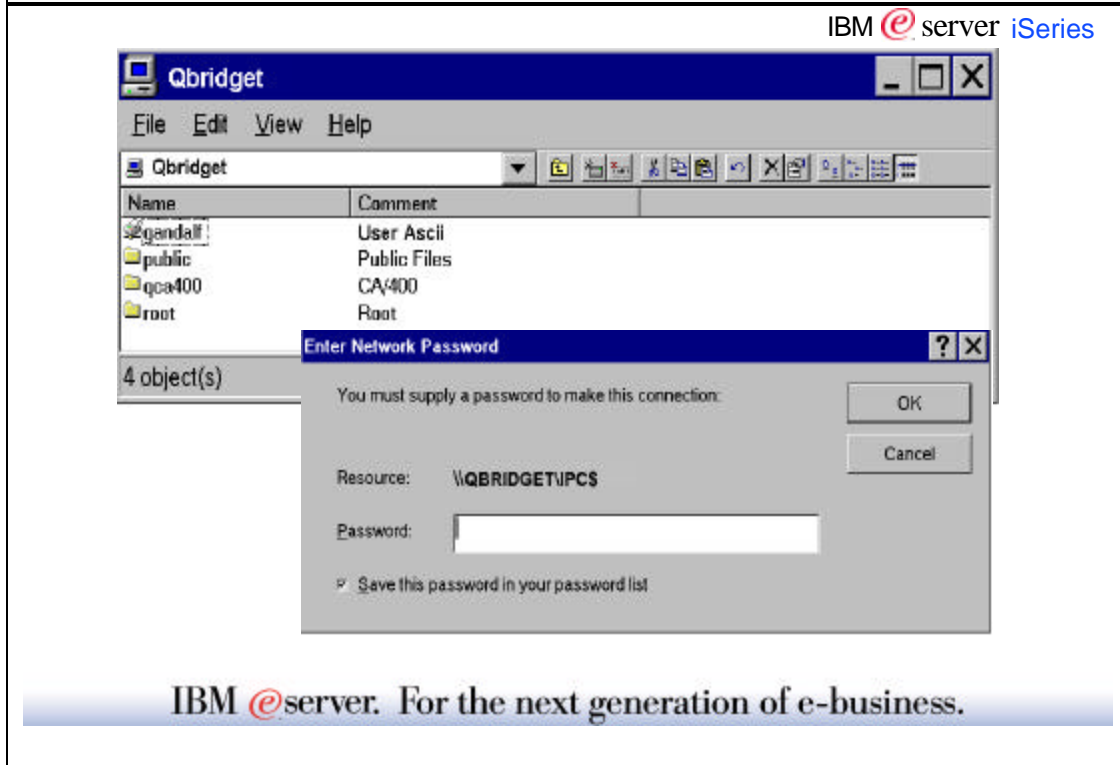
IBM  server. For the next generation of e-business.

Accessing AS/400 NetServer is also possible from DOS. Many of the SMB network (net) type commands are handled by the AS/400 NetServer. The Universal Naming Convention (**UNC**) is used here to identify AS/400 NetServer in the network. The UNC name consists of \\serverName\shareName; where serverName is the AS/400 NetServer name and shareName is the name of the shared resource.

Examples of other network commands that AS/400 NetServer will handle include:

- ▣ **net view** -which will list the servers in your domain
- ▣ **dir \\qbridget\qca400** -which will list the files in the directory for the qca400 share
- ▣ **net print \\qbridget\gandalf** -which will list the spooled files in the iSeries output queue for the gandalf share

Security



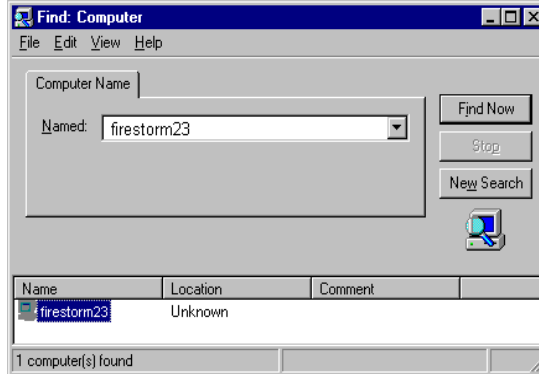
When using AS/400 NetServer, normal iSeries User Profiles and passwords apply. With Windows 95/98, the userid used to originally logon to the Client For Microsoft Networks (which may be the same as your Windows signon password) is used to access NetServer. With Windows NT/2000, the option to select a different userid is presented. If the passwords do not match, a password window is presented. Windows will optionally remember the password.

If a User Profile is not found that matches the userid used to access AS/400 NetServer, an optionally configurable guest User Profile may be used. This guest would be previously created by the administrator, it should not be allowed to signon to the iSeries, and it MUST not have any special authorities. Using the guest User Profile, you may view AS/400 NetServer shares and other iSeries directories and output queues to which the guest has access. If you will be printing to output queues with the guest profile, then it will require a password. This is because AS/400 NetServer communicates with the internal Network Print Server which requires a password.

Disabled Users

IBM  server iSeries

- A user becomes disabled for AS/400 NetServer access when the number of password violations exceeds the QMAXSIGN system value.
 - Prior to V5R1, this can easily happen from a Windows client if you don't increase the value for QMAXSIGN
 - A disabled NetServer user is NOT disabled for other ways of iSeries access (i.e. the profile does not get disabled)



IBM  server. For the next generation of e-business.

The Issue:

The reason this problem can be a common occurrence is the way Windows clients often contact the AS/400 NetServer. For example, the screen shot shows the results of a 'find computer' when there is a password mismatch. Notice the text "Unknown" for the location. This is the clue that the password the client is sending is invalid. By the time this screen appears, Windows has already tried the bad password several times. Now, if the user double clicks on the firestorm23 computer, Windows will try several more times before putting up the password prompt. If QMAXSIGN is set only to 5 or less, then this threshold may already be reached, and the user will be denied access no matter what password they use.

How to tell if a user has been disabled:

- Check the QSYSOPR message queue (DSPMSG QSYSOPR) for message CPIX682
- Disabled Users dialog in V5R1

Possible actions to resolve:

1. -Restart NetServer (will reenable each user) OR
-CHGUSRPRF userid (will reenable individual user)
2. Increase value for QMAXSIGN
3. Change password on the client to match
4. In V5R1, use the new Disabled Users dialog from OpsNav!

In **V5R1**, multiple signon attempts in quick succession by the client will only be logged as **one** password violation, greatly reducing the chance of users becoming disabled. This is handled in a way that does not compromise security.

Configuring AS/400 NetServer

...with ease!

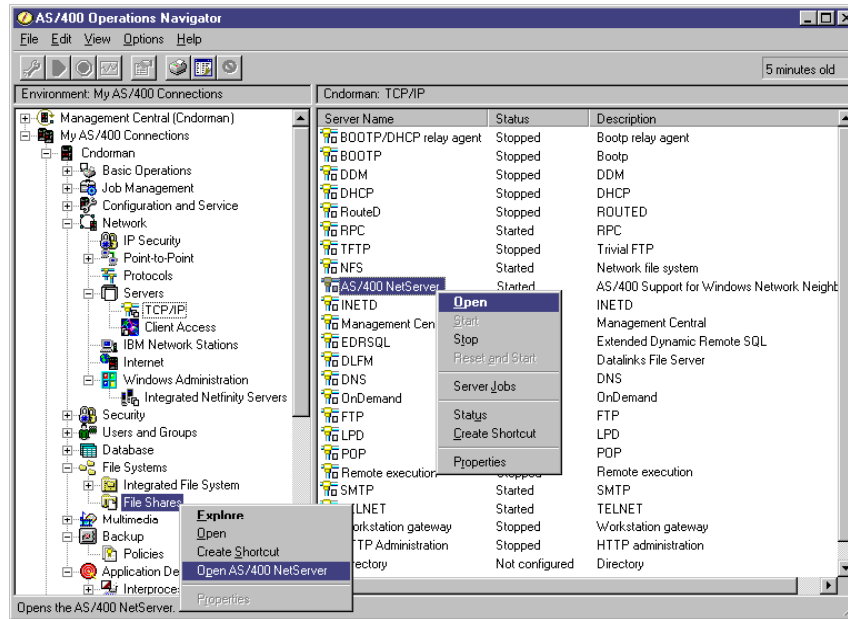
IBM @server. For the next generation of e-business.

▸ **Note:**

- All the administrative functions available through AS/400 Operations Navigator (except autostarting with TCP/IP) are accessible through AS/400 APIs. You may use the iSeries System API Reference as a guide when implementing AS/400 NetServer administration through your CL, COBOL, RPG, C, and C++ programs. APIs available today include:
 - Add File Server Share (QZLSADFS)
 - Add Print Server Share (QZLSADPS)
 - Change File Server Share (QZLSCHFS)
 - Change Print Server Share (QZLSCHPS)
 - Change Server Guest (QZLSCHSG)
 - Change Server Information (QZLSCHSI)
 - Change Server Name (QZLSCHSN)
 - End Server (QZLENDIS)
 - End Server Session (QZLENSIS)
 - List Server Information (QZLSLSTI)
 - Open List of Server Information (QZLSOLST)
 - Remove Server Share (QZLSRMS)
 - Start Server (QZLSSTRS)

Locating AS/400 NetServer in Operations Navigator

IBM  server iSeries



IBM  server. For the next generation of e-business.

The administration interface for AS/400 NetServer is provided through AS/400 Operations Navigator which is part of Client Access Express/400. By default AS/400 NetServer shares the Client Access Express/400 install directory with the network using file share QIBM so you can install Client Access Express/400. Once Client Access Express/400 is installed, AS/400 Operations Navigator may be used to administer AS/400 NetServer starting, stopping, properties, file and print shares, and sessions.

