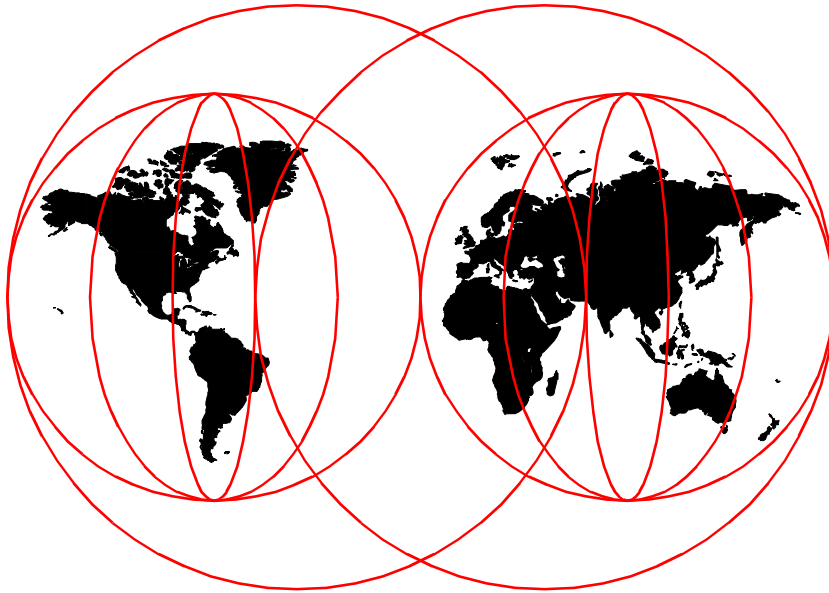


Exploring Net.Commerce Hosting Server

Yu-Phing Ong, Claus Dreyer, Yoonkyoung Kang, Youngwook Kim, Daesung Chung



International Technical Support Organization

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Exploring Net.Commerce Hosting Server

September 1999

Take Note!

Before using this information and the product it supports, be sure to read the general information in Appendix C, "Special Notices" on page 307.

First Edition (September 1999)

This edition applies to 3.1.2 of IBM Net.Commerce Hosting Server with the plugin tool for use with the IBM AIX 4.3.2.

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Preface

This redbook is intended as a guide for readers who want to implement e-commerce hosting service with the IBM Net.Commerce Hosting Server (NCHS). The authors assume that the readers of this book have a basic understanding of IBM Net.Commerce. Readers who want to get further information on any of the products referenced in this book may refer to the related documentations cited in Appendix D, "Related publications" on page 311.

This redbook covers three different subjects. The first subject discusses the planning and installation of NCHS. The second subject is about basic customization of NCHS. The third subject is on how to manage NCHS including database management and performance tuning.

The team that wrote this redbook

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Chapter 1. Introduction to Net.Commerce Hosting Server

This chapter presents how e-commerce site hosting is a growth opportunity for CSPs, how to meet the need for hosted e-commerce, the architecture and components of Net.Commerce Hosting Server, added functions of Net.Commerce Hosting Server, and the features of the Net.Commerce and Net.Commerce Hosting Server

1.1 Need for e-commerce hosting

The Internet now means serious business for thousands of small to mid-sized organizations. Many companies now know that an important contributor to growth is electronic sales, that is, selling products and services to new customers on the Internet. Yet, many of these companies are inexperienced in these areas. They lack the resources and skills to create and host their own e-commerce sites. Others prefer to focus on their core competencies: selection, merchandising, service, customization, and delivery.

Net.Commerce Hosting Server provides a way to become a Commerce Service Provider(CSP) by providing e-commerce sites for companies. By establishing a site for someone else, you receive monthly income and are first in line for service revenues for integrating the site-to-client order processing systems or customizing the site. You can add value to your core e-commerce platform with new and unique capabilities. This makes it easier for you to specialize in particular markets and attract new clients.

Prospects for hosted e-commerce services are as follows:

- **Merchandisers and resellers needing a Web site**

There are thousands of merchandisers and resellers who are small or medium-sized businesses who want to sell their goods and services on the Web. They sell to consumers and other business. Most do not have the expertise or resources required to create an e-commerce site and keep it fully operational 24 hours a day, seven days a week. These companies are a prime audience for e-commerce services from a CSP.

- **Manufacturers needing advanced applications and technology for online sales**

Smaller, specialized manufacturers often use skilled (and costly) sales channels. Depending on the product, they sell to other businesses, consumers, or both. To grow, they need to go online, but their products require high-end catalog systems or sophisticated search and customer assistance metaphors that they do not have the resources to develop or

operate. So, the CSP's opportunity is to assemble and integrate advanced applications and infrastructures and enable companies to use them at a fraction of the investment and time required to go it alone. In this way, the CSP earns new revenue from multiple customers for advanced applications.

- **Service organizations with online offerings**

Many consumer and business services can be sold successfully online. Examples include music, sports and cultural events, travel, real estate and insurance brokerage, design, advertising, consulting, and even accounting services. The e-business process for service organizations normally includes an e-commerce platform plus one or more applications specific to the line of business. The CSP opportunity for service organizations includes hosting the e-commerce site and integrating it with the specialized service applications.

- **Industry groups with common needs**

Many industries present natural opportunities for information and technology sharing, such as uniform data formats and processes for sales transactions or standard product/service specifications. Opportunities can be found among similar businesses in a market or trading partners arrayed along a supply chain. These situations involve groups of potential customers with similar or complementary needs. While any player may not be able to convince its peer to agree on processes and standards, a business/industry association, consortium, or other umbrella group can provide a comfortable way for the industry participants to work together.

Sometimes these needs can be met through imaginative use of e-commerce tools. The umbrella organization may choose to provide the e-commerce platform in a way that all members can use its service. Alternatively, the umbrella organization can certify one, or a small number, of service providers (such as a CSP) to provide the necessary e-commerce service. This approach has been used in years past with Electronic Data Interchange (EDI) networks and with credit card issuance and processing.

1.2 Overview of Net.Commerce Hosting Server

In this section a overview of the Net.Commerce Hosting server and its advantages are discussed.

1.2.1 IBM Net.Commerce Hosting Server description

The Net.Commerce Hosting Server is a packaged solution providing a platform for creating and operating hosted e-commerce services. It enables service providers to *lease* hosted Web storefronts to businesses who are not ready or able to make in-house IT investment in e-commerce. Storefront rental is an ideal option for small businesses who lack the expertise or resources to develop, operate, and maintain an e-commerce site, or for any business just wanting to test e-commerce as a new channel before making a bigger investment.

The Net.Commerce Hosting Server is an integrated solution built on the scalable, multi-site platform of Net.Commerce Version 3. It provides a cost effective, low maintenance way for CSPs to provide complete e-commerce solutions to multiple sellers. An e-commerce site created on the Net.Commerce Hosting Server automatically supports all of the basic features required to do business on the Web including:

- Shopper registration and address book
- Catalog of departments and products for browsing and searching
- Shopping cart
- Tax and shipping calculation
- Online credit card authorization
- Order submission and notification
- Broadcast e-mail
- Customer support
- Statistical reporting

In addition, the Net.Commerce Hosting Server exploits the WebSphere Application Server, which is included in the Net.Commerce Hosting Server package.

The Net.Commerce Hosting Server provides built-in features and tools to support the following tasks:

- **Service setup**
 - Guide to operating the service
 - Customizable CSP starter site
 - Private labeling of the merchant interface
 - Seller management interface

- Granular seller access control
- Online seller sign-up and profile interface
- Site/mall directory template
- **Service operations**
 - Notification of system events
 - Seller customer service interface
 - Broadcast e-mail to sellers
 - Store activation/deactivation
 - Configurable tracking of billable events
- **Site analysis**
 - Automatic, scheduled routing of summary of site activity
 - On-demand reports of cross-store traffic, sales, shoppers, and more
- **Store creation**
 - Easy-to-use merchant tools
 - Enhanced store creation process
 - Visual site design with preconfigured options
 - Merchant asset management for page graphics
 - Catalog data entry/update tool
- **Store operations**
 - Seller ability to open, close, publish store
 - E-mail notification of system events and errors
 - Shopper customer service interface
 - Broadcast e-mail to shoppers
- **Order management**
 - Automatic e-mail order notification
 - Order query and processing interface
 - E-mail buyer of order status changes
- **Store analysis**
 - Automatic, scheduled routing of summary of store activity
 - On-demand reports of store traffic, sales, shoppers, and more
- **Payment processing**

- Off-line payment for alternative or manual payment methods
- Online credit card payment with CyberCash integration and configuration. SET protocol is not supported with this payment method.
- Online credit card payment with IBM Payment Server cassette. The IBM Payment Server is enrolled in the SET Secure Electronic Transaction (SET) compliance process
- Encryption of payment information in the database
- **Sales tax calculation**
 - Configuration wizard
 - Jurisdiction-based sales tax calculation
- **Shipping**
 - Configuration wizard
 - Jurisdiction-based shipping cost calculation

Year 2000

The products in the Net.Commerce Hosting Server package are Year 2000 ready. When used in accordance with their associated documentation, they are capable of correctly processing, providing, and/or receiving date data within and between the twentieth and twenty-first centuries.

1.2.2 Advantages of NCHS

Unlike other e-commerce platforms, the features, tools, and documentation of the Net.Commerce Hosting Server are oriented towards running a hosted service for multiple customers, not to just running a single e-commerce site. The advantages for CSP are as follows:

1.2.2.1 Advantages for CSPs

The advantages of the Net.Commerce Hosting Server for CSPs are as follows.

- **Low cost and ease of operation** - The product automates operations such as merchant sign-up and enablement, reporting, order notification, merchant support, and error notification.
- **Quick time to market** - Tools and documentation guide every aspect of service setup and operations. Basic, end-to-end e-commerce functionality is built-in.

- **Ease of merchant enablement and support** - The product includes tools, wizards, pre-fabricated templates, self-service administration, and built-in customer support.
- **New revenue opportunities** - This feature can be offered to merchants as part of the basic service or for an additional price. The system is also extendible to support new features and services.
- **Flexible options** - The product supports common hosting business models, such as mall, shared, or virtual. It also provides a flexible architecture, support for multiple platforms, and many customization and integration points.

1.2.2.2 Advantages for merchants

The benefits of the Net.Commerce Hosting Server for merchants are summarized as follows.

