





of your AS/400 Dedicated Server for Domino

by Jeff Cook

Level: Intermediate
Works with: Domino 5.0
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The AS/400 platform has quickly grown to become the second most popular platform for deploying Domino, right behind Windows NT. Yet many of those now using it are new to the platform.

This article helps simplify the steps necessary to bring an AS/400 Dedicated Server for Domino (DSD) online. It does not bury you in the details of the AS/400, but rather discusses what is essential to know to get your DSD up and running. You can learn the rest in time. By following these instructions, you should be able to configure and bring a DSD online in less than one hour.

This article covers nine steps:

- A brief overview of the AS/400 including its syntax, basic architecture, and file system structure.
- 2. Connecting the operations console cable.
- 3. Installing the operations console software on a PC.
- 4. Creating the connection in the operations console software to your DSD.
- 5. Finishing the OS/400 operating system installation.
- 6. Configuring TCP/IP.
- 7. Setting miscellaneous AS/400 system settings to disable autostart and ensure remote log on.
- 8. Enabling the AS/400's NetServer Windows Network Neighborhood file sharing.
- Installing Client Access Express on the administrator's PC on the TCP/IP network.

It concludes with additional information about installing, configuring, and autostarting Domino on the AS/400 platform.

This article assumes Domino administration experience and knowledge of TCP/IP. You should also have the blue-and-white book included with your AS/400, titled *AS/400 940x 170, 6xx, 7xx, and Sxx Installation and Upgrade Guide*, available to you in order to complete the installation of the OS/400 operating system.

A brief overview of the AS/400

If you aren't familiar with the AS/400, don't worry. It is a server and, like any server, you can configure it. You simply need to learn the basics of AS/400 syntax and AS/400 system architecture.

Understanding AS/400 syntax and jargon

The AS/400 operating system is called OS/400. The version of OS/400 is of the format V4R4, or version 4, release 4. Here is a table that translates PC and Windows NT jargon into the AS/400 equivalent.

PC/NT Jargon	AS/400 Equivalent
Processor speed MHz	Measured in CPW
RAM	Main storage
Hard disk space	DASD
Administrator log on	QSECOFR
Boot	IPL (Initial Program Load)
Service packs	PTF's
Ctrl-Alt-Del	PWRDWNSYS (press F4 to choose restart)
Path	Library list
Task Manager	WRKSYSSTS (select intermediate mode) and WRKACTJOB

System architecture

The AS/400 is a server, not a workstation and server. In other words, unlike a PC server, there is no connection for a keyboard, mouse, or video connection on the back of the server. You must connect a device of some sort to manage it. (I'll cover how to do this in the next section.) When you connect to the AS/400 to configure or manage it, you will primarily be using text-based, 5250 terminal emulation, a "green screen." Later, you can remotely use this same green screen or manage some basic areas of the AS/400 using a graphical user interface (GUI) called Operations Navigator.

First, take a quick look at the OS/400 file system and then at the 5250 terminal emulation green screen.

Data "Root" QDLS QLANSrv Programs QSYS.LIB QOpenSys QNetWare QOPT QFileSvr.400

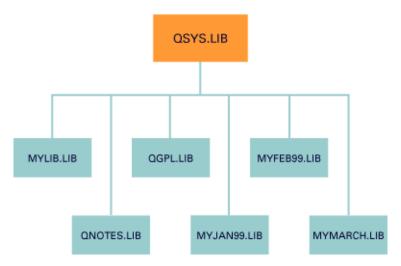
OS/400 file system overview

OS/400 has multiple file systems. To help integrate these multiple file systems with the PC environment, the Integrated File System, or IFS, was

created. The Integrated File System is a part of OS/400 that lets you support stream input/output and storage management in a way similar to personal computer and UNIX operating systems, while providing you with an integrating structure over all information stored in the AS/400. It allows for UNIX-style directories and file names. It has a root / directory and multiple levels of directories. It is identical in architecture to a PC file system except that it uses the forward slash as a delimiter (/) instead of the backslash (\), and it typically resides in one area so there is no need for a drive letter like C:

The most useful AS/400 file system command for PC users is WRKLNK. It lets you navigate through the Integrated File System on the green screen. You should spend some time navigating through the file system to see the files and file types (extensions) on your DSD.