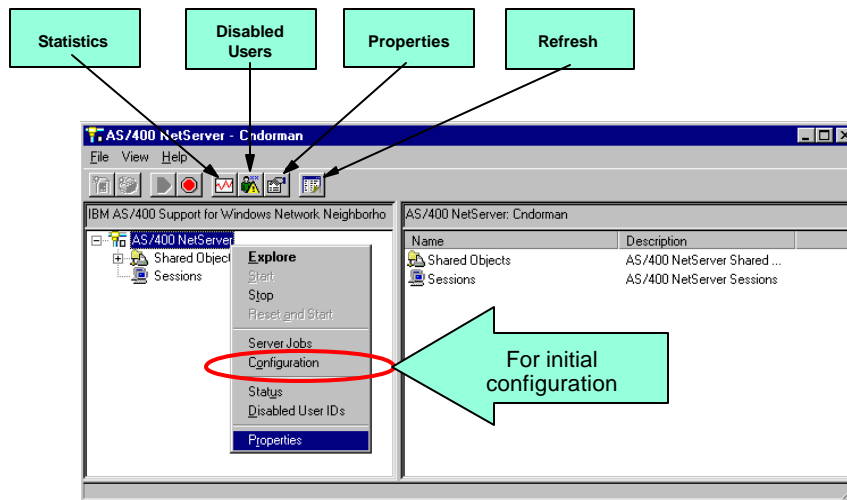
With Client Access Express, there are two ways (actually 3) to get to the AS/400 NetServer:

1. Take the Network path (Network->Servers->TCP/IP and double click AS/400 NetServer), or
2. The fast path is through the File Systems path as shown on the left pane of the screen shot


- A window will open for the AS/400 NetServer.
-
- New in V5R1 is a taskpad option at the bottom on the OpsNav window. Just click the File Systems branch and then click "Manage AS/400 NetServer shares" in the taskpad.

AS/400 NetServer Open Window

IBM  server iSeries



V5R1 View

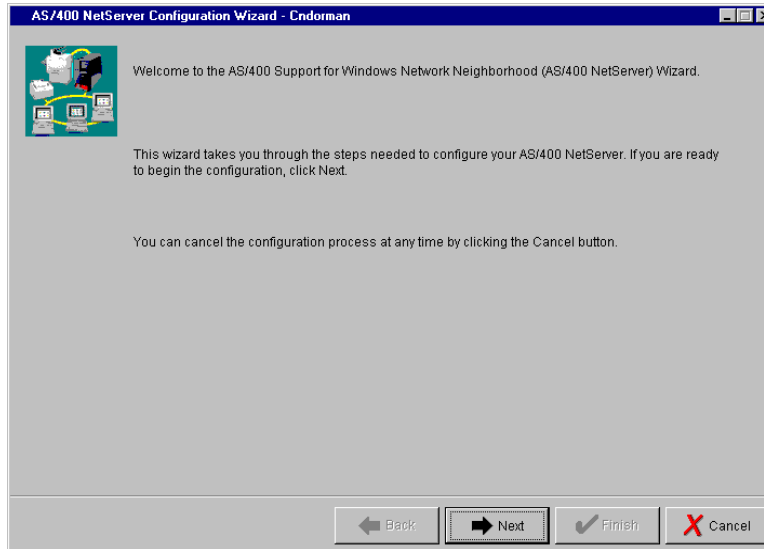
IBM  server. For the next generation of e-business.


- Server jobs context menu item was added in V4R4. This option opens a separate window that lists the AS/400 NetServer file jobs. Print jobs are not contained in QSERVER subsystem so they are not displayed.
- Disabled Users item is new for V5R1.

Use the Wizard in V5R1

Choose File Menu-->Configuration

IBM  server iSeries

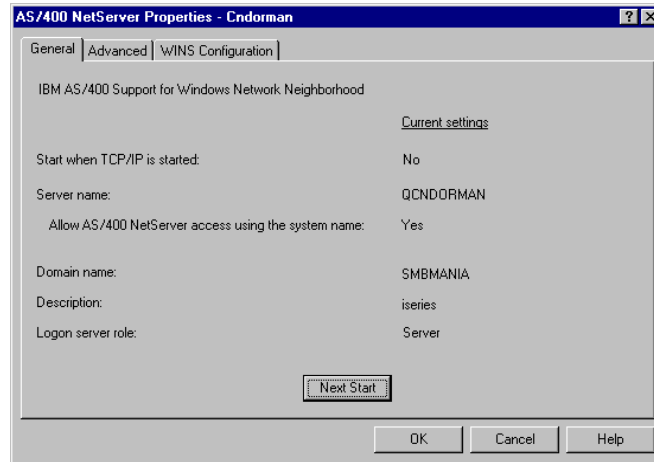


IBM  server. For the next generation of e-business.


- ▶ **If you're new AS/400 NetServer, you should try the Configuration Wizard starting in release V5R1.**
- ▶
- ▶ The configuration wizard walks you through a series of questions and it will configure AS/400 NetServer for you based on your responses. It will recommend settings like whether to use the 'Q' name or not. Its use simplifies configuring AS/400 NetServer for the first time.
- ▶
- ▶ For configuration in releases prior to V5R1 or if you want to change specific settings, go to "Properties" of AS/400 NetServer.

Properties: General Tab

IBM  server iSeries



V5R1 Properties dialog

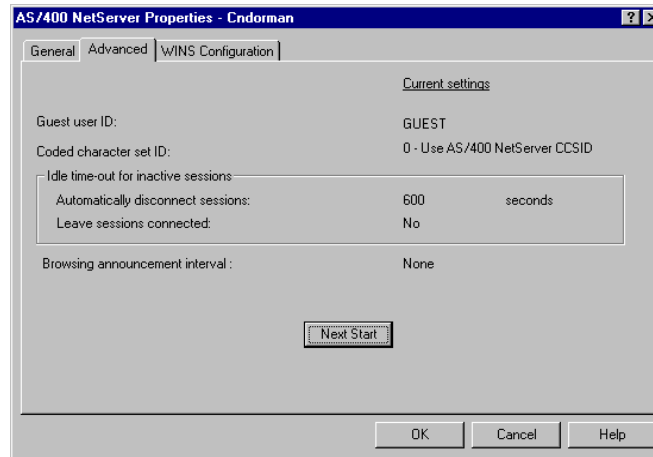
IBM  server. For the next generation of e-business.

- ▶ Press the Next Start button to change the values. The new values entered will take effect the next time the server is started.
- ▶
- ▶ **Server name:** Defaults to "Q" plus existing system name. Because new systems default the system name to the serial number, the server name will be 'Q' plus the serial number for most new systems.
- ▶ **Domain name:** Works best if this is the same domain (Workgroup) as PCs in the network that want to access AS/400 NetServer
- ▶ **Description:** Can be anything. Shows up on "Find Computer"
- ▶
- ▶ The "Reset to Current" option on the Next Start dialog, resets all values on dialog to currently active values for AS/400 NetServer.
- ▶
- ▶ **Don'ts:**
 - Don't check the 'Allow AS/400 NetServer access...' box if the server name you are providing already is the name of the AS/400.
 - Don't use the AS/400 NetServer name or system name for the domain name

For information on choosing the name of your AS/400 NetServer, see the appendix at the end of this presentation.

Properties: Advanced Tab

IBM  server iSeries



V5R1 Properties dialog

IBM  server. For the next generation of e-business.

- **Guest User Profile:** By default, only users with valid iSeries User Profiles and passwords can access resources on the iSeries. An iSeries Administrator with *SECADM special authority can specify an AS/400 NetServer "Guest" User Profile to be used by unknown users connecting to AS/400 NetServer. The Guest User Profile allows iSeries file and print sharing by users who otherwise would not require an iSeries User Profile. The Guest User Profile **MUST** have no special authority, and only give it a password if printing is going to be used. In this case, specify *SIGNOFF for the initial menu of the profile which will disallow green screen signons. **Prior to V5R1, be sure to configure a guest user profile if you will be using an INS (Integrated Netfinity Server) to connect to NetServer - this way long user names like "Administrator" are allowed to connect.** *The truncated name support in V5R1 allows Administrator to connect to the iSeries user ADMINISTRA.*
- **Code page (CCSID in V5R1):** Code page used by PCs in the network. Default is based on ASCII version of iSeries EBCDIC code page. In V4R4 and later, this value is not as important because iSeries supports exchanging information (such as share name and path name for example) in Unicode. This means that AS/400 NetServer is no longer limited to one configured code page to service all clients in a network. German, French and English clients can now seamlessly coexist without relying on this configuration value.
- **Idle time-out:** Sessions with no activity are eventually disconnected after this many seconds
- **Browse announce:** How often the iSeries broadcasts its existence. This value is in seconds for v4r5. The default is 720 or 12 minutes. This value was in milliseconds in prior releases. If set to 0 as shown here, then AS/400 NetServer will not broadcast its name and it won't show up in other computer's browse lists.

AS/400 Setup

IBM  iSeries

✓ **TCP/IP support configured**

✓ **QSERVER subsystem started**

→ STRSBS
SBS(QSERVER)

IBM  For the next generation of e-business.

▶ V4R2/V4R3

1. Make sure that TCP/IP is started and that at least one external TCP/IP interface is configured and active.
2. Make sure QSERVER subsystem is started.

▶ V4R4 and later


1. Make sure QSERVER subsystem is started
2. Make sure that TCP/IP is started and that at least one external TCP/IP interface is configured and active.

The order is important

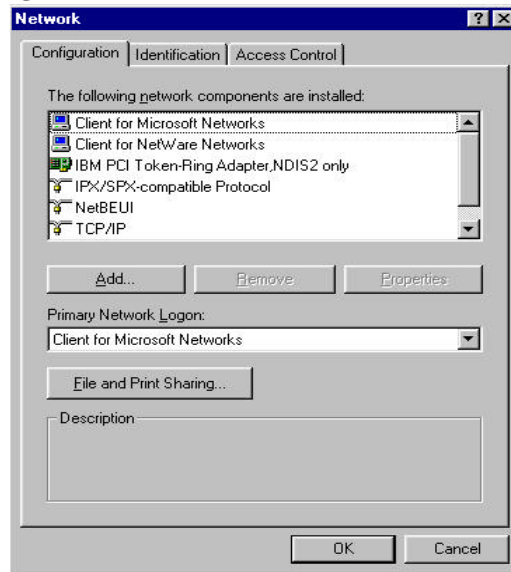
PC Configuration

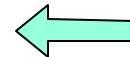
IBM @server. For the next generation of e-business.


