IBM

System i

Networking
IBM i NetServer

Version 6 Release 1

IBM

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> **Note**
>
> Before using this information and the product it supports, read the information in "Notices," on page 45.

Contents

IBM i NetServer

IBM® i Support for Windows Network Neighborhood (IBM i NetServer) is an IBM i function that enables Windows 2000, Windows XP, Windows Server 2003, and Windows Vista clients to access IBM i shared directory paths and shared output queues.

Windows clients on a network use the file and print sharing functions that are included in their operating systems. You do not need to install any additional software on your PC client to use and benefit from IBM i NetServer. However, if you need to administer IBM i NetServer properties from your PC client, you must have IBM i Access for Windows, System i® Navigator, and Host Servers (Option 12) installed.

Note: By using the code examples, you agree to the terms of the Code license and disclaimer information.

PDF file for IBM i NetServer

You can view and print a PDF file of this information.

To view or download the PDF version of this document, select IBM i NetServer (about 743 KB).

Other information

You can also view or print the following PDF:

The AS/400 NetServer Advantage describes how to configure and administer IBM i NetServer shares and printers. It also describes considerations for moving file and print serving from an Integrated Netfinity Server using Warp Server/400 or Novell Netware to IBM i NetServer.

Saving PDF files

To save a PDF on your workstation for viewing or printing:
1. Right-click the PDF link in your browser.
2. Click the option that saves the PDF locally.
3. Navigate to the directory in which you want to save the PDF.
4. Click **Save**.

Downloading Adobe Reader

You need Adobe Reader installed on your system to view or print these PDFs. You can download a free copy from the Adobe Web site (www.adobe.com/products/acrobat/readstep.html) .

IBM i NetServer versus IBM i Access for Windows

You do not need to install IBM i Access for Windows or System i Navigator to use IBM i NetServer.

Although IBM i NetServer provides specific support for accessing integrated file system and printing resources, it does not provide the same range of tools and interfaces as IBM i Access for Windows does.

IBM i NetServer and IBM i Access for Windows differ in the following ways:

IBM i NetServer

- You do not need to install software on your PC client to use IBM i NetServer. The operating system of your PC client contains all of the software that is required to access IBM i NetServer. IBM i NetServer does not require that you install additional software unless you are administering IBM i NetServer functions from a PC client by using System i Navigator.
- You can share a directory with read-only access.
- You can hide a share from the network by ending the share name with a $.
- You can hide IBM i NetServer from Windows My Network Places.
- You can share individual directories. This lends to better security.

IBM i Access for Windows

- IBM i Access for Windows provides additional functions: 5250 emulation and data transfer.

Installing IBM i Access for Windows on Windows PCs

You can install IBM i Access for Windows on your Windows client by using IBM i NetServer.

Note: Administering IBM i NetServer from a PC client requires the use of System i Navigator, which is a component of IBM i Access for Windows.

IBM i NetServer shares the QIBM directory with clients to allow IBM i users who already have user profiles to install IBM i Access for Windows on their PC clients. However, IBM i NetServer does not automatically configure guest support, and users without user profiles are not able to access integrated file system directories and output queues using IBM i NetServer. Only the network administrator can remove the file share from the QIBM directory.

To allow guests to have access to shared resources, you must configure the IBM i NetServer Advanced - Next start properties with a user profile for guest or anonymous users.

Installing IBM i Access for Windows on Windows 2000

Here are the steps for installing IBM i Access for Windows on your Windows 2000 client by using IBM i NetServer.

To install IBM i Access for Windows on your Windows 2000 client, follow these steps:
1. Click the **Start** button to open the **Start menu**.
2. Select **Search**.
3. Select **For files or Folders**.
4. Click the **Computers** link.
5. In the **Computer Name** field, specify the IBM i NetServer server name.
6. Click **Search Now**.
7. Double-click the computer that was found in step 6.
8. Expand **QIBM** > **ProdData** > **Access** > **Windows** > **Install**.
9. Double-click **Setup.exe**. The IBM i Access for Windows Install wizard takes you through the process of installing IBM i Access for Windows on your PC.

   Note: Make sure that you install the **Network** option of System i Navigator.

Installing IBM i Access for Windows on Windows XP

Here are the steps for installing IBM i Access for Windows on your Windows XP client by using IBM i NetServer.

To install IBM i Access for Windows on your Windows XP client, follow these steps:
1. Click the **Start** button to open the **Start menu**.

2. Select **Search**.
3. Click **Computers or People**.
4. Click **A Computer in the Network**.
5. In the **Computer Name** field, specify the IBM i NetServer server name.
6. Click **Search**.
7. Double-click the computer that was found in step 6.
8. Expand **QIBM** > **ProdData** > **Access** > **Windows** > **Install** > **Image**.
9. Double-click **Setup.exe**. The IBM i Access for Windows Install wizard takes you through the process of installing IBM i Access for Windows on your PC.

   Note: Make sure that you install the **Network** option of System i Navigator.

Installing IBM i Access for Windows on Windows Server 2003

Here are the steps for installing IBM i Access for Windows on Windows Server 2003 client by using IBM i NetServer.

To install IBM i Access for Windows on your Windows Server 2003 client, follow these steps:
1. Click the **Start** button to open the **Start menu**.
2. Select **Search**.
3. Click **Other search options**.
4. Click **Printer, computers, or people**.
5. Click **A computer in the network**.
6. In the **Computer Name** field, specify the IBM i NetServer server name.
7. Click **Search**.
8. Double-click the computer that was found in step 7.
9. Expand **QIBM** > **ProdData** > **Access** > **Windows** > **Install** > **Image**.
10. Double-click **Setup.exe**. The IBM i Access for Windows Install wizard takes you through the process of installing IBM i Access for Windows on your PC.

   Note: Make sure that you install the **Network** option of System i Navigator.

Installing IBM i Access for Windows on Windows Vista

Here are the steps for installing IBM i Access for Windows on your Windows Vista client by using IBM i NetServer.

To install IBM i Access for Windows on your Windows Vista client, follow these steps:
1. Click the **Start** button to open the **Start menu**.
2. In the **Start Search** field, specify theIBM i NetServer server name.
3. Press Enter.
4. Double-click the computer that was found in step 3.
5. Expand **QIBM** > **ProdData** > **Access** > **Windows** > **Install**.
6. Double-click **Setup.exe**. The IBM i Access for Windows Install wizard takes you through the process of installing IBM i Access for Windows on your PC.

Note: Make sure that you install the **Network** option of System i Navigator.

Accessing IBM i NetServer with Linux and Samba client support

If you are using a Linux client, you can use Samba to access IBM i NetServer.

IBM i NetServer also supports the Linux Samba client. This support allows a Linux client running Samba to connect to IBM i NetServer through the smbclient and smbmount client utilities. ASCII printing (text, PDF, and postscript) is supported through the smbclient utility.

The Linux requirement is a kernel version of 2.4.4, or later and Samba 3.0.9, or later. Samba is an open source client and file server that is compatible with Microsoft Networking, which comes with many current distributions of Linux. For more information about Samba, Samba commands, or to download the latest version, see the Samba Web site (www.samba.org) .

For more information about using Linux Samba to access IBM i NetServer, see the IBM i NetServer Linux Client (Samba) Support Web site.

Getting started with IBM i NetServer

With IBM i NetServer, personal computers that run Windows or Linux software can seamlessly access data and printers that are managed by IBM i.

Requirements for using IBM i NetServer

To make IBM i NetServer function properly, some prerequisites need to be fulfilled.

Here are the requirements for using IBM i NetServer:
- A system with IBM i V4R2, or later, must be installed and configured for a TCP/IP network.
- A system name does not conflict with the system name that IBM i Access for Windows uses. See Server name guidelines for more information.
- You need a running network printing server to use IBM i NetServer print sharing capabilities. See "Configuring IBM i NetServer" for more information.
- The client for Microsoft Networks network component must be installed on your PC client. After this component and TCP/IP are installed and configured, you have access to the integrated file system directories and the output queues that are shared with the network.

  Note: If Linux clients are used, the appropriate Samba support must also be installed.
- An IBM i NetServer server name and Internet Protocol (IP) address resolution strategy must be used; for example, Domain Name System (DNS), Windows Internet Naming Service (WINS), or LMHOSTS file.
- Option 12 (Host Servers), a feature of the operating system, must be installed for IBM i NetServer functions to work correctly.

Configuring IBM i NetServer

To verify whether IBM i NetServer is properly configured, you can use a series of commands.

You must have *IOSYSCFG special authority to change any part of IBM i NetServer configuration. In addition, you must have *SECADM special authority to change the IBM i NetServer guest user profile. These changes will take effect the next time IBM i NetServer is started.

To configure IBM i NetServer, follow these steps:
1. Verify that TCP/IP support is configured on your system. You can use the Configure TCP/IP (`CFGTCP`) command to work with interfaces, routes, host table entries, and domain services. After the configuration is completed, use the Start TCP/IP (`STRTCP`) command to activate the support.

   Note: You must have at least one external TCP/IP interface configured and active to use IBM i NetServer.

2. Use the Work with Subsystems (WRKSBS) command to confirm that the QSERVER subsystem has started.
3. Verify that the IBM i NetServer system name is unique on the network. To change the IBM i NetServer default system and domain name, use the following command:

```
CALL QZLSCHSN PARM(server-name domain-name
'text description or comment' X'00000000')
```

   After you change the IBM i NetServer server name, you should add it to the Domain Name System (DNS) or to your PC client's LMHOST file.
4. To change IBM i NetServer guest support, use the following command:

```
CALL QZLSCHSG (guest-user-profile X'00000000')
```

   Users who require the file and print-sharing capabilities of IBM i NetServer but do not have a user profile need a guest user profile. IBM i NetServer does not automatically configure guest support. A user without a user profile will not be able to access IBM i NetServer.
5. To stop and start IBM i NetServer, use the following commands:

```
ENDTCPSVR *NETSVR
STRTCPSVR *NETSVR
```

   Note: All configuration changes made to IBM i NetServer, with the exception of share and session administration, do not take effect until you stop and restart the IBM i NetServer.
6. Use the Work with Active Job (WRKACTJOB) command to verify that there is a QZLSSERVER job running under the QSERVER subsystem. If the QZLSSERVER job is not active, you must restart IBM i NetServer.
7. Use the Work with TCP/IP Network Status (NETSTAT *CNN) command to verify that the following entries appear in the NETSTAT output file. If you cannot find these entries, you must restart IBM i NetServer.

```
** netbios>001:27:44 Listen
** netbios>000:00:01 *UDP
** netbios>000:00:00 *UDP
** netbios>000:30:57 Listen
** cifs>427:49:42 Listen
```

   Note: The NETSTAT command output might be many pages long.
8. Use the Work with Active Job (WRKACTJOB) command to ensure that there is a QNPSERVD job active in the QSYSWRK subsystem. If there is no QNPSERVD job, then you must use the Start Host Server (STRHOSTSVR *NETPRT) command to start the network print server. Starting the network print server ensures that IBM i NetServer print shares function properly.

Related tasks:
"Starting and stopping IBM i NetServer" on page 19
You can start IBM i NetServer if you want to immediately begin sharing data and printers with your PC clients. You can stop IBM i NetServer to end all sharing of resources. You can also stop and then restart IBM i NetServer if you want to change the IBM i NetServer configuration.

Configuring and connecting your PC client

Configuring your client properly ensures that all supported PC clients can locate IBM i NetServer and use file and print shares.

For information about setting up a Linux Samba client to use IBM i NetServer, see IBM i NetServer Linux Client (Samba) Support on the IBM i NetServer Web site.

Setting up a Windows PC client to find IBM i NetServer

IBM i NetServer supports Windows 2000, Windows XP, Windows Server 2003, and Windows Vista.

Setting up a Windows PC client to find IBM i NetServer allows you to easily access shared resources from your Windows PC client.

You must first ensure that clients can locate IBM i NetServer on the network. If this is not the case, network PC clients can use Domain Name System (DNS), Windows Internet Naming Service (WINS), or a `LMHOSTS` file to locate IBM i NetServer.