- **Quick time to market** - Sellers do not have to learn new skills or hire a new staff to do commerce on the Web. Easy-to-use tools allow them to quickly gain an e-commerce presence on the Web, freeing them to focus on doing business.
- **Low cost, low risk** - Sellers do not have to invest in the IT resources required to do business on the Web. For a known, manageable fee each month, they get the assurance of continued operations and support. They can test the new channel with less risk.
- **Self-service** - Easy-to-use, browser-based tools provide the seller 24-hour access to their store to perform daily tasks such as updating the catalog, querying and processing orders, and viewing store reports. Automatic customer service functions and CyberCash Credit Card payment processing is also provided.
- **Security and reliability** - The software behind the services is proven, industry-standard technology from IBM. The security and integrity of the data and transactions are assured.
- **Ready adaptability and extensibility** - As the success of a seller's store grows, it can be scaled appropriately. It can also be adapted and extended with advanced commerce features and a customized look and feel, all using the same set of tools without starting over.
- **Staying up-to-date, cost-effectively** - Rapid evolution of technology requires a high continuing investment in technical learning to stay competitive. Merchandising companies often decide that it can be more cost-effective to leverage another organization's investment in staying up-to-date with technology than to do it for themselves. This is good news for the CSP or other hosting providers. Hosting provides yet another way

to leverage the technical skills and knowledge you have developed in your other services, whether ISP, Web site development, systems integration, or transaction processing.

1.3 NCHS architecture

In this section, the overall architecture of the Net.Commerce Hosting Server is reviewed. The following diagram illustrates the various components of the Net.Commerce Hosting Server.

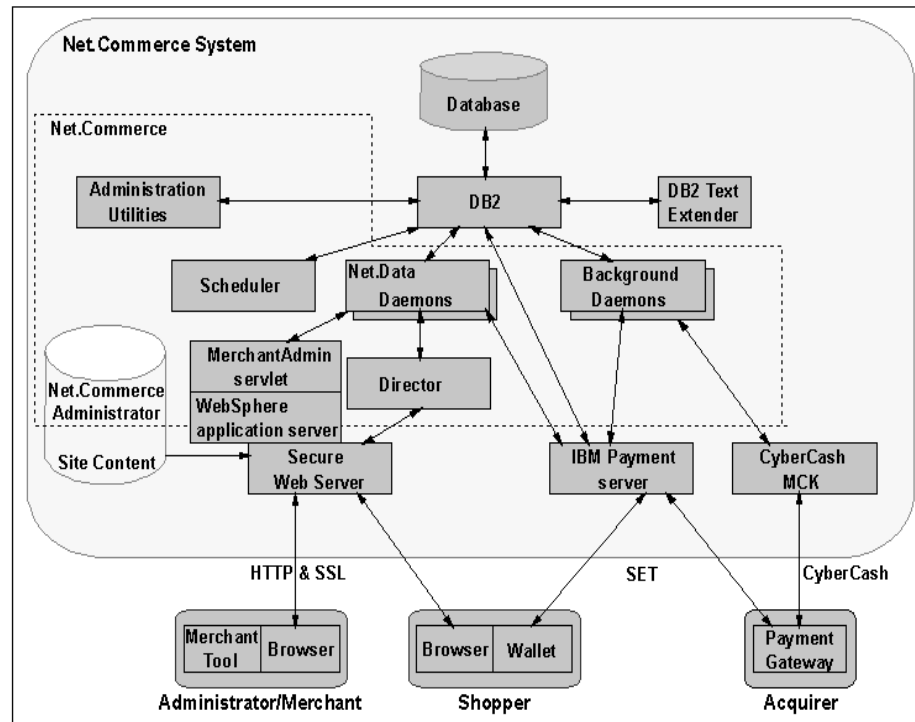


Figure 1. Net.Commerce Hosting Server system diagram

The Net.Commerce Hosting Server consists of the following components:

- **IBM Net.Commerce START** - Merchant server software
- **DB2 Universal Database** - A multimedia, Web-ready relational database management system for business intelligence and transaction processing.
- **Domino Go Webserver** - Web server for advanced site design and management.

- **Net.Data** - Database connectivity for Internet and intranet applications.
- **IBM Payment Server** - A Java-based cash register that provides the total security solution for handling credit cards on the Internet.
- **CyberCash Merchant Connection Kit** - Allows sellers to use CyberCash to authorize and process credit card payments for orders placed in their stores
- **CSP Starter Site** - A pre-configured, customizable *site in a box* for the CSPs hosted electronic commerce service
- **Merchant Pack** - The tools and documentation for sellers to use to design their site, create their catalog, and operate their store

1.3.1 Overview of NCHS components and features

The Net.Commerce Hosting Server meets the needs of three tiers of Internet commerce:

- Buyers on the Web - Consumer and business
- Sellers - Merchandisers, manufacturers, services, and associations
- Commerce Service Providers - Internet savvy ISPs, telcos, Web agencies, financial institutions, consortia, and others

At the core of the Net.Commerce Hosting Server is Net.Commerce V3, the award-winning, inherently scalable, cross-platform server of choice for electronic commerce. Net.Commerce is highly customizable and provides a range of e-commerce features appreciated by buyers and sellers alike.

The Net.Commerce Hosting Server's ease of setup for sellers comes from IBM Homepage Creator, which is built into the Merchant Pack and possibly the most user friendly, yet powerful, commerce site development tool available.

The Net.Commerce Hosting Server provides components and features needed by CSPs to operate a hosted e-commerce service. Those features are illustrated in Figure 2 on page 9.

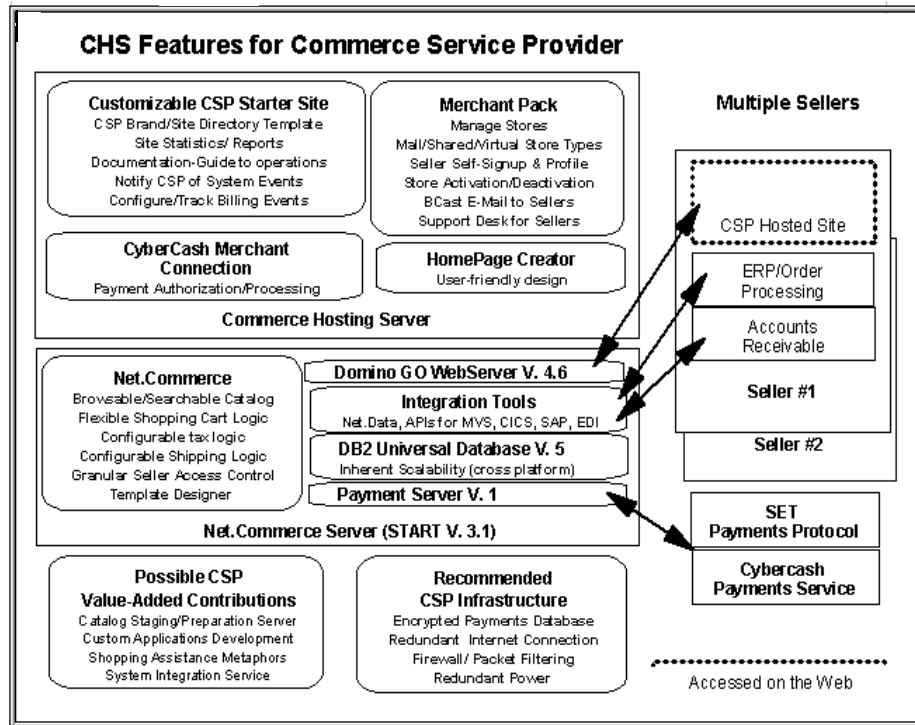


Figure 2. Net.Commerce Hosting Server features for CSP

The Net.Commerce Hosting Server also provides components and features needed by sellers (merchandisers, manufacturers, services, and associations) and buyers (consumers and business) for Internet commerce. Those features are illustrated in Figure 3 on page 10.

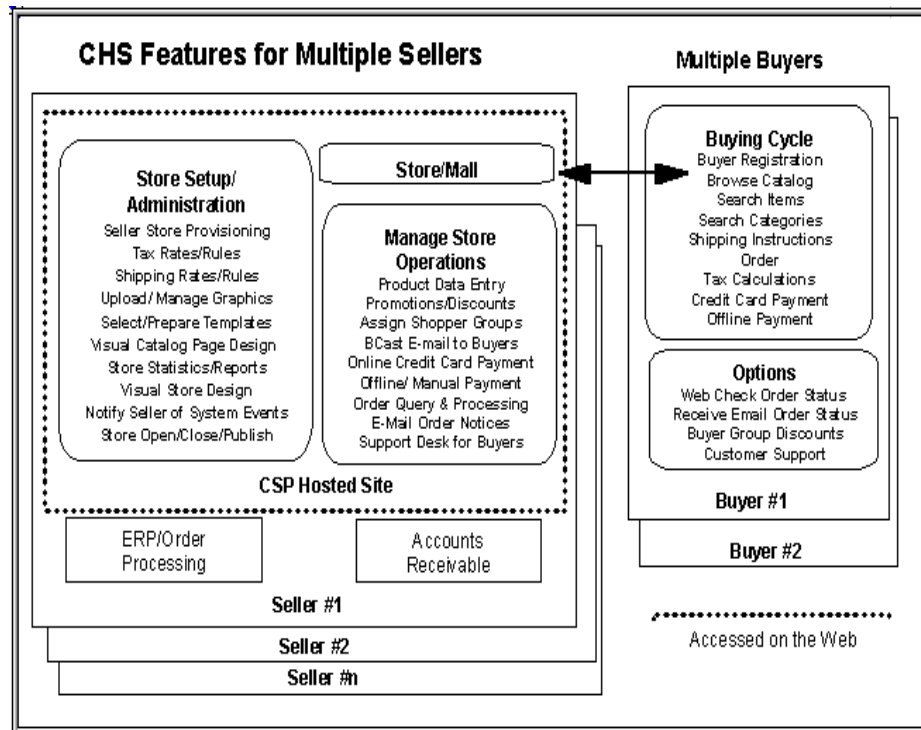


Figure 3. Net.Commerce Hosting Server features for multiple sellers

1.3.2 Domino Go Webserver

The Domino Go Webserver is a high performance, security-rich, transaction ready Web server. It proves Web developers and e-business managers with the necessary capabilities to quickly build, deploy, manage, and continuously improve their Web site environment.

The Domino Go Webserver works very closely with the Net.Commerce Hosting Server providing the means by which the Net.Commerce Hosting Server interacts with shoppers across the Internet.

When the Net.Commerce Hosting Server is set up, it creates a Web server instance that is used to service all interaction between a shopper and Net.Comemrcce Hosting Server. The Web server instance listens for http requests on the default port 80 and for https requests on the default port 443. Whenever a page related to the Net.Commerce Hosting Server is requested by a shopper, the Web server passes the request to the Net.Comemrcce Server director to process.

The Webserver is also responsible for implementing password validation for Net.Commerce Hosting Server requests. When a shopper registers, the user ID and password are stored in the Net.Commerce Hosting Server's validation list. The Web server then ensures that private information related to that shopper requires the user ID and password for access. The Web server also encrypts the conversation between the shopper and the Net.Commerce Hosting Server so that sensitive information, such as credit card numbers, can be kept safe.