PC Setup

 Use "Client for Microsoft Networks"

IBM  server iSeries



 Win9x

IBM  server. For the next generation of e-business.

Windows 95/98 and Windows for Workgroups clients must have the *Client for Microsoft Networks* network component installed which enables you to connect to other computers and to AS/400 NetServer in order to use the file and printers shared on them.

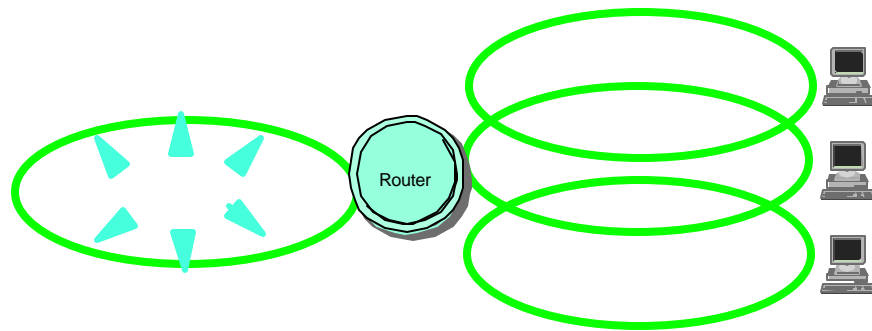
Windows NT clients must have the Workstation component installed.

Once this component, along with TCP/IP, is installed and configured, you will have access to the integrated file system directories and iSeries output queues shared with the network.

Complex TCP/IP Networks

IBM @server iSeries

- **Broadcasts get discarded by routers**
- **Need some other method for clients to locate servers**



IBM @server. For the next generation of e-business.


- The previous slide shows all you really need on the client side. Your existing TCP/IP configuration may just work to reach the AS/400 NetServer, but since we often get questions about connectivity issues, I want to digress through a few slides on name resolution.
- This slide shows the basic problem where multiple subnets are involved.

Name Resolution

IBM  server iSeries

Example ordering of resolution options a client could take

1. Cache
2. WINS
3. DNS
4. Broadcast
5. Lmhosts
file

IBM  server. For the next generation of e-business.

- The actual resolution steps depends on the client OS and which items are enabled and configured.

▸ Notes:

Domain Name System (DNS)

- Add AS/400 NetServer name (e.g. QBRIDGET) to DNS as an alias for AS/400/iSeries
- Add Client name to DNS
- Currently, DNS is the preferred choice

WINS (Windows Internet Name Service)

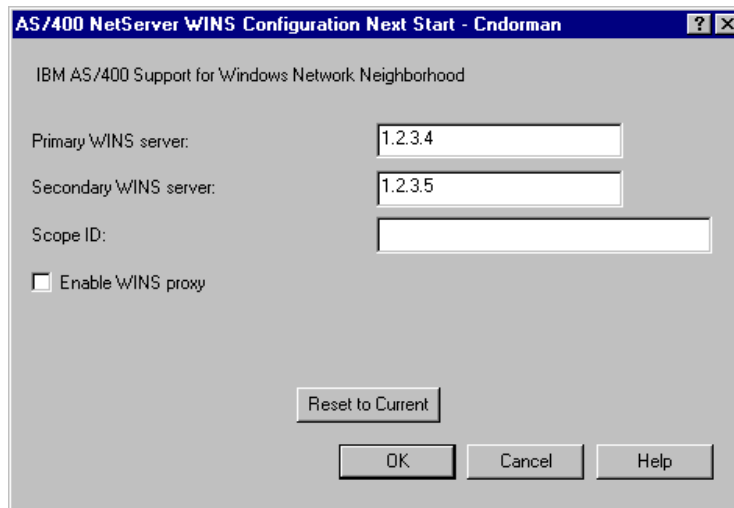
- If a Windows NT server exists on the network, it can provide the WINS service
- Clients and Servers register with WINS server to locate each other

Static configuration files

- PCs have LMHOSTS files that can be configured to find servers
- Static configuration file are difficult to administer
- Both clients and servers can be configured in LMHOSTS file

WINS Configuration - AS/400 NetServer

IBM  iSeries



AS/400 NetServer WINS Configuration Next Start - Cndorman

IBM AS/400 Support for Windows Network Neighborhood

Primary WINS server: 1.2.3.4


Secondary WINS server: 1.2.3.5

Scope ID:

Enable WINS proxy

Reset to Current

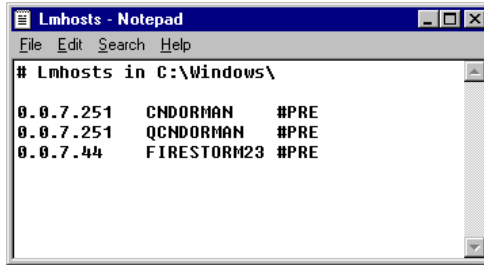
OK Cancel Help

IBM  For the next generation of e-business.

- ▶ AS/400 NetServer is compatible with and can be configured for WINS support. Please see Microsoft documentation for definitions of WINS server and Scope ID.
- ▶
- ▶ By acting as a WINS Proxy Server, the iSeries can perform name lookup requests on behalf of clients. The WINS server responds to the iSeries, and the iSeries in turn, sends the lookup results back to the client.
- ▶ By default, AS/400 NetServer acts as a WINS Proxy when the Primary or Secondary WINS server is configured. To disable WINS Proxy support in V4R2, V4R3, and V4R4, add a '@' in the first space of the Scope ID. When there is an '@' in the first space, the actual scope will start with whatever follows the '@'.
- In V4R5, there is a configuration option to enable or disable WINS Proxy support, and it is disabled by default. This is shown in the slide.
- ▶
- ▶ Normally, there should only be one system on a subnet acting as a WINS Proxy so that network traffic is reduced.

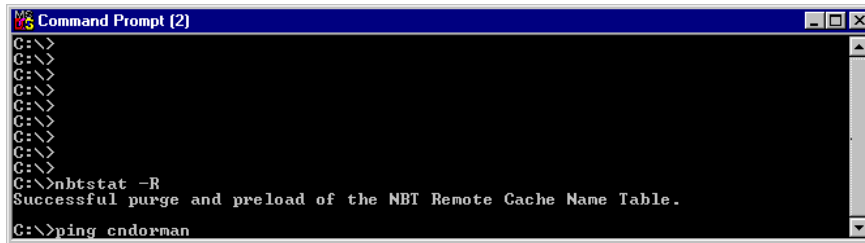
Name Resolution - Lmhosts file

IBM  server iSeries




```
# Lmhosts in C:\Windows\  
0.0.7.251 CNDORMAN #PRE  
0.0.7.251 QCNDORMAN #PRE  
0.0.7.44 FIRESTORM23 #PRE
```

- Using #PRE causes these entries to get preloaded in the name cache when the client boots.



```
C:\>  
C:\>  
C:\>  
C:\>  
C:\>  
C:\>  
C:\>  
C:\>  
C:\>  
C:\>  
C:\>nbtstat -R  
Successful purge and preload of the NBT Remote Cache Name Table.  
C:\>ping cndorman
```

- You can also purge the name cache and repopulate the preloaded entries from the command line.


IBM  server. For the next generation of e-business.

- ▶ NBT stands for NetBIOS over TCP/IP, and this communications layer is used by the AS/400 NetServer and Windows PCs to establish connections with the correct machine. Each system on the network that has resources or services available, registers these special names with NBT, and later clients can look them up.
- ▶
- ▶ First and foremost, the AS/400 NetServer name is registered with NBT, however if a client has a "dirty" name cache table, then it may not be able to find the AS/400 NetServer. This is why, after changing your Lmhosts file, if you want to avoid rebooting your PC, use the nbtstat -R command to purge the cache and preload the names in your new Lmhosts file.
- ▶
- ▶ If the Client For Microsoft Networks is not installed on the PC, then an error will be given when you try to run this command.
- ▶

Administering AS/400 NetServer

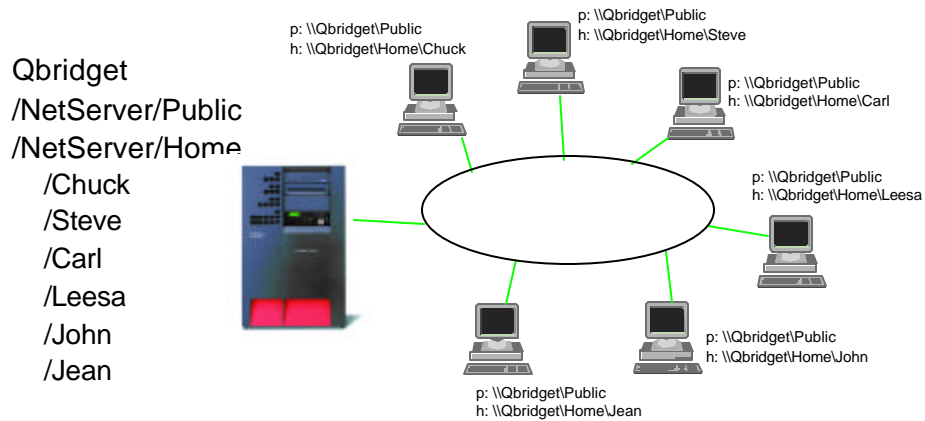
IBM  server iSeries


Setting Up File Shares

IBM  server. For the next generation of e-business.

File Sharing Example

IBM  server iSeries



IBM  server. For the next generation of e-business.

