The Integrated IBM Suites for Windows NT: A Powerful Package

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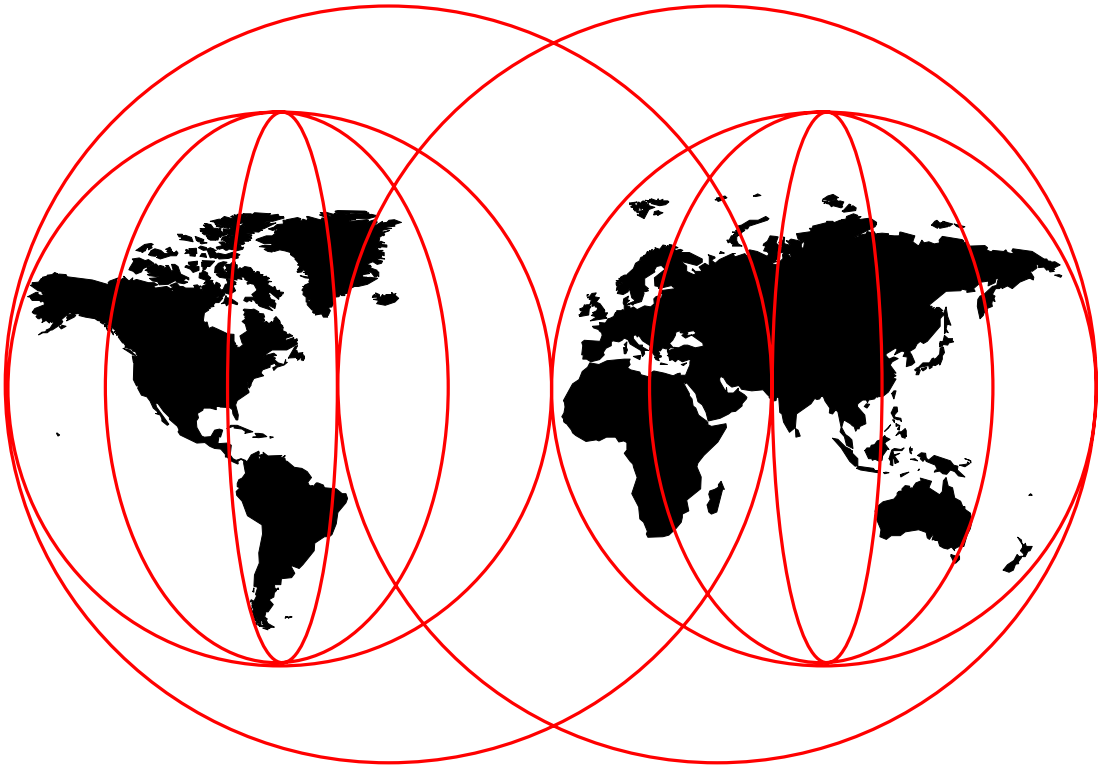

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June 1998

Take Note!

Before using this information and the product it supports, be sure to read the general information in Appendix E, “Special Notices” on page 459.

First Edition (June 1998)

This edition applies to Version 1 of the IBM Enterprise Suite for Windows NT for use with the Windows NT Operating System.

Note

This book is based on a pre-GA version of a product and may not apply when the product becomes generally available. We recommend that you consult the product documentation or follow-on versions of this redbook for more current information.

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Preface

This redbook provides an overview of the new IBM Enterprise Suite for Windows NT as well as shows how to implement the suite in various environments. A step-by-step approach to installing all of the components in the suite is provided as well as examples of how to integrate the components together to provide some sample solutions. Examples are provided to show the installation and customization in three different environments: a new install, a migration from previous IBM software server versions and installation on a system that already has Microsoft-based software servers.

This book shows you the benefits of having multiple servers installed on the same system. It also helps you with the setup of a 3-tier environment using Domino to access a back-end DB2 database. There are also lots of configuration files that are provided to help guide you through the scenarios. The chapters in this redbook focus on:

1. Overview of the suite and the ITSO environment
2. Installation of the suite components
3. Migration and coexistence
4. Tools and utilities
5. A database solution
6. A transaction-oriented solution

The Team That Wrote This Redbook

This redbook was produced by a team of specialists from around the world working at the Systems Management and Networking ITSO Center, Raleigh.

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IBM RTP

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Chapter 1. IBM Enterprise Suite for Windows NT Environment and Overview

This chapter provides an overview of the IBM Enterprise Suite for Windows NT offering as well as details of the software and hardware environment used for this project.

1.1 What Is IBM Enterprise Suite for Windows NT?

As part of a new effort to integrate and package many different software servers, IBM is providing a new software offering called, *IBM Enterprise Suite for Windows NT*.

The suites consist of a selection of the latest versions of the many market-leading IBM products available today on the NT platform. They are designed to help enterprises and departments integrate NT with both the Internet and existing corporate applications. This should help address technical challenges while protecting existing IT investments. It makes it easier for companies to buy and install IBM's key NT software products and reduces the cost of training by using existing skills. It also complements NT with a complete set of management tools.

There are three different versions of the NT Suites that package different components together. The one that we address in this book is called the *IBM Enterprise Suite for Windows NT* and has the following components:

- ADSM Server V3.1.1
- TXSeries V4.2
- Lotus Domino V4.6.1
- Intel LANDesk Management Suite V6.1
- TME10 LAN Access V1.1.1
- DB2 Universal Database Workgroup Edition V5
- DB2 Connect Enterprise V5
- Net.Data V1.0.12
- MQSeries V5
- Communications Server V5.01
- Netscape Navigator V4.04

These products work together on one or more servers and are installed with the *installation program*. While the licensing agreement for the package provides for everything to be installed on one physical system, it is likely that the servers will be installed on multiple servers (possibly Netfinity servers) in a distributed environment.

IBM Enterprise Suite for Windows NT has been designed to assist customers to quickly deploy applications on the Windows NT platform by making the software solution implementations quicker and less complex. It meets four distinct requirements:

1. Internet capabilities to extend the reach of the enterprise to customers, suppliers, business partners and remote workers.
2. Data management to unlock corporate information resources and exploit them more effectively.
3. Systems management capabilities to ensure that everything runs smoothly and integrated and reduces time spent on administration tasks.
4. Connectivity services to integrate NT-based applications with existing enterprise services such as hosts and UNIX systems.

The Internet is evolving into the way businesses do business. This could be linking to suppliers or extending departmental information to remote workers, or it could encompass the road warriors who make up the mobile work force.

The IBM Enterprise Suite for Windows NT provides a solid foundation to support e-business and data management solutions across organizations and across geographies.

There are a growing number of highly complex e-business applications that use NT as the gateway to highly sensitive data and applications held in the data center. These include customer self-service and supply chain integration solutions as well as corporate intranets. The IBM Enterprise Suite for Windows NT includes Lotus Domino Server and DB2 Universal Database products to enable rapid development of multimedia Web-based applications with access to back-end data. This allows departments to rapidly develop and deploy applications so they can quickly start to enjoy a return on their investment.

IBM Enterprise Suite for Windows NT also includes system management functions. In addition, ADSM ensures secure and rapid backup of valuable files and data. The eNetwork Communications Server provides access to the Internet as well as data held on enterprise servers elsewhere in the organization's intranet.

In addition, the IBM Enterprise Suite for Windows NT also offers MQSeries to guarantee delivery of asynchronous communications messages and allow the integration of data from multiple applications.

IBM's proven TXSeries enables transaction-based processes to be integrated into e-business applications.

1.1.1 Product Descriptions

A short description of each product follows:

- ADSM Server V3.1.1

  ADSM Server is an integrated unattended backup and restore, archive, hierarchical storage management and disaster recovery planning application. ADSM has been designed to simplify the complexity involved in storing and managing data across today's open, multi-platform client/server enterprise networks.

  It supports over 20 multi-vendor platforms, most major databases and applications and a broad range of protocols and devices. ADSM is used enterprise-wide and can be configured to automate storage management functions such as online hot backup for leading databases and applications.

These include: DB2, Oracle, Sybase, Informix, SQL Server, Lotus Notes and SAP/R3 (see http://www.storage.ibm.com/software/adsm/adsmhome.htm).

- TXSeries V4.2

  Transaction Series coordinates and integrates the functions of multiple application servers; it allows applications to run anywhere, any time.

  TXSeries provides a distributed Transaction Processing Monitor solution with APIs to CICS and ENCINA.

  IBM TXSeries provides you with a choice of two types of transaction processing solutions for Windows NT: CICS, the most popular transaction processing product in the world, and Transarc's innovative Encina distributed transaction processing technology. With IBM TXSeries, you can create a distributed client/server environment with all the reliability, availability and data integrity required for online transaction processing (OLTP) and business-critical applications.

  IBM TXSeries provides an application-oriented infrastructure for simplified development and single image system management production of client/server applications. It integrates key disciplines, such as relational database management systems (RDBMS), messaging and queuing technology and objects. In addition, TXSeries applications offer choice and flexibility of platforms, components and programming languages.

  Also see:

  - http://www.software.ibm.com/ts/txseries/
  - http://www.software.ibm.com/is/sw-servers/transaction
  - http://www.software.ibm.com/ts/cics/

- Lotus Domino 4.6.1

  Lotus Domino is an applications and messaging server with an integrated set of services to let you easily create secure, interactive business solutions for the Internet, corporate intranets and extranets. Lotus Domino allows you to rapidly build, deploy, and manage applications that help coordinate critical business activities online. It also supports a variety of client and server platforms including Web browsers, Notes clients, POP3 and IMAP4 mail clients (see http://www.lotus.com).

- DB2 Universal Database Workgroup EditionV5

  DB2 Universal Database (UDB) Version 5 is IBM's relational database server solution for the UNIX, OS/2 and Windows NT operating environments. It was released in September 1997 as a merged and enhanced release of its two successful predecessor products, DB2 Common Server V2.1 and DB2 Parallel Edition V1.2.

  With DB2 Universal Database you can support applications from business intelligence to transaction processing with a single database. It can also easily Web-enable enterprise data for your intranet or the Internet extending the reach of applications (see http://www.software.ibm.com/data/db2/).

- DB2 Connect Enterprise V5

  DB2 Connect includes the Client Application Enabler, DB2 ODBC Driver, Control Center and a Client Configuration Assistant (see http://www.software.ibm.com/data/db2/).

- Net.Data V1.0.12

  Net.Data enables Internet and intranet access to relational data on a variety of platforms, for example, DB2 UDB (see http://www.software.ibm.com/data/net.data/).

- MQSeries V5

  MQSeries is a family of messaging products which provides an open, scalable industrial-strength messaging information backbone that connects programs across a large number of IBM and non-IBM platforms. MQSeries has one interface for application location transparency that allows you to integrate newly developed NT applications into larger networks, no matter how many different platforms or network protocols are involved (see http://www.software.ibm.com/ts/mqseries/ or http://www.software.ibm.com/ts/mqseries/platforms/nt/).

- Communications Server V5.01

  The IBM Communications Server for Windows NT provides a powerful multiprotocol gateway and workstation communication services. It enables personal computers to communicate with System/390 and AS/400 hosts as well as other personal computers. It also allows SNA and sockets-based TCP/IP applications to run, unchanged, over both SNA and TCP/IP communication networks.

  The IBM Communications Server for Windows NT also provides TCP/IP users easy access to 3270 applications with its TN3270E support and provides Web browsers easy access to 3270 applications with IBM Host On-Demand, a Java-based tool. For easy server administration, the IBM Communications Server for Windows NT includes an easy to use, Web-based, cross-server administration tool enabling remote administration of multiple servers.

  For client/server and distributed applications, the IBM Communications Server for Windows NT includes support for High Performance Routing (HPR), Advanced Peer-to-Peer Networking (APPN) nodes and end nodes. The IBM Communications Server for Windows NT also supports a rich set of application programming interfaces as well as a broad range of wide area network (WAN) and local area network (LAN) connection types, protocols and adapters.

  Remote Administration Client transforms an NT workstation or server into a remote console for configuring and managing your Communication Servers.

  Web Administration allows you to manage the Communication Servers over the Web.

  Host On-Demand is a Java-based solution that provides TN3270 emulation from a Web browser.

  Personal Communications is the 3270 and 5250 emulators. This package only contains an entry-level version of Personal Communications. The full version also includes the protocol stack.

  SNA API clients are provided for Win NT, 95, 3.1x and OS/2. They enable the usage of SNA APIs on a workstation (see http://www.networking.ibm.com/cms/commserv.html or http://www.networking.ibm.com/pcf/pcfprod.html).

- Intel LANDesk Management Suite V6.1

The Intel suite helps enhance the IBM Enterprise Suite for Windows NT solution by providing some additional systems management information for Windows NT and for Novell NetWare in the area of asset management. In addition, it helps perform software distribution, software metering, inventory, monitoring and remote control. All of these functions can tie into the Tivoli Framework through Tivoli LAN Access.

- Tivoli LAN Access V1.1.1

  Tivoli LAN Access provides an interface to manage the LANDesk environement (it can also manage SMS and Netfinity).

- Netscape Navigator V4.04

  The Netscape Navigator is provided as a Web browser to help with many of the systems administration functions that the IBM Enterprise Suite for Windows NT components provide.

1.2 The IBM Enterprise Suite for Windows NT Environment

The rest of this chapter outlines the setup environment for the scenarios we discuss in Chapter 4, “Integration Scenario - Database” on page 159 and Chapter 5, “Integration Scenario - Transactions” on page 243. The scenarios are designed to illustrate how the IBM Enterprise Suite for Windows NT product set can be installed and configured in an integrated environment.

1.2.1 Hardware Considerations

This section shows you what hardware we used and gives you an idea on what hardware you should install to use many of the IBM Enterprise Suite for Windows NT features.

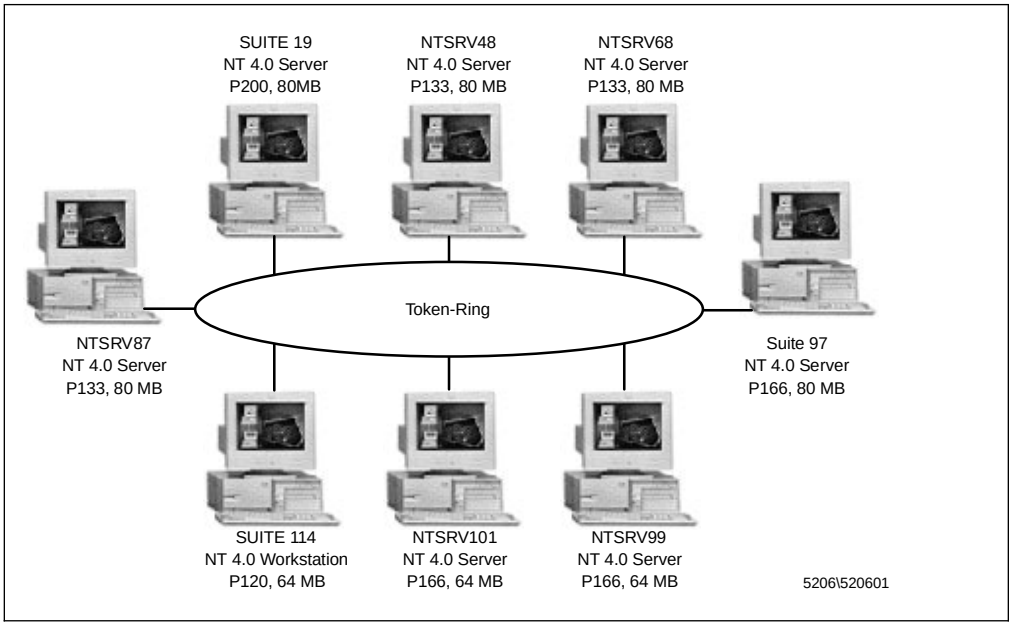


Figure 1. Hardware Environment

Note: If you want to install the IBM Enterprise Suite for Windows NT on a new machine, you should plan the security level for the disk drives. We

recommend that you use RAID-1 (mirroring) or RAID-5 for your server machine.

1.2.2 Software Considerations

For a base platform on each machine, we used Microsoft NT 4.0 Server with Service Pack 3. All of the examples are based on SP3 since that is the prerequisite level of code for this packaging. There are a few hot fixes (post SP3) and they should be installed if they apply to your environment. In addition, Service Pack 3 is required for the installation of Microsoft Internet Explorer 4.x.

In addition, on each machine we configured the NetBIOS and TCP/IP protocol. Since most networks use some combination of NetBIOS and TCP/IP we pre-configured our environment to have both. We did not use any NetWare servers so we left IPX unconfigured.

There were problems with IBM AntiVirus Version 2.x. If you have this product already installed, please remove it from the system before you start the installation of the IBM Enterprise Suite for Windows NT or upgrade it to Version 3. With the current version of IBM AntiVirus, Version 3, we didn't have any problems.

1.2.3 Install the IBM Enterprise Suite for Windows NT on a New Server

When you install a new NT server you need to decide if you are going to configure it as a primary domain controller, a backup domain controller or just a server. The main difference between a domain controller and an NT Server is that a domain controller holds the domain controller database (DCDB) in addition to the local user and rights database. This DCDB holds the entire user and rights database for the entire domain. You can only have one primary domain controller (PDC) in the entire domain, but you can have several backup domain controllers (BDC).

If it's the first NT 4.0 Server in your environment, you should set it up as a primary domain controller.

In Chapter 2, “Installation” on page 9 we show how to install IBM Enterprise Suite for Windows NT.

1.2.4 Install the IBM Enterprise Suite for Windows NT on a Running Server

Before you can install IBM Enterprise Suite for Windows NT you have to determine which products are currently on the machine. A simple way to do that is to open the Add/Remove Programs icon in the NT Control Panel.

Note: The IBM Enterprise Suite for Windows NT installation program performs prerequisite checking for the products contained in the suites. The reason you should check to see what is already on your system is due to the fact that you might be upgrading some components

In Chapter 3, “Migration and Coexistence” on page 127 we show how to install IBM Enterprise Suite for Windows NT on a running server with back-level products or products with similar functions.

To take a quick look at what products are already installed you can click on **Start, Settings** and **Control** followed by double-clicking on **Add/Remote Programs**.

Figure 2. Control Panel

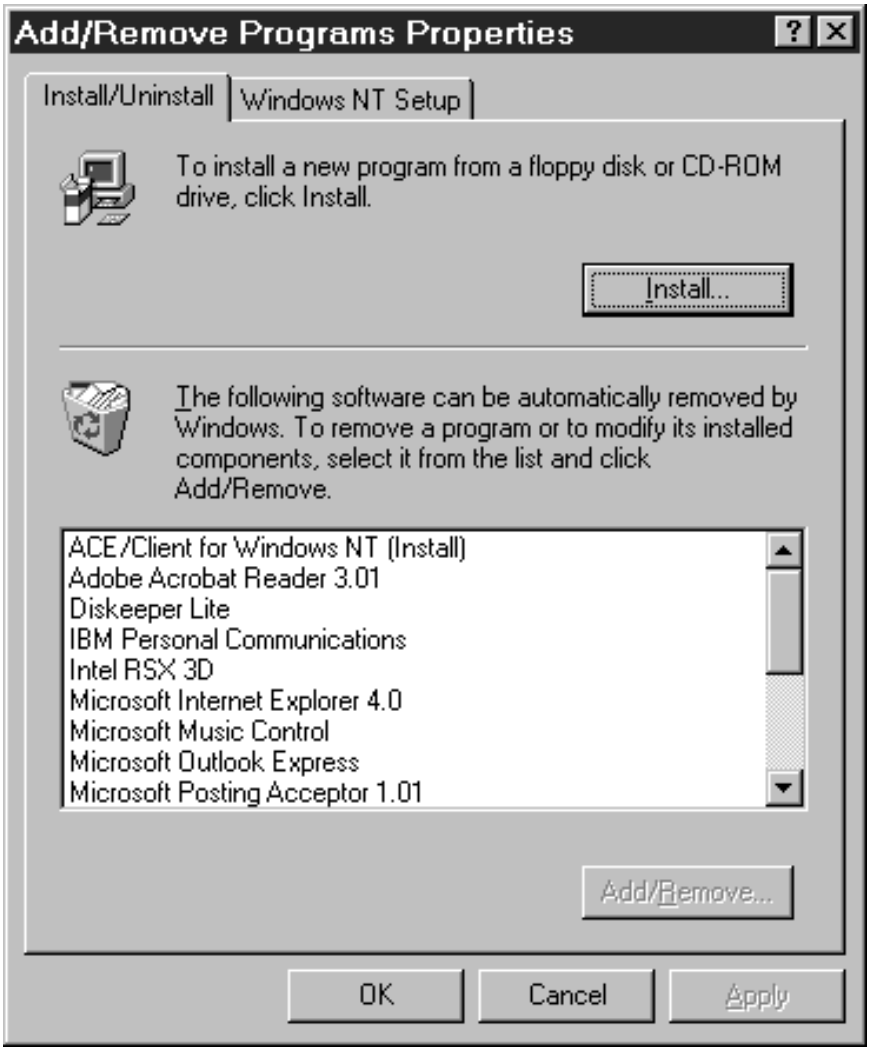


Figure 3. Add/Remove Programs

In addition to installing the base software platform of Windows NT and its maintenance (Service Pack 3), we needed to install a few other products. The products we installed were Netscape Navigator, Microsoft's Internet Explorer and the Microsoft Option Pack. The browsers were needed for our scenarios, and the MS Option Pack was used in our migration section where we migrated from a Microsoft environment to an IBM Enterprise Suite for Windows NT environment.

Note: If the Windows NT Option Pack is installed, it could update the ODBC level to 3.5. This is a problem for two of the components in IBM Enterprise Suite for Windows NT. Both DB2 and Intel LANDesk require ODBCs level to be at 3.0.

Please refer to 2.16, “Installation of the Netscape Navigator V4.04” on page 97 for the installation of the Netscape Navigator and to Appendix A, “The Microsoft Windows NT V4.0 Option Pack” on page 371 for the installation of the Microsoft Option Pack.

The decision point on whether or not you need Netscape Navigator or Microsoft Internet Explorer is not an easy one to answer. If you are planning on installing Microsoft products such as the Option Pack you need to install the Internet Explorer 4.01 as a prerequisite. There will probably also be future products that will have that browser as a prerequisite. Therefore, many people will choose to install both browsers on the same machine (as we did), to remove any limitations or restrictions. The versions that we installed were:

- Netscape Navigator V4.04
- Internet Explorer V4.01

As there are no other restrictions, the user can decide which browser they want to use.

1.2.5 Microsoft Windows NT V4.0 Option Pack

Microsoft provided the Option Pack as an add-on to Windows NT 4.0 Server.

This Option Pack CD included the Internet Information Server 4.0, MS Transaction Server 2.0, MS Message Queue Server 1,0, Internet Connection Services for MS RAS and a few other small applications such as an Index Server and an administration tool.

The Option Pack CD also includes the NT 4.0 Service Pack 3, but you need to install SP3 first. The next step is the installation of the Internet Explorer 4.01 and if you want to install the MS Message Queue Server you need to install the Microsoft SQL Server 6.5.

You don't need a fixpack for the SQL Server 6.5 to install the Option Pack.

A.1, “Installation of Microsoft Windows NT V4.0 Option Pack” on page 371 shows the steps to install the MS Option Pack for the NT 4.0 Server.

Chapter 2. Installation

This chapter begins the technical introduction into the installation of the IBM Enterprise Suite for Windows NT package. The main objectives of this chapter are to:

- Highlight prerequisites for the IBM Enterprise Suite for Windows NT installation and discuss software and hardware requirements, including a worksheet.
- Discuss IBM Enterprise Suite for Windows NT installation.
- Describe files that are built or modified during the installation.
- Show you how to uninstall IBM Enterprise Suite for Windows NT.

2.1 Hardware Prerequisites

Below are the minimum system requirements needed to install at least one component from IBM Enterprise Suite for Windows NT. The disk space required will depend on your environment configuration; however, to give you an idea see Figure 9 on page 15.

- Intel Pentium Pro 200 MHz Processor with 512 KB Cache or Pentium II 233 MHz or above.
- Minimum of 64 MB RAM but 128 MB RAM recommended
- 200 MB hard disk space plus 10 MB on startup drive for temporary use

The files in the temporary directory are erased after the installation completes. That location is determined by your %temp% environment variable.

2.2 Software Requirements

The following list of products and fixes are required to be installed on your machine before you install IBM Enterprise Suite for Windows NT:

- Microsoft Windows NT Server 4.0.
- Service Pack 3 must be applied.

Before installing, ensure that:

1. All running programs are stopped.
2. All older versions of the components you are installing on the server are stopped.
3. You are logged on with Administrator access on an ID with less than 8 characters.
4. Your installation drive is formatted as NTFS for TXSeries.
5. When installing Intel LANDesk Management Suite and DB2 UDB on the same physical machine, you need to either install them on the same logical drive or install them on drives of the same type. This could be NTFS or FAT.

IBM Enterprise Suite for Windows NT should be installed on NT Server and not on a Primary Domain Controller or a Backup Domain Controller.

2.2.1 IBM Enterprise Suite for Windows NT Product Interdependencies Matrix

The following table will help you to determine product interdependencies prior to installing IBM Enterprise Suite for Windows NT.

Table 1. IBM Enterprise Suite for Windows NT Product Interdependencies

NT Suite Component	Dependencies
ADSM	None
Communications Server	• If Personal Communications exists on the server, you must uninstall it before you can install Communications Server. • If you have an existing level of Communications Server installed, you will be prompted to uninstall it during the installation of the IBM Enterprise Suite for Windows NT version of Communications Server. • The Host On-Demand component requires a Webserver to function. If you do not have a Webserver installed (MS/IIS, Domino, or Netscape), you must manually configure Host On-Demand after it is installed. Otherwise, you can automatically configure it from your installed Web server at installation time of HOD. • Host On-Demand administration requires a Java-capable browser. Since the version of Internet Explorer that comes with Windows NT 4.0 is not Java-enabled, you must install either Netscape Navigator 4.0, which is included with IBM Enterprise Suite for Windows NT or another Java-enabled browser such as Internet Explorer 4.0.
DB2	None
DB2 Connect	None
MQSeries	None
Lotus Domino Server	None
Net.Data	None
Netscape Navigator	None
TXSeries Server	None
Intel LANDesk Management Suite	Requires DB2 UDB

2.3 Installation Program

The installation program is what you will use to install your software. This will allow you to choose the components you want to install and guide you through the installation process. The installation program will allow you to install the following components:

- ADSM Server
- eNetwork Communications Server

- DB2
- DB2 Connect
- MQSeries
- Lotus Domino
- Net.Data
- TXSeries
- Intel LANDesk Management Suite
- TME 10 LAN Access (installed separately)
- Other Products (Netscape Navigator)

The CDs in the IBM Enterprise Suite for Windows NT packet are labeled as follows:

- 1-1: Installation Programs, Netscape Navigator, TXSeries documentation
- 2-1 and 2-2: IBM Communications Server V5.01
- 3-1: IBM DB2 Universal Database Workgroup Edition V5.0
- 3-2: IBM DB2 Universal Database Workgroup Edition V5.0 Fixpak
- 4: IBM Adstar Distributed Storage Manager V3.1.1.0 and Net.Data V1.0.12
- 5-1 through 5-5: Lotus Domino 4.6.1
- 6: IBM DB2 Connect Enterprise Edition V5.0
- 7: IBM MQSeries V5.0
- 8: IBM TXSeries V4.2
- 9: Intel LANDesk Management Suite V6.1

2.3.1 Pre-installation Tasks

Before you start the installation program, you must be logged on to your machine with NT system administration authority, on an ID that is less than 8 characters in length. To find out what rights your user ID has, click on **Programs, Administrative Tools** and **User Manager for Domains**. Once the User Manager is open, highlight the username that you want to start the installation program under. When you click on the highlighted username twice, this will bring up a User Properties box. From the User Properties box, click on the **Groups** box and verify that the username is part of the administrators group. Another way to verify what rights your user ID has, is shown in the following procedure:

1. Access an NT command prompt.
2. Issue the command `net user ntadmin > C:\tmp\rights.out`.

   Note: Any user ID can be used in place of ntadmin; rights.out is an arbitrary name that can be given to the text file.

3. View the file (rights.out). We viewed our file using Notepad.

```
User Name                    NTADMIN
Full Name
Comment                      NT Administrator ID (8 Characters)
User's comment
Country code                 000 (System Default)
Account Active               Yes
Account Expires              Never

Password last set            2/13/98 12:16 PM
Password expires             Never
Password changeable          2/13/98 12:16 PM
Password required            Yes
User may change password     Yes

Workstations allowed         All
Logon script
User profile
Home directory
Last logon                   2/13/98 12:22 PM

Logon hours allowed          All

Local Group Memberships      *Administrators

Global Group memberships     *Domain Users        *Domain Admins
The command completed successfully
```

Figure 4. rights.out Text File

Once you have verified that your user ID has NT Administrative authority and that you are logged onto an ID that is less than 8 characters in length, you should review the readme file that is included with the installation program. This is where the latest information about the product is kept.

2.3.2 IBM Enterprise Suite for Windows NT Installation Notes and Observations

The installation program assists in the installation of the server components contained within the suite. The installation program presents a panel to select components to install, and then prompts the installer for the CD-ROMs as needed. The installation program will check for product dependencies, so if you install the products with the *Individual* process, it will warn you about other corequisities and prerequisities. Before you start any of the server installations, you should take a moment to review the requirements and implications of installing the software that you want. We strongly suggest you refer to Table 1 on page 10 for planning purposes.

The server installations will begin after the installation program is finished setting up. You will be prompted for the appropriate CDs for the servers that you selected. The remainder of this chapter is dedicated to covering this information and is divided into sections based on the individual server components.

To start the installation, simply insert the CD-1 into your CD-ROM drive and the Windows NT autorun function should start the installation. You will get a welcome screen.

Note: If you have previously disabled autorun, you will have to start the installation manually. The program to run on the CD is: `CDDRIVE\install\enu\setup.exe`.

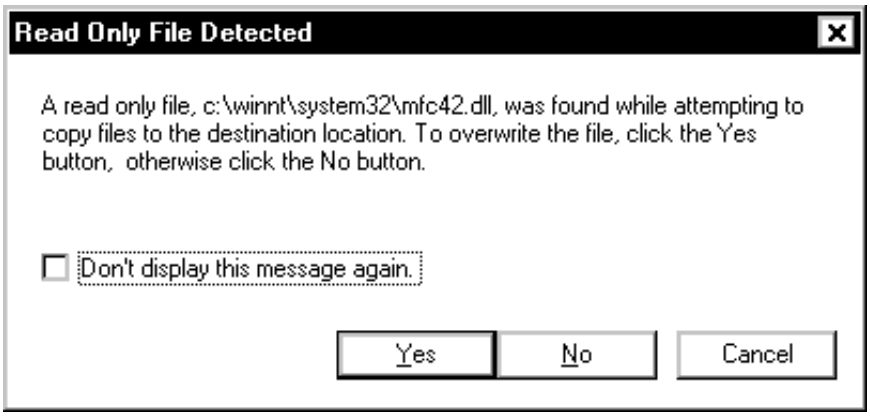


Figure 5. Read Only File Warning

Click on **Yes** if you receive the Read Only file warning message.

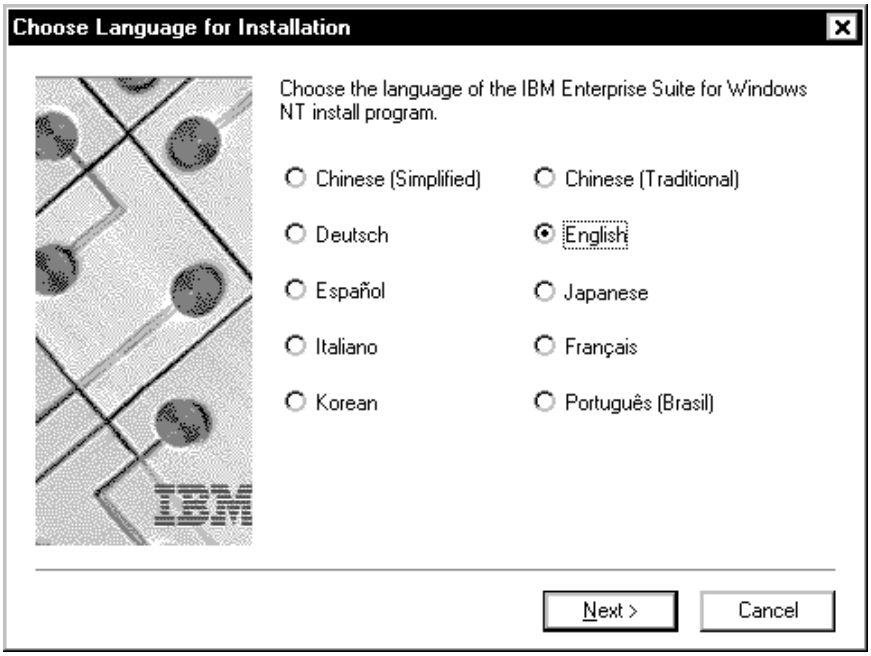


Figure 6. Select Language

Select the desired language for the installation. This language will be used during the entire installation process.

Click on **Next** to proceed.

Click on **Next** on the license window.

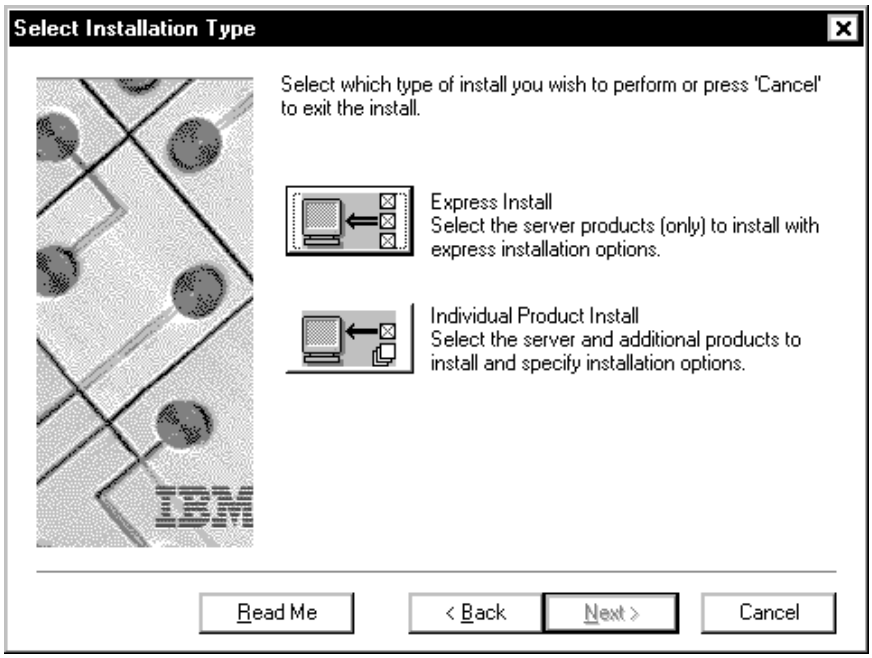


Figure 7. Select Installation Type

The installation process gives you two choices for installation:

1. Express Install

   This process allows you to select the software components you want and install them with default installation options. All component files are installed on a single drive.

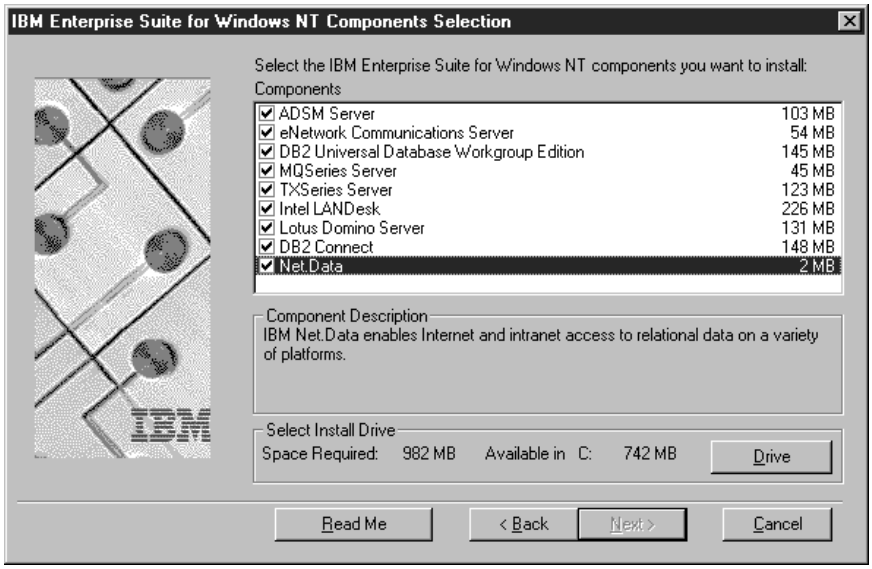


Figure 8. Express Setup Menu

2. Individual Product Install

   This is a custom installation and it allows you to select the desired components and specify any installation options. You will select the drive to be used to manage the IBM Enterprise Suite for Windows NT. When the other products

are installed, you will be able to select the installation drive for each component.

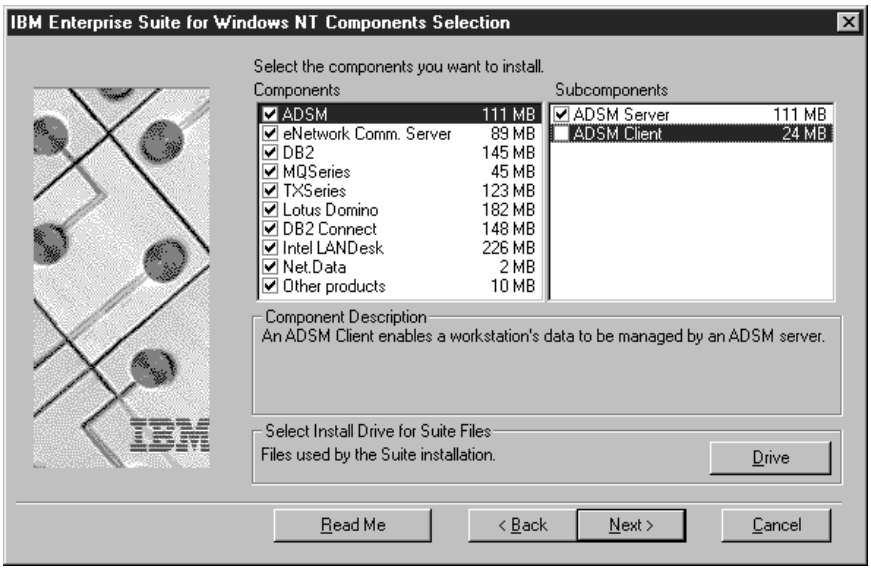


Figure 9. Individual Product Install

The installation program will create installation files and logs for each component selected for installation and create the IBMNT directory with the appropriate subdirectories for each of the products chosen.

For our examples, we used the individual product install (custom install) process.

Click on **Drive** to select the installation location of the components. Choose the drive and location where you want the Enterprise Suite files to be stored. The default is C:\IBMNT. Since TXSeries requires the drive to be NTFS, that is what we chose. Even without TXSeries, we would have made all of our drives NTFS for security and integrity reasons. Due to security, integrity and the fact that we installed TXSeries we suggest that you use NTFS. While it is not a requirement if you don't use TXSeries it would be easier and safer. To see what your drives are formatted for you can click on **Disk Administrator** located under Administrative Tools or open **My Computer** and click the right mouse button on the drive in question and select **Properties**.

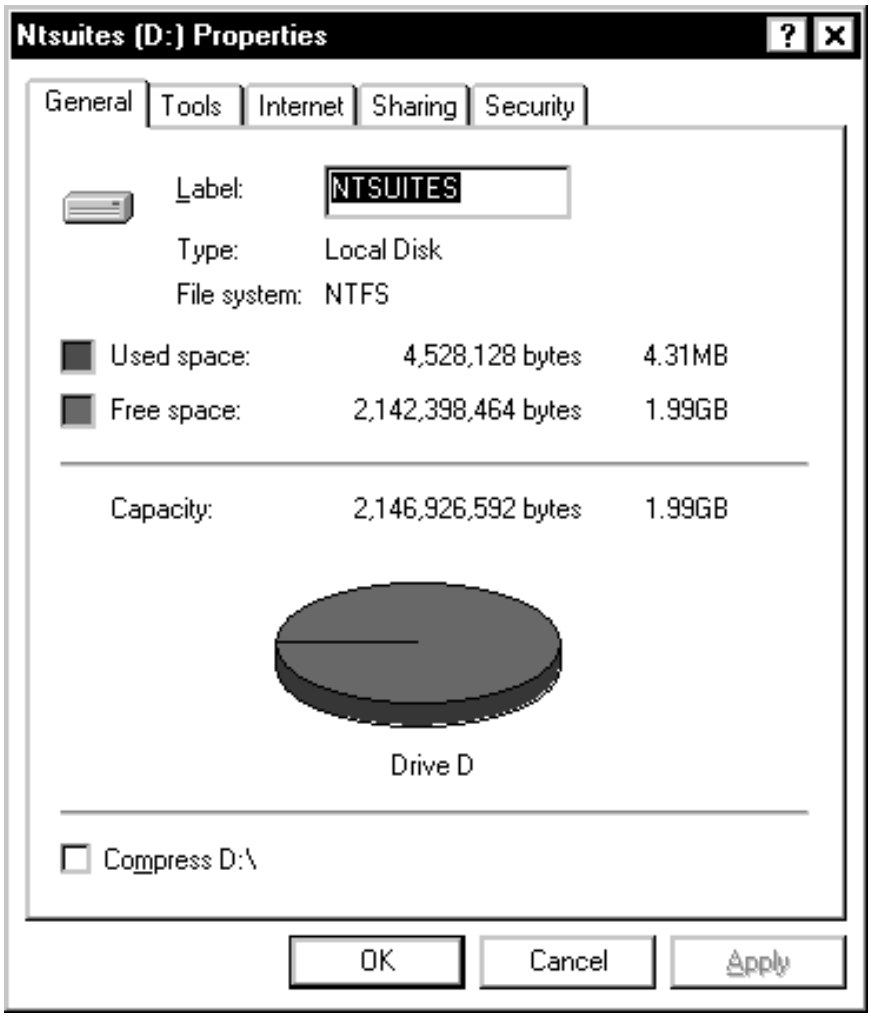


Figure 10. My Computer Drive Properties

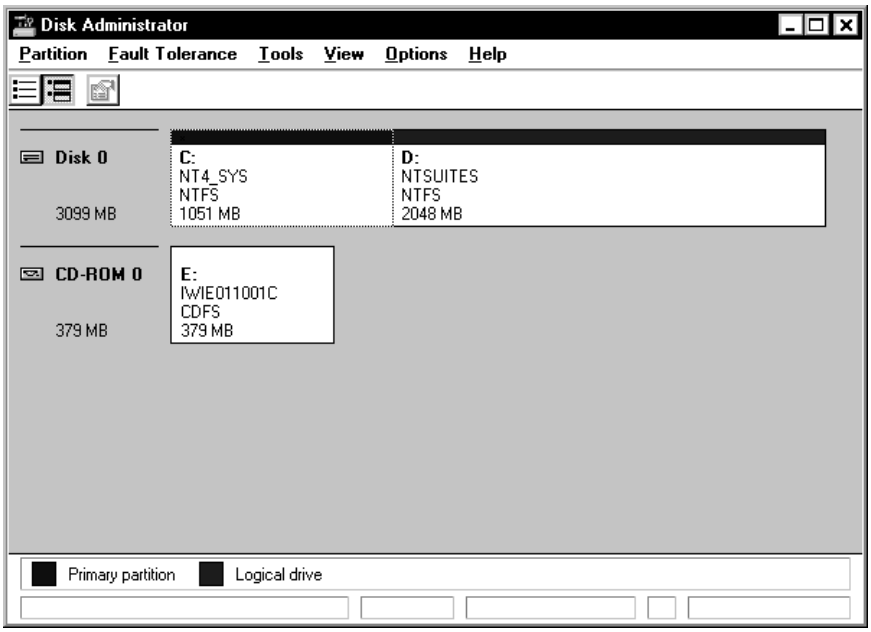


Figure 11. Disk Administrator Drive Properties

Having a drive that is NTFS formatted will provide better performance, allow for disk mirroring, and give you better security. It is mandatory for the installation of IBM Transaction Series.

From the panel shown in Figure 9 on page 15, select the components in the suite you would like to install.

Make sure that the current settings are correct. Double-check in the confirmation box that the installation type and the components that have been selected are the ones you want.

When you are ready, click on **Next**. The installation program will do some preliminary checking for installation discrepancies and issue messages. Here are some examples:

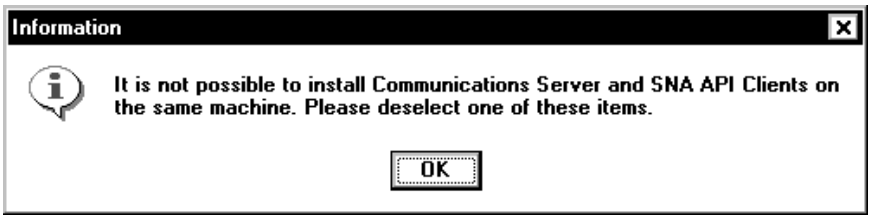


Figure 12. CS/NT and SNA API Clients Conflict

If you selected to install the SNA API Client as well as the server code, then you will get the above message. The message is a bit misleading as you can install the SNA API Client on the same machine, but not during the same install procedure. Once the Communications Server is installed, you can go back and install the SNA API Client manually.

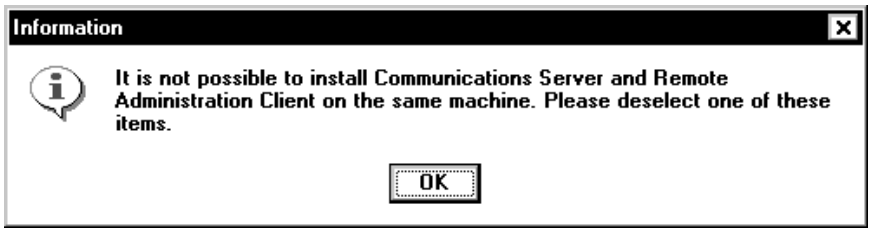


Figure 13. CS/NT and Remote Administration Conflict

Note: You can't have the Communications Server and the Remote Administration Client on the same machine.

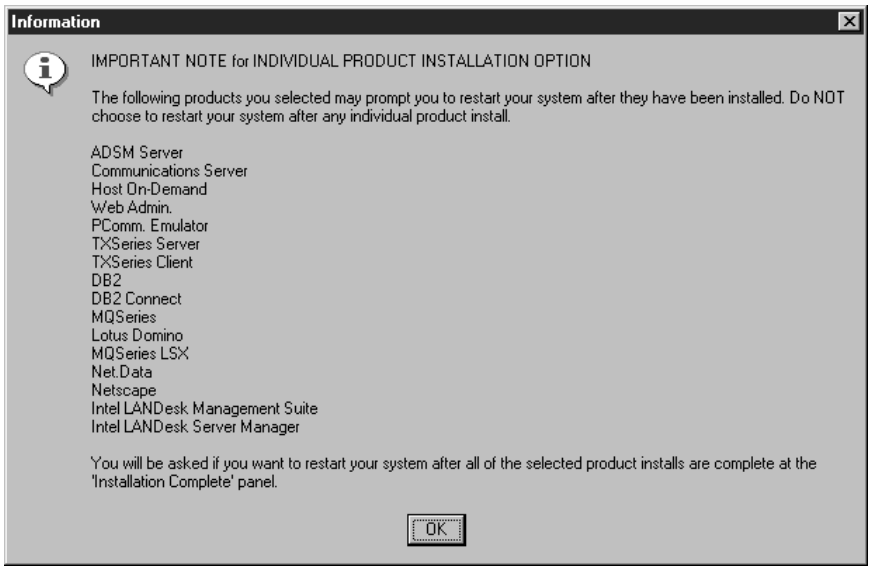


Figure 14. Important Note for Individual Product Installs

Figure 14 provides an important message as it instructs you not to reboot after each product is installed. By using the NT Suites installation program we do not need to reboot after each product is installed. We only reboot at the very end of installation, once all the products have been installed.

Continue with the installation by clicking on **Next**. After the products are installed properly you can view the readme file, view the IBM Suite Solution demo, or just restart your system.

At the end of the installation a 5-MB directory called IBMNT is created in the root directory of your installation path. It contains the online registration program and the uninstall program. In addition, a reference to IBM Enterprise Suite for Windows NT is created in the Start menu of Windows NT. The application pointer can be found by clicking on **Start, Programs** and then **IBM Suite for Windows NT**.

2.4 Installing Using the Express Option

The Express Installation option provides the simplest, quickest installation of the products in the IBM Enterprise Suite for Windows NT. The most common options are chosen and there are very few questions that have to be responded to before the installation proceeds. An example of the install process for the following products are shown here:

- ADSM Server
- Communications Server
- DB2 Universal Database Workgroup Edition

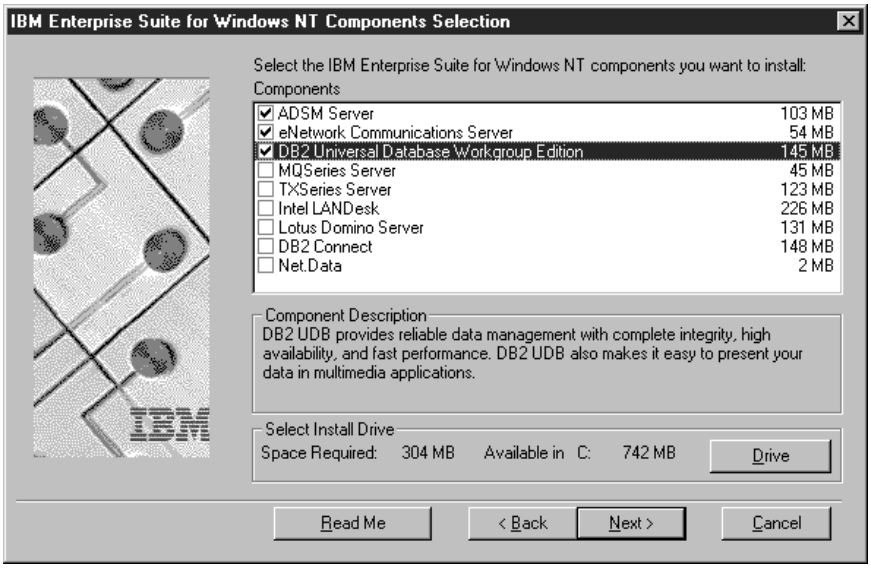


Figure 15. Express Install Sample

As you can see from the list, the products in Figure 8 on page 14 are the only ones available to install from the Express option. There is no option to install the Netscape Navigator, nor can you select which subcomponents of Communications Server to install. Click on **Next** to continue.

After you select the products you wish to install you may see a few warning messages. If you had selected ADSM you will get a prompt that informs you that it is not possible to install the ADSM Server and ADSM Clients on the same machine. You will have to deselect one of them. If you had also selected TXSeries and eNetwork Communications Server you will get a warning that the TXSeries client feature called Host TCP/IP cannot be installed along with eNetwork Communications Server.

Note: It is worth selecting each server component to see what subcomponents are associated with it.

Since there is no customizing of the selections, what components get installed when choosing your selections? In the following table we answer this question.

Table 2 (Page 1 of 2). IBM Enterprise Suite for Windows NT Express Component Installation

Express Component	**What gets installed?**
ADSM Server	ADSM server files, license files, online books, backup archive client files, API files, Webshell files, multimedia files, and ODBC support.
Communications Server	CS/NT base and LLC2 protocol.
DB2 Universal Database Workgroup Edition	DB2 UDB Workgroup Edition, graphical tools, DB2 ODBC driver, documentation. Control Center is autostarted at boot time. A DB2 extension is also installed.

Table 2 (Page 2 of 2). IBM Enterprise Suite for Windows NT Express Component Installation	
Express Component	**What gets installed?**
MQSeries	MQSeries base, clients, toolkit, online doc, bindings for Java and the Internet gateway. MQSeries LotusScript extension is also installed.
TXSeries Server	TXSeries base and server chosen by users at install time (CICS or Encina). The production system is installed. The server runtime and structured file server are installed.
Lotus Domino	Domino base.
DB2 Connect	DB2 Connect Enterprise Edition
Net.Data	Net.Data base.
Intel LANDesk	Management Suite and Server Manager

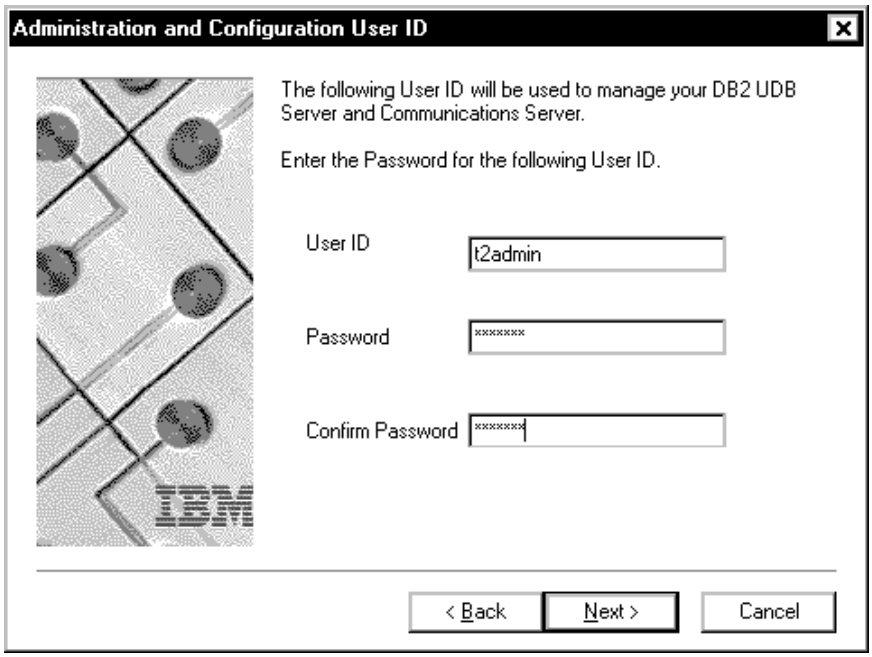


Figure 16. Admin/Config User ID

After choosing, the products show (since we chose DB2) that the installation program prompted us for the DB2 user ID that is used to install it. By default it chooses the user ID you are currently logged on to. Click on **Next** to continue if that is user ID that you wish to use.

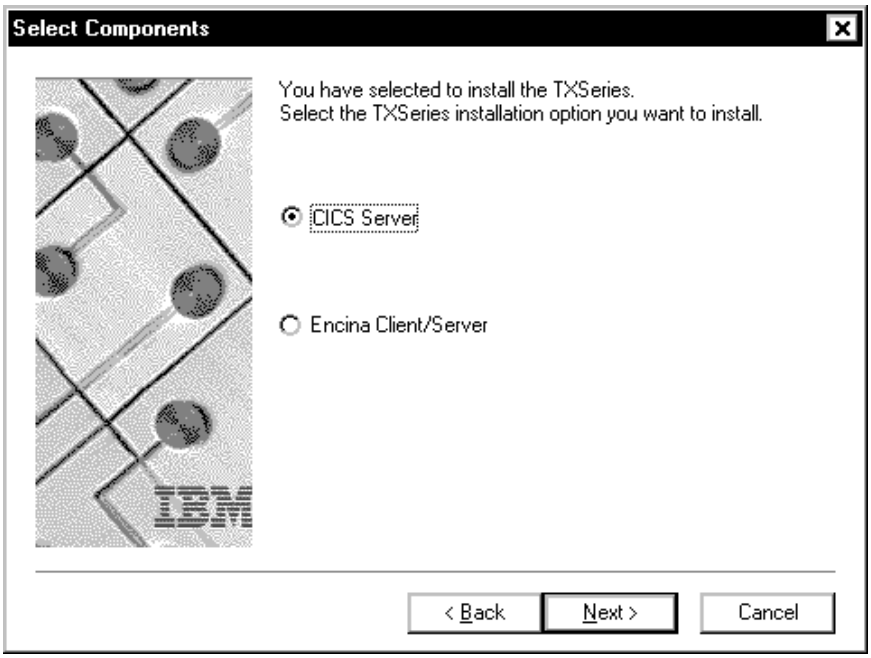


Figure 17. TXSeries Server Component Selection

If you chose the TXSeries from Express Install, you will be prompted to select which server component you wish to select. Make your choice and click on **Next** to proceed.

As with the individual install, you get one last chance to go back and correct anything before the installation starts. Click on **Next** to continue.

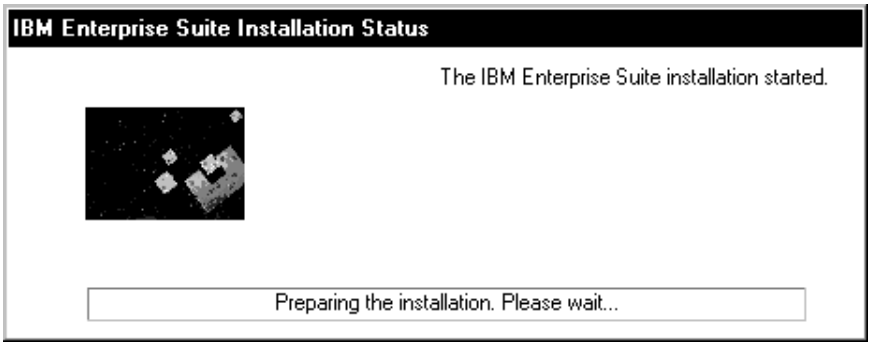


Figure 18. Express Installation Window

The only other prompts we received during the Express Install were for the CDs required.

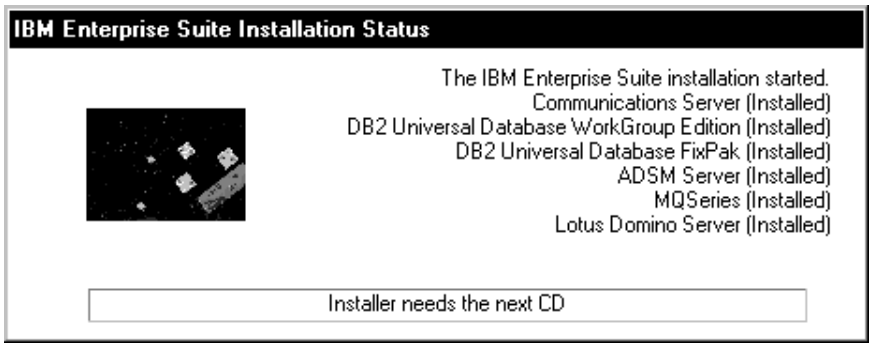


Figure 19. Express Installation Window

As the products install, a graphic icon is updated in the window to show what products have been installed and what product is installing.

Note: There are no interrupt prompts to reboot your machine in between the installation of the individual components of the IBM Enterprise Suite for Windows NT like there are during the Individual Install.

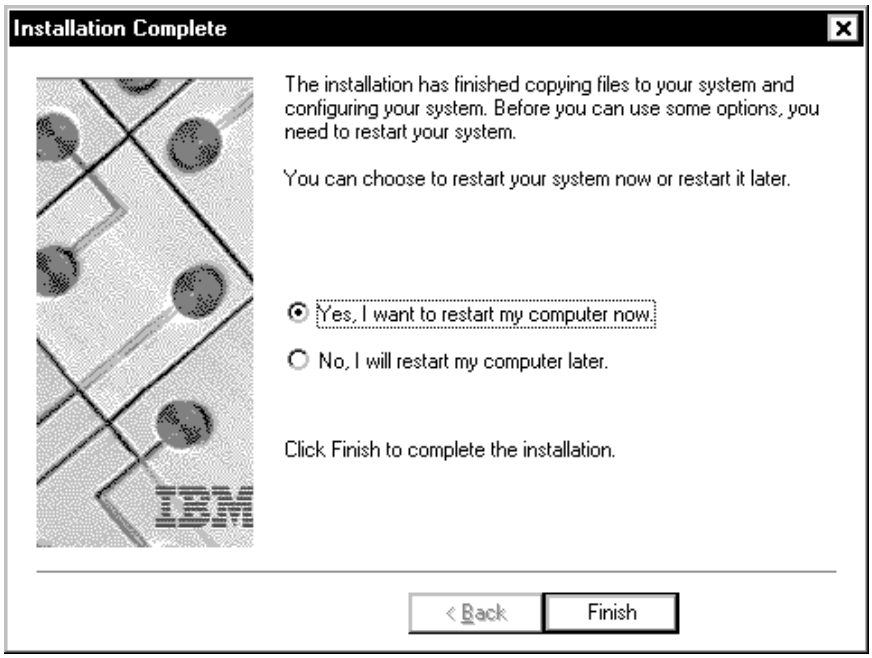


Figure 20. Reboot Screen

When all the products are installed, the installation program will prompt you to restart the computer. At this point, you are ready to reboot and the products are ready to customize and tailor.

2.5 Individual Installs

The rest of the installations in this chapter will be shown using the flow from the individual installs instead of the express option.

2.6 Installing ADSM Server V3.1.1

If you elected to install the ADSM Server, the installation program will prompt you to begin the installation process. During the installation process, there are a few choices that you will need to make regarding the components you want installed.

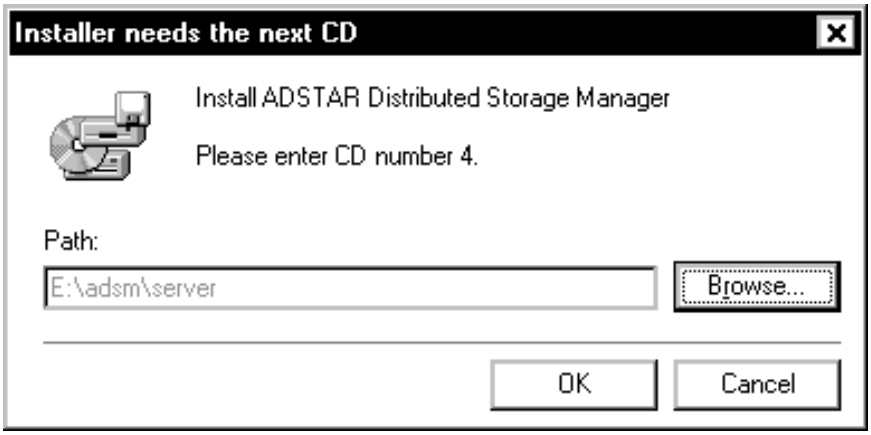


Figure 21. Insert the ADSM Product CD

Click on **OK** and then click on **Next** on the welcome screen.

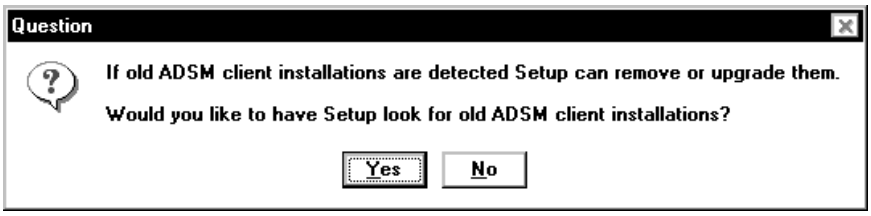


Figure 22. Question To Search for Old ADSM Versions

If you are sure there are no ADSM servers or clients installed on this machine you can click on No. Otherwise, if you are upgrading from a previous release, click on **Yes** so the installation program can search for the previous versions.

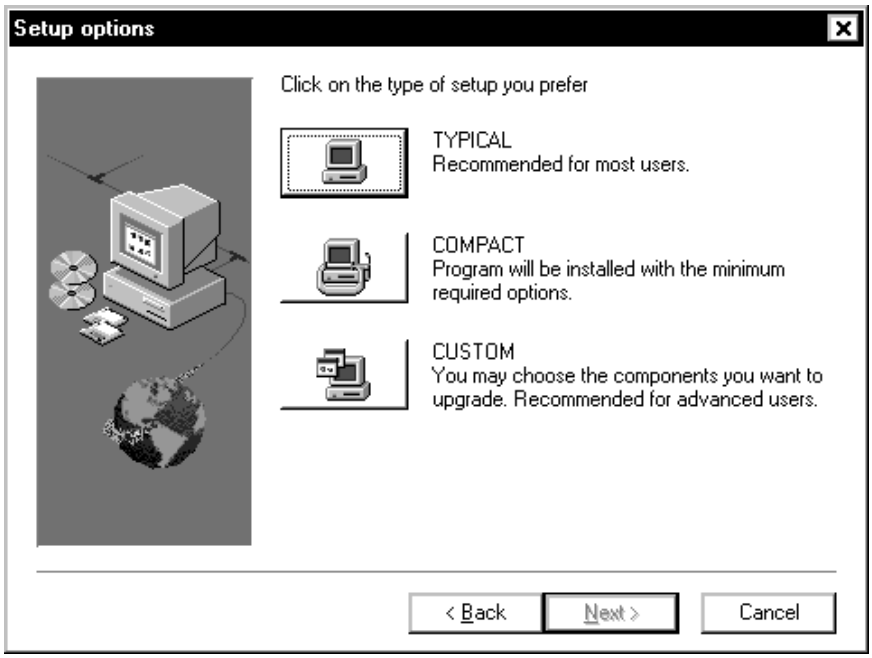


Figure 23. Setup Options

Click on **Custom** to see all of the choices.

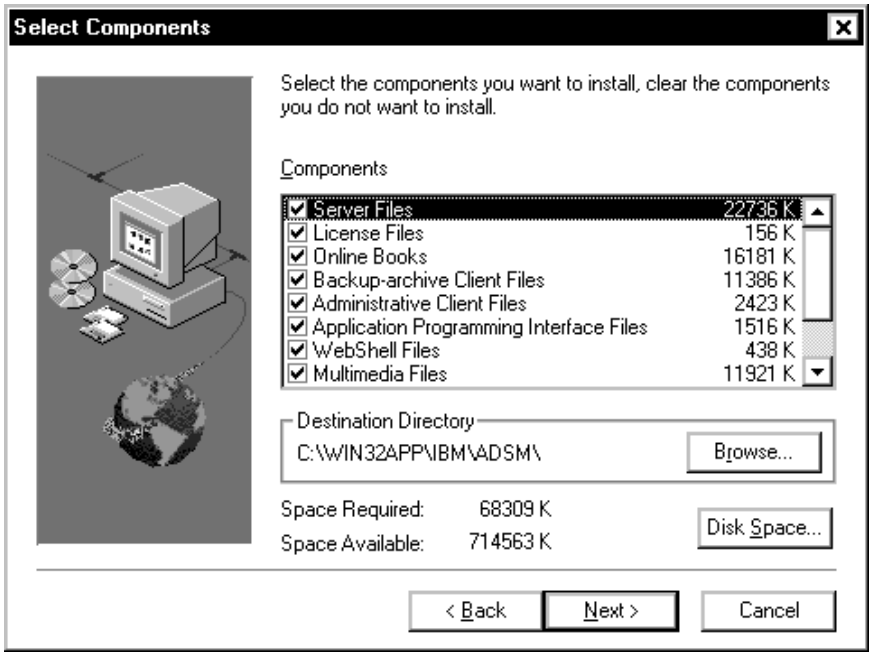


Figure 24. Select Components

Select the components you want to install and change the default installation path if you need to.

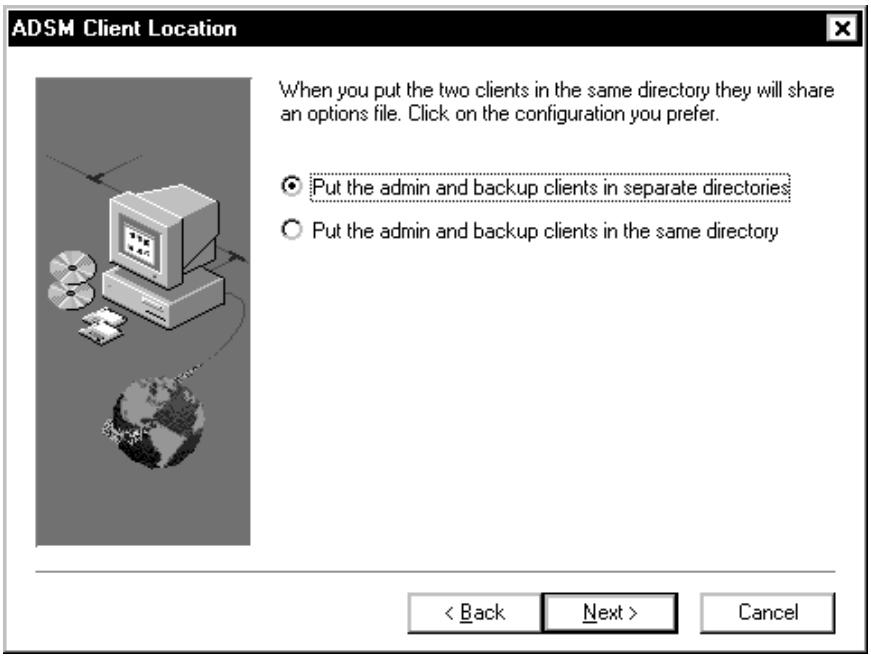


Figure 25. ADSM Client Location

To differentiate between the server and client files, you should elect to store their code in separate directories. If you put them in the same directory, the two clients will share the same option file, DSM.OPT.

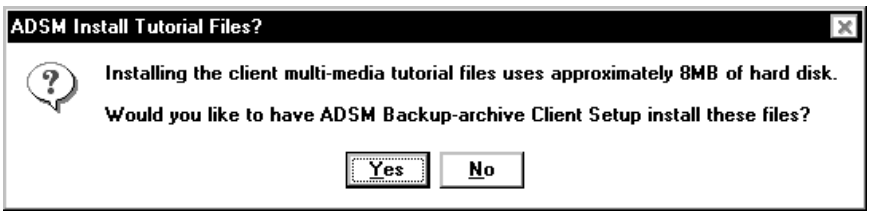


Figure 26. ADSM Install Tutorial Files

If you want to install the client multimedia files now, click on **Yes**. We chose to skip installing them for now, since we weren't interested in going through the tutorial and we didn't have any multimedia hardware to utilize anyway.

You need to indicate which language you will be installing the products with. For this project we selected **English**. It will default to the language picked in the installation program. Click on **Next** to continue.

Select a folder for the icons. We used the default.

At this point you can see which options will be installed. If you need to change a setting, you should do so at this point.

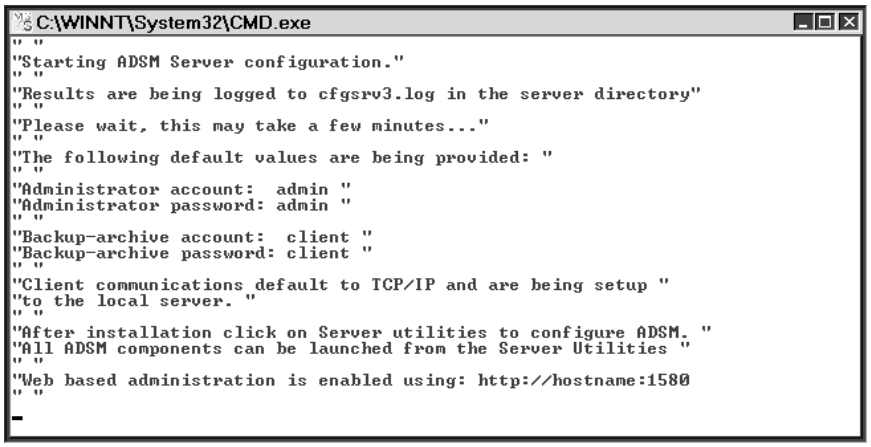


Figure 27. ADSM Server Configuration Window

Figure 27 shows you the installation process for ADSM. It indicates what IDs are being used as well as the fact that you can use Web Administration after the installation is done. We selected to configure the server using its default values. You can change these values later with the ADSM Server utilities.

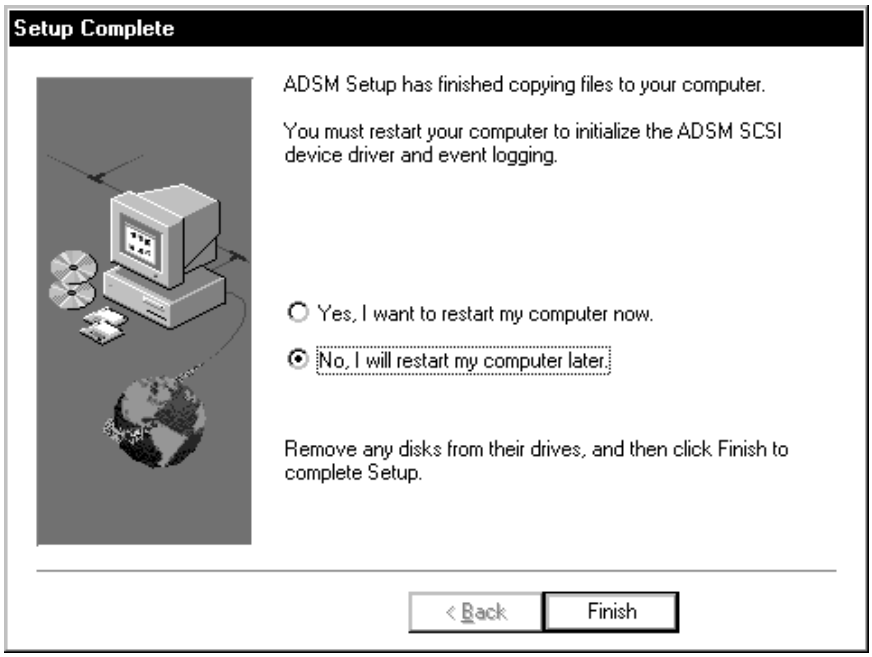


Figure 28. Setup Complete

Note: Once the installation is complete you will be prompted to restart your server, you should select **No**. If you choose to restart the server, all your installation program settings will be lost and you will have to run it again.

Figure 29. Server Utilities

We don't want to reboot now to get the DLL installed since we had more products to install. Clicking on **Finish** brought us to the publications.

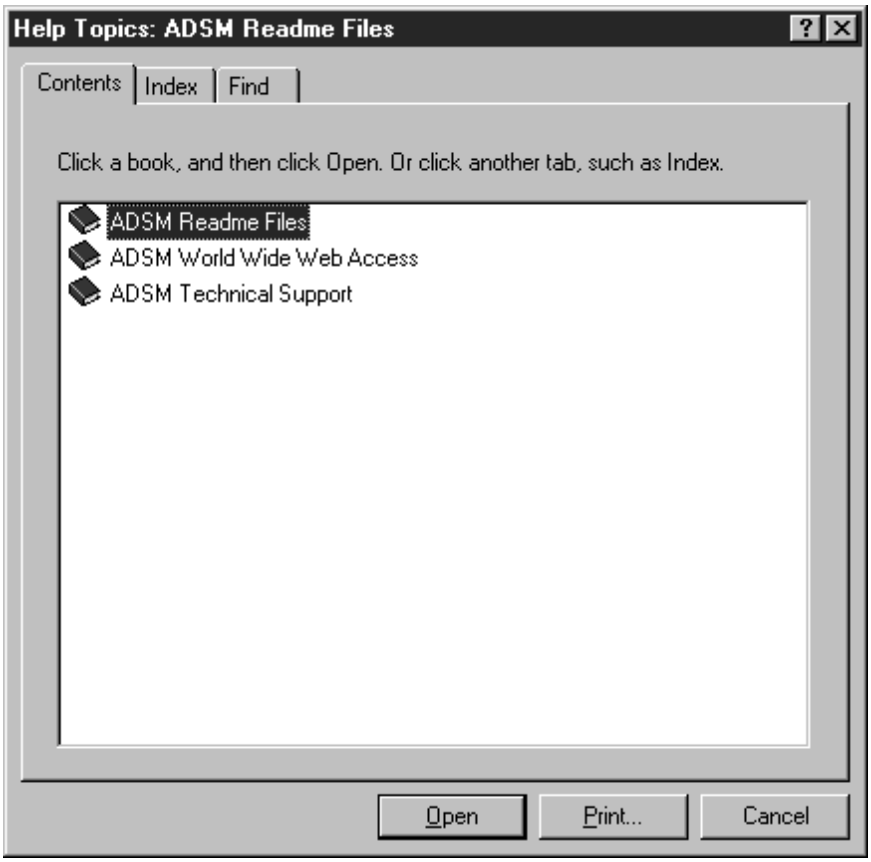


Figure 30. Server Utilities

2.6.1 User IDs and Rights

There are no required user IDs or rights required for the ADSM installation. For our example we used the user ID Administrator that is in the Administrator group.

2.6.2 Environment Variables

The environment variable DSMG_DIR with a value of (drive):\WIN32APP\IBM\odbc\ADSM gets added to NT's system properties.

2.6.3 Registry Implications

An entry for ADSM can be found in the registry under HKEY_LOCAL_MACHINE. It is located under SOFTWARE\IBM. Once you are there you can highlight ADSM to get information about the product regarding the version you are using, what fixes are installed and where on your machine the ADSM files are stored.

2.6.4 Files and Logs

The following logs are created at the ADSM Server install time:

- \WIN32APP\IBM\ADSM\server\cfgsrv3.log - Contains a log of the server configuration execution
- \WIN32APP\IBM\ADSM\server\initsrv3.log - Contains a log of the ADSM server initialization.

The only interesting information (aside from any errors that might occur and be logged there) is the licensing information given in the cfgsrv3.log. Here's what ours looked like:

```
ANR0993I ADSM server initialization complete.
ANR2803I License manager started.
ANR2835I Server is licensed for 1 clients.
ANR2854I Server is licensed for device support module 2.
ANR2560I Schedule manager started.
```

Figure 31. cfgsrv3.log File

2.6.5 Services

If you look in the Services window that is located in the Windows NT Control panel you can see that an additional service, ADSM Server, was added. It was set for manual startup. Another way to see a list of services that are started on your system is to issue `net start` at an NT command line. (If you would like to save the output, you can redirect the output to a file.) An example of this would be to issue the following command at a DOS prompt: `net start > services.out`. You can then review the services.out file in Windows Notepad and view the information (see Figure 32 on page 290). If you wanted to get a list of all services from a command, you could issue `winmsd /a` and then look for a file in the directory you are in called machinename.txt, where machinename is your system name. You will find a section called Services Report.

```
These Windows NT services are started:

  Alerter
  AppnNode
  Computer Browser
  EventLog
  FTP Publishing Service
  Gopher Publishing Service
  IBM SNA Client Services
  License Logging Service
  Messenger
  Net Logon
  NT LM Security Support Provider
  Plug and Play
  RAPISERVER
  Remote Procedure Call (RPC) Locator
  Remote Procedure Call (RPC) Service
  Server
  Simple TCP/IP Services
  SNMP
  Spooler
  TCP/IP NetBIOS Helper
  TrcBoot
  Workstation
  World Wide Web Publishing Service

The command completed successfully.
```

Figure 32. services.out File

There is no ADSM service in this list as it is set to manually start and was not started in this instance.

2.7 Installing ADSM V3.1.1 - Desktop Clients

Installing ADSM Client V3.1.1 is almost identical to installing ADSM Server V3.1.1. The process is fairly easy and does not require much interaction between you and the install process. A full installation consists of the backup archive client, administrator client, API, Webshell, and ODBC. A compact install consists of only the backup client and the administrative client. During the installation, you will need to make the following choices:

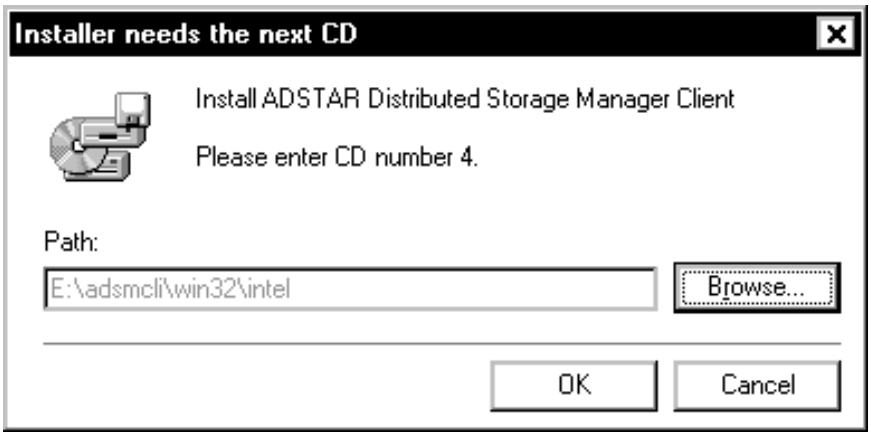


Figure 33. ADSM Client CD Prompt

1. Insert the proper CD and click on **OK** to proceed.

2. On the welcome screen click on **Next** to proceed.

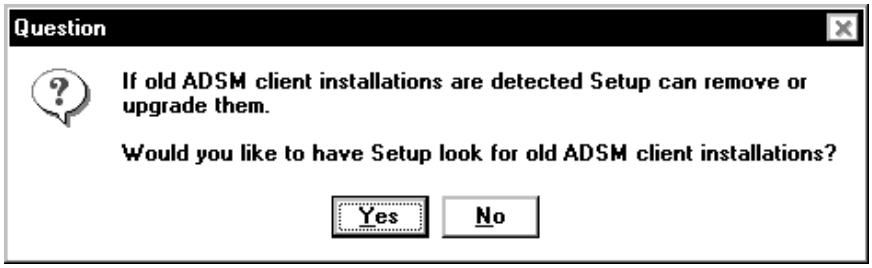


Figure 34. ADSM Client Old Client Search

3. If you have previous ADSM clients installed on your machine, you can have the installation search for them now for upgrade or removal. We were installing on a new machine so we selected **No** to continue.

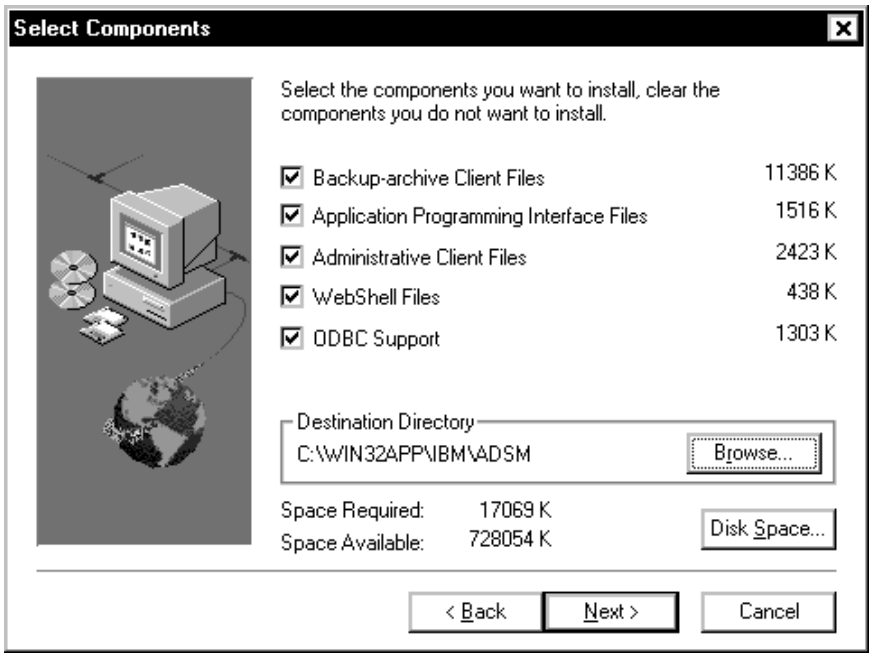


Figure 35. Select Components for ADSM Client

4. Select which components you want to install. The components consist of backup archive client files, application programming interface files, administrative client files, Webshell files and ADSM ODBC support.

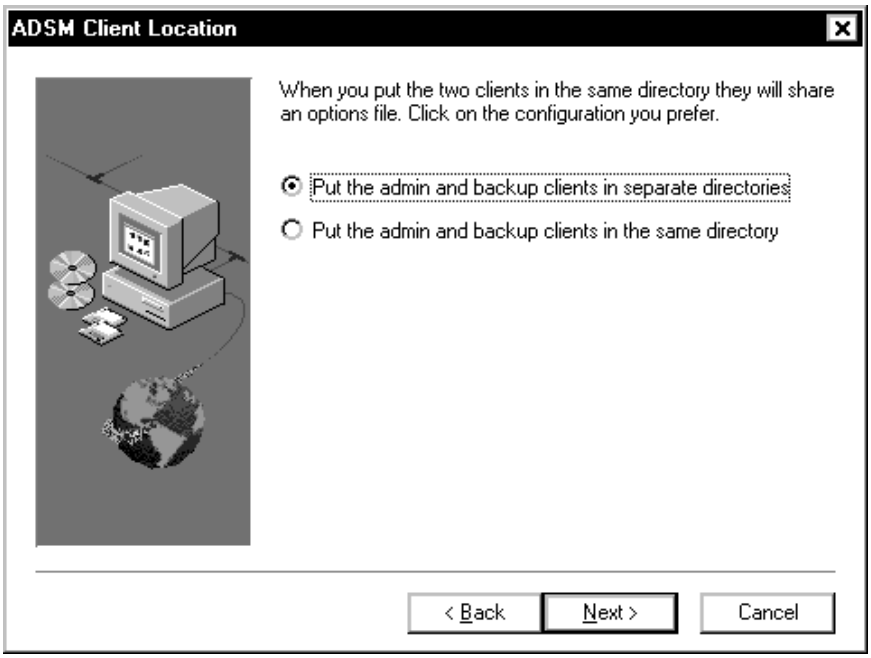


Figure 36. ADSM Client Location

5. Select where you want the administrative and backup client to be installed. You can install the two clients in the same directory or in different ones. If they are installed in the same directory, they will share a common options file. The advantage to this is that if you need to uninstall the software, you only have to do it one time from one directory.

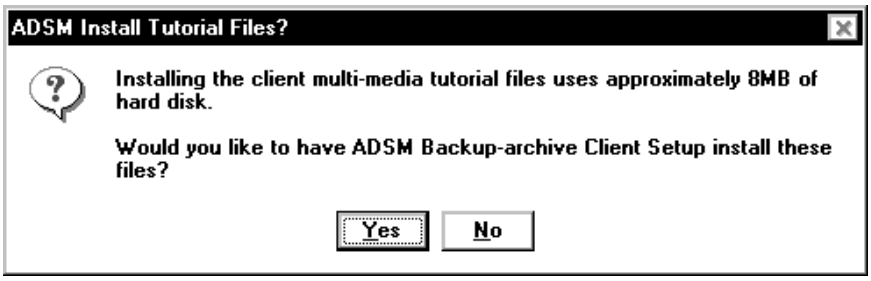


Figure 37. ADSM Client Multimedia Tutorial

6. Decide if you want to install the tutorial files. This is a good idea if you are new to this product or would like a better understanding of it. The tutorial files will take up 8 MB of space and are optional.
7. Select the language you want for the install and click on **Next** to continue.

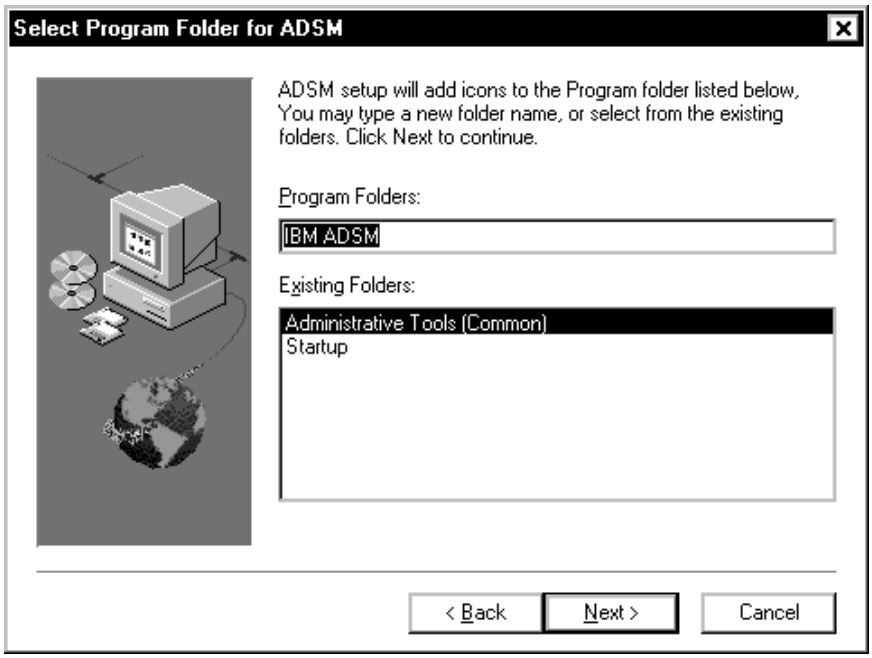


Figure 38. ADSM Client Program Folders

8. Select the program folder for the icons to install in and click on **Next** to continue.
9. If you are satisfied with all of your responses in the settings window, click on **Next** to install.
10. Once the installation is complete click on **Finish** to continue.

2.7.1 User IDs and Rights

To install the ADSM client, you do not have to have any particular user ID or access rights. If you want to set up the scheduler as an NT service, you must install the ADSM client under a user ID that has NT Administrative authority.

2.7.2 Environment Variable

If you had already installed ADSM Server V3.1.1 on your system, no additional environment variables will be added. If you do not have ADSM Server V3.1.1 currently on your machine, the client installation process will add the variable DSMG_DIR with a value of C:\WIN32APP\IBM\ADSM\odbc\ADSM. If you would like to view the environment variables, they can be viewed from the System Properties located in the Control Panel or you can enter `set | more` in any DOS prompt window.

2.7.3 Files and Logs

The following logs are created by the ADSM client:

- \WIN32APP\IBM\ADSM\saclient\dsmerror.log - This contains a log of the ADSM client initialization.
- \WIN32APP\IBM\ADSM\saclient\dsm.opt - This contains the ADSM client configuration information.
- \WIN32APP\IBM\ADSM\baclient\dsm.opt - This contains the ADSM backup client configuration information.

2.7.4 Registry Implications

There is a registry entry added in HKEY_CURRENT_USER. It is located under Software+IBM and is called ADSM server utilities in the following figure:

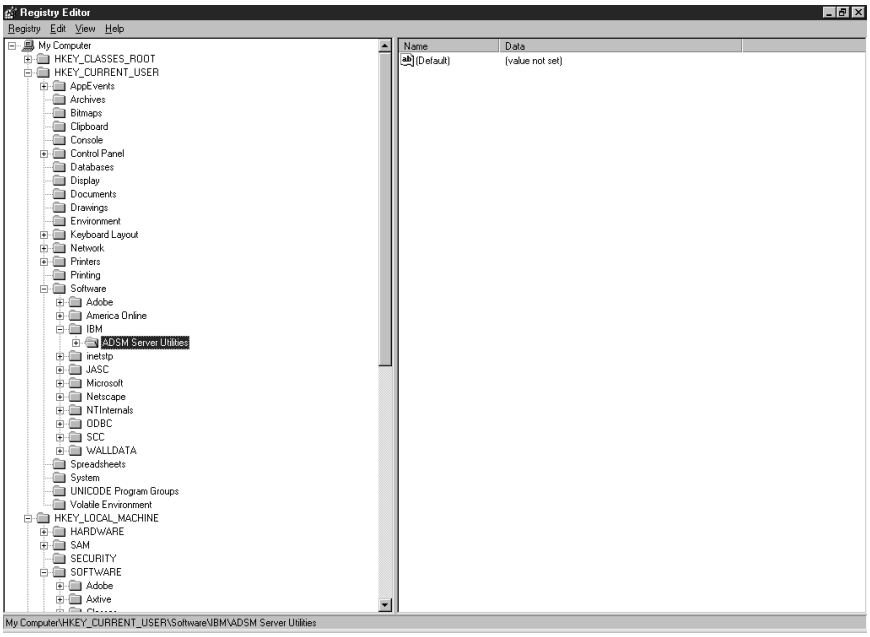


Figure 39. Registry

2.7.5 Services

The installation of the ADSM Client V3.1.1 will not add any new services to your system.

2.8 Installing Communications Server V5.01

When you select an individual product install for Communications Server you may choose from the following subcomponents: Communications Server, Host On-Demand, Web Administration and Personal Communications.

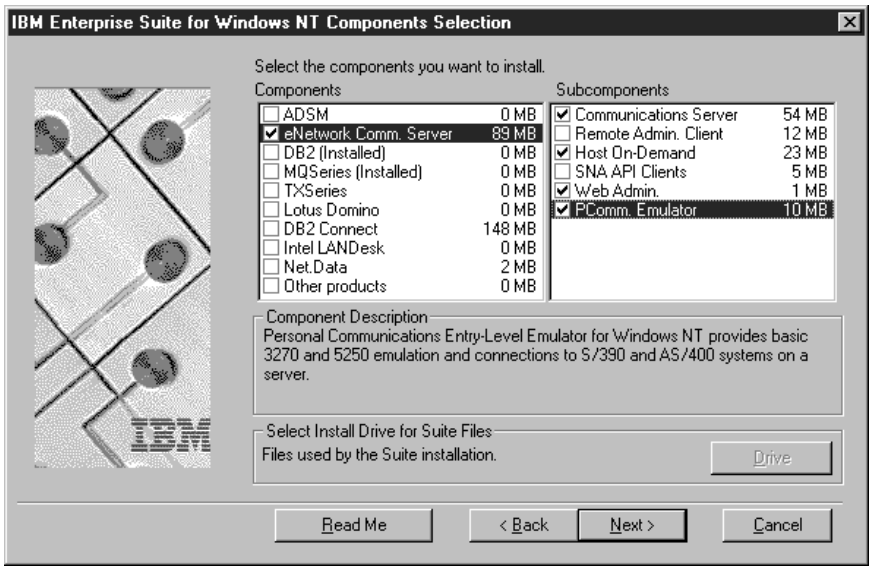


Figure 40. Communications Server Components

The following list contains guidelines to follow before you begin your installation:

1. Make sure that all other applications are closed before beginning the Communications Server installation.
2. The SNA API Clients and Remote Admin Client subcomponents may not be installed on the same server as the Communications Server subcomponent.
3. You must have TCP/IP enabled to use the SNA API Clients and remote administrative clients to communicate with Communications Server.
4. Microsoft's SNA Server and Communication Server cannot coexist on the same machine.
5. Do not place a network drive in your system path before the installation directory for CS/NT. Doing so will result in an error indicating that the application failed to initialize correctly when attempting to start CS/NT.
6. You can't install Communications Server on top of Personal Communications for Windows NT. In order for the two pieces of software to exist together you must install Communication Server first and Personal Communications second.

Note: Adobe Acrobat Reader can be installed after the IBM Enterprise Suite for Windows NT installation has completed.

The installation starts from the installation program when it asks for the CS/NT CD:

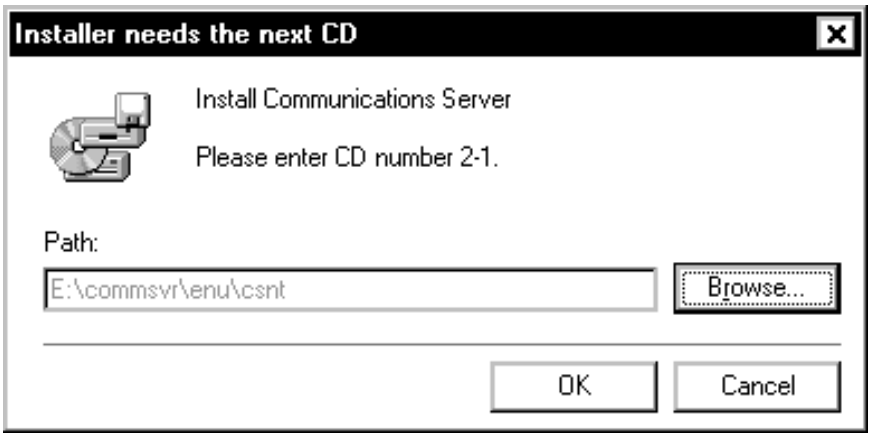


Figure 41. Installer Prompt for CS/NT

Insert the CS/NT CD Number 2-1 into the CD Drive and click on **OK**.

You may receive the following message if you have a previously installed copy of Communications Server on your machine.

Figure 42. Communications Server Uninstall Window

If you have an old version of Communications Server installed then you will need to click on **Yes** to remove it.

At the Welcome screen, click on **Next** to continue.

Choose the destination directory for Communications Server. The default path is C:\IBMCS. Select a drive that has enough disk space. Click on **Next** to continue.

Choose the Program Folders group for Communications Server to be placed in. We chose the default group provided. Click on **Next** to continue.

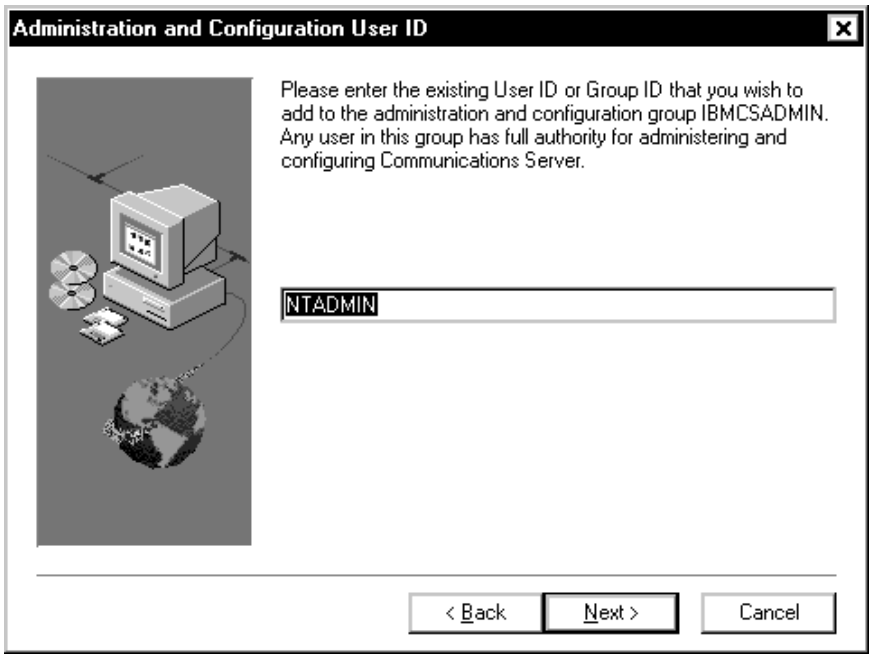


Figure 43. Communications Server Admin ID

Choose the user ID or group ID that you want to add to the administration group IBMCSADMIN. The ID must have administrator rights. In this case we used NTADMIN. Click on **Next** to continue.

Note: If the user ID you choose is a domain ID, it must be a domain administrator. You must also define a local administrator ID with the same name and password.

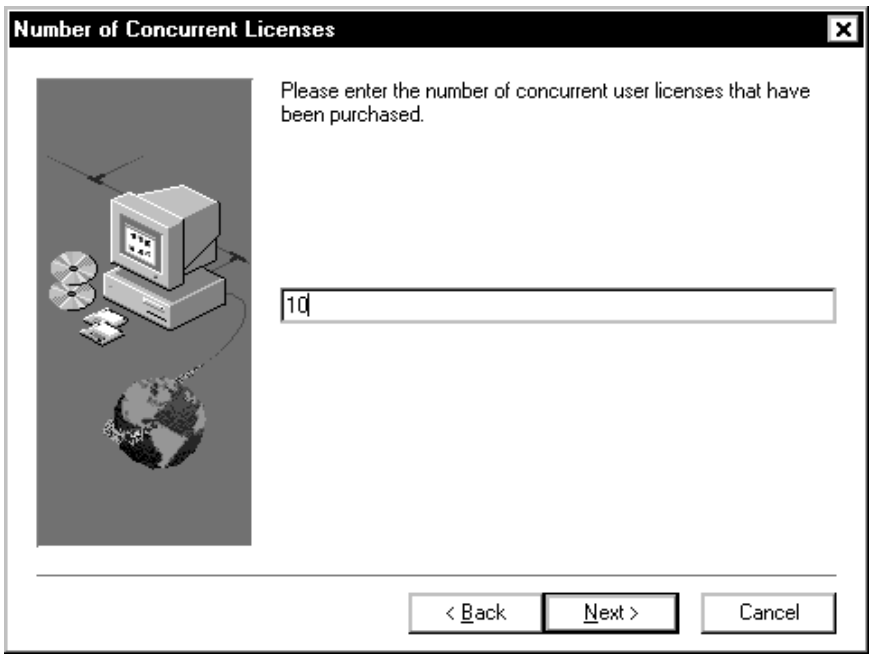


Figure 44. Communications Server Users Licenses

This is where you specify the number of user licenses for concurrent users. We picked a number of 10 for our scenarios. Of course the number you select will

depend upon what you have purchased. After entering the correct value click on **Next** to continue.

You will see a copy of the current settings next. This is the last chance you have to go back and change something before it starts copying. Make sure everything is correct. Click on **Next** to continue. If you need to change the user license limit after installation you may do so by issuing the `cslim` command from a command prompt.

The installation program then copies the new program files to the system.

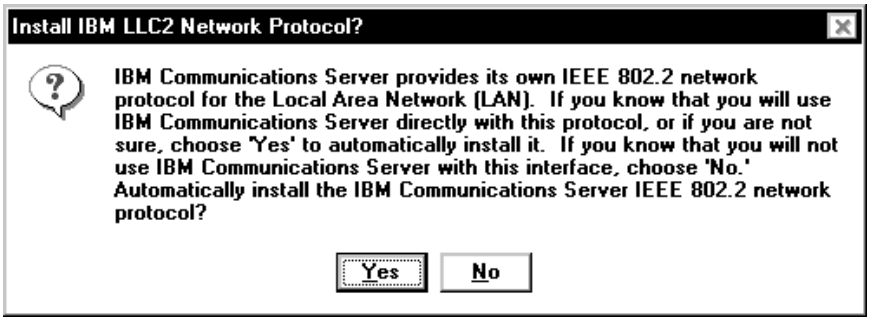


Figure 45. Install The LLC2 Protocol

If you need the SNA protocol on the machine you need to select **Yes** in Figure 45. If you are not sure if you will need it or not, it is easier to install it now. You can always de-select or disable it on the network adapter later on.

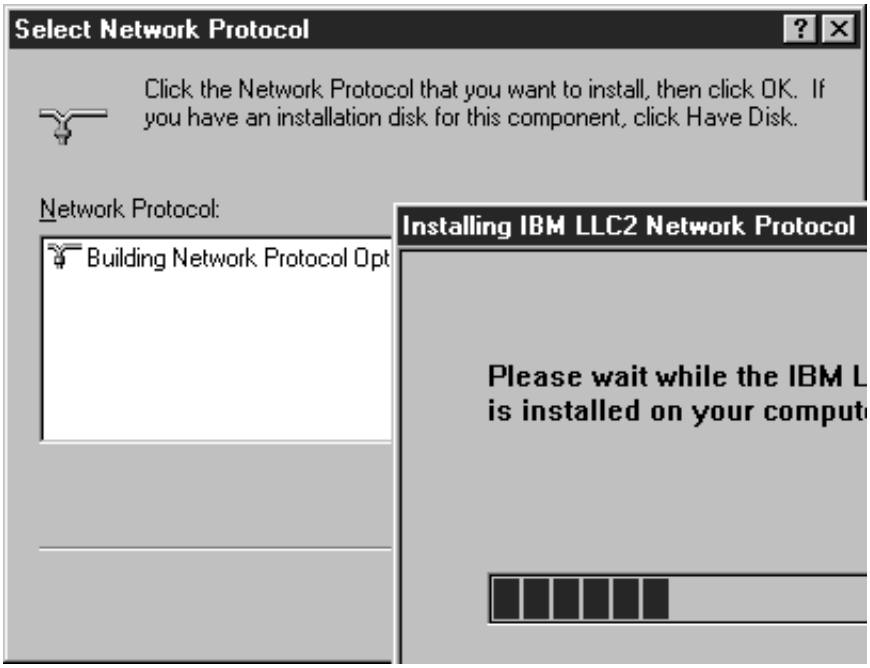


Figure 46. Automatic Installation of LLC2

After you select Yes, you will see the LLC2 protocol installed automatically for you.

You will be prompted with an opportunity to reboot the system at this time.

Note: Do *not* reboot at this time, since you are still in the middle of the installation process (using the installation program).

After you have finished with the install of the Communication Server base component, the system starts the installation procedure for the next part of the Communication Server.

2.8.1 Installing Host On-Demand

If you selected to install Host On-Demand V2.0 then this installation will start automatically.

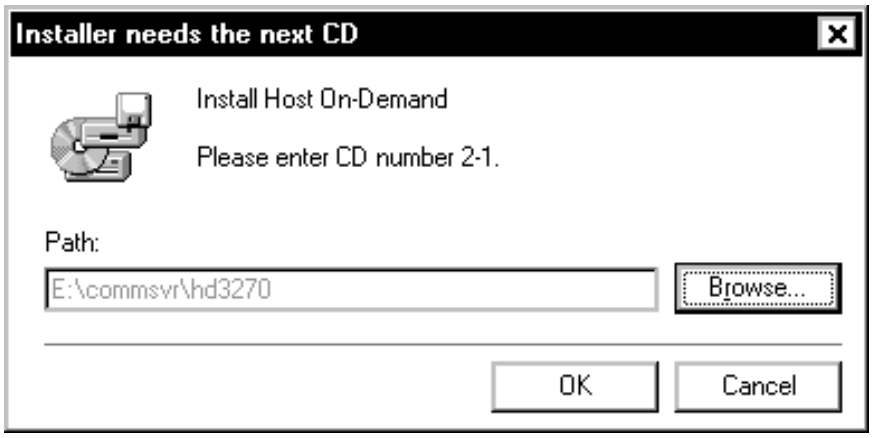


Figure 47. Installer Prompt for HOD

Make sure that the CS/NT CD Number 2-1 is still in the CD drive and click on **OK**.

Select the language you would like the installation to proceed in. Click on **OK** to proceed.

On the welcome screen click on **Next** to proceed.

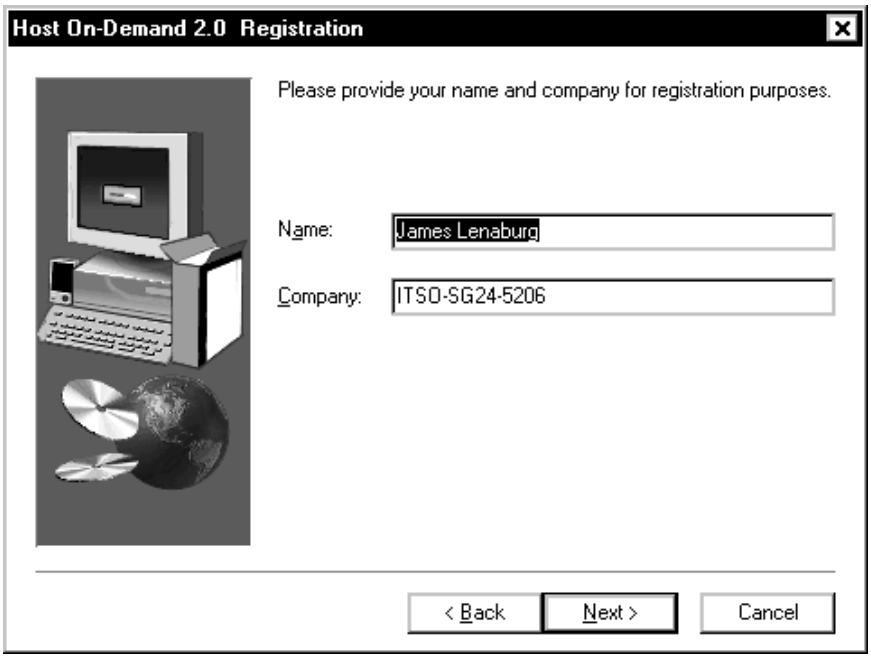


Figure 48. Registration Screen

Your registration information from the NT registry (what you entered when you installed NT Server) should already be filled in. If you want this product to be registered with different information, you can change it here. Click on **Next** to proceed.

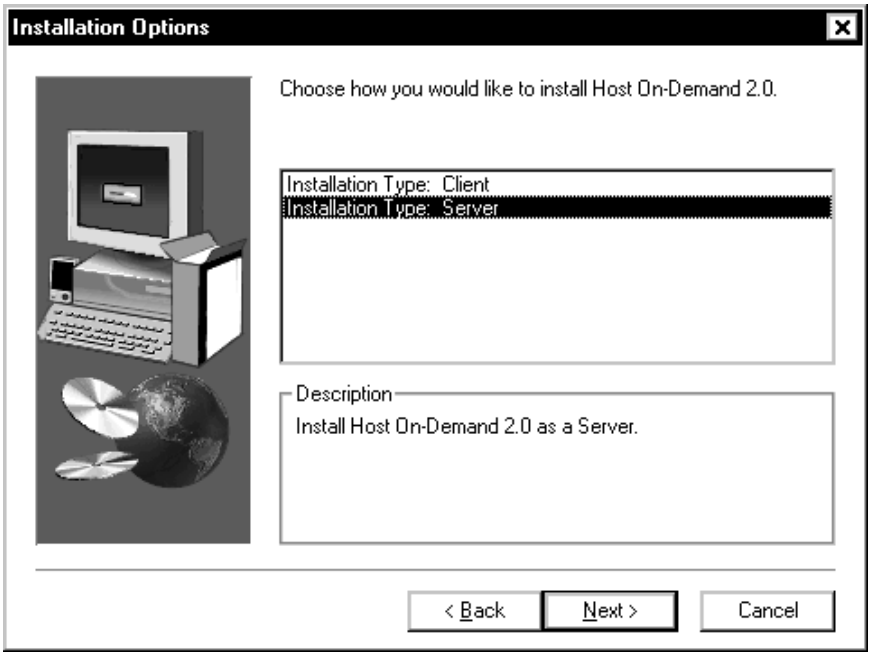


Figure 49. Installation Options

Installation Type: Server is selected by default.

If you want to install the HOD client piece for users that want 3270 emulation access via their browser, choose the client here. Click on **Next** to proceed.

Figure 50. No Webserver Found

If there is no Webserver installed on your machine, you will be presented with this message. It simply means that you will not be able to automatically configure HOD for your Webserver at this point, but will have to manually configure it after you install your Webserver. You can continue with the installation or cancel the installation of HOD for now. We continued with the intention of installing Domino later.

If you want additional language support, select the desired languages and click on **Next** to proceed.

Then choose the target directories for:

- Host On-Demand Server files
- Host On-Demand Web-related files

Choose the target directories and click on **Next**. We used the default directory structure.

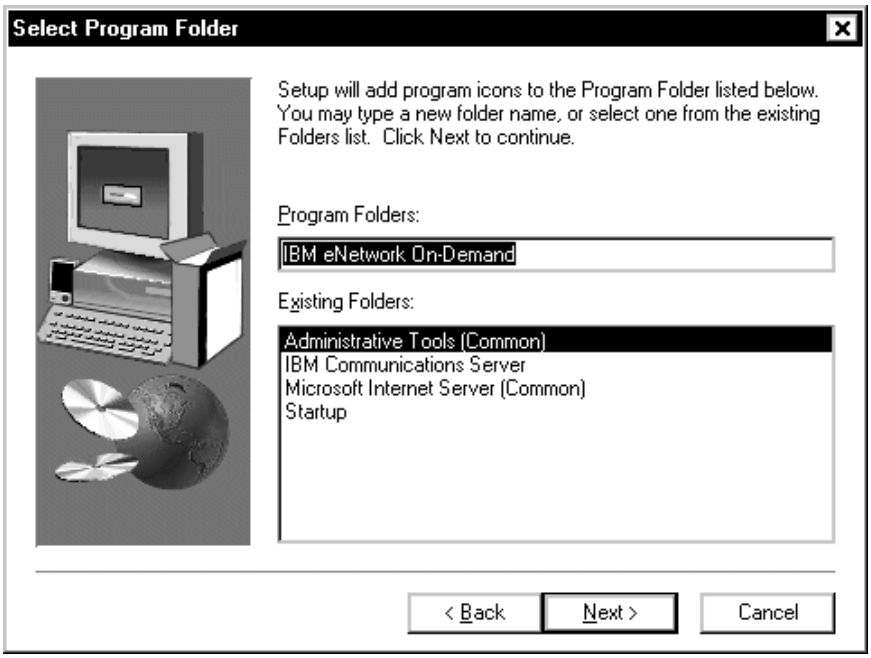


Figure 51. Select Program Folder

Choose a folder for the icons. Click on **Next** to proceed.

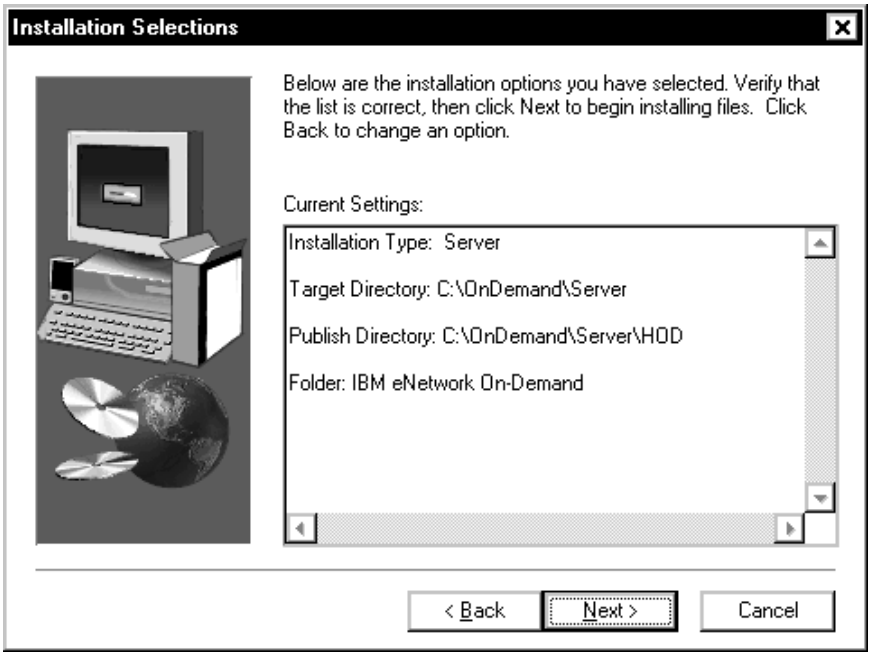


Figure 52. Installation Selections

Verify your selections and click on **Next** to proceed. The files will now be copied to your server.

After the files are copied to your server, the install procedure for Communications Server checks the registry to see what products are currently installed. In our case it finds that a Webserver was installed. The next panel will show you what Webservers are installed and let you choose which one you want to configure for use with Host On-Demand.

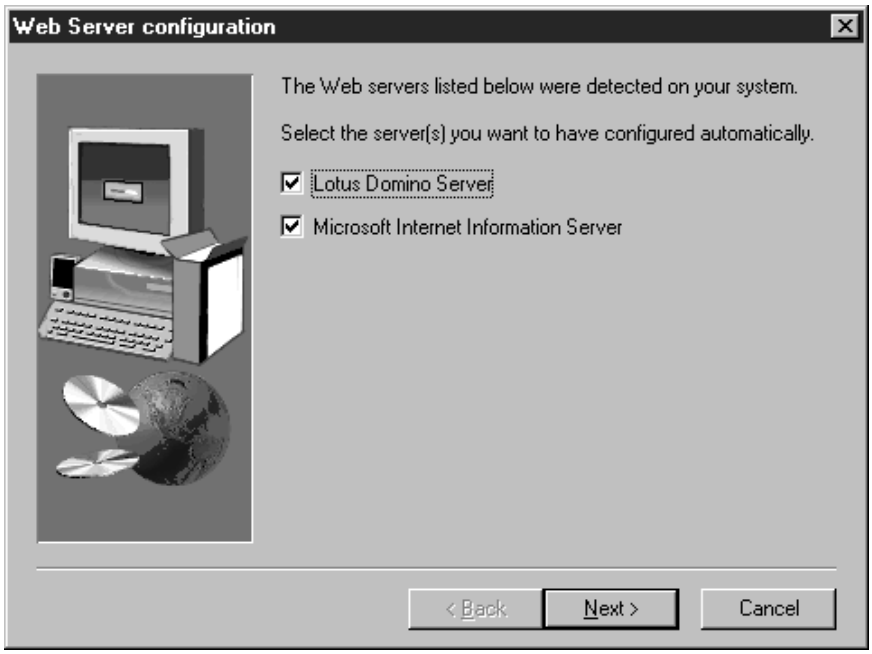


Figure 53. Webserver Configuration Options

Note: You will get the following message if you are installing on a new machine that does not have a Webserver already installed on it. The installation will let you continue, but you will have to manually configure support for your Webserver. Refer to the *Host On-Demand 2.0 Administrator's Guide* online on your machine.

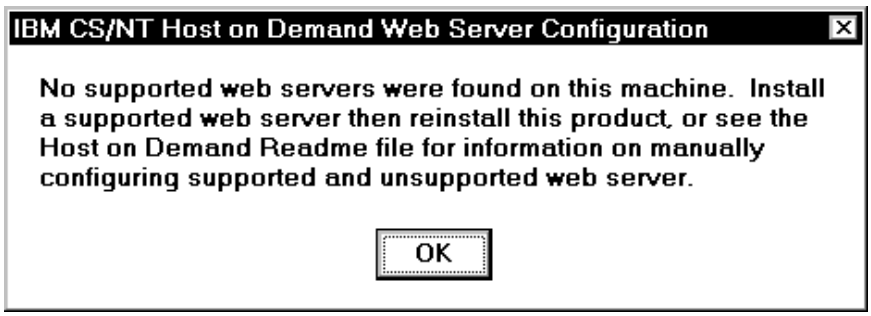


Figure 54. No Webserver Installed

Otherwise, you will be prompted with a list of Webservers to configure Host On-Demand with. If you have more than one server, you can select the ones you want to have HOD run with. You can select multiple Webservers if there are more than one on your server.

Click on **Next** to continue.

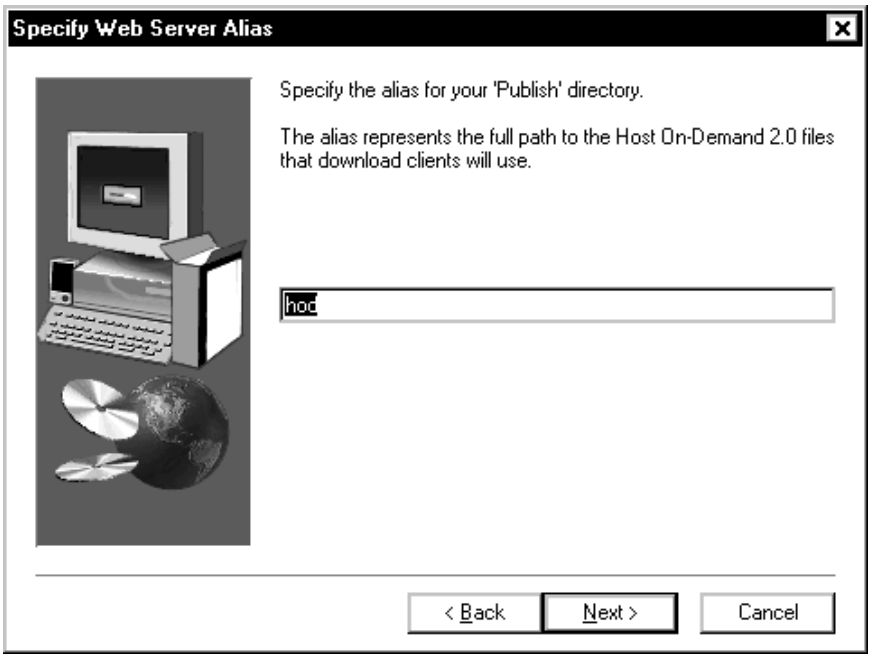


Figure 55. Specify Webserver Alias

Specify an alias for clients to download files to. We took the default.

Click on **Next** to continue.

After you get a message that the Webserver configuration is complete and that you might have to stop and restart the Webserver for your changes to take effect, click on **OK**. You don't have to worry about restarting your Webserver now, since after all of the installations are finished you will be rebooting the system.

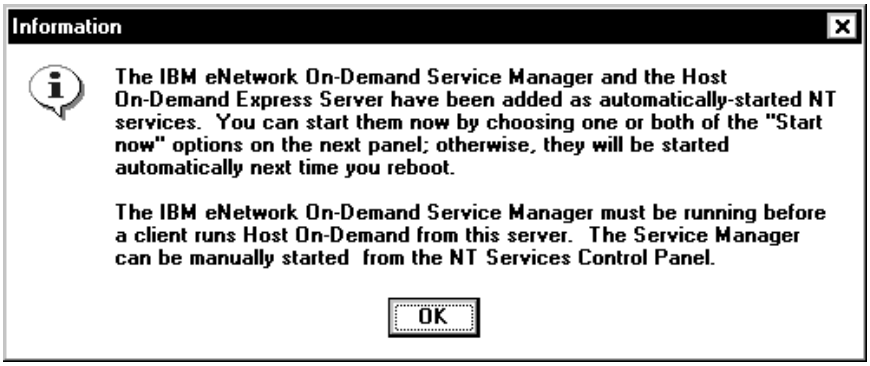


Figure 56. Installation Complete

Click on **OK** to continue.

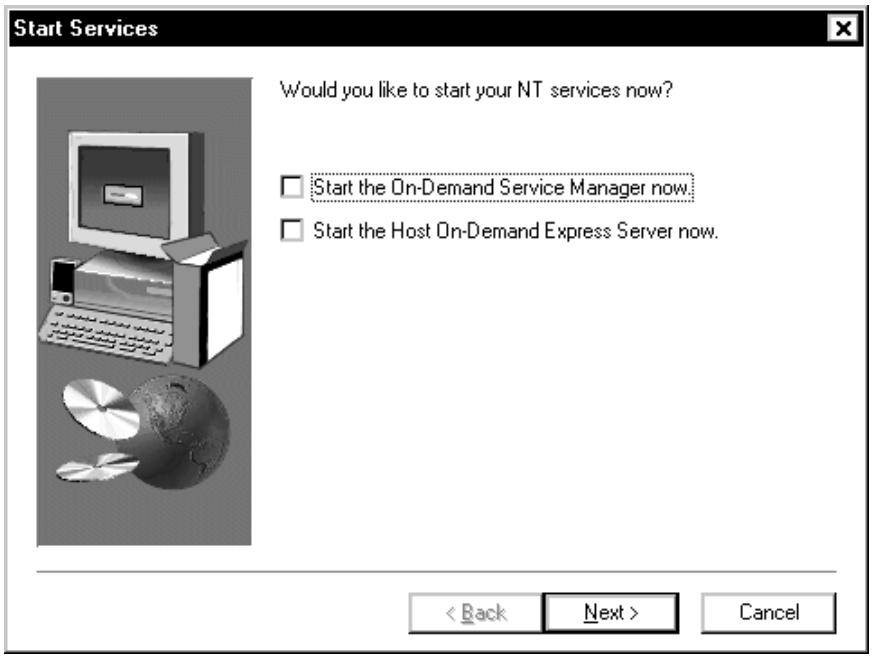


Figure 57. Services Information

You will get a message telling you that some services have been added to Windows NT. You will then get a window asking if you would like to start these NT services now. Since you are in the middle of the installation, at this time, deselect the boxes and click on **Next**.

If you want to view the readme, you can do so now, or continue on with the installation. We unchecked the box and proceeded by clicking on **Finish**.

2.8.1.1 Installing CS/NT Web Administration

The next component we installed using the installation program was Web Administration. This allows Communications Server to be configured and managed from any browser that supports Java, frames and cookies. A Webserver must be installed on the same server as Communications Server.

Note: The following Webserver software is supported for Web Administration:

- Lotus Domino Go Webserver.

  You can manually configure Domino Go using the directions provided for the IBM Internet Connection Server (ICS) in the Web Administration readme file. The readme can be found in the Communications Server folder.

  An evaluation copy of Lotus Domino Go Webserver can be downloaded from http://www.ics.raleigh.ibm.com/dominogowebserver.

- Lotus Domino.
- Microsoft Internet Information Server (IIS) for Windows NT.

  Microsoft Peer Webserver available with Windows NT Workstation can't be used because of its limitations.

- Other Webservers may be used, but their use is not currently supported.

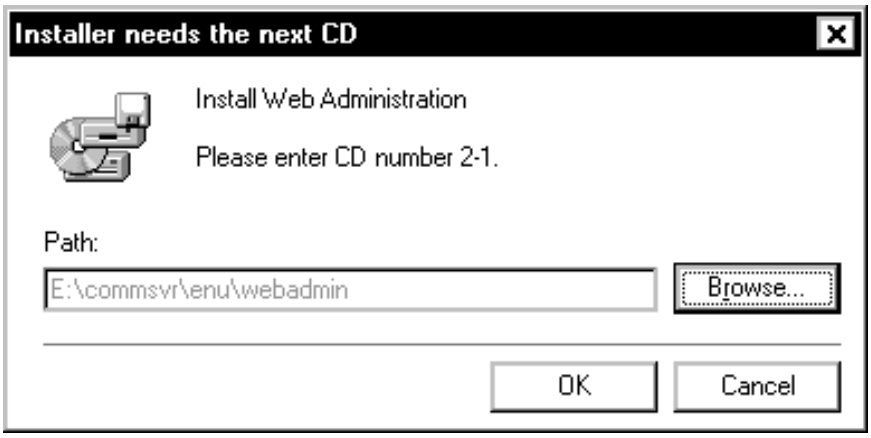


Figure 58. Webserver Administration CD Prompt

The CS/NT CD Number 2-1 should still be in the drive. Click on **OK** to continue.

On the welcome screen click on **Next** to continue.

You will then have the option of selecting the installation directory. The destination directory should be the same one where Communications Server was installed. Click on **Next** to proceed.

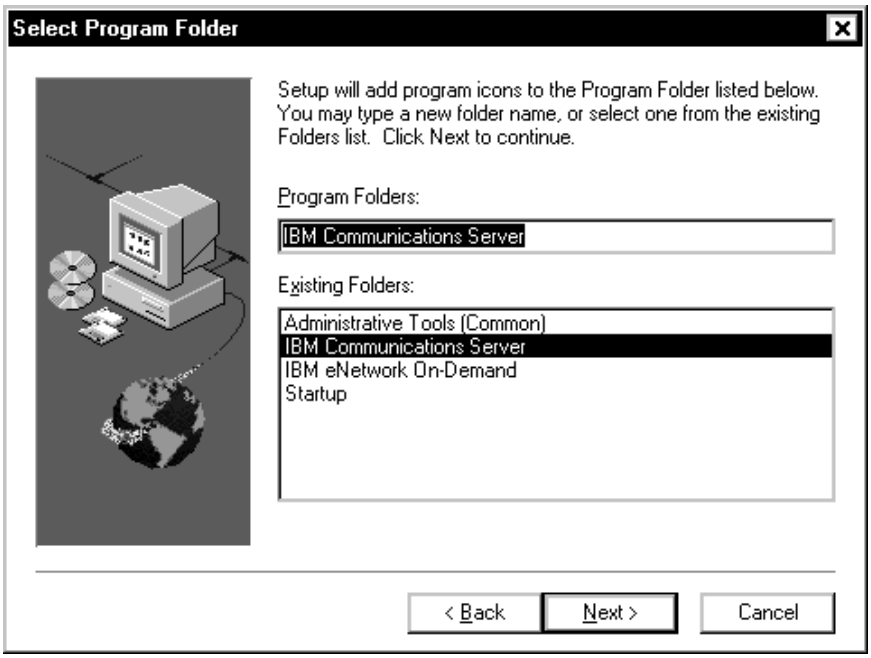


Figure 59. Select Program Folder

Select the default programs folder for the Web Administrator tool. Click on **Next** to proceed.

If everything is correct, proceed with copying the files. Click on **Next** to proceed.

After the files are copied to your server, you will get a message asking how you want to configure your Webserver options.

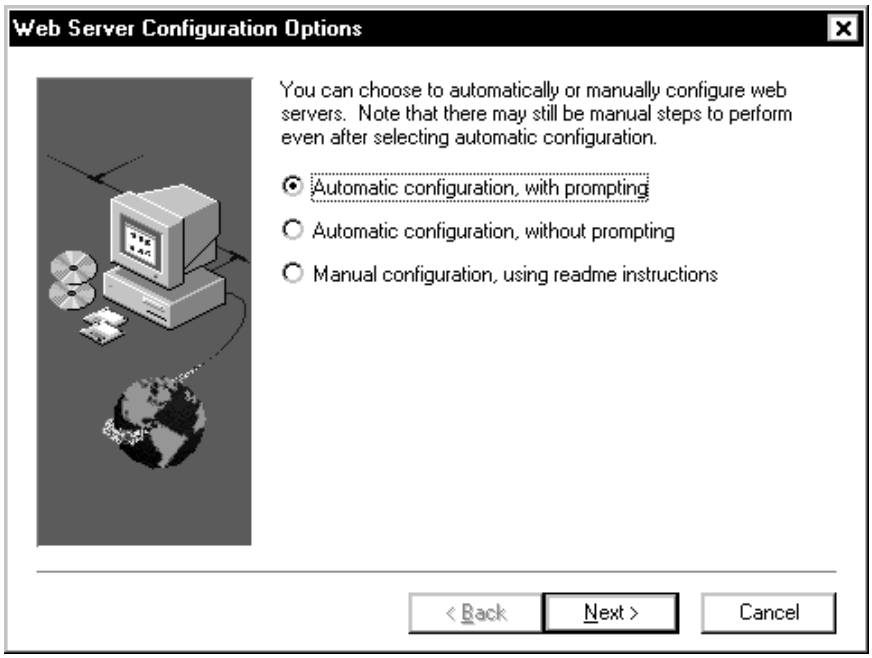


Figure 60. Webserver Configurations Options

You should use the Automatic configuration, with prompting option. Click on **Next** to continue.

The installation program checks the registry to see what products are currently installed and it should find that a Webserver was installed.

Note: You will get the following message if you are installing on a new machine that does not have a Webserver already installed on it. The installation will let you continue, but you will have to manually configure support for your Webserver. Refer to the *Host On-Demand 2.0 Administrator's Guide* online on your machine.

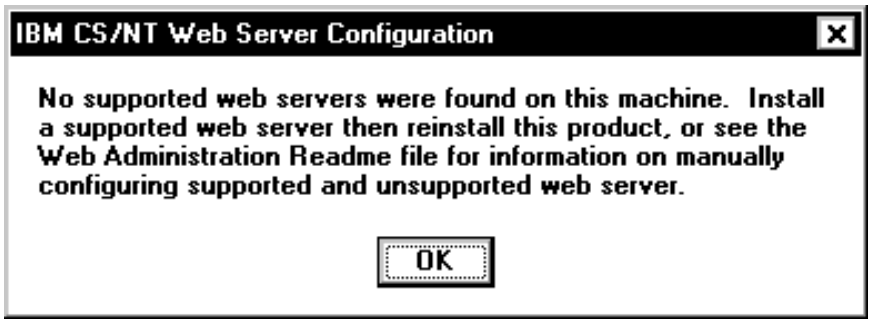


Figure 61. No Webservers Found

If there are multiple Webservers installed, you will be prompted with a list of Webservers to configure Host On-Demand with. If you have more than one server, you can select the ones you want to have Web Administrator to run with.

Click on **Next** to continue.

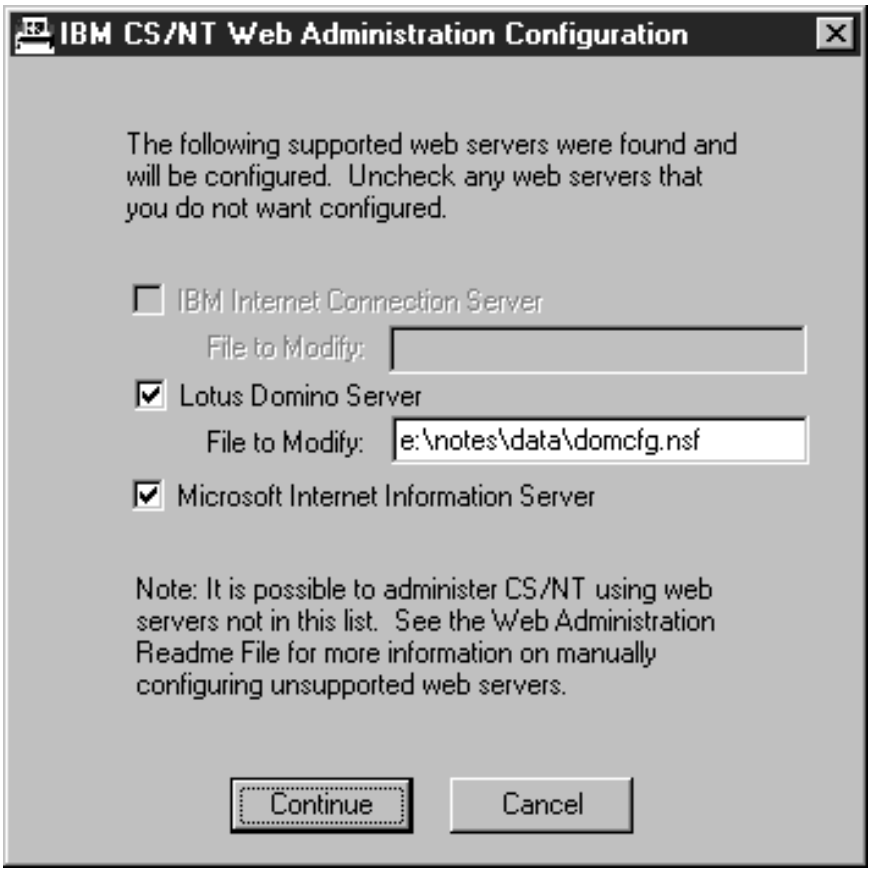


Figure 62. Choose the Webserver to Configure

Click on **Continue**.

When you are prompted with a message that says `For Microsoft IIS and Lotus Domino Web servers, you must change the user ID permissions to act as part of the operating system` you should click on **OK** to continue.

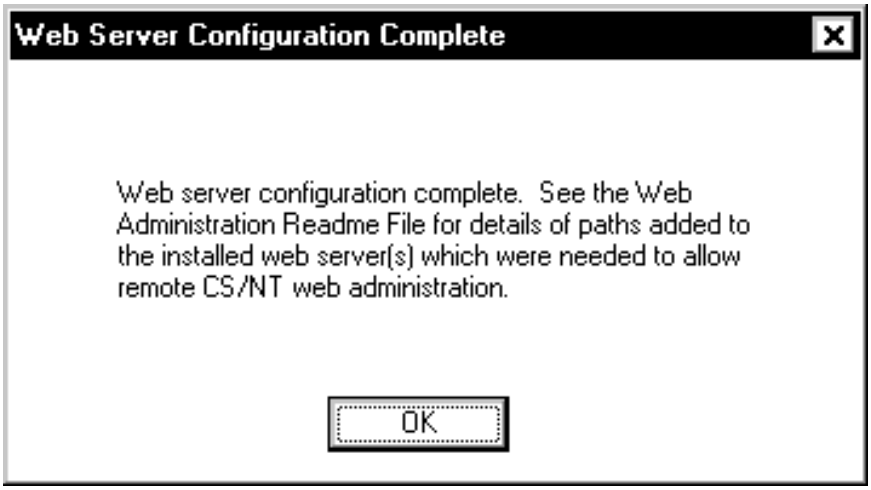


Figure 63. Installation Complete

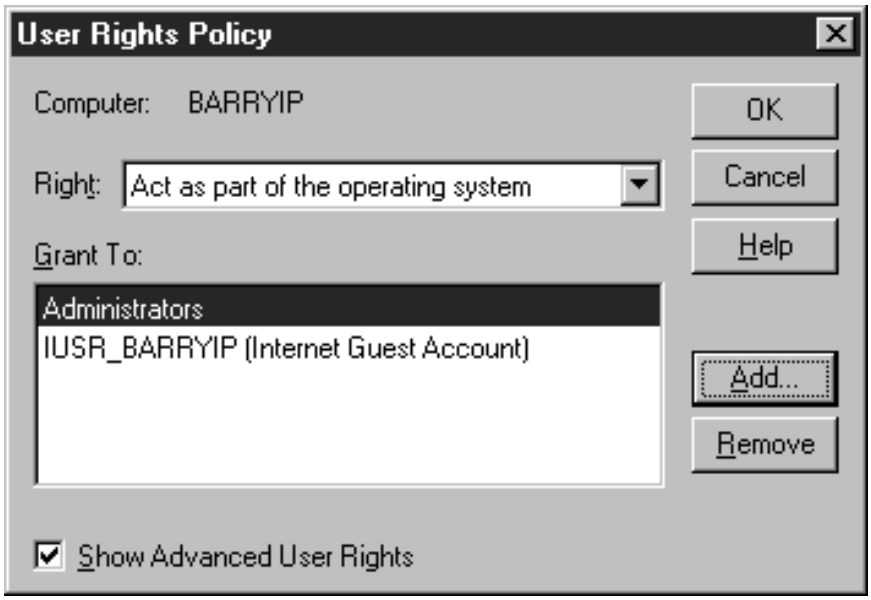


Figure 64. User Rights - Part of the Operating System

Click on **OK** to continue.

At this point you can view the Web Administration readme. We skipped this and clicked on **NO**.

The installation is complete and you can continue with the next product.

2.8.1.2 Installing Personal Communications

The next option was to install a light version of Personal Communications. With that version you can only use TCP/IP connections or connections from Communications Server.

Note: Keep in mind, that if you are going to install TXSeries, you may need some of the functions from PCOM 4.2.

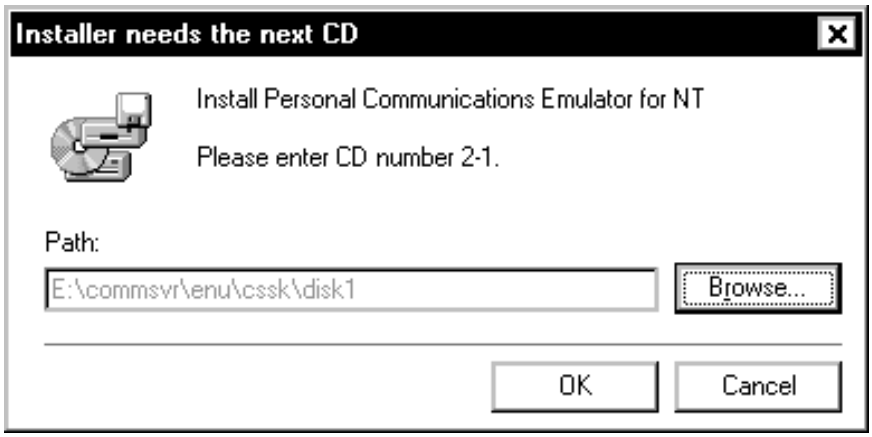


Figure 65. Personal Communications CD Prompt

The CS/NT CD Number 2-1 should still be in the drive. Click on **OK** to continue.

When you get the welcome screen you should click on **Next** to continue.

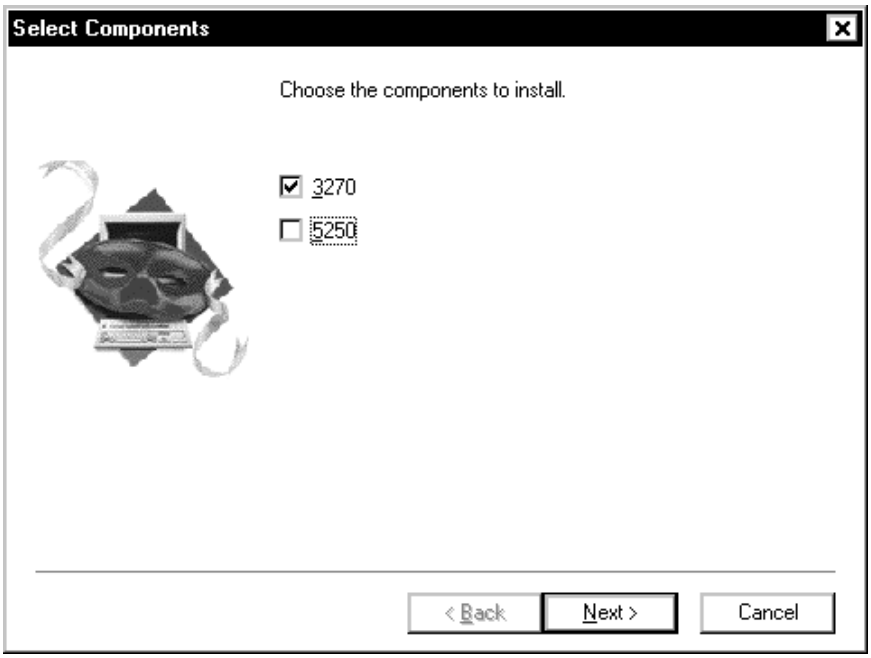


Figure 66. Choose Components

You can select 3270 and/or 5250 emulation. Since we were only communicating with an S/390, we de-selected 5250. Click on **Next** to continue.

Choose the installation directory for Personal Communications. We used the default directory C:\Personal Communications for our example. If you decide that you do not like the directory that you created, select a new location and proceed.

Click on **Next** to continue with the Personal Communications installation.

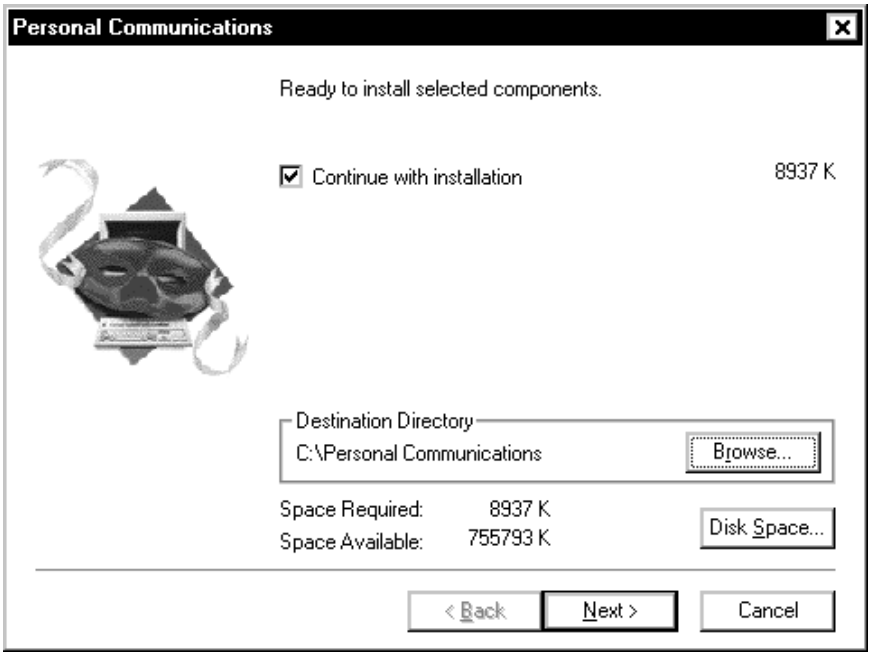


Figure 67. Install Selected Components for PCOMM

This is a good time to review the destination directory and the space requirements.

Click on **Next** to continue with the installation.

Select the default folder and proceed.

Click on **Next**.

The installation of IBM Communications Server and its components is now complete. The installation program will start the installation of the next product.

2.8.2 User IDs and Rights Required

You are required to install Communications Server with an administrator user ID with local authority. After the installation, you will notice that two additional groups have been added to your system user manager for domains: the first being IBMCSADMIN, which has the authority to administer and configure Communications Server and the second group being IBMCSAPI, which is created for Communications Server SNA client users.

2.8.3 Environment Variables

The environment variables that are added to your system during the installation of Communications Server are as follows:

1. SNAROOT with a value of C:\IBMCS.
2. Path has the value C:\IBMCS;C:\Personal Communications added to it.
3. Username variable changed to the user ID used to install the prouct.

2.8.4 Registry Implications

The following entries are added to your registry under HKEY_LOCAL_MACHINE\SOFTWARE\IBM:

- Communications Server
- Communications Server Web Administration
- Host On-Demand
- IBM LLC2
- Personal Communications

2.8.5 Files and Logs

You can use the Communications Server log viewer to view the errors in the PCSMSG.MLG message log. To view messages in a message log:

1. From the SNA Node Operations window select **Launch** then the **Log Viewer** option.

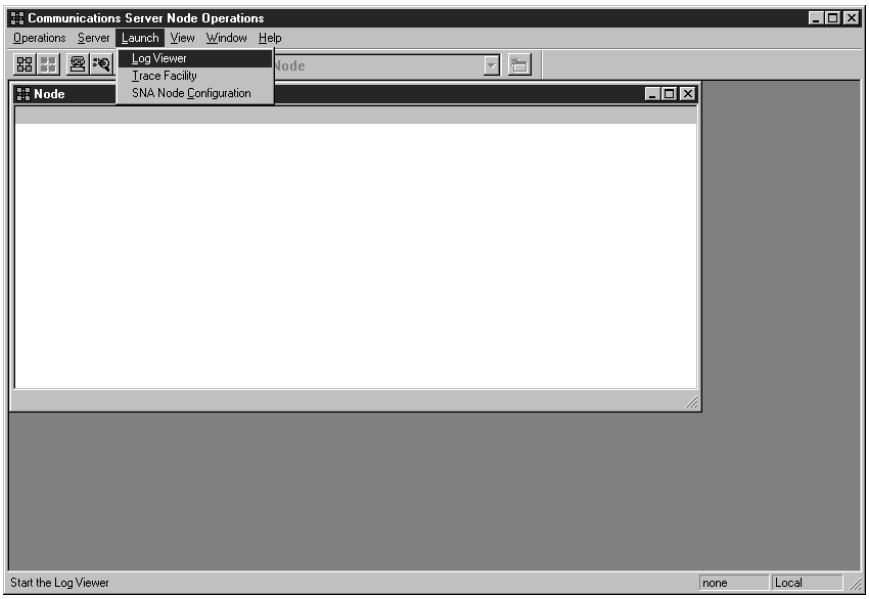


Figure 68. Launch Log Viewer

2. From the list of logged messages, double-click on a message number to display the help message.

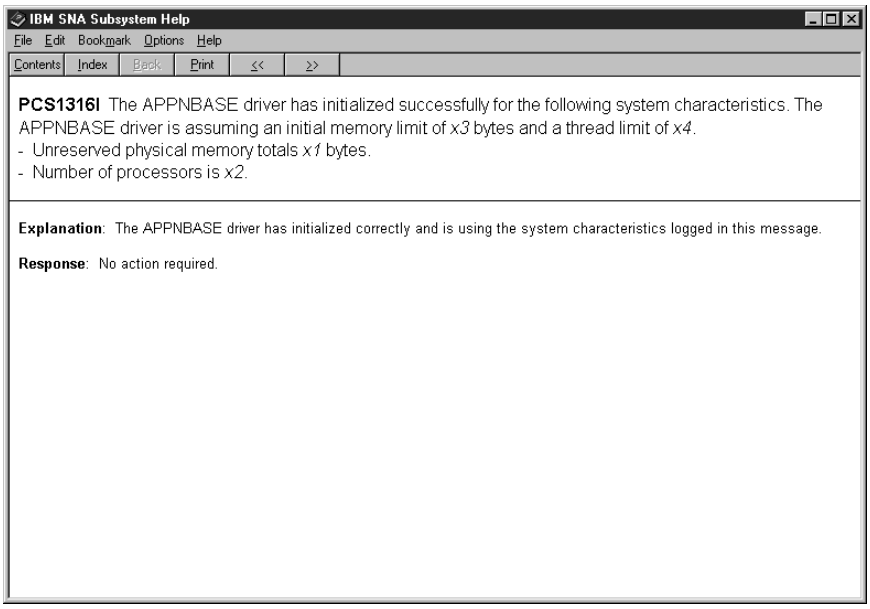


Figure 69. Decode Error Messages

NTs application event log will indicate a logged error for Communications Server. It is always a good idea to check there first.

Event Viewer - Application Log on \\BARRYIP

Log View Options Help

Date	Time	Source	Category	Event	User	Computer
5/5/98	7:33:03 AM	DB2DAS00	None	1	N/A	BARRYIP
5/5/98	7:33:01 AM	DB2DAS00	None	4	N/A	BARRYIP
5/5/98	7:33:01 AM	DB2DAS00	None	4	N/A	BARRYIP
5/5/98	7:33:01 AM	DB2	None	1	N/A	BARRYIP
5/5/98	7:32:58 AM	DB2	None	4	N/A	BARRYIP
5/5/98	7:32:57 AM	DB2	None	4	N/A	BARRYIP
5/5/98	7:32:56 AM	DB2	None	4	N/A	BARRYIP
5/5/98	7:32:04 AM	HODExpressServer	None	59	N/A	BARRYIP
5/5/98	7:32:02 AM	HODExpressServer	None	65	N/A	BARRYIP
5/4/98	3:04:38 PM	DB2DAS00	None	1	N/A	BARRYIP
5/4/98	3:04:38 PM	DB2	None	1	N/A	BARRYIP
5/4/98	3:04:37 PM	DB2DAS00	None	4	N/A	BARRYIP
5/4/98	3:04:37 PM	DB2DAS00	None	4	N/A	BARRYIP
5/4/98	3:04:36 PM	DB2	None	4	N/A	BARRYIP
5/4/98	3:04:36 PM	DB2	None	4	N/A	BARRYIP
5/4/98	3:04:36 PM	DB2	None	4	N/A	BARRYIP
5/4/98	3:04:05 PM	HODExpressServer	None	59	N/A	BARRYIP
5/4/98	3:04:03 PM	HODExpressServer	None	65	N/A	BARRYIP
5/4/98	2:05:29 PM	DB2	None	1	N/A	BARRYIP
5/4/98	2:05:27 PM	DB2	None	4	N/A	BARRYIP
5/4/98	2:05:27 PM	DB2	None	4	N/A	BARRYIP
5/4/98	2:05:27 PM	DB2	None	4	N/A	BARRYIP
5/4/98	12:58:08 PM	ADSMServer	None	4	N/A	BARRYIP
5/4/98	12:58:00 PM	ADSMServer	None	4	N/A	BARRYIP
5/4/98	12:57:17 PM	ADSMServer	None	4	N/A	BARRYIP
5/4/98	12:46:57 PM	HODExpressServer	None	59	N/A	BARRYIP
5/4/98	12:46:56 PM	HODExpressServer	None	65	N/A	BARRYIP

Figure 70. Application Event Log

2.8.6 Services

The following services are added to your system during the installation of Communications Server:

- AppnNode with at automatic startup
- Host On-Demand Express Server with automatic startup
- IBM eNetwork On-Demand Service Manager with automatic startup
- IBM SNA Client Services with a manual startup
- RAPISERVER with automatic startup
- TrcBoot with automatic startup

Another way to see a list of services that are started on your system is to issue `net start` at an NT CMD line. (If you would like to keep the scrolled text, pipe the services to a file.) An example of this would be to issue the following command at a DOS prompt: `net start > services.out`. You can then pull up the services.out file in Notepad and view the information (see Figure 32 on page 29).

2.9 Installing IBM DB2 Universal Database

When prompted by the Enterprise Edition installation program, you will begin the installation of DB2 Universal Database. During the installation process, you will be asked if you want to have your instance and the Control Center start at boot time. If this is a dedicated UDB server that is fine but keep in mind that the Control Center is very CPU and memory-intensive during startup.

The installation of DB2 UDB causes changes to your system. These changes are covered in the following subsections.

2.9.1 User IDs and Rights Required

In order to install DB2 UDB, you must be part of the NT Administrator group or be defined as a user with the Act as part of the operating system advanced user right. The username can be defined in the User Manager for Domains located under NT's Administrative Tools. The user ID that you install DB2 under *must* be 8 characters or less, therefore, you cannot use Administrator as a user ID to install this product. It is also important when choosing a user ID for DB2, that you remember to follow the appropriate DB2 naming conventions. The user ID can include the following characters as listed below:

- A through Z
- 0 through 9
- @
- $
- #
- _ (underscore)

Unless otherwise specified, all names must begin with one of the following characters:

- A through Z
- @
- #
- $

Do not use SQL-reserved words to name tables, views, columns, indexes, or authorization IDs. A list of SQL-reserved words is included in the SQL Reference which will be installed with the online documentation (if you select it).

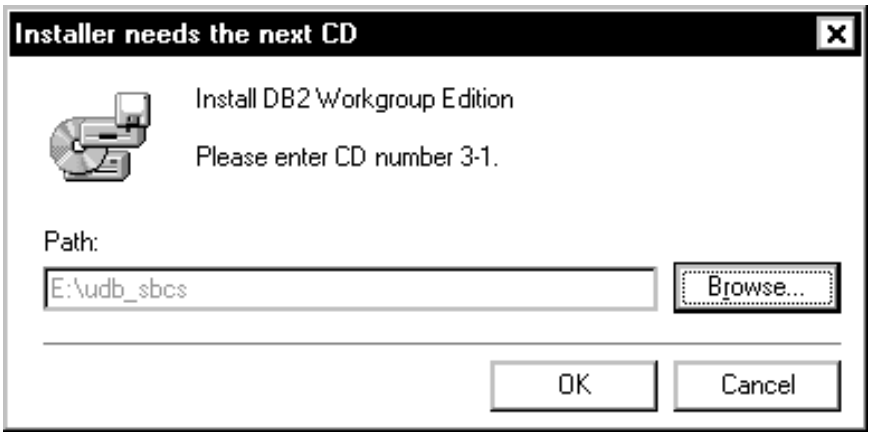


Figure 71. DB2 UDB Workgroup CD Prompt

After inserting the DB2 CD and clicking on **OK** you will have the option of selecting which products get installed:

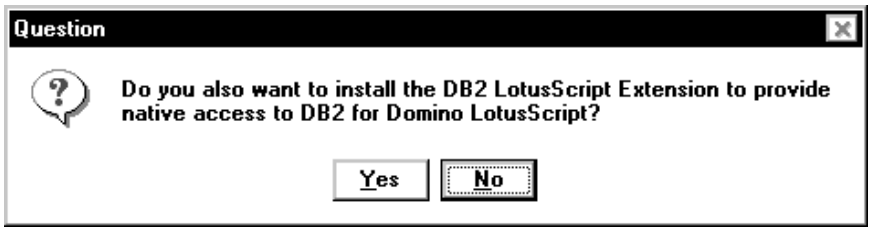


Figure 72. DB2 for Domino LotusScript Info

If you have Lotus Domino Server on your server, you will see Figure 72 pop up at this time. We chose to install this since we had Domino Server already installed.

Click on **Yes** to continue.

At the Welcome screen click on **Next** to continue.

.

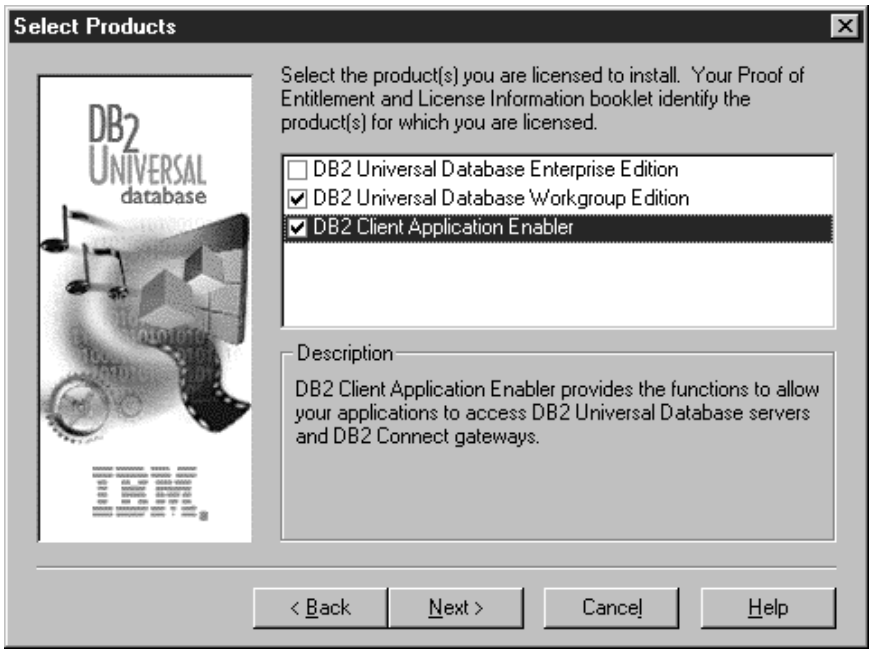


Figure 73. Product License Component Selection

You will then be asked to select the component that you are licensed for. For our installation, we chose the DB2 Universal Database Workgroup Edition.

Click on **DB2 Universal Database Workgroup Edition** and then click on **Next** to continue.

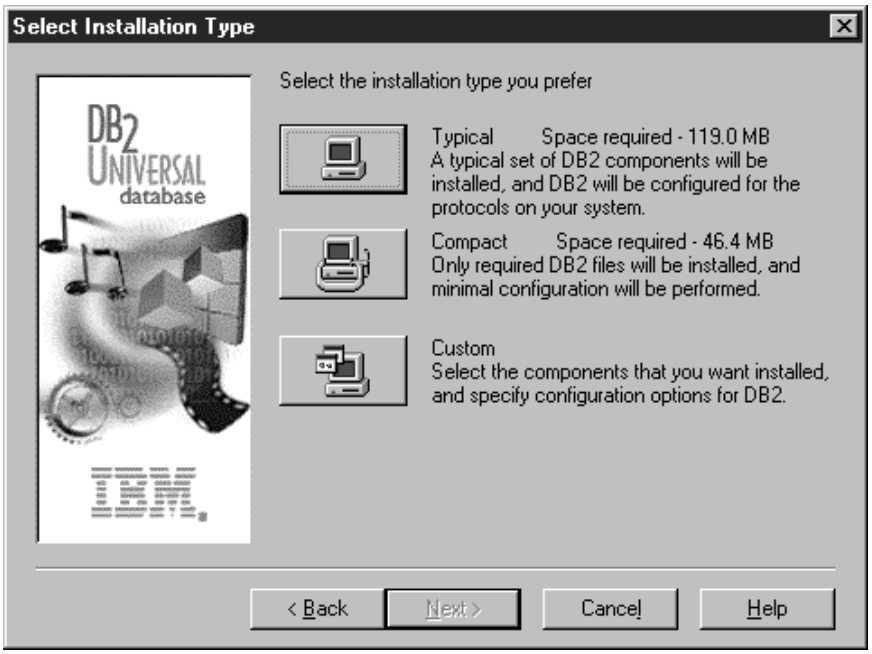


Figure 74. Select Products

You should choose **Custom**, so you can configure the DB2 product for your particular environment. In our example we selected all of the options except East Asian Conversion Support.

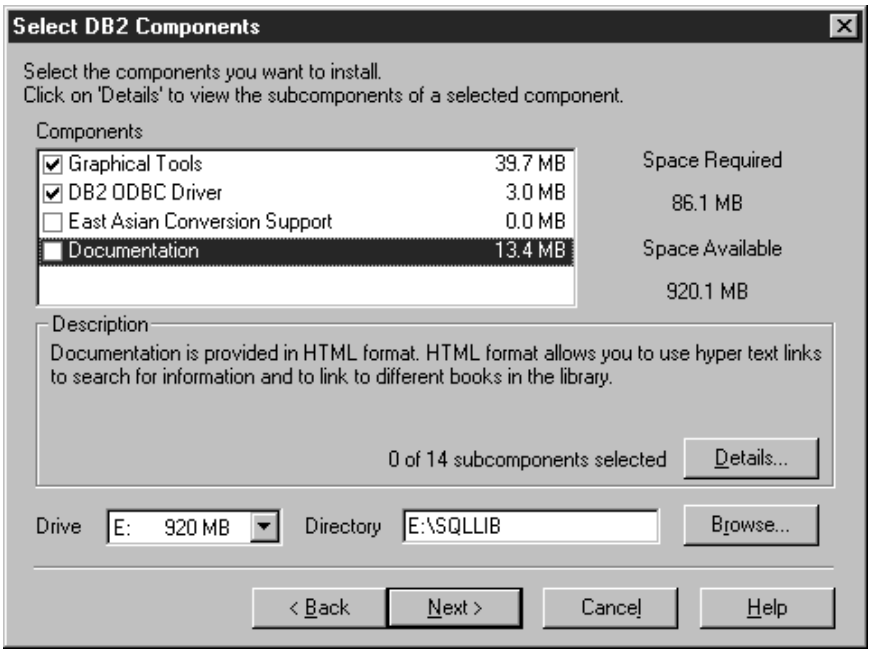


Figure 75. Select DB2 Components

Select the products you want to install and click on **Next**.

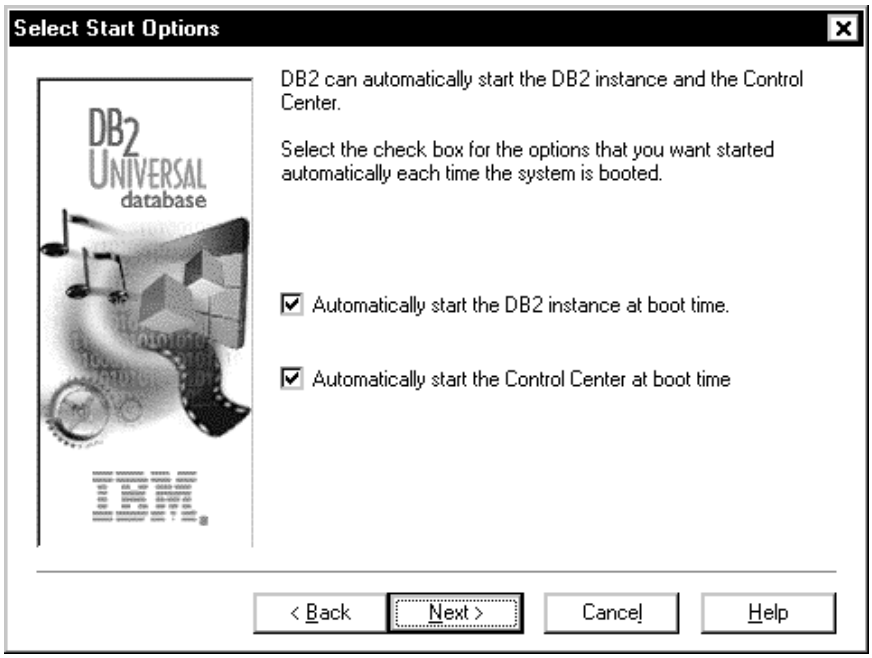


Figure 76. Select AutoStart Options

Note: Having the Instance and Control Center automatically start at boot time is a nice feature, but keep in mind that they require a lot of memory and are CPU-intensive. If this is not a dedicated DB2 server, we recommend that you manually start them each time your machine reboots.