Domino Go supports Web site types ranging from informational to transactional and includes tools for Web usage reporting and analysis. It runs on a wide range of computing platforms: Windows NT, OS/2 Warp, AIX, Sun Solaris, HP-UX, OS/400, and OS/390. And, Domino Go Webserver includes the Java development support including JDK 1.1 servlets and Server Side Includes and supports a range of Internet standards including HTTP 1.0 and 1.1, SSL V3, SHTTP (Secure HTTP), CGI, and so forth.

1.3.3 Net.Data

Net.Data is a CGI program that interprets macros and allows the creation of dynamic Web pages. A dynamic Web page, unlike a static one, can contain information that changes with time and context, such as the current level of inventory of a requested item. Net.Data provides a simple macro language and a rich function set that helps create such pages easily.

A Net.Data macro contains Net.Data directives, HTML tags, or SQL statements in plain text. This can be created with any text editor. The macro is invoked through the Secure Web Server, which uses the Net.Data CGI program to execute the requested macro.

In detail, Net.Commerce Hosting Server commands are generated in the buyer's browser by purchasing action. When received by the Net.Commerce Hosting Server, the commands invoke tasks that invoke macros or overridable functions to perform the called-for activity. Macros are based on Net.Data, SQL and HTML. They control the flow and appearance of the buying experience from the server side. Macros open up the buying process so that CSP can make small adjustments or major extensions. The Net.Data statements control processing; SQL statements search for and retrieve information from the Net.Commerce Hosting Server database; and the HTML defines the layout of the search results. Java can be added as well to provide additional functions in the end user's browser if needed.

The Net.Commerce Hosting Server uses Net.Data macros to display dynamic pages for stores and malls containing updated information customized for the

shopper. You can add your own macros or modify the existing macros to refine the presentation of a mall/store in the Net.Commerce Hosting Server.

1.3.4 DB2 Text Extender

The DB2 Text Extender adds the power of full-text retrieval to SQL queries by making use of features available in DB2 that lets you retrieve unstructured text documents. The DB2 Text Extender offers DB2 users and application programmers a fast, versatile, and intelligent method of searching through such text documents. The DB2 Text Extender's strength lies in its ability to search through many thousands of large text documents at a high speed, finding not only what you directly ask for, but also word variation and synonyms.

The DB2 Text Extender is a text retrieval program. It provides extensions to SQL. It works with a powerful and intelligent search engine to retrieve unstructured text stored in DB2 databases. Integrating the DB2 Text Extender into Net.Commerce Hosting Server stores allows shoppers to search for products more effectively. The DB2 Text Extender enables the supplier/seller to include synonyms, inexact matches, and proximity searches into the pages used by customers to find products or other information. Boolean and wildcard searches can be used as well.

The retrieval system of the DB2 Text Extender generates an internal index that contains significant words extracted from text in database columns as well as a reference to the column text. When a shopper initiates a search from within a mall or store, the retrieval system looks for a match between the shopper's input and the words in the index. When it finds a match, the corresponding column data is retrieved from the appropriate table in the database and displayed. Because the retrieval system searches through the index, the search is faster.

The DB2 Text Extender can perform searches for the following:

- Specific words or phrases, such as hammer or men's clothing.
- Synonyms of a word or phrase. For example, a shopper searching for the word book would also find products called article, volume, or manual.
- Words in proximity. For example, a shopper can search for the word jeans in the same sentence or paragraph as pants.
- Variation of a word, such as its plural form or a different tense. For example, a shopper searching for the word drive would also find driving, drove, and driven.

The searches can be wildcard in nature and use front, middle, and end masking and word and character masking. For example, a shopper can search for words that begin with the characters book or phrases that end with the word card. The DB2 Text Extender can access any kind of text including various languages and formats.

The DB2 Text Extender's powerful linguistic search technology includes text-analysis features, such as:

- Recognizing terms that contain non-alphanumeric characters, such as don't or \$14,225.
- Normalizing mixed-case terms and terms containing accented or special characters to a standard form. This allows a shopper to search for computer and also find Computer, or search for multi-media and also find multimedia.
- Reducing terms to their base form. A term, such as media, is reduced to its base form, medium. Conjugated verbs (such as bought) are reduced to their infinitives (buy). This allows the shopper to search for a product either by its name in the database or by some variation.

The DB2 Text Extender can be used to perform searches only in DB2 databases.

1.3.5 IBM Payment Server

The IBM Payment Server is a cash register on the Internet. For example, using the IBM Payment Server, credit cards can be accepted just as a salesperson accepts a credit card in a store. Consumers wishing to make a purchase from the Web site simply choose from a list of available payment methods. The IBM Payment Server is then activated. The IBM Payment Server will handle the necessary authorization requests and recording of the transaction in the company's database. This process happens automatically. With the IBM Payment Server, money can be collected from consumers easily and with security. IBM's flexible framework ensures that the capabilities of the IBM Payment Server will grow with the Internet and be enhanced as new methods of payment become available. The IBM Payment Server also manages the payment process, from communicating with the consumer to drafts with your financial institution. Records of transactions are maintained to facilitate later reconciliation and reporting. The IBM Payment Server includes a component to process digital certificates from an organization using certificate authority software, such as IBM Payment Registry. The IBM Payment Server is easily tailored to an industry, a way of doing business, and any existing technologies. The IBM Payment Server supports the following payment protocols available on the Web today:

- SET protocol for credit/charge card transactions
- SET debit card transactions

IBM has developed payment cassettes containing the protocol for using each type of payment. A new payment option is obtained by plugging in a new cassette. Changes to the existing system are kept to a minimum. New payment cassettes are being created as the technology becomes available on the Internet.

Payments made by consumers flow to the IBM Payment Server, which then communicates with back-end systems, such as financial institutions and payment processors. The IBM Payment Server handles all the payment transactions for the merchant and acts as a payment server (using established network payment protocols) alongside the merchant server or Web page. The IBM Payment Server can be customized to work with a merchant system using Web-based interfaces or APIs. It is an open system, written in Java, and can run on multiple platforms.

The IBM Payment Server contains a common payment API that is used for all payment types and functions: Receipt, approval, deposit, and refund. This API is implemented by the payment cassettes that contain the various types of payment protocols. Based on the consumer's selection of payment type, the IBM Payment Server selects the appropriate payment cassette to start the payment process.

1.3.6 CyberCash Merchant Connection Kit

CyberCash allows you to integrate secure online payment processes through an application called the CyberCash CashRegister. When merchants want to enable CyberCash payment at their stores, they must contact CyberCash to request an account. When merchants set up online payment with the Payment Setup Wizard within the merchant tool, they need to enter three pieces of CyberCash account information: A CyberCash ID, secret, and merchant key.

The CyberCash CashRegister is an application that enables secure online transactions. If your Acquire institution (the bank or financial institution that authorizes you to accept payment cards) uses the CyberCash gateway, then you can use the CashRegister to accept and process online payments. Net.Commerce contains DLLs and overridable functions to enable you to use the CashRegister from your storefront.

In the Net.Commerce Hosting Server, CyberCash provides the Merchant Connection Kit (MCK), which includes sample scripts, templates, and libraries

to help your merchants connect the merchant servers to the CashRegister Service. The MCK is designed to minimize the effort when service upgrades are introduced. Over time, service improvements will be implemented on CyberCash CashRegister servers behind the scenes allowing the partners or merchants to have no change at the MCK.

The benefits of this new technology include:

- Easy to install and certify at the merchant host location.
- Simple to operate and query through the Administration Server interface.
- Minimal hardware required.
- Immediate upgrades, revisions, and fixes are completed at CyberCash, which do not affect the merchant.
- Certificate requests imbedded in the registration process for SET enabled merchants.
- Simple definition and configuration of:
 - html files
 - scripts
 - templates

1.4 Added features in Net.Commerce Hosting Server

The Net.Commerce Hosting Server is a solution for a hosting service. Therefore, it includes added features for CSPs as well as the basic Net.commerce features (see Figure 4 on page 16). In addition, it provides a new GUI called merchant tool.

1.4.1 New functions

Net.Commerce site manager form

First, take a look at the NetCommerce hosting site manager form. To do this, go to http://your_hostname/ncadmin, then click **Site manager**.

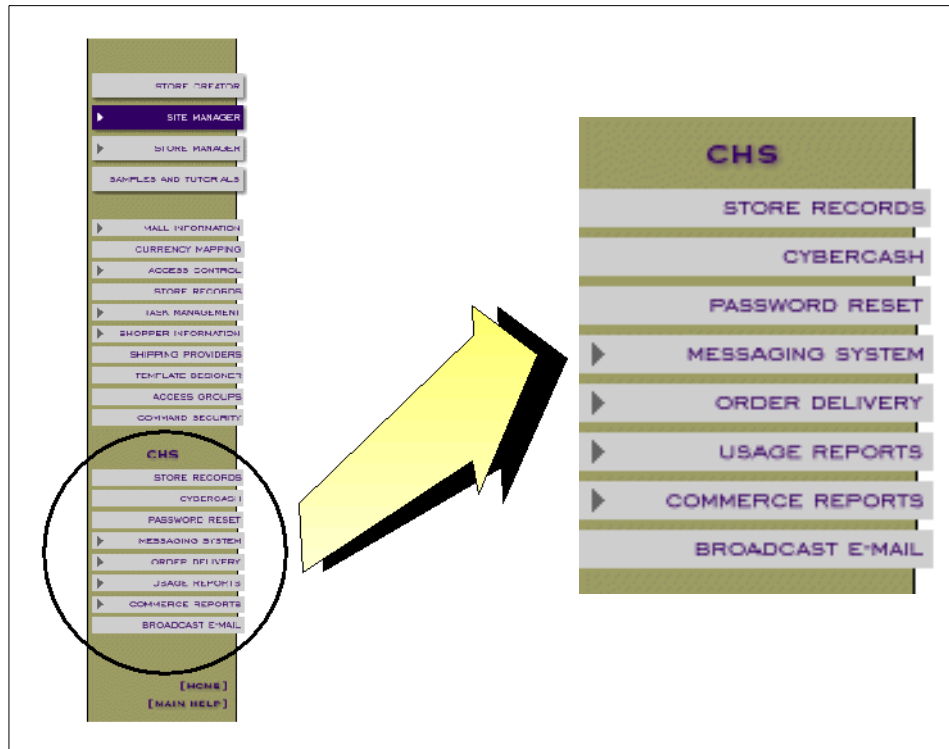


Figure 4. Net.Commerce hosting site manager forms

Eight features are added in Site Manager frame as follows:

- **Store Records** - Like the administrator of a conventional mall, you must keep a record of information for each store located within an electronic mall. For stores created with the Store Creator or the functions within the Store Manager, use the Store Records function to maintain general information about each store including the store name, company information, and contact information. Even if you are creating a store that is not part of a mall, you still need to use the Store Records function to open, or define, the store.