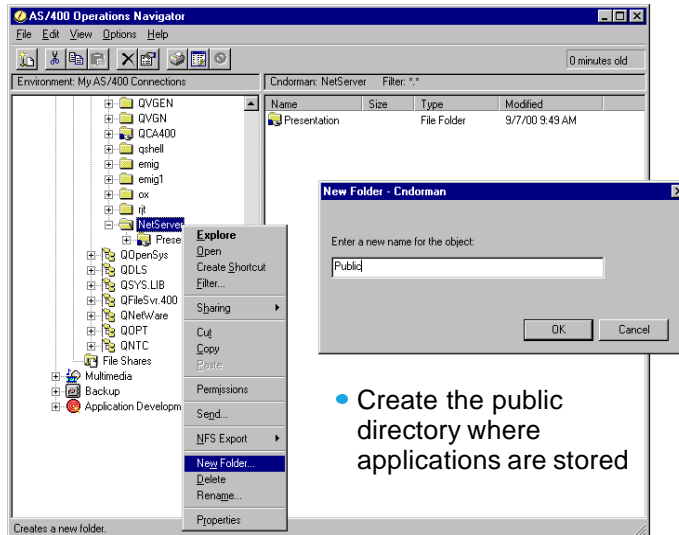
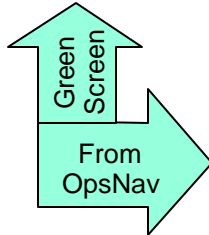
- ▶ Simple example of file sharing.
- ▶
- ▶ Directory Public could be a central repository for applications. Note one copy stored in a central location and shared with the network. All users on the network can access and use the application.
- ▶
- ▶ Each user in the network has their own data directory, but again stored on the iSeries.

Creating the directories


IBM  server iSeries

MKDIR DIR("\NetServer')

- Create the AS/400 NetServer branch of the iSeries integrated file system



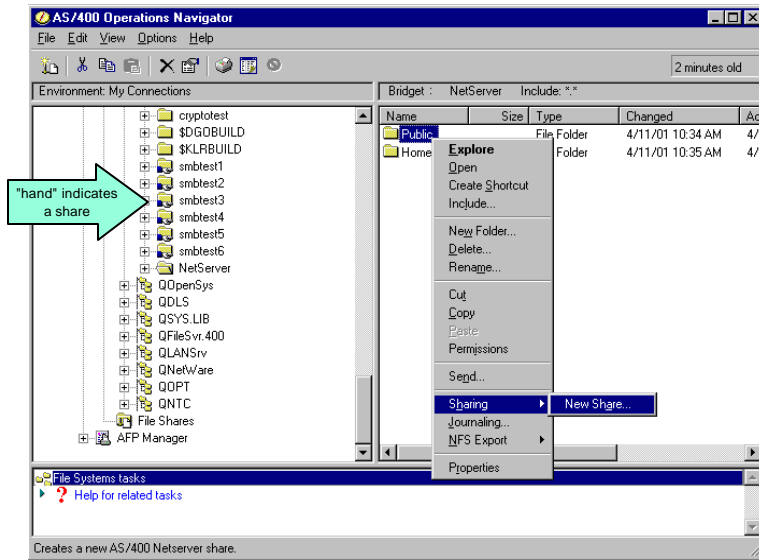
- Create the public directory where applications are stored


IBM  server. For the next generation of e-business.

Operations Navigator Shows Shares

IBM  server iSeries

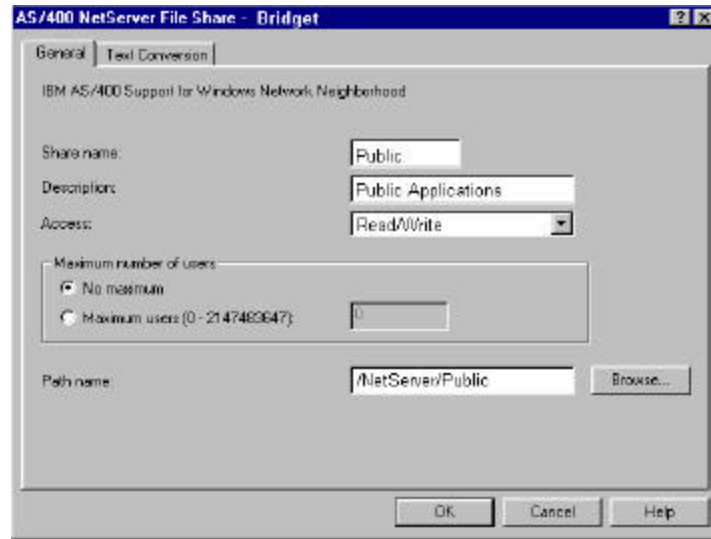
Directories Shown as Shared




IBM  server. For the next generation of e-business.

Sharing iSeries Directories

IBM  server iSeries



IBM  server. For the next generation of e-business.

Any integrated file system directory can be shared by the administrator. Normal access rules apply for the User Profile used when accessing AS/400 NetServer. For example, users accessing documents and folders in the QDLS file system must be enrolled in the system directory.

When directories are shared as **Read Only**, this overrides normal AS/400 authorities for files accessed using this share.

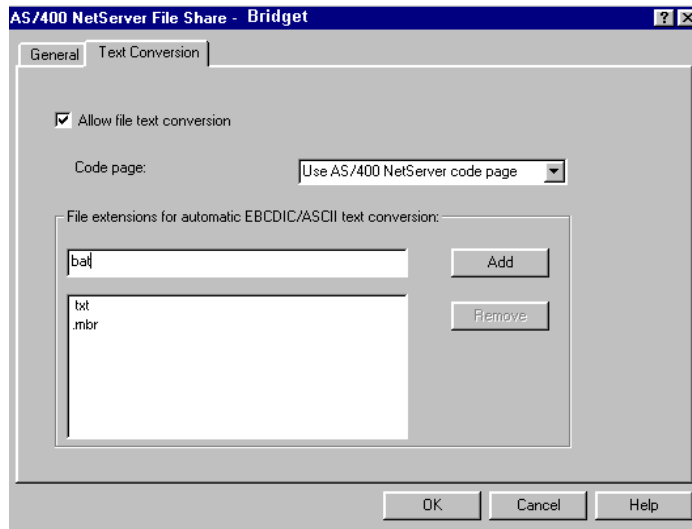
Directories can be shared with a **Maximum number of users** which results in the following:


- Limits concurrent users of a directory
- Allows for simple license management
- Does NOT affect users accessing the directory via other routes such as Client Access Express/400, NFS, or IFS commands

Sharing iSeries Directories

IBM  server iSeries

Text Conversion



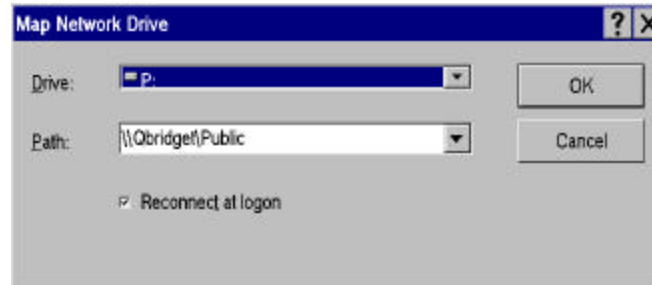
IBM  server. For the next generation of e-business.

In V4R4 and later, AS/400 NetServer will do EBCDIC/ASCII text conversion of file contents on the fly. By checking the **Allow text conversion** box, contents of files with the configured extensions will be converted from the **Code page** configured here to the code page of the file on the AS/400 if the file is being uploaded, and vice-versa.

- This conversion is specified on a per file share basis, and is not global like it was for the old Client Access.
- In V5R1, this field is a CCSID.

Mapping drives

IBM  server iSeries



IBM  server. For the next generation of e-business.

Mapping drives is really simple and no different when using Client for Microsoft Networks or Client Access (other than Express). It just requires that you have AS/400 NetServer configured properly before you can access the integrated file system.

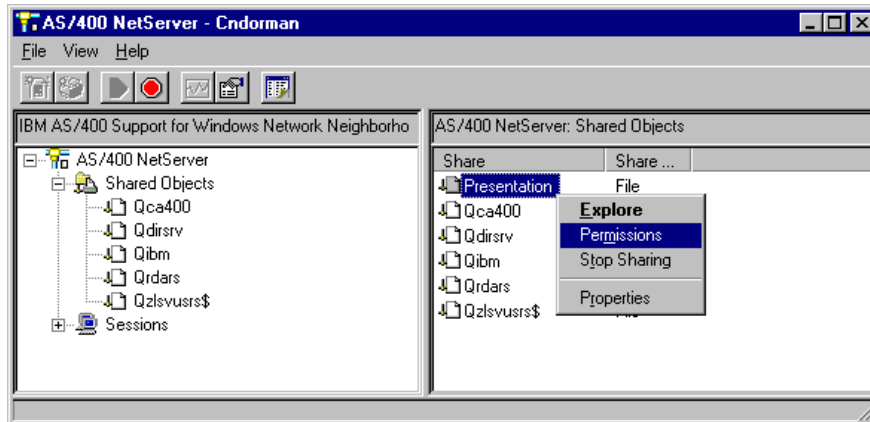
There are several ways to map drives:

1. Find computer and open it. Select share and right click to get context menu with Map network drive.
2. Through Windows Explorer and Tools file pulldown. Select Map network drive.
3. Through Operations Navigator, File systems, File Shares.
4. Net use command (DOS)
5. On Windows 2000, right click on My Network Places and select map network drive.


This view shows the UNC name with the AS/400 NetServer name following the double backslashes and the AS/400 NetServer file share name following the single backslash.

Open AS/400 NetServer

IBM  server iSeries



Viewing shares from the AS/400 NetServer window with additional administrative options.