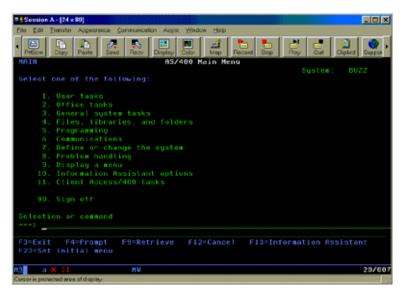
By default, the file system has several libraries, which are similar to the folders in Microsoft file systems. However, one specific difference is that OS/400 puts all libraries in one library called QSYS, and there is no hierarchy allowed. In other words, all libraries in QSYS are only one level deep. Also, the object names have a ten-character limit. For example, YOURFILE.SAVF is an example of an AS/400 file. YOURLIB.LIB is an example library name. By default, you don't have to specify file extensions. An extension is required only when accessing the objects through IFS; for example, the WRKLNK command accesses the object through IFS, so the extension is required.



QSYS.LIB is the same as your Program Files folder on your PC. In QSYS.LIB, there are many libraries. QGPL is the General Purpose Library. The Library List determines the Path setting of the AS/400. It determines what libraries to look in when you enter a command on the command line. To see it, you can enter GO CMDLIBL.

Overview of the green screen

The 5250 terminal emulator, or green screen, is your interface when working with an AS/400. Here is its main menu. (Go to the <u>AS/400 Main Menu</u> <u>sidebar</u> to see a bigger picture of this screen.)



Here are some general guidelines about working with this screen:

- If you enter an illegal keystroke, a red XII appears, as shown in the screen above. Press the Ctrl key to clear it.
- To use function keys above F12, press the Shift key simultaneously with a function key; for example, for F16 press Shift and F4.
- All commands are menu driven, or you can enter them on the command line.
- Use the Tab key to move to the underscored areas that designate input, or click them with your mouse.
- You will use F3 and F12 quite regularly to back out of a menu, to navigate back, or to "close" the screen you are on.
- Press F1 on any field for context-sensitive help.
- If you don't know the name of a command, type the first few letters followed by an asterisk (*); for example, type STR* to list all the commands that start with STR.
- To list the options of any command, type it and then press F4.
- The name of the menus will sometimes be listed in blue in the upper-left; to return to them, enter GO MENUNAME.
- Commands will also sometimes be listed at the top; to use that command again later, just enter the command.
- To stop a command that is hung, right-click the screen, click SYSREQ, press Enter, and then use the Menu to end the command.

When logging on, you typically see a Sign On screen similar to the following:



To log on as an administrator:

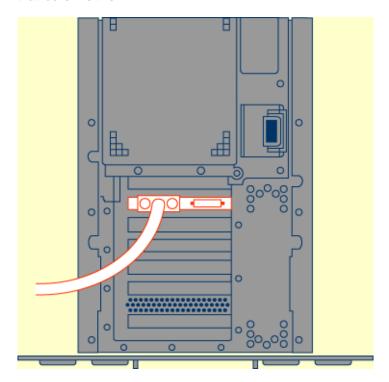
- 1. Type QSECOFR and press Tab.
- 2. Type QSECOFR's password and press Enter.

By default, the AS/400 Main Menu -- the green screen above -- appears.

Connecting the operations console cable

Now let's take the first step in getting your DSD online by connecting the cable to a PC running Windows 95/98/NT/2000. (A Windows 95 or 98 client is preferred.) You need to designate a simple PC to use that will permanently reside within 20 feet of your AS/400. This PC will be your AS/400 console.

Connect the cable from the AS/400 to the PC. Use a cable that has one end like the back of the AS/400 card shown below and a serial connection on the other end. Look at the back of your AS/400, and find the back of the card slot that looks like this:



Connect the cable to the left connector only. The right connector will not work. Then, connect the other nine-pin end to the serial port of your PC.

Installing the operations console software on the PC

Install Client Access Express from the "AS/400 Client Access Family for Windows" CD on the Windows 95/98/NT/2000 computer you connected. Client Access Express is similar to the standard Client Access software, except it is for TCP/IP only. For this article, we used Express client V4R4M0.

To install the software:

- Select Custom setup and select Operations Console, which is located toward the bottom of the list. Then click Next.
- 2. Reboot your PC.
- Visit the <u>AS/400 Client Access Service Packs page</u>, and download and install the Client Access Express service pack for the version of Client

Access you installed above.

4. Reboot your PC.

Creating the connection in the operations console software to your DSD

There are several modes that the AS/400 can IPL (or boot, for you PC users). This section takes you through setting a manual IPL on the AS/400 display panel, performing the manual IPL, and performing the initial DST log on to connect to the AS/400 over the cable.