Once you create a store record, the Store Information function is used to make any changes to this information. This updating task is typically done by the person who manages the online store. The Store Records function and the Store Information function are linked so that when the person managing the store changes any information, the Store Records form is automatically updated.

- **CyberCash** - CyberCash allows you to integrate secure online payment processes through an application called the CyberCash CashRegister. When merchants want to enable CyberCash payment at their stores, they must contact CyberCash to request an account. When merchants set up online payment with the Payment Setup Wizard within the merchant tool, they need to enter three pieces of CyberCash account information: A CyberCash ID, secret, and merchant key.
- **Password Reset** - You can reset passwords for two types of users: Merchants who subscribe to your hosting services, and shoppers who visit merchants' stores. You can also reset passwords if users have forgotten their original passwords, or if they request a new one. To reset the password for a site administrator, use the Access Control form.

Once you reset a password, notify the user by e-mail or by phone. With the e-mail method, the new password is system-generated and sent directly to the user through the Password Reset form. With the phone method, the new password is specified by the user, and you must manually submit the password into the system using this form.
- **Messaging System** - The Messaging System allows you to set up and manage the delivery of all messages for your site and stores. The messaging system comprises the default message delivery method, e-mail, with which the following types of messages may be transmitted: System errors, usage reports, order deliveries, order summaries, quarterly and monthly commerce reports, password resets, and broadcast e-mails. The plain file delivery method is included as an integration point that allows you to provide an additional delivery method for order delivery. You can assign the selected delivery methods to message types to make that delivery method available in all related setup forms. Additionally, you may deactivate your delivery method temporarily for maintenance purposes. The Error Delivery Setup form allows you to specify recipients of system error messages.
- **Order Delivery** - The Order Delivery feature allows you to set up and manage the methods by which merchants receive order messages. The default method is e-mail; however, you may choose to make plain file order messages available to merchants. If you activate plain file order delivery, you must first integrate that method with a way for merchants to access or download their order delivery messages, such as via fax server, encrypted e-mail, an FTP site, or a new interface from which merchants can download their message files using HTTP securely. You can specify order templates and maximum batch sizes for each method you activate. Use the Messaging System Setup form to create and activate the list of order delivery methods from which merchants can choose. Use the Order

Delivery Setup form to set up and maintain information specific to each method you activate.

- **Usage Reports** - The Usage Reports feature allows you to monitor each merchant's activity on a monthly basis for operational and billing purposes. You may use the information in the reports, for example, to determine how to charge merchants for different levels of service and for hardware growth and planning. For example, you may wish to charge merchants for their use of broadcast e-mail to shoppers if it is generating an extreme volume of e-mails. You may view the number of broadcast e-mail messages generated and the corresponding number of recipients and charge merchants accordingly. Usage reports are available both online and via automated e-mail delivery.
- **Commerce Reports** - Commerce Reports allows you to view and analyze information about your site's traffic and sales. Reports are available both online and via automated e-mail delivery based on:
 - The geographic region of the shopper's server - Region report
 - Referring URLs - Click trail report
 - Items for which shoppers search - Search queries report
 - Browsers most used by shoppers - Browsers used report

Commerce reports help you plan your service offering and advertise it to merchants via broadcast e-mail. The Region and Click trails reports help determine where to advertise regionally and by Web site. The Search report results can help you name your store categories. You may analyze your site using most popular browsers used by shoppers and adjust your offering to help merchants accommodate the commonly used Web browsers.

- **Broadcast E-mail** - The Broadcast E-mail function allows you to send messages simultaneously to multiple merchants. This function is convenient if you wish to inform merchants of changes to your service. For example, if you wish to provide a new level of service, such as domain name registration, you may use Broadcast E-mail to notify merchants of the new offering.

1.4.2 Merchant Tool

The Merchant Tool is a store creation applet for easy setup, modification, and management of the stores. Its interface consists of a series of HTML pages that use JavaScript to aid navigation. Some components of the Merchant Tool are implemented as Java applets. To use the merchant tool, the merchant needs one of the following browsers:

- Netscape Navigator/Communicator 4.06 or later
- Microsoft Internet Explorer 4.01 or later

The Merchant Tool consists of the following components as shown in Figure 5:



Figure 5. Merchant Tool screen

- **Home** - This tab contains a site map. Click any link in the site map to go directly to that function.
- **Get Started** - This tab contains a list of steps you should complete to create a store. For detailed instructions about how to complete each step, read the corresponding topic in the online help.
- **Set Up Your Store** - This tab provides access to all the functions you use to set up a store. It does not provide access to store management functions. The following functions are provided:
 - **store activity** - Displays key statistics about the daily activities in the store, such as the number of orders that were placed.

- get merchant tool - Downloads the merchant tool from your ISP's site.
- get merchant guide - Downloads the Merchant Operations guide, which you can print.
- edit pages - Starts the page editor where you create and modify store pages.
- edit catalog - Starts the catalog editor where you organize your store's products and categories.
- payment methods - Launches a payment wizard to set up automatic retrieval of payment information.
- publish store - Saves any changes you have made to your ISP's Web server.
- open/close store - Opens your store so that shoppers can place orders, or closes your store so that you can service the store or make changes.
- advanced - Displays key statistics about the daily activities of the store and accesses the other functions to define or change your store's settings.

Using the added features and functions described above, the Net.Commerce Hosting Server enables CSPs to create branded site hosting and rental services for multiple customers in a shared commerce server environment. Customers of these services can use browser-based tools to create and operate stores in this shared environment.

Chapter 2. Planning and installation

This chapter shows the installation procedures of the Net.Commerce Hosting Server in two different scenarios. Section 2.3, "Installation for a stand-alone machine" on page 33, describes the procedures to install all of the Net.Commerce Hosting Server components on a single server. Section 2.4, "Installation for a distributed configuration" on page 87 describes the procedures to install in a distributed configuration. Section 2.3 and Section 2.4 are intended to be self-sufficient, therefore, much of the contents are duplicated.

2.1 Planning guide

Choosing the right hardware to implement a solution involves considerations of the relative cost, performance, and scalability of each platform as well as the network configuration, protocols, and security.

2.1.1 Prerequisites

The following section describes prerequisite hardwares and softwares. Make sure you have all prerequisites satisfied before you begin to install.

2.1.1.1 Prerequisite Hardware

Ensure that your system meets the following minimum hardware requirements:

- To run the Net.Commerce Hosting Server commerce server, a dedicated RISC System/6000 or IBM Power Series family of machines (RS/6000 Model C20 or higher is recommended) with the following:
 - A 167 MHz processor
 - A minimum of 128 MB of random access memory (RAM)
 - A minimum of 900 MB of free disk space
 - A CD-ROM drive
- To access the Net.Commerce Administrator, a PC capable of running Windows NT, or Windows 95, with a graphics-capable monitor and a mouse is needed.
- A local area network (LAN) adapter that is supported by the TCP/IP protocol.

Plan to have multiple hard disks to balance I/O traffic. Spreading the busy table over multiple disk spindles is the first step to achieve optimal database

performance. Dedicating hard disks to the database logs is also useful. As a rule of thumb, allocating four to six hard disks per processor, if you are using a SMP machine, and dedicating two hard disks for the database logs will be optimal. The acceptable minimum numbers are one hard disk for database log and two hard disks per processor. For further information on planning number of hard disks, you may refer to 5.4.1.2, "Top database tuning points" on page 279. The way to relocate the busiest tables to other physical drives to balance I/O traffic is discussed in 4.2, "Optimizing NCHS database layout" on page 212. Be aware that this step is more easily done in the initial installation than after the initial installation. You had better decide before you begin installation.

The recommended size of AIX paging space is twice the size of physical memory, and it is best to spread the paging space over two hard disks.

Also keep in mind that not only Net.Commerce, but also DB2, require their own cache areas in the memory. Having more memory will also be helpful to avoid the memory contention.

How many disks do I need?

The minimum number of disks that meet the above conditions are:

- Two disks for AIX, LPPs, and paging system
- One disk to dedicate the database log
- Four disks to spread NCHS database (assuming two way SMP and two disks per processor)

Using a separate machine for the database is helpful under a heavy transaction environment.

A typical H/W configuration could be:

- Model - IBM RS/6000 F50
- CPU - PowerPC 604e 332 MHz four-way processor
- Memory - 1GMB memory
- DASD - Multiple of 9.1GB disks
- CD-ROM drive
- Mouse
- LAN adapter that is supported by the TCP/IP protocol
- 12/24 GB 4 mm Tape

2.1.1.2 Prerequisite Software

The prerequisite softwares are the following:

- AIX 4.2.1 or higher
- JDK 1.1.6 (If you use AIX 4.3.2 or higher, JDK 1.1.6 is already included)
- IBM Net.Commerce Hosting Server 3.1.2 for AIX includes:
 - Net.Commerce 3.1.1 for AIX
 - Net.Commerce 3.1.2.2 FixPak
 - IBM DB2 Universal Database 5.0 and UDB July FixPak
 - Domino Go Webserver 4.6.2.51 or Netscape Enterprise Server 3.51
 - IBM Payment Server 1.2
 - DB2 Text Extenders
 - WebSphere Application Server 1.1 (on a separate CD in NCHS package)

On the PC you use to access the Net.Commerce Administrator, ensure that you have:

- Windows NT, Windows 98, or Windows 95
- Netscape Communicator 4.5 (which is provided on NCHS CD)
- LAN adapter

2.1.2 Planning file system size

On a Net.Commerce Hosting Server machine, you must have the following minimum amounts of free space:

- 400,000 blocks of free space (at 512 K per block) in the /home directory. This is the place where the tablespaces of NCHS database are created by default. Depending on the size of your database, you may require more space.

Each DB2 instance requires approximately 40 MB in /home (40,000 blocks at 51 K each). This allows the creation of the database instance (20 MB) and the creation of one database (20 MB) for testing. Each extra database to be created requires approximately 20 MB initially.

The above recommendation applies only when the database is created under /home. If you are going to create the database on a new file system, secure the same amount of free space in the filesystem. You must also plan for further growth of the database either in the /home file system or the file system where the database is to be located.

- 2,000,000 blocks of free space (at 512 K per block) in the /usr directory. This is the place where NCHS software components are installed. More importantly, the disk space required for some of the subdirectories will grow as the number of merchant stores increases. NCHS creates the new HTML files and the new macro files under the subdirectories of /usr/lpp/NetCommerce3 when a new store is created. If merchants upload their own images files to the NCHS server, those image files are kept at a subdirectory of /usr/lpp/NetCommerce3. NCHS also copies the HTML files under /usr/lpp/internet/server_root/pub. It is recommended to ensure you have enough disk space for future growth.