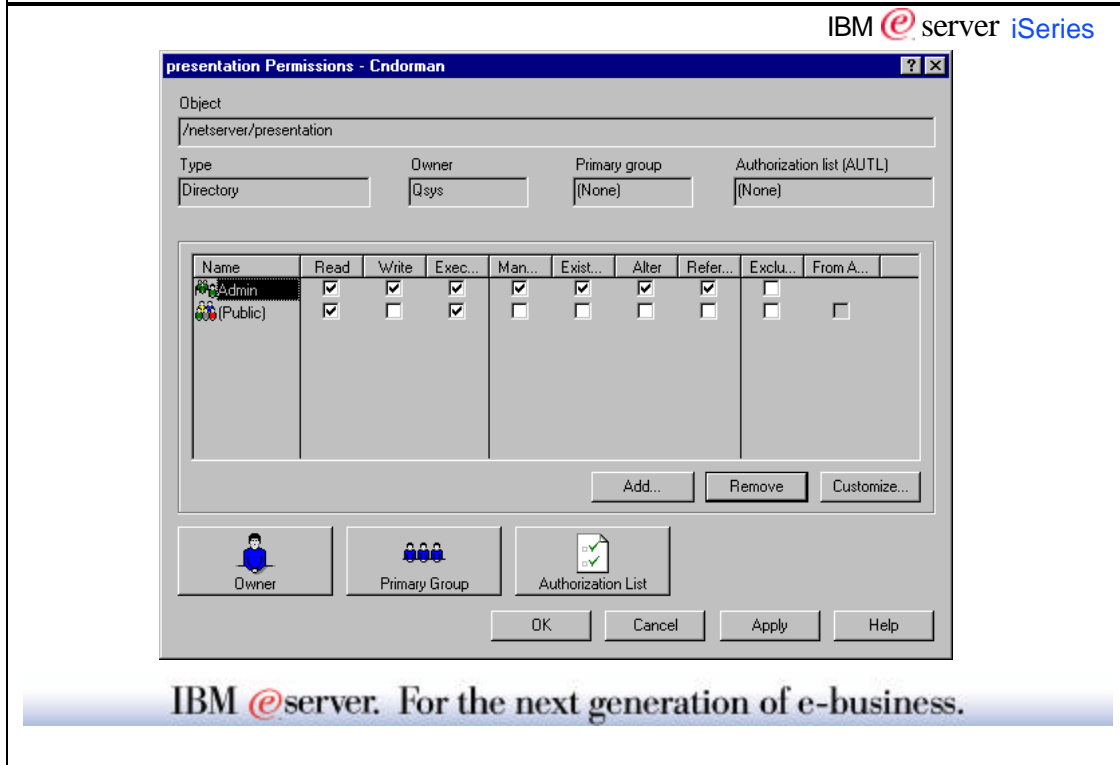
IBM  server. For the next generation of e-business.

AS/400 NetServer opens in a separate window when you select it from the file shares context menu or click on the new taskpad option in V5R1. You may have AS/400 NetServer windows open for multiple AS/400s simultaneously. If you select **Server Jobs** from the context menu after right-clicking on AS/400 NetServer, you will see the list of AS/400 NetServer file jobs displayed in a separate window (print jobs are not contained in the QSERVER subsystem, so they are not displayed).

If you select **Permissions** from the file share context menu, you can administer the authorities for the directory or file system configured as the path for the selected file share.

If you select **Explore** from a file share context menu, the Windows Explorer will execute exploring the entire Network Neighborhood until the AS/400 NetServer and share name are found. The contents of the IFS directory will be displayed in the right-hand pane of the Windows Explorer window.

iSeries Directory Permissions



What is shown here is the actual IFS (integrated file system) directory permissions dialog than can be accessed from AS/400 NetServer.

Shares may be shared with either read only or read/write access. This gives the administrator additional security choices for those users connecting through AS/400 NetServer. For example, a directory, PUBLIC, could be shared with read/write access, but the iSeries IFS directory authority for group PUBLIC would have read only access. The iSeries Administrator, ADMIN in this case, would be configured for full access to the directory making it possible for the administrator to make alterations to the directory, while an individual user could not.

Backup and restore made simple

IBM  server iSeries

Use established iSeries backup and restore strategy

- SAV command to save directories
- RST command to restore directories

No additional steps required for the end user

Build seamlessly on emerging V5R1 technologies:

- Journaled File Systems
- Independant ASPs


IBM  server. For the next generation of e-business.

- ▶ Because everything is stored on the iSeries, simply use your established backup and recovery strategy. Because you are using a central repository for applications and user data, recovery is as simple as restoring from backup or the current copy on the AS/400.
- ▶
- ▶ Also since files are served out the the IFS, emerging technologies like journaling and independent auxiliary storage pools (IASPs) can utilized. These technologies on the iSeries allow one to construct an even more 'highly available' file system and serving environment. There are other presentations available that focus on these possibilities. See John Swanson's IFS presentations for a file system perspective.
- ▶

Administering AS/400 NetServer

IBM  server iSeries

Setting Up Print Shares

IBM  server. For the next generation of e-business.

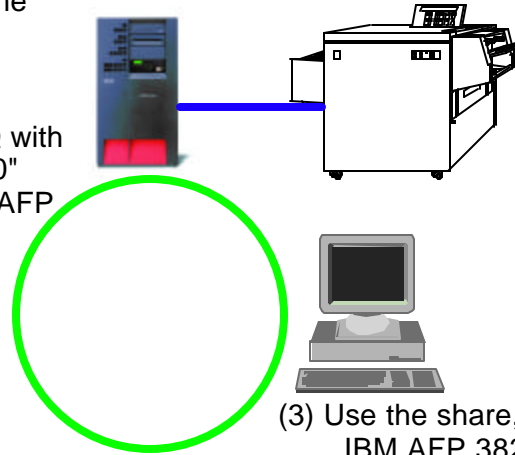
Print share example

IBM  server iSeries


PC printing to AFP printer

(1) Create outq on the iSeries for AFP printer

(2) Share the OUTQ with "IBM AFP 3820" printer driver, *AFP spool file type



(3) Use the share, using IBM AFP 3820 print driver

IBM  server. For the next generation of e-business.

Simple example of print share.

The iSeries is already configured with a device for the locally attached Advanced Function Printing (AFP) printer.

Each user in the network spools their print jobs to an iSeries output queue, using the iSeries DASD to handle network printing. The spooling operation is handled by AS/400 NetServer.

For step 1:

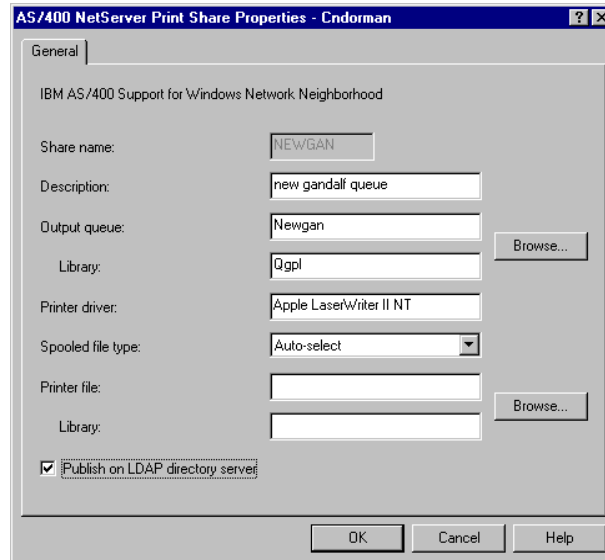
```
==>CRTOUTQ OUTQ(QUSRSYS/AFP3820)
```

- Creates output queue for directly attached AFP printer

The CRTOUTQ command is simple for directly attached printers because the iSeries will already contain a printer device with the device type, class, model and other specific parameters.

Sharing an Output Queue

IBM  server iSeries



AS/400 NetServer Print Share Properties - Endorman

General

IBM AS/400 Support for Windows Network Neighborhood

Share name: NEWGAN

Description: new gandalf queue

Output queue: Newgan

Library: Qqpl

Printer driver: Apple LaserWriter II NT


Spooled file type: Auto-select

Printer file:

Library:

Publish on LDAP directory server

OK Cancel Help

IBM  server. For the next generation of e-business.

As with any PC printing, the devil is in the details. Sharing a printer is easy, getting the correct print drivers to match the correct printer is sometimes tricky.

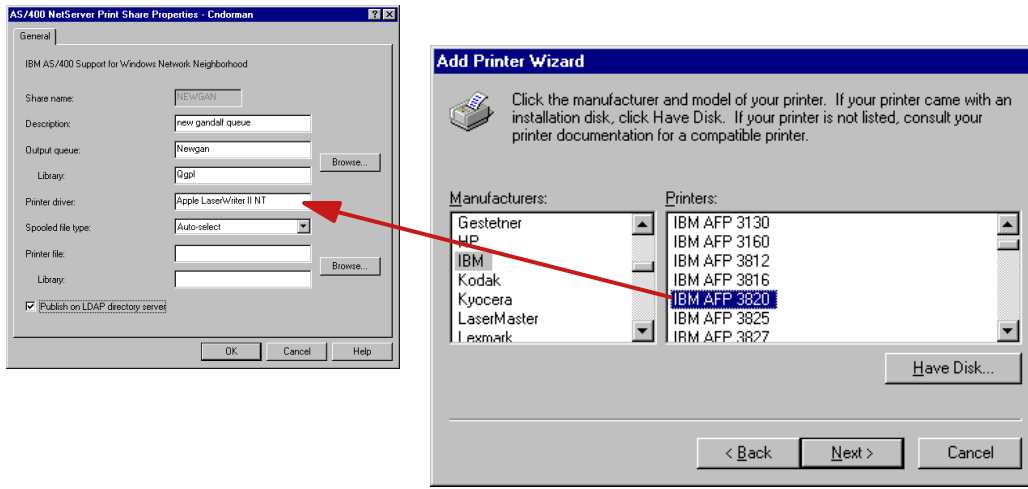
AS/400 NetServer can be configured so that the **Printer driver** supplies the type of the printer driver needed for the actual printer causing the client to automatically define the printer using that driver.

The **Spool file type** determines how spool files are created on the iSeries. Obviously this must match the correct destination for the output queue. Valid values include User ASCII, Advanced Function Print, SNA Character String, and in V4R4 we have Auto-select which means the incoming print stream is parsed to determine spooled file type on the fly.


Also in V4R4 and later, AS/400 NetServer will create all spooled files using a **Printer file** if configured. A printer file is used by the Network Print Server to identify the printer device used and spooling requirements. Note: The Spooled file type always overrides any value specified in the printer file.

Specifying the right printer driver name

IBM  server iSeries



You can use the *Add Printer Wizard* to see the list of printer drivers that your computer knows about.

IBM  server. For the next generation of e-business.

- ▶ Don't use the Add Printer Wizard to actually add a printer, but only to browse the list of printers - these are also the driver names.

Another AS/400 NetServer Print Scenario

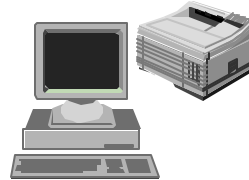
IBM  server iSeries

PC printing to PC-type printer


(1) Create outq connecting iSeries to LaserJet Printer (via CA/400, TCP/IP, network printer, etc.)