To start your AS/400 and finish defining this new operations console connection:

- 1. Connect the power cable to the AS/400.
- Click Start and choose Programs IBM AS/400 Client Access -Operations Console.
- 3. Choose File New Connection to define a new connection.
- 4. Type the name of your AS/400.
- 5. Select LCS only.
- 6. Once the new connection is defined, double-click the new connection to perform a DST log on.

Note: The DST log on is a preliminary log on from the operations console to the AS/400 over the cable you have connected. You are not logged into the green screen yet, just connected over the cable. (By the way, for your future use, CHGDSTPWD changes this DST password, and CHGPWD changes the password of the current user.)

For more information, see the blue-and-white book included with your AS/400, titled AS/400 940x 170, 6xx, 7xx, and Sxx Installation and Upgrade Guide or read Starting the system using a manual IPL from the AS/400 Operations Console Setup V4R4 online guide.

Finishing the OS/400 operating system installation

Once you successfully perform a DST log on, a green screen appears and you can finish the installation of OS/400. (If the green screen does not appear when attempting a DST log on, reboot your PC and try again.)

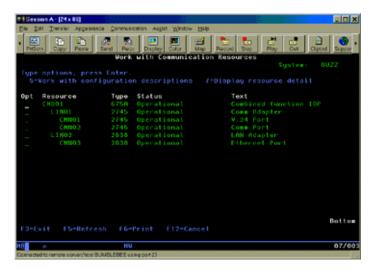
The OS/400 operating system that shipped with your AS/400 is similar to Windows NT when you initially receive it for a PC server; that is, you have to go through some initialization steps to complete the installation. To follow these initialization steps, refer to Chapter 6, "Installing a New AS/400 System with the Operating System Already Installed" of the blue-and-white book included with your AS/400, titled AS/400 Software Installation V4R4, or read Doing the Initial Program Load (IPL) from the online version of the AS/400 Software Installation V4R4 book.

Note: In following this sequence, you perform the actual IPL since you chose a manual IPL above.

Configuring TCP/IP

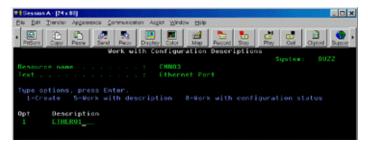
Next, you can configure TCP/IP:

- 1. Log on to a green screen session from the operations console.
- Type WRKHDWRSC TYPE(*CMN).
 (Go to the Work with Communication Resources menu sidebar to see a bigger picture of this screen.)

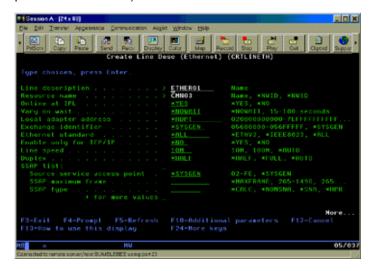


3. Type 5 in the Opt column next to the row that lists your Ethernet Port and press Enter.

(Go to the <u>Work with Configuration Descriptions menu sidebar</u> to see a bigger picture of this screen.)



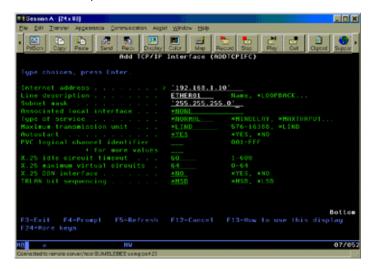
- 4. Type 1 in the Opt column and press Tab.
- Type ETHER01 and press Enter.
 (Go to the <u>Create Line Desc (Ethernet) Menu sidebar</u> to see a bigger picture of this screen.)



6. Check that the Line Speed and Duplex match your Ethernet network environment. Press Enter when you are done making any necessary

changes.

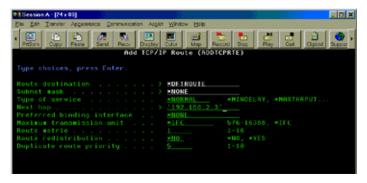
- 7. Type GO TCPADM at the command line and press Enter.
- 8. Type 1 and press Enter to select 1. Configure TCP/IP.
- 9. Type 1 and press Enter to select 1. Work with TCP/IP interfaces.
- Type 1 in the Opt column and press Enter.
 (Go to the <u>Add TCP/IP Interface Menu sidebar</u> to see a bigger picture of this screen.)