Planning future growth

The following directories are the places where new HTML files and new Net.Data macro files are created whenever a new store is created.

- /usr/lpp/internet/server_root/pub
- /usr/lpp/NetCommerce3/CHS/source
- /usr/lpp/NetCommerce3/macro/<your_locale>
- /usr/lpp/NetCommerce3/macro/<your_locale>/product
- /usr/lpp/NetCommerce3/macro/<your_locale>/category

In NCHS database, the USRTRAFFIC table keeps records of every connection of visitors to your NCHS site; hence, it soon grows large. The SHOPPER table also becomes large since it contains records about anonymous shoppers as well as registered shoppers. You should plan for their growth in size.

- 400,000 blocks of free space (at 512 K per block) in the root directory. The root directory may be used to store temporary files during installation.

For separate database server

If you are planning for a separate database server, which will contain nothing other than the database, be aware that the DB2 UDB Workgroup edition requires approximately 60 MB in /usr (110,000 blocks at 512 K each).

2.1.3 Planning IDs and passwords

There are various IDs and passwords used in Net.Commerce Hosting Server. Therefore, you should set up a plan in advance as follows:

Table 1. IDs and passwords

Usage	ID	Default passwd
AIX system administration	root	N/A
NCHS Configuration Manager	webadmin	webibm
Domino Go webserver configuration	webadmin	webibm
NetCommerce Administration Page	ncadmin	ncadmin
Payment Tab on NCHS Configuration Manager	N/A	<i>of_your_own</i>
DB2 user ID	db2inst1	ibmdb2
SSL key ring password	N/A	<i>of_your_own</i>
Merchant store ID	<i>of_your_own</i>	<i>of_your_own</i>
WebSphere Application Server manager	admin	admin

Note

The above IDs and passwords are the default or example value. Therefore, you should set up IDs and passwords of your own.

2.1.4 Design considerations for NCHS database

In this section, we will discuss design considerations for NCHS database. We will focus on the following key areas

- The type of table space to use.
- How to layout the tablespaces over multiple disk drives.

2.1.4.1 General design considerations

The general recommendations are:

- Place your paging space files on physically separate Direct Access Storage Devices (DASD).
- Paging space should be two or more times real memory.
- System and Database Executable code should be placed on a separate physical DASD to the database store.

- Database log files, which are accessed very often in a write mode, should be placed on a separate physical DASD.
- Ensure that there are an adequate number of disk drives for the database. four to six drives will be a good starting point. If you plan to use SMS type tablespaces (explained in the next section), create a new file system that is spread over multiple disk drives and place the home directory of the database instance owner under this file system when you are installing DB2.

Further database performance tuning can be done depending on the DB2 UDB table space type and database and database manager configuration. We will discuss the choice of table space type next.

2.1.4.2 Database tablespace types

A table space is a storage model that provides a level of indirection between a database and the tables stored within that database. Table spaces reside in nodegroups. Table spaces allow you to assign the location of databases and table data directly onto containers. (A container can be a directory name, a device name, or a file name.) This can provide improved performance, more flexible configuration, and better integrity.

There are two types of table spaces, both of which can be used in a single database:

- System Managed Space Table Space

In a System Managed Space (SMS) table space, the operating system's file system manager allocates and manages the space where the table is to be stored. The storage model typically consists of many files, representing table objects, stored in the file system space. The user decides on the location of the files, DB2 controls their names, and the file system is responsible for managing them. By controlling the amount of data written to each file, the database manager evenly spreads the data over the table space containers. An SMS table space is the default table space.

In an SMS table space, the file is extended one page at a time as the object grows. When inserting a large number of rows, some delay may result from waiting for the system to allocate another page.

- Database Managed Space Table Space

In a Database Managed Space (DMS) table space, the database manager controls the storage space. The storage model consists of a limited number of devices whose space is managed by DB2. The administrator decides which devices to use, and DB2 manages the space on the

devices. This table space is essentially an implementation of a special purpose file system designed to best meet the needs of the database manager. The table space definition includes a list of the devices or files belonging to the table space in which data can be stored.

Comparison between SMS and DMS

There are a number of trade-offs to consider when determining which type of table space you should use to store your data.

Advantages of a SMS Table Space:

- Space is not allocated by the system until it is required
- Creating a database requires less initial work since you do not have to predefine the containers.

Advantages of a DMS Table Space:

- The size of a table space can be increased by adding containers by using the ALTER TABLESPACE statement. Existing data is automatically rebalanced across the new set of containers to retain optimal I/O efficiency.
- The primary type of workload being managed by DB2 in your environment can have an effect on your choice of the type of table space used. Net.Commerce Hosting Server database workloads are similar to OLTP workloads. That is, transactions consist of highly repetitive basic SQL with few table joins.

DMS table spaces using device containers perform best in this situation.

- A table can be split across multiple table spaces based on the type of data being stored:
 - Long field and LOB data
 - Indexes
 - Regular table data

You might want to separate your table data for performance reasons or to increase the amount of data stored for a table. For example, you could have a table with 64 GB of regular table data, 64 GB of index data, and 2 TB of long data.

- The location of the data on the disk can be controlled if the operating system allows this.
- If all table data is in a single table space, a table space can be dropped and redefined with less overhead than dropping and redefining a table.

- In general, a well-tuned set of DMS table spaces will out-perform SMS table spaces.

Generally speaking, small personal databases are easiest to manage with SMS table spaces. On the other hand, for large, growing databases, you should restrict SMS table spaces to the temporary table spaces and create separate DMS table spaces that have with multiple containers for each table. In addition, long fields and indexes would be stored on their own table spaces.

To conclude, We can exploit the DMS architecture for performance enhancements on the Net.Commerce Hosting Server database by placing the most frequently access tables, and associated indexes, on table spaces with multiple containers that are placed on multiple, physically separate, DASDs. But ,be aware that NCHS creates SMS tablespaces by default. We will describe how to manually create DMS tablespaces and how to populate the NCHS database to them.

Considerations for DMS tablespace

When designing your DMS table spaces and containers, you should consider the following:

- The database manager uses striping to ensure an even distribution of data across all containers.
- Unlike SMS table spaces, the containers that make up a DMS table space do not need to be the same size. Also, if any container is full, DMS table spaces use any available free space from other containers.
- The space is pre-allocated. Because it is pre-allocated, the space must be available before the table space can be created. When using device containers, the device must also exist with enough space for the definition of the container. Each device can have only one container defined to it; so, to avoid wasted space, the size of the device and the size of the container should be equivalent. If, for example, the device is allocated with 5000 page,s and the device container is defined to allocate 3000 pages, then 2000 pages on the device will not be usable.

If you choose to use DMS table spaces with device containers, you must be willing to tune and administer your environment. For more information, see “Performance Considerations for DMS Devices” on page 28 as follows:

Performance Considerations for DMS Devices

If you are using Database Managed Storage (DMS) device containers for your table spaces, you need to understand the following so that you can effectively administer your environment:

- Buffering of data

Table data read from disk is normally available in the database's buffer pool. In some cases, a data page can be freed from the buffer pool before the application has actually used that page. (This can happen if the buffer pool space is required for other data pages.)

For table spaces using system managed storage (SMS), when the database manager subsequently requests the page from the file system, the file system may still have that page in its own cache. This can eliminate I/O that would otherwise have been required.

Table spaces using database managed storage (DMS) device containers do not use the file system or its cache. As a result, you may wish to increase the size of the database buffer pool and reduce the size of the file system cache to offset the fact that double buffering is not being done with DMS table spaces that use device containers.

With the AIX operating system, use of raw devices (that is, disks and their associated logical volumes instead of files or directories) will prevent any file system caching.

- Using LOB or LONG data

Because DB2 system catalogs contain some LOB columns, it is recommended that you keep them in SMS (or alternatively in DMS-file) table spaces.

Net.Commerce Hosting Server databases do not use any LOB data. The tables that use LONG data (these tables are: Category, product, progsgp, catsqp, etorder, etsetorder, etacqoperations, etsetprotdata, etsetmessage, setstatus, and taxprcode) are not used with high frequency. Hence, we will not focus on optimizing performance for LONG data.

In the following discussion, we will show two ways of optimizing database layout. In the first example described in 2.3, "Installation for a stand-alone machine" on page 33, we will recreate the file system /home to make it spread over multiple disk drives and make it a SMS tablespace to populate the NCHS database. In the second example described in 2.4, "Installation for a distributed configuration" on page 87, we will create several logical volumes that are placed on separate disks, respectively, and make it a DMS tablespace. The way to populate the NCHS database to the DMS tablespace is also shown.

2.2 Pre-installation

This chapter describes the steps you will need to perform before you install Net.Commerce and Net.Commerce Hosting Server 3.1.2.

To perform the steps described in this publication, you must have root user access.

Important

You must complete these pre-installation steps to ensure that Net.Commerce Hosting Server installation is successful.

2.2.1 Pre-installation steps

Before you install Net.Commerce 3.1.2.2 and Net.Commerce Hosting Server, you must perform the following steps:

1. Ensure that you have AIX 4.2.1 or higher on your Net.Commerce Hosting Server machine. AIX 4.3.2 is recommended.

You must have the following fixes applied:

- You must have the fix for APAR IX62253 applied. This APAR will update the C runtime xIC.rte to 3.1.4.8. If you do not have the IX62253 APAR applied, your server will be abnormally terminated when redirection to secure port 443 is attempted.

To determine your current Software AIX level, use the `oslevel` command as follows:

```
# oslevel
4.3.2.0
```

Installing Netscape Communicator

To install Netscape communicator from the Net.Commerce Hosting Server CD, do the following:

1. Insert the Net.Commerce Hosting Server CD into your CD drive.
 2. Switch to the `/Netscape` directory on the CD drive.
 3. Run `cc32e45.exe` and follow the instructions to complete the installation.
 4. When the installation is complete, remove the CD from the drive.
2. Ensure that you have JDK 1.1.6 installed on your system. If you have AIX 4.3.2 or higher, JDK 1.1.6 is already included in the base operating system.

If you have AIX 4.2, check to see if the JDK installed is version 1.1.6. Otherwise, you can obtain JDK 1.1.6 from the following URL:

<http://www.ibm.com/java/jdk/download>

3. If you are using Netscape Enterprise Server instead of Domino Go Webserver, it must be at version 3.51 or higher. Install it according to the instructions provided by Netscape. Configure Netscape Enterprise Server by following the instructions in the NCHS installation manual.
4. Net.Commerce requires that the DB2 instance user or Oracle user be running the Korn shell.