(2) Share the outq, with "LaserJet" printer driver, and *USERASCII spool file type



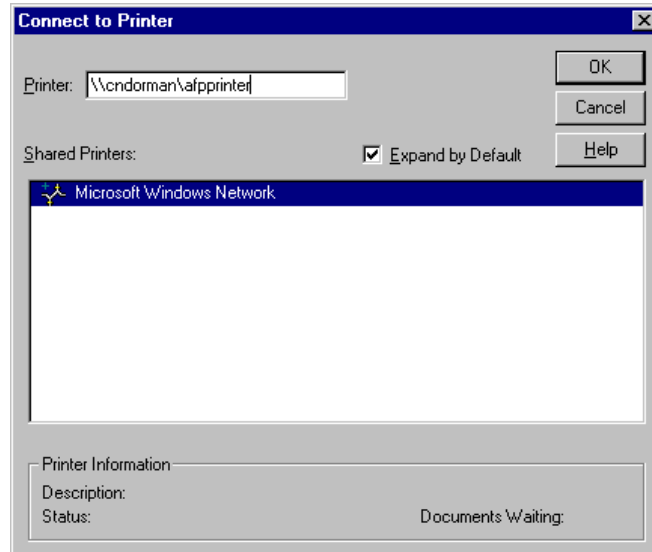
(3) PC uses the share, and specifies LaserJet printer driver


IBM  server. For the next generation of e-business.

- ▶ This example shows another network printer.
- ▶
- ▶ In this case there is no device on the iSeries configured for a locally attached printer.
- ▶
- ▶ Output queue configured for LPR/LPD, for example:
`CRTOUTQ OUTQ(QUSRSYS/ASCII) RMTSYS('remotepc') RMTprtQ('PCprinter') AUTOSTRWTR(1) CNNTYPE(*IP)
DESTTYPE(*OTHER) TRANSFORM(*NO)`
- ▶
- ▶ This requires two client/server operations:
 1. Spool using AS/400 NetServer
 2. Send using LPR/LPD

Installing a network printer

IBM  server iSeries



IBM  server. For the next generation of e-business.

- Once you have a printer shared, mapping and using it is really simple and no different when using Client for Microsoft Networks or Client Access (other than Express).
- There are several ways to install network printers:
 -
 - 1. Find computer and open it. Select share and right click to get context menu with Open or Install.
 -
 - 2. Double click on the print share you wish to install.
 -
 - 3. From the Start-Settings-Printers windows, double-click Add Printer and specify the UNC name of the network printer.
 -
 - 4. Net use command. (e.g. NET USE LPT2: \\Cndorman\LaserPrt)
 -
- This slide shows the UNC name with the AS/400 NetServer name following the double backslashes and the AS/400 NetServer print share name following the single backslash.

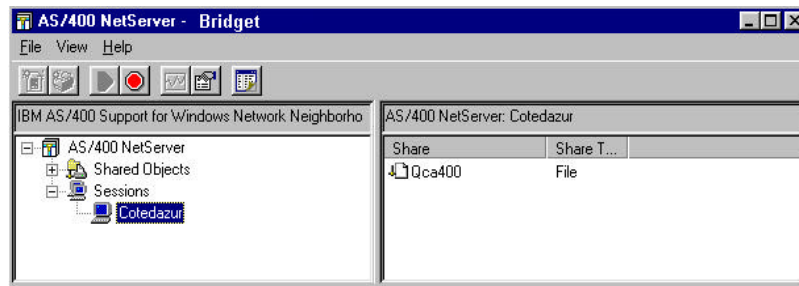
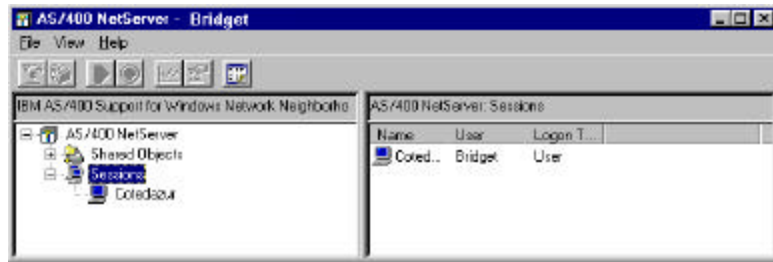
Managing AS/400 NetServer Activity


IBM @server. For the next generation of e-business.

Seeing Who is Connected to AS/400 NetServer

IBM  iSeries

Working with Sessions



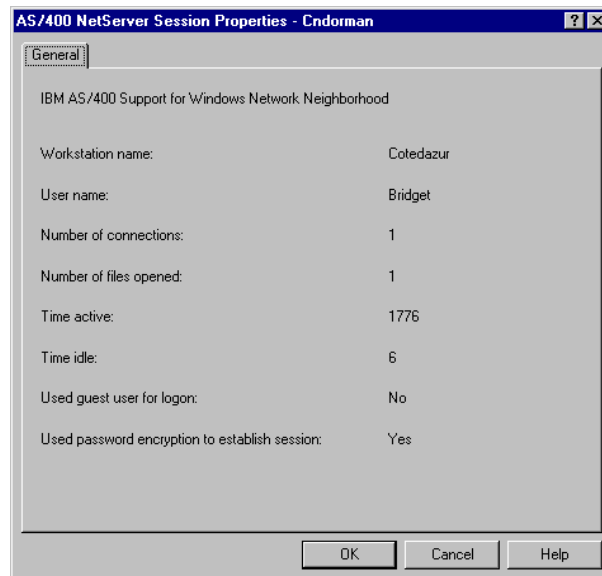
IBM  For the next generation of e-business.

- If you **Explore** the Sessions found under the AS/400 NetServer branch, you will see a list of workstations that have an established session open to AS/400 NetServer. Each time a workstation accesses AS/400 NetServer a session must be established if one is not already available. These sessions will disconnect and clean themselves up in one of three ways.
 1. The session is idle for the configurable number of seconds (this value is found on the AS/400 NetServer properties screen)
 2. The session goes through an orderly disconnection
 3. The session is ended by the AS/400 Administrator (select **End** from the session context menu)

If you **Explore** from an individual Session, you will see the list of shares being accessed by that workstation. Likewise, if you **Explore** from an individual Shared Object, you will see the list of workstations accessing that share.

Session Connection Status

IBM  server iSeries

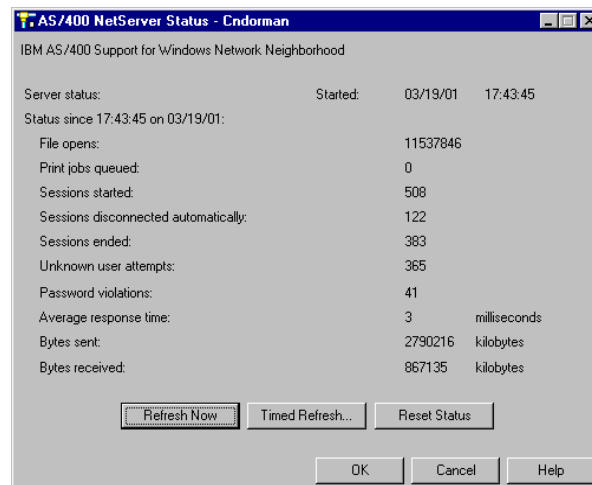


IBM  server. For the next generation of e-business.

- ▶ Session connection status was Introduced with V4R3M0 OS/400, V3R2M0 Client Access.
- ▶
- ▶ The List Server Information (QZLSLSTI) API and the Open List of Server Information (QZLSOLST) API have a format, ZLSL0600, that lists session connection information.
- Workstation name - Name of workstation associated with connection.
- User name - Name of user associated with the connection.
- Share name - Network name of the resource.
- Connection type - Type of connection, disk or spooled output queue.
- Connection ID - Number that identifies the connection.
- Files opened - Number of files that are currently open.
- Time connected - Number of seconds since connection was established.
- ▶ The slide shows Operations Navigator displaying the connection status information.

AS/400 NetServer Statistics

IBM  server iSeries




The screenshot shows a window titled "AS/400 NetServer Status - Cndorman" with the following data:

IBM AS/400 Support for Windows Network Neighborhood			
Server status:	Started:	03/19/01	17:43:45
Status since 17:43:45 on 03/19/01:			
File opens:		11537846	
Print jobs queued:		0	
Sessions started:		508	
Sessions disconnected automatically:		122	
Sessions ended:		383	
Unknown user attempts:		365	
Password violations:		41	
Average response time:		3	milliseconds
Bytes sent:		2790216	kilobytes
Bytes received:		867135	kilobytes

Buttons: Refresh Now, Timed Refresh..., Reset Status, OK, Cancel, Help

V5R1 Status Window

IBM  server. For the next generation of e-business.

- ▶ A separate window may be opened for each iSeries to display AS/400 NetServer statistics. These statistics may be automatically refreshed at a set interval. This gives you the ability to keep a close eye on each AS/400 NetServer in your network.
- ▶
- ▶ The List Server Information (QZLSLSTI) API and the Open List of Server Information (QZLSOLST) API have a format, ZLSL0400, that lists statistical information.
- ▶
- ▶ Operations Navigator displays the AS/400 NetServer statistics in a user friendly manner.
- Server status: Time server was started and time since statistics collection started
- File opens - Number of file opens for whole server.
- Print jobs queued - Number of print jobs queue for whole server.
- Sessions started - Number of sessions started.
- Sessions disconnected automatically - Number of sessions ended because of idle timer.
- Sessions ended - Number of sessions that ended either from the network or the by the administrator.
- Unknown users - Number of unknown users that have requested sessions.
- Password violations - Number of server password violations.
- Average response time - Average server response time in milliseconds.
- Bytes sent - Number of server bytes sent to the network (in K bytes)
- Bytes received - Number of server bytes received from the network (in K bytes)

Tips for AS/400 NetServer

& where to find additional information

IBM @server. For the next generation of e-business.