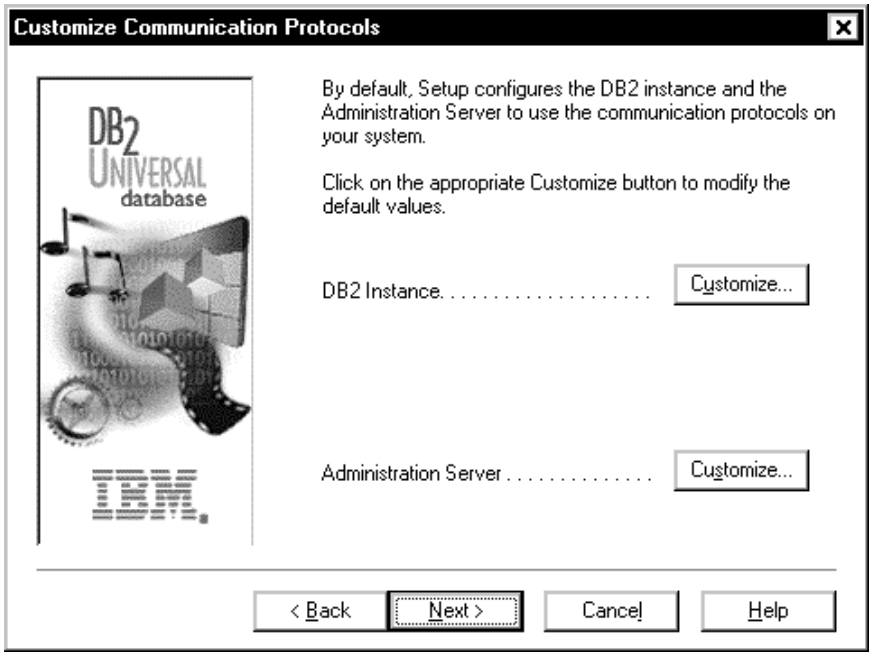


Figure 77. Customize Communication Protocols

Configure the DB2 Instance at this point. If you do not have the information needed to configure your protocols at this time, you can do it after the installation is completed.

Click on the **Customize** button located next to DB2 Instance.

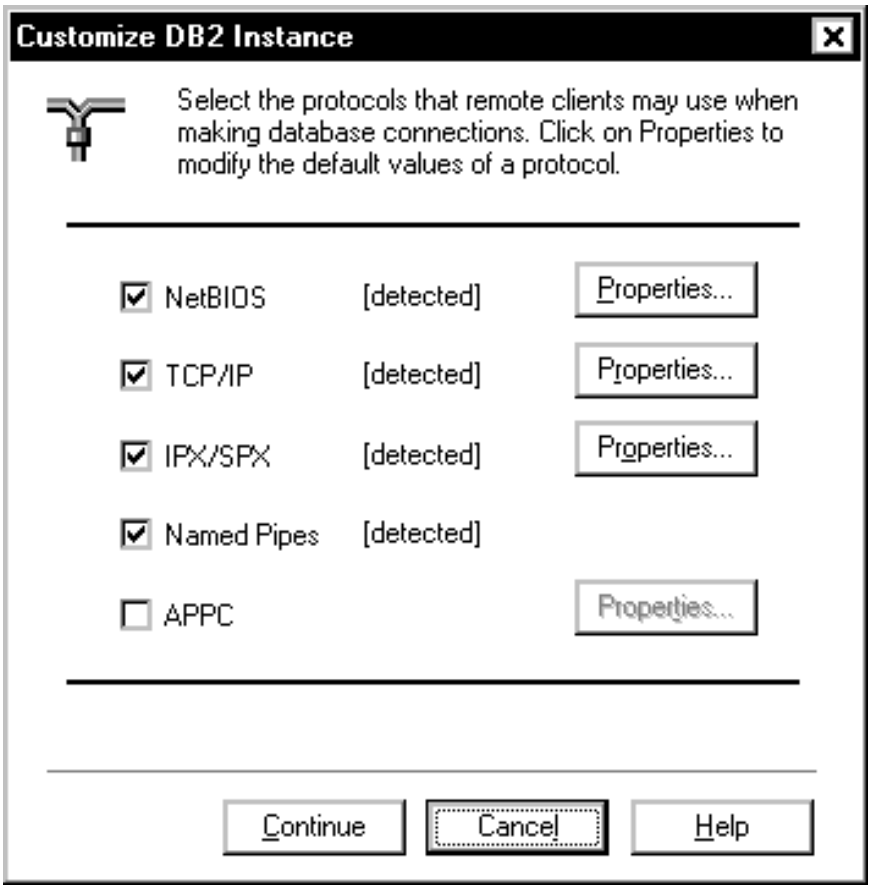


Figure 78. Customize DB2 Instance

You may review the default properties that are set up for the various transport protocols and modify them to fit your requirements. The following windows show the values for NetBIOS, TCP/IP, IPX and Named Pipes. De-select the protocols you do not need to use.

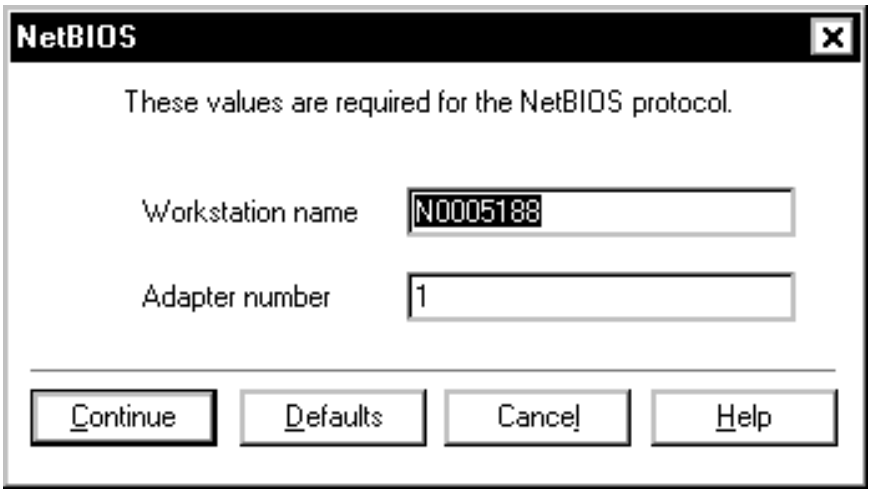


Figure 79. Configure the NetBIOS Protocol

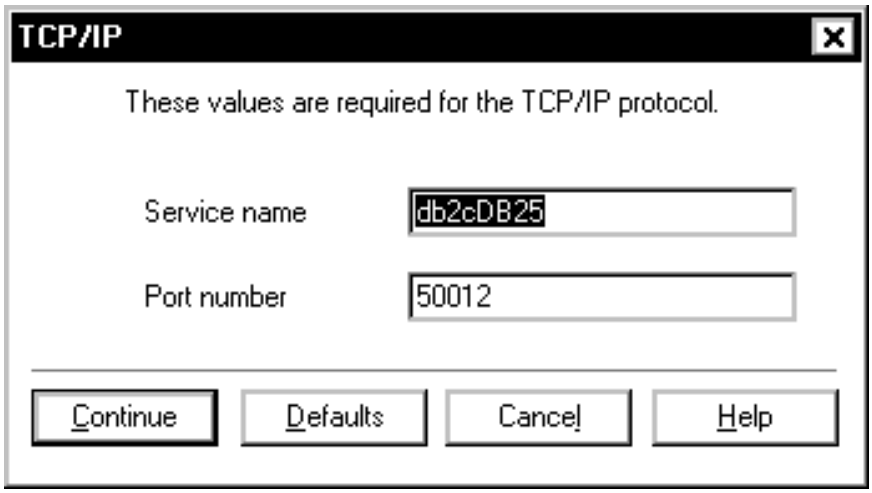


Figure 80. Configure the TCP/IP Protocol

Configure the Administration Server at this point. If you do not have the information needed to configure your protocols at this time, you can do it after the installation is completed.

Click on the **Customize** button next to Administrator server as shown in Figure 77 on page 56.

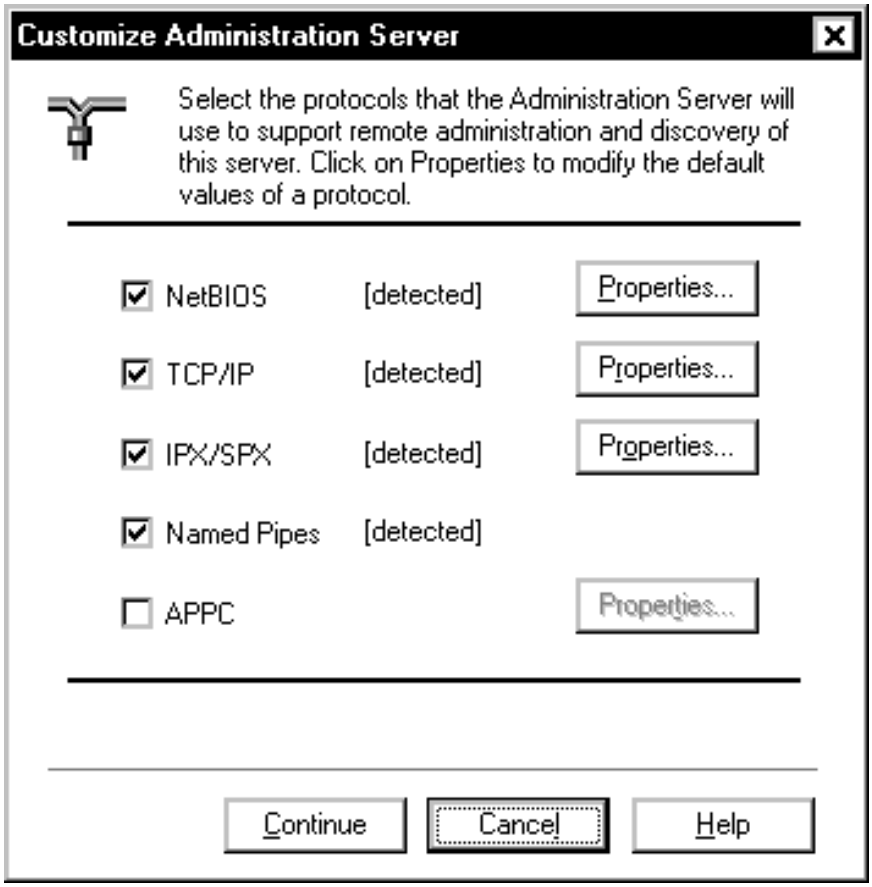


Figure 81. Customize Administration Server

You should review the properties to make sure they fit your environment:

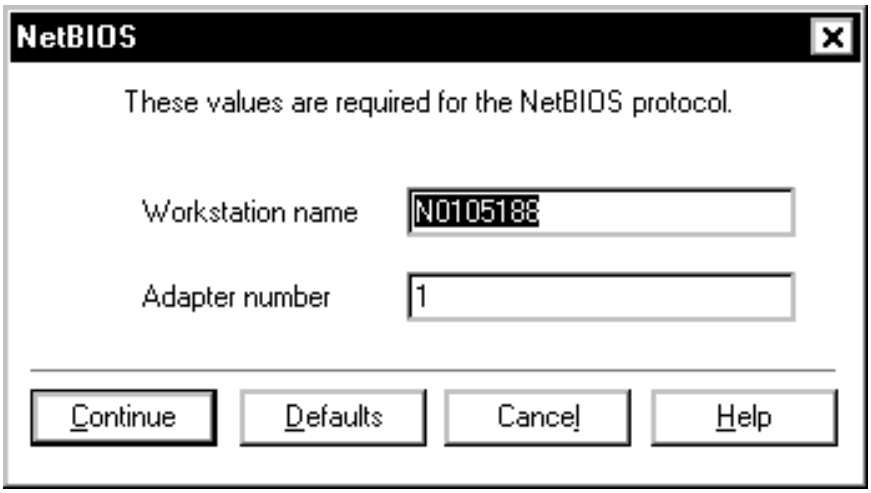


Figure 82. Configure the NetBIOS Protocol

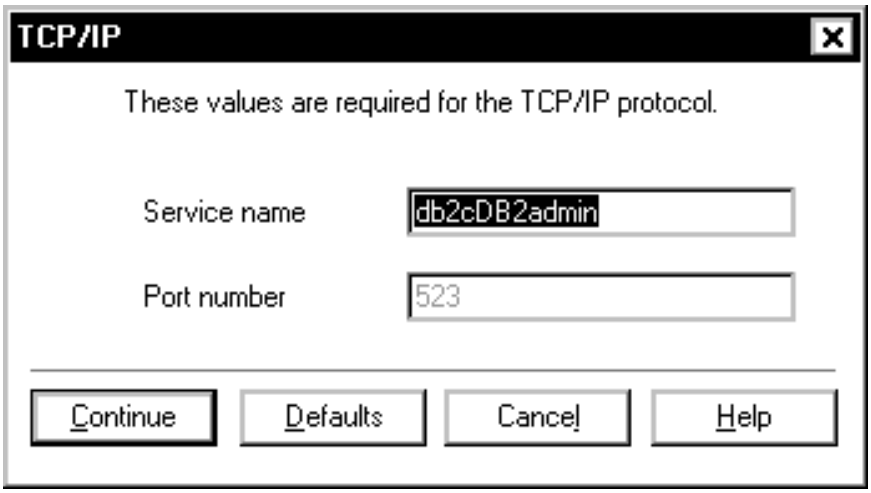


Figure 83. Configure the TCP/IP Protocol

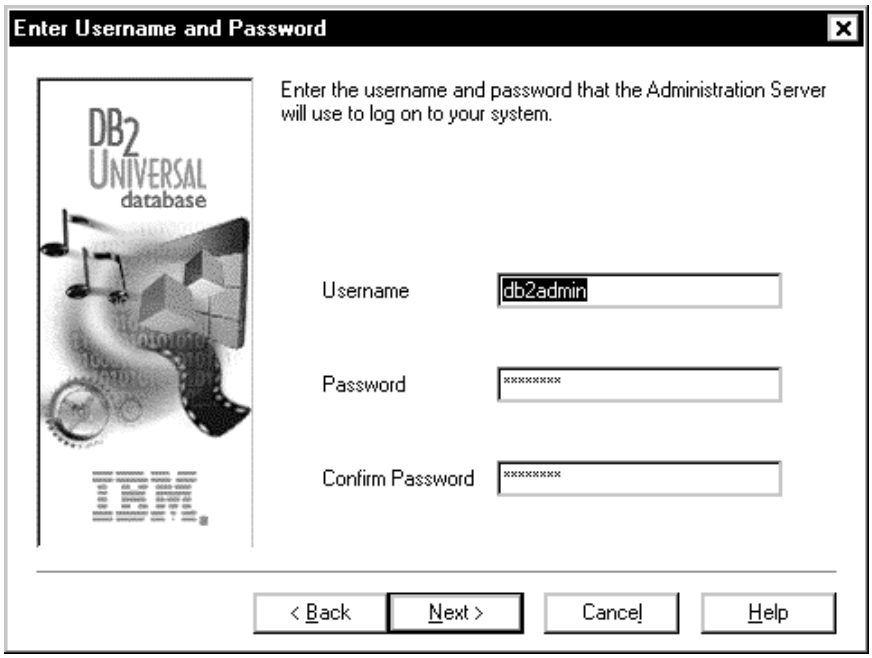


Figure 84. Enter Username and Password for Administration

When you set up the username you need to be aware that there is a restriction that the username must be 8 characters or less. Therefore, you cannot use the administrator user ID, since it has too many characters. By default, UDB will create a username of db2admin and a password of db2admin. You can change them to anything you want as long as it is not longer than 8 characters and complies with the DB2 naming rules that are shown in 2.9.1, “User IDs and Rights Required” on page 53.

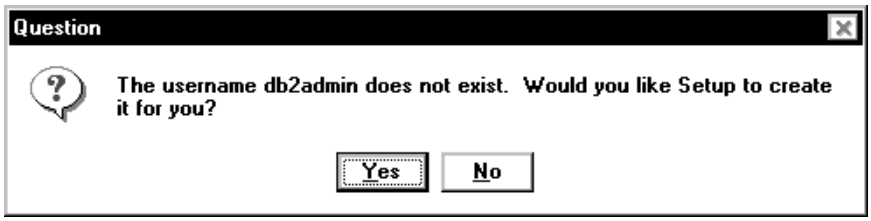


Figure 85. Username Doesn't Exist

You will get this message if NT can't validate whether the ID exists. Click on **OK** to continue.

Figure 86. Unable to Validate the User ID/Password

You will get this message if db2admin doesn't exist. It is for information purposes only. The DB2 installation should create the user ID now.

Note: With the installation of UDB documentation, you automatically get the product Net.Question. If you have Lotus Domino Go Webserver installed, it

also has a version of Net.Question that you can choose to install. The one that will get used for searching is the one that is first in the Path statement in your system environment variables. You might have to play with your local environment variables if you have a requirement to use both versions. This can be done with set commands.

In general, if you have both Net.Question products installed, you should remove one path entry from the path statement in the environment variables.

At this point, you can review your selections and proceed with installing the product, or back up and correct your choices.

After the files are copied, you will have an option to reboot the system. You should select **No** and go back to the installation program at this point in time.

2.9.2 Installing the DB2 UDB Fixpak

Included in the IBM Enterprise Suite for Windows NT is the latest DB2 UDB fixpak, which will automatically be installed when you choose to install DB2 UDB and any of its components.

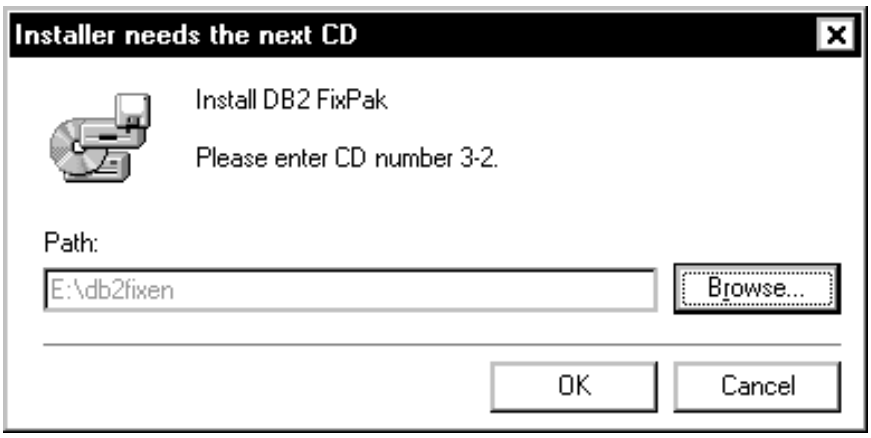


Figure 87. DB2 Fixpak CD Prompt

The installation program prompts you to replace the CD with the DB2 UDB fixpak CD. Replace the CD and click on **OK** to continue.

At the Welcome screen, click **Next** to continue.

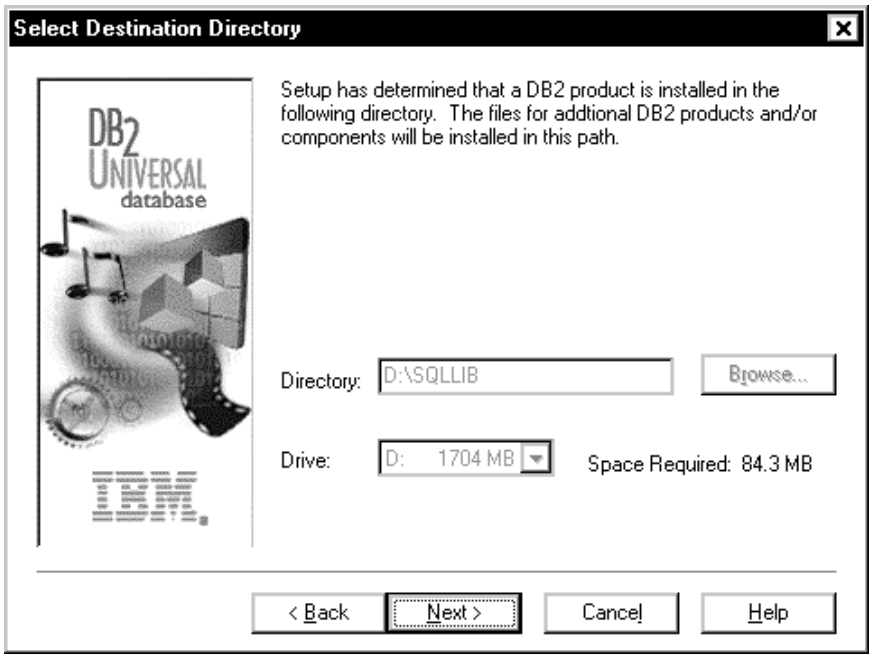


Figure 88. Destination Directory Confirmation

The installation program will have determined where DB2 resides and fill in the information for you. It does this using environment variables.

Click on **Next** to continue.

The installation is ready to copy the files. Review the settings and click on **Next** to continue.

2.10 Installing IBM DB2 Connect - Enterprise

After the fixpak is installed you are prompted for the next CD.

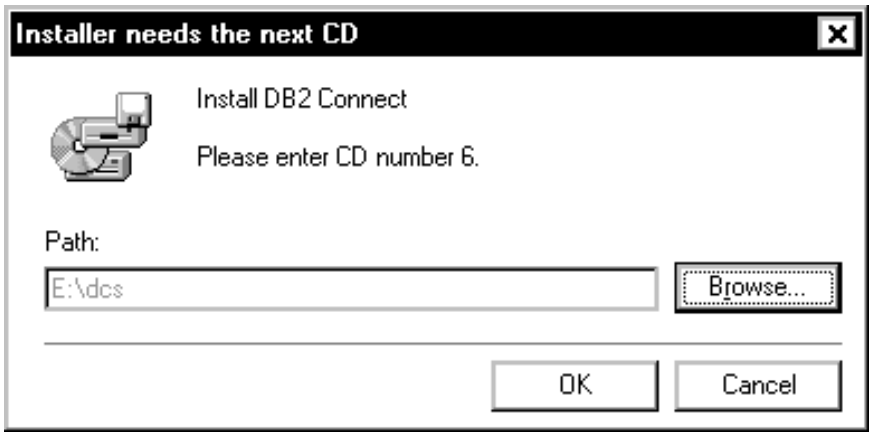


Figure 89. DB2 Connect CD Prompt

The installation program is now ready to install DB2 Connect. Replace the CD with the DB2 Connect CD and click on **OK** to continue.

The DB2 Welcome screen once again is presented and we clicked on **Next** to continue.

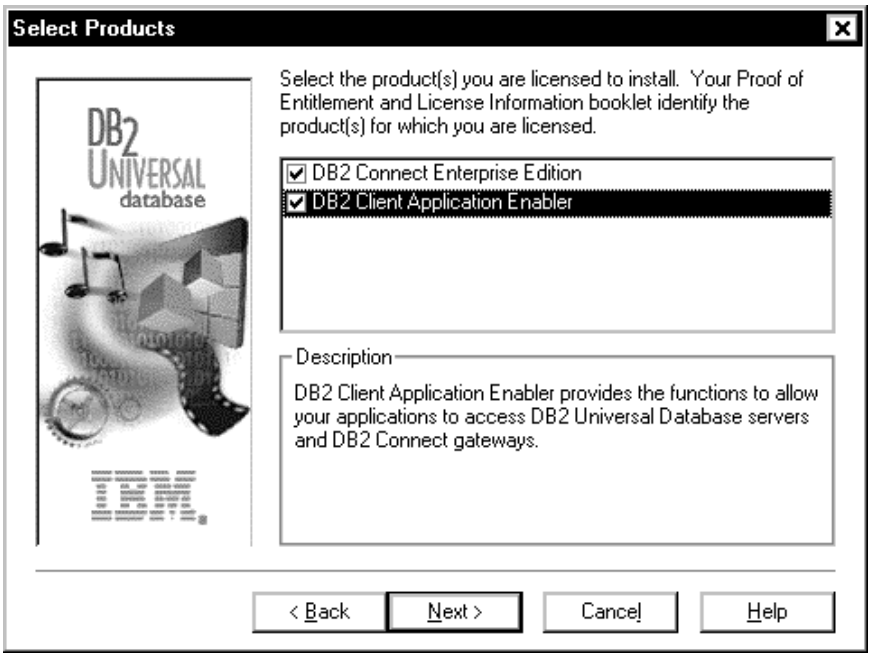


Figure 90. Product Installation Choice

We are prompted for the product to install. We chose to install both and clicked on **Next** to continue.

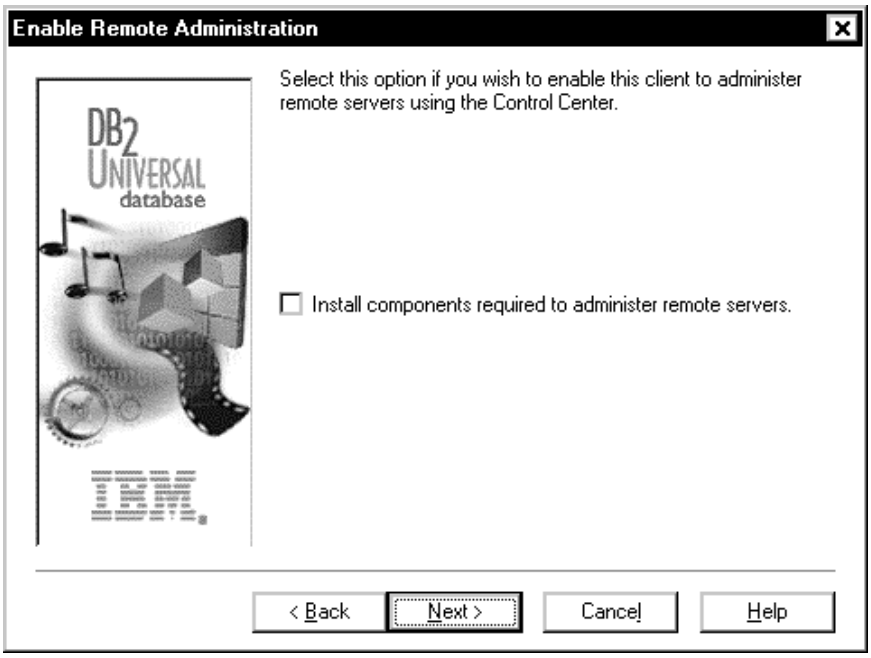


Figure 91. Enable Remote Administration

We did not choose to administer remote servers. Click on **Next** to continue.

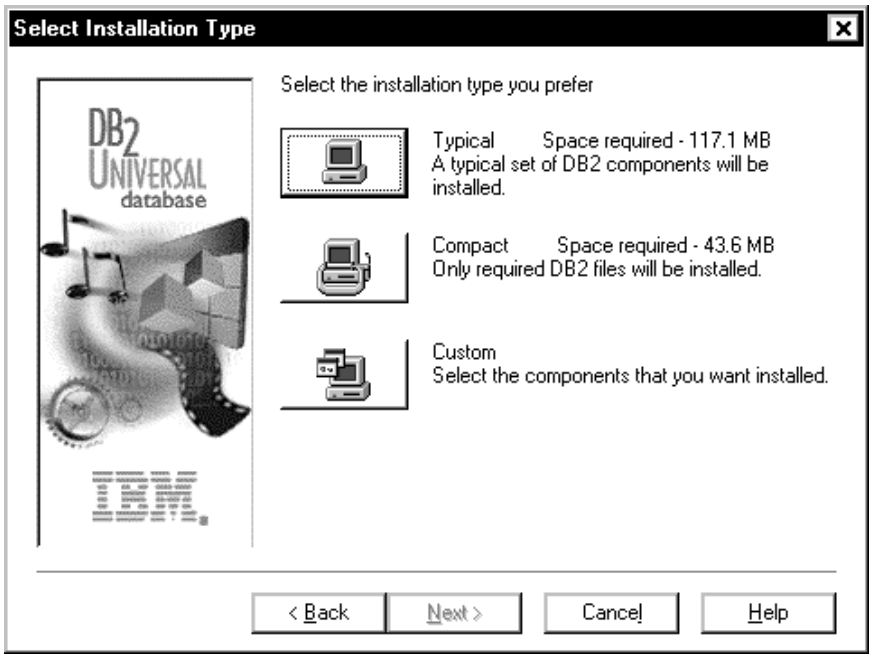


Figure 92. Choose Installation Type

So that we could pick the components to install, we chose **Custom**.

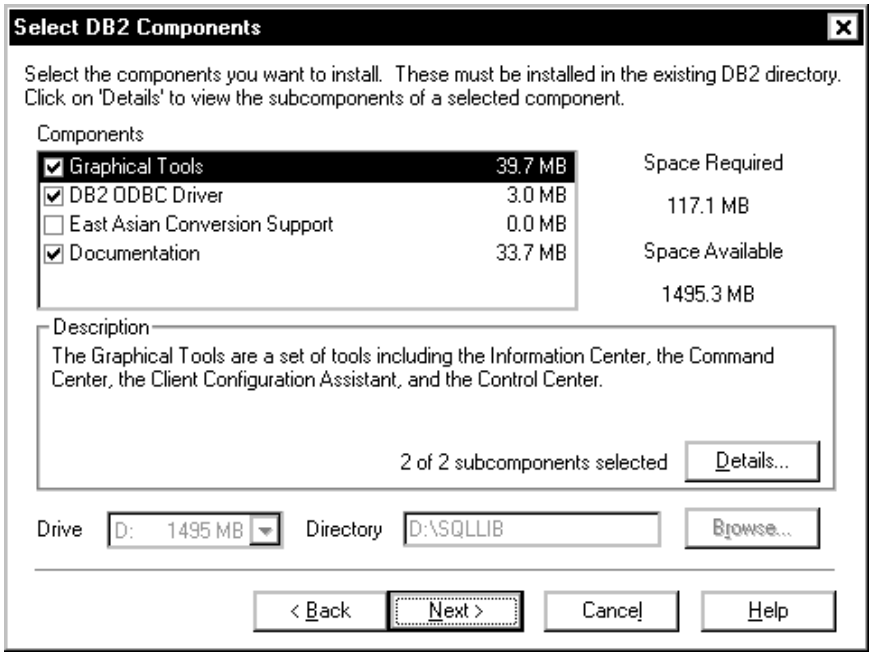


Figure 93. Select DB2 Components

At this point, we chose to install all the components except East Asian Conversion Support. Click on **Next** to continue.

You will be given the choice to:

- Automatically start the DB2 instance at boot time.
- Automatically start the Control Center at boot time.

We did not select to do either. We then clicked on **Next**.

You can review your settings and continue. Click on **Install** to continue copying files.

You are then prompted to reboot. Remember to choose to not reboot at this time if you are still installing products.

2.10.1 Environment Variables

Environment variables will be updated on your system when you install DB2 UDB. The additions to the System Properties are as follows:

- The variable LIB with a value of C:\SQLLIB\LIB.
- The variable INCLUDE with a value of C:\SQLLIB\INCLUDE.
- The variable Path will have the values C:\SQLLIB\BIN, C:\SQLLIB\FUNCTION, C:\SQLLIB\SAMPLES\REPL, and C:\SQLLIB\HELP added to it.
- The variable Path will also have the value C:\IMNQ_NT added. This entry is for Net.Question, which is used with the HTML Search Server included with UDB.
- The variable DBINSTANCE with a value of DB2.
- The variable I4_INSTALL_DRIVE with a value of C: (or drive installed to).
- The variable I4_LANG with a value of EN_US (or language chosen).
- The variable IMINST with the value HELP is added because of Net Question.
- The variable IMINISTSRV with the value C:\IMNNQ_NT is added due to Net.Question.

2.10.2 Registry Implications

DB2 adds an entry in the registry under HKEY_LOCAL_MACHINE. If you look under Software, you can see what version and fixes of DB2 you have installed.

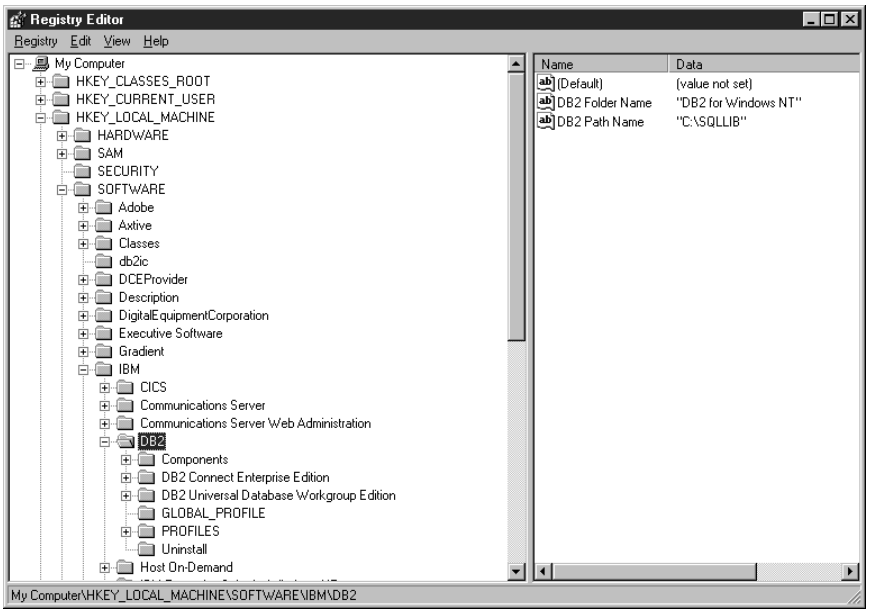


Figure 94. Registry - DB2

DB2 Connect updates the registry with an entry under HKEY_LOCAL_MACHINE. Under the software section, you will find that DB2 Connect has been added under IBM (see Figure 95 on page 66).

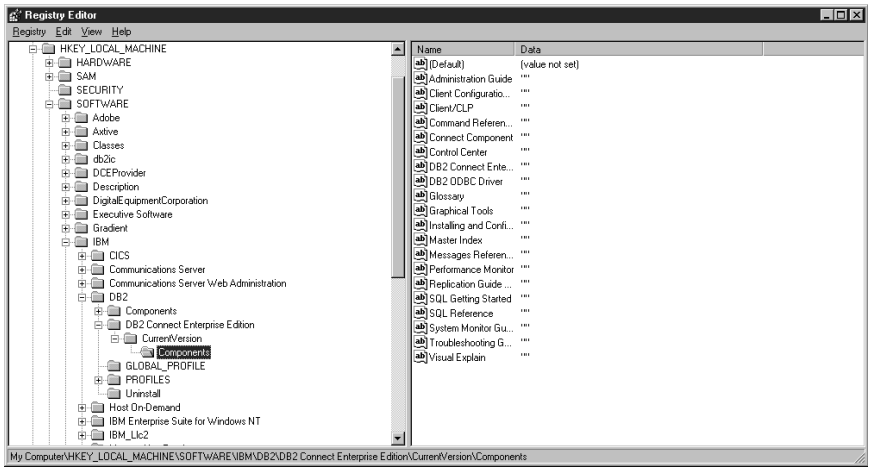


Figure 95. Registry - DB2 Connect

2.10.3 User IDs and Rights Required

You need to have a username that will be used to install DB2. The username must belong to the Administrators group and also be a valid DB2 username or have the Act as part of the operating system advanced user right. A valid DB2 username is 8 characters or less, can include letters A-Z, numbers 0-9, @, #, $, and _ . It must begin with a letter A-Z, @, $, or #.

2.10.4 Files and Logs

Files are created and stored by default in the C:\SQLLIB path unless you chose another drive letter or folder name during installation. After installation, a log file called DB2.LOG is created and stored in the DB2LOG directory. This log is useful for troubleshooting because it logs the product installation status. Another log file that is included with UDB is the DB2DIAG.LOG file that is located in \SQLLIB. This file includes messages from the startup of DB2 and any execution errors for the session.

Following is a sample piece of the beginning of DB2.LOG after installation:

```
Setup Log File Opened5-27-1998 11:37:06
----------------------------------------
=>Querying the system...
Windows NT Version: 4.0
Using Explorer Shell.
User has sufficient authority to install product and remove product.
Space requirements are being calculated...
=>Checking for previous installations...
Products to Install:
      DB2 Universal Database Workgroup Edition
      DB2 Client Application Enabler

Setup Type:
      CUSTOM

Components to Install:
      Required DB2 components
      Graphical Tools
            -Client Configuration Assistant
            -Control Center
                  -Performance Monitor
                  -Visual Explain
      DB2 ODBC Driver

DB2 System Name:BARRYIP

      Automatically start the Control Center at boot time

DB2 Instance Configuration:
      Automatically Start at Boot Time
      NetBIOS
            Workstation Name:N0000000
            Adapter Number:2
      TCP/IP
            Service Name:db2cDB2
            Port Number:50000
      Named Pipes

Administration Server Configuration:
      Log On Username:db2admin
      NetBIOS
            Workstation Name:N0100000
            Adapter Number:2
      TCP/IP
            Service Name:db2cDB2admin
            Port Number:523
      Named Pipes

Target Directory:
      E:\SQLLIB

Program Folder:
      DB2 for Windows NT
Setting up the registry and uninstall information...
Selecting components for install...
Setting up file transfer...
Performing file transfer to the target system...
```

Figure 96. Beginning of DB2.LOG

2.10.5 Services

New services are created during the installation of UDB and are as follows:

- DB2-DB2 - This service allows you to start and stop your instance and is automatically started at boot time.
- DB2-DB2DAS00 - This service allows you to perform remote administration.
- DB2 Governor - This service allows you to manually start and stop the DB2 Governor.
- DB2 Security - This service allows you to manually start and stop DB2 Security.

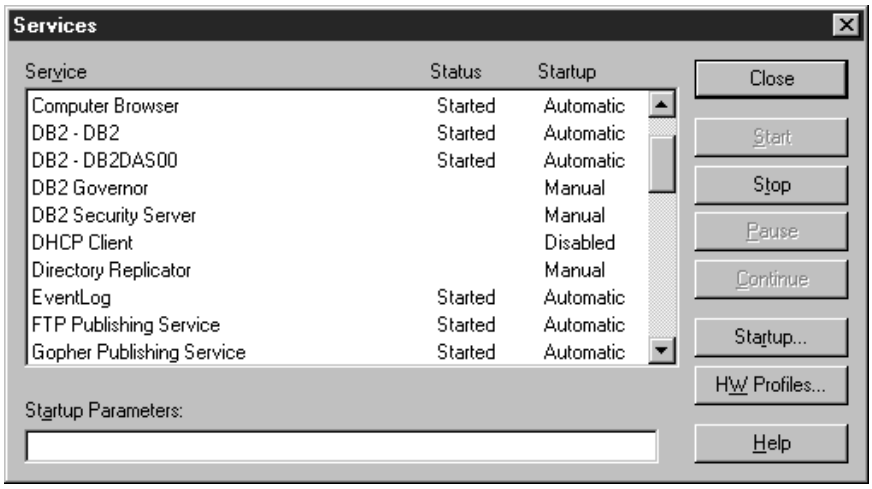


Figure 97. NT Services

Another way to see a list of services that are started on your system is to issue `net start` at an NT command line. (If you would like to keep the scrolled text, redirect the services to a file.) An example of this would be to issue the following command at a DOS prompt: `net start > services.out`. You can then pull up the services.out file in a Notepad and view the information (see Figure 32 on page 29).

2.11 Installing IBM MQSeries

If you elected to install MQSeries as a part of the installation program, then you will be led through the install process.

However, before you begin a list of pre-installation guidelines are listed below:

1. Ensure that you do not install in the root directory. You must always supply a directory for the installation.
2. All user exits need to be re-linked with threaded libraries before using them on V5.0 of this product. That is to make them thread-safe (this is if you had an older version of MQSeries already installed).
3. Logon with a user ID of less then 12 characters.

When the MQSeries installation starts, the installation program will prompt you for the CD.

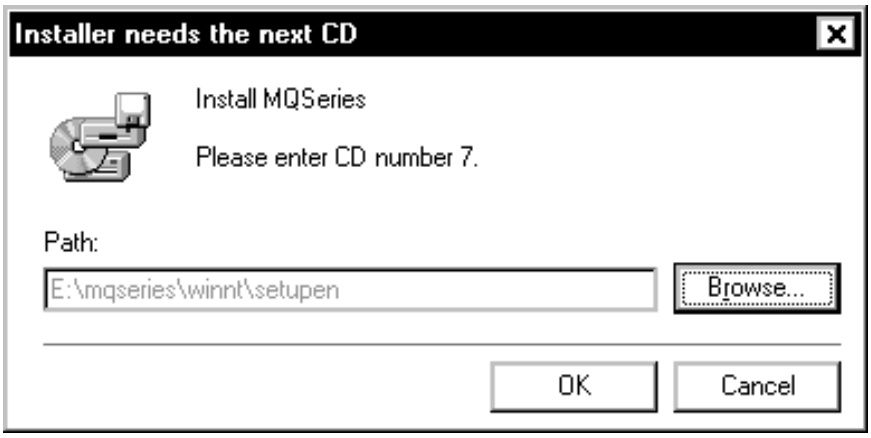


Figure 98. MQSeries CD Prompt

Click on **OK** when you have inserted the CD.

Click on **Next** to proceed after you see the Welcome screen.

Choose your destination directory for the program files and the data files:

- C:\MQM
- C:\MQM\data

Click on **Next** to proceed.

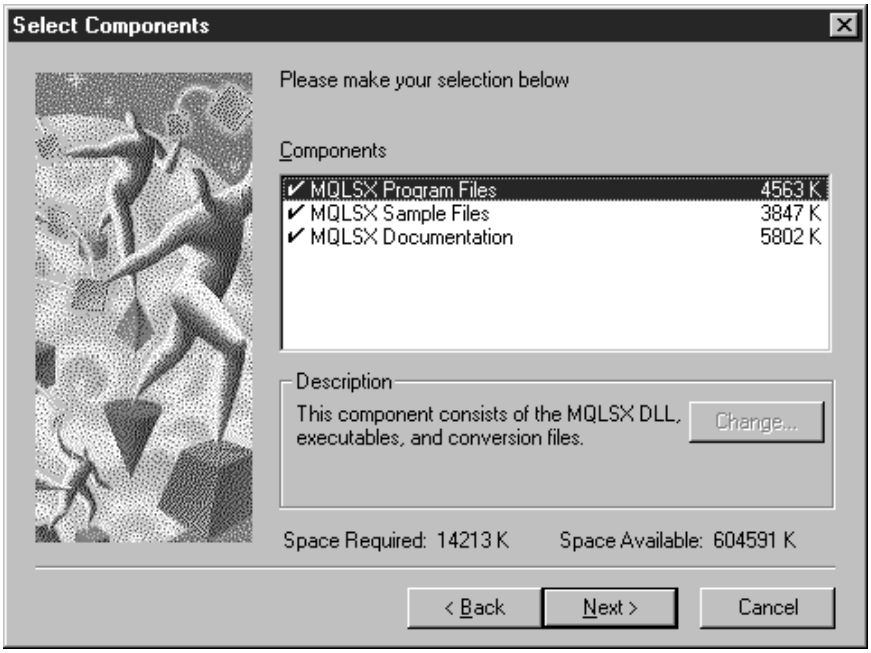


Figure 99. Select Components

The first step is to decide which components you need to install. We chose everything for our scenarios in Figure 99.

Select a folder for the program icons and click on **Next**.

If everything is correct, begin copying files by clicking on **Next**.

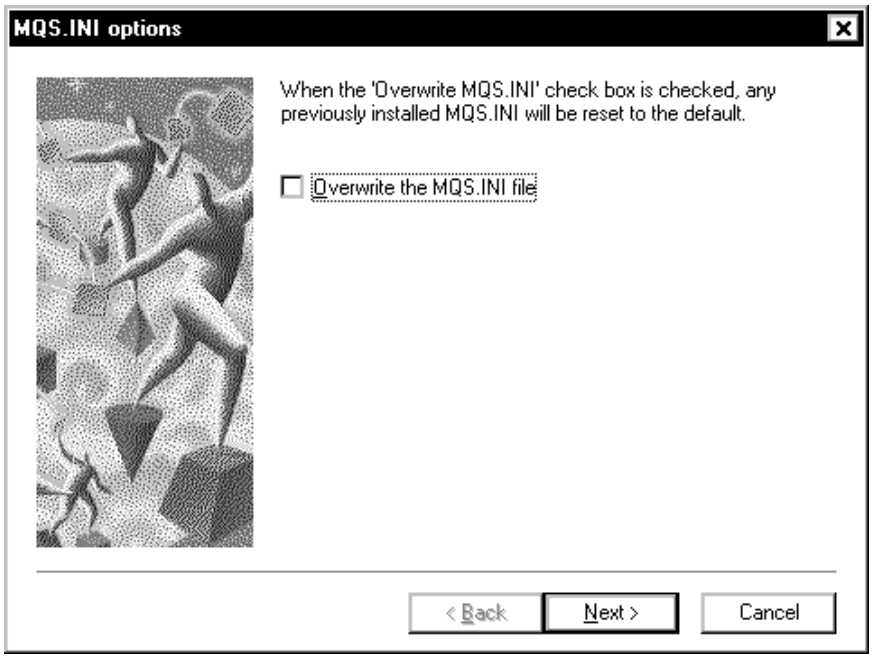


Figure 100. MQS.INI Options

Since there was no previous version of MQ installed we did not check the box. Even if there had been an older version of MQSeries installed you may not want to overwrite the INI file. If you are going to overwrite it, make a backup copy of it first. Click on **Next** to proceed.

We chose to skip reading the readme file now. Click on **Next** to continue.

The final window in the MQSeries install will give you the option to reboot the system. As with all product installations in the IBM Enterprise Suite for Windows NT package you must select **No** to not restart the computer.

2.11.1 Installing IBM MQSeries LotusScript Extension (LSX)

If you chose to install Lotus Domino Server with the MQSeries LSX, or chose MQSeries and Lotus Domino Server was already installed, then the installation of MQSeries LSX will occur. In addition, if you select both MQSeries and Lotus Domino Server you will be provided with the option.

When the MQSeries LSX installation starts, the installation program will prompt you for the CD:

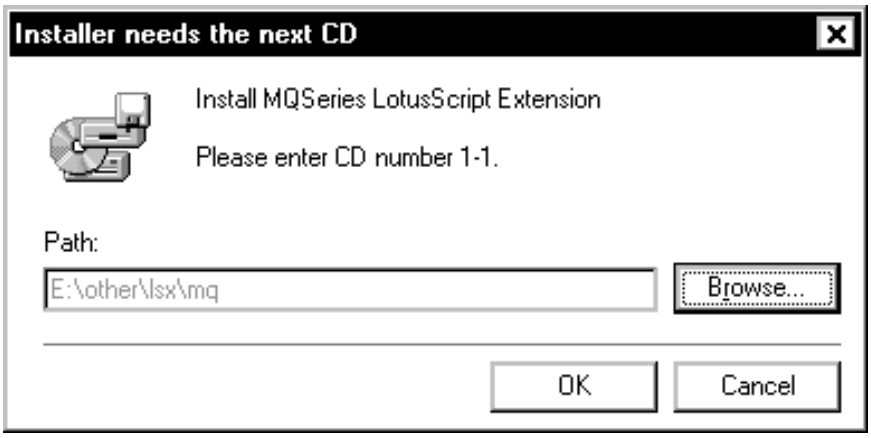


Figure 101. MQSeries LSX CD Prompt

Click on **OK** when you have the CD in place.

Click on **Next** to proceed after you read the MQSeries welcome screen.

Choose your destination directory for the program files and click on **Next** to proceed. The default directory is C:\MQM\MQLSX\.

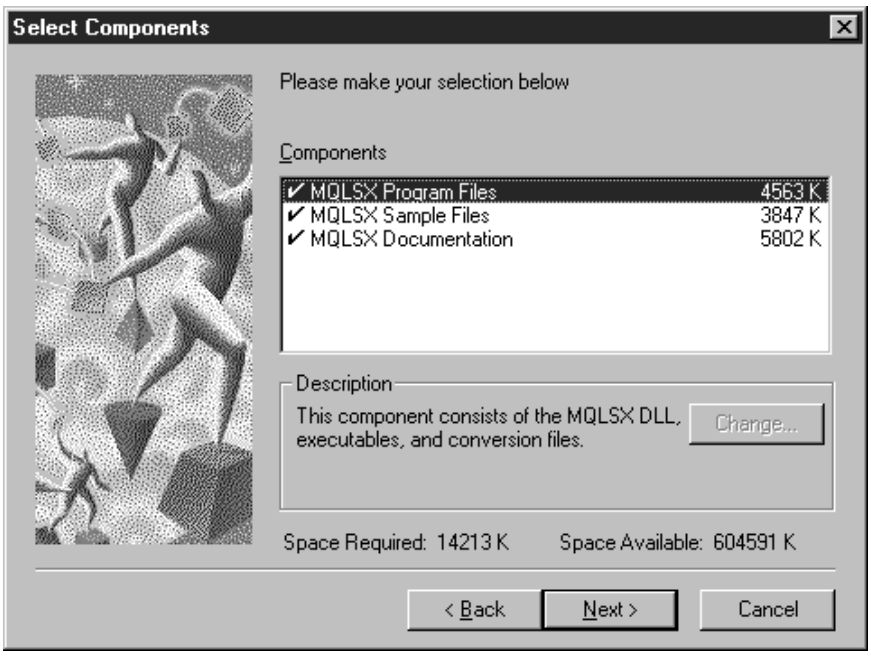


Figure 102. Select Components

The first step is to decide which components you need to install. We chose everything for our scenarios.

Select a folder for the program icons and click on **Next**.

If everything is correct, begin copying files by clicking on **Next**.

We chose to skip reading it now. Click on **Next** to continue.

The final window in the MQSeries LSX install will give you the option to reboot the system. As with all product installations in the IBM Enterprise Suite for Windows NT package you must select **No** to not restart the computer.

2.11.2 User IDs and Rights Required

MQSeries for Windows NT works with Windows NT's User Managers accounts. MQSeries authorizations, names of user IDs and groups are limited to a maximum of 12 characters and no spaces are allowed. This means that the Windows NT system-defined Administrator user ID can't issue MQSeries control commands. The individuals who will be using MQSeries will need to be part of the mqm group. If an mqm group has not been set up on your system, one will be created during the installation process. If you are going to administer any queue manager on your system, your user ID must belong to the local mqm or Administrators group. You must also be part of the mqm group or have administrative authority in order to:

- Use the runmqsc command.
- Administrator authorities on MQSeries for Windows NT using the setmqaut command.
- Create a queue manager using crtmqm.

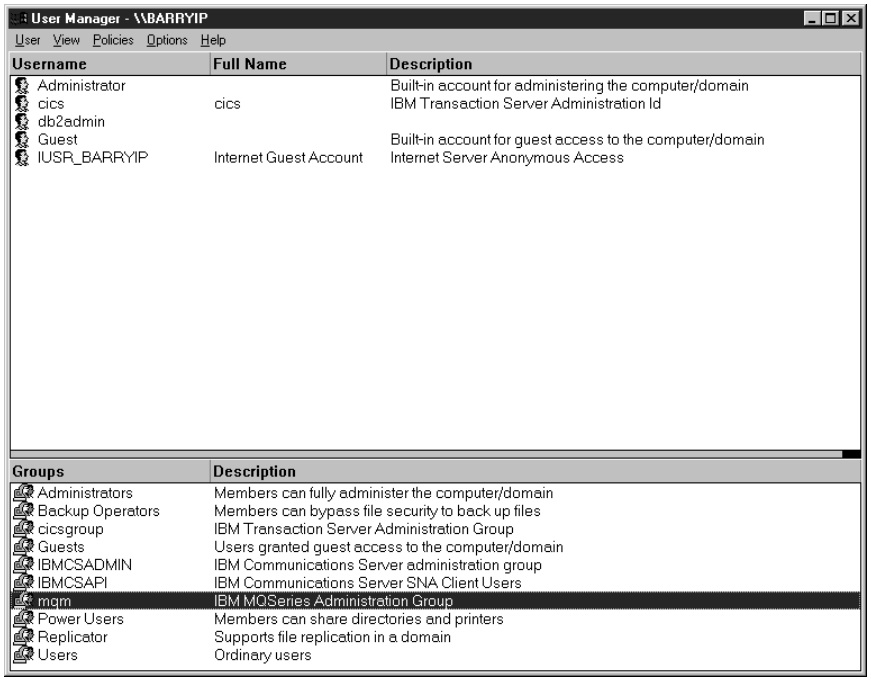


Figure 103. User Manager Groups

If you are sending channel commands to queue managers on a remote Windows NT system, you must have your user ID set up as a member of the mqm or administrators group on the target system.

2.11.3 Environment Variables

During the installation of MQSeries, additional environment variables will be added to your system. The following list contains the environment variables with the values that will be added to your system:

1. DMQ_PATH with a value of drive:\MQM\BIN
2. DMQ_XLAT_PATH with a value of drive:\MQM\BIN
3. INCLUDE with a value of drive:\MQM\TOOLS\C\INCLUDE
4. LIB is appended with a value of drive:\MQM\TOOLS\LIB
5. Path with two additional values of drive:\MQM\BIN and drive:\MQM\TOOLS\C\SAMPLES\BIN

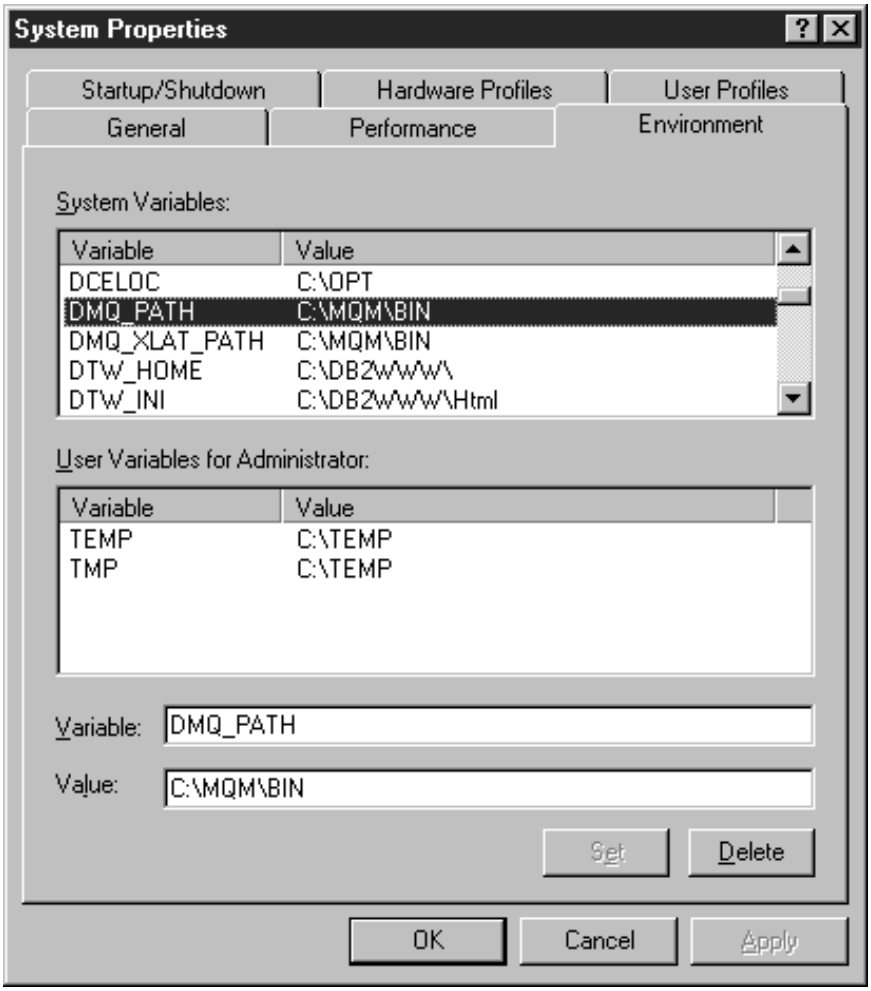


Figure 104. Environment Variables

2.11.4 Files and Logs

There are several error log files associated with MQSeries. The following list includes the error log files for MQSeries. (An assumption is made that MQSeries is installed on the C drive.)

- C:\mqm\qmgrs\qmname\errors - This log should be used if the queue manager name is known and the queue manager is available.

- C:\mqm\qmgrs\@SYSTEM\errors - This log should be used if the queue manager is not available.
- C:\mqm\errors - This log should be used if an error has occurred with a client application.

In our installations, we never saw anything in these logs. If you start a QManager it will create log entries. In addition to the logs that are part of MQSeries, errors are also logged in the application log. This can be viewed with the Windows NT event viewer.

2.11.5 Registry Implications

The installation of MQSeries will add an entry in the system registry under HKEY_LOCAL_MACHINE+SOFTWARE+IBM+MQSeries.

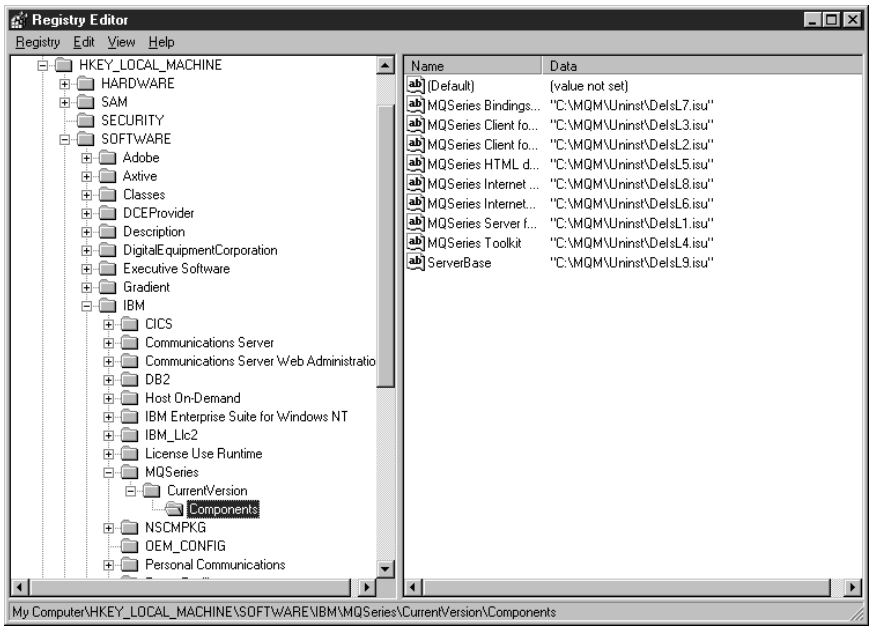


Figure 105. Registry

2.11.6 Services

A service named IBM MQSeries will be added to your system and can be found in Services under Control Panel. IBM MQSeries will automatically start at boot time.

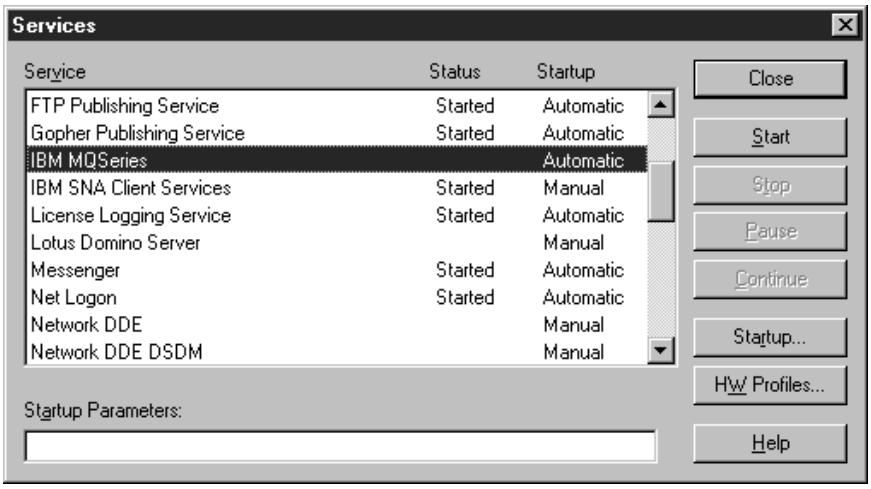


Figure 106. System Services

2.12 Installing IBM TXSeries

IBM TXSeries is an architecture of integrated software components that you can use to create a CICS environment, an Encina Monitor environment, or both.

Note: You are required to have Service Pack 3 for NT already installed before installing TXSeries.

Before you begin installing TXSeries on your machine, review the following list of guidelines:

- To use the DCE for Windows NT ADK option, you must also have suitable compilers and linkers installed on your system. For Intel platforms, Microsoft Visual C++ 4.0, 4.1, 4.2, 5.0 or IBM VisualAge C++ 3.5 provide a compatible environment.
- Prior to installing DCE for Windows NT, ensure that NetBIOS is enabled. This is required for DCE for Windows NT to obtain a system hardware address.
- All installations require that the Server runtime component be installed.

  See Figure 109 on page 77.
- You should install DCE for Windows NT only on NTFS volumes. This is recommended since access to security credential files is permitted only to the user that creates the files. These access checks are only possible on NTFS volumes. DCE for Windows NT will run properly if it is installed on a FAT volume, but is less secure than when installed on an NTFS system.
- Before configuring a client, make sure the client and server share a common RPC protocol tower.
- Depending on how you encode/decode an X.500 name, underscores within the name may not be supported.

When the installation process gets to the point where it is ready to install the TXSeries, it will prompt you for the correct CD:

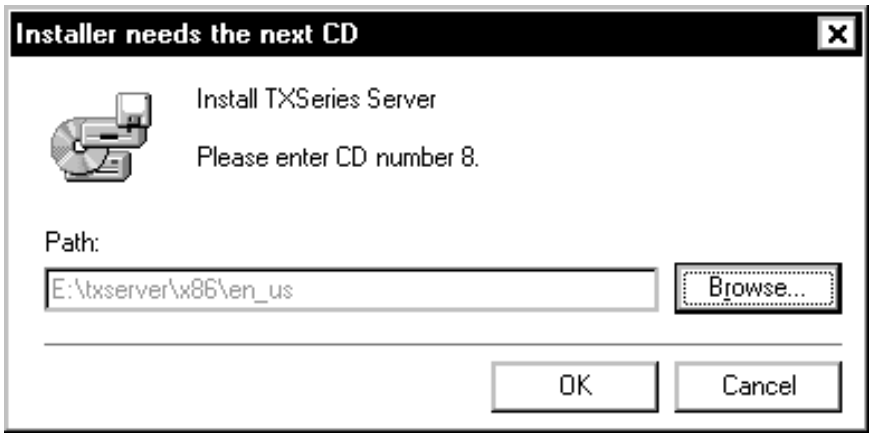


Figure 107. TXSeries CD Prompt

Make sure that the correct CD is in the drive and click on **OK**.

Click on **Next** to proceed after you read the Welcome screen.

The correct language should already be selected based on your installation program choice.

Click on **Next** to proceed.

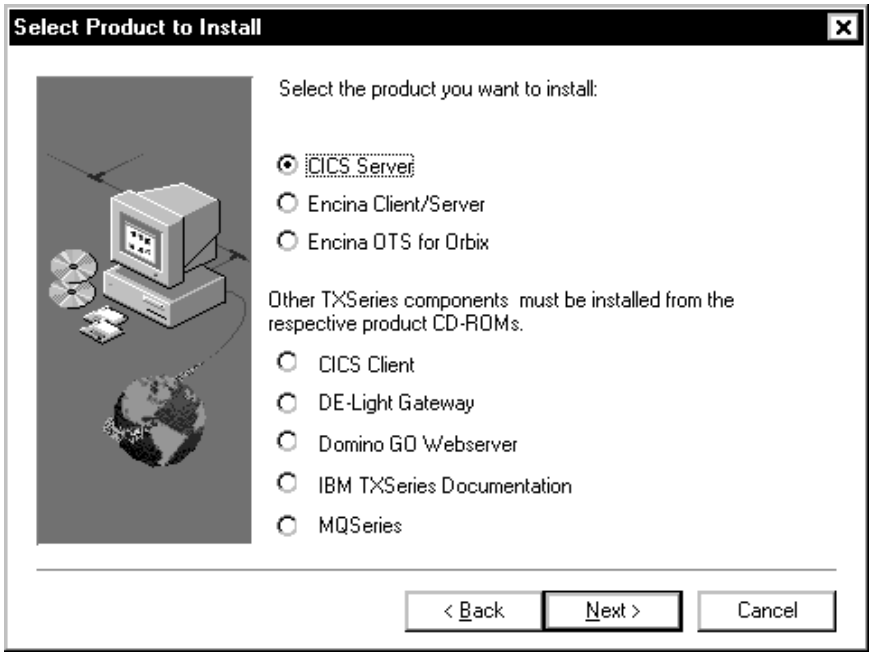


Figure 108. Select Products

We chose to just install CICS Server.

Click on **Next** to proceed.

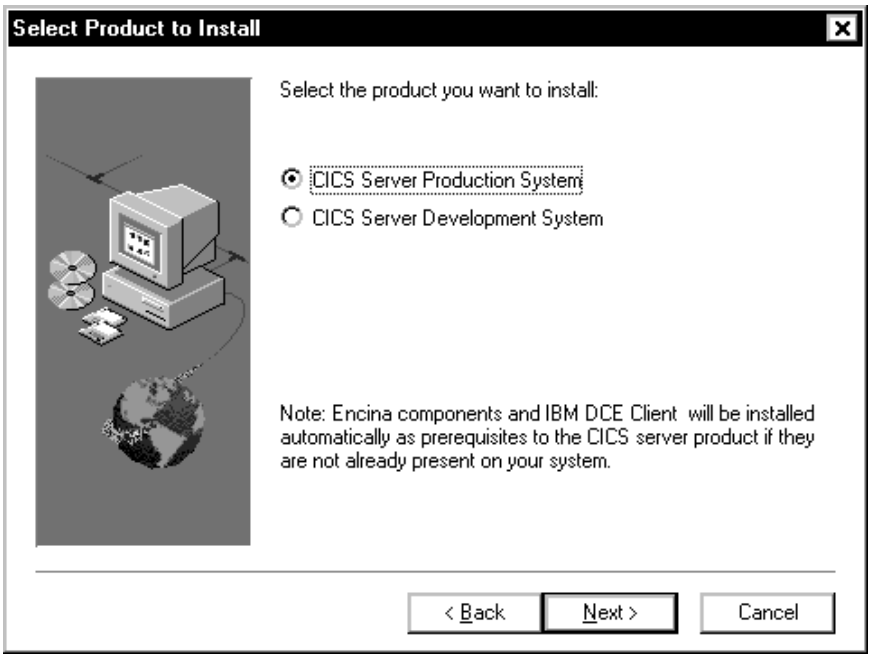


Figure 109. Select Product to Install

Choose the type of environment you have, production or development. We decided to install the server in a production environment at this point in time.

Click on **Next** to proceed.

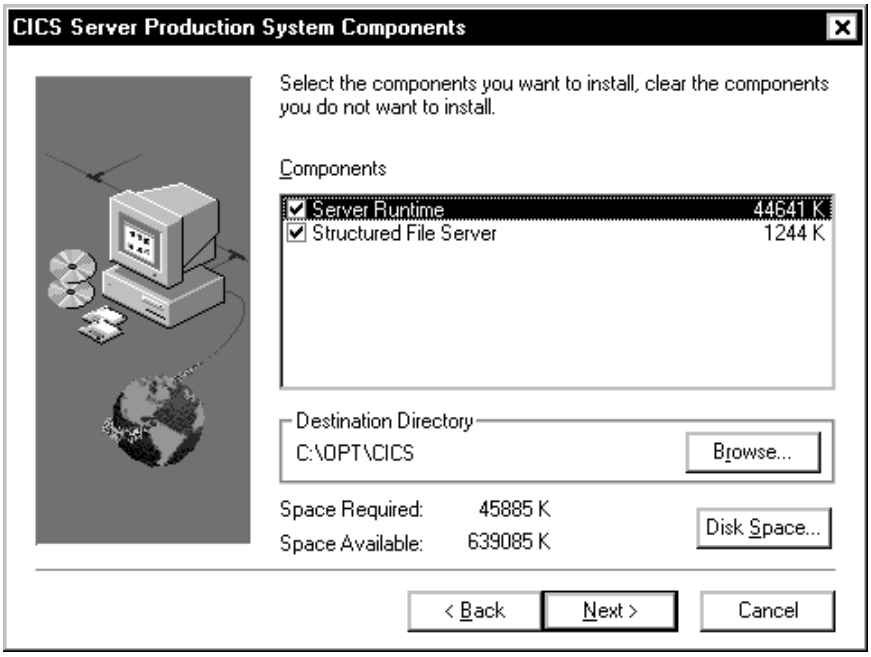


Figure 110. Select Product to Install

Since both the runtime and file server were already selected, we elected to stay with the defaults.

Click on **Next** to proceed.

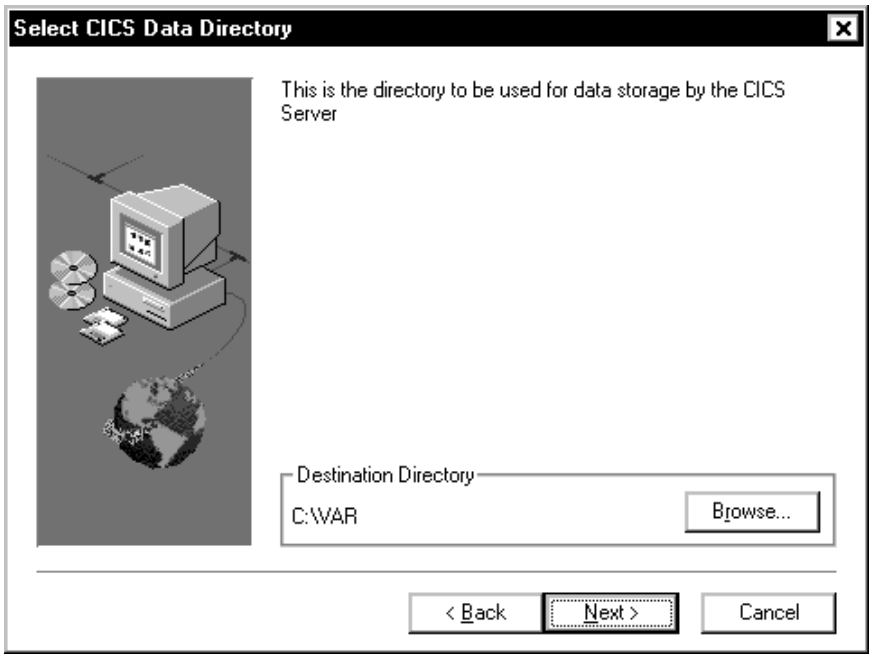


Figure 111. Select CICS Data Directory

This is your CICS Data Directory destination. We took the default.

Click on **Next** to proceed.

If you are sure you entered everything correctly, you may proceed. Otherwise, this is your last chance to go back and change something before the files are copied.

Click on **Next** to proceed.

The TXSeries Server components will be installed.

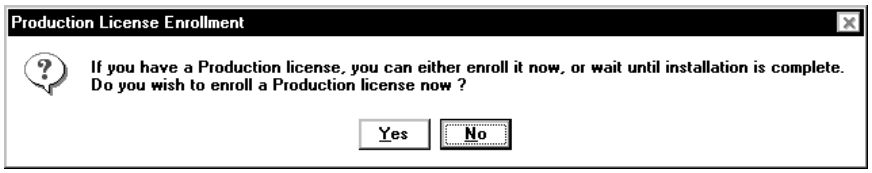


Figure 112. Production License Enrollment

After the files are all copied, you will be asked if you want to enroll your production license. Since we are in the middle of an installation, we chose to skip this step for later customization. Click on **No**.

The installation is complete and you may review the readme now if you want. We chose to skip this and proceed.

Click on **No**.

The installation is complete, but do not reboot at this time.

2.12.1 User IDs and Rights Required - CICS Server

This product should be installed from an NT Administrator ID. No other rights or IDs are needed.

2.12.2 Environment Variables - CICS Server

The following variables are added to the system properties during the installation of TXSeries:

- CICSBIN with a value of (drive):\OPT\CICS\BIN
- CICSHELP with a value of (drive):\OPT\CICS\BIN
- CICSLIB with a value of (drive):\OPT\CICS\LIB
- CICSNLS with a value of (drive):\OPT\CICS\msg\en_US\%N
- CICSPATH with a value of (drive):\OPT\CICS
- CICS_CST_HTML with a value of (drive):\OPT\CICS\msg\en_US\CSTHELP
- DCEBIN with a value of (drive):\dcelocal\bin
- DCEINC with a value of (drive):\OPT\dcelocal\include
- DCELOC with a value of (drive):\OPT
- DCE_USE_WCHA with a value of 1
- ENCBIN with a value of (drive):\opt\encina\bin
- ENCLOC with a value of (drive):\opt\encina
- ENCNLS with a value of (drive):\opt\encina\MSG\en_US\@N
- HELP is appended with (drive):\OPT\CICS\BIN
- INCLUDE is appended with (drive):\dcelocal\include and %DCELOC%
- LIB is appended with a value of %DCELOC%\dcelocal\lib;%CICSLIB%
- LOCPATH with a value of (drive):\OPT\dcelocal\locale
- NLSPATH has the added variables (drive):\OPT\dcelocal\nls\msg\%L\%N; (drive):\OPT\dcelocal\nls\msg\enus437\%N;%CICSNLS%;%ENCNLS%
- PATH is appended with (drive):\dce\dcelocal\bin;(drive):\dce\dcelocal \dcedcf;%CICSBIN%;%ENCBIN%

2.12.3 Registry Implications - CICS Server

An entry in the registry will be added to the following paths: HKEY_LOCAL_MACHINE\SOFTWARE\IBM\DCE for Windows NT and for HKEY_LOCAL_MACHINE\SOFTWARE\IBM\CICS for Windows NT.

2.12.4 Files and Logs - CICS Server

Two log files will be created in %SystemRoot%\TEMP (typically, C:\temp) Dce20 and DceEco. These are the install logs. The only interesting thing about these files would be any errors that might be logged there. Otherwise, the return code should be zero on a successful install. DCEsetup writes messages to the status and log windows during configuration. If you close either of these windows and then attempt any configuration operation, DCEsetup may crash. To recover, you will need to restart DCEsetup.

2.12.5 Services - CICS Server

During the installation of CICS Server, no services were added.

2.13 CICS Client

The CICS Client installation and customization is detailed in 5.2.2, “Installing the CICS Client and Internet Gateway” on page 255.

2.13.1 User IDs and Rights Required - CICS Client

This product should be installed from an NT Administrator ID. No other rights or IDs are needed.

2.13.2 Environment Variables - CICS Client

The following variables are added to the system properties during the installation of TXSeries:

- DCE_USE_WCHA with a value of 1
- DCE_VENDOR with a value of DEC
- DCEBIN with a value of C:\dcelocal\bin
- DCEINC with a value of C:\OPT\dcelocal\include
- DCELOC with a value of C:\OPT
- INCLUDE is appended with C:\dcelocal\include and %DCELOC%
- LIB with a value of %DCELOC%\dcelocal\lib
- LOCPATH with a value of C:\OPT\dcelocal\locale
- NLSPATH has the added variables C:\OPT\dcelocal\nls\msg\%L\%N; C:\OPT\dcelocal\nls\msg\enus437\%N

2.13.3 Registry Implications - CICS Client

An entry in the registry will be added to the following path: HKEY_LOCAL_MACHINE\SOFTWARE\IBM\DCE for Windows NT.

2.13.4 Files and Logs - CICS Client

Two log files will be created in C:\TEMP\: Dce20 and DceEco. The only interesting thing about these files would be any errors that might be logged there. Otherwise, the return code should be zero on a successful install. DCEsetup writes messages to the status and log windows during configuration. If you close either of these windows and then attempt any configuration operation, DCEsetup may crash. To recover, you will need to restart DCEsetup.

2.13.5 Services - CICS Client

During the installation of TXSeries, IBM CICS Client and IBM CICS Internet Gateway are added to your systems services.

2.14 Installing Lotus Domino Server

The installation of Domino Server will begin when the installation program prompts you for the CD.

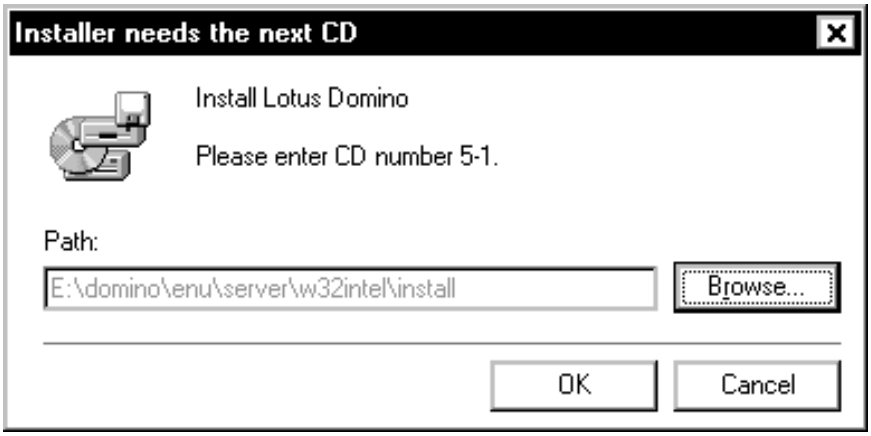


Figure 113. Domino Server CD Prompt

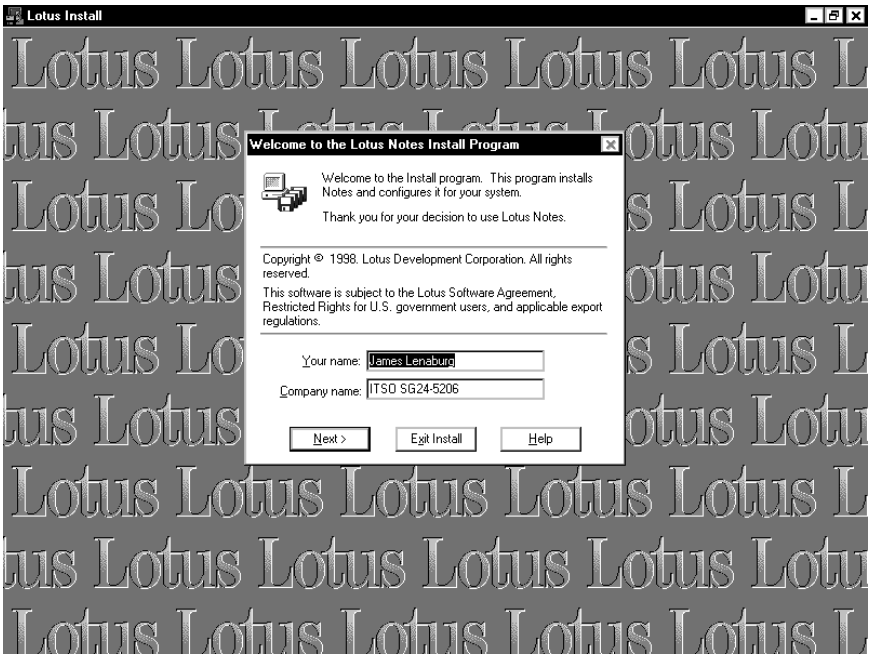


Figure 114. Domino Server Registration

The Domino Installation User Registration panel will now ask you for your name and organization to register. If you have previously installed any Lotus applications, it should come up filled in, but you can change it if you want. Click on **Next** to proceed.

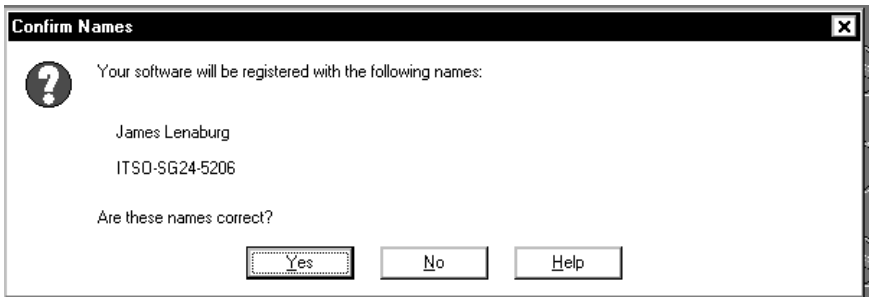


Figure 115. Registration Verification

The installation process verifies that everything is correct. You can make some changes or proceed. To proceed click on **Yes**.

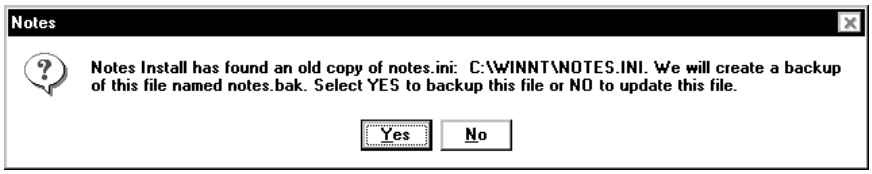


Figure 116. Previous Copy of Notes.ini

If you have a previous version of Lotus Domino or Notes installed, then you will get this message. If you want to preserve the settings in the file, click on **No** and the new settings will be added. Otherwise, click on **Yes** to back up the old file and create a new one.

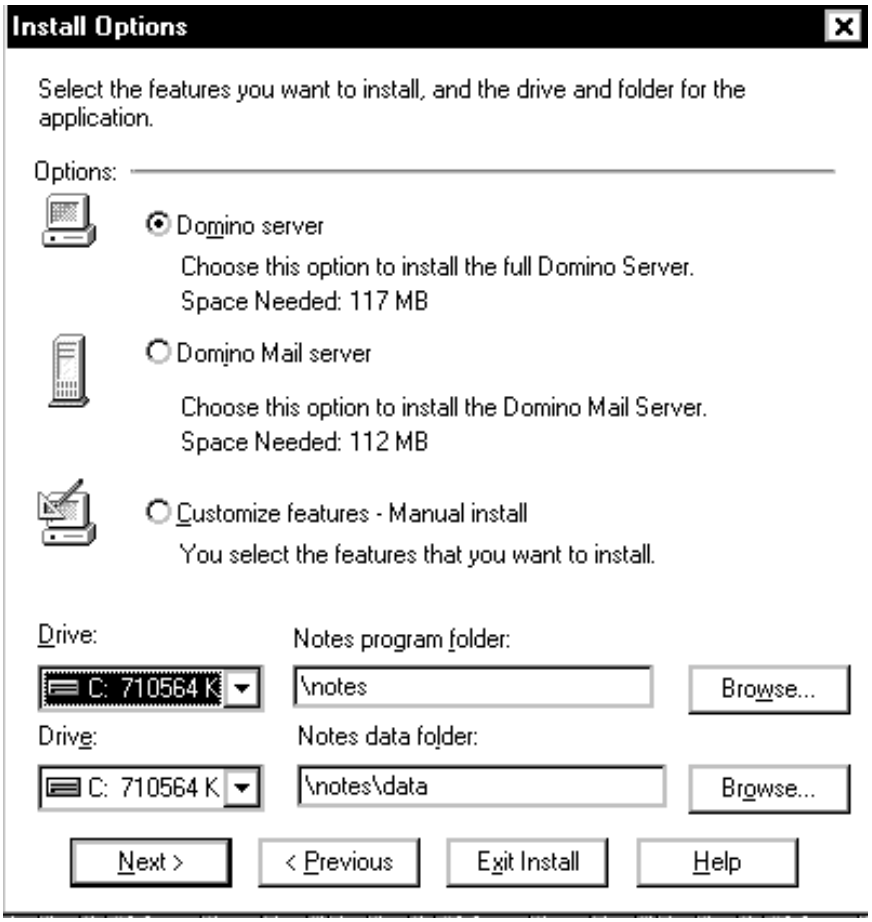


Figure 117. Lotus Domino Install Options

You are asked to choose installation options. The options you are given are:

- Domino Server - This installs the full Domino Server.
- Domino Mail Server - This installs the Mail Server.
- Custom Features - This allows you to manually choose which features you would like to install.

If you decide to do a full installation, you will have Domino Server Administration, Lotus Domino Server, and Lotus Notes added to your system.

We selected to customize the installation process so that we could have the most control over which options get installed.

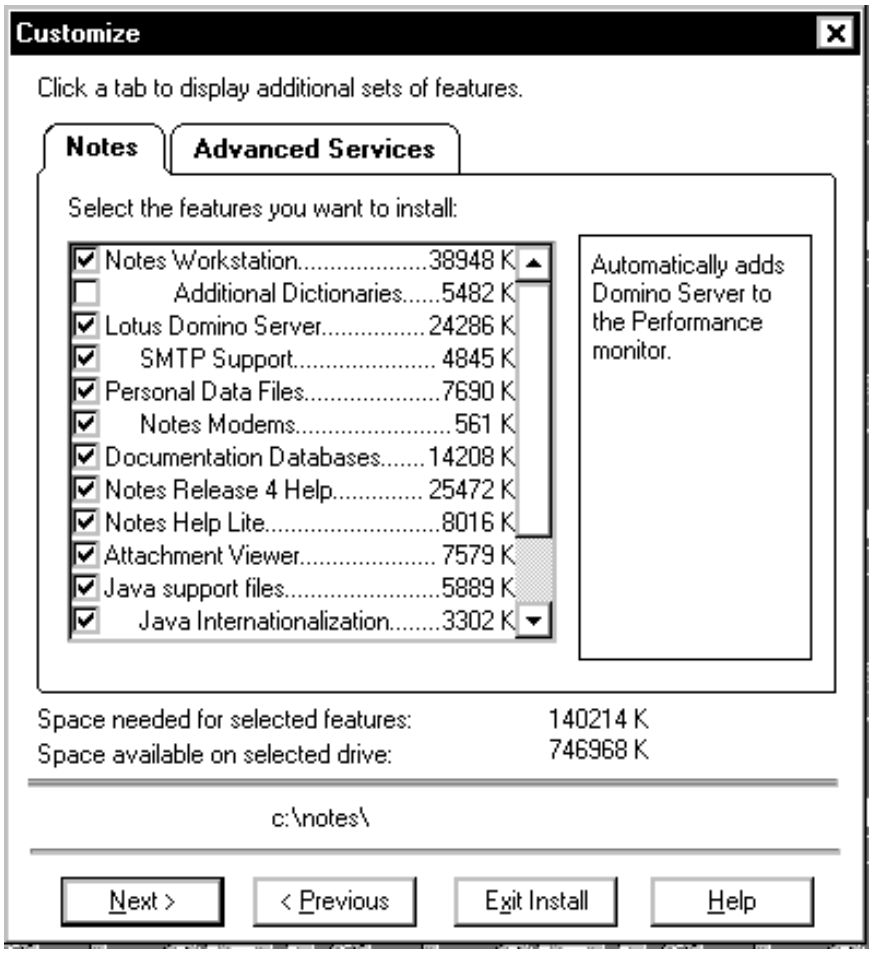


Figure 118. Customize Options to Install

During the installation you choose which components you wish to install from a customization window. If you would like the Domino Server to be added to the performance monitor, you will need to highlight Notes Performance Monitor in this window.

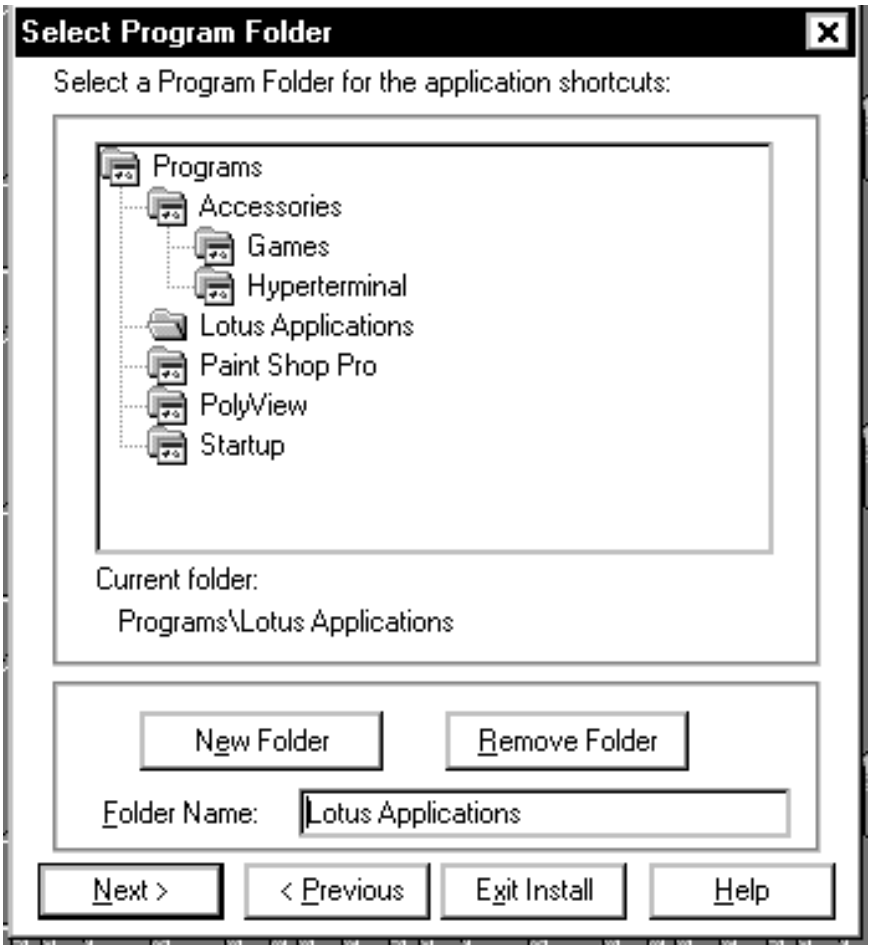


Figure 119. Choose Folder for Program Icons

Click on **Next** to select the default folder.

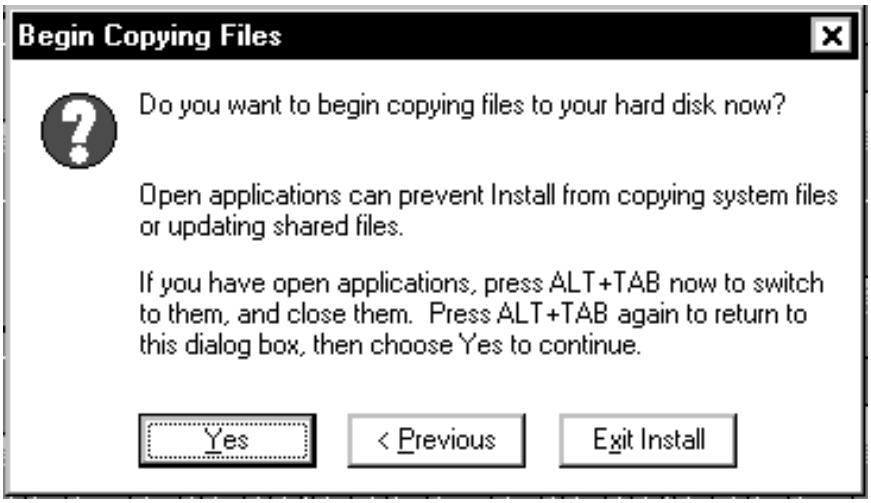


Figure 120. Ready to Copy Files

Click on **Yes** to start copying files. A progress bar will appear showing files being copied to the disk.

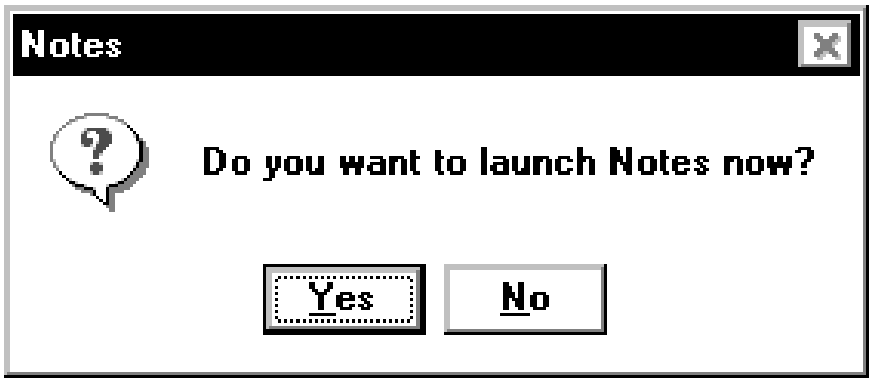


Figure 121. Launch Notes

Since Domino is being installed using the installation program along with other products, Notes should not be launched at this point in time. The Domino configuration will be done at a later time.

Click on **No** to proceed.

2.14.1 User IDs and Rights

To install and administer the Lotus Domino Server, you must be logged on to an administrator ID on NT. Since you are an administrator on NT, you also have the capability to synchronize your Lotus users and NT user. You can perform the following tasks from either Domino or NT:

- Register a new user.

  When you add users to NT, you can register them as Notes users or Internet-only users. For Notes users, Domino creates a Person Document, a mail file, and a Notes ID. For Internet-only users, Domino creates only a Person Document with an Internet password.

  If you are registering a user for the first time, you can make all three of the users' passwords the same: Windows NT, Notes and Notes Internet. If a user is already registered in Notes, you can't change the user's existing password in the user ID file.
- Delete a user.
- Delete a group.
- Rename a user in Domino and automatically rename the corresponding user in NT.
- Register existing NT users in Notes and assign them to a Notes Group.
- Create a new group account in Windows NT and automatically create the same group in Domino.
- Add existing NT groups to Notes and register each group member in Notes.
- Create common passwords between Notes and Windows NT.

2.14.2 Environment Variable

There are no additional environment variables added to your system when you install Lotus Domino Server.

2.14.3 Files and Logs

The following is a list of logs that are available within Domino:

- nstatlog.exe - This stores the database usage statistics and is found in drive:\notes\nstatlog.exe.
- log.nsf - This is created during Notes setup and is found in drive:\notes\data. This logfile creates a database that records Notes Server activities and remote workstation activities.
- loga4 - This is the Note log analysis tool that lets you see log events. This is found in drive:\notes\data.
- domlog.nsf - Is created during setup and stores the Domino Web Server log files. This is found in drive:\notes\data.
- certlog.nsf - This is the certification log and an entry is added every time a new user is certified. This log is located in drive:\notes\data.

All of these logs can be added as databases to the Lotus Notes desktop.

2.14.4 Registry Implications

After the installation, you will see a registry entry under HKEY_LOCAL_MACHINE in software\IBM. The following figure shows this entry:

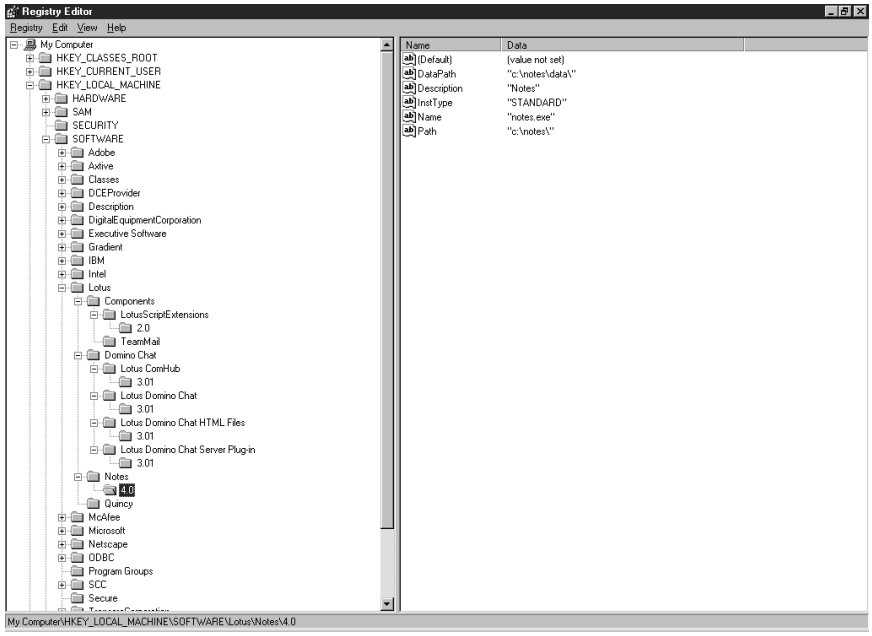


Figure 122. Domino Customization Window

2.14.5 Services

A service called Lotus Domino Server (with a manual startup) is added to the other system services located under Control Panel.

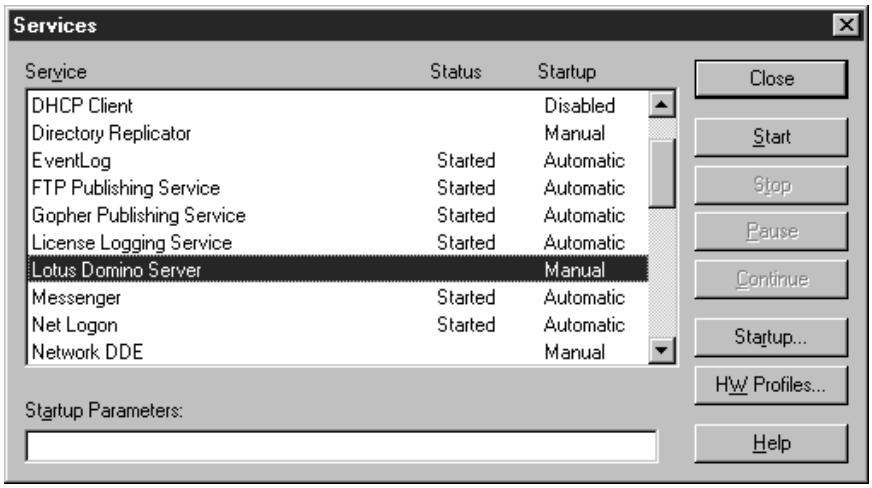


Figure 123. Services Window

Another way to see a list of services that are started on your system is to issue `net start` at an NT CMD line. (If you would like to keep the scrolled text, redirect the services to a file.) An example of this would be to issue `net start > services.out`. at a DOS prompt. You can then pull up the services.out file in Notepad and view the information (see Figure 32 on page 29).

2.15 Installing IBM Net.Data

The Net.Data installation will begin when the installation program prompts you for the CD. It is important to uninstall any previous version of Net.Data before you begin with a new one. Although the installation of Net.Data is straight forward, there are some options and messages that you should take note of. The two most important being the configuration of the CGI-Bin path and the configuration of the HTML path, which you will encounter during the installation:

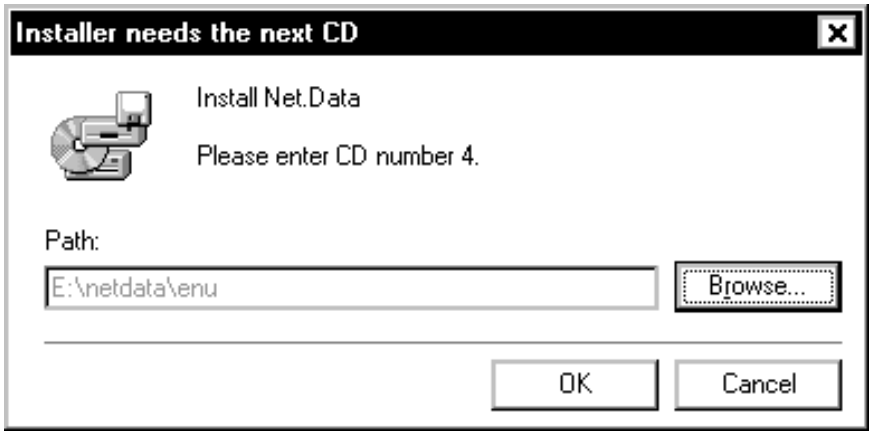


Figure 124. Net.Data CD Prompt

1. Insert the appropriate CD and click on **OK** to proceed.

2. After reading the welcome screen click on **Next** to continue.
3. Choose the destination directory for Net.Data and click on **Next** to proceed. We used C:\DB2WWW.

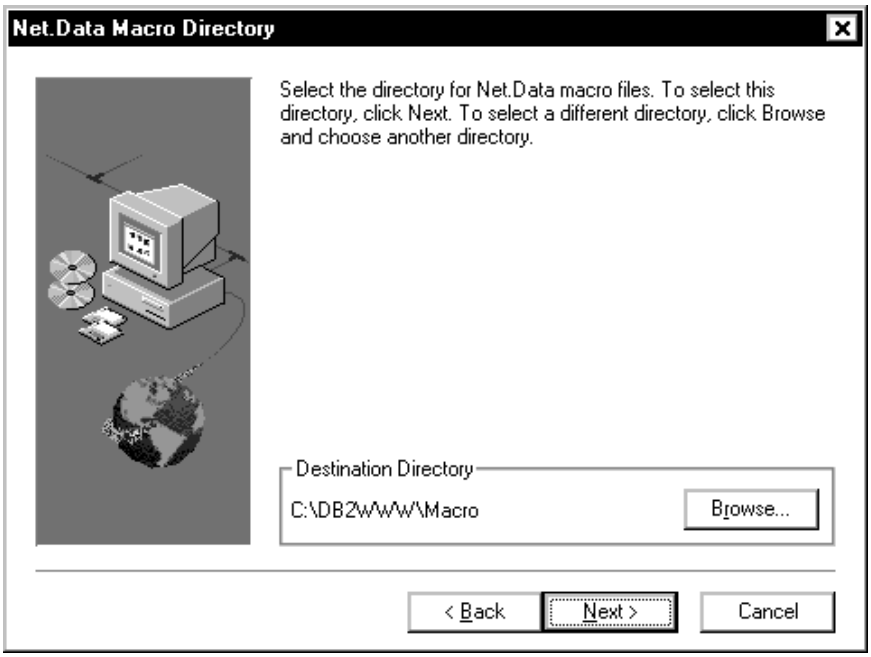


Figure 125. Net.Data Macro Directory

4. Choose the destination directory for the Net.Data macro directory and click on **Next** to proceed.

Figure 126. Net.Data Webserver Prompt

5. This panel just asks you to make sure you know where your Webservers CGI programs and Web pages are stored. You can use the default directories too, just point to them with your WebServer. Click on **OK** to proceed.

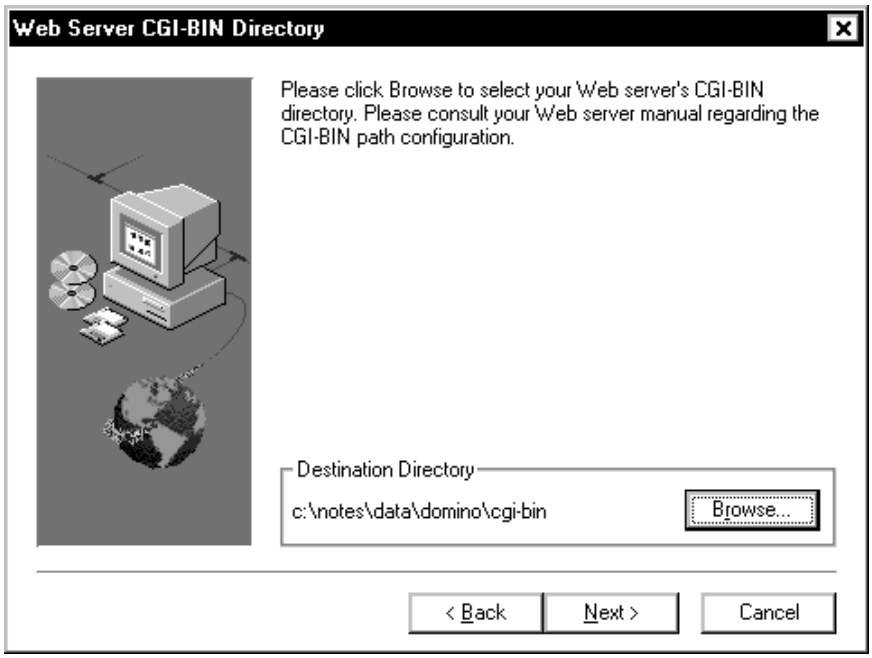


Figure 127. CGI-BIN Destination Directory

6. Configure the destination directory for CGI-Bin. It is very important that you have the right configuration for this directory path. If you are not sure where your CGI-Bin file is, you can look in your Webserver manual to verify its location or you can use NT Explorer to locate the file.

   See 4.3.2.2, “Customizing Net.Data” on page 223 for more information on customizing Net.Data after it is installed.

   Click on **Next** to continue.

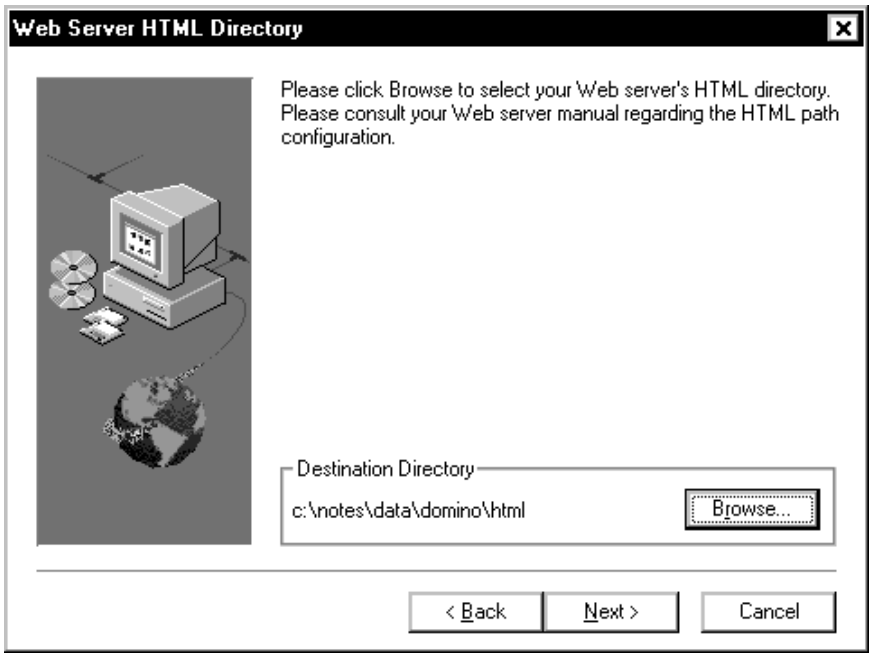


Figure 128. HTML Destination Directory

7. Configure the destination directory for HTML. It is very important that you have the right configuration for this directory path. If you are not sure where your HTML file is, you can look in your Webserver manual to verify its location or you can use NT Explorer to locate the file.
8. Setup is complete now, but do not reboot the system. Select **No** and wait for the installation program restart screen.

All of the Net.Data files are located in the directory Db2www. Db2www is created off of the root directory (in our example that would be C:) during the Net.Data installation.

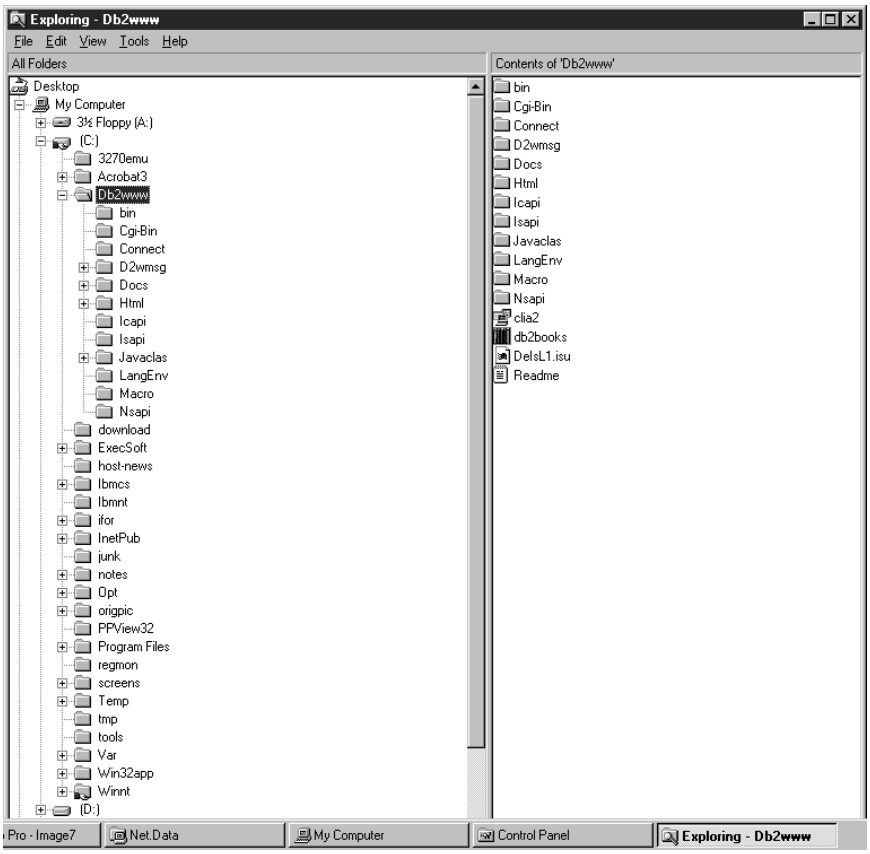


Figure 129. System Properties

2.15.1 User IDs and Rights Required

There are no special user IDs or rights required to install Net.Data. In our example, we used the user ID db2admin that belongs to the Administrators group.

2.15.2 Environment Variables

The following list contains the environment variables that the Net.Data installation adds to your system:

- CLASSPATH with a value of (drive):\DB2WWW\Javaclas.
- DTW_HOME with a value of (drive):\DB2WWW\.
- DTWINI with a value of (drive):\notes\data\domino\html.
- DTW_INI with a value of (drive):\notes\data\domino\html.

- An additional value of (drive):\DB2WWW\D2wmsg\EN_US\%N will be added to the NLSPATH variable.

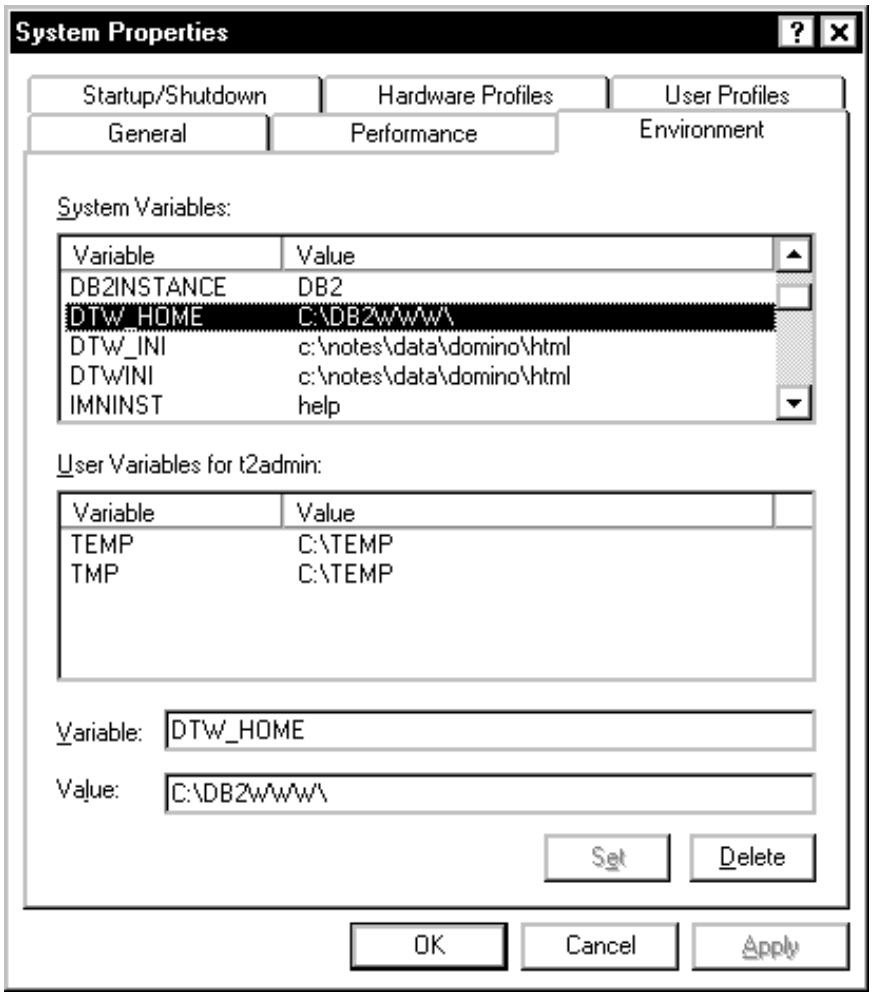


Figure 130. System Properties

2.15.3 Files and Logs

The following is a list of files that are installed with Net.Data and may need to be accessed at one time or another:

- <cgi-bin>\db2www.exe - Executable program
- <cgi-bin>\d2wsql.bnd - Database bind file
- <html>\db2www.ini - Net.Data initialization file
- <html>*.htm - Net.Data HTML files
- <html>\images*.gif - Image files used in HTML demo files
- <html>\tmplobs - Directory to store temporary LOBS from queries
- <inst_dir>\connect - Live Connection files
- <inst_dir>\nsapi - NSAPI files
- <inst_dir>\isapi - ISAPI files
- <inst_dir>\icapi - ICAPI files

Two additional files that are important to know about are the DB2WWW.ini file and the dtwcm.cnf file. DB2WWW.ini is the Net.Data configuration file and the dtwcm.cnf file is the live connection configuration file and is found in the connect subdirectory.

```
DTW_CM_PORT=7128
ENVIRONMENT (DTW_SQL)     C:\WINNT\System32\DTWSQL.DLL    ( IN DATABASE, LOGIN, PASSWORD, TRANSACTION_SCOPE, SHOWSQL, ALIGN,
START_ROW_NUM)
ENVIRONMENT (DTW_SYB)     C:\WINNT\System32\DTWSYB.DLL    ( IN DATABASE, LOGIN, PASSWORD, TRANSACTION_SCOPE, SHOWSQL, ALIGN,
START_ROW_NUM)
ENVIRONMENT (DTW_ODBC)    C:\WINNT\System32\DTWODBC.DLL   ( IN DATABASE, LOGIN, PASSWORD, TRANSACTION_SCOPE, SHOWSQL, ALIGN)
ENVIRONMENT (DTW_DEFAULT) C:\WINNT\System32\DTWFUNC.DLL   ( OUT RETURN_CODE )
ENVIRONMENT (DTW_APPLET)  C:\WINNT\System32\DTWJAVA.DLL   ( )
ENVIRONMENT (DTW_REXX)    C:\WINNT\System32\DTWREXX.DLL   ( OUT RETURN_CODE )
ENVIRONMENT (DTW_PERL)    C:\WINNT\System32\DTWPERL.DLL   ( OUT RETURN_CODE )
ENVIRONMENT (DTW_SYSTEM)  C:\WINNT\System32\DTWSYS.DLL    ( OUT RETURN_CODE )
ENVIRONMENT (DTW_FILE)    C:\WINNT\System32\DTWFFI.DLL    ( OUT RETURN_CODE )
ENVIRONMENT (DTW_WEBREG)  C:\WINNT\System32\DTWREG.DLL    ( OUT RETURN_CODE )
ENVIRONMENT (DTW_JAVAPPS)                                 ( OUT RETURN_CODE ) CLIETTE "DTW_JAVAPPS"
ENVIRONMENT (DTW_DLDPB)                     DTWDLDPB      ( IN DATABASE, LOGIN, PASSWORD, OUT RETURN_CODE) CLIETTE
"DTW_DLDPB:$(DATABASE)"
ENVIRONMENT (USR_TEST)                      DTWTEST       ( OUT RETURN_CODE )
MACRO_PATH     e:\DB2WWW\Macro
BIND_FILE      e:\notes\data\domino\d2wsql.bnd
HTML_PATH      e:\notes\data\domino
INCLUDE_PATH   e:\DB2WWW\Macro
EXEC_PATH      e:\DB2WWW\Macro
DB2INSTANCE    DB2
```

Figure 131. DB2WWW.INI

```
CONNECTION_MANAGER{
MAIN_PORT=7128
ADMIN_PORT1=7131
ADMIN_PORT2=7133
}
CLIETTE DTW_SQL:SAMPLEDB{
MIN_PROCESS=1
MAX_PROCESS=3
START_PRIVATE_PORT=7100
START_PUBLIC_PORT=7300
EXEC_NAME=cltdb2.exe
DATABASE=SAMPLEDB
BINDFILE=e:\notes\data\domino\d2wsql.bnd
LOGIN=*USE_DEFAULT
PASSWORD=*USE_DEFAULT
}
CLIETTE DTW_SYB:SYBASEDB{
MIN_PROCESS=0
MAX_PROCESS=1
START_PRIVATE_PORT=7140
START_PUBLIC_PORT=7340
EXEC_NAME=cltsyb.exe
DATABASE=SYBASEDB
BINDFILE=NOT_USED
LOGIN=*USE_DEFAULT
PASSWORD=*USE_DEFAULT
}
```

Figure 132 (Part 1 of 2). DTWCM.CNF

```
CLIETTE DTW_DLDPB:LIBSRVRN{
MIN_PROCESS=0
MAX_PROCESS=5
START_PRIVATE_PORT=7150
START_PUBLIC_PORT=7350
EXEC_NAME=cldldpb.exe
DATABASE=LIBSRVRN
BINDFILE=NOT_USED
LOGIN=FRNADMIN
PASSWORD=PASSWORD
}
CLIETTE DTW_JAVAPPS{
MIN_PROCESS=0
MAX_PROCESS=1
START_PRIVATE_PORT=5100
START_PUBLIC_PORT=5300
EXEC_NAME=launchjv.bat
}
```

Figure 132 (Part 2 of 2). DTWCM.CNF

2.15.4 Registry Implications

An entry in the registry for Net.Data will appear under HKEY_LOCAL_MACHINE+SOFTWARE+IBM+DB2+Net.Data for NT.

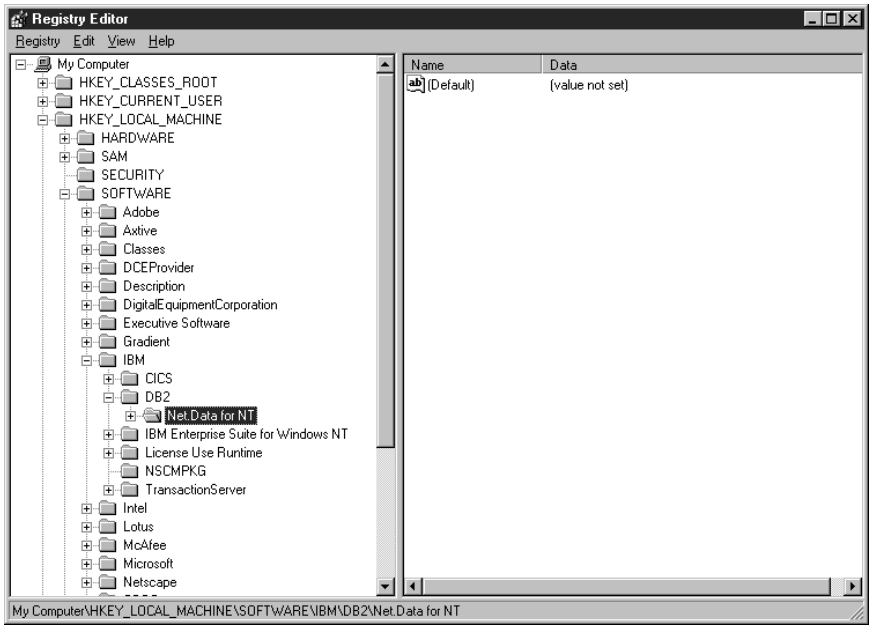


Figure 133. Registry

2.15.5 Services

No additional services will be added to your system during the Net.Data installation.

2.15.6 Installing the Lotus Notes Client

This section details the initial installation of the Lotus Notes client. It does not go through the customization of the client once it is installed, since those details are covered in 4.2.1, “Tier-1 - SUITE114” on page 160 and 5.1.1, “Installing the Notes Client” on page 244.

The Lotus Notes client program can be found on CD-5. The install program is drive:domino\enu\client\w32intel\install\install.exe.

Read the license information and click on **Agree** to continue.

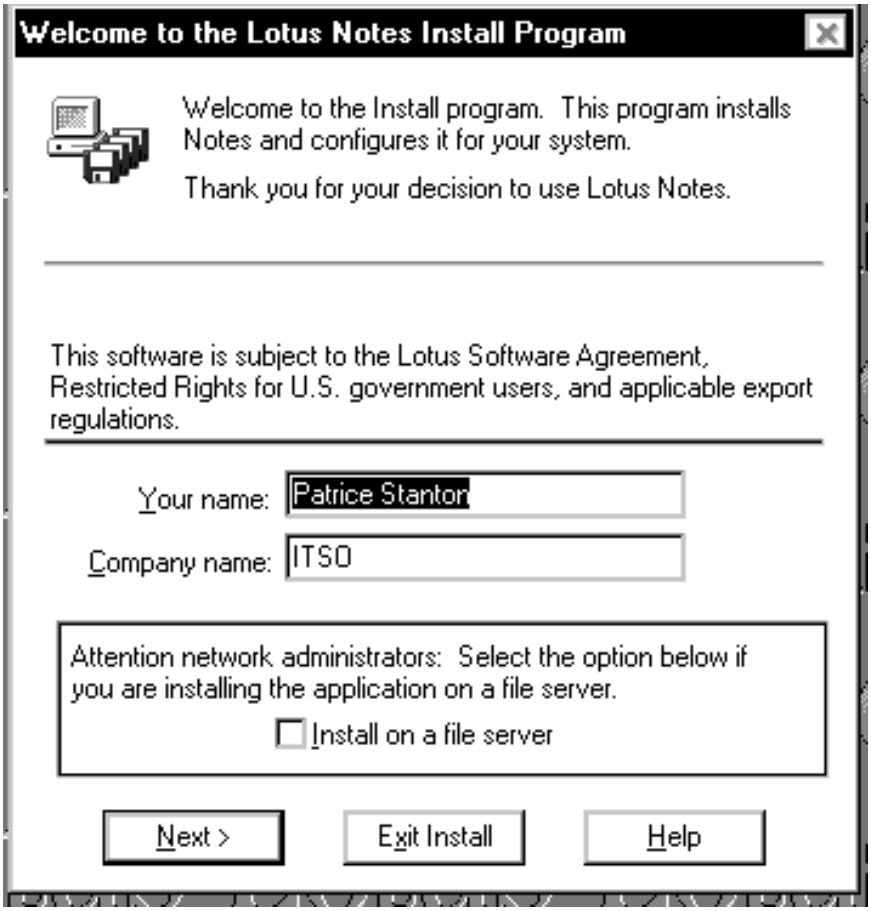


Figure 134. Welcome to the Install Program

If you had previously installed a Lotus product on your machine, this information will be filled in. Otherwise, enter the Name and organization of the user here and click on **Next** to continue.

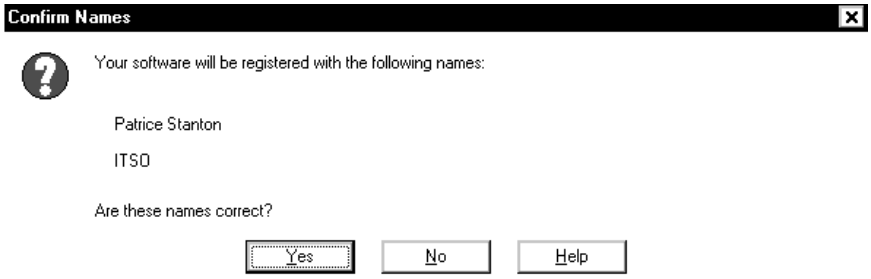


Figure 135. Software Registered Confirmation

This screen just confirms what you just entered and gives you a chance to go back and change it if you want. Otherwise, click on **Next** to continue.

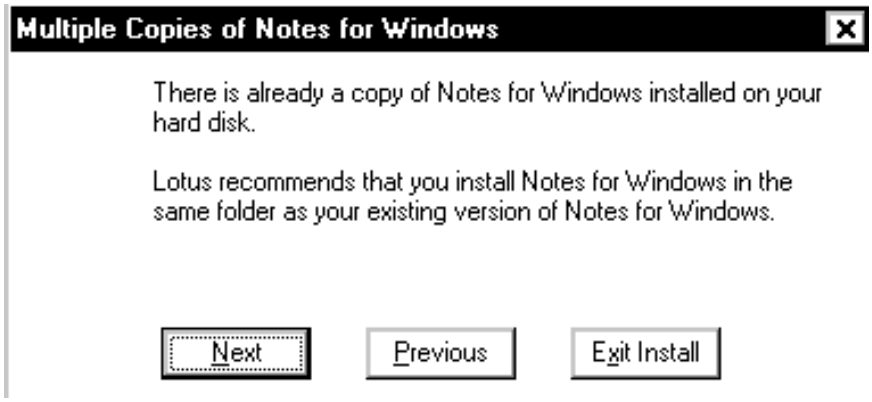


Figure 136. Multiple Copies Information Screen

If you are upgrading a previous copy of Lotus Notes client, you will receive this message. It is recommended that you install the client in the same directory as the old client. Click on **Next** to continue.

Figure 137. Install Options

This panel allows you to choose from the various install options. The standard install was the path that we chose to take. If this is the first time that you are installing a Notes client, you can choose the drive to install it on. Then click on **Next**.

Choose a folder to put the icons in. We took the default of Lotus Applications. Click on **Next** to continue.

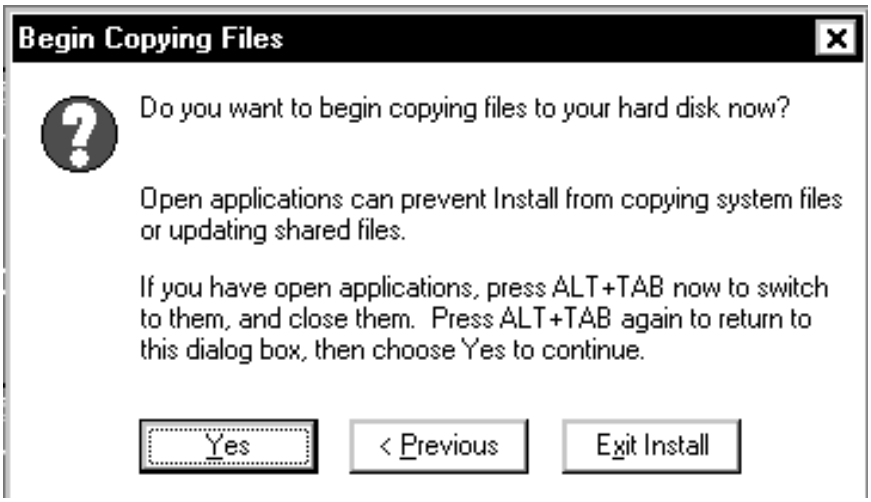


Figure 138. Begin Copying Files Prompt

Click on **Yes** to start copying files. A progress bar will appear showing files being copied.

The installation is now complete. Click on **OK** to continue.

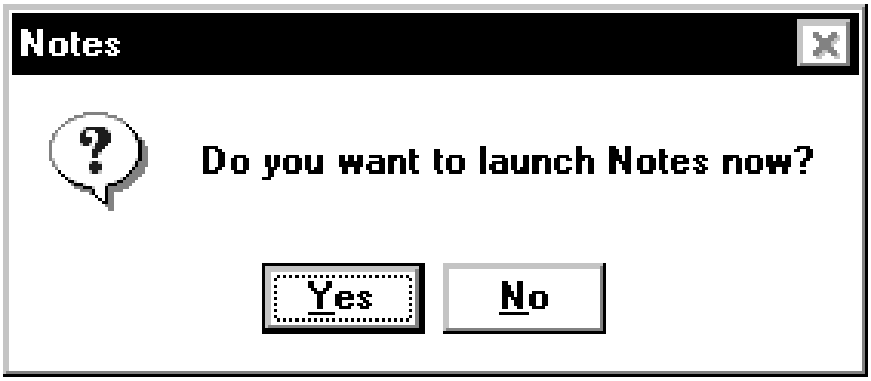


Figure 139. Launch Notes

You can now go ahead and launch Notes to complete the customization. Click on **Yes** to launch Notes, otherwise, **No** to return to your desktop.

2.16 Installation of the Netscape Navigator V4.04

Since some of the products contained in the IBM Enterprise Suite for Windows NT require a Java-enabled browser for some of the configuration tools (for example, Communications Server), Netscape Navigator 4.04 is included in the package.

The following section shows how to install the Netscape Navigator. There are no prerequisites for installing the Navigator.

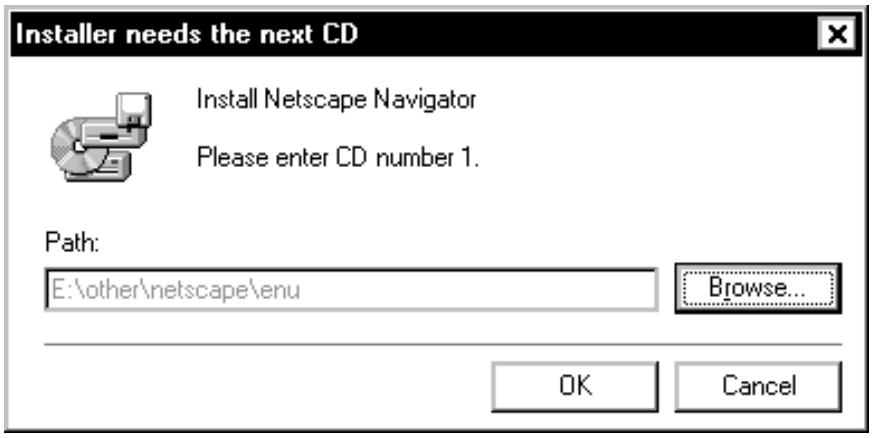


Figure 140. Netscape CD Prompt

1. Place the appropriate CD in the drive and click on **OK**.
2. If you're sure you want to proceed, click on **Yes**.
3. Click on **Next** to proceed on the Netscape welcome window.
4. Click on **Yes** to accept the license.

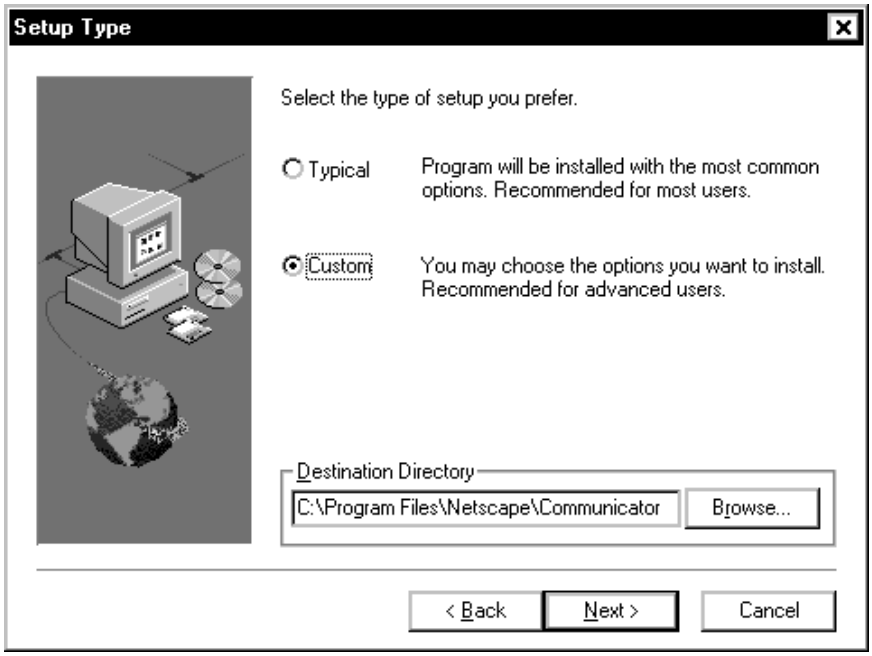


Figure 141. Netscape Setup Type

5. If you choose the Custom method of installation, you will have maximum control over options to install. We chose this installation method. Select **Custom** to see all of the choices:

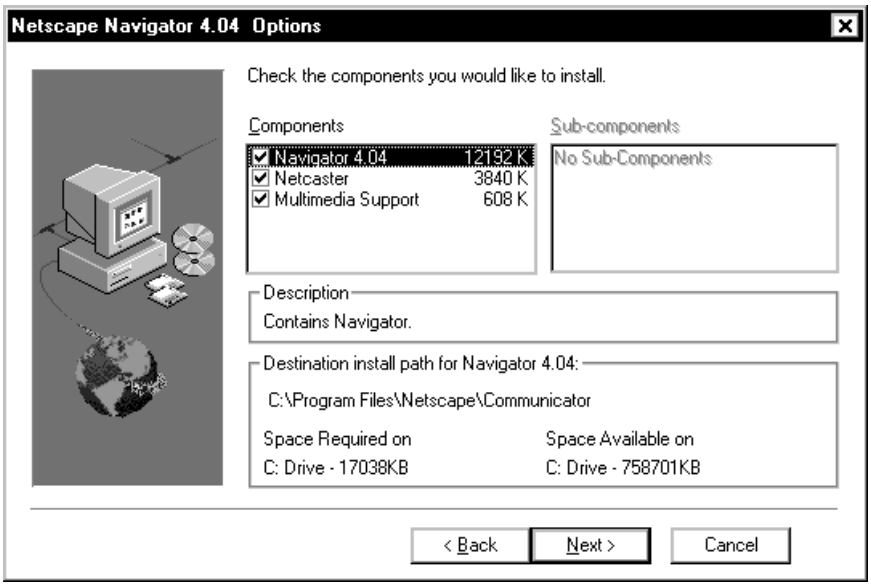


Figure 142. Choose Netscape Options

6. You can select the various components to install. We installed everything. Click on **Next** to continue.

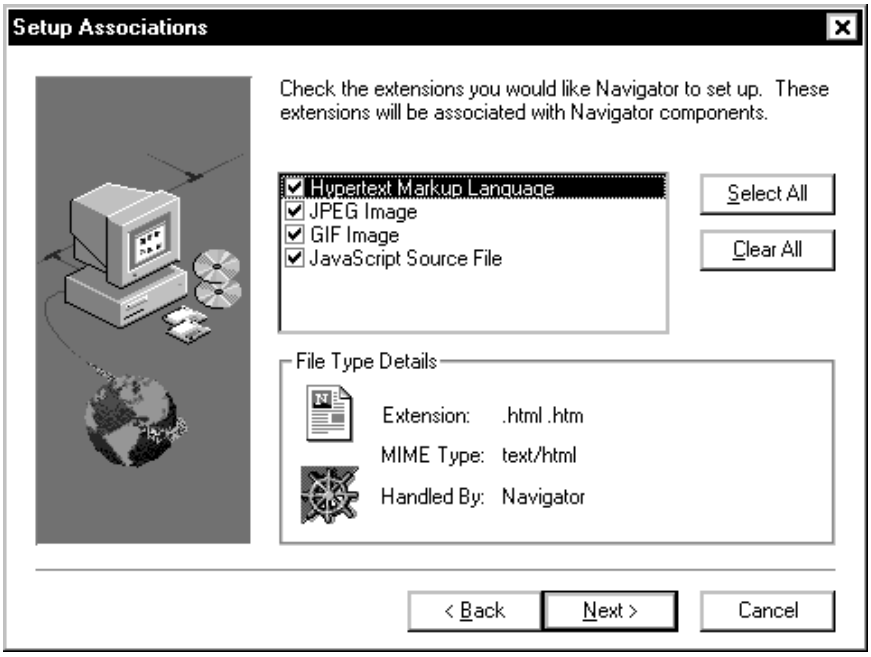


Figure 143. Choose Netscape Setup Associations

7. You can select the various file associations for Netscape to build during the install. Click on **Next** to continue.
8. You can select the folder name where you want the Netscape icons to be located and click on **Next** to continue.

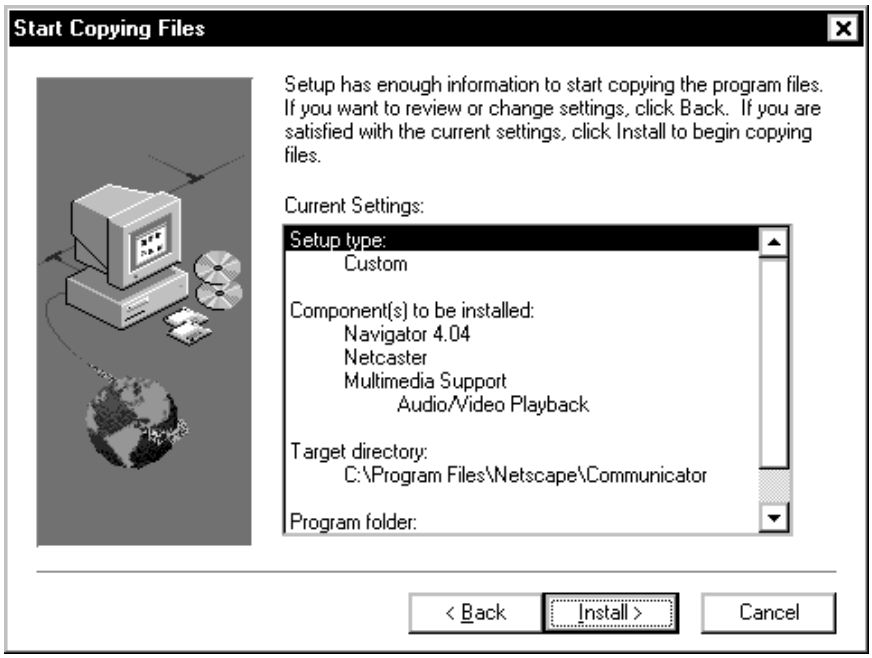


Figure 144. Start Copying Files

9. If everything is correct, you start copying the files when you click on **Install**.
10. If you want to read the readme, you can or proceed to the end by clicking on **Install** to continue.
11. You will need to restart the computer when the Installatioon program tells you to.

2.17 Installing Intel LANDesk Management Suite

One of the systems management components of IBM Enterprise Suite for Windows NT is Intel LANDesk Management Suite V6.1. As with the other products we have looked at so far, it is part of the integrated install. It does have a prerequisite of a database (DB2 is the component that we chose as well as DB2 CAE). In addition, as was mentioned in Chapter 1, “IBM Enterprise Suite for Windows NT Environment and Overview” on page 1 we need to make sure that the level of ODBC is V3.0. The way that you can see what level of ODBC you have installed is to select the following series of windows: **Start, Settings, Control Panel, ODBC**. Then use the pull-down option **About** to find out what level of ODBC your system is using.

Additional items that are mentioned in the readme file on CD-9 in IBM Enterprise Suite for Windows NT are:

- You need to install this component on NT Server and not on a Primary Domain Controller or a Backup Domain Controller.
- It needs to be on the same logical drive as DB2.
- It can be NTFS or FAT as long as it is with DB2.
- It will require the DB2 fixpak that comes with IBM Enterprise Suite for Windows NT.

- You should run this install with the same user ID that you installed DB2 with (an ID that is 8 characters or less). We used db2admin.

Whether you selected Intel LANDesk Management Suite as part of the Individual install or the Express install you should make sure that DB2 and its Fixpak were installed first.

Figure 145. Insert CD-9 for Intel LANDesk Management Suite

The first screen you will see as part of the install is shown in Figure 145. It is for the Server Manager subcomponent.

Figure 146. LANDesk Server Manager 3.02

The Server Manager install (or uninstall) starts from the same screen. Following the setup screen you will be prompted to enter your license key. Since the license key is already filled in for you, just click on **Next**.

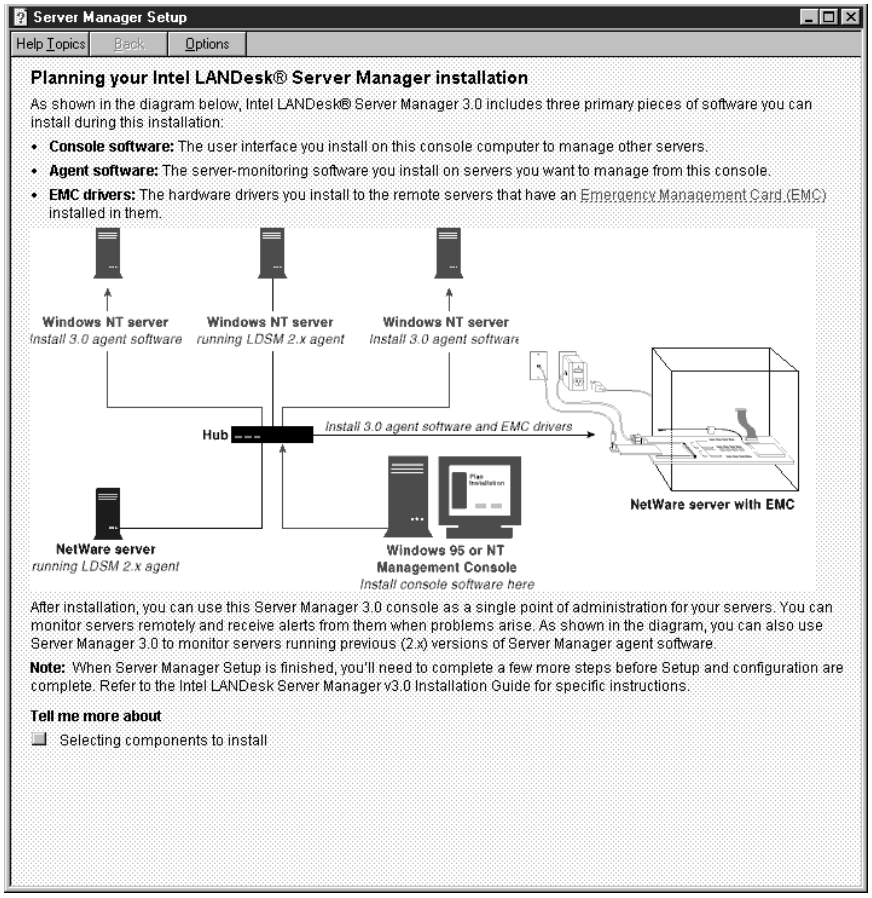


Figure 147. Installation Plan

The install process has a help function along with it that can gives you an overview of the environment that you would use the product in.

The components that you can install are:

- Server Manager Console
- Server Manager Agent

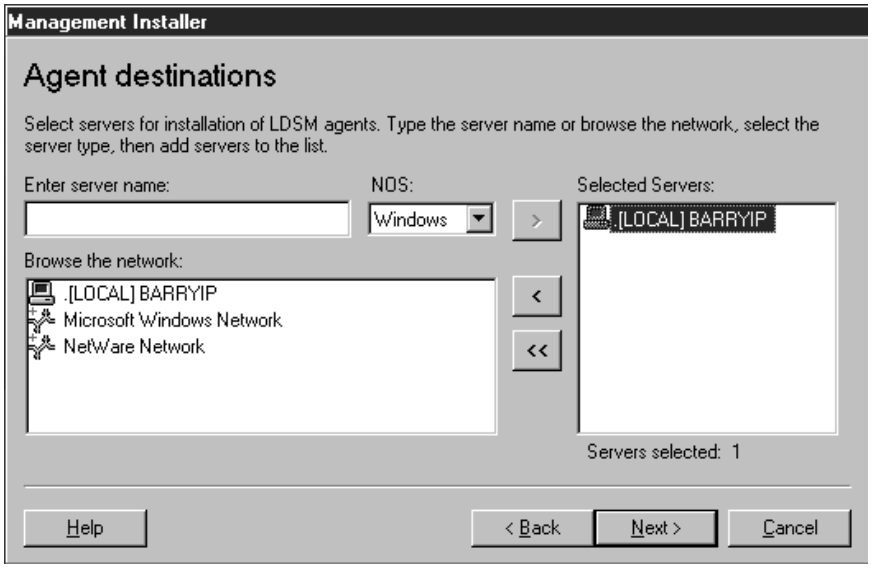


Figure 148. Agent Destination

Indicate which servers you will be installing the LANDesk Server Manager agents on. In this case we installed it on our IBM Enterprise Suite for Windows NT master system.

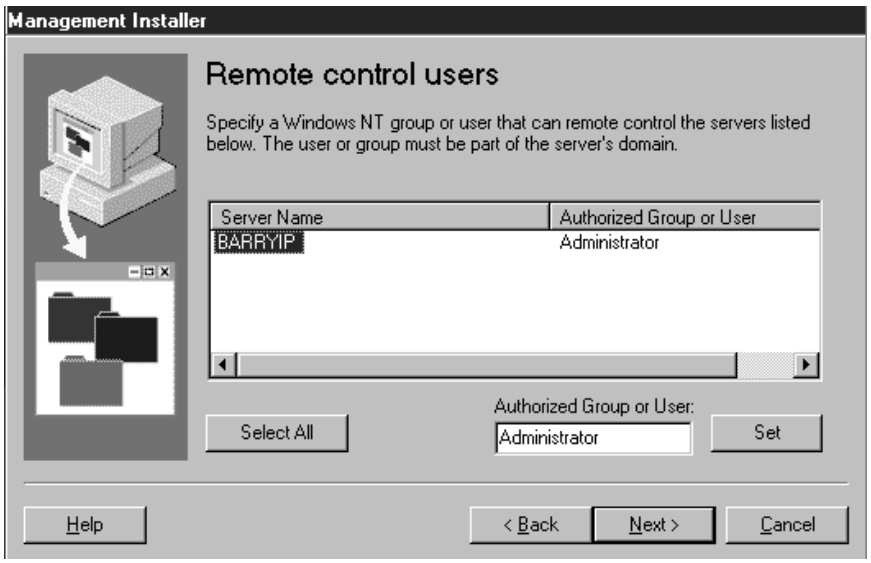


Figure 149. Remote Control

You have the option of specifying which systems can use the remote control feature. After clicking on **Next** and **Install**, files will be copied from the CD to your system.

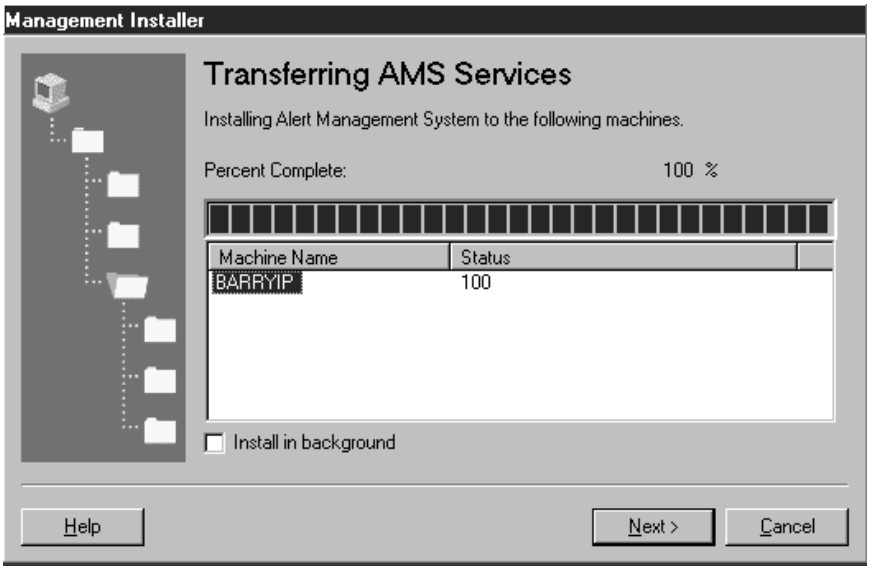


Figure 150. Alert Management

After the Server Manager and remote control files are installed the Alert Management System (AMS) code will be installed. Upon completion of that step, click on **Next** and then **Next** again. Finally, you will have to click on **Finish**.

Next, the Management Suite subcomponent will be installed. In order to perform that installation, there are some database requirements that will need to be met.

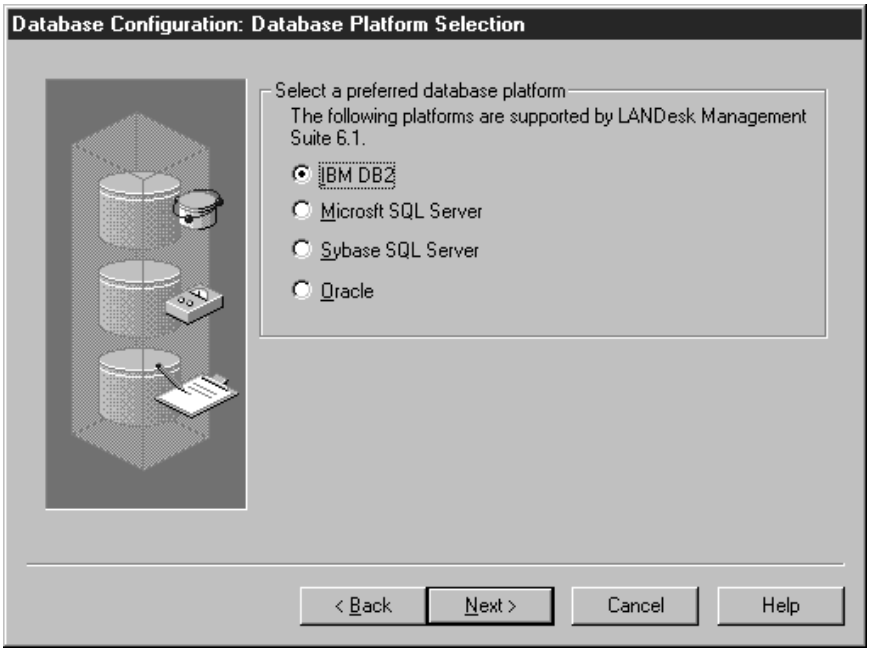


Figure 151. Databases

There is a database configuration wizard that will help guide you through the database installation. You can select which database you want to use. Since DB2 is already installed and part of IBM Enterprise Suite for Windows NT we selected it.

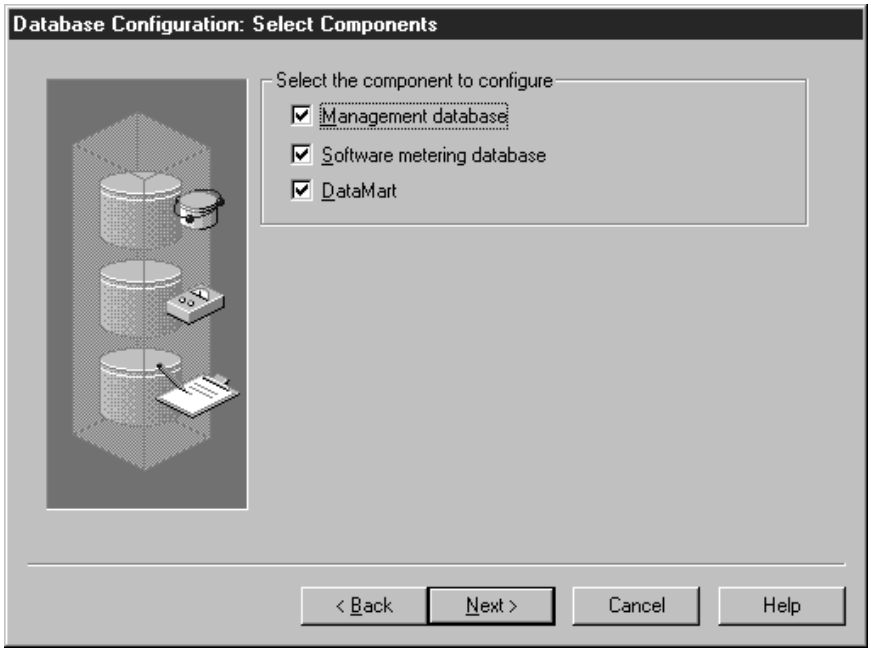


Figure 152. Database Configuration

There will be three databases to configure: PDDB, MTDB and DMDB. You will have to know which user ID has administrator access and also another user ID for the installation of the three databases. We used the default one that was created with the DB2 installation. The user ID was db2admin.

Following the successful creation of the databases you install process will bring you to a new setup window for the Desktop Manager.

Figure 153. Components to Install

We selected to install the Core Server and Management Console. If you wish to use Software Metering you need to click on its check box as well.

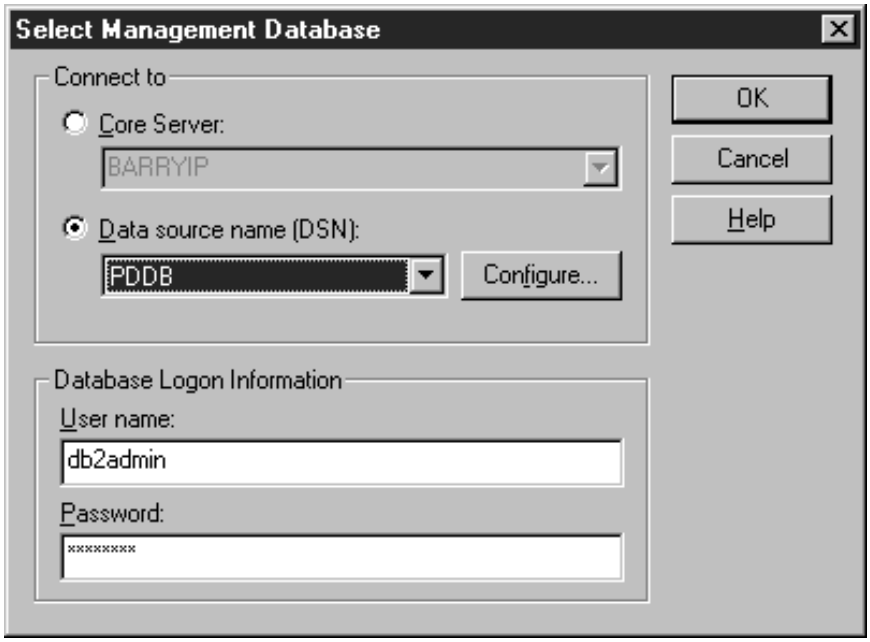


Figure 154. Management Database

In order to connect to the Management database you will have to specify the user ID and password that was specified earlier in the installation (db2admin in this case) as well as the Data source name (PDDB). This was the final step in the installation process.

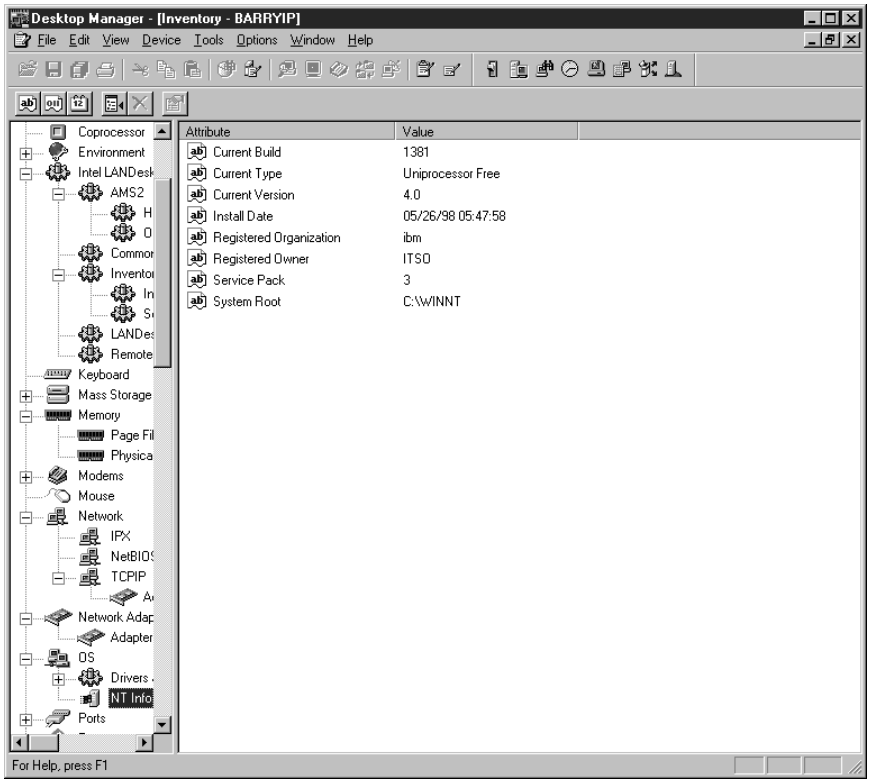


Figure 155. Inventory

After everything was installed and the system was rebooted we verified that Intel LANDesk Management Suite was fully installed. We ran some simple transactions. One of the tasks that we tried was to view inventory information that the agent had gathered and stored in the management database.

2.17.1 User IDs and Rights Required

You will need to be logged on with a user ID that has administrator rights and can access the DB2 database. Therefore, it will also need to be a user ID that is eight characters or less in length.

2.17.2 Environment Variables

The installation process updates the Path variable. It added \Program Files\INTEL\DMI\BIN.

In addition, WIN32DMIPATH=(drive):\smm32\dmi\nt was added.

2.17.3 Files and Logs

The installation process places the following four logs on the Windows NT system drive:

1. SMSInstall.LOG

   This breaks out by type the files that were installed:

   - Server Manager Console files
   - Server Manager NT Agents files

- Server Manager AMS2 Services files
- DMI 2.0 Services files
- Server Manager Uninstall files
- Remote Control Services files

2. SMSInstallHistory.LOG
3. Dtmsetup.log in %SystemRoot%\logs
4. %SystemRoot%\IBMNT\LANDESK\setup.log

The install process also builds a directory: \Program Files\Intel\DTM\log and the file \Program Files\Intel\DTM\LDLOGON\meterwin.log.

In addition to the intallation files that were placed on our destination drive (in this case E:) a directory was created on our C: drive under \Program Files\Intel.

2.17.4 Registry Implications

An entry in the registry for LANDesk will appear under HKEY_LOCAL_MACHINE+SOFTWARE+INTEL. There are entries under that for:

- CSSM_s
- Desktop Manager
- LANDesk

There are several entries in HKEY_CLASSES_ROOT on local machine under CLSID.

My Computer\HKEY_CLASSES_ROOT also contains entries. There are a lot of entries so you might want to use the *regedit* command to find keys. Regedit is easier to use when searching the registry then regedt32. If you have the Windows NT Resource Kit installed the regfind command is very useful for this as well.

2.17.5 Services

The following services were added with the installation of LANDesk Server:

- Intel Alert Handler
- Intel Alert Originator
- Intel File Transfer
- Intel Inventory Server
- Intel PDS
- Intel Scheduler
- Intel Server Monitor
- Intel Software Distribution Server
- Intel WUSER Agent

2.18 Tivoli LAN Access Installation

This section shows the installation and customization of the Tivoli environment as well as Tivoli LAN Access. LAN Access is installed as a separate component and it integrates with the Tivoli framework. For more details on the framework see *TME 10 Framework Version 3.2: An Introduction to the Lightweight Client Framework*.

2.18.1 How LAN Access Works

TME 10 LAN Access consists of the following components:

- A LAN Access component that allows you to create a set of new LAN Access objects that plug into TME and interface with existing Tivoli framework applications.
- A Tivoli event adapter that enables LAN Access to receive network events from supported LAN management applications.
- A multiprotocol transport that enables communication between LAN Access and supported LAN management applications.
- LAN Access agent code called Multi-Platform Manager (MPM) providers. MPM providers enable TME 10 applications to use the network.

2.18.2 LAN Access Objects

TME 10 LAN Access objects are used to represent LAN clients on the Tivoli Desktop. Once defined, LAN Access objects can be used by Tivoli Inventory and Software Distribution applications. The GUI for these new objects is consistent with the Tivoli interface.

LAN Access objects created in the environment are:

- LAN Access Site Object

  The LAN Access site object resides on an NT managed node, displays as a managed resource, and allows you to select the network locations where MPM providers have been installed.

- LAN Access Collection Object

  The LAN Access collection object is created inside a LAN Access site object and represents a filtered grouping of LAN tool clients.

- LAN Access Node Object

  The LAN Access node object represents a single LAN client. A LAN Access node object must exist in at least one LAN Access collection object, but can also exist in multiple LAN Access collection objects.

All three types of objects can subscribe to one or more profile managers. Distributing a profile to a TME 10 LAN Access object performs the action upon all LAN clients that are members of that particular LAN Access object. You may need to distribute a profile to an entire LAN, to a filtered group of LAN clients, or to a single LAN client. LAN Access objects give you the flexibility to perform network operations for all of these scenarios, according to the needs and requirements of your organization.

2.18.3 Tivoli Event Adapter

TME 10 LAN Access provides a dedicated event adapter to process LAN-generated alerts. When you create a LAN Access site object, the event adapter is initialized to begin monitoring for alerts. When an alert is received, the LAN Access event adapter sends an event to the event server so that the event can be viewed from the Tivoli Enterprise Console.

2.18.4 Multi Protocol Transport

LAN Access provides transport components to enable communication between the NT managed node where LAN Access is installed and the LAN stations where MPM providers are installed. The LAN Access transport supports TCP/IP, NetBIOS, IPX, SNA to ensure integration with existing LANs.

2.18.5 MPM Providers

MPM providers use the Multi-Platform Management application programming interface (MPM API). The MPM API allows one management application to communicate with another management application by presenting a common API. The MPM API is an open specification and is available for use without royalties.

2.19 Prerequisites for Installing LAN Access 1.1 on Framework 3.2

Before you can install Tivoli LAN Access V1.1.1 you have to first install V1.1 on the Tivoli framework.

If you are installing the base release of Tivoli LAN Access V1.1 on the Tivoli V3.2 framework you will need to make a modification to the IND file. The process you should follow is:

- Copy the contents of LAN Access CD-ROM onto a temporary drive.
- Edit the file LACCESS.IND.
- Delete the last two lines of this file so as to eliminate the dependencies upon Framework 3.1 or Framework 3.1.2.

```
LACCESS:description:Tivoli LAN Access Version 1.1:TIV_MSB
LACCESS:id:CAT:Message Catalogs:both::::
LACCESS:fp:CAT:generic::30:1
LACCESS:id:ALIDB:Server Database:server:@HostName@.db:::
LACCESS:fp:ALIDB:generic::150:2
LACCESS:id:BIN:Binaries:both:@Arch@:::
LACCESS:fp:BIN:w32-ix86::2500:3
LACCESS:fp:BIN:aix3-r2::500:4
LACCESS:fp:BIN:aix4-r1::500:5
LACCESS:fp:BIN:hpux9::500:6
LACCESS:fp:BIN:hpux10::500:7
LACCESS:fp:BIN:solaris2::500:8
LACCESS:fp:BIN:sunos4::500:9
LACCESS:patch_id:LA_1.1
LACCESS:depends:TMP_3.1
LACCESS:depends:TMF_3.1.2
```

Deleting those last two lines removes a dependency check.