Note: If IBM i NetServer and your Windows client are in the same workgroup (domain) and in the same subnet (network segment), then no additional setup on the client is needed. If you find IBM i NetServer only by the IP address, then no additional setup is needed.

If IBM i NetServer is not placed in the same workgroup and the same subnet as the PC client, the PC client must use one of the following approaches to locate IBM i NetServer:
* Make an entry for IBM i NetServer in the network Domain Name System (DNS) database. Using DNS is the easiest way to locate and connect to IBM i NetServer.
* IBM i NetServer is configured to register with Windows Internet Naming Service (WINS).
* Create entries for IBM i NetServer in PC client static configuration files (such as `LMHOSTS`).

IBM i NetServer User Datagram Protocol broadcasts
A system that is placed in the same workgroup (domain) and the same subnet (network segment) as the PC client uses IBM i NetServer User Datagram Protocol (UDP) broadcasts.

In many TCP/IP networks, various routers in the network filter out UDP broadcast frames. A client on one side of a router cannot find IBM i NetServer because the UDP broadcast cannot cross the router.

When setting up smaller networks to filter UDP broadcasts, you should consider using other mechanisms for locating the system.

Note: If you place all of your IBM i NetServer and PC clients in the same workgroup and the same subnet, then IBM i NetServer appears in My Network Places of Windows 2000, Windows XP, Windows Server 2003, and Windows Vista without any additional configuration.

Related tasks:
"IBM i NetServer and Domain Name System management"
If you use Domain Name System (DNS) to locate and connect to IBM i NetServer, you need to connect and configure your PC client with DNS first.
"IBM i NetServer and Windows Internet Naming Service management" on page 8
If you are using Windows Internet Naming Service (WINS) to locate and connect to IBM i NetServer, connect and configure your PC client with WINS first.
"PC client LMHOSTS static configuration files" on page 11
In large distributed networks, LMHOSTS static configuration files are helpful for mapping system names to IP addresses.

IBM i NetServer and Domain Name System management
If you use Domain Name System (DNS) to locate and connect to IBM i NetServer, you need to connect and configure your PC client with DNS first.

Related concepts:
"IBM i NetServer User Datagram Protocol broadcasts"
A system that is placed in the same workgroup (domain) and the same subnet (network segment) as the PC client uses IBM i NetServer User Datagram Protocol (UDP) broadcasts.

Connecting your PC client with DNS:

TCP/IP networks can use Domain Name System (DNS) to map system names to IP addresses.

In a DNS network, an entry tells clients in the network how to map the system name to its correct TCP/IP address.

If you want PC clients to access IBM i NetServer by using DNS, then you must add the IBM i NetServer system name and IP address to the DNS database on IBM i. Using DNS is generally the easiest way for clients to access IBM i NetServer on a distributed network.

To add a new DNS database entry for IBM i NetServer on the network, you must specify the IBM i NetServer server name.

Configuring your PC client with DNS:

To avoid any potential conflicts in the client operating system, configure Domain Name System (DNS) entries for both the operating system and IBM i NetServer.

Configuring Domain Name System (DNS) entries for both the operating system and IBM i NetServer allows PC clients to address IBM i Access for Windows as SYSTEM1 while addressing IBM i NetServer as QSYSTEM1, even though both use the same IP address.

Configuring your PC client with DNS on Windows 2000:

To configure your PC client with DNS on Windows 2000, follow these steps.
 1. Open the Windows **Start Menu**.
 2. Select **Settings** and then select **Control Panel**.
 3. Double-click **Network and Dialup Connections**.
 4. Select the **Protocols** tab.
 5. Select **Local Area Connection**.
 6. Click **Properties**.
 7. Select **Internet Protocol (TCP/IP)** and click **Properties**.
 8. Click **Advanced**.
 9. Click the **DNS** tab.
 10. Specify the host name, domain, DNS service search order, and domain suffix search order for DNS.
 11. Click **OK**.

Configuring your PC client with DNS on Windows XP:

Here are the steps for configuring your PC client with DNS on Windows XP.

To configure your PC client with DNS on Windows XP, follow these steps:
 1. Click the **Start** button to open the **Start menu**.
 2. Select **Control Panel**.
 3. Click **Network and Internet Connections**.
 4. Click **Network Connections**.
 5. Select the appropriate connection and click **Change settings of this connection**.
 6. Select **Internet Protocol (TCP/IP)**.
 7. Click **Properties**.
 8. Click **Advanced**.

9. Select the **DNS** tab.
10. Specify the host name, domain, DNS service search order, and domain suffix search order for DNS.
11. Click **OK**.

Configuring your PC client with DNS on Windows Server 2003:

Here are the steps for configuring your PC client with Domain Name System (DNS) on Windows Server 2003.

To configure your PC client with DNS on Windows Server 2003, follow these steps:
1. Click the **Start** button to open the **Start menu**.
2. Select **Control Panel**.
3. Click **Network Connections**.
4. Select **Local Area Connection**.
5. Click **Properties**.
6. Select **Internet Protocol (TCP/IP)** and click **Properties**.
7. Click **Advanced**.
8. Select the **DNS** tab.
9. Specify the host name, domain, DNS service search order, and domain suffix search order for DNS.
10. Click **OK**.

Configuring your PC client with DNS on Windows Vista:

Here are the steps for configuring your PC client with DNS on Windows Vista.

To configure your PC client with DNS on Windows Vista, follow these steps:
1. Click the **Start** button to open the **Start menu**.
2. Select **Control Panel**.
3. Click **Network and Internet**.
4. Click **Network and Sharing Center**.
5. Click **View status**.
6. Click **Properties**.
7. Select **Internet Protocol Version 4 (TCP/IP 4)** or **Internet Protocol Version 6 (TCP/IP 6)**.
8. Click **Properties**.
9. Click **Advanced**.
10. Select the **DNS** tab.
11. Specify the host name, domain, DNS service search order, and domain suffix search order for DNS.
12. Click **OK**.

IBM i NetServer and Windows Internet Naming Service management
If you are using Windows Internet Naming Service (WINS) to locate and connect to IBM i NetServer, connect and configure your PC client with WINS first.

Related concepts:
"IBM i NetServer User Datagram Protocol broadcasts" on page 6
A system that is placed in the same workgroup (domain) and the same subnet (network segment) as the PC client uses IBM i NetServer User Datagram Protocol (UDP) broadcasts.

Connecting your PC client with WINS:

Windows Internet Naming Service (WINS) allows clients to map system names to their actual TCP/IP addresses.

Windows NT systems and Linux Samba servers can provide WINS, which allows clients to map system names to their actual TCP/IP addresses. WINS is a dynamic naming service that resolves NetBIOS computer names to IP addresses. Although IBM i cannot act as a WINS server, it can act as a WINS proxy. This enables non-WINS clients to obtain name resolution from WINS. A WINS proxy receives broadcasted name requests from non-WINS clients and resolves them by directing queries to a WINS server.

Note: Using WINS proxy is not a recommended method of resolving computer names to IP addresses.

You can specify an address for a network WINS server on the IBM i NetServer WINS configuration - Next start dialog box in System i Navigator. Then you can configure clients to connect to IBM i NetServer by using the WINS server.

After you configure your PC clients and IBM i NetServer with WINS addresses, you do not need to perform any additional network configuration. PC clients can now locate and connect to IBM i NetServer by using WINS.

Note: In a complex TCP/IP network, where the IBM i NetServer is configured as a logon server, a WINS solution for address resolution is better than DNS because logon clients in separate subnets need to be able to resolve special NetBIOS service names in addition to the configured IBM i NetServer name.

Configuring your PC client with WINS:

When using WINS, you must configure IBM i NetServer with the IP address of the WINS and you also need to configure the client to use the same WINS IP address.

Configuring your PC client with WINS on Windows 2000:

Here are the steps for configuring your PC client for use with WINS on Windows 2000.

To configure your client for use with WINS, follow these steps:
1. Open the Windows **Start Menu**.
2. Select **Settings** and then select **Control Panel**.
3. Double-click **Network and Dialup Connections**.
4. Select the **Protocols** tab.
5. Select **Local Area Connection**.
6. Click **Properties**
7. Select **Internet Protocol (TCP/IP)** and click **Properties**.
8. Click **Advanced**.
9. Click the **WINS** tab.
10. Specify the WINS server IP addresses in the correct search order.
11. Click **OK**.

Configuring your PC client with WINS on Windows XP:

Here are the steps for configuring your client for use with WINS on Windows XP.

To configure your client for use with WINS, follow these steps:
1. Click the **Start** button to open the **Start menu**.
2. Select **Control Panel**.
3. Click **Network and Internet Connections**.
4. Click **Network Connections**.
5. Select the appropriate connection and click **Change settings of this connection** task.
6. Click **Properties**.
7. Select **Internet Protocol (TCP/IP)** and click **Properties**.
8. Click **Advanced**.
9. Select the **WINS** tab.
10. Specify the WINS server IP addresses in the correct search order.
11. Click **OK**.

Configuring your PC client with WINS on Windows Server 2003:

Here are the steps for configuring your client for use with WINS on Windows Server 2003.

To configure your client for use with WINS, follow these steps:
1. Click the **Start** button to open the **Start menu**.
2. Select **Control Panel**.
3. Click **Network Connections**.
4. Select **Local Area Connection**.
5. Click **Properties**.
6. Select **Internet Protocol (TCP/IP)** and click **Properties**.
7. Click **Advanced**.
8. Click the **WINS** tab.
9. Specify the WINS server IP addresses in the correct search order.
10. Click **OK**.

Configuring your PC client with WINS on Windows Vista:

Here are the steps for configuring your PC client for use with WINS on Windows Vista.

To configure your client for use with WINS, follow these steps:
1. Click the **Start** button to open the **Start menu**.
2. Select **Control Panel**.
3. Click **Network and Internet**.
4. Click **Network and Sharing Center**.
5. Click **View status**.
6. Click **Properties**.
7. Select Internet **Protocol Version 4 (TCP/IP 4)** or **Internet Protocol Version 6 (TCP/IP 6)**
8. Click **Properties**.
9. Click **Advanced**.
10. Select the **WINS** tab.

11. Specify the WINS server IP addresses in the correct search order.
12. Click **OK**.

Configuring IBM i NetServer with the address of the network WINS server:

Using System i Navigator, you can configure IBM i NetServer with the address of the network Windows Internet Naming Service (WINS) server.

WINS allows PC clients to connect to and access IBM i NetServer shared resources.

To configure IBM i NetServer with the address of the network WINS server, follow these steps:
1. Open a connection to System i Navigator on your system.
2. Expand **Network** > **Servers**.
3. Click **TCP/IP**.
4. Right-click **IBM i NetServer** and select **Properties**.
5. Select the **WINS Configuration** tab.
6. Click **Next start**.
7. In the **Primary WINS server** field, enter the IP address of the network WINS server. IBM i NetServer uses this WINS server for client connections the next time you start IBM i NetServer.
8. In the **Secondary WINS server** field, enter the IP address of the secondary network WINS server. IBM i NetServer uses this secondary WINS server for client connections the next time you start IBM i NetServer.
9. In the **Scope ID** field, enter a text string to serve as the network scope for the WINS server. The WINS server uses this scope ID the next time you start IBM i NetServer.

   Note: You must configure any PC clients that use IBM i NetServer with the same scope ID that you specify here. WINS also functions properly if you leave this entry for scope ID blank on both IBM i NetServer and any clients.
10. Specify whether you want to enable or disable the IBM i NetServer to act as a WINS proxy.
11. Click **OK** to save your changes.

PC client LMHOSTS static configuration files
In large distributed networks, LMHOSTS static configuration files are helpful for mapping system names to IP addresses.

Connecting your PC client with LMHOSTS

The operating systems on the supported PC client can provide static configuration files that map system names to TCP/IP addresses. These files are typically more difficult to manage than a solution that involves more centralized control; for example, a DNS or WINS server. This difficulty results because your network administrator must configure each PC client individually. However, static configuration files are useful in large distributed networks. In this environment, clients and servers exist in different subnets (network segments) and possibly different workgroups (domains). Static configuration files help clients locate servers.