11. Press Enter when you are ready to continue.

Now you need to add your default route, or the gateway address, for your TCP/IP network:

- 1. Type 2 and press Enter to select 2. Work with TCP/IP routes.
- Type 1 in the Opt column and press Enter. (Go to the <u>Add TCP/IP Route menu sidebar</u> to see a bigger picture of this screen.)



- 3. Type *DFTROUTE in the Route destination field.
- 4. Type *NONE in the Subnet mask field.
- 5. Type your gateway address in the Next Hop field.
- 6. Press Enter when you are done.
- Type 12 and press Enter to select 12. Change TCP/IP domain information.
- 8. Type your domain name and any host names for this DSD.

- 9. Type GO TCPADM on the command line and press Enter.
- 10. From the GO TCPADM menu, type 3 and press Enter to select 3. Start TCP/IP.

Note: If at any time after Ethernet is started, the Ethernet cable is disconnected from the back of your DSD, AS/400 requires that you reset the line status. To do this, you need to log on using your operations console and type WRKLIND ETHER01, then select the Work with Status screen. On the Work with Status screen, select Vary On.

Setting miscellaneous AS/400 system settings

There are several other options you need to set as well.

Disabling the AS/400 SMTP and HTTP autostart settings

You must make sure that the AS/400 SMTP and HTTP autostart settings are disabled so that they won't conflict with Domino:

- 1. Type CFGTCP on the command line and press Enter.
- 2. Type 20 and press Enter to select 20. Configure TCP/IP applications.
- 3. Type 14 and press Enter to select 14. Configure HTTP.
- 4. Type 1 and press Enter to select 1. Change HTTP attributes.
- 5. Check that the Autostart field is set to *NO.
- 6. Press F12 until you see the Configure TCP/IP Applications menu.
- 7. Type 12 and press Enter to select 12. Configure SMTP.
- 8. Type 3 and press Enter to select 3. Change SMTP attributes.
- 9. Check that the Autostart field is set to *NO.

Ensuring remote log on

Next you can change the remote command security policy and Telnet system sign on parameters so that you are able to log on to this system remotely from another PC on the network:

- 1. Type WRKSYSVAL on the command line and press Enter.
- 2. Check that the following values are set and change them if necessary:

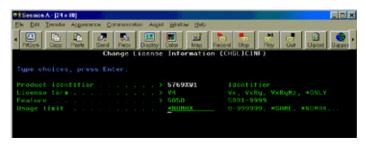
```
QRMTSIGN = *FRCSIGNON
QAUTORMT = 1
QAUTOVRT = 10
QLMTSECOFR = 0
```

You also need to change the Client Access Licensing setting to allow you to log on to this system remotely from another PC on the network:

- 1. Type WRKLICINF on the command line and press Enter.
- Press the Page Down key to see the 5769XW1 Product. (Go to the <u>Work with License Information menu sidebar</u> to see a bigger picture of this screen.)



Type a 2 beside it and press Enter.
 (Go to the <u>Change License Information sidebar</u> to see a bigger picture of this screen.)



- 4. Change the Usage Limit to *NOMAX and press Enter twice.
- 5. At the confirmation message, type G on the command line to confirm this change and press Enter.

Enabling the AS/400's NetServer Windows Network Neighborhood file sharing

To allow your AS/400 to reside on your Network Neighborhood for file sharing and transferring and Windows print serving, type the following on the command line, inserting your desired server name and NT domain/workgroup name:

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

Note: It would be a good idea to register this server name and your Domino server name in your company's DNS at this time.

Create a guest user account named GUEST with *NONE for the password:

- 1. Type CRTUSRPRF and press Enter.
- 2. Type CALL QZLSCHSG (GUEST X'00000000') and press Enter.

Using a PC in your NT network, log on as a domain administrator and create an NT server using the name you used above:

- Type ENDTCPSVR *NETSVR and press Enter to end the NetServer, if it is running.
- 2. Type STRTCPSVR *NETSVR and press Enter to start the NetServer.

Now use a PC on your network to look in the Network Neighborhood for the server name you used above to verify the server is visible on the network. Alternatively, you can verify its presence from the Start menu by selecting Find - Computers and entering the server name to find.

Additional file shares, file sharing settings, and print share settings are managed using the Operations Navigator, which has a GUI interface:

- To start Operations Navigator, click Start and select Programs IBM AS/400 Client Access - Operations Navigator.
- 2. Select File Systems IFS Directory-Name.
- 3. Right-click the directory name and select Sharing to share a directory.