2.20 Installation of Tivoli LAN Access 1.1

You should have all Tivoli applications and the necessary patches installed as well as Intel LANDesk and DB2 in the appropriate systems before installing Tivoli LAN Access 1.1. We used Tivoli Framework 3.2 plus some other Tivoli products: Tivoli Inventory V3.2, Tivoli Software Distribution 3.1 and Tivoli TEC 3.1.

In the following sections we will be describing how to install the different LAN Access components on the corresponding systems, and show how they relate to our environment.

2.20.1 Installation of LAN Access TME 10 Component

The LAN Access V1.1 component has to be installed as a base product before we can install V1.1.1. You install this component using the Tivoli desktop on the TMR server, which can be a UNIX or an NT system, and on the NT managed nodes.

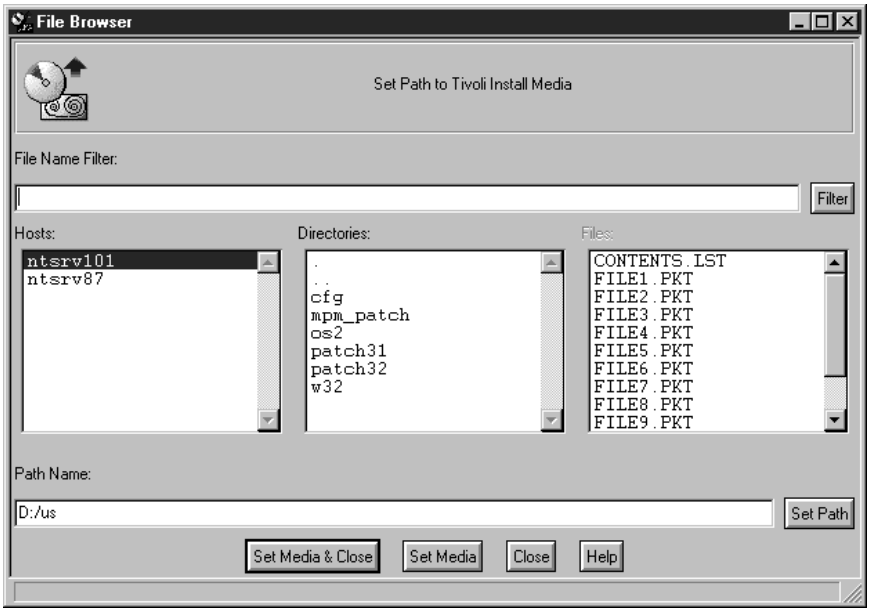


Figure 156. Installation of LAN Access

Set the media path to point to the temporary drive where you copied the contents of the CD.

Figure 157. Installation of LAN Access

Include in the *Clients to Install On list* the TMR server and all other managed nodes which will be used as LAN Access sites.

2.20.2 Installation of LAN Access Components on the NT Managed Node

To install the components needed on the NT managed node, you have to run setup.exe found under \us\w32\ on the CD. You run the setup on the managed node itself, not from the TMR. Tivoli LAN Access automatically detects what components are needed and selects and installs them for you, so, for the NT managed node, the LAN Access event adapter and LAN Access transport will be installed. The screens that follow show the steps for the installation:

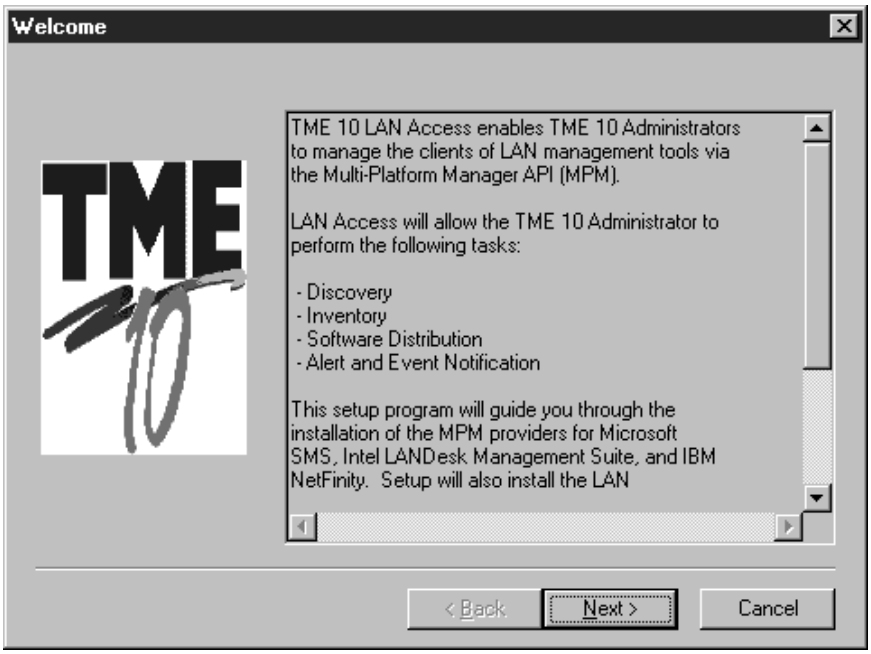


Figure 158. Welcome Window

Click on **Next** since this is just an initial welcome window.

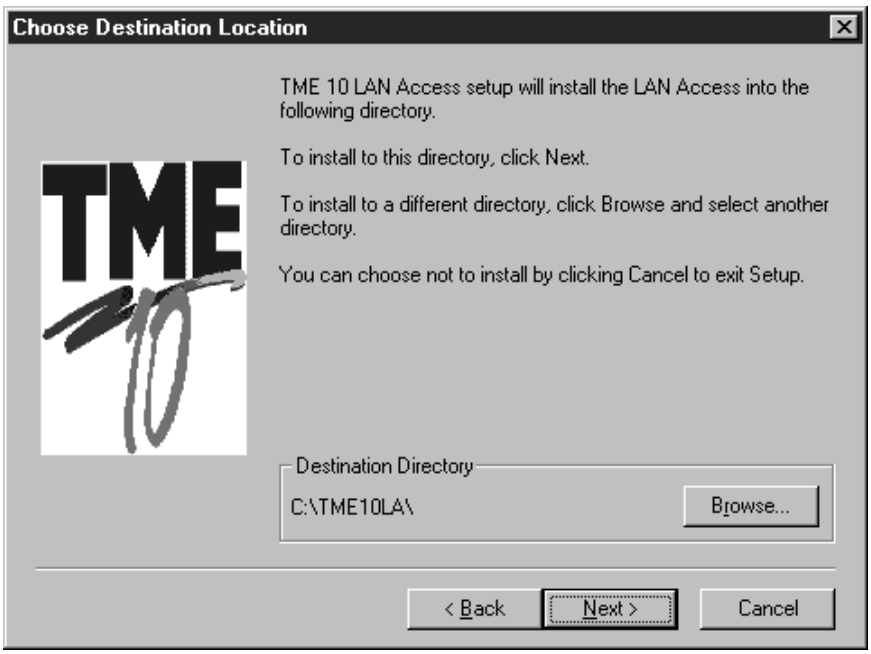


Figure 159. Destination Location Window for LAN Access

Click on **Next** after you set the LAN Access directory.

Figure 160. Destination Location Window for LAN Access Transport Component

If you choose destination directories that do not exist, they will be created for you. After you have decided on the directory click on **Next**.

Tivoli needs to have access authority to start the LAN Access event adapter. The user entered in these fields should be a member of the **Tivoli_Admin_Priviledges** group in the NT managed node and should also be included in the current login names list for the Tivoli root administrator in the TMR server. In the next two figures we show where you can find the login names for the Tivoli administrator. This can be done once LAN Access installation is complete.

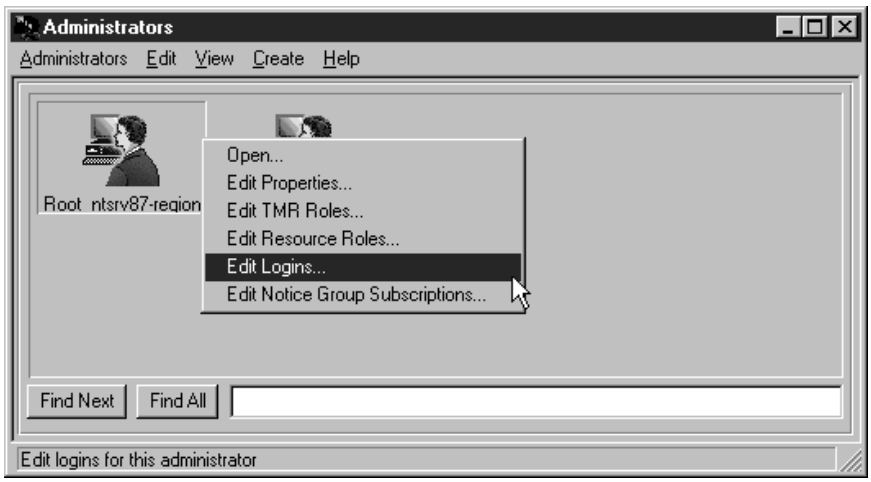


Figure 161. Administrators Window in the Tivoli Desktop

Right click on the Tivoli administrator and select the **Edit Logins** option to display the Set Login Names Window. If the login name is not listed, you can add it by entering the name in the Add Login Name field and clicking on **Change & Close**.

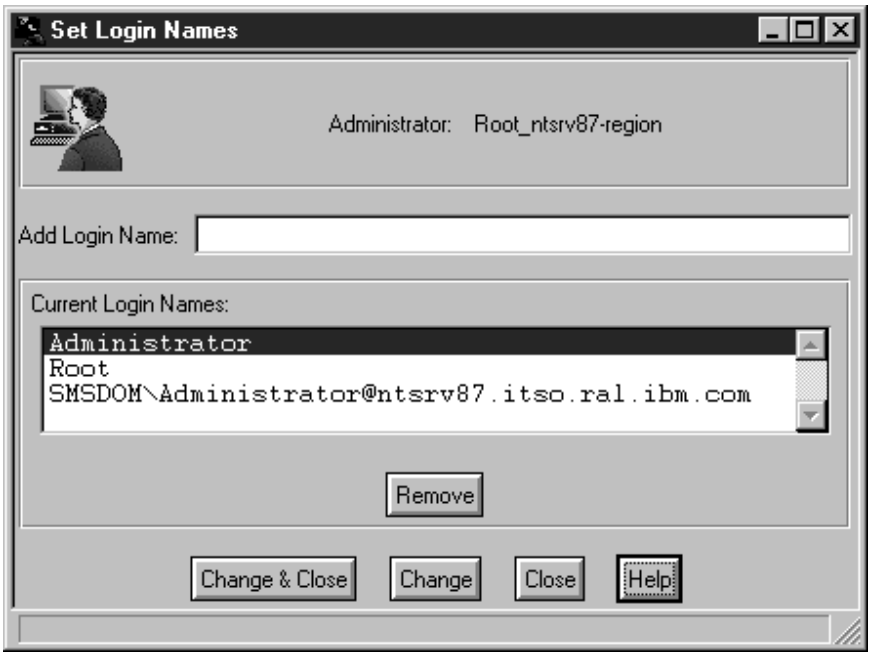


Figure 162. Set Login Names Window

LAN Access automatically detects the network drivers installed in the system. You should enable the driver that the NT managed node is going to use to communicate with the Intel LANDesk component. In this example we have NetBIOS, IEEE 802.2 (SNA/APPC) and TCP/IP. In our environment we will be using the TCP/IP transport.

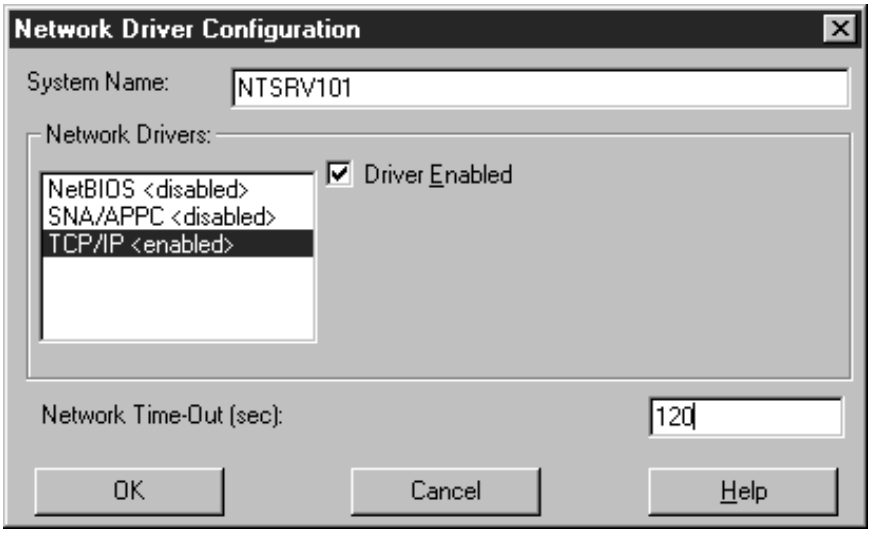


Figure 163. Network Driver Configuration Window

The default network time-out is 15 seconds. You should modify this value taking into consideration the load and speed of your systems and network. If you have many bridges and routers or slow links that your traffic will be going over you may need a higher value then 15.

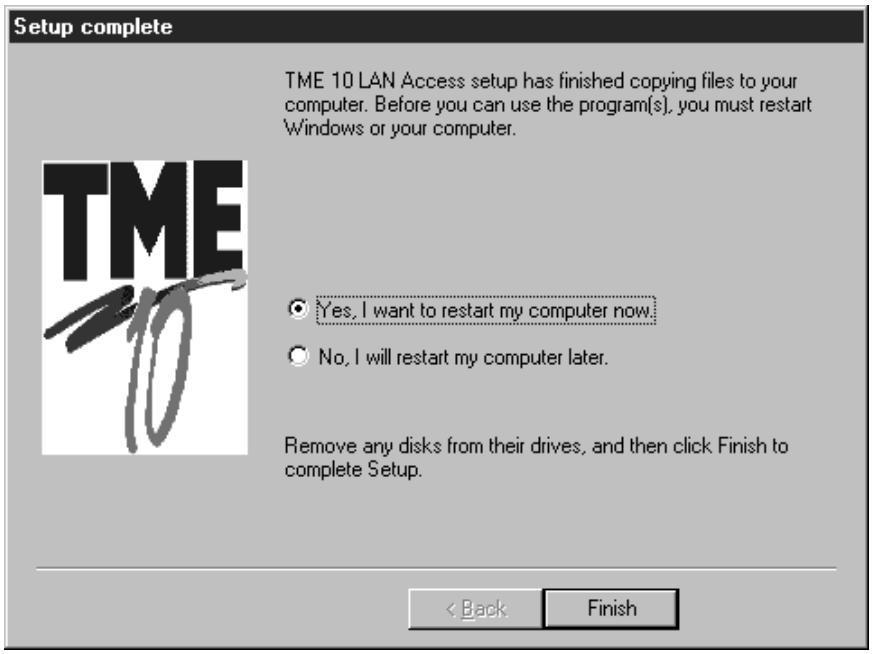


Figure 164. Completion Window

Click on **Finish** to close this window and reboot the system.

2.20.3 Installation of LAN Access Components on the Intel LANDesk Site

To install the components needed on the Intel LANDesk system, you have to run `setup.exe tme` found under \us\w32\ on the CD. You run this on the Intel LANDesk provider machine and not from the Tivoli desktop. In our case this was on system *ntsrv48*. Tivoli LAN Access automatically detects what components are needed and selects and installs them for you. Therefore, it is important that you have all your other products installed before you perform this step. For example, you should already have Intel LANDesk and the provider installed. If the node was going to have other providers on it, you should install them before you run setup to install the MPM-API. You just need to step through the windows to install the provider code.

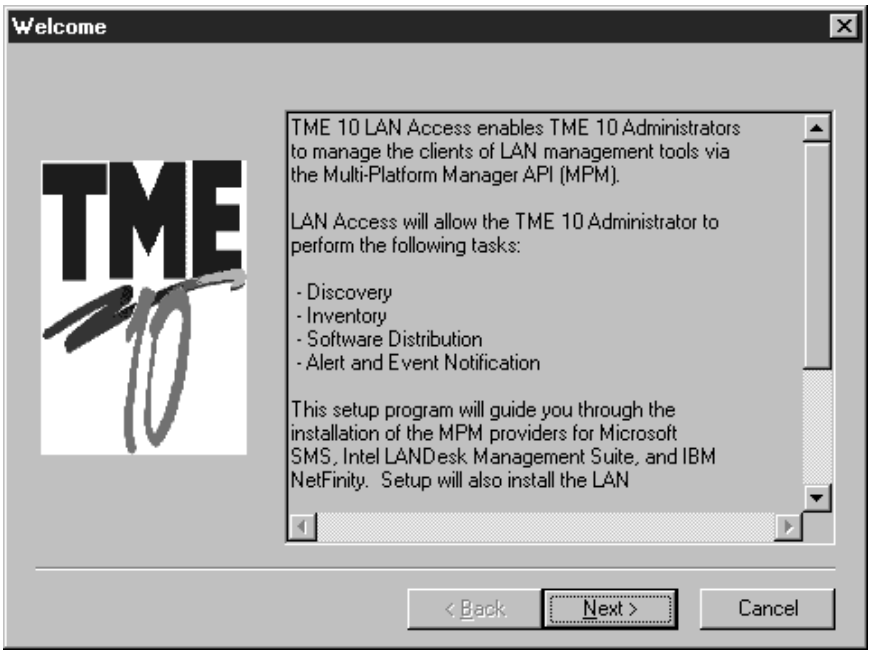


Figure 165. Welcome Window

Installing the MPM-API will permit the integration of LAN Access and the systems management application to occur. The key functions that will be able to be performed are: Discovery, inventory, software distribution and event notification.

2.20.4 Upgrade to Tivoli LAN Access 1.1.1

Tivoli LAN Access 1.1.1 is an upgrade to Tivoli LAN Access 1.1. This upgrade also consists of two parts, a TME and a non-TME part.

- The TME part is the Tivoli LAN Access V1.1.1 upgrade for TMF 3.2 and is installed from the Tivoli desktop with the install patch option. The path on the CD for this part is \us\patch32\.
- The non-TME part is the Tivoli LAN Access 1.1.1 upgrade for the provider nodes. It must be install on all systems where we previously installed the provider. The directory path for the installation of this part is \us\mpm_patch\. Don't forget to read the Tivoli LAN Access 1.1.1 Release Notes before attempting this installation to make sure you have performed all the prerequisite steps.

2.20.4.1 LAN Access 1.1.1 Upgrade for Tivoli Framework 3.2

The upgrade is done using the wpatch command or using the Tivoli desktop. We installed the patch using the desktop install patch menu option. Our TMR was located on ntsrv87.

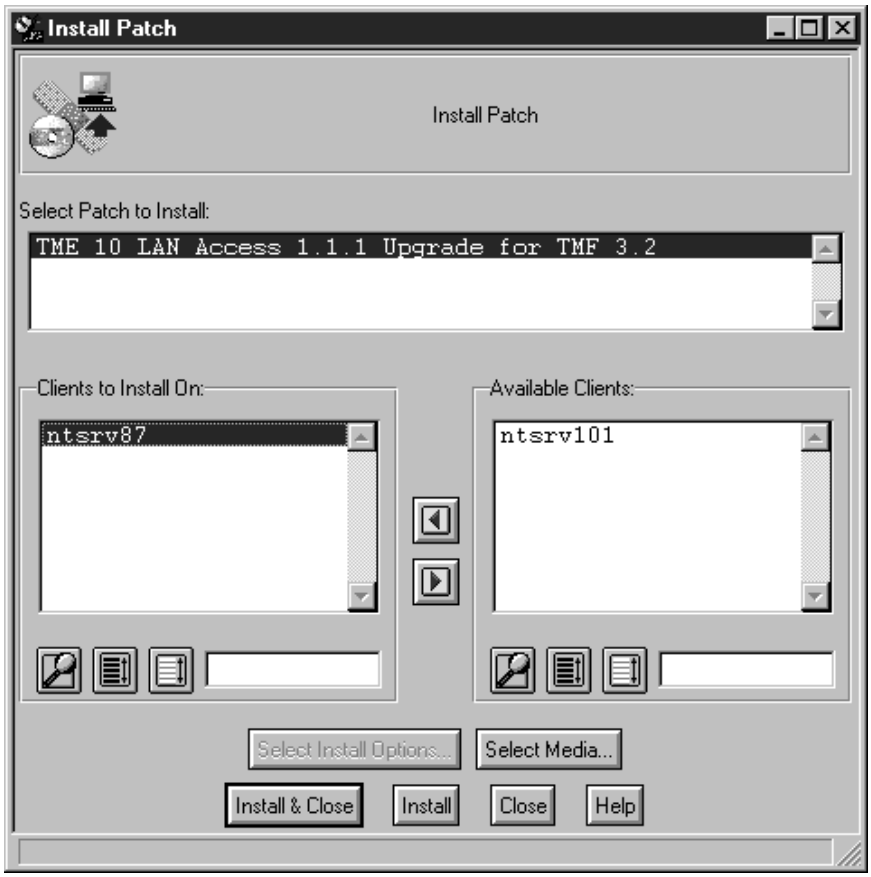


Figure 166. Installing Upgrade

After entering the location we clicked on **Install & Close**.

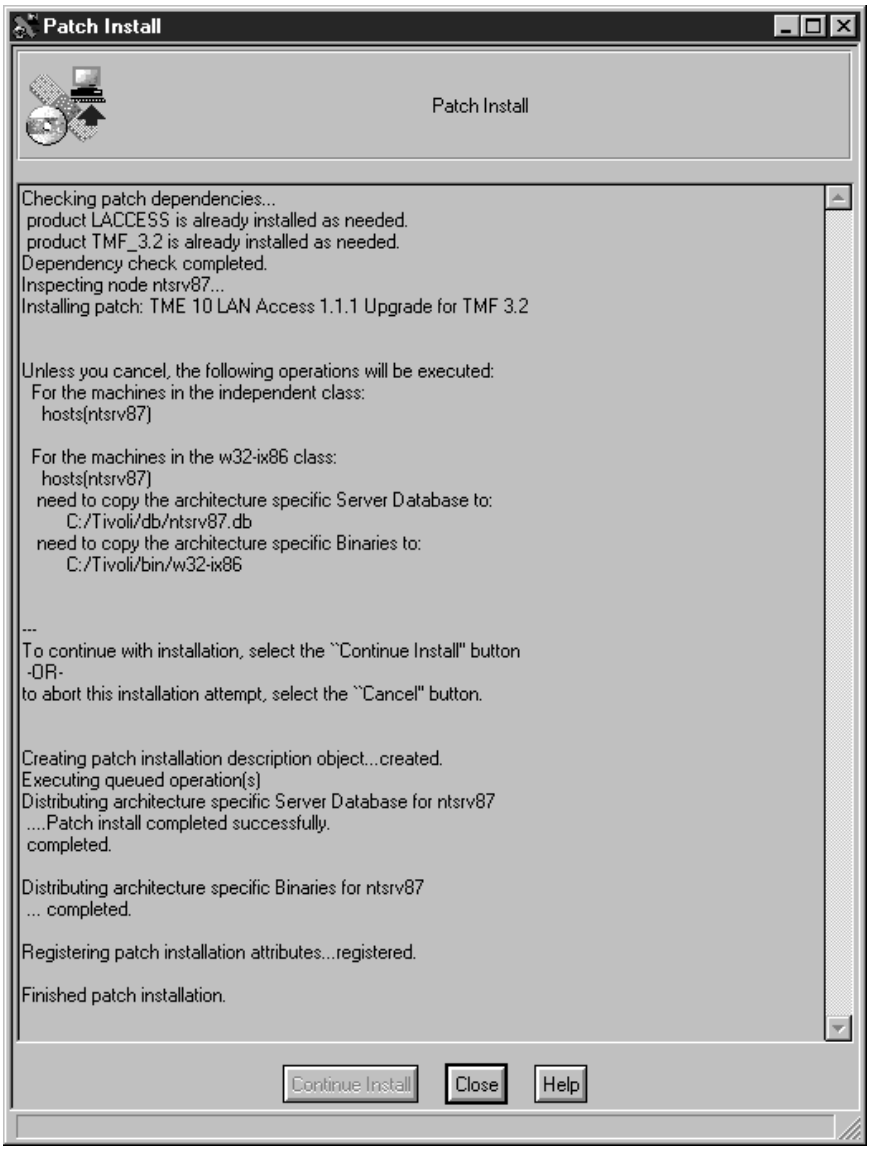


Figure 167. Installing Upgrade

The patch installed successfully and we were upgraded to Tivoli LAN Access V1.1.1.

2.20.4.2 LAN Access 1.1.1 Upgrade for the Provider Sites

A patch was also required to put on our MPM provider sites. In our example, this is for the Intel LANDesk provider but the same patch would need to be applied for the other (Netfinity and SMS) providers.

Run `setup.exe tme` from the MPM_Patch directory. The parameter, *tme*, is only required for Intel LANDESK V6.0 and V6.1..

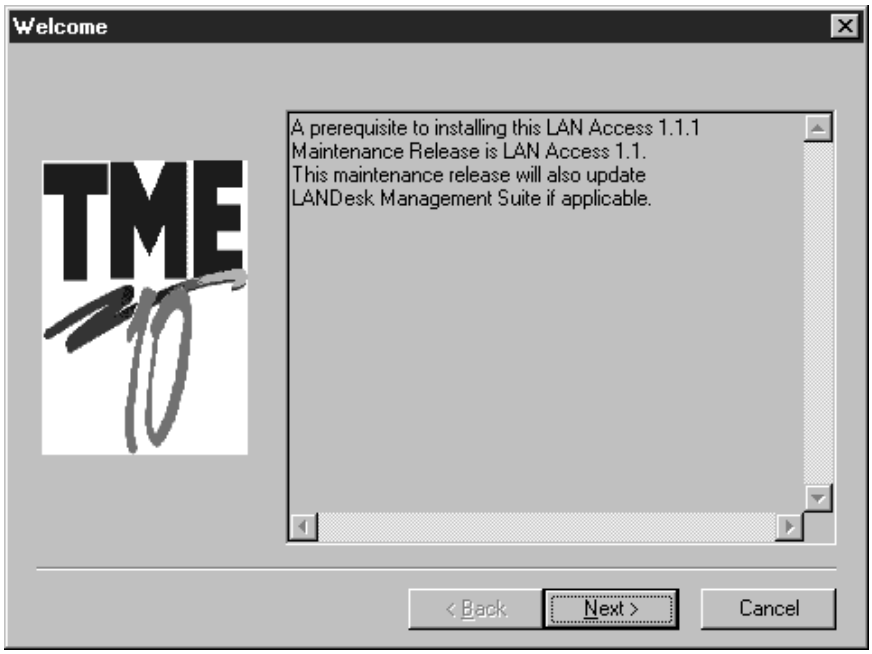


Figure 168. Installing Upgrade

The updated code will be placed in the same directory as the base Tivoli LAN Access V1.1 code was located.

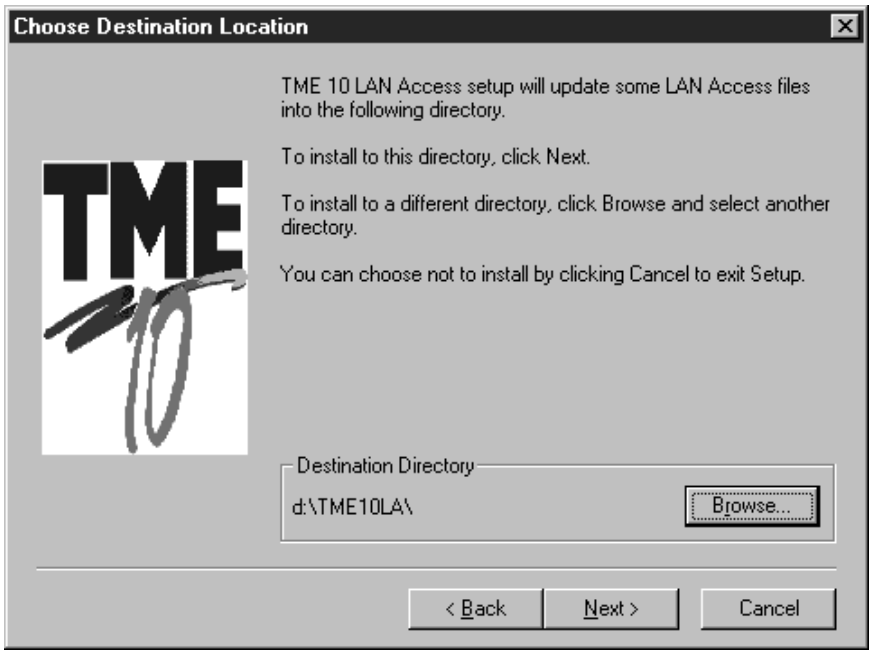


Figure 169. Installing Upgrade

You will need to reboot your MPM provider after installing the patch.

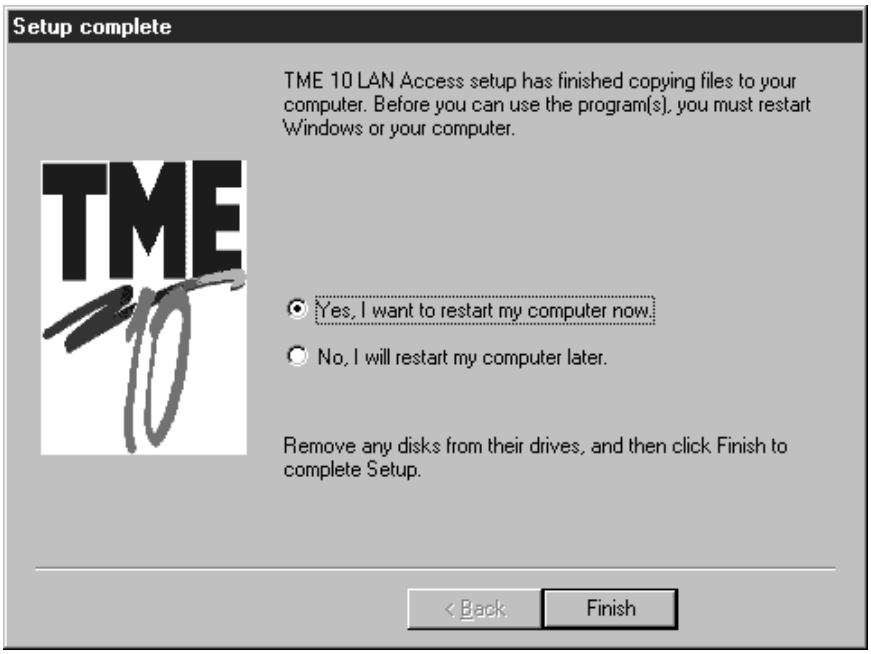


Figure 170. Installing Upgrade

After installing the product make sure that you set the proper administrator roles by opening the Administrator window and selecting **Resources** and assigning the available roles. In this case, we selected all of the available roles.

The next item to check on is Current Notice Groups. If the installation was successful, there should be a new notice group called LANAccess.

Figure 171. Add LAN Access Notice Group

Make sure that you edit the notice group subscriptions. This is done by opening the Administrators window using the right mouse button and selecting **Edit Notice Group Subscriptions**.

Figure 172. Administrator Information Changed

After changing an administrator role you have to restart your desktop to make the changes take effect.

2.21 Installation of IBM Enterprise Suite for Windows NT Complete

After you have finished installing your last product chosen during the installation process, the IBM Enterprise Suite for Windows NT reboot panel will be displayed.

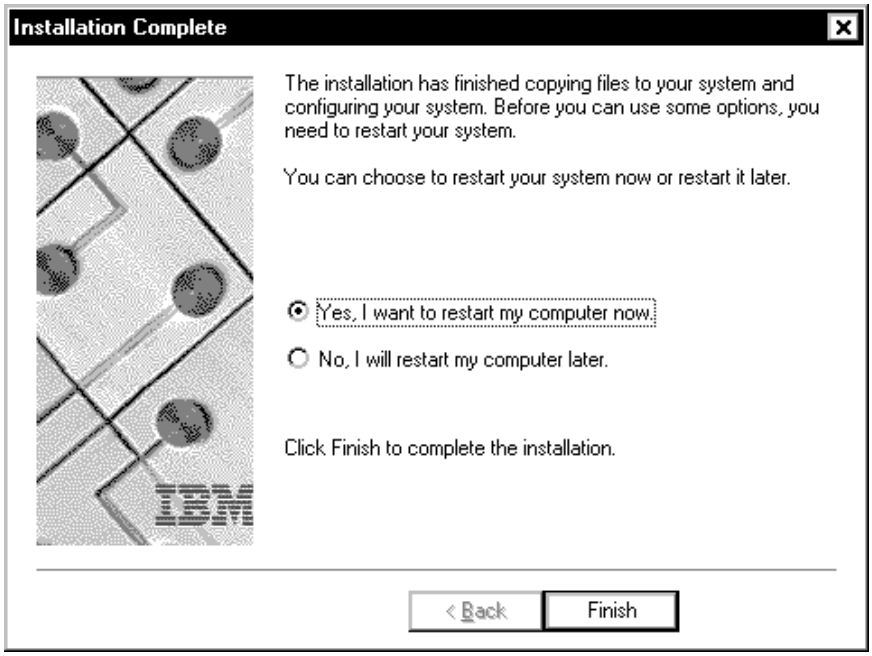


Figure 173. Reboot Screen

You should elect to reboot at this time before attempting to start any of the products.

2.22 Uninstalling IBM Enterprise Suite for Windows NT

There are a number of ways to uninstall the installed products using IBM Enterprise Suite for Windows NT. Below we show the two simplest methods.

2.22.1 Uninstalling from the Control Panel

This is by far the simplest and most common method of removing software from Windows NT 4.0. However, uninstalling using the Add/Remove Programs Application from the Control Panel of Windows NT 4.0 only allows you to uninstall one component at a time. This uninstall process clears the registry and normally asks you to restart the server when it is finished. Our recommendation is that you delete all the installed software that you want to remove before you restart the server.

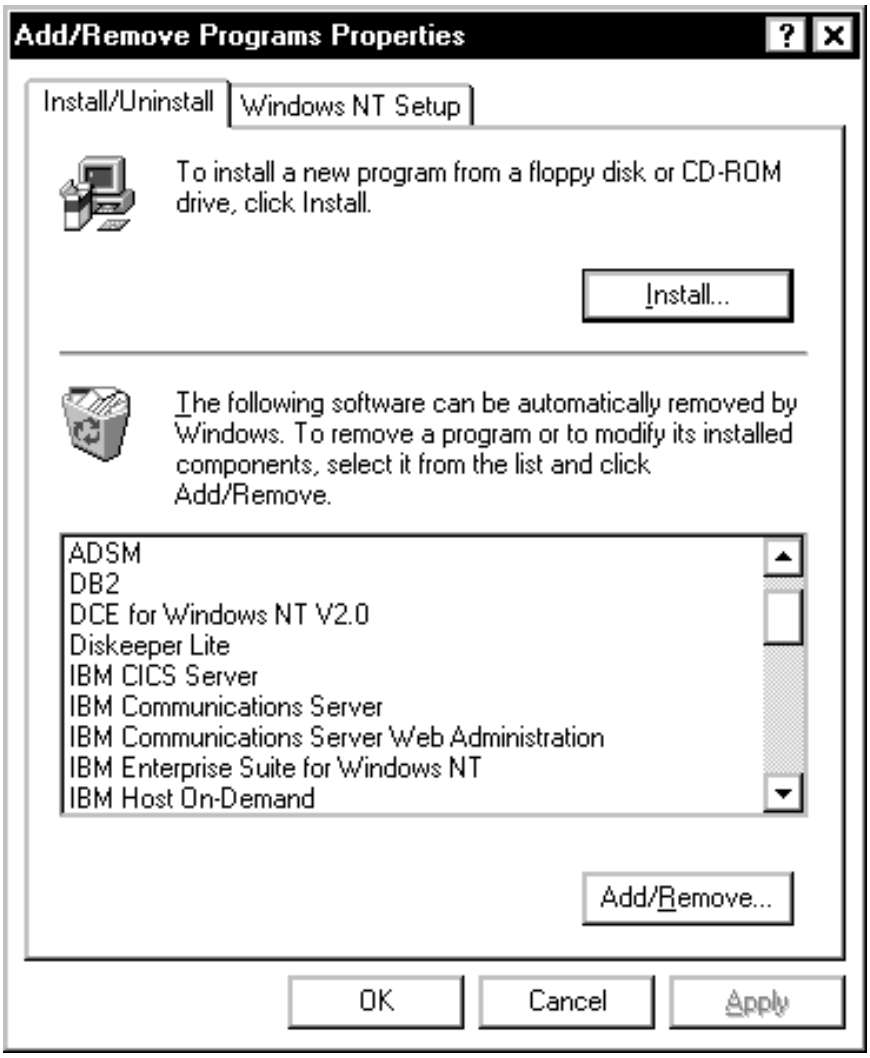


Figure 174. Uninstalling Using an NT 4.0 Utility

2.22.2 Running the IBM Enterprise Suite for Windows NT Uninstall Utility

Note: If you only have one product from the IBM Enterprise Suite for Windows NT installed, and run the IBM Enterprise Suite for Windows NT Uninstall utility, the utility will assume you want to remove it and the IBM Enterprise Suite for Windows NT component as well. If you want to to uninstall the single component itself and leave the IBM Enterprise Suite for Windows NT control programs intact, then run the single component uninstall itself.

You can run the IBM Enterprise Suite for Windows NT Uninstall utility by clicking **Start**, **Programs** and **IBM Suite for Windows NT** of Windows NT 4.0. This utility allows you to select multiple software components that you wish to uninstall.

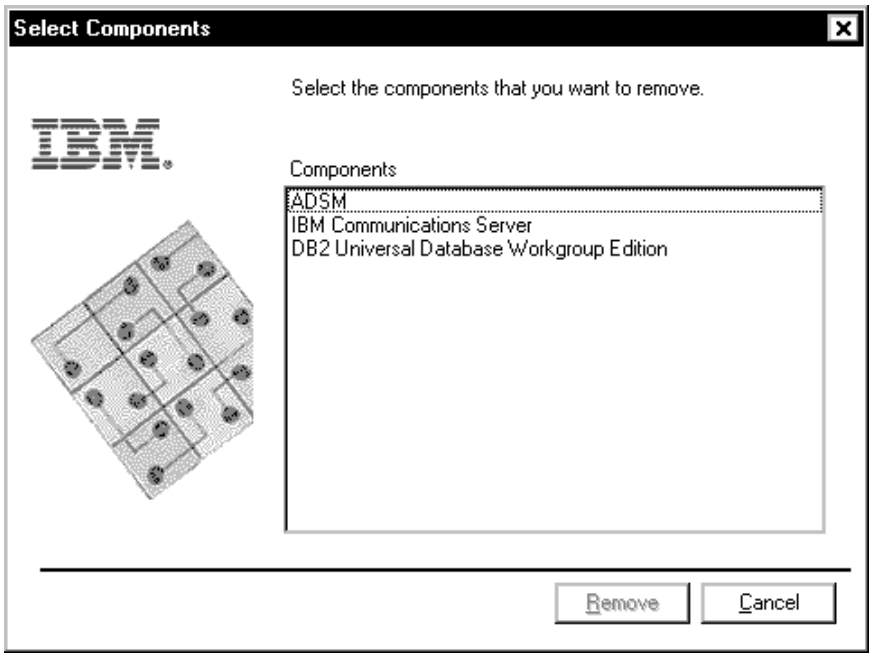


Figure 175. Uninstalling Using the IBM Enterprise Suite for Windows NT Utility

2.22.3 Items to Cleanup after the Uninstall

After you uninstall some or all of the products, there are some things left around that you may want to delete or keep, depending on if you are planning a migration to a new product or not. Here is what we found:

- Communications Server
  - The IBMCS directory and the PRIVATE subdirectory remained after the uninstall.
  - The ONDEMAND directory remained with emexpsr.log and some other files totaling about 2 KB.
  - The Personal Communications directory was left and was empty.
- ADSM Server/Client
  - \Win32app\Ibm\Adsm\server directory was left and contained the dsmserv.opt, initialization logs and some other files.
  - \Win32app\Ibm\Adsm\saclient directory was left and contained the dsm.opt and dsmerror.log.
  - \Win32app\Ibm\Adsm\baclient directory was left and contained the dsm.opt file.
- DB2 UDB
  - Db2log directory with db2.log file containing installation and error information.
  - Sqllib directory with three empty subdirectories.

  - The environment variables I4_INSTALL_DRIVE and I4_LANG were left around.
- MQSeries
  - MQM directory with the mqs.ini system ini file created during setup.
- TXSeries
  - TXSeries leaves all of its environment information intact after you uninstall it, so you have to manually go back and remove it using the System Properties - Environment tool.
  - TXSeries leaves Cicscli and Var directories along with multiple subdirectories under Var.
- Domino Server
  - Domino leaves its program group information out there after uninstalling the product.
  - The folder Notes\data is left with the file pid.nbf.
  - Domino leaves its service behind in the Services. You can't get rid of it through the Control Panel.
- Net.Data
  - Net.Data leaves all of its environment variables intact even after uninstalling. They can be manually removed via the Control Panel-Environment tool.
  - Net.Data leaves behind all of it Program Group information.
  - No directories or files were left behind.

Chapter 3. Migration and Coexistence

This chapter shows how to install the IBM Enterprise Suite for Windows NT in an environment that already has some IBM and Microsoft Servers installed. For a base system we used two different system environments.

In 3.2, “Migrate a Machine with IBM Products Installed” on page 129 we describe a migration from older IBM and Lotus products to the IBM Enterprise Suite for Windows NT.

The following products were installed before the migration:

- NT 4.0 Server with Service Pack 3
- Internet Explorer V4.01
- Netscape Navigator V4.04
- IBM Communications Server V5.0
- IBM DB2 Server V2.1.2
- IBM DDCS
- IBM Internet Connection Server (ICS) V4.1.1
- Lotus Notes Server V4.5

In 3.3, “Coexistence of Microsoft and IBM Products” on page 151 we describe the installation and coexistence with Microsoft products previous installed.

The following products were installed before the installation of the IBM Enterprise Suite for Windows NT:

- NT 4.0 Server with Service Pack 3
- Internet Explorer V4.01
- Netscape Navigator V4.04
- MS SQL Server V6.5
- MS Internet Information Server (IIS) V4.0
- MS Transaction Server V2.0
- MS Message Queue Server V1.0

Both environments had Windows NT Service Pack 3 installed, but no other product fixes or hotfixes were installed before we installed the NT Integrated Suites.

For details on the installation procedures for the IBM Enterprise Suite for Windows NT see Chapter 2, “Installation” on page 9. In this chapter we only show the changes that occur when you add the NT Suites package onto a system that already has some products installed.

3.1 Environment

Before you begin to migrate a server you should always do a complete system backup. This is very important in case you have a problem with the migration, or if you need to go back to the original system to test out a scenario.

You also need to make sure that you have a user account with administrator rights and you need full control of the NTFS drives. You should only use this administrator account to install the products. You can see your rights by entering the following command in a command prompt window:

```
net user
```

This gives you a list of authorized users on this machine.

```
User accounts for \\NTSRV99

-------------------------------------------------------------------
Administrator            boernerf                 cics
Gagan                    Guest                    jhajjj
The command completed successfully.
```

To determine whether a particluar user has administrator access at a command prompt issue the command `net user username | more`, where username is a user ID from the list above.

```
net user gagan

User name                    Gagan
Full Name
Comment                      Built-in account for administering the
                             Computer/Domain.
User's comment
Country code                 000 (System Default)
Account active               Yes
Account expires              Never

Password last set            3/30/98 11:45 AM
Password expires             Never
Password changeable          3/30/98 11:45 AM
Password required            Yes
User may change password     Yes

Workstations allowed         All
Logon script
User profile
Home directory
Last logon                   Never

Logon hours allowed          All

Local Group Memberships      *Administrators       *cicsgroup
                             *IBMCSADMIN
Global Group memberships     *None
The command completed successfully.
```

For our scenarios we used two Intel machines (166 MHz, 64 MB memory) for the server components. Clients and back-end servers were located on other systems. Since we had all of the IBM NT Suites Servers installed on one system, we used one system for migration and one system for coexistence. Since the product announcement letter indicates you can spread the servers across multiple machines (as long as you only have one copy of each software component) it may be logical (for performance purposes) to put the components on more then one

machine. For our scenarios, since we did not have a production environment we limited ourselves to just a few machines.

3.2 Migrate a Machine with IBM Products Installed

This section describes a migration from older IBM and Lotus products to the new IBM Enterprise Suite for Windows NT.

Although it is recommended to stop all services before migration, these products were all running as a service with the automatic start option or they were in the startup list for the server. It would have been easier if the services were not started, but we chose to assume the worst-case scenario.

If you want to get a list of all the services that are started on a system, at the command prompt issue the command: `net start` or `winmsd /s`.

We migrated the existing products to the following from the IBM Enterprise Suite for Windows NT package:

- IBM Communications Server V5.01
- IBM DB2 Universal Database V5
- IBM DB2 Connect
- Lotus Notes Server V4.6.1

In Version 5 of DB2, IBM DDCS is integrated into DB2 Connect. The other server products (for example, ICS) should also work after the migration.

3.2.1 Things to Do before Migration

Before you can start the migration of the products you need to check some things for each product you want to migrate. The next sections show you the things you should do.

3.2.1.1 Before Migrating Communication Server

Besides your full backup you can back up the \IBMCS\PRIVATE\ folder into a separate location.

With this version of the installation program you need to manually uninstall the old version of the Communications Server, Personal Communications and the Remote Administrative Client. production code.

You can remove the Communications Server component with either the *Add/Remove* program or with a utility function. We suggest you use the *Add/Remove* program.

In case you had a problem with removing it you can remove the Communications Server with the command `rmcsnt`. Upon executing it you will be prompted to verify that you really wish to remove it from the system.

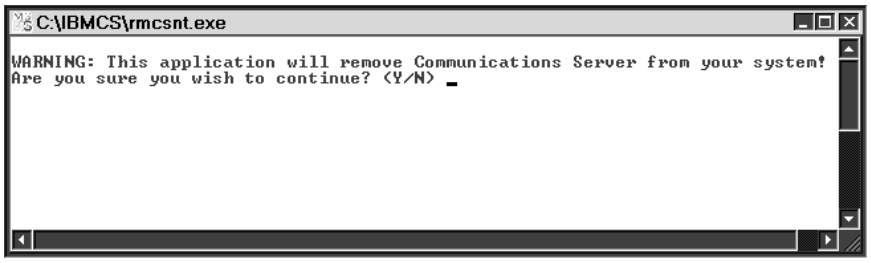


Figure 176. Command RMCSNT

Another way to remove it is to delete all the products using the Add/Remove Programs function that is built into Windows NT.

Figure 177. Control Panel

Upon double-clicking on the **Add/Remove Programs** icon in the Control Settings folder, you get the following window:

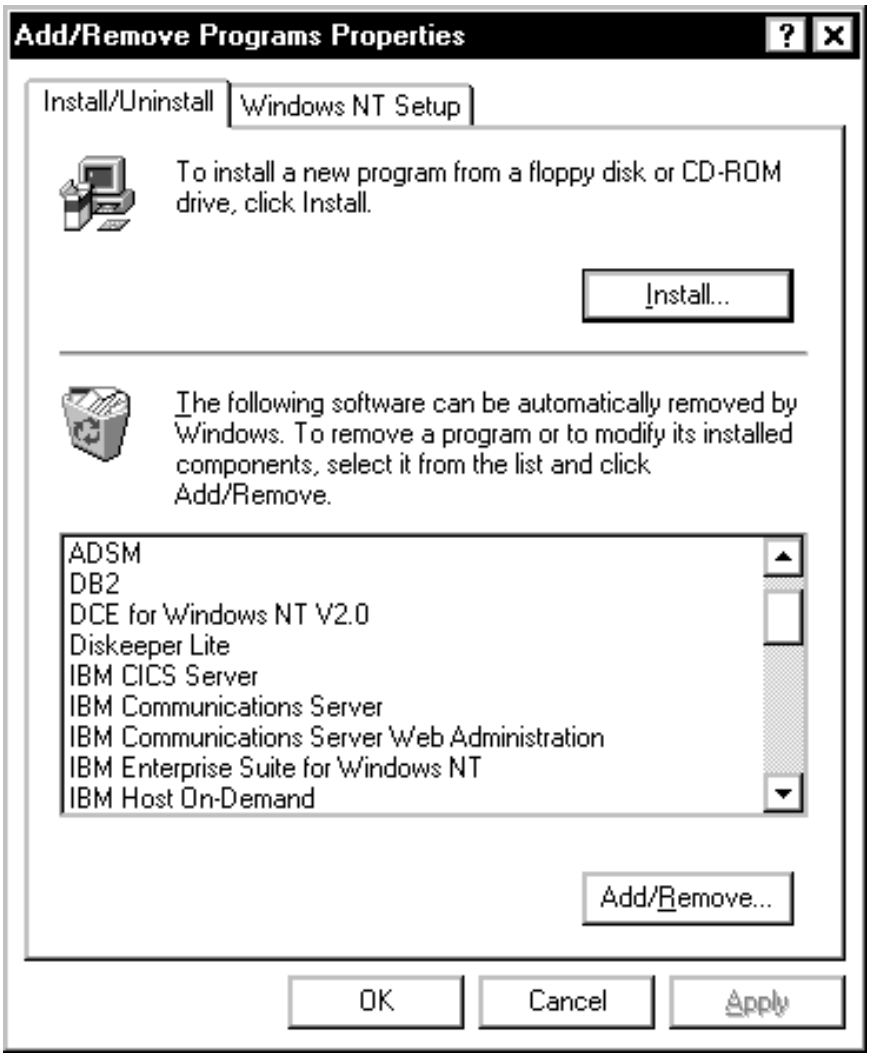


Figure 178. Add/Remove Programs

In terms of IBM Communications Server, if you decide to manually delete the files and directories, make sure that you don't delete the directory \IBMCS\PRIVATE. Otherwise, you won't be able to migrate your definitions.

If you don't uninstall the old version, you can come across three situations that will result in an abnormal termination of the installation program.

1. The first failure you get if you follow the Individual install procedure. The installation program for the Communications Server (which is called from the installation program) tries to uninstall the old product and the LLC2 protocol. If you do so, you need to reboot, otherwise NT won't allow you to add the new LLC2 protocol. The reboot ends this part of the installation programs execution. You will next go to the Host On-Demand install.
2. The second failure is in the installation program itself. If you agree to uninstall the Communication Server, you get the window Confirm File Deletion as shown below:

Figure 179. IBM Communications Server Is Installed

When you answer yes to remove the current copy of CS/NT, the installation program requests the CD for the next product, or if you are only installing CS/NT, the installation program will exit to the reboot request screen.

You get the same error condition with the installation of the Remote Administration Client from the Communication Server product.

3. The third situation occurs if you have Personal Communications already installed. You get the following error message:

Figure 180. IBM Personal Communications Is Installed

The installation program also wants the next CD for the next product or exits to the reboot screen just like it did with Communications Server.

3.2.1.2 Before Migrating DB2

In addition to your full system backup, you should back up each database separately as an extra precaution.

In our case, we already had DB2 installed, so we needed to check the databases before migration. On the CD labeled 3-1 (IBM DB2 Universal Database Workgroup Edition V5.0), there is a migration program in \DB2\COMMON\ called db2ckmig, which you run for each database you have on the system.

The following figure shows you the syntax for db2ckmig and an example of migrating one database on our system.

Figure 181. Syntax of DB2CKMIG

After the machine has finished running the command, it produces a logfile. This file should be empty. If this file is empty, you can migrate the database. Otherwise you have to refer to the DB2 documentation. You can find these messages in *DB2 Quick Beginnings*, Chapter 18, Pre-Installation Checks.

3.2.1.3 Before Migrating Lotus Notes Server

If you have a full backup of your machine and a separate backup of the NAMES.NSF, DESKTOP.DSK and *.ID files, you don't need to do anything special before migrating the Notes Server. You only need to stop the Notes Server as shown in 3.2.2.1, “How to Stop the Products” on page 135.

3.2.2 Migration

After you insert the first CD the migration starts with the start of the installation program.

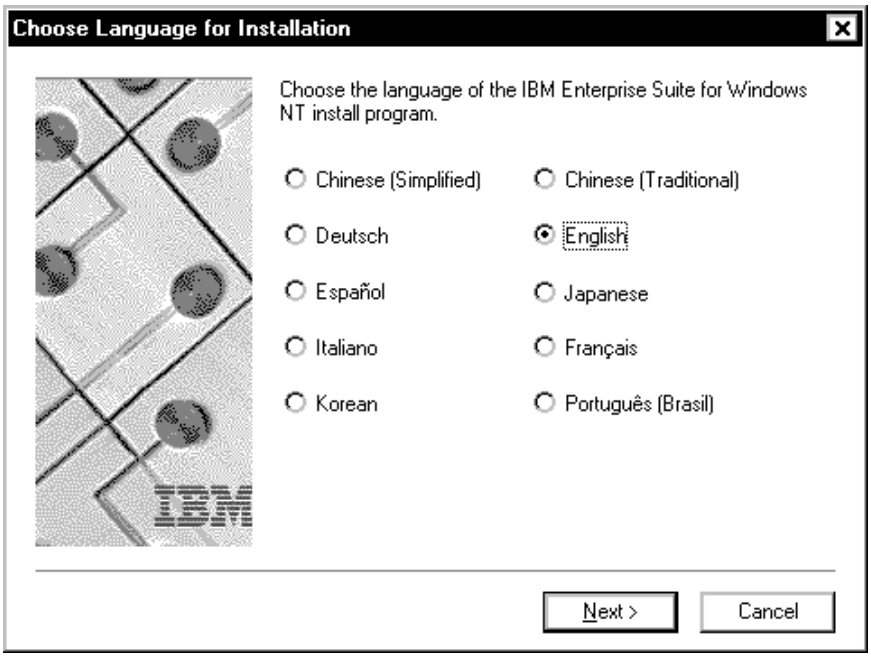


Figure 182. Select Language

You need to choose the language you want to install. This language will be used during the entire installation process.

You also need to stop all running products that you want to upgrade (refer to 3.2.2.1, “How to Stop the Products” on page 135).

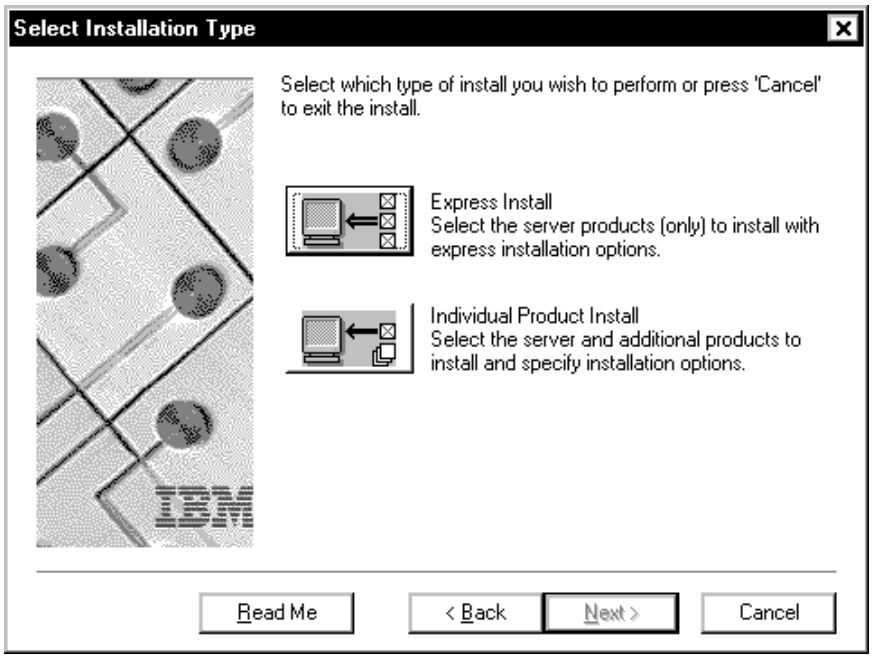


Figure 183. Select Installation Type

Click on **Individual Product Install** to select the root directory and then you will be brought to a window where you can select the components to install and you can decide which disk to store them on.

Select the directory and the drive where the installations will take place.

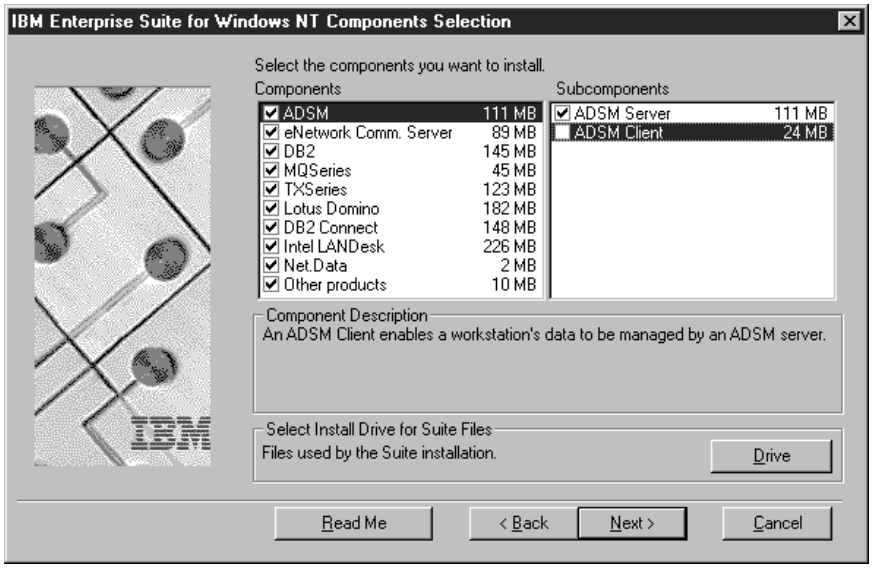


Figure 184. Select the Components

Note: Make sure that you have read the README.1ST file on CD-1 before you begin any installation.

At this point you start with the installation of the products you want to install. Please refer to 3.2.3, “Migrate the Communication Server Products” on page 137 and

3.2.5, “Migrate the Lotus Products” on page 140 for the detailed steps of the installation.

At this point in the installation process, all of the products are installed and after the reboot all of the components will be integrated.

After you verified your system, you should do another full system backup.

3.2.2.1 How to Stop the Products

There are many different ways to stop the services that are associated with each of the products. In this section we show you an easy way to do it.

Open the **Services** window from the Control Panel as shown in the following two figures:

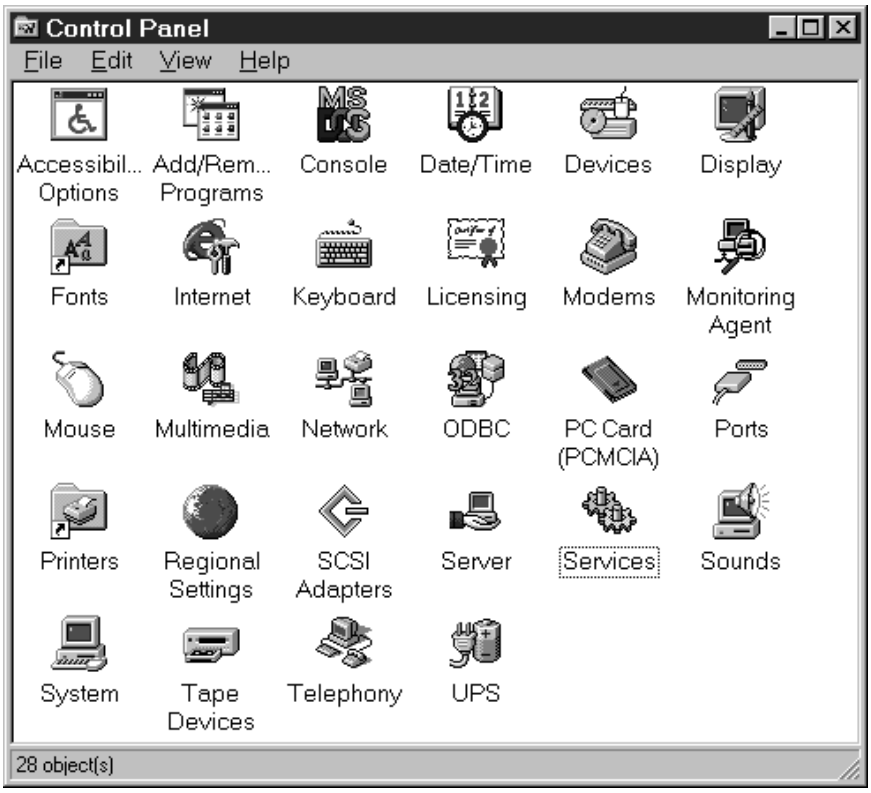


Figure 185. Control Panel

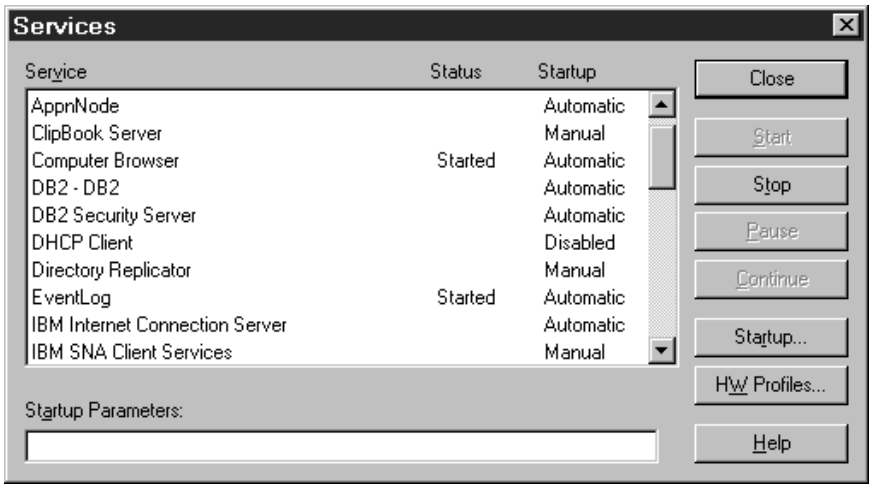


Figure 186. Services

Stop the following services by clicking on the service and then on **Stop**:

- DB2 - DB2
- DB2 Security Server
- IBM Internet Connection Server
- IBM SNA Client Services

IBM SNA Client Services is a service for the Communications Server.

As the next figure shows, you can also stop the node from the SNA Node Operation facility. You do this from the **Operations** and **Stop Node** pull-down windows as shown below:

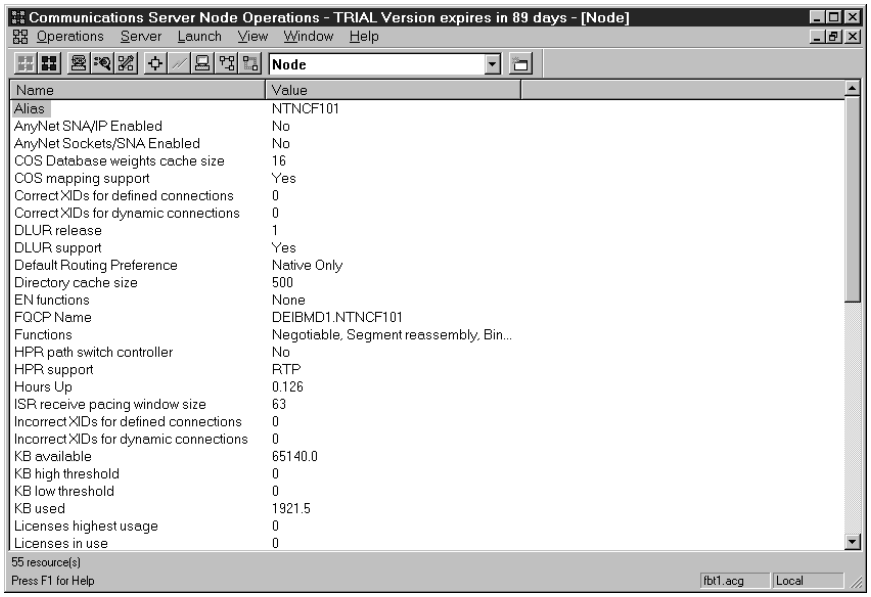


Figure 187. Communications Server Node Operations - Node Is Started

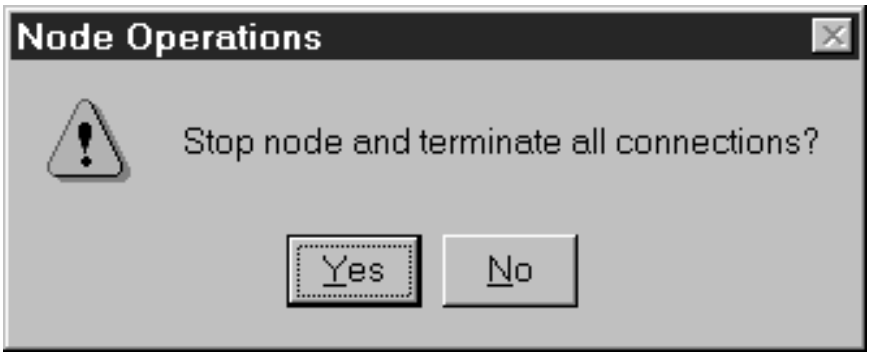


Figure 188. Stop Node Window

Click on **Yes**.

The Node and the Communication Server services should stop.

The next figure shows the Lotus Domino Server console. The Lotus Domino Server can be stopped by typing `q` in the console window.

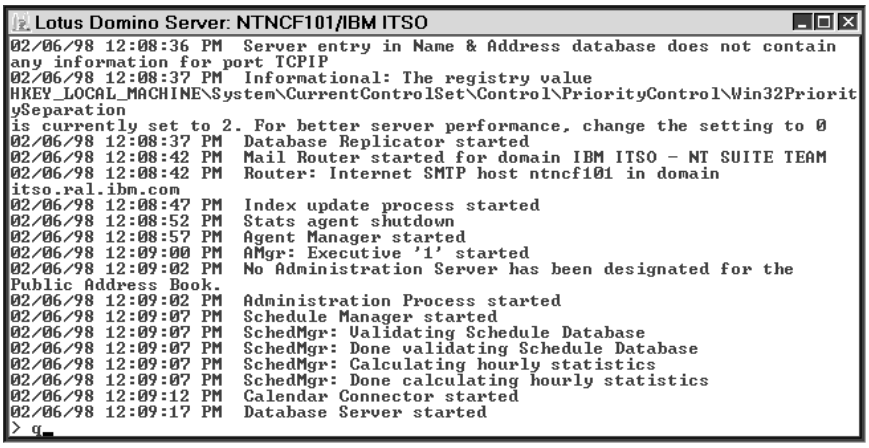


Figure 189. Lotus Domino Server Console

3.2.3 Migrate the Communication Server Products

The first product we migrated was the Communications Server. It has a lot of components and we wanted to install most of them. The ones that you install will be dependent upon your configuration and your requirements.

For our scenario, we started from a previously installed Communications Server 5.0 system and migrated to the new 5.01 included with the IBM Enterprise Suite for Windows NT.

We got to this point from the installation program shown in Figure 184 on page 134 where you selected to install Communications Server and its components. Now the installation program will prompt you for the Communications Server CD.

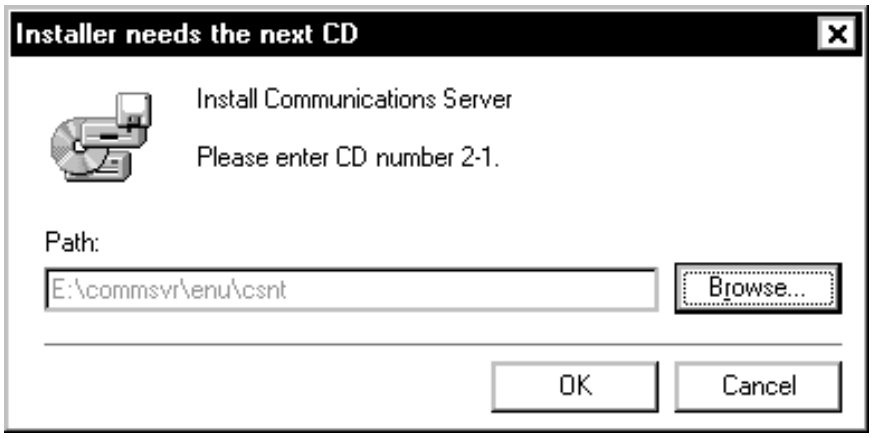


Figure 190. Installer Prompt for CS/NT

At this point, the installation will proceed precisely as detailed in 2.8, “Installing Communications Server V5.01” on page 33. Please refer to this section for the remainder of the Communications Server migration steps.

3.2.4 Migrate the DB2 Products

The next product to migrate is DB2. Be sure you have followed the procedure to check the databases as described in 3.2.1.2, “Before Migrating DB2” on page 132 and that all of the log files that were created by the DB2CKMIG command are empty. If they are empty, it means that the check utility did not have any problems.

After inserting CD 3-1 (the CD for DB2 UDB) and clicking on **OK** you will have the option of selecting which products will get installed:

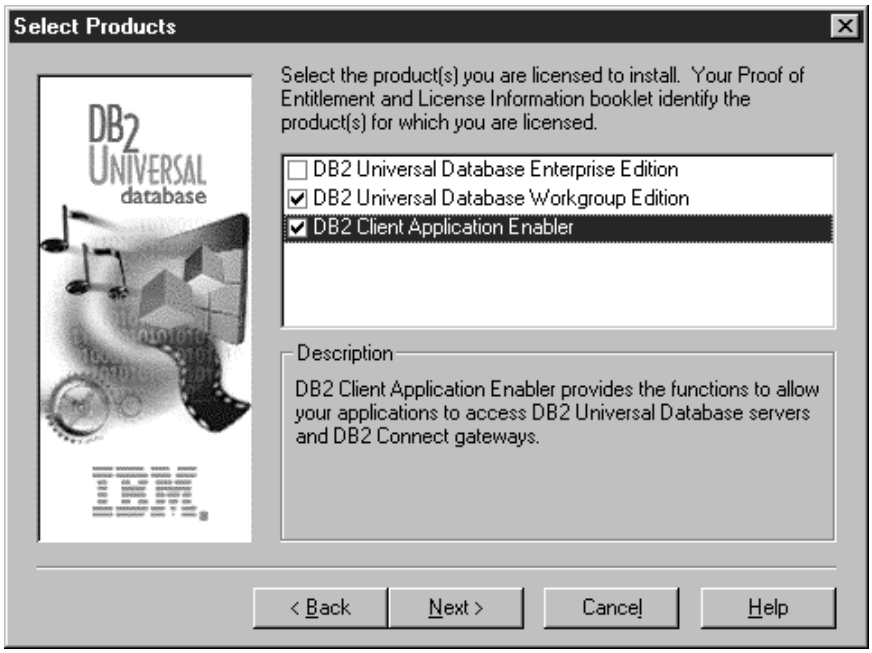


Figure 191. Select Products

Select the products you want to install. The installation utility will search for a previous version of the code on your system.

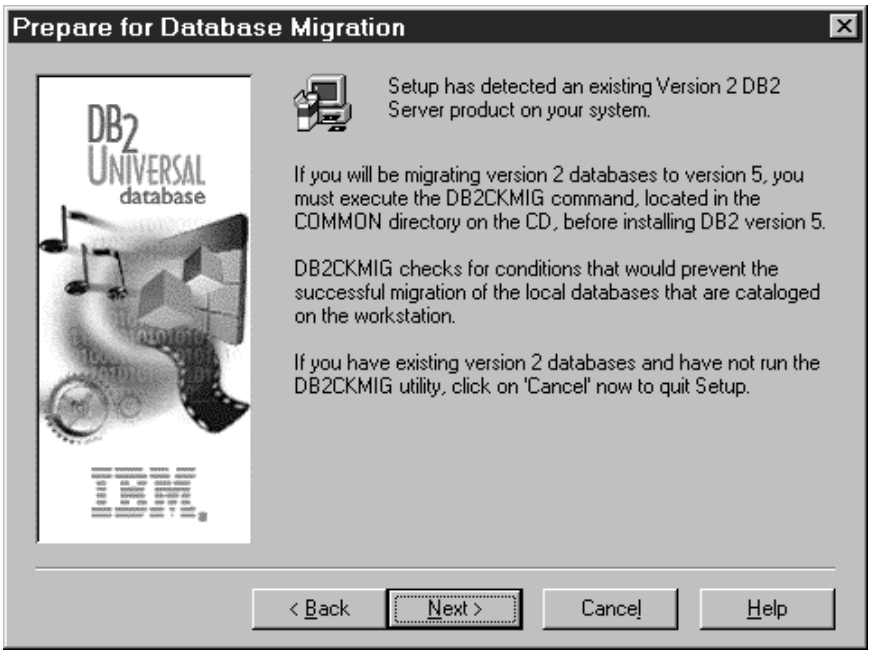


Figure 192. Hint For Database Migration

This is your last opportunity to try and migrate your data.

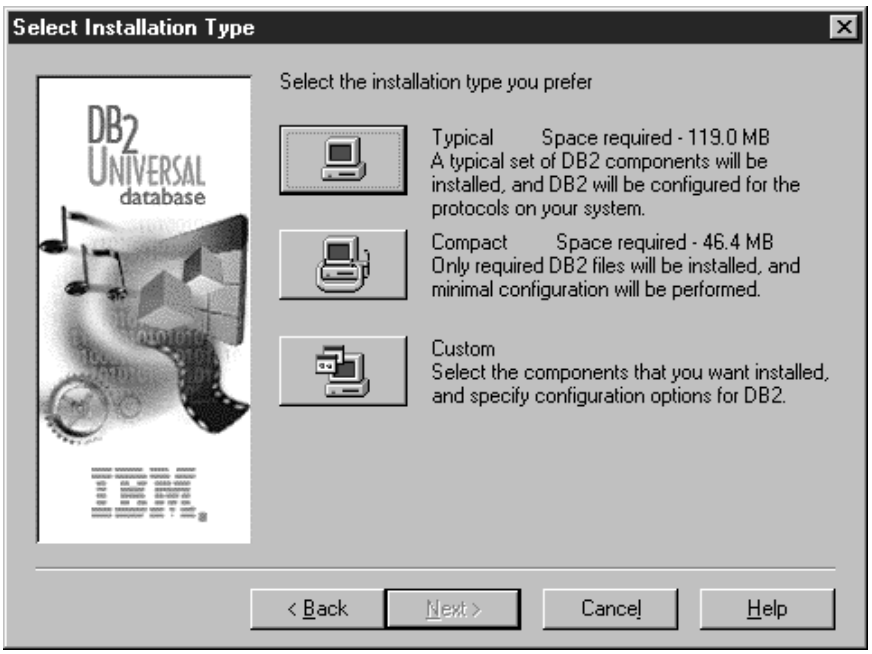


Figure 193. Select Installation Type

You should choose **Custom**, so you can configure the DB2 product for your specific environment.

At this point, the installation will proceed precisely as detailed in 2.9, “Installing IBM DB2 Universal Database” on page 52. Please refer to this section for the remaining DB2 migration steps.

3.2.5 Migrate the Lotus Products

As with the other components, the installation program will prompt you to insert the Lotus Notes CD.

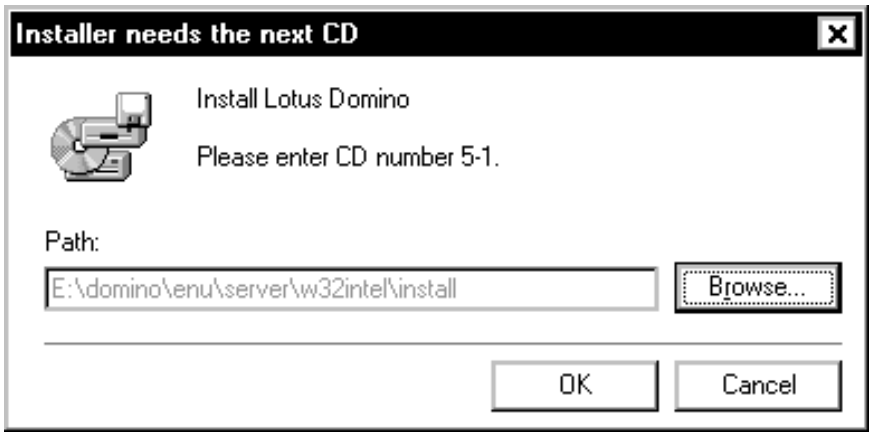


Figure 194. Domino Server CD Prompt

After reading the CD you will get the initial welcome window followed by a warning window if a previous version of Notes was found.

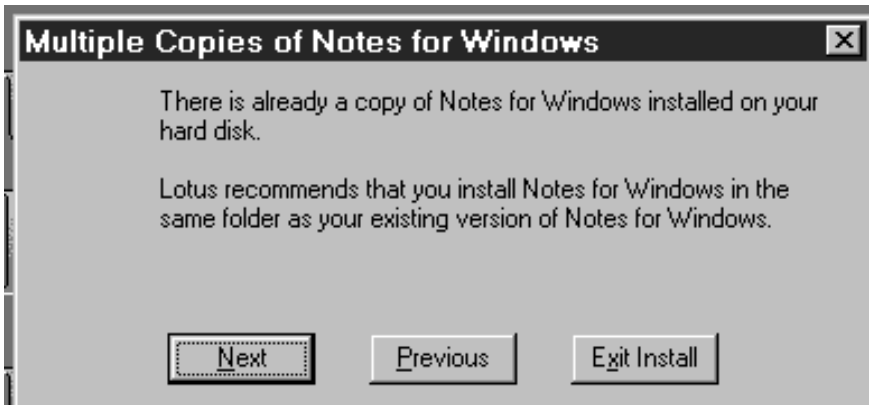


Figure 195. Lotus Install Program Found an Older Version

Click on **Next**.

You should install the new version in the same path as the old one. Be sure to back up your important files and databases before installing the new version.

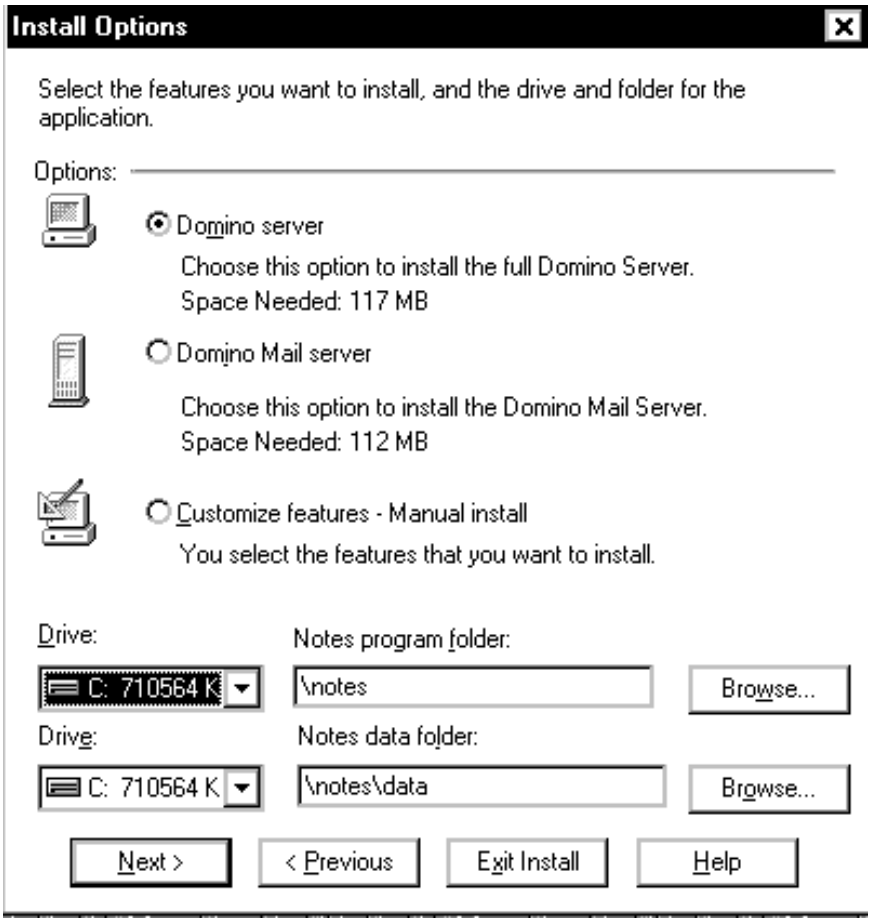


Figure 196. Install Options

We selected to customize the installation process so that we could have the most control over which options get installed.

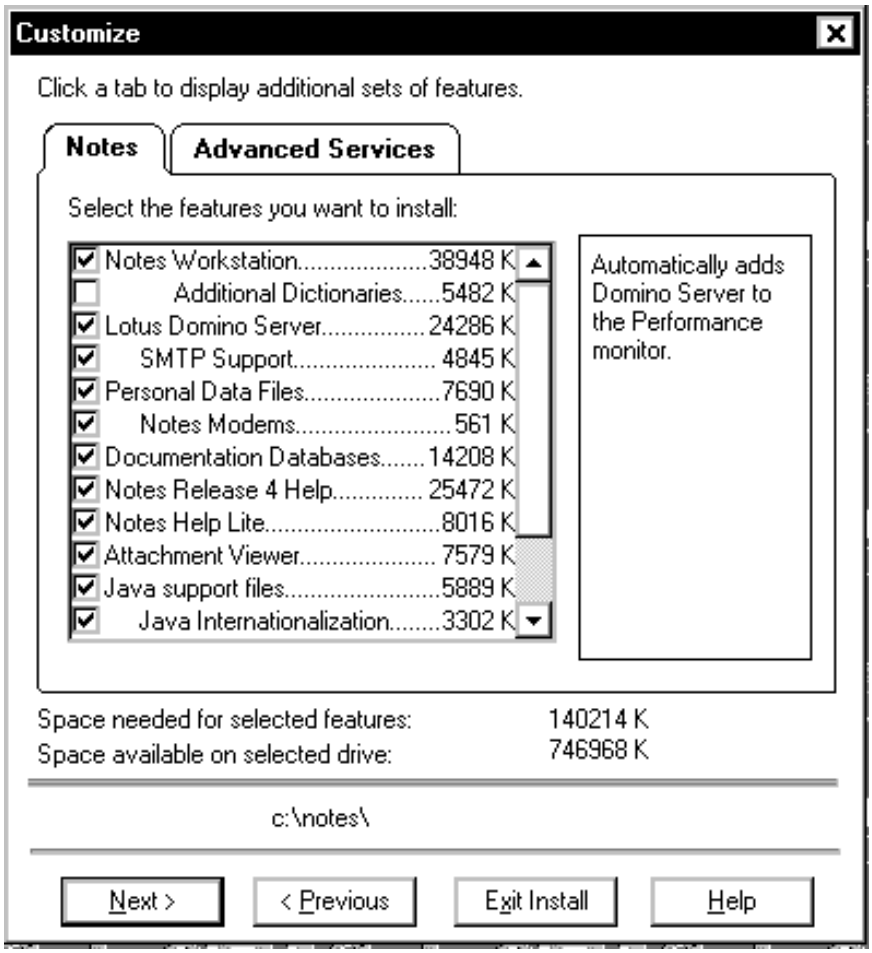


Figure 197. Customize Options to Install

After the components are installed you will have the option to launch Notes right away. You should choose **No**. First you need to reboot for the other products you have previously installed.

Note: Remember to copy your old databases, desktop and ID files back into your \notes directory structure.

3.2.6 Things to Do after Migration

After the successful installation of the products and the reboot of the machine you will need to reconfigure the products. We outline several steps that you should follow in the following sections.

- CSNT Server - Migrate Configuration
- DB2 - Migrate Databases
- Lotus Notes - Migrate Databases

3.2.6.1 Things to Do after Migrating Communications Server

If you have any old configuration files, you can try to migrate them at this point.

Start Communications Server by bringing up **Node Operations** from the IBM Communications Server group.

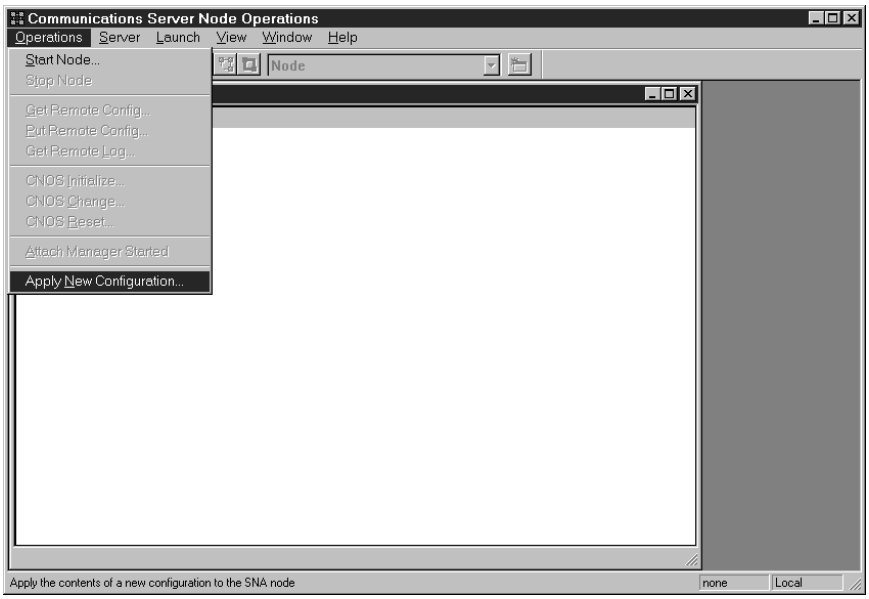


Figure 198. Apply New Configuration

You need to select **Apply New Configuration** to migrate the old configuration files.

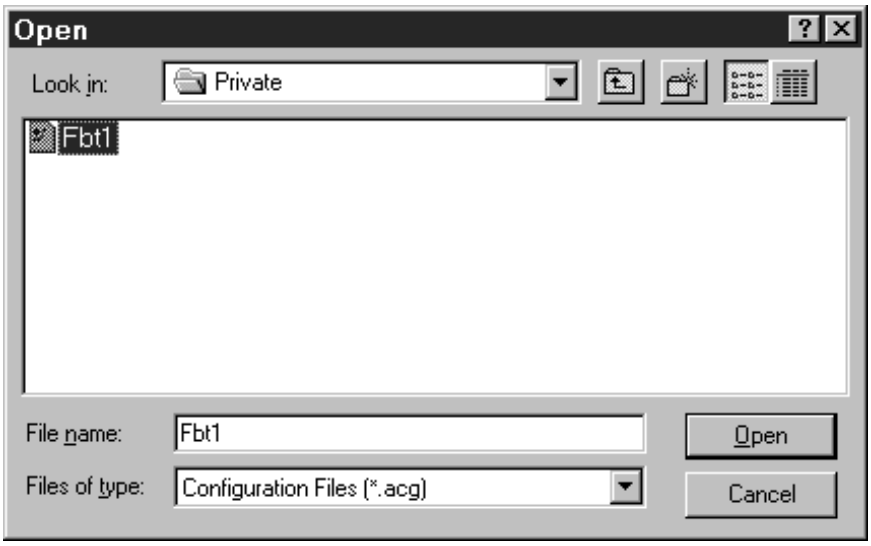


Figure 199. Open the Old Configuration File

After you have activated your new configuration file, you can autostart the Communication Server with the next IPL. To do this, open a command prompt window and enter the command: `csstart -a`. This will autostart the Communcations Server the next time Windows NT is restarted and use the current configuration file.

3.2.6.2 Things to Do after Migrating DB2

When you migrated to DB2 UDB V5, there was a logfile created during the installation. It was placed into C:\DB2LOG\DB2.LOG. This file shows the installed options, each installed file and the shared files that it didn't change. It was around 16,000 bytes on our system. A second logfile will be created during the start of the new DB2 version in C:\SQLLIB\DBAMSG.LOG. It includes messages about the database migration. The next figure shows an example of the DBAMSG log file.

```
2  02/06/1998  10:27:12  SQL5035  The database requires migration SQLSTATE=55001
2  02/06/1998  14:43:23  SQL5035  The database requires migration SQLSTATE=55001
2  02/06/1998  14:43:39  SQL5035  The database requires migration SQLSTATE=55001
2  02/13/1998  14:04:46  SQL1032  No start database manager command was issued SQLSTATE=57019
2  02/13/1998  14:04:46  SQL1032  No start database manager command was issued SQLSTATE=57019
```

Figure 200. Example of the Logfile DBAMSG

After the installation of the new version of DB2 you need to migrate the databases. If you don't migrate them, you will get the following error message when you try to use the database:

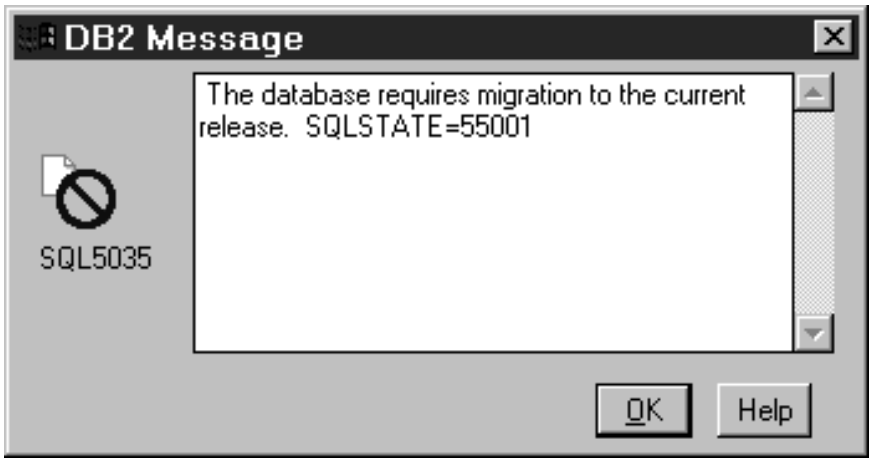


Figure 201. DB2 Message - Database Requires Migration

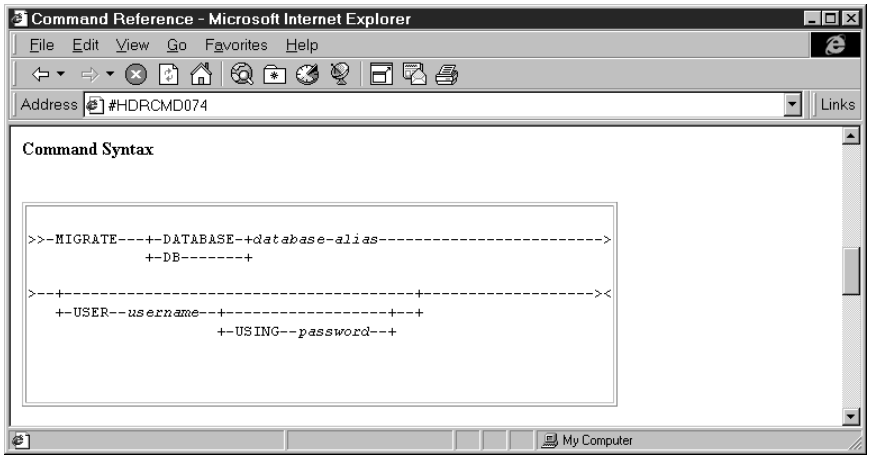


Figure 202. Command Syntax for MIGRATE DATABASE

Figure 202 shows you the syntax for the migrate database command and the next figure shows you an example.

Figure 203. DB2 Command Line Processor Window

That's all you need to do after migrating the DB2 products.

The configuration for DB2 (for example, DB2 Connect) will be converted automatically and should work fine.

3.2.6.3 Things to Do after Migrating Lotus Notes Server

Lotus Notes will also require you to migrate its databases. The following steps show you the way to do this.

If you don't migrate the databases, you will get an error message when you start the Notes Server similar to the following:

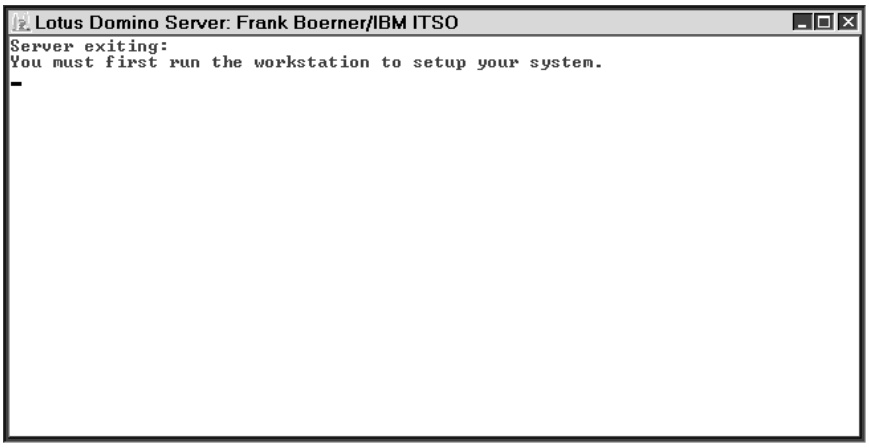


Figure 204. Lotus Notes Server Console

You have to start the **Lotus Notes Workstation** program and follow the next two steps.

1. First, you see (at the bottom) that Notes starts to upgrade the design of all of the databases on this machine.

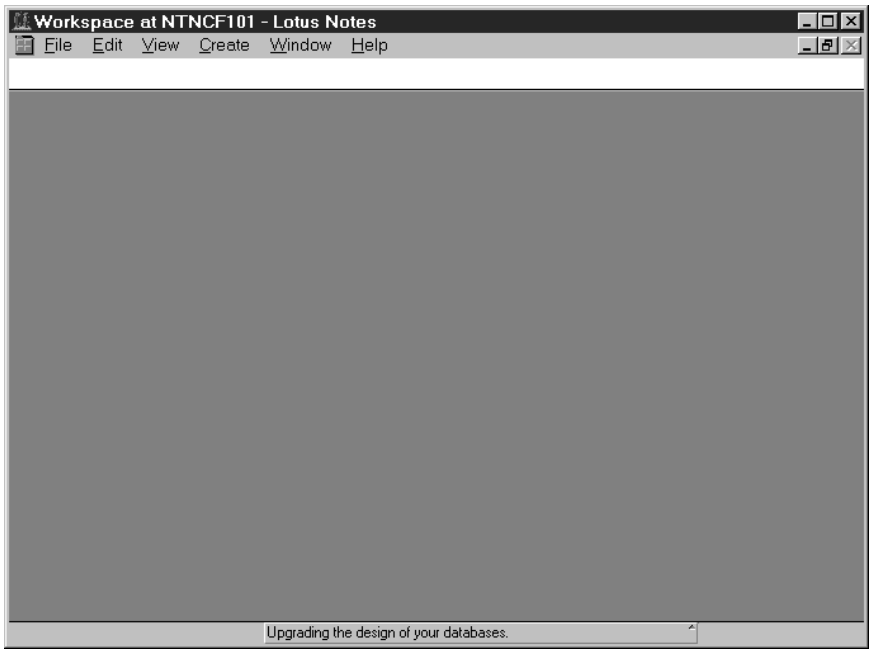


Figure 205. Workspace at Lotus Notes

2. Then you have an option to upgrade your design of the Notes Name and Address Book (NAB) with the new version of Lotus Notes.

Figure 206. Lotus Notes Upgrade Procedure

After clicking on **Yes** the setup of Lotus Notes Server is complete.

You also get a new program to administer Lotus Notes. It is called Domino Server Administration.

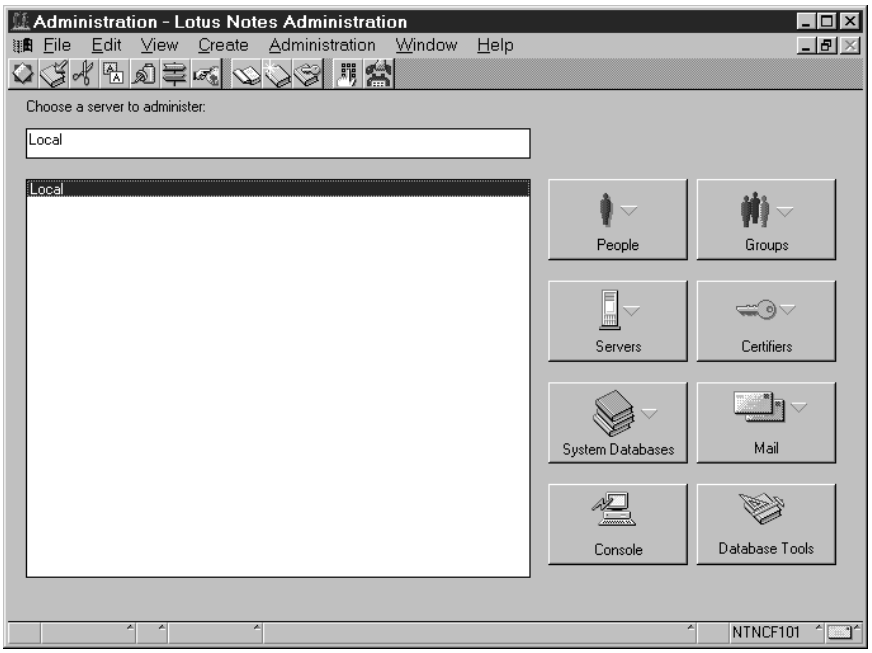


Figure 207. New - Lotus Notes Administration

That completes the to do list after migration for the products in the first scenario.

The next few pages provide details and try to show the differences between the products and their environment after the migration.

3.2.7 Migration Differences

This section shows the effects the migration had upon the system. We looked at the environment, the services and what processes were running.

3.2.7.1 Differences in the Environment

Our system variables looked like the following before our migration:

```
Microsoft Diagnostics Report For \\NTNCF101       (before migration)


Environment Report

System Environment Variables
   ComSpec=C:\WINNT\system32\cmd.exe
   Os2LibPath=C:\WINNT\system32\os2\dll;
   Path=C:\WINNT\system32;C:\WINNT;C:\IBMCS;C:\NTRESKIT;
     C:\NTRESKIT\Perl;C:\SQLLIB\BIN;C:\SQLLIB\FUNCTION;
     C:\WWW\BIN;C:\Personal Communications
   windir=C:\WINNT
   OS=Windows_NT
   PROCESSOR_ARCHITECTURE=x86
   PROCESSOR_LEVEL=5
   PROCESSOR_IDENTIFIER=x86 Family 5 Model 2 Stepping 12, GenuineIntel
   PROCESSOR_REVISION=020c
   NUMBER_OF_PROCESSORS=1
Lib=C:\SQLLIB\LIB
   Include=C:\SQLLIB\INCLUDE
   DB2PATH=C:\SQLLIB
   DB2INSTANCE=DB2
   BOOKSHELF=C:\SQLLIB\BOOK
   HELP=C:\SQLLIB\HELP
   NLSPATH=c:\db2www\d2wmsg\%L\%N
   LOCPATH=c:\db2www\d2wloc
   LANG=EN_US
   NTRESKIT=C:\NTRESKIT

Environment Variables for Current User
   TEMP=C:\TEMP
   TMP=C:\TEMP
```

The next screen shows the environment after the migration. You should notice that most of the new entries came from the DB2 Universal Database family.

```
Microsoft Diagnostics Report For \\NTNCF101        (after migration)


Environment Report

System Environment Variables
   BOOKSHELF=C:\ifor\WIN\BIN\EN_US
   ComSpec=C:\WINNT\system32\cmd.exe
DB2INSTANCE=DB2
   HELP=C:\ifor\WIN\BIN
   I4_INSTALL_DRIVE=C:
   I4_LANG=EN_US
   IMNINST=help
   IMNINSTSRV=C:\IMNNQ_NT
   Include=C:\SQLLIB\INCLUDE
   LANG=EN_US
   Lib=C:\SQLLIB\LIB
   LOCPATH=c:\db2www\d2wloc
   NLSPATH=c:\db2www\d2wmsg\%L\%N;C:\ifor\LS\MSG\%L\%N
   NTRESKIT=C:\NTRESKIT
   NUMBER_OF_PROCESSORS=1
   OS=Windows_NT
   Os2LibPath=C:\WINNT\system32\os2\dll;
   Path=C:\WINNT\system32;C:\WINNT;C:\NTRESKIT;C:\NTRESKIT\Perl;
     C:\WWW\Bin;C:\IMNNQ_NT;C:\ifor\WIN\BIN;
     C:\ifor\WIN\BIN\EN_US;C:\SQLLIB\BIN;C:\SQLLIB\FUNCTION;
     C:\SQLLIB\SAMPLES\REPL;C:\SQLLIB\HELP;C:\IBMCS;
     C:\Personal Communications
   PROCESSOR_ARCHITECTURE=x86
   PROCESSOR_IDENTIFIER=x86 Family 5 Model 2 Stepping 12, GenuineIntel
   PROCESSOR_LEVEL=5
   PROCESSOR_REVISION=020c
   windir=C:\WINNT
SNARoot=C:\IBMCS

Environment Variables for Current User
   TEMP=C:\TEMP
   TMP=C:\TEMP
```

3.2.7.2 Services - Before and After

Below is a list of all NT-related services that were on the system before the migration:

```
Microsoft Diagnostics Report For \\NTNCF101       (before migration)


Services Report
Alerter                            Running   (Automatic)
AppnNode                           Running   (Automatic)
Computer Browser                   Running   (Automatic)
DB2 - DB2                          Running   (Automatic)
DB2 Security Server                Running   (Automatic)
EventLog (Event log)               Running   (Automatic)
IBM SNA Client Services            Running   (Manual)
IBM Internet Connection Server     Running   (Automatic)
RIP for Internet Protocol          Running   (Automatic)
Server                             Running   (Automatic)
Workstation (NetworkProvider)      Running   (Automatic)
License Logging Service            Running   (Automatic)
TCP/IP NetBIOS Helper              Running   (Automatic)
Messenger                          Running   (Automatic)
Net Logon (RemoteValidation)       Running   (Automatic)
Plug and Play (PlugPlay)           Running   (Automatic)
Protected Storage                  Running   (Automatic)
RAPISERVER                         Running   (Automatic)
Remote Procedure Call (RPC) Service Running  (Automatic)
Simple TCP/IP Services             Running   (Automatic)
Spooler (SpoolerGroup)             Running   (Automatic)
TrcBoot                            Running   (Automatic)
UPS                                          (Manual)
Workstation                        Running   (Automatic)
WorldWideWeb Publishing Service    Running   (Automatic)
```

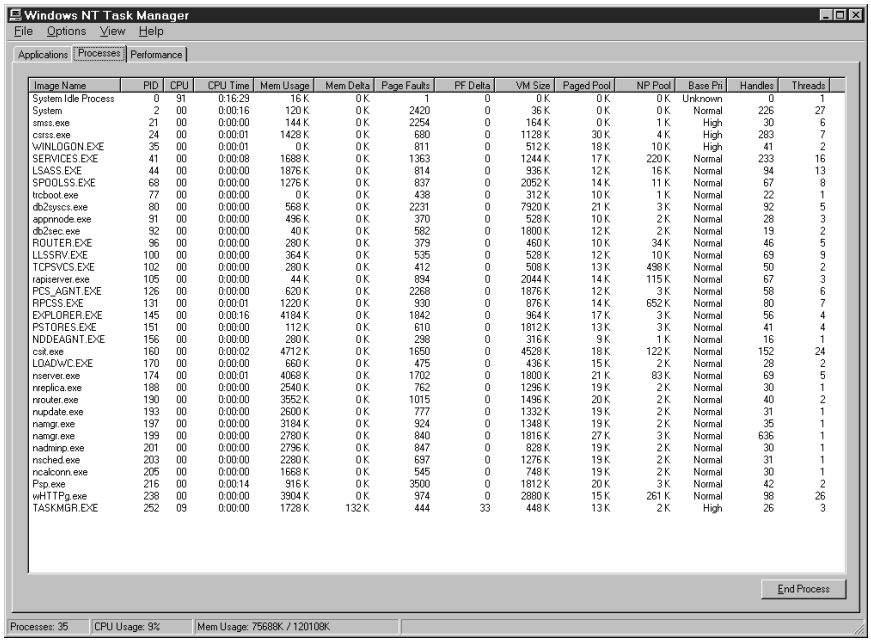
Below is a list of all NT-related services that were on the system after the migration. You can see that there are only two new services: DB2 - DB2DAS00 and DB2 Governor.

```
Microsoft Diagnostics Report For \\NTNCF101       (after Migration)


Services Report
Services Report
Alerter                            Running   (Automatic)
AppnNode                           Running   (Automatic)
Computer Browser                   Running   (Automatic)
DB2 - DB2                          Running   (Automatic)
DB2 - DB2DAS00                     Running   (Automatic)
DB2 Governor                       Running   (Automatic)
DB2 Security Server                Running   (Automatic)
EventLog (Event log)               Running   (Automatic)
IBM SNA Client Services            Running   (Manual)
IBM Internet Connection Server     Running   (Automatic)
RIP for Internet Protocol          Running   (Automatic)
Server                             Running   (Automatic)
Workstation (NetworkProvider)      Running   (Automatic)
License Logging Service            Running   (Automatic)
TCP/IP NetBIOS Helper              Running   (Automatic)
Messenger                          Running   (Automatic)
Net Logon (RemoteValidation)       Running   (Automatic)
Plug and Play (PlugPlay)           Running   (Automatic)
Protected Storage                  Running   (Automatic)
RAPISERVER                         Running   (Automatic)
Remote Procedure Call (RPC) Service Running  (Automatic)
Simple TCP/IP Services             Running   (Automatic)
Spooler (SpoolerGroup)             Running   (Automatic)
TrcBoot                            Running   (Automatic)
UPS                                          (Manual)
Workstation                        Running   (Automatic)
WorldWideWeb Publishing Service    Running   (Automatic)
```

3.2.7.3 Differences in Running Processes

In this section we show the running processes, how much memory they use and how many threads and handles they use. These figures are only snapshots and are used more to see what actual processes are running than to make any value judgements on the performance of the system:



Windows NT Task Manager

File Options View Help

Applications | Processes | Performance

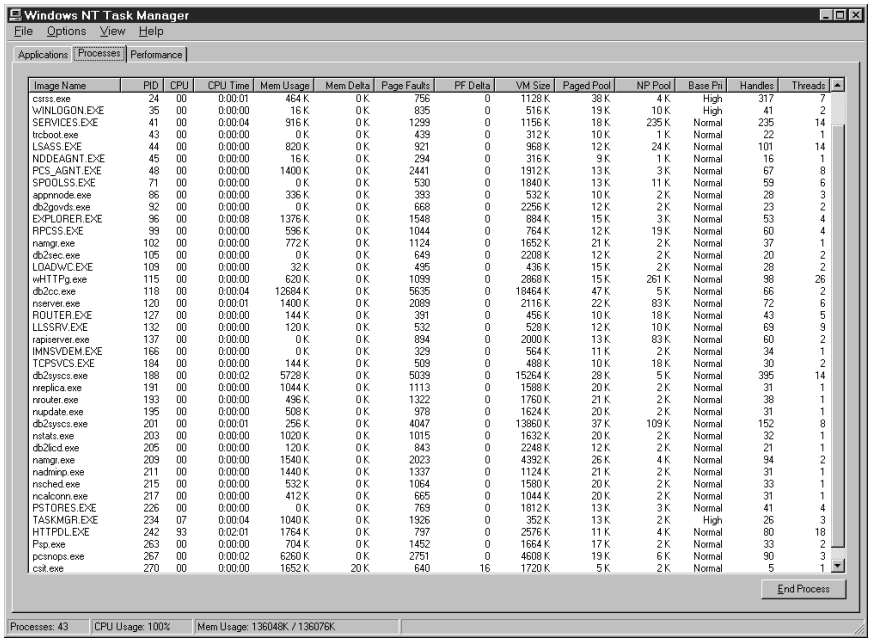
Image Name	PID	CPU	CPU Time	Mem Usage	Mem Delta	Page Faults	PF Delta	VM Size	Paged Pool	NP Pool	Base Pri	Handles	Threads
System Idle Process	0	91	0:16:29	16 K	0 K	1	0	0 K	0 K	0 K	Unknown	0	1
System	2	00	0:00:16	120 K	0 K	2420	0	36 K	0 K	0 K	Normal	226	27
smss.exe	21	00	0:00:00	144 K	0 K	2254	0	164 K	0 K	1 K	High	30	6
csrss.exe	24	00	0:00:01	1428 K	0 K	680	0	1128 K	30 K	4 K	High	283	7
WINLOGON.EXE	35	00	0:00:01	0 K	0 K	811	0	512 K	18 K	10 K	High	41	2
SERVICES.EXE	41	00	0:00:08	1688 K	0 K	1363	0	1244 K	17 K	220 K	Normal	233	16
LSASS.EXE	44	00	0:00:00	1876 K	0 K	814	0	936 K	12 K	16 K	Normal	94	13
SPOOLSS.EXE	68	00	0:00:00	1276 K	0 K	837	0	2052 K	14 K	11 K	Normal	67	8
trcboot.exe	77	00	0:00:00	0 K	0 K	438	0	312 K	10 K	1 K	Normal	22	1
db2sysc.exe	80	00	0:00:00	568 K	0 K	2231	0	7920 K	21 K	3 K	Normal	92	5
apprnnode.exe	91	00	0:00:00	496 K	0 K	370	0	528 K	10 K	2 K	Normal	28	3
db2sec.exe	92	00	0:00:00	40 K	0 K	582	0	1800 K	12 K	2 K	Normal	19	2
ROUTER.EXE	96	00	0:00:00	280 K	0 K	379	0	460 K	10 K	34 K	Normal	46	5
LLSSRV.EXE	100	00	0:00:00	364 K	0 K	535	0	528 K	12 K	10 K	Normal	69	9
TCPSVCS.EXE	102	00	0:00:00	280 K	0 K	412	0	508 K	13 K	498 K	Normal	50	2
rapiserver.exe	105	00	0:00:00	44 K	0 K	894	0	2044 K	14 K	115 K	Normal	67	3
PCS_AGNT.EXE	126	00	0:00:00	620 K	0 K	2268	0	1876 K	12 K	3 K	Normal	58	6
RPCSS.EXE	131	00	0:00:01	1220 K	0 K	930	0	876 K	14 K	652 K	Normal	80	7
EXPLORER.EXE	145	00	0:00:16	4184 K	0 K	1842	0	964 K	17 K	3 K	Normal	56	4
PSTORES.EXE	151	00	0:00:00	112 K	0 K	610	0	1812 K	13 K	3 K	Normal	41	4
NDDEAGNT.EXE	156	00	0:00:00	280 K	0 K	298	0	316 K	9 K	1 K	Normal	16	1
csit.exe	160	00	0:00:02	4712 K	0 K	1650	0	4528 K	18 K	122 K	Normal	152	24
LOADWC.EXE	170	00	0:00:00	660 K	0 K	475	0	436 K	15 K	2 K	Normal	28	2
nserver.exe	174	00	0:00:01	4068 K	0 K	1702	0	1800 K	21 K	83 K	Normal	69	5
nreplica.exe	188	00	0:00:00	2540 K	0 K	762	0	1296 K	19 K	2 K	Normal	30	1
nrouter.exe	190	00	0:00:00	3552 K	0 K	1015	0	1496 K	20 K	2 K	Normal	40	2
nupdate.exe	193	00	0:00:00	2600 K	0 K	777	0	1332 K	19 K	2 K	Normal	31	1
namgr.exe	197	00	0:00:00	3184 K	0 K	924	0	1348 K	19 K	2 K	Normal	35	1
namgr.exe	199	00	0:00:00	2780 K	0 K	840	0	1816 K	27 K	3 K	Normal	636	1
nadminp.exe	201	00	0:00:00	2796 K	0 K	847	0	828 K	19 K	2 K	Normal	30	1
nsched.exe	203	00	0:00:00	2280 K	0 K	697	0	1276 K	19 K	2 K	Normal	31	1
ncalconn.exe	205	00	0:00:00	1668 K	0 K	545	0	748 K	19 K	2 K	Normal	30	1
Psp.exe	216	00	0:00:14	916 K	0 K	3500	0	1812 K	20 K	3 K	Normal	42	2
wHTTPg.exe	238	00	0:00:00	3904 K	0 K	974	0	2880 K	15 K	261 K	Normal	98	26
TASKMGR.EXE	252	09	0:00:00	1728 K	132 K	444	33	448 K	13 K	2 K	High	26	3

End Process

Processes: 35 | CPU Usage: 9% | Mem Usage: 75688K / 120108K

Figure 208. Running Processes before the Migration

After the migration, the following tasks were executing:



Windows NT Task Manager

File Options View Help

Applications | Processes | Performance

Image Name	PID	CPU	CPU Time	Mem Usage	Mem Delta	Page Faults	PF Delta	VM Size	Paged Pool	NP Pool	Base Pri	Handles	Threads
csrss.exe	24	00	0:00:01	464 K	0 K	756	0	1128 K	38 K	4 K	High	317	7
WINLOGON.EXE	35	00	0:00:00	16 K	0 K	835	0	516 K	19 K	10 K	High	41	2
SERVICES.EXE	41	00	0:00:04	916 K	0 K	1299	0	1156 K	18 K	235 K	Normal	235	14
trcboot.exe	43	00	0:00:00	0 K	0 K	439	0	312 K	10 K	1 K	Normal	22	1
LSASS.EXE	44	00	0:00:00	820 K	0 K	921	0	968 K	12 K	24 K	Normal	101	14
NDDEAGNT.EXE	45	00	0:00:00	16 K	0 K	294	0	316 K	9 K	1 K	Normal	16	1
PCS_AGNT.EXE	48	00	0:00:00	1400 K	0 K	2441	0	1912 K	13 K	3 K	Normal	67	8
SPOOLSS.EXE	71	00	0:00:00	0 K	0 K	530	0	1840 K	13 K	11 K	Normal	59	6
apprnnode.exe	86	00	0:00:00	336 K	0 K	393	0	532 K	10 K	2 K	Normal	28	3
db2govds.exe	92	00	0:00:00	0 K	0 K	668	0	2256 K	12 K	2 K	Normal	23	2
EXPLORER.EXE	96	00	0:00:08	1376 K	0 K	1548	0	884 K	15 K	3 K	Normal	53	4
RPCSS.EXE	99	00	0:00:00	596 K	0 K	1044	0	764 K	12 K	19 K	Normal	60	4
namgr.exe	102	00	0:00:00	772 K	0 K	1124	0	1652 K	21 K	2 K	Normal	37	1
db2sec.exe	105	00	0:00:00	0 K	0 K	649	0	2208 K	12 K	2 K	Normal	20	2
LOADWC.EXE	109	00	0:00:00	32 K	0 K	495	0	436 K	15 K	2 K	Normal	28	2
wHTTPg.exe	115	00	0:00:00	620 K	0 K	1099	0	2868 K	15 K	261 K	Normal	98	26
db2cc.exe	118	00	0:00:04	12684 K	0 K	5635	0	18464 K	47 K	5 K	Normal	66	2
nserver.exe	120	00	0:00:01	1400 K	0 K	2089	0	2116 K	22 K	83 K	Normal	72	6
ROUTER.EXE	127	00	0:00:00	144 K	0 K	391	0	456 K	10 K	18 K	Normal	43	5
LLSSRV.EXE	132	00	0:00:00	120 K	0 K	532	0	528 K	12 K	10 K	Normal	69	9
rapiserver.exe	137	00	0:00:00	0 K	0 K	894	0	2000 K	13 K	83 K	Normal	60	2
IMNSVDEM.EXE	166	00	0:00:00	0 K	0 K	329	0	564 K	11 K	2 K	Normal	34	1
TCPSVCS.EXE	184	00	0:00:00	144 K	0 K	509	0	488 K	10 K	18 K	Normal	30	2
db2sysc.exe	188	00	0:00:02	5728 K	0 K	5039	0	15264 K	28 K	5 K	Normal	395	14
nreplica.exe	191	00	0:00:00	1044 K	0 K	1113	0	1588 K	20 K	2 K	Normal	31	1
nrouter.exe	193	00	0:00:00	496 K	0 K	1322	0	1760 K	21 K	2 K	Normal	38	1
nupdate.exe	195	00	0:00:00	508 K	0 K	978	0	1624 K	20 K	2 K	Normal	31	1
db2sysc.exe	201	00	0:00:01	256 K	0 K	4047	0	13860 K	37 K	109 K	Normal	152	8
nstats.exe	203	00	0:00:00	1020 K	0 K	1015	0	1632 K	20 K	2 K	Normal	32	1
db2licd.exe	205	00	0:00:00	120 K	0 K	843	0	2248 K	12 K	2 K	Normal	21	1
namgr.exe	209	00	0:00:00	1540 K	0 K	2023	0	4392 K	26 K	4 K	Normal	94	2
nadminp.exe	211	00	0:00:00	1440 K	0 K	1337	0	1124 K	21 K	2 K	Normal	31	1
nsched.exe	215	00	0:00:00	532 K	0 K	1064	0	1580 K	20 K	2 K	Normal	33	1
ncalconn.exe	217	00	0:00:00	412 K	0 K	665	0	1044 K	20 K	2 K	Normal	31	1
PSTORES.EXE	226	00	0:00:00	0 K	0 K	769	0	1812 K	13 K	3 K	Normal	41	4
TASKMGR.EXE	234	07	0:00:04	1040 K	0 K	1926	0	352 K	13 K	2 K	High	26	3
HTTPDL.EXE	242	93	0:02:01	1764 K	0 K	797	0	2576 K	11 K	4 K	Normal	80	18
Psp.exe	263	00	0:00:00	704 K	0 K	1452	0	1664 K	17 K	2 K	Normal	33	2
pcsnops.exe	267	00	0:00:02	6260 K	0 K	2751	0	4608 K	19 K	6 K	Normal	90	3
csit.exe	270	00	0:00:00	1652 K	20 K	640	16	1720 K	5 K	2 K	Normal	5	1

End Process

Processes: 43 | CPU Usage: 100% | Mem Usage: 136048K / 136076K

Figure 209. Running Processes after the Migration

3.2.8 The Registry after the Installation

Here we would show you a part of the registry. It should only provide you with an idea of where you can find entries for a specific product.

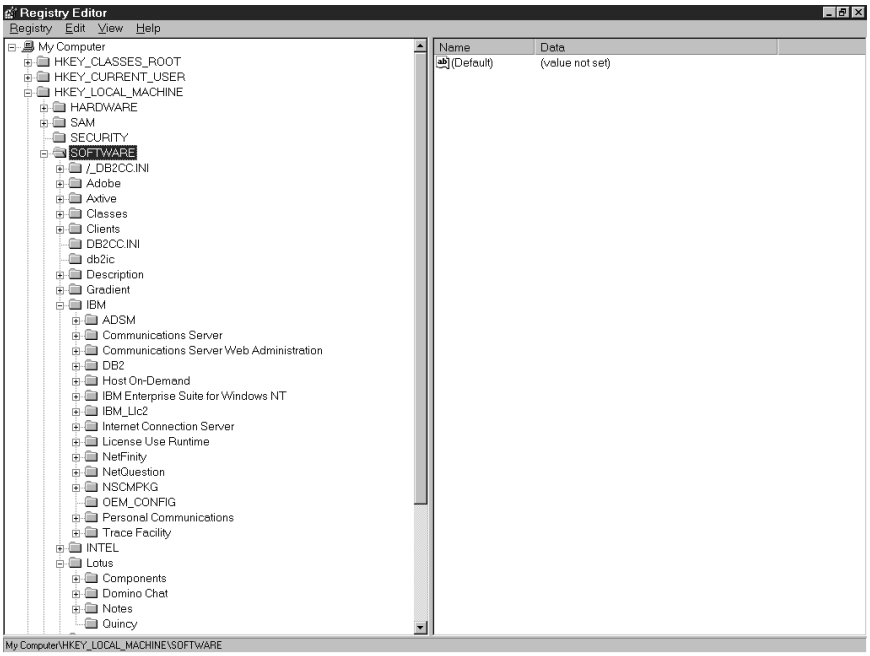


Figure 210. \HKEY_LOCAL_MACHINE\SOFTWARE after the Migration

You can refer to Chapter 2, “Installation” on page 9 for other detailed information about the changes after the installation of the IBM Enterprise Suite for Windows NT.

3.3 Coexistence of Microsoft and IBM Products

This scenario describes the coexistence of Microsoft products and the IBM Enterprise Suite for Windows NT.

The following products were installed in this case before the migration:

- NT 4.0 Server with Service Pack 3
- Internet Explorer V4.01
- Netscape Navigator V4.04
- MS SQL Server V6.5
- MS Internet Information Server (IIS) V4.0
- MS Transaction Server V2.0
- MS Message Queue Server V1.0

In addition to installing the base software platform of Windows NT and its maintenance (Service Pack 3), we needed to install a few other products. The products we installed were Microsoft's Internet Explorer and the Microsoft Option Pack. This is to try and show other environments that might exist as a base platform.

Microsoft provided the Option Pack as an add-on to Windows NT 4.0 Server.

For more information on installing the Option Pack, please refer to A.1, “Installation of Microsoft Windows NT V4.0 Option Pack” on page 371.

3.3.1 Things to Do before Installing the IBM Enterprise Suite for Windows NT

Note: Before you can start the installation of the products you should do a full backup of your machine. This is strongly recommended in case you run into any problems.

You don't need to do anything special before you can start the installation of the IBM Enterprise Suite for Windows NT.

For detailed instructions on the installation of the IBM Enterprise Suite for Windows NT, please refer to Chapter 2, “Installation” on page 9.

3.3.2 Post Installation Tasks

After you reboot you need to change the autostart default values for the services that you want automatically started at boot time. We changed the following new services from manual to automatic.

- ADSM Server Start
- DB2 Governor
- DB2 Security Server
- IBM CICS Client
- IBM CICS Internet Gateway

You can now start to configure all of the new products. For configuration examples, refer to Chapter 4, “Integration Scenario - Database” on page 159 and Chapter 5, “Integration Scenario - Transactions” on page 243.

3.3.3 Changes with the Install of the IBM Products

This section shows the changes that occurred as a result of the installation of the IBM Enterprise Suite for Windows NT. You should also refer to Chapter 2, “Installation” on page 9 for detailed information about registry entries, user IDs and rights.

3.3.3.1 Differences in the Environment

The environment variables before the installation of the IBM Enterprise Suite for Windows NT follows:

```
Microsoft Diagnostics Report For \\NTSRV99     (before installation)


Environment Report

System Environment Variables
   ComSpec=C:\WINNT\system32\cmd.exe
   INCLUDE=C:\Program Files\Mts\Include
   LIB=C:\Program Files\Mts\Lib
   NTRESKIT=C:\NTRESKIT
   NUMBER_OF_PROCESSORS=1
   OS=Windows_NT
   Os2LibPath=C:\WINNT\system32\os2\dll;
   Path=C:\WINNT\system32;C:\WINNT;C:\NTRESKIT;C:\NTRESKIT\Perl;
     C:\MSSQL\BINN;C:\Program Files\Mts
   PATHEXT=.COM;.EXE;.BAT.VBS;.JS;
   PROCESSOR_ARCHITECTURE=x86
   PROCESSOR_IDENTIFIER=x86 Family 5 Model 2 Stepping 12, GenuineIntel
   PROCESSOR_LEVEL=5
   PROCESSOR_REVISION=020c
   windir=C:\WINNT

Environment Variables for Current User
   TEMP=C:\TEMP
   TMP=C:\TEMP
```

The environment variables after the installation of the IBM Enterprise Suite for Windows NT follows:

```
Microsoft Diagnostics Report For \\NTSRV99      (after installation)


Environment Report

System Environment Variables
ComSpec=C:\WINNT\system32\cmd.exe
INCLUDE=D:\SQLLIB\INCLUDE;C:\PROGRAM Files\MTS\INCLUDE;
C:\MQM\TOOLS\C\INCLUDE;C:\OPT\dcelocal\include
LIB=C:\PROGRAM FILES\MTS\LIB;C:\OPT\CICS\LIB;C:\MQM\TOOLS\LIB;
C:\OPT\dcelocal\lib
NTRESKIT=C:\NTRESKIT
NUMBER_OF_PROCESSORS=1
OS=Windows_NT
Os2LibPath=C:\WINNT\system32\os2\dll;
Path=C:\WINNT\SYSTEM32;C:\WINNT;C:\MSSQL\BINN;C:\PROGRAM FILES\MTS;
C:\IBMCS;C:\OPT\ENCINA\BIN;C:\OPT\CICS\BIN;C:\IFOR\WIN\BIN;
C:\CICSCLI\BIN;C:\CICSCLI\CIG\BIN;C:\PERSONAL COMMUNICATIONS;
D:\SQLLIB\BIN;D:\SQLLIB\FUNCTION;D:\SQLLIB\SAMPLES\REPL;
D:\SQLLIB\HELP;C:\IFOR\WIN\BIN;C:\IFOR\WIN\BIN\EN_US;C:\MQM\BIN;
C:\MQM\TOOLS\C\SAMPLES\BIN;C:\OPT\dcelocal\bin;
C:\OPT\dcelocaldcedcf
PATHEXT=.COM;.EXE;.BAT;.CMD;.VBS;.JS
PROCESSOR_ARCHITECTURE=x86
PROCESSOR_IDENTIFIER=x86 Family 5 Model 2 Stepping 12, GenuineIntel
PROCESSOR_LEVEL=5
PROCESSOR_REVISION=020c
windir=C:\WINNT
SNARoot=C:\IBMCS
DCELOC=C:\OPT
DCEBIN=C:\OPT\dcelocal\bin
DCE_VENDOR=DEC
RPC_SUPPORTED_PROTSEQS=ncacn_ip_tcp:ncadg_ip_udp
ENCLOC=C:\OPT
ENCBIN=C:\OPT\ENCINA\BIN
ENCNLS=C:\OPT\ENCINA\MSG\@L\@N
NLSPATH=C:\OPT\ENCINA\MSG\@L\@N;C:\OPT\CICS\msg\en_US\%N;
C:\IFOR\LS\MSG\EN_US\%N;C:\IFOR\LS\MSG\%L\%N;C:\DB2WWW\D2wmsg\EN_US\%N;
C:\OPT\dcelocal\nls\msg\%L\%N;C:\OPT\dcelocal\nls\msg\enus437\%N
CICSBIN=C:\OPT\CICS\BIN
CICSHELP=C:\OPT\CICS\BIN
CICSNLS=C:\OPT\CICS\msg\en_US\%N
CICSLIB=C:\OPT\CICS\LIB
CICS_CST_HTML=C:\OPT\CICS\msg\en_US\CSTHELP
HELP=C:\OPT\CICS\BIN;C:\ifor\WIN\BIN
CICSPATH=C:\OPT\CICS
I4_INSTALL_DRIVE=C:
LANG=ENUS437
DSMG_DIR=C:\WIN32APP\IBM\ADSM\odbc\ADSM
DB2INSTANCE=DB2
BOOKSHELF=C:\ifor\WIN\BIN\EN_US
I4_LANG=EN_US
DMQ_XLAT_PATH=C:\MQM\BIN
DMQ_PATH=C:\MQM\BIN
classpath=C:\MQM\JAVA\LIB;C:\MQM\TOOLS\MQBIND\SAMPLES\EN_US;C:\DB2WWW\Javaclass
DTWINI=C:\DB2WWW\Html
DTW_INI=C:\DB2WWW\Html
DTW_HOME=C:\DB2WWW\
DCEINC=C:\OPT\dcelocal\include
LOCPATH=C:\OPT\dcelocal\locale
DCE_USE_WCHAR_NAMES=1

Environment Variables for Current User
TEMP=C:\TEMP
TMP=C:\TEMP
```

As you can see, there are a lot of new environment variables.

3.3.3.2 New Running Services

This section shows the services on the system. We showed all of the services, not just the ones that were running before the IBM Enterprise Suite for Windows NT installation:

```
Microsoft Diagnostics Report For \\NTSRV99     (before installation)


Services Report

Alerter                                     Running   (Automatic)
Computer Browser                            Running   (Automatic)
Certificate Authority                       Running   (Automatic)
Content Index                               Running   (Automatic)
ClipBook Server                             Running   (Automatic)
EventLog (Event log)                        Running   (Automatic)
IIS Admin Service                           Running   (Manual)
Server                                      Running   (Automatic)
Workstation (NetworkProvider)               Running   (Automatic)
License Logging Service                     Running   (Automatic)
TCP/IP NetBIOS Helper                       Running   (Automatic)
Messenger                                   Running   (Automatic)
MSDTC (MS Transactions)                     Running   (Automatic)
FTP Publishing Service                      Running   (Automatic)
Microsoft Message Queue Service             Running   (Automatic)
MSSQLServer                                 Running   (Automatic)
Network DDE (NetDDEGroup)                   Running   (Manual)
Network DDE DSDM                            Running   (Manual)
Net Logon (RemoteValidation)                Running   (Automatic)
Microsoft NNTP Service                      Running   (Automatic)
NT LM Security Support Provider             Running   (Manual)
Plug and Play (PlugPlay)                    Running   (Automatic)
Protected Storage                           Running   (Automatic)
Remote Procedure Call (RPC) Service         Running   (Automatic)
Simple TCP/IP Services                      Running   (Automatic)
Microsoft SMTP Service                      Running   (Automatic)
SNMP                                        Running   (Automatic)
Spooler (SpoolerGroup)                      Running   (Automatic)
SQLExecutive                                Running   (Automatic)
World Wide Web Publishing Service           Running   (Automatic)
```

After the IBM Enterprise Suite for Windows NT installation, we had the following services installed on our system:

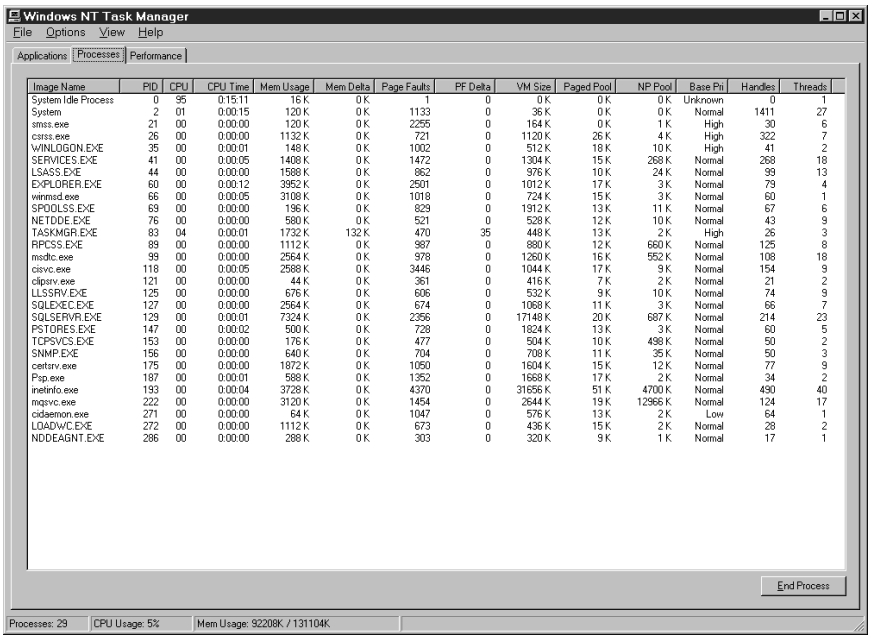
```
Microsoft Diagnostics Report For \\NTSRV99      (after installation)


Services Report

ADSM Server                                     Running   (Automatic)
Alerter                                         Running   (Automatic)
AppnNode                                        Running   (Automatic)
Computer Browser                                Running   (Automatic)
Certificate Authority                           Running   (Automatic)
Content Index                                   Running   (Automatic)
ClipBook Server                                 Running   (Automatic)
DB2 - DB2                                       Running   (Automatic)
DB2 - DB2DAS00                                  Running   (Automatic)
DB2 Governor                                    Running   (Automatic)
DB2 Security Server                             Running   (Automatic)
EventLog (Event log)                            Running   (Automatic)
IBM CICS Client                                 Running   (Automatic)
IBM CICS Internet Gateway                       Running   (Automatic)
IBM MQSeries                                    Running   (Automatic)
IIS Admin Service                               Running   (Manual)
Server                                          Running   (Automatic)
Workstation (NetworkProvider)                   Running   (Automatic)
License Logging Service                         Running   (Automatic)
TCP/IP NetBIOS Helper                           Running   (Automatic)
Messenger                                       Running   (Automatic)
MSDTC (MS Transactions)                         Running   (Automatic)
FTP Publishing Service                          Running   (Automatic)
Microsoft Message Queue Service                 Running   (Automatic)
MSSQLServer                                     Running   (Automatic)
Network DDE (NetDDEGroup)                       Running   (Manual)
Network DDE DSDM                                Running   (Manual)
Net Logon (RemoteValidation)                    Running   (Automatic)
Microsoft NNTP Service                          Running   (Automatic)
NT LM Security Support Provider                 Running   (Manual)
Plug and Play (PlugPlay)                        Running   (Automatic)
Protected Storage                               Running   (Automatic)
RAPISERVER                                      Running   (Automatic)
Remote Procedure Call (RPC) Service             Running   (Automatic)
Simple TCP/IP Services                          Running   (Automatic)
Microsoft SMTP Service                          Running   (Automatic)
SNMP                                            Running   (Automatic)
Spooler (SpoolerGroup)                          Running   (Automatic)
SQLExecutive                                    Running   (Automatic)
TrcBoot                                         Running   (Automatic)
World Wide Web Publishing Service               Running   (Automatic)
```

3.3.3.3 Differences in Running Processes

In this section we see the running processes, how much memory they use and how many threads and handles they use. These figures are only snapshots in time and can not be used to make inferences about overall performance.



Windows NT Task Manager

File Options View Help

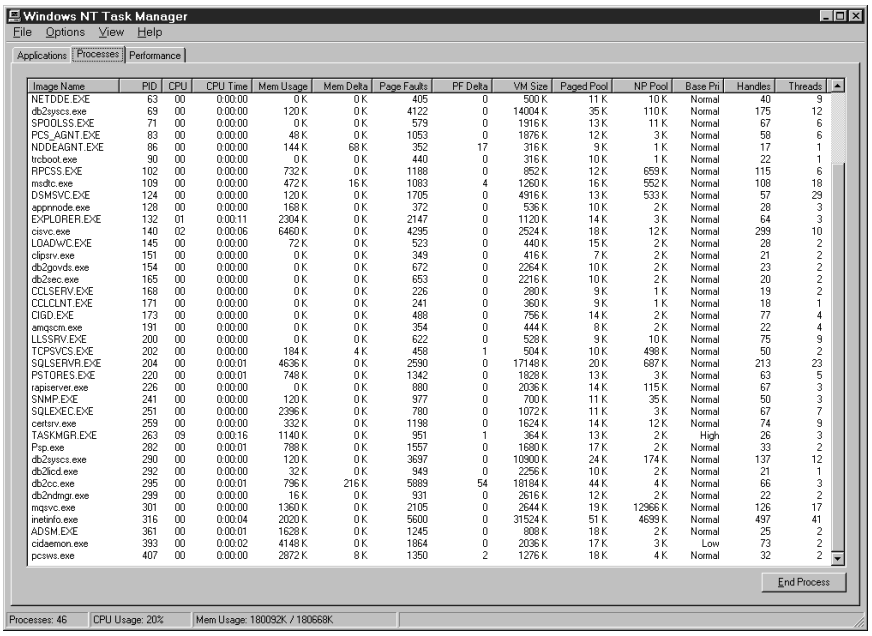
Applications | Processes | Performance

Image Name	PID	CPU	CPU Time	Mem Usage	Mem Delta	Page Faults	PF Delta	VM Size	Paged Pool	NP Pool	Base Pri	Handles	Threads
System Idle Process	0	95	0:15:11	16 K	0 K	1	0	0 K	0 K	0 K	Unknown	0	1
System	2	01	0:00:15	120 K	0 K	1133	0	36 K	0 K	0 K	Normal	1411	27
smss.exe	21	00	0:00:00	120 K	0 K	2255	0	164 K	0 K	1 K	High	30	6
csrss.exe	26	00	0:00:00	1132 K	0 K	721	0	1120 K	26 K	4 K	High	322	7
WINLOGON.EXE	35	00	0:00:01	148 K	0 K	1002	0	512 K	18 K	10 K	High	41	2
SERVICES.EXE	41	00	0:00:05	1408 K	0 K	1472	0	1304 K	15 K	268 K	Normal	268	18
LSASS.EXE	44	00	0:00:00	1588 K	0 K	862	0	976 K	10 K	24 K	Normal	99	13
EXPLORER.EXE	60	00	0:00:12	3952 K	0 K	2501	0	1012 K	17 K	3 K	Normal	79	4
winmsd.exe	66	00	0:00:05	3108 K	0 K	1019	0	724 K	15 K	3 K	Normal	60	1
SPOOLSS.EXE	69	00	0:00:00	196 K	0 K	829	0	1912 K	13 K	11 K	Normal	67	6
NETDDE.EXE	76	00	0:00:00	580 K	0 K	521	0	528 K	12 K	10 K	Normal	43	9
TASKMGR.EXE	83	04	0:00:01	1732 K	132 K	470	35	448 K	13 K	2 K	High	26	3
RPCSS.EXE	89	00	0:00:00	1112 K	0 K	987	0	880 K	12 K	660 K	Normal	125	8
msdtc.exe	99	00	0:00:00	2564 K	0 K	978	0	1260 K	16 K	552 K	Normal	108	18
cisvc.exe	118	00	0:00:05	2588 K	0 K	3446	0	1044 K	17 K	9 K	Normal	154	9
clipsrv.exe	121	00	0:00:00	44 K	0 K	351	0	416 K	7 K	2 K	Normal	21	2
LLSSRV.EXE	125	00	0:00:00	676 K	0 K	606	0	532 K	9 K	10 K	Normal	74	9
SQLEXEC.EXE	127	00	0:00:00	2564 K	0 K	674	0	1068 K	11 K	3 K	Normal	66	7
SQLSERVR.EXE	129	00	0:00:01	7324 K	0 K	2356	0	17148 K	20 K	687 K	Normal	214	23
PSTORES.EXE	147	00	0:00:02	500 K	0 K	728	0	1824 K	13 K	3 K	Normal	60	5
TCPSVCS.EXE	153	00	0:00:00	176 K	0 K	477	0	504 K	10 K	498 K	Normal	50	2
SNMP.EXE	156	00	0:00:00	640 K	0 K	704	0	708 K	11 K	35 K	Normal	50	3
certsrv.exe	175	00	0:00:00	1872 K	0 K	1050	0	1604 K	15 K	12 K	Normal	77	9
Psp.exe	187	00	0:00:01	588 K	0 K	1352	0	1668 K	17 K	2 K	Normal	34	2
inetinfo.exe	193	00	0:00:04	3728 K	0 K	4370	0	31656 K	51 K	4700 K	Normal	490	40
mqsvc.exe	222	00	0:00:00	3120 K	0 K	1454	0	2644 K	19 K	12966 K	Normal	124	17
cidaemon.exe	271	00	0:00:00	64 K	0 K	1047	0	576 K	13 K	2 K	Low	64	1
LOADWC.EXE	272	00	0:00:00	1112 K	0 K	673	0	436 K	15 K	2 K	Normal	28	2
NDDEAGNT.EXE	286	00	0:00:00	288 K	0 K	303	0	320 K	9 K	1 K	Normal	17	1

End Process

Processes: 29 | CPU Usage: 5% | Mem Usage: 92208K / 131104K

Figure 211. Running Processes before the Installation



Windows NT Task Manager

File Options View Help

Applications | Processes | Performance

Image Name	PID	CPU	CPU Time	Mem Usage	Mem Delta	Page Faults	PF Delta	VM Size	Paged Pool	NP Pool	Base Pri	Handles	Threads
NETDDE.EXE	63	00	0:00:00	0 K	0 K	405	0	500 K	11 K	10 K	Normal	40	9
db2syscs.exe	69	00	0:00:00	120 K	0 K	4122	0	14004 K	35 K	110 K	Normal	175	12
SPOOLSS.EXE	71	00	0:00:00	0 K	0 K	579	0	1916 K	13 K	11 K	Normal	67	6
PCS_AGNT.EXE	83	00	0:00:00	48 K	0 K	1053	0	1876 K	12 K	3 K	Normal	58	6
NDDEAGNT.EXE	86	00	0:00:00	144 K	68 K	352	17	316 K	9 K	1 K	Normal	17	1
tcbootl.exe	90	00	0:00:00	0 K	0 K	440	0	316 K	10 K	1 K	Normal	22	1
RPCSS.EXE	102	00	0:00:00	732 K	0 K	1188	0	852 K	12 K	659 K	Normal	115	6
msdtc.exe	109	00	0:00:00	472 K	16 K	1083	4	1260 K	16 K	552 K	Normal	108	18
DSMSVC.EXE	124	00	0:00:00	120 K	0 K	1705	0	4916 K	13 K	533 K	Normal	57	29
appnnode.exe	128	00	0:00:00	168 K	0 K	372	0	536 K	10 K	2 K	Normal	28	3
EXPLORER.EXE	132	01	0:00:11	2304 K	0 K	2147	0	1120 K	14 K	3 K	Normal	64	3
cisvc.exe	140	02	0:00:06	6460 K	0 K	4295	0	2524 K	18 K	12 K	Normal	299	10
LOADWC.EXE	145	00	0:00:00	72 K	0 K	523	0	440 K	15 K	2 K	Normal	28	2
clipsrv.exe	151	00	0:00:00	0 K	0 K	349	0	416 K	7 K	2 K	Normal	21	2
db2govds.exe	154	00	0:00:00	0 K	0 K	672	0	2264 K	10 K	2 K	Normal	23	2
db2sec.exe	165	00	0:00:00	0 K	0 K	653	0	2216 K	10 K	2 K	Normal	20	2
CCLSERV.EXE	168	00	0:00:00	0 K	0 K	226	0	280 K	9 K	1 K	Normal	19	2
CCLCLNT.EXE	171	00	0:00:00	0 K	0 K	241	0	360 K	9 K	1 K	Normal	18	1
CIGD.EXE	173	00	0:00:00	0 K	0 K	488	0	756 K	14 K	2 K	Normal	77	4
amqscrm.exe	191	00	0:00:00	0 K	0 K	354	0	444 K	8 K	2 K	Normal	22	4
LLSSRV.EXE	200	00	0:00:00	0 K	0 K	622	0	528 K	9 K	10 K	Normal	75	9
TCPSVCS.EXE	202	00	0:00:00	184 K	4 K	458	1	504 K	10 K	498 K	Normal	50	2
SQLSERVR.EXE	204	00	0:00:01	4636 K	0 K	2590	0	17148 K	20 K	687 K	Normal	213	23
PSTORES.EXE	220	00	0:00:01	748 K	0 K	1342	0	1828 K	13 K	3 K	Normal	63	5
rapiserver.exe	226	00	0:00:00	0 K	0 K	880	0	2036 K	14 K	115 K	Normal	67	3
SNMP.EXE	241	00	0:00:00	120 K	0 K	977	0	700 K	11 K	35 K	Normal	50	3
SQLEXEC.EXE	251	00	0:00:00	2396 K	0 K	780	0	1072 K	11 K	3 K	Normal	67	7
certsrv.exe	259	00	0:00:00	332 K	0 K	1198	0	1624 K	14 K	12 K	Normal	74	9
TASKMGR.EXE	263	09	0:00:16	1140 K	0 K	951	1	364 K	13 K	2 K	High	26	3
Psp.exe	282	00	0:00:01	788 K	0 K	1557	0	1680 K	17 K	2 K	Normal	33	2
db2syscs.exe	290	00	0:00:00	120 K	0 K	3697	0	10900 K	24 K	174 K	Normal	137	12
db2licd.exe	292	00	0:00:00	32 K	0 K	949	0	2256 K	10 K	2 K	Normal	21	1
db2cc.exe	295	00	0:00:01	796 K	216 K	5889	54	18184 K	44 K	4 K	Normal	66	3
db2ndrng.exe	299	00	0:00:00	16 K	0 K	931	0	2616 K	12 K	2 K	Normal	22	2
mqsvc.exe	301	00	0:00:00	1360 K	0 K	2105	0	2644 K	19 K	12966 K	Normal	126	17
inetinfo.exe	316	00	0:00:04	2020 K	0 K	5600	0	31524 K	51 K	4699 K	Normal	497	41
ADSM.EXE	361	00	0:00:01	1628 K	0 K	1245	0	808 K	18 K	2 K	Normal	25	2
cidaemon.exe	393	00	0:00:02	4148 K	0 K	1864	0	2036 K	17 K	3 K	Low	73	2
pcsws.exe	407	00	0:00:00	2872 K	8 K	1350	2	1276 K	18 K	4 K	Normal	32	2

End Process

Processes: 46 | CPU Usage: 20% | Mem Usage: 180092K / 180668K

Figure 212. Running Processes after the Installation

3.3.4 Registry after the Installation

Here we show you a part of the registry. It should give you an idea of where you can find entries for specific products.

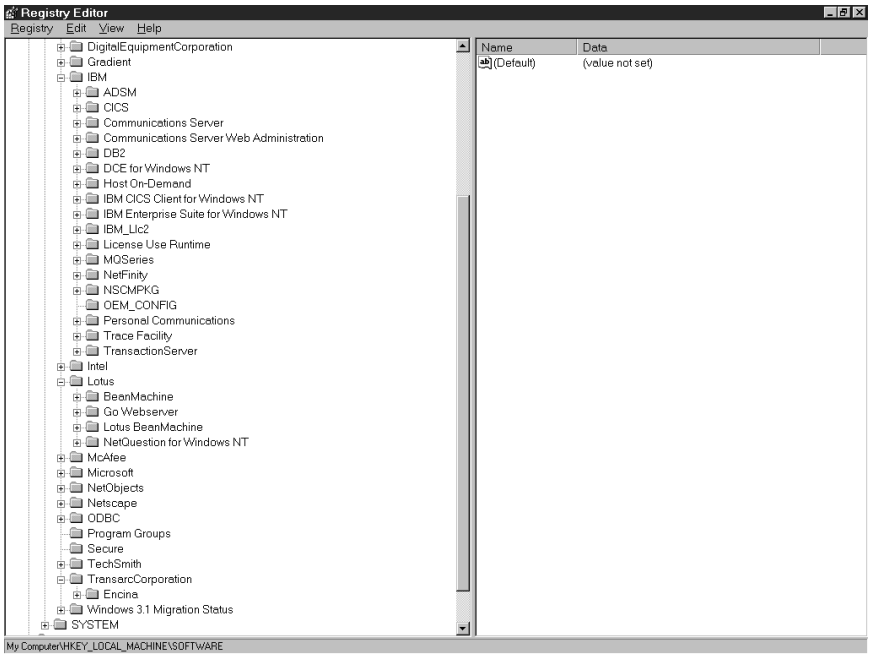


Figure 213. \HKEY_LOCAL_MACHINE\SOFTWARE after the Installation

Chapter 4. Integration Scenario - Database

This scenario shows the accessing of legacy data in an NT DB2 database, in a three-tier environment. The method to be demonstrated is Web browser connection net.data to access the DB2 database (YES).

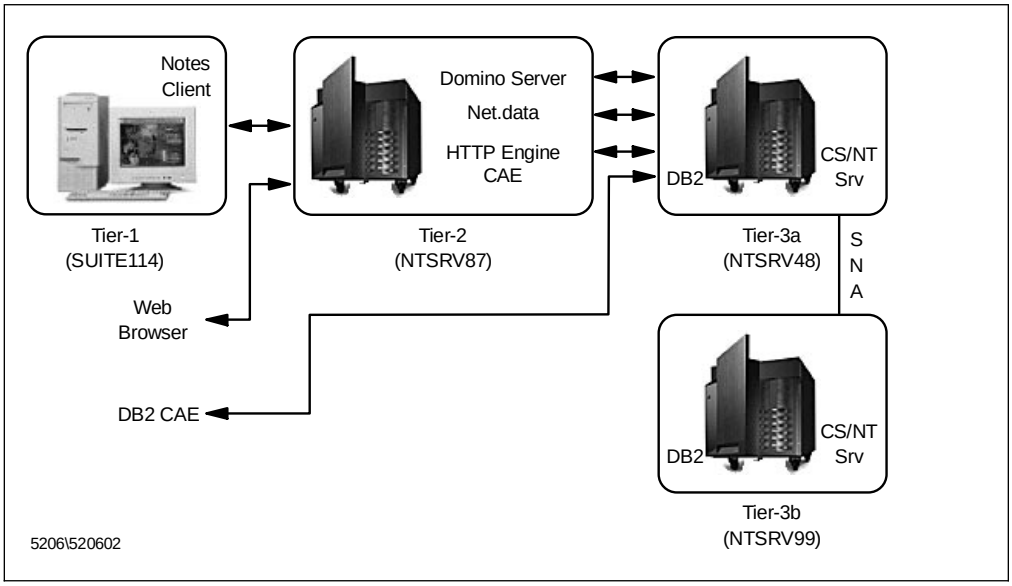


Figure 214. Integration Environment

4.1 Set Up Machines

To set up this scenario we installed the following components on the respective machines:

Note: Please refer to the individual product installations described in Chapter 2, “Installation” on page 9.

- Tier-1 - SUITE114
  - NT Workstation 4 with Service Pack 3 (Base)
  - Lotus Notes Client 4.6.1
  - Netscape Communicator Professional Edition 4.04
- Tier-2 - NTSRV87
  - NT Server 4 with Service Pack 3 (Base)
  - Lotus Domino 4.6.1
  - Net.Data
  - DB2 UDB
- Tier-3a - NTSRV48
  - NT Server 4 with Service Pack 3 (Base)
  - DB2 Universal Database 5 Workgroup edition
  - Communication Server for NT 5.01

- Tier-3b - NTSRV99
  - NT Server 4 with Service Pack 3 (Base)
  - DB2 Universal Database 5 Workgroup edition
  - Communication Server for NT 5.01

Note: You may have to install some hot fixes from the Microsoft ftp site. We did not have to put on any of those fixes for our scenarios.

The URL for the Microsoft hot fixes is:

`ftp://ftp.microsoft.com/bussys/winnt/winnt-public/fixes/usa/nt40/hotfixes-postSP3/`

4.2 Configuring the Machines

To set up the scenario, we had to configure and customize the machines after the installation of the products.

4.2.1 Tier-1 - SUITE114

After the products are installed, and after the server has been configured and users added, we needed to set up the client function.

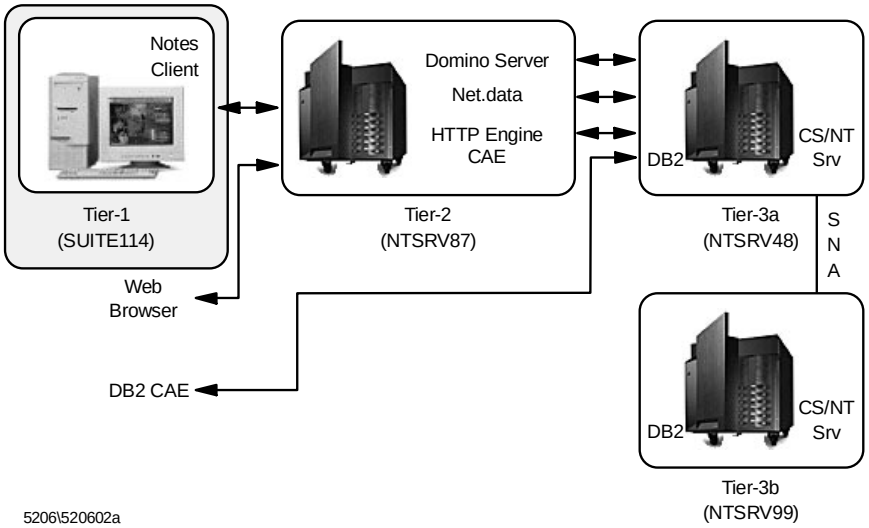


Figure 215. SUITE114 Configuration

1. From the Start menu, select **Programs**, **Lotus Applications** and then **Lotus Notes**.
2. The default radio buttons are correct, but we needed to select the **Your Notes user ID has been supplied to you in a file** option in the following window:

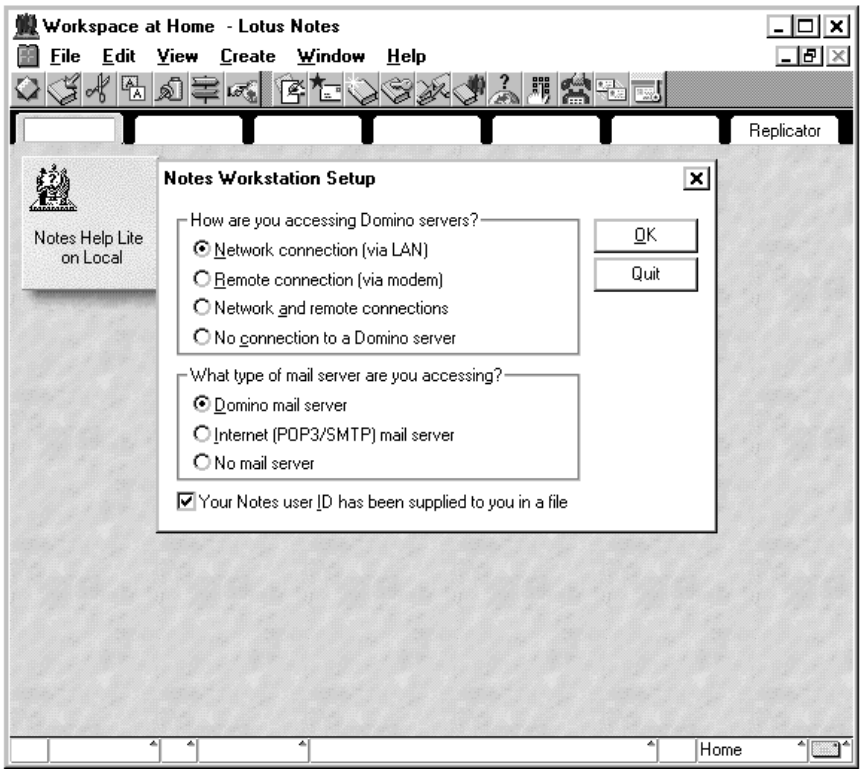


Figure 216. Notes Workstation Setup

3. Click on **OK**.
4. Locate your ID file in the directory window. This will be where you saved it in 4.2.2.3, “Registering Users” on page 172, step 13.

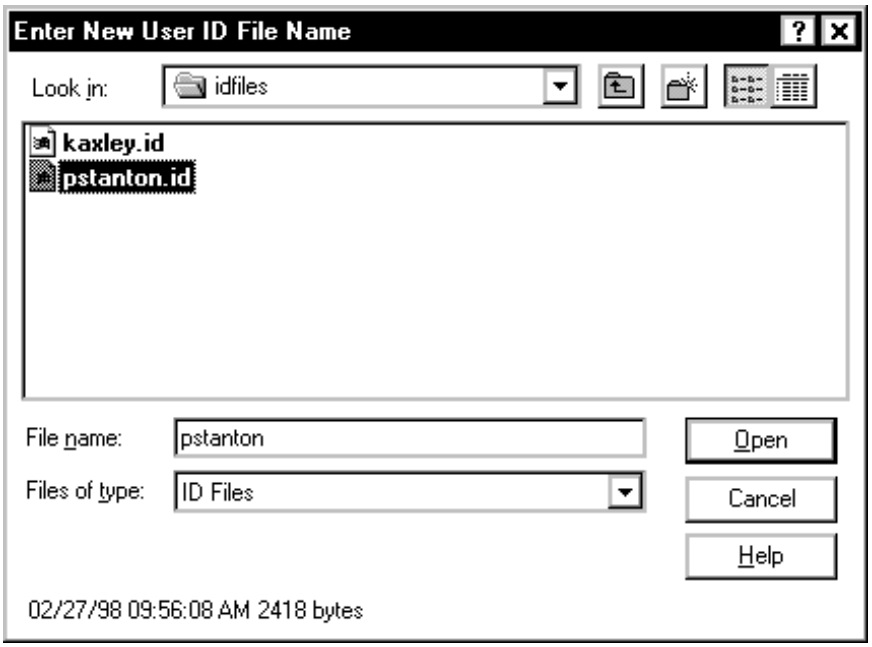


Figure 217. Locating Your ID File

5. Click on **Open**.

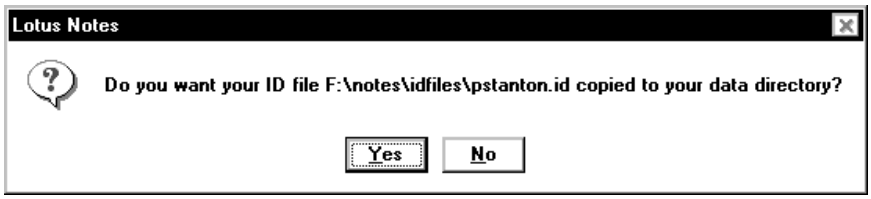


Figure 218. ID File Copy Confirmation

6. Click on **Yes**.

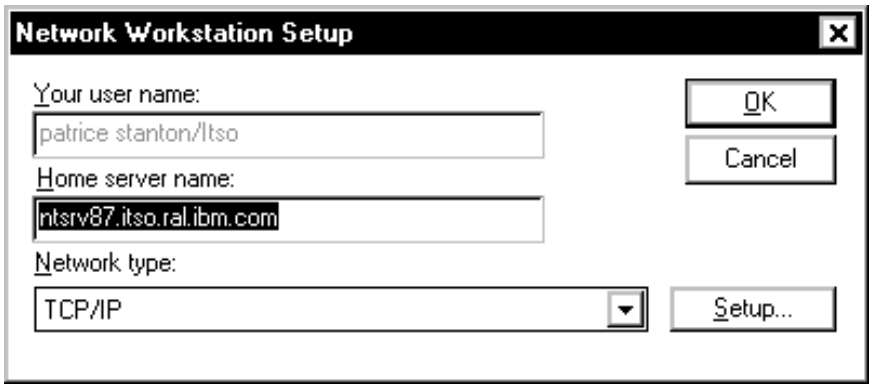


Figure 219. Network Workstation Setup

7. Enter the home server name you defined for your Domino server and click on **OK**.
8. Select your time zone and click on **OK**.