All PC clients supported by IBM i NetServer provide the LMHOSTS file that can map system names to IP addresses. The LMHOSTS file contains IP addresses and system names. You can use these files to map the IP address for both the system and IBM i NetServer. Mapping the IP address for both the system and IBM i NetServer allows clients to find the system and IBM i NetServer in a large distributed network environment.

You can also add an entry into the `LMHOSTS` file that points to an `LMHOSTS` file that is administered centrally on IBM i. By pointing all clients to the central file on the system, you need to maintain only one `LMHOSTS` file for the network.

You can find more information about `LMHOSTS` files in the sample `LMHOSTS` file that is provided with your Windows operating system. Additional information is available in your operating system documentation.

Configuring your PC client with LMHOSTS

If you are using the `LMHOSTS` file, then you must configure `LMHOSTS` with the system name and IP address for IBM i NetServer to ensure client connectivity. To add a preloaded entry to the `LMHOSTS` file, follow these steps:

1. Go to the `\WINNT\system32\drivers\etc` directory.
2. Add the following entry to the `LMHOSTS` file:

    ```
    TCP/IP-address iSeries-NetServer-server-name #PRE
    ```

    ```
    10.5.10.1 QNETSERVER #PRE
    ```

    For example, if the IBM i NetServer is a logon server, you can add the following entry to the `LMHOSTS` file:

    ```
    10.5.10.1 QNETSERVER #PRE #DOM:netdomain (netdomain is the domain name that
    the logon server services).
    ```

Related concepts:

"IBM i NetServer User Datagram Protocol broadcasts" on page 6
A system that is placed in the same workgroup (domain) and the same subnet (network segment) as the PC client uses IBM i NetServer User Datagram Protocol (UDP) broadcasts.

Finding IBM i NetServer on the network

You can use your PC client to find IBM i NetServer on the network. By doing so, you can access shared resources on the network and make sure that your connection method to IBM i NetServer is running.

Finding IBM i NetServer from the Windows client

You can use the Windows client to find IBM i NetServer. By doing so, you can access shared resources from your Windows client.

If IBM i NetServer and your client are in the same workgroup (domain) and in the same subnet (network segment), follow these steps to find IBM i NetServer:

For Windows 2000 and XP:
1. Open **My Network Places**.
2. Double-click **Computers Near Me**.
3. Select the IBM i NetServer name.

For Windows Server 2003:
1. Open **Windows Explorer**.
2. Expand **My Network Places** > **Entire Network** > **Microsoft Windows Network**.
3. Expand the domain or workgroup in which IBM i NetServer is located.
4. Select the IBM i NetServer name.

For Windows Vista:
1. Click the **Start** button to open the **Start** menu.
2. Select **Network**.

3. Select the IBM i NetServer server name.

If the PC client and IBM i NetServer are not in the same workgroup (domain), follow these steps to find IBM i NetServer:

For Windows 2000:
1. Open **My Network Places**.
2. Double-click **Entire Contents**.
3. Click **Show Entire Contents**.
4. Double-click **Microsoft Windows Network**.
5. Open the domain in which IBM i NetServer is located.
6. Select the IBM i NetServer name.

For Windows XP or Windows Server 2003:
1. Open **Windows Explorer**.
2. Expand **My Network Places** > **Entire Network** > **Microsoft Windows Network**.
3. Expand the domain or workgroup in which IBM i NetServer is located.
4. Select the IBM i NetServer name.

For Windows Vista:
1. Click the **Start** button to open the **Start** menu.
2. Specify the IBM i NetServer server name in the **Start Search** field.
3. Press Enter.

Finding IBM i NetServer from Windows Search

For Windows 2000:
1. Open the Windows **Start** menu.
2. Select **Search**.
3. Select **For files or Folders**.
4. Click the **Computers** link.
5. In the **Computer Name** field, specify the IBM i NetServer server name.
6. Click **Search Now**.

For Windows XP:
1. Open the Windows **Start** menu.
2. Select **Search**.
3. Click **Computers or People**.
4. Click **A Computer in the Network**.
5. Specify the IBM i NetServer server name in the appropriate field.
6. Click **Search**.

For Windows Server 2003:
1. Open the Windows **Start** menu.
2. Click **Search**.
3. Click **Other search options**.
4. Click **Printer, computers, or people**.
5. Click **A computer in the network**.

6. Specify the IBM i NetServer server name in the appropriate field.
7. Click **Search**.

Windows clients support the addressing of systems by using both fully qualified names and Internet Protocol (IP) addresses. The use of fully qualified names and IP addresses allows Windows clients to access data on IBM i NetServer in the absence of other naming mechanisms.

You can use any of the following valid forms when addressing an IBM i NetServer with a Windows client. For example, you can use any of these forms with the **Find Computer** dialog box.

- `qsystem1.mysite.com`
- `system1.mysite.com`
- `1.2.34.123`

These forms also work from a Windows command prompt, as in the following examples:

- `dir \\qsystem1.mysite.com\qca400\*.*`
- `del \\system1.mysite.com\jim.doc`
- `type \\1.2.34.567\scott.txt`

Related tasks:

"Accessing file shares from a Windows client" on page 27
You can use your Windows client to access the file shares by using IBM i NetServer.

"Troubleshooting IBM i NetServer location on the network" on page 42
You can use the troubleshooting techniques if you have trouble finding IBM i NetServer on the network.

Related information:

 iSeries NetServer Linux Client (Samba) Support

Administering IBM i NetServer

By administering IBM i NetServer, you can manage file and print shares and control other IBM i NetServer functions.

System i Navigator is a component of IBM i Access for Windows. It provides the administration interface for IBM i NetServer. By default, IBM i NetServer shares the IBM i Access for Windows installation directory on the network.

You can install IBM i Access for Windows by accessing the default IBM i NetServer file share `QIBM`.

After installing IBM i Access for Windows and System i Navigator, you are ready to administer IBM i NetServer.

Viewing and configuring IBM i NetServer properties

You can view and configure IBM i NetServer properties, such as general settings, security settings, and WINS configuration by using System i Navigator.

To display IBM i NetServer properties using System i Navigator, follow these steps:

1. Open System i Navigator and connect to the system you want to work with.
2. Expand **Network** > **Servers**.
3. Click **TCP/IP** to display a list of TCP/IP servers available.
4. Right-click **IBM i NetServer** and select **Properties**.

The System i Navigator online help provides detailed information about each of the IBM i NetServer dialog boxes.

Enabling IBM i NetServer support for Kerberos V5 authentication

Kerberos provides strong authentication for client and server applications by using secret-key cryptography. IBM i NetServer also supports Kerberos Version 5 (V5) for user authentication.

To enable IBM i NetServer support for Kerberos V5 authentication, you must first have the System i Navigator Security option, Network authentication service, and Enterprise Identity Mapping (EIM) configured.

You can enable IBM i NetServer support for Kerberos V5 authentication through IBM i NetServer properties. The configuration wizard helps you configure the necessary services required for use with Kerberos V5. You must also complete the additional configuration requirements for Kerberos V5 authentication enablement.

To enable IBM i support for Kerberos V5 authentication through IBM i NetServer properties, follow these steps:

1. In System i Navigator, expand **Network** > **Servers** > **TCP/IP**.
2. Right-click **IBM i NetServer** and select **Properties**.
3. On the **Security** tab, click the **Next Start** button.
4. On the Security Next Start dialog box, select one of the following authentication methods:
   - If you select **Passwords/Network authentication**, clients that do not support Kerberos or clients that do support Kerberos but are not currently participating in a Kerberos realm use encrypted passwords to authenticate.
   - If you select **Network authentication**, all clients must use Kerberos to authenticate with the server. Therefore, only clients that support Kerberos V5 can connect to IBM i NetServer after this support is enabled. The following Windows clients do not support Kerberos V5:
     – Windows 95
     – Windows 98
     – Windows NT
     – Windows Me
5. Click **OK**.

Note: If you fail to complete all of the configuration requirements, you will be unable to use IBM i NetServer after you restart the server.

Related information:

Network authentication service

Enterprise Identity Mapping (EIM)

Installing System i Navigator Security option

You need to install the System i Navigator Security option before enabling IBM i NetServer support for Kerberos V5 authentication.

To install the Security option, follow these steps:

1. Click **Start** > **Programs** > **IBM System i Access for Windows** > **Selective Setup**.
2. Follow the instructions in the window.
3. On the Component Selection dialog box, expand **System i Navigator**, and click to place a check mark next to Security.
4. Continue going through the rest of Selective Setup.

Starting IBM i NetServer Configuration wizard

To use Kerberos V5 with IBM i NetServer, additional configuration is required. The configuration wizard helps you through the additional configuration requirements for using Kerberos V5 with IBM i NetServer.

To start the IBM i NetServer Configuration wizard, follow these steps:

1. Open System i Navigator and connect to the system you want to work with.

2. Expand **Network** > **Servers**.

3. Click **TCP/IP** to display a list of TCP/IP servers available.

4. Right-click **IBM i NetServer** and select **Configuration**.

5. Follow the instructions to complete the IBM i NetServer Configuration wizard.

Additional configuration requirements for Kerberos V5 authentication enablement

To use Kerberos V5 authentication with IBM i NetServer, you need to configure Enterprise Identity Mapping (EIM) and Network authentication.

Complete all of the following steps before restarting the system:

1. If you currently have EIM and Network authentication service configured, skip this step and proceed to step 2.

   Note: The EIM configuration wizard gives you the option to configure Network authentication service, if it is not currently configured on your system. In this event, you must select to configure the Network authentication service, because it is a required service to use Kerberos V5 authentication with IBM i NetServer.

   To configure EIM and Network authentication service, complete the following steps:

   a. Open System i Navigator and connect to the system with which you want to work.

   b. Expand **Network**.

   c. Right-click **Enterprise Identity Mapping** and select **Configure**.

   d. Follow the instructions in the EIM configuration wizard.

   Note: If Network authentication service is not currently configured on the system, you will be prompted to configure this service during the EIM configuration wizard. You must ensure that you select to add the IBM i NetServer service principals when configuring Network authentication service.

2. If Network authentication service is already configured on your system, manually add the service principal names to the keytab.

   a. **For Windows 2000 clients:**

      HOST/<fully qualified name>@<REALM>
      HOST/<qname>@<REALM>
      HOST/<IP Address>@<REALM>

   b. **For Windows XP and Windows Server 2003 clients:**

      cifs/<fully qualified name>@<REALM>
      cifs/<qname>@<REALM>
      cifs/<IP Address>@<REALM>

   Keytab entries can be added using the Kerberos Key Tab (QKRBKEYTAB) API. On a command line, use the following command string: `CALL PGM(QKRBKEYTAB) PARM('ADD' 'HOST/`*qname*`')` where *qname* is the fully qualified name or the IP address.

3. Additional setup is also required on the Windows 2000 or Windows Server 2003 domain controller that the IBM i NetServer clients use as the Key Distribution Center (KDC).

   Complete the following steps to configure an IBM i NetServer service principal on the Windows KDC:

   a. Install the Support Tools from your Windows server CD.

      Note: Instructions for installing the Support Tools can be found in Microsoft KB article Q301423

      (support.microsoft.com/support/kb/articles/Q301/4/23.ASP) .

b. Create a new user in the Active Directory.

c. From a command prompt, use the ktpass.exe support tool to map a service principal to the newly created user. The password used for ktpass should match the password used to create the service principal on the system. Substituting your own parameters for the items in < >, use the appropriate command call as follows.

For Windows 2000 clients:

```
ktpass -princ HOST/<iSeriesNetServerName@REALM>
-mapuser <new user> -pass <password>
```

For Windows XP or Windows Server 2003 clients:

```
ktpass -princ cifs/<iSeriesNetServerName>@REALM> -mapuser <new user>
-pass <password>
```

Note: Only one principal can be mapped to a user. If both HOST/* and cifs/* principals are needed, each must be mapped to a separate Active Directory user.

d. Repeat steps 3b and 3c if you want to access IBM i NetServer using additional principal names.

e. Restart the system.