Determining File Readiness

IBM @server iSeries

```
Session A - [24 x 80]
File Edit Transfer Appearance Communication Assist Window Help
PrtScr Copy Paste Send Recv Display Color Map Record
Work with Active Jobs
CPU %: .0 Elapsed time: 00:00:00 Active jobs: 04/04/99 22:53:58 112
Type options, press Enter.
2=Change 3=Hold 4=End 5=Work with 6=Release 7=Display message
8=Work with spooled files 13=Disconnect ...
Opt Subsystem/Job User Type CPU % Function Status
---
QSERVER QSTS SBS .0 DEQM
QPMSERVSD QUSER BCH .0 SELW
QSERVER QPGMR ASJ .0 EVTW
QZDASRVSD QUSER BCH .0 SELW
QZLSFILE QUSER PJ .0 DEQM
QZLSFILE QUSER PJ .0 RUN
QZLSSERVER QPGMR BCH .0 EVTW
Parameters or command
===>
F3=Exit F4=Prompt F5=Refresh F10=Restart statistics
F11=Display elapsed data F12=Cancel F14=Include F24=More keys
MC a MW 10/002
```

IBM @server. For the next generation of e-business.

- ▶ **WRKACTJOB SBS(QSERVER)** will show the NetServer daemon job that listens for both print and file client requests, **QZLSSERVER**.
- ▶
- ▶ **QZLSFILE** pre-started jobs are waiting to be assigned to client file requests. In the job log you will find the workstation and user name identifying the client request.
- ▶

Determining Print Readiness

IBM  server iSeries




```
Session A - [24 x 80]
File Edit Transfer Appearance Communication Assist Window Help
PrintScreen Copy Paste Send Recv Display Color Map Record
Work with Active Jobs
CPU %: 17.2 Elapsed time: 00:08:56 Active jobs: 112 04/04/99 RCHAS7BD
23:02:54
Type options, press Enter.
2=Change 3=Hold 4=End 5=Work with 6=Release 7=Display message
8=Work with spooled files 13=Disconnect ...

Opt Subsystem/Job User Type CPU % Function Status
---
QSYSWRK QSYS 3BS .0 DEQW
NETSNTAP QSYS BCH .0 PGM-QVNAAMON SELW
QECG QSVSM BCH .0 PGM-QNSECSJB DEQW
QMSF QMSF BCH .0 DEQW
QNETWARE QSYS BCH .0 PGM-QFPANTWJ DEQW
QNPSEVD QUSER BCH .0 SELW
QNSCRMON QSVSM BCH .0 PGM-QNSCRMON DEQW
QPASVRP QSYS BCH .0 PGM-QPASVRP DEQW
QPASVRS QSYS BCH .0 PGM-QPASVRS TIMW
More...

Parameters or command
===>
F3=Exit F4=Prompt F5=Refresh F10=Restart statistics
F11=Display elapsed data F12=Cancel F14=Include F24=More keys

MS a MW 10/002
```

IBM  server. For the next generation of e-business.

- ▶ **WRKACTJOB SBS(QSERVER)** will show the NetServer daemon job that listens for both print and file client requests, **QZLSSERVER**.
- ▶
- ▶ **WRKACTJOB SBS(QSYSWRK)** will show the Network Print Server daemon job that listens for client print requests, **QNPSEVD**.
- ▶
- ▶ **QNPSEVRS** pre-started jobs are waiting to be assigned to print requests. In the job log you will find the user name identifying the client request.
- ▶
- ▶ In V4R2 and V4R3 **QNPSEVRS** jobs were found under **QSYSWRK**. In V4R4 the location is configurable, defaulting to **QUSRSYS**.
- ▶
- ▶

Determining NBT Readiness

IBM server iSeries

```
Session A - [24 x 80]
File Edit Transfer Appearance Communication Assist Window Help
PrtScrn Copy Paste Send Recv Display Color Map Record
Work with TCP/IP Connection Status
System: RCHAS7BD
Local internet address . . . . . : *ALL
Type options, press Enter.
4=End 5=Display details
  Opt Remote Remote Local Idle Time State
  --- * Address Port Port Time
  --- * * * *
  --- * * * *
  --- * * * *
  --- * * * *
  --- * * * *
  --- * * * *
  --- * * * *
  --- * * * *
  --- * * * *
  --- * * * *
  --- * * * *
  F5=Refresh F11=Display byte counts F13=Sort by column
  F14=Display port numbers F22=Display entire field F24=More keys
More...
M&C a MW 11/003
```

IBM server. For the next generation of e-business.

- ▶ **NETSTAT *CNN** shows network connection status. NetBIOS over TCP/IP requires four ports to be active. If these four ports are not displayed, restart NetServer.
- ▶
- ▶ The following entries should exist:
 - ▶ * * netbios > 063:02:05 Listen
 - ▶ * * netbios > 000:06:34 *UDP
 - ▶ * * netbios > 000:00:22 *UDP
 - ▶ * * netbios > 001:01:59 Listen
 - ▶
- ▶ In V5R1 and additional entry for local port 445 will exist. This allows Windows 2000 clients to connect using native TCP.
- ▶

NBTSTAT

```

MS-DOS Prompt
8 x 8
QRCHASPR7 <03> UNIQUE 9.5.151.236 -1
QRCHASPR7 <00> UNIQUE 9.5.151.236 -1
QRCHASPR7 <20> UNIQUE 9.5.151.236 -1
QRCHASF4M <03> UNIQUE 9.5.151.118 -1
QRCHASF4M <00> UNIQUE 9.5.151.118 -1
QRCHASF4M <20> UNIQUE 9.5.151.118 -1
QRCHASFE2 <03> UNIQUE 9.5.176.49 -1
QRCHASFE2 <00> UNIQUE 9.5.176.49 -1
QRCHASFE2 <20> UNIQUE 9.5.176.49 -1
GBPRULES <03> UNIQUE 9.5.60.11 -1
GBPRULES <00> UNIQUE 9.5.60.11 -1
GBPRULES <20> UNIQUE 9.5.60.11 -1

C:\WINDOWS>nbtstat -a qrchas224

NetBIOS Remote Machine Name Table
-----
Name          Type          Status
-----
BORG111       <20> UNIQUE      Registered
QRCHAS224     <20> UNIQUE      Registered
MAC Address = 00-00-00-00-00-00

C:\WINDOWS>nbtstat -a borgt111

NetBIOS Remote Machine Name Table
-----
Name          Type          Status
-----
BORG111       <00> UNIQUE      Registered
LNE_NT        <00> GROUP       Registered
BORG111       <03> UNIQUE      Registered
BORG111       <20> UNIQUE      Registered
LNE_NT        <1E> GROUP       Registered
LNE_NT        <1D> UNIQUE      Registered
.._MSBROWSE_ <01> GROUP       Registered
MAC Address = 40-00-59-36-B1-11

C:\WINDOWS>

```

IBM @server. For the next generation of e-business.

- Displays protocol statistics and current TCP/IP connections using NBT.
- **NBTSTAT [-a RemoteName] [-A IP address] [-c] [-n] [-r] [-R] [-s] [S] [interval]]**
-
- **-a (adapter status)** Lists the remote machine's name table given its name
- **-A (Adapter status)** Lists the remote machine's name table given its IP address.
- **-c (cache)** Lists the remote name cache including the IP addresses
- **-n (names)** Lists local NetBIOS names.
- **-r (resolved)** Lists names resolved by broadcast and via WINS
- **-R (Reload)** Purges and reloads the remote cache name table
- **-S (Sessions)** Lists sessions table with the destination IP addresses
- **-s (sessions)** Lists sessions table converting destination IP addresses to host names via the hosts file.
-
-
- **RemoteName** Remote host machine name.
- **IP address** Dotted decimal representation of the IP address.
- **interval** Redisplays selected statistics, pausing interval seconds between each display. Press Ctrl+C to stop redisplaying statistics.
-

Other Resources...

IBM  server iSeries

★ AS/400 NetServer Web Site:

- <http://www.ibm.com/servers/eserver/series/netserver/>
 - Introduction Articles
 - What's New?
 - Express Migration Article
 - Information APARs
 - Links to Technical References
 - System API Reference
 - Printing and Express Redbooks
 - Operations Navigator Instructions
 - Presentations and articles

★ Diagnostics Aids Volume 2

- ▶ Expansion of VLOGs
- ▶ Expansion of Trace Points

★ The AS/400 NetServer Advantage Redbook: SG24-5196

IBM  server. For the next generation of e-business.

- ▶ AS/400 Support Web Site:
 - ▶ <http://www.as400service.ibm.com/>
 - ▶ Expand Tech Info & Databases
 - ▶ Select Software Knowledge Base
 - ▶ Select Host Servers

Other resources...

IBM  server iSeries

★ AS/400 NetServer Informational APARs

- ▶ II11081 - V4R2 PTF Information
- ▶ II11239 - Tips and Techniques
- ▶ II11435 - Support of Windows Terminal Server Edition
- ▶ II11938 - Support of Windows 2000
- ▶ II11752 - V4R3 PTF information
- ▶ II12091 - V4R4 PTF Information
- ▶ II12537 - V4R5 PTF Information


IBM  server. For the next generation of e-business.

AS/400 NetServer Advanced Support

IBM  iSeries

What's New in V5R1?

- Domain Logon Support
- More Security options
- Disabled Users Administration
- Configuration Wizard in OpsNav
- Large File Support (> 2GB)
- Session management enhancements for WTS
- Added support for Windows NT background services
- Scalability Improvements
- Printer shares can be published in Directory Services

IBM  For the next generation of e-business.

- ▶ Security options include:
 - System password levels
 - NTLMv2 authentication
- ▶
- ▶ What's going away in V5R1:
 - service support for Windows 3.11
 - service support for Windows NT 3.51
- ▶ Come to the session called "Harnessing Domain Logon Support with AS/400 NetServer" to find out more about all the different enhancements in V5R1.

Conclusion

IBM @server. For the next generation of e-business.