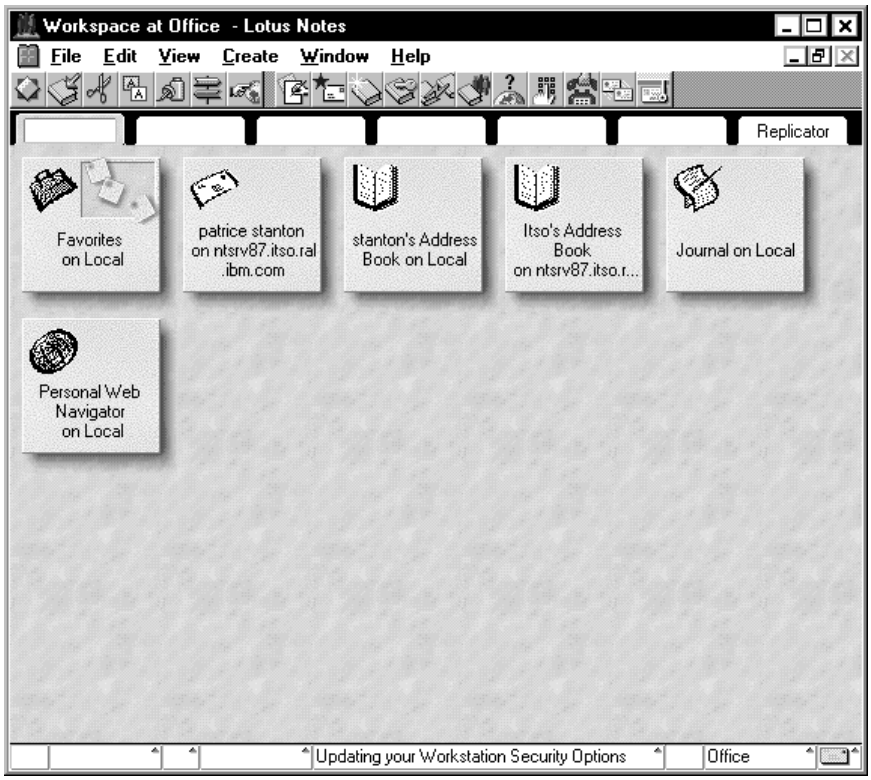


Figure 220. Notes Desktop

9. Your Notes desktop setup is complete.

4.2.2 Tier-2 - NTSRV87

The three things that we needed to do on the server are following:

1. Configure Domino for the first time.
2. Register users.
3. Update the mail template for Web users.

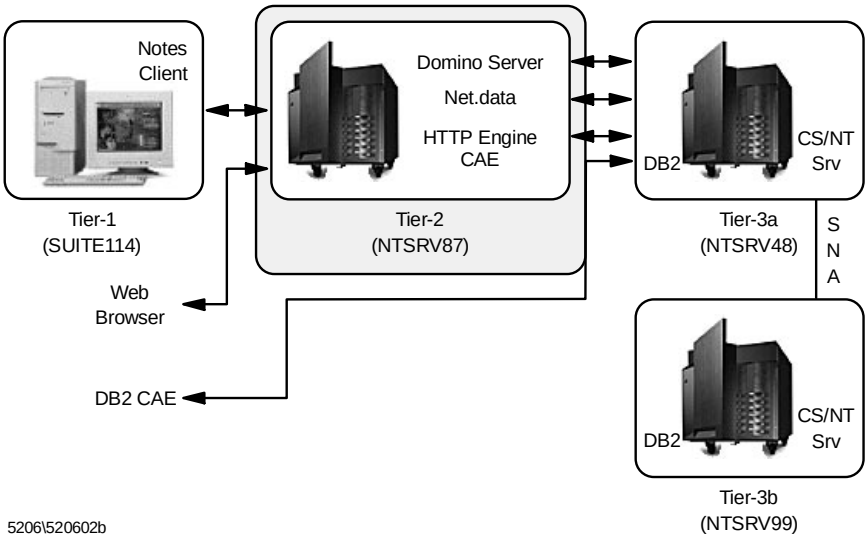


Figure 221. NTSRV87 Configuration

4.2.2.1 Configure Server

The following are the steps to configure the server:

1. From the Start menu, select **Programs**, **Lotus Applications** and then **Lotus Notes**.

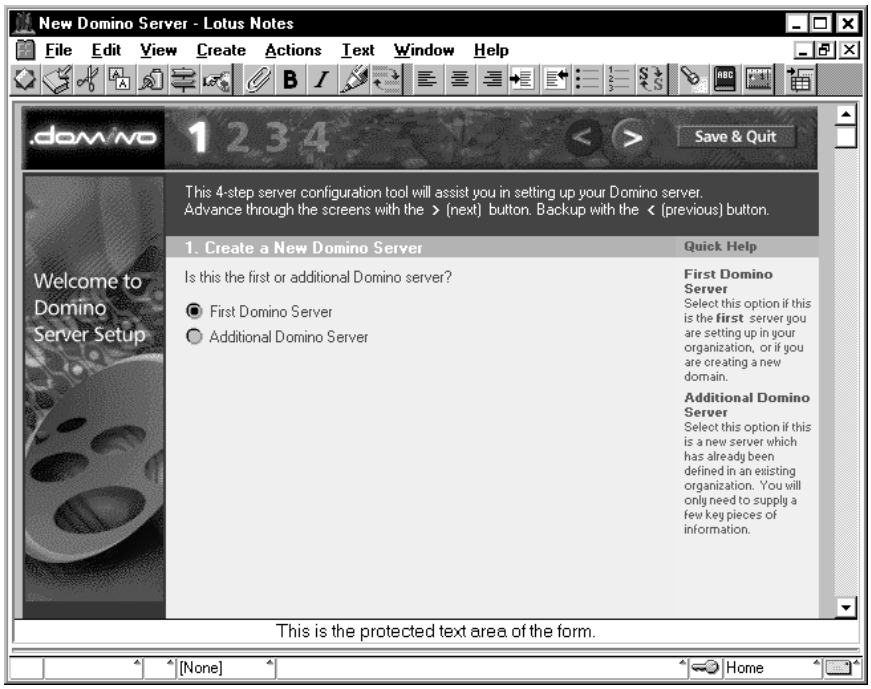


Figure 222. Domino First Server

2. Leave **First Domino Server** selected and click on the right arrow button at the top of the display.

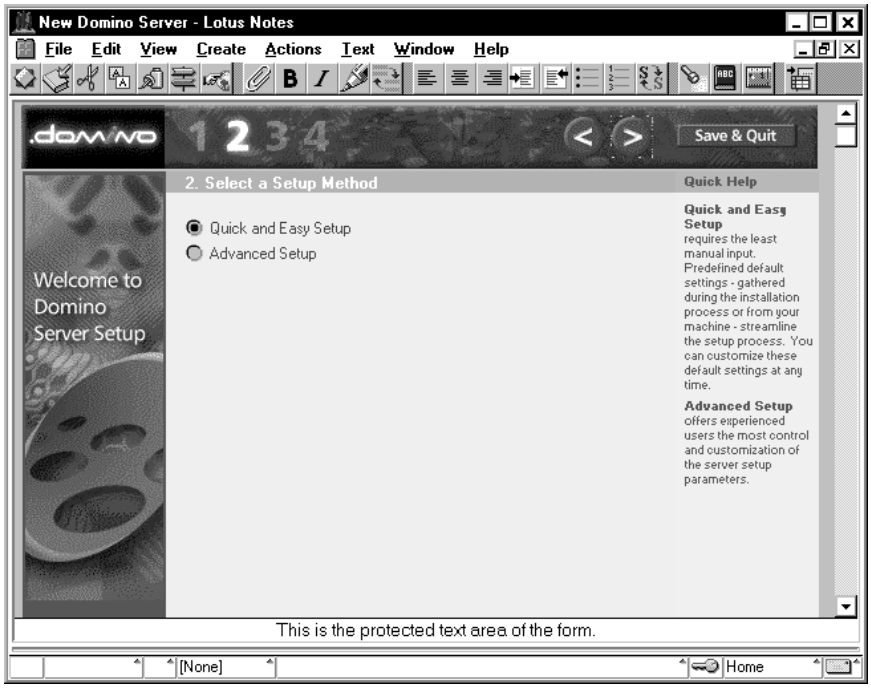


Figure 223. Domino Quick Setup

3. Leave **Quick and Easy Setup** selected and click on the right arrow button at the top of the display.

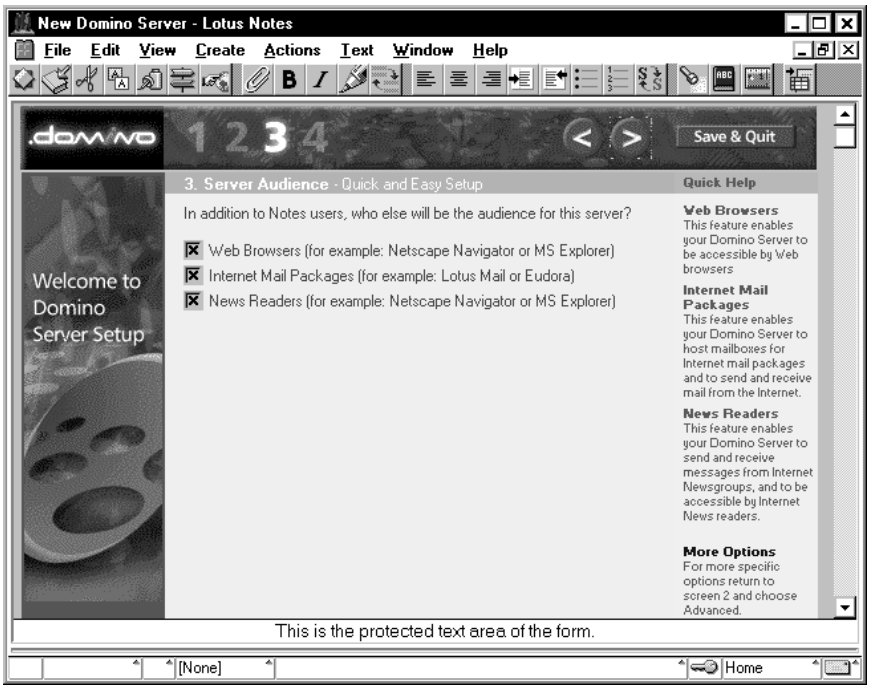


Figure 224. Domino Server Audience

4. Select **Web Browsers**, **Internet Mail Packages**, and **News Readers** and click on the right arrow button at the top of the page.

   You can go back and disable or enable ports you want to use after the server is installed.

   This would be done by opening the Name and Address book and clicking on the server twistie in the navigation panel. Then you would click on servers. In the view panel, you'll see a list of server names. Select the server you want to change and click on **Edit Server**. Then click on the twistie that says **Internet Port and Security Configuration**. Configure the ports as need and press the escape key so you can save your changes.

   Note: For the purposes of this scenario all ports were enabled, however, the only port required was for the Web browser.

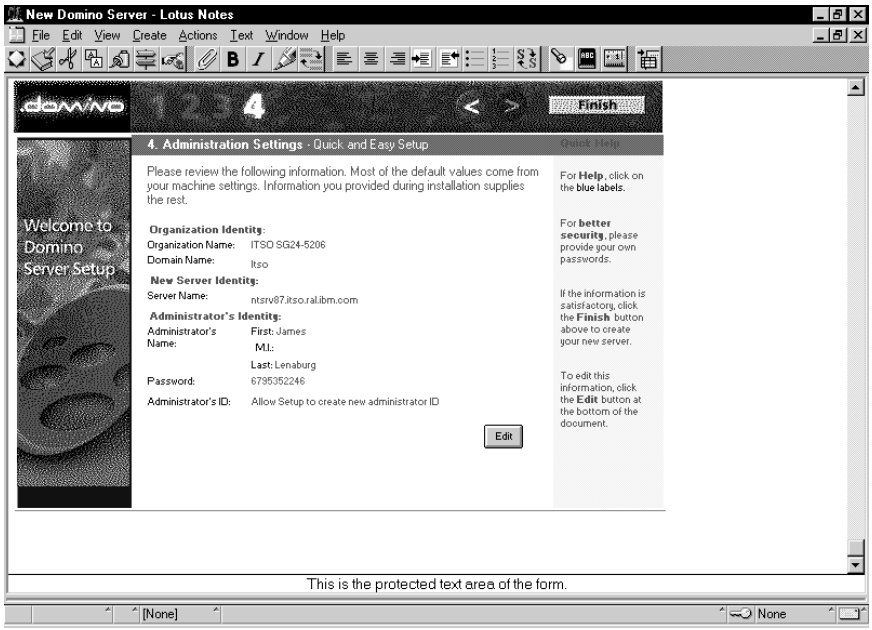


Figure 225. Domino Administration Setup

5. Click on **Edit**.

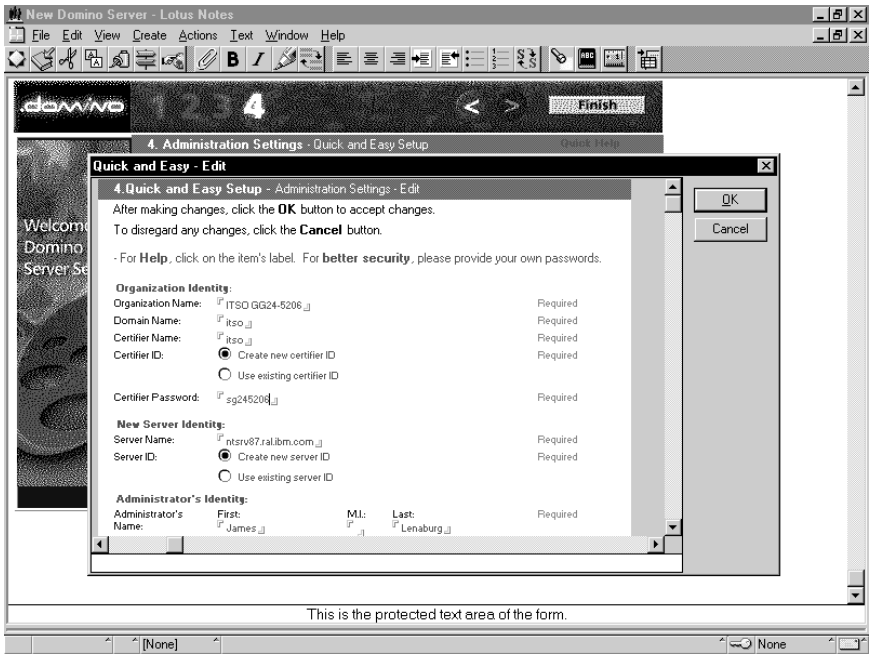


Figure 226. Domino Certifier ID

Click on **OK**. New certifier IDs are created for this scenario because it is recommended that users provide their own passwords instead of using Domino's pre-generated ones.

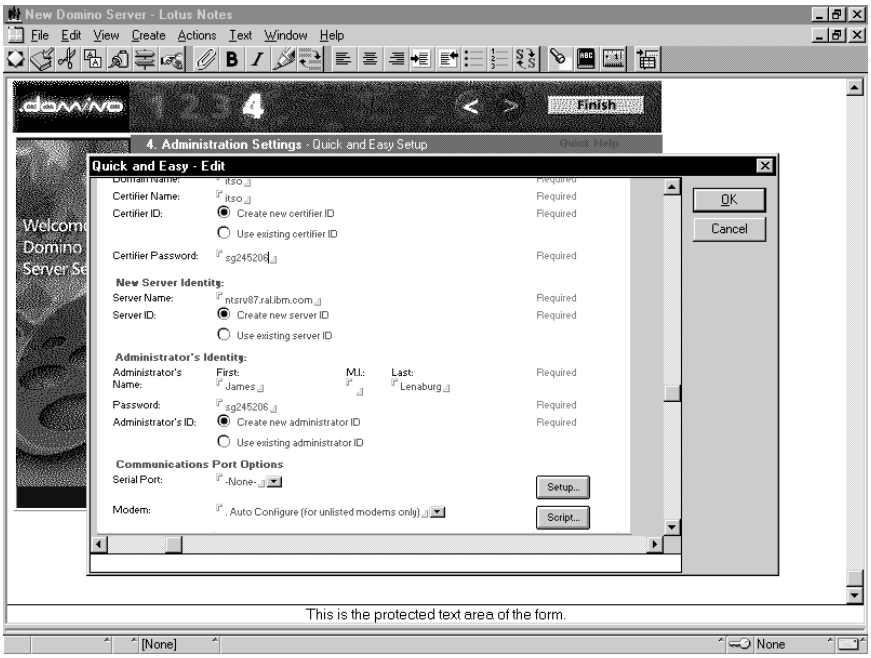


Figure 227. Domino Administrator ID

6. Under Administrator's Identity, leave **Create new administrator ID** selected. Enter a new password (same as above) in the password field.

   Note: Passwords by default must be at least 8 characters. Be sure and document them in a secure place so you don't forget them. Also, passwords are case-sensitive. If you don't enter a password of at least 8 characters, you will get a pop-up window with an error message. You just need to click on **OK** and enter it again.

7. Click on the **Finish** button.
8. Click on the correct time zone button and click on **OK**.
9. Click on **Exit to Workspace**.
10. Click on **Yes** after you have saved your passwords.

    You need to make sure you document your passwords or remember them because they are required for Domino administration.

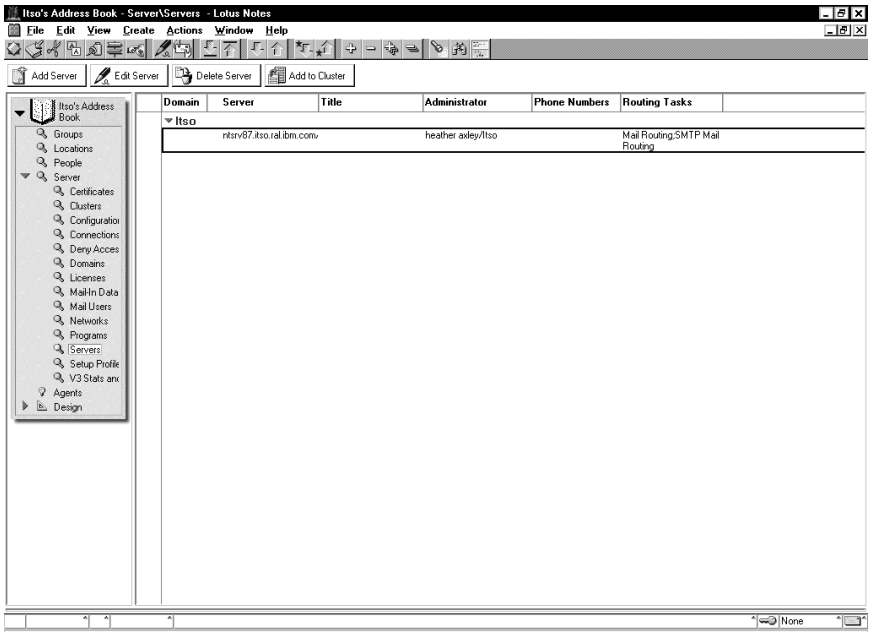


Figure 228. Domino Server Setup

4.2.2.2 HTTP Customization

The default port for both the Microsoft IIS Server and for Domino is port 80. In order to avoid a port conflict, the Domino HTTP port can be changed to 8008. Other ways to avoid this conflict are:

- When installing NT 4.0 Server, we could have selected to not install IIS Server.
- During the installation of NT 4.0 Server, change the default port for IIS Server to something other than 80.
- Only have one of the Internet servers up and running at a time.

The following steps outline how to change the port number for the Domino HTTP server so it doesn't conflict with an existing Microsoft Internet server:

1. In the Address Book section, click on **Server** and then **Servers** to see the server record.
2. Highlight the appropriate server record and double-click on the left mouse button to bring you to the following window:

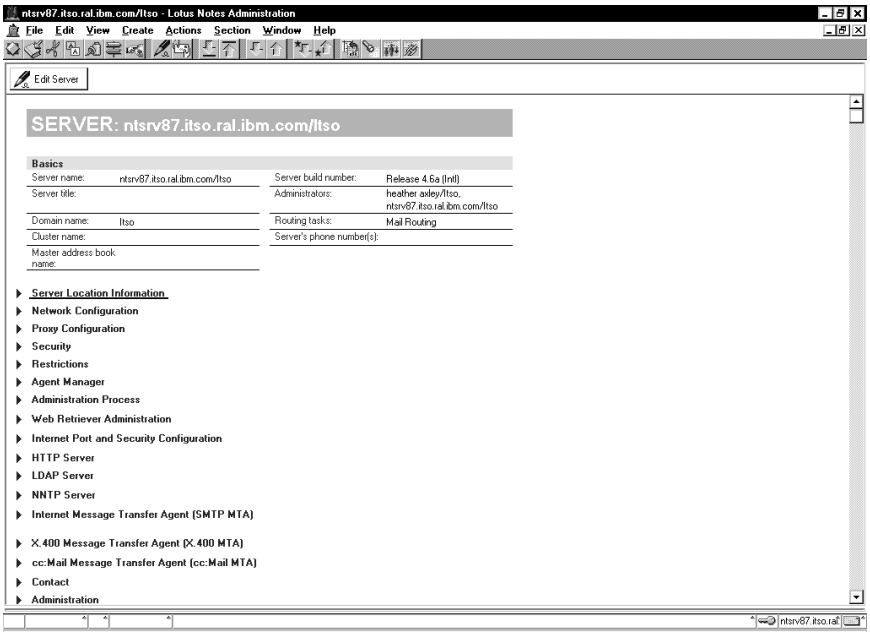


Figure 229. Edit Server Record

3. Click on **Edit Server**.
4. Click on **Internet Port and Security Configuration** to expand it.

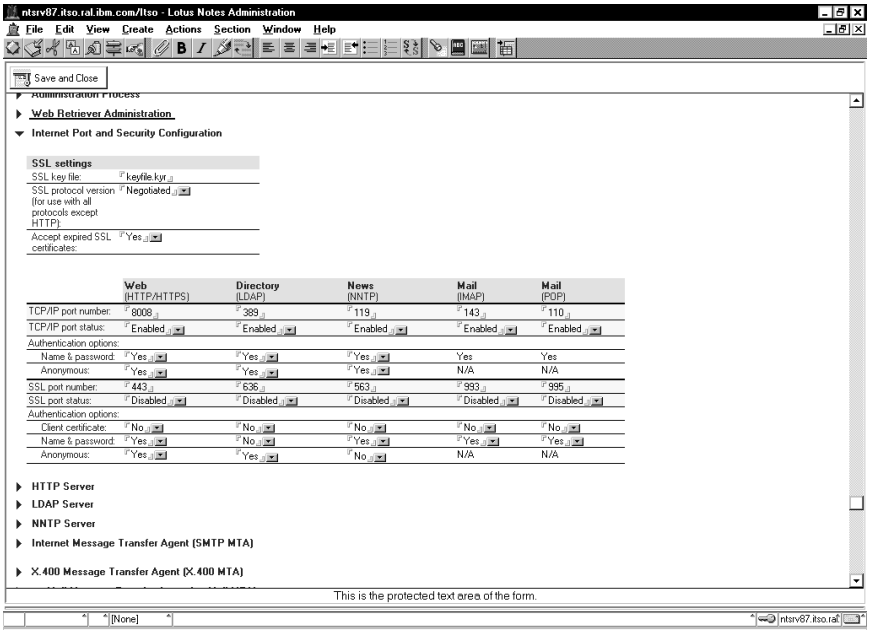


Figure 230. Edit Internet Ports

5. Under the Web column, change the TCP/IP port number from `80` to `8008`.

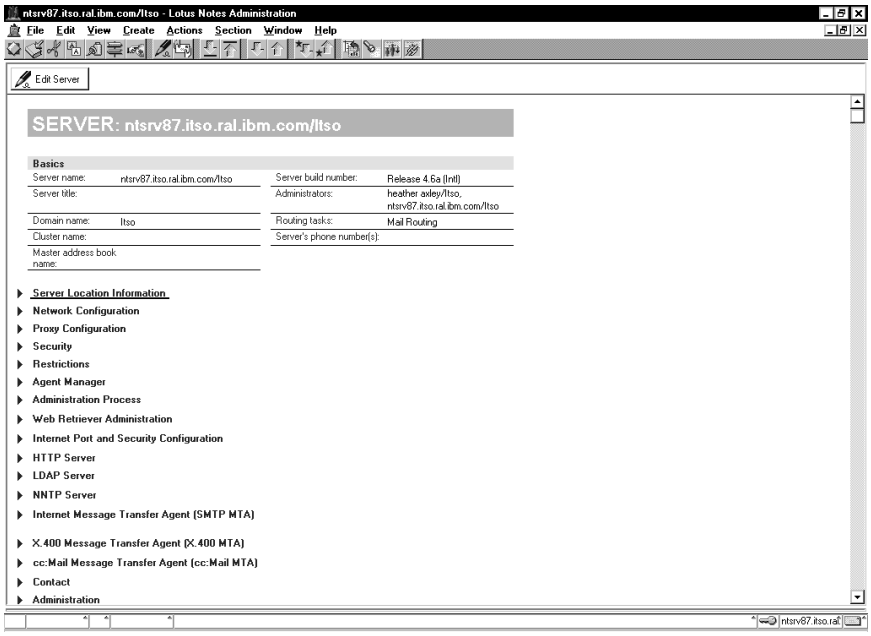


Figure 231. Edit Server Record

6. Click on **HTTP Server** to expand it as follows:

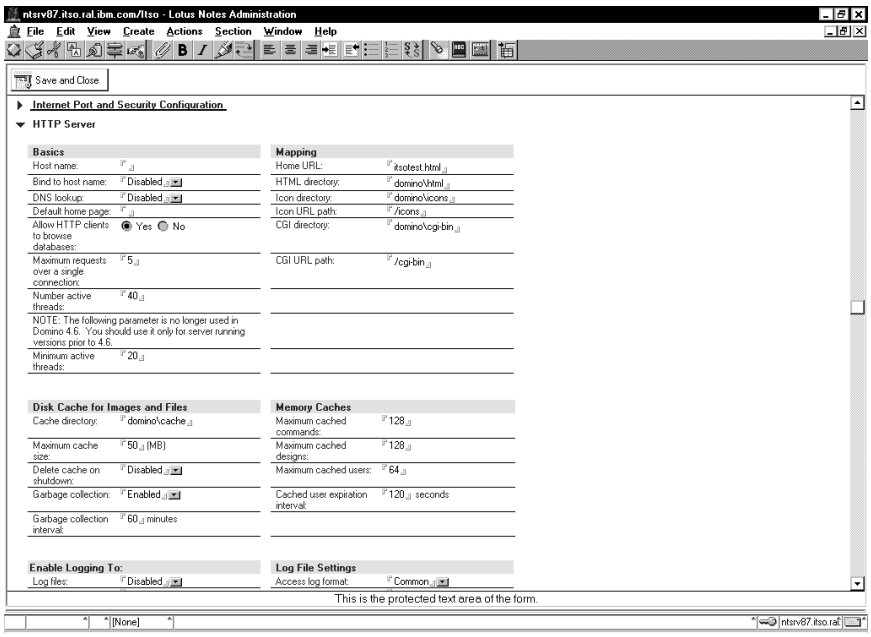


Figure 232. Edit HTTP Server

7. Change the Home URL to one that is used in your environment.
8. Blank out the Default Home Page field.
9. Click on **Save and Close**.

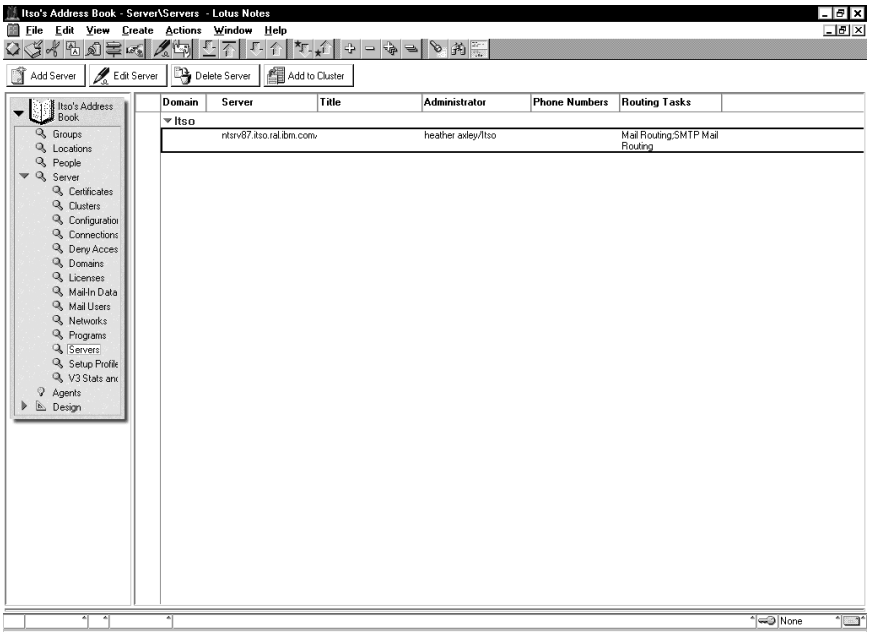


Figure 233. Domino Server Setup

10. We are now ready to start the Domino Server.
11. From the Start menu, select **Programs**, **Lotus Applications** and then **Lotus Domino Server**.
12. The server will start up and is ready to add user IDs for clients.
13. If you make changes to the HTTP server configuration while Domino is running, you will need to stop and restart the HTTP server to make the changes active. Go to the Lotus Domino Server console session which you can access from the running task bar or task list.

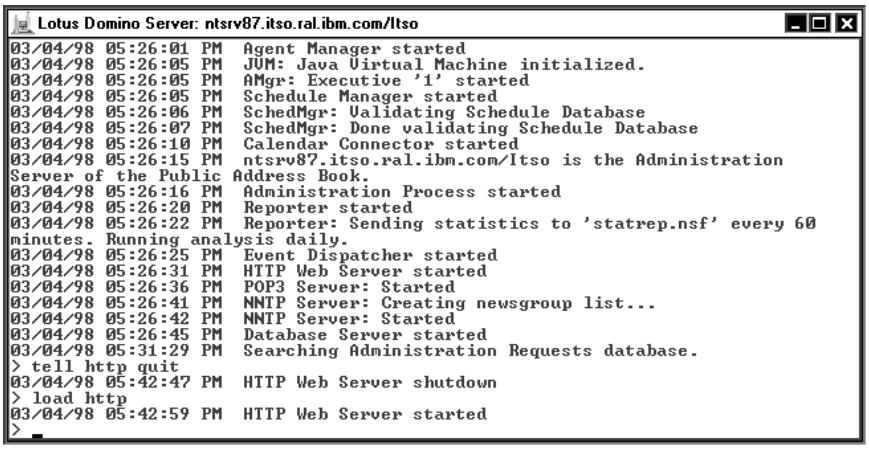


Figure 234. Domino Server Window

14. In order to stop the HTTP server task enter the following:

    ```
    tell http quit
    ```

15. To re-start the HTTP server task enter:

    ```
    load http
    ```

4.2.2.3 Registering Users

Before users install the Notes client on their workstation, you need to register the user with the Domino server. The user registration process creates:

- A person document in the Public Address Book
- A user ID
- A server-based mail file for Notes Mail, POP or IMAP mail

If you are using Windows NT, you can also create Windows NT user accounts when you register users. This allows you to eliminate the requirement to separately create the Windows NT user account. Your Domino server administrator account must have administrator authority on the Domain Controller to create users.

1. Select **File**, **Tools** and then **Server Administration** to bring you to the following window:

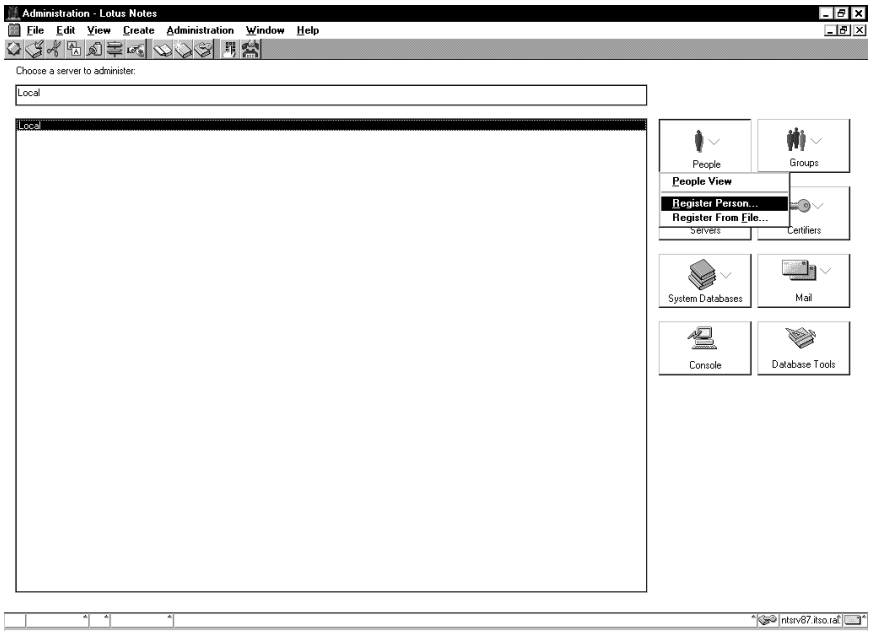


Figure 235. Registering Persons

2. Click on the **People** icon, and select **Register Person**.

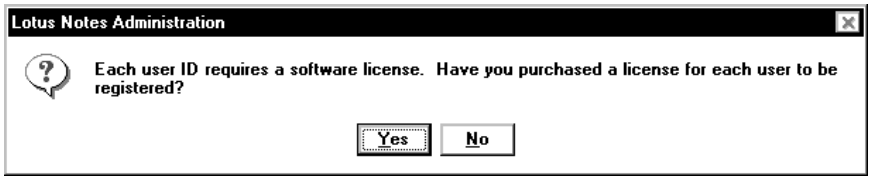


Figure 236. Create ID Confirmation

3. Click on **Yes**, and enter the certifier's password.

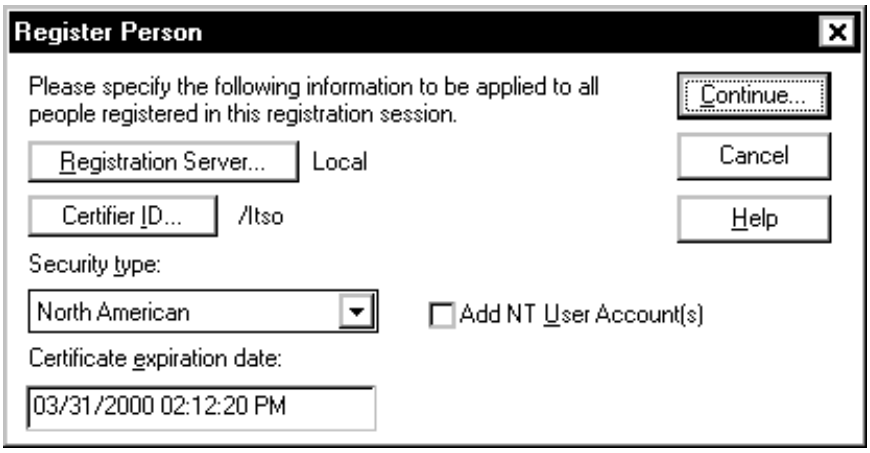


Figure 237. Registering Person Dialog

4. Click on **Continue**.

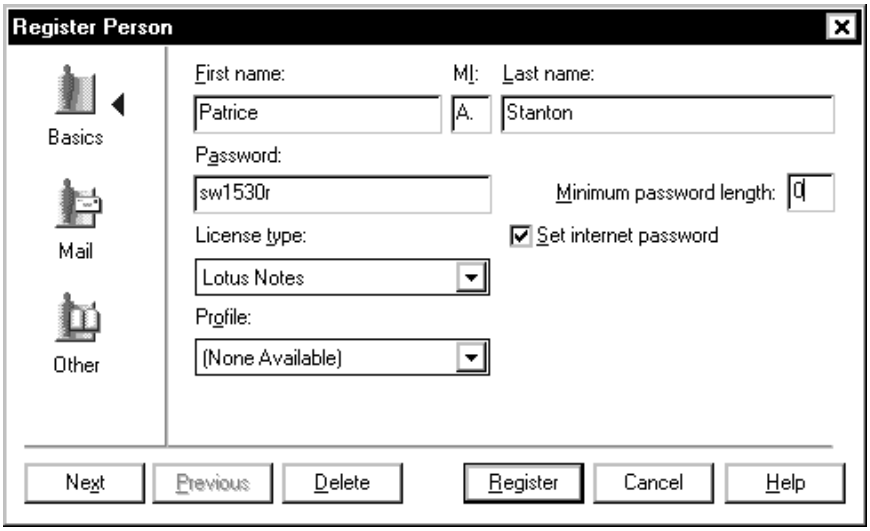


Figure 238. User Name Registration

5. In the First and Last name fields, specify the user ID to be registered (in our case, from the Suite114 client install).
6. Set the minimum password length to 0.
7. Check the **Set Internet password** box.

   This is to allow the user on a Web browser to access his or her mail database by entering his or her Lotus Notes user ID and password.
8. Click on the **Other** icon on the left side of the window as shown in the following window:

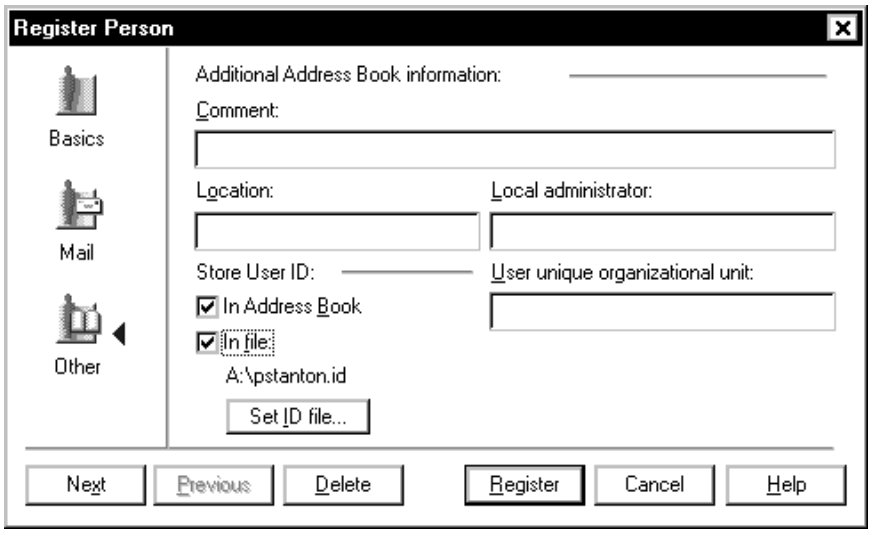


Figure 239. Storing User ID

9. Check the **In File** box.
10. Click on **Set ID file**.

    If you get the following window:

Figure 240. Abort Error Message

11. Click on **Abort** since we have the ID file on our hard drive and not on a diskette.

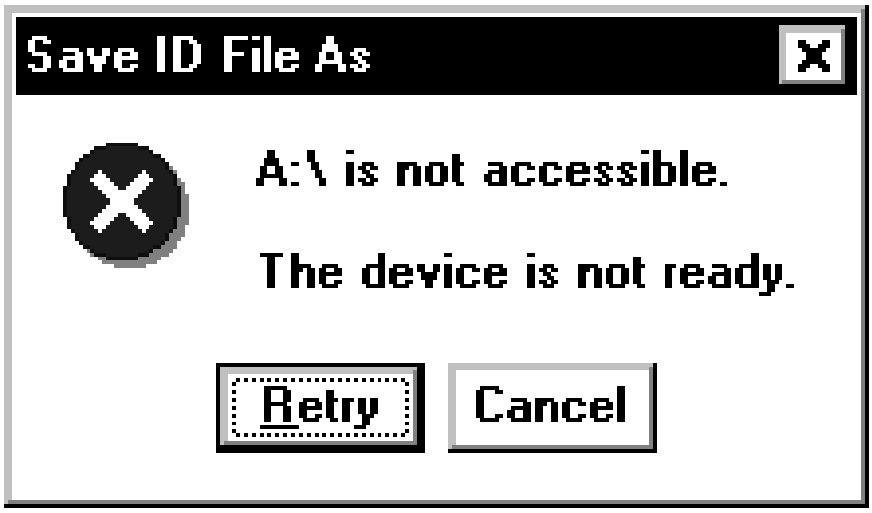


Figure 241. Diskette Error Message

12. Click on **Cancel** so that you will be able to enter the location for the ID file.

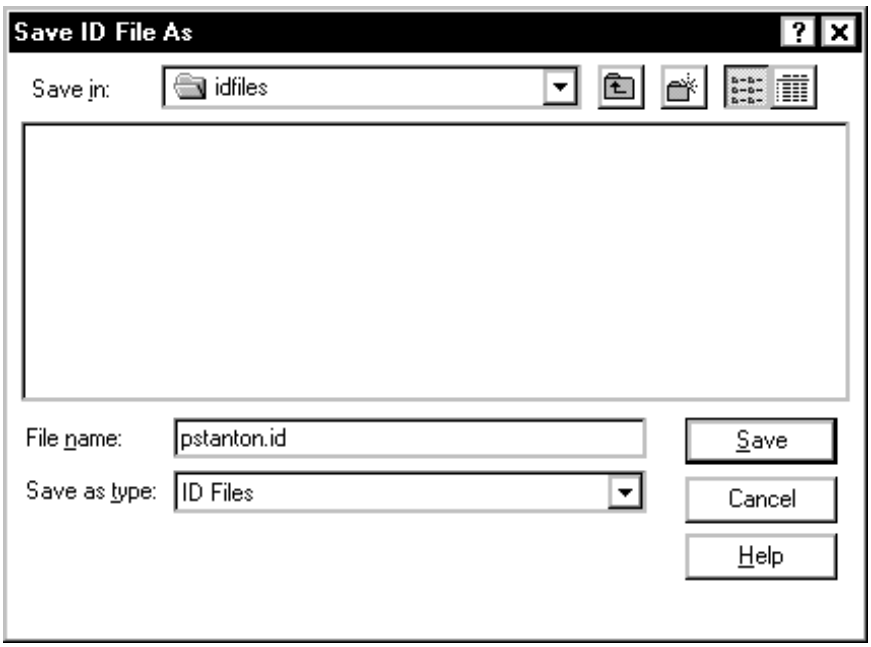


Figure 242. Save ID File

13. Change to the directory where you want to store the ID files. Type in a file name for the ID file and click on **Save**.

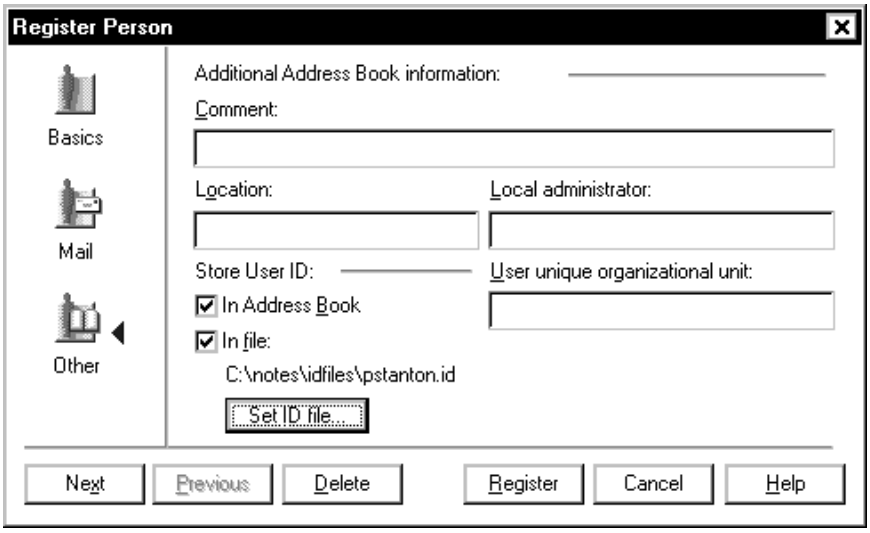


Figure 243. Complete Registration

Note: You need to uncheck the **In Address Book** box. You can't have a copy of the ID file in the address book without having a password.

14. Click on **Register** in Figure 243 to complete the process.
15. You will be asked if you want to register any more people. Select no.
16. Click on **People** and **People View** to see the new person added.

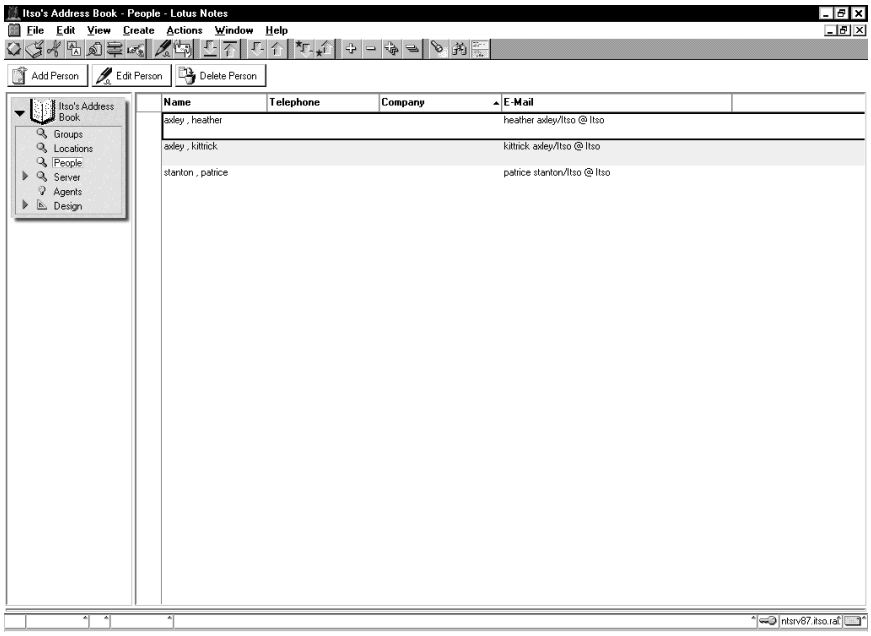


Figure 244. Registered Users

4.2.2.4 Registering a Group of Users From a Text File

If you have a large number of users to register, you may want to take advantage of this procedure. It is documented in *Getting Started with the Domino Server 4.6*, in Chapter 2, page 42.

The steps are outlined below:

1. Use a text editor to create a file with the following format (one user per line):

   ```
   Lastname;Firstname;MiddleInitial;organizationalunit;password;
   IDfiledirectory;IDfilename;homeservername;mailfiledirectory;
   mailfilename;location;comment;forwarding address;profile name;
   local administrator
   ```

2. From the administrator panel, click on **People**, and choose **Register from file**.
3. Click on **Yes** for user license.
4. Enter the certifier password.
5. Select North America or International Security.
6. If you are registering NT users, you can check on the **Add NT User Account(s)** to create their accounts.
7. Click on **Continue**.
8. Select the text file containing the user information and press Enter.
9. Enter the minimum password length for a user.
10. Select the license type that you purchased for the users.
11. Click on **Mail** and make any changes that are required; otherwise take the defaults.
12. Click on **Register** to register the users.

Note: For more details on this, please refer to the *Getting Started with the Domino Server 4.6* manual, in Chapter 2, page 42.

4.2.2.5 Updating Web Clients Mail Database Template

For all users that will be accessing the Domino server via a Web browser, you need to change their mail template so they can use it.

1. Select **File**, **Database** and **Open**.
2. Scroll to the **Mail** folder and double-click on it to open it.

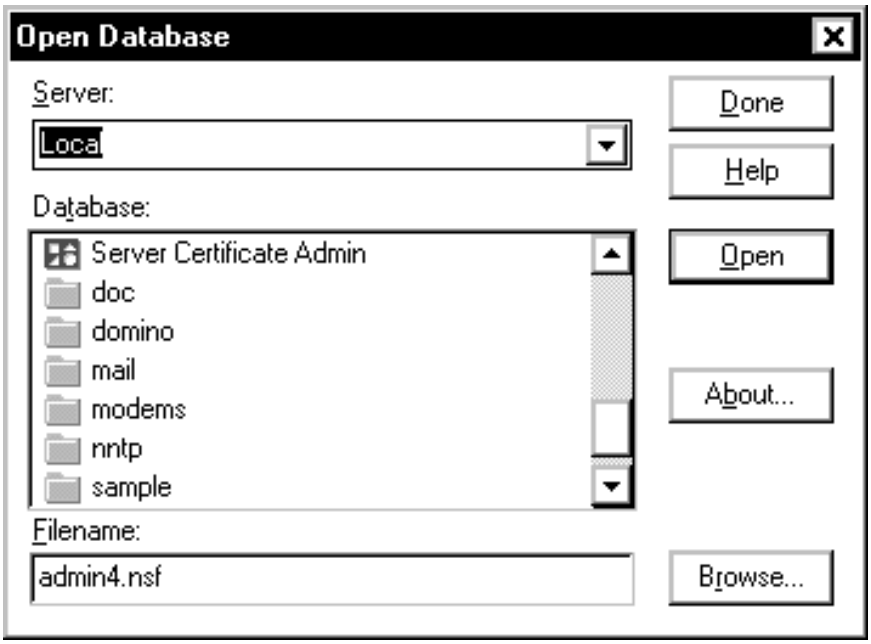


Figure 245. Open Mail Databases

3. Select the user's mail database to be updated, and click on **Open**.

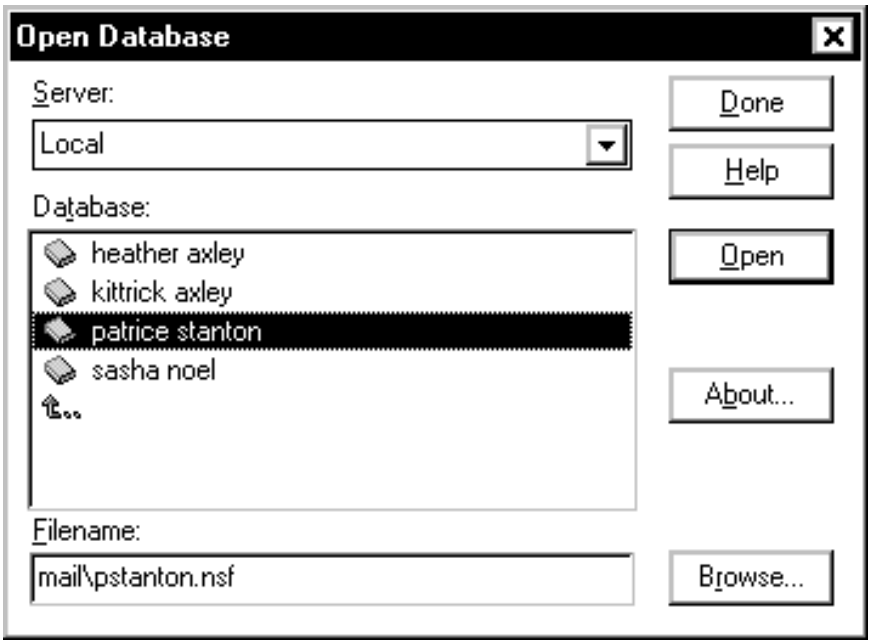


Figure 246. Mail Database

4. Press Esc in the About Mail screen. Select **File**, **Database** and then **Replace Design**.

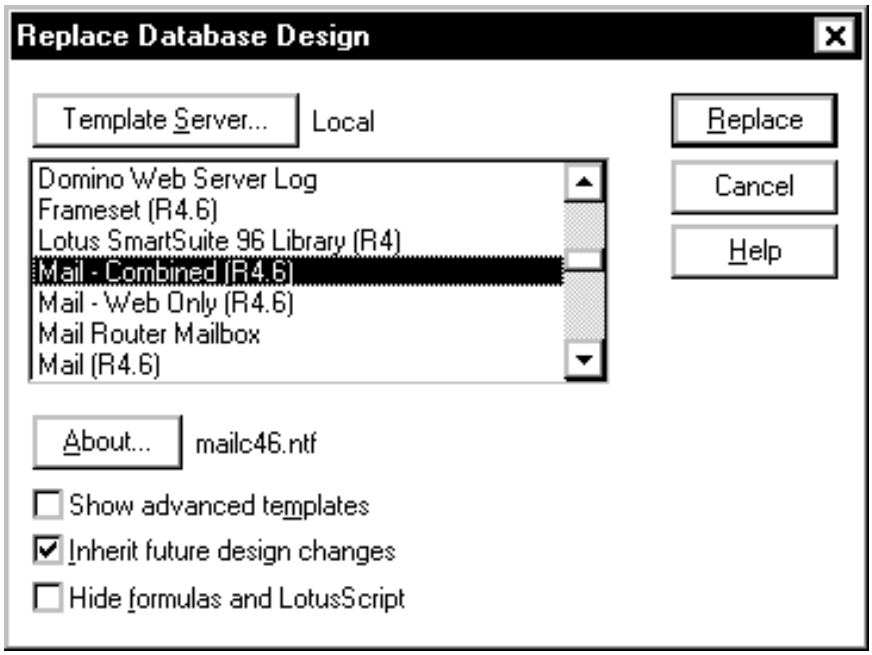


Figure 247. Select Mail Database

5. Scroll down the list and select **Mail-Combined (R4.6)**.
6. Click on **Replace**.

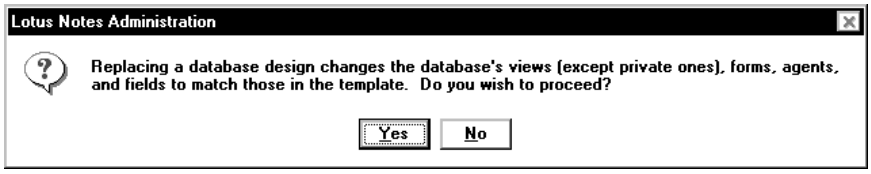


Figure 248. Mail Template Replace Confirmation

7. Click on **Yes** to proceed.
8. Repeat for any other clients that will access the Notes Mail database from a Web browser.

4.2.3 Tier-3a - NTSRV48

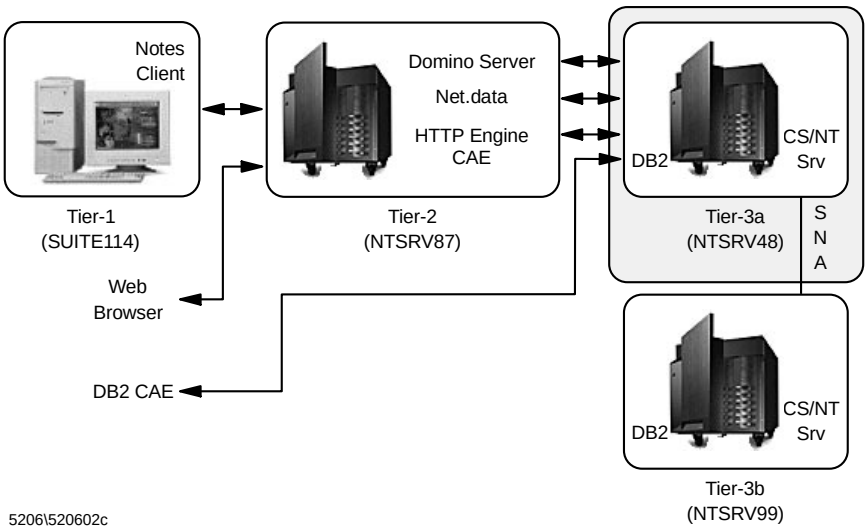


Figure 249. NTSRV48 Configuration

After the products are installed, we needed to set up the back-end server function. We explain how to do this in the following sections.

4.2.3.1 Creating the SAMPLE Database

The following shows how to create the SAMPLE database:

- Create the sample database that comes with DB2. We used it since we didn't have another database available on the server.

  1. From the Start menu, select **Programs**, **DB2 for Windows NT** and then **First Steps**.

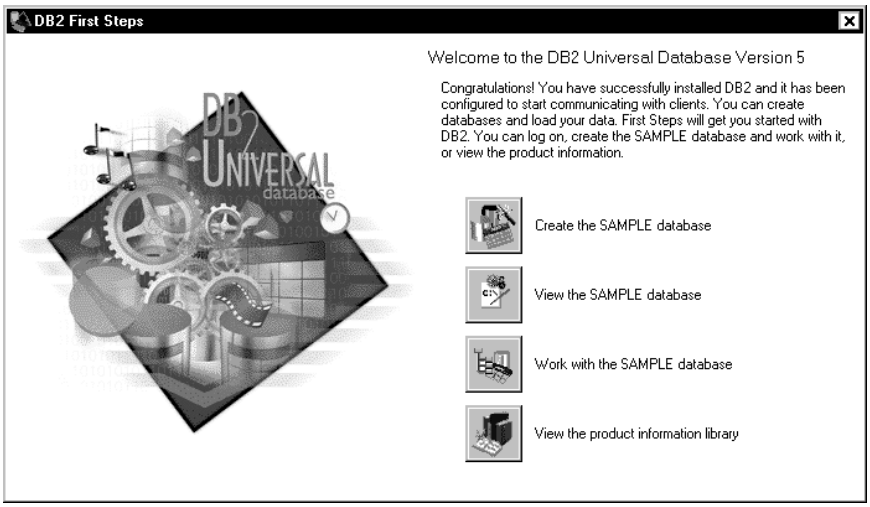


Figure 250. First Steps

  2. Click on **Create the SAMPLE Database**.
  3. Click on **Yes** when prompted to create it.

Figure 251. Creating SAMPLE Database

4. Click on **OK** when the database is created.

4.2.3.2 Configuring CS/NT to CS/NT

We then configured Tier-3a to communicate with Tier-3b over an LU 6.2 link. Then we configured DB2 Connect on Tier-3a to connect to the database on Tier-3b and have it appear as a Tier-3a database to Tier-2 when it tries to connect to it.

Table 3. Communications Server Configuration Details

Parameter	Tier-3a (NTSRV48)	Tier-3b (NTSRV99)
Fully Qualified CP Name (Node Name)	NETID.NTSRV48	NETID.TIER3B
Partner LU name	NETID.TIER3B	n/a
Partner LU Alias	NTSRV99	n/a
Destination Address (NIC Address)	400000000099	n/a
Local LU Name	C5TIER3A	TIER3B
Symbolic Destination Name	DB2NTB (alias to TPNAME=CPIC)	n/a
DB2UDB TPNAME	n/a	CPIC
APPN Node Type	End Node	Network Node

- To start Communications Server configuration, select the Windows NT **Start** menu. Click on **Programs**, then **IBM Communications Server**, and finally **SNA Node Configuration**.

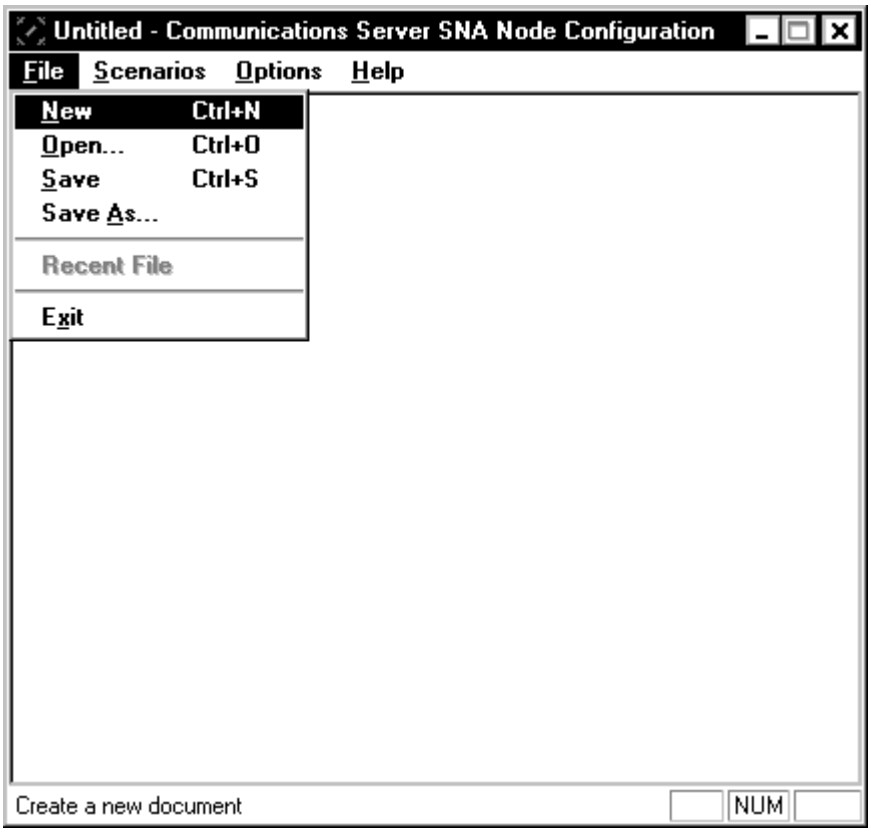


Figure 252. New Configuration

- From the File pull-down menu select **New**.

  If you already have a valid CS/NT configuration file and you wish to update it, simply select your configuration file from the File menu instead.

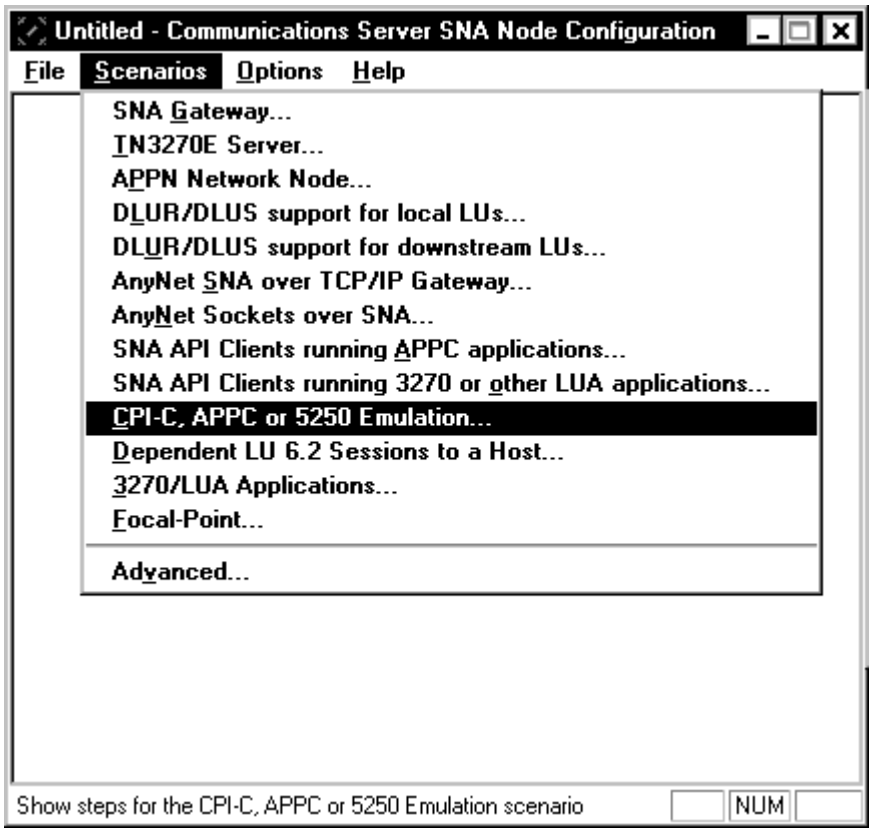


Figure 253. Open a New Scenario APPC

- From the Scenarios menu, select **CPI-C, APPC or 5250 Emulation**.

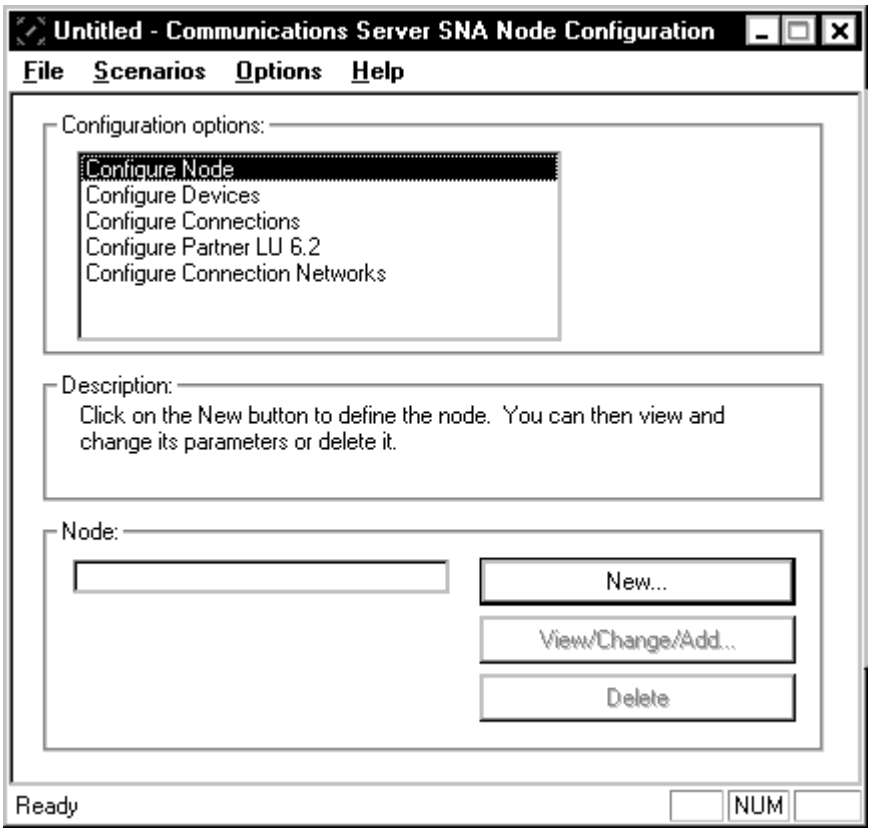


Figure 254. Configure Node

- In the main configuration window, select **Configure Node** in the top list box and click on the **New** push button.

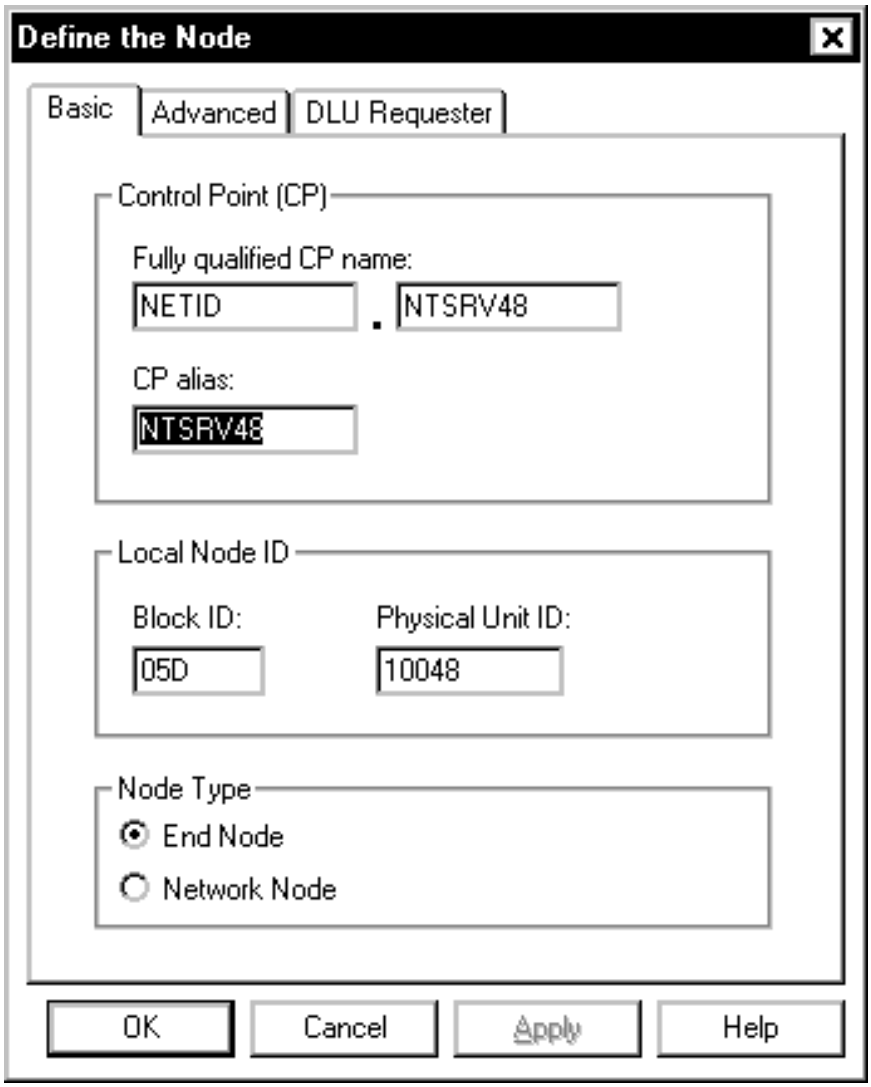


Figure 255. Define the Node

- In the Control Point (CP) section, type in the fully qualified CP name for NTSRV48 as shown in Table 3 on page 180. Type `NTSRV48` for the alias. We used a unique value of 10048 for the Physical Unit ID (PUID). This can be any unique identifier associated with the CP Name. Click on on **OK** to get back to the main configuration window.

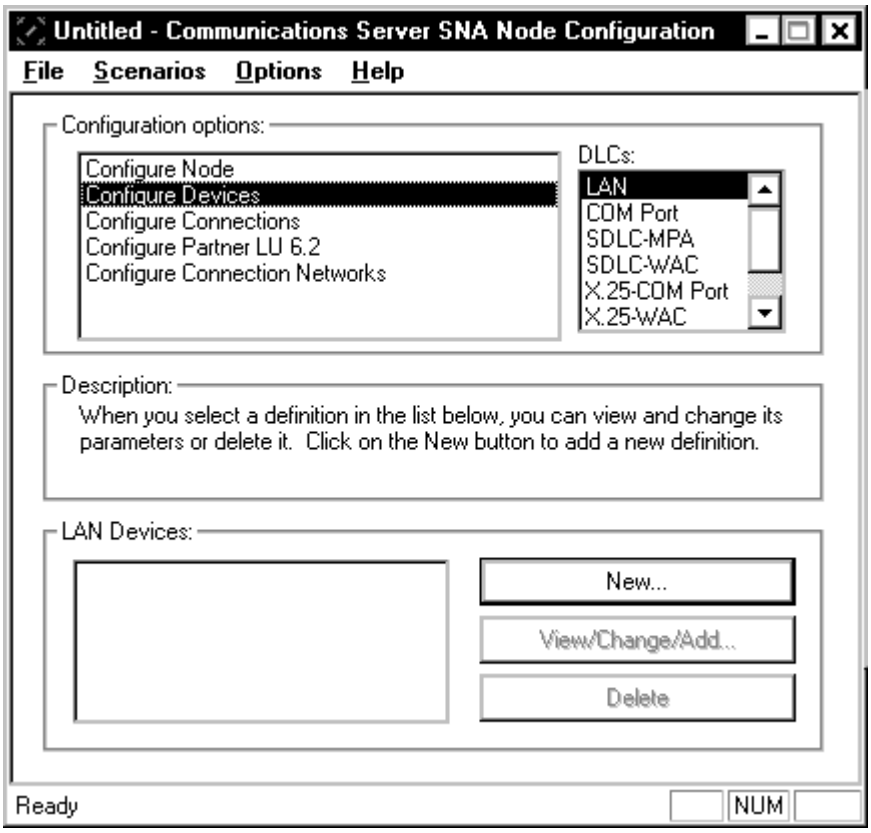


Figure 256. Configure Connections

- Select **Configure devices** in the top list box. A second list box will appear. LAN is selected by default. Then click on the **New** push button.

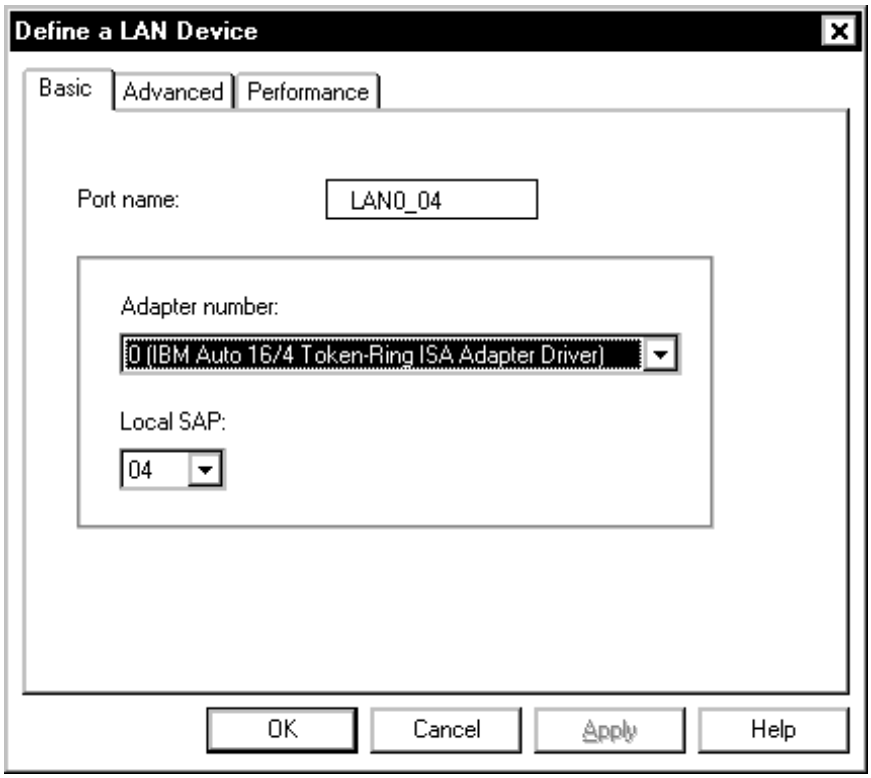


Figure 257. Define a LAN Device

Since we are making the connection over the LAN, the defaults should be fine, but if you have more than one LAN adapter, make sure that the one selected is the one you want to use. Click on **OK** to proceed.

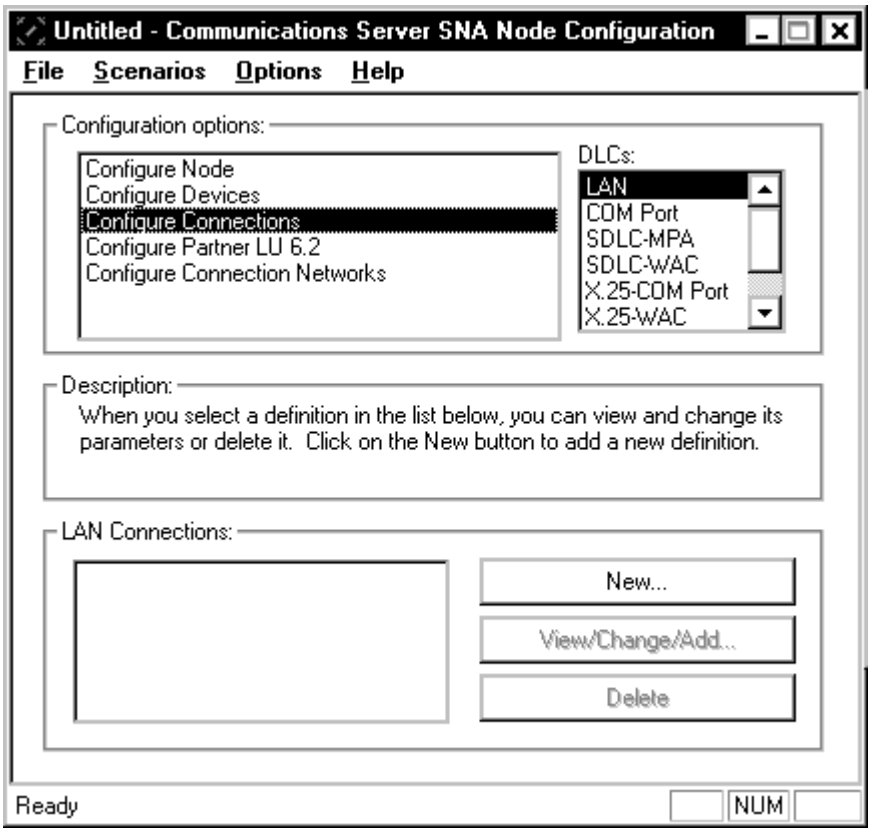


Figure 258. Define a Connection

- Select **Configure Connections** in the top list box. A second list box will appear. LAN should already be selected. Click on the **New** push button.

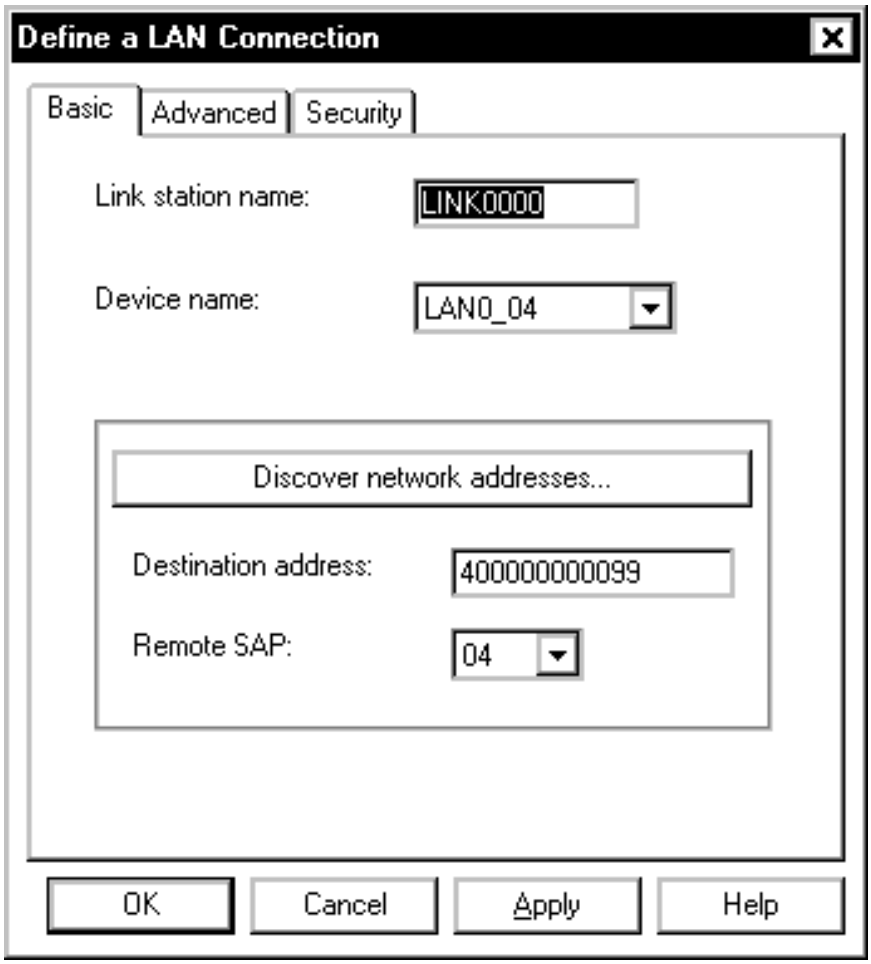


Figure 259. Define a Host Connection

- We now need to define the connection to the Tier-3b back-end NT server. We'll leave the default link name at `LINK0000` since we don't anticipate needing anymore links.

  The device name should already be selected as LAN0_04.

- We entered the destination address of the Tier-3b back-end NT server on this panel. Since the other default values are acceptable, click on **OK** to return to the main panel.

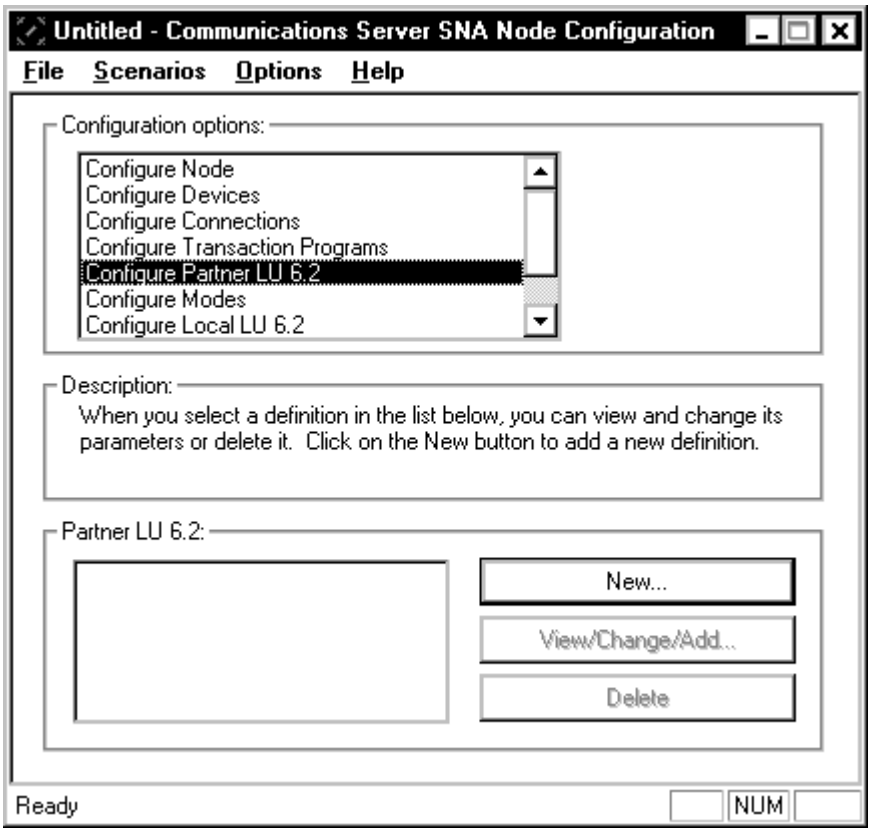


Figure 260. Configure Partner LU

- Select **Configure Partner LU 6.2** in the top list box and click on the **New** button.

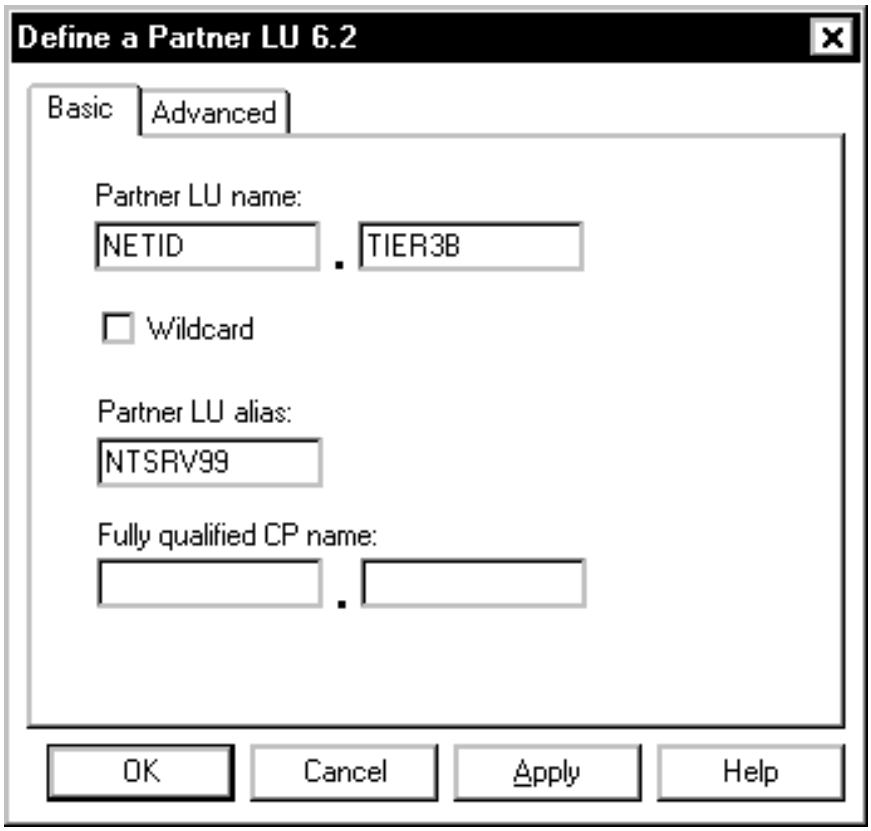


Figure 261. Define Partner LU

- Fill in the values for Partner LU name for Tier-3b (NTSRV99) here. Fill in the alias for Tier-3b. You don't need to fill in the Fully qualified CP name field since you are connecting to an APPN network node. Click on **OK** to get back to the main configuration window.

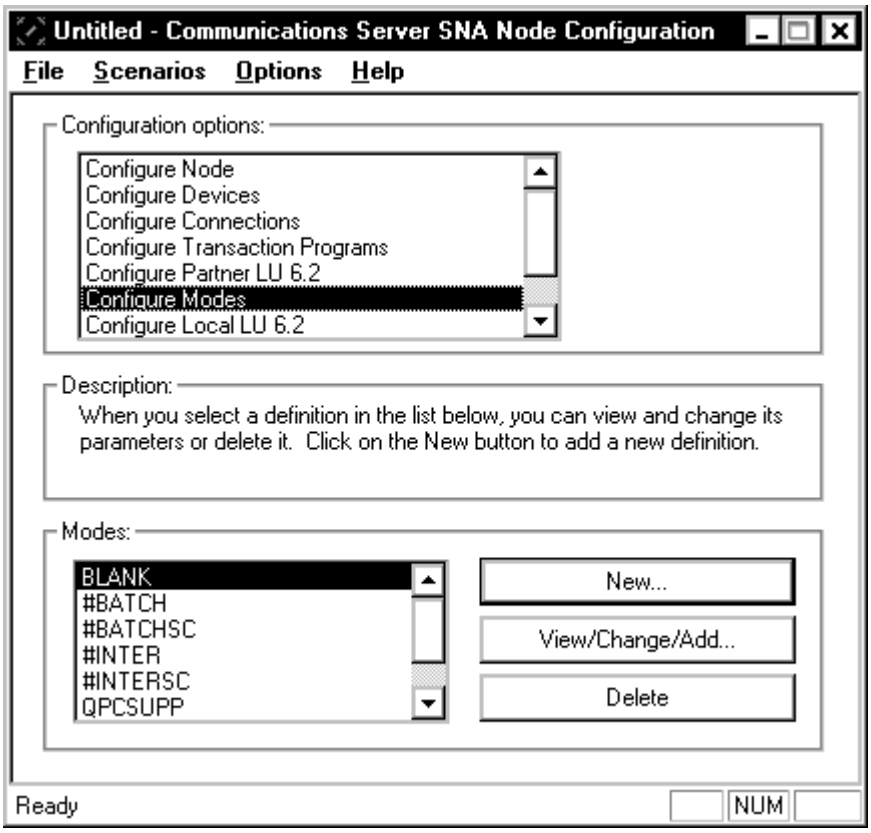


Figure 262. Configure Modes

- Select **Configure Modes** in the top list box and click on the **New** button.

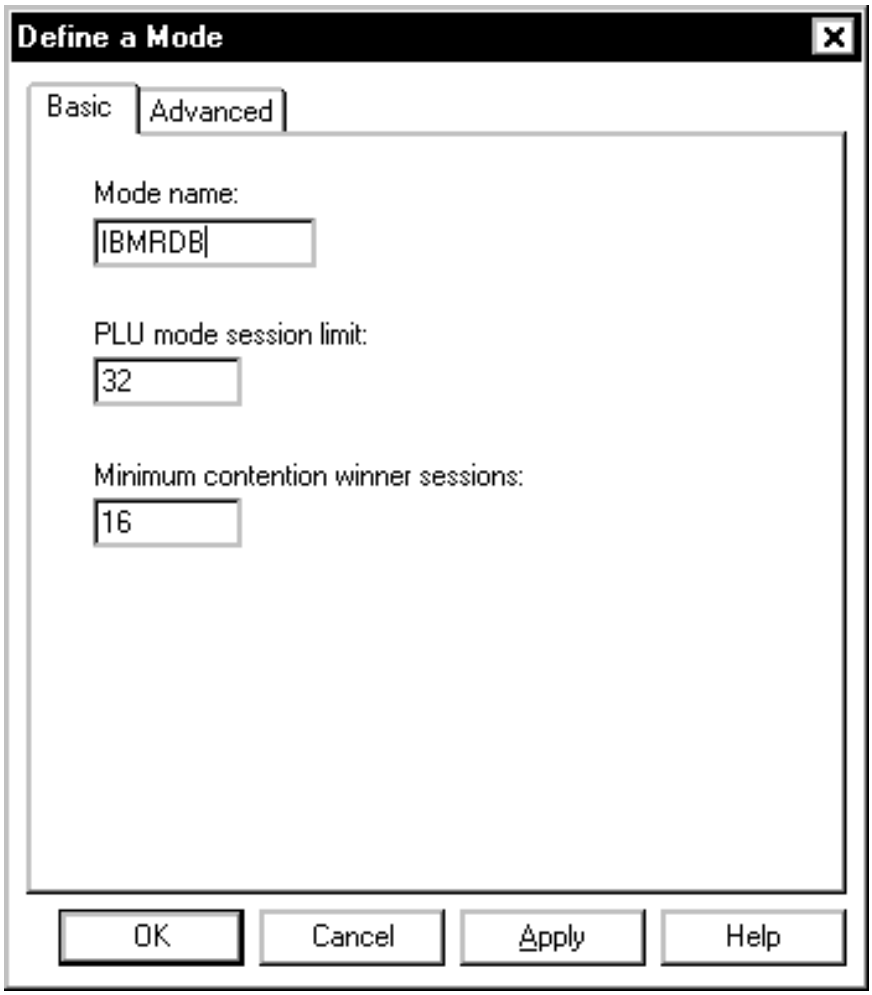


Figure 263. Define a Mode

- Enter `IBMRDB` in the Mode name field in Figure 263.

  The PLU mode session limit controls the number of parallel sessions between your local LU and the partner LU using the IBMRDB mode. Since each DRDA connection uses its own APPC session, the mode session limit will also limit the number of concurrent DRDA sessions. For this scenario, the defaults should be OK. Click on the **OK** button to return to the main window.

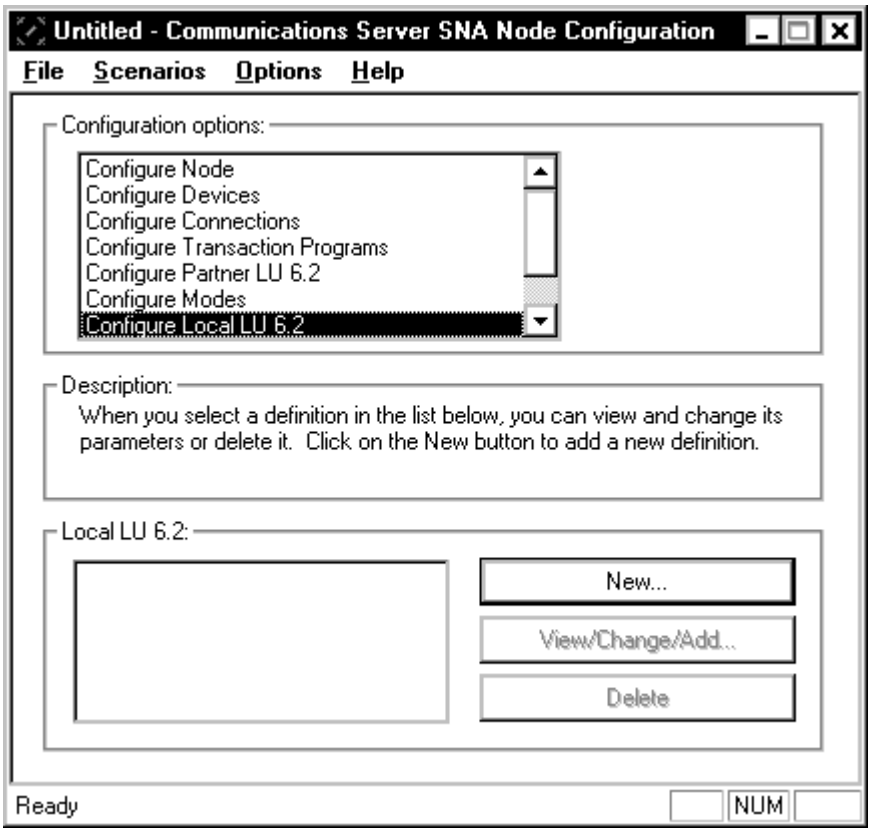


Figure 264. Configure Local LU 6.2

- Select **Configure Local LU 6.2** in the top list box and click on the **New** button.

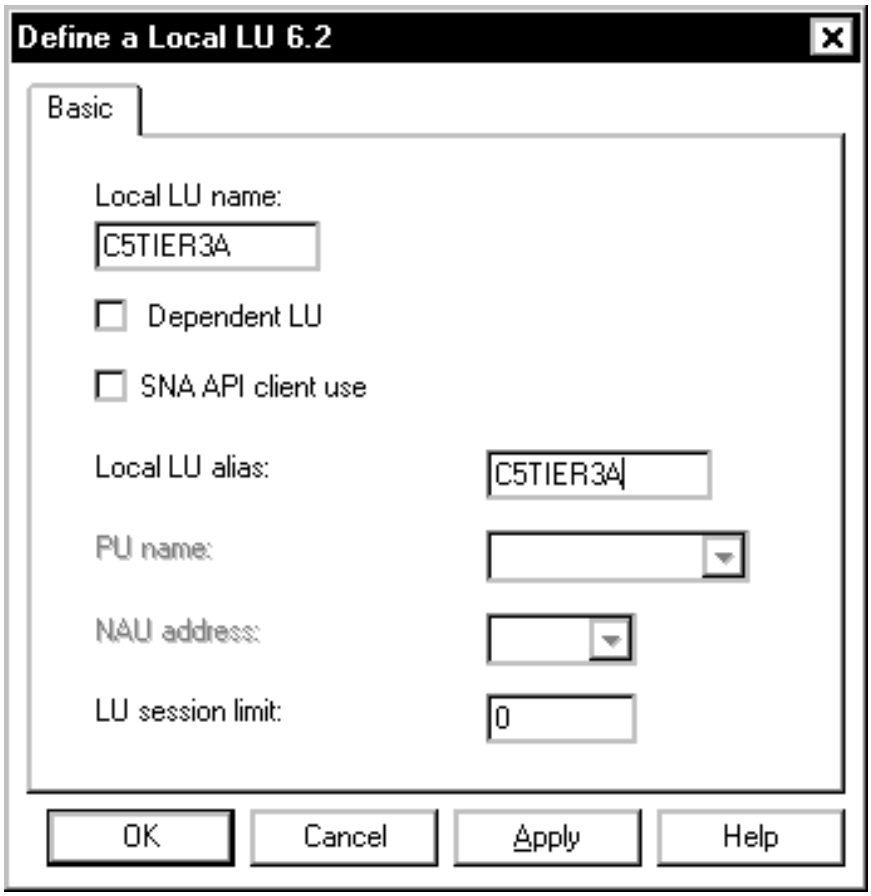


Figure 265. Define a Local LU 6.2

- Enter the Local LU name and use the same name for the alias as was used in Table 3 on page 180. Click on **OK** to get back to the main window.

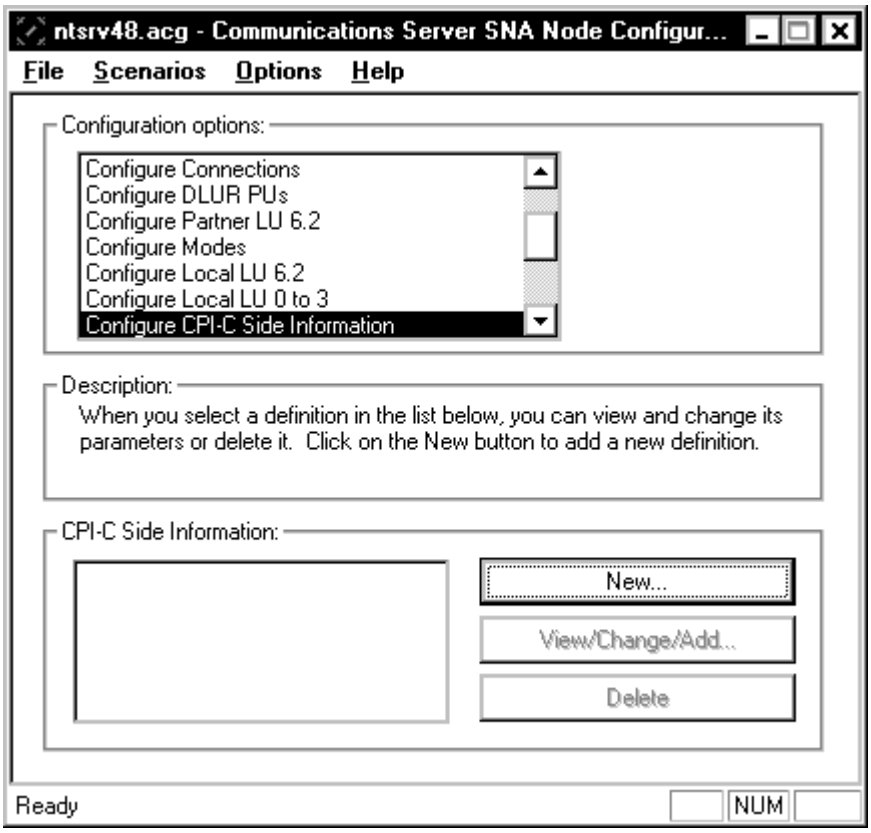


Figure 266. Configure CPI-C Side Information

- Moving the scroll bar down, select **Configure CPI-C Side Information** in the top list box and click on the **New** button.

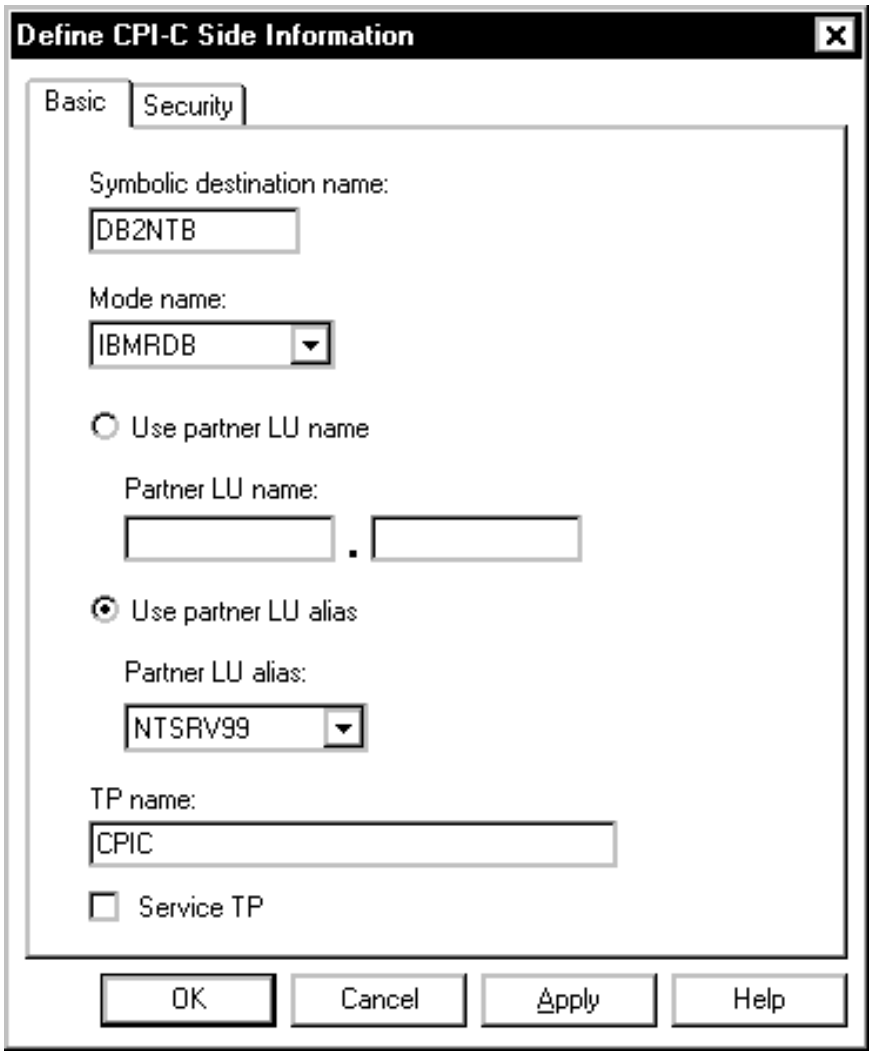


Figure 267. Define CPI-C Side Information

- We chose **DB2NTB** for the symbolic name representing the Tier-3b back-end NT Server. This value will be used when we catalog the Tier-3b node in our DB2 Connect system.
- For the Mode name, select **IBMRDB** from the drop-down list.
- Click on **Use partner LU alias** and select the partner LU alias you defined earlier (NTSRV99).
- For DB2NT UDB, we can choose any TPNAME we want, as long as we have a matching TPNAME in the server we want to access (Tier-3b). We chose to use `CPIC` for our TPNAME.

  Note: Don't be confused by this name. It can be anything you choose. We chose this name because it was already in use on our Tier-3b server. It could have been any name.
- Make sure Service TP is not checked. DB2UDB assigns the actual transaction program dynamically, so we do not want this to be a Service TP.
- The rest of the default values are acceptable. Click on **OK** to return to the main screen.

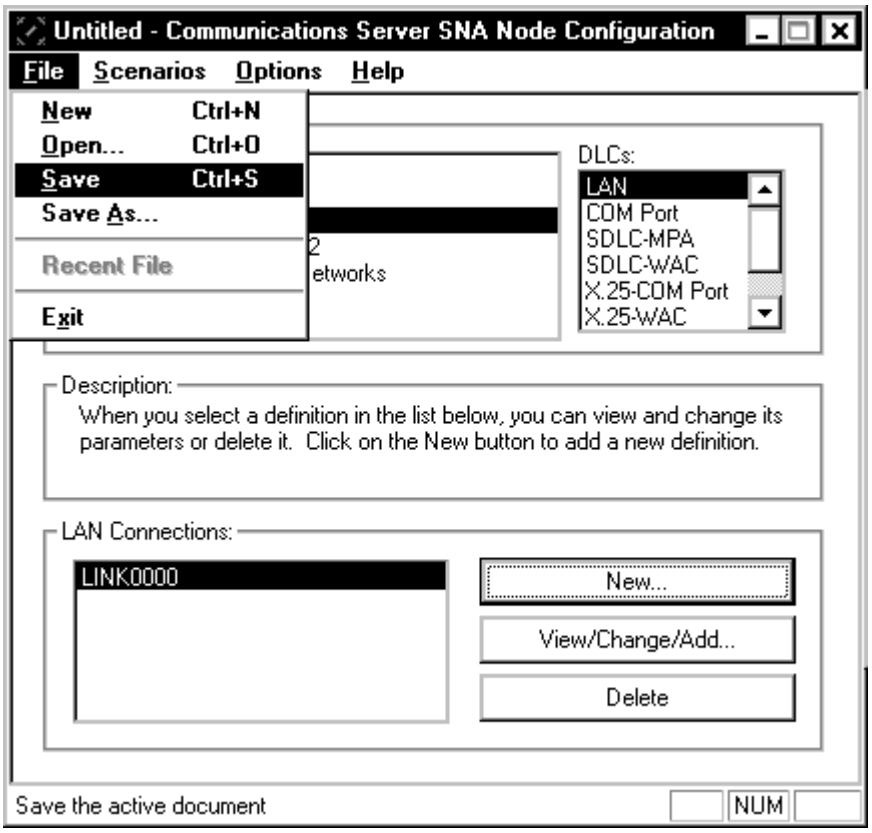


Figure 268. Save Configuration

- We are now ready to file and save the new configuration. Click on **File** and then **Save**.

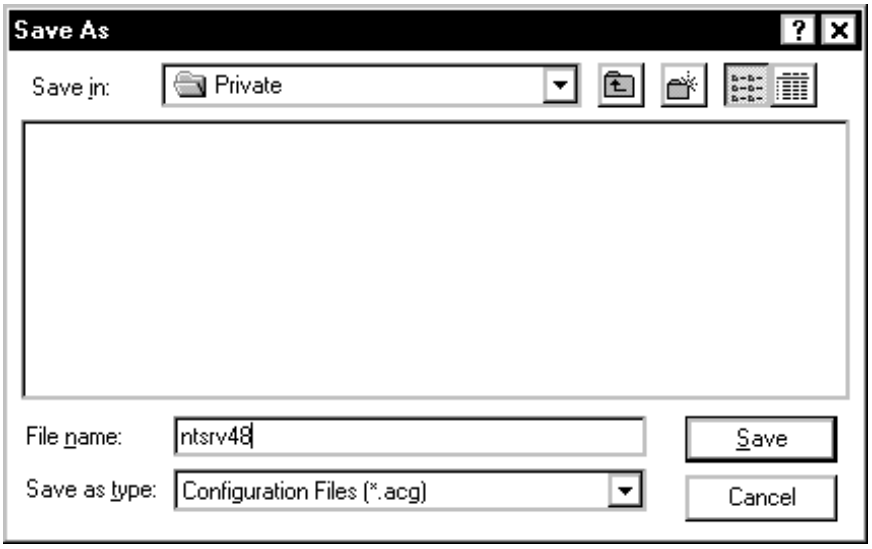


Figure 269. File Name to Save

- In the file name, type in the name of the configuration file to save (in our case, we typed our server name `NTSRV48`) and click on **Save** to continue.

- We are now ready to start CS/NT and apply the new configuration file. From **Start**, click on **Programs**, **IBM Communications Server** and then **SNA Node Operations**.

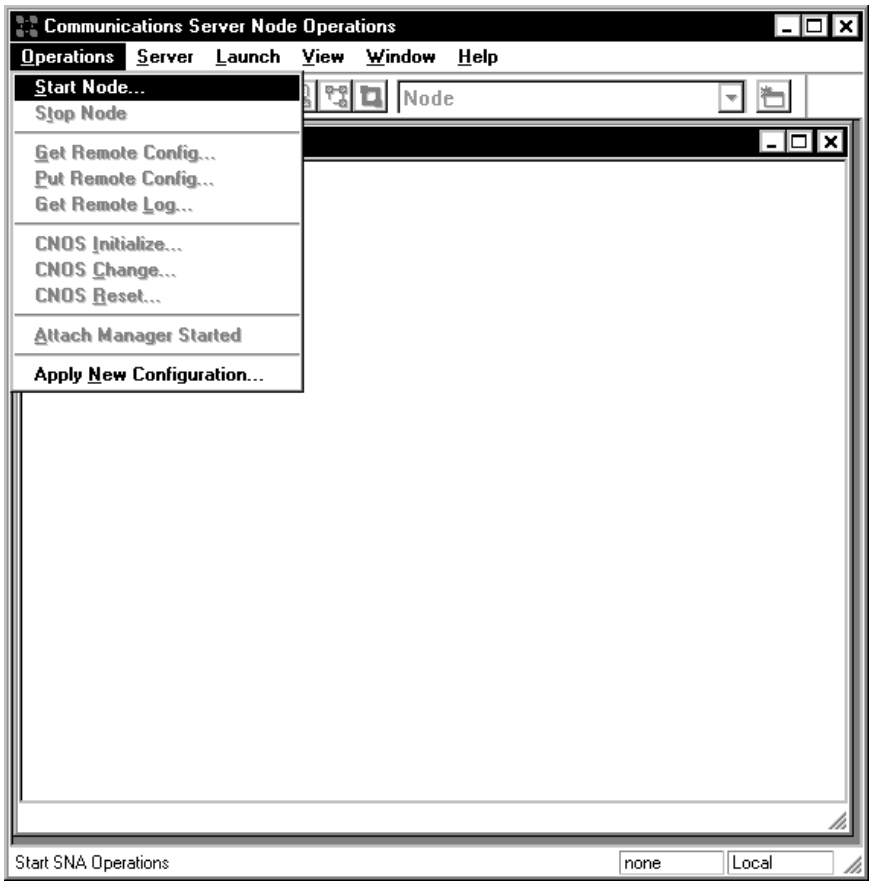


Figure 270. Start Node

- Click on **Operations** and **Start Node**.

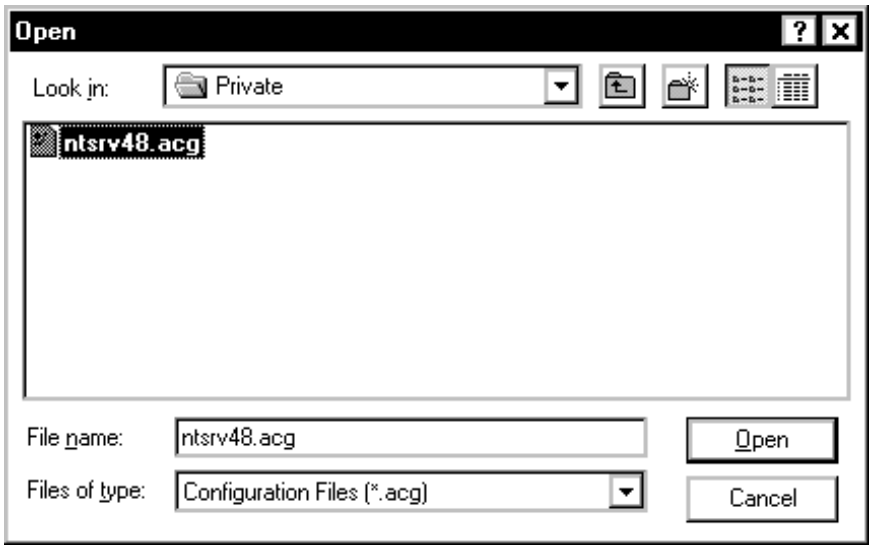


Figure 271. Open Configuration

- Select the configuration file name that you previously saved and click on **Open**.

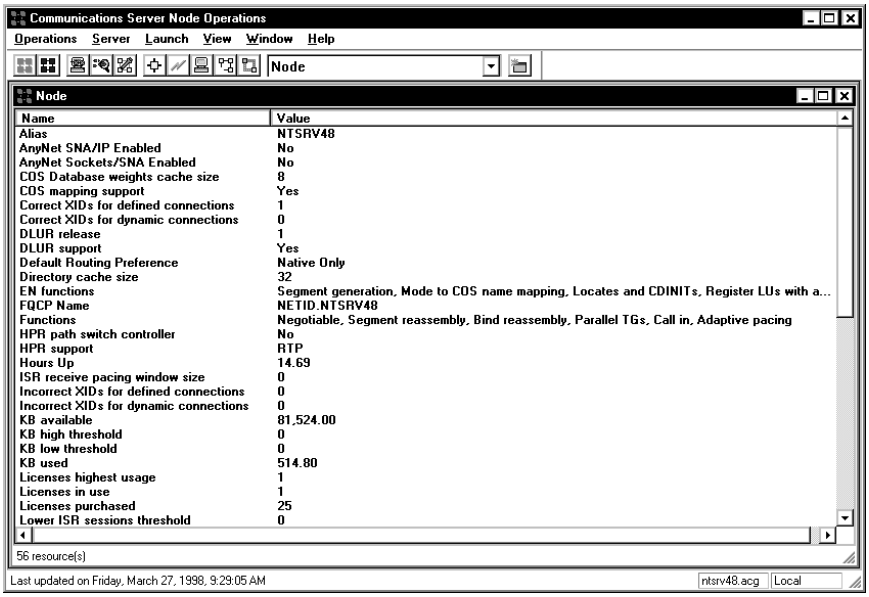


Figure 272. Node View

- The node should now start with the configuration file and after a short period of time you should see the node started and information should appear in the window similar to what is shown in the following window:

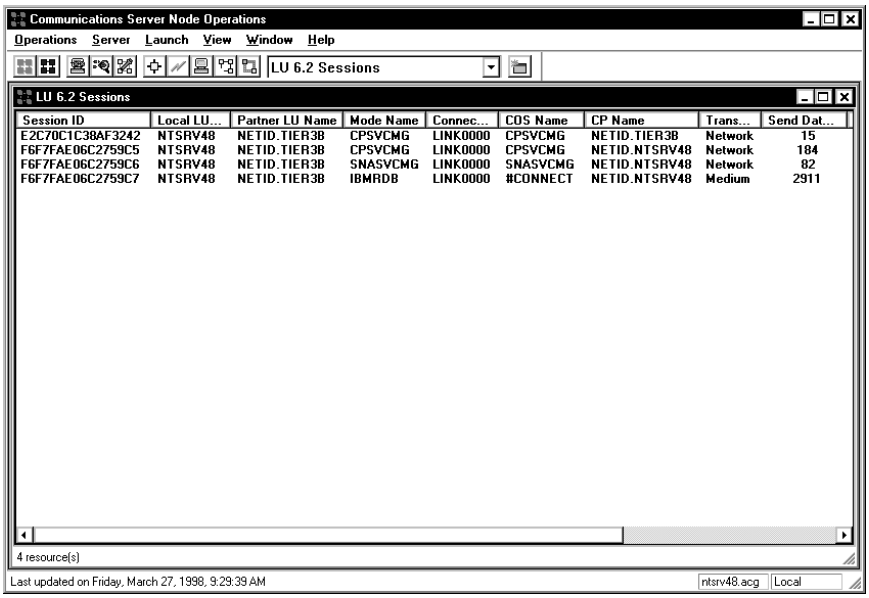


Figure 273. Sessions View

- To check the sessions to Tier-3b, click on the square icon (three icons to the left of the lightning bolt) to view them. If you have successfully tested the database connection to the Tier-3b server, you should see four sessions; otherwise, you will only see two.

For the CS/NT Configuration file, see Appendix D, “Communications Server Profile for Tier-3a” on page 453.

4.2.4 Tier-3b - NTSRV99

We used an NT server for our back-end DB2 database server. Even though it might be more realistic to use a UNIX machine or a mainframe for the back-end, we decided to use an NT server to keep within the framework of the IBM Enterprise Suite for Windows NT package. This machine is assumed to be already set up and running with the following products required for this scenario:

- DB2 UDB
- CS/NT

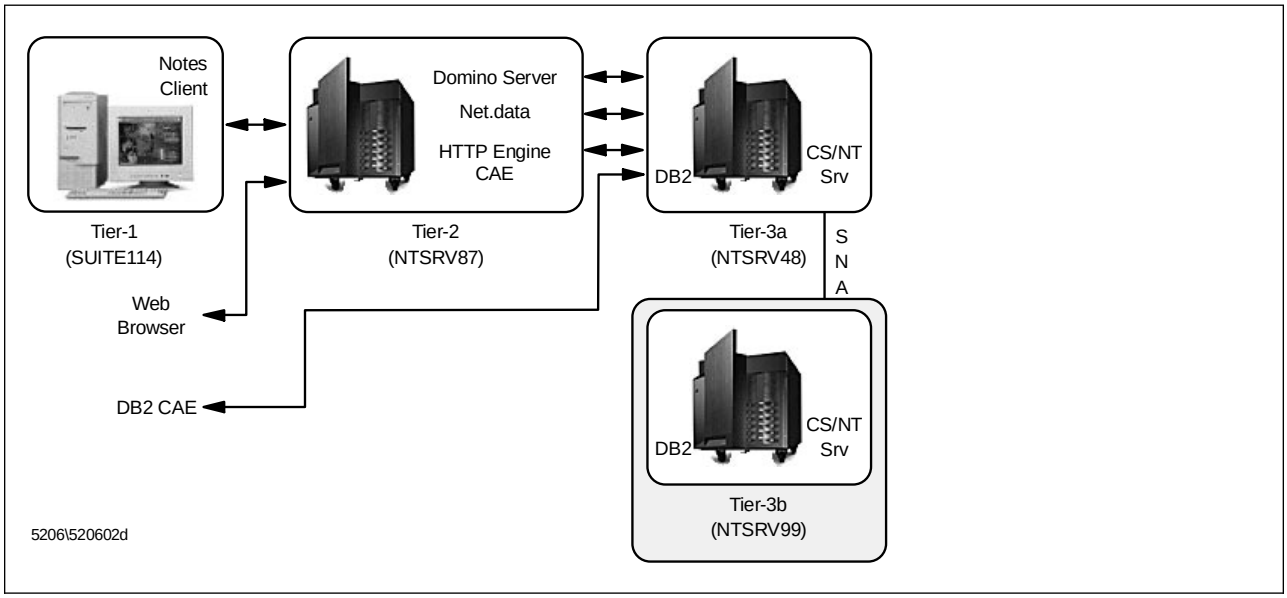


Figure 274. NTSRV99 Configuration

We show the required steps for configuring this machine for this scenario only. The required steps are:

1. Create a TPNAME entry in the CS/NT configuration for the Tier-3a server to connect to.
2. Update/confirm that the TPNAME entry is assigned in the DB2UDB configuration.
3. Update/confirm that APPC is specified as a protocol in the DB2UDB configuration.

4.2.4.1 Customizing Tier-3b

In order to customize Tier-3b we performed the following steps:

1. If the Communications Server Node Operations program is not started, start it from the IBM Communications Server group.
2. Pull down **Operations**, then select **Stop Node**. Click on **Yes** to stop the node.
3. Pull down **Launch** and select **SNA Node Configuration**.
4. In the Configuration Options window, scroll down until you see **Transaction Programs**. Click on it to highlight it and in the lower section of the panel, click on **New**.

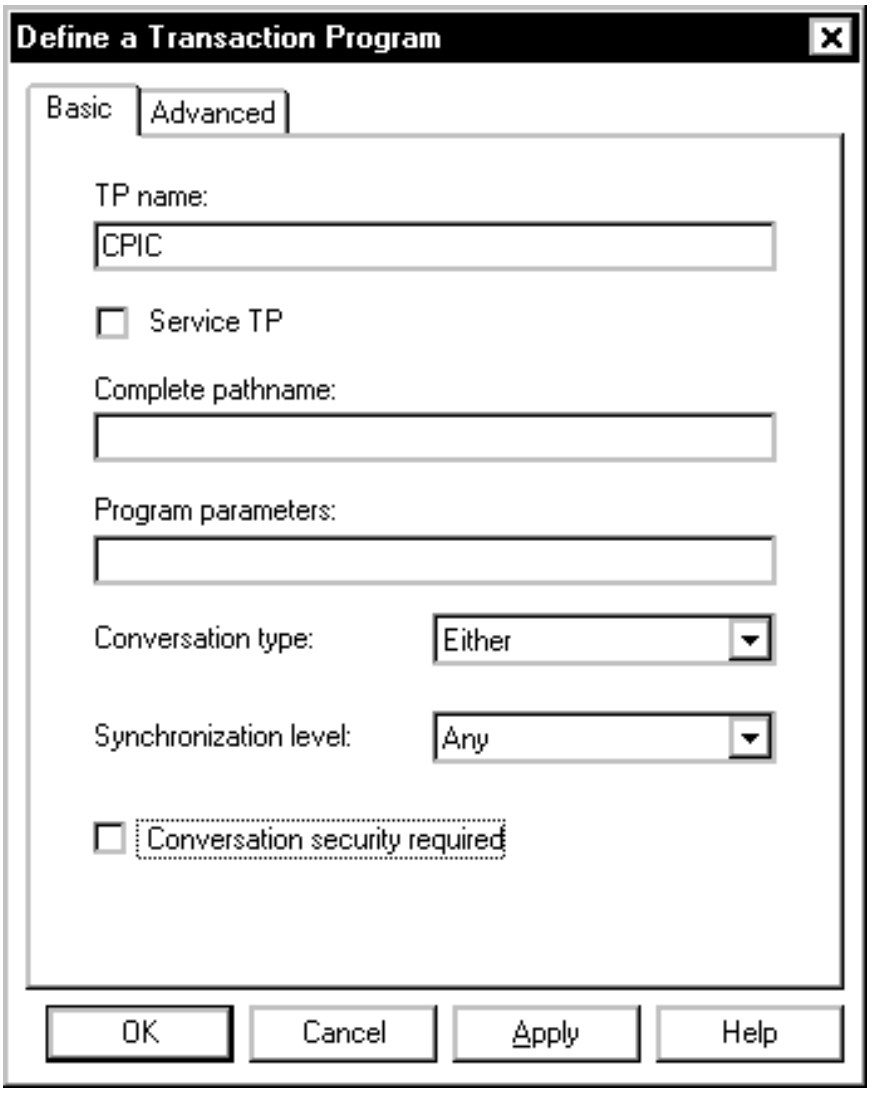


Figure 275. Open Configuration

5. In the TPNAME box, type in `CPIC`. Remember, this is any name that you wish. It is not a defined variable. This was used in this scenario since it was already defined in the Tier-3b DB2UDB configuration.
6. Uncheck the **Conversation Security Required** box.
7. Click on **OK** when this is done. No other information is required.
8. Click on **File** and save the new configuration file.
9. Return to the Communications Server Node Operations program.
10. Click on **Operations**, then select **Start Node**. Highlight your configuration file and click on **Open**. Your CS/NT node should then start. Minimize the window. The CS/NT configuration is complete.

We are now ready to configure the DB2UDB parameters.

In our scenario, we knew that the TPNAME for our DB2UDB Tier-3b server was set to CPIC. Unless you have set this variable on your server, the value for TPNAME

will be blank. To see what your variable is set to, and to set it to the desired value, follow this procedure:

1. From the **Start** menu, select **Programs**, **DB2 for Windows NT** and **Command Window**.
2. Get the database manager configuration information with the command: `db2 get dbm cfg > db2cfg.txt`. This will pipe the contents to the file db2cfg.txt which you can then view with Notepad. Here is a sample of the contents:

```
         Database Manager Configuration

    Node type = Database Server with local and remote clients

Database manager configuration release level            = 0x0800

Maximum total of files open               (MAXTOTFILOP) = 16000
CPU speed (millisec/instruction)             (CPUSPEED) = 4.000000e-005

Max number of concurrently active databases     (NUMDB) = 8
Transaction processor monitor name        (TP_MON_NAME) =

Default charge-back account           (DFT_ACCOUNT_STR) =

Java Development Kit 1.1 installation path (JDK11_PATH) =

Diagnostic error capture level              (DIAGLEVEL) = 3
Diagnostic data directory path               (DIAGPATH) =

Default database monitor switches"
  Buffer pool                         (DFT_MON_BUFPOOL) = OFF
  Lock                                   (DFT_MON_LOCK) = OFF
  Sort                                   (DFT_MON_SORT) = OFF
  Statement                              (DFT_MON_STMT) = OFF
  Table                                 (DFT_MON_TABLE) = OFF
  Unit of work                            (DFT_MON_UOW) = OFF

SYSADM group name                        (SYSADM_GROUP) =
SYSCTRL group name                      (SYSCTRL_GROUP) =
SYSMAINT group name                    (SYSMAINT_GROUP) =

Database manager authentication        (AUTHENTICATION) = SERVER
Trust all clients                      (TRUST_ALLCLNTS) = YES
Trusted client authentication          (TRUST_CLNTAUTH) = CLIENT

Default database path                       (DFTDBPATH) = D:

Database monitor heap size (4KB)          (MON_HEAP_SZ) = 24
UDF shared memory set size (4KB)           (UDF_MEM_SZ) = 256

Backup buffer default size (4KB)            (BACKBUFSZ) = 1024
Restore buffer default size (4KB)           (RESTBUFSZ) = 1024

Agent stack size                       (AGENT_STACK_SZ) = 16
Minimum committed private memory (4KB)   (MIN_PRIV_MEM) = 32
Private memory threshold (4KB)        (PRIV_MEM_THRESH) = 1296

Sort heap threshold (4KB)                  (SHEAPTHRES) = 10000

Directory cache support                     (DIR_CACHE) = YES

Java Virtual Machine heap size (4KB)     (JAVA_HEAP_SZ) = 512

Application support layer heap size (4KB)   (ASLHEAPSZ) = 15
Max requester I/O block size (bytes)         (RQRIOBLK) = 32767
DOS requester I/O block size (bytes)     (DOS_RQRIOBLK) = 4096
Query heap size (4KB)                   (QUERY_HEAP_SZ) = 1000
DRDA services heap size (4KB)            (DRDA_HEAP_SZ) = 128

Priority of agents                           (AGENTPRI) = SYSTEM
Max number of existing agents               (MAXAGENTS) = 200
Agent pool size                       (NUM_POOLAGENTS) = 4 (calculated)
Initial number of agents in pool      (NUM_INITAGENTS) = 0
Max number of coordinating agents    (MAX_COORDAGENTS) = MAXAGENTS
Max no. of concurrent coordinating agents  (MAXCAGENTS) = MAX_COORDAGENT S
```

Figure 276 (Part 1 of 2). NTSRV99 DBM Configuration

```
Keep DARI process                            (KEEPDARI) = YES
Max number of DARI processes                  (MAXDARI) = MAX_COORDAGENT S

Index re-creation time                       (INDEXREC) = ACCESS

Transaction manager database name         (TM_DATABASE) = 1ST_CONN
Transaction resync interval (sec)     (RESYNC_INTERVAL) = 180

SPM name                                     (SPM_NAME) =
SPM log size                           (SPM_LOG_FILE_SZ) = 256
SPM resync agent limit                  (SPM_MAX_RESYNC) = 20

NetBIOS Workstation name                        (NNAME) = N0005188

TCP/IP Service name                          (SVCENAME) = db2cDB27
APPC Transaction program name                  (TPNAME) = CPIC
IPX/SPX File server name                   (FILESERVER) = *
IPX/SPX DB2 server object name             (OBJECTNAME) = *
IPX/SPX Socket number                      (IPX_SOCKET) = 879E

Discovery mode                               (DISCOVER) = SEARCH
Discovery communication protocols       (DISCOVER_COMM) = TCPIP
Discover server instance                (DISCOVER_INST) = ENABLE

Directory services type                      (DIR_TYPE) = NONE
Directory path name                    (DIR_PATH_NAME) = /.:/subsys/database/
Directory object name                   (DIR_OBJ_NAME) =
Routing information object name        (ROUTE_OBJ_NAME) =
Default client comm. protocols         (DFT_CLIENT_COMM) =
Default client adapter number          (DFT_CLIENT_ADPT) = 0

Maximum query degree of parallelism   (MAX_QUERYDEGREE) = ANY
Enable intra-partition parallelism     (INTRA_PARALLEL) = NO

No. of int. communication buffers(4KB)(FCM_NUM_BUFFERS) = 1024
Number of FCM request blocks              (FCM_NUM_RQB) = 512
Number of FCM connection entries      (FCM_NUM_CONNECT) = (FCM_NUM_RQB * 0.75)
Number of FCM message anchors         (FCM_NUM_ANCHORS) = (FCM_NUM_RQB * 0.75)
```

Figure 276 (Part 2 of 2). NTSRV99 DBM Configuration

3. If the value for the Transaction Program Name (TPNAME) is not set, use the following command to set it:

   `db2 update dbm cfg using tpname CPIC`

```
D:\SQLLIB\BIN>db2 update dbm cfg using tpname CPIC
DB20000I  The UPDATE DATABASE MANAGER CONFIGURATION command completed
successfully.
DB21025I  Client changes will not be effective until the next time the
application is started.  Server changes will not be effective until the next
DB2START command.
```

Figure 277. Update DBM Configuration with TPNAME

Now we need to verify that APPC is available as a protocol to use with DBM.

4. Enter the following command at the command prompt:

   `db2set -all.`

```
D:\SQLLIB\BIN>db2set -all
[i&rbkr. DB2NBADAPTERS=1
[i] DB2COMM=appc,tcpip,netbios,npipe
[g] DB2SYSTEM=NTSRV48
[g] DB2PATH=D:\SQLLIB
[g] DB2INSTDEF=DB2
[g] DB2ADMINSERVER=DB2DAS00
```

Figure 278. Update DBM Configuration with TPNAME

5. If you do not see appc listed on the DB2COMM variable, you must set it with the following command:

   `db2set DB2COMM=appc,tcpip,netbios,npipe`

   That sets DB2UDB to use APPC, TCP/IP, NetBIOS and Named Pipes for communications.

6. After you execute this command, you can repeat the db2set -all command to verify the changes occurred.
7. The changes will not be effective until you start and stop the DBM. At the command prompt, enter `DB2STOP` and wait until the prompt comes back.
8. Enter `DB2START` to restart DBM.
9. The configuration on Tier-3b server is now complete.

4.3 Customizing the Scenario

In this section, we set up Tier-2 so that it can connect to Tier-3a's database and make it available to the Tier 1 client.

Before we set up Tier-2 to connect, we want to connect Tier-3a to Tier-3b's database over APPC. This was done so that when Tier-2 looks at Tier-3a, it will see two databases available to connect to. It will look to Tier-2 as if Tier-3a has two local databases, when in fact, one will be local and one will actually be remote on Tier-3b.

Even though this scenario actually shows connectivity between two Windows NT UDB servers, in actuality, the Tier-3b server could be any of the UDB servers including OS/400, OS/390 or RS/6000. For a much more in-depth look at UDB DB2, please refer to *The Universal Connectivity Guide to DB2*.

4.3.1 Tier-3a - NTSRV48

We need to connect and catalog the SAMPLE database on Tier-3b.

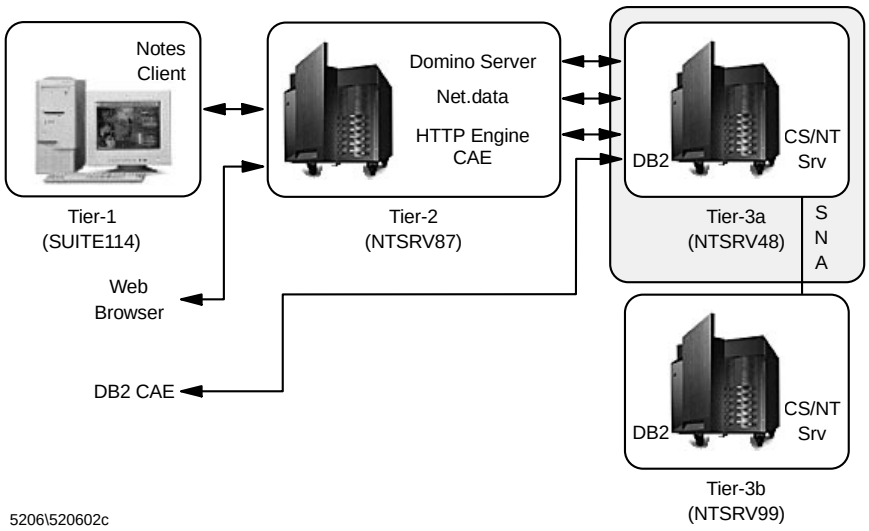


Figure 279. NTSRV48 Customizing

4.3.1.1 Cataloging Remote Databases with Client Configuration Assistant (CCA)

To start the CCA, select the Windows NT **Start** menu. Click on **Programs**, then on **DB2 for Windows NT** and finally on **Client Configuration Assistant**.

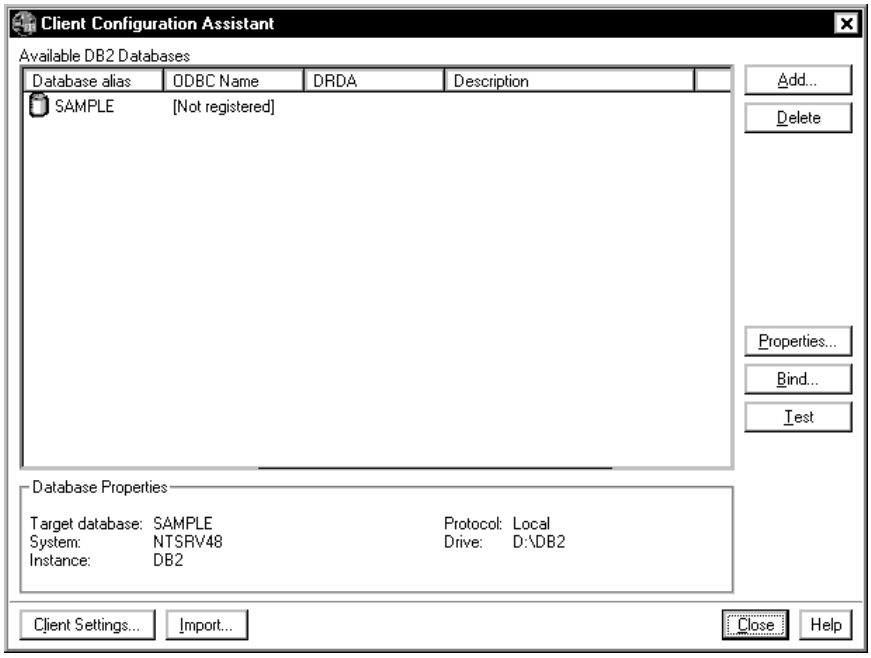


Figure 280. Client Configuration Assistant

1. To catalog a remote database, select the **Add** button in the upper-right corner of the CCS's main window.

   The Add Database SmartGuide appears.

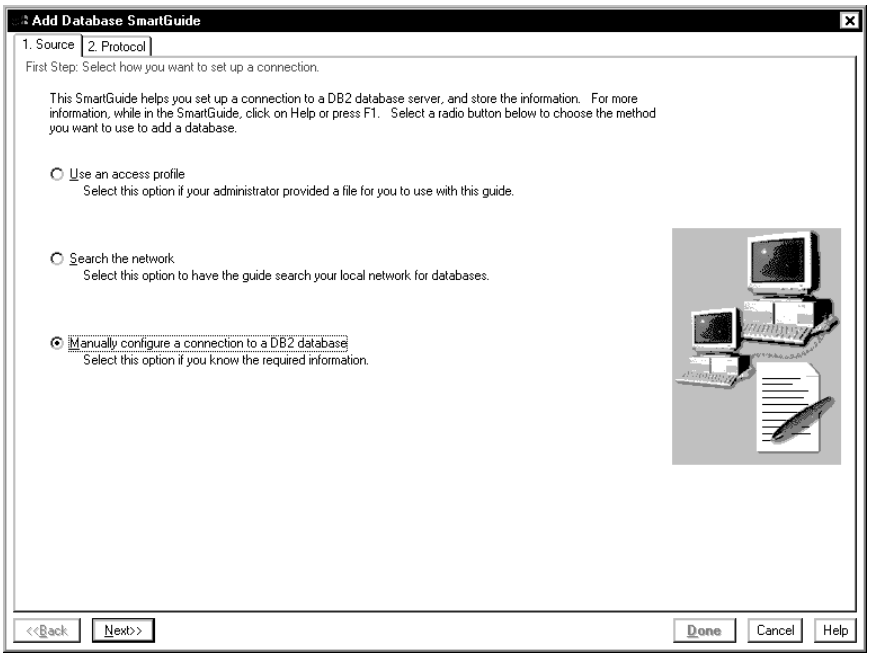


Figure 281. Add Database SmartGuide (NT)

2. Select **Manually configure a connection to a DB2 database** and click on **Next**.

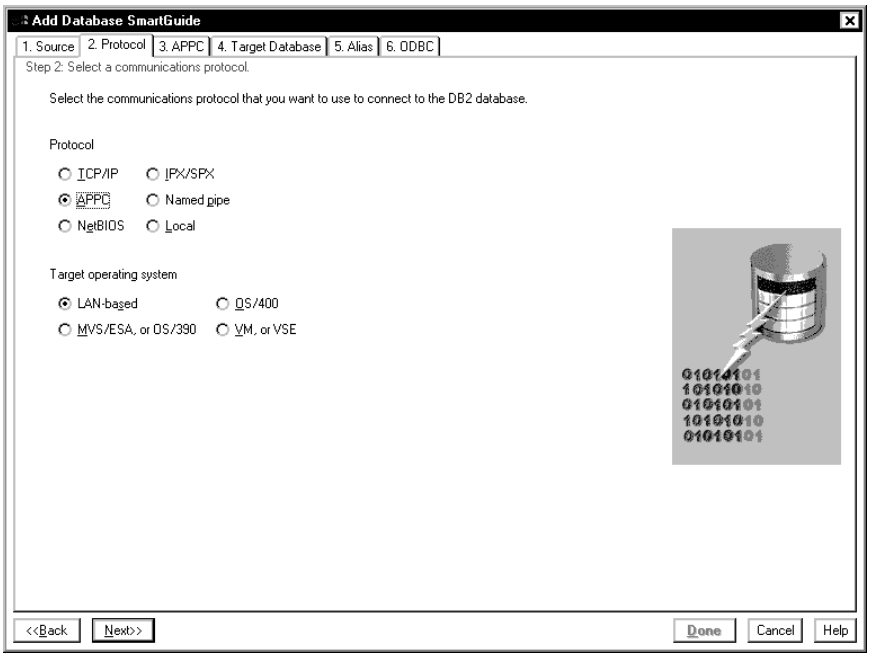


Figure 282. Add Database Protocol Selection

3. Select **APPC** as your protocol.

   The CCA will populate the Target operating system area with the operating systems available to APPC.

   The default selected will be LAN-based. This will allow you to connect to other LAN-attached UDB DBM servers (such as Windows NT).

4. Click on **Next**.

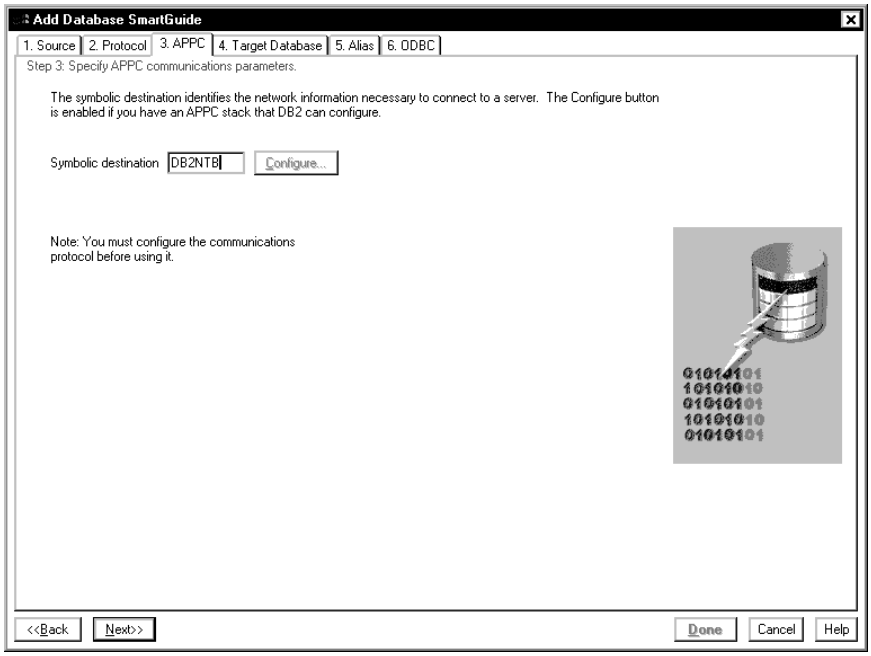


Figure 283. Add Database APPC Configuration

5. Fill in the Symbolic name previously configured for Tier-3b (DB2NTB). This value is case-sensitive so make sure you type it in just like you did in CS/NT (all caps).
6. Click on **Next**.

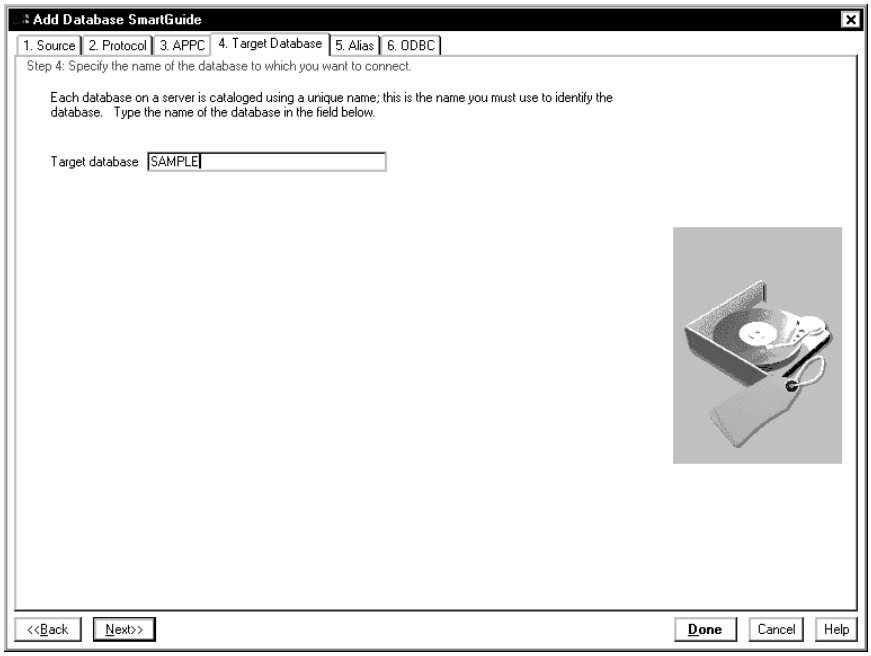


Figure 284. Add Database Target Database

7. Enter the Target Database name here. We are using SAMPLE from Tier-3b.
8. Click on **Next**.

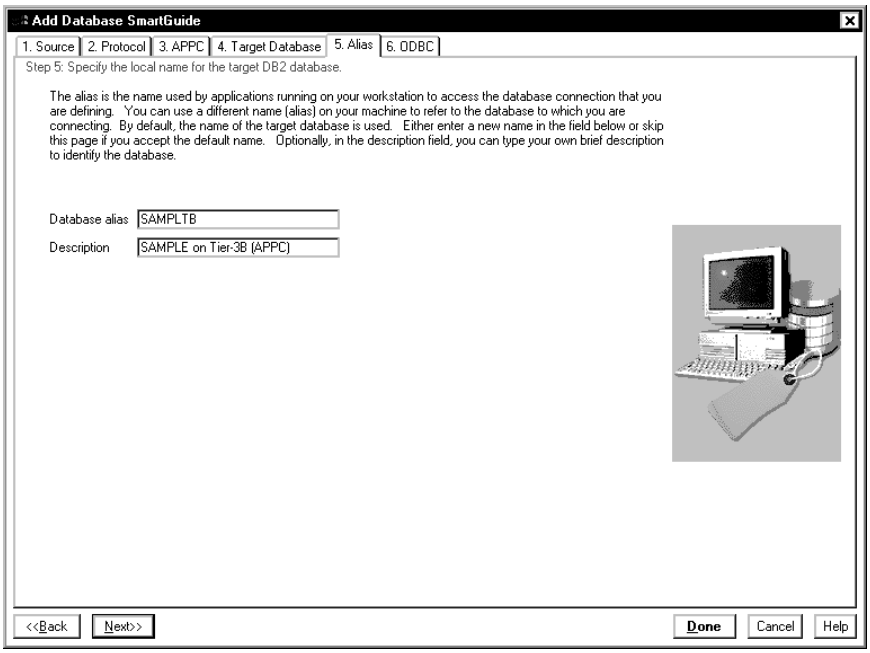


Figure 285. Add Database Alias

9. Choose a database alias name.

   We chose something that would be easy to remember so we could determine what it was on Tier-2. We used `SAMPLTB` (SAMPLE on Tier-3b) and a description of `SAMPLE on Tier-3b (APPC)`.

10. Click on **Next**.

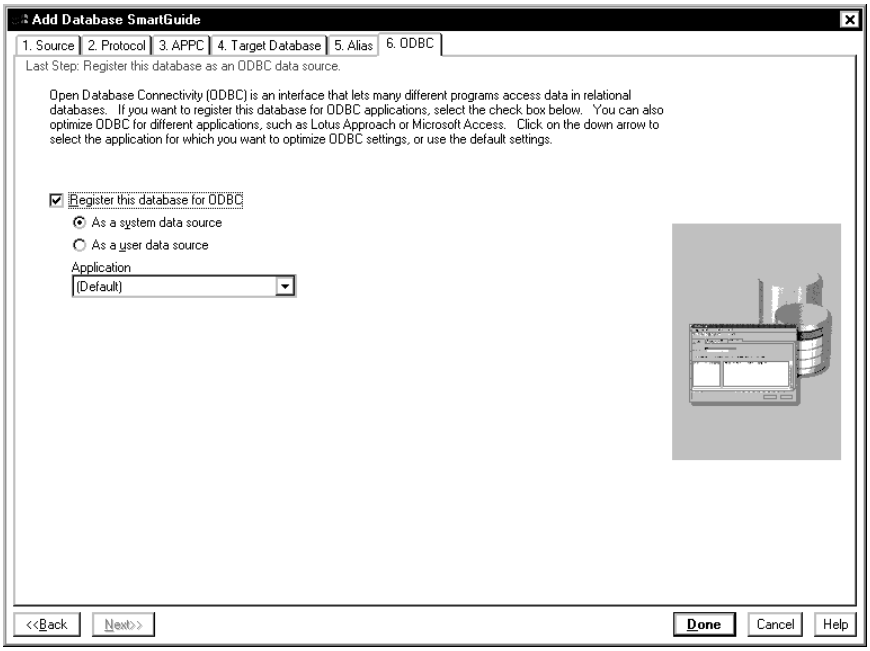


Figure 286. Add Database ODBC

11. If you want application programs executing on Tier-3a to access the DB2 UDB on Tier-3b using ODBC, then select **Register this database for ODBC** and

choose either As a user data source or As a system data source. We took the defaults.

12. Click on **Done**.

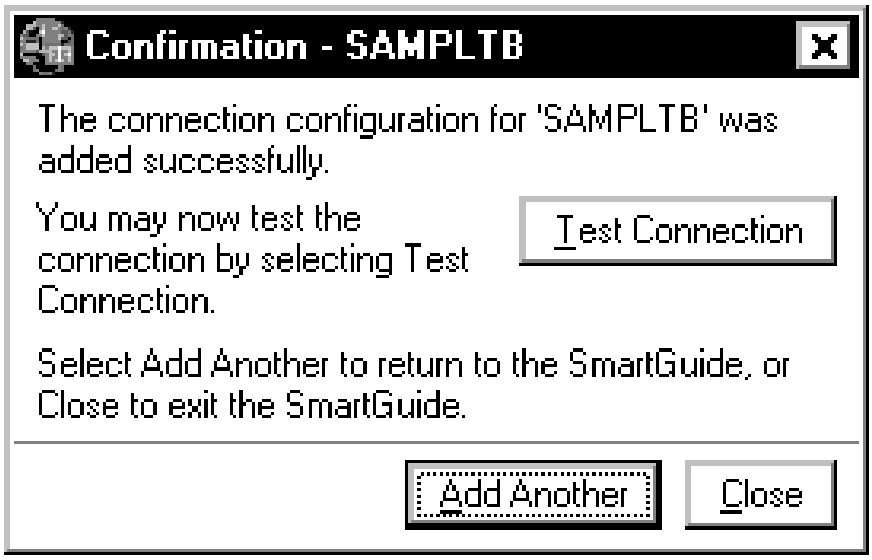


Figure 287. Add Database Test Connection

The CCA will now give you a chance to test the connection to the database. If you want to do this now, make sure you have CS/NT started on both servers.

13. Click on the **Test Connection** button.

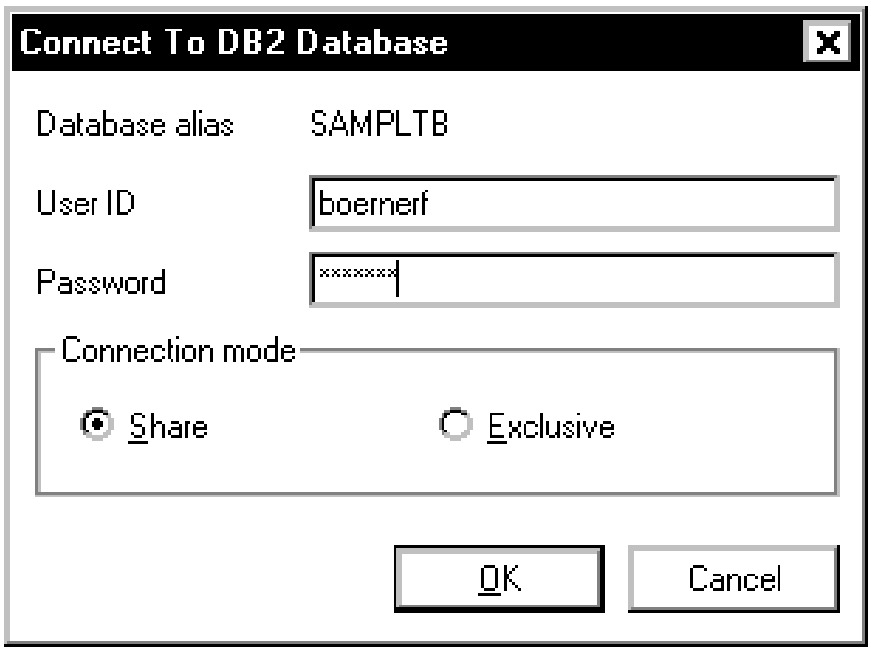


Figure 288. Add Database Login Panel

14. Fill in the User ID and Password prompt with a valid NT Admin ID on Tier-3b. Leave the Connection mode set to Share.

15. Click on **OK** to try and connect.

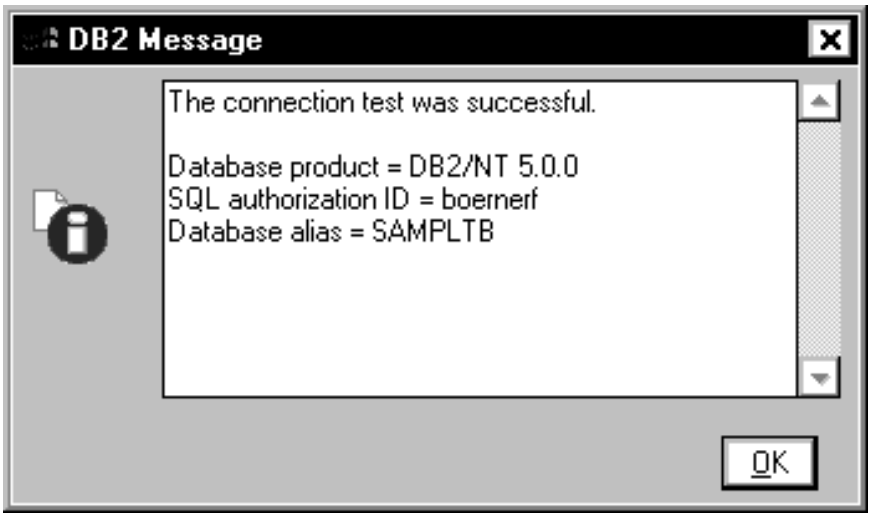


Figure 289. Add Database Test Connection Results

16. A window will pop up with the results.

    If you get an error trying to connect, check these things first:

    - Is DB2 started on Tier-3a and Tier-3b?
    - Is CS/NT started on Tier-3a and Tier-3b?
    - Re-check the DBM Configuration on Tier-3b and make sure the TPNAME is set to the corresponding value in the CS/NT CPIC-Side information Symbolic Destination Name definition on Tier-3a.
    - Stop DBM on both machines.
    - Stop and restart CS/NT on both machines.
    - Restart DBM on both machines.
    - Try to test the connection again.

    If all of the above checks out OK, use the diagnostics information and the online DB2UDB message manual to diagnose the problem. You may also want to consult *The Universal Connectivity Guide to DB2*.

17. Click on **OK** to return to the CCA panel.

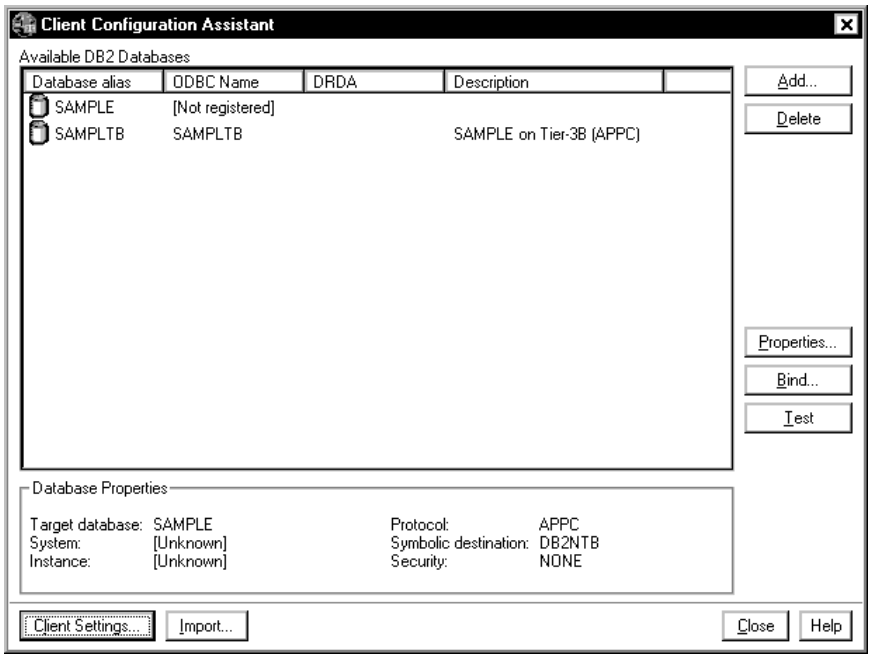


Figure 290. Tier-3a CCA Panel after Completion

18. You should now see the database in the CCA window. If you click on it, you will see more information in the database properties pane located at the bottom of the window in Figure 290.
19. You are now ready to set up Tier-2.

4.3.2 Tier-2 - NTSRV87

The following two things need to be done to the server:

1. Catalog the remote databases
2. Customize Net.Data

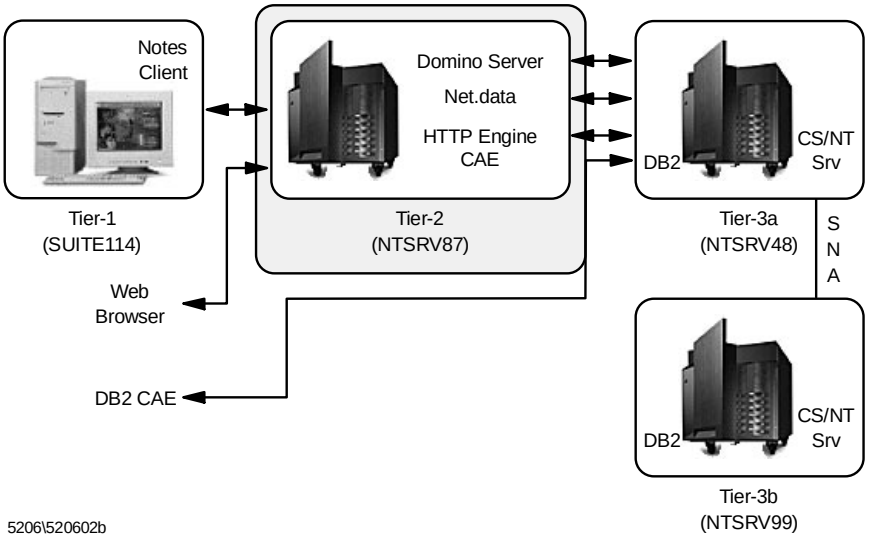


Figure 291. NTSRV87 Customizing

4.3.2.1 Cataloging Remote Databases with Client Configuration Assistant (CCA)

You will need to catalog the remote DB2 database so that the DB2 UDB Client Application Enabler (CAE) will be able to connect to your remote database and retrieve data.

In this case (which is different from the previous sections usage of CCA in the configuration of NTSRV48) we catalog databases using the Search the network option to find appropriate databases, rather than manually configuring them.

When using this option, the CCA uses the supported protocols of TCP/IP, NetBIOS and named pipes to search for database servers. Since we have two databases available on Tier-3a, Tier-2 should find both of them when it does the search.

The following list contains instructions on how to catalog your remote DB2 database using the CCA so that you can connect and retrieve data through your CAE:

- From the Windows Start button, click on **Programs**, **DB2 for Windows NT** and then **Client Configuration Assistant**.

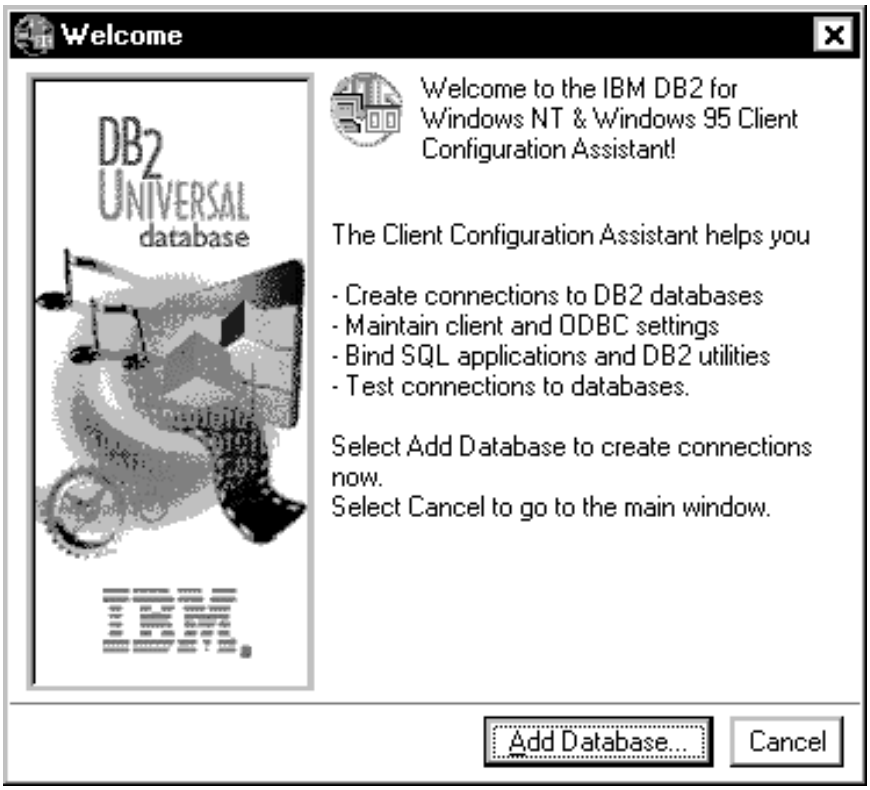


Figure 292. Client Configuration Assistant

- Click on the **Add Database** button to open up the Add Database SmartGuide window.

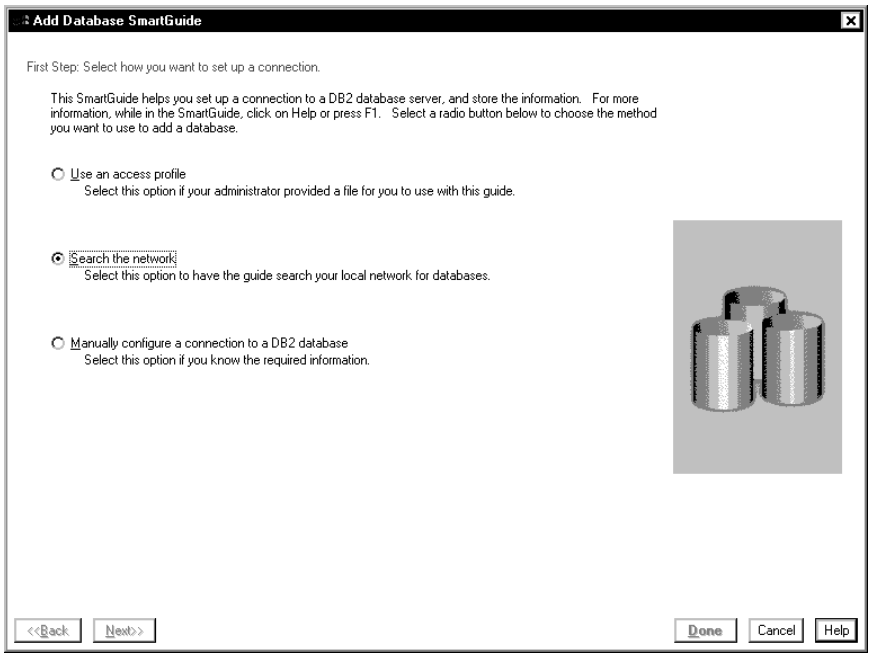


Figure 293. Add Database SmartGuide

- At the Add Database SmartGuide window select the **Search the Network** option. This will let UDB search the network and detect other DB2 systems with discovery enabled.

  Note: The UDB Administration Server will listen for known discovery requests from clients on the TCP/IP and NetBIOS protocols only.

- Click on **Next** to continue.

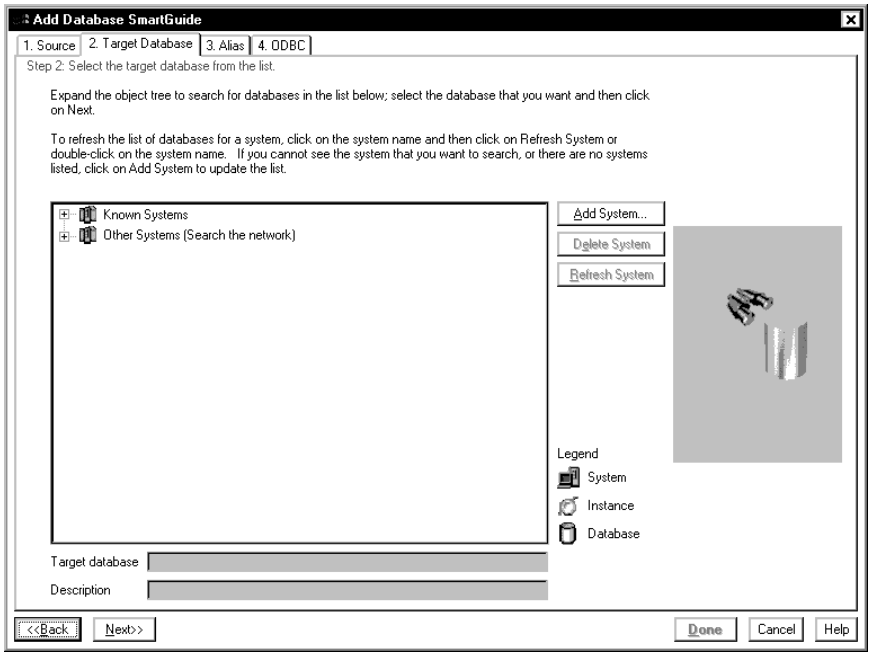


Figure 294. Target Database Location

- Locate the system where your remote database resides. Find your database by clicking on the **+** located to the left of the Other Systems (Search the network).

You will receive the following message:

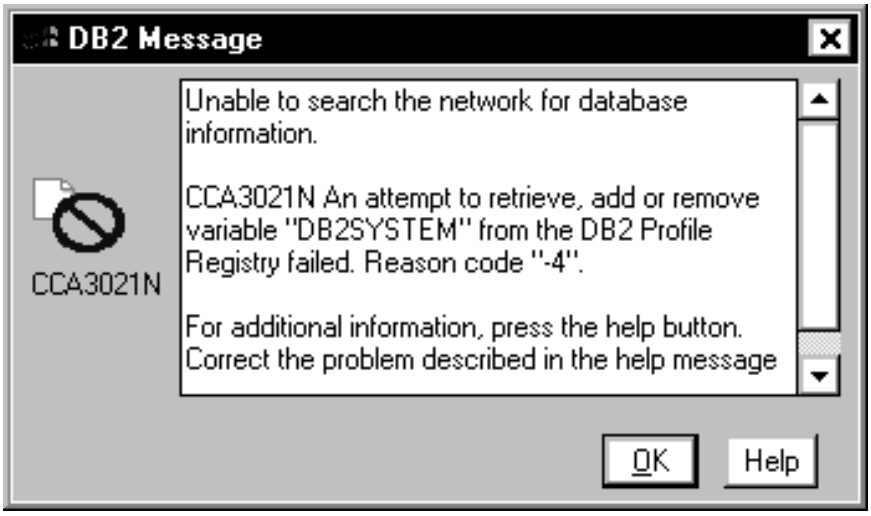


Figure 295. Unable to Search the Network

This is because there is no profile information for systems in the DB2SYSTEM registry entry. Click on **OK** to continue.

You will receive the following message:

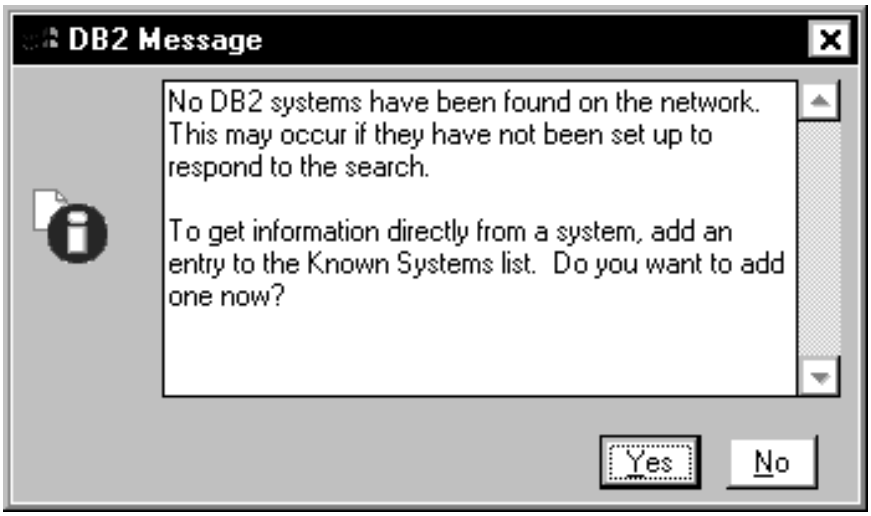


Figure 296. No DB2 Systems Found

This is because no systems were found on the network. We need to add them manually. Click on **OK** to continue.

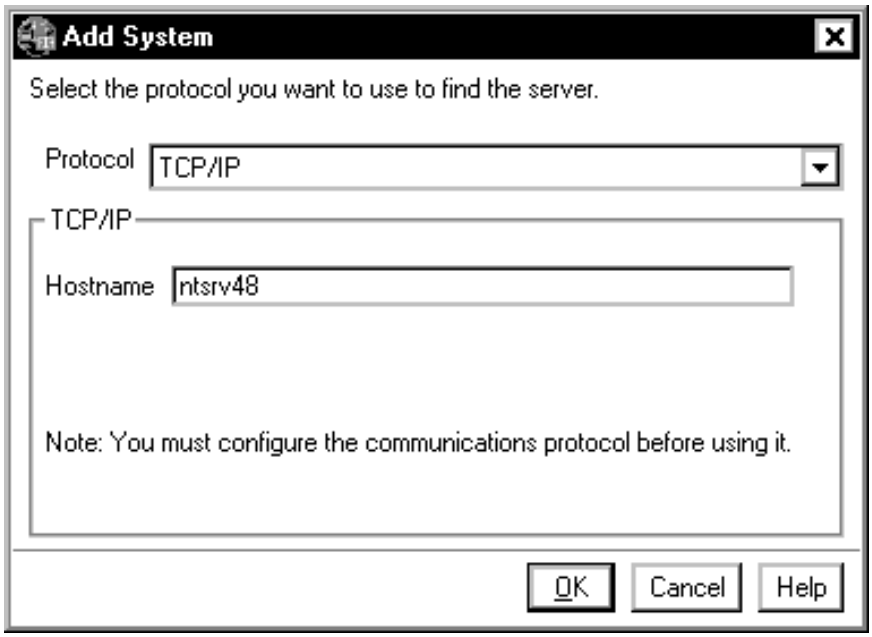


Figure 297. Add System

In our scenario, we are looking for NTSRV48 (Tier-3a). So leave TCP/IP selected as the protocol and enter `ntsrv48` in the Hostname field. Click on **OK** to continue.