Related information:

Network authentication service

Enterprise Identity Mapping (EIM)

Changing the IBM i NetServer server name

The IBM i NetServer server name is the name that you use to install IBM i Access for Windows and to access your IBM i NetServer over the network and the Internet.

Under most circumstances, you do not need to change the server name that IBM i NetServer uses on the operating system. Even though you can connect to IBM i NetServer using any name you choose, you should not change the server name from its default. The name should be the same as your system name. However, if you must change the IBM i NetServer server name, review the naming guidelines beforehand. You can view the system name in the network attributes by using the Display Network Attributes (DSPNETA) CL command.

Note: You must have *IOSYSCFG authority to change the IBM i NetServer configuration. The change to the system name does not take effect until the next time IBM i NetServer is started.

To change the IBM i NetServer system name by using System i Navigator, follow these steps:

1. Open System i Navigator and connect to the system you want to work with.
2. Expand **Network** > **Servers**.
3. Click **TCP/IP** to retrieve a list of the TCP/IP servers available.
4. Right-click **IBM i NetServer** and select **Properties**.
5. On the General page, click **Next Start**. In the **Server name** field, specify the name that IBM i NetServer should use.

Server name guidelines

The default name configured for IBM i NetServer is typically not the same as the TCP/IP system name. This is done to avoid conflicts with older versions of Client Access (pre-V4R4) that look for the system name. However, you are encouraged to have the IBM i NetServer name configured to be the same as the system name when possible.

Therefore, if you are using IBM i NetServer for the first time or if you have changed the TCP/IP name of your system, you should also change the IBM i NetServer name to match the system name when the following conditions are true:

- No Windows clients in the network are currently using Client Access for Windows 95/NT (pre-V4R4).
- No users currently have network drives or printers mapped to IBM i NetServer shares.

If you have not completed the migration to IBM i Access for Windows for all Windows PCs on your network from a pre-V4R4 version of Client Access, you should keep the IBM i NetServer name different from the system name to avoid inconsistent results for the clients.

Note: If users in your network currently have network drives or printers mapped to IBM i NetServer shares, you should disconnect these mappings before changing the IBM i NetServer name. Otherwise, these mappings fail when automatically trying to reconnect using the older name. You should also update any DOS scripts on the clients that refer to the older IBM i NetServer name.

To avoid making all of these updates simultaneously, you can select the **Allow IBM i NetServer access using System i name on the IBM i NetServer** option in the General Next Start Properties dialog box before you change the IBM i NetServer name. The next time IBM i NetServer is stopped and restarted, both names will be recognized. The new system name can be used when you configure new Windows clients while the existing clients continue to use (map to) the previous name.

Disabled user profiles

IBM i NetServer uses user profiles and passwords to allow network administrators to control how users can access data. In addition, the QMAXSIGN system value specifies how many unauthorized sign-on attempts disable the user profile for IBM i NetServer use.

A user profile becomes disabled when the user tries to access IBM i NetServer a specified number of times with an incorrect password. A user profile cannot become completely disabled when connecting to a system with IBM i NetServer. If a user exceeds the maximum number of sign-on attempts, the user profile becomes disabled for IBM i NetServer use only. Other types of access, such as a system sign-on, are not prevented.

IBM i NetServer uses the last-changed date in user profiles to determine whether they have changed since becoming disabled. If the last-changed date is newer than the date of becoming disabled, the user profile becomes enabled again for use with IBM i NetServer.

Notes:

1. The QSYSOPR message queue displays the CPIB682 error message, which indicates when auser profile was disabled for use with IBM i NetServer.

2. Some clients will try a name and password several times without the user being aware of it. For example, if the user's desktop password does not match the user profile password, the client can try to access IBM i NetServer several times before displaying the Network Password window. When the correct password is supplied, the user profile might already be disabled for IBM i NetServer use on the system. If you encounter this situation, the maximum sign-on attempts allowed system value, QMAXSIGN, can be increased to accommodate multiple client authentication attempts. You can use the Work with System Values command `WRKSYSVAL SYSVAL (QMAXSIGN)` to change the maximum sign-on times.

Displaying disabled user profiles

You can use System i Navigator to display the detailed information about the disabled user profiles.

To display the disabled IBM i NetServer users, follow these steps:

1. From System i Navigator, expand *system* > **Network** > **Servers**.
2. Click **TCP/IP** to view a list of TCP/IP servers available.
3. Right-click **IBM i NetServer** and select **Open**.
4. Click **File** in the upper left corner.
5. On the pull-down menu, select **Disabled User IDs**.

Enabling a disabled user profile

You can re-enable a user profile that has become disabled by using System i Navigator or by changing the user profile. You can also enable a disabled user profile by stopping and restarting IBM i NetServer.

There are three ways that you can enable a user profile that has been disabled.

To use System i Navigator to enable a disabled IBM i NetServer user profile, follow these steps:

Note: You need *IOSYSCFG and *SECADM authorities to enable a disabled user profile through System i Navigator.

1. From System i Navigator, expand *system* > **Network** > **Server**.
2. Click **TCP/IP** to view the list of TCP/IP servers available.
3. Right-click **IBM i NetServer** and select **Open**.
4. Click **File** in upper left corner.
5. On the pull-down menu, select **Disabled User IDs**.
6. Click a disabled user ID and select **Enable User ID**.

You can also enable a disabled IBM i NetServer user by changing the user profile. To change the user profile, enter the following command:

CHGUSRPRF USRPRF(*USERNAME*)

where *USERNAME* is the name of the user profile you want to re-enable.

You can exit the Change User Profile display without making any changes to the properties for the user profile.

A third way to enable a disabled IBM i NetServer user is to stop and then restart IBM i NetServer.

Related reference:

"IBM i NetServer security: Guest versus nonguest" on page 37
Typically you can access IBM i NetServer by using a user profile. The guest profile will be used when the requested ID (as sent by Windows or Samba) is not found.

Starting and stopping IBM i NetServer

You can start IBM i NetServer if you want to immediately begin sharing data and printers with your PC clients. You can stop IBM i NetServer to end all sharing of resources. You can also stop and then restart IBM i NetServer if you want to change the IBM i NetServer configuration.

IBM i NetServer starts automatically when TCP/IP is started. If you need to restart IBM i NetServer, follow these steps:

1. Open a connection to System i Navigator on your system.
2. Expand **File System**.
3. Right-click **File Shares** and select **Open IBM i NetServer**.
4. Right-click **IBM i NetServer** and select **Start**.

If you do not have System i Navigator installed, use the following command to start IBM i NetServer:

STRTCPSVR *NETSVR

To stop IBM i NetServer, follow these steps:

1. Open System i Navigator and connect to the system you want to work with.
2. Expand **Network** > **Servers**.
3. Click **TCP/IP** to retrieve a list of TCP/IP servers available.

4. Right-click **IBM i NetServer** and select **Stop**.

If you do not have System i Navigator installed, use the following command to stop IBM i NetServer:

`ENDTCPSVR *NETSVR`

Related tasks:

"Configuring IBM i NetServer" on page 4
To verify whether IBM i NetServer is properly configured, you can use a series of commands.

Administering subsystems for IBM i NetServer

You can administer the subsystems in which user jobs are run. For example, you can create separate subsystems for users or groups of IBM i NetServer users, add prestart jobs to subsystem descriptions, and specify the subsystems.

The QSERVER subsystem is still included with the same default prestart job entries. If a client attempts to use a subsystem that does not have prestart job entries defined, the system then runs in the QSERVER subsystem using batch-immediate jobs. If this occurs, the jobs maintain the same name, but might have a job type of BCI (batch-immediate) instead of PJ (pre-start) when viewed on the Work With Active Jobs (WRKACTJOB) display.

System performance

The End TCP/IP Server (ENDTCPSVR) command and the End Server (QZLSENDS) API also take a longer time to complete when ending IBM i NetServer. These commands take more time to process because all of the jobs associated with the server must be ended when the daemon job is ended.

The connection time might also be slightly longer when batch-immediate jobs are used.

Adding prestart jobs to a subsystem description

When you configure clients to run jobs in a subsystem other than QSERVER, you must also add the necessary prestart jobs to the subsystem description. For example, to add prestart jobs for QZLSFILE to another subsystem, use the following command string (inserting your own subsystem name): ADDPJE SBSD(*subsystemname*) PGM(QSYS/QZLSFILE) USER(QUSER) STRJOBS(*YES) INLJOBS(1) THRESHOLD(1) ADLJOBS(5) JOB(*PGM) JOBD(QSYS/QZLSPJ) MAXUSE(200) WAIT(*YES) POOLID(1) CLS(QSYS/QPWFSERVER *CALC *NONE *CALC). Adding prestart jobs for QZLSFILET is similar to adding prestart jobs for QZLSFILE. Substitute QZLSFILE with QZLSFILET in the previous command string and change the following parameters: ADLJOBS(0), JOBD(QSYS/QZLSPJ), and MAXUSE(1).

This command starts one prestart job in the subsystem that you configured. This job is used when a new connection is established to IBM i NetServer. For QZLSFILE, when the number of prestart jobs drops below one, five more prestart jobs are started to be used by future connections. For QZLSFILET, only one job runs in a subsystem.

Specifying subsystems

To specify the subsystems that IBM i NetServer server jobs run in, follow these steps:

1. From System i Navigator, expand **Network** > **Servers**.
2. Click **TCP/IP**.
3. Right-click **IBM i NetServer** and select **Properties**.
4. Click the **Subsystems** tab.
5. Specify the subsystem settings that you want to use. Use the **Help** button to find information about individual fields.
6. Click **OK** when you are finished.

Related concepts:

"Troubleshooting user profile connections" on page 38
When you try to access a file share, errors might occur because of user profile problems.

Setting the guest user profile for IBM i NetServer

A guest user profile provides a base level of access for clients who do not have a valid user profile. According to the needs, you can grant different levels of authority to different guests by setting the guest user profile.

You can set the user profile that IBM i NetServer uses for guest users using System i Navigator. You can also specify what level of authority guests will have to IBM i shared resources using IBM i NetServer. You need input/output system configuration (*IOSYSCFG) and security administrator (*SECADM) special authority to change the guest user profile information. The change to the guest user profile does not take place until the next time IBM i NetServer is started.

To set the guest user profile for IBM i NetServer, follow these steps:
1. Open System i Navigator and connect to the system you want to work with.
2. Expand **Network** > **Servers**.
3. Click **TCP/IP** to retrieve a list of TCP/IP servers available.
4. Right-click **IBM i NetServer** and select **Properties**.
5. Go to the Advanced dialog box and click **Next Start**.
6. In the **Guest User Profile** field, type the user profile that you want guests to have when they use IBM i NetServer.

   Notes:

   a. If you leave this field blank, then unknown users do not have access to resources through IBM i NetServer.
   b. The guest user profile that you specify cannot have any special authorities. Guests should have little or no authority on IBM i.

Related concepts:

"Guest user profiles" on page 30
IBM i NetServer supports guest user profiles, also known as an *anonymous user profile*.

Viewing IBM i NetServer status

The IBM i NetServer Status dialog box contains important statistical information that can help you to effectively administer IBM i NetServer.

You can refresh the current statistics for the system, reset all values to 0, or set the time interval between refresh requests from the IBM i NetServer Status dialog box.

When you set the time, in minutes, between refresh requests to the host for IBM i NetServer status, the timed refresh values are saved so that you do not have to refresh each time the IBM i NetServer Status dialog box is opened. Timed refresh values are saved for each system, not for each user.

To display IBM i NetServer status, follow these steps:
1. Open System i Navigator and connect to the system you want to work with.
2. Expand **Network** > **Servers**.
3. Click **TCP/IP** to display a list of TCP/IP servers available.
4. Right-click **IBM i NetServer** and select **Status**.

The System i Navigator online help provides more details about each field on the IBM i NetServer Status dialog box.

Viewing a list of IBM i NetServer shared objects

You can view a list of the objects that IBM i NetServer is currently sharing by using System i Navigator or Windows clients.