2.2.1.1 Allocating a CD file system

If your CD-ROM does not mount automatically, allocate a CD file system by doing the following:

```
# crfs -v cdrfs -p ro -d cd0 -m /cdrom
```

2.2.1.2 Increasing free space

To determine whether you have enough free space, type `df` on an AIX command line and look for information about the `/usr` and `/` directories. If the free space is greater than the amounts indicated in 2.1.2, "Planning file system size" on page 23, continue with steps provided in Step 2.2.1.4 on page 33.

In our example, a sample output of the `df` command shows the following:

```
/> df
Filesystem      512-blocks      Free %Used    Iused %Iused Mounted on
/dev/hd4         32768         23688  28%      981   12% /
/dev/hd2        917504        124000  87%     16728  15% /usr
/dev/hd9var      32768         29808  10%      169    5% /var
/dev/hd3         65536         63032   4%        54    1% /tmp
/dev/hd1         32768         31640   4%        18    1% /home
```

If there is not enough free space, record the current size and amount of free space currently available (to use in step 8 below) and change the size of the `/home`, `/usr`, and `/` directories by following the steps below.

Increasing Disk Space

Do not increase the size of these directories by decreasing the size of another file system. Use only the method described below.

1. On an AIX command line, type `smit` or `smitty`.

2. From the System Management menu, select **System Storage Management (Physical & Logical Storage)**.
3. Select **File Systems**.
4. Select **Add/Change/Show/Delete File Systems**.
5. Select **Journaled File Systems**.
6. Select **Change/Show Characteristics of a Journaled File System**.
7. Select **/home**.
8. Calculate the size required for the /home directory by using this formula:
$$new_size = current_size + required_space - free_space$$
where *current_size* and *free_space* are the values you recorded above, and *required_space* is the amount of free space required as indicated at the beginning of this section.
For our example, the required space works out to the following:
 - increase /usr by 1,900,000 blocks (at 512 K per block)
 - increase / by 380,000 blocks (that is, the root file system)
9. Type the value of *new_size* into the SIZE of file system field.

2.2.1.3 Create a new file system

Note

The discussion in this section applies only to the machines where the database is installed.

For better performance and future growth, should change the physical location where the /home file system is placed. Remove the /home file system, then recreate the file system to make it spread over multiple disk drives. In our example, enter the following:

```
# mkvg -f -y dbvg hdisk2 hdisk3 hdisk4
# rmfs /home
# mklv -y'dblv' -a'c' -e'x' dbvg 100 hdisk2 hdisk3 hdisk4
# crfs -v jfs -d dblv -m /home -A yes
# mount /home
# df /home
```

Make sure you have enough free space.

2.2.1.4 Verify paging space

You must have at least 128 MB of paging space. If you are using Netscape Enterprise Server, you may need to add another 20 MB of paging space to the recommended 128 MB of paging space.

To determine whether you have enough paging space, do the following:

1. On an AIX command line, type `smit` or `smitty`.
2. From the System Management menu, select **System Storage Management (Physical & Logical Storage)**.
3. Select **Logical Volume Manager**.
4. Select **Paging Space**.
5. Select **List All Paging Spaces**. The Command Status window appears indicating that your request has started. The request completes when the Command field at the top of the window changes from Running to OK. All the paging spaces are now listed.
6. Add up the sizes of all the active paging spaces. If the total is at least 128 MB, continue with the next step. If not, record the total and increase the amount of paging space. Then ,continue with the next step.

If the results window is still displayed, press **F10** to exit if you are using `smitty`, press **F12** to exit if you are using `smit`

2.3 Installation for a stand-alone machine

This section describes how to install all of the Net.Commerce Hosting Server components on a single server. If you are going to install a distributed environment, skip to section 2.4, "Installation for a distributed configuration" on page 87. Before you begin, your system should be in compliance with all the software and hardware requirements described above.

The starting point of this installation will be the software that comes along with NCHS. Some components may be exchanged with components from other vendors, and some may be left out as described in the installation manual. However, in the following, all of the components that come with NCHS will be installed on a single server.

2.3.1 Installing the code

The installation of the Net.Commerce Hosting Server is made up of installing several independent products, which are, in time, tied together by Net.Commerce. It is beyond the scope of this text to discuss the advantages of this approach, but it may clarify why NCHS is spread over multiple CDs.

Be sure to complete the pre-installation step in 2.2.1, “Pre-installation steps” on page 30.

2.3.1.1 Installing Domino Go Webserver

1. Log on to your AIX system as the user root. You can verify that you are actually the root user by issuing the command `id`. Notice the `uid=0(root)` in the example below.

```
# id
uid=0(root) gid=0(system)
groups=2(bin),3(sys),7(security),8(cron),10(audit)
#
```

2. Mount the CD entitled *Lotus Domino Go Webserver Version 4.6.2.51* and change to the directory `/cdrom/usr/sys/inst.images`.

```
# mount /cdrom
# cd /cdrom/usr/sys/inst.images
# ls
.toc                               internet_server.loc.fr_FR
NetQ.cgi                           internet_server.msg.Es_ES
NetQ.pkg                            internet_server.msg.fr_FR
internet_server.base               internet_server.msg.en_US
internet_server.java               internet_server.msg.es_ES
internet_server.loc.Es_ES          internet_server.msg.fr_FR
internet_server.loc.fr_FR          internet_server.security.common
internet_server.loc.es_ES          internet_server.security.us_secure
#
```

You can list the contents of the directory and verify that you are in the right place as shown above.

The Web server will be installed using SMITTY, but you could use SMIT instead. However, the following description will only refer to SMITTY.

3. Run SMITTY with the `install_all` fastpath:

```
# smitty install_all
```

4. Type `./` in the INPUT device / directory field for software and press **Enter**.
5. Place the cursor in the SOFTWARE to install field on the next screen that comes up. (The cursor should already be in that field). Press **F4** to list the file sets available for installation. Use the cursor keys to move up and down and **F7** to select the following file sets:
 - `internet_server.base`
 - `internet_server.loc.lang`
(lang could be substituted with a language of your choice. In the following, we use `en_US`)

- internet_server.msg.lang
- internet_server.security.common
- internet_server.security.us_secure
(This file set only appears and should only be selected if you have the North American edition of the NCHS.)
- internet_server.security.export
(This file set only appears and should only be selected if you have the Export edition of the NCHS.)

Important

Make sure you do *not* select and install the fileset internet_server.java.

6. Press **Enter** when you have made all your selections. This will bring you back to the previous screen.
7. Press **Enter** twice to start the installation.

Note

Optionally you can do a preview of the installation by setting the PREVIEW only? field to yes.

An OK indication will be displayed in the upper left hand corner after a successful installation.

```

                                COMMAND STATUS

Command: OK                stdout: yes                stderr: no

Before command completion, additional instructions may appear below.

[TOP]
installp -acgNqwX -d ./ -f File 2>&1

File:
internet_server.base.admin      4.6.2.51
internet_server.base.doc        4.6.2.51
internet_server.base.httpd      4.6.2.51
internet_server.msg.en_US.httpd 4.6.2.51
internet_server.security.common.httpd 4.6.2.51
internet_server.security.us_secure.httpd 4.6.2.51

-----+
                                Pre-installation Verification...
[MORE...132]

F1=Help           F2=Refresh       F3=Cancel        Esc+6=Command
Esc+8=Image       Esc+9=Shell      Esc+0=Exit       /=Find
n=Find Next

```

8. Press **F10** to exit SMITTY.
9. Unmount the CD by running the command `umount`.

This completes the installation of the Web server.

2.3.1.2 Installing DB2

In this section the steps to install DB2 on a stand alone RS/6000 is described.

1. Ensure you are logged on as the root user. The command `id` can be used to verify that.
2. Mount the CD entitled *IBM Net.Commerce START for AIX, Version 3.1.1*.
3. Change directory to `/cdrom/NetCommerce3` as shown below

```

# mount /cdrom
# cd /cdrom/NetCommerce3
# ls
.toc      aix.apar  db2ext    db2setup  runtime
DOC       aix.ptf   db2extfix ics      start
Netscape  db2       db2fix    ifor      sysChk
#

```

4. You are now ready to run the installation program `db2setup`. Type the following on the command line:


```
./db2setup
```

The installation program will check that your system has the necessary PTFs installed before the actual installation begins. If you do not, then the program will ask if you want them installed or not. It will look something like the following:

```
You are required to install additional PTFs for your operating system.
Your system may fail if you do not apply these fixes:
```

OS Level	APAR/PTF#	RUN-TIME PROCESSOR	File Name
AIX4.2	U453611	MultiProcessor	./aix.PTF/AIX4.2.1/SMP/bos.mp.4.2.1.9.bff
AIX4.2	U453426	UniProcessor	./aix.PTF/AIX4.2.1/UNI/bos.up.4.2.19.bff
AIX4.3	IX72273	MultiProcessor	./aix.APAR/AIX4.3/bos.mp.4.3.0.1.bff
AIX4	U453695	xLC++ runtime	./runtime/ptf_4_2_1

```
Would you like to install the PTFs automatically now (y/n) ?
y
```

5. Answer `y` to automatically install the PTFs.

Some additional information may be shown during the installation of the PTFs.

6. You are requested to reboot your AIX system. Change to the root directory

```
cd /
```

and run the following two commands to reboot:

```
bosboot -a
```

```
shutdown -Fr
```

Your machine will now reboot.