The NetServer is located in Network - Servers - TCP/IP. Right-click it for properties and double-click it to manage current sessions.

Note: Don't forget that you can also FTP into the system as well to transfer files

Installing Client Access Express on the administrator's PC on the TCP/IP network

By installing Client Access Express on an administrator's PC on the TCP/IP network, you allow an administrator to manage the AS/400 remotely from a PC further than 20 feet from the server. You can manage your AS/400 from anywhere that you can establish a TCP/IP connection to your DSD. Green screen emulation is handled on the standard Telnet port 23.

5250 terminal emulation and Operations Navigator

Install Client Access Express from the "AS/400 Client Access Family for Windows" CD on a Windows 95/98/NT/2000 computer. (A Windows 95 or 98 client is preferred.) Client Access Express is similar to the standard Client Access software, except it is for TCP/IP only. For this article, we used Express client V4R4M0.

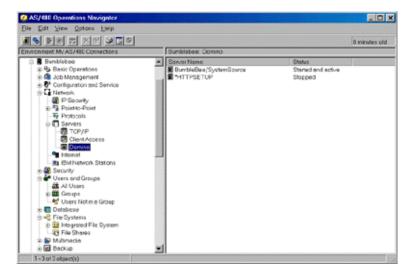
To install the software:

- Select Custom setup and select Operations Navigator and PC5250 Emulation.
- 2. Reboot the PC.
- Visit the <u>AS/400 Client Access Service Packs page</u>, and download and install the Client Access Express service pack for the version of Client Access you installed above.
- 4. Reboot the PC.

Next, define a connection to your DSD:

- 1. Start Operations Navigator.
- 2. Select File Add AS/400 Connection.
- 3. Because you have installed 5250 emulation, you can right-click the server name in the left window and select Display Emulator to open a green screen.

(Go to the **Operations Navigator sidebar** to see a bigger picture of this screen.)



Domino add-in for Operations Navigator

Finally you need to add Domino support for Operations Navigator using the Domino Server plug-in. To do this, you need to do a Selective Setup for Client Access Express and point to the \SERVERNAME\QIBM directory:

- Click Start and select Programs IBM AS400 Client Access Express -Selective Setup.
- 2. Click Next.
- 3. Type \\SERVERNAME\QIBM in the Source directory box.

Once the plug-in is added, you should see Domino listed in the Operations Navigator under Networks - Servers. You can double-click your Domino server to launch the Domino Administrator client or right-click it to see the Domino server properties. If no Domino server is listed, you will need to install Domino for AS/400 (see the next section).

About installing and configuring Domino for AS/400

If you have ordered your DSD with Domino installed, you will need to install and configure Domino only if you want to upgrade to a more recent version. Obviously, however, if Domino is not installed, you need to install it.

For help installing Domino for AS/400, please refer to the IBM Redbook that covers how to install and configure Domino for the AS/400, titled *Lotus Domino for AS/400 R5: Implementation*. You can **order it or download it** from the IBM Redbooks site.

Once Domino is installed, you can type WRKDOMSVR to see your Domino servers and work with them. To add your first server, use the GO CMDDOM command and choose 3. Configure Domino Server.

Automatically starting TCP/IP and your Domino server

To ensure that Domino and TCP/IP are automatically loaded whenever your DSD is restarted, you can edit the startup file.

Type WRKSYSVAL QSTRUPPGM to display the name of the file used at startup, usually QSTRUP, located in QSYS. We will move it to QGPL so that upgrades won't replace it.

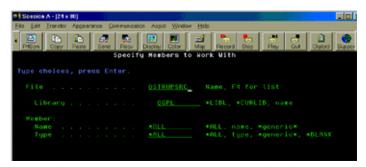
The startup file must be written in source code and compiled. Therefore, you must have the Application Developer Toolset/400 installed. If you do not have the Toolset installed, see the <u>Installing the Application Developer</u>

Toolset/400 sidebar for more information.

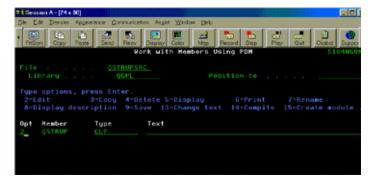
To start the Application Developer ToolSet/400 (5769-PW1), type Start PDM (STRPDM) at the command line.