You can use IBM i NetServer to access shared resources on a System i network. These shares consist of the following items, called **shared objects**:

- **File shares**, which share integrated file system directories
- **Print shares**, which share output queues

Viewing a list of IBM i NetServer shared objects using System i Navigator

Using System i Navigator, you can view a list of objects that IBM i is currently sharing with PC clients by using IBM i NetServer.

To view a list of currently shared objects from System i Navigator, follow these steps:

1. From System i Navigator, expand **Network** > **Servers**.
2. Click **TCP/IP** to view a list of TCP/IP servers available.
3. Right-click **IBM i NetServer** and select **Open**.
4. Expand **Shared Objects** to display a list of currently shared objects.

Viewing a list of IBM i NetServer shared objects using Windows clients

Using Windows clients, you can view a list of objects that IBM i is currently sharing with PC clients by using IBM i NetServer.

For Windows 2000:
1. Open the Windows **Start** menu.
2. Select **Search**.
3. Select **For files or Folders**.
4. Click the **Computers** link.
5. In the **Computer Name** field, specify the IBM i NetServer server name.
6. Click **Search Now**.
7. Open IBM i NetServer by double-clicking the found computer.

For Windows XP:
1. Open the Windows **Start** menu.
2. Select **Search**.
3. Click **Computers or People**.
4. Click **A Computer in the Network**.
5. In the **Computer Name** field, specify the IBM i NetServer server name.
6. Click **Search**.
7. Open IBM i NetServer by double-clicking the found computer.

For Windows Server 2003:
1. Open the Windows **Start** menu.
2. Select **Search**.
3. Click **Other search objects**.
4. Click **Printer, computers, or people**.

5. Click **A computer in the network**.
6. In the **Computer Name** field, specify the IBM i NetServer server name.
7. Click **Search**.
8. Open IBM i NetServer by double-clicking the found computer.

For Windows Vista:
1. Open the Windows **Start** menu.
2. In the **Start Search** field, specify the IBM i NetServer server name.
3. Press Enter.
4. Open IBM i NetServer by double-clicking the found computer.

Note: You must enroll all users who are working with shared objects from the QDLS file system into the system distribution directory. Users who are not enrolled in the system distribution directory are not able to access file shares from the QDLS file system. Use the Add Directory Entry (ADDDIRE) CL command to enroll users in the system distribution directory.

Viewing and configuring IBM i NetServer shared object properties

You can access the server attributes for IBM i NetServer shared objects through System i Navigator, which allows you to display and change the properties of a file or print share.

To view the properties for an IBM i NetServer shared object, follow these steps:
1. Open System i Navigator and connect to the system you want to work with.
2. Expand **Network** > **Servers**.
3. Click **TCP/IP** to retrieve a list of the TCP/IP servers available.
4. Right-click **IBM i NetServer** and select **Open**.
5. Expand **Shared Objects**.
6. Right-click a shared object and select **Properties**.

Viewing shared object status

By viewing the current statistics for a shared object connection to IBM i NetServer through System i Navigator, you can acquire information such as workstation name, user name, share type, and time connected.

You cannot change or reconfigure shared object statistics because they are records that contain information only.

To display IBM i NetServer shared object status, follow these steps:
1. Open System i Navigator and connect to the system you want to work with.
2. Expand **Network** > **Servers**.
3. Click **TCP/IP** to display a list of TCP/IP servers available.
4. Right-click **IBM i NetServer** and select **Open**.
5. Expand **Shared Objects**.
6. Select a shared object.
7. Right-click the session connection and select **Status**.

The System i Navigator online help provides more details about IBM i NetServer shared object status.

Viewing a list of IBM i NetServer sessions

IBM i NetServer starts a session whenever a client successfully accesses a shared file or print resource. The session displays the PC client, user name, and session ID. You can view a list of active IBM i NetServer sessions.

To view a list of active IBM i NetServer sessions, follow these steps:

1. Open System i Navigator and connect to the system with which you want to work.
2. Expand **Network** > **Servers**.
3. Click **TCP/IP** to retrieve a list of the TCP/IP servers available.
4. Right-click **IBM i NetServer** and select **Open**.
5. Expand **Sessions** to retrieve a list of active sessions.

Viewing IBM i NetServer session properties

By viewing the attributes for an active IBM i NetServer session through System i Navigator, you can see the properties of the clients that use IBM i shared resources.

You cannot change or reconfigure these properties because they are records of client activity that contain information only.

To display the properties for an IBM i NetServer session, follow these steps:

1. Open System i Navigator and connect to the system you want to work with.
2. Expand **Network** > **Servers**.
3. Click **TCP/IP** to retrieve a list of the TCP/IP servers available.
4. Right-click **IBM i NetServer** and select **Open**.
5. Expand **Sessions**.
6. Right-click a user session and select **Properties**.

IBM i NetServer supports multiple users, including guests, logged on from the same workstation. Information for each session displays the actual user name even if the guest account was used for authentication. As a result, you can see duplicate sessions with the same workstation and user name. Information will be displayed for the following fields:

- Number of connections
- Number of files open
- Number of sessions

Notes:

1. If multiple sessions have been established, they can end when the IBM i NetServer idle time-out value has expired. This occurs regardless of whether there are open files for that session.
2. Multiple users can be active from the same workstation. Ending a user session ends only the IBM i NetServer file and print activity for that session. However, when the client workstation detects the loss of connectivity for one of the sessions, the client workstation can decide to end them all and optionally establish new sessions.

The System i Navigator online help provides detailed information about each of the IBM i NetServer session properties dialog boxes.

Viewing IBM i NetServer session connection status

You can view the current statistics for a workstation session connection to IBM i NetServer through System i Navigator.

You cannot change or reconfigure the session connection statistics because they are records of client activity that contain information only.

To display IBM i NetServer session connection status, follow these steps:
1. Open System i Navigator and connect to the system you want to work with.
2. Expand **Network** > **Servers**.
3. Click **TCP/IP** to display a list a TCP/IP servers available.
4. Right-click **IBM i NetServer** and select **Open**.
5. Expand **Sessions**.
6. Select a session.
7. Right-click the session connection and select **Status**.

Note: IBM i NetServer now supports multiple users, including guests, logged on from the same workstation.

The System i Navigator online help provides more details about IBM i NetServer session connection status.

Stopping an IBM i NetServer session

IBM i NetServer supports multiple users, including guests, logged on from the same workstation. You can end single or multiple user sessions on a workstation to stop a client's use of file and print shares on a specific session.

If multiple users are active from the same workstation, ending a user session ends only the IBM i NetServer file and print activity for that session. In addition, ending an active IBM i NetServer session stops the client's use of file or print shares on that session. To stop an active session, follow these steps:
1. Open System i Navigator and connect to the system you want to work with.
2. Expand **Network** > **Servers**.
3. Click **TCP/IP** to retrieve a list of TCP/IP servers available.
4. Right-click **IBM i NetServer** and select **Open**.
5. Expand **Sessions**.
6. Right-click the user sessions and select **Stop**. If more than one session is active on this same workstation, you are given the option of ending multiple user sessions on the workstation.

Note: Stopping the session of a client does not stop the client from reconnecting to the system and using IBM i NetServer again.

File shares

An IBM i NetServer file share is a directory path that IBM i NetServer shares with clients on the network.

A file share can consist of any integrated file system directory. You can create, display, configure, and end IBM i NetServer file shares.

In general, all integrated file system limitations and considerations apply when you access shared directories with IBM i NetServer.

Staring from V6R1, IBM i NetServer supports IPv6 access in the file sharing function.

Related concepts:

"Case sensitivity of file systems for IBM i NetServer" on page 27
All file systems, except for three, are case insensitive and do not cause case sensitivity conflicts with supported PC clients.

Creating IBM i NetServer file shares

You can share any directory in the integrated file system with clients in the network by using IBM i NetServer. Creating a file share allows PC clients to easily access resources on the system.

Unlike IBM i Access for Windows, IBM i NetServer does not share the entire integrated file system with the network by default.

To create a new file share by using System i Navigator, follow these steps:
1. Open System i Navigator and connect to the system you want to work with.
2. Expand **Network** > **Servers**.
3. Click **TCP/IP** to retrieve a list of TCP/IP servers available.
4. Right-click **IBM i NetServer** and select **Open**.
5. Right-click **Shared Objects** and select **New** and then **File**.
6. Use the General Properties page to configure the new file share with a name, description, access, maximum number of users, and directory path name.
7. Use the Text Conversion page to identify which file types must have their contents converted from the file coded character set ID (CCSID) to the CCSID you specify for the share.

The System i Navigator online help provides more details about IBM i NetServer file share properties.

Controlling access to IBM i NetServer file shares

You can assign an access setting for IBM i NetServer file shares to control the PC clients' level of access to objects in the directory paths of the integrated file system.

If you set the access of a file share to **Read only**, then clients do not have the authority to change a file. If you set the access of a file share to **Read/Write**, then client users can change any files they have authority to in the shared directory paths.

To set the access for an IBM i NetServer file share, follow these steps:
1. Open a connection to System i Navigator on your system.
2. Expand **Network** > **Servers**.
3. Click **TCP/IP** to retrieve a list of the TCP/IP servers available.
4. Right-click **IBM i NetServer** and select **Open**.
5. Expand **Shared Objects**.
6. Right-click a file share and select **Properties**.
7. Click the pull-down menu in the **Access** field.
8. Set the file share access to read only by selecting **Read only**. Set the file share access to read/write by selecting **Read/Write**.

Stopping IBM i NetServer file sharing

You can stop file sharing with other clients.

To stop the sharing of an integrated file system directory, follow these steps:
1. Open a connection to System i Navigator on your system.
2. Expand **Network** > **Servers**.
3. Click **TCP/IP** to retrieve a list of the TCP/IP servers available.
4. Right-click **IBM i NetServer** and select **Open**.
5. Expand **Shared Objects**.
6. Right-click a shared file and select **Stop Sharing**.

Note: A file share that is stopped is still available to all clients that are already using the share. A stopped file share is not available for any new client requests. Any attempts to create a new connection to the stopped share will fail.

Accessing file shares from a Windows client

You can use your Windows client to access the file shares by using IBM i NetServer.

To access file shares by using a Windows client, you can either map file shares to logical drives or use Universal Naming Convention (UNC) mapping. However, working with logical drive letters might be easier.

To map an IBM i NetServer file share to a logical drive on your Windows client, follow these steps:
1. Right-click the **Start** button and choose **Explore** to open the Windows Explorer.
2. Open the **Tools** pull-down menu on the Windows Explorer and select **Map network drive**.
3. Select the letter of a free drive for the file share.
4. Enter the name of an IBM i NetServer file share. For example, you can enter the following syntax:
   `\\QSYSTEM1\Sharename`

   Note: `QSYSTEM1` is the IBM i NetServer server name on IBM i, and `Sharename` is the name of the file share you want to use.
5. Click **OK**.

Related tasks:

You can use your PC client to find IBM i NetServer on the network. By doing so, you can access shared resources on the network and make sure that your connection method to IBM i NetServer is running.

Case sensitivity of file systems for IBM i NetServer

All file systems, except for three, are case insensitive and do not cause case sensitivity conflicts with supported PC clients.

The following three file systems, however, are case sensitive:
- QOpenSys
- User-Defined File System (UDFS), if specified case-sensitive when created
- Network File System (NFS), depending on which remote file system you access

The case of file names is significant in case-sensitive file systems. The names can consist of both uppercase and lowercase characters. For example, the QOpenSys file system can have three files in it with the following names:
```
NETSERVE.DAT
NetServe.DAT
netserve.DAT
```

These three files have technically different names (because QOpenSys is case-sensitive) and represent three distinct, separate objects on the system.

All the PC clients that IBM i NetServer supports are case insensitive. The case of file names is insignificant because all file names are translated automatically into uppercase. For example, from the three example files that are listed above, all the PC clients IBM i NetServer supports would recognize only the following file:
```
NETSERVE.DAT
```

Therefore, IBM i NetServer might not work correctly when using files in case sensitive file systems. This is particularly true when working with case sensitive file systems while you are using a graphical user interface such as the Windows 95 Explorer.

All other file systems are case insensitive and do not cause case-sensitivity conflicts with supported PC clients.