7. Log on as root when your system comes back online.
8. Mount the CD in the CD-ROM drive.
9. Change directory to `/cdrom/NetCommerce3`.
10. Run the DB2 install program again:

```
./db2setup
```

11. The installation program will now display the following window:

```

----- Install DB2 V5 -----
|
| Select the products you are licensed to install. Your Proof of
| Entitlement and License Information booklet identify the products for
| which you are licensed.
|
| To see the preselected components or customize the selection, select
| Customize for the product.
| [ ] DB2 Client Application Enabler           : Customize... :
| [ ] DB2 UDB Workgroup Edition               : Customize... :
| : : DB2 UDB Enterprise Edition              : Customize... :
| : : DB2 Connect Enterprise Edition          : Customize... :
| : : DB2 UDB Extended Enterprise Edition     : Customize... :
| : : DB2 Software Developer's Kit           : Customize... :
|
| To choose a language for the following components, select Customize for
| the product.
|   DB2 Product Messages                      [ Customize... ]
|   DB2 Product Library                      [ Customize... ]
|
| [ OK ]           [ Cancel ]           [ Help ]
|
-----

```

12. Use the cursor keys to move up and down and the spacebar to select **DB2 UDB Workgroup Edition**.

```

----- Install DB2 V5 -----
|
| Select the products you are licensed to install. Your Proof of
| Entitlement and License Information booklet identify the products for
| which you are licensed.
|
| To see the preselected components or customize the selection, select
| Customize for the product.
| [ ] DB2 Client Application Enabler           : Customize... :
| [*] DB2 UDB Workgroup Edition               [ Customize... ]
| : : DB2 UDB Enterprise Edition              : Customize... :
| : : DB2 Connect Enterprise Edition          : Customize... :
| : : DB2 UDB Extended Enterprise Edition     : Customize... :
| : : DB2 Software Developer's Kit           : Customize... :
|
| To choose a language for the following components, select Customize for
| the product.
|   DB2 Product Messages                      [ Customize... ]
|   DB2 Product Library                      [ Customize... ]
|
| [ OK ]           [ Cancel ]           [ Help ]
|
-----

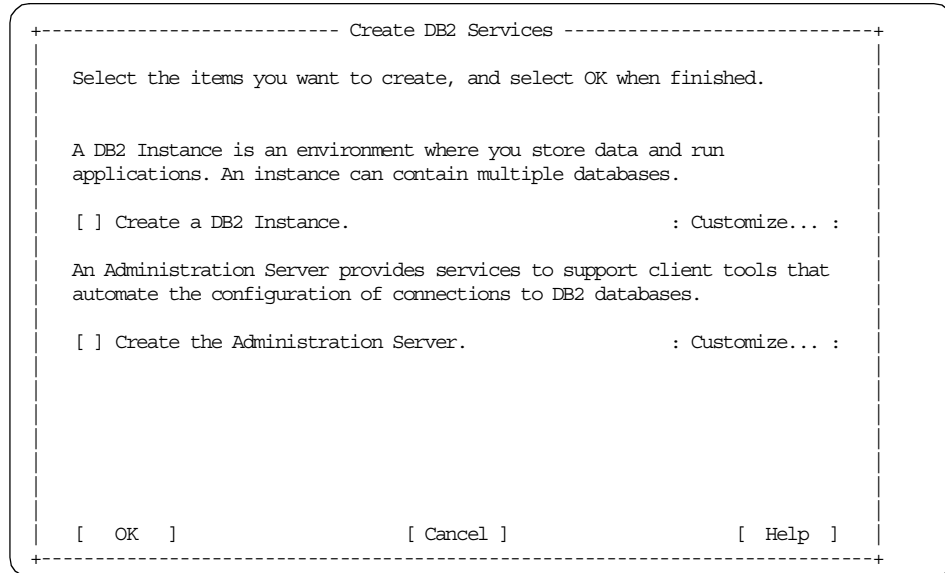
```

Optionally, you could install DB2 messages in languages other than English. To do that, you select **Customize**, which is next to DB2 Product

Message, and choose whatever language you prefer in the window that pops up.

13.To continue, highlight **OK** and press **Enter** in the window entitled Install DB2 V5.

14.The Create DB2 Services window appears:



15.Highlight **Create a DB2 Instance** and press **Enter**. This will bring you to the following window:

```

+----- Create DB2 Services -----+
+--- DB2 Instance ---+
|
| Authentication:
|   Enter User ID, Group ID, Home Directory and Password that
|   will be used for the DB2 Instance.
|   User Name      [db2inst1]
|   User ID        :          :          [*] Use default UID
|   Group Name     [db2iadml]
|   Group ID       :          :          [*] Use default GID
|   Home Directory [/home/db2inst1 ]
|   Password       [***** ]
|   Verify Password [***** ]          [ Default ]
|
| Protocol:
|   Select Customize to change the default          [ Customize... ]
|   communication protocol.
|
| [*] Auto start DB2 Instance at system boot.
| [ ] Create a sample database for DB2 Instance.
|
| [ OK ]          [ Cancel ]          [ Help ]
+-----+

```

16. Enter a password in the Password and Verify Password fields but use the default values for User Name, Group Name and Home Directory as shown above.

Make sure **Auto start DB2 Instance at system boot.** is selected.

17. Highlight **OK** and press **Enter**.

18. The User-Defined Functions window appears:

```

+----- Create DB2 Services -----+
+--- User-Defined Functions ---+
|
| Fenced User-Defined Functions enable application developers to
| create their own suite of functions specific to their application
| or domain.
|
| Authentication:
|   Enter User ID, Group ID, Home Directory and Password that
|   will be used for the fenced User-Defined Functions.
|   User Name      [db2fenc1]
|   User ID       :      :          [*] Use default UID
|   Group Name    [db2fadml]
|   Group ID      :      :          [*] Use default GID
|   Home Directory [/home/db2fenc1 ]
|   Password      [***** ]
|   Verify Password [***** ]          [ Default ]
|
| Note: It is not recommended to use the DB2 Instance user ID for
|       security reasons.
|
| [ OK ]          [ Cancel ]          [ Help ]
+-----+

```

19. Enter a password in the Password and Verify Password fields and accept default values for the rest of the fields by highlighting **OK** and pressing **Enter**.

20. The Create DB2 Services window is displayed:

```

+----- Create DB2 Services -----+
|
| Select the items you want to create, and select OK when finished.
|
| A DB2 Instance is an environment where you store data and run
| applications. An instance can contain multiple databases.
|
| [*] Create a DB2 Instance.          [ Customize... ]
|
| An Administration Server provides services to support client tools that
| automate the configuration of connections to DB2 databases.
|
| [ ] Create the Administration Server. : Customize... :
|
| [ OK ]          [ Cancel ]          [ Help ]
+-----+

```

Notice that only **Create a DB2 Instance** is selected.

21. Highlight **OK** and press **Enter**.
22. Ignore the warning message that appears indicating the Administration Server is not created. Do this by highlighting **OK** and pressing **Enter**.
23. A summary report appears. Highlight **Continue** and press **Enter**.
24. A warning appears advising you that this is your last chance to stop the installation. Highlight **OK** and press **Enter**.
25. The installation begins. The selected components are installed, and your instance ID is created. This installation process can take up to 15 minutes depending on the speed of your system.
26. You will see a Notice window when the installation completes. Highlight **OK** and press **Enter**.
27. The Status Report window is displayed. Highlight **OK** and press **Enter** to close the window.
28. You are now back to the DB2 Installer window. Highlight **Close** and press **Enter**.
29. A warning indicating that the Administration Server is not created appears. Ignore the warning by highlighting **OK** and pressing **Enter**.
30. A final notice appears advising that you are leaving the DB2 Installer. Highlight **OK** and press **Enter**.
31. Change to the DB2 instance user (db2inst) you have just created by typing the following on the command line:

```
# su - db2inst1
```

32. Use a text editor, for example vi, to edit the .profile file.

33. Add the following line to the bottom of the file:

```
$ . sqllib/db2profile
```

An example of how the .profile file should look shown below:

```
PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:$HOME/bin:/usr/bin/X11:/sbin: .
export PATH

if [ -s "$MAIL" ]           # This is at Shell startup. In normal
then echo "$MAILMSG"       # operation, the Shell checks
fi                          # periodically.

. sqllib/db2profile
```

34. Type the following on the command line to ensure that the new `.profile` file does not contain errors:

```
$ . .profile
```

35. You can verify that the environment of the instance user (`db2inst1`) works by doing what is shown in the screen capture below:

```
$ echo $DB2INSTANCE
db2inst1
$ db2start
SQL1063N  DB2START processing was successful.
```

36. Unmount the CD by running the `umount` command.

This completes the installation of DB2. The next step is to install the DB2 FixPak.

1. You should still be logged on as the user `db2inst1`. You can verify this by using the `id` command.

2. Stop DB2 by running the commands:

```
$ db2 force applications all
$ db2 terminate
$ db2stop
$ exit
```

3. All DB2 processes should be stopped now, and you should be the root user.

4. Mount the CD entitled *DB2 Universal Database July FixPak*.

5. Change to the FixPak directory by running this command:

```
# cd /cdrom
```

6. The FixPak will be installed using SMITTY with the `update_all` fastpath. Run this command:

```
# smitty update_all
```

7. Type `./` in the INPUT device / directory for software field and press **Enter**.

8. You should now see the window shown below. Press **Enter** twice to start the installation.

```

Update Installed Software to Latest Level (Update All)

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                [Entry Fields]
INPUT device / directory for software      ./
SOFTWARE to update                        _update_all
PREVIEW only? (update operation will NOT occur)  no          +
COMMIT software updates?                  yes         +
SAVE replaced files?                      no          +
AUTOMATICALLY install requisite software?  yes         +
EXTEND file systems if space needed?       yes         +
VERIFY install and check file sizes?      no          +
DETAILED output?                          no          +
Process multiple volumes?                 yes         +

F1=Help          F2=Refresh      F3=Cancel      F4=List
Esc+5=Reset     Esc+6=Command  Esc+7=Edit     Esc+8=Image

```

9. When the installation completes with an **OK** indication in the upper left hand corner, then exit SMITTY by pressing **F10**.

10. You have to update the database instance. Do this by running the command:

```
# /usr/lpp/db2_05_00/instance/db2iupdt db2inst1
```

11. Log on as the instance owner (db2inst1) by typing:

```
# su - db2inst1
```

12. Start DB2 by running the **db2start** command from the command prompt:

```
$ db2start
```

The installation of both DB2 and the DB2 FixPak is now completed.

2.3.1.3 Installing Net.Commerce

Follow the the steps given below to install the Net.Commerce.

1. Ensure you are logged on as the root user. The **id** command can be used to verify this.
2. Mount the CD entitled *IBM Net.Commerce START for AIX, Version 3.1.1*.

3. Change directory to /cdrom/NetCommerce3 as shown below

```
# mount /cdrom
# cd /cdrom/NetCommerce3
# ls
.toc      aix.apar  db2ext    db2setup  runtime
DOC       aix.ptf   db2extfix ics      start
Netscape  db2       db2fix    ifor      sysChk
#
```

4. Ensure that DB2 has been started. Change user to the instance owner (db2inst1) and start the database manager. The screen capture below shows how this is done:

```
# su - db2inst1
$ db2start
SQL1026N The database manager is already active.
$
```

Notice that the database manager may already be active.

5. Exit back to the root user. Type `exit` on the command line.
6. Start SMITTY with the fastpath `install_all`:

```
# smitty install_all
```
7. Type `./` in the INPUT device / directory for software field and press **Enter**.
8. Place the cursor in the **SOFTWARE to install** field on the next screen that comes up. (The cursor should already be in that field). Press **F4** to list the file sets available for installation.
9. Select the following filesets using the cursor keys to move up and down and press **F7** to select the following:
 - NetCommerce3.Mall
 - NetCommerce3.Server
 - NetCommerce3.html
 - NetCommerce3.loc.en_US
 - NetCommerce3.msg.en_US
 - db2ext
 - db2tx_05_00
10. Press **Enter** when you have made all your selections. This will bring you back to the previous screen.
11. Press **Enter** twice to start the installation.