You should then see NTSRV48 appear under Known Systems and the DB2 databases available should appear under the DB2 tree.

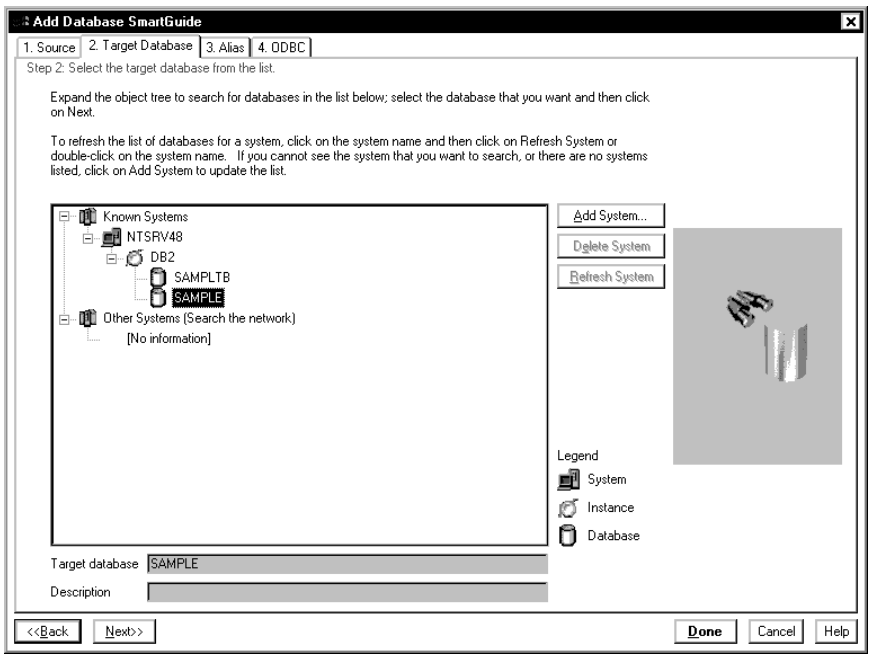


Figure 298. NTSRV48 Available Databases

- Highlight the remote database that you want to connect to. After you highlight the database, the database name will appear in the Target Database box. First we connect to the SAMPLE database.

- Click on **Next** to open the alias page in the Database SmartGuide.

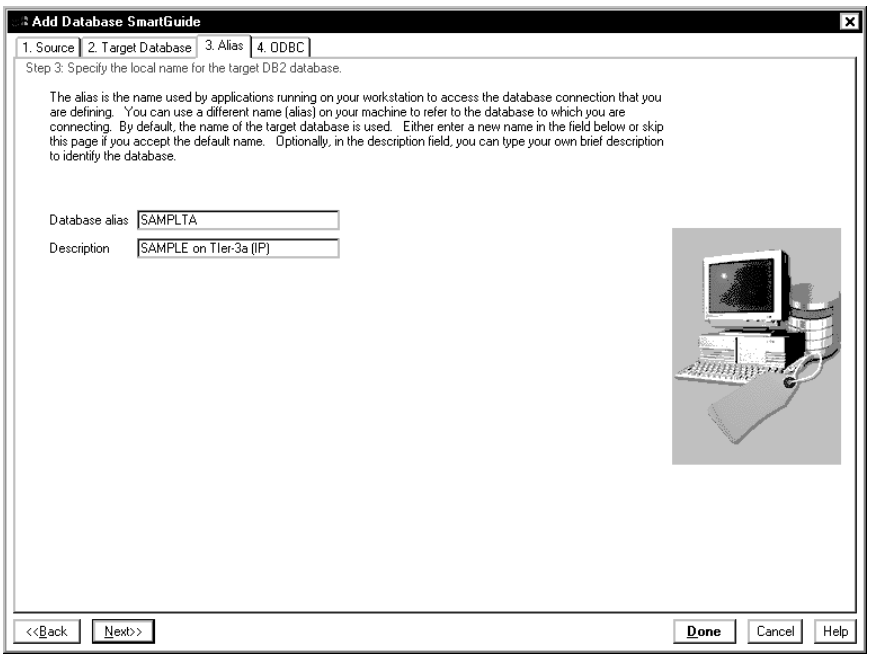


Figure 299. Database Alias Specification

- Fill in the alias of the remote database that you want to connect to. By default, the database name will automatically be placed in the Database alias box. You do not have to change this if you don't want to. We want to use a descriptive alias and good description. So for an alias, we entered `SAMPLTA` (SAMPLE on Tier-3a) and a description of `SAMPLE on Tier-3a (IP)` to denote that we are connecting to this database over IP.
- Click on **Next** to open up the ODBC page. This is where you register your database as an ODBC data source.

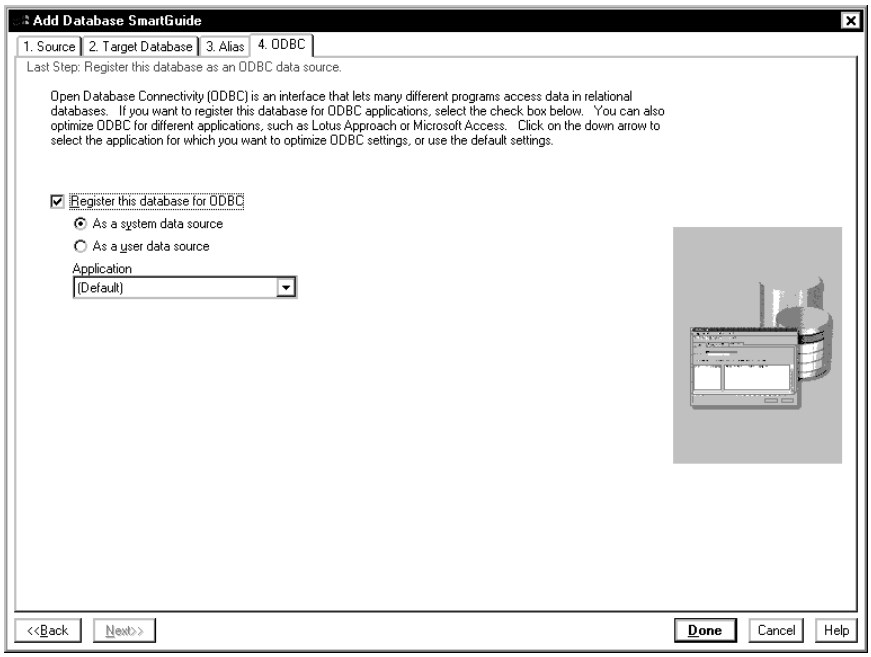


Figure 300. ODBC Registration

- Click on **Done** to complete the database catalog process.

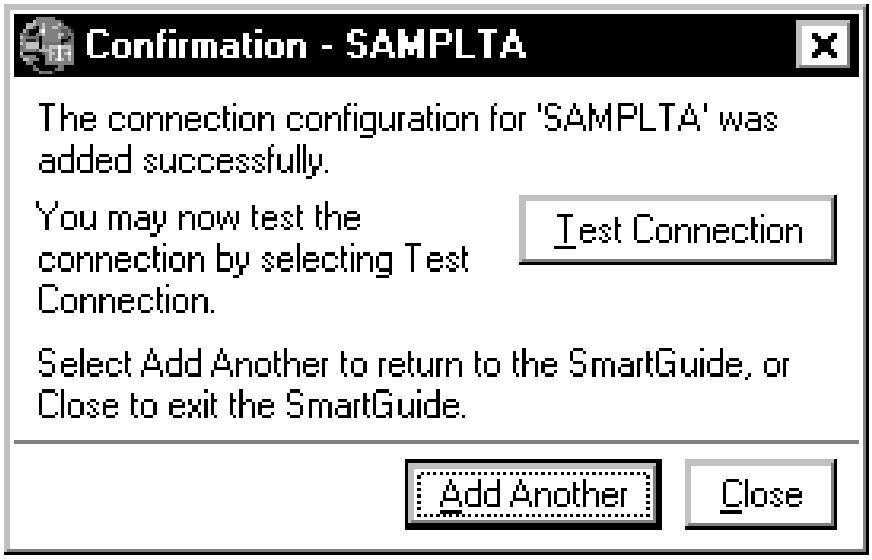


Figure 301. Confirmation of Connection Configuration

- You should receive confirmation that the connection configuration was added successfully. At this time, you can test the connection by clicking on the **Test Connection** box.

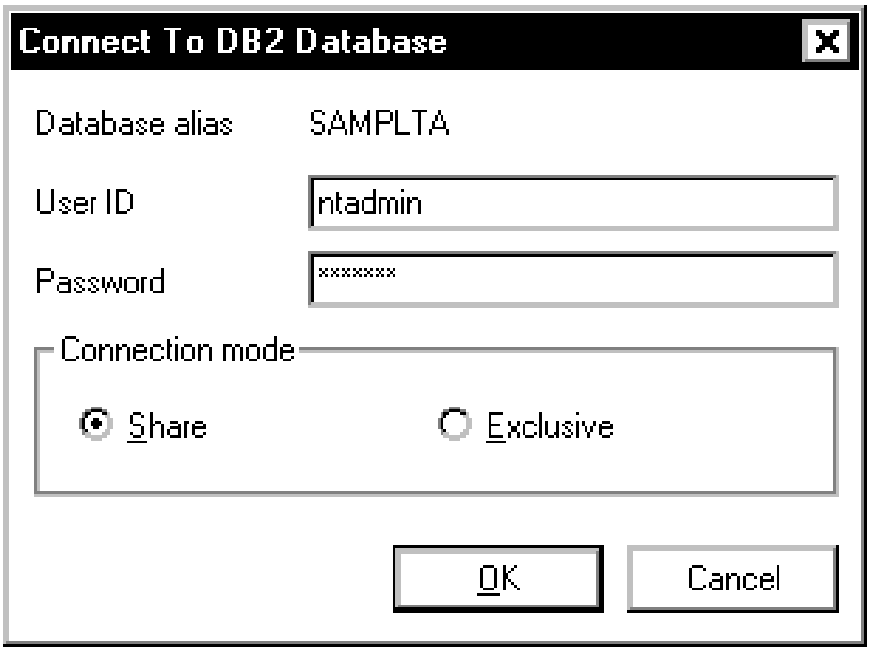


Figure 302. Connect to Database

- Connect to the DB2 database by filling in your user ID and password. Then click on **OK**.

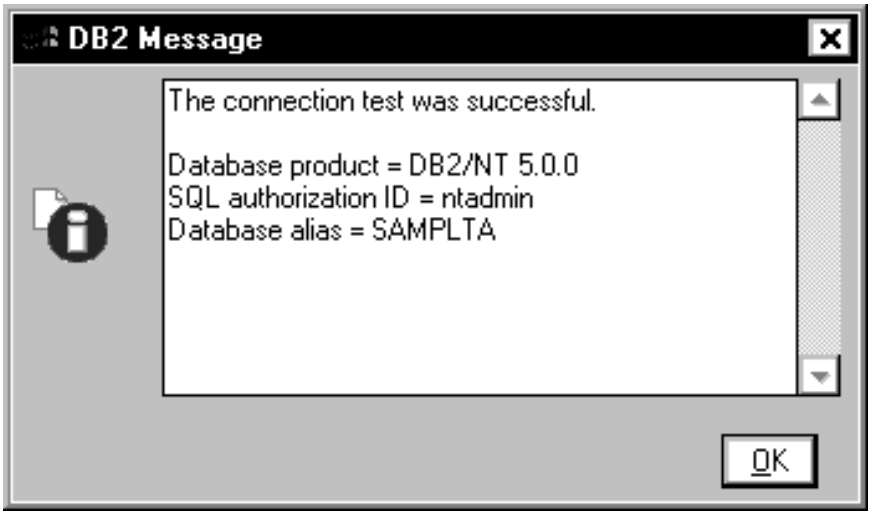


Figure 303. Successful DB2 Connection Message

- You should receive a test connection message. If the configuration was done correctly, you will receive confirmation. If the connection fails, your test connection message will alert you of this.

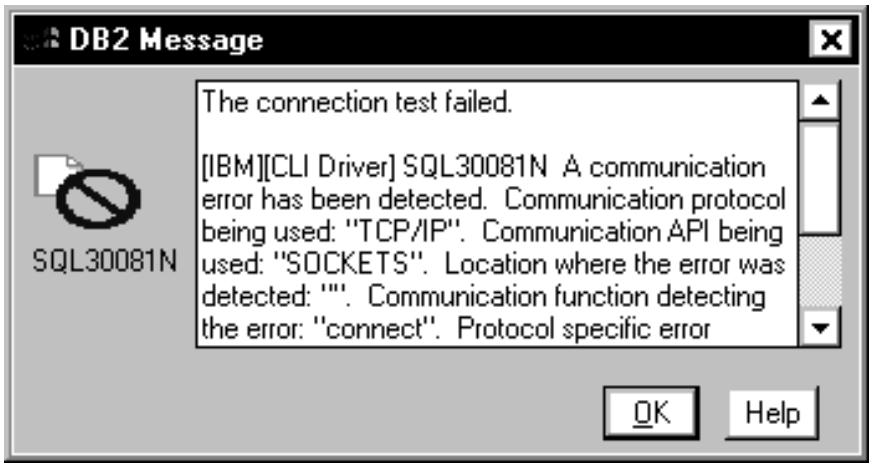


Figure 304. Unsuccessful DB2 Connection Message

- Now we need to add the other database, so we click on **Add Another** in Figure 301 on page 218.
- This will return you to the CCA Add Database SmartGuide.

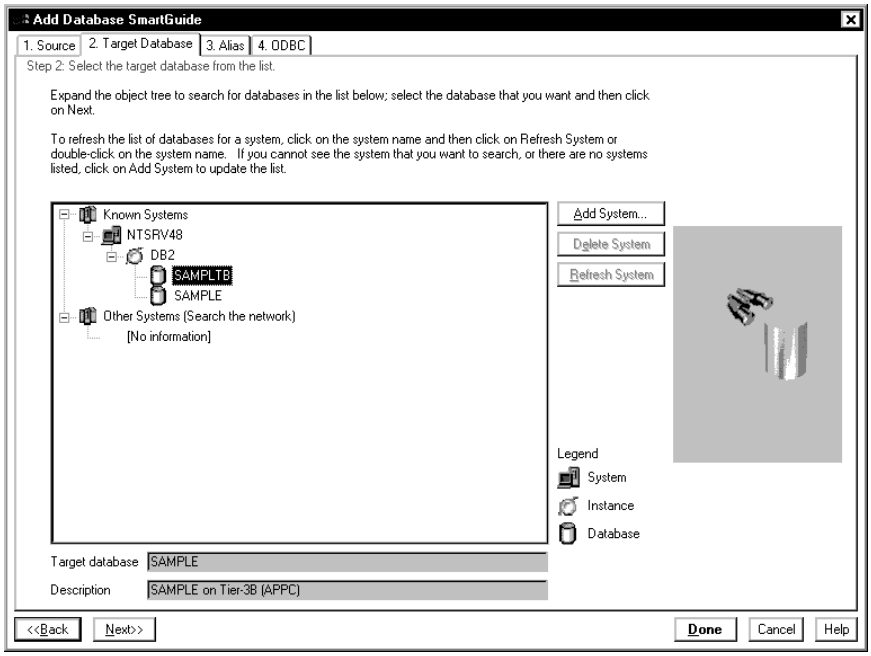


Figure 305. NTSRV48 Choosing SAMPLTB

- Select the second database available on NTSRV48 which should be SAMPLTB. (It was previously cataloged.)
- Notice that when you click on this database, the information in the Target Database and Description are filled in from when we cataloged this database on NTSRV48.
- Click on **Next** to proceed.

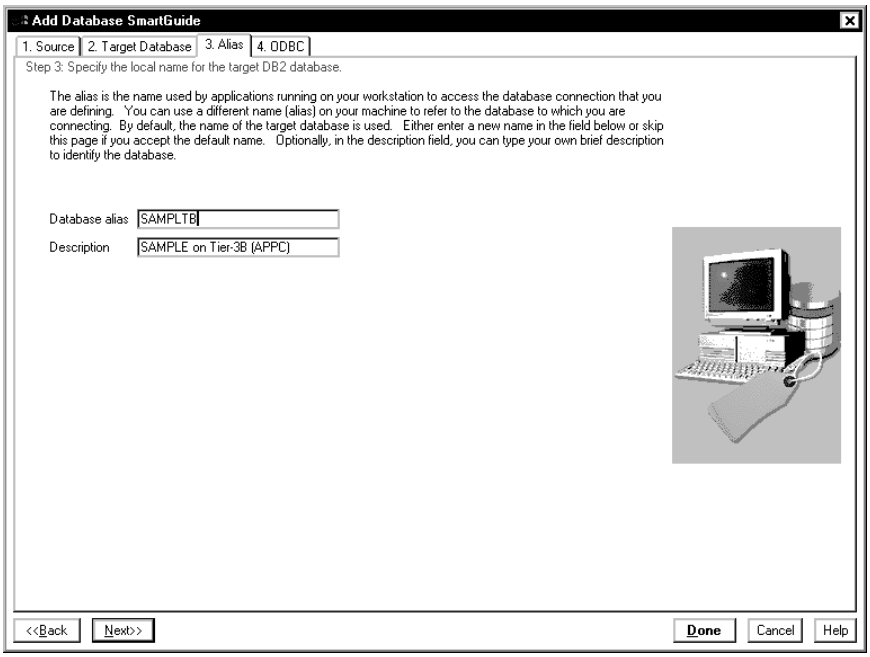


Figure 306. NTSRV48 Target Database

- We wanted to use a descriptive alias and good description. Therefore, for an alias we typed `SAMPLTB` (SAMPLE on Tier-3b) and a description of `SAMPLE on Tier-3b (APPC)` to denote that we are connecting to this database over IP.
- Click on **Next** to open up the ODBC page. This is where you register your database as an ODBC data source.

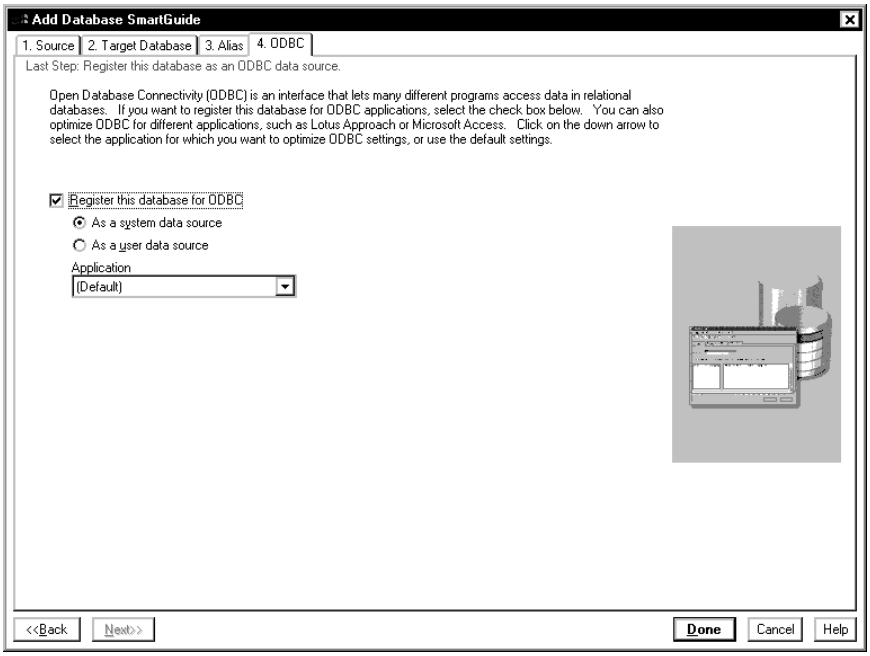


Figure 307. ODBC Registration

- Click on **Done** to complete the database catalog process.

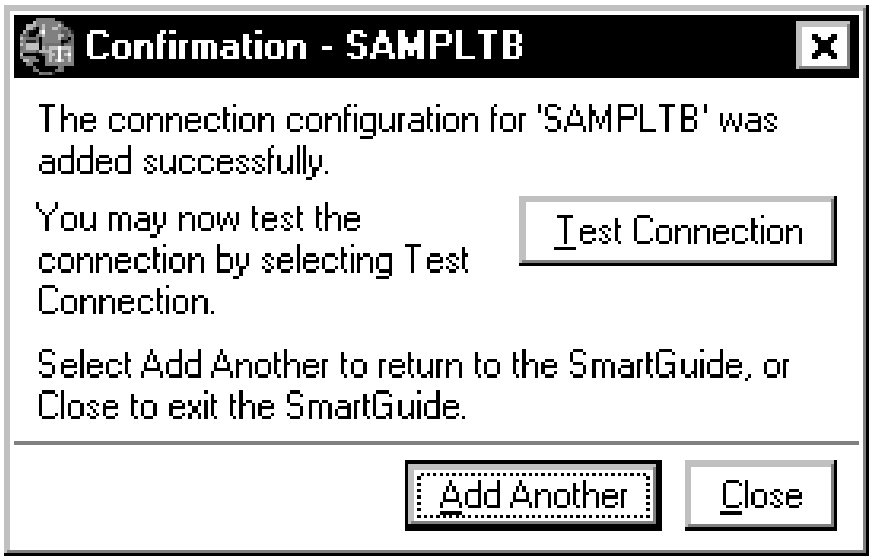


Figure 308. Confirmation of Connection Configuration

- You should receive confirmation that the connection configuration was added successfully. At that time, you will also want to test the connection by clicking on the **Test Connection** box.

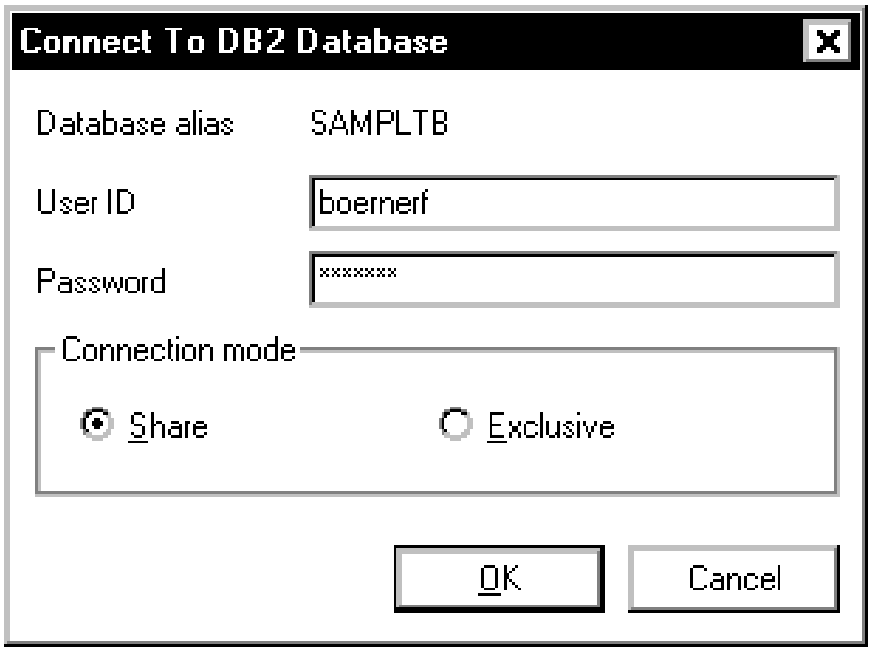


Figure 309. Connect to Database

- Connect to the DB2 database by filling in your user ID and password. Then click on **OK**.

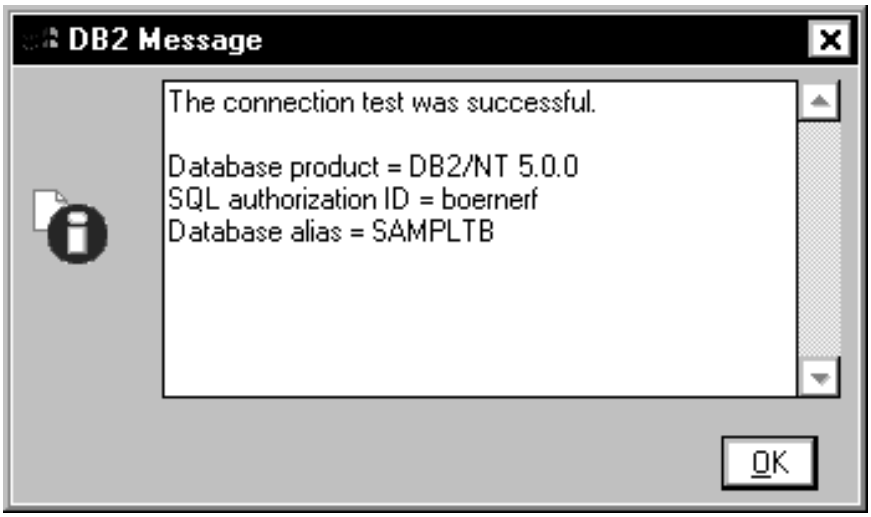


Figure 310. Successful DB2 Connection Message

- You should receive a test connection message. If the configuration was done correctly, you will receive confirmation.

4.3.2.2 Customizing Net.Data

Net.Data was installed and configured to connect and pull data from DB2 and display the requested data on your Web page. An executable named db2www.exe is called and by default searches the macro subdirectory for the macro that was defined in your Web page link. Once db2www.exe locates the macro, it will search for the specific block that you have requested. The block location in the macro that needs to be read is also defined in the Web page link at the Domino server. This is described in more detail throughout this section. Additional information about Net.Data can be found in the Net.Data documentation that is installed with the product.

The first thing that you need to do is make sure that Net.Data is installed and configured correctly. To do this, you need to ensure that the CGI-bin and HTML paths in Net.Data are pointing to the correct Domino CGI-BIN and HTML subdirectories (see 2.15, “Installing IBM Net.Data” on page 88).

When you installed Net.Data, you were asked to point to your correct CGI-BIN and HTML subdirectories (see Figure 126 on page 89). We were using Domino as our Webserver so we chose the directories shown in Figure 127 on page 90 and Figure 128 on page 90. Verify this by looking at the db2www.ini file in (drive):\notes\data\domino\html.

```
DTW_CM_PORT=7128
ENVIRONMENT (DTW_SQL)     C:\WINNT\System32\DTWSQL.DLL
ENVIRONMENT (DTW_SYB)     C:\WINNT\System32\DTWSYB.DLL
ENVIRONMENT (DTW_ODBC)    C:\WINNT\System32\DTWODBC.DLL
ENVIRONMENT (DTW_DEFAULT) C:\WINNT\System32\DTWFUNC.DLL
ENVIRONMENT (DTW_APPLET)  C:\WINNT\System32\DTWJAVA.DLL
ENVIRONMENT (DTW_REXX)    C:\WINNT\System32\DTWREXX.DLL
ENVIRONMENT (DTW_PERL)    C:\WINNT\System32\DTWPERL.DLL
ENVIRONMENT (DTW_SYSTEM)  C:\WINNT\System32\DTWSYS.DLL
ENVIRONMENT (DTW_FILE)    C:\WINNT\System32\DTWFFI.DLL
ENVIRONMENT (DTW_WEBREG)  C:\WINNT\System32\DTWREG.DLL
ENVIRONMENT (DTW_JAVAPPS)
ENVIRONMENT (DTW_DLDPB)                     DTWDLDPB
ENVIRONMENT (USR_TEST)                      DTWTEST
MACRO_PATH     C:\DB2WWW\Macro
BIND_FILE      c:\notes\data\domino\cgi-bin\d2wsql.bnd
HTML_PATH      c:\notes\data\domino\html
INCLUDE_PATH   C:\DB2WWW\Macro
EXEC_PATH      C:\DB2WWW\Macro
```

Figure 311. Net.Data Environment

This is the db2www.ini file as it appeared on our machine. As you can see, the BIND_FILE is pointing to the domino\cgi-bin directory and the HTML_PATH is pointing to the domino\html directory. The BIND_FILE variable points to the location of the db2www.exe program which is called by Net.Data. The HTML_PATH is the location of the html documents that are used by Domino.

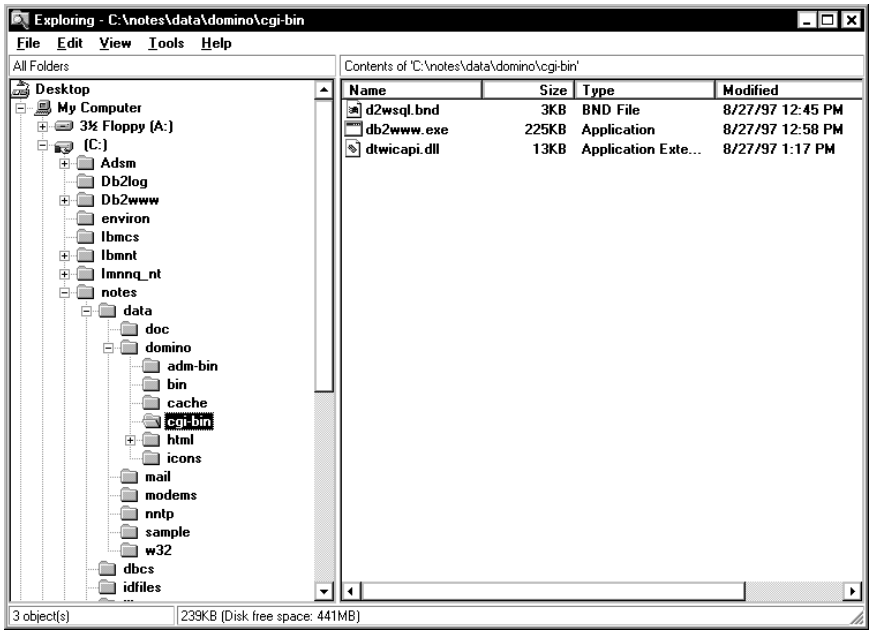


Figure 312. Exploring cgi-bin

Now we need to create a macro for db2www.exe to use to access the database and pull the appropriate information from the tables chosen. The file should go into your macro subdirectory chosen in Figure 125 on page 89.

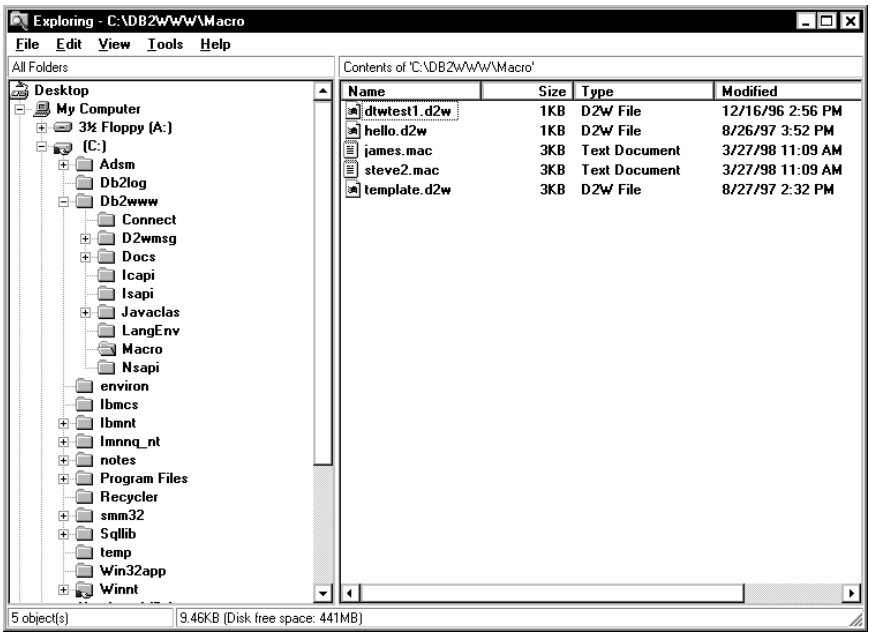


Figure 313. Exploring Macro

Use your favorite editor to create the new macro file in this directory ((drive):\DB2WWW\Macro).

The following list includes steps to create a macro for db2www.exe to read:

1. Decide what language you want to write your macro in. This choice is based on what language environment is available to you and what built-in functions you want to use. Your choice may include any one of the following:
   - Java applet
   - Perl
   - REXX
   - SQL
   - System language environment
   - Flat file interface built-in functions
   - Web registry built-in functions
2. Decide what types of queries you want to make.

Once you know what language you want to write your macro in and what database queries you want to make, you are ready to start writing your macro. Net.Data has several examples of macros. Its output is located in the online documentation. If you are new to Net.Data, it is a good idea to review these code samples. For our example we used template.d2w (which is located in drive d:\db2www\Macro). As a starting point, edit template.d2w and save it as Steve2.mac (or a name that is meaningful to you). See the following window:

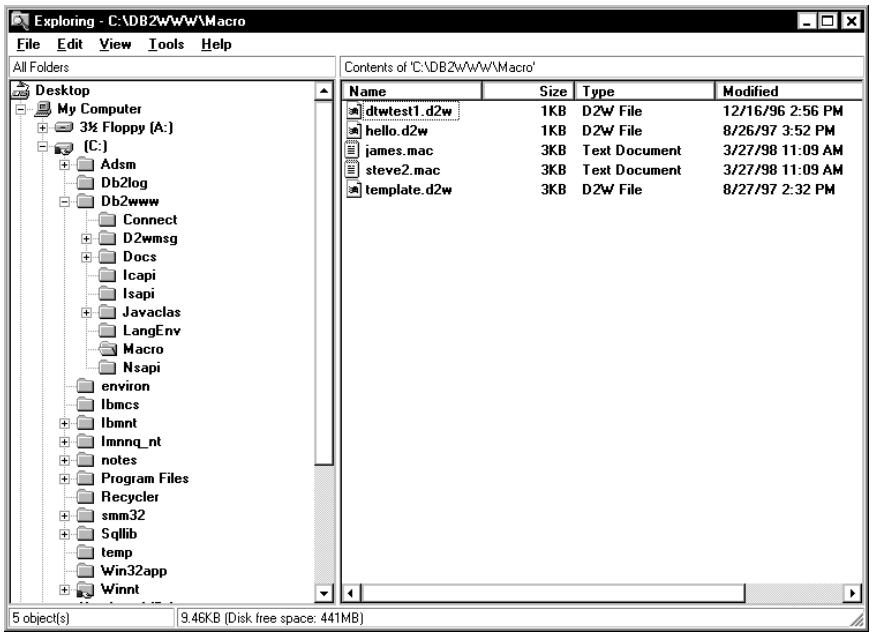


Figure 314. Exploring - Macro

When you begin to write your macro, remember that it is structured with three different types of blocks which include:

1. Define block.
2. Function block.
3. HTML block.

Net.Data macro definitions

The define block contains definitions of variables that can be referenced in other blocks. These variables can be changed at any time and allow you to make global changes to the macro.

steve.mac

This macro defines the Tier-3a SAMPLE database query of the EMPLOYEE table.

The define block in steve2.mac is shown in the following figure.

```
***************************************************************************
Overview:

This file can be used as a template for creating Net.Data macro files to
DB2 data.  Please see the "Net.Data Application Developer's Guide" for
more information.

***************************************************************************
%}

%{
***************************************************************************
Define Section:

  Use this section to define variables (e.g. DATABASE) used in your
macro file.  At a minimum, the DATABASE variable must be defined.
***************************************************************************
%}

%DEFINE{
   DATABASE="sample"
   LOGIN="ntadmin"
   PASSWORD="password"
   SHOWSQL="YES"
   table1="EMPLOYEE"
   varname2="EMPNO"
   varname3="$(table1).FIRSTNME"
   varname4="$(table1).MIDINIT"
   varname5="$(table1).LASTNAME"
%}
```

Figure 315. steve2.mac - Define Block

The function block contains function definitions. The following figure shows the function block for our example steve2.mac.

```
***************************************************************************
Function query:

  Use this section to define SQL queries.  Each section can contain only
SQL command.  The SQL_MESSAGE sub-sections are optional.
***************************************************************************
%}

%FUNCTION(DTW_SQL) query1() {
   select * from $(table1) where $(varname5) LIKE '$(Search1)%'
%}

%{
```

Figure 316. steve2.mac - Function Block

The HTML block contains familiar HTML tags, which make writing Web macros easy. Most macros have two HTML blocks. steve2.mac has two HTML blocks named INPUT and REPORT.

```
************************************************************************
INPUT Section:

  Use this section to specify the page (in HTML) to be used to collect
information from the user to be used in the query.  Note how the value o
ACTION specifies the report section of this macro file.  When the
user selects the "Submit Query" button, the REPORT section specified
below will be processed.
************************************************************************
%}

%HTML(INPUT){
<HTML>
<TITLE>Title Goes Here</TITLE>
<H1>Search for Employee Last Name on NTSRV48</H1>
<p>
This query displays data from the employee table.
<hr>
<FORM METHOD="POST"
ACTION="/cgi-bin/db2www.exe/steve2.mac/report">
Enter the search data below...
<p>
Search Criterion1: <INPUT TYPE="text" NAME="Search1" VALUE="A" SIZE=10>
<hr>
<INPUT TYPE="submit" VALUE="Submit Query"> <INPUT TYPE="reset" VALUE="Reset">
</FORM>
</HTML>
%}

%{
```

Figure 317. steve2.mac - HTML Block-Named Input

```
************************************************************************
REPORT Section:

  Use this section to specify the page (in HTML) to be seen after the
SQL queries are executed.  Usually, this page provides some header and
footer information and executes the SQL statements in between.
************************************************************************
%}

%HTML(REPORT){
<HTML>
<TITLE>Report Title Goes Here</TITLE>
<P>
Here are the results of the first query:
<P>
@query1()

</HTML>
%}
```

Figure 318. steve2.mac - HTML Block-Named Report

james.mac This macro defines the Tier-3b SAMPLE database query for the ORG table.

```
*************************************************************************
Overview:

This file can be used as a template for creating Net.Data macro files to
DB2 data.  Please see the "Net.Data Application Developer's Guide" for
more information.

*************************************************************************
%}

%{
*************************************************************************
Define Section:

  Use this section to define variables (e.g. DATABASE) used in your
macro file.  At a minimum, the DATABASE variable must be defined.
*************************************************************************
%}

%DEFINE{
   DATABASE="SAMPLTB"
   LOGIN="boernerf"
   PASSWORD="sw1530r"
   SHOWSQL="YES"
   table1="ORG"E"
   varname2="EMPNO"
   varname3="$(table1).DEPTNUMB"
   varname4="$(table1).DEPTNAME"
   varname5="$(table1).MANAGER"
%}
```

Figure 319. james.mac - Define Block

The function block contains function definitions. The following figure shows the function block for our example james.mac.

```
*************************************************************************
Function query:

  Use this section to define SQL queries.  Each section can contain only
SQL command.  The SQL_MESSAGE sub-sections are optional.
*************************************************************************
%}

%FUNCTION(DTW_SQL) query1() {
   select * from $(table1) where $(varname4) LIKE '$(Search1)%'
%}

%{
```

Figure 320. james.mac - Function Block

The HTML block contains familiar HTML tags, that make writing Web macros easy. Most macros have two HTML blocks. james.mac has two HTML blocks named INPUT and REPORT.

```
************************************************************************
INPUT Section:

  Use this section to specify the page (in HTML) to be used to collect
information from the user to be used in the query.  Note how the value o
ACTION specifies the report section of this macro file.  When the
user selects the "Submit Query" button, the REPORT section specified
below will be processed.
************************************************************************
%}

%HTML(INPUT){
<HTML>
<TITLE>Title Goes Here</TITLE>
<H1>Search for Department name on NTSRV99</H1>H1>
<p>
This query displays data from the org table.able.
<hr>
<FORM METHOD="POST"
ACTION="/cgi-bin/db2www.exe/james.mac/report">>
Enter the search data below...
<p>
Search Criterion1: <INPUT TYPE="text" NAME="Search1" VALUE="A" SIZE=10>
<hr>
<INPUT TYPE="submit" VALUE="Submit Query"> <INPUT TYPE="reset" VALUE="Reset">
</FORM>
</HTML>
%}

%{
```

Figure 321. james.mac - HTML Block-Named Input

```
************************************************************************
REPORT Section:

  Use this section to specify the page (in HTML) to be seen after the
SQL queries are executed.  Usually, this page provides some header and
footer information and executes the SQL statements in between.
************************************************************************
%}

%HTML(REPORT){
<HTML>
<TITLE>Report Title Goes Here</TITLE>
<P>
Here are the results of the first query:
<P>
@query1()

</HTML>
%}
```

Figure 322. james.mac - HTML Block-Named Report

Setting up Net.Data is fairly simple. The following is a recap of what we did to get our Net.Data working:

1. Make sure that Net.Data is installed correctly. You can do this by verifying that db2www.exe is located in drive:\notes\data\domino.
2. Create a macro that db2www.exe will read. This consists of:
   - Choosing a language to write the macro in that best suites your needs and environment.

- Deciding what queries you want to perform against the UDB database.
- Making sure that you place your macro in the Macro subdirectory located in the DB2WWW directory.

For our example, we used template.d2w (the sample template included with Net.Data) as a starting point and from there we edited it and saved it as steve2.mac.

4.3.3 Tier-1 - SUITE114

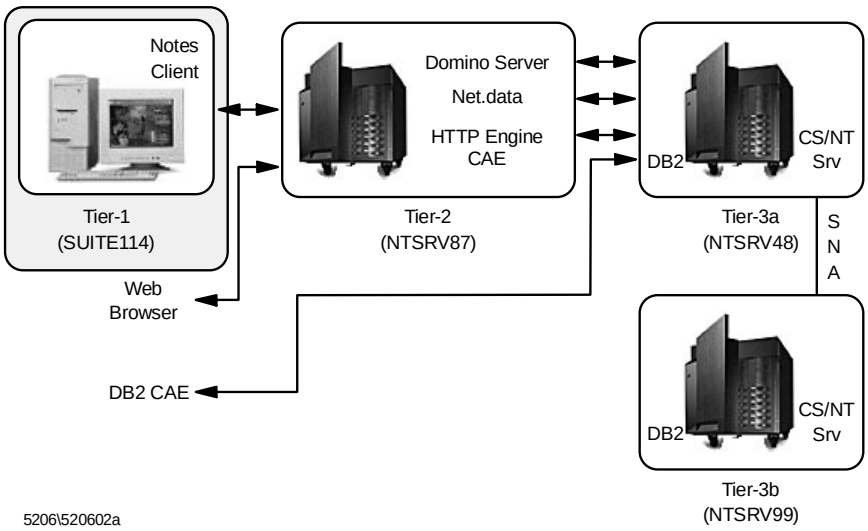


Figure 323. SUITE114 Customizing

We did our home page creation and customization on the client since that is where we had the browser.

4.3.3.1 Customizing Your Domino Default Home Page

In this section, we show how to create a simple home page for your Domino server. This home page can contain the links into the Domino server databases and the sample Database query program.

The Web page was created on the Tier-1 - SUITE114 which had Netscape Communicator 4.04 installed on it. Communicator has a built-in, easy-to-use Web page composer. The IBM Enterprise Suite for Windows NT package comes with Netscape Navigator not Communicator, but we installed Communicator so that we would have a simple tool to use to create our HTML pages.

1. Before you start, you should map a network drive to the drive on the Domino Server so you can store the Web page there. The directory on the server should be \NOTES\DATA\DOMINO\HTML.

   Note: Keep in mind the security implications of this. You should limit access to specific users and not the default access of Everyone.

2. Start Communicator from the desktop.
3. Click on **Communicator** and **Page Composer**.

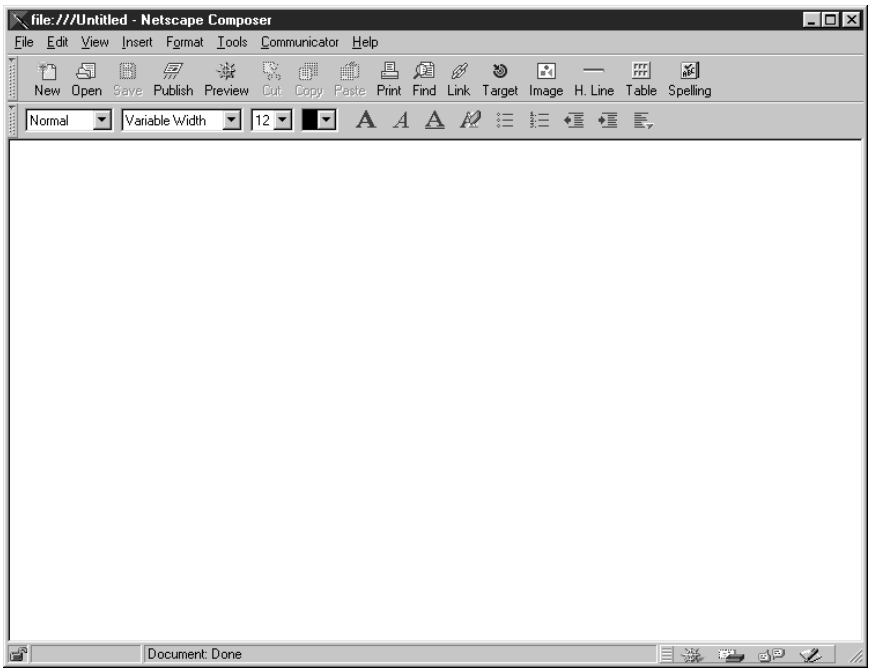


Figure 324. Netscape Composer

4. Type in the title for your Web page.

   For this example we used, `Welcome to the ITSO Domino NT Suites Server - NTSRV87`.

5. Use the text editing tools to make the font bigger and change the color for effect.

6. Skip two lines and type in `View Domino Server Contents`.

7. Skip two lines and type in `Query SAMPLTA (Sample) database on Tier-3a: Employee Table`.

8. Skip two lines and type in `Query SAMPLTB (Sample) database on Tier-3b: Org Table`.

   The following window shows the resulting Web page:

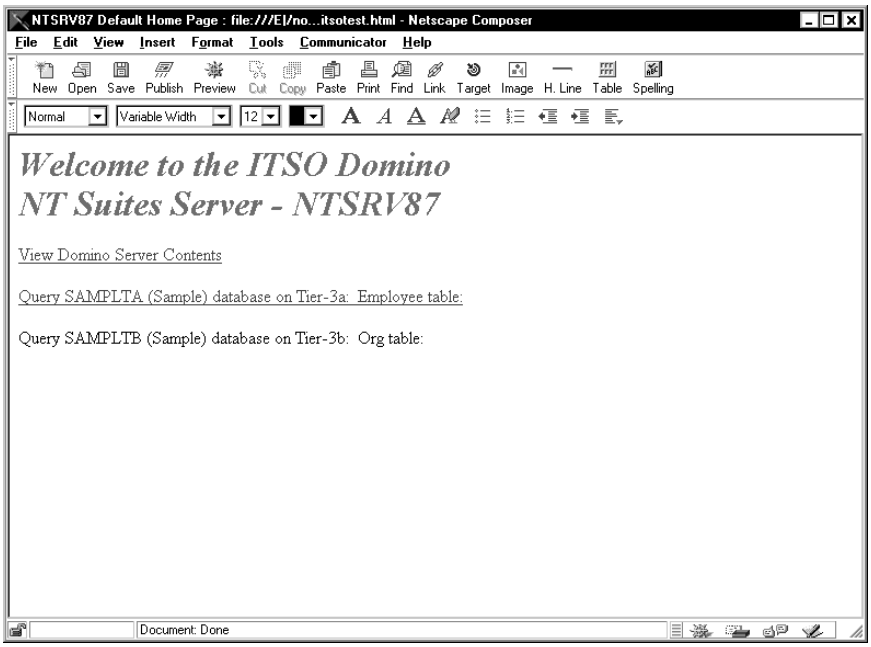


Figure 325. Sample Web Page Design

```
<HTML>
<HEAD>
   <META HTTP-EQUIV="Content-Type" CONTENT="text/html; charset=iso-8859-1">
   <META NAME="Author" CONTENT="Patrice Stanton">
   <META NAME="GENERATOR" CONTENT="Mozilla/4.04 [en] (WinNT; I) [Netscape]">
   <TITLE>NTSRV87 Default Home Page</TITLE>
</HEAD>
<BODY>
<B><I><FONT COLOR="#3333FF"><FONT SIZE=+3>Welcome
to the ITSO Domino</FONT></FONT></I></B>
<BR><B><I><FONT COLOR="#3333FF"><FONT SIZE=+3>NT Suites Server - NTSRV87</FONT></FONT></I></B>

<P><FONT COLOR="#3333FF"><A HREF="http://ntsrv87.itso.ral.ibm.com:8008/?Open">View
Domino Server Contents</A></FONT>

<P><A HREF="http://ntsrv87.itso.ral.ibm.com:8008/cgi-bin/db2www/steve2.mac/input">Query
SAMPLTA (Sample) database on Tier-3a:  <I>Employee Table</I></A><I><A
HREF="http://ntsrv87.itso.ral.ibm.com:8008/cgi-bin/db2www/
steve2.mac/input"></A></I>

<P><A HREF="http://ntsrv87.itso.ral.ibm.com:8008/cgi-bin/db2www/james.mac/input">Query
SAMPLTb (Sample) database on Tier-3b:  <I>Org Table</I></A>
</BODY>
</HTML>
```

Figure 326. HTML Source for ITSOTEST.HTML

9. Put the cursor on the **View Domino Server Contents** line and highlight the entire line.

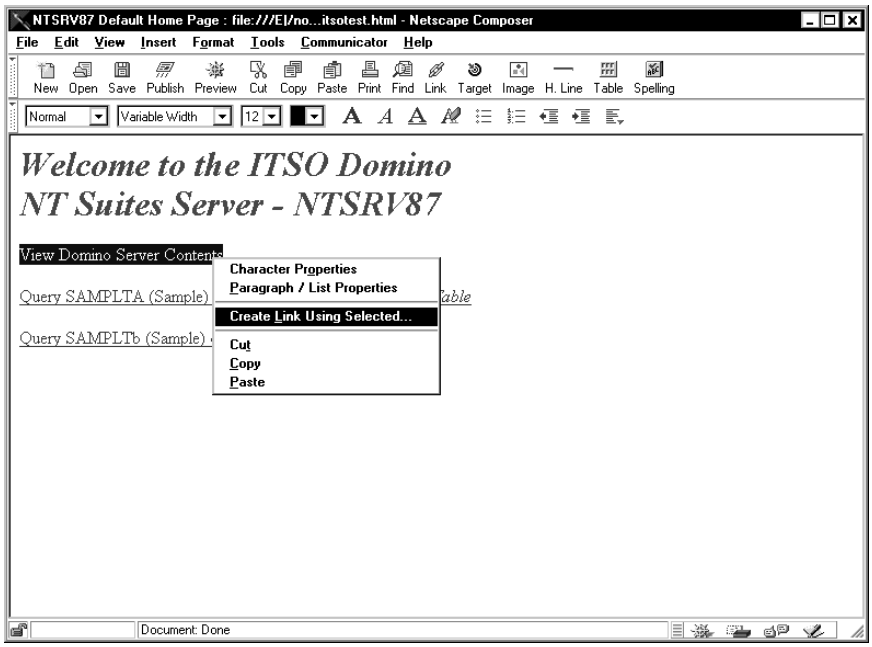


Figure 327. Creating a Link

10. Click on the right mouse button.
11. Select **Create Link Using Selected**.

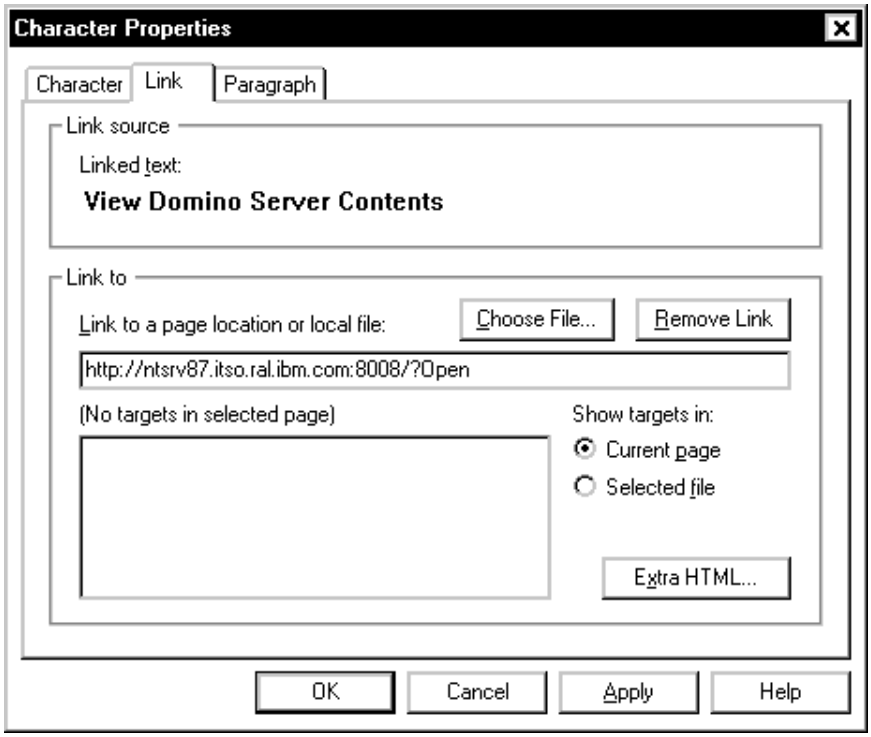


Figure 328. Highlighting Text for Link

12. In the Link to a page location or local file box, type in `http://ntsrv87.itso.ral.ibm.com:8008/?Open`.
13. Click on **OK**.

14. Put the cursor on the Query SAMPLTA (Sample) database on Tier-3a line and highlight the entire line.

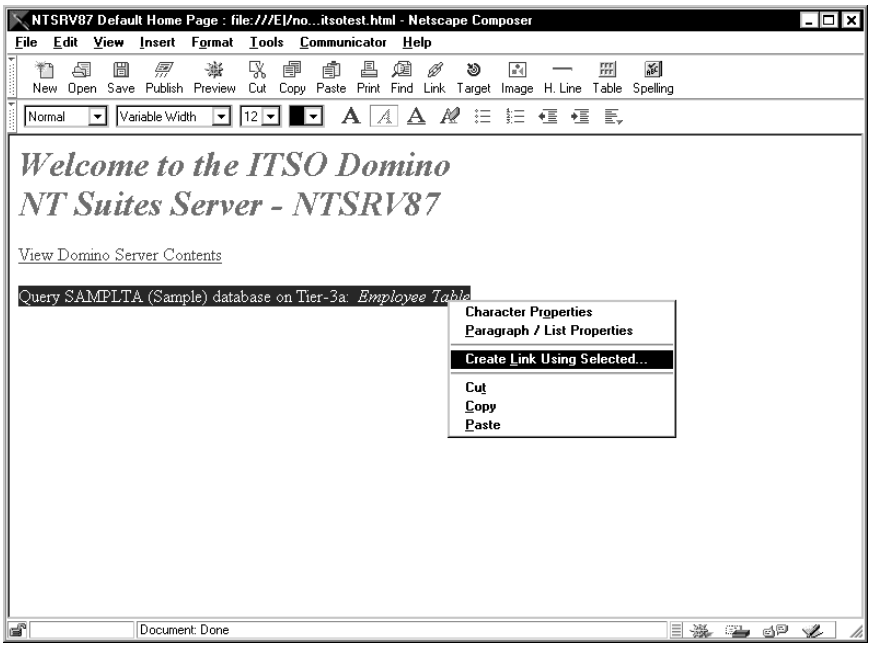


Figure 329. Highlighting Text for Link

15. Click on the right mouse button.
16. Click on **Create Link Using Selected**.

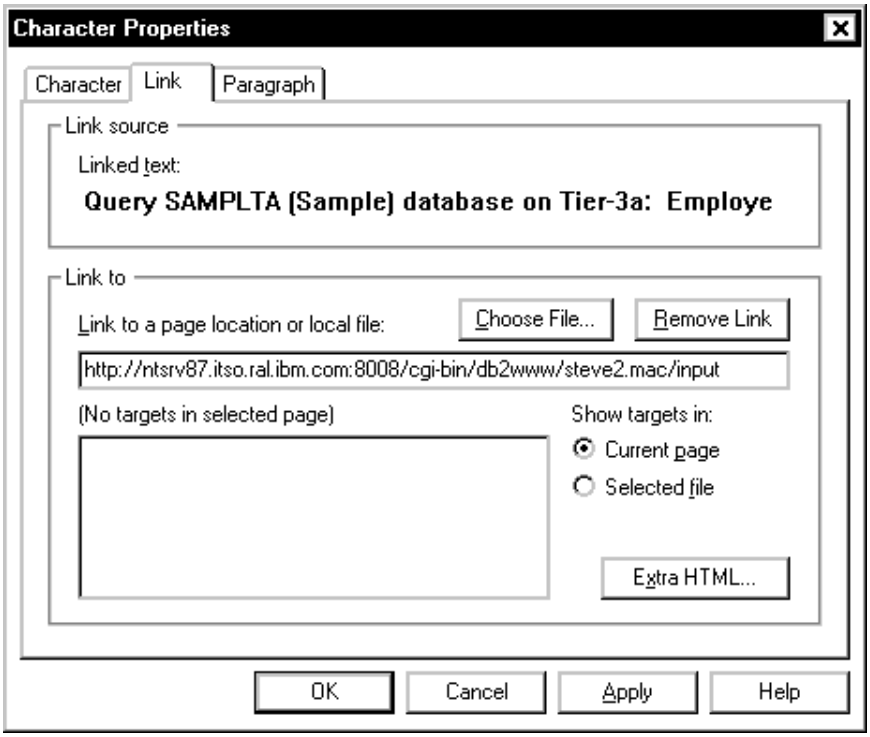


Figure 330. Link Creation Dialog Box

17. In the Link to a page location or local file box, type in `http://ntsrv87.itso.ral.ibm.com:8008/cgi-bin/db2www/steve2.mac /input`.
18. Click on **OK**.
19. Put the cursor on the Query SAMPLTB (Sample) database on Tier-3b line and highlight the entire line.

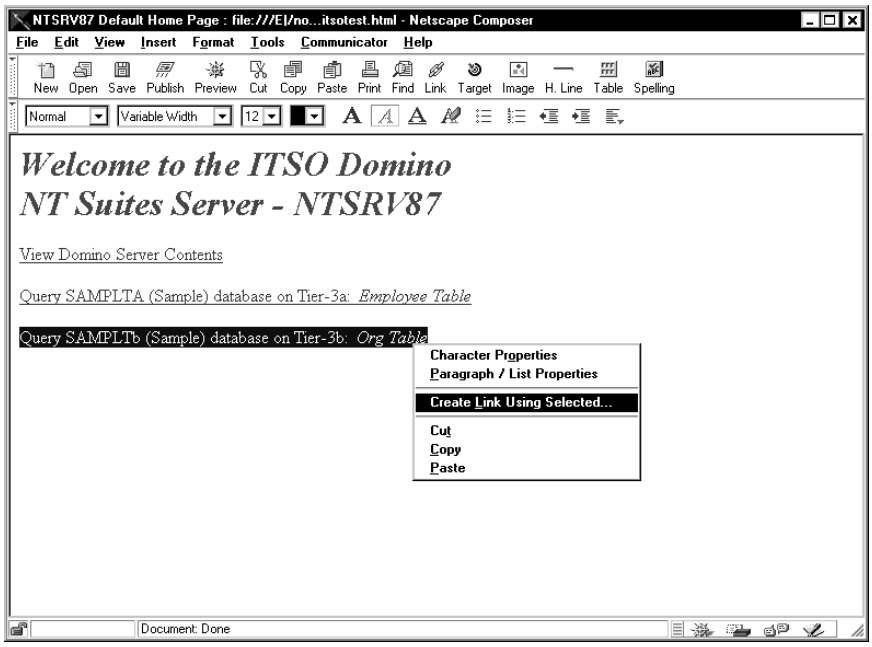


Figure 331. Highlighting Text for Link

20. Click on the right mouse button.
21. Click on **Create Link Using Selected**.

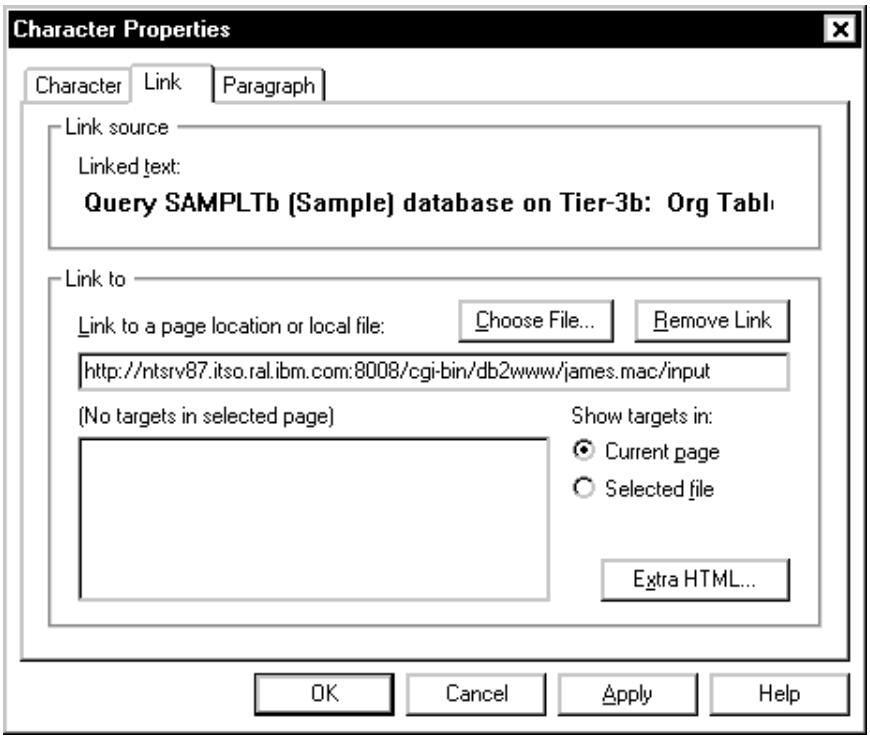


Figure 332. Link Creation Dialog Box

22. In the Link to a page location or local file box, type in
    `http://ntsrv87.itso.ral.ibm.com:8008/cgi-bin/db2www/james.mac /input`
23. Click on **OK**.

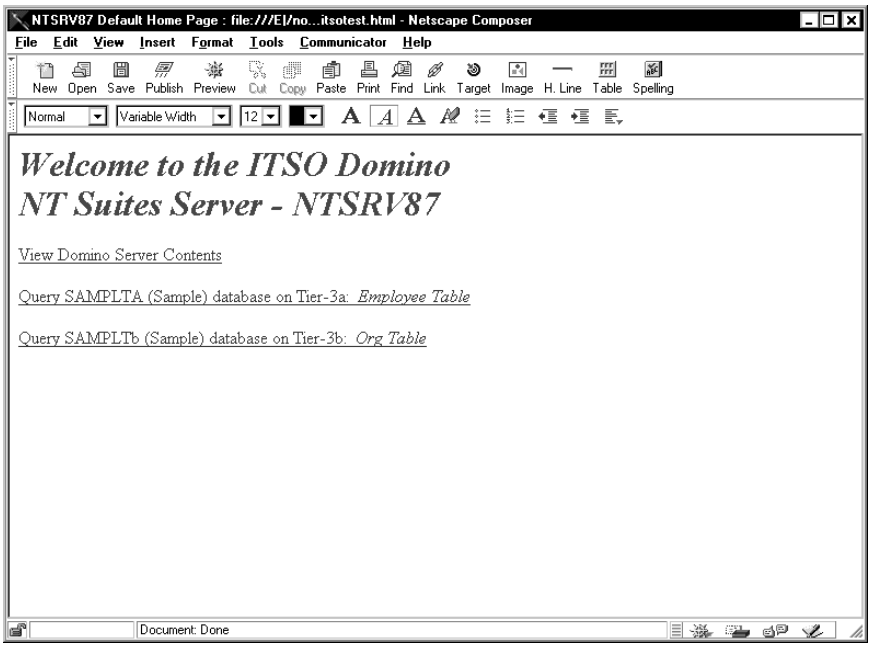


Figure 333. ITSOTEST Home Page

24. Click on the **Preview** icon on the menu bar.

    When you get the pop-up message that indicates you have to save the page locally before continuing, click on **Save**.

25. Click on **Save**.

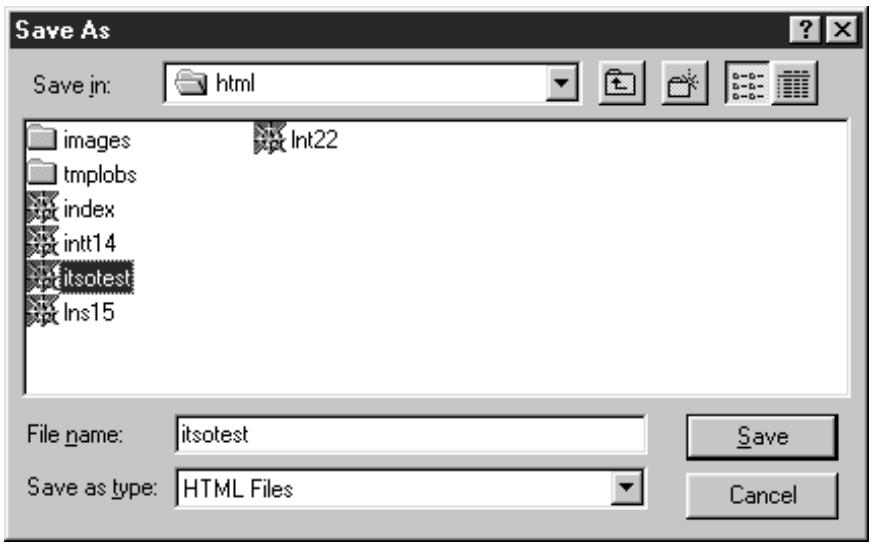


Figure 334. Save As Dialog Box

26. In the Save As box, go to the mapped network drive from Step 1 above: `\NOTES\DATA\DOMINO\HTML`
27. Enter the file name. We used `itsotest`. An HTML file type will automatically be appended.
28. Click on **Save**.
29. If you are prompted for a Page Title, enter the title and click on **OK**. We used `NTSRV87 Default Home Page`.
30. To test, close Composer which should bring you back to the Netscape Communicator window.

4.4 Validating the Scenario

We are now going to validate that from our Web browser we can access the Domino home page and query the SAMPLE databases on Tier-3a and Tier-3b.

Before beginning, make sure that:

- The Domino Server is started on Tier-2.
- DB2 is started on Tier-3a and Tier-3b.
- CS/NT is started on Tier-3a and Tier-3b and that there is a connection started.

On the SUITE114 client, start the Netscape Communicator.

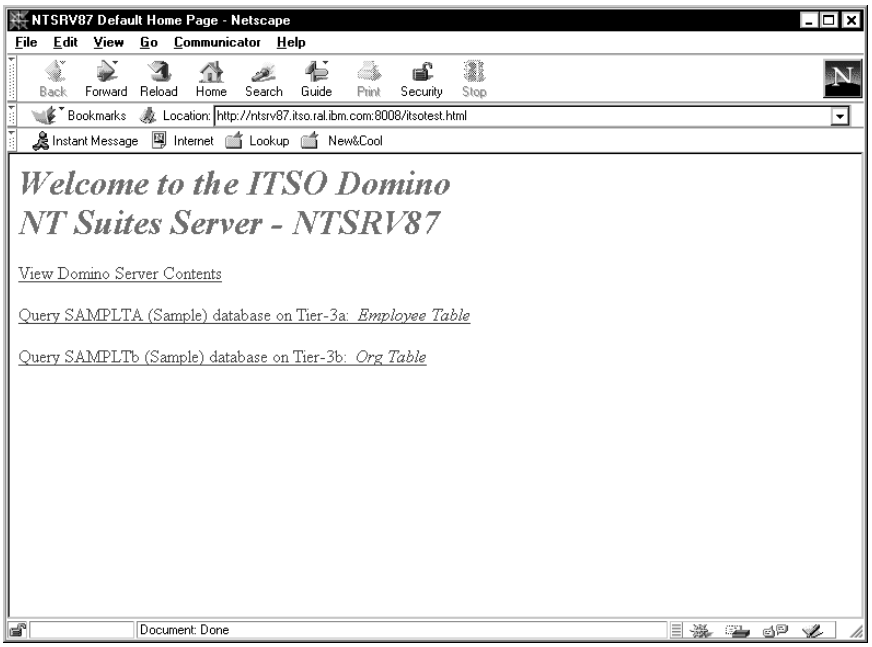


Figure 335. ITSOTEST Home Page

1. In the Location window, enter the URL for the Domino Server: `ntsrv87.itso.ral.ibm.com:8008/itsotest.html`

   Note: You do not have to put in the leading http://.

2. You should see the Web page you created come up.
3. Click on **View Domino Server Contents**.

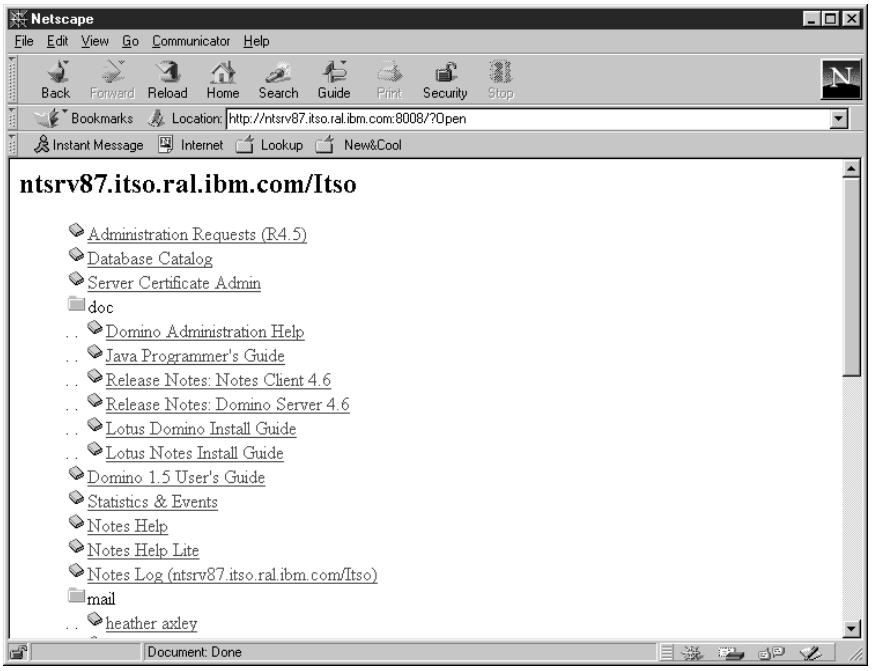


Figure 336. Domino Server Home Database View

4. You should see the server view of databases.
5. Click on the **Back** arrow.

6. Click on **Query SAMPLTA (Sample) database...**.
7. You should see the Search for Employee Last Name dialog.

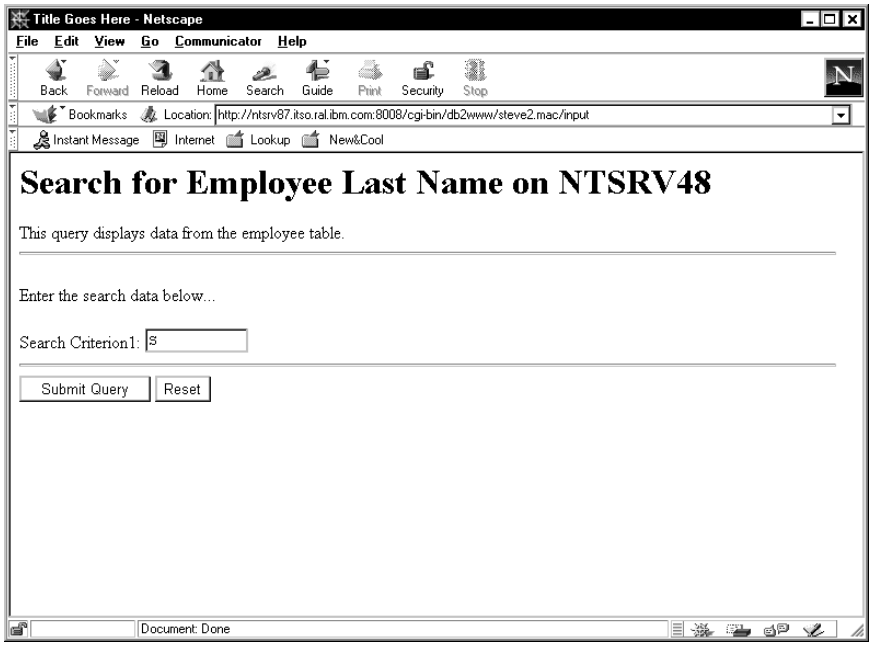


Figure 337. Tier-3a Query Input

8. Enter a single letter in the Search Criterion box: `S`.

   Note: This is case-sensitive.
9. Click on **Submit Query**.
10. You will see the results screen from your query.

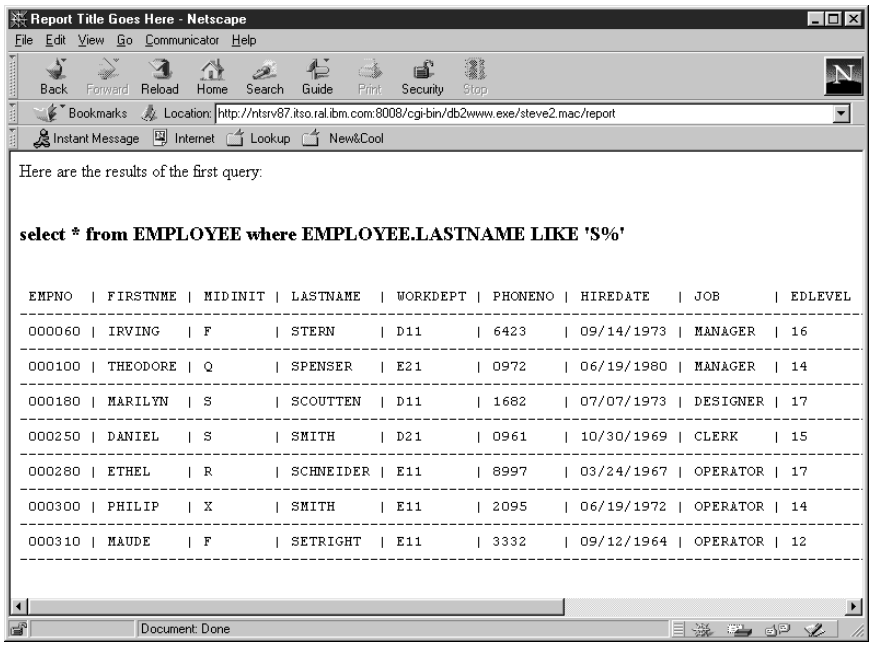


Figure 338. Tier-3a Database Query Results

11. Click on the **Home** icon at the top of the Netscape window to return to the NTSRV87 home page.
12. Click on **Query SAMPLTB (Sample) database**.
13. You should see the Search for Department name dialog.

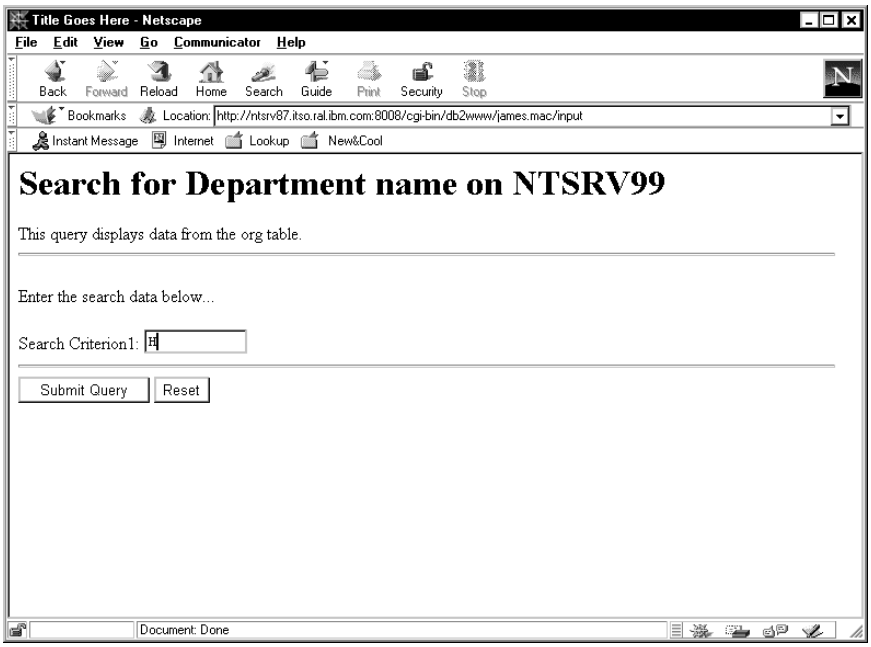


Figure 339. Tier-3b Query Input

14. Enter a single letter in the Search Criterion box: `H`.

    Note: This is case-sensitive.
15. Click on **Submit Query**.
16. You will see the results screen from your query. This completes the validation.

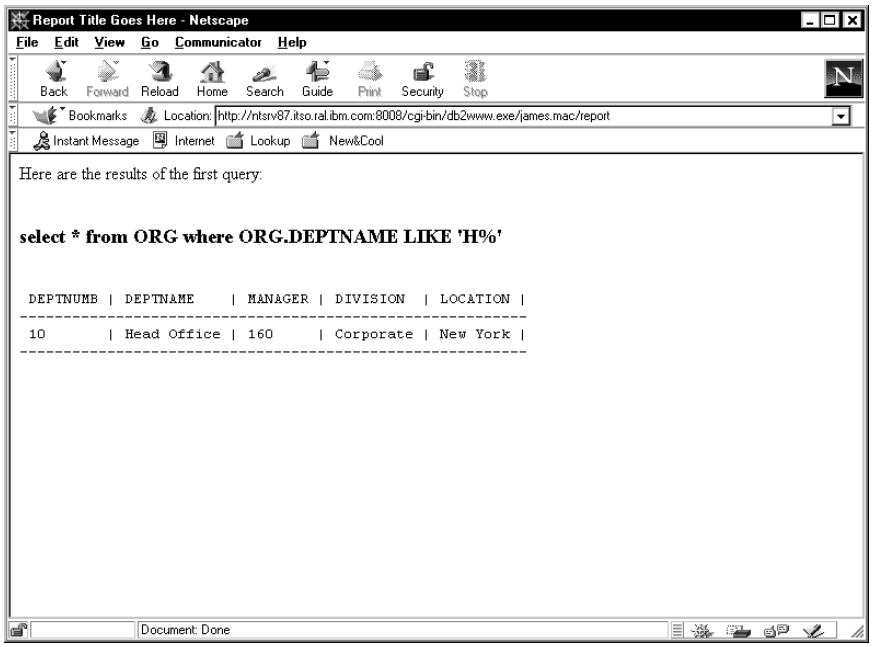


Figure 340. DB2 Database Query Results

Chapter 5. Integration Scenario - Transactions

In this scenario we demonstrate how IBM Enterprise Suite for Windows NT can be used to implement browser-initiated transaction server transactions and access a back-end DB2 database.

A browser-initiated transaction would flow from the client to a CICS Internet Gateway, which then uses a CICS Client installed on the same system to connect to a CICS Server over TCP/IP. The CICS Server uses Communications Server to connect to a second CICS Server, DB2 and ADSM over an SNA link. The flow for that is shown in Figure 341.

The transaction we used here is called *Menu*. Menu is a sample application that is packaged with CICS to help you verify that the components were installed correctly. If you have used CICS on the S/390 platform you may have heard it called an initial verification program (IVP).

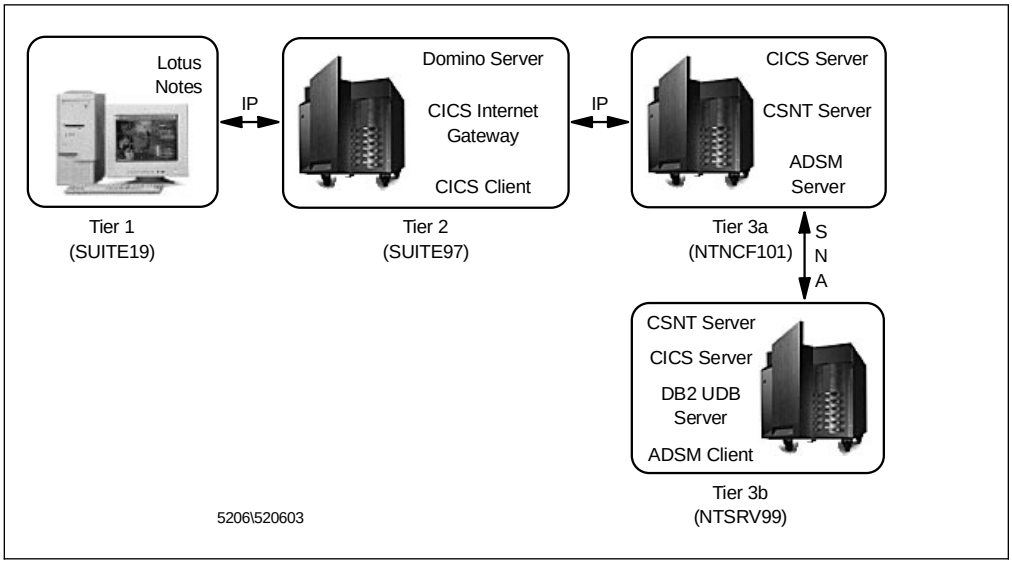


Figure 341. The Transaction Scenario Environment

In order to lay the ground work for the scenario it is important to understand what the environment is and what is installed on each system.

5.1 Configure Tier 1 - SUITE19

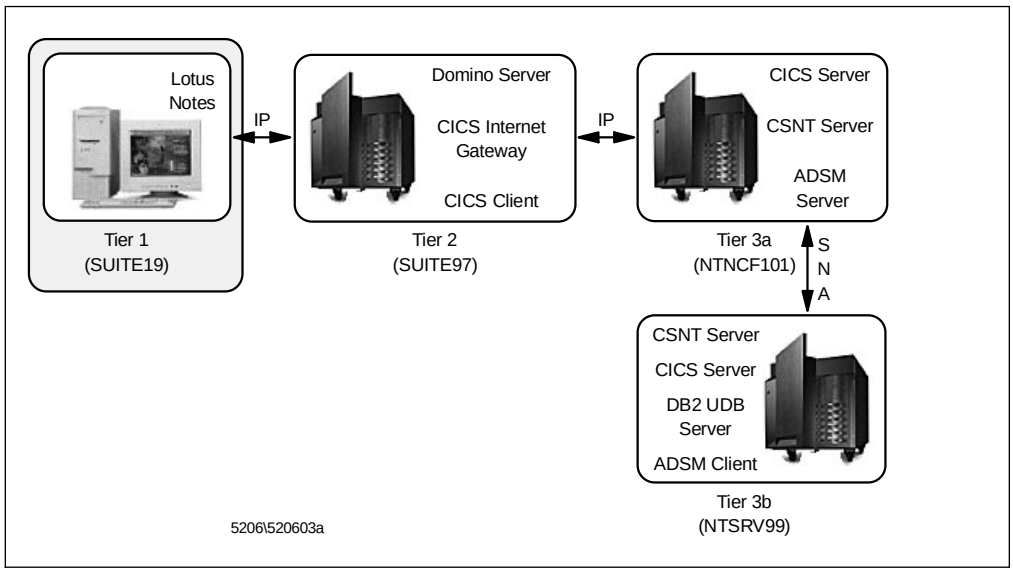


Figure 342. Configuring Tier 1

This machine (SUITE19) is the client machine and it has the following components installed on it:

- NT 4.0 Workstation with Serivce Pack 3
- Internet Explorer V4.01
- Netscape Navigator V4.04
- Lotus Notes Client V4.6.1

In this scenario this machine needs to function as a Web browser (client). On this machine we had the following Web browsers available to us:

- MS Internet Explorer 4.01
- Netscape Navigator 4.04
- Lotus Notes Web Browser 4.6.1

We decided to use the Lotus Notes Web browser. This browser is included and installed automatically with the Lotus Notes client. To use this integrated Web browser you need to perform some minor configuration changes to the Notes server as shown in 5.2.1, “Configuring the Notes Server” on page 251. In 5.1.1, “Installing the Notes Client” we focused on the installation and configuration of a typical Lotus Notes client.

5.1.1 Installing the Notes Client

After you start the installation procedure you get the following screen where you can choose the drive, directory and the install options:

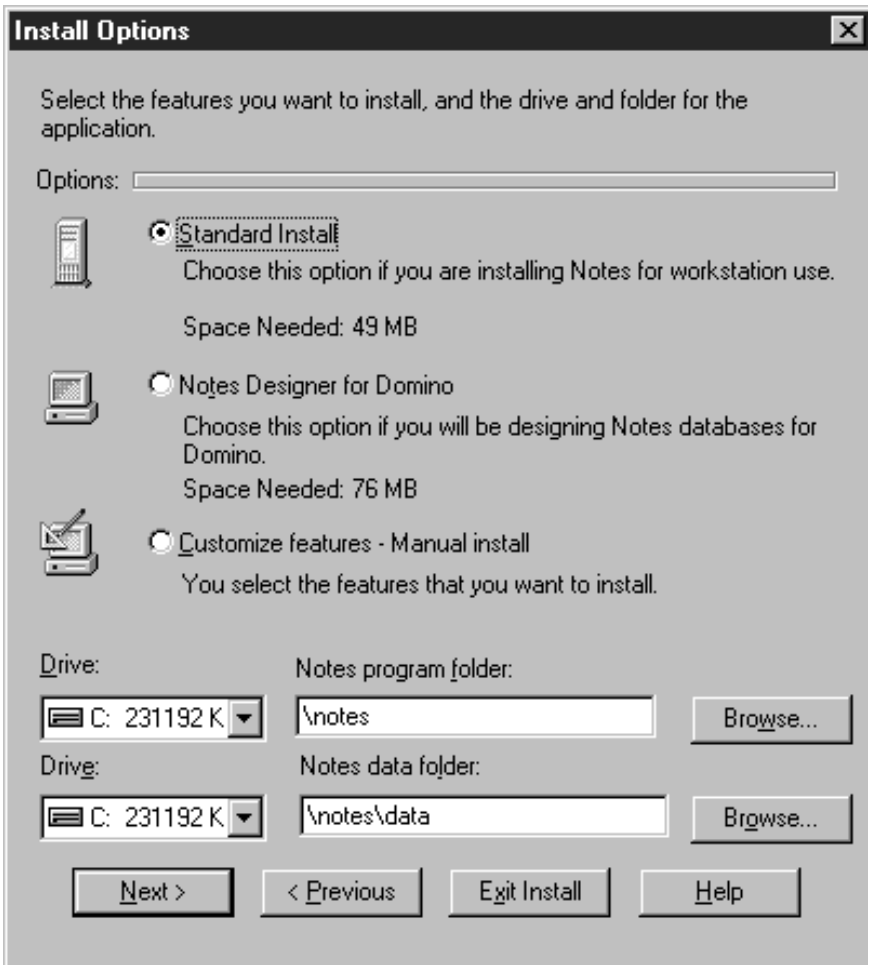


Figure 343. Install Options

We used Standard Install, which uses default values for most of the settings.

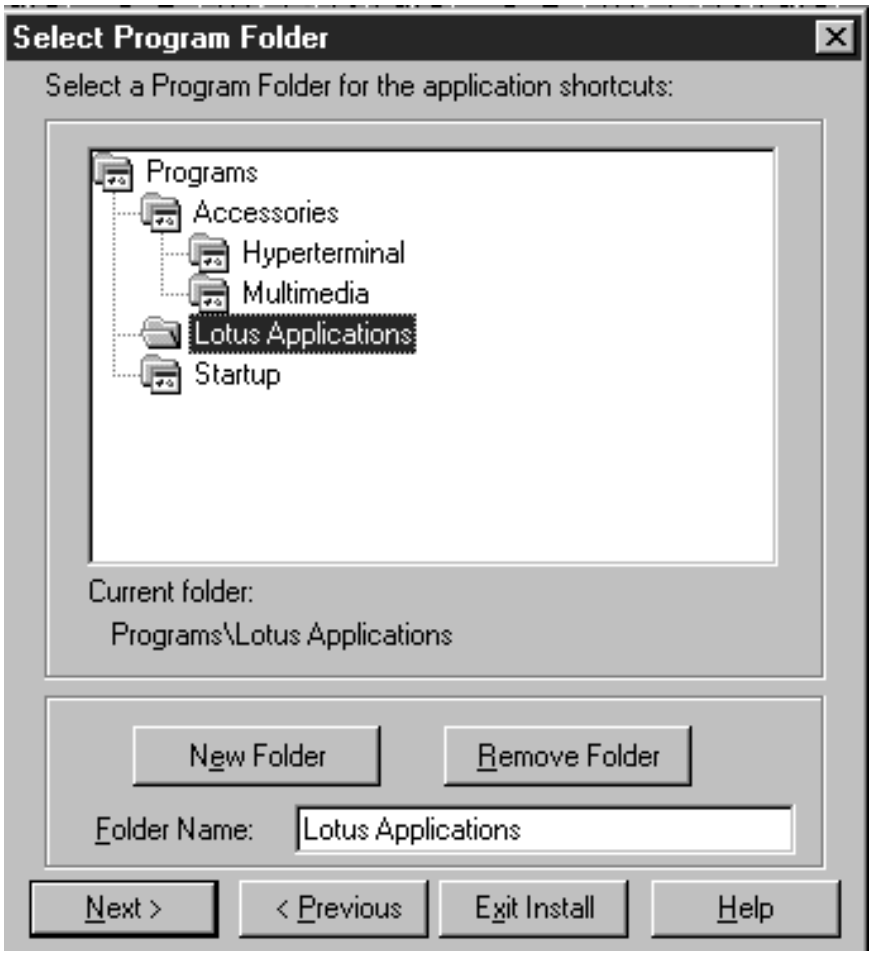


Figure 344. Select Program Folder

Select a program folder for Domino. When the installation is complete you can launch the Notes client. The next few steps show you how to configure the Notes client. To configure your Notes client, you only need the user.ID file and the server name. Copy the user.ID file into the directory c:\notes\data.

When you start Lotus Notes, you get the following screen:

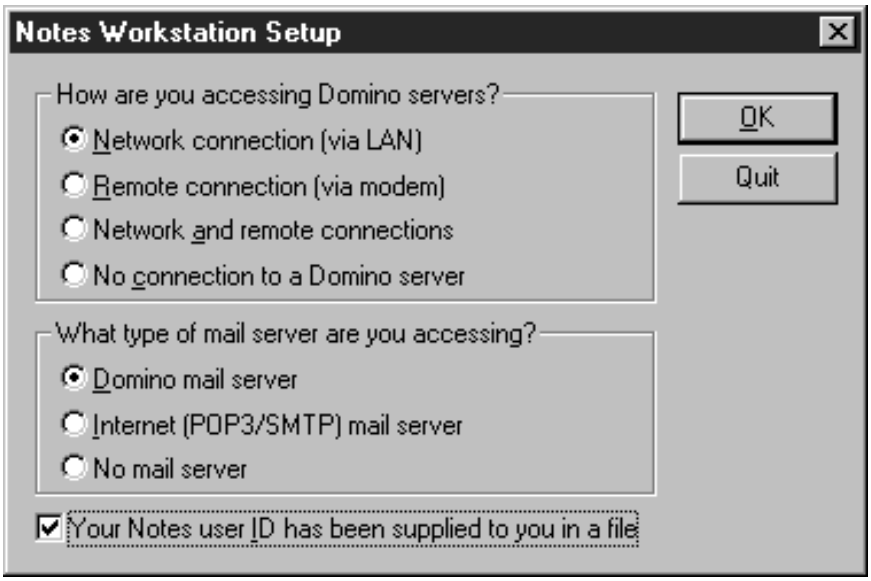


Figure 345. Notes Workstation Setup

Make sure that you click on the box at the bottom of the screen that indicates that you already have your ID file. Then, click on **OK**. In order for the Notes client workstation to access the Notes server a user ID needs to be created for each user. For an overview of how this is done refer to 4.2.2.3, “Registering Users” on page 172.

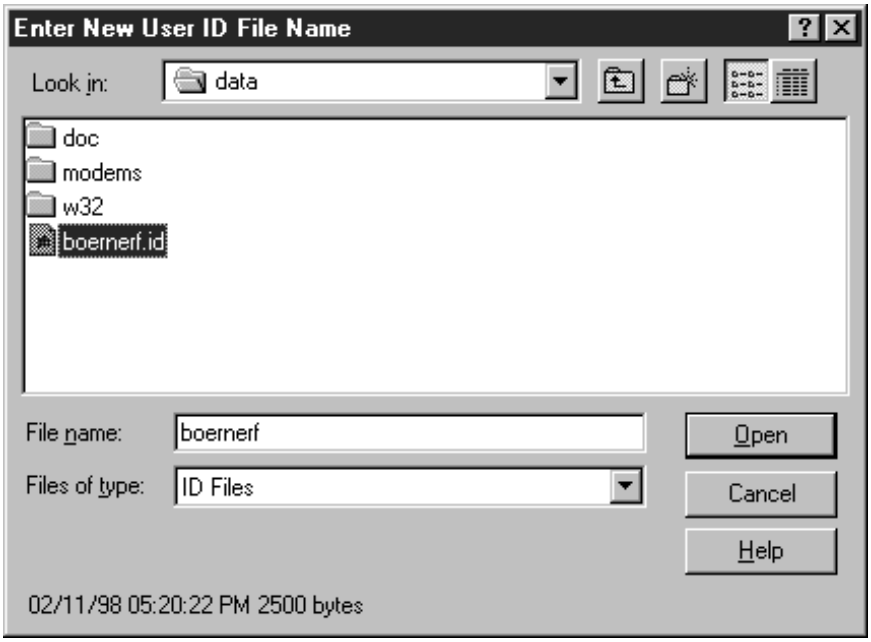


Figure 346. Choose ID File

Choose the ID file and enter the password for that ID file.

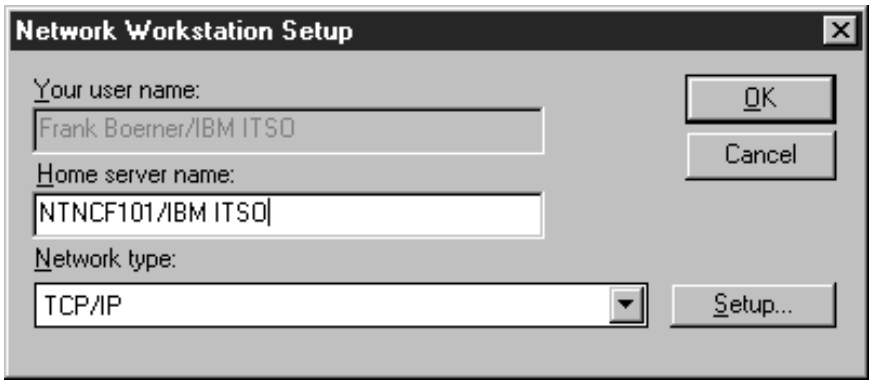


Figure 347. Network Workstation Setup

You need to type in the Home server name and click on **OK**.

The following two screens show you a sample of the Workspace and the Inbox.

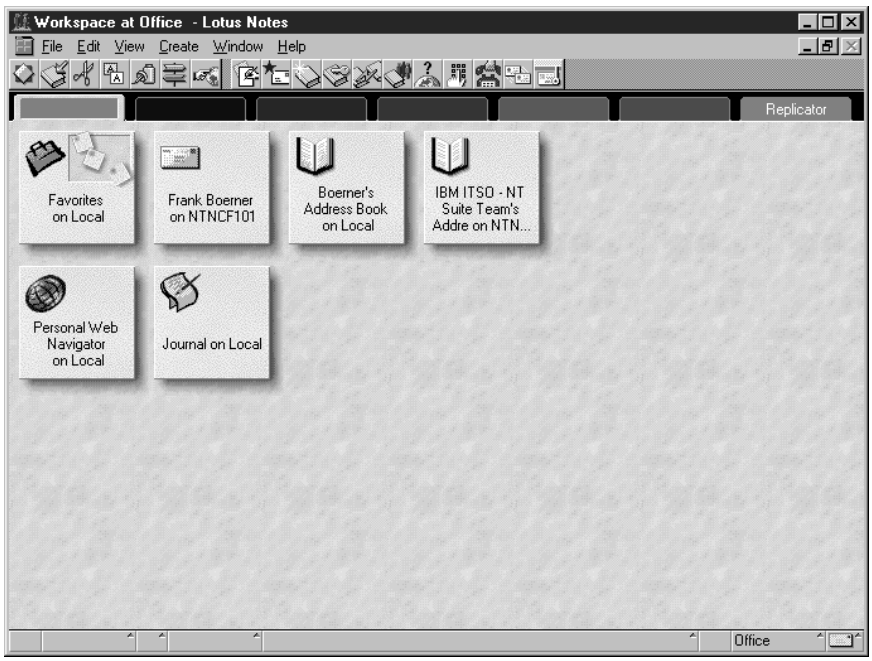


Figure 348. Default Workspace

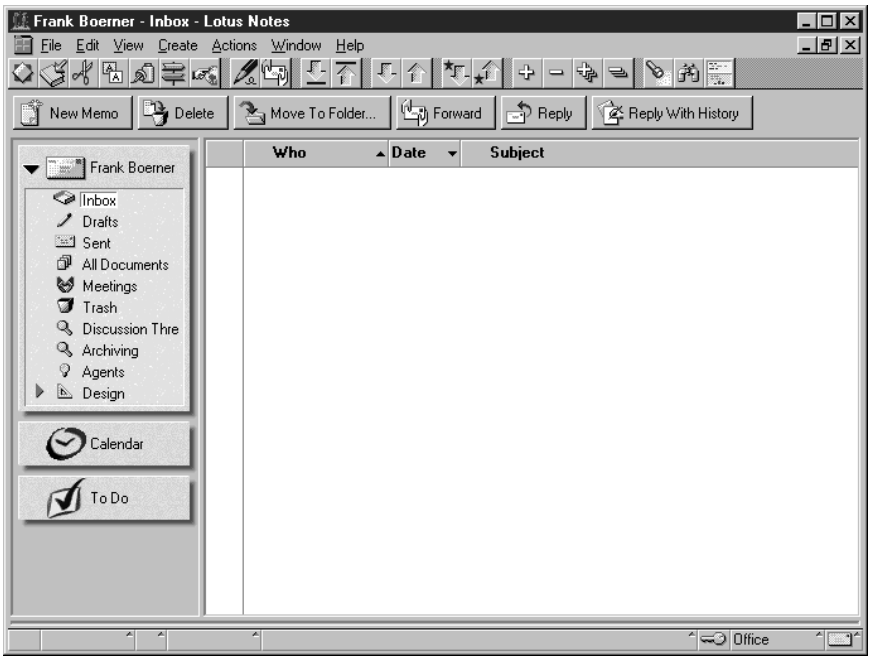


Figure 349. Inbox

To use the Notes client as a Web browser you need to change the configuration of your current location. Click on **File, Mobile,** and select **Edit Current Location**.

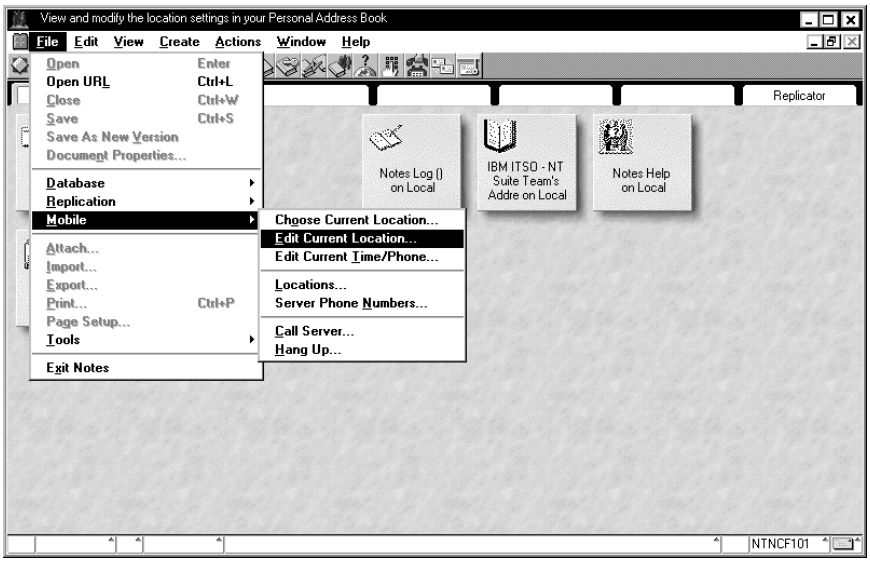


Figure 350. Edit Current Location

Here you have two fields to configure:

1. Web Proxy - Define your proxy servers URL and port number.
2. Internet Browser - Select which Web browser the Lotus Notes client should launch when Web access is required. We chose **Notes**.

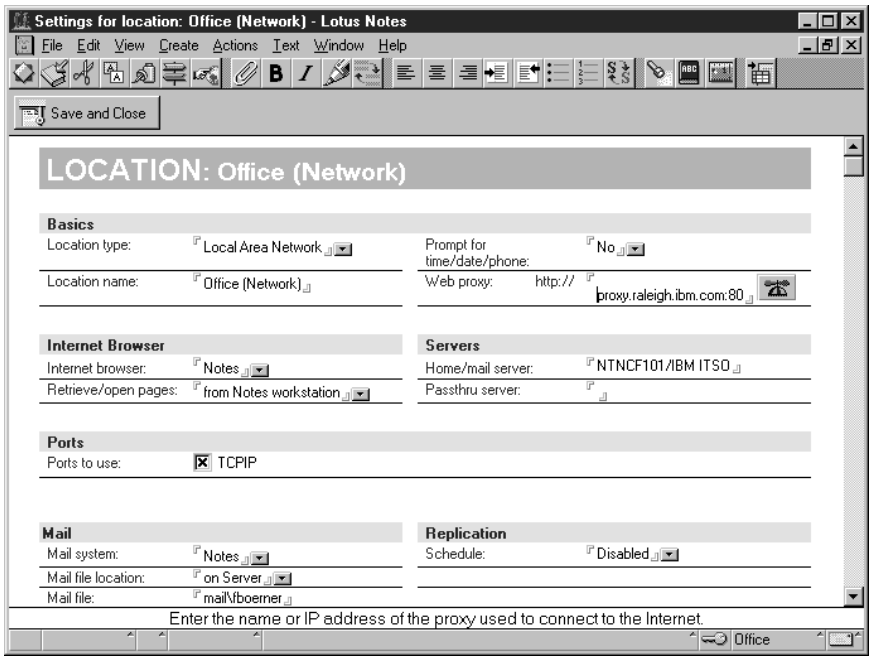


Figure 351. Configure Proxy

Click on **Save and Close** to save your configuration.

If you now open the Personal Web Navigator, you should have access to the Internet. The default home page is http://notes.net/welcome.nsf as you can see in the following figure. To open this home page, click on **File** and **Open URL**.

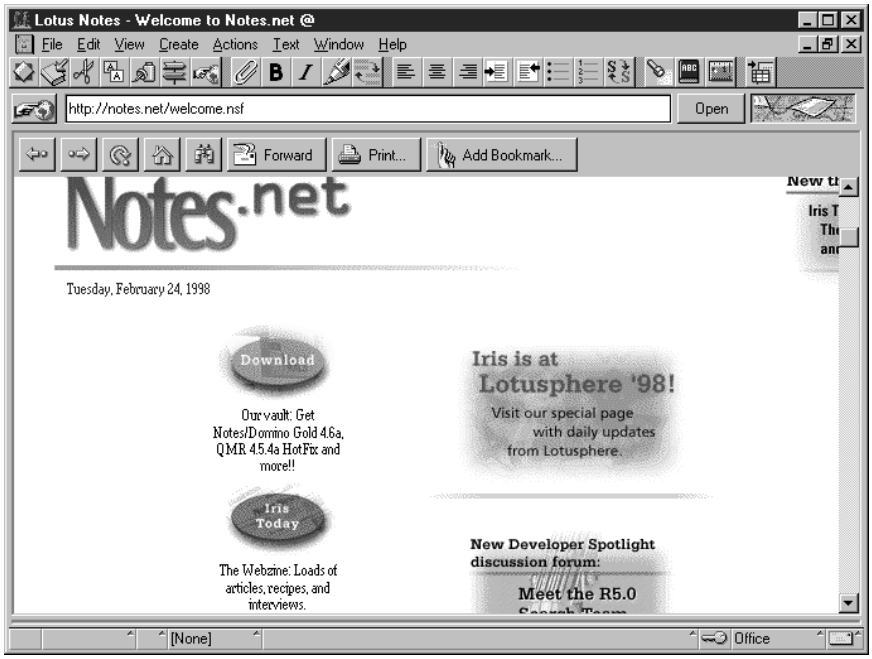


Figure 352. Lotus Notes Web Browser

5.2 Configure Tier 2 - SUITE97

The Tier 2 machine (SUITE97) provides the Webserver and CICS Internet Gateway functions for this scenario. It is connected to Tier 1 and 3 using TCP/IP.

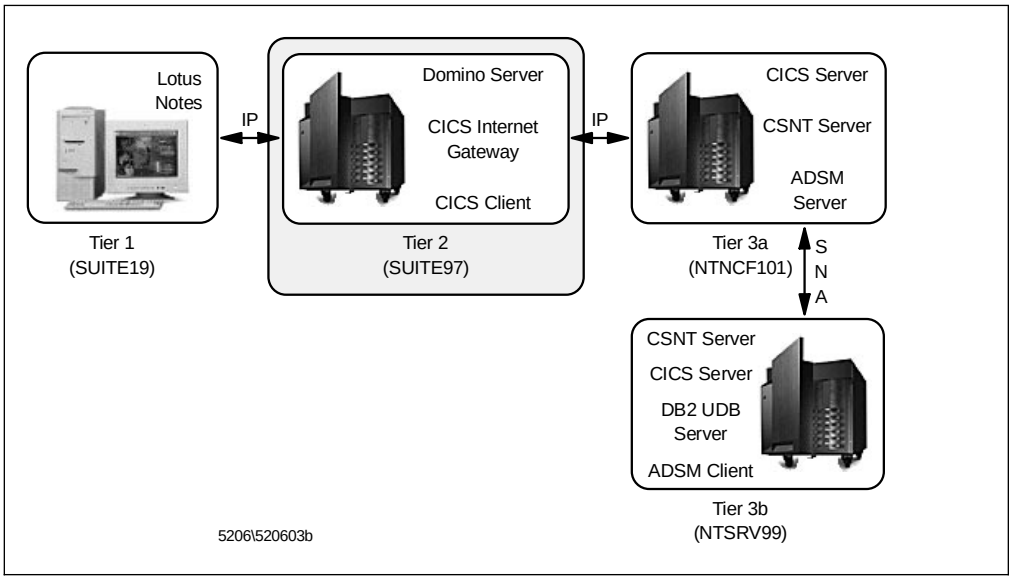


Figure 353. Configuring Tier 2

The software installed on the machine is:

- NT 4.0 Server
- Service Pack 3
- Internet Explorer V4.01
- Netscape Navigator V4.04
- IBM Communications Server V5.01
- Lotus Domino Server V4.6.1
- IBM CICS Client V2.03 (includes CICS Internet Gateway)
- IBM ADSM Client V3.1.1

When choosing a Webserver you need to consider whether it is supported by CICS or not. The CICS Internet Gateway supports:

- Lotus Domino Server
- IBM Internet Connection Server
- Lotus Domino Go Webserver
- Netscape Server

5.2.1 Configuring the Notes Server

This section shows you how to easily configure a Lotus Notes Domino server.

First, start the Notes client and click on **Lotus Notes**. You get the following screens:

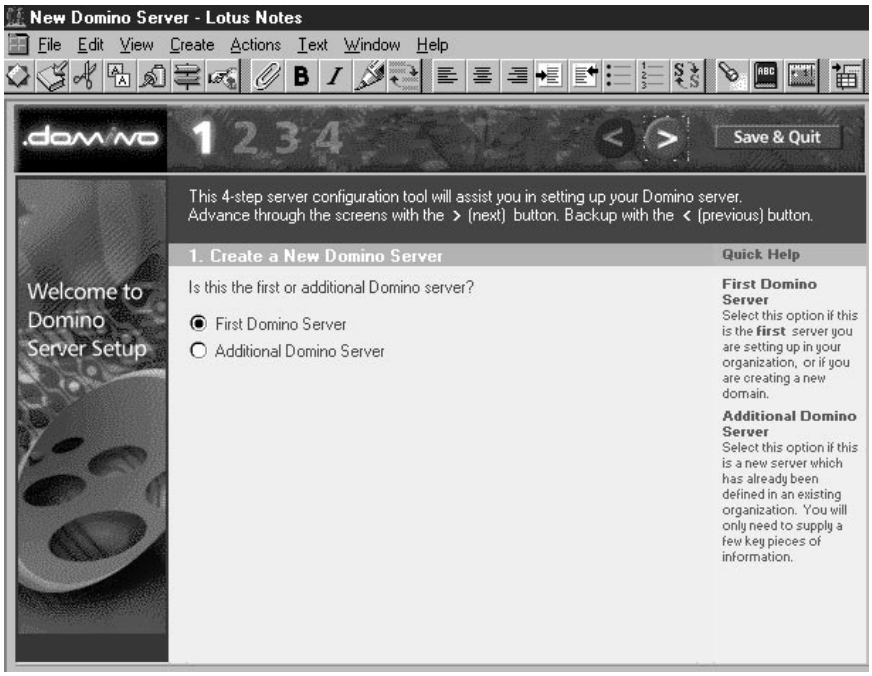


Figure 354. Configure Notes Domino Server - Step 1

If there are no other Notes servers running, choose **First Domino Server** and then click on **>** to go to the next screen.

Note: If there are other Notes Servers running, then you need to select the radio button **Additional Domino Server**. In order to set up an additional server you need to register it on the First Domino Server from Domino Server Administration, which can be accessed via **Start, Programs** and **Lotus Applications**.

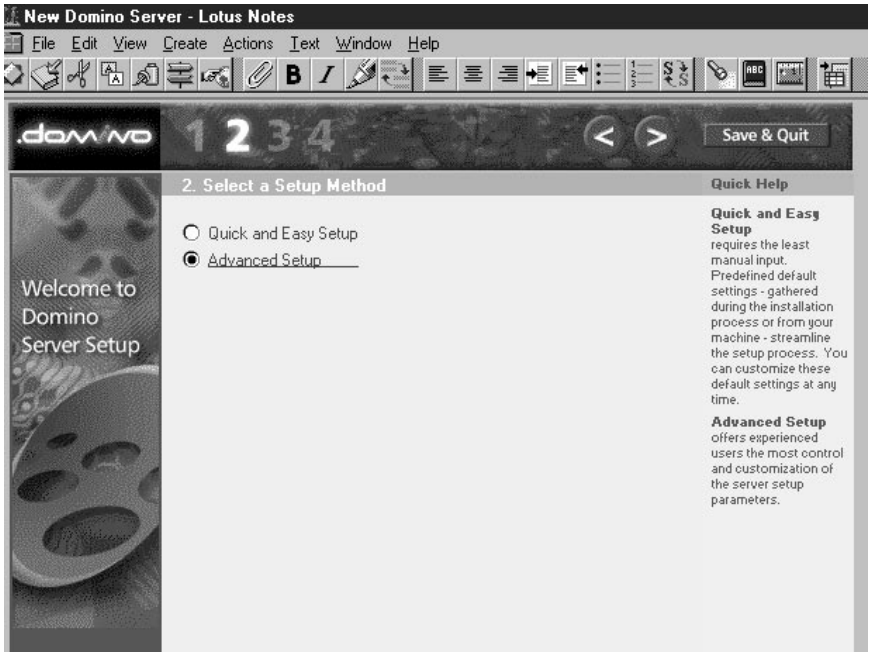


Figure 355. Configure Notes Domino Server - Step 2

On the second configuration screen you have two options, Quick and Easy, which use default settings or Advanced, which allows customization. Select **Advanced Setup** to see all of the possible choices for the configuration. Click on **>** to go to the next screen.

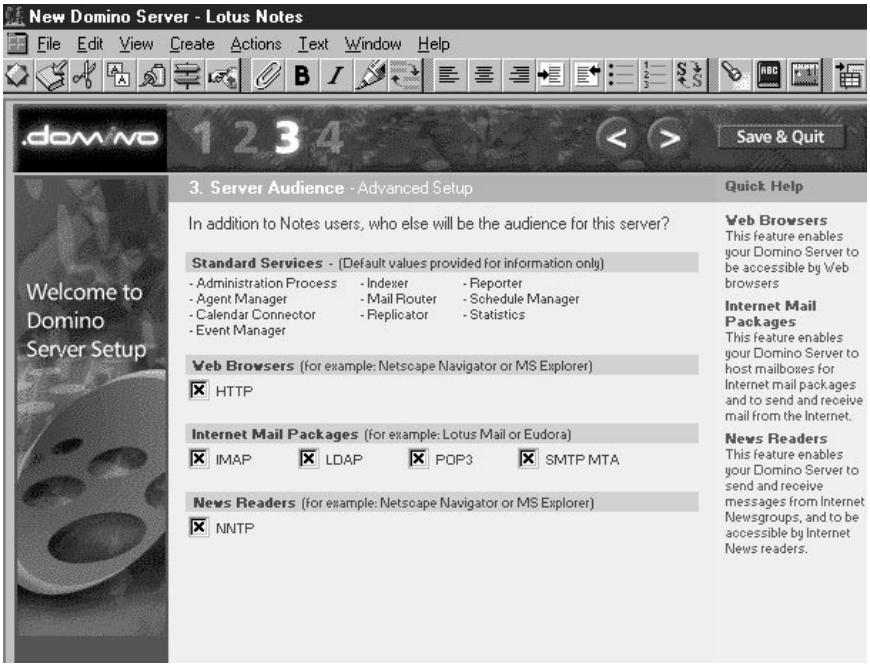


Figure 356. Configure Notes Domino Server - Step 3

Select the services that are required. If you are not sure about the services you need or need to add some at a later stage, you can do so by editing the server configuration from the Domino Server Administration program. Click on **>** to go to the next screen.

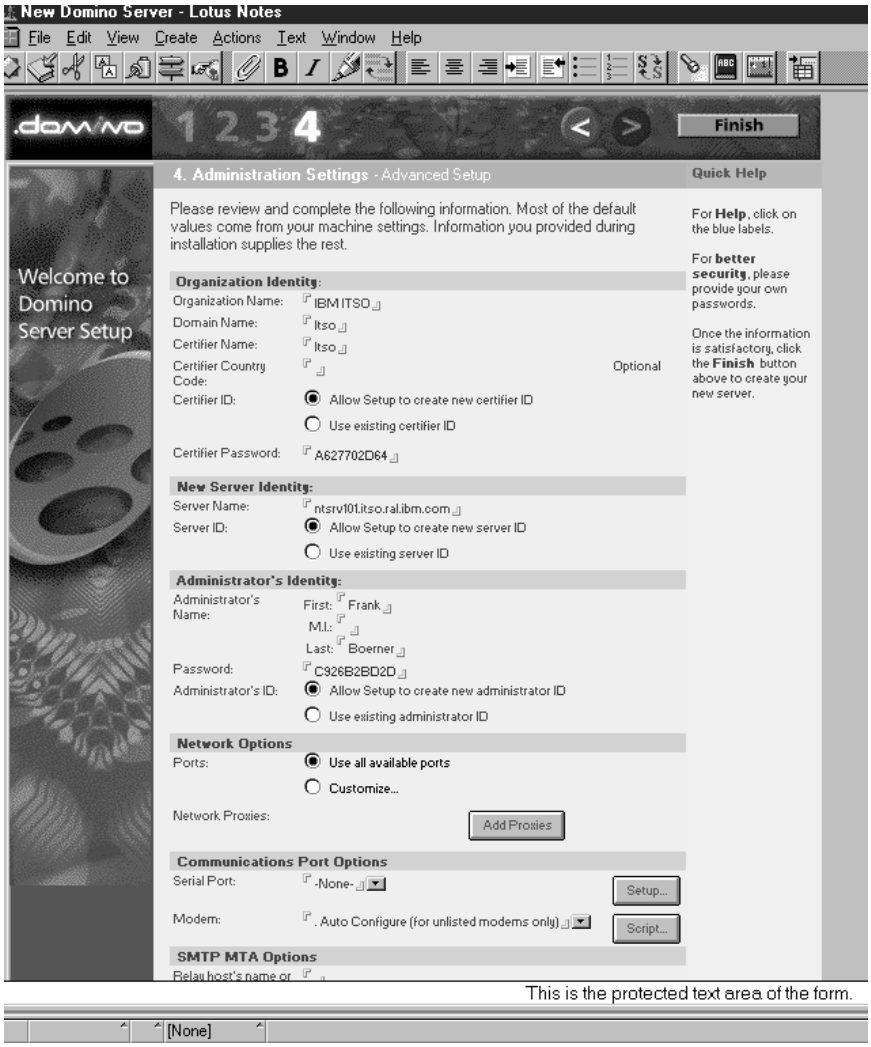


Figure 357. Configure Notes Domino Server - Step 4

Here you get two passwords, which you will need when you define additional IDs or attempt any administration task on the Notes servers. You have to remember the two passwords since you will need them later on to configure Domino.

If you use a proxy to connect to the Internet, click on **Add Proxies** to configure them at this point. Click on **Finish** to complete the Notes server configuration.

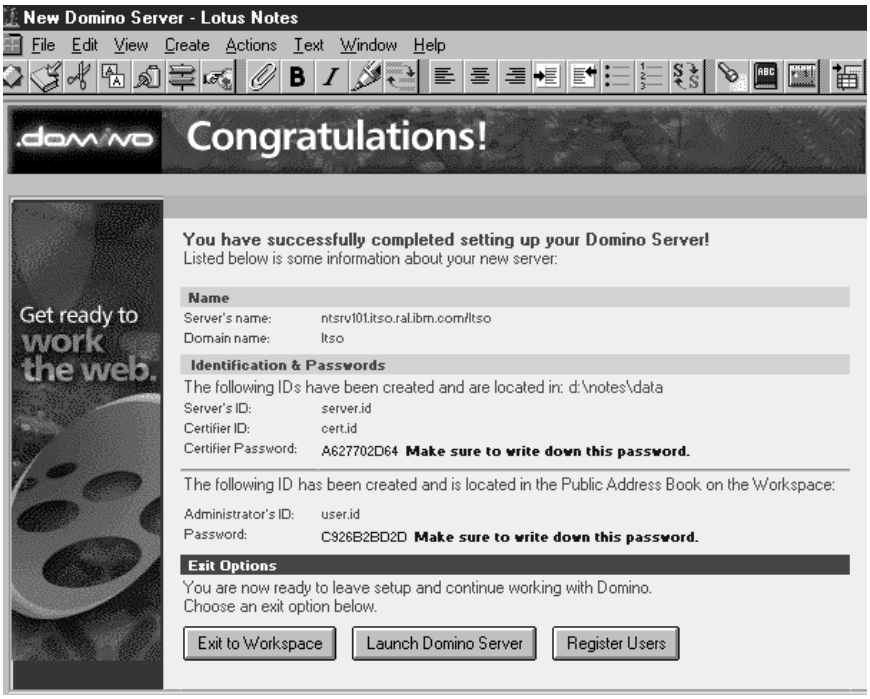


Figure 358. Configure Notes Domino Server - Finish

The Domino configuration is now complete and you can start the Domino server by clicking on **Launch Domino Server**.

Once you start the server, a separate window will open. It will look similar to the following window:

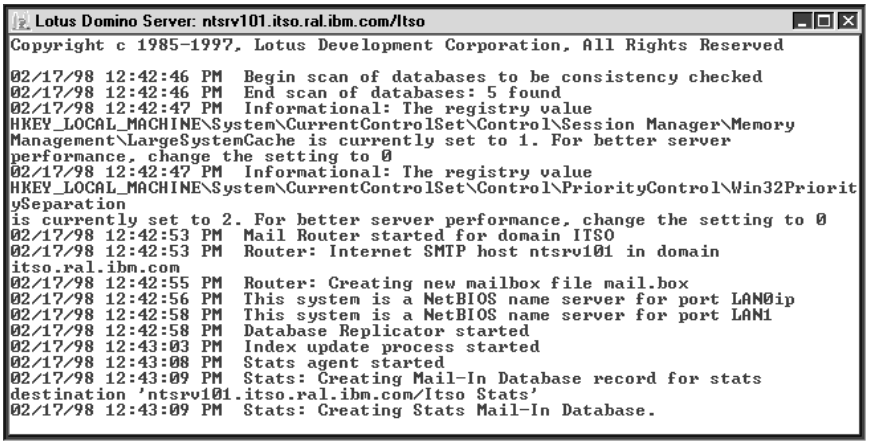


Figure 359. Notes Domino Server Console

5.2.2 Installing the CICS Client and Internet Gateway

The transaction server functions will be provided by the CICS Server family of products which also includes the CICS Internet Gateway. But what exactly do we need the CICS Internet Gateway for?

The advantage of the CICS Internet Gateway is that it enables you to use your own front-end as the user interface to an existing CICS application. The end user does

not need to know anything about the CICS Server, the application it is running, or the data it stores. All of that will be transparent to the user.

In our scenario CICS Clients will communicate with the CICS Server by using the External Presentation Interface (EPI), which enables graphical and multimedia interfaces to be used with traditional CICS applications running on a CICS Server. The CICS Internet Gateway will function as an interface between the Webserver, a CICS application and its data. By using the CICS EPI, 3270 data streams are translated into HTML format. This enables the CICS application to be accessed by any Web browser without any modifications to the browser or more importantly the CICS application. The EPI provides a method for enhancing an existing CICS application by adding a graphical interface.

A CICS Client can communicate with multiple CICS Servers using the following protocols:

- NetBIOS
- TCP/IP
- SNA-APPC

In our scenario the Tier 2 CICS Client will access the Tier 3a CICS Server using a TCP/IP connection. The CICS Servers at Tier 3a and Tier 3b will in turn be connected over an SNA link.

In setting up the CICS Client we used the AutoInstall feature. This means that the user does not need to predefine the connection to the CICS Server.

The CICS Internet Gateway Client for NT requires a minimum of 16 MB of memory and 15 MB of disk space on the operating system drive.

The components of CICS Client that you can choose to install are:

- CICS Client runtime system
- CICS Client programming samples
- CICS Client documentation
- CICS Gateway for Lotus Notes
- CICS Internet Gateway
- CICS Gateway for Java
- CICS Host TCP/IP Access Feature

Note: Do not install the CICS Host TCP/IP Access Feature ir you are also installing the Communications Server for NT component.

For our scenario we just installed the CICS Internet Gateway.

At the start of the installation a panel is displayed. Select the **Overwrite Files** check box, which will automatically replace any existing files that have the same name or location as the files being installed. Following that an Install - directories panel is displayed where you can select the components you wish to install.

Note: You can choose any number of software components, from one, to all.

Providing you have enough disk space you can continue with the installation. Otherwise, you may have to perform some housekeeping or point to another logical drive. To determine how much disk space is on each drive, select the **Disk Space** button. By default, the product gets installed in the directory C:\CICSCLI, although this can be changed. The CICS Internet Gateway is installed into a cig directory under the main CICS Client directory.

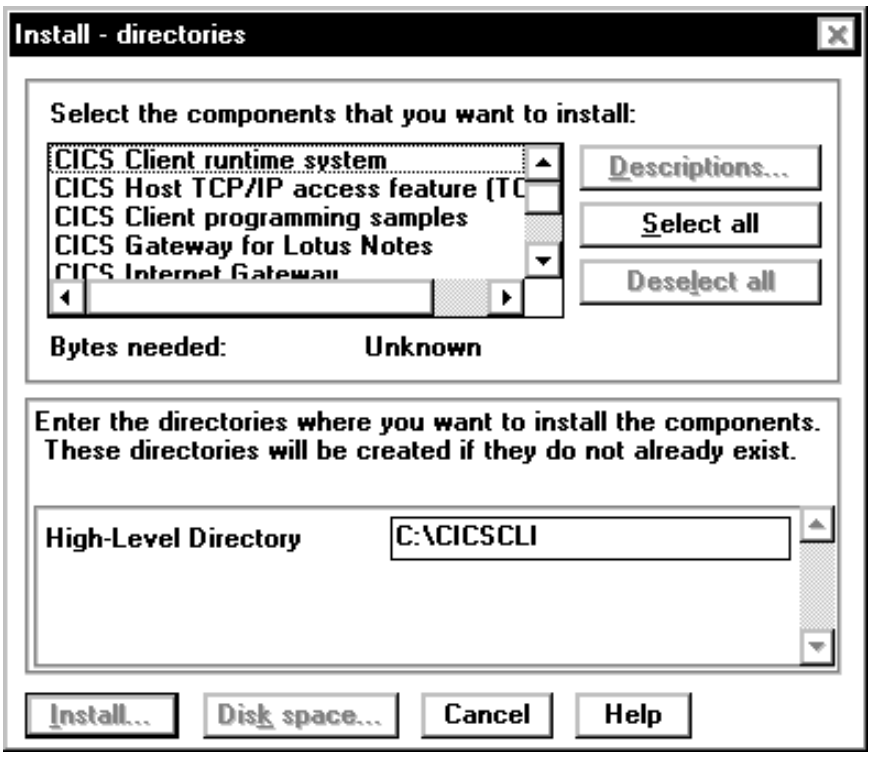


Figure 360. CICS Client Installation Panel

At a minimum, you need to install the CICS Client runtime system and the CICS Internet Gateway to configure this scenario.

The next step is to select the language you wish the CICS messages to be displayed in. We selected English.

A panel is displayed that asks if you would like to install the CICS Client as a Common Program Group or as a Personal Program Group. We chose the Common Program Group. In addition, you need to decide whether you want to update the Path variable and register the CICS Client as a Service. We suggest you check both of these boxes.

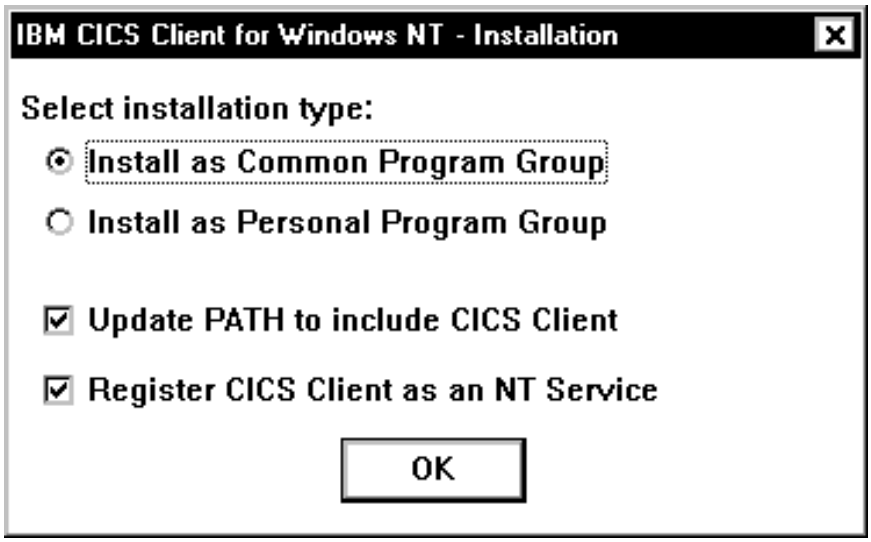
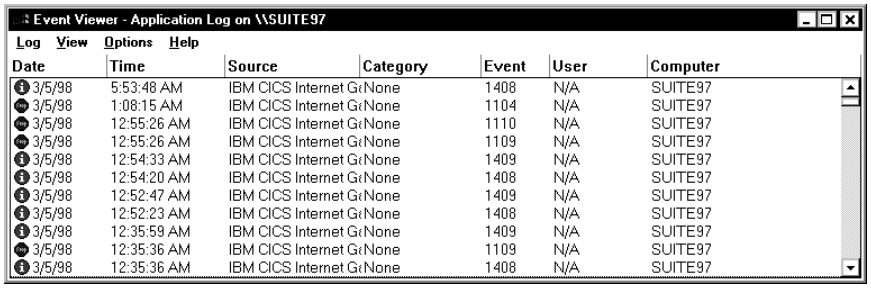


Figure 361. CICS Client Folder, Path and Service Options

Running the CICS Client as an NT Service has several advantages:

- The CICS Client can be set so that it starts up automatically at Windows startup without a user having to log on to the computer.
- You can log off the computer and still keep CICS Client running.
- Relevant CICS Client messages are recorded in the Application and System log of the Windows NT Event Viewer as shown in Figure 362.



Date	Time	Source	Category	Event	User	Computer
3/5/98	5:53:48 AM	IBM CICS Internet G	None	1408	N/A	SUITE97
3/5/98	1:08:15 AM	IBM CICS Internet G	None	1104	N/A	SUITE97
3/5/98	12:55:26 AM	IBM CICS Internet G	None	1110	N/A	SUITE97
3/5/98	12:55:26 AM	IBM CICS Internet G	None	1109	N/A	SUITE97
3/5/98	12:54:33 AM	IBM CICS Internet G	None	1409	N/A	SUITE97
3/5/98	12:54:20 AM	IBM CICS Internet G	None	1408	N/A	SUITE97
3/5/98	12:52:47 AM	IBM CICS Internet G	None	1409	N/A	SUITE97
3/5/98	12:52:23 AM	IBM CICS Internet G	None	1408	N/A	SUITE97
3/5/98	12:35:59 AM	IBM CICS Internet G	None	1409	N/A	SUITE97
3/5/98	12:35:36 AM	IBM CICS Internet G	None	1109	N/A	SUITE97
3/5/98	12:35:36 AM	IBM CICS Internet G	None	1408	N/A	SUITE97

Figure 362. Event Viewer - CICS Entries in the Application Log

On the next screen, since you requested to install the Host TCP/IP connection, you are given the option to install Personal Communications. We chose **Cancel** in this instance, because we don't want a host session and we don't need to connect to a host CICS on this machine for our scenario.

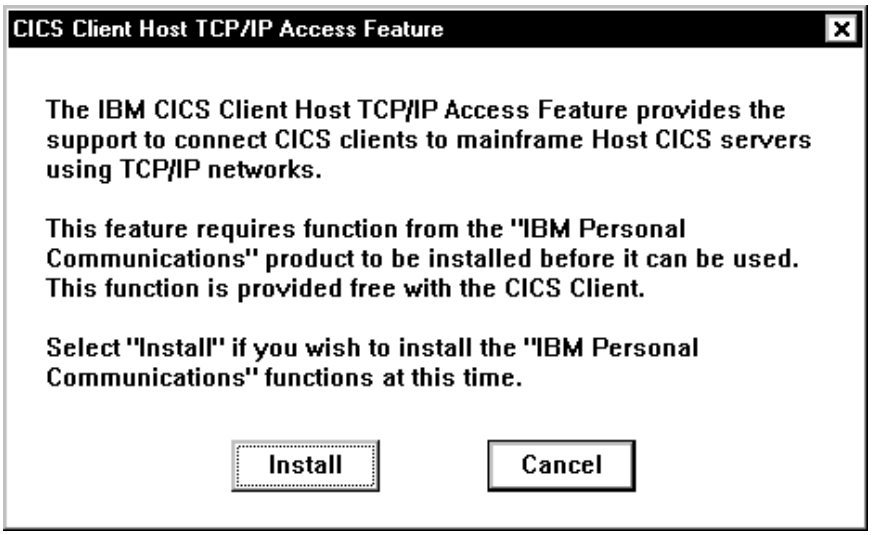


Figure 363. CICS Client Host TCP/IP Install

However, if you did decide to install Personal Communications, then you need to be aware of the following:

- If you will be using APPC Support, then Version 4.2 of Personal Communications must be installed (or Version 4.1 with the APAR IC16672).
- At the time of writing this book, April 1998, if you want to be able to use SNA and the TCP62 protocols at the same time, the latest Personal Communications APAR needs to be installed. Otherwise, the TCP62 protocol will fail if the node is already running even if the AnyNet SNAP/IP device is configured.

Note: IBM's TCP62 function provides an Application Program Interface (API) that simplifies configuration of AnyNet LU6.2 support over TCP/IP. This function simplifies end-user tasks by eliminating SNA and AnyNet unique configuration, thus making it possible to use LU6.2 applications in TCP/IP environments as if they were Sockets applications. The TCP62 function is included in eNetwork Personal Communications 4.2's Access Feature for Windows 95 and Access Feature for Windows NT. It is also included in eNetwork Communication Server for OS/2 Warp's Access Features for OS/2, Windows 95 and Windows NT.

At the end of installation, the Installation and Maintenance panel is displayed. Select **OK** to exit. This results in an IBM CICS Client For Windows NT Program Manager group being created (see Figure 364 on page 260).

At this point we rebooted the server to complete the installation of the client.

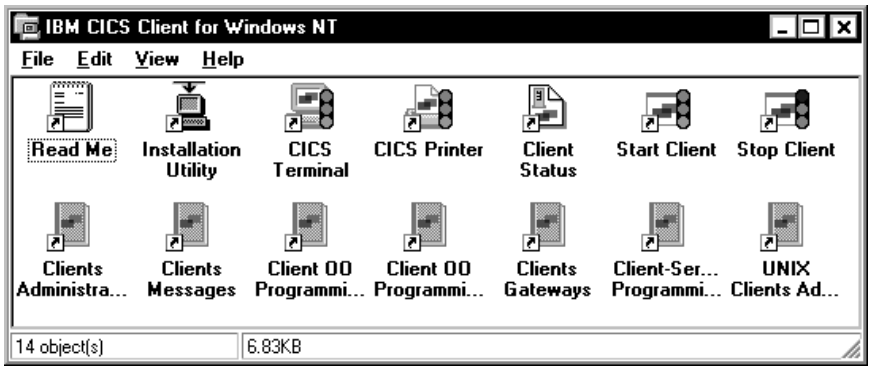


Figure 364. The CICS Client Program Folder

When the product has been successfully installed the following CICS Internet Gateway keys are added to the Windows NT Registry:

- \HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CICS Internet Gateway
- \HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\EventLog\Application\CICS Internet Gateway

5.2.3 Configuring the CICS Internet Gateway

The CICS Internet Gateway has a configuration file called cigd.ini, which can be found in c:\cicscli\cig\bin\cigd.ini. Before running the CICS Internet Gateway verify that the following entries can be found in the cigd.ini file (see C.1.2, “The CIGD.INI File - Tier 2” on page 401):

- Trace=c:\cicscli\cig\admin\cigtrace.log

  This file is created as a result of running a CICS Client trace.

- Error=c:\cicscli\cig\admin\cigerror.log

  This file logs the CICS-related errors in greater detail than the Event Viewer.

- Info=c:\cicscli\cig\admin\ciginfo.log

  This file describes the environment settings that are being used for the CICS Client.

- Header=c:\cicscli\cig\html\headtext.htm

  This file contains the gif image of the header of the default CICS Internet Gateway home page, cigstart.htm.

- Trailer=c:\cicscli\cig\html\tailtext.htm

  This file contains information that will be displayed at the bottom of the CICS Internet Gateway home page, cigstart.htm.

- Exitpage=/cig/cigstart.htm

  This is the main body of the CICS Internet Gateway Web page.

If all the pages are present, then the gateway installation was successful. The Web pages can be edited and personalized, but we suggest that you leave them as they are if you wish to reproduce this scenario. Once you have done that, you might want to tailor it for your own environment.

In order to use the CICS Internet Gateway with your Webserver, the server needs to be configured to access the CICS Internet Gateway program and its files as well as be configured to run CGI scripts.

To change the configuration for the Webserver you have to change the file HTTPD.CNF (if this Webserver is Notes Domino, IBM Internet Connection Server or Domino Go Webserver). For the Notes Domino server the file HTTPD.CNF is in the directory \notes\data. A copy of the file can be found in C.1.3, “The Lotus Domino Server - Tier 2” on page 403.

Before the statement:

```
Pass   /*              c:\notes\data\html\*
(c:\www\html\* for ICS and Domino Go)
```

You need to add the following three lines:

```
Exec   \cig-bin\*      c:\cicscli\cig\cgi\*
Exec   \cig-admin\*    c:\cicscli\cig\admin\*
Pass   /cig/*          c:\cicscli\cig\html\*
```

To protect the cig\admin directory, add the statements.

```
Protect /admin-bin/*    PROT-ADMIN
Protect /cig-admin/*    PROT-ADMIN
```

Note: The /cgi-admin/ directory allows users to perform administration tasks on the CICS Internet Gateway, so be careful who you grant access to.

At this point, you need to change the startup options for the CICS Client and the CICS Internet Gateway to automatic. You can do this from the Services window. Following that you need to restart the system.

After the reboot the Notes server and the CICS Internet Gateway should start and you can access the CICS Internet Gateway from the Web browser as shown in Figure 365 on page 262. To use the CICS Internet Gateway, you need to view the cigstart.htm page. The whole URL statement is http://hostname.domain.name/cig/cigstart.htm.

Figure 365. CICS Internet Gateway

Clicking on the box to view the gateway settings presents you with the following window:

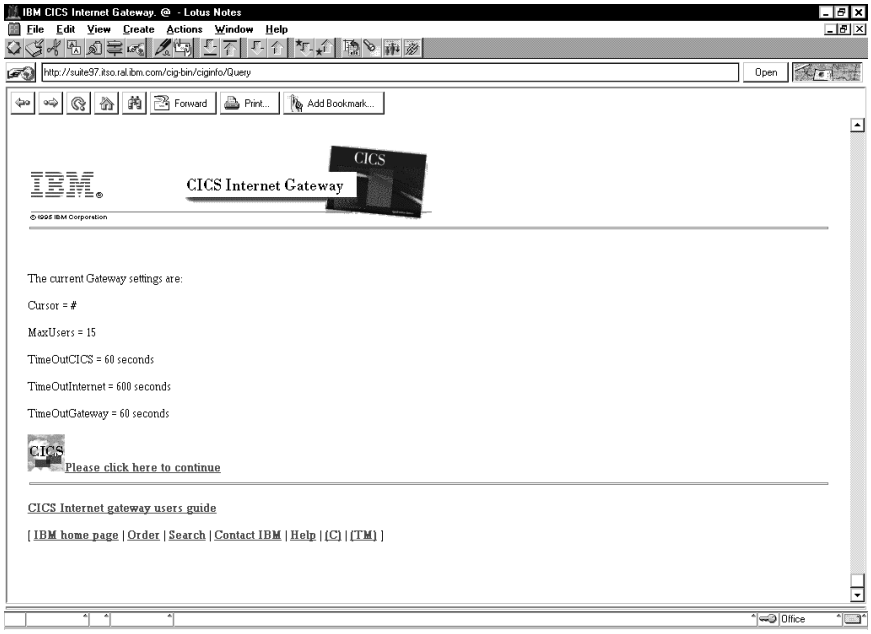


Figure 366. CICS Internet Gateway Configuration

The CICSCLI.INI file will also be installed with CICS Clients in the \CICSCLI\BIN directory. This is the client initialization file and contains three sections:

1. A client section
2. One or more server connections as CICS Clients can connect to multiple CICS Servers.

3. One or more driver sections depending on how many protocols are being used to connect to the CICS Servers. The default protocol is TCP/IP. The entire INI file can be found in C.1.1, “The CICS Internet Gateway” on page 399.

This file can be edited using any text-based editor. However, in our scenario the default setting were OK.

5.3 Configure Tier 3a - NTNCF101

The Tier 3a machine (NTNCF101) functions as a:

- CICS Server to route the CICS transaction to Tier 3b.
- Communications Server to create a link and manage an APPC session with Tier 3b.
- ADSM server to back up and retrieve data.

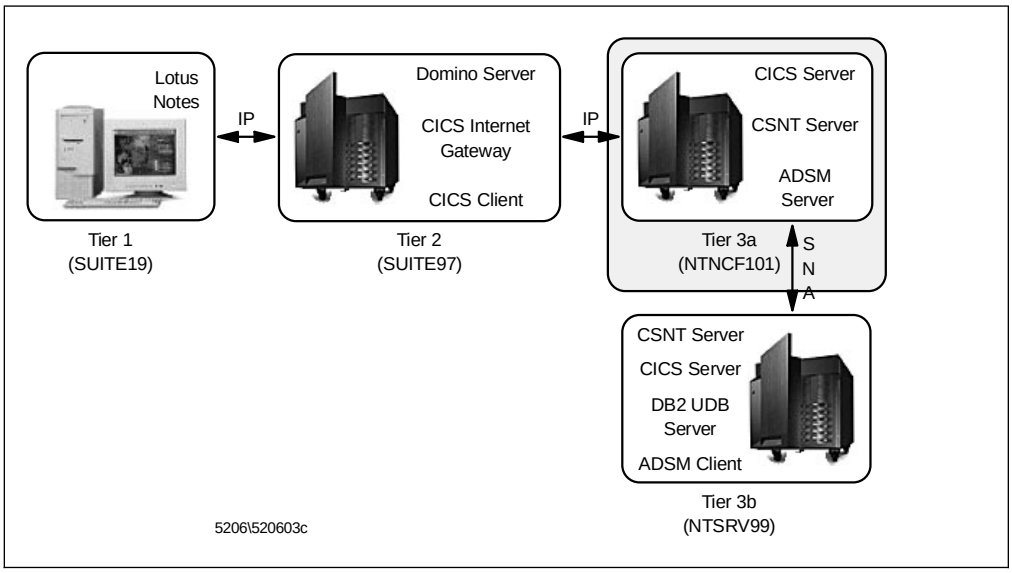


Figure 367. Configuring Tier 3b

5.3.1 Configuring the Communications Server on Tier 3a

To define a configuration, the first thing you need to do is to start the Communications Server Configuration utility by clicking on **Start, Programs, IBM Communication Server** and **SNA Node Configuration**. This will take you to a panel where you can start a new configuration by clicking on **File** and **New**. This will automatically display the Scenario pull-down menu. From here select **Advanced**. You should see a panel that displays all the possible configuration options as shown in the following figure:

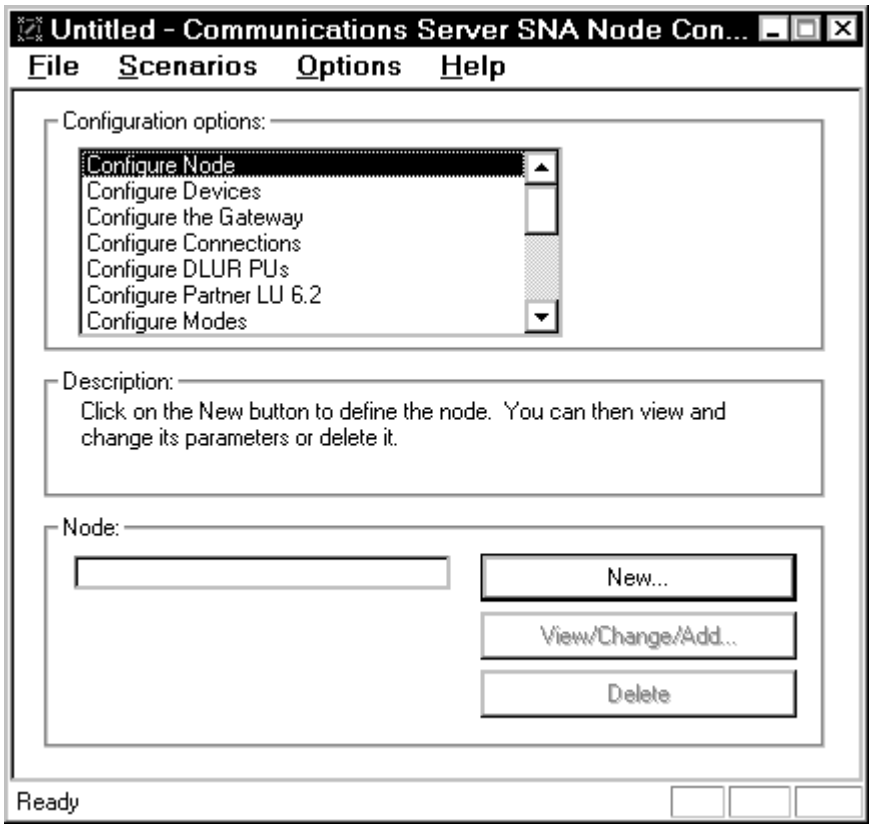


Figure 368. Communications Server SNA Node Configuration

The next step is to highlight **Configure Node** and then click on **New**. This will take you to the Define the Node window as shown in Figure 369 on page 265. This is where you define the machine to the SNA network by giving it a control point (CP) name.

Note: The CP name must be unique in the network (different from all other CP names and logical unit (LU) names).

The CP name consists of two parts:

1. The network name, which is the name of the SNA network.
2. The LU name, which the name of the SNA resource on the network.

As CP names can sometimes be difficult to remember you can also define a CP alias, which is a local nickname for your SNA node.

At the bottom of the panel there are two radio buttons that allow you to indicate the functions for this SNA node. SNA nodes can be one of two types:

1. End nodes - These provide limited SNA functions and are generally used in situations where no routing or management services is expected from that SNA node. It uses the services of a network node for directory and routing services.
2. Network nodes - These provide routing, directory and management for all APPN network resources in their domain. SNA servers are commonly defined as network nodes which gives them greater SNA functions.

As we only have two SNA nodes in our scenario the choice is yours as to whether you want to define the nodes as end nodes or network nodes. We chose network

node since in many instances Communications Servers would normally be configured as such.

For the scenario we chose the values shown in the following window:

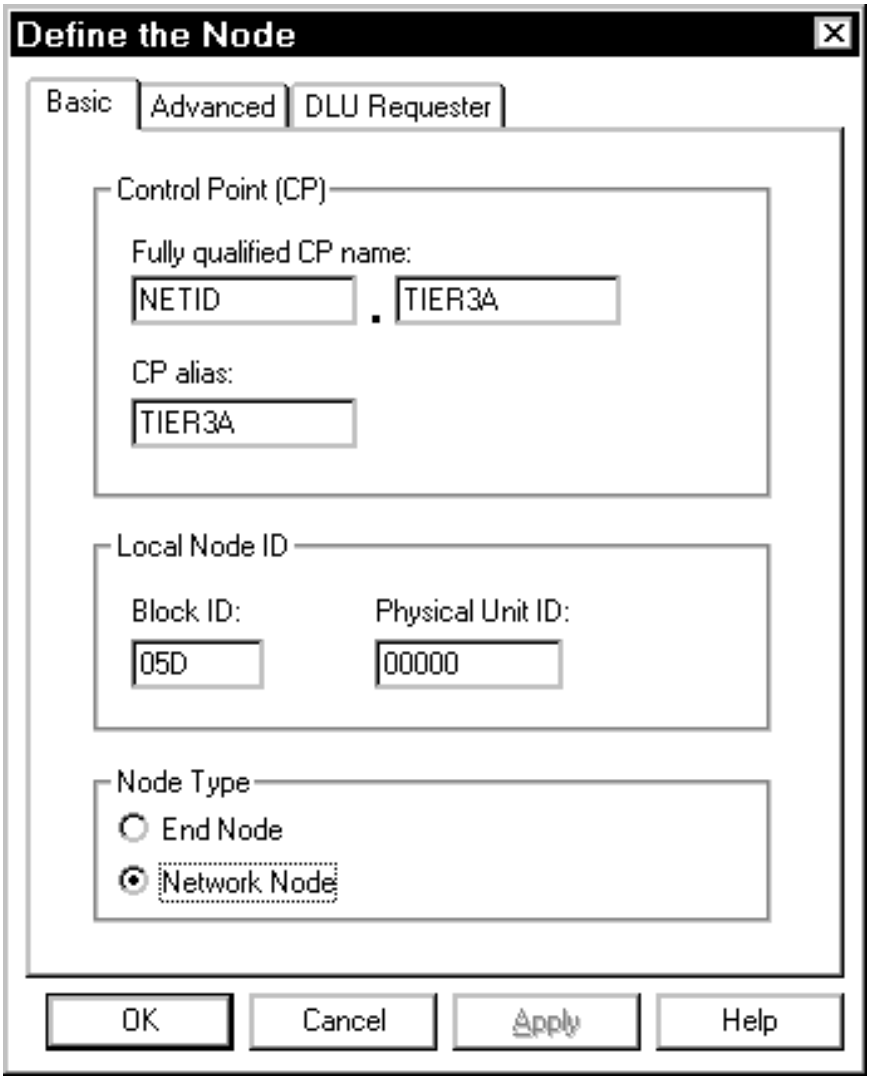


Figure 369. Define the Node

Once all the values are entered click on **OK** which will take you back to the main configuration panel.

The next step is to determine the type of network that will be used to connect the machines: Tier 3a and Tier 3b. When you highlight **Configure Devices** a DLC window appears where you can select the network type. In our scenario we used a token-ring LAN so we selected **LAN** and clicked on **New**.

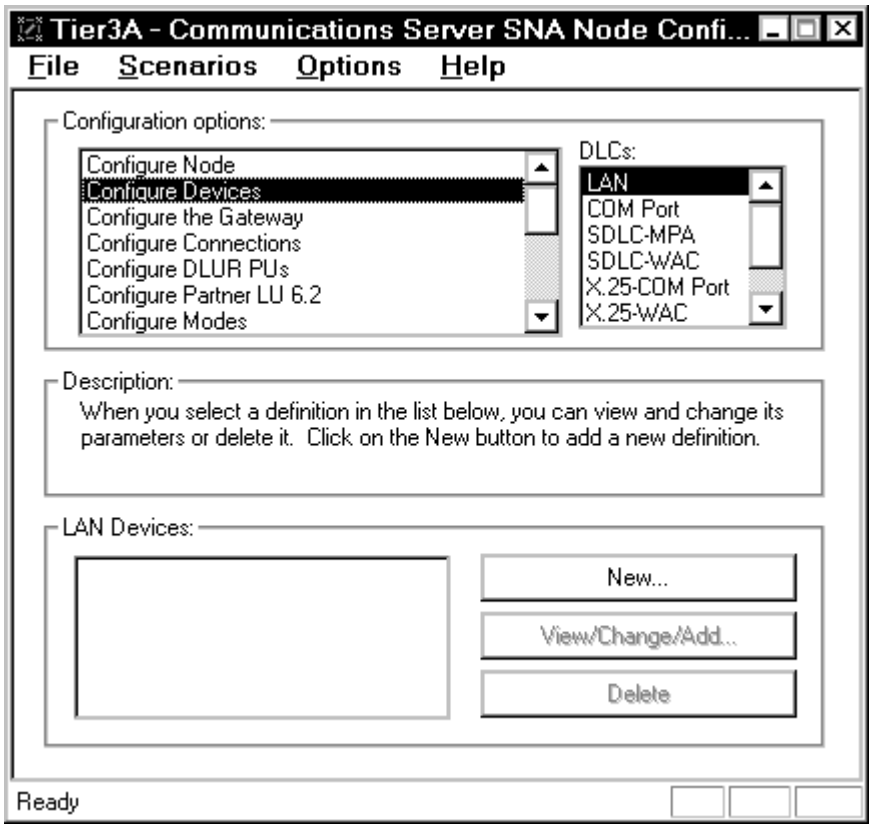


Figure 370. Configure Devices

If the adapters and LLC2 driver have been installed successfully, you should see a screen similar to the following:

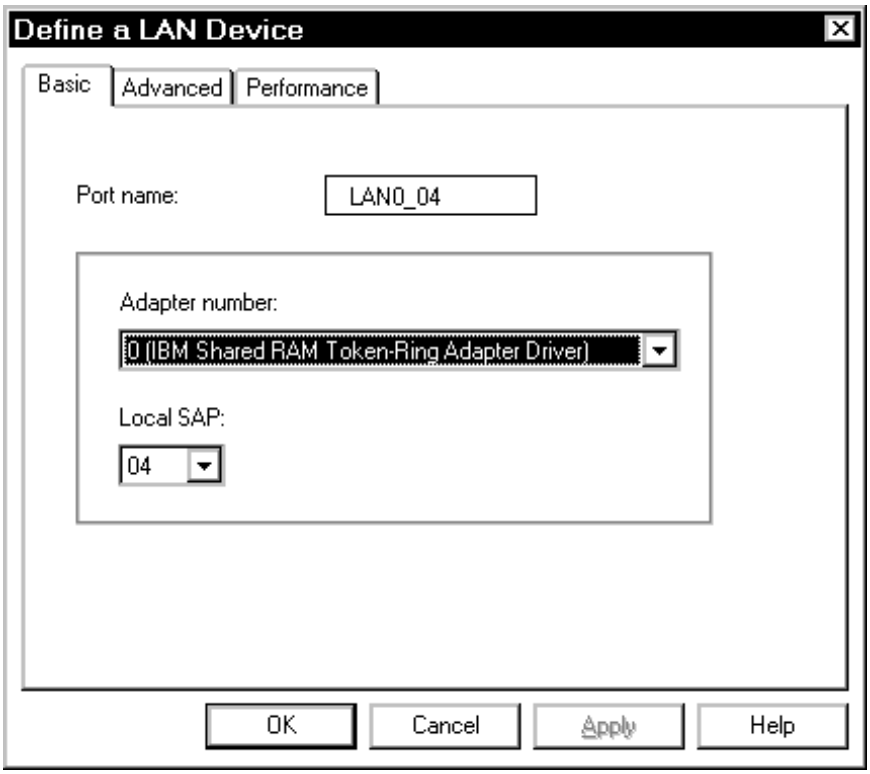


Figure 371. Define a LAN Device

Click on **OK** and the device will be added. The next step is to configure connections to the CICS Server at Tier 3b. Highlight **Configure Connections** in the main configuration panel and select **New**.

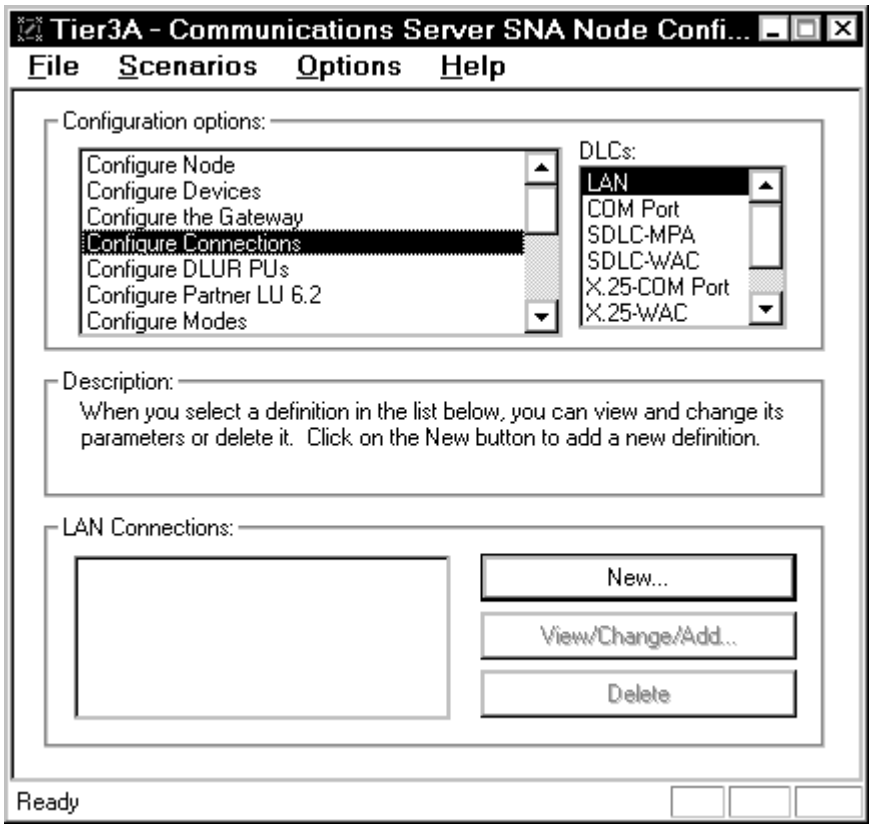


Figure 372. Configure Connections

From the Basic tab you need to enter a link station name which normally reflects the device you are connecting to. We chose the name of Tier 3b, NTSRV99. You also need to define the MAC address of Tier 3b in the Destination address field. The SAP value you define must also match the SAP value that Tier 3b is using. The remote SAP value can be found by starting the node configuration at Tier 3b and accessing the panel, Define a LAN Connection. The SAP value can be found under the Basic tab.

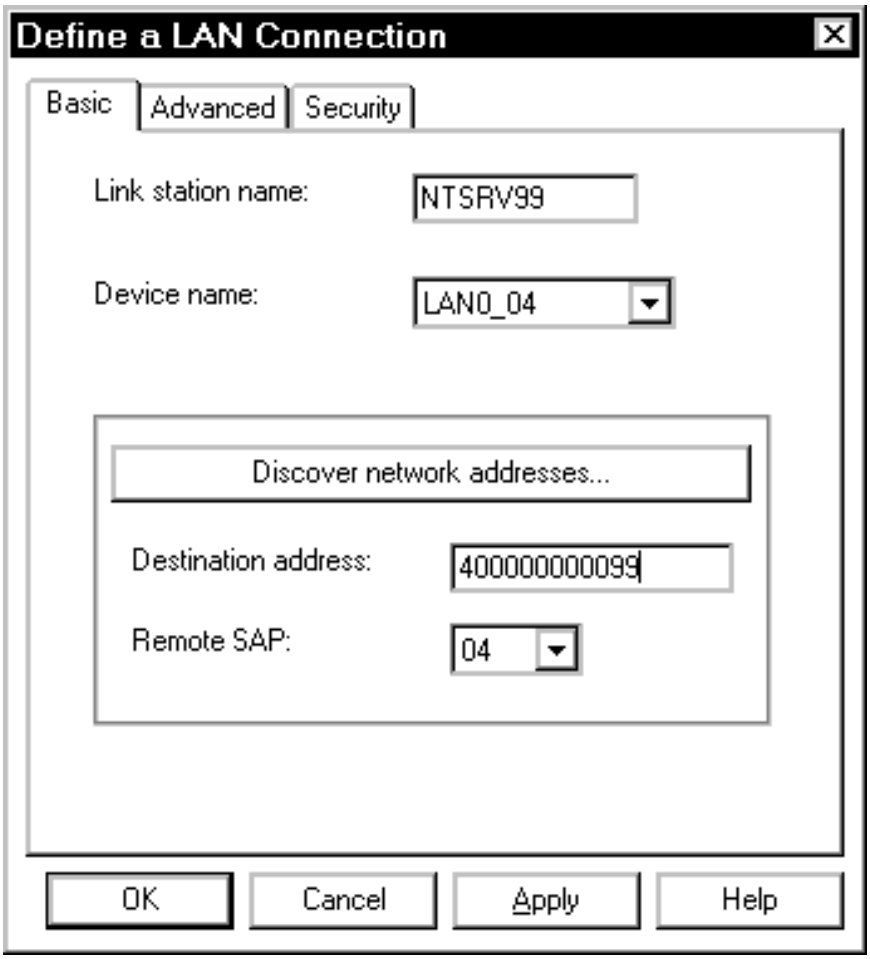


Figure 373. Define a LAN Connection - Basic

There are three tabs in this window. Click on the **Security** tab to define the adjacent CP name. Enter the fully qualified CP name of the partner node, Tier 3b. You can also update the window to show that Tier 3b is a network node. This information is used to verify that the partner node at the defined destination address is really who they say they are.

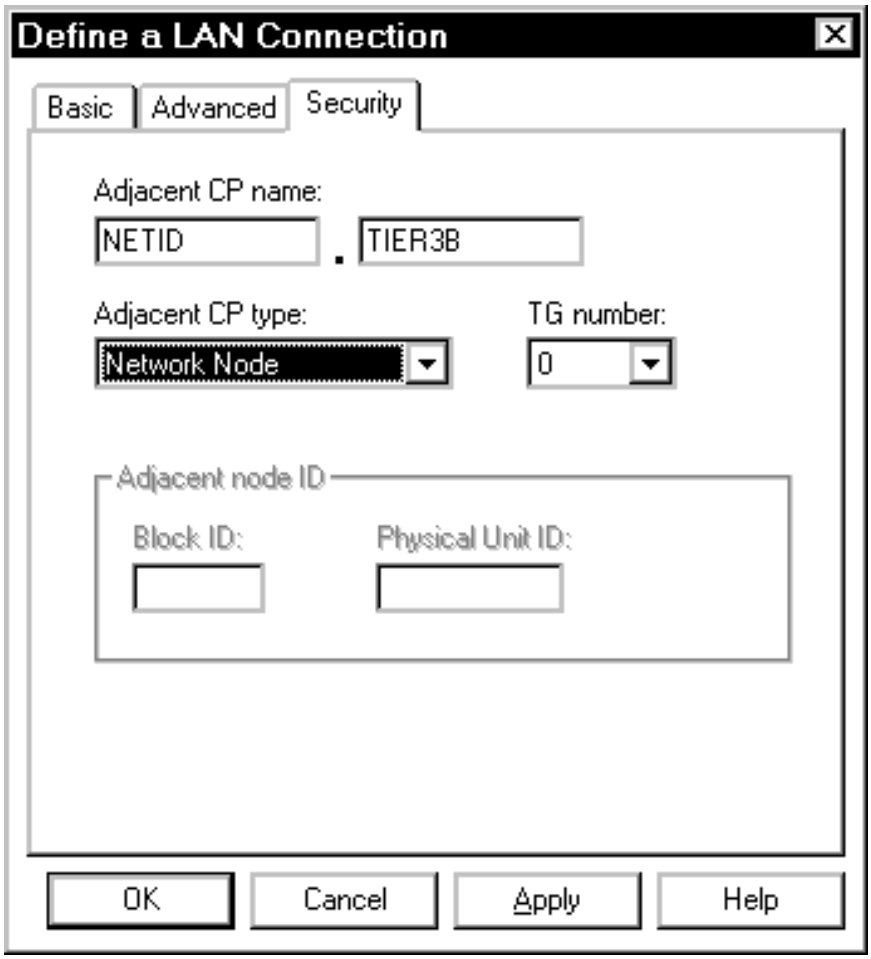


Figure 374. Define a LAN Connection - Security

Clicking on **OK** takes you back to the main configuration panel.