Print shares

A *print share* is an output queue that is shared with PC clients on the network. You can share any output queue with the clients by using IBM i NetServer.

You can create, display, configure, and end print shares. A print share consists of any output queue and supports the following spooled file types:
- User ASCII
- Advanced Function Printing
- SNA Character String
- Auto-select

The spooled file type determines how the spooled files are created on your system. If autoselect is not used, the spooled file type must correspond exactly to the output queue destination, or you will receive a print error.

Starting from V6R1, IBM i NetServer supports IPv6 access in the print sharing function.

Creating a print share

You can share any output queue with PC clients in the network by creating an IBM i NetServer print share.

To create a new IBM i NetServer print share by using System i Navigator, follow these steps:
1. Open System i Navigator and connect to the system you want to work with.
2. Expand **Network** > **Servers**.
3. Click TCP/IP to retrieve a list of the TCP/IP servers available.
4. Right-click **IBM i NetServer** and select **Open**.
5. Right-click **Shared Objects** and select **New** and then select **Printer**.
6. In the **General - Properties** dialog box, configure the new print share with a name, description, output queue, library, printer driver, spooled file type, and printer file.

The System i Navigator online help provides detailed information about the IBM i NetServer print share dialog box.

PC client print device drivers for use with print shares

IBM i NetServer acts as a print server that makes the services of the IBM i network print server available to PC clients. The network print server provides client access to print objects and resources.

Network Print Server allows clients with the correct print device drivers to spool print jobs onto output queues of various spooled file types. These spooled file types are as follows:
- User ASCII
- Advanced Function Printing (AFP)
- SNA Character String (SCS)
- Auto-select

You can access AFP and SCS print device drivers for the supported Windows PC clients in either of the following ways:

- AFP print device drivers are available for free download from the IBM Printing systems Web site (www.printers.ibm.com) .

- You can also find stand-alone AFP and SCS print device drivers in the `Qca400\Win32\Install\Printer` folder. Under the appropriate directory for your client type, you can find the AFP and SCS print device drivers.

Stopping print sharing

You can stop print sharing by using System i Navigator.

To stop print sharing from System i Navigator, follow these steps:
1. Open System i Navigator and connect to the system you want to work with.
2. Expand **Network** > **Servers**.
3. Click **TCP/IP** to retrieve a list of the TCP/IP servers available.
4. Right-click **IBM i NetServer** and select **Open**.
5. Expand **Shared Objects**.
6. Right-click a shared printer and select **Stop Sharing**.

Using print shares with Windows 2000, Windows XP, Windows Server 2003, and Windows Vista client

You can use your Windows client to access IBM i print shares by using IBM i NetServer.

To use your Windows client to access print shares, follow these steps:

For Windows 2000 or Windows XP:
1. Open **My Network Places**.
2. Double-click **Computers Near Me**.
3. Select the IBM i NetServer server name.
4. Open IBM i NetServer by double-clicking the found computer.
5. Right-click a shared printer and select **Open**.
6. If prompted, select **Yes** to set up the printer on your computer.
7. If prompted, select the appropriate print device driver for the shared printer.
8. Click **Next**.
9. When you have properly set up the shared printer, click **Finish**.

For Windows Server 2003:
1. Open **Windows Explorer**.
2. Expand **My Network Places** > **Entire Network** > **Microsoft Windows Network**.
3. Expand the domain node.
4. Select the IBM i NetServer server name.
5. Open IBM i NetServer by double-clicking the found computer.
6. Right-click a shared printer and select **Open**.
7. In the prompted window, click **Yes** to set up the printer on your computer.
8. In the prompted window, select the appropriate print device driver for the shared printer.
9. Click **Next**.
10. When you have properly set up the shared printer, click **Finish**.

For Windows Vista:

1. Click the **Start** button to open the **Start menu**.
2. Select **Network**.
3. Select the IBM i NetServer server name.
4. Open IBM i NetServer by double-clicking the found computer.
5. Right-click a shared printer and select **Open**.
6. In the prompted window, click **Yes** to set up the printer on your computer.
7. In the prompted window, select the appropriate print device driver for the shared printer.
8. Click **Next**.
9. When you have properly set up the shared printer, click **Finish**.

IBM i NetServer security

By using IBM i NetServer securely, you can ensure that only authorized users can access IBM i NetServer resources, configuration, or shared data.

User profile authority requirements

You can secure IBM i NetServer by controlling user profile authorities.

IBM i NetServer authenticates client files and print requests that are based on the user identity (user ID) and password that are used in the Windows desktop logon. If a user profile matches the Windows desktop client user ID, then the passwords are checked. If the passwords do not match, IBM i NetServer prompts the client to enter the correct one.

Note: If the Windows user ID is longer than 10 characters (also the maximum length of the user profile name), then IBM i NetServer truncates the Windows user ID to 10 characters and attempts to match it with a user profile. For example, a user profile called ADMINISTRA can be created to match the Windows Administrator user without requiring guest support.

In order to access IBM i NetServer shared resources, clients might not need a user profile that matches their Windows desktop user. IBM i NetServer can provide guest support for those clients that need only basic file and print services. This support is not automatically enabled.

To configure this support, follow these steps:

1. Right-click the IBM i NetServer icon and select **Properties**.
2. Select the **Advanced** tab.
3. Click the **Next Start** button.
4. Specify the guest user profile name in the appropriate field.

Note: You need *IOSYSCFG and *SECADM special authorities to change the IBM i NetServer guest configuration. Changes take effect the next time IBM i NetServer is started. In addition, the guest user profile should not have any special authorities and should have access only to those integrated file system directories and output queues that are used for basic file and print services.

Guest user profiles

IBM i NetServer supports guest user profiles, also known as an *anonymous user profile*.

IBM i can automatically map an unknown user to the guest user profile if you specify a guest user profile. Your network administrator can specify and change the guest user profile that IBM i NetServer uses if necessary on the IBM i NetServer Advanced - Next start page within System i Navigator. In general, the guest user profile should have few authorities because the guest user is considered an untrusted user.

Related tasks:
"Setting the guest user profile for IBM i NetServer" on page 21
A guest user profile provides a base level of access for clients who do not have a valid user profile.
According to the needs, you can grant different levels of authority to different guests by setting the guest
user profile.

Hiding IBM i NetServer from the network

For an added measure of security, you can hide IBM i NetServer from the Windows My Network Places.

To hide IBM i NetServer from the network, follow these steps:

1. Open System i Navigator and connect to the system you want to work with.
2. Expand **Network** > **Servers**.
3. Click **TCP/IP** to display a list of TCP/IP servers available.
4. Right-click **IBM i NetServer** and select **Properties**.
5. Click the **Advanced** tab and click the **Next Start** button.
6. Select **None** in the **Browsing announcement interval** field.

Note: Setting the browsing announcement interval to None stops the host announcements to the
network. It also stops domain announcements if IBM i NetServer is configured as a logon server
and might cause problems for logon services for some networks. In general, the default browsing
announcement interval should be kept if IBM i NetServer is a logon server. The default browsing
announcement interval is 720 seconds, or 12 minutes.

Related reference:
"IBM i NetServer does not appear in Windows My Network Places" on page 35
IBM i NetServer might not appear in Windows My Network Places for a variety of reasons.

Requiring clients to sign requests

Communications between client and server can be made more secure by requiring clients to sign
requests.

This is done using a key derived from the client's authentication data. By default, clients are not required
to sign requests.

To require clients to sign requests, follow these steps:

1. Open System i Navigator and connect to the system you want to work with.
2. Expand **Network** > **Servers**.
3. Click **TCP/IP** to display a list of TCP/IP servers available.
4. Right-click **IBM i NetServer** and select **Properties**.
5. Click the **Security** tab and click the **Next Start** button.
6. From the **Require clients to sign requests** drop down box, choose **Yes**, **Optional**, or **No**.

Using Windows messenger service with IBM i NetServer

IBM i NetServer can automatically send informational messages to users in some situations.

Under the following situations, IBM i NetServer automatically sends informational messages:
- The user password is about to expire.
- The user is denied access for a variety of reasons when trying to connect to a share through IBM i
  NetServer.
- Active users need to be alerted that the administrator is about to stop IBM i NetServer.

Related concepts:

"Troubleshooting IBM i NetServer using Windows messenger service" on page 42
You can use Windows messenger service to troubleshoot problems with IBM i NetServer.

Configuring the clients

For client workstations to receive informational messages, the messenger service must be active.

You must configure your PC clients to activate this service.

Configuring clients on Windows 2000 and Windows XP

You can configure clients on Windows 2000 and Windows XP operating systems to receive informational messages.

To configure the clients on the Windows 2000 and Windows XP operating system, follow these steps:

1. Click **Start** > **Settings** > **Control Panel**.
2. Open **Services** from **Administrative Tools**.
3. Scroll down to find Messenger.
4. Ensure that the status is **Started** and the **Startup** type is **Automatic**.

Configuring clients on Windows Server 2003

You can configure clients on Windows Server 2003 to receive informational messages.

To configure the clients on the Windows 2000 and Windows XP operating system, follow these steps:

1. Click **Start** > **Control Panel**.
2. Open **Services** from **Administrative Tools**.
3. Scroll down to find Messenger.
4. Ensure that the status is **Started** and the **Startup** type is **Automatic**. To start WinPopup.exe, follow these steps:
   a. Click **Start** > **Run**.
   b. Type `winpopup.exe` in the Open field.
   c. Click **OK**.

Configuring clients on Linux

You can configure the clients on the Linux operating system to receive informational messages.

To configure the clients on Linux, follow these steps:

Note: By using the code examples, you agree to the terms of the "Code license and disclaimer information" on page 43.

1. Enable Samba's messenger support. Edit the smb.conf file so that it contains a message command directive. Here is an example line:

```
message command = /bin/bash -c 'echo -e  WinPopup Message from %f on
$(date): \n >> /tmp/msg.txt; cat %s >> /tmp/msg.txt; echo -e
\n\n >> /tmp/msg.txt; rm %s'
```

2. Restart the Samba server. For example, (on Red Hat): /etc/rc.d/init.d/samba restart.
3. Create a shell script that can read the /tmp/msg.txt file and place the messages into a window in the background. Here is an example bash script:

```
#!/bin/bash

# Run this script in the background to display a message window where
# WinPopup messages are displayed in sequence. Samba must be started
# and smb.conf must be configured to append messages to /tmp/msg.txt
```

```
# remove old messages
rm /tmp/msg.txt
touch /tmp/msg.txt
chmod 666 /tmp/msg.txt

rxvt -fb -sb -fn lucidasanstypewriter-bold-14 -sl 2048 -bg red -fg
white -title SMB Network Messages -geometry 80x10+150+280 -e tail -f
/tmp/msg.txt
```

> **Note:** This script creates an rxvt window. If you do not have rxvt installed or want to use an xterm window, substitute xterm instead.

4. Save the script as tailmsg.sh and be sure to make this an executable file.
5. Run this file in the background: ./tailmsg.sh &.

Enabling IBM i NetServer for messaging specific to Windows

Administrative alerts are turned off by default. You can enable IBM i NetServer for messaging specific to Windows.

To enable messaging specific to Windows, follow these steps:
1. Open System i Navigator and connect to the system you want to work with.
2. Expand **Network** > **Servers**.
3. Click **TCP/IP** to display a list of TCP/IP servers available.
4. Right-click **IBM i NetServer** and select **Properties**.
5. Click the **Advanced** tab and click the **Next Start** button.
6. Click the check box next to **Allow administrative alerts**.
7. Specify the **Minimum message severity**. Valid values are from 0 to 99.

Associated IBM i messages

Some IBM i messages have been added to accommodate messaging support specific to Windows.

These messages are not issued on IBM i. Only the text of the messages is used (with replacement) to send as a network message to the client user attempting to connect.

These messages are as follows:

CPIB68A
> No user profile found for user &1.

CPIB68B
> The profile for user &1 is disabled.

CPIB68C
> The password for user &1 is expired.

CPIB68D
> No password exists for user &1.

CPIB68E
> User &1 is disabled for IBM i NetServer access.