AS/400 NetServer Changes the Playing Field

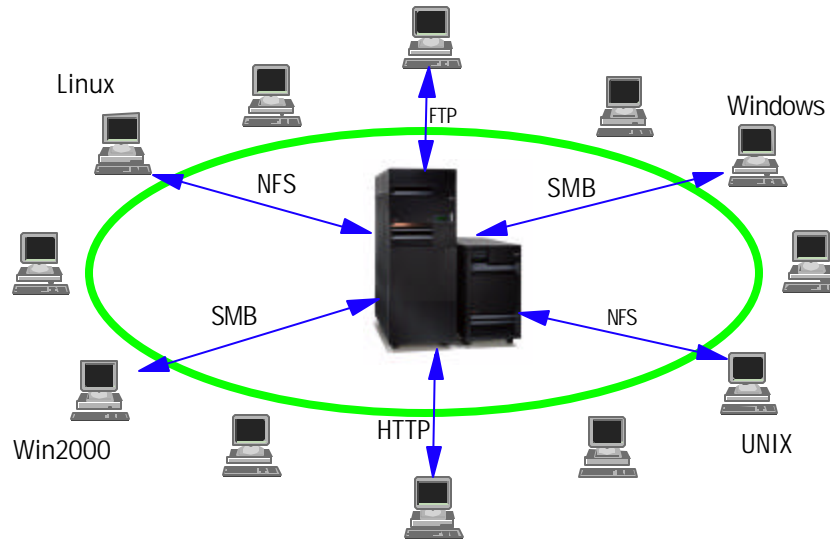
IBM @server iSeries

- iSeries becomes a more natural server in the enterprise, as well as in the Internet!
- As customers migrate from Client Access/400 to the Express client, AS/400 NetServer steps up to provide the seamless file and print services required.
- Customers can choose Client Access/400 or AS/400 NetServer for clients as appropriate
- For those clients requiring only file and print services, AS/400 NetServer provides it using native Windows networking protocols. No extra client software needed.


IBM @server. For the next generation of e-business.

iSeries: Speaking your language

IBM  server iSeries



Questions?

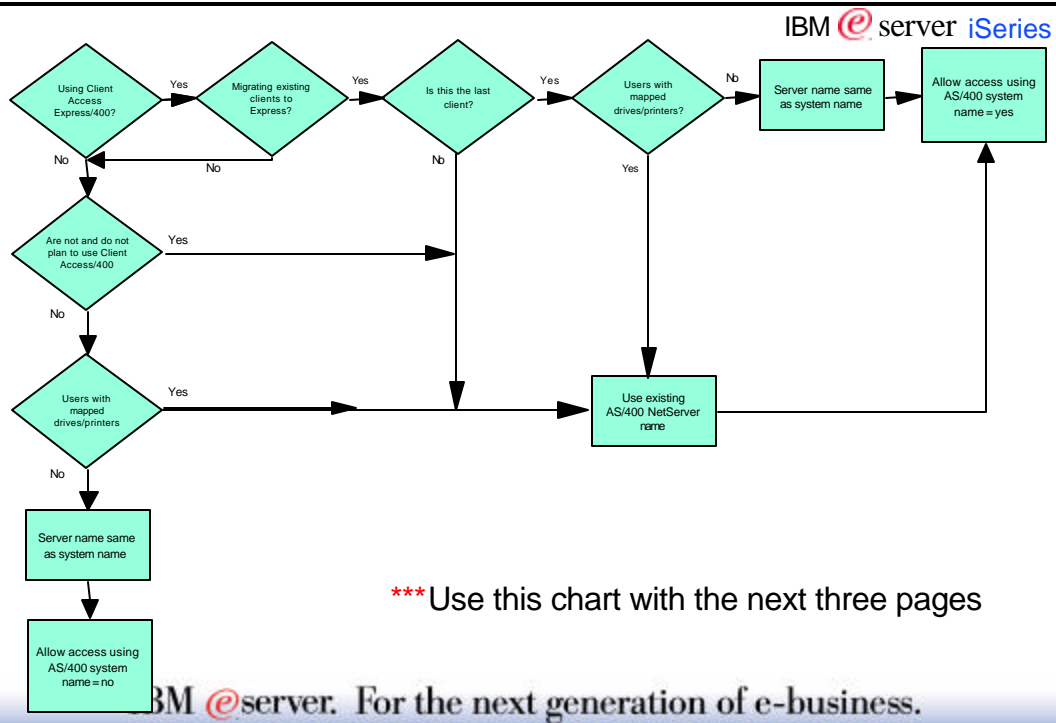
IBM  server. For the next generation of e-business.

Appendix

Naming AS/400 NetServer

IBM @server. For the next generation of e-business.

Decision tree for naming your AS/400 NetServer



- ▶ This decision tree is based on V4R4 and later releases, however, if you are at preV4R4 releases, you can still use it. Just start at the appropriate point.
- ▶
- ▶ Why is migration important? The old Client Access (non-Express) is going out of service.

Naming AS/400 NetServer

IBM @server iSeries

Important Info!

Use same name as iSeries / AS/400 system name?

- ▶ There are **no** *Client for Microsoft Networks*-AS/400 NetServer clients with network drives currently mapped using an AS/400 NetServer name different than the AS/400 system name.
- ▶ Are not using Client Access network file and print (other than Express) in network, now and in the future.

Use name **different** than iSeries system name?

- ▶ There is a mixed environment with both Client Access network file and print users (other than Express), and *Client for Microsoft Networks*-AS/400 NetServer users.


IBM @server. For the next generation of e-business.

Naming AS/400 NetServer (Continued)

IBM  server iSeries

Select 'Allow AS/400 NetServer access using iSeries name'?

- ▶ There are *Client for Microsoft Network*-AS/400 NetServer clients with network drives and printers mapped using an AS/400 NetServer name different than the iSeries system name.
- ▶ Migration from previous Client Access Family members to Express is complete for all clients in the network and you do not plan on using Client Access network drives and printers (other than Express) in the future.
- ▶ There are no Client Access network drives and printers users (other than Express) in the network.

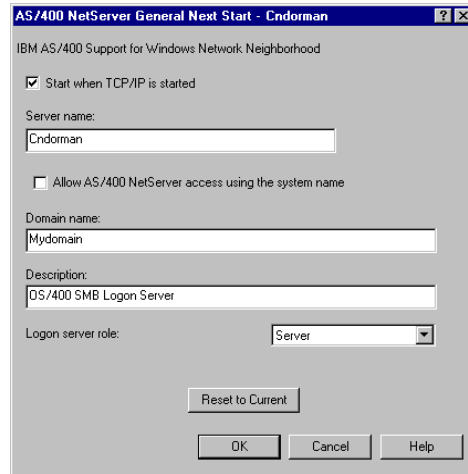
IBM  server. For the next generation of e-business.

- ▶ This basically says that you check this option if you are C/A Express only shop: either each client has Express installed or it is only using the *Client for Microsoft Networks* networking component to access the AS/400 NetServer (no C/A installed).

AS/400 NetServer Properties - Next Start

IBM  server iSeries

Be cautious when you choose to select the Allow AS/400 NetServer access using system name box. The iSeries system name is not enabled by default because this can cause conflicts if you still have Client Access Family members (other than Express) in your network. When Client Access and AS/400 NetServer use the same server name, both servers will attempt to answer a client request. The first one to satisfy the client's request takes control, producing inconsistent results for the client. If you have ONLY Express clients in your network and do not have resources mapped to AS/400 NetServer using a name that is not the same as the system name, then it is safe (and recommended) that AS/400 NetServer and the system name are the same.



IBM  server. For the next generation of e-business.

In V4R4 and later, AS/400 NetServer will automatically start and stop with TCP/IP. If you do not want AS/400 NetServer started with TCP/IP, uncheck the **Start when TCP/IP is started** box. This is the one setting on this panel that takes effect immediately. What this means is if you hit the *'Reset to Current'* button on the near the bottom, the old value will not be retrieved.

- **Server name:** Defaults to "Q" plus existing system name. Because new systems default the system name to the serial number, the server name will be 'Q' plus the serial number for most new systems.
- **Domain name:** Works best if this is the same domain (Workgroup) as PCs in the network that want to access AS/400 NetServer
- **Description:** Can be anything. Shows up on "Find Computer"

Reset to Current, resets all values on dialog to currently active values for AS/400 NetServer. Any changes take effect the next time AS/400 NetServer is started.

Don'ts:

- Don't check the 'Allow AS/400 NetServer access...' box if the server name you are providing already is the name of the AS/400.
- Don't use the AS/400 NetServer name or system name for the domain name

Trademarks and Disclaimers

© Copyright International Business Machines Corporation 2001

References in this document to IBM products or services do not imply that IBM intends to make them available in every country.

The following terms are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both:

IBM 

AS/400
AS/400e
e-business logo
IBM

IBM Logo
iSeries
OS/400
OS/2

OS/2 WARP

Lotus, Freelance, and Word Pro are trademarks of Lotus Development Corporation in the United States, other countries, or both.

Tivoli and NetView are trademarks of Tivoli Systems Inc. in the United States, other countries, or both.

C-bus is a trademark of Corollary, Inc. in the United States, other countries, or both.

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

PC Direct is a trademark of Ziff Communications Company in the United States, other countries, or both and is used by IBM Corporation under license.

ActionMedia, LANdesk, MMX, Pentium and ProShare are trademarks of Intel Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

SET and the SET Logo are trademarks owned by SET Secure Electronic Transaction LLC.

Other company, product and service names may be trademarks or service marks of others.

Information is provided "AS IS" without warranty of any kind.

All customer examples described are presented as illustrations of how those customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics may vary by customer.


Information in this presentation concerning non-IBM products was obtained from a supplier of these products, published announcement material, or other publicly available sources and does not constitute an endorsement of such products by IBM. Sources for non-IBM list prices and performance numbers are taken from publicly available information, including vendor announcements and vendor worldwide homepages. IBM has not tested these products and cannot confirm the accuracy of performance, capability, or any other claims related to non-IBM products. Questions on the capability of non-IBM products should be addressed to the supplier of those products.

All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only. Contact your local IBM office or IBM authorized reseller for the full text of the specific Statement of Direction.

Some information in this presentation addresses anticipated future capabilities. Such information is not intended as a definitive statement of a commitment to specific levels of performance, function or delivery schedules with respect to any future products. Such commitments are only made in IBM product announcements. The information is presented here to communicate IBM's current investment and development activities as a good faith effort to help with our customers' future planning.

Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput or performance that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput or performance improvements equivalent to the ratios stated here.

Photographs shown are of engineering prototypes. Changes may be incorporated in production models.

IBM  For the next generation of e-business.