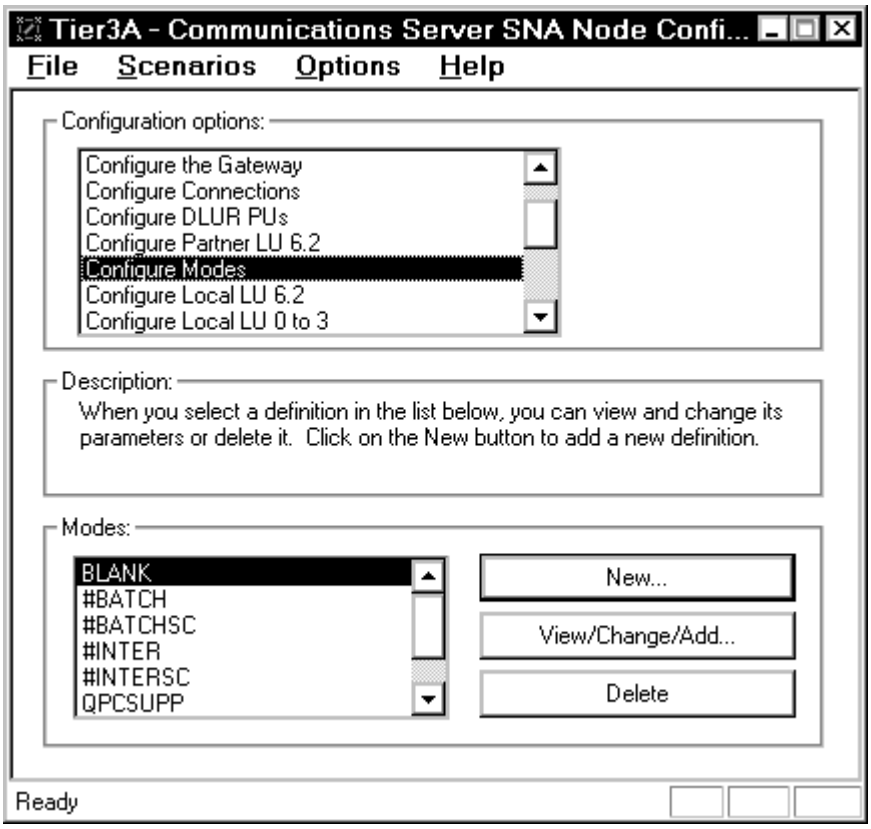


Figure 375. Configure Modes

The next component to configure is the Mode, which defines the characteristics of the session between the two SNA nodes. As a result of highlighting Configure Modes a list of modes appears. Select the mode **Blank** and click on **New**.

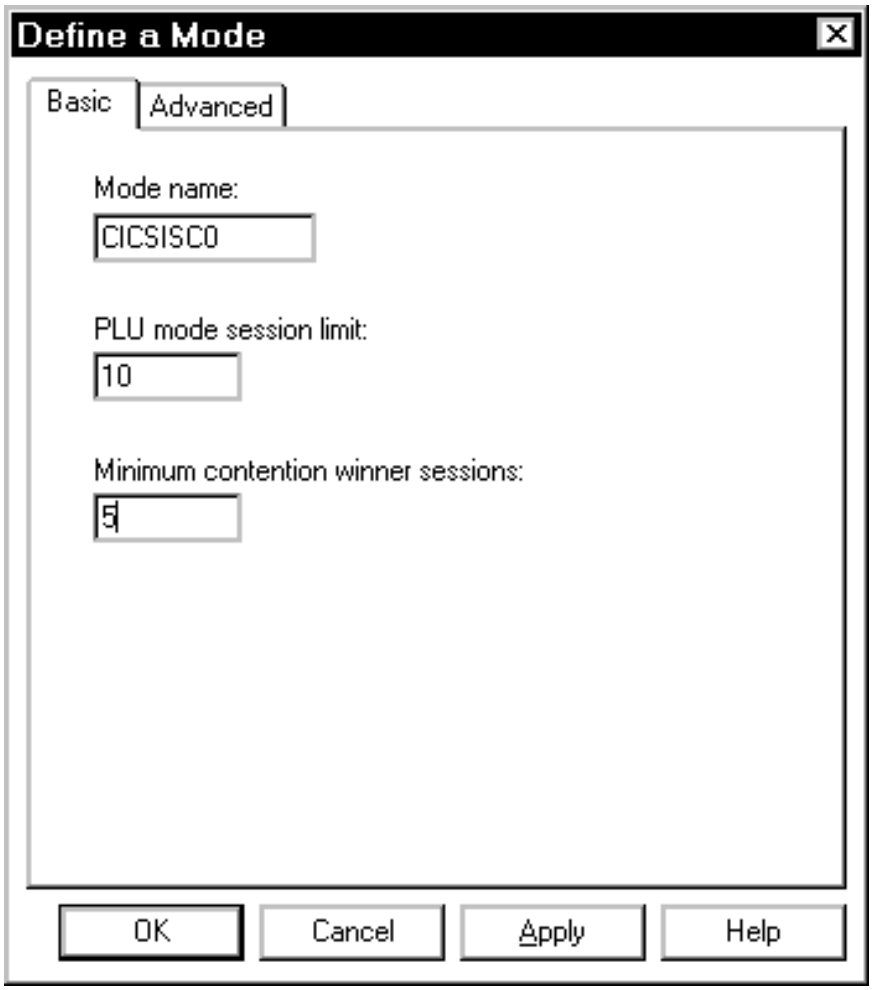


Figure 376. Define a Mode - Basic

In the Basic tab enter the Mode name `CICSISC0`. The mode name can actually be anything you wish. Next we need to define the maximum number of concurrently active LU-LU sessions. The default value is 32, but assigning a lower number improves system performance, so we set the session limit to `10` as we knew that the MENU transaction was not going to activate that many LU sessions. The Minimum Contention Winner Sessions specifies the minimum number of sessions an LU can activate without requesting permission from the other node. As we have defined 10 PLUs we decided to be fair and assign both LUs with equal opportunity to assign LU sessions, so we set it to `5`.

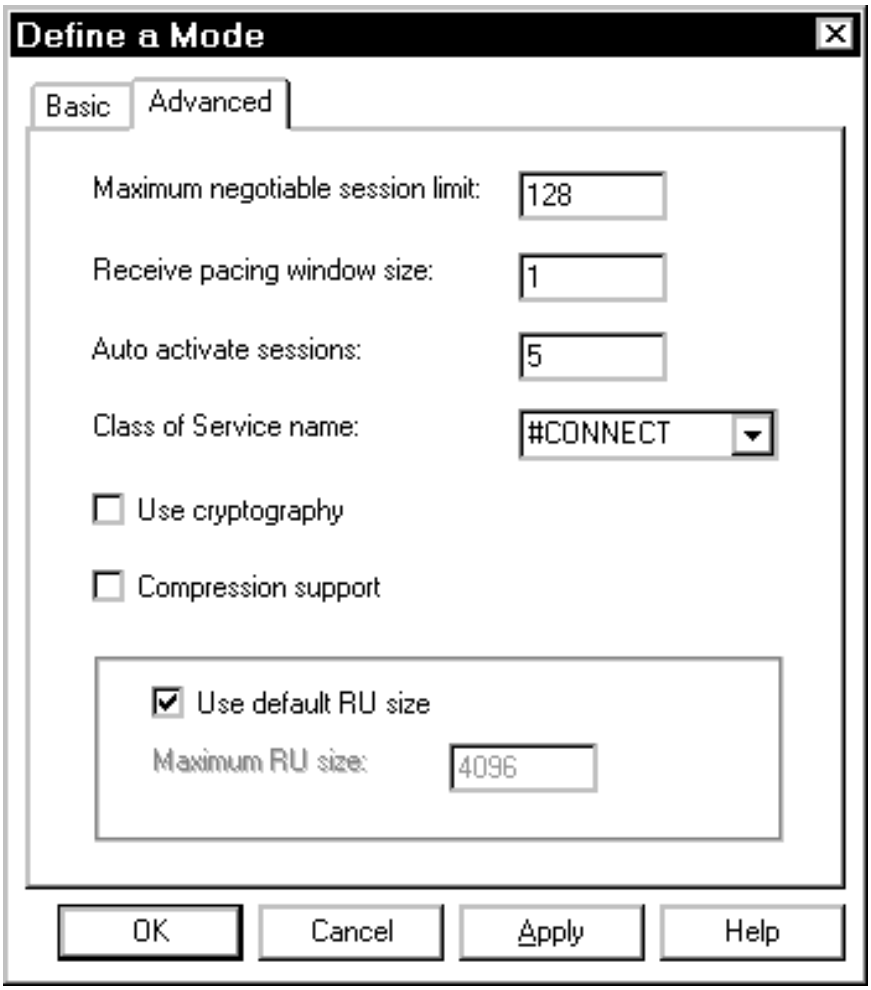


Figure 377. Define a Mode - Advanced

The Advanced tab allows you to change the performance characteristics of the session CICSISCO. Default values are usually sufficient, but enter values to match the ones in Figure 377. For best performance match these values on both servers, then click on **OK**. The new mode will be added to the configuration.

The next step is to define a local LU that the CICS Server can use. Therefore, select **Configure Local LU 6.2**.

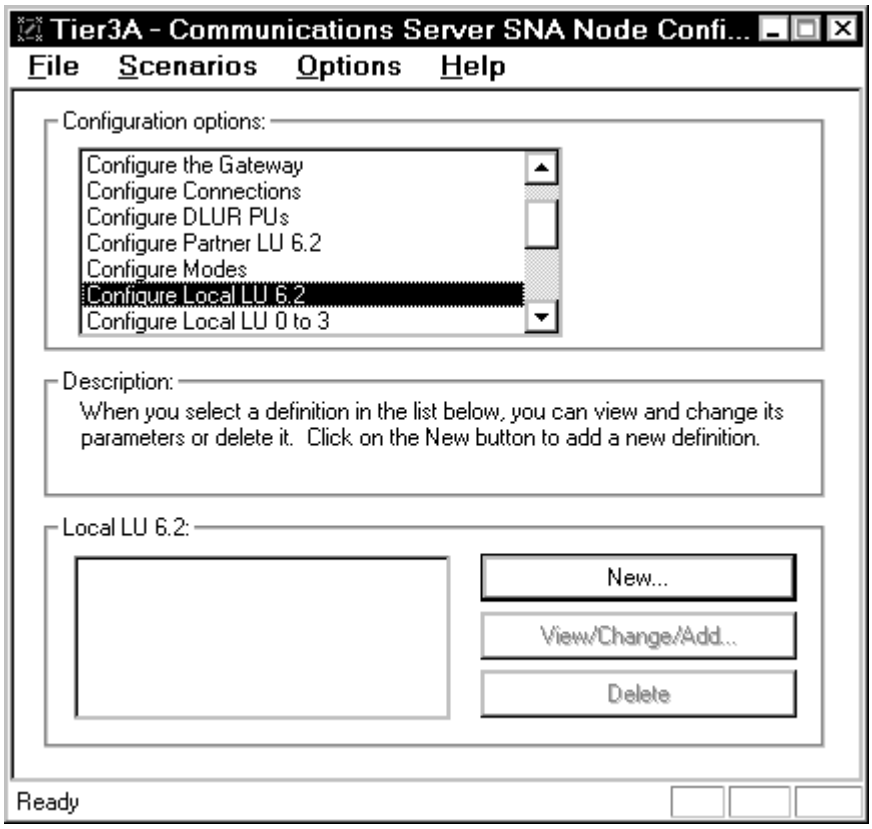


Figure 378. Configure Local LU 6.2

In the one panel that is available for this option, enter a unique LU name. We chose the host name of the server Tier 3a, NTNCF101. We also chose the same name for the alias, although this could be anything that is easy to remember. The value `0` is entered by default in the Session Limit field. This means that there is no session.

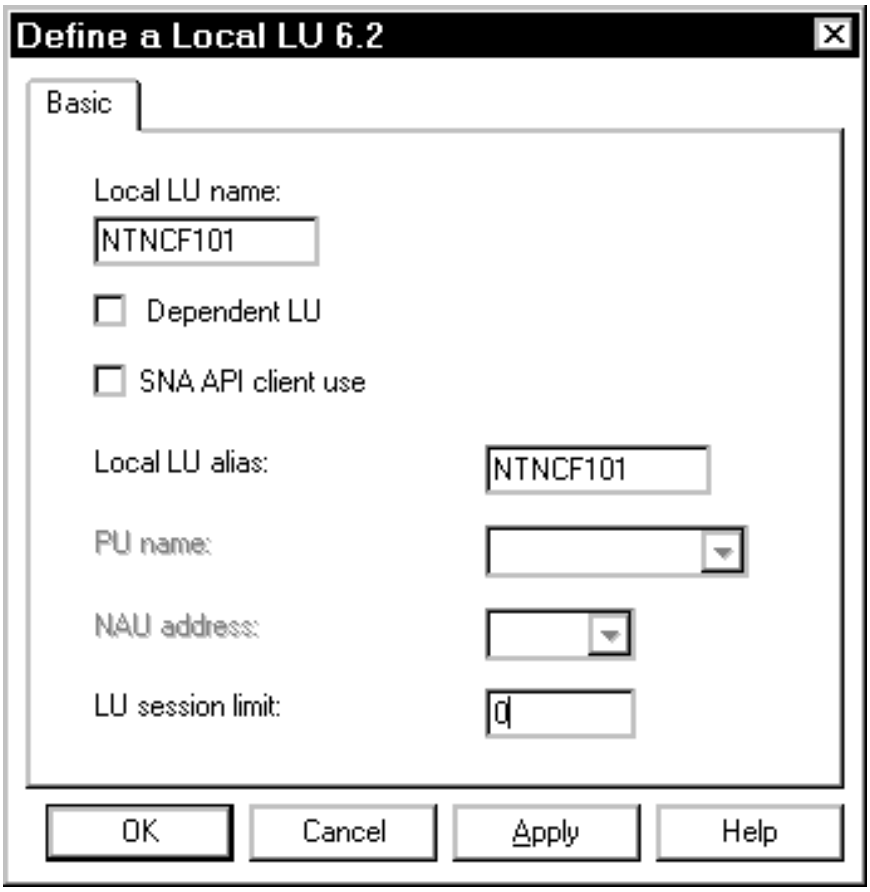


Figure 379. Define a Local LU 6.2

Click on **OK** to go to the main configuration panel again. We need to define information about the remote system that we want to connect to. The first thing we need to define is the partner LU name. On the main panel select **Configure Partner LU6.2** and then click on **New**.

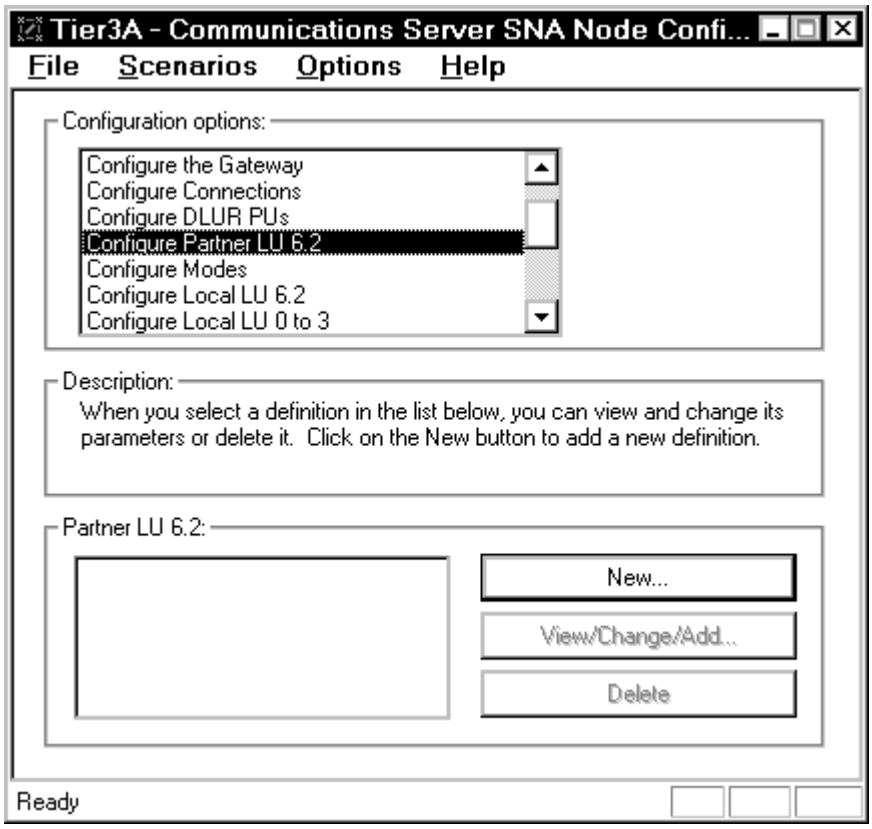


Figure 380. Configure Partner LU 6.2

In order to enter values in this field you need to collect data from the partner node or at least know what the partner node's fully qualified CP name and LU name is. Enter a fully qualified partner LU Name of `NETID.NTSRV99` and a fully qualified CP name of `NETID.TIER3b` from Tier 3b.

The Partner LU Alias can be anything since it is local to this machine. Click on **OK** when you are done.

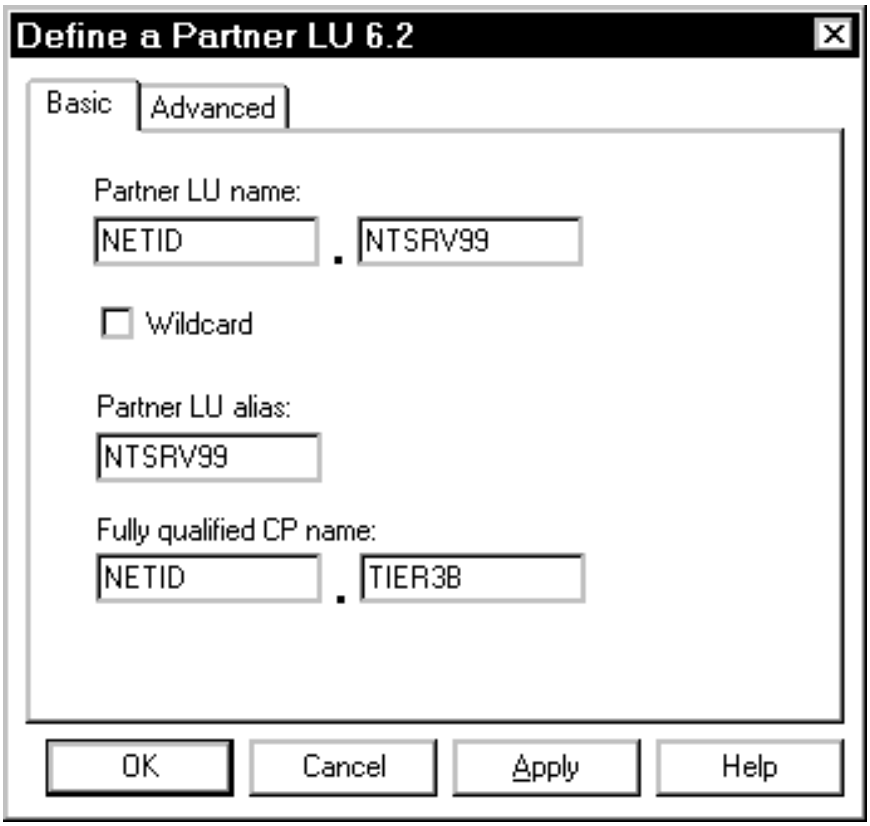


Figure 381. Define a Partner LU 6.2

The Communications Server configuration is now complete. To save and verify your configuration, select **File, Save** and give the configuration a meaningful name. Then select **Yes** to make it your default configuration.

The configuration you created can be seen in C.2.6, “Communications Server - Tier 3a” on page 424.

To start the Communication Server configuration you need to start the SNA Node Operations by selecting **Start, Programs** and **IBM Communications Server**. Here you can choose to start the SNA node by clicking on the **Green** button. You can also start the node by clicking on **Operations** and **Start**.

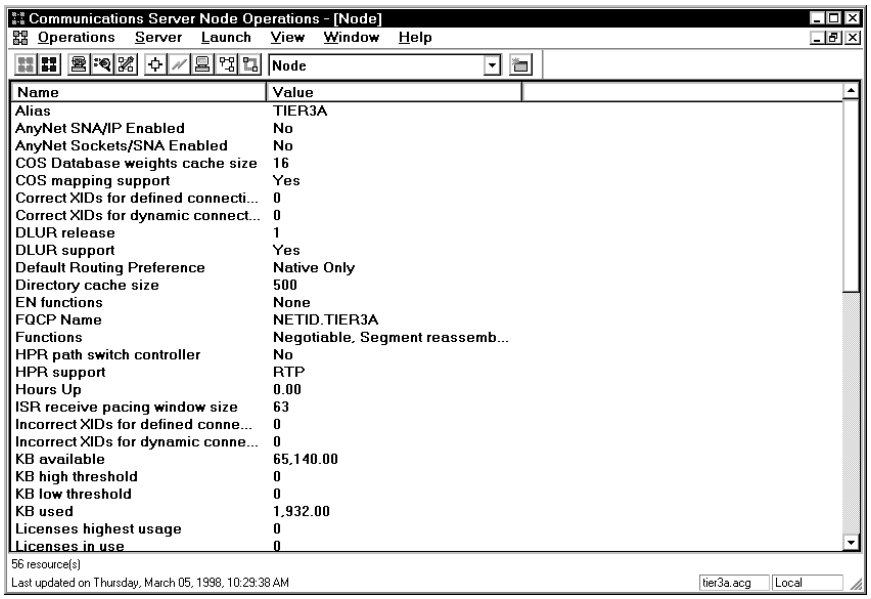


Figure 382. Communications Server Node Operations

You may also want the Communications Server SNA node to start automatically as a service when the server is booted up. This can be done by entering the following command at a command prompt:

```
csstart -a
```

Optionally, you could add after *-a* the location of your Communications Server configuration files. For example, `csstart -a C:\IBMCS\private\myconfig.acg`..

The next time you reboot, your default Communications Server configuration is automatically started.

5.3.2 Communications Server Web Administration

We have just discussed configuring Communications Server using the standard GUI on the Windows NT platform. The Communications Server can also be configured using a Web browser. The Web Administration tool will allow a person with administrator access to perform many of the tasks as if they were sitting at the server. These include querying a nodes status, displaying and changing configuration files and starting or stopping the Communications Server for NT node.

Note: We do not be show detailed steps on the installation and configuration as these are explained clearly in the redbook titled *IBM Communications Server for Windows NT 5.0.*

To run the Web Administration utility you need to install a Webserver on the same machine as the Communications Server and a Web browser on any client machine. To utilize all of the functions, the Web browser should support Java.

The Web Administration utility is an installable component of Communications Server for NT, thus it can be installed using IBM Enterprise Suite for Windows NT. After completing the installation you need to configure your Webserver. As a result of the installation, a CSC subdirectory is created under the IBMCS directory which contains the EXE files in a BIN directory, the HTML and Java files in an HTML directory and the GIF files in an IMAGES directory. These three CSC subdirecties

need to be added to the Webserver directories. Depending upon which Webserver you use the Webserver configuration information can be found in the readme file that is installed when the Web Administrator is installed.

For most Webservers you can access them by pointing the browser to the page http://hostname, where hostname is the TCP/IP name of the system running your Web and Communications Server. As soon as a browser is granted access to the Webserver, a page similar to the following (csmmain.html) is shown:

Figure 383. Communications Server Web Administration

From this page we can access the Communications Server by clicking on the **Logon** button.

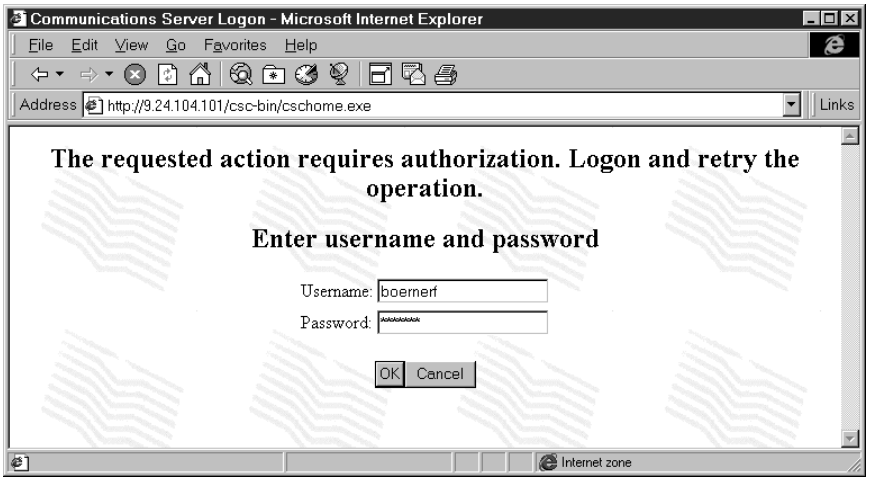


Figure 384. Communications Server Web Administration - Logon

At the logon screen enter a user ID and password that is defined in the IBMCSADMIN group on the NT Server and click on **OK**. The user ID should belong to this group since it must have administrator access. If the logon was successful, you will be presented with the following screen, from where you can administer the Communications Server:

Figure 385. Communications Server Web Administration - Menu Panel

By clicking on **Show Remote** if you are using a Java-based browser, you will get a Remote style panel which will allow you to perform functions that you would normally do at the server itself.

Figure 386. Communications Server Web Administration - Remote Panel

You can select to start the communications node by clicking on **Start**.

Figure 387. Communications Server Web Administration - Start the Node

If we query the node status from the Remote panel, then we get the screen shown in Figure 388 on page 283.

Figure 388. Communications Server Web Administration - Node Status

Following is the output of the query command issued at the Web interface.

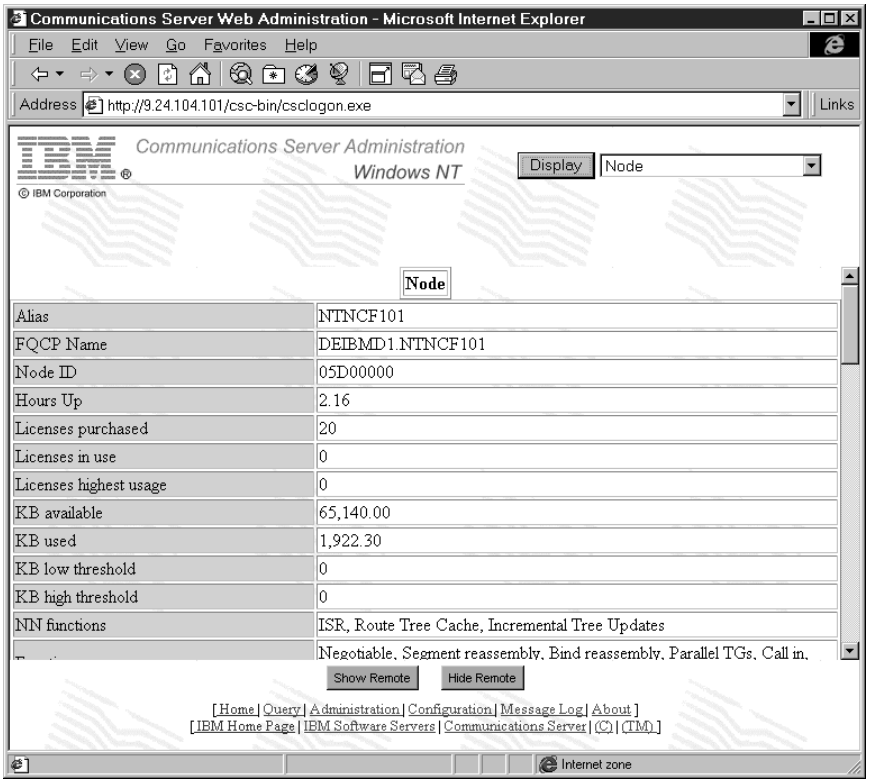


Figure 389. Communications Server Web Administration - Display Node

5.3.3 CICS Server Configuration

In our scenario, the CICS Server on Tier 3a routes the request from the CICS Internet Gateway on Tier 2 using Communications Server to the CICS Server on Tier 3b (see Figure 1 on page 5).

In order for the CICS Server in Tier 3a to route transaction requests to the CICS Server in Tier 3b we decided to implement an SNA link between the two nodes. In a CICS environment there are two ways to implement SNA:

1. Local SNA support using a product such as IBM Communications Server for NT V5.01
2. PPC Gateway Server SNA support using an Encina Gateway Server

In our environment to decided to implement local SNA support using Communications Server for NT. To configure a CICS Server for SNA we needed to:

- Configure the SNA product providing the SNA Services. In this case it is Communications Server.
- Set up a listener definition.
- Set up a local name for your CICS region.
- Set up a communications definition entry.

The CICS Server always requires RPC. Even though the DCE client is automatically installed when the server is installed, you only need RPC in this case.

To help you understand this section better we provide some explanations for the different definition types for the CICS Server we used:

- RD - Region Definition

  The RD contains static and dynamic information required by the CICS region when it's started. It includes control and initialization information.

- LD - Listener Definition

  A standard CICS region receives only requests from clients and servers that use a DCE RPC interface. LDs define additional methods that a CICS region can use to listen for requests.

- CD - Communications Definition

  CD defines the remote system with which this region can communicate. This communication can be over TCP/IP or SNA. The remote system can be another CICS system, an Encina application or an SNA logical unit (LU 6.2) system.

- TD - Transaction Definition

  TD defines all the transactions that CICS can process in this region. Each entry contains control information used by CICS to identify and run a transaction.

  You always have to create the region definition (RD) first. Then all other definitions will be saved in definition.STANZA files (for example, TD.stanza) for this region. You can define different regions with different definitions (xx.stanza - files).

Next we show you how to configure a CICS environment.

1. Add the following environment variables:
   - CICS_HOSTS=tcpip_host_name_for _CICS_ server_1 tcpip_host_name_for _CICS_server_2

     For example, CICS_HOST=NTSRV99.ITSO.RAL.IBM.COM.

     Note: All CICS Servers that you might need to communicate with must be in this list.
   - ENCINA_BINDING_FILE=x:\var\cics_servers\ servers_binding, where x=drive letter.

After changing the environment variables it is easiest to reboot the system for them to take effect.

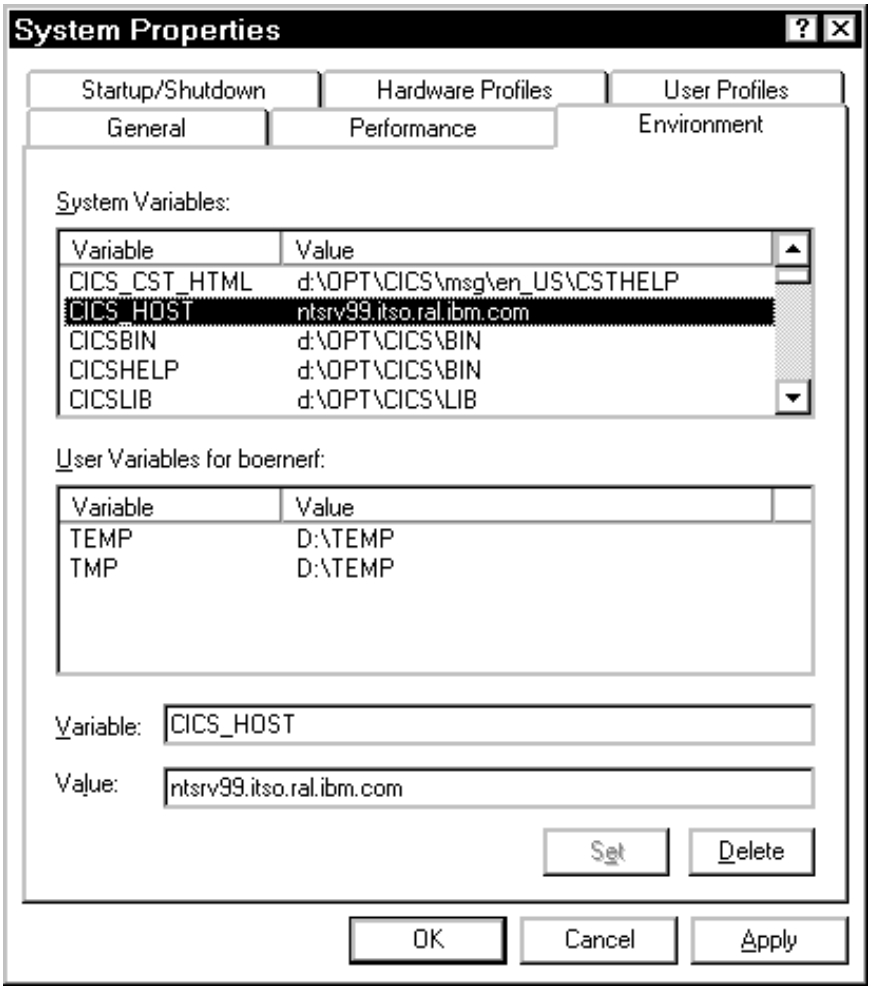


Figure 390. CICS Server Environment Definitions - CICS

Once you are logged on to the CICS Server with administrator rights, perform the following steps:

1. Issue the command `cicscp -v -l cicscp.log create dce -R`.

   Note: This command should only be used by customers who are not using DCE authentication.

2. Issue the command: `type cicscp.log`.

   It will produce the following output:

```
cicscp started at Tue Mar 03 17:35:55 1998
 cicscp is creating the DCE configuration
  cicscp is configuring the machine as an RPC-only machine
    with the cell name '/.../dce_cell.NTNCF101'"
 cicscp has finished creating the DCE configuration
cicscp stopped at Tue Mar 03 17:36:01 1998
```

You then need to create a CICS region for this server. To do that, start the CICS Server Administration utility and click on **Subsystem**, **New** and **CICS Region**, as shown in the next figure:

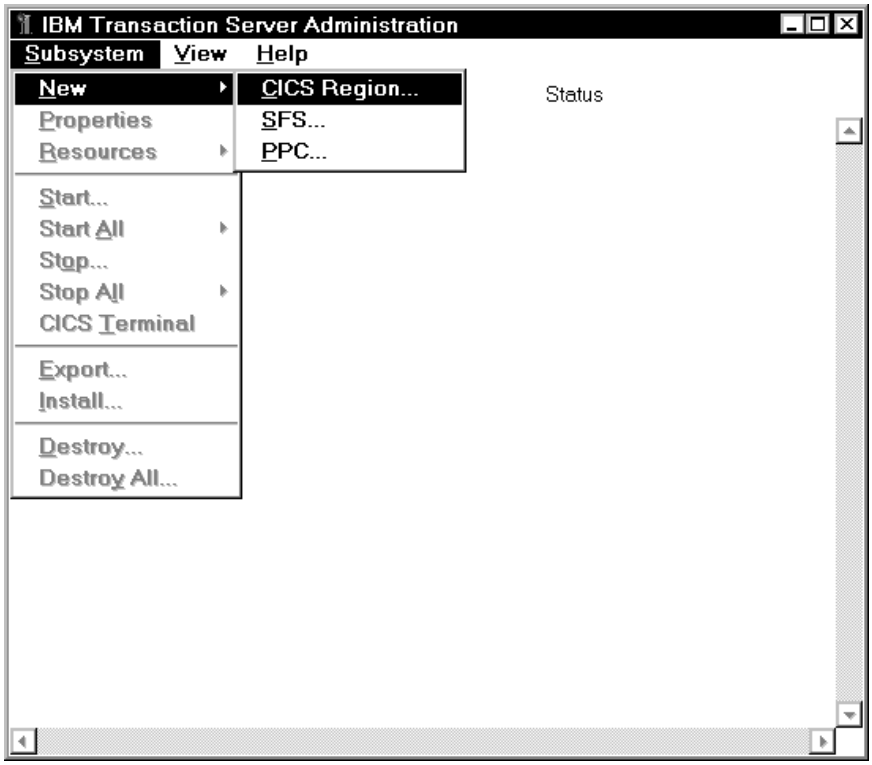


Figure 391. Create a CICS Region

To configure the new region, we gave it a region name and de-selected **Use DCE services to locate servers**.

Note: If you are using SNA communications, enter the Region name in uppercase.

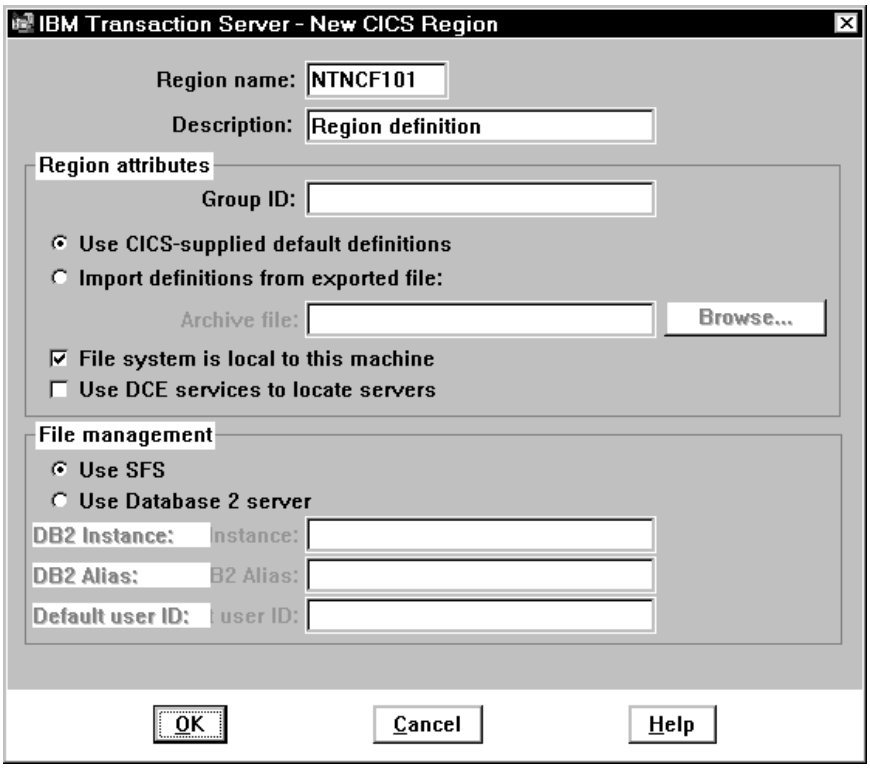


Figure 392. New CICS Region

To configure the region for SNA communications, click with the right mouse button on the new region and select **Properties**. Then configure the following fields:

- Local network name = NETID
- Local LU name = NTNCF101
- Change the Start type to auto

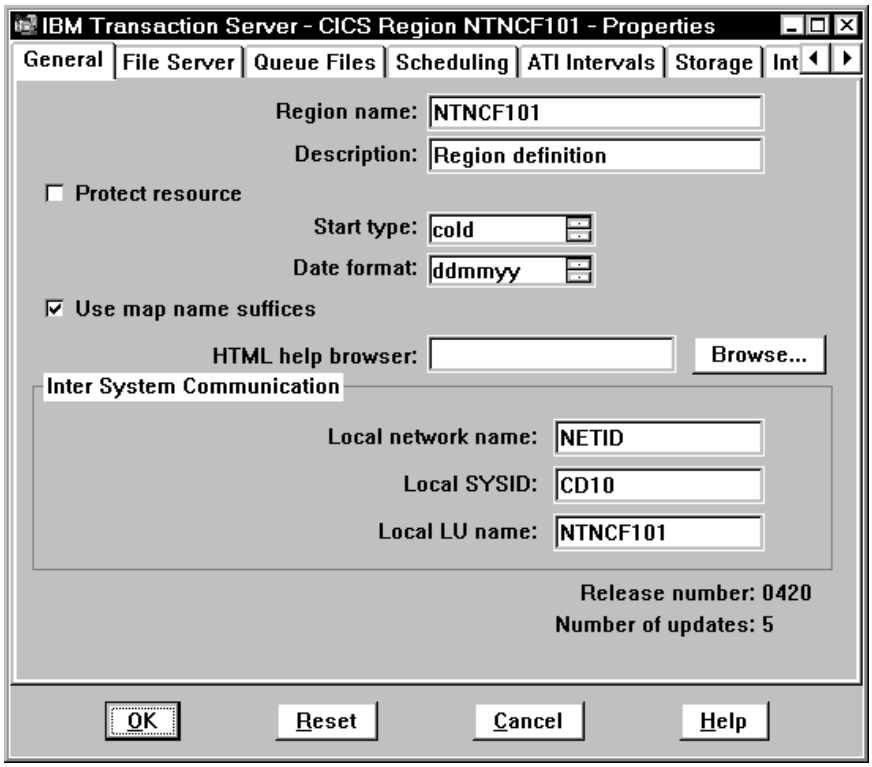


Figure 393. CICS Region Properties - General

You also get a structured file server (SFS) definition automatically. You don't have to change anything in the SFS definition.

An SFS is a record-oriented file system that Transaction Processing Managers use for their system and user files. SFS uses DCE RPCs to communicate with other servers, such as CICS regions. SFS provides both data processing and administrative functions. The data processing functions provide the standard operations needed to access and modify data: read, insert, update, delete, lock, and unlock. The administrative functions enable programs to query and modify SFS files and volumes, duplicate and delete files, and more. If SFS is used on a machine on which CICS has been installed, the Administration utility can be used to administer both SFS and CICS. SFS offers transaction integrity and log-based recovery, while supporting large numbers of concurrent users and very large files that can span multiple disks. In our scenario we only use SFS in Tier 3a.

The CICS region set up is now complete.

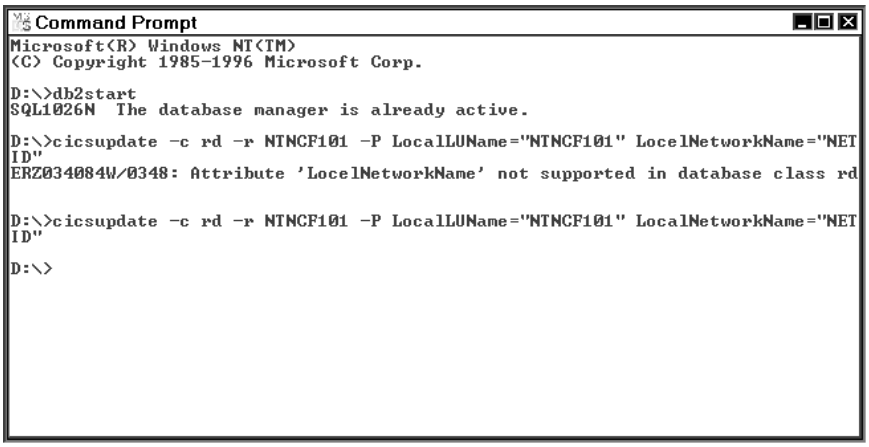


Figure 394. CICS Server Command Line Region Update

If you want to start the CICS region automatically, you can create a shortcut and put it in the Startup folder. Figure 395 shows the properties for this shortcut.

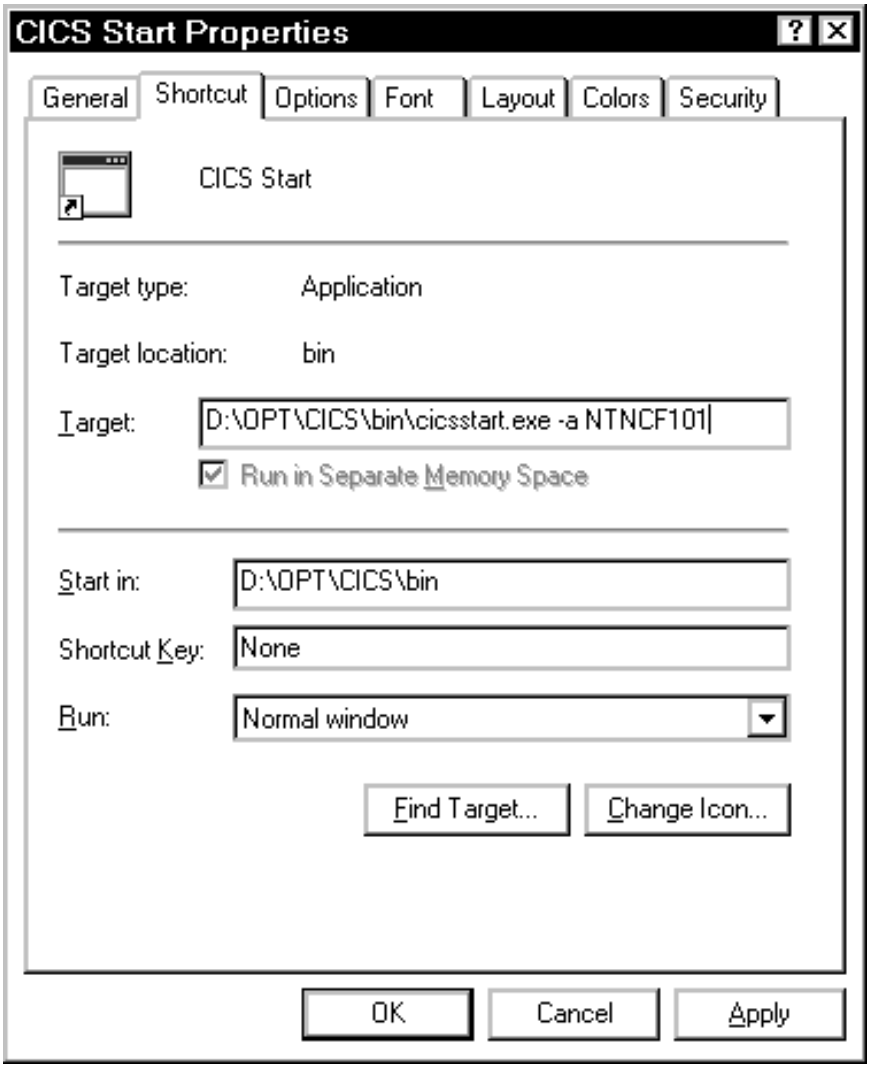


Figure 395. CICS Start Shortcut Properties

The next step is to lock the CICS resources that will be in use by the CICS application. In order to do that you need to update the RD.stanza file. Type the following in a command window:

```
cicsupdate -c rd -r NTNCF101 -P SafetyLevel=none
```

You won't see any output. This command changes only one line in the file RD.stanza. You can see the file in C.2.2, “The CICS Region Definition on Tier 3a” on page 416.

Then you need to add two listener entries for the CICS Server: one for TCP/IP (see Figure 397 on page 291), and the other for Named Pipes (see Figure 398 on page 292). To access the Listener screens perform the following:

- From the Administrator utility, select **Subsystem**, **Resources** and **Listener**.
- From the Listeners panel select **Listeners, New**.

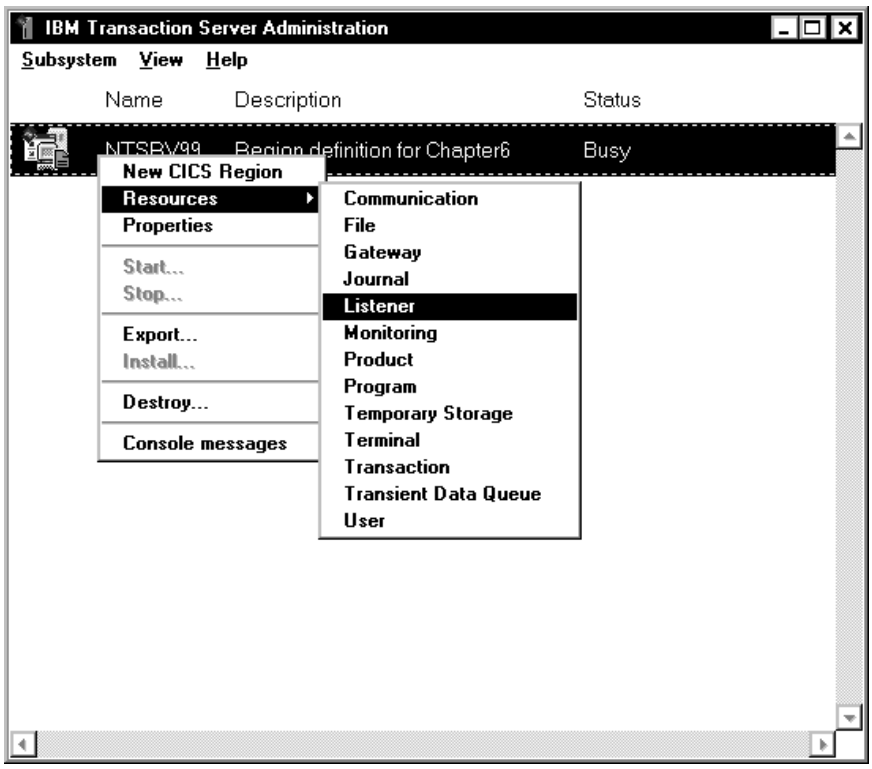


Figure 396. Create a Listener

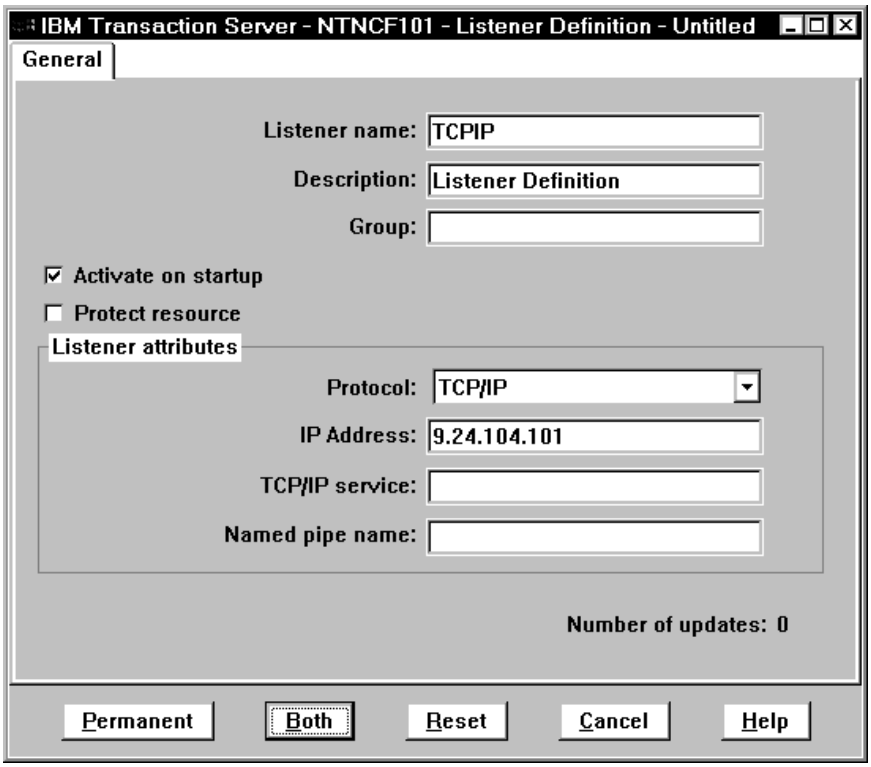


Figure 397. Listener Definition TCPIP

Note: If you wish to use the default TCP/IP port for CICS listener TCPIP, you can leave the TCP/IP service field empty. CICS will use port 1435 by default.

After configuring the listeners you need to click on **Permanent**.

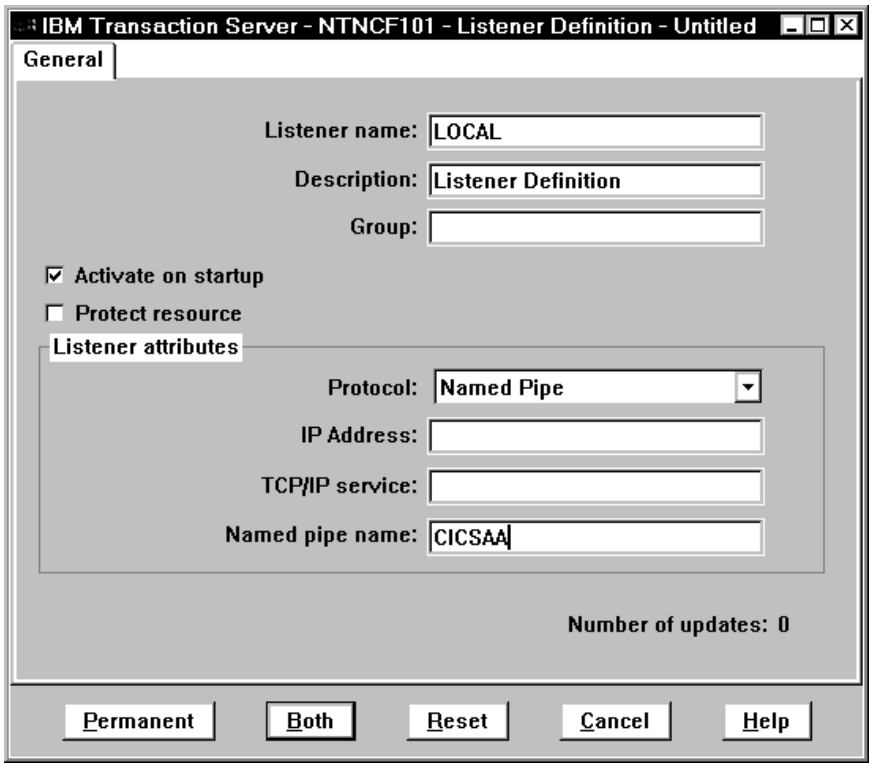


Figure 398. Listener Definition LOCAL

We added a definition for named pipes similar to the one we added for TCP/IP. Once it is added click on **Permanent**.

To complete the listener definition configuration you need to add a services entry to the services file. This file is located at:
\WINNT\SYSTEM32\DRIVERS\ETC\SERVICES.

Add the following line:

```
machine name      1435/tcp          #CICS listens on this port
```

In our case the machine name is NTNCF101 as can be seen in the following extract from the SERVICES file.

```
kpop              1109/tcp          # Pop with Kerberos
phone             1167/udp
NTNCF101          1435/tcp          #CICS listens on this port
ingreslock        1524/tcp
maze              1666/udp
```

A copy of the listener definition file can be found in C.2.4, “The CICS Listener Definition on Tier 3a” on page 419.

After configuring the listener definition we needed to define a communication definition, which defines the remote CICS region that Tier 3a will communicate with.

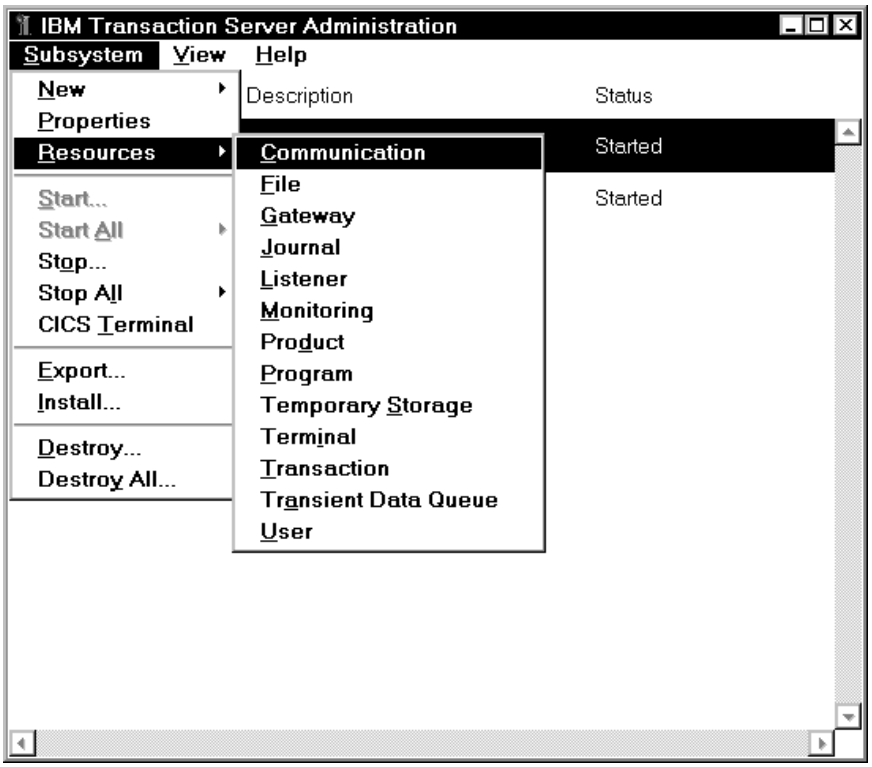


Figure 399. Open the Communication Entries

At the IBM Transactions Server Administration window click on **Subsystem**, **Resources** and then **Communication**.

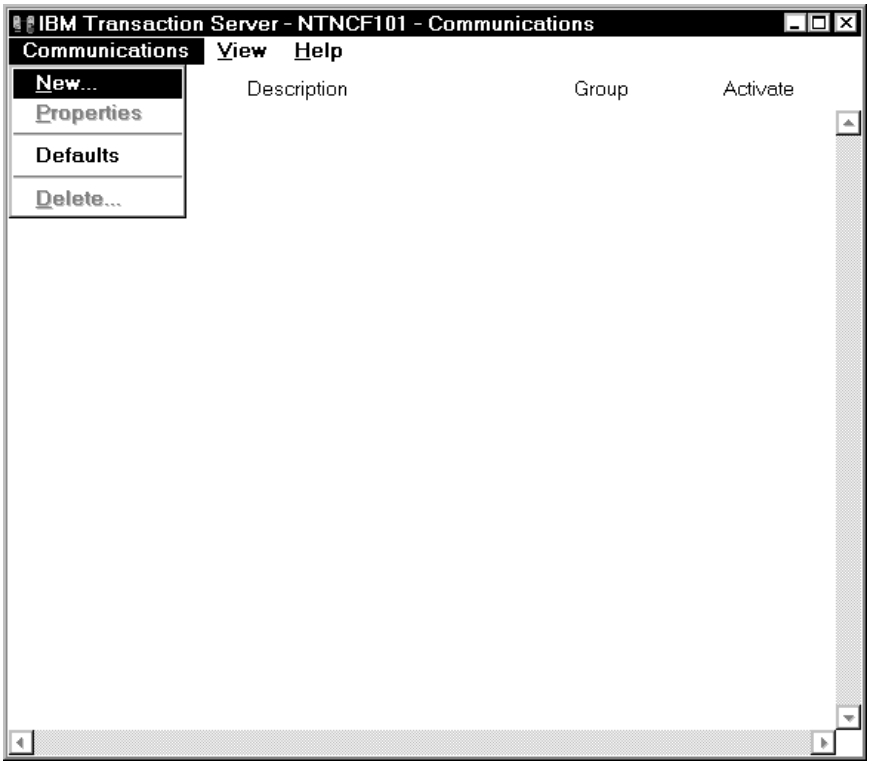


Figure 400. Create a New Communications Definition

In the communication definition that is now open, click on **Communications** and **New** to create a new definition.

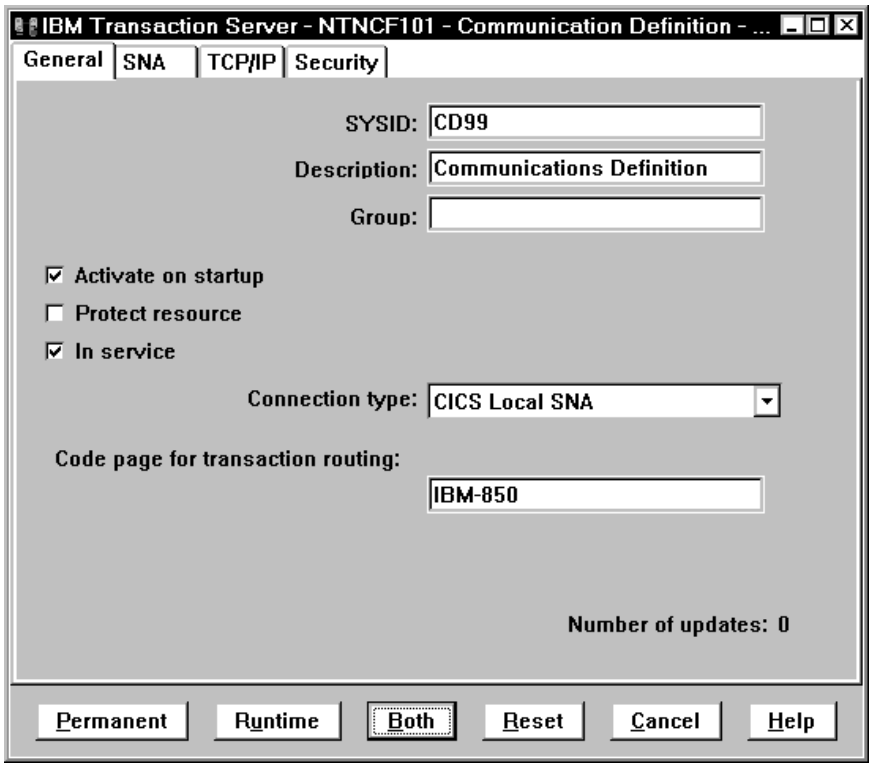


Figure 401. Create a Communication Entry - General

The two CICS Servers, Tier 3a and Tier 3b, will be communicating with each other over SNA. The two servers will be identified using their respective SYSIDs. Therefore, in this panel we need to define the SYSID of the partner CICS Server. Under the General tab we enter the SYSID of Tier 3b, which is CD99. The connection type is selected to be **CICS Local SNA** and the code page is left with its default.

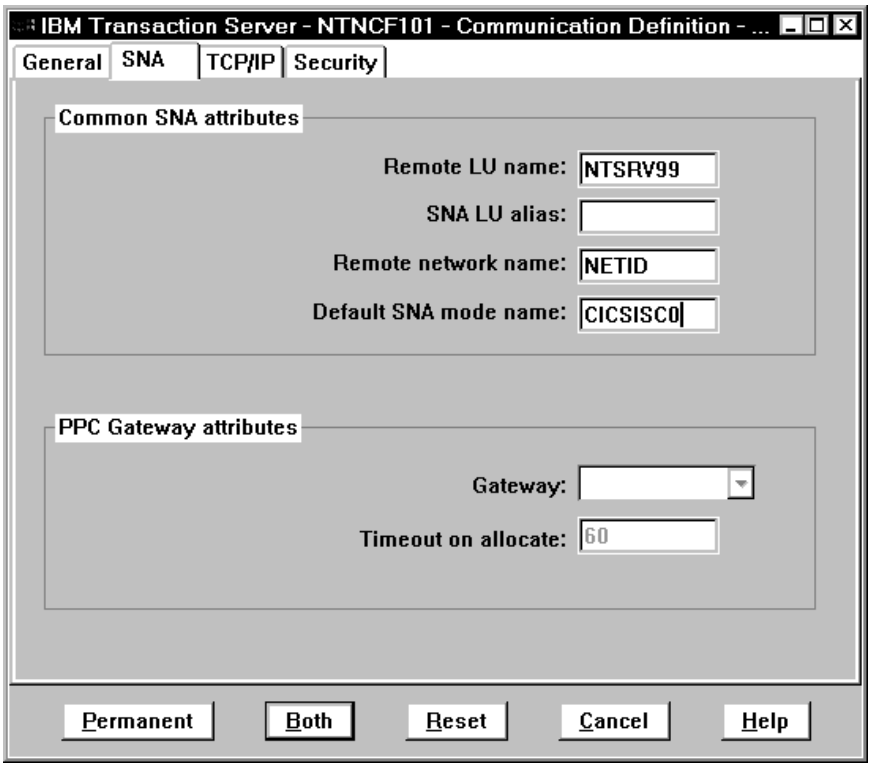


Figure 402. Create a Communication Entry - SNA

Under the SNA tab enter the LU name of Tier 3b which was defined in Communications Server. In our case this was NTSRV99. The NETID was the same on both machines as NETID and the mode name is the one we defined in the communication definition on Tier 3b, CICSISC0.

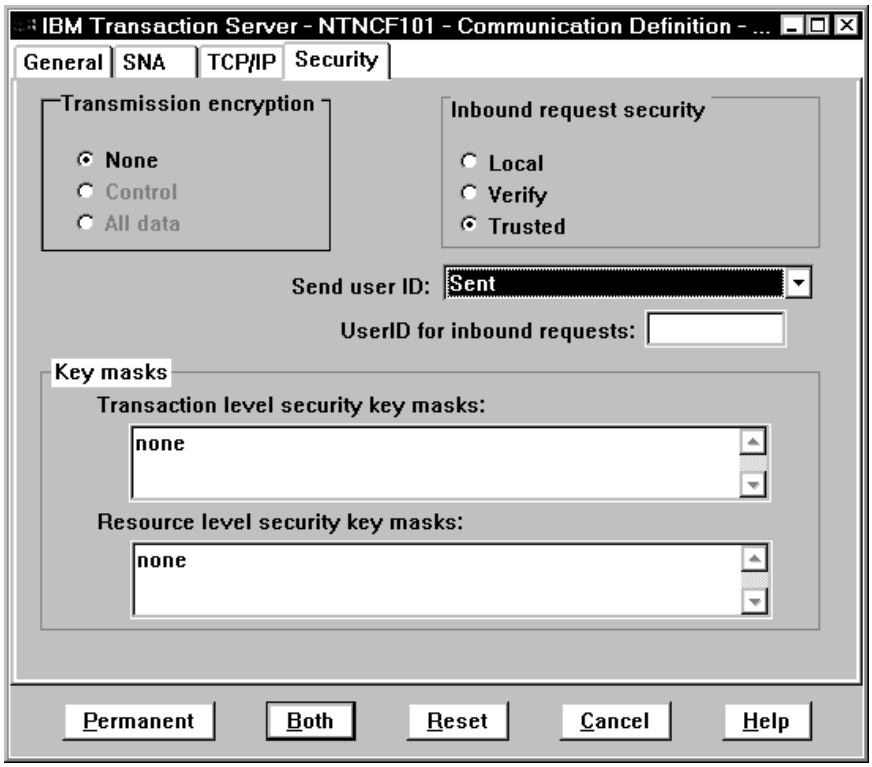


Figure 403. Create a Communication Entry - Security

Under the Security tab, we only have to change the security type to Trusted, which means that the CICS region will accept user IDs with or without a password. Click on **Permanent** to complete the communication definition configuration.

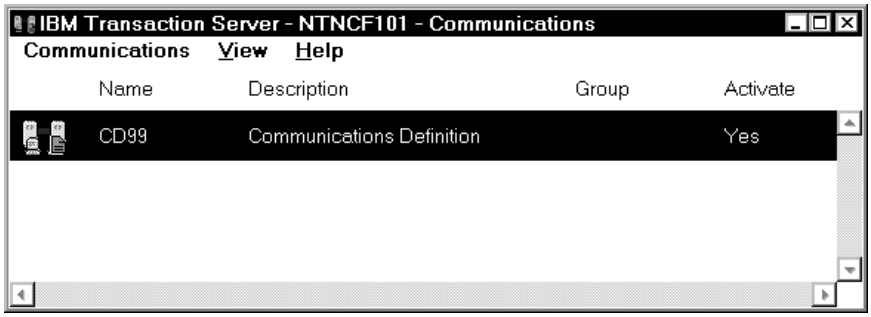


Figure 404. Communication Definitions

After completing the communication definition configuration you should get a screen similar to Figure 404. A copy of the communication definition file can be found in C.2.3, “The CICS Communication Definition on Tier 3a” on page 418.

Next we need to create the transaction program we are going to use. To create the sample transaction program MENU that comes with the CICS Server, enter the following cicsivp command. If it is successful, you should get the following output.

```
C:\>cicsivp -r NTNCF101

ERZ085007I/0005: Please wait, initializing......
ERZ085011I/0007: Now updating the stanza files
ERZ085013I/0010: Successfully added resource 'FILEA' to class 'fd'
ERZ085013I/0010: Successfully added resource 'LOGA' to class 'tdd'
ERZ085013I/0010: Successfully added resource 'L86O' to class 'tdd'
ERZ085013I/0010: Successfully added resource 'L86O' to class 'wd'
ERZ085013I/0010: Successfully added resource 'DFHDALL' to class 'pd'
ERZ085013I/0010: Successfully added resource 'DFHDBRW' to class 'pd'
ERZ085013I/0010: Successfully added resource 'DFHDCOM' to class 'pd'
ERZ085013I/0010: Successfully added resource 'DFHDMNU' to class 'pd'
ERZ085013I/0010: Successfully added resource 'DFHDREN' to class 'pd'
ERZ085013I/0010: Successfully added resource 'DFHDGA' to class 'pd'
ERZ085013I/0010: Successfully added resource 'DFHDGB' to class 'pd'
ERZ085013I/0010: Successfully added resource 'DFHDGC' to class 'pd'
ERZ085013I/0010: Successfully added resource 'DFHDGK' to class 'pd'
ERZ085013I/0010: Successfully added resource 'DFHDGL' to class 'pd'
ERZ085013I/0010: Successfully added resource 'INQY' to class 'td'
ERZ085013I/0010: Successfully added resource 'ADDS' to class 'td'
ERZ085013I/0010: Successfully added resource 'UPDT' to class 'td'
ERZ085013I/0010: Successfully added resource 'BRWS' to class 'td'
ERZ085013I/0010: Successfully added resource 'OREQ' to class 'td'
ERZ085013I/0010: Successfully added resource 'MENU' to class 'td'
ERZ085013I/0010: Successfully added resource 'OREN' to class 'td'
ERZ085009I/0006: The cicsivp ended with a return code of '0'.
```

Now that we have created the transaction definitions we must configure them since we need to route requests for certain transactions to Tier 3b. To access the transaction definitions, from the IBM Transactions Server Administration window, click on **Subsystem**, **Resources** and then **Transactions**. This will take you to a screen similar to the following:

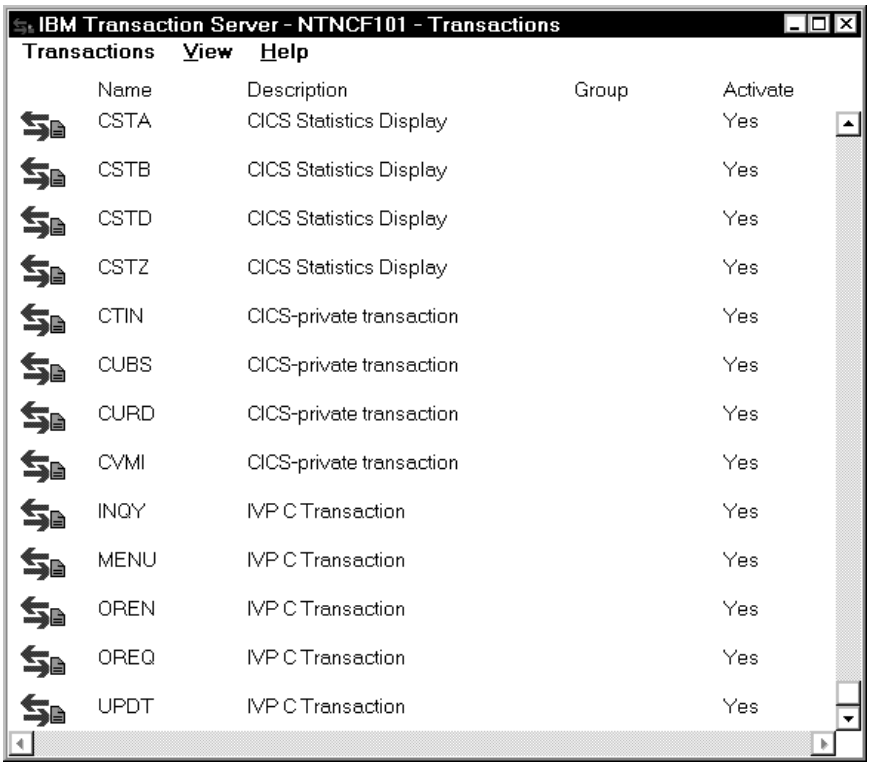


Figure 405. CICS Server - Transaction Server Definitions

We need to change the transaction definitions for all entries described as IVP C Transaction, so that all requests for these transactions are routed to Tier 3b. As

the routing will occur over an SNA link, we need to change the SYSIDs to point to Tier 3b, CD99, much like we did when defining the communication definitions.

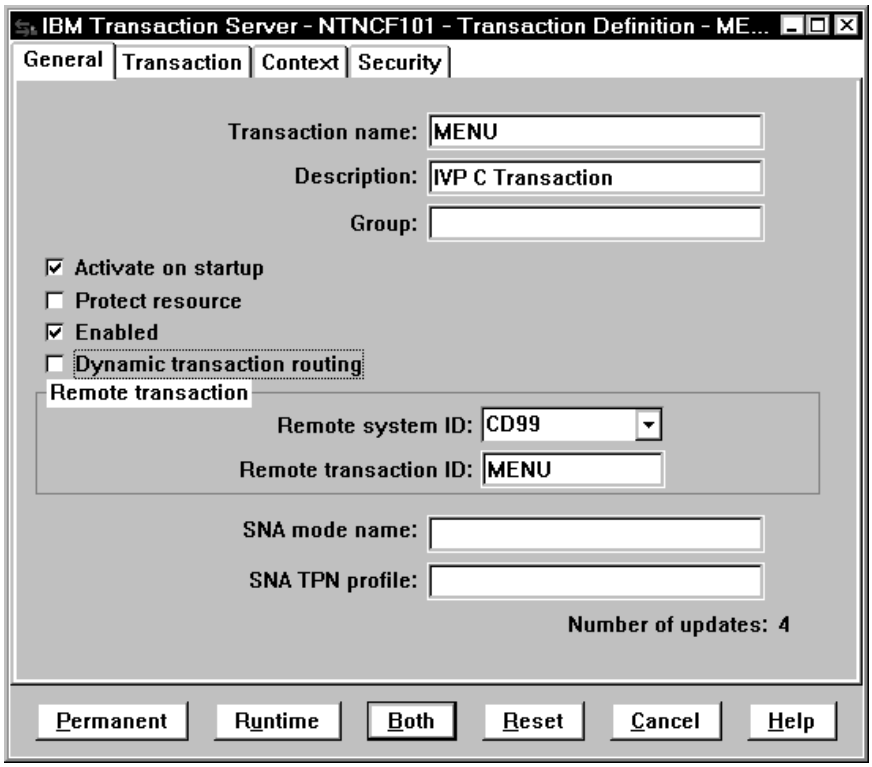


Figure 406. CICS Server Transaction Server Definition - General

Double-click on each transaction definition defined as IVPC Transaction to take you to the Transaction Definitions properties panel. Under the General tab enter a Remote System ID of `CD99` as shown in Figure 406.

A copy of the transaction definition file can be found in C.2.5, “The CICS Transaction Definition on Tier 3a” on page 420.

Note: There is an alternate way to update the transaction server definitions using the GUI. You can issue the following commands at the command line or create a batch file.

```
cicsupdate -c td -r ntncf101 -P INQY RemoteSysId="CD99" RemoteName="INQY"
cicsupdate -c td -r ntncf101 -P ADDS RemoteSysId="CD99" RemoteName="ADDS"
cicsupdate -c td -r ntncf101 -P UPDT RemoteSysId="CD99" RemoteName="UPDT"
cicsupdate -c td -r ntncf101 -P BRWS RemoteSysId="CD99" RemoteName="BRWS"
cicsupdate -c td -r ntncf101 -P OREQ RemoteSysId="CD99" RemoteName="OREQ"
cicsupdate -c td -r ntncf101 -P MENU RemoteSysId="CD99" RemoteName="MENU"
cicsupdate -c td -r ntncf101 -P OREN RemoteSysId="CD99" RemoteName="OREN"
```

Next, you need to configure the CICS Server local client INI file called CICSLCLI.INI, located in \opt\cics\bin\.

- Find the first entry that begins with Server= and which has NamedPipeName=CICSAA. This entry was added by the listener definition that you created earlier.
- Change the entry to read Server=NTNCF101 as shown below.

- Save and exit.

```
;-----------------------------------------------------------------------
; Server section - This section defines a server to which the client may
;                  connect.  There may be several Server sections.
;
; The Local Client is only supported via named pipe communications.
; The "Server" name must be unique within this initialization file
; and does not need to match any CICS Server name.
;
; The value of "NamedPipeName" is the method by which client and
; server are connected, this must match the value specified in the
; CICS Server Listener Definition (LD) "NamedPipeName" attribute.
;
Server = CICS01                 ; Arbitrary, unique name for the server
   Description = Named Pipe Support for local client ;
   Protocol = LOCALCLI          ; Matches with a Driver section below
   NetName = 00.00.00.00        ; Dummy.
   NamedPipeName = CICSCC       ; Must match servers named pipe
Server = NTNCF101               ; Arbitrary, unique name for the server
   Description = Named Pipe Support for local client ;
   Protocol = LOCALCLI          ; Matches with a Driver section below
   NetName = 00.00.00.00        ; Dummy
   NamedPipeName = CICSAA       ; Must match servers named pipe
```

The configuration of the CICS Server is now complete. We recommend that the Tier 3a server be rebooted before the CICS Server is started. You can start the region by clicking with the right mouse button on the region and selecting **Start**. Then select the **Cold** option.

Once the CICS Server is started you can start a sample application that is packaged with the server called MENU. To invoke this transaction go to the Windows Start button and select **Programs, IBM CICS Server for Windows NT** and **Start Local Terminal**. You will see a CICS Server selection panel where you need to decide which CICS Server you require. Select the server that you have configured. In this scenario it was NTNCF101. At the 3270 emulation screen enter the transaction name, MENU, in uppercase. The Local Terminal screen can be seen in Figure 407.

Note: When running the CICS terminal you get a 3270 style screen where the enter key is the right Ctrl button.

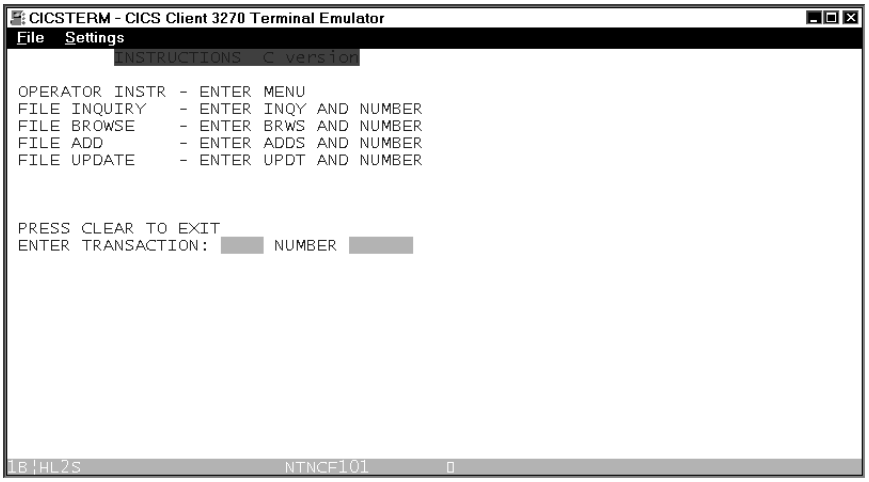


Figure 407. CICS Transaction Program - MENU

5.3.4 Configuring the ADSM Server

As most of the ADSM servers can be configured from the ADSM client component, we have described the configuration process in 5.4.5, “ADSM Server and Client” on page 331.

5.4 Configure Tier 3b - NTSRV99

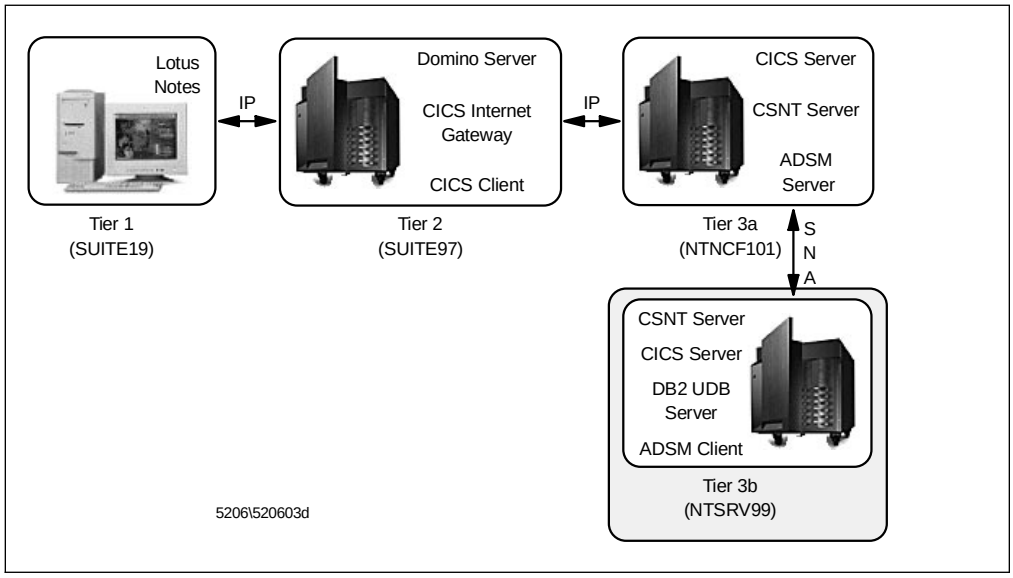


Figure 408. Configuring Tier 3b

In order for the CICS Server in Tier 3b to receive transaction requests from the CICS Server in Tier 3a, we implemented an SNA link between the two nodes. In a CICS environment there are two ways to implement SNA:

- Local SNA support using a product such as IBM Communications Server for NT V5.01.
- PPC Gateway Server SNA support using an Encina Gateway Server.

In our environment we implemented the option Local SNA Support using Communications Server for NT. To configure a CICS Server for SNA we needed to:

1. Configure the SNA product providing the SNA Services, in our case this is Communications Server.
2. Set up a listener definition.
3. Set up a local name for your CICS region.
4. Set up a communications definition entry.

5.4.1 Configuring the Communications Server on Tier 3b

To define a configuration, you need to start the Communications Server Configuration utility by clicking on **Start, Programs, IBM Communication Server** and **SNA Node Configuration**. This will take you to a panel where you can start a new configuration by clicking on **File** and **New**. This will automatically display the Scenario pull-down menu. From there, select **Advanced**. You should now have a

panel that displays all the possible configuration options as shown in the following figure:

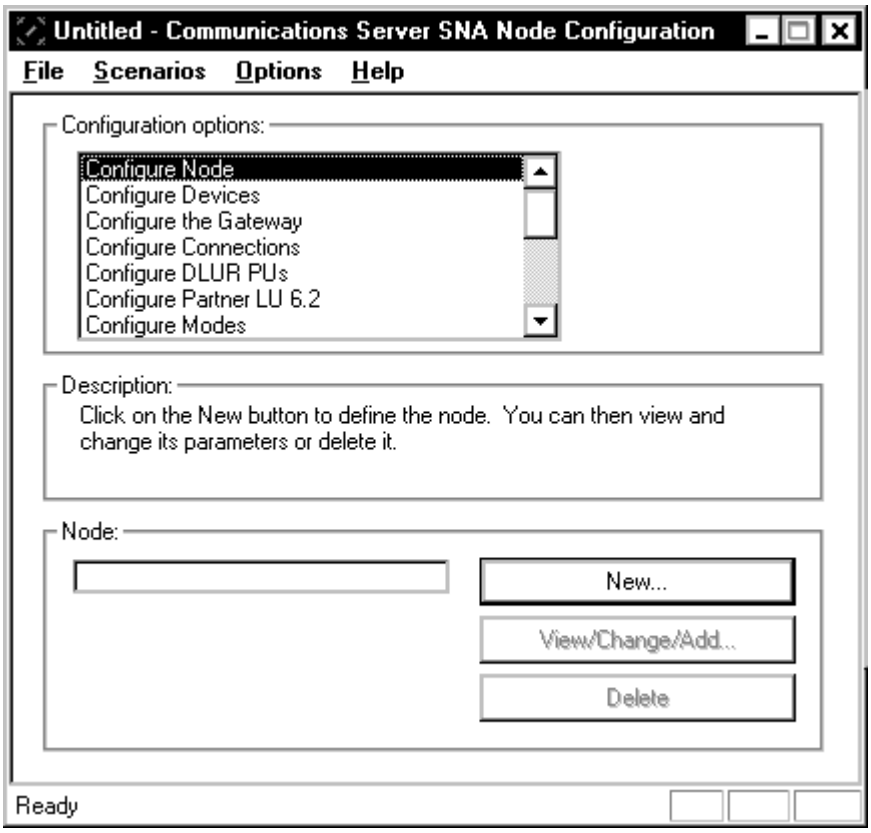


Figure 409. Configure Node

The next step is to highlight **Configure Node** and then click on **New**. This will take you to the Define the Node window. This is where you define your machine to the SNA network by giving it a control point (CP) name.

Note: The CP name must be unique in the network (different from all other CP names and logical unit (LU) names).

The CP name consists of two parts:

1. The network name, which is the name of the SNA network.
2. The LU name, which the name of the SNA resource on the network.

Since CP names can sometimes be difficult to remember you can also define a CP alias, which is a local nickname for your SNA node. At the bottom of the panel there are two radio buttons that allow you to determine the function of this SNA node. SNA servers are commonly defined as network nodes which gives them more SNA functions. For our scenario we chose the values depicted in the following window:

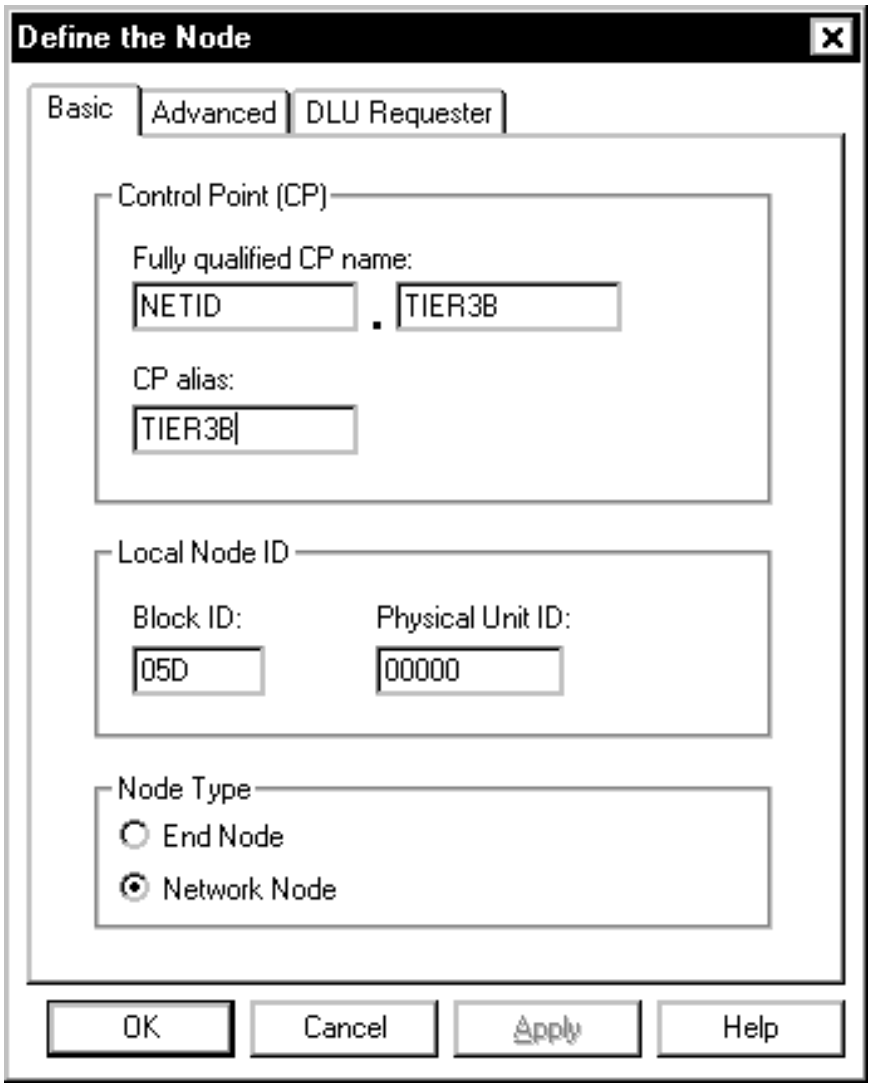


Figure 410. Define the Node

Once all the values are entered, click on **OK** which will take you back to the main configuration panel.

The next step is to determine the type of network that will be used to connect the machines Tier3a and Tier 3b. When you highlight **Configure Devices** a DLC window appears where you can select the network type. In our scenario we used a token-ring LAN, so highlight **LAN** and click on **New**.

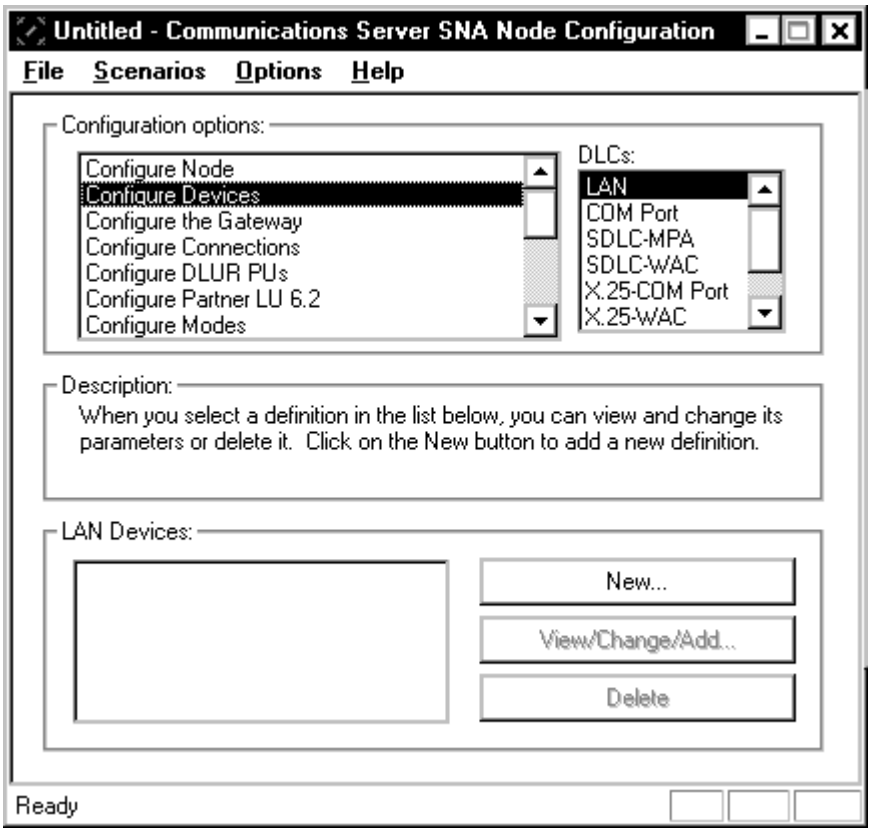


Figure 411. Configure Devices

If the adapters and LLC2 driver have been installed successfully, you should see a screen similar to the following window:

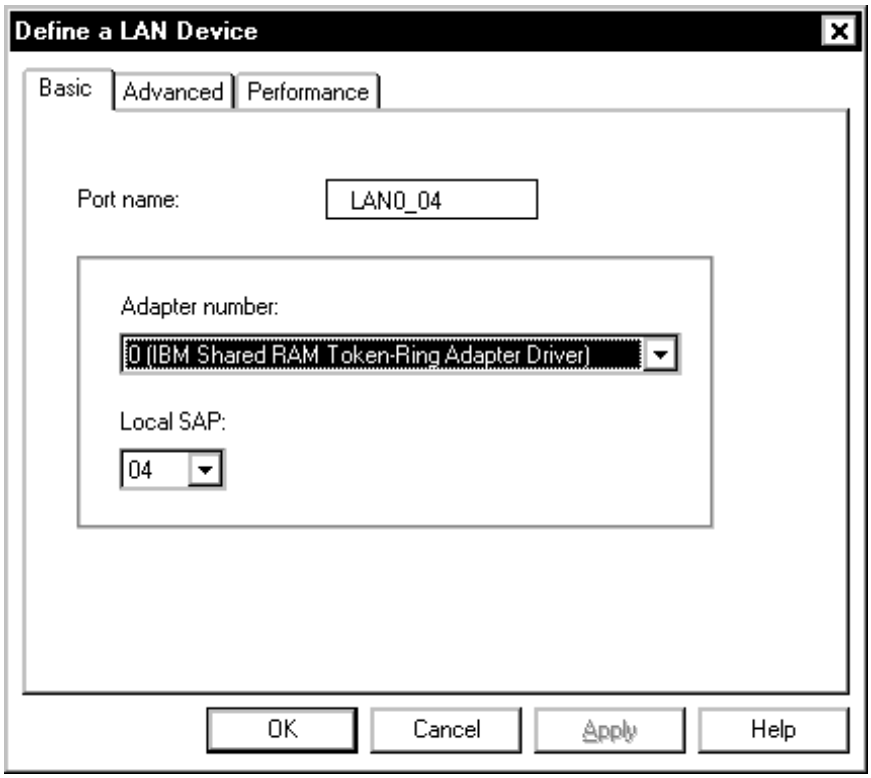


Figure 412. Define a LAN Device

Click on **OK** and the device will be added. The next step is to configure connections to the CICS Server at Tier 3a. Select **Configure Connections** in the main configuration panel and select **New**.

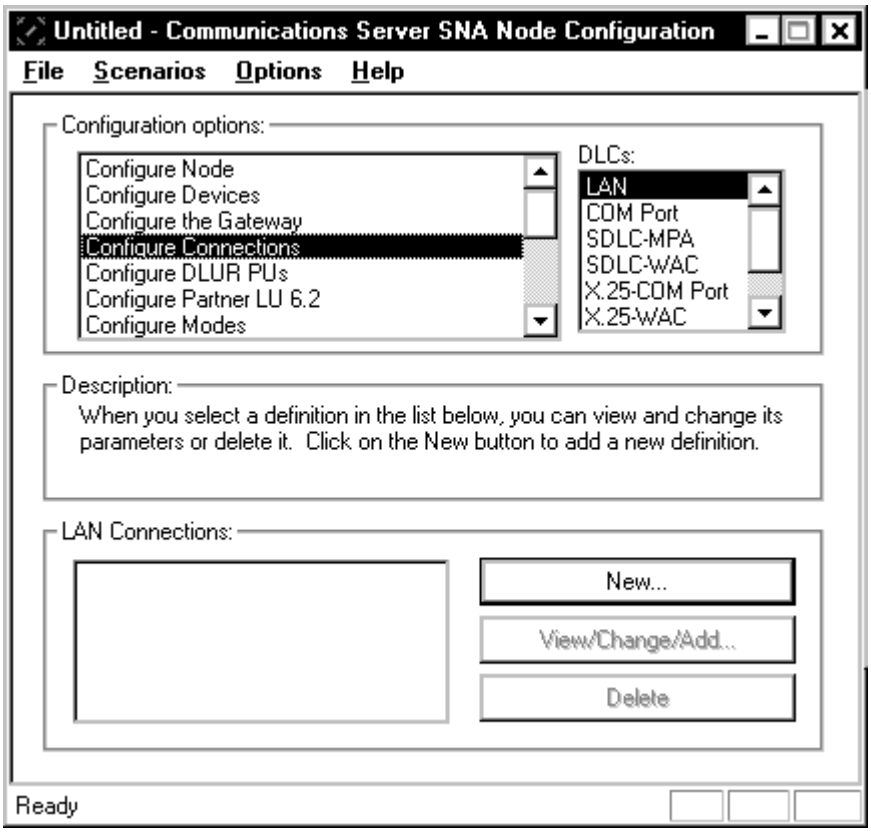


Figure 413. Configure Connections

At the Basic tab you need to enter a link station name which normally reflects the device you are connecting to. We chose the name of Tier 3a, NTNCF101. You also need to define the MAC address for Tier 3a in the Destination address field. The SAP value you define must also match the SAP value that Tier 3a is using.

Note: To locate the MAC address easily on Windows NT we pinged the partner machine we wanted the MAC address of and then used the arp -a command to resolve the MAC address.

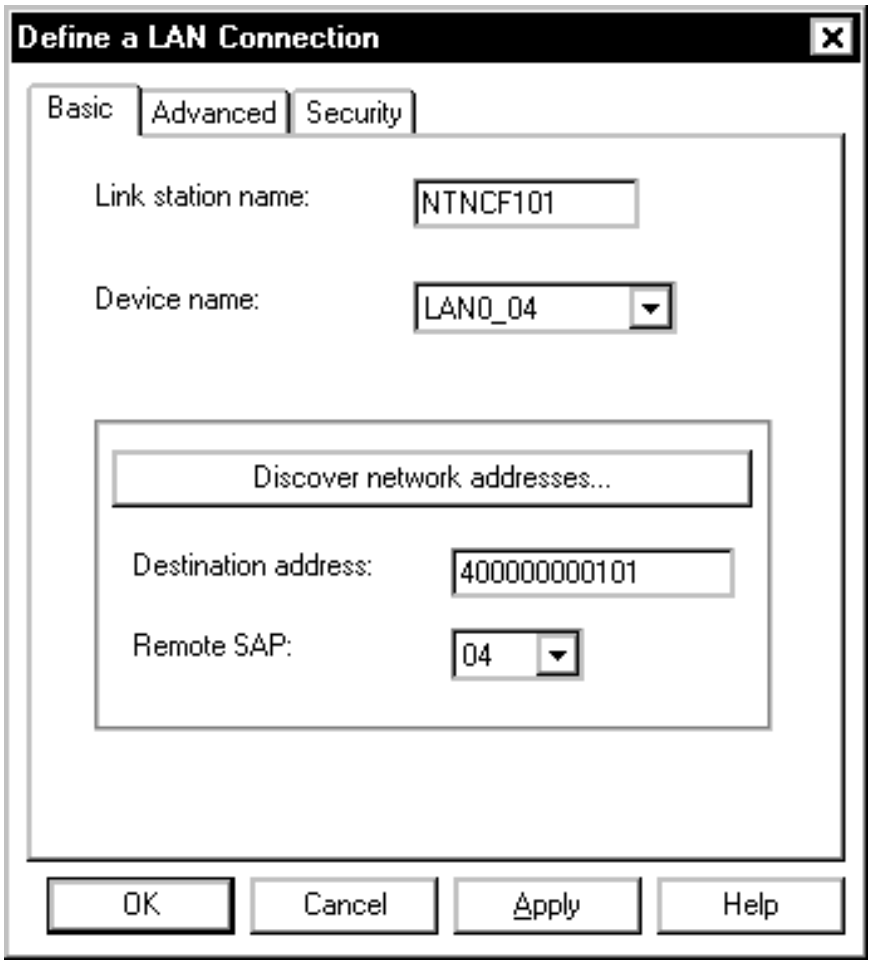


Figure 414. Define a LAN Connection - Basic

There are three tabs in Figure 415 on page 307. Click on the **Security** tab to define the Adjacent CP name. Then enter the fully qualified CP name of the partner node, Tier 3a. You can also indicate that Tier 3a is a network node. This information is used to verify that the partner node at the defined destination address is who it says it is.

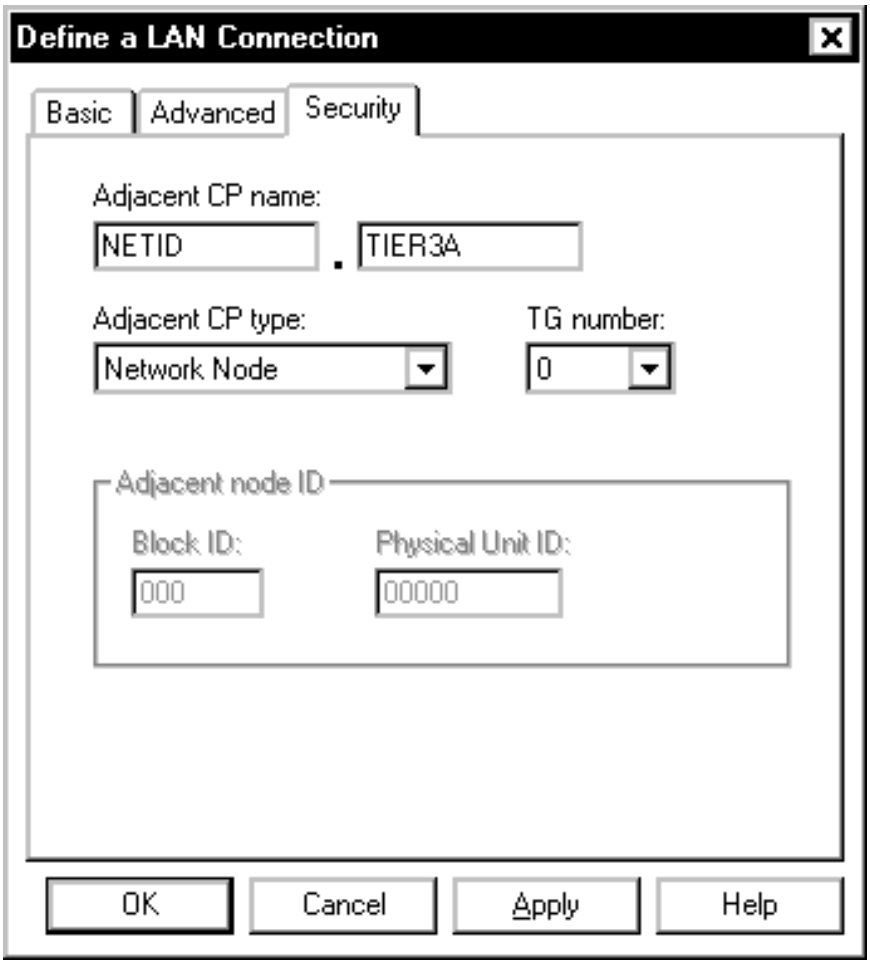


Figure 415. Define a LAN Connection - Security

Clicking on **OK** takes you back to the main configuration panel. The next component to configure is the Mode, which defines the characteristics of the session between the two SNA nodes. As a result of highlighting **Configure Modes** a list of modes appears. Select the mode **Blank** and click on **New**.

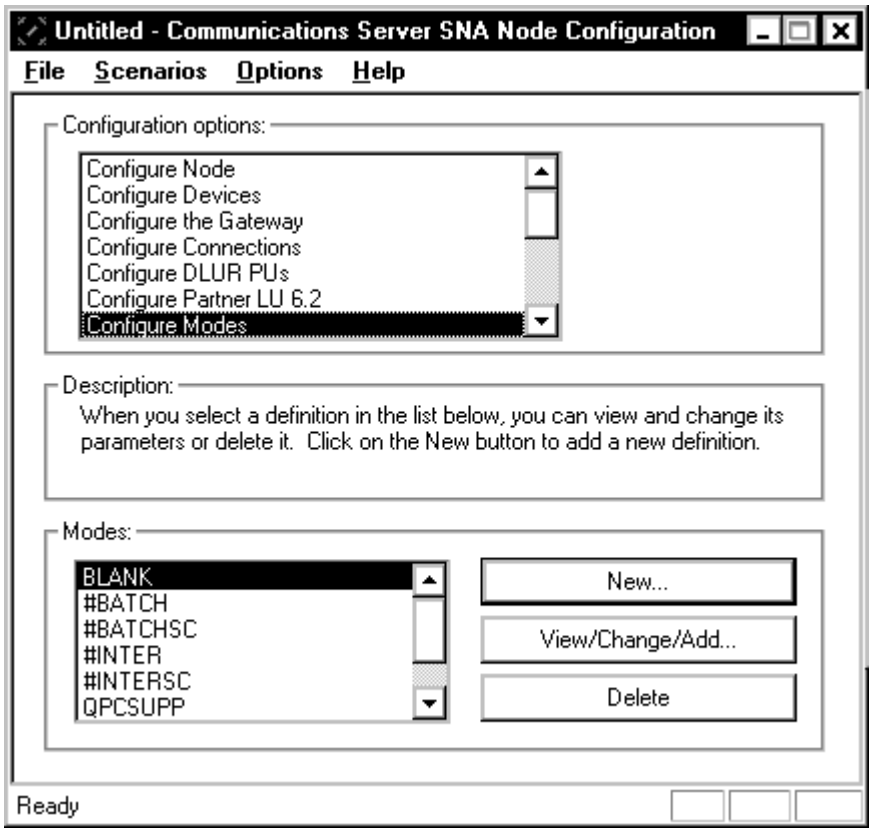


Figure 416. Configure Modes

In the Basic tab enter the mode name `CICSISC0` and set the PLU mode session limit to `10`. Also, set the Minimum Contention Winner Sessions to `5`.

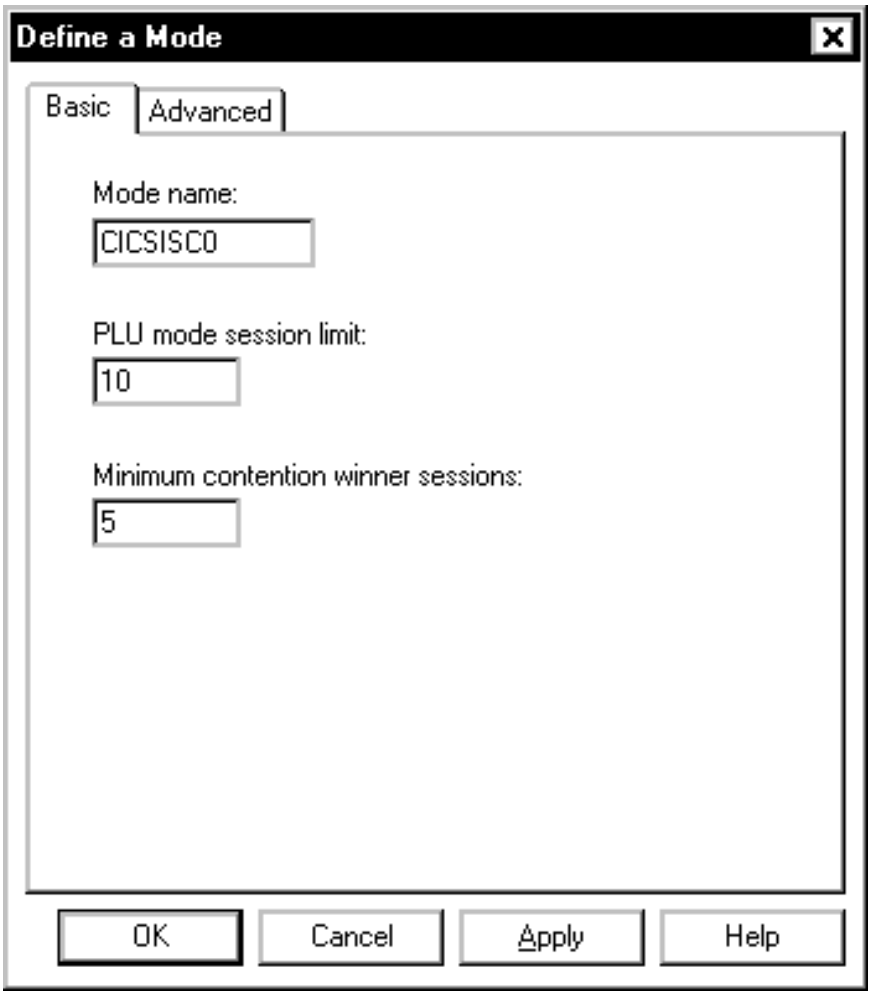


Figure 417. Define a Mode - Basic

The Advanced tab allows you to change the performance characteristics of the session CICSISCO. Default values are usually sufficient but enter the values to match Figure 377 on page 273.

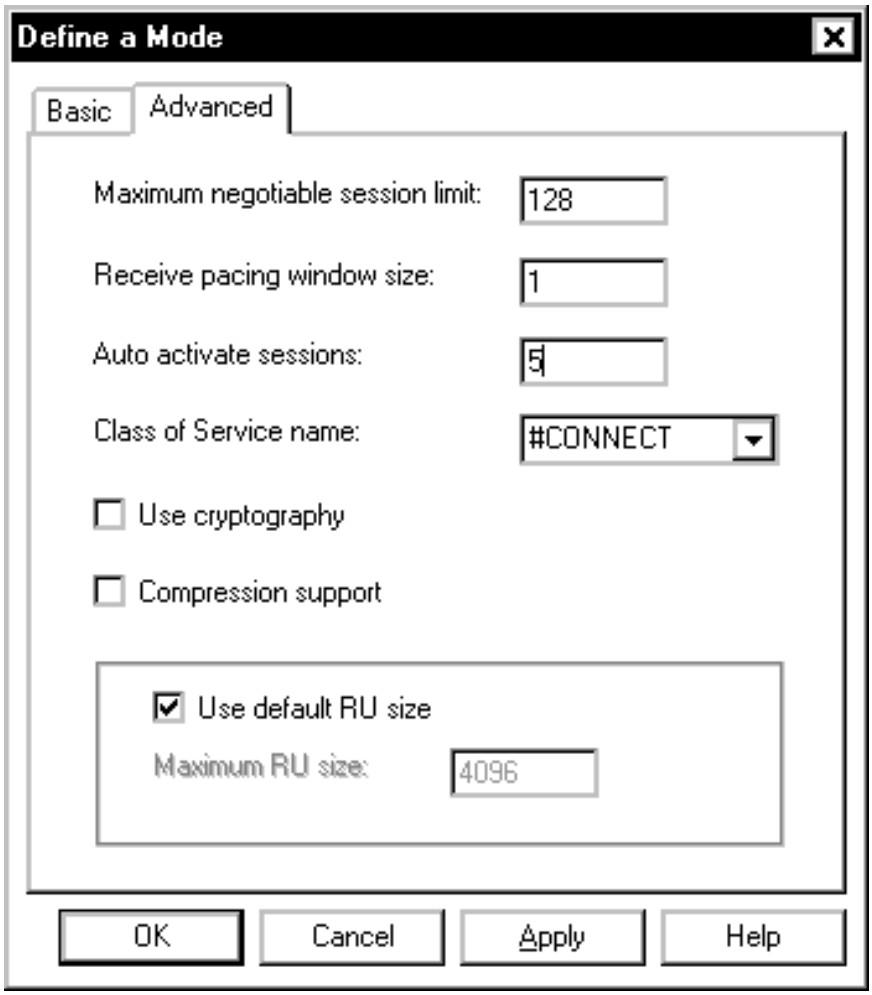


Figure 418. Define a Mode - Advanced

In order to obtain the best performance, match these values on both servers. Then click on **OK**. The new mode will be added to the configuration.

The next step is to define a local LU that the CICS Server can use. Select **Configure Local LU 6.2** from the main configuration panel and click on **New**.

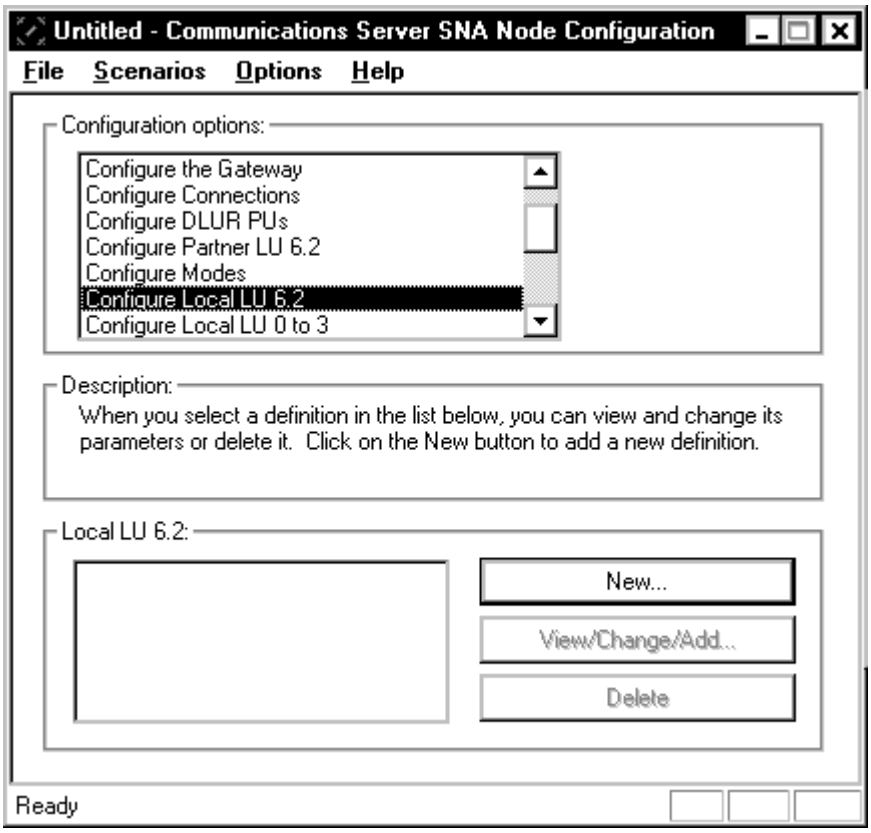


Figure 419. Configure Local LU 6.2

On this panel enter a unique LU Name. We chose the host name of the server Tier 3b, NTSRV99. We also chose the same name for the alias, although this could be anything that is easy to remember. The value `0` is entered by default in the Session Limit field. This means that there is no session limit.

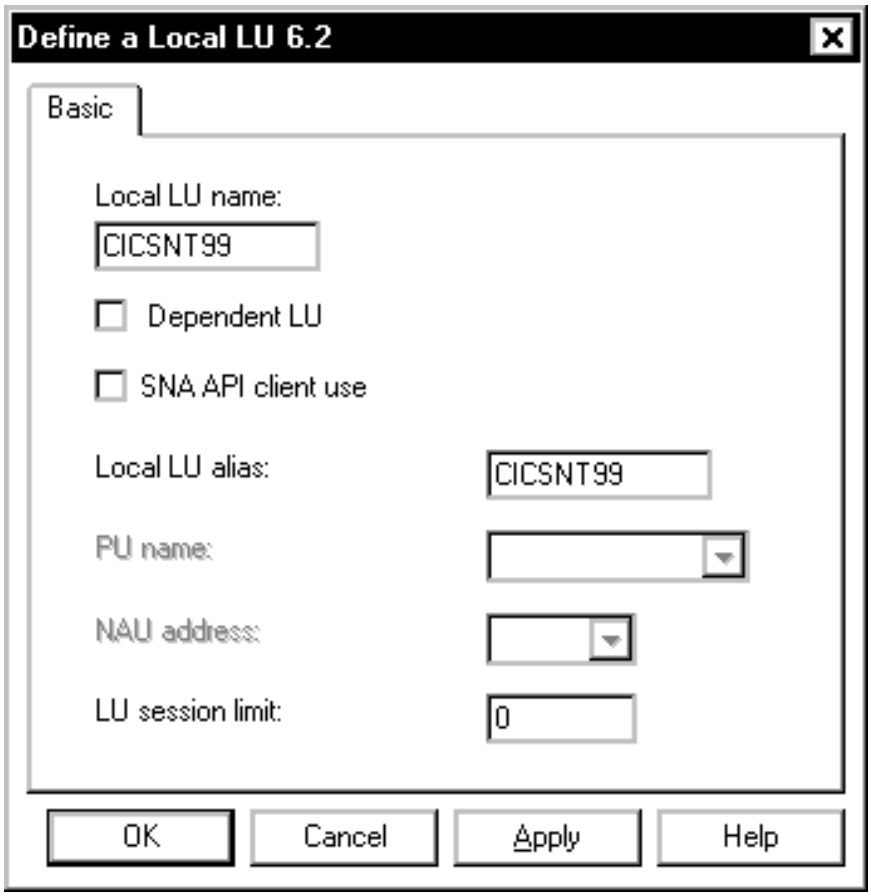


Figure 420. Define a Local LU 6.2

Click on **OK** to go to the main configuration panel again. We now need to define information about the remote system that we want to connect to. The first thing we need to define is the partner LU name. On the main panel highlight **Configure Partner LU6.2** and click on **New**.

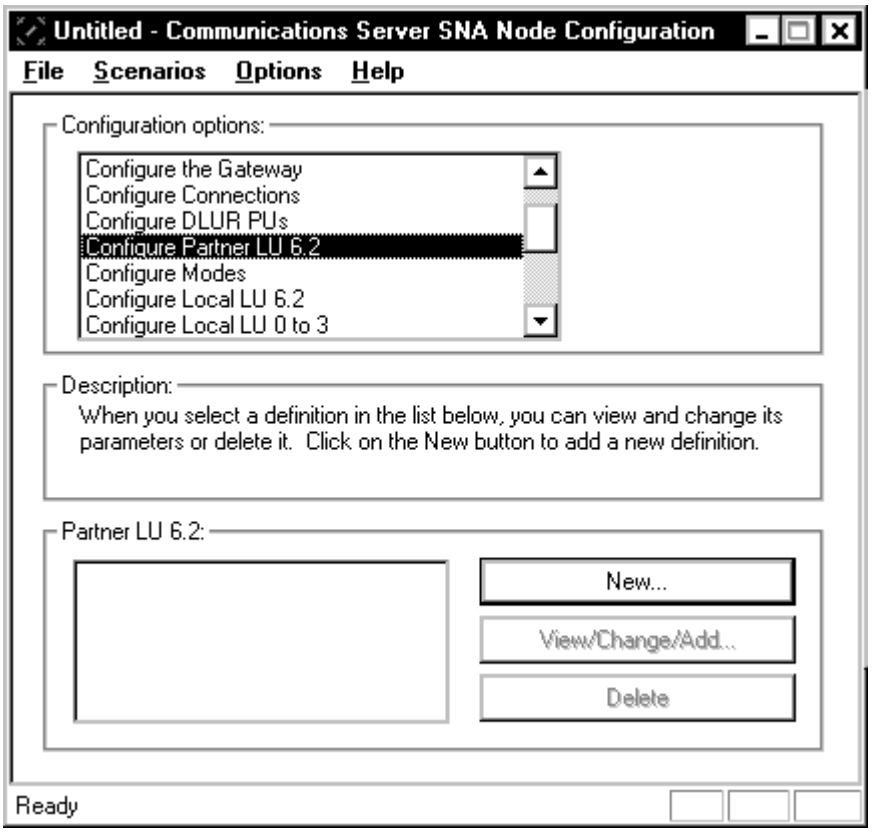


Figure 421. Configure Partner LU 6.2

In order to enter values in this field you need to collect data from the partner node or at least know what the partner nodes fully qualified CP name and LU name is. Enter a fully qualified Partner LU Name of `NETID.NTNCF101` and a Fully qualified CP name of `NETID.TIER3a` from Tier 3a.

The partner LU alias can be anything as it is local to this machine. Click on **OK** when you are done.

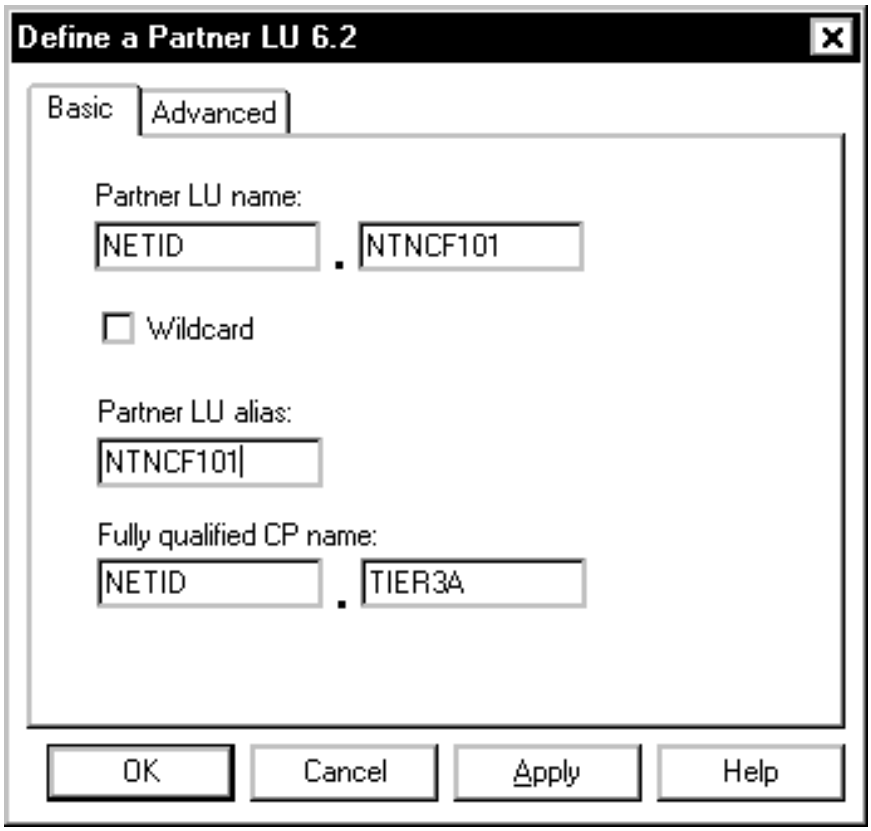


Figure 422. Define a Partner LU 6.2

The Communications Server configuration is now complete. To save and verify your configuration select **File, Save** and give the configuration a meaningful name. Then click on **Yes** to make it your default configuration.

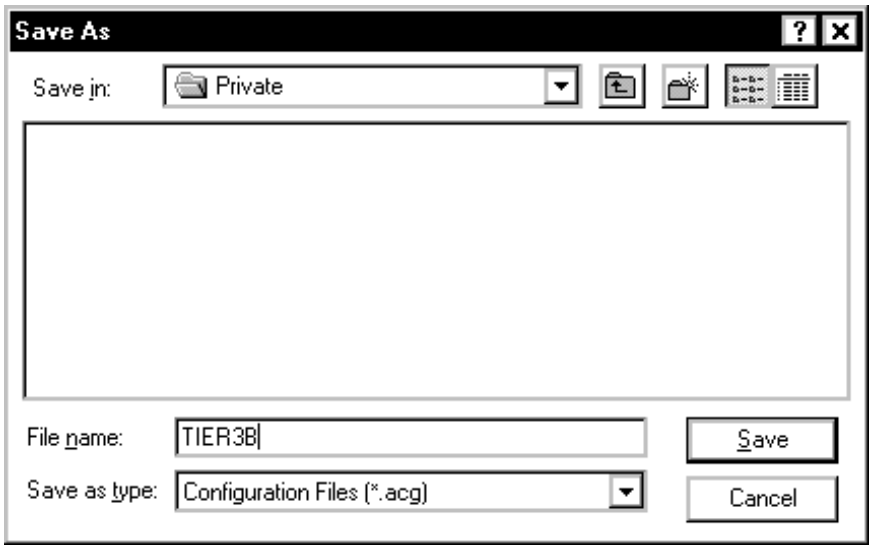


Figure 423. Save the Configuration

A copy of the communication definition file can be found in C.3.3, “The CICS Communication Definition on Tier 3b” on page 442.

To start the Communication Server configuration you need to start SNA Node Operations by selecting **Start, Programs** and **IBM Communications Server**. Here you can select to start the SNA node by clicking on the **Green** button. You can also start the node by clicking on **Operations** and **Start**.

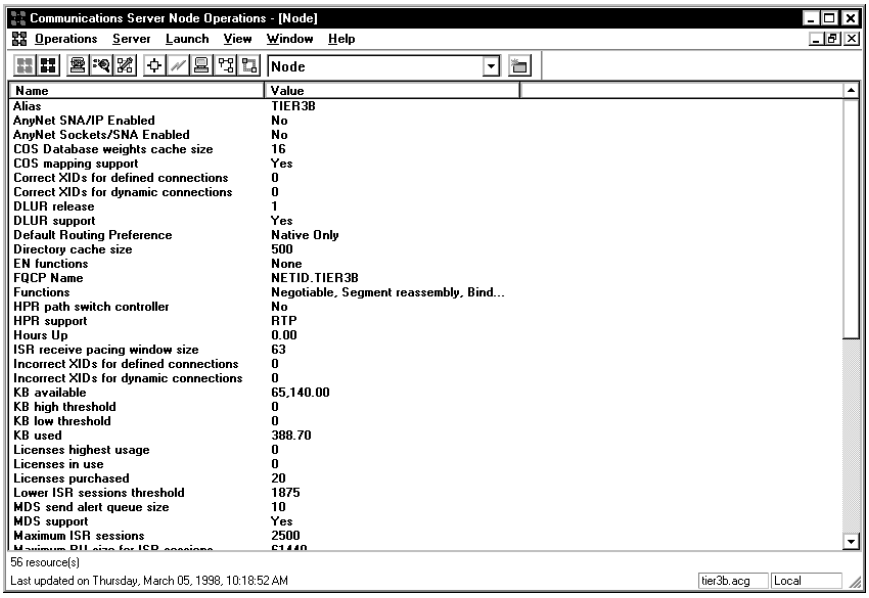


Figure 424. Communications Server Node Operations

You may also want the Communications Server SNA node to start automatically as a service when the server is booted up. This can be done by entering `csstart -a` at a command prompt. The next time you reboot your default Communications Server configuration is automatically started.

5.4.2 DB2 UDB Server

All the DB2 configuration that was required was performed at installation. We used the basic configuration steps from 3.2.4, “Migrate the DB2 Products” on page 138. For the CICS definitions to use DB2, refer to 5.4.3.1, “Configuring the CICS Server to Use DB2” on page 329.

5.4.3 CICS Server Configuration

In our scenario, the CICS Server in Tier 3b receives a request from the CICS Server in Tier 3a via Communications Server.

Note: For a description of the different types of definitions for our CICS environment, please refer to 5.3.3, “CICS Server Configuration” on page 284.

Once you are logged onto the CICS Server with administrator access, perform the following steps:

1. Add the following environment variables:
   - CICS_HOSTS=tcpip_host_name_for _CICS_ server_1 tcpip_host_name_for _CICS_server_2

     For example: CICS_HOST=NTNCF101.ITSO.RAL.IBM.COM.

Note: All CICS Servers that you might need to communicate with must be in this list.

- ENCINA_BINDING_FILE=x:\var\cics_servers\ servers_binding, where x=drive letter.
- DB2_RR_TO_RS=ON
- DB2COMM=NETBIOS,TCPIP
- DB2INSTANCE=DB2

Note: The last two entries were added during the DB2 configuration. We just need to confirm that they are there. The DB2COMM value will reflect the protocols that you will use with DB2. The DB2INSTANCE value does not have to be the default, DB2.

2. Issue the command `cicscp -v -l cicscp.log create dce -R`.

   Note: This command should only be used by customers who are not using DCE authentication.

3. Issue the command: `type cicscp.log` and you should get the following output:

```
cicscp started at Tue Mar 03 17:35:55 1998
 cicscp is creating the DCE configuration
  cicscp is configuring the machine as an RPC-only machine
        with the cell name '/.../dce_cell.NTNCF101'"
 cicscp has finished creating the DCE configuration
cicscp stopped at Tue Mar 03 17:36:01 1998
```

4. Reboot the server for the changes to take place.

You then need to create a CICS region for this server. To do this, start the CICS Server Administration utility. Click on **Subsystem**, **New** and **CICS Region** as shown in the next figure:

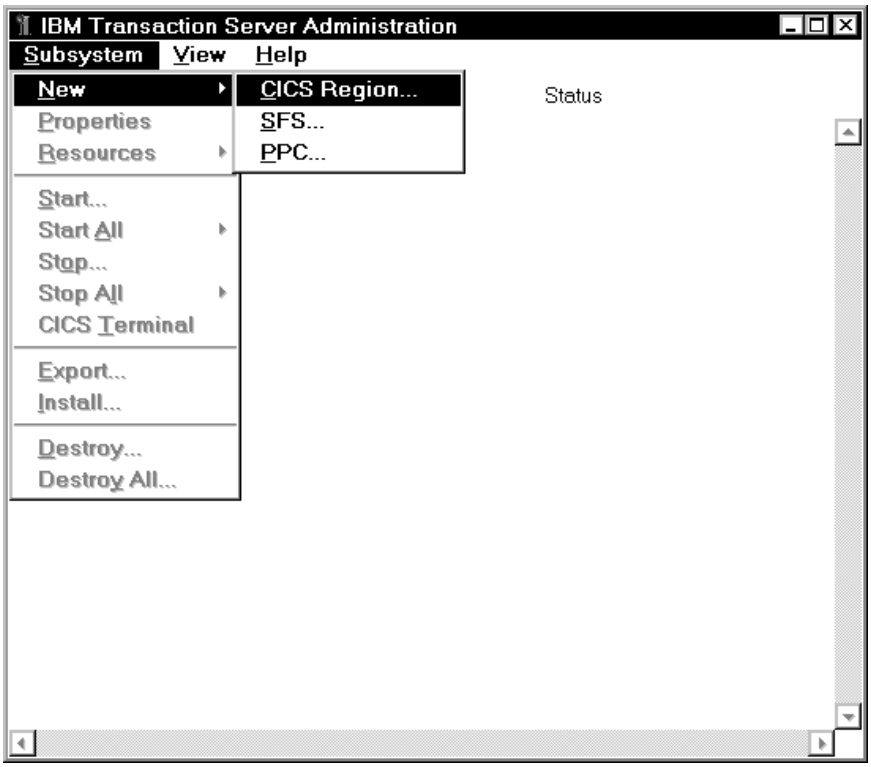


Figure 425. Create a CICS Region

To configure the new region, we gave it a region name and de-selected **Use DCE services to locate servers**.

Note: If you are using SNA communications, enter the Region Name in uppercase.

Since you are accessing a DB2 database from this CICS Server you need to select **Use DB2 Server** and not SFS in this configuration. We configured the DB2 parameters as follows:

- DB2 Instance=DB2

  This value is obtained from the environment variable DB2INSTANCE.
- DB2 Alias=CICSDB
- Default user ID=BOERNERF

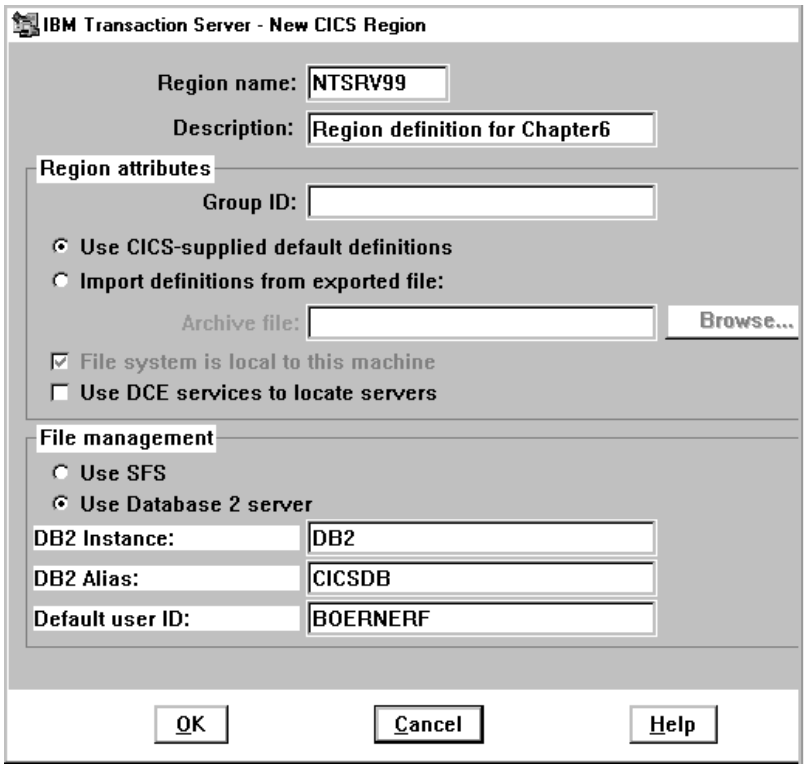


Figure 426. New CICS Region

To configure the region for SNA communication, click with the right mouse button on the new region and select **Properties**. Then configure the following fields in Figure 427 on page 319:

- Local network name = NETID
- Local LU name = NTSRV99
- Change the Start type to auto

  See 5.4.1, “Configuring the Communications Server on Tier 3b” on page 300 for the initial definitions.

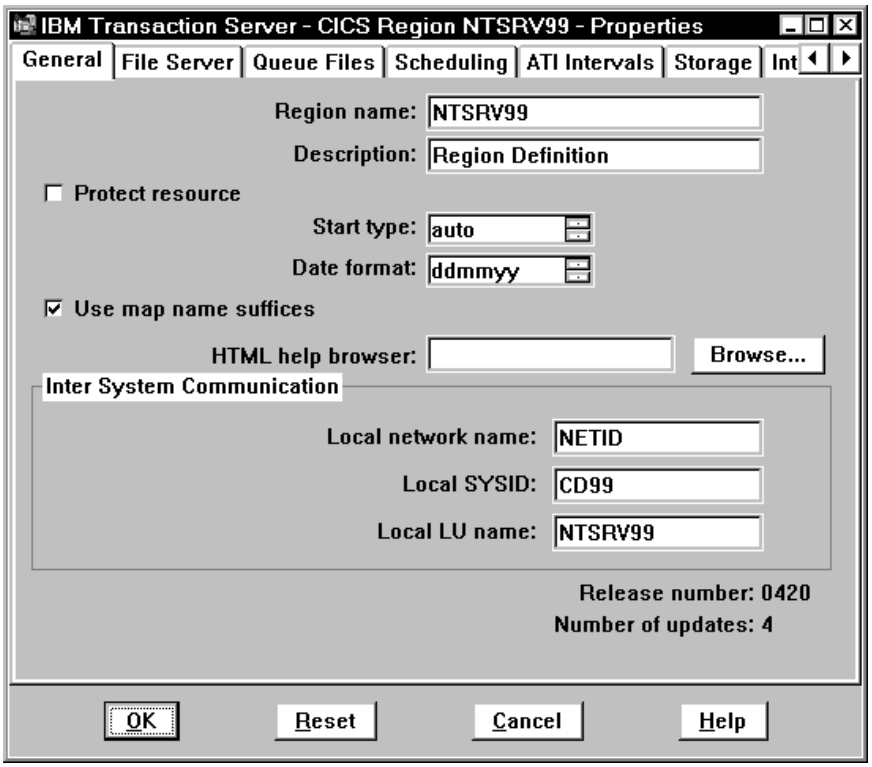


Figure 427. CICS Region Properties - General

After configuring the CICS region to use DB2 instead of CICS SFS, the CICS create region File Server menu is automatically updated.

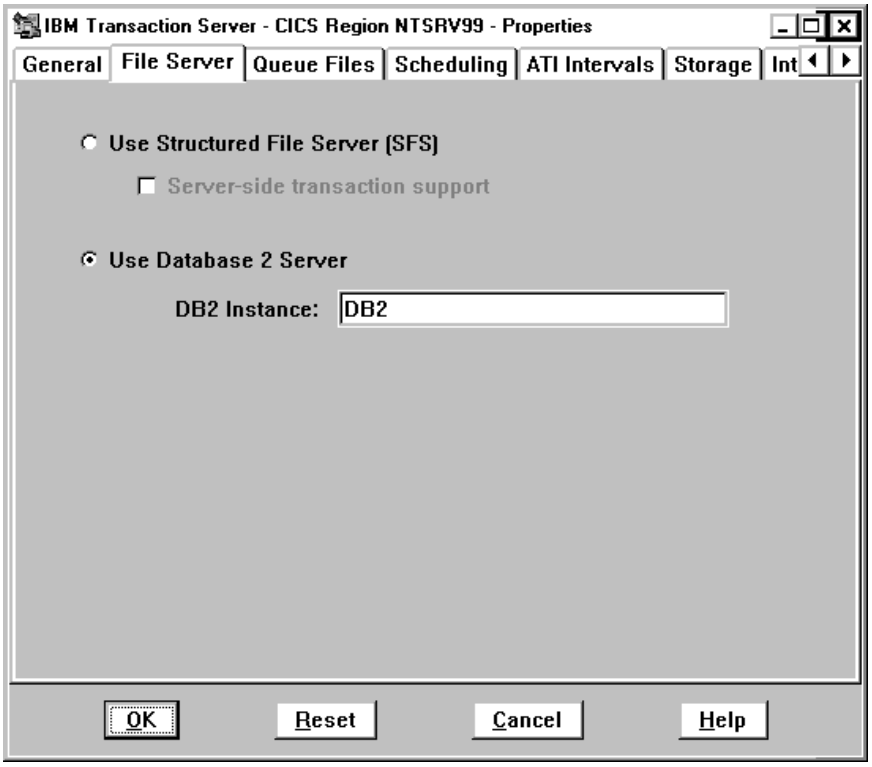


Figure 428. CICS Region Properties - File Server

The CICS region setup is now complete.

A copy of the CICS region definition file can be found in C.3.2, “The CICS Region Definition on Tier 3b” on page 440.

If you want to start the CICS region automatically, you can create a shortcut and put it in the Windows NT startup folder. Figure 429 shows the properties for the shortcut.

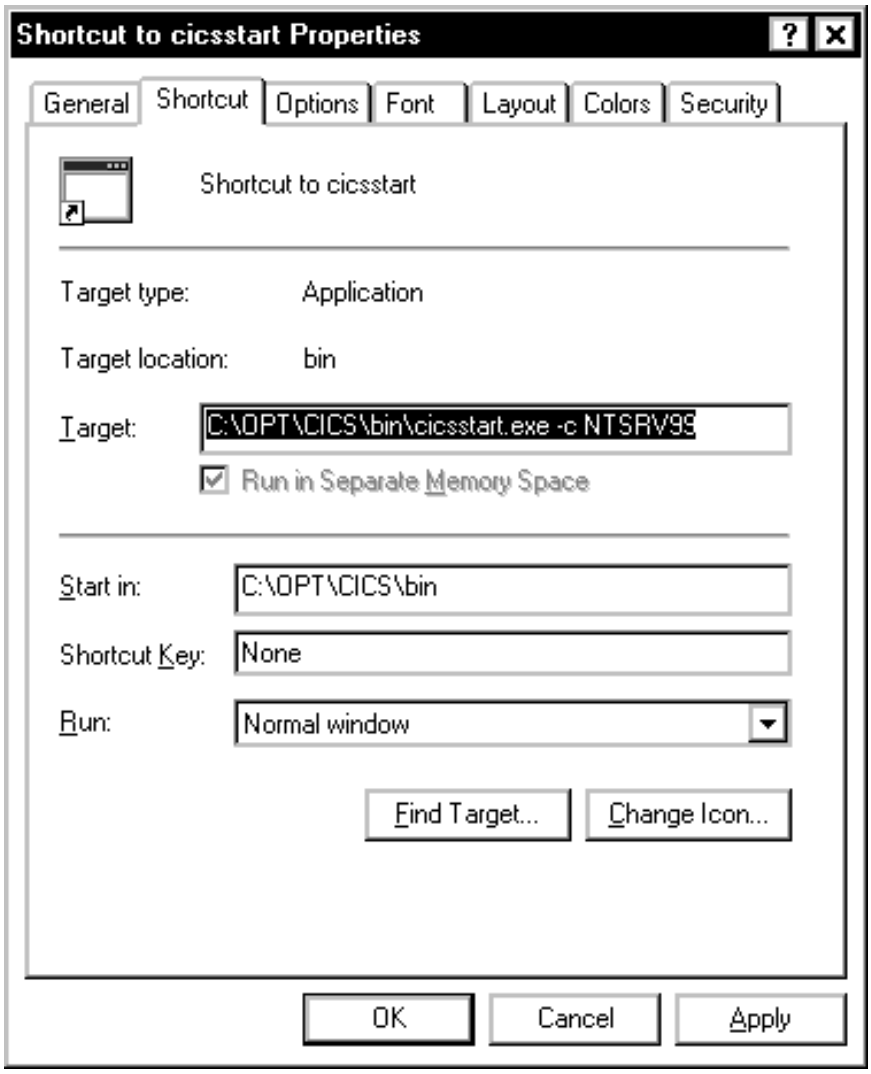


Figure 429. CICS Start Shortcut Properties

The next step is to lock the CICS resources while they are in use by a CICS application. In order to do that, you need to update the RD.stanza file. Type the following command in a command window:

```
cicsupdate -c rd -r NTSRV99 -P SafetyLevel=none
```

You won't get any output from the command. It will only update one line in the file RD.stanza. The RD.stanza file can be seen in C.3.2, “The CICS Region Definition on Tier 3b” on page 440.

Next, we need to add two listener entries for the CICS Server. One is for TCP/IP (see Figure 431 on page 322), and the other is for SNA (see figure Figure 432 on page 323).

To access the listener screens perform the following:

- From the Administrator utility, select **Subsystem, Resources** and **Listener**.
- From the Listeners panel select **Listeners** and **New**.

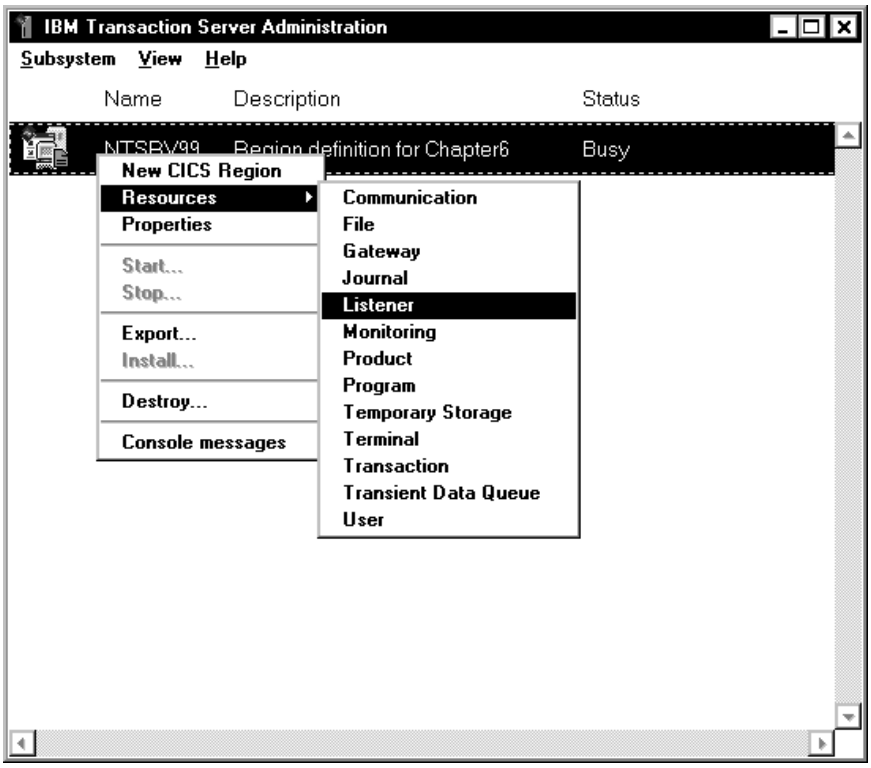


Figure 430. Open Listener Window

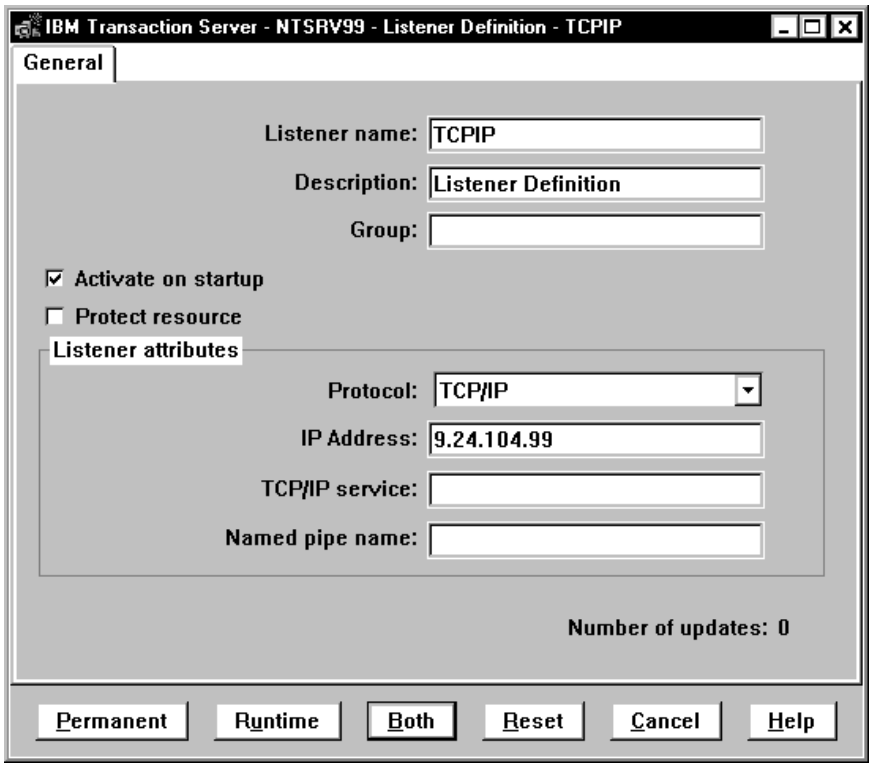


Figure 431. Listener Definition TCPIP

Here we entered the TCP/IP address of the local machine, NTSRV99, which is 9.24.104.99. All other values were left with their default value.

Note: If you wish to use the default TCP/IP port for CICS Listener TCPIP, you can leave the TCP/IP service field empty. CICS will use port 1435 by default.

After configuring the Listener for TCP/IP you need to click on **Permanent**. Repeat the same steps in order to add an SNA listener.

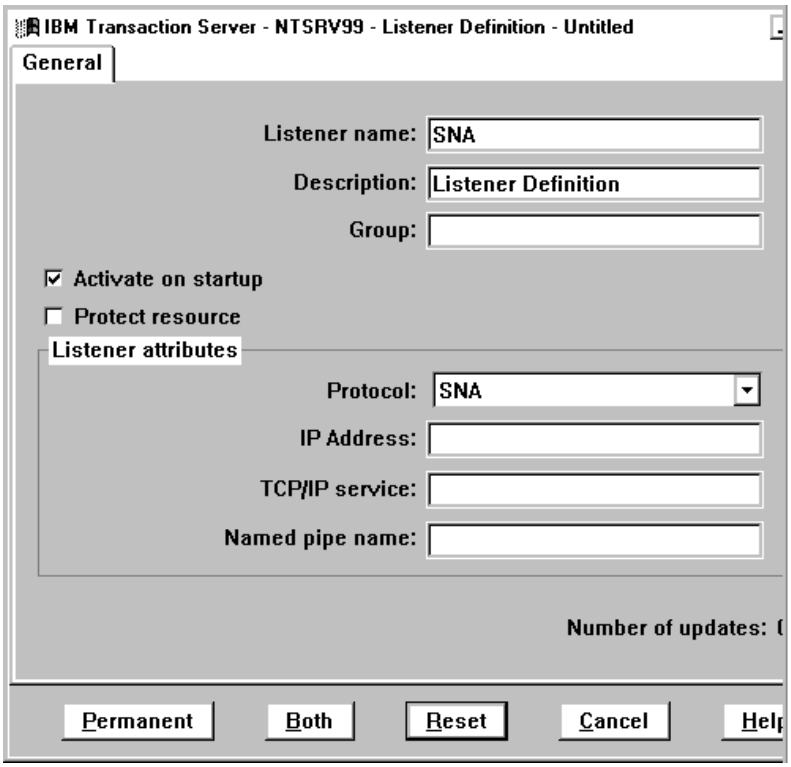


Figure 432. Listener SNA

To define an SNA listener, add a listener name and description and from the list box in the Protocol field select **SNA**. Click on **Permanent** when this is done.

To complete the listener definition configuration you need to add a services entry to the `services` file. This file is located at:
\WINNT\SYSTEM32\DRIVERS\ETC\SERVICES. Add the following line:

```
machine name      1435/tcp          #CICS listens on this port
```

In our case our machine name (and region name) is NTSRV99 as can be seen in the following extract from the SERVICES file.

```
kpop              1109/tcp          # Pop with Kerberos
phone             1167/udp
NTSRV99           1435/tcp          #CICS listens on this port
ingreslock        1524/tcp
maze              1666/udp
```

The listener definition file can be seen in C.3.4, “The CICS Listener Definition on Tier 3b” on page 443.

After configuring the listener definition we need to define a communication definition which defines the remote CICS region that Tier 3b will communicate with.

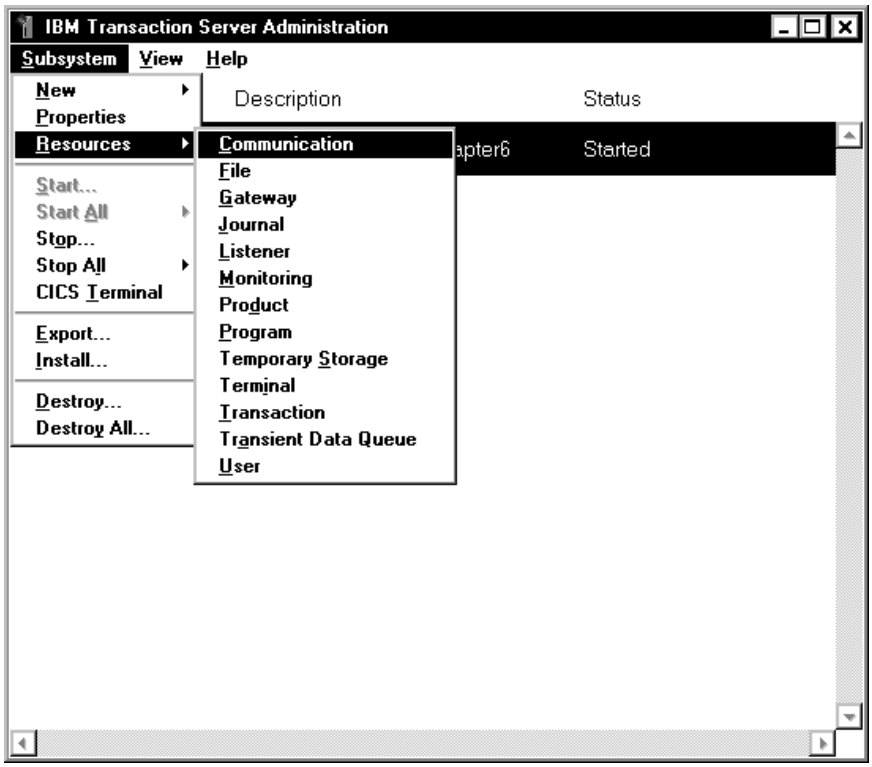


Figure 433. Open the Communications Window

At the IBM Transactions Server Administration window click on **Subsystem, Resources Communication**.

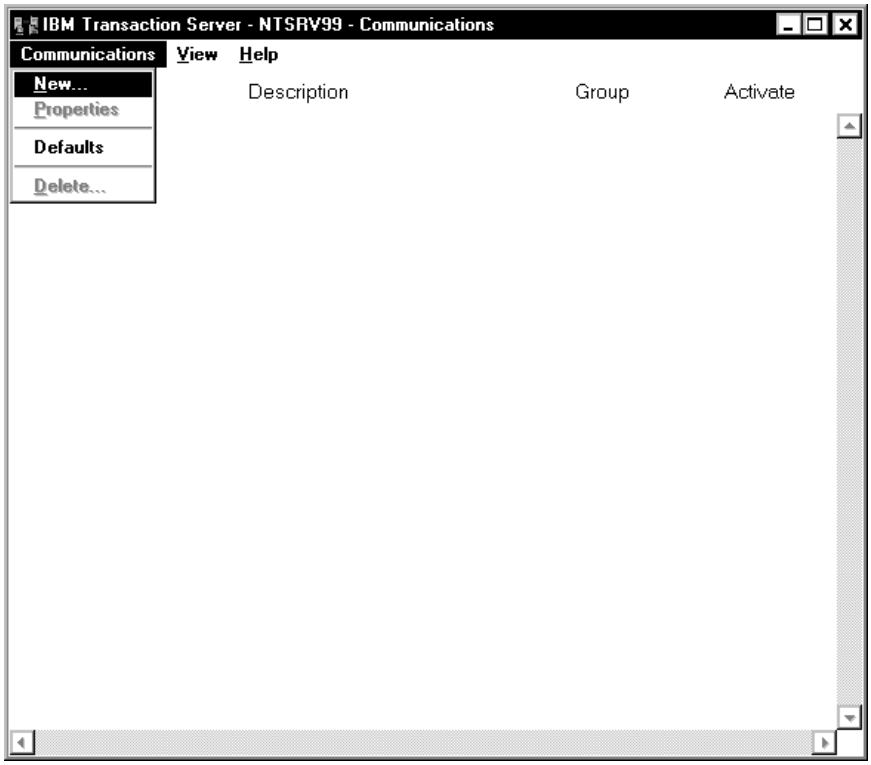


Figure 434. Create a New Communications Definition

In the communication definition that is opened, click on **Communications** and **New** to create a new definition.

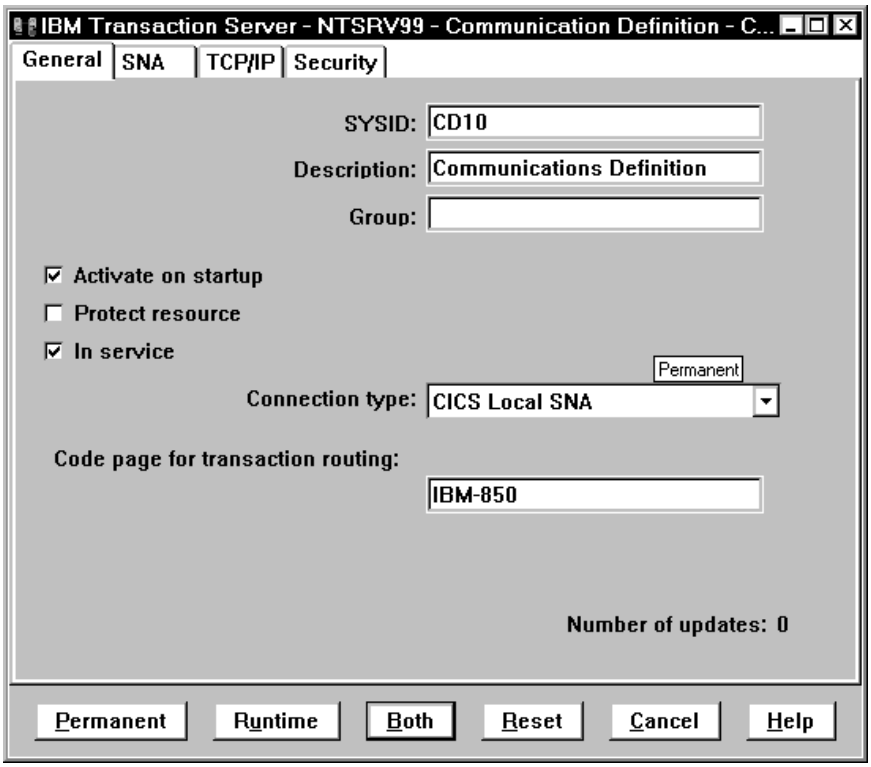


Figure 435. Create a Communication - General

The two CICS Servers, Tier 3a and Tier 3b, will be communicating with each other over SNA. The two servers will be identified using their respective SYSIDs. In this panel we need to define the SYSID of the partner CICS Server. Under the General tab we entered the SYSID of Tier 3a, which is `CD10`. The connection type is selected to be CICS Local SNA and the code page is left as its default value.

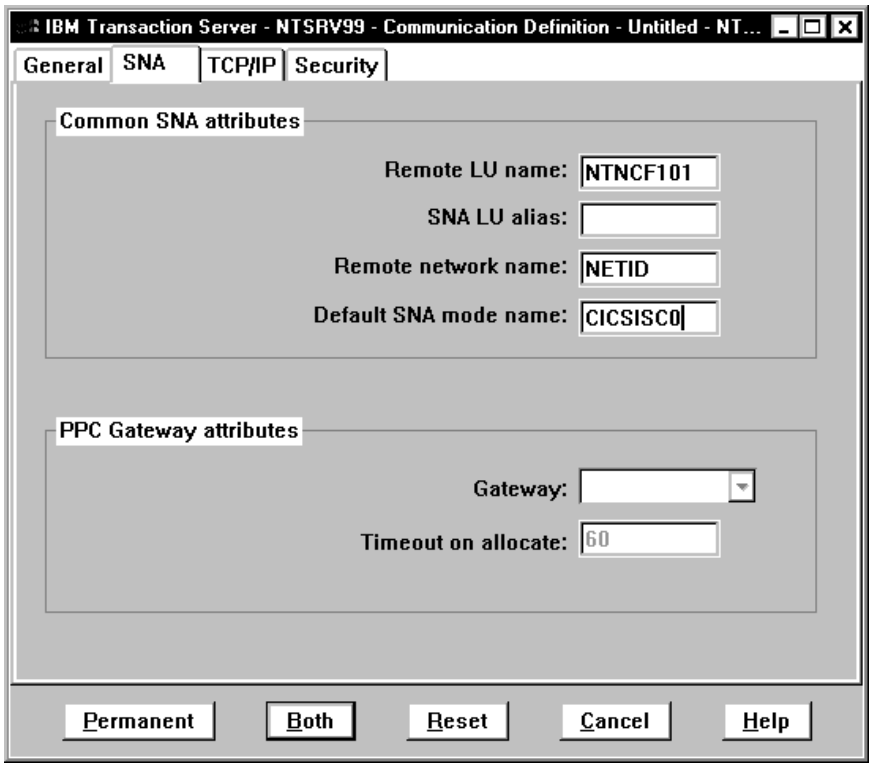


Figure 436. Create a Communication - SNA

Under the SNA tab enter the LU name of Tier 3a which was defined in Communications Server. In our case this was NTNCF101. The NETID was the same on both machines, NETID, and the mode name is the one we defined in the Communications Definition on Tier 3a, CICSISC0.

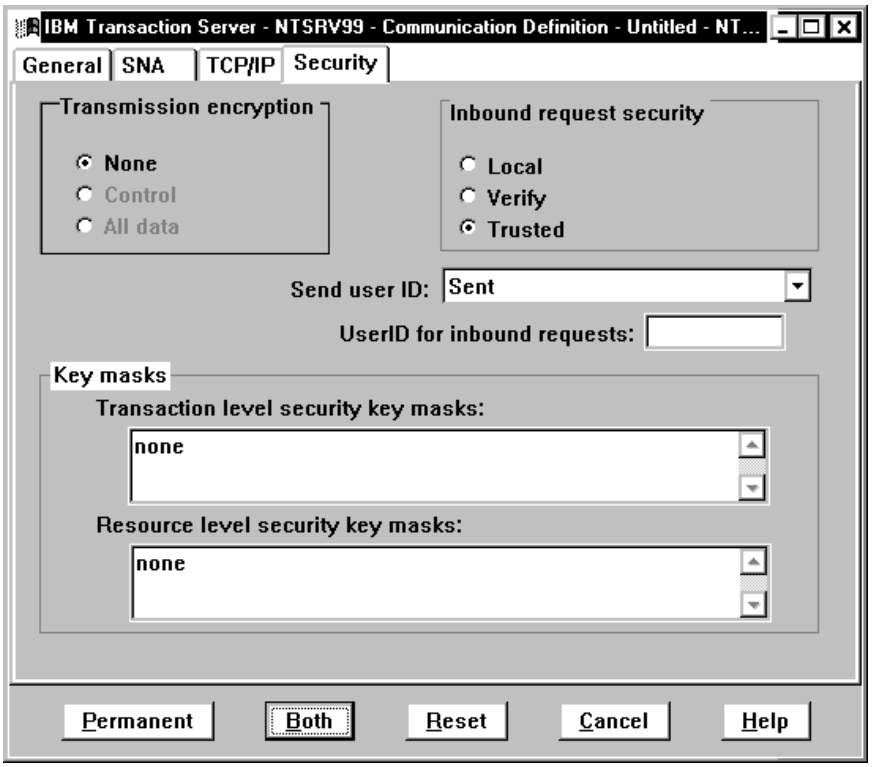


Figure 437. Create a Communication - Security

Under the Security tab, we only had to change the security type to Trusted, which means that the CICS region will accept user IDs with or without a password.

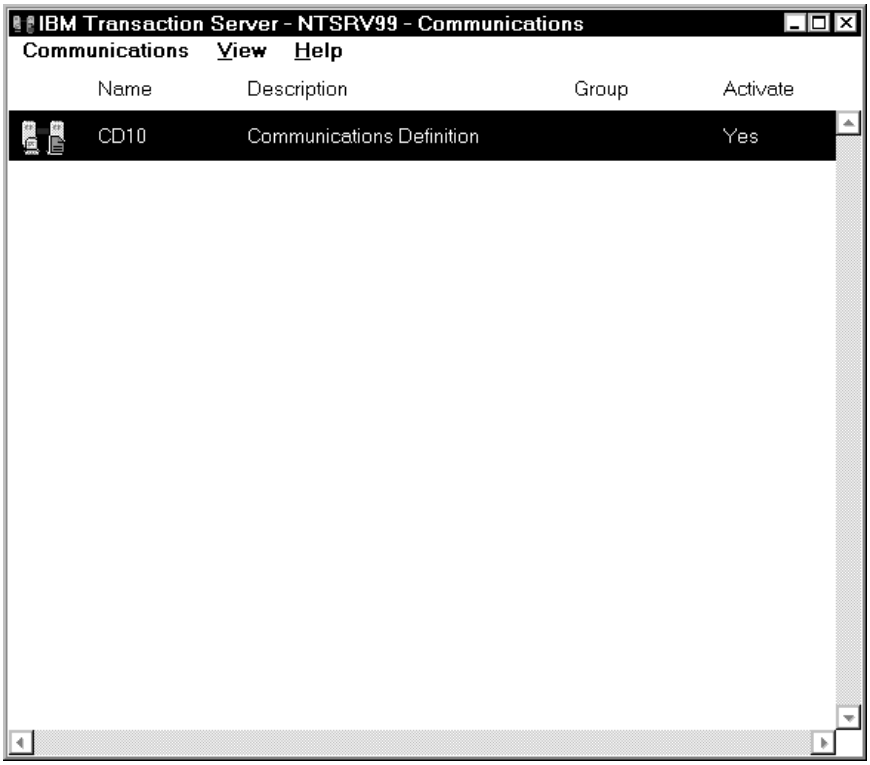


Figure 438. Communications Window

Click on **Permanent** to complete the communication definition configuration. After completing the communication definition configuration you should get a screen similar to Figure 438.