CPIB68F
> User &1 was enabled for IBM i NetServer access.

CPIB690
> Password for user &1 will expire in &2 day(s).

CPIB691
> User &1 has successfully connected.

CPIB692
> User &1 encountered Kerberos error &2 connecting through IBM i NetServer.

Note: You must set the minimum message severity value to 10 to send the CPIB691 welcome message each time a user connects. Otherwise, set the value to 20 to ignore this message. The value of 30 disables information messages CPIB68F, CPIB690, and CPIB691.

Displaying a log of the message send attempts

To display a log of network messages that the server attempted to send, you can use the IBM i NetServer maintenance program.

The log contains a maximum of the last 500 messages by default. These messages are deleted when the log is dumped. You can only see the network messages logged since the last time that they were dumped.

To call the maintenance utility, use the following command:

CALL PGM(QZLSMAINT) PARM('32')

The log is dumped into a spooled file in the QSECOFR output queue. Use the Work with Spooled Files (WRKSPLF QSECOFR) command to display the queue.

Example: Spooled file dump of logged messages

```
TIME              NAME      IP-ADDR   TYPE  RC    MESSAGE

1/23/02 17:39:55  SMBTEST1  C0050939  2     0   CPIB68B: THE PROFILE FOR USER
     SMBTEST1 IS DISABLED.

1/23/02 17:40:16  JOE1      C005095D  7     0   CPIB690: PASSWORD FOR USER JOE1
     WILL EXPIRE IN 3 DAY(S).
```

Note: If the RC column is not 0, then there was either an error delivering the message to the user or the client's message handling service reported an error condition.

Sending custom messages through IBM i NetServer

If you have built the GO NETS tools for IBM i NetServer using the QUSRTOOL library support, you can use the Send NetServer Message (SNDNSVMSG) command to send custom messages to registered users on the network.

The Send NetServer Message (SNDNSVMSG) command is available through option 14 on the GO NETS menu, and it functions like the NET SEND command on Windows.

The user can use the GO NETS tools to use commands or a menu (instead of the NetServer APIs) to add, change, display, and work with shares; start and end NetServer; and change and display NetServer configuration information.

Examples

Note: By using the code examples, you agree to the terms of the "Code license and disclaimer information" on page 43.

Sending a Windows message to user name JOE1 on the network and to user KRISTY on client machine WORKSTATION1

SNDNSVMSG MSG('Reminder: Memo is due today.') TONETID((JOE1) (KRISTY WORKSTATION1))

Because a workstation name is not provided for the first user (JOE1), the message is sent to the PC that holds the NetBIOS name. Normally, when a Windows 2000, Windows XP, or Windows Server 2003 workstation is started, the workstation registers its NetBIOS name on the local subnet and with WINS (when WINS is configured).

When a user logs on, then the user's name is also registered with the messenger service. To see which names are registered with the messenger service, specify NBTSTAT -a workstation from a command prompt. The following example output shows four registered message names on workstation HORSE:

```
        NetBIOS Remote Machine Name Table

    Name            Type          Status
   ---------------------------------------------
    HORSE        <00>  UNIQUE      Registered
    DEPT8        <00>  GROUP       Registered
    HORSE        <20>  UNIQUE      Registered
    DEPT8        <1E>  GROUP       Registered
    HORSE-AFS    <20>  UNIQUE      Registered
    HORSE        <03>  UNIQUE      Registered
    HORSE$       <03>  UNIQUE      Registered
    MANNY        <03>  UNIQUE      Registered
```

Sending a Windows message to all users who have active session connections to IBM i NetServer

```
SNDNSVMSG MSG('&1, the Hawthorne server will be taken down for a disk  replacement at 1pm')
TONETID((*ALLNSVCNN))
```

The &1 can be used to indicate the user name for replacement text in the message.

Sending a Windows message to all users who have made a connection in the past to IBM i NetServer (since it was restarted)

```
SNDNSVMSG MSG('Good morning, dedicated users!') TONETID((*ALLUSERS))
```

Messages cannot be longer than 126 character.

Tips and techniques

These tips and techniques help solve problems or make IBM i NetServer work more efficiently for you.

IBM i NetServer does not appear in Windows My Network Places

IBM i NetServer might not appear in Windows My Network Places for a variety of reasons.

IBM i NetServer takes advantage of the Microsoft proprietary browsing protocol, which allows IBM i NetServer to appear in Windows My Network Places. The browsing protocol results in a separate list of computers for each protocol on each adapter. As a result, because IBM i NetServer does not support NetBIOS, when you transfer these lists, you might lose those non-NetBIOS supporting computers from the list.

It is a good idea to make all the computers in the same subnet members of the same domain (workgroup). This ensures that the browse announcements from IBM i NetServer are received by a computer capable of gathering information for the Windows Network Neighborhood.

Note: If IBM i NetServer is a logon server, then it will be the master browser for the domain and maintain the list of computers. Again, the browse list might not be complete if some servers are in a different subnet and that subnet does not have its own master browser that knows to contact the domain master browser with its list.

IBM i NetServer might also be hidden from the network because of the interval setting for browse announcement.

Related tasks:

"Hiding IBM i NetServer from the network" on page 31
For an added measure of security, you can hide IBM i NetServer from the Windows My Network Places.

IBM i NetServer fails to start

If IBM i NetServer fails to start, you can view the message in the QSYSOPR message queue. Use this message to find the cause of the problem.

The message reads as follows:

```
Message ID . . . . . . :   CPIB683      Severity . . . . . . . :   40
Message type . . . . . :   Information
Date sent  . . . . . . :   04/01/98     Time sent  . . . . . . :   14:02:55

Message . . . . :   The IBM i Support for Windows Network Neighborhood
  (IBM i NetServer) was unable to start.
Cause . . . . . :   The required IBM i NetServer job QZLSSERVER was unable to
  start because of reason code 5.  See the following reason codes and their
  meanings:
     1 - Unable to retrieve user credentials.
     2 - Unable to retrieve credentials.
     3 - Exchange user profile failed.
     4 - Unable to obtain lock for service program QZLSSRV1 in library QSYS.
     5 - Start of the NetBIOS over TCP/IP failed with return code 3420.
     6 - Start of the internal server failed with return code 3420.
     7 - Error occurred when sharing resources with the network.
```

Use the help information about this message to help you find the cause of the problem.

Starting IBM i NetServer at initial program load

IBM i NetServer can be started and ended as an individual TCP/IP server by using the Start TCP/IP Server and End TCP/IP server commands.

IBM i NetServer is now automatically started and ended as a TCP server when the Start TCP/IP (STRTCP) or End TCP/IP (ENDTCP) commands are called. Additionally, IBM i NetServer can be started and ended as an individual TCP/IP server with the use of the Start TCP/IP Server (STRTCPSVR SERVER(*NETSVR)) and End TCP/IP Server (ENDTCPSVR SERVER(*NETSVR)) commands.

You can specify whether the IBM i NetServer starts automatically when TCP/IP is started by selecting the **Start when TCP/IP is started** option on the IBM i NetServer General Next Start dialog box. This value affects TCP/IP start behavior (it is not an IBM i NetServer property), so the changes do not take effect immediately. When using System i Navigator in IBM i Access for Windows, you can follow the following steps to find this dialog box:

1. In System i Navigator, expand **Network** > **Servers** > **TCP/IP** > **IBM i NetServer**.
2. Right-click the **IBM i NetServer** icon.
3. Select **Properties**.
4. Select the **General** tab.
5. Press the **Next Start** button.

The QZLSSERVER job is in the QSERVER subsystem. The Start Server (QZSLSTRS) and End Server (QZLSENDS) APIs start and end the server. Because of this, no changes are needed in your startup program if the QSERVER subsystem is started before TCP/IP is started.

IBM i NetServer security: Guest versus nonguest

Typically you can access IBM i NetServer by using a user profile. The guest profile will be used when the requested ID (as sent by Windows or Samba) is not found.

The guest user profile allows the file and print sharing by users who otherwise would not require a user profile.

When using IBM i NetServer, normal user profiles and passwords apply. By default, only users with valid user profiles and passwords can access resources on the system. Windows 2000, Windows XP, and Windows Server 2003 offer the option to select a different user ID. If the passwords do not match, you will see a password window. Windows can optionally be set to remember the password.

A user profile is disabled from using IBM i NetServer when the user has tried to access IBM i NetServer a number of times with an incorrect password. The system value name QMAXSIGN specifies how many unpermitted access attempts disable a user profile. The Windows operating system will try to access IBM i NetServer again when access is denied. So it might appear that the QMAXSIGN limit is reached before the number of times actually tried by the client. If the user profile does become disabled for IBM i NetServer, you can use several methods to re-enable the user profile.

If a user profile is not found that matches the user ID that is used to access IBM i NetServer, you can use an optionally configurable guest user profile. This guest, created by the IBM i administrator who has *SECADM special authority, should only have a password if guest print sharing is being used, and must not have any special authorities. The guest user profile allows file and print sharing by users who otherwise would not require a user profile.

Note: The guest user profile must have a password if it is to be used for accessing print shares because the network print server requires one.

Related tasks:

"Enabling a disabled user profile" on page 19
You can re-enable a user profile that has become disabled by using System i Navigator or by changing the user profile. You can also enable a disabled user profile by stopping and restarting IBM i NetServer.

API guides

You can access all of the administrative functions that are available through System i Navigator by using application programming interfaces (APIs). This means that you can administer IBM i NetServer through your CL, COBOL, RPG, C, and C++ programs.

The following list shows APIs that are currently available for administering IBM i NetServer:
- 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 (QZLSSCHSI)
- Change Server Name (QZLSCHSN)
- End Server (QZLSENDS)
- End Server Session (QZLSENSS)
- List Server Information (QZLSLSTI)
- Open List of Server Information (QZLSOLST)
- Remove Server Share (QZLSRMS)
- Start Server (QZLSSTRS)

Related information:

Application programming interfaces

Backup and recovery of configuration and share information

IBM i NetServer uses files in the integrated file system to store configuration values and share entries.
You should back up these files every time you save the entire system and each time you change the
administration of IBM i NetServer.

In addition, plan the frequency of your save operations carefully to ensure that you always have a usable
backup available if your system should fail.

This is the location of the IBM i NetServer configuration and share data files on the system:
/QIBM/UserData/OS400/NetServer.

The following specific files are needed:
* **Qazlscfg**: The file contains configuration information.
* **Qazlsshr**: The file contains share information.
* **Qazlsext*xxx***: The file contains text conversion information for a file share, where xxx is a file share
  name.

Note: The following directory should be backed up if IBM i NetServer is configured as a logon server:
/QIBM/UserData/OS400/NetServer/NetLogon.

Related information:

Recovering your system

Troubleshooting IBM i NetServer

The problems you encounter when you use IBM i NetServer might relate to the status of IBM i NetServer,
the PC client connections, or the user profile.

You might experience various difficulties when trying to locate IBM i NetServer on the network or using
IBM i NetServer resources. Troubleshooting IBM i NetServer helps to solve the specific problems.

Troubleshooting user profile connections

When you try to access a file share, errors might occur because of user profile problems.
* **Lack of authorization**

  User profiles might not be authorized to a particular shared directory. If this occurs, ensure that the
  user can access the directory by using control language (CL) commands, such as the Work with Object
  Links (WRKLNK) command.
* **Attempting to connect with incorrect password**

  Users might be unable to use IBM i NetServer if they attempt to connect with an incorrect password
  too many times. If this occurs, then the system sends a message (CPIB682) to the QSYSOPR message
  queue. This message indicates that the user profile has been disabled for IBM i NetServer access. This
  does not disable the user profile for IBM i or IBM i Access for Windows, but it does stop the user
  profile from accessing IBM i NetServer.