Now you need to create a file, retrieve the source file from the current startup program, edit this new source, and then compile and save the new startup program. To do this:

- 1. Type CRTSRCPF FILE(QGPL/QSTRUPSRC) and press Enter.
- Type RTVCLSRC PGM(QSYS/QSTRUP) SRCFILE(QGPL/QSTRUPSRC) and press Enter.
- 3. Type STRPDM and press Enter.
- 4. Type 3 and press Enter to select 3. Work with members.
- Type QSTRUPSRC as the file and QGPL as the Library.
 (Go to the <u>Specify Members to Work With sidebar</u> to see a bigger picture of this screen.)



- 6. Press Enter.
- Type 2 in the Opt column next to QSTRUP.
 (Go to the Work with Members Using PDM sidebar to see a bigger picture of this screen.)



- 8. Press Enter.
- 9. Go to line 0046.00 by pressing the Page Down key until you see the bottom of the screen and then pressing the Tab key.
- With the cursor on line 0046.00, insert 8 blank lines by typing I8 (I for insert).

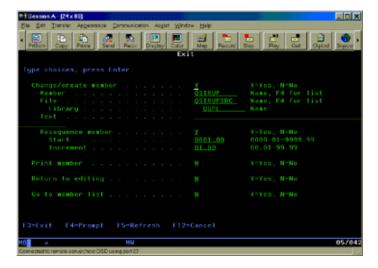
Note: You can select Communication - Configure - Size to make your screen 132 wide for easier reading.

11. Add the following lines of text in the blank lines after line 0046.00, typing the name of your Domino server in place of SERVERNAME. (You can copy and paste the lines from this article if you want.)

```
STRTCP /* Start TCPIP */
MONMSG MSGID(CPF0000 TCP0000)
DLYJOB DLY(60) /* Wait 60 seconds */
STRHOSTSVR SERVER(*ALL) /* Start TCPIP Host Servers */
MONMSG MSGID(CPF0000)
DLYJOB DLY(60) /* Wait 60 seconds */
QSYS/STRDOMSVR SERVER(SERVERNAME) /* Start Domino Server
MONMSG MSGID(CPF0000)
```

Note: On any line you can press F4 to see the options for that command.

- 12. Press Enter to complete the addition of the new lines.
- Press F3 to exit and save the file.
 (Go to the <u>STRPDM exit confirmation sidebar</u> to see a bigger picture of this screen.)



14. Check that the Change/Create Member field is set to Y.

- 15. Press Enter.
- Type 14 in the Opt column next to the file and press Enter to compile QSTRUP in QGPL. (You could press F4 to change the location of the new file.)

Now you need to tell the AS/400 to use this new file as the startup file:

- 1. Type WRKSYSVAL QSTRUPPGM and press Enter.
- 2. Type 2 in the Opt column next to QSTRUPPGM and press Enter.
- Change the value for library to QGPL and leave the startup program as QSTRUP.
- 4. Press Enter to save.

Finally, change use and edit authorities.

 Give QPGMR and QNOTES *USE authority to the following file in the IFS using the WRKAUT command:

WRKAUT /QIBM/UserData/LOTUS/LOTUS SERVERS

Give QPGM and QNOTES *USE authority to the following object in the QNOTES library using the WRKOBJ command:

WRKOBJ QNOTES/QNNINSMT

- 3. In the WRKOBJ menu, select 2 and press Enter to see the current security for QNNINSMT.
- 4. Press F6 and add QNOTES to the list of users allowed to use this object.

The next time your AS/400 starts, it will load TCP/IP and the Domino server automatically.

Conclusion

After following these instructions and administering Domino on the AS/400, you will soon realize the distinct advantages of the AS/400 platform. And with the two new DSD models recently released, the 270 and the 820, the performance will be even better on DSD AS/400s. Welcome to the world of serious business infrastructure!

ABOUT THE AUTHOR

Jeff Cook is a Principal R5 CLP Systems Administrator and Principal R5 CLP Application Developer at Venture **SystemSource** in Jackson, Mississippi.

Jeff has specialized in advanced Domino for AS/400 consulting for the last three years. Jeff came to work for SystemSource after helping build a Premier Lotus Business Partner in Austin, Texas, that received a Lotus Beacon Finalist Award in 1999.