The communication definition file can be found in C.3.3, “The CICS Communication Definition on Tier 3b” on page 442.

The next step is to create the MENU transaction program by issuing the command `cicsivp -r NTSRV99`. You can view the sample transactions that have been created by clicking on **Subsystem, Resources** and **Transactions** from the CICS Administration Utility window.

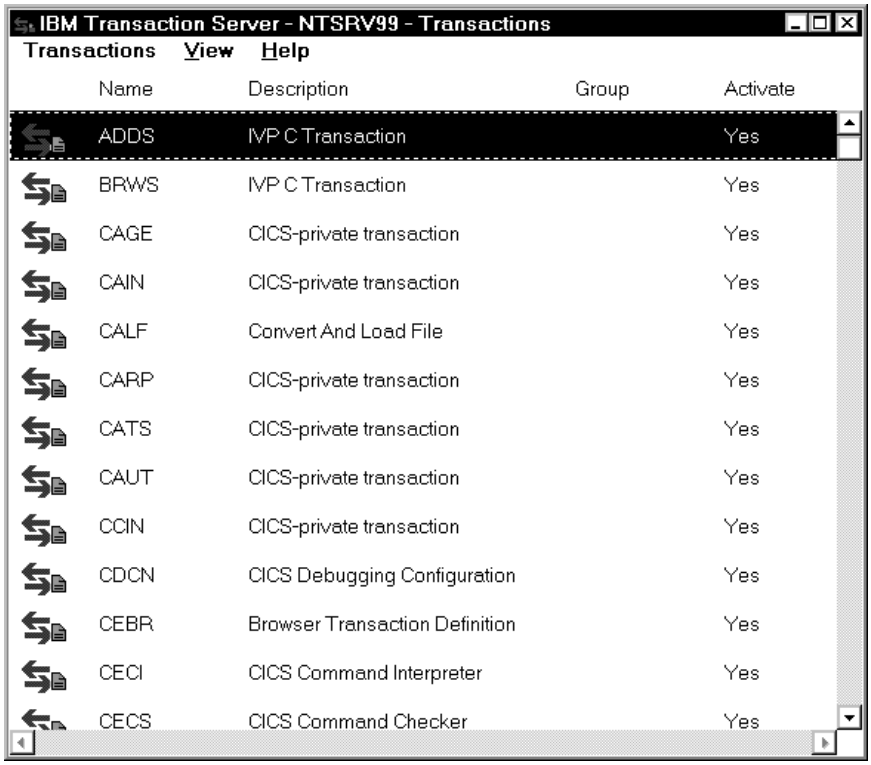


Figure 439. CICS Server Transaction Definitions

Next we needed to configure the CICS Server local client INI file CICSLCLI.INI, located in \opt\cics\bin\.

- Find the first entry that begins with Server= and which has NamedPipeName=CICSAA. This entry was added by the listener definition that you created earlier.
- Change the entry to read Server=NTSRV99.

```
;-----------------------------------------------------------------------
; Server section - This section defines a server to which the client may
;                  connect.  There may be several Server sections.
;
; The Local Client is only supported via named pipe communications.
; The "Server" name must be unique within this initialization file
; and does not need to match any CICS Server name.
;
; The value of "NamedPipeName" is the method by which client and
; server are connected, this must match the value specified in the
; CICS Server Listener Definition (LD) "NamedPipeName" attribute.
;
Server = CICS01                 ; Arbitrary, unique name for the server
   Description = Named Pipe Support for local client ;
   Protocol = LOCALCLI          ; Matches with a Driver section below
   NetName = 00.00.00.00        ; Dummy.
   NamedPipeName = CICSCC       ; Must match servers named pipe
Server = NTSRV99                ; Arbitrary, unique name for the server
   Description = Named Pipe Support for local client ;
   Protocol = LOCALCLI          ; Matches with a Driver section below
   NetName = 00.00.00.00        ; Dummy
   NamedPipeName = CICSAA       ; Must match servers named pipe
```

- Save and exit.

5.4.3.1 Configuring the CICS Server to Use DB2

To see the basic configuration of DB2 that is performed during the installation process see 2.9, “Installing IBM DB2 Universal Database” on page 52.

Note: The following has to be done before creating the CICS/DB2 region.

In order to configure the DB2 database for the CICS Servers you need to enter the following from a DB2 command window:

1. Create a database:

   ```
   DB2 CREATE DATABASE CICSDB ALIAS CICSDB
   ```

2. Connect to the database:

   ```
   DB2 CONNECT TO CICSDB
   ```

3. Specify the connect policy:

   ```
   DB2 GRANT CONNECT ON DATABASE TO PUBLIC
   ```

4. Reset the database connection:

   ```
   DB2 CONNECT RESET
   ```

5. Set the DB2 TP_MON_NAME configuration parameter, where libEncserver.dll is an Encina module in the \opt\encina\bin directory:

   ```
   DB2 UPDATE DBM CFG USING TP_MON_NAME libEncServer.dll
   ```

   The following window shows the DB2 command window after these commands:

```
DB2 CLP - DB2CLP.BAT DB2.EXE
Expected tokens may include:  "SELECT".  SQLSTATE=42601
db2 => create database CICSDB alias CICSDB
DB20000I  The CREATE DATABASE command completed successfully.
db2 => connect to cicsdb

   Database Connection Information

 Database product        = DB2/NT 5.0.0
 SQL authorization ID    = BOERNERF
 Local database alias    = CICSDB

db2 => grant connect on database to public
DB20000I  The SQL command completed successfully.
db2 => connect reset
DB20000I  The SQL command completed successfully.
db2 => update dbm cfg using tp_mon_name libencserver.dll
DB20000I  The UPDATE DATABASE MANAGER CONFIGURATION command completed
successfully.
DB21025I  Client changes will not be effective until the next time the
application is started.  Server changes will not be effective until the next
DB2START command.

db2 => _
```

Figure 440. DB2 Command Window

6. Stop and start DB2 to allow all changes to take effect.

   Enter the following commands in a command prompt window:

   - `db2 disconnect all`
   - `net stop db2ntsecserver`
   - `net stop db2`
   - `net start db2`
   - `net start db2ntsecserver`

Next we need to configure CICS to use DB2. We do this using the cicsdb2conf command.

```
C:\>cicsdb2conf -r NTSRV99 -C -i DB2 -a CICSDB -u BOERNERF,password
ERZ102002I/0001: Configuring 'DB2' for region 'NTSRV99'.
ERZ102033I/0004: Create system defined 'SYS$XA' XA definition for region 'NTSRV9
9'.
ERZ102035I/0006: Update the region definitions (RD) for region 'NTSRV99' for 'DB
2' configuration.
ERZ102038I/0009: Update of file definitions (FD) for region 'NTSRV99' for 'DB2'
configuration.
```

The configuration of the CICS Server is now complete. We recommend that the servers Tier 3a and Tier 3b are rebooted once before the CICS Server is started.

5.4.4 Starting the CICS Region

To verify that the DB2 services are started you can either examine the Windows NT Services window or issue the following commands to start them:

- net start db2
- net start db2ntsecserver

To get a list of all services that are started you can enter: `net start`.

You can start the region by clicking with the right mouse button on the region and selecting **Start**. Then select **Cold**.

Once the CICS Server is started you can start a sample MENU application that is packaged with the server. To invoke this transaction go to the Windows Start

button and select **Programs, IBM CICS Server for Windows NT** and **Start Local Terminal**. You will see a CICS Server Selection panel where you need to select the CICS Server. Select the server that you have configured. In this scenario it was NTSRV99. At the 3270 emulation screen enter the transaction name, `MENU`, in uppercase.

Note: When running the CICS Terminal the enter key is right Ctrl button.

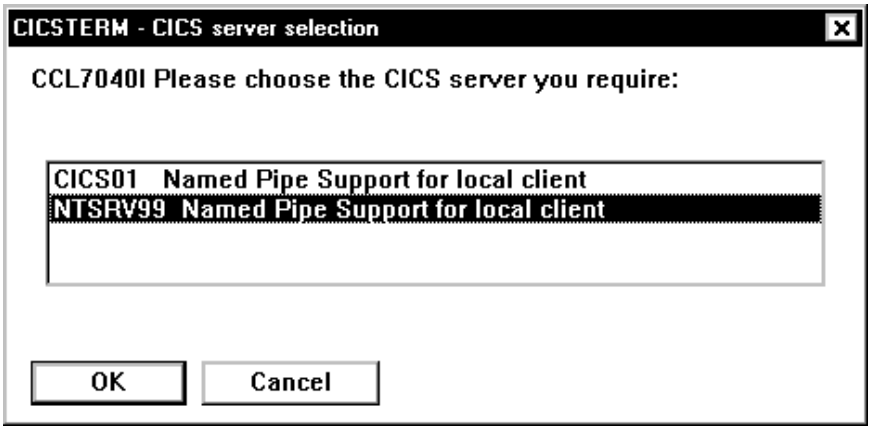


Figure 441. CICS Server Selection

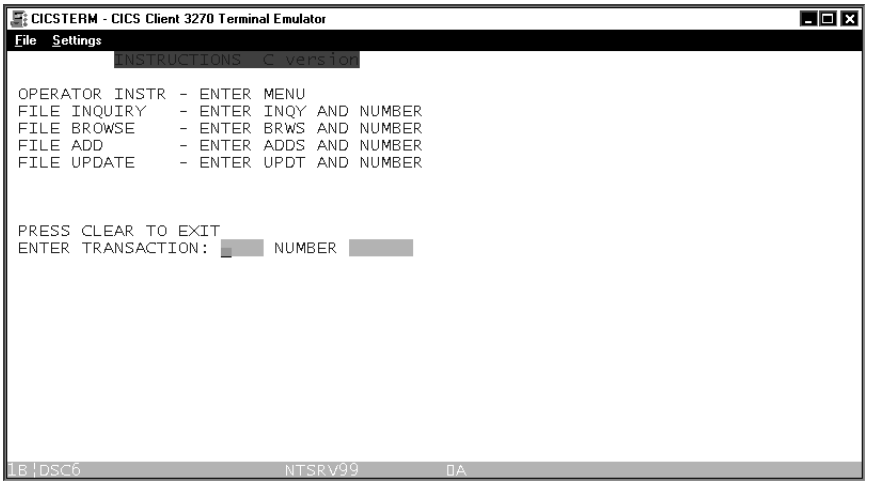


Figure 442. CICS Transaction Program - MENU

5.4.5 ADSM Server and Client

We now look at what is required to configure the ADSM server and client so that we can back up the data in the DB2 database.

5.4.5.1 Methods of Configuring ADSM Server

In an NT Server environment, the ADSM server can be configured using four different interfaces:

1. Using the ADSM server utilities

   This utility is only available with ADSM server on the NT platform and runs only on the server. It can be accessed by clicking on **Start, Programs, IBM ADSM** and **ADSM Server Utilities**. When this is opened a series of icons is arranged

at the bottom of the window. It allows you to access different server utilities which all help you to set up, configure and maintain your server. These utilities include:

- Wizards
- Diagnostics
- Server Accounting
- Server Options
- Server Services

Figure 443 to Figure 445 on page 333 show some samples of this utility.

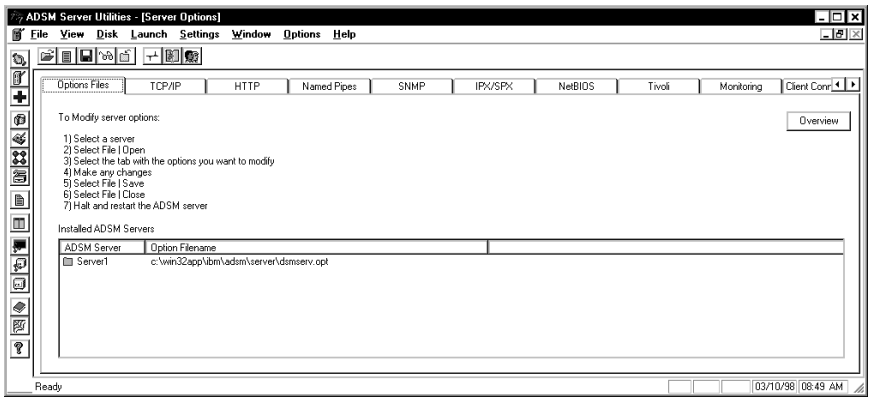


Figure 443. ADSM Server Utilities - Server Options

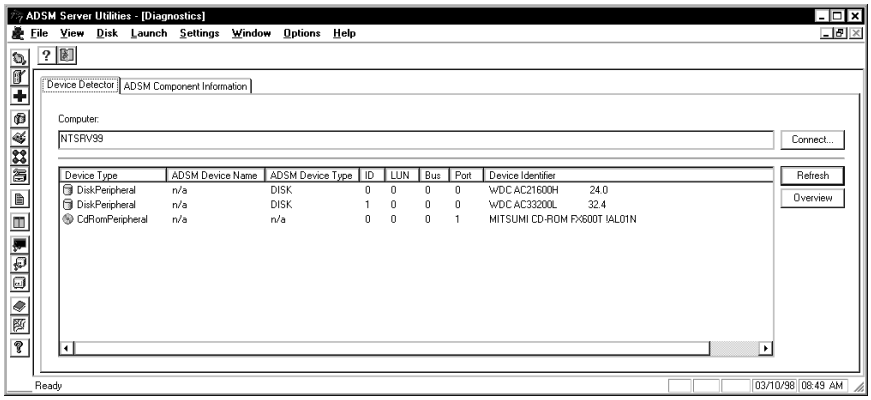


Figure 444. ADSM Server Utilities - Diagnostics

The Wizards help you to configure the ADSM environment. It also helps you change volumes, clients and device configurations. We found it useful to use the Wizard when creating and defining storage pool volumes on the ADSM server as they provide useful guidelines for calculating storage requirements.

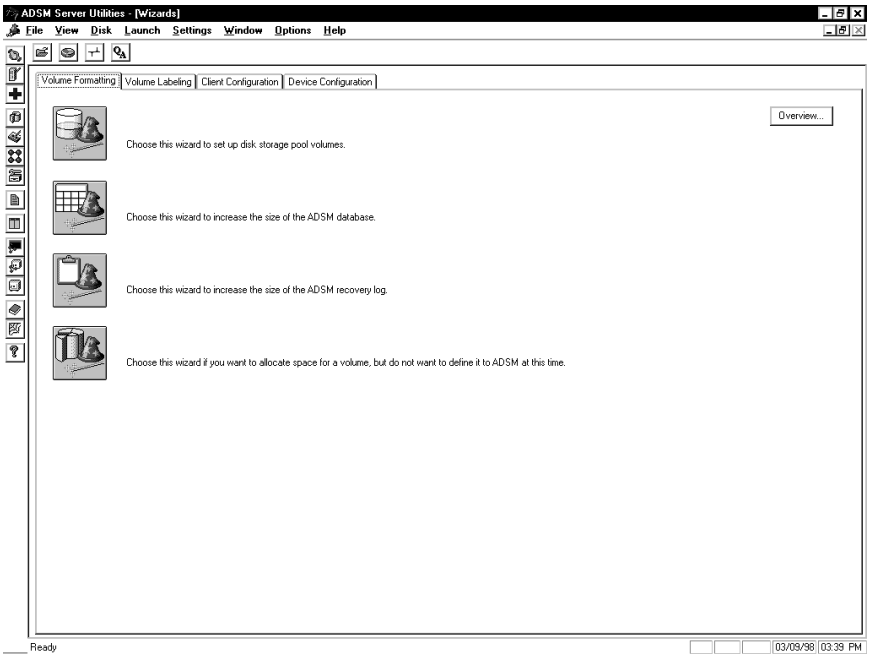


Figure 445. ADSM Server Utilities - Wizards

2. Using the Administrative Client

   To configure your ADSM server, you can also use the administrative client which allows you to configure the ADSM server from multiple client platforms. You can access this method on an ADSM client by clicking on **Start, Programs, IBM ADSM** and **Administrative Client**. After doing that you will be asked to enter a user ID and password to validate that you have administrator privilege to access the ADSM server. The administrative client enables you to monitor and administer the services that the server provides. This is a powerful configuration method and one which has a consistent look and feel across many platforms. Due to this flexibility we chose this method to configure many of the settings of the ADSM server.

3. Using the ADSM Administrative Command Line

   We can also configure the ADSM server from the ADSM administrative command line by clicking on **Start, Programs, IBM ADSM** and **ADSM Admin Command Line**. When you access this utility you are expected to enter your ADSM user ID and password since you could be accessing the ADSM server from another machine. This method requires you to have a detailed knowledge of the ADSM commands and syntax. This configuration method is also available on all platforms; however, we suggest that unless you are very familiar with ADSM commands, you use the GUI.

4. Configuring ADSM Using a Web Browser Interface

   We can also configure the ADSM server over the Internet (or Intranet) using a Web browser to access the ADSM server. We do this by pointing the Web browser to the ADSM server hostname and port as configured in NT and the DSMSERV.OPT file respectively. In our case the hostname is NTNCF101 and the port is the default port in the DSMSERV.OPT file, 1580. In this case we entered `http://ntncf101:1580/`. You would then be presented with a logon screen where, if you have not defined a user ID yet, you may enter the default user ID and password: admin and admin.

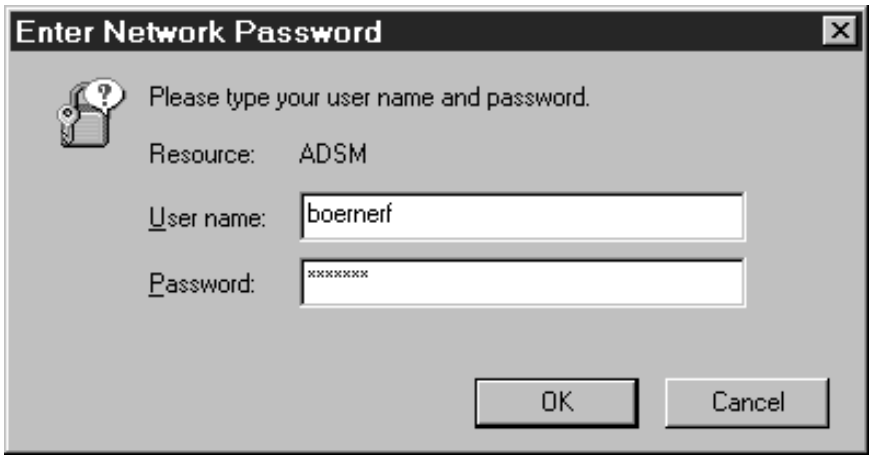


Figure 446. User ID Panel to Access ADSM Menu

Following the logon you will be presented with the same interface as if you were sitting at the server itself as can be seen in Figure 447 to Figure 448 on page 335.

Figure 447. ADSM Server Administration

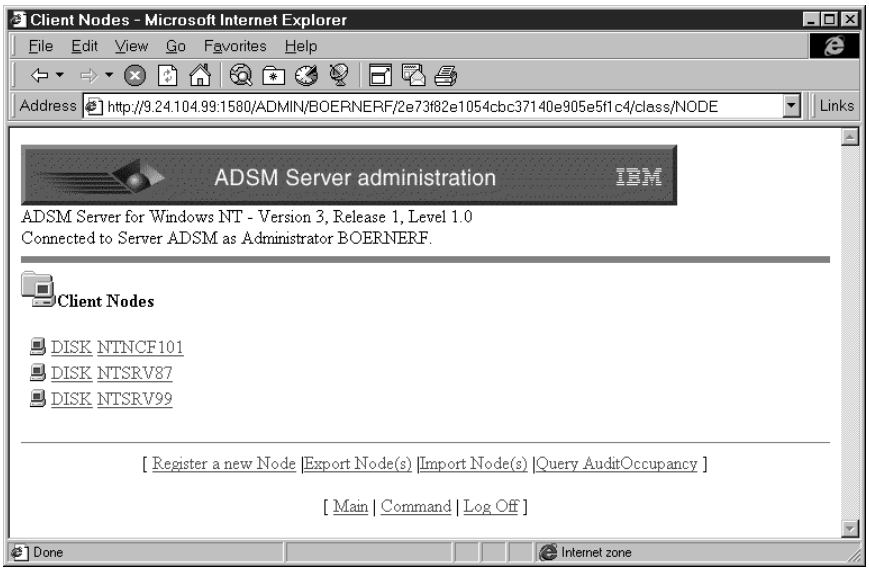


Figure 448. ADSM Server Administration - Client Nodes

5.4.5.2 Configuring the ADSM Server

The basic server parameters are held in the server options file, DSMSERV.OPT, which is a text file that can be edited to update various options. The file can be found in the directory C:\WIN32APP\IBM\ADSM\SERVER on the ADSM Server. The entire file can be seen in C.2.7, “The ADSM Server DSMSERV.OPT File” on page 429. A small extract from it follows:

```
*===================================================================
*  ADSTAR Distributed Storage Manager
*  Server Options File - Version 3, Release 1, Level 0
*  5639-A09 (C) Copyright IBM Corporation, 1990, 1997,
*  All Rights Reserved.
*===================================================================
*   ADSTAR Distributed Storage Manager (ADSM):
*   Server Options File (dsmserv.opt)
*   Platform: Windows NT
*
*   Note -- This file was generated by the ADSM Options File Editor.
*===================================================================
*  HTTP
*  Specifies the HTTP port address of an ADSM Web interface.
COMMmethod HTTP
HTTPPort 1580
*==================================================================
*  TCPIP
*******************************************************************
COMMmethod TCPIP
TCPPort 1500
```

For our scenario we connected the ADSM Client to the ADSM server using a TCP/IP connection. Therefore, in this file we have to check that the TCP/IP protocol is uncommented and therefore activated. We also activated HTTP so that we could administer the server from a remote location.

On the ADSM client we can also edit two DSM.OPT files. The number of files will depend upon whether or not you chose to put both the ADSM server and client files

in the same directory during the installation as shown in Figure 25 on page 25. If they are in the same directory, then you will only have one DSM.OPT file. The DSM.OPT file can be found in the directory C:\WIN32APP\IBM\ADSM\SACLIENT for the administrative client and in the directory C:\WIN32APP\IBM\ADSM\BACLIENT for the backup client. Within these files you need to activate the TCP/IP protocol by removing the comments from around the TCP/IP statements. Then insert the IP address from the server. In our case this was 9.24.104.101. Also insert a node name for the client: NTSRV99. This file needs to be edited on each of the nodes. It can easily be accessed from the GUI by clicking on **Start, Programs, ADSM** and then **Administrative Client Options** or **Backup Client Options** depending on which one you need to edit. An extract from the client DSM.OPT file follows:

```
*********************************************************************
* IBM Adstar Distributed Storage Manager
*
* Sample dsm.opt for 32-Bit Windows backup and archive Client-V3 level
*
* See options.wri for complete options file documentation
*********************************************************************

*===================================================================
* TCP/IP
*===================================================================

commmethod      tcpip
tcpport          1500
TCPServeraddress 9.24.104.101
```

The ADSM installation process automatically creates but does not start the NT services. Therefore, we need to ensure that the ADSM server Services have been started. In order for this service to always be started it is best to change the startup type for the ADSM server service from `Manual` to `Automatic`. When you configure the ADSM server to start automatically, the ADSM server will start when the NT Server is rebooted.

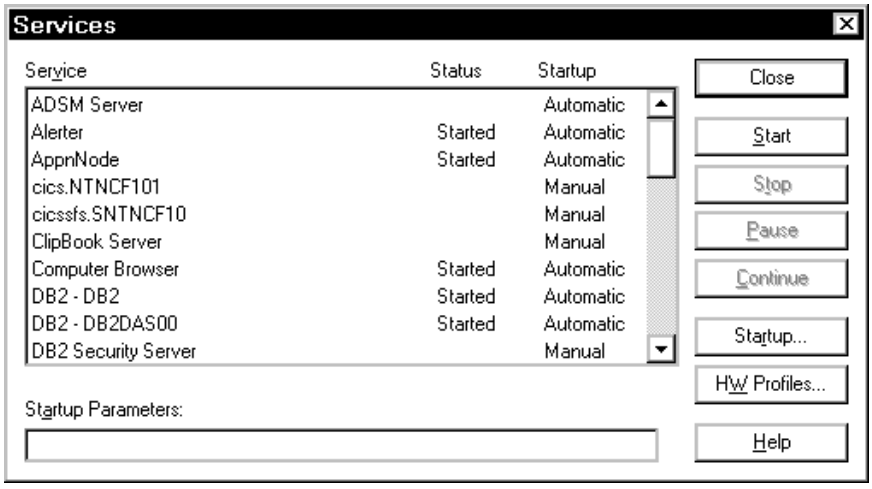


Figure 449. NT Server - ADSM Server Services

Now, you can start the ADSM Administrative Client by clicking on **Start, Programs, IBM ADSM** and **ADSM Administrative Client**. It will prompt you to log on to the server.

The default user ID is admin and the default password is also admin.

The System Administrator window shows you exactly what is configured. It is a parent window within which most of the ADSM settings can be configured. The components you wish to configure can be launched from the Component Tree. In the Component Tree window you will notice that you have a tree view of the ADSM icons by clicking on the **+** symbol to the left of the icons.

For security reasons we suggest that the first thing you do is change the default password for the admin account and at the same time add one or more other users for the administration of the ADSM server as shown in Figure 450. In order to add other administrators, in the ADSM System Administrator Component Tree window, double-click on **Administrators**. In the Administrator window that opens, right click the mouse button in the window and then click on **Add**.

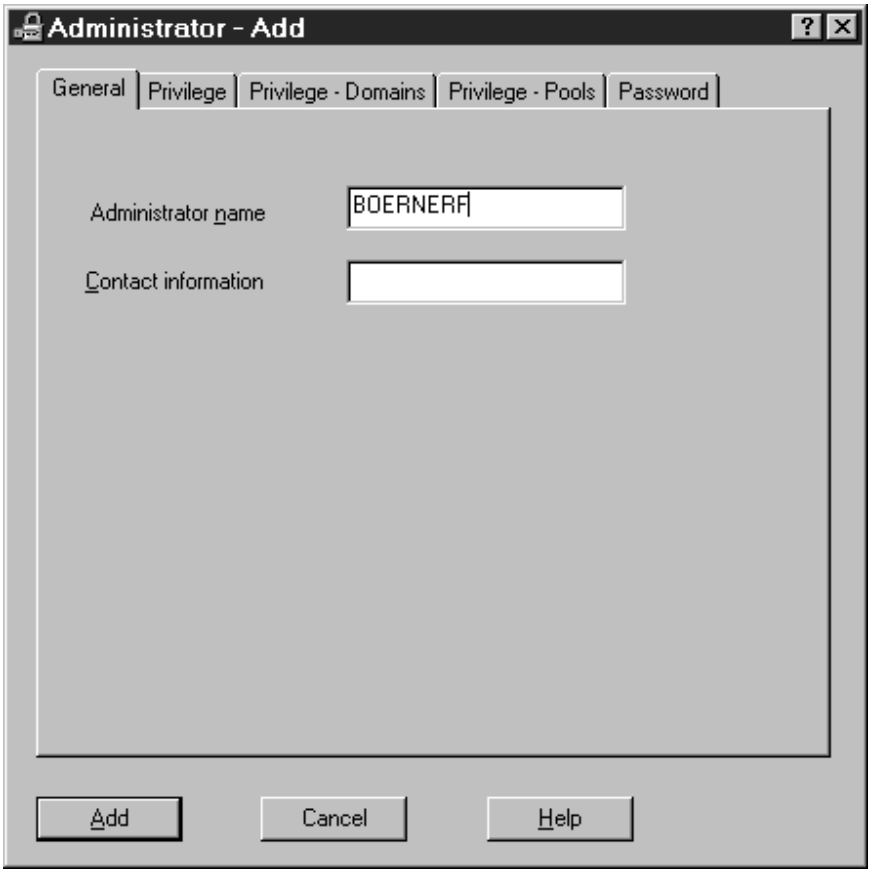


Figure 450. Add an Administrator

As this is an ADSM server ID and not an NT Server Administration ID the Administrator name can be anything you wish and does not necessarily have to be a previously defined ID within the NT System.

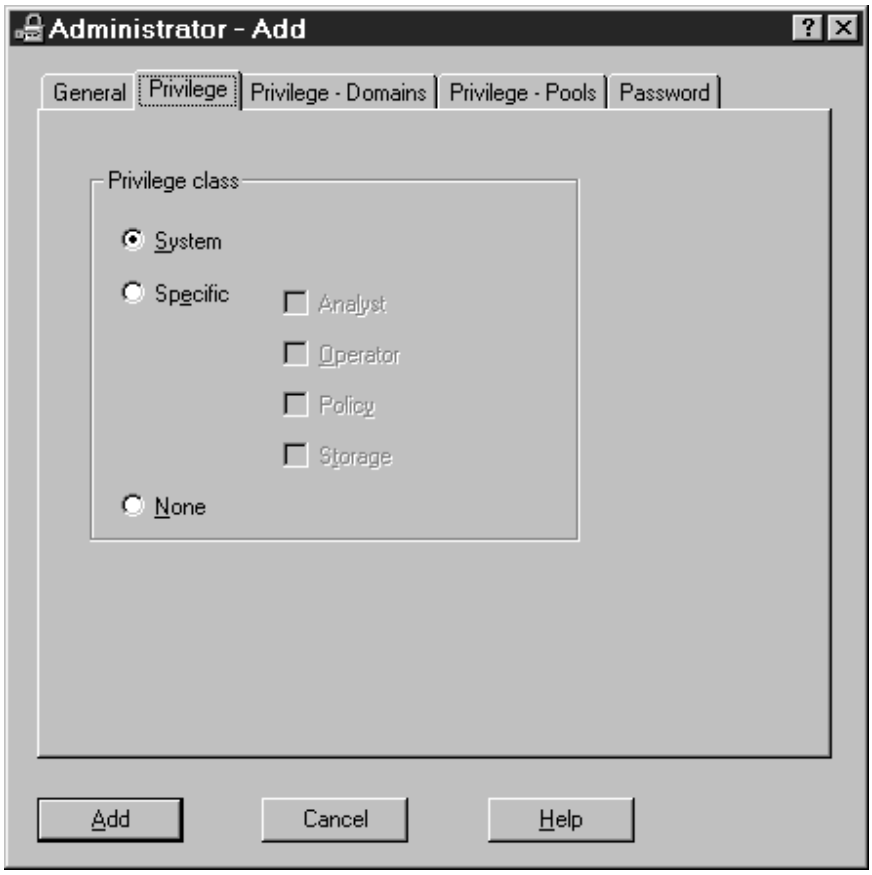


Figure 451. Privileges for the New Administrator

There are different levels of authority for administrators:

- System - This level has total power and has access to all the ADSM server utilities and functions.
- Policy - This level can define policies, management classes and register nodes.
- Storage - This level can add volumes, define storage pools and manage database error and recovery logs.
- Operator - This level can respond to system messages and cancel sessions between the ADSM server and a client.
- Analyst - This level can only issue query commands to see the state of a session or server.

For the privilege class we chose System, otherwise, the new user will not have full administrator access to all the ADSM server functions.

After you have configured new user IDs they should appear in the Administrator window of the ADSM System Administrator as shown in the following window:

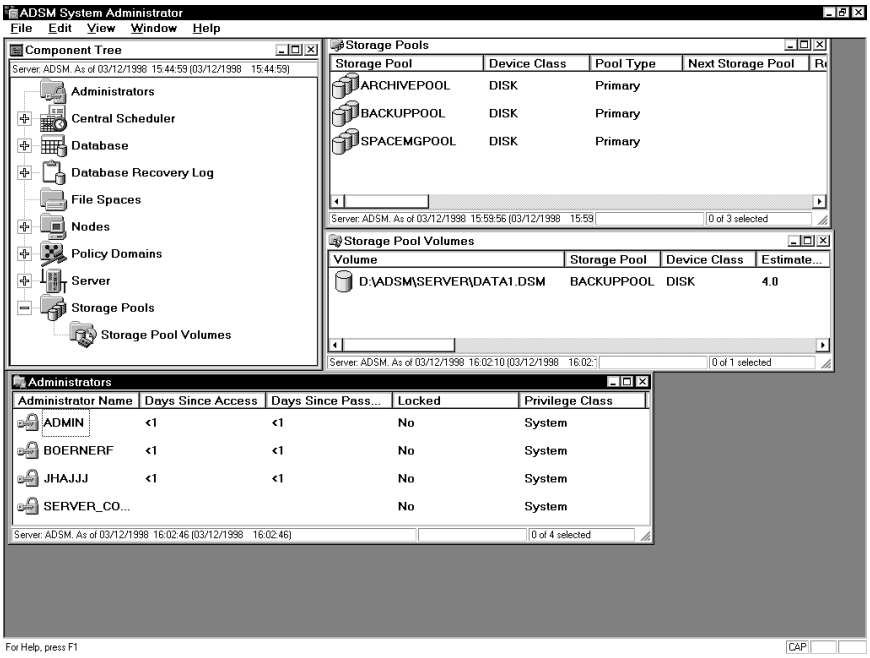


Figure 452. ADSM System Administrators Window

ADSM can store client backup and archive data onto different media types, which in turn require a storage pool which can consist of many volumes. However, there can only be one storage pool per media type. The volumes that belong to the storage pools can be either logical volumes created on the disk or physical removable media volumes. In our scenario we backed up to disk, so we defined logical volumes. But, before we do we that we need to define a storage pool. During the installation process, the ADSM server defines three storage pools:

1. Archivepool
2. Backuppool
3. Spacemgpool

Note: Normally, before you define a storage pool you would need to define the device class. However, ADSM creates a device class for hard disk backups automatically during the installation called Disk. If we were to back up to a tape device, then we would have to define the device class for that device from the ADSM command line interface.

To define a storage pool from the ADSM System Administrator window (as shown in Figure 452), double-click on **Storage Pools** in the window called Component Tree and then right click in the storage pools window. This causes a menu to pop up. Click on **Add**.

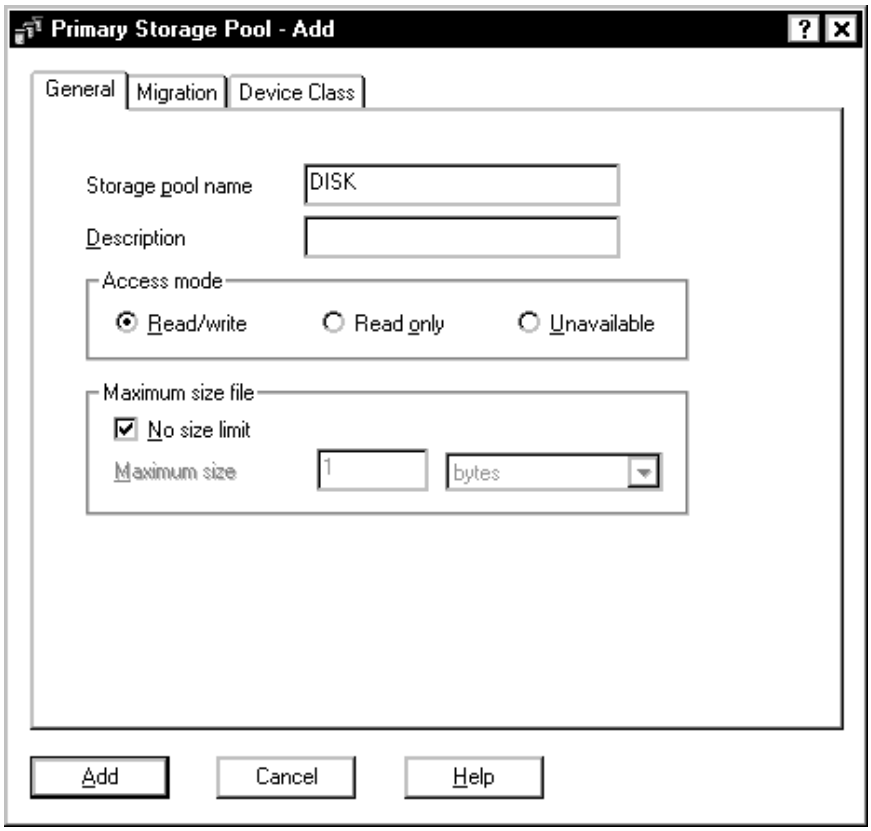


Figure 453. Add a Primary Storage Pool

In our scenario a storage pool can be considered to be a disk consisting of physical and logical volumes. The way we define a storage pool helps to control the space in the storage pools.

Under the General tab in the Storage pool name field, enter the name of the storage pool. We chose DISK. For the Access mode you need to select **Read/write** as you will be saving data as well as retrieving it. In the Maximum size file field the administrator can define a maximum size for the storage pool, which is generally not needed as files exceeding the threshold value will automatically be migrated to the next storage pool.

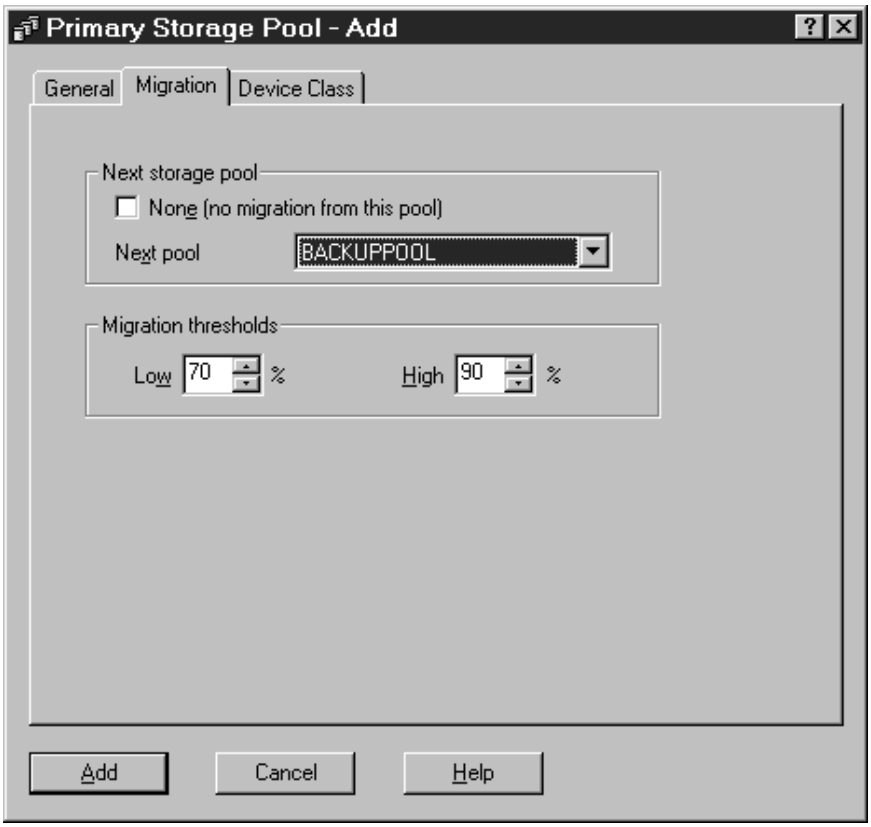


Figure 454. Add a Primary Storage Pool - Define Migration

Under the Migration tab you can define another Primary storage pool to store data in case your selected pool overflows or your maximum defined file size is exceeded. You can define a high-low migration threshold for each storage pool. When these thresholds are reached the data is moved from one storage pool to another. When the amount of data in the storage pool reaches the high threshold value, ADSM moves the data to the next storage pool until the amount of data in the storage pool reaches the low threshold value.

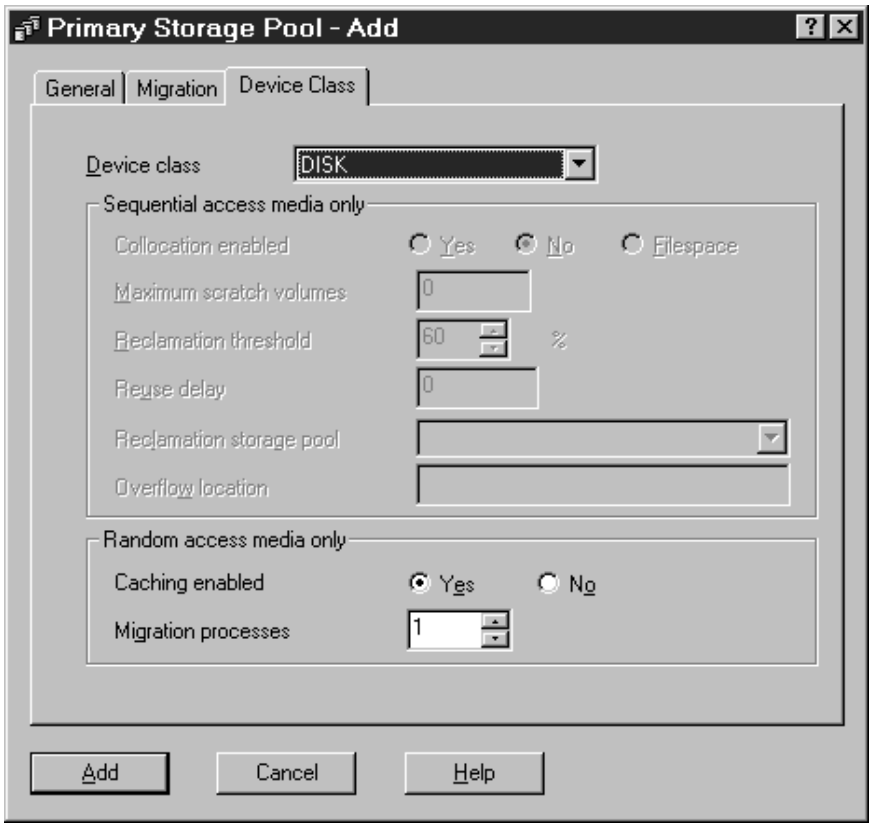


Figure 455. Add a Primary Storage Pool - Choose a Device Class

Under the Device Class tab, select the device class you want to use. We used the default device class DISK. When you use tape drives, you need to create the device class using the command line interface. There is a large greyed out area titled Sequential Access Media Only which is for space reclamation. This applies to tape backup only and is used to ensure that tapes are being used efficiently. In our scenario we used a disk, so we ignored this parameter. The Caching enabled and Migration processed fields can be left as unchanged.

Note: In our scenario, we used hard drives to save the data instead of a tape, but there is no difference in the configuration. The only thing that you need to be aware of is that Windows NT can't share devices between NT and ADSM.

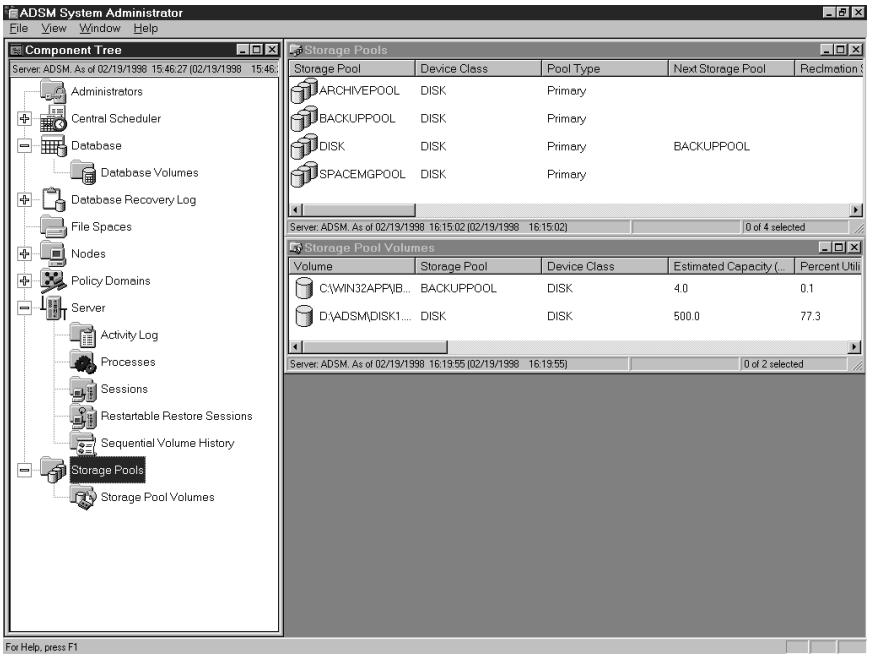


Figure 456. Storage Pool and Volumes

The next thing to do is to define the storage pool volumes. However, in order to do this you need a valid volume name. We did not know our volume name in this case because we were backing up to a hard disk. If we were backing up to a tape drive, then we would have to format and label the tapes to use them with ADSM and we would know the volume names of all the tapes. Therefore, with tapes we do not need to perform the following steps.

To define the volume name for our scenario where we are backing up to a local hard disk we can either use the administrative command line or the Wizards. We chose the Wizards as this is simpler and less error prone. To start the Wizards you need to access the ADSM server utilities, by clicking on **Start, IBM ADSM** and **ADSM Server Utilities** and then double-clicking on **Wizards** at the bottom of the window.

Note: The Server Utilities can only be accessed from the server machine where the ADSM server is installed. If you had been working on the client to define the user IDs and storage pools, please go to the ADSM server to define the storage pool volumes.

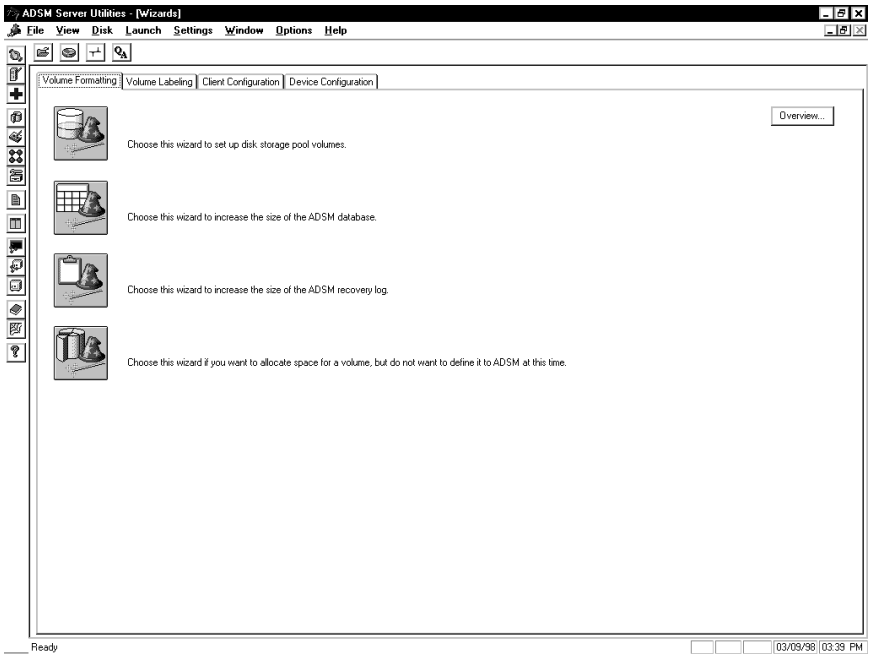


Figure 457. ADSM Server Utilities - Wizards

On the Wizards window click on the top wizard next to **Choose this wizard to set up disk storage pool volumes**. This will start a dialog that allows you to define the size of the storage pool and volume.

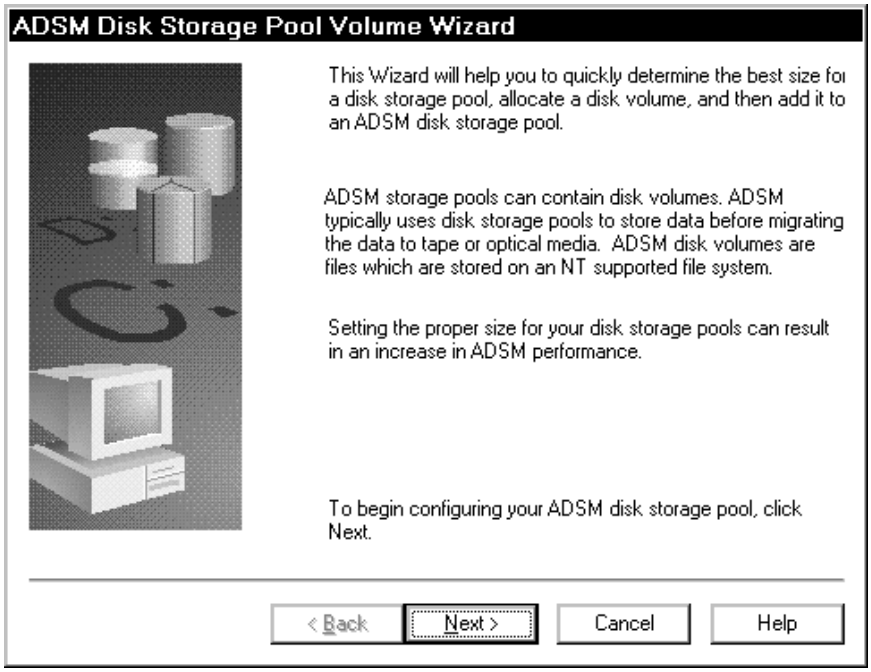


Figure 458. ADSM Disk Storage Pool Wizard - Introduction Screen

To verify you have administrator access you need to enter your administrator account user ID and password. Click on **Next**.

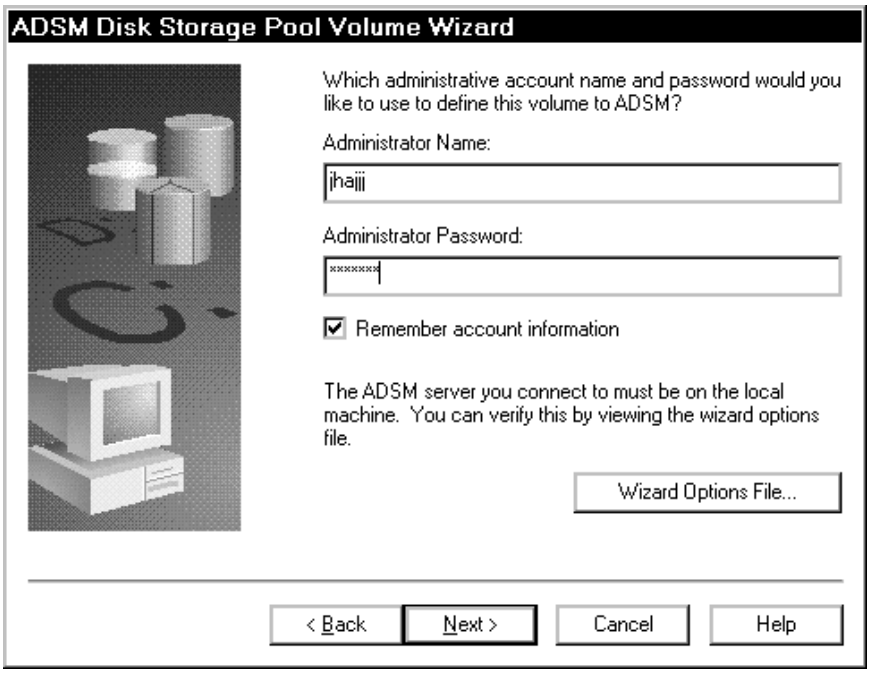


Figure 459. ADSM Disk Storage Pool Wizard - Accessing the Server

The ID you enter here is not an NT administrator ID but an ADSM administrator ID that you would have defined earlier.

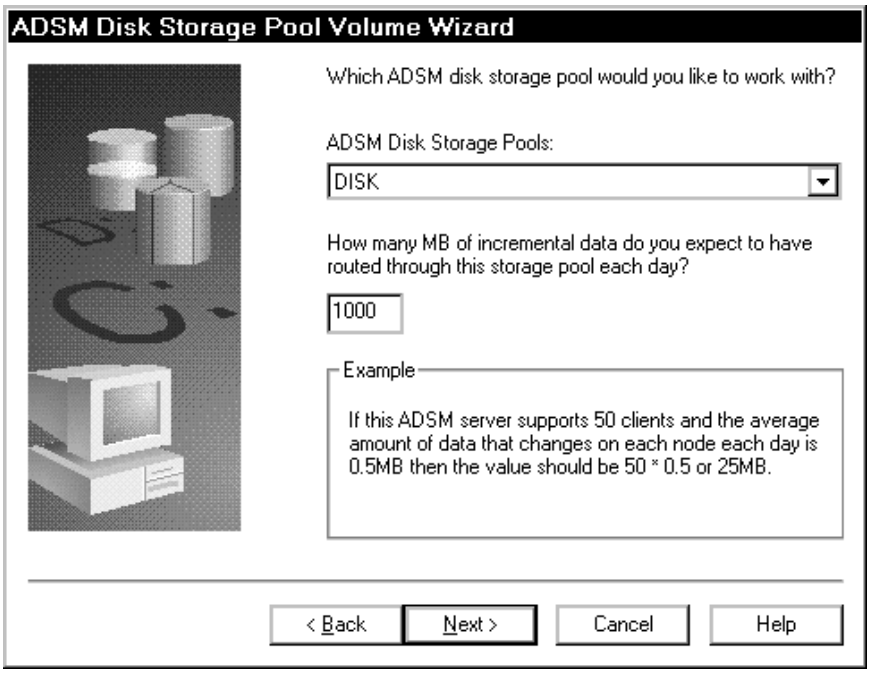


Figure 460. ADSM Disk Storage Pool Wizard - Selecting the Pool

In this window in the ADSM Disk Storage Pools pull-down menu you need to select the storage pool that you have already defined, in this case Disk. You also need to estimate the amount of client data to be managed, in MB of data, on a daily basis. We chose a random value of 1000 MB, which was well within the disk space we had to back up the data on.

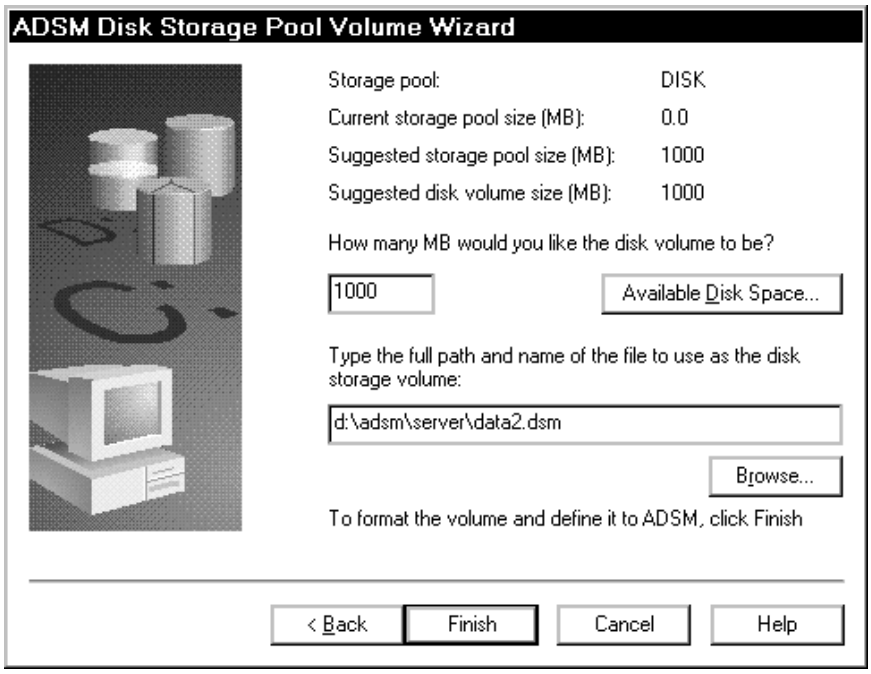


Figure 461. ADSM Disk Storage Pool Wizard - Where to Back Up the Data

In this window you will be asked to select the the size of the disk volume. The path that is entered is that of the ADSM server, but you can change this to specify exactly where you want your data to be backed up on the ADSM server. In addition, if you select Available Disk Space, that will allow you to check that there is sufficient disk space for the volume to be created. The following window shows you an example of that:

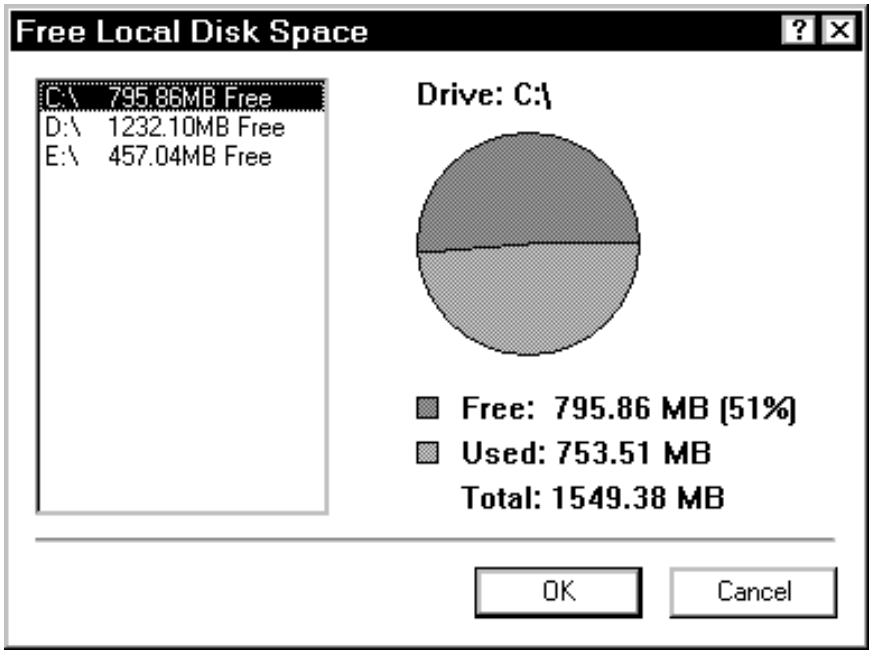


Figure 462. ADSM Disk Storage Pool Wizard - Free Disk Space

Click on **Finish** to complete defining the size of disk storage pools and the size of disk volumes.

Note: This completes our interaction with the Wizard and we now continue the configuration from the Administration Client window. The next thing to do is to add the storage pool Volume name and define it to our default device, DISK.

From the Component Tree window in the Administrator Client window click on the **+** next to the storage pools and double-click on **Storage Pool Volumes**. In the next window, right click on the mouse button and click on **Add** in the pop-up menu to define a new storage pool volume.

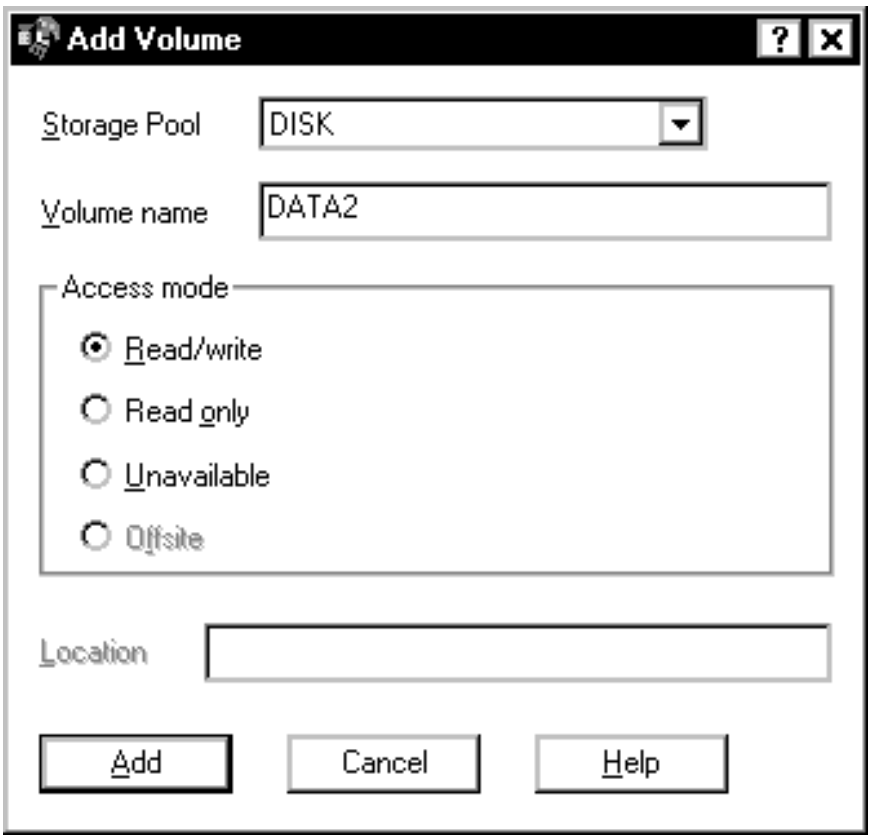


Figure 463. Add Volume Name

In the Storage Pool field select **DISK** and in the Volume name field enter `DATA2`. We chose DATA2 because this is the file name of the Disk Storage Volume as defined in Figure 461 on page 346.

The next thing we need to do is define and configure policy domains, policy sets, management classes and archive/backup copy groups. Policies are a set of rules that define how ADSM will treat the data. They are defined centrally on the ADSM server in policy domains which are a collection of clients. However, a client can only belong to one policy domain.

To define a policy domain open the ADSM System Administrator window and double-click on the **Policy Domains** icon in the Component Tree window. You can then create a policy domain by clicking the right mouse button and selecting **Add**.

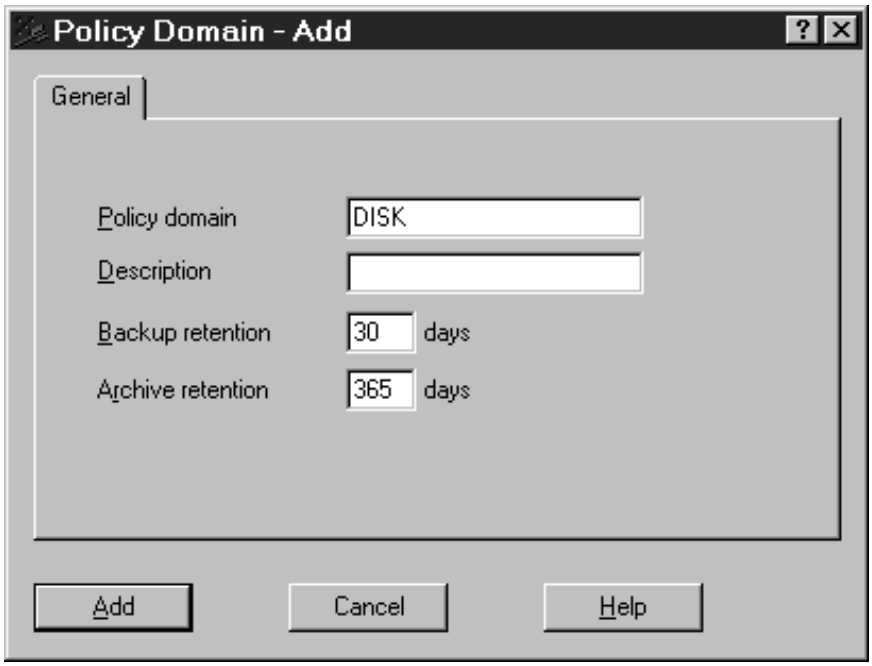


Figure 464. Add a Policy Domain

In the policy domain window you need to name your new policy domain. We entered the name `DISK` although this can be anything you wish. The Backup Retention field and Archive Retention fields allow you to specify how long backed up and archived files are to be kept on the ADSM server. Click on **Add** when you have finished.

The next thing is to add a policy set to our policy domain. We do this by clicking on the **+** to expand the policy domains tree and then double-clicking on the **Policy Set** to open the policy set window. In this window click the right mouse button and select **Add**. In the Policy Domain field select **DISK** from the pull-down menu as this is the policy we have just defined. In the Policy Set field enter a name for the set you are adding. We called ours DISK.

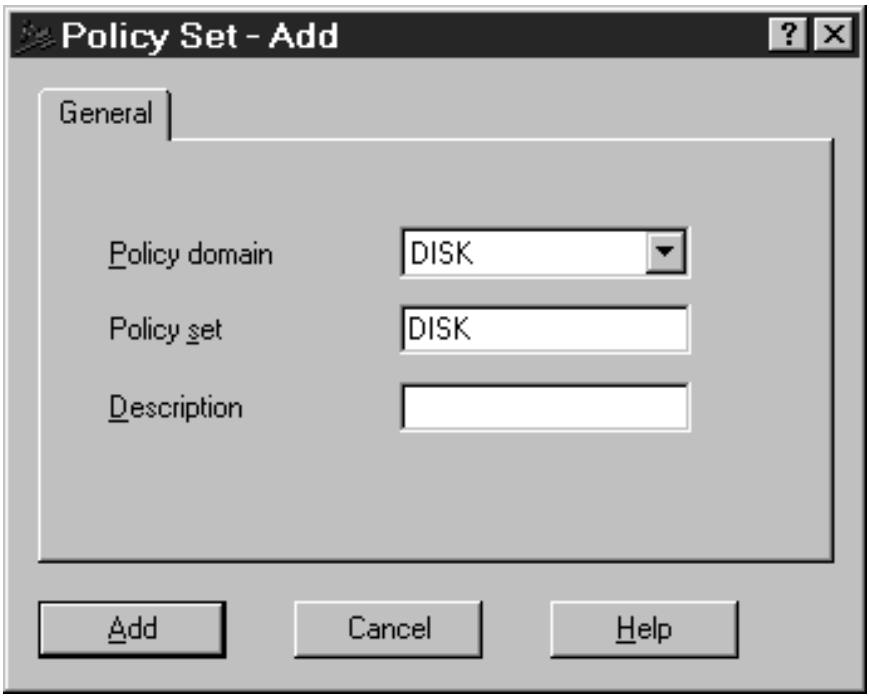


Figure 465. Add a Policy Set

Policy sets allow different types of data to be treated differently. Within a policy set there are management classes which define how to manage the backed up, archived or migrated data. This can be considered to be a name for a policy set and there can be multiple management classes within a policy set.

Management classes have two copy groups:

1. A backup group which specifies:
   - Where the backup data should be stored, in which storage pool.
   - What to do if the file is in use during backup.
   - Whether the file should be backed up only if has been modified, or whether it should be backed up anyway.
   - The frequency of incremental backups.
   - How many copies of the file are to be stored and how long to keep the last remaining one.
2. Archive Group

   As archiving has no version control, you only have to define the following:
   - Where the archived data is to be kept, in which storage pool.
   - What to do if the file is in use during archiving.
   - How long the archived file is to be stored for.

We now configure a management class, backup copy group and archive copy group.

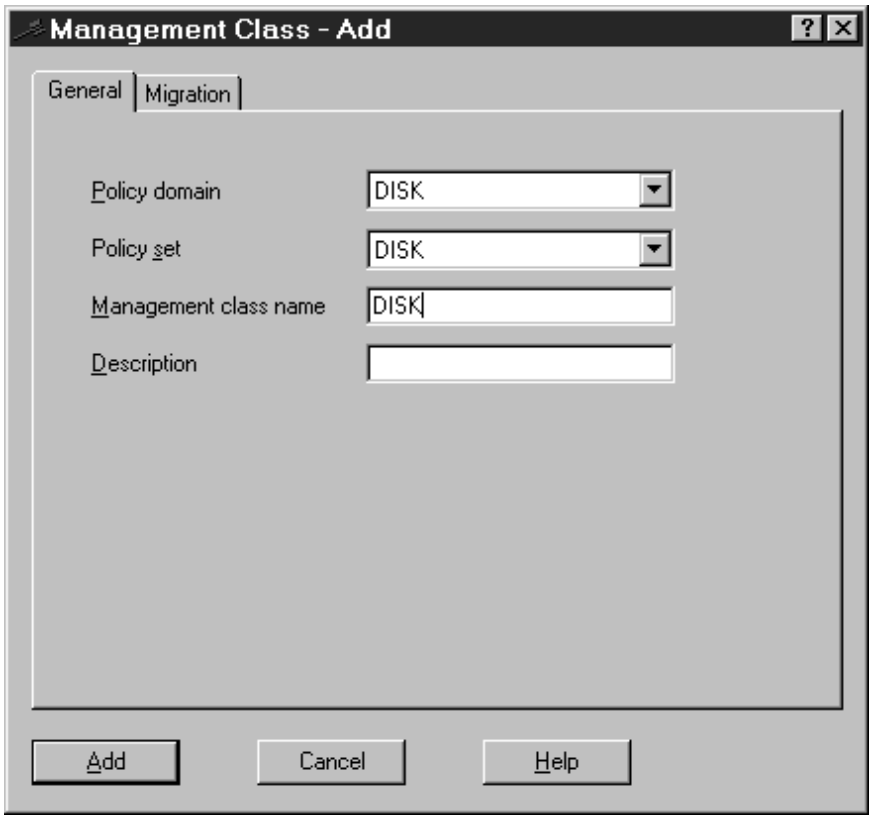


Figure 466. Add a Management Class

From the ADSM Administrative Client Component Tree window expand all the levels under policy sets by clicking on the **+** next to the icon and double-clicking on the **Management Classes** icon. In this new window right click the mouse button and select **Add**. Under the General tab, select the previously defined names of the policy domain and policy set. In our case that would be DISK. Then assign the management class a name. Once again we chose DISK.

Now go to the Migration tab. Migration is designed to help save disk space and keep the cost of disk upgrades to a minimum. It does this by moving inactive data from the client to the ADSM server. Migration criteria can be done in one of three ways:

- Automatic - This allows threshold migration to occur.
- Selective - This allows migration by command.
- None - This states that no migration is allowed.

We chose not to migrate the data by choosing **None**. The only other choice to be made is to select the storage pool destination, which in our case is DISK.

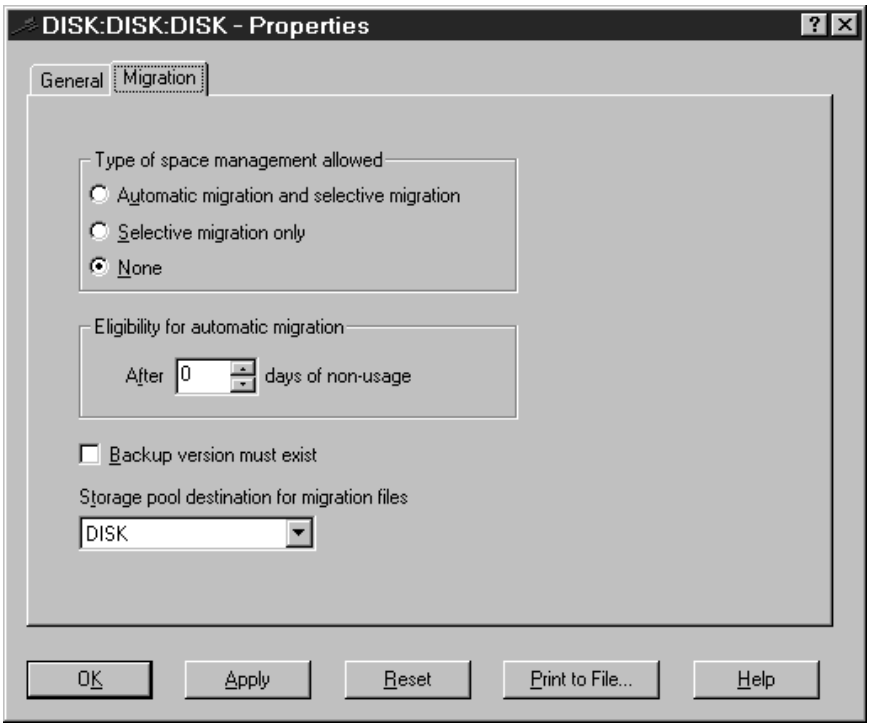


Figure 467. Add a Management Class - Migration Files

Then add a backup copy group. From the ADSM Administrative Client component tree window expand all the levels under Management classes by clicking on the **+** on the Backup Copy Groups icon. In this new window right click with the mouse and select **Add**. Under the General tab choose the previously defined policy domain, policy set and management class, all of which were DISK in our scenario.

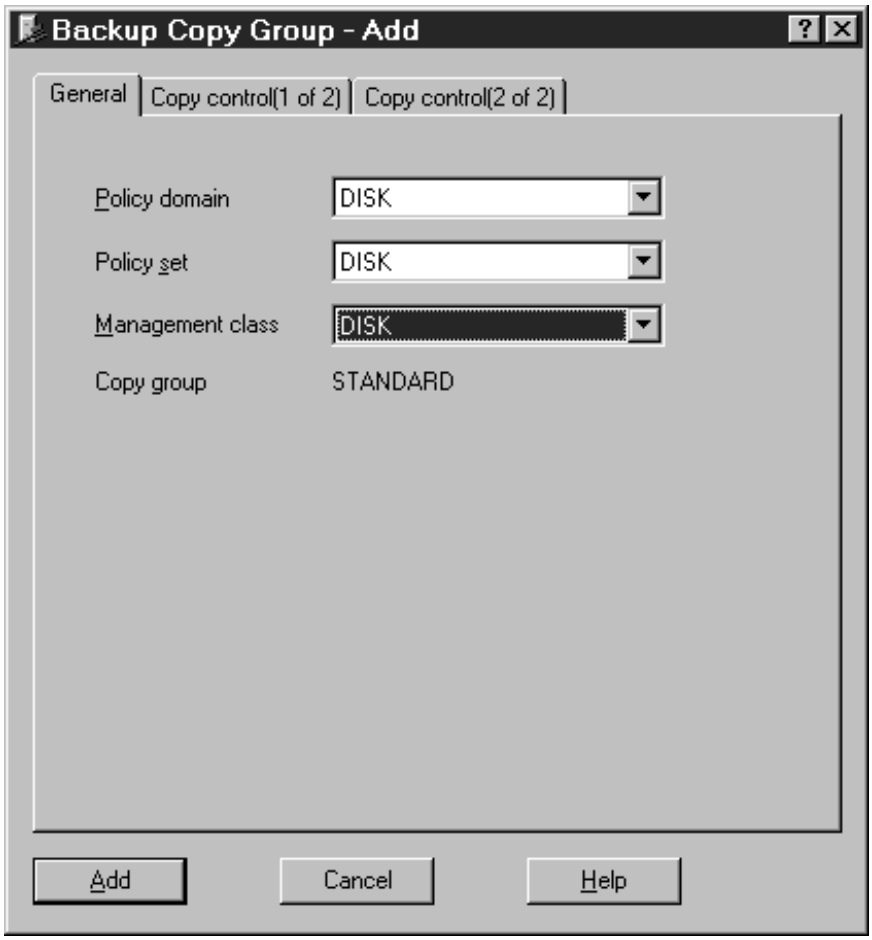


Figure 468. Add a Backup Copy Group

Under the tab Copy Control (1 of 2) in the Copy Mode area you can specify whether you want a file to be considered for backup depending upon whether it has been modified or not. We set the Copy mode to Modified, which only backs up the file if it has been changed. The Copy Serialization section allows you to specify what action is to be taken if the file is in use while it is being backed up. You have four choices:

1. Static - Do not back up the file if it is in use.
2. Shared Static - Retry the backup if the file is in use.
3. Dynamic - Do not check if the file is in use, just back it up.
4. Shared Dynamic - If the file is still in use during backup, make a backup even though the file may change.

We selected the **Dynamic** button.

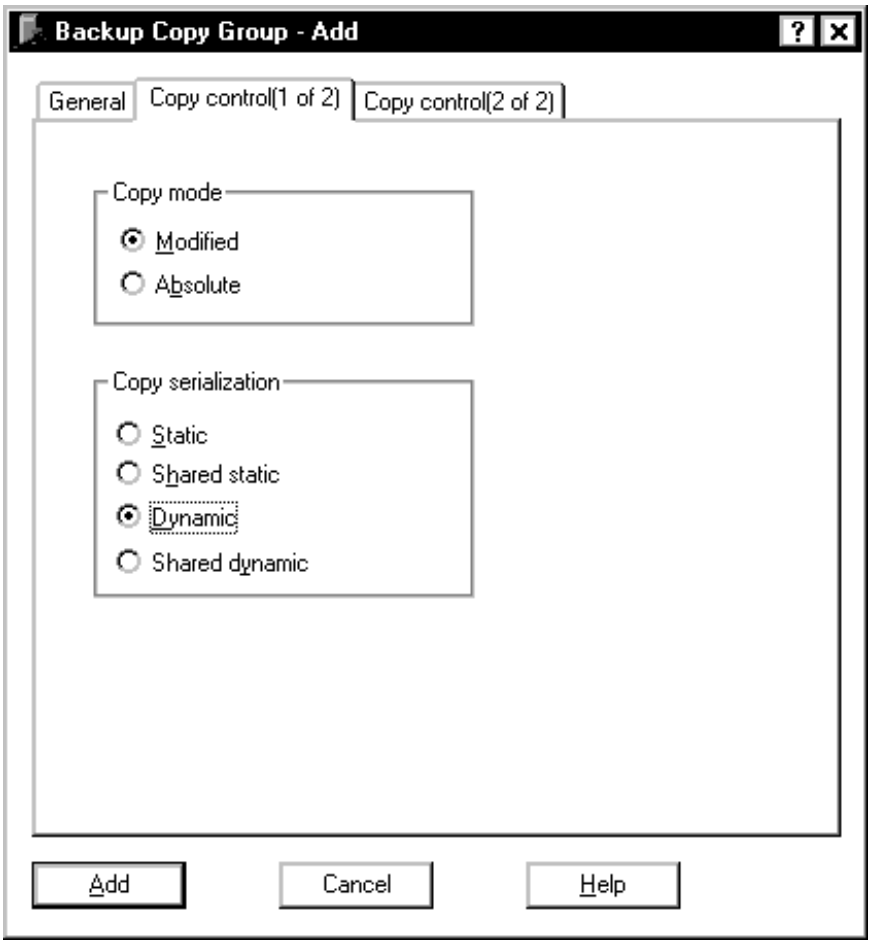


Figure 469. Add a Backup Copy Group - Copy Control (1 of 2)

Under the tab Copy Control (2 of 2) we need to specify how often we want the data backed up and how long a backup copy should be kept. In the Copy Frequency field we specified `0` which means that backup can occur whenever the client runs an incremental backup. The If Client Data Exists field is used to specify how many copies of data are to be kept on the ADSM server while the file also exists on the client. We chose a value of `2`. The If Client Data Is Deleted field allows you to specify how many backups to keep if the file has been deleted on the client. We chose the default value of `1`.

The Number of Days field allows you to set how long you wish to keep all backup files, other than the most recent one on the server. We chose the default value of `30`.

The Length of Time to Retain Only Backup Version field allows you to set the number of days you want the last version of the backup file to be stored. Finally, on this screen we need to define which pool to store the backup data in, so we select **DISK** from the pull-down menu.

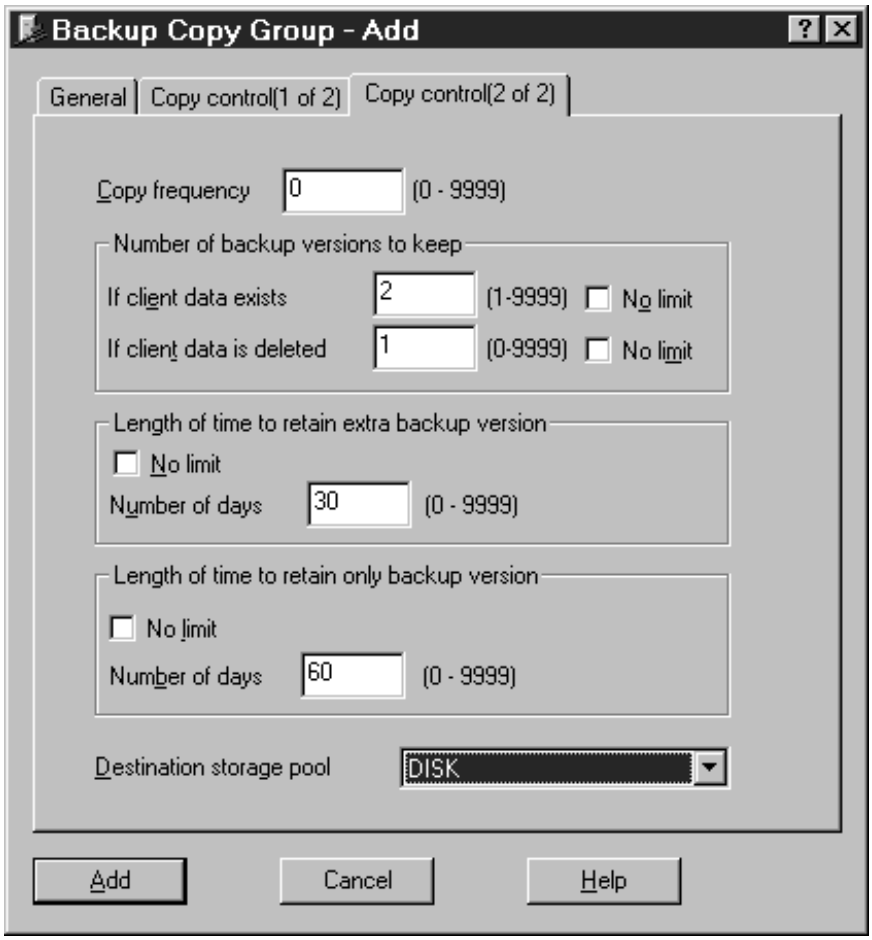


Figure 470. Add a Backup Copy Group - Destination Storage Pool

Click on **Add** at the bottom of the configuration window to add the backup copy group.

Next, double-click on the **Archive Copy Groups** icon in the Component Tree window. Right click in the Archive Copy Groups window and select **Add**. Under the General tab set the policy domain, policy set and management class to DISK.

Figure 471. Add an Archive Copy Group

Under the Copy Control (1 of 2) tab the Copy Serialization section allows you to specify what action is to be taken if the files is in use while it is being archived. You have four choices:

1. Static - Do not archive the file if it is in use.
2. Shared Static - Retry the archive process if the files is in use.
3. Dynamic - Do not check if the file is in use, just archive it.
4. Shared Dynamic - If the file is still in use during the archive process, archive it even though the file may change.

We selected the **Shared Static** button.

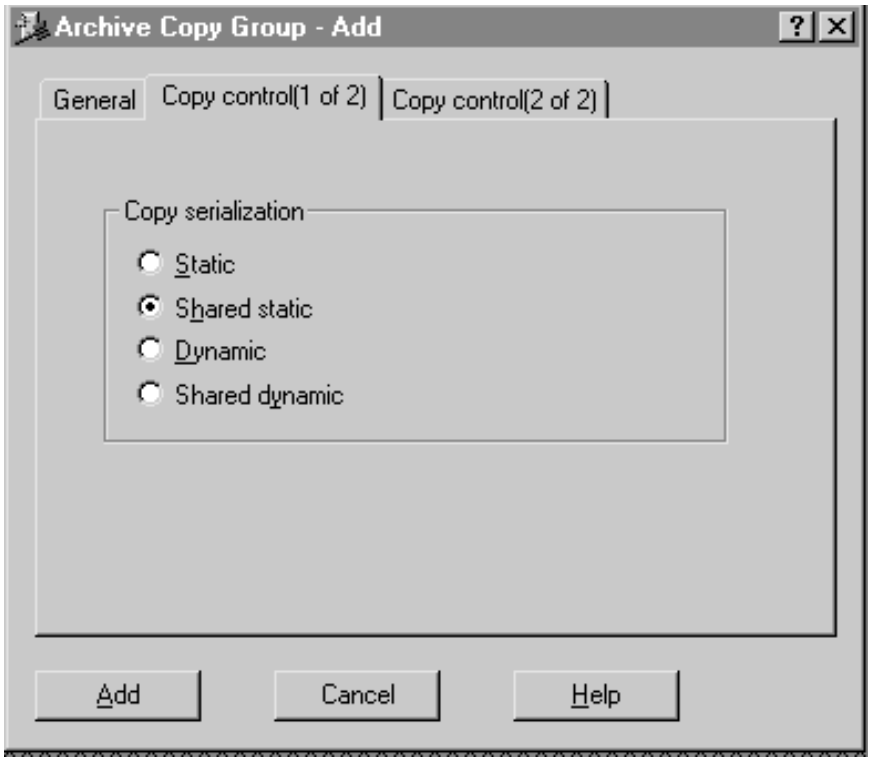


Figure 472. Add an Archive Copy Group - Copy Control(1 of2)

Under the Copy Control(2 of 2) tab we can set the amount of time we want to keep the archived copies of data. You can either set the length of time to *No Limit*, which means that the archive will never be deleted or you can specify the amount of time archived data can be kept for. We decided to set the archive limit to 365 days.

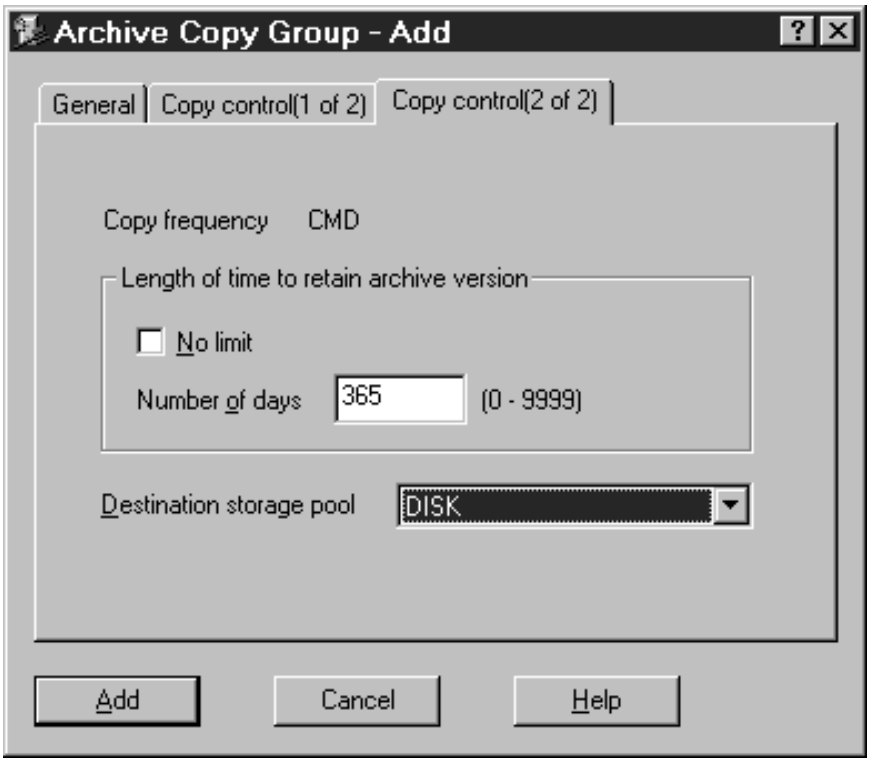


Figure 473. Add an Archive Copy Group - Destination Storage Pool

At the bottom of the configuration window click on **Add** to add the archive copy group.

The next step is to define and register a node with the ADSM server. We do this by double-clicking on the **Nodes** icon in the Component Tree window to open the Nodes window. In the Nodes window click on the right mouse button and select **Add**.

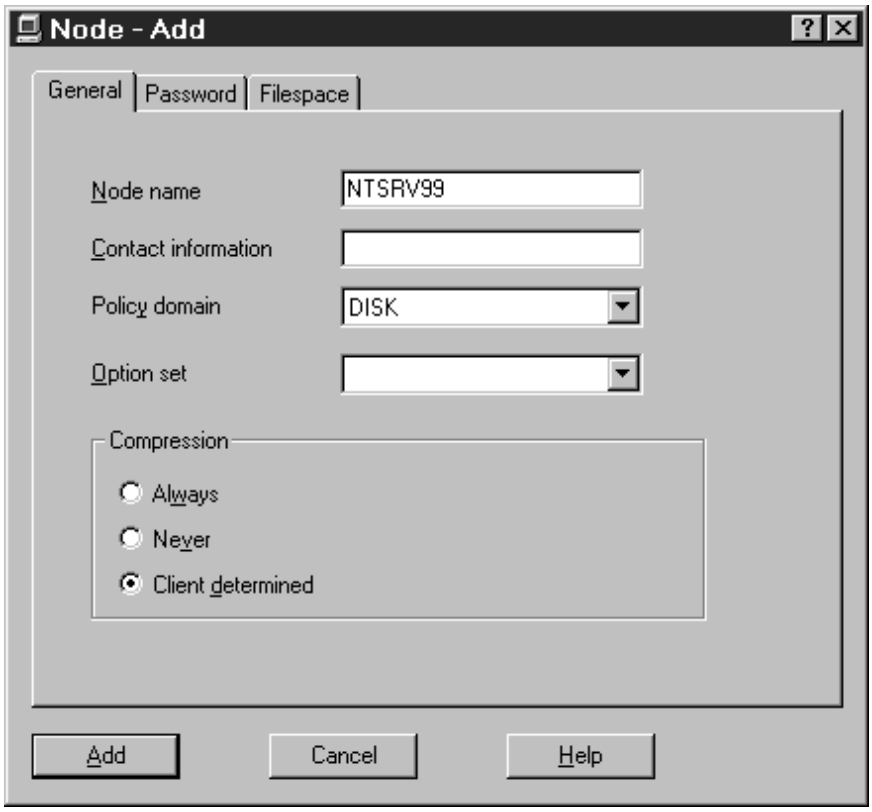


Figure 474. Add a Node

Under the General tab enter the Node name. Since we had installed the ADSM client on server Tier 3b and it had a TCP/IP host name of NTSRV99, we decided to use that. You need to be make sure that the node name matches the name defined in the DSM.OPT file on the client. You then need to define the policy that the node can access, which is DISK in our case. The Option Set allows you to specify the name of a collection of client options that apply to a node or set of nodes. We did not define any. Data compression is the default and it is done at the client level in the DSM.OPT file. Backed up and archived files get compressed before they are sent across the network to the ADSM server. We have three options under the General tab:

1. Always - Data is always compressed regardless of the settings specified in the client options file.
2. Never - Data is never compressed even if it is specified in the client options file.
3. Client Determined - Compression is determined by the settings in the client options file.

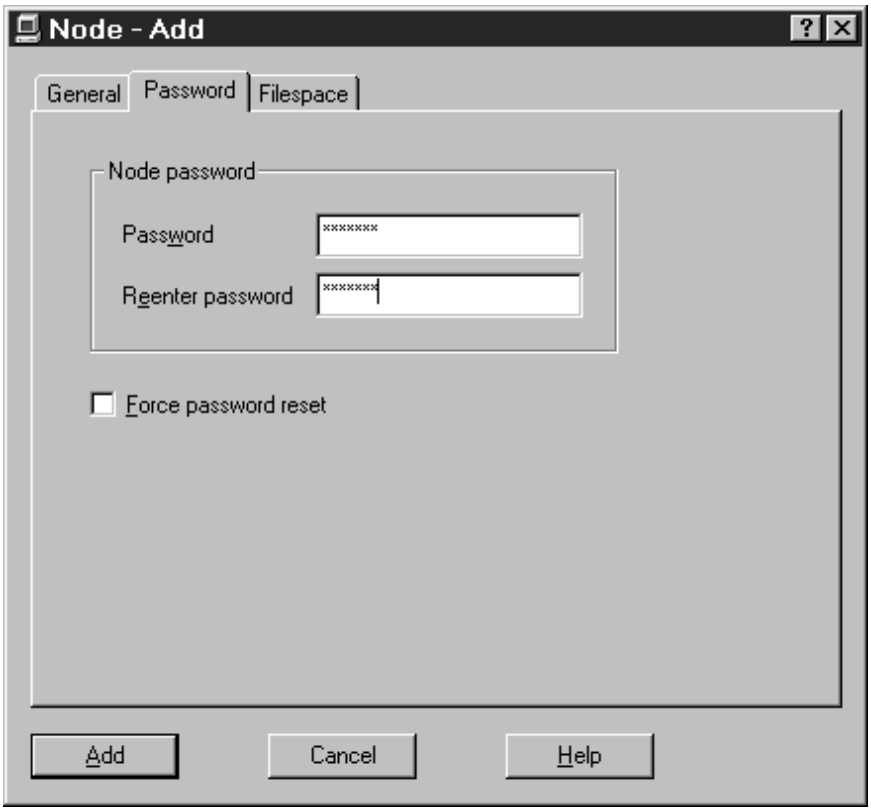


Figure 475. Password for the New Node

Next we need to specify a password for the node to verify that it can access the ADSM server services.

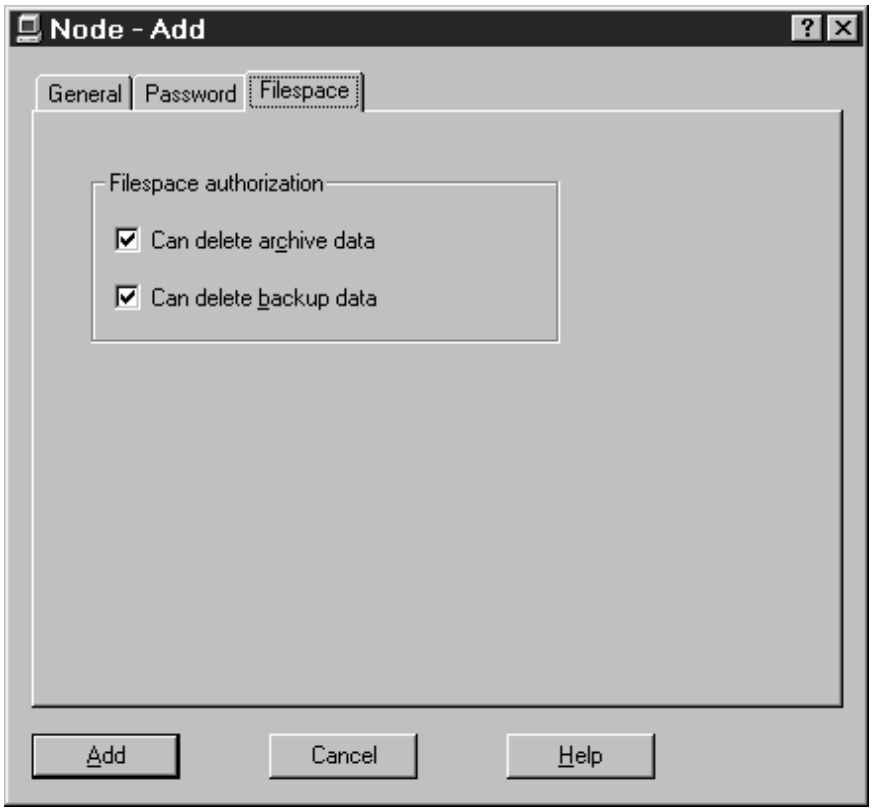


Figure 476. Data Authority for the New Node

Finally, under the Filespace tab we need to determine whether the node can delete backed up and archived files on the ADSM server. We chose to give the node full control and selected both; however, the default is only to delete archived files. Then click on **Add** to complete the node definition.

This completes the configuration for the ADSM server and client.

The following two figures show what the configuration looks like when using a disk (Figure 477 on page 361) and tape (Figure 478 on page 361).

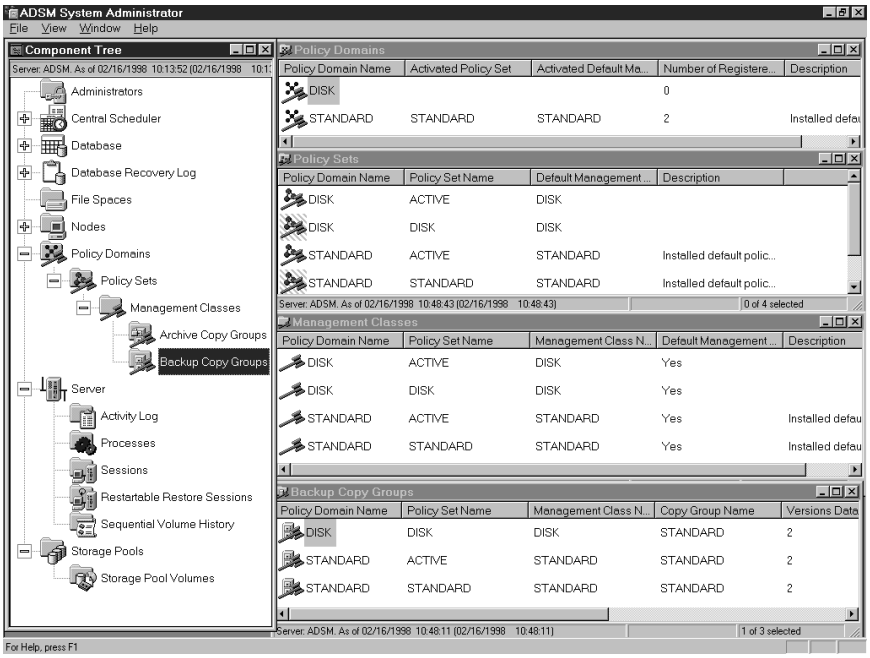


Figure 477. Policy Windows - Configured with Hard Disks As Backup Media

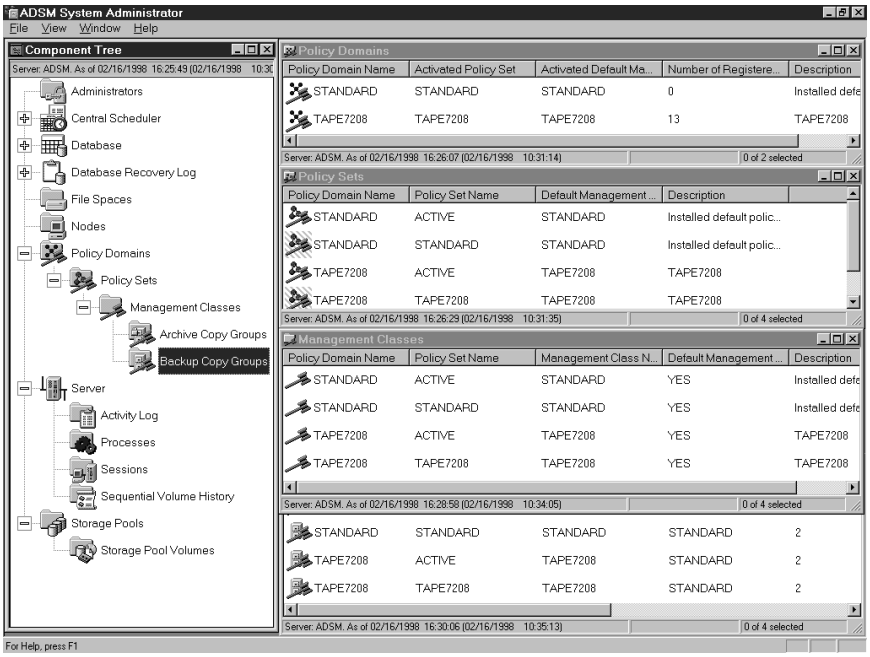


Figure 478. Policy Windows - Configured with Tape Drives As Backup Media

5.5 Running the Scenario

In this section we bring together all the components that we have configured so far and illustrate how to run them in an integrated manner.

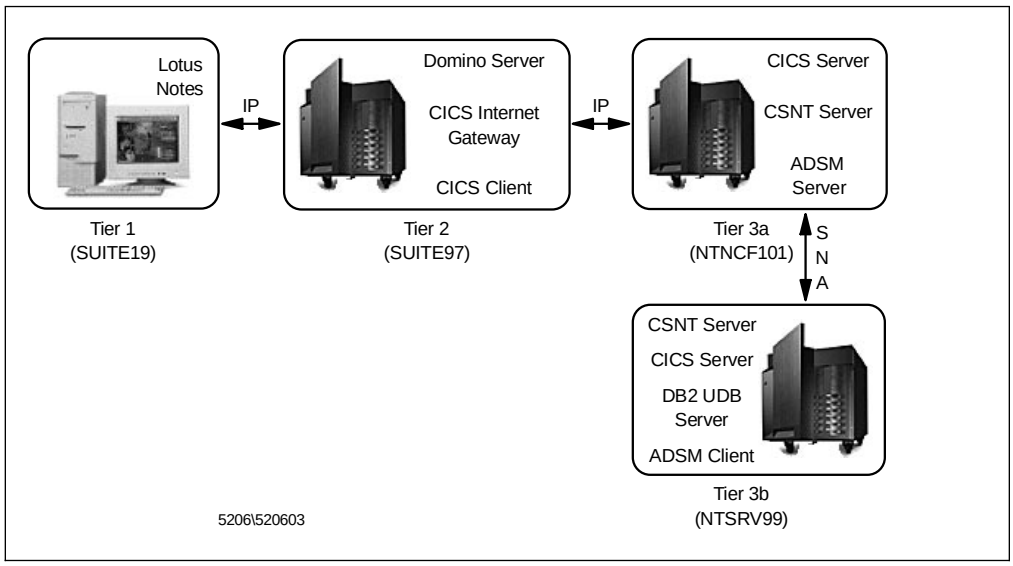


Figure 479. Transaction Scenario Environment

5.5.1 CICS Transaction Routing

To run the sample CICS application called MENU from a Web browser, open the Lotus Notes client on Tier 1. The desktop should appear to be similar to Figure 480.

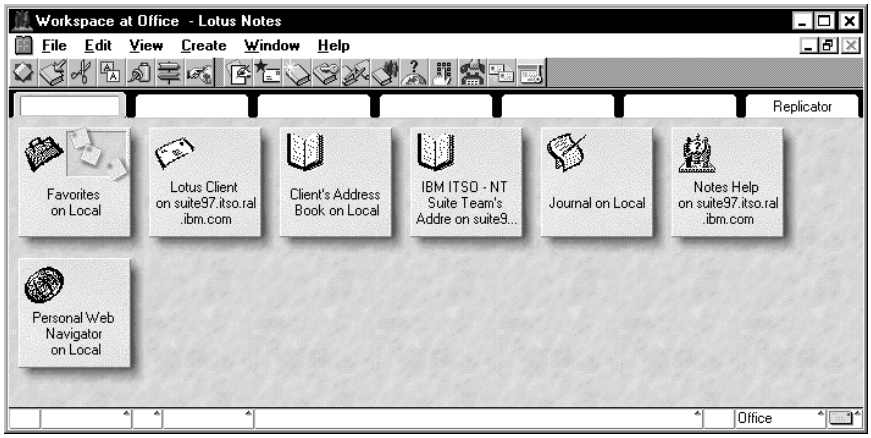


Figure 480. Lotus Notes Client Desktop

Double-click on the icon **Personal Web Navigator**. You should get prompted for a password. Enter the password and you will get a window similar to Figure 481 on page 363. If this is the first time you are running the scenario then there is likely to be no bookmarks pointing to the CICS Internet Gateway. So click on **File, Open Url** and enter the URL for the gateway home page of your Lotus Domino Server. In our case this was http://suite97.itso.ibm.com/cig/cigstart.htm.

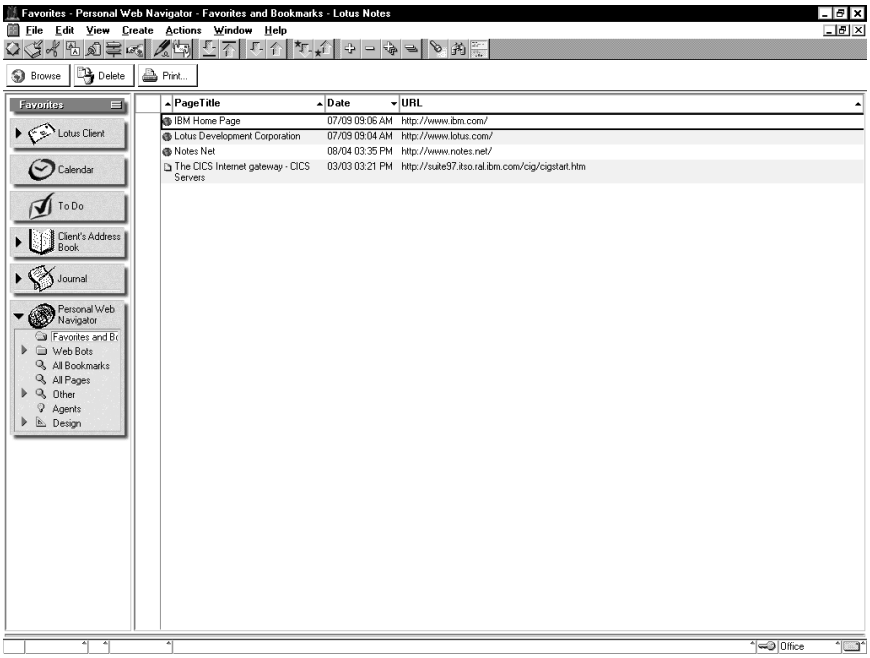


Figure 481. Lotus Notes - Personal Web Navigator

On the opening screen of the CICS Internet Gateway, you can perform several tasks on the CICS Servers, for example, querying current gateway settings and listing the available CICS Servers.

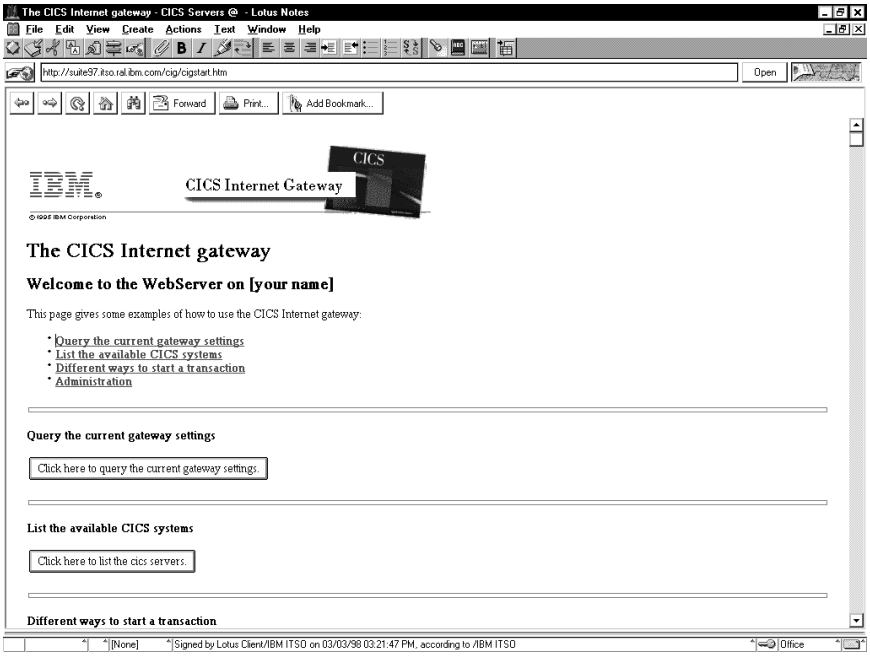


Figure 482. Access to the CICS Internet Gateway via the Web Browser

Click on **Click here to list the CICS Servers**. You should be presented with a screen similar to Figure 483 on page 364, which allows you to select a CICS Server to connect to. We want to connect to NTNCF101. Also from this screen you can enter the transaction you wish to run, so enter `MENU` and click on **Enter**. The transaction name must be entered in uppercase.

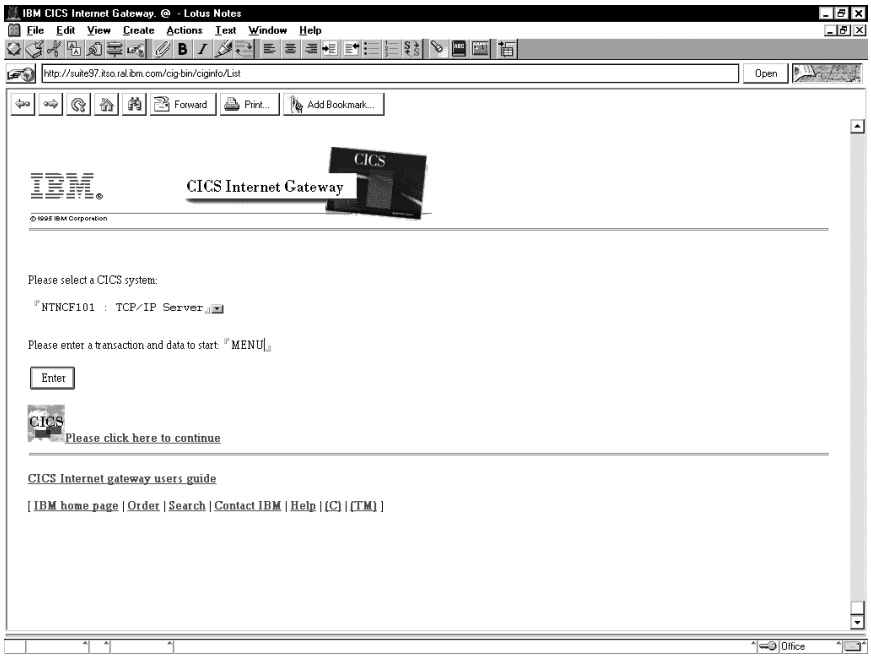


Figure 483. Selecting the CICS Server and Transaction Program

At the main menu interface enter a transaction ID from the ones listed. We entered `BRWS` and then clicked on **Enter**. You may have to scroll down the screen to see the Enter button.

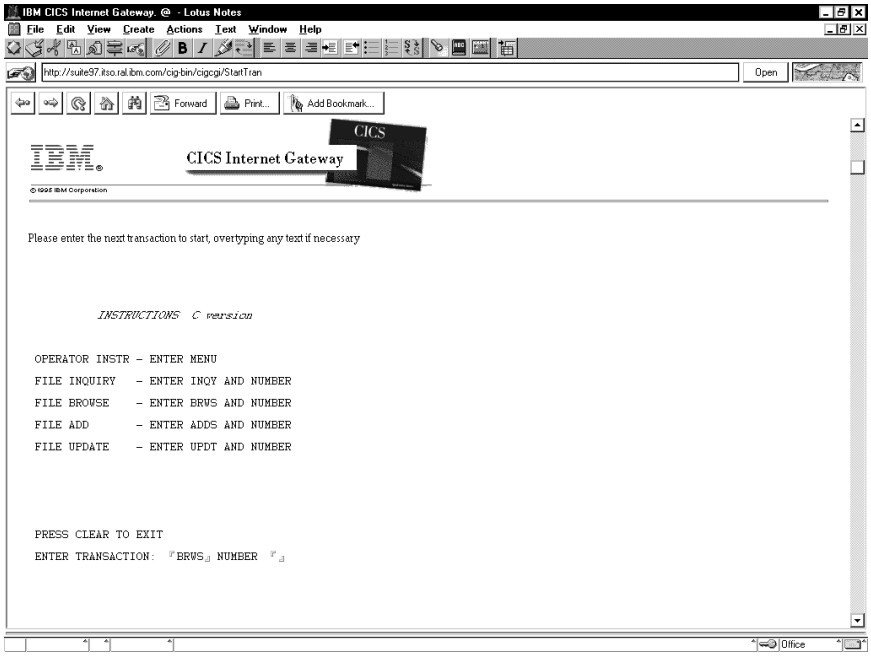


Figure 484. Running the CICS Transaction Program - Main Menu

The result of running the transaction BRWS is displayed in Figure 486 on page 366. The request to run transaction program BRWS was sent from Tier 1, the browser, to Tier 2, the Domino Server and CICS Internet Gateway. Tier 2 sent the request to Tier 3a, the CICS Server. Tier3a routed the BRWS transaction to Tier 3b, the CICS Server where the transactions are defined. The CICS Server at

Tier 3b runs BRWS and retrieves the data from the database server on Tier 3b. The result of running the transaction is then routed back to the client, Tier 1.

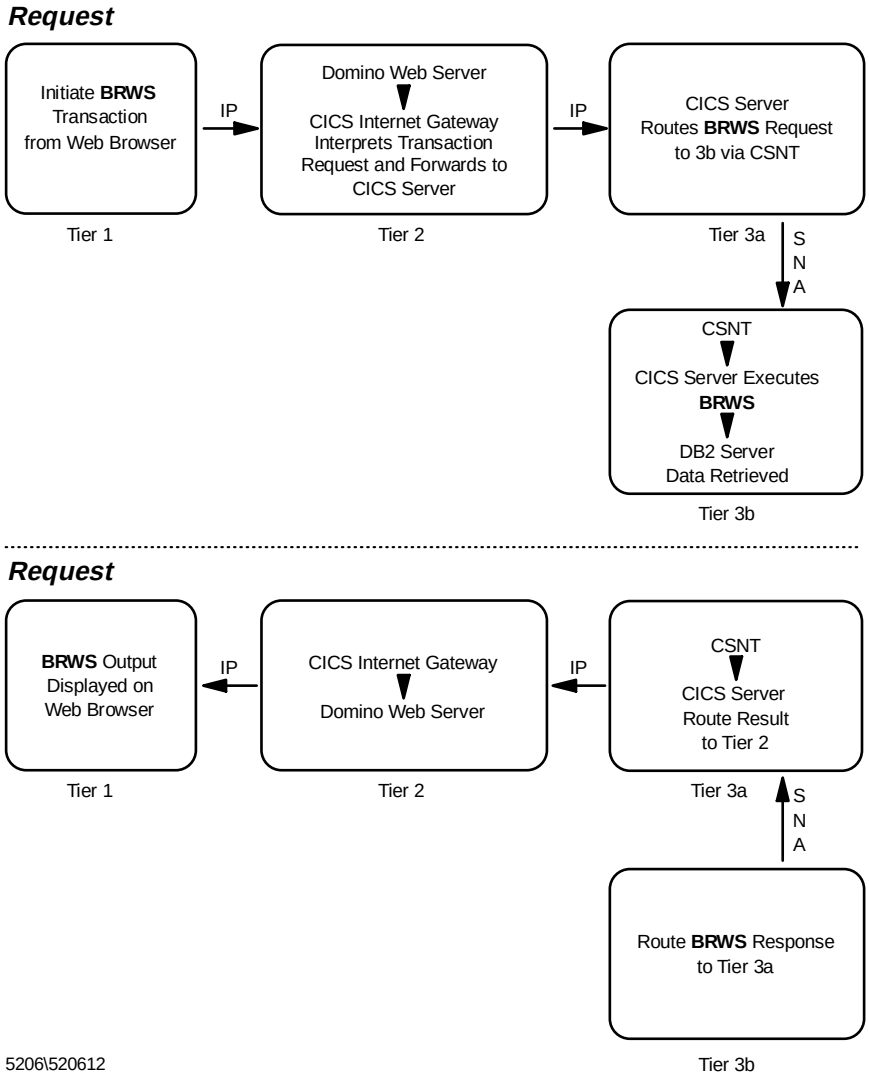


Figure 485. Scenario Flow

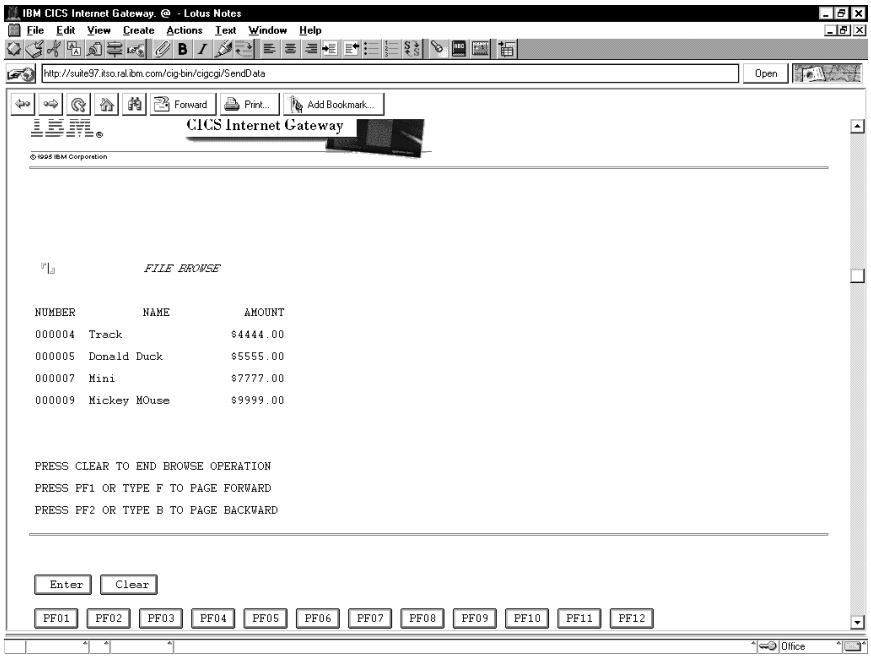


Figure 486. CICS MENU Transaction Output

5.5.2 Running the ADSM Backup

The ADSM backup procedure is used in this scenario to back up data to the storage pool DISK. We can back up data in two ways:

1. Having a DB2 directed backup to ADSM.
2. Having an ADSM directed backup of data.

We used the second method where ADSM selectively backs up the data on a system.

To start the ADSM backup procedure click on **Start, Programs, IBM ADSM** and **ADSM Backup Client** to get the screen in Figure 488 on page 367. From there we can either back up, restore, archive or retrieve data. The ADSM server name will be filled in automatically from the DSM.OPT file. All you need to do is validate yourself by entering a valid password. Then click on **Login**.

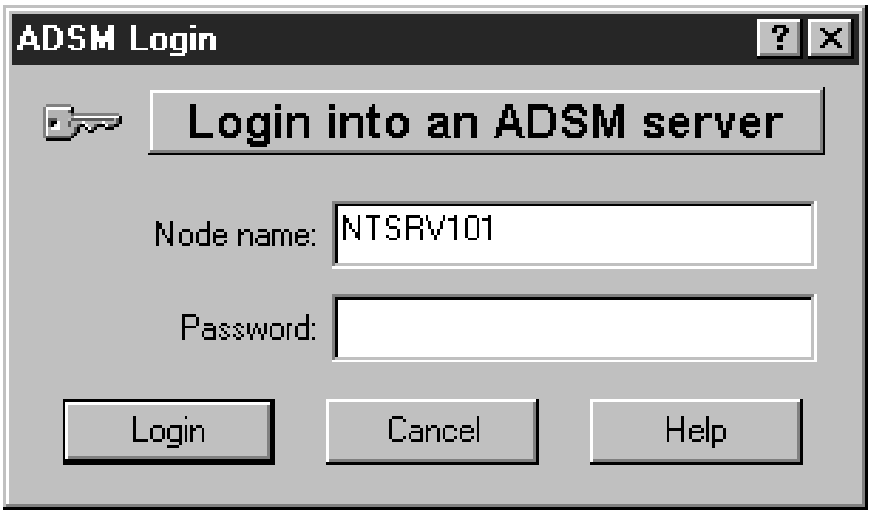


Figure 487. Log in to ADSM Server

After successfully logging in you will be presented with the following screen, where you can choose whether you want to back up or retrieve data. We are going to back up some data so click on **Backup**.

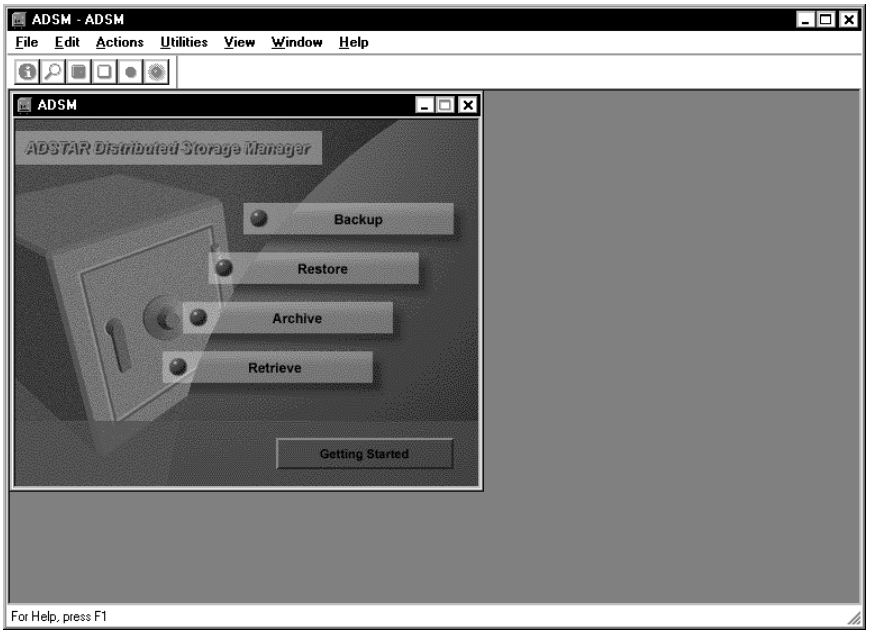


Figure 488. ADSM Backup Client Menu Window

Clicking on Backup allows us to then specify what type of backup we require, either:

- Changed or Deleted - These are files that have changed since the last backup, regardless of whether the file dates are older or newer than the last backup.
- Quick: Changed Files - This backs up files that have changed since the last backup. It does this by checking file dates.
- Always backup - This will always backup the selected files.

The default is Changed or Deleted. From the file tree click on the **+** to expand the drives and directories until you are at the level you wish to back up.

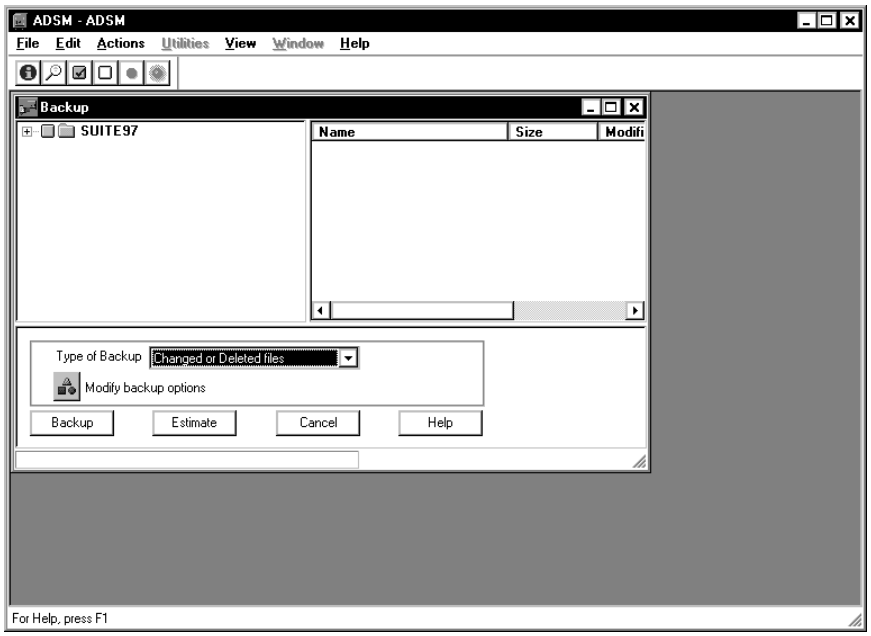


Figure 489. ADSM Backup Client Window

Next select the directories and files that you wish to back up. The selected components will have a check mark next to them. If you select a directory then all of its contents are automatically selected too. Once you have decided what to back up, click on **Backup**.

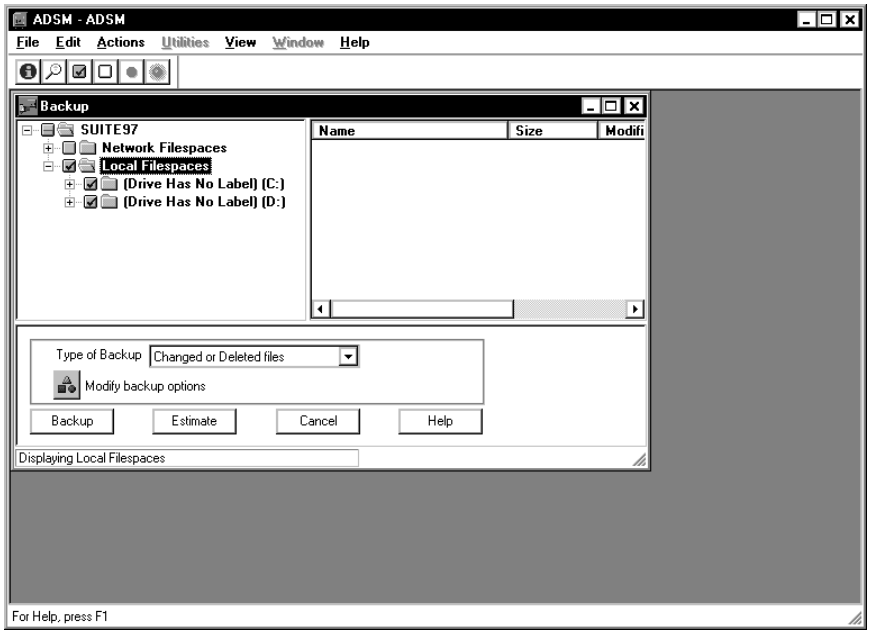


Figure 490. ADSM Backup Client - Selecting Files to Back Up

The Backup Status window shows the backup in progress and also reports any failures if they occur.

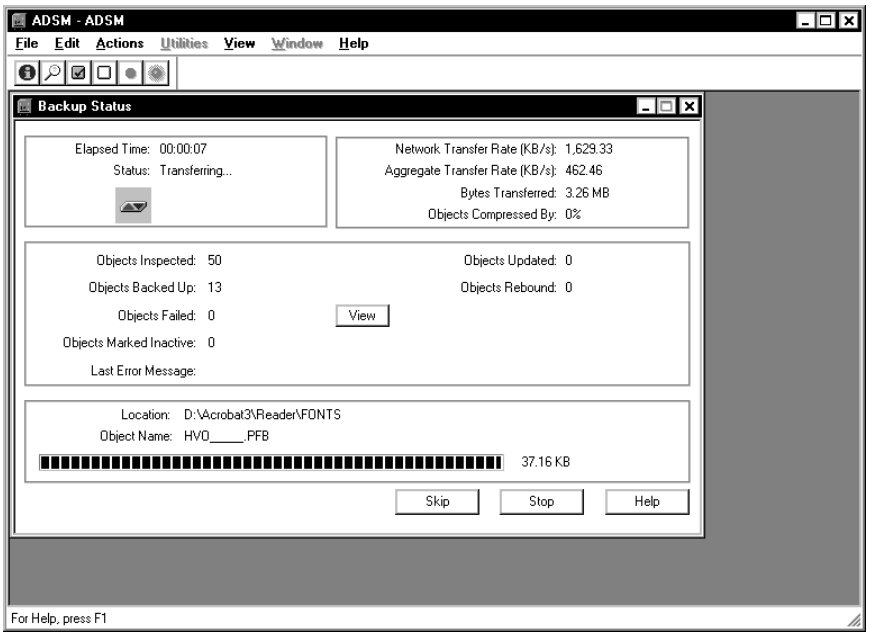


Figure 491. ADSM Backup Client Status Window

At successful completion you get a Backup Completed verification window. Just click on **OK**.

5.5.2.1 DB2 Directed Backup to ADSM

We can also use DB2 to back up the database to ADSM. We do this by clicking on **Start, Programs, DB2 for Windows NT, Administration Tools** and **Control Center**. On opening the control center click on **Systems** and all the corresponding trees until you find the database you wish to backup. Highlight the database by clicking on it and then right click on the database name to get a pop-up menu. Within the menu select **Backup database**. A new window will appear which will allow you to specify what media type you would like the database backed up to. Select **ADSM** and click on **Backup**.

Appendix A. The Microsoft Windows NT V4.0 Option Pack

This Option Pack includes the Internet Information Server 4.0, MS Transaction Server 2.0, MS Message Queue Server 1,0, Internet Connection Services for MS RAS and a few other small applications such as an Index Server and an administration tool.

The Option Pack also includes the NT 4.0 Service Pack 3, but you need to install the SP3 first. You will need to install Internet Explorer 4.01. If you want to install the MS Message Queue Server, you need to install the Microsoft SQL Server 6.5.

Note: You don't need a fixpack for SQL Server 6.5 when you are going to install the Option Pack.

The decision on whether or not you need Netscape or Microsoft Internet Explorer is not an easy one to answer. If you are planning on installing Microsoft products, such as the Option Pack, you need to install the Internet Explorer as a prerequisite. There will probably be future products that will have that browser as a prerequisite. Therefore, many people will choose to install both browsers on the same machine (as we did), to remove any limitations or restrictions.

As there are no other restrictions, the user can decide which browser they want to use.

Note: If the Windows NT Option Pack is installed, it could update the ODBC level to 3.5. This is a problem for two of the components in IBM Enterprise Suite for Windows NT. Both DB2 and Intel LANDesk require ODBCs level to be at 3.0.

For the coexistence scenario, we had to install the Internet Explorer V4.01 and the MS Option Pack first. In A.1, “Installation of Microsoft Windows NT V4.0 Option Pack” we give a short description of this installation procedure.

A.1 Installation of Microsoft Windows NT V4.0 Option Pack

The following section shows the steps to install the MS Option Pack for the NT 4.0 Server.

To start the install insert the NT 4.0 Option Pack CD or if you got the install code through download start the Setup program from the download path.

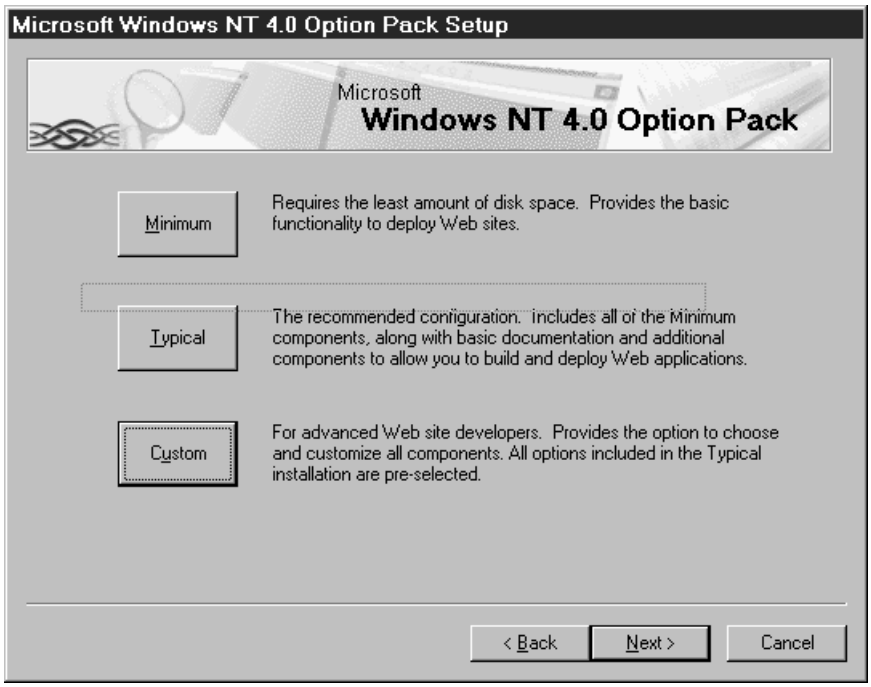


Figure 492. Select the Installation Path

Click on **Custom** to see all the choices.

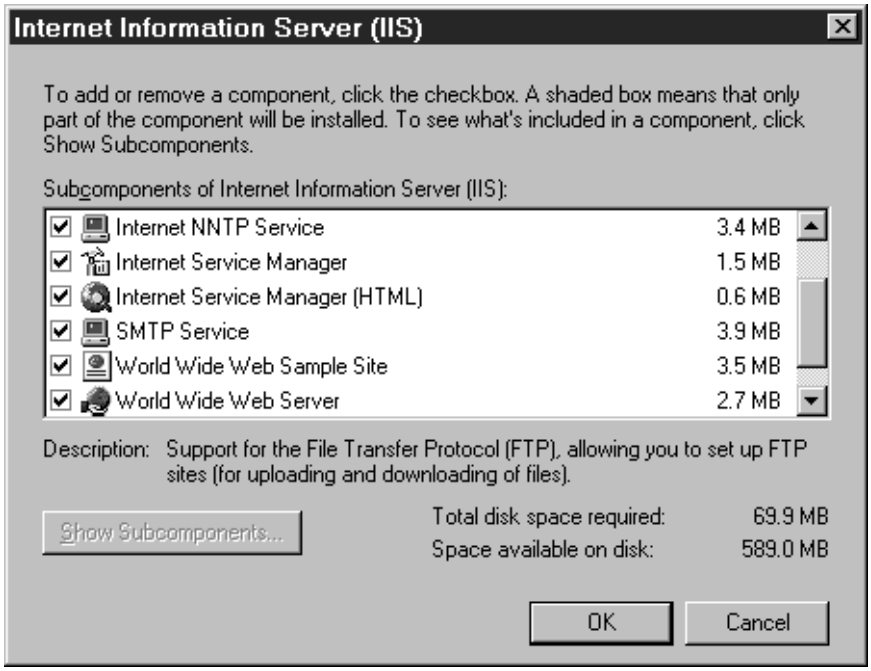


Figure 493. Select Components for the Internet Information Server (IIS)

Note: The installation of IIS 4.0 deletes the Microsoft Gopher if it is already installed since it is no longer supported.

All configuration files and Active Server Pages (ASP) files should be converted and run after the migration to IIS 4.0. For further details or if you have problems see http://backoffice.microsoft.com.

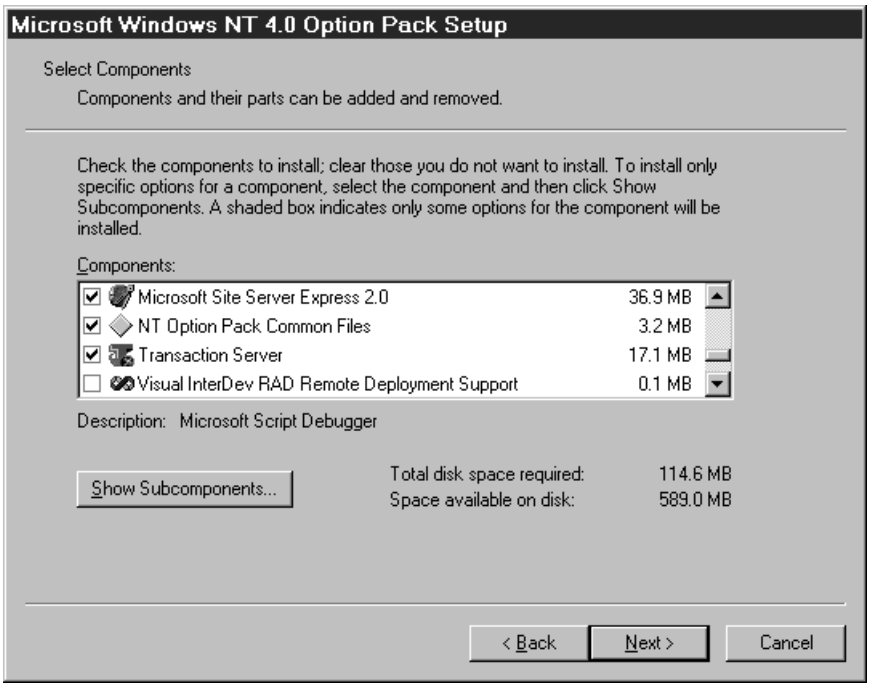


Figure 494. Select Components

Select the components you want to install.

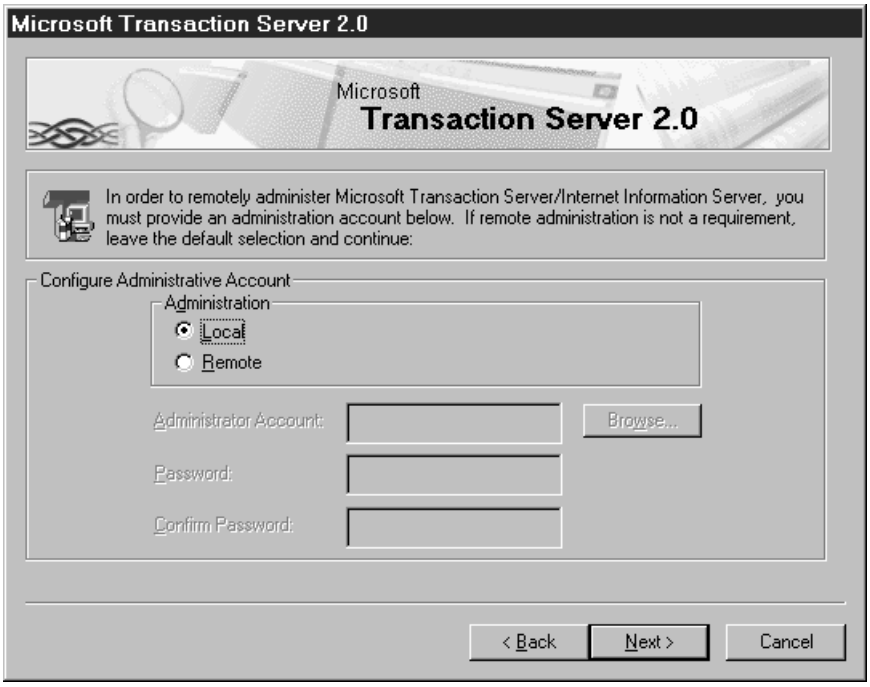


Figure 495. Configure Administrative Account for the Transaction Server

You can select **Remote** and select an account if you want to configure Transaction Server/IIS from another NT machine. If you are installing it locally, select **Local**.

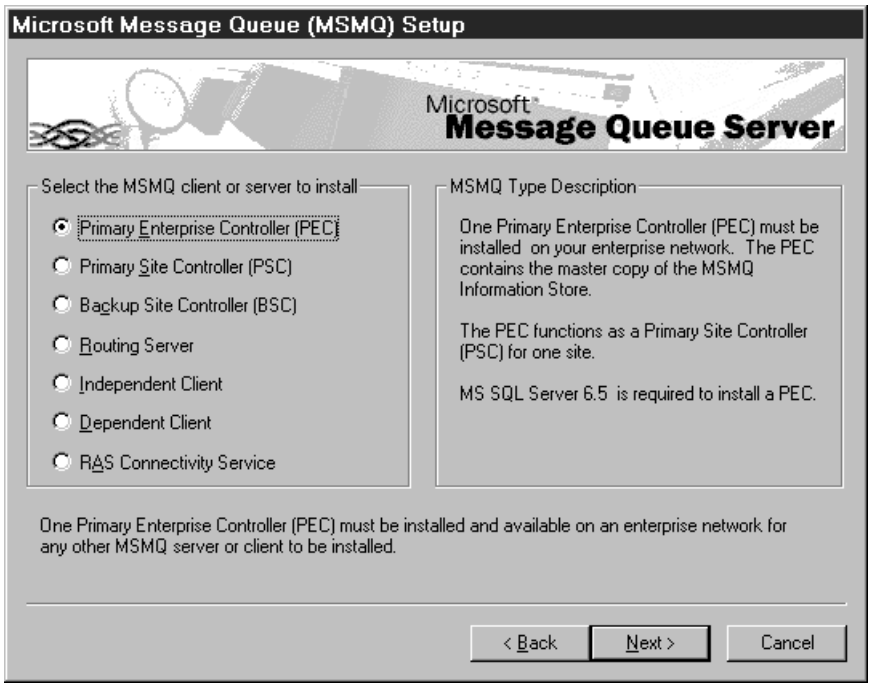


Figure 496. Microsoft Message Queue (MSMQ) Setup

Note: You need to install the MS SQL Server 6.5 as a prerequisite to the MS Message Queue Server installation.

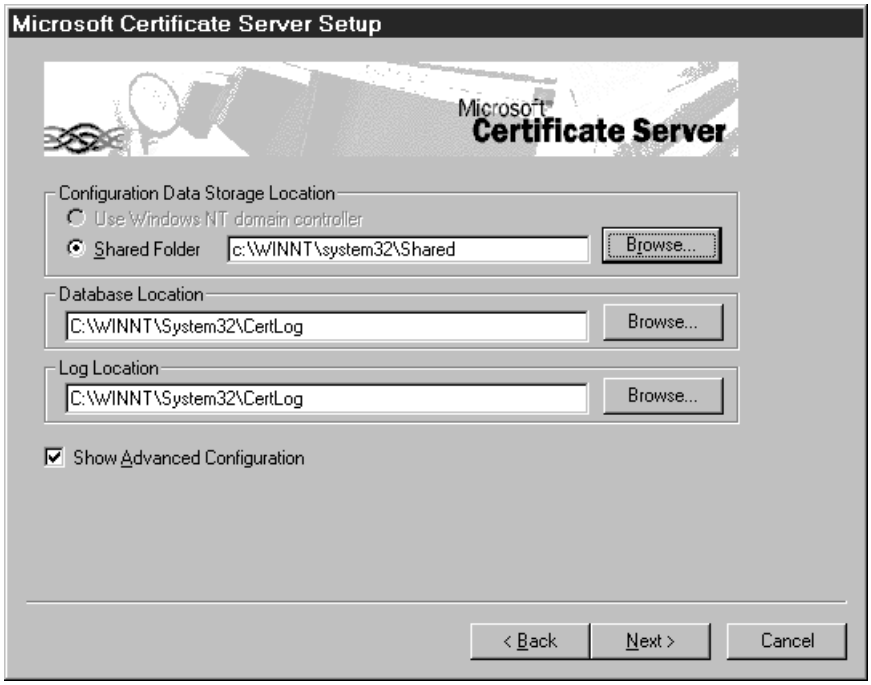


Figure 497. Select Directories for the MS Certificate Server

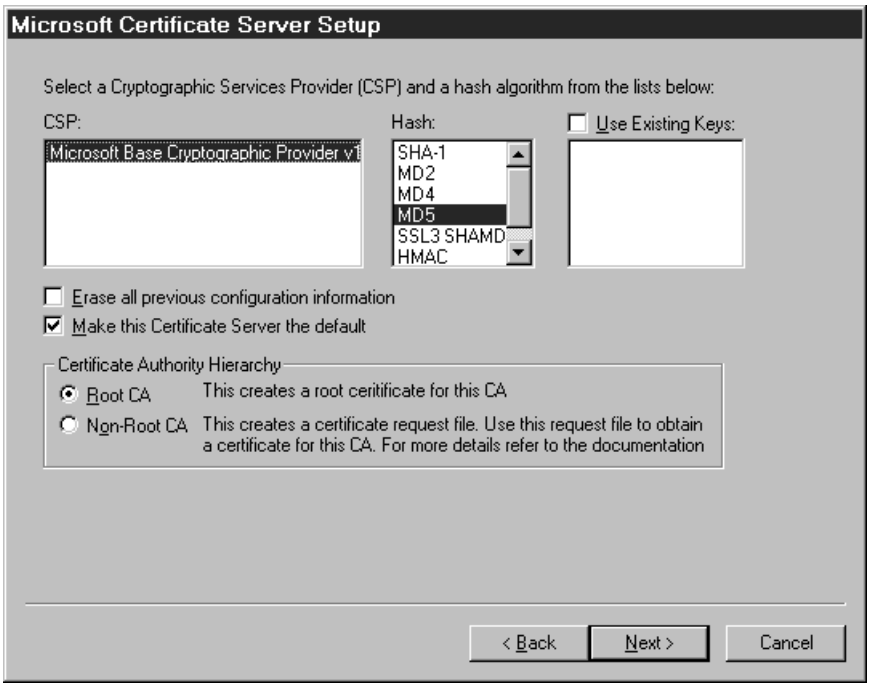


Figure 498. Select a Cryptographic Service Provider

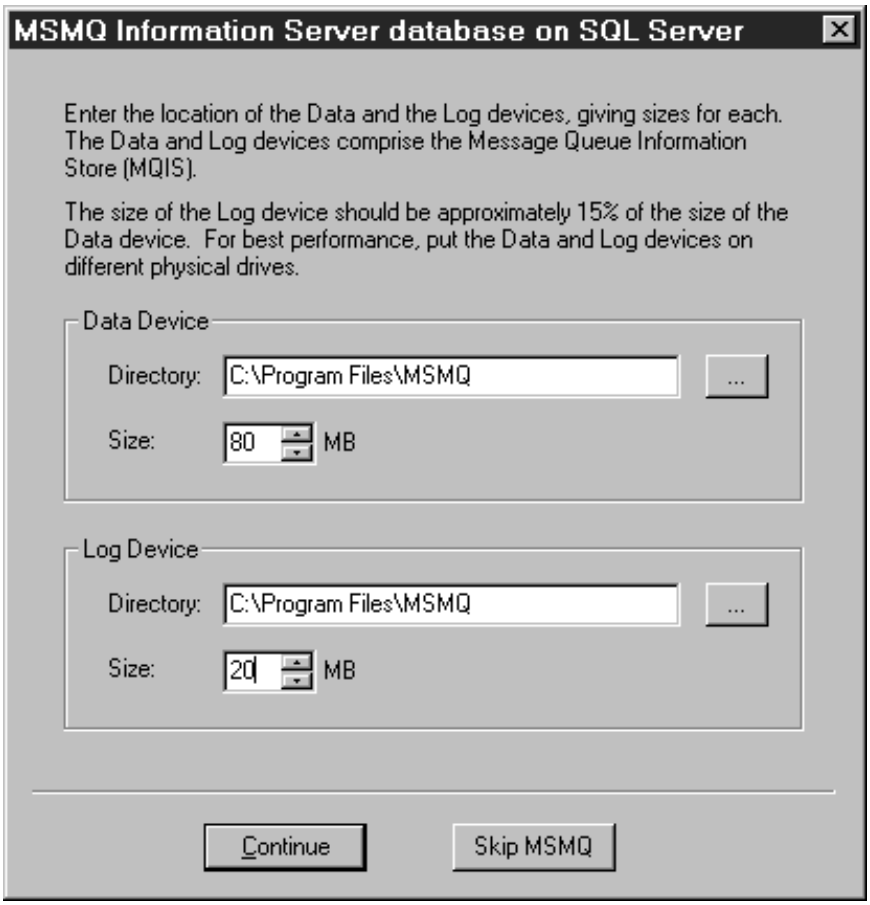


Figure 499. Select a Database Size, a Log File Size and Location for MSMQ

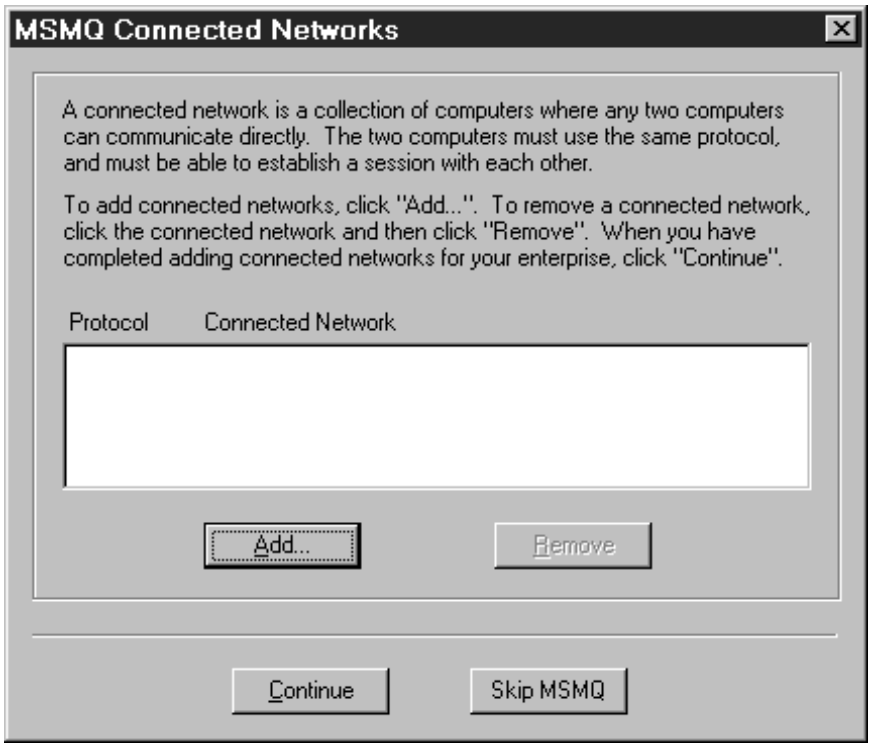


Figure 500. MSMQ Connected Networks

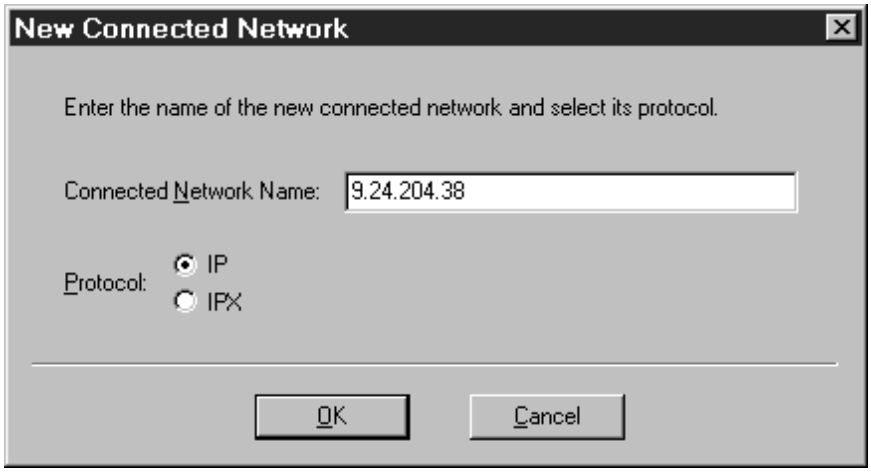


Figure 501. Add a New Network

After the installation of the Option Pack, you need to reboot the system.

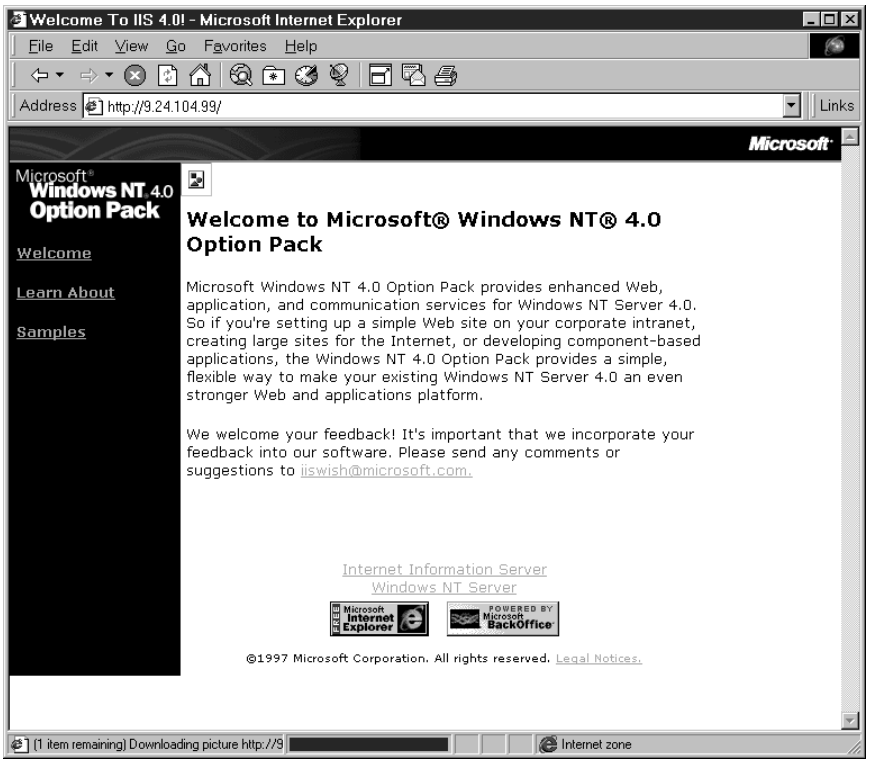


Figure 502. The New Default Home Page of the IIS

These products were all running with the automatic start option. It would have been easier to install the new products if the services were not already started, but we chose to assume the worst-case scenario.

We installed the following products from the IBM Enterprise Suite for Windows NT package:

- IBM Communications Server V5.01
- IBM DB2 Universal Database V5
- IBM Net.Data
- IBM MQSeries V5.0
- IBM TXSeries V4.2
- IBM ADSM Server V3.1.1

The Microsoft server products (for example, IIS) should also work after the installation of the IBM Enterprise Suite for Windows NT.

Appendix B. Tools and Utilities

This appendix shows some of the tools and utilities that are present with the software components in the IBM Enterprise Suite for Windows NT.

The IBM Enterprise Suite for Windows NT is comprised of many components that include a variety of tools and utilities that help with administration, management, and troubleshooting. Some of these tools and utilities can be used in conjunction with several of the software components allowing you to leverage your administration, management and troubleshooting resources across the IBM Enterprise Suite for Windows NT.

B.1 Administration Tools

The majority of the components that the IBM Enterprise Suite for Windows NT is comprised of have various tools that will help you administer and manage each component. User administration for each individual component of the IBM Enterprise Suite for Windows NT is performed differently. Although most of the software components have administration tools included, it is a good idea to take advantage of the administration tools and utilities that are included with the NT operating system itself. Many of these tools can be run in client/server mode and will allow you to perform administration and routine system management tasks remotely as long as you are in the same domain and have the appropriate system administrator authority. These tools include the following:

- The Administrative Wizard makes performing basic administrative task easy. It allows you to:
  - Add user accounts.
  - Create and modify user accounts.
  - Manage file and folder access.
  - Add printers.
  - Add and remove programs.
  - Install new modems.
  - Install or update new client workstations.
  - Check licensing for installed applications.

  Since it is likely that the various software components that you have installed from the IBM Enterprise Suite for Windows NT will span multiple servers, this tool will allow you to manage basic administrative tasks such as adding user accounts and updating client workstations from one central location.

Figure 503. Administration Wizard

- License Manager is an administration tool that is installed with the NT operating system. A record of what software has been purchased and the number of clients and servers for each computer in your domain is kept here. This tool can only be used if you have system administration rights on your domain.

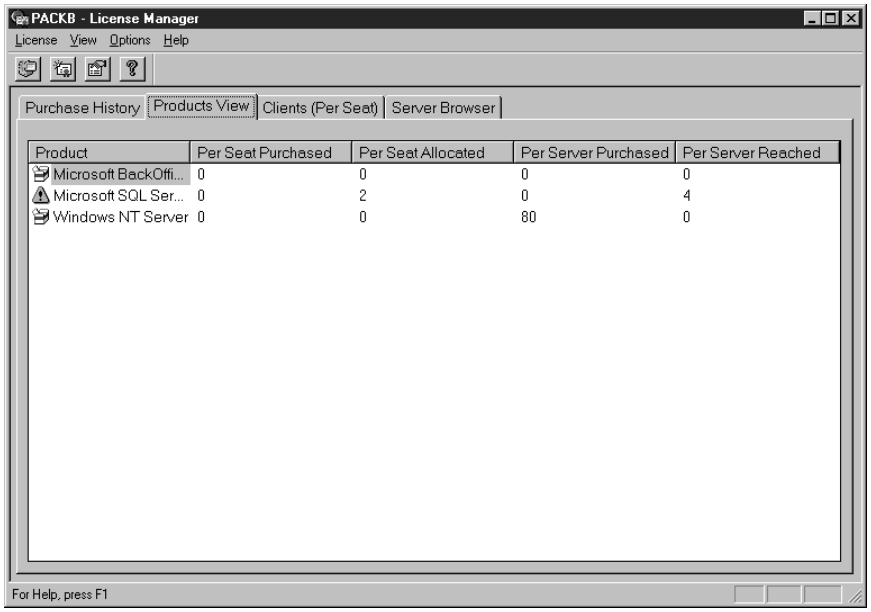


Figure 504. License Manager

- The Server Manager allows you to look at a computer's shared directories, properties and services. It also allows you to send messages to any users connected to the particular machine of your choice. An example of how this can be useful is when you need to reboot a dedicated DB2 UDB server in your domain, you can send a notification to all users connected to it and allow the users to complete or terminate what they are doing and allow them time to disconnect.

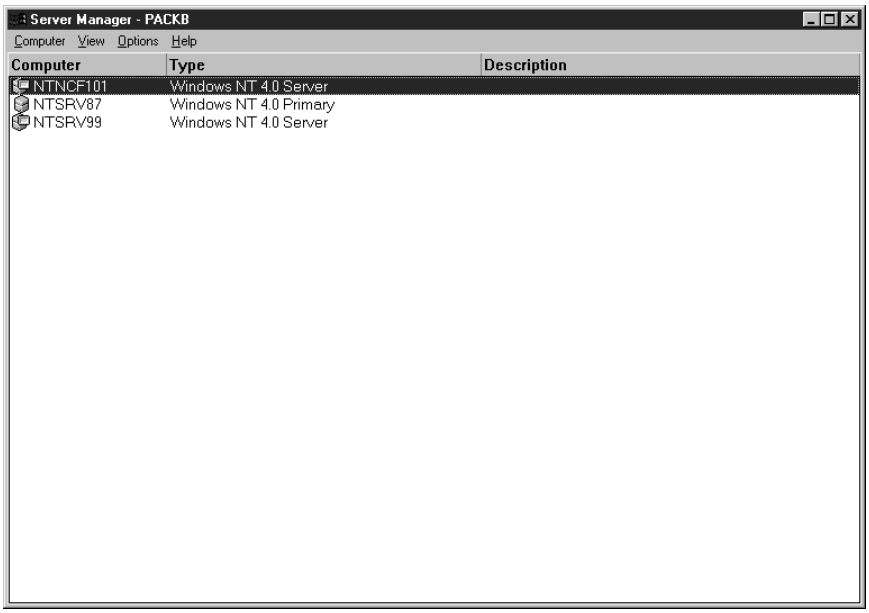


Figure 505. User Manager for Domains

- System Policy Editor allows you to view computers and users of your choice. This is helpful when you need to edit any definitions on a remote system. You can only use this if you have administrative authority.

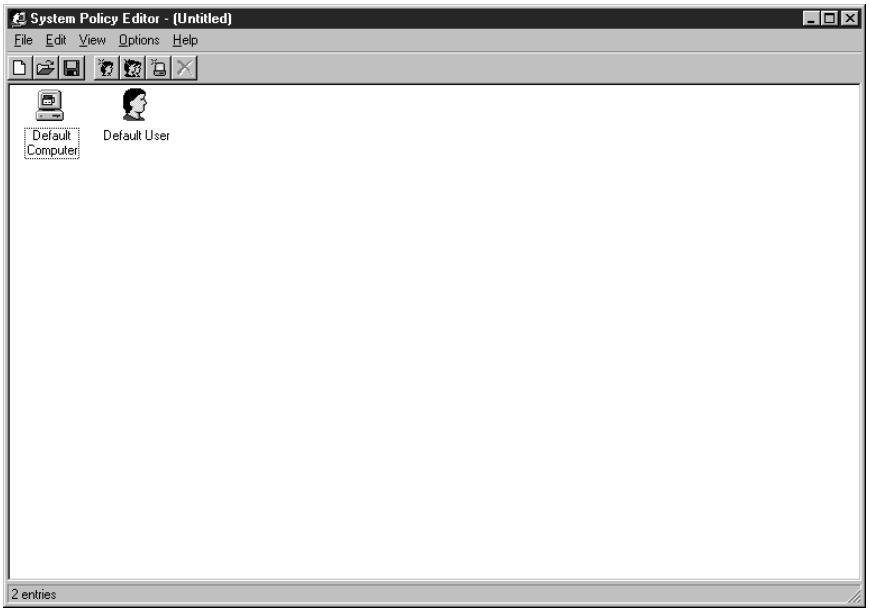


Figure 506. User Manager for Domains

- User Manager for Domains is a tool that allows you to define users and groups rights, privileges, user IDs and passwords as long as you have administrative authority. One of the major benefits of this tool is that you can take advantage of being able to centrally manage the groups that are created during the installation of CICS, DB2, Communication Server, and MQSeries. If you do not have administrative authority at the domain level, this tool allows you to define users and groups on your local machine.

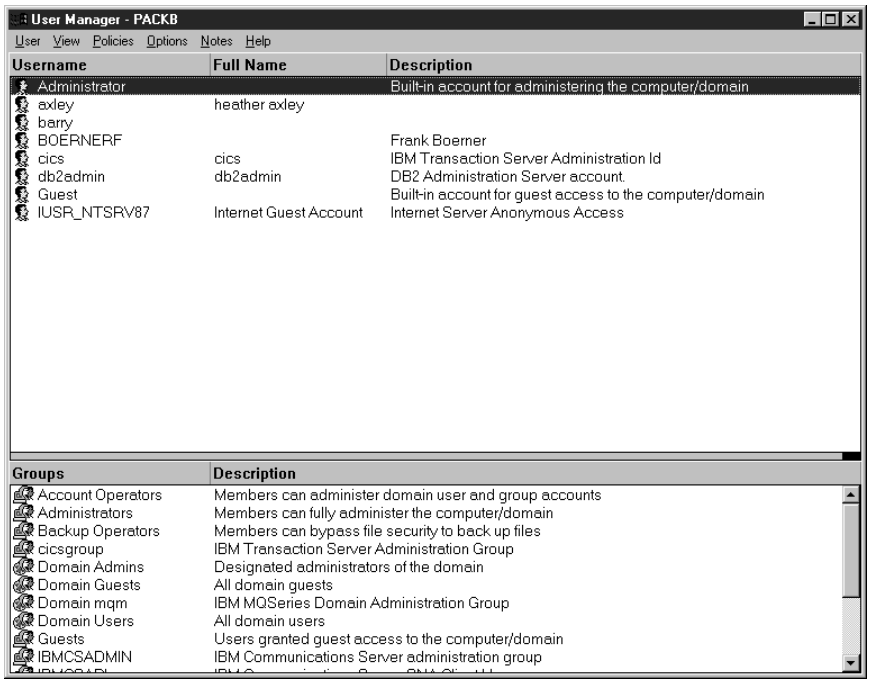


Figure 507. User Manager for Domains

- The Windows for NT Diagnostics tool is an excellent resource for information on your systems:
  - Services and their states (running or stopped)
  - Resources
  - Environment variables and settings
  - Network settings and statistics
  - Version of what operating system you are running
  - HAL, processor and BIOS information
  - Displays adapter and driver information
  - Drives
  - Physical and kernal memory with pagefile size

  Keep in mind that you can view any of the above-mentioned information on any machine in your domain as long as your user ID belongs to the system administrator group.