  Note: Management Central has a function to monitor messages from the QSYSOPR message queue. An
  administrator can use this function to be alerted to profiles being disabled for IBM i NetServer
  use. The administrator can use System i Navigator to periodically look at a list of disabled users
  and re-enable users from the window. To find all disabled user profiles, right-click **IBM i
  NetServer** and select **Disabled Profiles**.
* **QZLSFILE and QZLSFILET jobs are not configured for a subsystem**

Clients should connect to IBM i NetServer by using their valid user profiles and not the guest user profile. The QZLSFILET or QZLSFILE job might be in the QSERVER subsystem for each active client user that connects to an IBM i NetServer file share. However, QZLSFILET and QZLSFILE jobs can run in another subsystem if the user has configured other subsystems to run IBM i NetServer jobs. Message CPIAD12 in the job log indicates which user or client the QZLSFILE job is servicing. A QZLSFILET job might have numerous messages in the job log because it services multiple clients. From System i Navigator, under **Network** > **Servers** > **TCP/IP**, double-click **IBM i NetServer** and then click **Sessions**. A listing of users and their respective workstation names, logon types, and server sessions is displayed.

- **Trying to access a non threadsafe file system while running threaded**

  A client that is running threaded will receive "access denied" type errors when trying to access a non threadsafe file system (such as QDLS or QNetWare). The client will also receive errors when attempting to map a drive to a non threadsafe file system when the client session is running threaded. For a listing of file systems that are not threadsafe, see File system considerations for multithreaded programming.

  As of V5R4, IBM i NetServer by default services file shares in a multithreaded job. The threaded activity for all sessions in a subsystem runs in the pool of threads in the QZLSFILET job for that subsystem. Non threaded client activity is still run in QZLSFILE jobs.

  A QZLSFILE job in the correct subsystem is still required to launch a threaded session. Whether a client can run threaded is determined when it first maps a drive to the integrated file system. The first phase of mapping the first drive for a client runs in a QZLSFILE job. If the session can run threaded, the session is transferred into the single QZLSFILET job in the subsystem. If the file system is not threadsafe, or the ADDEXITPGM THDSAFE() option for the QIBM_QPWFS_FILE_SERV exit point is specified as *UNKNOWN or *NO, or QZLSFILET is not present in the subsystem, the client runs in a QZLSFILE job for this session. The QZLSFILE job log records when a client starts. When a client ends the session, the QZLSFILE job returns to prestart wait status and its job log is cleared. When a client starts a session with a QZLSFILET job, message CPIAD12 is written into its job log. Because the QZLSFILET job is used by multiple client sessions, the session end message, CPIAD13, is written to its job log when a user/client session is ended. These messages will accumulate in the job log.

  To prevent "access denied" type errors, the recommended solution is to avoid starting the QZLSFILET job in the QSERVER subsystem (or other user subsystems). This might involve configuring user subsystems in System i Navigator so that some clients run threaded and others run nonthreaded. Use the following command to remove the prestart job entry for QZLSFILET from the QSERVER subsystem:

  ```
  RMVPJE  SBSD(QSYS/QSERVER)  PGM(QSYS/QZLSFILET)
  ```

  If a prestart job entry is to be removed from a different subsystem, then that subsystem needs to be specified instead of QSERVER along with its correct library (the program remains the same).

  Programs created with the activation group new ACTGRP(*NEW) option will cause multithreaded jobs to end when the program returns. Therefore, when clients might run in a threaded environment (QZLSFILET job), a program created with ACTGRP(*NEW) should not be registered for exit point QIBM_QPWFS_FILE_SERV.

- **Active print users**

  Active print users will have a job in QUSRWRK that connects to IBM i NetServer. A message in the job log indicates to which user the QNPSERVS job belongs.

Related tasks:

"Troubleshooting file share problems" on page 41
If you experience problems with IBM i NetServer file share readiness, check the status of IBM i NetServer on the system.

"Administering subsystems for IBM i NetServer" on page 20
You can administer the subsystems in which user jobs are run. For example, you can create separate subsystems for users or groups of IBM i NetServer users, add prestart jobs to subsystem descriptions, and specify the subsystems.

Related information:

Troubleshooting file share directory paths

You might receive errors when accessing an IBM i NetServer file share if the directory path you have specified does not exist in the integrated file system.

If you have specified a directory path for a file share, but the directory path does not exist on IBM i, then clients will receive an error. The directory path that you specify on the File Share General-Properties dialog box must exist on the system for clients to avoid an error.

Troubleshooting print share problems

You might experience problems when using an IBM i NetServer network printer online for a variety of reasons.

- The network printer might not work online because the user does not have authorization to the output queue. If this occurs, you should ensure that the user can access the output queue by using control language (CL) commands, such as the Edit Object Authority (EDTOBJAUT) command.
- You might experience difficulty with spooling print jobs to an output queue when using an IBM i NetServer print share. For IBM i NetServer print shares to function properly, the network print server must be running. If you do not start the Network Printing Server, then IBM i NetServer print shares will not function.
- Clients should connect to IBM i NetServer by using their valid user profiles and not the guest user profile. There is one QNPSERVS job entry in the QUSRWRK subsystem for each active client that connects to an IBM i NetServer print share. The QNPSERVS job starts when a client connects to a shared print resource.
- The guest user profile must have a password and be enabled.
- A maximum of 350 spooled files will be displayed in a network printer window.

Troubleshooting print problems when using guest support

When you use the IBM i NetServer guest support to access the output queues, you might experience trouble when trying to access the server. In addition, your specified printer might not go online.

If this is the case, you must add a password to the IBM i NetServer guest user profile, for example, SMBGUEST. You must also ensure that you enable the user profile. The network print server requires a password for authentication although it will not prompt the user to enter a password.

The addition of a password in the SMBGUEST user profile does not affect users who access IBM i NetServer file and print shares. When a user requires guest support for file and print services, IBM i NetServer does not prompt the user for the SMBGUEST password. Because the SMBGUEST user profile has a password and is enabled, set the initial menu parameter to *SIGNOFF, INLMNU(*SIGNOFF), to deny signon access.

Troubleshooting PC client connection problems

You can test whether your connection method to IBM i NetServer (for example, Domain Name System) is running if you experience connection problems.

To test your connection, follow these steps:
1. Open a Windows command prompt from your PC client.
2. Enter the PING command to test your client connection to IBM i. For example, you can ping IBM i NetServer by entering this command:

   ping QSYSTEM1

   Note: QSYSTEM1 is the server name of IBM i NetServer on IBM i.

If you get a positive return value, then the client connection to IBM i NetServer is operating normally. This means that the method the client uses to connect to IBM i NetServer and to the system is working.

Tips:

- Run nbtstat -A *ip-address-of-server* from a command prompt on the client to check connectivity: `C:\WINDOWS>nbtstat -a qnetserver`. If the name of the system is unknown or cannot be resolved, the use of nbstat can also be helpful.
- Another way to check client connectivity to the system is to see whether there is an active NetServer session for the client. Using System i Navigator, under **Network** > **Servers** > **TCP/IP**, double-click **IBM i NetServer**, and then click **Sessions**. A listing of users and their respective workstation names, logon types, and system sessions is displayed.

Troubleshooting file share problems

If you experience problems with IBM i NetServer file share readiness, check the status of IBM i NetServer on the system.

To check the status of IBM i NetServer, follow these steps:

1. Verify that the system has started the QSERVER subsystem. If the system has not already started the QSERVER subsystem, then start it by using the Start Subsystem (STRSBS) CL command.
2. Verify that the system has started the QZLSSERVER job within QSERVER. If the system has not already started the QZLSSERVER job, then start it by using the STRTCPSVR *NETSVR CL command.
3. Verify that the QZLSFILE prestarted job is waiting for a program start request (`PSRW` status on the Work with Active Jobs display).

   If threaded support is required, verify that the QZLSFILET job is awaiting client requests for file or print serving (`TIMW` or `TIMA` status on the Work with Active Jobs display).

   If neither the QZLSFILET nor a QZLSFILE prestarted job is waiting for a program start request, then use the Start Prestart Jobs (STRPJ) CL command. This starts the prestarted job.

   Note: If a subsystem is configured to start the QZLSFILET job, that single QZLSFILET job services multiple clients and their respective threadsafe file shares. There are multiple QZLSFILE jobs in a subsystem, and each one supports one client and all of the thread unsafe file shares that are accessed by a Windows client when using IBM i NetServer. However, if not running threaded, Linux connects to a separate QZLSFILE job for each mount of an IBM i NetServer share.

4. Add the QZLSFILET or QZLSFILE prestarted job to the QSERVER subsystem description (or a different subsystem description if you have configured others) if it is not already present. You can use the Add Prestarted Job Entry (ADDPJE) CL command to add the prestarted job entry.

Related concepts:

"Troubleshooting user profile connections" on page 38
When you try to access a file share, errors might occur because of user profile problems.

Troubleshooting print device driver problems

You might notice unreadable printed text when using the Advanced Function Printing (AFP) print device drivers that you download from the IBM Printing systems Web site.

The unreadable text occurs because the AFP print device driver substitutes fonts when using information that is directly embedded into the print stream of your print job. There are two options available for you to solve the problem:

- Turn off **Font Substitution** and turn on **Create Inline Form Definition** in the printer properties on your PC.
- Install license program AFP Fonts 5769FN1 and AFP DBCS Fonts 5769FNT.

Related information:

Installing, upgrading, or deleting IBM i and related software

Troubleshooting IBM i NetServer using the QSYSOPR message queue

The system operator's message queue, QSYSOPR, contains important information for troubleshooting IBM i NetServer. Messages are logged to the QSYSOPR message queue each time IBM i NetServer starts and stops and when there are any specific errors to report.

The first message indicates whether IBM i NetServer initialized completely during startup. This message is important because it not only specifies whether IBM i NetServer started properly, but also lists the IBM i NetServer server name.

If IBM i NetServer fails to start successfully, the QSYSOPR message queue logs an error message that indicates the reason for the failure.

Using Display Log (DSPLOG) to find IBM i NetServer

The Display Log (DSPLOG) CL command with parameter MSGID(CPIB680) displays a message that indicates when IBM i NetServer started. The message also specifies the IBM i NetServer system name. You might need to adjust the beginning date of the search by using the PERIOD parameter. The message should read as follows:

```
Support for Windows Network Neighborhood (IBM i NetServer) SERVER_NAME Initialization Complete.
```

Troubleshooting IBM i NetServer location on the network

You can use the troubleshooting techniques if you have trouble finding IBM i NetServer on the network.

If you experience problems when trying to find IBM i NetServer on the network, you can take several steps to resolve the problems:

1. Ping the IBM i NetServer server name. Pinging the IBM i NetServer server name reloads the IBM i NetServer IP address into the PC client cache file.
2. Verify that you are using the correct system name for IBM i NetServer. The QSYSOPR message queue specifies the correct IBM i NetServer system name.
3. Verify that you have configured your PC client to properly resolve the IBM i NetServer system name to an Internet Protocol (IP) address. Configure your PC client to resolve the IBM i NetServer system name to an IP address in one of the following ways:
   - Map the IBM i NetServer system name to its IP address by using the Domain Name System (DNS).
   - Map the IBM i NetServer system name to its IP address by using the Windows Internet Naming Service (WINS).
   - Map the IBM i NetServer system name to its IP address by adding an entry to the LMHOSTS file.

Related tasks:

"Finding IBM i NetServer on the network" on page 12
You can use your PC client to find IBM i NetServer on the network. By doing so, you can access shared resources on the network and make sure that your connection method to IBM i NetServer is running.

Troubleshooting IBM i NetServer using Windows messenger service

You can use Windows messenger service to troubleshoot problems with IBM i NetServer.

A user trying to connect to a share through IBM i NetServer might be denied access for the following reasons:
- The password does not match.
- There is not enough authority to the underlying file system object.
- The user profile does not exist.

- The user profile is disabled.
- The user is disabled for IBM i NetServer access.
- The password is expired.
- The user profile does not have a password.
- There was a Kerberos authentication failure.

In each of the previous situations, the client typically does not report a meaningful error message to help distinguish the problem. Support has been added to IBM i NetServer to allow messages to be sent over the network to client users on Windows 2000 and Windows XP, as well as Linux operating systems. This can greatly improve problem analysis for user profile connectivity problems.

Related concepts:

"Using Windows messenger service with IBM i NetServer" on page 31
IBM i NetServer can automatically send informational messages to users in some situations.

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