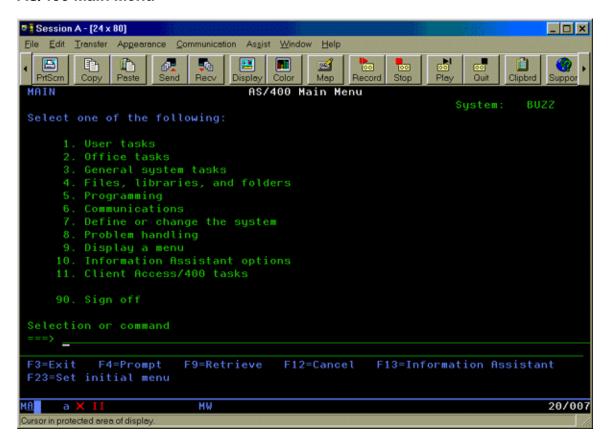
Jeff's seven years of Notes and Domino background includes: software project management, software process consulting, Domino business development, Domino infrastructure planning, advanced Domino systems administration, advanced Domino Web development, advanced LotusScript development, and Domino for AS/400 fast-track training.

Jeff has a B.S. in Electrical Engineering from Mississippi State University. He is a husband to his wife of 5 years, Ann, and a father to one two-year old boy named Timothy. Jeff enjoys spending time with his family, watching college sports, and improving his hopeless golf game. You can contact Jeff at jeff.cook@sysource.com.





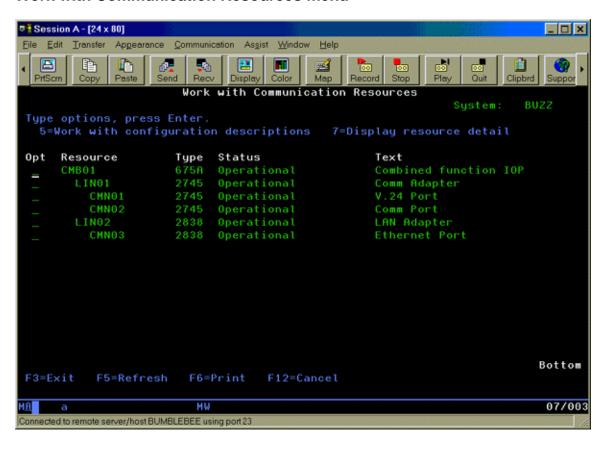
AS/400 Main Menu







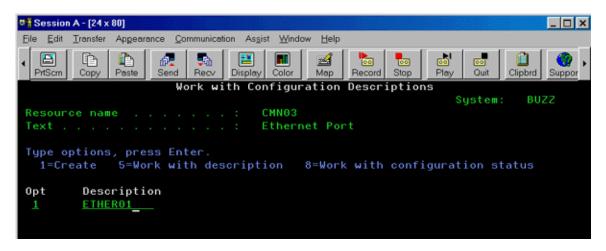
Work with Communication Resources menu







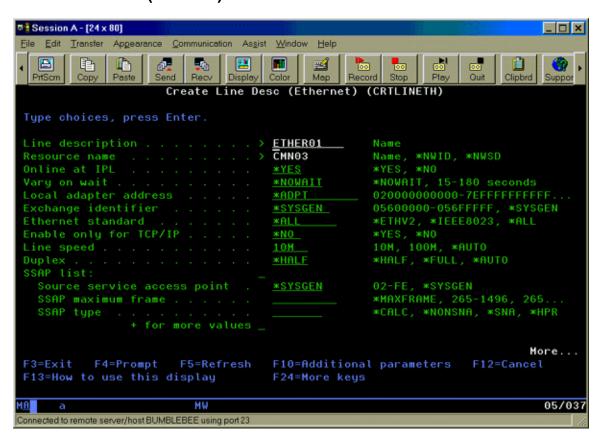
Work with Configuration Descriptions menu