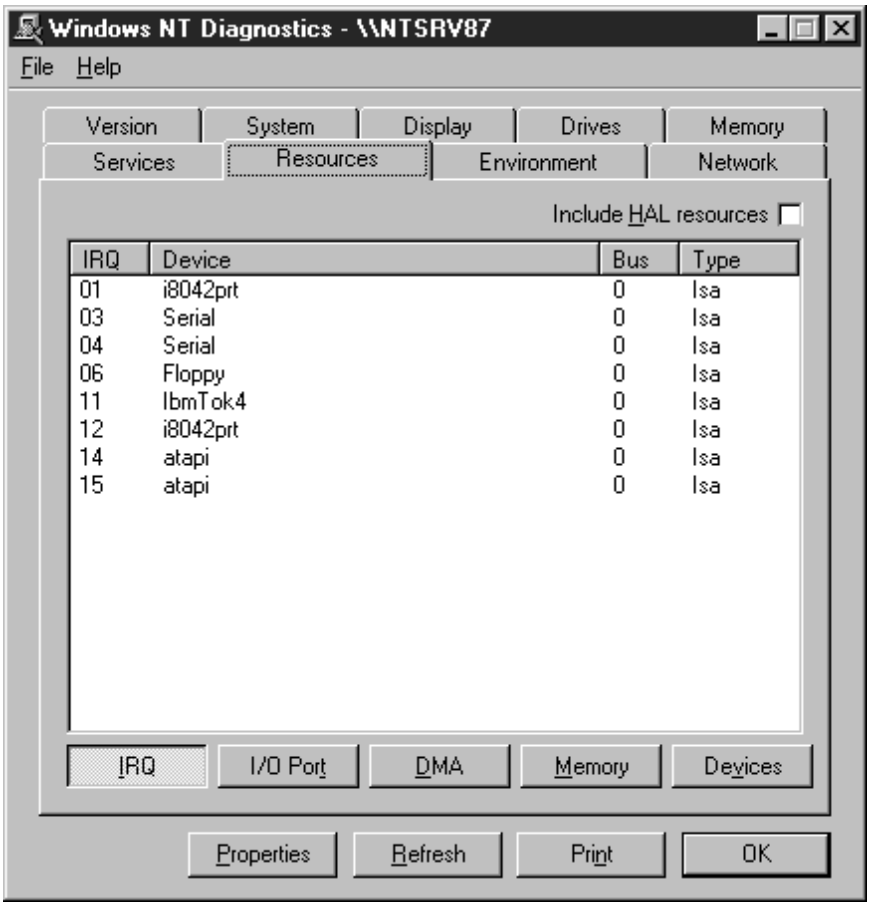


Figure 508. Windows NT Diagnostics

In addition to taking advantage of the NT operating system's administration tools, you will also want to use some of the tools that are built in with the IBM Enterprise Suite for Windows NT individual software components.

ADSM has several administration tools that are included with the product. The list below includes ADSMs administration tools:

- Web Browser Interface - This tool allows you to perform remote administration via the Web. You must have a Web browser that supports HTML V2.0 or higher.
- ADSM Backup Client - This tool has a graphical user interface (GUI) that allows you to:
  - Back up and restore databases.
  - Archive and retrieve packages.
  - Request connection information.
  - Edit preferences.
  - Retrieve user access list.
  - Change passwords.
  - Back up and restore registry.
  - Delete archived data and filespaces.

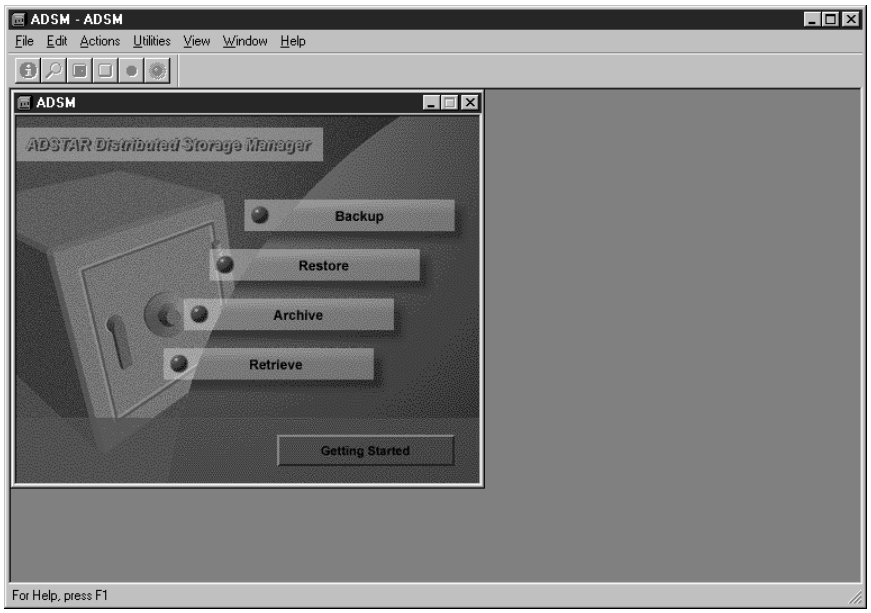


Figure 509. ADSM Backup Client

Both the Web browser and the ADSM backup client allow you to perform remote backup administration of your machines. If you are not using any type of RAID storage on your server(s), it is mandatory that you have a reliable backup strategy for your systems data. Being able to perform this remotely is a feature that allows flexibility for seen and unforeseen circumstances. An example of how this can be useful is that with the access to ADSM through a Web browser, a DBA who is out of the office sick, can stay at home and remotely perform backups or change database backup scheduling as long as he/she has a connection to the Internet. Or maybe a LAN administrator is out of the office and needs to perform backups of entire systems; this would be added assurance that he\she can always perform this task.

- ADSM Scheduler allows you to install and configure scheduler service on local or remote Windows NT machines. In order to use this utility, you must belong to the administrators group. The ADSM scheduler can be used to back up DB2 databases and any other files residing on local or remote machines.

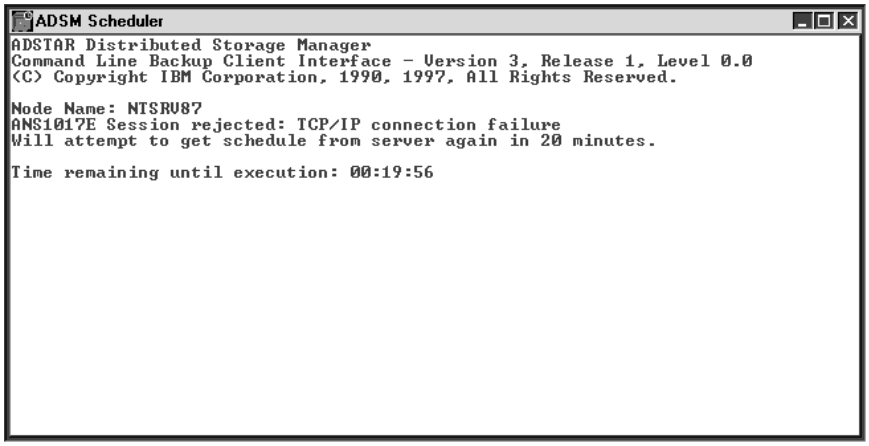


Figure 510. ADSM Scheduler

DB2 UDB (Workgroup Edition) has administration tools that are included with DB2 UDB and can be useful outside of administering DB2. All DB2 administration tools are located in the DB2 for Windows NT folder. The list below contains helpful tools that can be used both inside and out of DB2.

- Alert Center
- Control Center
- Event Analyzer
- Journal
- Script Center
- Tool Settings

The alert center allows you to work with alerts generated in the snapshot monitor. The icons in the alert center represent alarms and warnings generated by the performance variable threshold values that you set in the snapshot monitor. Not only do you have the ability to set which variables that you want monitored, you also have the ability to control when the alert center is active.

The control center is another tool that allows you to perform administrative tasks for DB2 and will be used more often than the other administration tools. From the control center you can do the following:

- Display all the systems to which yours is connected.
- Create a basic database.
- Create and work with objects below the database level.

You can also use the control center to manage systems, instances, databases, and database objects, such as tables and views. In the Control Center, you can display all of your systems, databases, and database objects and perform administration tasks on them. From the Control Center, you can also open other DB2 administration centers to help you work with DB2 commands, jobs, and scripts while optimizing queries and monitoring performance.

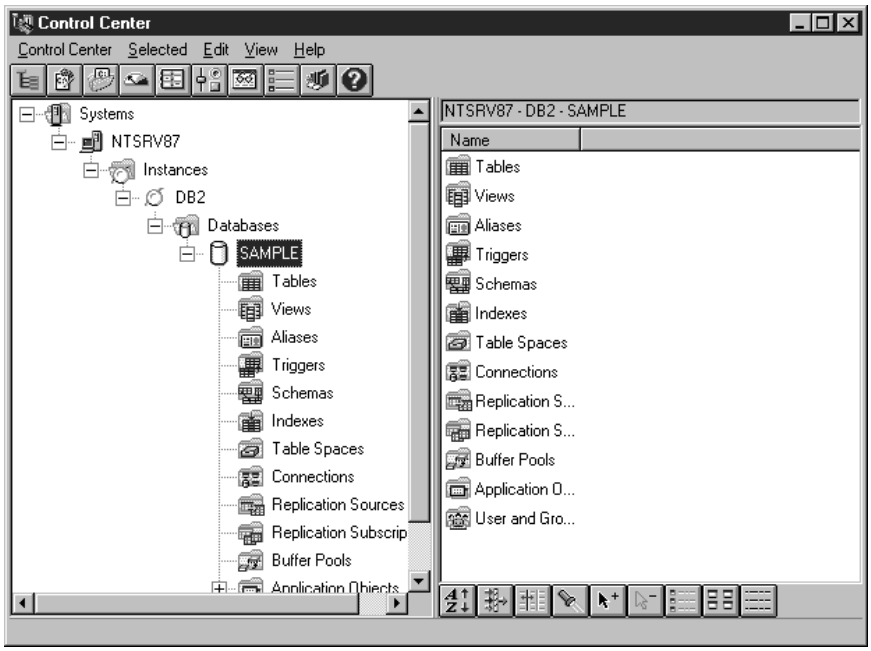


Figure 511. Control Center

The event analyzer allows you to access information on database activities that is collected by event monitors. To use this, you must enter the event file path, database name and decide if you want to view the static SQL text. The file that contains event monitor data is created before you start monitoring events and therefore is located where you created it in the first place.

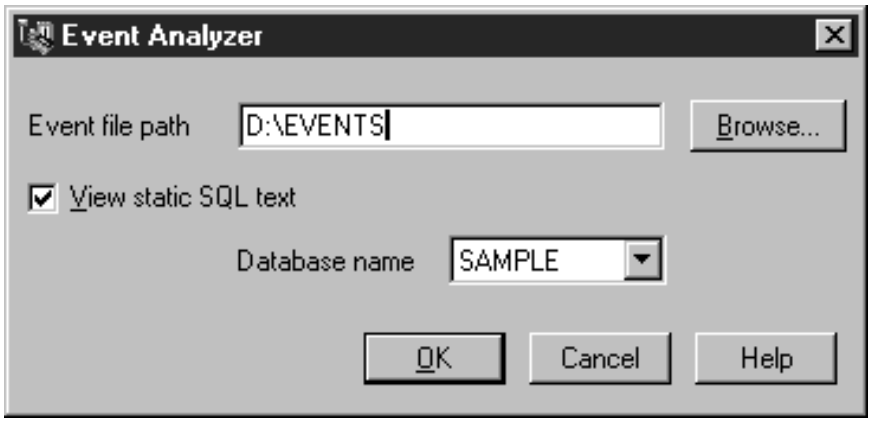


Figure 512. Event Analyzer

Journal is another tool that can be very helpful with database administration. You can use it to view the status of the jobs you are running, the recovery of a particular database, any alerts (with their severity level) and any DB2 error messages that you receive with their date, time and ID. The following figure contains an example of an entry in the message file and was logged because our node directory was empty. These error messages are independent from the error messages that are logged in the NT event log (see Figure 513 on page 387).

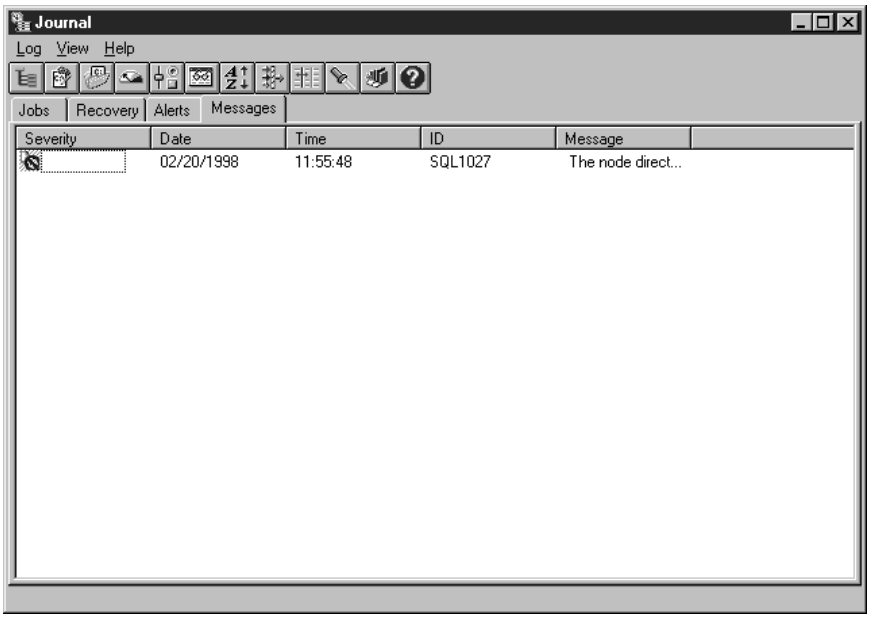


Figure 513. Journal

The script center is an administration tool included within DB2 UDB. This is helpful when you need to view summary information about all command scripts, backup scripts and reorganize table scripts that are known to the system. A saved script is a set of one or more commands or scripts that are created through the command center or script center and contains no scheduling information. Saved script activity is logged on the jobs page located in the journal.

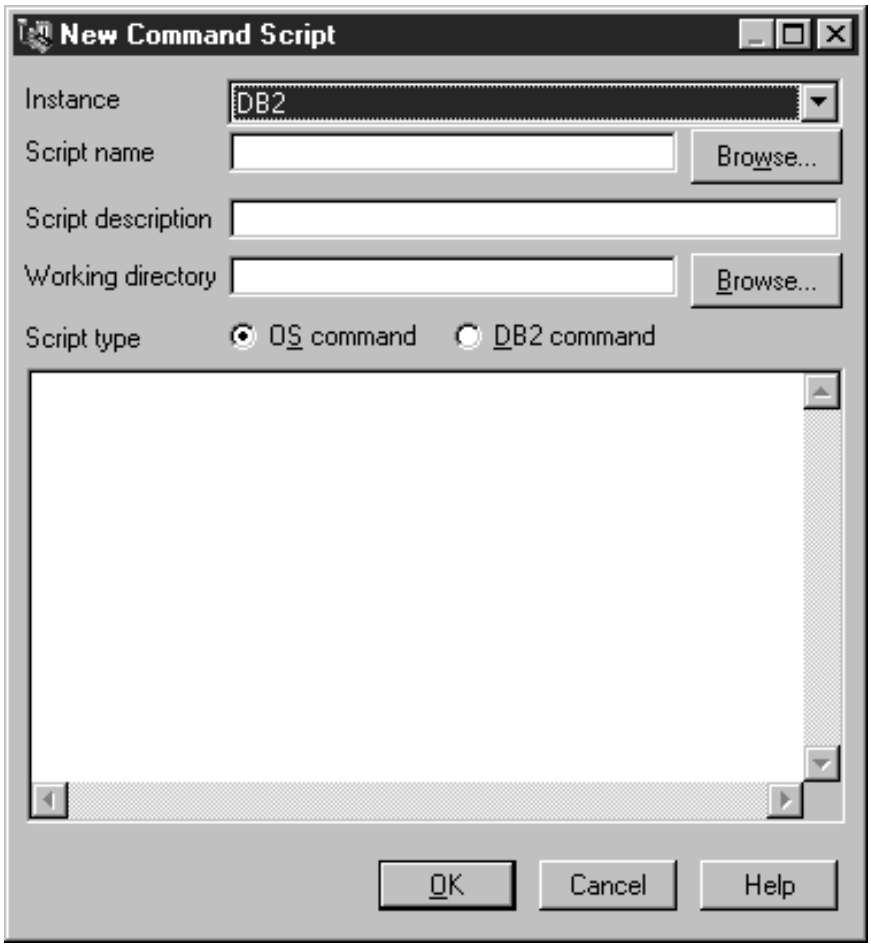


Figure 514. Script Center

To access the any of the administration tools, you must do the following:

- From the desktop, open the **DB2** product folder. Depending on the system you are running, for example, the Windows NT operating system, it could be called DB2 for Windows NT. On systems running the Windows NT 4.0 and Windows 95 operating systems, it is found in the Start menu.
- Open the **Server Administration** folder.
- Double-click on the icon that you need. The administration tool (of your choice) opens.

DB2 Connect - Enterprise Edition

The administration for DB2 Connect is very similar to the administration of DB2 UDB. It also has the control center that was already mentioned. In addition to the control center, the following list includes other tools to help you with connect administration:

- The command line processor lets you issue SQL statements against a DRDA server database.
- The database system monitor utility lets the system administrator monitor system connections. It also helps the system administrator determine the source of an error. The system administrator can correlate client applications with the corresponding jobs running on DRDA server.

- Import and export utilities let you copy data to and from a file on workstation and a DRDA server database.
- The DB2 Connect trace utility lets application developers analyze th flow of the DRDA data stream between the DB2 Connect workstation and the DRDA server database management system.
- The DB2 Control Center lets administrators create and schedule data replication jobs as well as perform other database administration tasks.
- The DB2 Command Center provides a more graphical version of the command line processor.

B.2 Problem Determination Tools

The IBM Enterprise Suite for Windows NT allows you to take advantage of the problem determination tools that are installed with some of the individual components. This allows you to utilize specific tools for multiple purposes, thus expanding your troubleshooting resources. The following list contains problem determination tools that can be useful in troubleshooting problems across multiple IBM Enterprise Suite for Windows NT components:

1. The Communication Server log file

   The Communication Server log file contains SNA, hardware and protocol errors that could assist with resolving problems. The following window shows the contents of the log file:

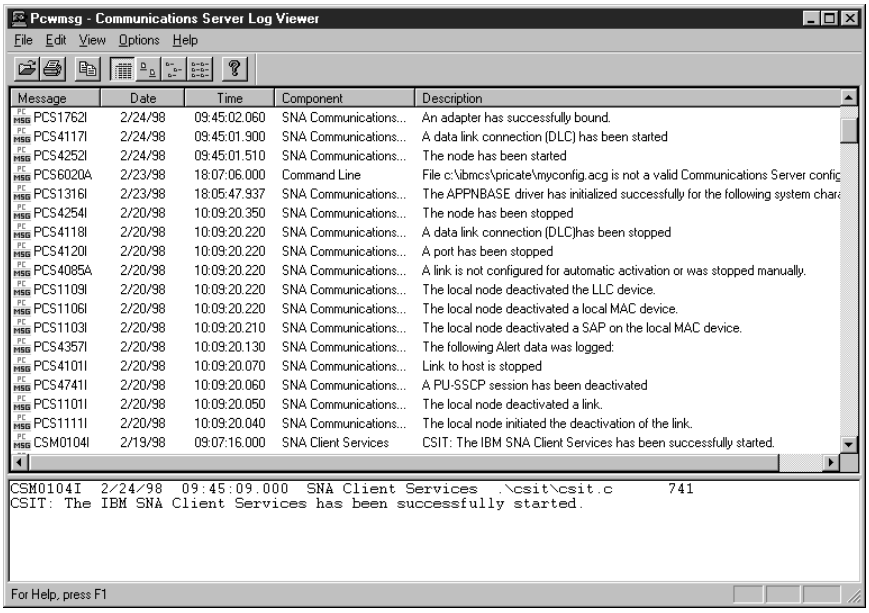


Figure 515. Communications Server Log File

2. The Communication Server trace facility

   Communication Server has a trace facility built in that can help with problem determination across several IBM Enterprise Suite for Windows NT components.

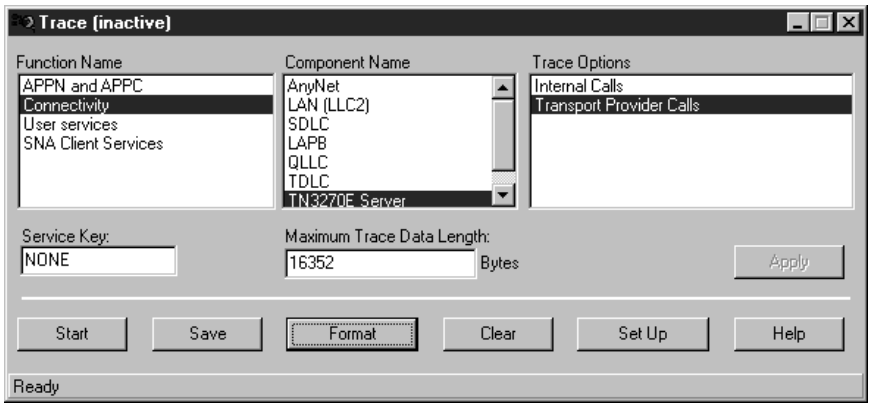


Figure 516. Communication Server Trace Facility

3. The db2diag.log file installed with DB2 UDB

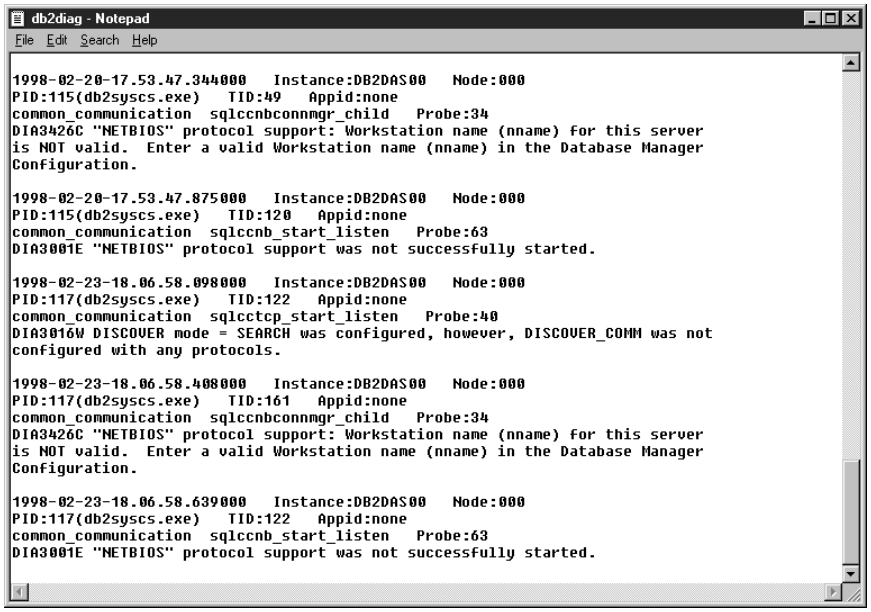


Figure 517. UDBs db2diag.log File

4. The Event Viewer installed with the NT operating system

   The Event Viewer keeps track of system activity. A log of events is kept here and any serious system errors can be retrieved and analyzed here. This is good for troubleshooting system problems as well as individual software component error log files.

Event Viewer - System Log on \\NTSRV87

Log View Options Help

Date	Time	Source	Category	Event	User	Computer
2/20/98	5:53:56 PM	SNMP	None	1001	N/A	NTSRV87
2/20/98	5:53:54 PM	BROWSER	None	8015	N/A	NTSRV87
2/20/98	5:53:54 PM	BROWSER	None	8015	N/A	NTSRV87
2/20/98	5:52:26 PM	EventLog	None	6005	N/A	NTSRV87
2/20/98	5:50:04 PM	SNMP	None	1001	N/A	NTSRV87
2/20/98	5:49:56 PM	BROWSER	None	8015	N/A	NTSRV87
2/20/98	5:49:55 PM	BROWSER	None	8015	N/A	NTSRV87
2/20/98	5:49:50 PM	BROWSER	None	8022	N/A	NTSRV87
2/20/98	5:48:36 PM	EventLog	None	6005	N/A	NTSRV87
2/20/98	5:49:39 PM	BROWSER	None	8021	N/A	NTSRV87
2/20/98	5:47:06 PM	BROWSER	None	8033	N/A	NTSRV87
2/20/98	5:47:06 PM	BROWSER	None	8033	N/A	NTSRV87
2/20/98	5:33:19 PM	SNMP	None	1001	N/A	NTSRV87
2/20/98	5:33:03 PM	BROWSER	None	8015	N/A	NTSRV87
2/20/98	5:33:03 PM	BROWSER	None	8015	N/A	NTSRV87
2/20/98	5:31:52 PM	EventLog	None	6005	N/A	NTSRV87
2/20/98	5:32:56 PM	BROWSER	None	8021	N/A	NTSRV87
2/20/98	5:29:58 PM	SNMP	None	1001	N/A	NTSRV87
2/20/98	5:29:56 PM	BROWSER	None	8015	N/A	NTSRV87
2/20/98	5:29:56 PM	BROWSER	None	8015	N/A	NTSRV87
2/20/98	5:28:30 PM	EventLog	None	6005	N/A	NTSRV87
2/20/98	5:26:17 PM	SNMP	None	1001	N/A	NTSRV87
2/20/98	5:26:17 PM	BROWSER	None	8015	N/A	NTSRV87
2/20/98	5:26:14 PM	BROWSER	None	8015	N/A	NTSRV87
2/20/98	5:24:47 PM	EventLog	None	6005	N/A	NTSRV87
2/20/98	12:02:46 PM	SNMP	None	1001	N/A	NTSRV87
2/20/98	12:02:44 PM	BROWSER	None	8015	N/A	NTSRV87
2/20/98	12:02:42 PM	BROWSER	None	8015	N/A	NTSRV87
2/20/98	12:01:27 PM	EventLog	None	6005	N/A	NTSRV87

Figure 518. Event Viewer

Net.Data Some additional tools are found at: http://www.software.ibm.com/data/net.data/tools/. The tools located on this Web page are included in the following list:

1. Webserver Administration tool - Performs administrative tasks on your server, such as defining default server attributes, configuring Web products, and adding and deleting products that are administered via the Web.
2. Web Registry Editor - Stores persistent data that can be accessed by Web-based applications.
3. REXX Web Macro Functions - A set of Web macro function blocks that are written for REXX language environment. They can perform basic functions such as string manipulation and table presentation.

B.3 DB2 UDB - Workgroup Edition Security

The security for UDB takes place during two different phases. The first being authentication and the second being authorization.

Authentication does not take place within DB2. This occurs externally when the operating system verifies that a user ID and password are correct.

Authorization takes place within DB2. It is the process whereby DB2 obtains information about an authenticated DB2 user that indicates the database operations a user can perform and what data objects may be accessed. With each user request there may be more than one authorization check depending on the objects and operations involved. DB2 tables and configuration files are used to record the permissions associated with each authorization name. The authorization name of an authenticated user, and those of groups in which the user is a member, are compared against the recorded permissions. Based on the comparison, DB2 decides whether to allow the user the requested information. After a user has been authenticated and authorized, DB2 checks to make sure that you have the right

privileges (which are granted by the DB2 administrator on each table) to handle the data.

B.3.1 DB2 Connect - Enterprise Edition Security

DB2 Connect itself does not perform user validations. If you want the actual DB2 Connect workstation to perform user validation, you must rely on the workstation security subsystem to perform this function.

Authentication must also occur for DB2 Connect. The list below contains the various ways that authentication can be set up for DB2 Connect:

- Validation at the client
- Validation at the DB2 Connect workstation
- Validation at both the DB2 Connect workstation and the DRDA server
- Validation at the DRDA server
- Validation at a DCE security server

To set where the validation takes place, you must set the Authentication parameter in the database directory and the Security parameter in the node directory.

B.4 Performance Measurement Tools

Although there are performance measurement tools included within some of the IBM Enterprise Suite for Windows NT components, it is a good idea to take advantage of some of the performance measurement tools that are included in Windows NT. The following list contains tools included in Windows NT that will help measure performance on your system:

- Microsoft Performance Monitor

  This monitor is located under administration tools and will allow you to monitor your systems CPU utilization and memory usage.

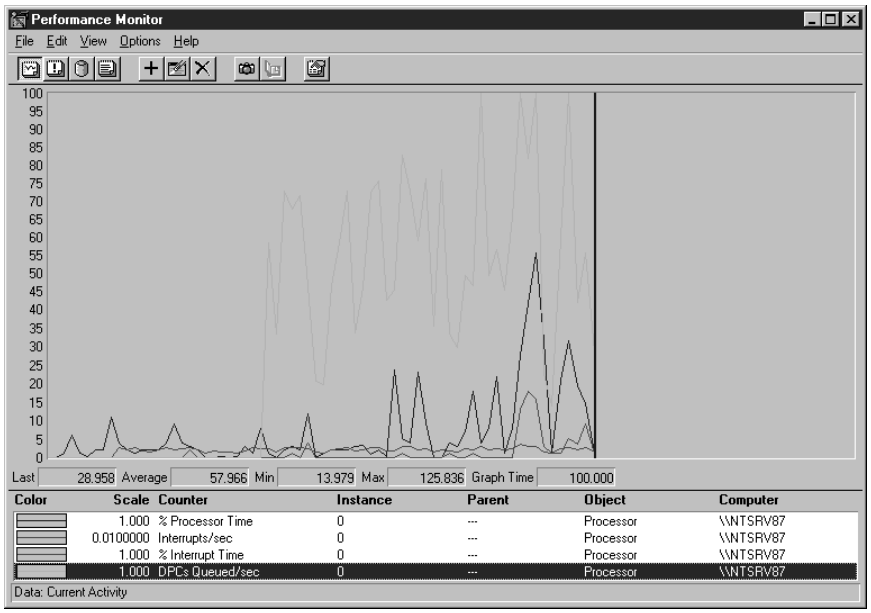


Figure 519. MS Performance Monitor

- Task Manager

  You can open the task manager by pressing down on the Ctrl, Alt and Delete keys at the same time and clicking on the Task Manager box. Or you can place your mouse pointer on the task bar and and click on it with your right mouse button and choose the task manager from the pop-up menu. Either way, once you pull up the task manager, you can monitor applications, processes, CPU performance and memory usage.

  With the task manager, you can view which applications are running and terminate them at any time by clicking on the End Task box.

Figure 520. Active Applications

You can monitor processes CPU time, memory usage and PIDs from the task manager. You can end a process at any time by clicking on the End Process button located at the bottom of the window.

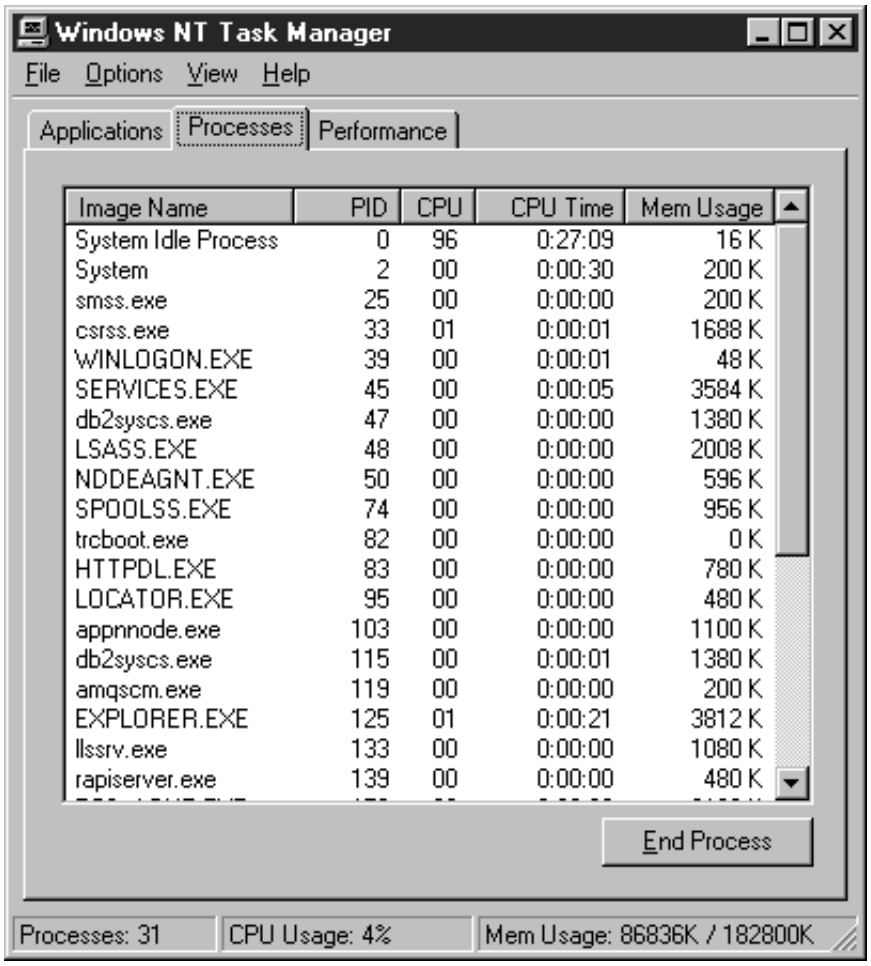


Figure 521. Active Processes

You can monitor your systems CPU performance, memory usage, handles, threads and processes from the performance page in the task manager.

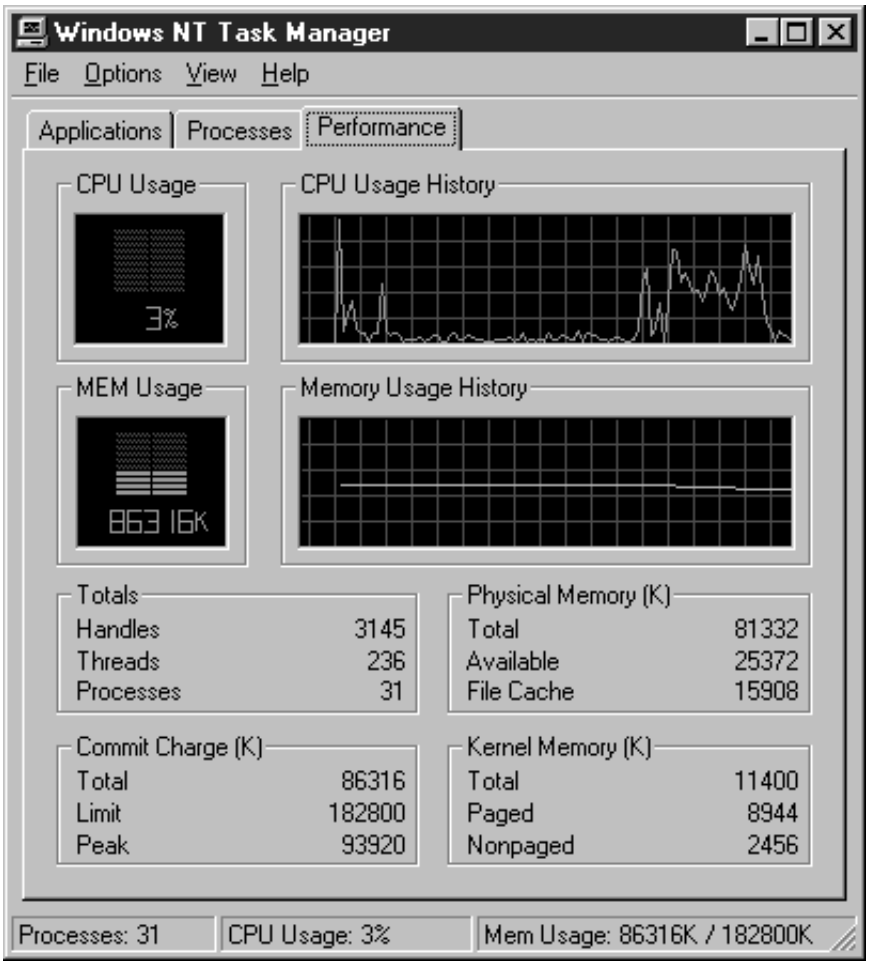


Figure 522. CPU and Memory Performance

The Network Monitor allows you to monitor network utilization, frames per second and bytes per second. You can capture system statistic with this tool and use the information for troubleshooting purposes.

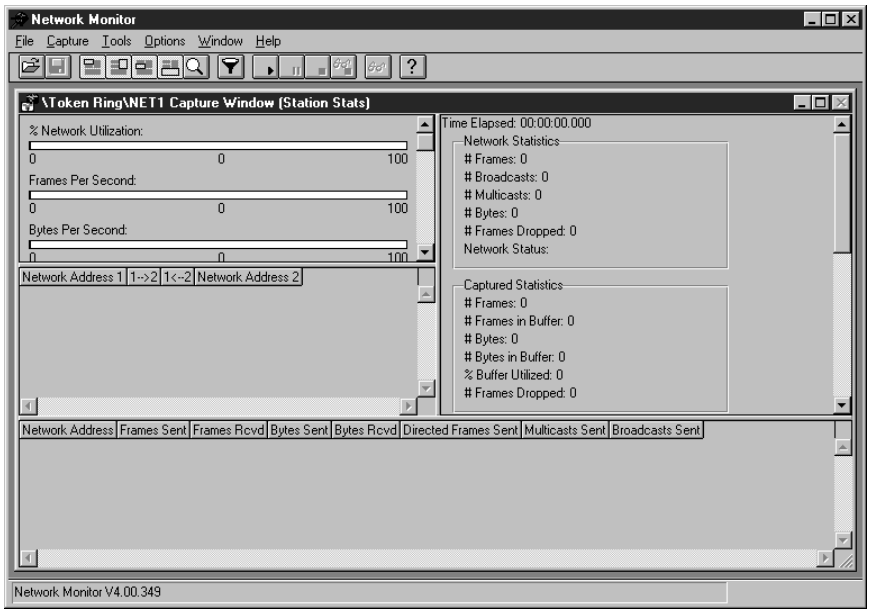


Figure 523. Network Monitor

DB2 has several built-in performance measurement tools that can be used outside of DB2. The following list contains these tools:

1. Snapshot Monitor - This is activated by issuing the GET SNAPSHOT command from the command line or DB2's Control Center and will give you snapshots of monitor data. You can configure the snapshot monitor to take a picture when certain thresholds are exceeded or at regular intervals in time.
2. Event Monitor - You must have DBADM authority to use Event Monitor. The three phases of initiating the event monitor are:
   a. Creating the event monitor definition.
   b. Activating the event monitor.
   c. Reading the trace data that the monitor collected.

   To start the Event Monitor, you must create a definition in the database system catalogs with a CREATE EVENT MONITOR statement. Once the event monitor is defined, you can activate it through the Control Center or by issuing the SQL statement: SET EVENT MONITOR evnameSTATE1. You can then read binary trace data from the Event Analyzer, located in the Control Center.

The database system monitor correlates:

- The DRDA correlation token (CRRTKN), for unprotected conversations.
- The logical unit of work identifier (LUWID), for two-phase conversations protected by an SNA Syncpoint Manager (SPM).
- The unit of work ID (UOWID), for two-phase connections protected by the DRDA-3 Syncpoint Manager (as used over TCP/IP connections).
- The DB2 Connect connection identifier (the Application ID).

This shows which DB2 Connect connection caused the problem. This allows the system administrator to force the individual client application from the system without affecting the other clients using the DB2 Connect connection.

In addition to using these monitors with DB2, you can use them to collect information that can be used to manage and troubleshoot problems with other products in the IBM Enterprise Suite for Windows NT.

Monitoring system and database activity, possible problems and performance issues can be accomplished with these tools. The information that can be defined and collected through the monitors, can give you information on:

- Database connections and status
- Locks that each connection hold
- The number of tables being accessed
- The progression of a query or application
- The CPU consumption of a query or application
- How long an application has been idle
- How long each application has been running

Even though the data collected seems to be DB2-specific, all of the information collected could reveal the cause of performance problems on your system. An example of this would be if you had UDB, Communication Server and MQSeries all on one machine. Everything seems to be running correctly but your MQSeries and Communications Server seem to be running extremely slow. You can't understand why this is happening because you have checked every configurable parameter imaginable and they all seem to be set correctly. At this point, it would be a great idea to look at the activity of DB2 and its applications with this monitoring tool to make sure that system resources aren't being monopolized by UDB. Tracing deadlocks can help you determine conflicts between applications that lead to poor overall performance. You can also see what applications are holding locks and fail to commit their transactions. This monitoring tool is just an additional tool that can be used to help you pinpoint what is causing a system performance hit.

Appendix C. System Files for the Transaction Scenario

This appendix includes all the system and configuration files that were used in Chapter 5, “Integration Scenario - Transactions” on page 243.

C.1 Tier 2

This machine known as Suite97 is configured as a CICS Client Internet Gateway and Lotus Domino Server.

C.1.1 The CICS Internet Gateway

The CICS Internet Gateway configuration information is located in c:\cicscli\bin\cicscli.ini. The entires that have changed in this file have been highlighted. The file is used to define which CICS Servers you wish to connect to and the protocol that is to be used. The protocol you decide upon should be uncommented.

```
;*********************************************************************
;* IBM CICS Client - Initialization File                             *
;*********************************************************************

; Format:
;   Section = Name
;       Parameter = Value
;       Parameter = Value
;       ...
;
; "Section" must be either Client, Server or Driver.  There must be just
; one Client section but there may be several Server or Driver sections.
; For each type of section a set of Parameters and associated Values may
; be defined.  Often these may be omitted and will then assume sensible
; default values.  This sample INI file lists only those parameters that
; typically may required changing.
;
; Refer to the "IBM CICS Clients Administration" book for full details
; of available parameters and values for each section.

;---------------------------------------------------------------------
; Client section - This section defines the local CICS client.  There
;                  should only be one Client section.

Client = *                      ; Auto-install client on the server
   MaxServers = 3               ; Only allow one server connection
   MaxRequests = 20             ; Limit the maximum server interaction
   MaxBufferSize = 32           ; Allow for a 32K maximum COMMAREA
   LogFile = CICSCLI.LOG        ; Set the error log file name
   TraceFile = CICSCLI.TRC      ; Set the trace log file name
   DumpFile = CICSCLI.DMP       ; Set the memory trace dump file name
   DumpMemSize = 16             ; Allow for 16k of trace in memory
   DosMemory = 48               ; The DOS client's memory pool size
;  CPName = ABCD1234.EFGH5678   ; The TCP62 client's fully qualified CP name
;  DomainNameSuffix = cicstcp.ibm.com ; Domain name suffix for TCP62 server
```

Figure 524 (Part 1 of 3). CICS Client Initialization

```
;-----------------------------------------------------------------------
; Server section - This section defines a server to which the client may
;                  connect.  There may be several Server sections.
;
; The default example is for TCP/IP communications.  Further examples
; for NetBIOS and SNA communications are shown but are commented out.
; Beware that these are examples only, for successful communications
; (particularly when using SNA) many parameters may need changes from
; their default or illustrated values.

Server = NTNCF101         ; Arbitrary name for the server
   Description = TCP/IP Server  ; Arbitrary description for the server
   Protocol = TCPIP             ; Matches with a Driver section below
   NetName = 9.24.104.101 ; The server's TCP/IP address
   Port = 0                     ; Use the default TCP/IP CICS port

Server = NTSRV99          ; Arbitrary name for the server
   Description = TCP/IP Server  ; Arbitrary description for the server
   Protocol = TCPIP             ; Matches with a Driver section below
   NetName = 9.24.104.99  ; The server's TCP/IP address
   Port = 0                     ; Use the default TCP/IP CICS port

;Server = CICSNETB               ; Arbitrary name for the server
;   Description = NetBIOS Server ; Arbitrary description for the server
;   Protocol = NETBIOS           ; Matches with a Driver section below
;   NetName = CICSOS2            ; The server's NetBIOS name
;   Adapter = 0                  ; Use NetBIOS on LAN adapter 0
;   UpperCaseSecurity = Y        ; Fold Userid and Password to uppercase
;   InitialTransid = CLOG        ; Initial terminal transaction name

;Server = CICSSNA                ; Arbitrary name for the server
;   Description = SNA Server     ; Arbitrary description for the server
;   Protocol = SNA               ; Matches with a Driver section below
;   NetName = ABCD1234.EFGH5678  ; The server's fully qualified LU name
;   LocalLUName = WXYZ9999       ; The client's local LU name
;   ModeName = LU62PS            ; The SNA communications mode name

;Server = CICST62                ; Arbitrary name for the server
;   Description = TCP62 Server   ; Arbitrary description for the server
;   Protocol = TCP62             ; Matches with a Driver section below
;   NetName = ABCD1234.EFGH5678  ; The server's fully qualified LU name
;   LocalLUName = WXYZ9999       ; The client's local LU name
;   ModeName = TN62              ; The SNA communications mode name
;-----------------------------------------------------------------------
```

Figure 524 (Part 2 of 3). CICS Client Initialization

```
; Driver section - This section defines a communications protocol DLL
;                  used to communicate with a server.  There may be
;                  several Driver sections.
;
; The default example is for TCP/IP communications.  Further examples
; for NetBIOS and SNA communications are shown but are commented out.

Driver = TCPIP         ; Matches the Server's Protocol value
   DriverName = CCLWNTIP        ; Use the WinNT TCP/IP communications DLL

;Driver = NETBIOS               ; Matches the Server's Protocol value
;   DriverName = CCLWNTNB       ; Use the WinNT NetBIOS communications DLL

;Driver = SNA                   ; Matches the Server's Protocol value
;   DriverName = CCLWNTSN       ; Use the WinNT SNA communications DLL

;Driver = TCP62                 ; Matches the Server's Protocol value
;   DriverName = CCLTCP62       ; Use the IBM TCP62 communications DLL

;***********************************************************************
;* End of file                                                         *
;***********************************************************************
```

Figure 524 (Part 3 of 3). CICS Client Initialization

C.1.2 The CIGD.INI File - Tier 2

If the CICS Client Internet Gateway has been successfully installed, you should see the following file with the highlighted entries.

```
;-----------------------------------------------------------------------
; IBM CICS Internet Gateway Initialization File
;-----------------------------------------------------------------------
; Format:
;   Comment lines which have a ; in the first collumn.
;   Blank lines.
;
;   [Section]
;   Parameter = Value
;   Parameter = Value
;   ...
;
; [Section] must be either Default or Override. There must be
; just one of each section. It must be enclosed in square brackets.
; For each type of section, a set of Parameters and associated Values may
; be defined.  Often these may be omitted and will then assume sensible
; default values, but when defined, they must be in the correct section.
; This sample file lists all the parameters that are available and which
; section they must reside in.

;-----------------------------------------------------------------------
; Default section  - This section defines features which can not be
;                    overridden with start tran.
;
; Trace            - This parameter specifies the name of the trace file,
;                    when trace is enabled.
;                    This will default to cigtrace.log
; Error            - This parameter specifies the name of the error file.
;                    This will default to cigerror.log
; Info             - This parameter specifies the name of the information
;                    file. This will default to ciginfo.log
;                    This parameter is not relevant on the OS/2 platform,
;                    which provides a Graphical User Interface (GUI) instead.
; Cursor           - This specifies the character that will be interpreted
;                    as the cursor position.  It should be specified in Hex.
;                    This will default to 0x23 ( # ).
; MaxUsers         - This parameter specifies the maximum number of
;                    concurrent users on this gateway.
;                    This will default to 15.
; TimeOutCICS      - This parameter specifies how long the system will
;                    wait for CICS to respond. It is specified in seconds.
;                    This will default to 60 seconds.
; TimeOutInternet  - This parameter specifies how long the system will
;                    wait for the Internet to respond. It is specified in
;                    seconds.
;                    This will default to 600 seconds ( 10 Mins ).
; TimeOutGateway   - This parameter specifies how long the system will
;                    wait for the Gateway to respond. It is specified in
;                    seconds.
;                    This will default to 60 seconds.
```

Figure 525 (Part 1 of 4). CICS Internet Gateway Initialization File

```
[Default]
Trace = d:\CICSCLI\cig\admin\cigtrace.log
Error = d:\CICSCLI\cig\admin\cigerror.log
Info = d:\CICSCLI\cig\admin\ciginfo.log  Cursor = 0x23
MaxUsers = 15
TimeOutCICS = 60
TimeOutInternet = 600
TimeOutGateway= 60
```

Figure 525 (Part 2 of 4). CICS Internet Gateway Initialization File

```
;-----------------------------------------------------------------------
; Override section - This section defines features which can be
;                    overridden with start tran.
;
; Header           - This specifies the fully qualified path name to a
;                    piece of HTML that will be imbedded at the top of
;                    every page.
;                    This will default to no header.
; Trailer          - This specifies the fully qualified path name to a
;                    piece of HTML that will be imbedded at the bottom of
;                    every page.
;                    This will default to no trailer.
; ExitPage         - This specifies the URL of the exit page that will be
;                    displayed at the end of the session.  This can either
;                    be local  ( eg. /cig/cigstart.htm )
;                    or remote ( eg. http://saints/cig/cigstart.htm )
;                    NB. A local URL will be faster.
;                    It can also be the URL of a cgi script to call on exit
;                    ( eg. /cig-bin/cleanup )
;                    This will default to /cig/cigstart.htm
; ExitAid          - In some cases it will be necessary to back out of a
;                    transaction. This parameter specifies the name of the
;                    key which will be entered to exit. This value should
;                    be specified in Hex. e.g. 0x33 for  PF3 .
;                    This will default to 0x00 (i.e. don't attempt to
;                    cleanly exit a transaction when an error occurs).
;                    Note: This could mean that the terminal cannot be
;                    be deleted because the EPI still believes that the
;                    transaction is still active
; PFKey24          - In some CICS applications 24 PF keys are required.
;                    This option allows you to specify whether you would
;                    like these PF 13 to 24 keys to be displayed. A value of
;                    On will enable displaying of these PF keys.
;                    Note: Loading these extra graphics will be slower.
;                    This will default to Off.
; PAKeys           - In some CICS applications the 3 PA keys are required.
;                    This option allows you to specify whether you would
;                    like these extra PA keys to be displayed. A value of
;                    On will enable displaying of these PA keys.
;                    Note: Loading these extra graphics will be slower.
;                    This will default to Off.
; GraphicKeys      - The function keys can be displayed either as Web
;                    Browser submit keys or as graphic images (GIF files).
;                    A value of On will enable displaying of these GIF
;                    images.
;                    Note: Loading these extra graphics will be slower.
;                    This will default to non graphic keys.
; AutoExit         - At the end of a session, a CICS terminal would
;                    normally expect to run another transaction. A value of
;                    On in this parameter will force the gateway to display
;                    the ExitPage.
;                    This will default to Off.
; ImbedHTML        - A transaction may contain the character '<', if it does
;                    a Web browser would interpret this as an HTML tag.  This
;                    also allows the transaction to send valid HTML tags such
;                    as picture references.  If ImbedHTML is set to On then
;                    tags will be passed, otherwise the browser will display
;                    them as raw text.
;                    This will default to Off.
; AppendEXE        - Some Web servers (for example Microsoft Internet
;                    Information Server) require URLs which refer to CGI
;                    programs to include a .EXE extension after the name
;                    of the CGI program. If AppendEXE is set to On, then
;                    when returning HTML, the gateway will append .EXE to
;                    any URLs which refer to a CGI program.
;                    This will default to Off.
```

Figure 525 (Part 3 of 4). CICS Internet Gateway Initialization File

```
&lrbrk.Override]
Header = d:\CICSCLI\cig\html\headtext.htm
Trailer = d:\CICSCLI\cig\html\tailtext.htm
ExitPage = /cig/cigstart.htm ExitAid = 0x00
PFKey24 = Off
PAKeys = Off
GraphicKeys = Off
AutoExit = Off
ImbedHTML = Off
AppendEXE = Off
```

Figure 525 (Part 4 of 4). CICS Internet Gateway Initialization File

C.1.3 The Lotus Domino Server - Tier 2

The Lotus Domino Server is configured as a Web server. The configuration information is held in c:\notes\data\httpd.cnf.

```
##############################################################        #################
#         Map suffixes to the content-type of a file.
#         Defaults:  see list below
#         Syntax: Addtype <.suffix><representation><encoding><quality>
#                 <quality> is optional
#         This directive may be defined multiple times in the configuration file.
##############################################################        #################

AddType  .mime     www/mime                      binary  1.0 # Internal -- MIME is
                                                               # not recursive
AddType  .bin      application/octet-stream      binary  1.0 # Uninterpreted binary
AddType  .oda      application/oda               binary  1.0
AddType  .pdf      application/pdf               binary  1.0
AddType  .ai       application/postscript        8bit    0.5 # Adobe Illustrator
AddType  .PS       application/postscript        8bit    0.8 # PostScript
AddType  .eps      application/postscript        8bit    0.8
AddType  .ps       application/postscript        8bit    0.8
AddType  .rtf      application/x-rtf             7bit    1.0 # RTF
AddType  .csh      application/x-csh             7bit    0.5 # C-shell script
AddType  .dvi      application/x-dvi             binary  1.0 # TeX DVI
AddType  .hdf      application/x-hdf             binary  1.0 # NCSA HDF data file
AddType  .latex    application/x-latex           8bit    1.0 # LaTeX source
AddType  .nc       application/x-netcdf          binary  1.0 # Unidata netCDF data
AddType  .cdf      application/x-netcdf          binary  1.0
AddType  .sh       application/x-sh              7bit    0.5 # Shell-script
AddType  .tcl      application/x-tcl             7bit    0.5 # TCL-script
AddType  .tex      application/x-tex             8bit    1.0 # TeX source
AddType  .texi     application/x-texinfo         7bit    1.0 # Texinfo
AddType  .texinfo  application/x-texinfo         7bit    1.0
AddType  .t        application/x-troff           7bit    0.5 # Troff
AddType  .roff     application/x-troff           7bit    0.5
AddType  .tr       application/x-troff           7bit    0.5
AddType  .man      application/x-troff-man       7bit    0.5 # Troff with man macros
AddType  .me       application/x-troff-me        7bit    0.5 # Troff with me macros
AddType  .ms       application/x-troff-ms        7bit    0.5 # Troff with ms macros
AddType  .src      application/x-wais-source     7bit    1.0 # WAIS source
AddType  .bcpio    application/x-bcpio           binary  1.0 # Old binary CPIO
AddType  .cpio     application/x-cpio            binary  1.0 # POSIX CPIO
AddType  .gtar     application/x-gtar            binary  1.0 # Gnu tar
AddType  .shar     application/x-shar            8bit    1.0 # Shell archive
AddType  .sv4cpio  application/x-sv4cpio         binary  1.0 # SVR4 CPIO
AddType  .sv4crc   application/x-sv4crc          binary  1.0 # SVR4 CPIO with CRC
#
#    The following are neutral CAE formats:
#
AddType  .igs      application/iges              binary  1.0 # IGES Graphics format
AddType  .iges     application/iges              binary  1.0 # IGES Graphics format
AddType  .IGS      application/iges              binary  1.0 # IGES Graphics format
AddType  .IGES     application/iges              binary  1.0 # IGES Graphics format
AddType  .stp      application/STEP              8bit    1.0 # ISO-10303 STEP  -
AddType  .STP      application/STEP              8bit    1.0 # Product data files
AddType  .step     application/STEP              8bit    1.0
AddType  .STEP     application/STEP              8bit    1.0
AddType  .dxf      application/dxf               binary  1.0 # DXF (AUTODESK)
AddType  .DXF      application/dxf               binary  1.0
AddType  .vda      application/vda               binary  1.0 # VDA-FS Surface data
AddType  .VDA      application/vda               binary  1.0
AddType  .set      application/set               8bit    1.0 # SET (French CAD std)
AddType  .SET      application/set               8bit    1.0
AddType  .stl      application/SLA               8bit    1.0 #  Stereolithography
AddType  .STL      application/SLA               8bit    1.0
AddType  .ods      application/oleobject         8bit    1.0 # OLE storage
```

Figure 526 (Part 1 of 14). Lotus Domino Server Configuration

```
#     The following are vendor-specific CAD-formats commonly
#     used at CERN and in HEP institutes:
#
AddType  .dwg      application/acad              binary  1.0 # Autocad drawing files
AddType  .DWG      application/acad              binary  1.0
AddType  .SOL      application/solids            binary  1.0 # MATRA Prelude solids
AddType  .DRW      application/drafting          binary  1.0 # Prelude Drafting
AddType  .prt      application/pro_eng           binary  1.0 # PTC Pro/ENGINEER part
AddType  .PRT      application/pro_eng           binary  1.0
AddType  .unv      application/i-deas            binary  1.0 # SDRC I-DEAS files
AddType  .UNV      application/i-deas            binary  1.0
AddType  .CCAD     application/clariscad         binary  1.0 # ClarisCAD files
AddType  .snd      audio/basic                   binary  1.0 # Audio
AddType  .au       audio/basic                   binary  1.0
AddType  .aiff     audio/x-aiff                  binary  1.0
AddType  .aifc     audio/x-aiff                  binary  1.0
AddType  .aif      audio/x-aiff                  binary  1.0
AddType  .wav      audio/x-wav                   binary  1.0 # Windows+ WAVE format
AddType  .bmp      image/bmp                     binary  1.0 # OS/2 bitmap format
AddType  .gif      image/gif                     binary  1.0 # GIF
AddType  .ief      image/ief                     binary  1.0 # Image Exchange fmt
AddType  .jpg      image/jpeg                    binary  1.0 # JPEG
AddType  .JPG      image/jpeg                    binary  1.0
AddType  .JPE      image/jpeg                    binary  1.0
AddType  .jpe      image/jpeg                    binary  1.0
AddType  .JPEG     image/jpeg                    binary  1.0
AddType  .jpeg     image/jpeg                    binary  1.0
AddType  .tif      image/tiff                    binary  1.0 # TIFF
AddType  .tiff     image/tiff                    binary  1.0
AddType  .ras      image/cmu-raster              binary  1.0
AddType  .pnm      image/x-portable-anymap       binary  1.0 # PBM Anymap format
AddType  .pbm      image/x-portable-bitmap       binary  1.0 # PBM Bitmap format
AddType  .pgm      image/x-portable-graymap      binary  1.0 # PBM Graymap format
AddType  .ppm      image/x-portable-pixmap       binary  1.0 # PBM Pixmap format
AddType  .rgb      image/x-rgb                   binary  1.0
AddType  .xbm      image/x-xbitmap               7bit    1.0 # X bitmap
AddType  .xpm      image/x-xpixmap               binary  1.0 # X pixmap format
AddType  .xwd      image/x-xwindowdump           binary  1.0 # X window dump (xwd)
AddType  .html     text/html                     8bit    1.0 # HTML
AddType  .htm      text/html                     8bit    1.0 # HTML on PCs
AddType  .htmls    text/x-ssi-html               8bit    1.0 # Server-side includes
AddType  .shtml    text/x-ssi-html               8bit    1.0 # Server-side includes
AddType  .c        text/plain                    7bit    0.5 # C source
AddType  .h        text/plain                    7bit    0.5 # C headers
AddType  .C        text/plain                    7bit    0.5 # C++ source
AddType  .cc       text/plain                    7bit    0.5 # C++ source
AddType  .hh       text/plain                    7bit    0.5 # C++ headers
AddType  .m        text/plain                    7bit    0.5 # Objective-C source
AddType  .f90      text/plain                    7bit    0.5 # Fortran 90 source
AddType  .txt      text/plain                    7bit    0.5 # Plain text
AddType  .rtx      text/richtext                 7bit    1.0 # MIME Richtext format
AddType  .tsv      text/tab-separated-values     7bit    1.0 # Tab-separated values
AddType  .etx      text/x-setext                 7bit    0.9 # Struct Enchanced Txt
AddType  .MPG      video/mpeg                    binary  1.0 # MPEG
AddType  .mpg      video/mpeg                    binary  1.0
AddType  .MPE      video/mpeg                    binary  1.0
AddType  .mpe      video/mpeg                    binary  1.0
AddType  .MPEG     video/mpeg                    binary  1.0
AddType  .mpeg     video/mpeg                    binary  1.0
AddType  .qt       video/quicktime               binary  1.0 # QuickTime
AddType  .mov      video/quicktime               binary  1.0
AddType  .avi      video/x-msvideo               binary  1.0 # MS Video for Windows
AddType  .movie    video/x-sgi-movie             binary  1.0 # SGI  moviepalyer
AddType  .gz       multipart/x-gzip              binary  1.0
AddType  .zip      multipart/x-zip               binary  1.0 # PKZIP
AddType  .tar      multipart/x-tar               binary  1.0 # 4.3BSD tar
AddType  .ustar    multipart/x-ustar             binary  1.0 # POSIX tar
AddType  *.*       www/unknown                   binary  0.2 # Try to guess
AddType  *         www/unknown                   binary  0.2 # Try to guess
AddType  .cxx      text/plain                    7bit    0.5 # C++
AddType  .for      text/plain                    7bit    0.5 # Fortran
AddType  .mar      text/plain                    7bit    0.5 # MACRO
AddType  .log      text/plain                    7bit    0.5 # logfiles9
AddType  .com      text/plain                    7bit    0.5 # scripts
AddType  .sdml     text/plain                    7bit    0.5 # SDML
```

Figure 526 (Part 2 of 14). Lotus Domino Server Configuration

```
AddType  .list     text/plain                   7bit    0.5 # listfiles
AddType  .lst      text/plain                   7bit    0.5 # listfiles
AddType  .def      text/plain                   7bit    0.5 # definition files
AddType  .conf     text/plain                   7bit    0.5 # definition files
AddType  .         text/plain                   7bit    0.5 # files with no extension
AddType  .dcr      application/x-director       binary  1.0 # Shockwave for Director
AddType  .dir      application/x-director       binary  1.0 # Shockwave for Director
AddType  .dxr      application/x-director       binary  1.0 # Shockwave for Director
##############################################################        #################
##############################################################        #################
#
#            I M P O R T A N T   N O T E:
#
##############################################################        #################
##############################################################        #################
# The contents of this file are used by the Domino server.
# Making changes, additions, or deletions below this note
# is not supported in this release of Domino.
#
##############################################################        #################



##############################################################        #################
#          Map suffixes to MIME content-encodings.
#          Defaults see list below
#          Syntax:  AddEncoding <.suffix><encoding>
#          Each keyword will have two values.  Multiple keyword/values are
##############################################################        #################

AddEncoding  .Z           x-compress    1.0   # Compressed data
AddEncoding  .gz          x-gzip        1.0



##############################################################        #################
#          Map suffixes to the language of a document.
#          Default:  <none>
#          Syntax:   AddLanguage <.suffix><encoding>
#          There will be two values for each keyword.  Multiple keyword/
#          values are allowed.
# Example:
# AddLanguage   .uk  en_UK
##############################################################        #################



##############################################################        #################
#
#       Specify path for the standard icons included in directory listings
#       Default:IconPath <ServerRoot>/icons/*
#       Syntax: IconPath <icon directory path>
#
##############################################################        #################
IconPath /icons/
```

Figure 526 (Part 3 of 14). Lotus Domino Server Configuration

```
##############################################################        #################
#       Specify blank icon URL for directory listing
#       Default:  default shown below
#       Syntax:  AddBlankIcon <icon URL><ALT text>
#
#       Specify directory icon URL for directory listing
#       Default:  default shown below
#       Syntax:  AddDirIcon <icon URL><ALT text>
#
#       Specify parent directory icon URL for directory listing
#       Default:  default shown below
#       Syntax:  AddParentIcon <icon URL><ALT text>
#
#       Specify unknown icon URL for directory listing
#       Default:  default shown below
#       Syntax:  AddUnknownIcon <icon URL><ALT text>
#
#       Bind icon URL to a MIME content-type or content-encoding
#       Default:  default set of icons shown below
#       Syntax:  AddIcon <icon URL><ALT text><template>
##############################################################        #################
AddBlankIcon   blank.gif
AddDirIcon     dir.gif          DIR
AddParentIcon  back.gif         UP
AddUnknownIcon unknown.gif      ???
AddIcon        binary.gif       BIN  binary
AddIcon        text.gif         TXT  text/*
AddIcon        image.gif        IMG  image/*
AddIcon        movie.gif        MOV  video/*
AddIcon        sound.gif        AU   audio/*
AddIcon        tar.gif          TAR  multipart/*tar
AddIcon        compress.gif     CMP  x-compress x-gzip


##############################################################        #################
#
#          Specify whether case sensitivity for suffixes is on or off.
#          Default:  Off
#          Syntax:  SuffixCaseSense  <on/off>
#          Only one value per keyword is allowed; only one keyword/value
#          pair is allowed.
#
##############################################################        #################
SuffixCaseSense   Off


##############################################################        #################
#
#         Indicate if the absence of a trailing slash in the URL will
#         provide a directory listing or the default welcome page.
#         Default:  On
#         Syntax:  AlwaysWelcome <on/off>
#
##############################################################        #################
AlwaysWelcome  On


##############################################################        #################
#
#          Enable/disable or selective directory browsing
#          Default:  On
#          Syntax:  DirAccess <on/off/selective>
#          One value per keyword is allowed.  One keyword/value pair is
#          allowed.
##############################################################        #################

DirAccess   off

##############################################################        #################
#
#       Configure/disable readme feature for directory browsing.
#       Default:  top
#       Syntax:  DirReadme <top/bottom/off>
#       One value per keyword is allowed.  One keyword/value pair is
#       allowed.
##############################################################        #################
DirReadme  top
```

Figure 526 (Part 4 of 14). Lotus Domino Server Configuration

```
##############################################################        #################
#
#       Control the appearance of the directory listing.
#       Defaults:  DirShowIcons        On
#                  DirShowDate         On
#                  DirShowSize         On
#                  DirShowDescription  On
#                  DirShowBrackets     On
#                  DirShowCase         On
#                  DirShowHidden       On
#                  DirShowBytes        Off
#       Syntax:  <directive> <on/off>
#       Only one value per keyword is allowed.  Only one keyword/value
#       pair is allowed.
#
##############################################################        #################
DirShowIcons        On
DirShowDate         On
DirShowSize         On
DirShowDescription  On
DirShowBrackets     On
DirShowCase         On
DirShowHidden       On
DirShowBytes        Off
##############################################################        #################
#
#       Specify the maximum width for the description text in
#       directory listings.
#       Default:  DirShowMaxDescrLength 25
#       Syntax:  DirShowMaxDescrLength  <num>
#       Only one value per keyword is allowed.  Only one keyword/value
#       pair is allowed.
#
##############################################################        #################
DirShowMaxDescrLength  25


##############################################################        #################
#
#       Specify the minimum width for the filename field for
#       directory listings.
#       Default:  DirShowMinLength  15
#       Syntax:  DirShowMinLength  <num>
#       Only one value per keyword is allowed.  Only one keyword/value
#       pair is allowed.
##############################################################        #################
DirShowMinLength  15

##############################################################        #################
#
#       Specify the maximum width for the filename field for
#       directory listings.
#       Default:  DirShowMaxLength  25
#       Syntax:  DirShowMaxLength  <num>
#       Only one value per keyword is allowed.  Only one keyword/value
#       pair is allowed.
#
##############################################################        #################
DirShowMaxLength  25

##############################################################        #################
#
#        Enabling and disabling HTTP methods
#        Defaults:  GET, HEAD, and POST are enabled, the rest are disabled
#        Syntax:  Enable  <method>
#                 Disable  <method>
#
##############################################################        #################
Enable    GET
Enable    HEAD
Enable    POST

Disable   PUT
Disable   DELETE
```

Figure 526 (Part 5 of 14). Lotus Domino Server Configuration

```
##############################################################        #################
#
#         Specify the directory where meta-information should be stored.
#         Default:  .web
#         Syntax:  MetaDir  <directory name>
#         Only one keyword/value pair is allowed
#
##############################################################        #################
MetaDir     .web

##############################################################        #################
#
#         Specify the suffix for the file in which meta-information is
#         to be stored.  Meta-information is stored in a file with the
#         same name as the actual document, but appended with a suffix
#         specified by the MetaSuffix directive.
#         Default:  .meta
#         Syntax:  MetaSuffix  <.suffix>
#         Only one value per keyword, but multiple keyword/value pairs
#         are allowed.
#
##############################################################        #################
MetaSuffix     .meta
##############################################################        #################
#         The httpd daemon normally gives a content-length header line for
#         every document it returns. When it's running as a proxy it buffers
#         the document received from the remote server before sending it to
#         the client.  This directive can be used to set the value of this
#         buffer.  If it is exceeded the document will be returned without
#         a content-length header field.
#         Default:  50 K
#         Syntax:  MaxContentLengthBuffer  <size in K>
#         Only one keyword/value pair allowed.
#
##############################################################        #################
MaxContentLengthBuffer   50 K
```

Figure 526 (Part 6 of 14). Lotus Domino Server Configuration

```
##############################################################        #################
# User authentication and document protection
#
#       Within the configuration file, there are three directives that define
#       file access protection: Protect, Defprot, and Protection.
#
#       The Protection directive
#       defines how a set of files is to be protected, in other words, a protection set-up.
#       A protection set-up can be the name of a separate protect file or can be defined within the
#       configuration file.
#
#       The Protect and DefProt directives define the association of a protection set-up with a set of
#       files to be protected.  The Defprot statement associates a protection setup with a file template
#       but does not activate the protection.  The Protect statement associates a protection set-up
#       with a file template and activates the protection.
#
#
#
#  Protection directive:
#       Syntax:  Protection set-up name { directives }
#          Within the braces, any combination of nine possible protection directives can be defined:
#          AuthType, ServerID, PassWdFile, GroupFile, GetMask, PutMask, PostMask, Mask, ACLOverride
#       Default:  <none>
#
#
#  Protect directive:
#     Syntax:  Protect template
#     Default:  <none>
#
#  DefProt directive:
#     Syntax:  DefProt template setup
#     Default:  <none>
#
#  Example DefProt and Protect directives
#
#       Protection setup by usernames; specify groups in the group
#       file "if you need groups"; create and maintain password file
#       with the htadm program
#
# Protection PROT-SETUP-USERS {
#         ServerId        YourServersFancyName
#         AuthType        Basic
#         PasswdFile      /where/ever/passwd
#         GroupFile       /where/ever/group
#         GET-Mask        user, user, group, group, user
# }
#
#
#       Protection setup by hosts; you can use both domain name
#       templates and IP number templates
#
# Protection PROT-SETUP-HOSTS {
#         ServerId        YourServersFancyName
#         AuthType        Basic
#         PasswdFile      /where/ever/passwd
#         GroupFile       /where/ever/group
#         GET-Mask        @(*.ibm.com, 128.141.*.*, *.ncsa.uiuc.edu)
# }
# Defprot /very/secret/URL/*
# Protect /very/secret/URL/*      PROT-SETUP-USERS
# Protect /another/secret/URL/*   PROT-SETUP-HOSTS
#
#Protection  PROT-ADMIN  {
#      PasswdFile   C:\WINNT35\admin.pwd
#      Mask         All@(*)
#      PostMask     All@(*)
#      PutMask      All@(*)
#      GetMask      All@(*)
#      AuthType     Basic
#      ServerID     Private_Authorization
#}
#
#Protect  /admin-bin/*  PROT-ADMIN
##############################################################        #################
```

Figure 526 (Part 7 of 14). Lotus Domino Server Configuration

```
##############################################################        #################
#       Pass the URLs that this proxy is willing to forward.
#
# Pass    http:*
# Pass    ftp:*
# Pass    gopher:*
# Pass    wais:*
# Pass    https:*
##############################################################        #################


##############################################################        #################
#
#       Proxy server protection and caching directives
#
##############################################################        #################
#
#       Proxy protections; if you want only certain domains to use
#       your proxy, uncomment these lines and specify the Mask
#       with hostname templates or IP number templates:
#
# Protection PROXY-PROT {
#       ServerId        YourProxyName
#       Mask            @(*.ibm.com, 128.141.*.*, *.ncsa.uiuc.edu)
# }
# Protect  *  PROXY-PROT
#
# Protect    http:*      PROXY-PROT
# Protect    ftp:*       PROXY-PROT
# Protect    gopher:*    PROXY-PROT
# Protect    wais:*      PROXY-PROT
# Protect    https:*     PROXY-PROT
##############################################################        #################



##############################################################        #################
#
#       Enable caching, specify cache root directory, and cache size
#       in megabytes
#
#       Turn caching on or off
#       Default:  Caching  Off
#       Syntax:  Caching  <On | Off>
#
##############################################################        #################
Caching         Off

##############################################################        #################
#
#       Absolute path of the cache directory.  Subdirectories will be created
#       for each protocol cached.
#       Default:  <none>
#       Syntax:  CacheRoot <directory>
# Example:
# CacheRoot       \your\cache\root\dir
#
##############################################################        #################

##############################################################        #################
#
#       Maximum cache size in megabytes
#       Default:  CacheSize 5 M
#       Syntax:  CacheSize <size> M
#
##############################################################        #################
CacheSize       5 M
```

Figure 526 (Part 8 of 14). Lotus Domino Server Configuration

```
##############################################################        #################
#
#       Maximum time to keep cache files.  Files older than specified time
#       are removed.
#       Default:  <none>
#       Syntax:  CacheClean <URL template> <time-spec>
# Examples:
# CacheClean      *                2 months
# CacheClean      http:*           1 week
# CacheClean      gopher:*         20 days
# CacheClean      http://*.com/*   20 days 6 hours
#
##############################################################        #################


##############################################################        #################
#       Maximum time to keep unused cache files.  Files older than specified
#       time are removed.
#       Default:  <none>
#       Syntax:  CacheUnused <URL template> <time-spec>
# Examples:
# CacheUnused     http:*          2 weeks
# CacheUnused     ftp:*           1 week
# CacheUnused     gopher:*        1 week
#
##############################################################        #################

##############################################################        #################
#
#       Maximum time to keep cache files for which the server gave neither
#       an Expires nor a Last-Modified header.
#       Specify default expiry times for ftp and gopher;
#       NEVER specify it for HTTP, otherwise documents generated by
#       scripts get cached which is usually a bad thing.
#
#       Default: <dependent on protocol>
#       Syntax:  CacheDefaultExpiry <URL template> <time-spec>
##############################################################        #################
CacheDefaultExpiry      ftp:*           1 day
CacheDefaultExpiry      gopher:*       1 day
CacheDefaultExpiry      http:*          0 days

##############################################################        #################
#
#       Garbage collection controls
#
#       Enable garbage collection -- remove expired files to free up memory.
#       Default:  Enabled whenever caching is enabled
#       Syntax:  Gc <On | Off>
#
##############################################################        #################
Gc      Off

##############################################################        #################
#
#       Daily garbage collection time
#       Default:  03:00
#       Syntax:  GcDailyGC <military time format>
#
##############################################################        #################
GcDailyGc      03:00

##############################################################        #################
#
#       Amount of virtual storage in kilobytes to allocate for garbage collection
#       Default:  500
#       Syntax:  GcMemUsage  <number of kilobytes>
#
##############################################################        #################
GcMemUsage      500
```

Figure 526 (Part 9 of 14). Lotus Domino Server Configuration

```
##############################################################        #################
#
#       Lower limit of size criterion for removal of cached files.  All files
#       below this size are assigned equal size criterion priority.
#       All values are converted to kilobytes
#       Default:  200 kilobytes
#       Syntax:  CacheLimit_1  <number of kilobytes> K
#
##############################################################        #################
CacheLimit_1    200 K

##############################################################        #################
#
#       Upper limit of size criterion for removal of cached files.  All files
#       above this size are assigned equal size criterion priority.
#       All values are converted to kilobytes
#       Default:  4 megabytes
#       Syntax:  CacheLimit_2  <number of kilobytes> K
#
##############################################################        #################
CacheLimit_2    4000 K

##############################################################        #################
#
#       URLs matching specified template will not be cached.
#       Default:  <none>
#       Syntax:  NoCaching  <URL template>
#       This directive can occur multiple times within the configuration file
# Example:
# NoCaching                   http://Localhost/*
#
##############################################################        #################

##############################################################        #################
#
#       Only URLs matching the specified template will be cached.
#       Default:  <none>
#       Syntax:  CacheOnly   <URL template>
#       This directive can occur multiple times within the configuration file
# Example:
# CacheOnly                    http://info.ibm.com/*
#
##############################################################        #################

##############################################################        #################
#
#       Proportion of a file's age (LastModified) to be used as the expiry time.
#       This is used to determine expiry time when a remote server
#       does not specify an Expires header. For instance, if a file is
#       1 month old and CacheLastModifiedFactor was set to 0.5, the file
#       would expire in approximatley 15 days.
#       Default:  0.1
#       Syntax:  CacheLastModifiedFactor <proportion>
#
##############################################################        #################
CacheLastModifiedFactor     0.1

##############################################################        #################
#
#       Interval of time until document expiry within which document will
#       not be cached.  By default, no document expiring within 2 minutes
#       will be cached.
#       Default:  2 minutes
#       Syntax:  CacheTimeMargin <time margin>
#
##############################################################        #################
CacheTimeMargin             2 minutes
```

Figure 526 (Part 10 of 14). Lotus Domino Server Configuration

```
##############################################################        #################
#
#       Set proxy to standalone mode so that only documents found in cache
#       are returned.  Files not in cache will return an error rather than
#       connecting to other servers.  This setting is typically used with
#       expiry checking disabled.
#       Default:  Off
#       Syntax:  CacheNoConnect  <On | Off>
#
##############################################################        #################
CacheNoConnect               Off
##############################################################        #################
#
#       Set expiry checking to on if you do not want to return an expired
#       document.  If it is desirable to have the proxy always return
#       documents from cache (e.g., for demos), expiry checking can be turned
#       off.
#       Default:  On
#       Syntax:  CacheExpiryCheck <On | Off>
#
##############################################################        #################
CacheExpiryCheck             On
##############################################################        #################
#
#       Amount of time after which a cache lock can be broken.  Cache
#       files are locked during retrieval.  The lock timeout ensures
#       that a file will not be locked indefinitely should a retrieval fail.
#       NOTE: CacheLockTimeOut should never be less that OutPutTimeOut.
#       Default:  20 minutes
#       Syntax:  CacheLockTimeOut  <time-spec>
#
##############################################################        #################
CacheLockTimeOut             20 minutes
##############################################################        #################
#
#       Path and name of file that contains a log of all document requests.
#       The value can be either an absolute path or a path relative to
#       ServerRoot (one example shown of each)
#       Default:  <none>
#       Syntax:  CacheAccessLog  <file path>
# Examples:
# CacheAccessLog   /absolute/path/logfile
# CacheAccessLog   logs/logfile
#
##############################################################        #################
```

Figure 526 (Part 11 of 14). Lotus Domino Server Configuration

```
##############################################################        #################
#
#       Configuring Proxy to Connect To Another Proxy
#
#       HTTP proxy server that the server should contact for HTTP requests
#       if the server being configured is part of a chain of proxies.
#       Default:  <none>
#       Syntax:  http_proxy <URL>
#
#       FTP proxy server that the server should contact for FTP requests
#       if the server being configured is part of a chain of proxies.
#       Default:  <none>
#       Syntax:  ftp_proxy <URL>
#
#       Gopher proxy server that the server should contact for Gopher requests
#       if the server being configured is part of a chain of proxies.
#       Default:  <none>
#       Syntax:  gopher_proxy <URL>
#
#       WAIS proxy server that the server should contact for WAIS requests
#       if the server being configured is part of a chain of proxies.
#       Default:  <none>
#       Syntax:  wais_proxy <URL>
#
#       A list of Internet addresses or domains from which the server should
#       retrieve resources directly rather than going through a proxy.
#       Default:  <none>
#       Syntax:  no_proxy <template>
# Examples:
# http_proxy      http://outer.proxy.server/
# ftp_proxy        http://outer.proxy.server/
# gopher_proxy   http://outer.proxy.server/
# wais_proxy      http://outer.proxy.server/
# no_proxy    .my.domain,.ibm.com:8001
#
##############################################################        #################
```

Figure 526 (Part 12 of 14). Lotus Domino Server Configuration

```
##############################################################        #################
#
#  ServerPriority directive:
#     Syntax:  ServerPriority  0|1|2
#     Default:  1
#     Note:    This is the priority class on you system you want your server to run.
#              0 -  normal process (no priority)
#              1 -  maximum priority as a normal process
#              2 -  maximum priority as a server foreground process.
##############################################################        #################
ServerPriority 1

##############################################################        #################
#
#     Path and name of files that are to be loaded into memory each time the
#     server is started.  This directive may occur multiple times within the
#     configuration file.  The name must be fully qualified and may not contain
#     any wildcard charcters.
#     Syntax:  CacheLocalFile  <file path>
#     Default: <none>
# Examples:
# CacheLocalFile   /temp/path/index.html
#
##############################################################        #################

##############################################################        #################
#
#  imbeds:
#    Use this directive to enable server side includes.
#    Syntax:  imbeds   <on/off/files/cgi><.suffix>
#             <.suffix> is optional - if present, it limits which files are
#             parsed for server side includes.
#    Default: on .shtml
#    If more than one imbeds directive is specified, the last one is used.
#
##############################################################        #################
imbeds on .shtml


##############################################################        #################
### Added for Web Administration
#
Fail /adm-bin
#
#our protection setup
Protection ADMINPROT {
      AuthType Basic
      ServerId /
      GetMask All
      PostMask All
}
Authentication Basic WAAUTH:Authentication
#
# resources being protected (multiple Protect directives are allowed)
Protect /adm-bin/* ADMINPROT
#
##############################################################        #################

##############################################################        #################
#
# Server-side imagemap support
#
##############################################################        #################

service /cgi-bin/htimage*  INTERNAL:HTImage*
service /cgi-bin/imagemap* INTERNAL:HTImage*
```

Figure 526 (Part 13 of 14). Lotus Domino Server Configuration

```
##############################################################        #################
##############################################################        #################
#             Changes for the scenario in chapter 6
##############################################################        #################
#
EXEC \cig-bin\*   d:\cicscli\cig\cgi\*
EXEC \cig-admin\* d:\cicscli\cig\admin\*
PASS /cig/*       d:\cicscli\cig\html\*
#
##############################################################       #################
#
PASS /*           d:\notes\data\domino\html
#
##############################################################        #################
#
Protect /admin-bin/*   PROT-ADMIN
Protect /cig-admin/*   PROT-ADMIN
#
##############################################################        #################
```

Figure 526 (Part 14 of 14). Lotus Domino Server Configuration

C.2 Tier 3a

Tier 3a is configured as a CICS Server, Communications Server and an ADSM Server.

C.2.1 The CICS Server Configuration - Tier 3a

The CICS Server file c:\opt\cics\bin\cicslcli.ini defines the CICS Server and the protocol it should use to communicate.

```
;*********************************************************************
;* IBM Local CICS Client - Initialization File                       *
;*********************************************************************
; Format:
;   Section = Name
;      Parameter = Value
;      Parameter = Value
;      ...
;
; "Section" must be either Client, Server or Driver.  There must be just
; one Client section but there may be several Server or Driver sections.
; For each type of section a set of Parameters and associated Values may
; be defined.  Often these may be omitted and will then assume sensible
; default values.  This sample INI file lists only those parameters that
; typically may required changing.
;
Client = *                      ; Auto-install client on the server
   MaxServers = 2               ; Matches MaxServers on the server

;---------------------------------------------------------------------
; Server section - This section defines a server to which the client may
;                  connect.  There may be several Server sections.
;
; The Local Client is only supported via named pipe communications.
; The "Server" name must be unique within this initialization file
; and does not need to match any CICS Server name.
;
; The value of "NamedPipeName" is the method by which client and
; server are connected, this must match the value specified in the
; CICS Server Listener Definition (LD) "NamedPipeName" attribute.
;
Server = CICS01                 ; Arbitrary, unique name for the server
   Description = Named Pipe Support for local client ;
   Protocol = LOCALCLI          ; Matches with a Driver section below
   NetName = 00.00.00.00        ; Dummy
   NamedPipeName = CICSCC       ; Must match servers named pipe

Server = NTNCF101     ; Arbitrary, unique name for the server
   Description = Named Pipe Support for local client ;
   Protocol = LOCALCLI          ; Matches with a Driver section below
   NetName = 00.00.00.00        ; Dummy
   NamedPipeName = CICSAA       ; Must match servers named pipe

;---------------------------------------------------------------------
; Driver section - This section defines a communications protocol DLL
;                  used to communicate with a server.  There may be
;                  several Driver sections.
;
; The Local Client is only supported by the named pipe communications DLL
;
Driver = LOCALCLI               ; Matches the Server's Protocol value
   DriverName = ERZCLPIP        ; Use the named pipe communications DLL

;*********************************************************************
;* End of file                                                       *
;*********************************************************************
```

Figure 527. CICS Client Initialization File

C.2.2 The CICS Region Definition on Tier 3a

This file is located in C:\VAR\cics_regions\NTNCF101\RD\RD.NTNCF101. It is important not to manually edit the file. All changes to the file must be made via the GUI. The changes made to this file are highlighted. This file defines this CICS region's characteristics.

```
#
# This file should only be altered using the CICS Resource Definition
# Online (RDO) facilities.
#


:ml7
ResourceDescription="Region definition"
AmendCounter=5
Modifiable=no
StartType=cold
Groups=
StartupProgList=
ShutdownProgList1=
ShutdownProgList2=
DefaultUserId="CICSUSER"
FileSystemType=SFS
RDBMSInstance=""
FileRSLCheck=external
TransientDataRSLCheck=external
TemporaryStorageRSLCheck=external
JournalRSLCheck=external
ProgramRSLCheck=external
TransactionRSLCheck=external
ESMLoad=no
ESMModule=""
RuntimeProtection=none
LogicalTDQProtection=none
PhysicalTDQProtection=none
NonRecTDQProtection=none
RecTSQProtection=none
NonRecTSQProtection=none
LocalQProtectProtection=none
LocalQProtection=none
ReleaseNum="0420"
LocalSysId="CD10"
LocalNetworkName="NETID"
CWASize=512
MinServer=1
MaxServer=5
ClassMaxTasks=1,1,1,1,1,1,1,1,1,1
ClassMaxTaskLim=0,0,0,0,0,0,0,0,0,0
ServerIdleLimit=3600
SafetyLevel=none
RPCListenerThreads=0
DateForm=ddmmyy
ClassTableSize=5,50,50,1,50,50,50,20,5,50,1,20,5,5
MaxRegionPool=4194304
MaxTaskPrivatePool=1048576
```

Figure 528 (Part 1 of 3). CICS Region Definition

```
MaxTSHPool=1048576
RegionPoolThreshold=90
TaskShPoolThreshold=90
TaskSHNumBuckets=512
LoadDataNumBuckets=512
SysDump=no
PCDump=yes
ABDump=yes
DumpName="dumps"
CoreDumpName="dir1"
Trace=all
TraceModules=0
ExternalTrace=no
TraceFileA="trace.a"
TraceFileB="trace.b"
TraceFileSize=3276800
SysTraceBufferSize=163840
UserTraceDirectory="D:\VAR\cics_tmp"
PublicUserTraceFile="cicspubl"
IntrospectInterval=10
IntrospectLevel=minimal
ISCDelayMinutes=10
CUBSDelayMinutes=5
CARPDelayHours=8
ProtectPurgeDelayPeriod=8
PurgeDelayPeriod=8
StatsRecord=yes
StatFile="statsfile"
SufficesSupported=yes
CheckpointInterval=1000
DefaultFileServer="/.:/cics/sfs/%H"
RecTSQFile="%Rcicsrectsqfile"
RecTSQIndex="cicsrectsqidx"
RecTSQVol="sfs_%S"
RecTSQPrePages=5
RecTSQMaxRecs=1000000
NonRecTSQFile="%Rcicsnrectsqfil"
NonRecTSQIndex="cicsnrectsqidx"
NonRecTSQVol="sfs_%S"
NonRecTSQPrePages=5
NonRecTSQMaxRecs=1000000
LogicalTDQFile="%Rcicstdqlgfile"
LogicalTDQIndex="cicstdqlgidx"
LogicalTDQVol="sfs_%S"
LogicalTDQPrePages=5
LogicalTDQMaxRecs=1000000
PhysicalTDQFile="%Rcicstdqphfile"
PhysicalTDQIndex="cicstdqphidx"
PhysicalTDQVol="sfs_%S"
PhysicalTDQPrePages=5
PhysicalTDQMaxRecs=1000000
NonRecTDQFile="%Rcicstdqnofile"
NonRecTDQIndex="cicstdqnoidx"
NonRecTDQVol="sfs_%S"
NonRecTDQPrePages=5
NonRecTDQMaxRecs=1000000
LocalQProtectFile="%Rcicsplqfile"
AutoDCELogin=no
```

Figure 528 (Part 2 of 3). CICS Region Definition

```
LocalQProtectIndex="cicsplqidx"
LocalQProtectVol="sfs_%S"
LocalQProtectPrePages=5
LocalQProtectMaxRecs=1000000
LocalQFile="%Rcicsnlqfile"
LocalQIndex="cicsnlqidx"
LocalQVol="sfs_%S"
LocalQPrePages=5
LocalQMaxRecs=1000000
TSQAgeLimit=20
ProgramCacheSize=0
LocalLUName="NTNCF101"
RegionPoolBase=0
TaskSharedPoolBase=0
ServerSideTran=no
AuthenticationService=CICS
NameService=NONE
AllowDebugging=no
ECIPasswordCacheSeconds=28800
AutoinstallMode=default
MaxConsoleSize=0
MaxTaskCPU=0
MaxTaskCPUAction=warning
TransDumpTrace=no
```

Figure 528 (Part 3 of 3). CICS Region Definition

C.2.3 The CICS Communication Definition on Tier 3a

This file is located in C:\VAR\cics_regions\NTNCF101\CD\CD.NTNCF101. It is important to not manually edit the file. All changes to the file must be made via the GUI. The changes made to this file are highlighted. We added the remote nodes netid and luname as they were defined in Communications Server.

```
:

#
# This file should only be altered using the CICS Resource Definition
# Online (RDO) facilities.
#

:ml7
    GroupName               = ""
    ActivateOnStartup       = yes
    ResourceDescription     = "Communications Definition"
    AmendCounter            = 0
    Permanent               = no
    ConnectionType          = ppc_tcp
    RemoteLUName            = ""
    RemoteNetworkName       = ""
    SNAConnectName          = ""
    DefaultSNAModeName      = ""
    GatewayName             = ""
    ListenerName            = ""
    RemoteTCPAddress        = ""
    RemoteTCPPort             = 1435
    DCECell                 = "/.:/"
    AllocateTimeout           = 60
    RemoteCodePageTR        = "IBM-850"
    InService               = yes
    OutboundUserIds         = sent
    RemoteSysSecurity       = local
    LinkUserId              = ""
    TSLKeyMask              = none
    RSLKeyMask              = none
    RemoteSysEncrypt        = none
```

Figure 529 (Part 1 of 2). Communication Definition

```
CD99: GroupName=""
ActivateOnStartup=yes
ResourceDescription="Communications Definition"
AmendCounter=0
Permanent=no
ConnectionType=local_sna
RemoteLUName="NTSRV99" RemoteNetworkName="NETID" SNAConnectName=""
DefaultSNAModeName="CICSISC0" GatewayName=""
ListenerName=""
RemoteTCPAddress=""
RemoteTCPPort=1435
DCECell="/.:/"
AllocateTimeout=60
RemoteCodePageTR="IBM-850"
InService=yes
OutboundUserIds=sent
RemoteSysSecurity=trusted LinkUserId=""
TSLKeyMask=none
RSLKeyMask=none
RemoteSysEncrypt=none
```

Figure 529 (Part 2 of 2). Communication Definition

C.2.4 The CICS Listener Definition on Tier 3a

This file is located in C:\VAR\cics_regions\NTNCF101\LD\LD.NTNCF101. It is important to not manually edit the file. All changes to the file must be made via the GUI. The changes made to this file are highlighted.

```
#
# This file should only be altered using the CICS Resource Definition
# Online (RDO) facilities.
#

:ml7
    GroupName               = ""
    ActivateOnStartup       = yes
    ResourceDescription     = "Listener Definition"
    AmendCounter            = 0
    Permanent               = no
    Protocol                = TCP
    TCPAddress              = ""
    TCPService              = ""
    SNAServerTransport      = TCP
    SNAServerIdentifier     = ""
    SNAServerNodeName       = ""
    NamedPipeName           = ""

TCPIP: GroupName=""
ActivateOnStartup=yes
ResourceDescription="Listener Definition"
AmendCounter=0
Permanent=no
Protocol=TCP
TCPAddress="9.24.104.101" TCPService=""
SNAServerTransport=TCP
SNAServerIdentifier=""
SNAServerNodeName=""
NamedPipeName=""
```

Figure 530 (Part 1 of 2). Listener Definition

```
SNA GroupName=""
ActivateOnStartup=yes
ResourceDescription="Listener Definition"
AmendCounter=0
Permanent=no
Protocol=SNA TCPAddress=""
TCPService=""
SNAServerTransport=TCP
SNAServerIdentifier=""
SNAServerNodeName=""
NamedPipeName=""


LOCAL GroupName=""
ActivateOnStartup=yes
ResourceDescription="Listener Definition"
AmendCounter=0
Permanent=no
Protocol=NamedPipe
TCPAddress=""
TCPService=""
SNAServerTransport=TCP
SNAServerIdentifier=""
SNAServerNodeName=""
NamedPipeName="CICSAA"
```

Figure 530 (Part 2 of 2). Listener Definition

C.2.5 The CICS Transaction Definition on Tier 3a

This file is located in C:\VAR\cics_regions\NTNCF101\TD\TD.NTNCF101. It is important to not manually edit the file. All changes to the file must be made via the GUI. The changes made to this file are highlighted. Remember that in this case we chose to route the transaction requests to CD99.

```
#
# This file should only be altered using the CICS Resource Definition
# Online (RDO) facilities.
#

removed the default definitions....

INQY:
GroupName=""
ActivateOnStartup=yes
ResourceDescription="IVP C Transaction"
TClass=no
AmendCounter=2
Permanent=no
EnableStatus=enabled
Dynamic=no
RemoteSysId="CD99" RemoteName="INQY"
RSLKey=private
TSLKey=1
RSLCheck=none
TSLCheck=internal
TransDump=no
ProgName="DFHDALL"
TPNSNAProfile=""
TemplateDefined=no
IsBackEndDTP=no
TWASize=0
Priority=0
Purgeability=purgeable
Syncpoint=no_prompt_finish
DeadLockTimeout=0
InDoubt=wait_backout
UCTranFlag=no
SNAModeName=""
LocalQ=no
Timeout=0
InvocationMode=in_out_terminal|user_start|ATI_start|internal_ATI_start|
triggered_start|at_normal_running
MaxTaskCPU=0


ADDS:
GroupName=""
ActivateOnStartup=yes
ResourceDescription="IVP C Transaction"
TClass=no
AmendCounter=3
Permanent=no
EnableStatus=enabled
Dynamic=no
RemoteSysId="CD99" RemoteName="ADDS"
RSLKey=private
TSLKey=1
RSLCheck=none
TSLCheck=internal
TransDump=no
ProgName="DFHDALL"
TPNSNAProfile=""
TemplateDefined=no
IsBackEndDTP=no
TWASize=0
Priority=0
Purgeability=purgeable
Syncpoint=no_prompt_finish
DeadLockTimeout=0
InDoubt=wait_backout
UCTranFlag=no
SNAModeName=""
LocalQ=no
Timeout=0
InvocationMode=in_out_terminal|user_start|ATI_start|internal_ATI_start|
triggered_start|at_normal_running
MaxTaskCPU=0
```

Figure 531 (Part 1 of 4). CICS RDF on Tier 3a

```
UPDT:
GroupName=""
ActivateOnStartup=yes
ResourceDescription="IVP C Transaction"
TClass=no
AmendCounter=2
Permanent=no
EnableStatus=enabled
Dynamic=no
RemoteSysId="CD99" RemoteName="UPDT"
RSLKey=private
TSLKey=1
RSLCheck=none
TSLCheck=internal
TransDump=no
ProgName="DFHDALL"
TPNSNAProfile=""
TemplateDefined=no
IsBackEndDTP=no
TWASize=0
Priority=0
Purgeability=purgeable
Syncpoint=no_prompt_finish
DeadLockTimeout=0
InDoubt=wait_backout
UCTranFlag=no
SNAModeName=""
LocalQ=no
Timeout=0
InvocationMode=in_out_terminal|user_start|ATI_start|internal_ATI_start|
triggered_start|at_normal_running
MaxTaskCPU=0


BRWS:
GroupName=""
ActivateOnStartup=yes
ResourceDescription="IVP C Transaction"
TClass=no
AmendCounter=2
Permanent=no
EnableStatus=enabled
Dynamic=no
RemoteSysId="CD99" RemoteName="BRWS"
RSLKey=private
TSLKey=1
RSLCheck=none
TSLCheck=internal
TransDump=no
ProgName="DFHDBRW"
TPNSNAProfile=""
TemplateDefined=no
IsBackEndDTP=no
TWASize=0
Priority=0
Purgeability=purgeable
Syncpoint=no_prompt_finish
DeadLockTimeout=0
InDoubt=wait_backout
UCTranFlag=no
SNAModeName=""
LocalQ=no
Timeout=0
InvocationMode=in_out_terminal|user_start|ATI_start|internal_ATI_start|
triggered_start|at_normal_running
MaxTaskCPU=0
```

Figure 531 (Part 2 of 4). CICS RDF on Tier 3a

```
OREQ:
GroupName=""
ActivateOnStartup=yes
ResourceDescription="IVP C Transaction"
TClass=no
AmendCounter=2
Permanent=no
EnableStatus=enabled
Dynamic=no
RemoteSysId="CD99" RemoteName="OREQ"
RSLKey=private
TSLKey=1
RSLCheck=none
TSLCheck=internal
TransDump=no
ProgName="DFHDCOM"
TPNSNAProfile=""
TemplateDefined=no
IsBackEndDTP=no
TWASize=0
Priority=0
Purgeability=purgeable
Syncpoint=no_prompt_finish
DeadLockTimeout=0
InDoubt=wait_backout
UCTranFlag=no
SNAModeName=""
LocalQ=no
Timeout=0
InvocationMode=output_terminal|user_start|ATI_start|internal_ATI_start|
triggered_start|at_normal_running
MaxTaskCPU=0


MENU:
GroupName=""
ActivateOnStartup=yes
ResourceDescription="IVP C Transaction"
TClass=no
AmendCounter=4
Permanent=no
EnableStatus=enabled
Dynamic=no
RemoteSysId="CD99" RemoteName="MENU"
RSLKey=private
TSLKey=1
RSLCheck=none
TSLCheck=internal
TransDump=no
ProgName="DFHDMNU"
TPNSNAProfile=""
TemplateDefined=no
IsBackEndDTP=no
TWASize=0
Priority=0
Purgeability=purgeable
Syncpoint=no_prompt_finish
DeadLockTimeout=0
InDoubt=wait_backout
UCTranFlag=no
SNAModeName=""
LocalQ=no
Timeout=0
InvocationMode=in_out_terminal|user_start|ATI_start|internal_ATI_start|
triggered_start|at_normal_running
MaxTaskCPU=0
```

Figure 531 (Part 3 of 4). CICS RDF on Tier 3a

```
OREN:
GroupName=""
ActivateOnStartup=yes
ResourceDescription="IVP C Transaction"
TClass=no
AmendCounter=2
Permanent=no
EnableStatus=enabled
Dynamic=no
RemoteSysId="CD99" RemoteName="OREN"
RSLKey=private
TSLKey=1
RSLCheck=none
TSLCheck=internal
TransDump=no
ProgName="DFHDREN"
TPNSNAProfile=""
TemplateDefined=no
IsBackEndDTP=no
TWASize=0
Priority=0
Purgeability=purgeable
Syncpoint=no_prompt_finish
DeadLockTimeout=0
InDoubt=wait_backout
UCTranFlag=no
SNAModeName=""
LocalQ=no
Timeout=0
InvocationMode=in_out_terminal|user_start|ATI_start|internal_ATI_start|
triggered_start|at_normal_running
MaxTaskCPU=0
```

Figure 531 (Part 4 of 4). CICS RDF on Tier 3a

C.2.6 Communications Server - Tier 3a

The Communications Server defintion on Tier 3a, which defines a single APPC link to Tier 3b follows:

```
*TSTue Mar 10 14:49:22 1998
NODE=(
     ANYNET_SUPPORT=ANYNET_SUPPORTED
     CP_ALIAS=TIER3A
     DEFAULT_PREFERENCE=NATIVE
     DISCOVERY_SUPPORT=DISCOVERY_SERVER
     FQ_CP_NAME=NETID.TIER3A
     MAX_COMPRESSION_LEVEL=NONE
     NODE_ID=05D00000
     NODE_TYPE=NETWORK_NODE
     REGISTER_WITH_CDS=1
     REGISTER_WITH_NN=0
)
PORT=(
     PORT_NAME=LAN0_04
     DLC_DATA=00000000000004
     DLC_NAME=LAN
     IMPLICIT_CP_CP_SESS_SUPPORT=1
     IMPLICIT_DEACT_TIMER=0
     IMPLICIT_DSPU_SERVICES=NONE
     IMPLICIT_HPR_SUPPORT=1
     IMPLICIT_LIMITED_RESOURCE=NO
     LINK_STATION_ROLE=NEGOTIABLE
     MAX_IFRM_RCVD=8
     MAX_RCV_BTU_SIZE=65535
     PORT_TYPE=SATF
     PORT_LAN_SPECIFIC_DATA=(
          ACK_DELAY=100
          ACK_TIMEOUT=10000
          ADAPTER_NUMBER=0
          BUSY_STATE_TIMEOUT=15
          IDLE_STATE_TIMEOUT=30
          LOCAL_SAP=04
          OUTSTANDING_TRANSMITS=16
          POLL_TIMEOUT=8000
          POOL_SIZE=32
          REJECT_RESPONSE_TIMEOUT=10
          TEST_RETRY_INTERVAL=8
          TEST_RETRY_LIMIT=5
          XID_RETRY_INTERVAL=8
          XID_RETRY_LIMIT=5
     )
)
LINK_STATION=(
     LS_NAME=NTSRV99
     ACTIVATE_AT_STARTUP=1
     ADJACENT_NODE_TYPE=NETWORK_NODE
     AUTO_ACTIVATE_SUPPORT=0
     CP_CP_SESS_SUPPORT=1
     DEFAULT_NN_SERVER=0
     DEST_ADDRESS=40000000009904
     DISABLE_REMOTE_ACT=0
     DSPU_SERVICES=NONE
     FQ_ADJACENT_CP_NAME=NETID.TIER3B
     HPR_SUPPORT=0
     LIMITED_RESOURCE=NO
     LINK_DEACT_TIMER=0
     LINK_STATION_ROLE=USE_ADAPTER_DEFAULTS
     MAX_IFRM_RCVD=0
     MAX_SEND_BTU_SIZE=65535
     NODE_ID=05D00000
     PORT_NAME=LAN0_04
     SOLICIT_SSCP_SESSION=0
     TARGET_PACING_COUNT=1
     TG_NUMBER=0
     USE_DEFAULT_TG_CHARS=1
     USE_PU_NAME_IN_XID=0
)
```

Figure 532 (Part 1 of 5). Communicaition Server Profile for Tier 3a

```
DLUR_DEFAULTS=(
     DEFAULT_PU_NAME=TIER3A
     DLUS_RETRY_LIMIT=3
     DLUS_RETRY_TIMEOUT=5
)
LOCAL_LU=(
     LU_NAME=NTNCF101
     LU_ALIAS=NTNCF101
     LU_SESSION_LIMIT=0
     NAU_ADDRESS=0
     ROUTE_TO_CLIENT=0
     SYNCPT_SUPPORT=0
)
MODE=(
     MODE_NAME=BLANK
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#CONNECT
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=8192
     MAX_RU_SIZE_UPPER_BOUND=1024
     MIN_CONWINNERS_SOURCE=4096
     PLU_MODE_SESSION_LIMIT=8192
     RECEIVE_PACING_WINDOW=3
)
MODE=(
     MODE_NAME=#BATCH
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#BATCH
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=0
     MAX_NEGOTIABLE_SESSION_LIMIT=8192
     MAX_RU_SIZE_UPPER_BOUND=2048
     MIN_CONWINNERS_SOURCE=4096
     PLU_MODE_SESSION_LIMIT=8192
     RECEIVE_PACING_WINDOW=20
)
MODE=(
     MODE_NAME=#BATCHSC
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#BATCHSC
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=8
     MAX_RU_SIZE_UPPER_BOUND=2048
     MIN_CONWINNERS_SOURCE=4
     PLU_MODE_SESSION_LIMIT=8
     RECEIVE_PACING_WINDOW=3
)
```

Figure 532 (Part 2 of 5). Communicaition Server Profile for Tier 3a

```
MODE=(
     MODE_NAME=#INTER
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#INTER
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=8192
     MAX_RU_SIZE_UPPER_BOUND=4096
     MIN_CONWINNERS_SOURCE=4096
     PLU_MODE_SESSION_LIMIT=8192
     RECEIVE_PACING_WINDOW=20
)
MODE=(
     MODE_NAME=#INTERSC
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#INTERSC
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=8
     MAX_RU_SIZE_UPPER_BOUND=2048
     MIN_CONWINNERS_SOURCE=4
     PLU_MODE_SESSION_LIMIT=8
     RECEIVE_PACING_WINDOW=7
)
MODE=(
     MODE_NAME=CICSISC0
     AUTO_ACT=5
     COMPRESSION=PROHIBITED
     COS_NAME=#CONNECT
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=128
     MAX_RU_SIZE_UPPER_BOUND=4096
     MIN_CONWINNERS_SOURCE=5
     PLU_MODE_SESSION_LIMIT=10
     RECEIVE_PACING_WINDOW=1
)
MODE=(
     MODE_NAME=IBMRDB
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#CONNECT
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=128
     MAX_RU_SIZE_UPPER_BOUND=4096
     MIN_CONWINNERS_SOURCE=16
     PLU_MODE_SESSION_LIMIT=32
     RECEIVE_PACING_WINDOW=1
)
```

Figure 532 (Part 3 of 5). Communicaition Server Profile for Tier 3a

```
MODE=(
     MODE_NAME=QPCSUPP
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#CONNECT
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=52
     MAX_RU_SIZE_UPPER_BOUND=1024
     MIN_CONWINNERS_SOURCE=26
     PLU_MODE_SESSION_LIMIT=52
     RECEIVE_PACING_WINDOW=2
)
MODE=(
     MODE_NAME=QSERVER
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#CONNECT
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=64
     MAX_RU_SIZE_UPPER_BOUND=1024
     MIN_CONWINNERS_SOURCE=0
     PLU_MODE_SESSION_LIMIT=64
     RECEIVE_PACING_WINDOW=7
)
MODE=(
     MODE_NAME=SNASVCMG
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=SNASVCMG
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=0
     MAX_NEGOTIABLE_SESSION_LIMIT=2
     MAX_RU_SIZE_UPPER_BOUND=512
     MIN_CONWINNERS_SOURCE=1
     PLU_MODE_SESSION_LIMIT=2
     RECEIVE_PACING_WINDOW=1
)
PARTNER_LU=(
     FQ_PLU_NAME=NETID.NTSRV99
     ADJACENT_CP_NAME=NETID.TIER3B
     CONV_SECURITY_VERIFICATION=1
     MAX_MC_LL_SEND_SIZE=32767
     PARALLEL_SESSION_SUPPORT=1
     PARTNER_LU_ALIAS=NTSRV99
     PREFERENCE=USE_DEFAULT_PREFERENCE
)
```

Figure 532 (Part 4 of 5). Communicaition Server Profile for Tier 3a

```
TP=(
     TP_NAME=APINGD
     API_CLIENT_USE=0
     CONVERSATION_TYPE=EITHER
     DUPLEX_SUPPORT=EITHER_DUPLEX
     DYNAMIC_LOAD=1
     INCOMING_ALLOCATE_TIMEOUT=30
     LOAD_TYPE=0
     PATHNAME=d:\IBMCS\apingd.exe
     PIP_ALLOWED=1
     QUEUED=0
     RECEIVE_ALLOCATE_TIMEOUT=3600
     SECURITY_RQD=0
     SYNC_LEVEL=EITHER
     TP_INSTANCE_LIMIT=0
     TP_NAME_FORMAT=0
)
CPIC_SIDE_INFO=(
     SYM_DEST_NAME=CPIC
     CONVERSATION_SECURITY_TYPE=PROGRAM
     MODE_NAME=IBMRDB
     PARTNER_LU_NAME=NTSRV99
     SECURITY_PASSWORD=9EB6A946CF32EA56748B
     SECURITY_USER_ID=boernerf
     TP_NAME=076DB
     TP_NAME_TYPE=SNA_SERVICE
)
ADJACENT_NODE=(
     FQ_CP_NAME=NETID.TIER3B
     LU_ENTRY=(
          WILDCARD_LU=0
          FQ_LU_NAME=NETID.NTSRV99
     )
)
SPLIT_STACK=(
     POOL_NAME=<None>
     STARTUP=1
)
VERIFY=(
     CFG_MODIFICATION_LEVEL=12
     CFG_VERSION_LEVEL=1
)
```

Figure 532 (Part 5 of 5). Communicaition Server Profile for Tier 3a

C.2.7 The ADSM Server DSMSERV.OPT File

```
*  ==================================================================
*  ADSTAR Distributed Storage Manager
*  Server Options File - Version 3, Release 1, Level 0
*  5639-A09 (C) Copyright IBM Corporation, 1990, 1997,
*  All Rights Reserved.
*  ==================================================================
*
*   ADSTAR Distributed Storage Manager (ADSM):
*   Server Options File (dsmserv.opt)
*   Platform: Windows NT
*
*   Note -- This file was generated by the ADSM Options File Editor.
*
*  ====================================================================
*
*  HTTP
*
*   ********************************************************************
*   HTTPport
*
*   Specifies the HTTP port address of an ADSM Web interface.
*
*   Syntax
*   +------------------+----------------------------------------------+
*   | HTTPport         | port_addr                                    |
*   +------------------+----------------------------------------------+
*
COMMmethod HTTP
HTTPPort 1580
*
*  ====================================================================
*
*  TCPIP
*
*   ********************************************************************
*   TCPPort
*
*   Specifies the TCP/IP port address of an ADSM server.
*
*   Syntax
*   +------------------+----------------------------------------------+
*   | TCPPort          | port_addr                                    |
*   +------------------+----------------------------------------------+
*
COMMmethod TCPIP
TCPPort 1500
*
```

Figure 533 (Part 1 of 10). ADSM Server DSMSERV.OPT

```
*   ******************************************************************
*   TCPWindowsize
*
*   Specifies the amount of data to send or receive
*   before TCP/IP exchanges acknowledgements with the client node.
*   This actual window size that is used in a session will be the
*   minimum size of the server and client window sizes.
*   Larger window sizes may improve performance
*   at the expense of memory usage.
*
*   Syntax
*   +------------------+---------------------------------------------+
*   | TCPWindowsize    | window_size                                 |
*   +------------------+---------------------------------------------+
*
TCPWindowsize 0
*
*   ******************************************************************
*   TCPNODELAY
*
*   Specifies whether the server should send small amounts
*   of data or allow TCP/IP to buffer the data.
*   Disallowing buffering may improve throughput at the expense
*   of more packets being sent over the network.
*
*   Syntax
*   +------------------+---------------------------------------------+
*   | TCPNODELAY       | YES | NO                                    |
*   +------------------+---------------------------------------------+
*
TCPNODELAY No
*
*  ===================================================================
*
*  NAMEDPIPE
*
*   ******************************************************************
*   NAMEdpipename
*
*   Specifies the name of the ADSM server's named pipe.
*
*   Syntax
*   +------------------+---------------------------------------------+
*   | NAMEdpipename    | name                                        |
*   +------------------+---------------------------------------------+
*
COMMmethod NAMEDPIPE
NAMEdpipename \\.\pipe\adsmpipe
*
*  ===================================================================
*
*   ******************************************************************
*   NPBUFFERSIZE
*
*   Specifies the size of the named pipes communication buffer size
*   in KB.
*
*   Syntax
*   +-----------------------+-----------------------------------------+
*   | NPBUFFERSIZE          | value                                   |
*   +-----------------------+-----------------------------------------+
*
NPBUFFERSIZE 8
*
*  ===================================================================
*
*   ******************************************************************
*   SECUREPIPES
*
*   Specifies whether or not to use secure named pipes (NT Unified Logon.)
*
*   Specify a value of Yes or No
*
*   Syntax
*   +-----------------------+-----------------------------------------+
*   | SECUREPIPES           | value                                   |
*   +-----------------------+-----------------------------------------+
*
SECUREPipes No
```

Figure 533 (Part 2 of 10). ADSM Server DSMSERV.OPT

```
*
*  ==================================================================
*
*   ******************************************************************
*   ADSMGroup
*
*   Specifies the Windows NT Group name to use for authentication.
*
*   Syntax
*   +-----------------------+----------------------------------------+
*   | ADSMGROUP             | groupname                              |
*   +-----------------------+----------------------------------------+
*
ADSMGROUPname adsmserver
*
*   ******************************************************************
*   NPAUDITSuccess
*
*   Specifies whether or not to audit successful use of secure named pipes
*
*   Specify a value of Yes or No
*
*   Syntax
*   +-----------------------+----------------------------------------+
*   | NPAUDITSuccess        | value                                  |
*   +-----------------------+----------------------------------------+
*
NPAUDITSuccess No
*
*   ******************************************************************
*   NPAUDITFailure
*
*   Specifies whether or not to audit a failed attempt to use of secure
*   named pipes
*
*   Specify a value of Yes or No
*
*   Syntax
*   +-----------------------+----------------------------------------+
*   | NPAUDITFailure        | value                                  |
*   +-----------------------+----------------------------------------+
*
NPAUDITFailure No
*
*  ==================================================================
*
*  MSGINTERVAL
*
*   ******************************************************************
*   MSGINTerval
*
*   Specifies the number of minutes to wait between issuing a mount-tape
*   tape message on the ADSM server console.
*
*   Syntax
*   +------------------+---------------------------------------------+
*   | MSGINTerval      | value                                       |
*   +------------------+---------------------------------------------+
*
MSGINTerval 1
*
*  ==================================================================
*
*  MAXSESSIONS
*
*   ******************************************************************
*   MAXSessions
*
*   Specifies the number of simultaneous client sessions.
*
*   Syntax
*   +------------------+---------------------------------------------+
*   | MAXSessions      | value                                       |
*   +------------------+---------------------------------------------+
*
MAXSessions 25
```

Figure 533 (Part 3 of 10). ADSM Server DSMSERV.OPT

```
*
*  ====================================================================
*
*  BUFPOOLSIZE
*
*   ********************************************************************
*   BUFPoolsize
*
*   Specifies the size of the database buffer pool in Kbytes.
*
*   Syntax
*   +------------------+----------------------------------------------+
*   | BUFPoolsize      | value                                        |
*   +------------------+----------------------------------------------+
*
BUFPoolsize 2048
*
*  ====================================================================
*
*  LOGPOOLSIZE
*
*   ********************************************************************
*   LOGPoolsize
*
*   Specifies the size of the log buffer pool in Kbytes.
*
*   Syntax
*   +------------------+----------------------------------------------+
*   | LOGPoolsize      | value                                        |
*   +------------------+----------------------------------------------+
*
LOGPoolsize 512
*
*  ====================================================================
*
*  COMMTIMEOUT
*
*   ********************************************************************
*   COMMTimeout
*
*   Specifies the communication timeout value in seconds.
*
*   Syntax
*   +------------------+----------------------------------------------+
*   | COMMTimeout      | value                                        |
*   +------------------+----------------------------------------------+
*
COMMTimeout 60
*
*  ====================================================================
*
```

Figure 533 (Part 4 of 10). ADSM Server DSMSERV.OPT

```
*  IDLETIMEOUT
*
*   ********************************************************************
*   IDLETimeout
*
*   Specifies the number of seconds that a client session can be idle
*   before its session will be canceled.
*
*   Syntax
*   +------------------+----------------------------------------------+
*   | IDLETimeout      | value                                        |
*   +------------------+----------------------------------------------+
*
IDLETimeout 15
*
*  ====================================================================
*
*  TXNGroupmax
*
*   ********************************************************************
*   TXNGroupmax
*
*   Specifies the number of files tranferred as a group between commit
*   points.
*
*   Syntax
*   +------------------+----------------------------------------------+
*   | TXNGroupmax      | numfiles                                     |
*   +------------------+----------------------------------------------+
*
TXNGroupmax 40
*
*  ====================================================================
*
*  DATEFORMAT
*
*   ********************************************************************
*   DATEformat
*
*   Specifies the format in which date references will be displayed.
*
*   Syntax
*   +------------------+----------------------------------------------+
*   | DATEformat       | value                                        |
*   +------------------+----------------------------------------------+
*
DATEformat 1
*
*  ====================================================================
*
*  TIMEFORMAT
*
*   ********************************************************************
*   TIMEformat
*
*   Specifies the format in which time references will be displayed.
*
*   Syntax
*   +------------------+----------------------------------------------+
*   | TIMEformat       | value                                        |
*   +------------------+----------------------------------------------+
*
TIMEformat 1
*
*  ====================================================================
*
```

Figure 533 (Part 5 of 10). ADSM Server DSMSERV.OPT

```
*  NUMBERFORMAT
*
*   ********************************************************************
*   NUMberformat
*
*   Specifies the format in which number references will be displayed.
*
*   Syntax
*   +------------------+---------------------------------------------+
*   | NUMberformat     | value                                       |
*   +------------------+---------------------------------------------+
*
NUMberformat 1
*
*  ====================================================================
*
*  MESSAGEFORMAT
*
*   ********************************************************************
*   MESsageformat
*
*   Specifies the format in which messages will be displayed.
*
*   Syntax
*   +------------------+---------------------------------------------+
*   | MESsageformat    | value                                       |
*   +------------------+---------------------------------------------+
*
MESsageformat 1
*
*  ====================================================================
*
*  LANGUAGE
*
*   ********************************************************************
*   LANGuage
*
*   Specifies the language to use for help and error messages.
*
*   Syntax
*   +------------------+---------------------------------------------+
*   | LANGuage         | name                                        |
*   +------------------+---------------------------------------------+
*
LANGuage AMENG
*
*  ====================================================================
*
*  EXPINTERVAL
*
*   ********************************************************************
*   EXPInterval
*
*   Specifies the number of hours between automatic inventory expiration
*   runs.
*
*   Syntax
*   +------------------+---------------------------------------------+
*   | EXPInterval      | value                                       |
*   +------------------+---------------------------------------------+
*
```

Figure 533 (Part 6 of 10). ADSM Server DSMSERV.OPT

```
EXPInterval 24
*
*  ====================================================================
*
*  EXPQUIET
*
*   ********************************************************************
*   EXPQUiet
*
*   Reduces the number of policy change messages generated during
*   expiration processing.
*
*   Specify a value of Yes or No
*
*   Syntax
*   +------------------+----------------------------------------------+
*   | EXPQUiet         | value                                        |
*   +------------------+----------------------------------------------+
*
EXPQUiet Yes
*
*  ====================================================================
*  MIRRORREAD
*
*   ********************************************************************
*   MIRRORRead
*
*   Specifies the mode used for reading recovery log pages or data base
*   log pages
*
*   Syntax
*   +------------------+-----------+---------------------------------+
*   | MIRRORRead       | LOG | DB  |  Normal | Verify                |
*   +------------------+-----------+---------------------------------+
*
MIRRORRead DB Normal
*
*  ====================================================================
*
*   MIRRORWRITE
*
*   ********************************************************************
*     MIRRORWrite
*
*   Specifies how mirrored volumes are accessed when the server writes
*   pages to the recovery log or database during normal processing.
*
*   Syntax
*   +------------------+-----------+---------------------------------+
*   | MIRRORWrite      | LOG | DB  |  Sequential | Parallel          |
*   +------------------+-----------+---------------------------------+
*
MIRRORWrite DB Sequential
*
*  ====================================================================
*  MIRRORREAD
*
*   ********************************************************************
*   MIRRORRead
*
*   Specifies the mode used for reading recovery log pages or data base
*   log pages
*
*   Syntax
*   +------------------+-----------+---------------------------------+
*   | MIRRORRead       | LOG | DB  |  Normal | Verify                |
*   +------------------+-----------+---------------------------------+
*
MIRRORRead LOG Normal
```

Figure 533 (Part 7 of 10). ADSM Server DSMSERV.OPT

```
*
*  ====================================================================
*
*   MIRRORWRITE
*
*   ********************************************************************
*     MIRRORWrite
*
*   Specifies how mirrored volumes are accessed when the server writes
*   pages to the recovery log or database during normal processing.
*
*   Syntax
*   +------------------+-----------+---------------------------------+
*   | MIRRORWrite      | LOG | DB  |  Sequential | Parallel          |
*   +------------------+-----------+---------------------------------+
*
MIRRORWrite LOG Parallel
*
*  ====================================================================
*
*  MOVEBATCHSIZE
*
*   ********************************************************************
*   MOVEBatchsize
*
* Use this entry field to specify the number of files that are to be
* moved and grouped together in a batch within the same transaction.
*
* Specify a number between 1 and 256.
*
* The default value is 32.
*
*   Syntax
*   +------------------+---------------------------------------------+
*   | MOVEBatchsize    | value                                       |
*   +------------------+---------------------------------------------+
*
MOVEBatchsize 40
*
```

Figure 533 (Part 8 of 10). ADSM Server DSMSERV.OPT

```
*  ====================================================================
*
*  MOVESIZETHRESHOLD
*
*   ******************************************************************
*   MOVESizethreshold
*
* Use this entry field to specify a threshold, in megabytes, for the amount
* of data moved as a batch within the same server transaction. When this
* threshold is reached, no more files are added to the current batch. A
* new transaction is then started after the current batch is moved.
*
* Specify a number between 1 and 500 (megabytes).
*
* The default value is 1 (megabyte).
*
*   Syntax
*   +-------------------+---------------------------------------------+
*   | MOVESizethreshold | value                                       |
*   +-------------------+---------------------------------------------+
*
MOVESizethresh 500
*
*  ====================================================================
*
*  STATUSMSGCNT
*
*   ******************************************************************
*   STAtusmsgcnt
*
* Use this entry field to specify the number of records (times 1000)
* that will be processed between status messages during DSMSERV DUMPDB
* and DSMSERV LOADDB commands.
*
* Specify a number between 1 and 10000 (this number is multiplied by 1000).
*
* The default value is 10.
*
*   Syntax
*   +--------------------+---------------------------------------------+
*   | STAtusmsgcnt       | value                                       |
*   +--------------------+---------------------------------------------+
*
STAtusmsgcnt 1
*
*  ====================================================================
*
```

Figure 533 (Part 9 of 10). ADSM Server DSMSERV.OPT

```
*   VOLUMEHISTORY
*   ********************************************************************
*    VOLUMEHistory <filename>
*
*   Specifies the name of a file that should contain sequential
*   volume history information when it is changed by the server.
*   Sequential volume history information is used by the administrator
*   and server processes during server database recovery.
*
*   More than one of these parameters may be specified to record
*   sequential volume history information to multiple files
*
*   Syntax
*   +------------------+----------------------------------------------+
*   | VOLUMEHistory    | filename                                     |
*   +------------------+----------------------------------------------+
*
VOLUMEHistory volhist.out
*
*  ====================================================================
*
*   DEVCONFIG
*   ********************************************************************
*    DEVCONFig <filename>
*
*   Specifies the name of a file that should contain device
*   configuration information when it is changed by the server.
*   Device configuration information is used by the
*   server processes during server database recovery or load and
*   DSMSERV DUMPDB processing.
*
*   More than one of these parameters may be specified to record
*   device configuration information to multiple files.
*
*   Syntax
*   +------------------+----------------------------------------------+
*   | DEVCONFig        | filename                                     |
*   +------------------+----------------------------------------------+
*
DEVCONFig devcnfg.out
*
*  ====================================================================
*
*   ********************************************************************
*   RESTOREINTERVAL
*
*   Specifies the restore interval.
*
*   Syntax
*   +-----------------------+---------------------------------------+
*   | RESTOREINTERVAL       | value                                 |
*   +-----------------------+---------------------------------------+
*
RESTOREINTerval 1440
```

Figure 533 (Part 10 of 10). ADSM Server DSMSERV.OPT

C.3 Tier 3b

The server Tier 3b is configured as a CICS Server, Communications Server and ADSM Server.

C.3.1 The CICS Server Configuration - Tier 3b

The CICS Server file c:\opt\cics\bin\cicslcli.ini defines the CICS Server and the protocol it should use to communicate.

```
;*************************************************************************
;* IBM Local CICS Client - Initialization File                           *
;*************************************************************************
; Format:
;   Section = Name
;      Parameter = Value
;      Parameter = Value
;      ...
;
; "Section" must be either Client, Server or Driver.  There must be just
; one Client section but there may be several Server or Driver sections.
; For each type of section a set of Parameters and associated Values may
; be defined.  Often these may be omitted and will then assume sensible
; default values.  This sample INI file lists only those parameters that
; typically may required changing.
;
Client = *                      ; Auto-install client on the server
   MaxServers = 2               ; Matches MaxServers on the server

;-------------------------------------------------------------------------
; Server section - This section defines a server to which the client may
;                  connect.  There may be several Server sections.
;
; The Local Client is only supported via named pipe communications.
; The "Server" name must be unique within this initialization file
; and does not need to match any CICS Server name.
;
; The value of "NamedPipeName" is the method by which client and
; server are connected, this must match the value specified in the
; CICS Server Listener Definition (LD) "NamedPipeName" attribute.
;
Server = CICS01                 ; Arbitrary, unique name for the server
   Description = Named Pipe Support for local client ;
   Protocol = LOCALCLI          ; Matches with a Driver section below
   NetName = 00.00.00.00        ; Dummy
   NamedPipeName = CICSCC       ; Must match servers named pipe

Server = NTSRV99      ; Arbitrary, unique name for the server
   Description = Named Pipe Support for local client ;
   Protocol = LOCALCLI          ; Matches with a Driver section below
   NetName = 00.00.00.00        ; Dummy
   NamedPipeName = CICSAA       ; Must match servers named pipe

;-------------------------------------------------------------------------
; Driver section - This section defines a communications protocol DLL
;                  used to communicate with a server.  There may be
;                  several Driver sections.
;
; The Local Client is only supported by the named pipe communications DLL
;
Driver = LOCALCLI               ; Matches the Server's Protocol value
   DriverName = ERZCLPIP        ; Use the named pipe communications DLL

;*************************************************************************
;* End of file                                                           *
;*************************************************************************
```

Figure 534. Server Configuration for Tier 3b

C.3.2 The CICS Region Definition on Tier 3b

This file is located in C:\VAR\cics_regions\NTSRV99\RD\RD.NTSRV99. It is important not to manually edit the file. All changes to the file must be made via the GUI. The changes made to this file are highlighted. Remember that in this case we define DB2 as our storage area and not SFS.

```
#
# This file should only be altered using the CICS Resource Definition
# Online (RDO) facilities.
#


:ml7
ResourceDescription="Region Definition"
AmendCounter=4
Modifiable=no
StartType=auto.
Groups=
StartupProgList=
ShutdownProgList1=
ShutdownProgList2=
DefaultUserId="CICSUSER"
FileSystemType=DB2
RDBMSInstance=DB2
FileRSLCheck=external
TransientDataRSLCheck=external
TemporaryStorageRSLCheck=external
JournalRSLCheck=external
ProgramRSLCheck=external
TransactionRSLCheck=external
ESMLoad=no
ESMModule=""
RuntimeProtection=none
LogicalTDQProtection=none
PhysicalTDQProtection=none
NonRecTDQProtection=none
RecTSQProtection=none
NonRecTSQProtection=none
LocalQProtectProtection=none
LocalQProtection=none
ReleaseNum="0420"
LocalSysId="CD99" LocalNetworkName="NETID" CWASize=512
MinServer=1
MaxServer=5
ClassMaxTasks=1,1,1,1,1,1,1,1,1,1
ClassMaxTaskLim=0,0,0,0,0,0,0,0,0,0
ServerIdleLimit=3600
SafetyLevel=none
RPCListenerThreads=0
DateForm=ddmmyy
ClassTableSize=5,50,50,1,50,50,50,20,5,50,1,20,5,5
MaxRegionPool=4194304
MaxTaskPrivatePool=1048576
MaxTSHPool=1048576
RegionPoolThreshold=90
TaskShPoolThreshold=90
TaskSHNumBuckets=512
LoadDataNumBuckets=512
SysDump=no
PCDump=yes
ABDump=yes
DumpName="dumps"
CoreDumpName="dir1"
Trace=all
TraceModules=0
ExternalTrace=no
TraceFileA="trace.a"
TraceFileB="trace.b"
TraceFileSize=3276800
SysTraceBufferSize=163840
UserTraceDirectory="C:\VAR\cics_tmp"
PublicUserTraceFile="cicspubl"
IntrospectInterval=10
IntrospectLevel=minimal
ISCDelayMinutes=10
CUBSDelayMinutes=5
CARPDelayHours=8
ProtectPurgeDelayPeriod=8
PurgeDelayPeriod=8
StatsRecord=yes
StatFile="statsfile"
SufficesSupported=yes
CheckpointInterval=1000
DefaultFileServer=CICSDB
```

Figure 535 (Part 1 of 2). CICS RDF on Tier 3b

```
RecTSQFile="%Rrectsq#"
RecTSQIndex="dx%Rrectsq#"
RecTSQVol="sfs_%S"
RecTSQPrePages=5
RecTSQMaxRecs=1000000
NonRecTSQFile="%Rnrectsq#"
NonRecTSQIndex="dx%Rnrectsq#"
NonRecTSQVol="sfs_%S"
NonRecTSQPrePages=5
NonRecTSQMaxRecs=1000000
LogicalTDQFile="%Rlogtdq#"
LogicalTDQIndex="dx%Rlogtdq#"
LogicalTDQVol="sfs_%S"
LogicalTDQPrePages=5
LogicalTDQMaxRecs=1000000
PhysicalTDQFile="%Rphtdq#"
PhysicalTDQIndex="dx%Rphtdq#"
PhysicalTDQVol="sfs_%S"
PhysicalTDQPrePages=5
PhysicalTDQMaxRecs=1000000
NonRecTDQFile="%Rnrectdq#"
NonRecTDQIndex="dx%Rnrectdq#"
NonRecTDQVol="sfs_%S"
NonRecTDQPrePages=5
NonRecTDQMaxRecs=1000000
LocalQProtectFile="%Rlqprot#"
AutoDCELogin=no
LocalQProtectIndex="dx%Rlqprot#"
LocalQProtectVol="sfs_%S"
LocalQProtectPrePages=5
LocalQProtectMaxRecs=1000000
LocalQFile="%Rlque#"
LocalQIndex="dx%Rlque#"
LocalQVol="sfs_%S"
LocalQPrePages=5
LocalQMaxRecs=1000000
TSQAgeLimit=20
ProgramCacheSize=0
LocalLUName="NTSRV99" RegionPoolBase=0
TaskSharedPoolBase=0
ServerSideTran=no
AuthenticationService=CICS
NameService=NONE
AllowDebugging=no
ECIPasswordCacheSeconds=28800
AutoinstallMode=default
MaxConsoleSize=0
MaxTaskCPU=0
MaxTaskCPUAction=warning
TransDumpTrace=no
```

Figure 535 (Part 2 of 2). CICS RDF on Tier 3b

C.3.3 The CICS Communication Definition on Tier 3b

This file is located in C:\VAR\cics_regions\NTSRV99\CD\CD.NTSRV99. It is important to not manually edit the file. All changes to the file must be made via the GUI. The changes made to this file are highlighted. Remember that we define the SYSID of the partner node.

```
#
# This file should only be altered using the CICS Resource Definition
# Online (RDO) facilities.
#

:ml7
    GroupName               = ""
    ActivateOnStartup       = yes
    ResourceDescription     = "Communications Definition"
    AmendCounter            = 0
    Permanent               = no
    ConnectionType          = ppc_tcp
    RemoteLUName            = ""
    RemoteNetworkName       = ""
    SNAConnectName          = ""
    DefaultSNAModeName      = ""
    GatewayName             = ""
    ListenerName            = ""
    RemoteTCPAddress        = ""
    RemoteTCPPort             = 1435
    DCECell                 = "/.:/"
    AllocateTimeout           = 60
    RemoteCodePageTR        = "IBM-850"
    InService               = yes
    OutboundUserIds         = sent
    RemoteSysSecurity       = local
    LinkUserId              = ""
    TSLKeyMask              = none
    RSLKeyMask              = none
    RemoteSysEncrypt        = none


CD10: GroupName=""
ActivateOnStartup=yes
ResourceDescription="Communications Definition"
AmendCounter=0
Permanent=no
ConnectionType=local_sna
RemoteLUName="NTNCF101" RemoteNetworkName="NETID" SNAConnectName=""
DefaultSNAModeName="CICSISC0" GatewayName=""
ListenerName=""
RemoteTCPAddress=""
RemoteTCPPort=1435
DCECell="/.:/"
AllocateTimeout=60
RemoteCodePageTR="IBM-850"
InService=yes
OutboundUserIds=sent
RemoteSysSecurity=trusted LinkUserId=""
TSLKeyMask=none
RSLKeyMask=none
RemoteSysEncrypt=none
```

Figure 536. Communications Definition

C.3.4 The CICS Listener Definition on Tier 3b

This file is located in C:\VAR\cics_regions\NTSRV99\LD\LD.NTSRV99. It is important to not manually edit the file. All changes to the file must be made via the GUI. The changes made to this file are highlighted.

```
#
# This file should only be altered using the CICS Resource Definition
# Online (RDO) facilities.
#

:ml7
    GroupName               = ""
    ActivateOnStartup       = yes
    ResourceDescription     = "Listener Definition"
    AmendCounter            = 0
    Permanent               = no
    Protocol                = TCP
    TCPAddress              = ""
    TCPService              = ""
    SNAServerTransport      = TCP
    SNAServerIdentifier     = ""
    SNAServerNodeName       = ""
    NamedPipeName           = ""

TCPIP: GroupName=""
ActivateOnStartup=yes
ResourceDescription="Listener Definition"
AmendCounter=0
Permanent=no
Protocol=TCP TCPAddress="9.24.104.99"
TCPService=""
SNAServerTransport=TCP
SNAServerIdentifier=""
SNAServerNodeName=""
NamedPipeName=""


SNA: GroupName=""
ActivateOnStartup=yes
ResourceDescription="Listener Definition"
AmendCounter=0
Permanent=no
Protocol=SNA
TCPAddress=""
TCPService=""
SNAServerTransport=TCP
SNAServerIdentifier=""
SNAServerNodeName=""
NamedPipeName=""


LOCAL: GroupName=""
ActivateOnStartup=yes
ResourceDescription="Listener Definition"
AmendCounter=0
Permanent=no
Protocol=NamedPipe
TCPAddress=""
TCPService=""
SNAServerTransport=TCP
SNAServerIdentifier=""
SNAServerNodeName=""
NamedPipeName="CICSAA"
```

Figure 537. Listener Definition for Tier 3b

C.3.5 The CICS Transaction Definition on Tier 3b

This file is located in C:\VAR\cics_regions\NTSRV99\TD\TD.NTSRV99. It is important not to manually edit the file. All changes to the file must be made via the GUI. There was nothing to change in this file since we were not going to reroute the transactions anywhere else.

```
#
# This file should only be altered using the CICS Resource Definition
# Online (RDO) facilities.
#

we have removed the default definitions....

INQY:
GroupName=""
ActivateOnStartup=yes
ResourceDescription="IVP C Transaction"
TClass=no
AmendCounter=3
Permanent=no
EnableStatus=enabled
Dynamic=no
RemoteSysId=""
RemoteName=""
RSLKey=private
TSLKey=1
RSLCheck=none
TSLCheck=internal
TransDump=no
ProgName="DFHDALL"
TPNSNAProfile=""
TemplateDefined=no
IsBackEndDTP=no
TWASize=0
Priority=0
Purgeability=purgeable
Syncpoint=no_prompt_finish
DeadLockTimeout=0
InDoubt=wait_backout
UCTranFlag=no
SNAModeName=""
LocalQ=no
Timeout=0
InvocationMode=in_out_terminal|user_start|ATI_start|internal_ATI_start|
triggered_start|at_normal_running
MaxTaskCPU=0


ADDS:
GroupName=""
ActivateOnStartup=yes
ResourceDescription="IVP C Transaction"
TClass=no
AmendCounter=4
Permanent=no
EnableStatus=enabled
Dynamic=no
RemoteSysId=""
RemoteName=""
RSLKey=private
TSLKey=1
RSLCheck=none
TSLCheck=internal
TransDump=no
ProgName="DFHDALL"
TPNSNAProfile=""
TemplateDefined=no
IsBackEndDTP=no
TWASize=0
Priority=0
Purgeability=purgeable
Syncpoint=no_prompt_finish
DeadLockTimeout=0
InDoubt=wait_backout
UCTranFlag=no
SNAModeName=""
LocalQ=no
Timeout=0
InvocationMode=in_out_terminal|user_start|ATI_start|internal_ATI_start|
triggered_start|at_normal_running
MaxTaskCPU=0
```

Figure 538 (Part 1 of 4). CICS RDF on Tier 3b

```
UPDT:
GroupName=""
ActivateOnStartup=yes
ResourceDescription="IVP C Transaction"
TClass=no
AmendCounter=3
Permanent=no
EnableStatus=enabled
Dynamic=no
RemoteSysId=""
RemoteName=""
RSLKey=private
TSLKey=1
RSLCheck=none
TSLCheck=internal
TransDump=no
ProgName="DFHDALL"
TPNSNAProfile=""
TemplateDefined=no
IsBackEndDTP=no
TWASize=0
Priority=0
Purgeability=purgeable
Syncpoint=no_prompt_finish
DeadLockTimeout=0
InDoubt=wait_backout
UCTranFlag=no
SNAModeName=""
LocalQ=no
Timeout=0
InvocationMode=in_out_terminal|user_start|ATI_start|internal_ATI_start|
triggered_start|at_normal_running
MaxTaskCPU=0


BRWS:
GroupName=""
ActivateOnStartup=yes
ResourceDescription="IVP C Transaction"
TClass=no
AmendCounter=3
Permanent=no
EnableStatus=enabled
Dynamic=no
RemoteSysId=""
RemoteName=""
RSLKey=private
TSLKey=1
RSLCheck=none
TSLCheck=internal
TransDump=no
ProgName="DFHDBRW"
TPNSNAProfile=""
TemplateDefined=no
IsBackEndDTP=no
TWASize=0
Priority=0
Purgeability=purgeable
Syncpoint=no_prompt_finish
DeadLockTimeout=0
InDoubt=wait_backout
UCTranFlag=no
SNAModeName=""
LocalQ=no
Timeout=0
InvocationMode=in_out_terminal|user_start|ATI_start|internal_ATI_start|
triggered_start|at_normal_running
MaxTaskCPU=0
```

Figure 538 (Part 2 of 4). CICS RDF on Tier 3b

```
OREQ:
GroupName=""
ActivateOnStartup=yes
ResourceDescription="IVP C Transaction"
TClass=no
AmendCounter=3
Permanent=no
EnableStatus=enabled
Dynamic=no
RemoteSysId=""
RemoteName=""
RSLKey=private
TSLKey=1
RSLCheck=none
TSLCheck=internal
TransDump=no
ProgName="DFHDCOM"
TPNSNAProfile=""
TemplateDefined=no
IsBackEndDTP=no
TWASize=0
Priority=0
Purgeability=purgeable
Syncpoint=no_prompt_finish
DeadLockTimeout=0
InDoubt=wait_backout
UCTranFlag=no
SNAModeName=""
LocalQ=no
Timeout=0
InvocationMode=output_terminal|user_start|ATI_start|internal_ATI_start|
triggered_start|at_normal_running
MaxTaskCPU=0


MENU:
GroupName=""
ActivateOnStartup=yes
ResourceDescription="IVP C Transaction"
TClass=no
AmendCounter=6
Permanent=no
EnableStatus=enabled
Dynamic=no
RemoteSysId=""
RemoteName=""
RSLKey=private
TSLKey=1
RSLCheck=none
TSLCheck=internal
TransDump=no
ProgName="DFHDMNU"
TPNSNAProfile=""
TemplateDefined=no
IsBackEndDTP=no
TWASize=0
Priority=0
Purgeability=purgeable
Syncpoint=no_prompt_finish
DeadLockTimeout=0
InDoubt=wait_backout
UCTranFlag=no
SNAModeName=""
LocalQ=no
Timeout=0
InvocationMode=in_out_terminal|user_start|ATI_start|internal_ATI_start|
triggered_start|at_normal_running
MaxTaskCPU=0
```

Figure 538 (Part 3 of 4). CICS RDF on Tier 3b

```
OREN:
GroupName=""
ActivateOnStartup=yes
ResourceDescription="IVP C Transaction"
TClass=no
AmendCounter=3
Permanent=no
EnableStatus=enabled
Dynamic=no
RemoteSysId=""
RemoteName=""
RSLKey=private
TSLKey=1
RSLCheck=none
TSLCheck=internal
TransDump=no
ProgName="DFHDREN"
TPNSNAProfile=""
TemplateDefined=no
IsBackEndDTP=no
TWASize=0
Priority=0
Purgeability=purgeable
Syncpoint=no_prompt_finish
DeadLockTimeout=0
InDoubt=wait_backout
UCTranFlag=no
SNAModeName=""
LocalQ=no
Timeout=0
InvocationMode=in_out_terminal|user_start|ATI_start|internal_ATI_start|
triggered_start|at_normal_running
MaxTaskCPU=0
```

Figure 538 (Part 4 of 4). CICS RDF on Tier 3b

C.3.6 Communications Server - Tier 3b

The communications definition on Tier 3b, which defines a single APPC link to Tier 3a follows:

```
*TSWed Mar 11 12:56:48 1998
NODE=(
     ANYNET_SUPPORT=ANYNET_SUPPORTED
     CP_ALIAS=TIER3B
     DEFAULT_PREFERENCE=NATIVE
     DISCOVERY_SUPPORT=DISCOVERY_SERVER
     FQ_CP_NAME=NETID.TIER3B
     MAX_COMPRESSION_LEVEL=NONE
     NODE_ID=05D00000
     NODE_TYPE=NETWORK_NODE
     REGISTER_WITH_CDS=1
     REGISTER_WITH_NN=0
)
PORT=(
     PORT_NAME=LAN0_04
     DLC_DATA=00000000000004
     DLC_NAME=LAN
     IMPLICIT_CP_CP_SESS_SUPPORT=1
     IMPLICIT_DEACT_TIMER=0
     IMPLICIT_DSPU_SERVICES=NONE
     IMPLICIT_HPR_SUPPORT=1
     IMPLICIT_LIMITED_RESOURCE=NO
     LINK_STATION_ROLE=NEGOTIABLE
     MAX_IFRM_RCVD=8
     MAX_RCV_BTU_SIZE=65535
     PORT_TYPE=SATF
     PORT_LAN_SPECIFIC_DATA=(
          ACK_DELAY=100
          ACK_TIMEOUT=10000
          ADAPTER_NUMBER=0
          BUSY_STATE_TIMEOUT=15
          IDLE_STATE_TIMEOUT=30
          LOCAL_SAP=04
          OUTSTANDING_TRANSMITS=16
          POLL_TIMEOUT=8000
          POOL_SIZE=32
          REJECT_RESPONSE_TIMEOUT=10
          TEST_RETRY_INTERVAL=8
          TEST_RETRY_LIMIT=5
          XID_RETRY_INTERVAL=8
          XID_RETRY_LIMIT=5
     )
)
LINK_STATION=(
     LS_NAME=NTNCF101
     ACTIVATE_AT_STARTUP=1
     ADJACENT_NODE_TYPE=NETWORK_NODE
     AUTO_ACTIVATE_SUPPORT=0
     CP_CP_SESS_SUPPORT=1
     DEFAULT_NN_SERVER=0
     DEST_ADDRESS=40000000010104
     DISABLE_REMOTE_ACT=0
     DSPU_SERVICES=NONE
     FQ_ADJACENT_CP_NAME=NETID.TIER3A
     HPR_SUPPORT=0
     LIMITED_RESOURCE=NO
     LINK_DEACT_TIMER=0
     LINK_STATION_ROLE=USE_ADAPTER_DEFAULTS
     MAX_IFRM_RCVD=0
     MAX_SEND_BTU_SIZE=65535
     NODE_ID=05D00000
     PORT_NAME=LAN0_04
     SOLICIT_SSCP_SESSION=0
     TARGET_PACING_COUNT=1
     TG_NUMBER=0
     USE_DEFAULT_TG_CHARS=1
     USE_PU_NAME_IN_XID=0
)
DLUR_DEFAULTS=(
     DEFAULT_PU_NAME=TIER3B
     DLUS_RETRY_LIMIT=3
     DLUS_RETRY_TIMEOUT=5
)
```

Figure 539 (Part 1 of 4). Communications Server Tier 3b

```
LOCAL_LU=(
     LU_NAME=NTSRV99
     LU_ALIAS=NTSRV99
     LU_SESSION_LIMIT=0
     NAU_ADDRESS=0
     ROUTE_TO_CLIENT=0
     SYNCPT_SUPPORT=0
)
MODE=(
     MODE_NAME=BLANK
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#CONNECT
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=8192
     MAX_RU_SIZE_UPPER_BOUND=1024
     MIN_CONWINNERS_SOURCE=4096
     PLU_MODE_SESSION_LIMIT=8192
     RECEIVE_PACING_WINDOW=3
)
MODE=(
     MODE_NAME=#BATCH
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#BATCH
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=0
     MAX_NEGOTIABLE_SESSION_LIMIT=8192
     MAX_RU_SIZE_UPPER_BOUND=2048
     MIN_CONWINNERS_SOURCE=4096
     PLU_MODE_SESSION_LIMIT=8192
     RECEIVE_PACING_WINDOW=20
)
MODE=(
     MODE_NAME=#BATCHSC
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#BATCHSC
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=8
     MAX_RU_SIZE_UPPER_BOUND=2048
     MIN_CONWINNERS_SOURCE=4
     PLU_MODE_SESSION_LIMIT=8
     RECEIVE_PACING_WINDOW=3
)
MODE=(
     MODE_NAME=#INTER
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#INTER
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=8192
     MAX_RU_SIZE_UPPER_BOUND=4096
     MIN_CONWINNERS_SOURCE=4096
     PLU_MODE_SESSION_LIMIT=8192
     RECEIVE_PACING_WINDOW=20
)
MODE=(
     MODE_NAME=#INTERSC
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#INTERSC
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=8
     MAX_RU_SIZE_UPPER_BOUND=2048
     MIN_CONWINNERS_SOURCE=4
     PLU_MODE_SESSION_LIMIT=8
     RECEIVE_PACING_WINDOW=7
)
```

Figure 539 (Part 2 of 4). Communications Server Tier 3b

```
MODE=(
     MODE_NAME=CICSISC0
     AUTO_ACT=5
     COMPRESSION=PROHIBITED
     COS_NAME=#CONNECT
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=128
     MAX_RU_SIZE_UPPER_BOUND=4096
     MIN_CONWINNERS_SOURCE=5
     PLU_MODE_SESSION_LIMIT=10
     RECEIVE_PACING_WINDOW=1
)
MODE=(
     MODE_NAME=IBMRDB
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#CONNECT
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=128
     MAX_RU_SIZE_UPPER_BOUND=4096
     MIN_CONWINNERS_SOURCE=16
     PLU_MODE_SESSION_LIMIT=32
     RECEIVE_PACING_WINDOW=1
)
MODE=(
     MODE_NAME=QPCSUPP
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#CONNECT
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=52
     MAX_RU_SIZE_UPPER_BOUND=1024
     MIN_CONWINNERS_SOURCE=26
     PLU_MODE_SESSION_LIMIT=52
     RECEIVE_PACING_WINDOW=2
)
MODE=(
     MODE_NAME=QSERVER
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#CONNECT
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=64
     MAX_RU_SIZE_UPPER_BOUND=1024
     MIN_CONWINNERS_SOURCE=0
     PLU_MODE_SESSION_LIMIT=64
     RECEIVE_PACING_WINDOW=7
)
MODE=(
     MODE_NAME=SNASVCMG
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=SNASVCMG
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=0
     MAX_NEGOTIABLE_SESSION_LIMIT=2
     MAX_RU_SIZE_UPPER_BOUND=512
     MIN_CONWINNERS_SOURCE=1
     PLU_MODE_SESSION_LIMIT=2
     RECEIVE_PACING_WINDOW=1
)
PARTNER_LU=(
     FQ_PLU_NAME=NETID.NTNCF101
     ADJACENT_CP_NAME=NETID.TIER3A
     CONV_SECURITY_VERIFICATION=1
     MAX_MC_LL_SEND_SIZE=32767
     PARALLEL_SESSION_SUPPORT=1
     PARTNER_LU_ALIAS=NTNCF101
     PREFERENCE=USE_DEFAULT_PREFERENCE
)
```

Figure 539 (Part 3 of 4). Communications Server Tier 3b

```
TP=(
     TP_NAME=APINGD
     API_CLIENT_USE=0
     CONVERSATION_TYPE=EITHER
     DUPLEX_SUPPORT=EITHER_DUPLEX
     DYNAMIC_LOAD=1
     INCOMING_ALLOCATE_TIMEOUT=30
     LOAD_TYPE=0
     PATHNAME=C:\IBMCS\apingd.exe
     PIP_ALLOWED=1
     QUEUED=0
     RECEIVE_ALLOCATE_TIMEOUT=3600
     SECURITY_RQD=0
     SYNC_LEVEL=EITHER
     TP_INSTANCE_LIMIT=0
     TP_NAME_FORMAT=0
)
CPIC_SIDE_INFO=(
     SYM_DEST_NAME=CPIC
     CONVERSATION_SECURITY_TYPE=PROGRAM
     MODE_NAME=IBMRDB
     PARTNER_LU_NAME=NTNCF101
     SECURITY_PASSWORD=9EB6A946CF32EA56748B
     SECURITY_USER_ID=boernerf
     TP_NAME=076DB
     TP_NAME_TYPE=SNA_SERVICE
)
ADJACENT_NODE=(
     FQ_CP_NAME=NETID.TIER3A
     LU_ENTRY=(
          WILDCARD_LU=0
          FQ_LU_NAME=NETID.NTNCF101
     )
)
SPLIT_STACK=(
     POOL_NAME=<None>
     STARTUP=1
)
VERIFY=(
     CFG_MODIFICATION_LEVEL=12
     CFG_VERSION_LEVEL=1
)
```

Figure 539 (Part 4 of 4). Communications Server Tier 3b

Appendix D. Communications Server Profile for Tier-3a

This appendix contains a copy of the Communications Server profiles that were built in the scenarios in this book.

```
*TSThu Mar 26 12:23:58 1998
NODE=(
     ANYNET_SUPPORT=ANYNET_SUPPORTED
     CP_ALIAS=NTSRV48
     DEFAULT_PREFERENCE=NATIVE
     DISCOVERY_SUPPORT=DISCOVERY_CLIENT
     FQ_CP_NAME=NETID.NTSRV48
     MAX_COMPRESSION_LEVEL=RLE
     NODE_ID=05D10048
     NODE_TYPE=END_NODE
     REGISTER_WITH_CDS=1
     REGISTER_WITH_NN=1
)
PORT=(
     PORT_NAME=LAN0_04
     DLC_DATA=00000000000004
     DLC_NAME=LAN
     IMPLICIT_CP_CP_SESS_SUPPORT=1
     IMPLICIT_DEACT_TIMER=0
     IMPLICIT_DSPU_SERVICES=NONE
     IMPLICIT_HPR_SUPPORT=1
     IMPLICIT_LIMITED_RESOURCE=NO
     LINK_STATION_ROLE=NEGOTIABLE
     MAX_IFRM_RCVD=8
     MAX_RCV_BTU_SIZE=65535
     PORT_TYPE=SATF
     PORT_LAN_SPECIFIC_DATA=(
          ACK_DELAY=100
          ACK_TIMEOUT=10000
          ADAPTER_NUMBER=0
          BUSY_STATE_TIMEOUT=15
          IDLE_STATE_TIMEOUT=30
          LOCAL_SAP=04
          OUTSTANDING_TRANSMITS=16
          POLL_TIMEOUT=8000
          POOL_SIZE=32
          REJECT_RESPONSE_TIMEOUT=10
          TEST_RETRY_INTERVAL=8
          TEST_RETRY_LIMIT=5
          XID_RETRY_INTERVAL=8
          XID_RETRY_LIMIT=5
     )
)
LINK_STATION=(
     LS_NAME=LINK0000
     ACTIVATE_AT_STARTUP=1
     ADJACENT_NODE_TYPE=APPN_NODE
     AUTO_ACTIVATE_SUPPORT=0
     CP_CP_SESS_SUPPORT=1
     DEFAULT_NN_SERVER=0
     DEST_ADDRESS=40000000009904
     DISABLE_REMOTE_ACT=0
     DSPU_SERVICES=NONE
     HPR_SUPPORT=0
     LIMITED_RESOURCE=NO
     LINK_DEACT_TIMER=0
     LINK_STATION_ROLE=USE_ADAPTER_DEFAULTS
     MAX_IFRM_RCVD=0
     MAX_SEND_BTU_SIZE=65535
     NODE_ID=05D10048
     PORT_NAME=LAN0_04
     SOLICIT_SSCP_SESSION=0
     TARGET_PACING_COUNT=1
     TG_NUMBER=0
     USE_DEFAULT_TG_CHARS=1
     USE_PU_NAME_IN_XID=0
)
```

Figure 540 (Part 1 of 5). NTSRV48.ACG Configuration File

```
DLUR_DEFAULTS=(
     DEFAULT_PU_NAME=NTSRV48
     DLUS_RETRY_LIMIT=3
     DLUS_RETRY_TIMEOUT=5
)
LOCAL_LU=(
     LU_NAME=C5TIER3A
     LU_ALIAS=C5TIER3A
     LU_SESSION_LIMIT=0
     NAU_ADDRESS=0
     ROUTE_TO_CLIENT=0
     SYNCPT_SUPPORT=0
)
MODE=(
     MODE_NAME=BLANK
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#CONNECT
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=8192
     MAX_RU_SIZE_UPPER_BOUND=1024
     MIN_CONWINNERS_SOURCE=4096
     PLU_MODE_SESSION_LIMIT=8192
     RECEIVE_PACING_WINDOW=3
)
MODE=(
     MODE_NAME=#BATCH
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#BATCH
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=0
     MAX_NEGOTIABLE_SESSION_LIMIT=8192
     MAX_RU_SIZE_UPPER_BOUND=2048
     MIN_CONWINNERS_SOURCE=4096
     PLU_MODE_SESSION_LIMIT=8192
     RECEIVE_PACING_WINDOW=20
)
MODE=(
     MODE_NAME=#BATCHSC
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#BATCHSC
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=8
     MAX_RU_SIZE_UPPER_BOUND=2048
     MIN_CONWINNERS_SOURCE=4
     PLU_MODE_SESSION_LIMIT=8
     RECEIVE_PACING_WINDOW=3
)
MODE=(
     MODE_NAME=#INTER
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#INTER
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=8192
     MAX_RU_SIZE_UPPER_BOUND=4096
     MIN_CONWINNERS_SOURCE=4096
     PLU_MODE_SESSION_LIMIT=8192
     RECEIVE_PACING_WINDOW=20
)
```

Figure 540 (Part 2 of 5). NTSRV48.ACG Configuration File

```
MODE=(
     MODE_NAME=#INTERSC
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#INTERSC
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=8
     MAX_RU_SIZE_UPPER_BOUND=2048
     MIN_CONWINNERS_SOURCE=4
     PLU_MODE_SESSION_LIMIT=8
     RECEIVE_PACING_WINDOW=7
)
MODE=(
     MODE_NAME=IBMRDB
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#CONNECT
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=128
     MAX_RU_SIZE_UPPER_BOUND=4096
     MIN_CONWINNERS_SOURCE=16
     PLU_MODE_SESSION_LIMIT=32
     RECEIVE_PACING_WINDOW=1
)
MODE=(
     MODE_NAME=QPCSUPP
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#CONNECT
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=52
     MAX_RU_SIZE_UPPER_BOUND=1024
     MIN_CONWINNERS_SOURCE=26
     PLU_MODE_SESSION_LIMIT=52
     RECEIVE_PACING_WINDOW=2
)
```

Figure 540 (Part 3 of 5). NTSRV48.ACG Configuration File

```
MODE=(
     MODE_NAME=QSERVER
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=#CONNECT
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=1
     MAX_NEGOTIABLE_SESSION_LIMIT=64
     MAX_RU_SIZE_UPPER_BOUND=1024
     MIN_CONWINNERS_SOURCE=0
     PLU_MODE_SESSION_LIMIT=64
     RECEIVE_PACING_WINDOW=7
)
MODE=(
     MODE_NAME=SNASVCMG
     AUTO_ACT=0
     COMPRESSION=PROHIBITED
     COS_NAME=SNASVCMG
     CRYPTOGRAPHY=NONE
     DEFAULT_RU_SIZE=0
     MAX_NEGOTIABLE_SESSION_LIMIT=2
     MAX_RU_SIZE_UPPER_BOUND=512
     MIN_CONWINNERS_SOURCE=1
     PLU_MODE_SESSION_LIMIT=2
     RECEIVE_PACING_WINDOW=1
)
PARTNER_LU=(
     FQ_PLU_NAME=NETID.TIER3B
     ADJACENT_CP_NAME=NETID.TIER3B
     CONV_SECURITY_VERIFICATION=1
     MAX_MC_LL_SEND_SIZE=32767
     PARALLEL_SESSION_SUPPORT=1
     PARTNER_LU_ALIAS=NTSRV99
     PREFERENCE=USE_DEFAULT_PREFERENCE
)
TP=(
     TP_NAME=APINGD
     API_CLIENT_USE=0
     CONVERSATION_TYPE=EITHER
     DUPLEX_SUPPORT=EITHER_DUPLEX
     DYNAMIC_LOAD=1
     INCOMING_ALLOCATE_TIMEOUT=30
     LOAD_TYPE=0
     PATHNAME=D:\IBMCS\apingd.exe
     PIP_ALLOWED=1
     QUEUED=0
     RECEIVE_ALLOCATE_TIMEOUT=3600
     SECURITY_RQD=0
     SYNC_LEVEL=EITHER
     TP_INSTANCE_LIMIT=0
     TP_NAME_FORMAT=0
)
```

Figure 540 (Part 4 of 5). NTSRV48.ACG Configuration File

```
CPIC_SIDE_INFO=(
     SYM_DEST_NAME=DB2NTB
     CONVERSATION_SECURITY_TYPE=NONE
     MODE_NAME=IBMRDB
     PARTNER_LU_NAME=NTSRV99
     TP_NAME=CPIC
     TP_NAME_TYPE=APPLICATION_TP
)
ADJACENT_NODE=(
     FQ_CP_NAME=NETID.TIER3B
     LU_ENTRY=(
          WILDCARD_LU=0
          FQ_LU_NAME=NETID.TIER3B
     )
)
SPLIT_STACK=(
     POOL_NAME=<None>
     STARTUP=1
)
VERIFY=(
     CFG_MODIFICATION_LEVEL=12
     CFG_VERSION_LEVEL=1
)
```

Figure 540 (Part 5 of 5). NTSRV48.ACG Configuration File

Appendix E. Special Notices

This publication is intended to help programmers and analysts who are planning on implementing the IBM Enterprise Suite for Windows NT. The information in this publication is not intended as the specification of any programming interfaces that are provided by IBM Enterprise Suite for Windows NT. See the PUBLICATIONS section of the IBM Programming Announcement for IBM Enterprise Suite for Windows NT for more information about what publications are considered to be product documentation.

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Appendix F. Related Publications

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

F.1 International Technical Support Organization Publications

For information on ordering these ITSO publications see “How to Get ITSO Redbooks” on page 463.

- *ADSM V3 Technical Guide*, SG24-2236
- *ADSM Server for Windows NT Configuration and Recovery Examples* , SG24-4878
- *The Universal Connectivity Guide to DB2*, SG24-4894
- *IBM Communications Server for Windows NT 5.0*, SG24-2099
- *TME 10 Framework Version 3.2: An Introduction to the Lightweight Client Framework*, SG24-2025

F.2 Redbooks on CD-ROMs

Redbooks are also available on CD-ROMs. **Order a subscription** and receive updates 2-4 times a year at significant savings.

CD-ROM Title	Subscription Number	Collection Kit Number
System/390 Redbooks Collection	SBOF-7201	SK2T-2177
Networking and Systems Management Redbooks Collection	SBOF-7370	SK2T-6022
Transaction Processing and Data Management Redbook	SBOF-7240	SK2T-8038
Lotus Redbooks Collection	SBOF-6899	SK2T-8039
Tivoli Redbooks Collection	SBOF-6898	SK2T-8044
AS/400 Redbooks Collection	SBOF-7270	SK2T-2849
RS/6000 Redbooks Collection (HTML, BkMgr)	SBOF-7230	SK2T-8040
RS/6000 Redbooks Collection (PostScript)	SBOF-7205	SK2T-8041
RS/6000 Redbooks Collection (PDF Format)	SBOF-8700	SK2T-8043
Application Development Redbooks Collection	SBOF-7290	SK2T-8037

F.3 Other Publications

These publications are also relevant as further information sources:

- *CICS Client Gateway Version 2.0.1*, SC33-1821-01
- *CICS for Windows NT Administration Guide*, SC33-1881-01
- *ADSM Connect Agent for Lotus Notes, Installation and User's Guide*, SH26-4056
- *CICS for Windows NT, Concepts and Facilities* , GC33-1878
- *Getting Started with the Domino Server 4.6*

How to Get ITSO Redbooks

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

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

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- **PUBORDER** — to order hardcopies in United States
- **GOPHER link to the Internet** - type `GOPHER.WTSCPOK.ITSO.IBM.COM`
- **Tools disks**

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

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

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

  ```
  TOOLCAT REDBOOKS
  ```

  To get lists of redbooks, type the following command:

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

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

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

  For a list of product area specialists in the ITSO: type the following command:

  ```
  TOOLS SENDTO WTSCPOK TOOLS ZDISK GET ORGCARD PACKAGE
  ```

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

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

- **IBM Direct Publications Catalog on the World Wide Web**

  `http://www.elink.ibmlink.ibm.com/pbl/pbl`

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For information so current it is still in the process of being written, look at "Redpieces" on the Redbooks Web Site (`http://www.redbooks.ibm.com/redpieces.html`). Redpieces are redbooks in progress; not all redbooks become redpieces, and sometimes just a few chapters will be published this way. The intent is to get the information out much quicker than the formal publishing process allows.

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Outside North America:	dkibmbsh at ibmmail	bookshop@dk.ibm.com

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United States (toll free)	1-800-879-2755
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(+45) 4810-1420 - Dutch	(+45) 4810-1620 - Italian
(+45) 4810-1540 - English	(+45) 4810-1270 - Norwegian
(+45) 4810-1670 - Finnish	(+45) 4810-1120 - Spanish
(+45) 4810-1220 - French	(+45) 4810-1170 - Swedish

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- **Fax** — send orders to:

United States (toll free)	1-800-445-9269
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