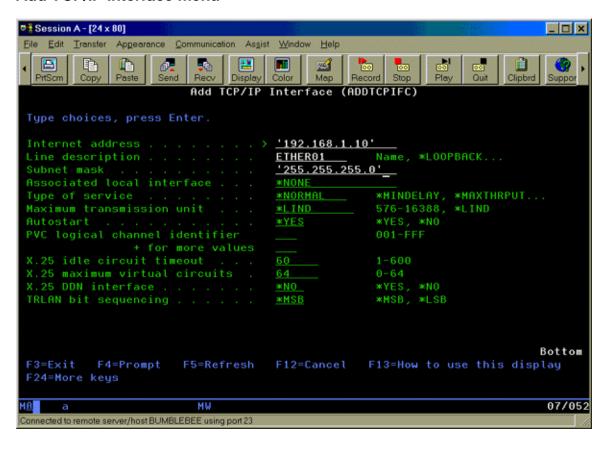
Create Line Desc (Ethernet) menu







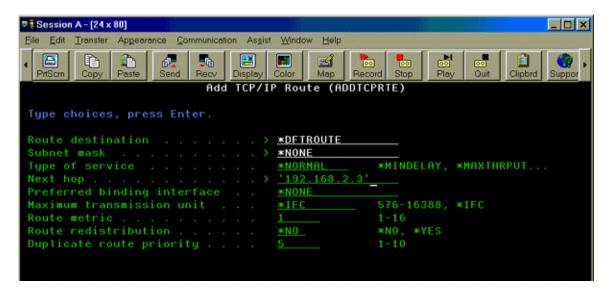
Add TCP/IP Interface menu







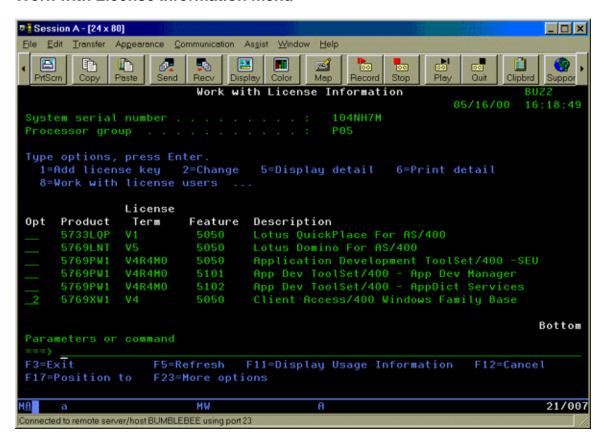
Add TCP/IP Route menu







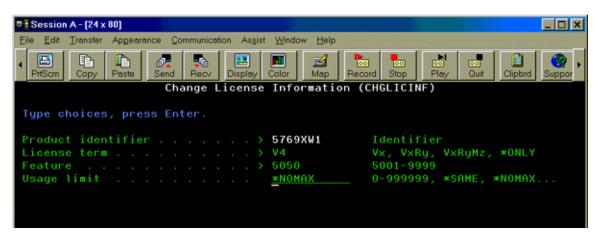
Work with License Information menu







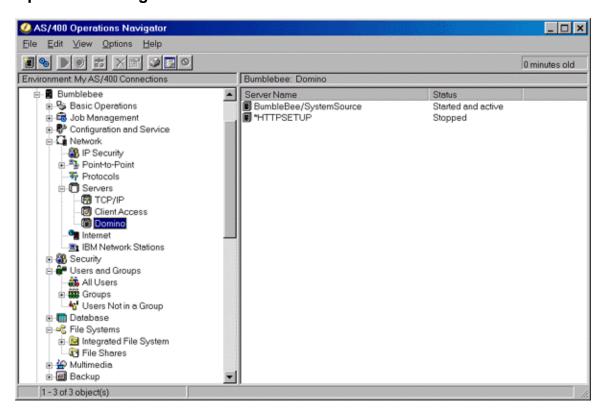
Change License Information







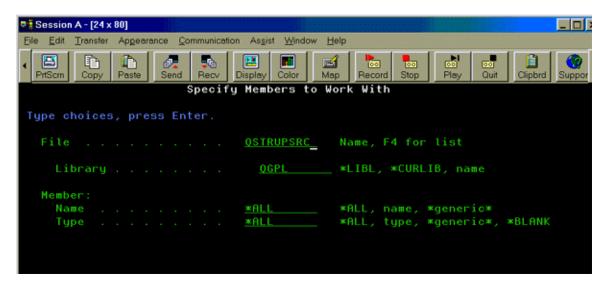
Operations Navigator







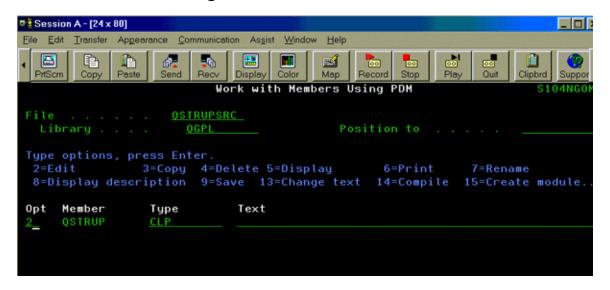
Specify Members to Work With







Work with Members Using PDM







STRPDM exit confirmation sidebar