An OK indication will be displayed in the upper left hand corner after a successful installation.

Note

We have experienced that the DB2 Text Extenders some times fail to install the first time. An easy way to resolve this is to reinstall the db2ext and db2tx_05_00 filesets. The installation works the second time

12. Press **F10** to exit SMITTY.

The next step is to configure the DB2 Text Extenders.

1. Make sure you are still the root user. Use the `id` command to verify.

2. Change the directory to:

```
# cd /usr/lpp/db2ext/instance
```

3. Run `DMBINSTANCE` as follows:

```
# ./dmbinstance db2inst1
```

4. The configuration program will prompt you to confirm a number of questions. Answer `yes` to all the questions.

5. Log on as the database instance owner (`db2inst1`), by typing:

```
# su - db2inst1
```

6. Use a text editor, for example `vi`, to edit the `.profile` file.

7. Add the following two lines to the `.profile` file:

```
export LANG=en_US
. dmb/dmbprofile
```

8. An example of how the `.profile` file should look is as follows:


```

PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:$HOME/bin:/usr/bin/X11:/sbin:.

export PATH

if [ -s "$MAIL" ]           # This is at Shell startup. In normal
then echo "$MAILMSG"       # operation, the Shell checks
fi                          # periodically.

. sqllib/db2profile

export LANG=en US
. dmb/dmbprofile

```

9. Save the .profile file.

10. The next step is to install the DB2 Text Extenders FixPak, but first the DB2 and DB2 Text Extenders must be stopped. Run the following commands:

```

$ txstop
$ db2 force applications all
$ db2 terminate
$ db2stop

```

11. Exit back to the root user by typing:

```

$ exit

```

12. You need to find a place on a file system where there is more than 60 MB of free space. You can use the command `df -k` to view your file systems. It will show the following:

```

# df -k
Filesystem      1024-blocks      Free %Used    Iused %Iused Mounted on
/dev/hd4         221184          202472    9%      1045    1% /
/dev/hd2        1392640          563816   60%     31176   9% /usr
/dev/hd9var       8192             6960    16%      179    9% /var
/dev/hd3         24576            23444    5%        68    2% /tmp
/dev/hd1         212992          125548   42%      794    2% /home
/dev/cd0         612804           0       100%    306402 100% /cdrom
#

```

The free space on each file system is shown in kilobytes in the `Free` column. As you can see from the screen capture above, there is enough space in either `/`, `/usr` or `/home`. If you do not have a file system with enough free space, then you must expand a file system or create a new one. Use `SMITTY` to either expand or create a file system.

Since we had enough space in /home, we simply created a temporary directory in /home called temp. We will, therefore, assume in the following that there is a directory called /home/temp with at least 60 MB of free space.

13. Change directory as follows:

```
# cd /home/temp
```

(You should, of course, change to whatever directory you have created for this purpose.)

14. Uncompress the files needed for the DB2 Text Extender FixPak as follows:

```
# uncompress -c /cdrom/NetCommerce3/db2extfix/u454574.pkg.Z >
u454574.pkg
```

15. This should create one file in your current directory.

```
# ls -al
total 112706
drwxr-xr-x  2 root    system    512 Jun 16 11:43 .
drwxr-xr-x  7 bin     bin      512 Jun 16 09:09 ..
-rw-r--r--  1 root    system   57702400 Jun 16 11:45 u454574.pkg
#
```

16. Start SMITTY with the fastpath install_latest:

```
# smitty install_latest
```

17. Type ./ in the INPUT device / directory for software field and press **Enter**.

18. Press **Enter** twice to start the installation.

An OK indication will be displayed in the upper left hand corner after a successful installation, and your SMITTY window should look as follows:

```

COMMAND STATUS

Command: OK          stdout: yes          stderr: no

Before command completion, additional instructions may appear below.

[TOP]
installp -acgNQqwx -d ./ -f File 2>&1

File:
db2tx_05_00.client.rte          5.0.2.0
db2tx_05_00.rte.com             5.0.2.0
db2tx_05_00.nls.client         5.0.2.0
db2tx_05_00.nls.server        5.0.2.0
db2tx_05_00.server.rte        5.0.2.0

+-----+
+-----+
Pre-installation Verification...
+-----+
+-----+
[MORE...54]

F1=Help          F2=Refresh          F3=Cancel          Esc+6=Command
Esc+8=Image      Esc+9=Shell         Esc+0=Exit        /=Find
n=Find Next

```

19. Press **F10** to exit SMITTY.

This completes the installation of DB2 Text Extenders. The next step is to install the IBM Payment Server.

2.3.1.4 Installing IBM payment server 1.2

Follow the steps given below to install the IBM payment server.

1. Ensure you are logged on as the root user. The command `id` can be used to verify this.
2. Mount the CD entitled *IBM Net.Commerce 3.1.2.2 FixPak*.
3. Change the directory to `/cdrom/payment_server` as shown below:

```

# mount /cdrom
# cd /cdrom/payment_server
# ls
.toc          PTF_U300066.pkg  U300066.inf      eTill_en_US.pkg
PTF_U300064.pkg  U300064.inf      eTill.pkg
#

```

4. Start SMITTY.
5. Place the cursor on the **Software Installation and Maintenance** from the System Management menu and press **Enter**.

- Place the cursor on the **Install and Update Software** from the Software Installation and Maintenance menu and press **Enter**.
- Place the cursor on the **Install/Update From ALL Available Software** from the Install and Update Software menu and press **Enter**.
- Type **./** in the INPUT device / directory for software field and press **Enter**.
- Place the cursor on the **SOFTWARE to install** field on the next screen that comes up. Type **all** and press **Enter** twice to start the installation
An OK indication will be displayed in the upper left hand corner after a successful installation as shown below:

```

COMMAND STATUS

Command: OK          stdout: yes          stderr: no

Before command completion, additional instructions may appear below.

[TOP]
installp -acgNqX -d ./ -V2 -f File 2>&1

File:
  all

+-----+
+-----+
|                        Pre-installation Verification...                        |
+-----+
+-----+
Verifying selections...done
Verifying requisites...done
Results...

[MORE...600]

F1=Help          F2=Refresh       F3=Cancel       Esc+6=Command
Esc+8=Image      Esc+9=Shell      Esc+0=Exit      /=Find
n=Find Next

```

10. Press **F10** to exit SMITTY.

11. Verify the following filesets were installed.

```

# ls1pp -l eTill*
Fileset                Level  State  Description
-----
Path: /usr/lib/objrepos
eTill.base             1.2.6.0 COMMITTED IBM Payment Server for AIX
eTill.certreq         1.2.6.0 COMMITTED IBM Payment Server for AIX
(eecertreq Utility)
eTill.messages        1.2.6.0 COMMITTED IBM Payment Server for AIX
(Properties)
eTill.msg.en_US.base  1.2.6.0 COMMITTED IBM Payment Server for AIX
(Publications - en_US)
eTill.setsdk          1.2.6.0 COMMITTED IBM Payment Server for AIX
(Support Libraries)

```

12. Unmount the CD by running the `umount` command.

This completes the installation of the IBM payment server.

2.3.1.5 Applying the Net.Commerce 3.1.2.2 FixPak

Follow the steps below to install the Net.Commerce 3.1.2.2 FixPak.

1. Log on to the DB2 instance user (db2inst1).
2. Ensure that the following lines have been added to the `.profile` file under the DB2 instance home directory:

```
. sqllib/db2profile
. dmb/dmbprofile
```

An example of how the `.profile` file should look like is as follows:

```
PATH=/usr/bin:/usr/lib:/etc:/usr/sbin:/usr/ucb:$HOME/bin:/usr/bin/X11:/
sbin:.
export PATH

if [ -s "$MAIL" ]           # This is at Shell startup. In normal
then echo "$MAILMSG"       # operation, the Shell checks
fi                          # periodically.

. sqllib/db2profile

export LANG=En_US
. dmb/dmbprofile
~
".profile" 16 lines, 322 characters
```

3. Log out from the DB2 instance user by typing `exit` on the command line.
4. Ensure you are logged on as the root user. The command `id` can be used to verify this.
5. Ensure that all Net.Commerce instances are stopped by typing the following on the command line:

```
# ps -ef | grep NetCommerce
```

6. Mount the CD entitled *IBM Net.Commerce 3.1.2.2 FixPak*.
7. Change directory to `/cdrom/start` as shown below:

```
# mount /cdrom
# cd /cdrom/start
# ls
```

```

.toc                NetCommerce3.html        NetCommerce3.ps
NetCommerce3.Mall  NetCommerce3.loc.en_US
NetCommerce3.Server NetCommerce3.msg.en_US
#

```

8. Start SMITTY.
9. Place the cursor on the **Software Installation and Maintenance** from the System Management menu and press **Enter**.
10. Place the cursor on the **Install and Update Software** from the Software Installation and Maintenance menu and press **Enter**.
11. Place the cursor on the **Update installed Software to Latest Level (Update All)** from the Install and Update Software menu and press **Enter**.
12. Type **./** in the INPUT device / directory for software field and press **Enter**.
13. You should now see the window shown below. Press **Enter** twice to start the update.

```

Update Installed Software to Latest Level (Update All)

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                     [Entry Fields]
INPUT device / directory for software      ./
SOFTWARE to update                        _update_all
PREVIEW only? (update operation will NOT occur)  no      +
COMMIT software updates?                  yes     +
SAVE replaced files?                      no      +
AUTOMATICALLY install requisite software?  yes     +
EXTEND file systems if space needed?       yes     +
VERIFY install and check file sizes?      no      +
DETAILED output?                          yes     +
Process multiple volumes?                 yes     +

F1=Help          F2=Refresh          F3=Cancel          F4=List
Esc+5=Reset      Esc+6=Command      Esc+7=Edit        Esc+8=Image
Esc+9=Shell      Esc+0=Exit        Enter=Do

```

An OK indication will be displayed in the upper left hand corner after a successful update as follows:

```
COMMAND STATUS

Command: OK          stdout: yes          stderr: no

Before command completion, additional instructions may appear below.

[TOP]
installp -acgNqwX -d ./ -V2 -f File 2>&1

File:
NetCommerce3.Mall.business      3.1.2.0
NetCommerce3.Mall.groce         3.1.2.0
NetCommerce3.Server.admin       3.1.2.0
NetCommerce3.Server.adt         3.1.2.0
NetCommerce3.Server.pyset       3.1.2.0
NetCommerce3.Server.rte         3.1.2.0
NetCommerce3.Server.tedit       3.1.2.0
NetCommerce3.Server.txavp       3.1.2.0
NetCommerce3.html.en_US         3.1.2.0
[MORE...4385]

F1=Help          F2=Refresh          F3=Cancel          Esc+6=Command
Esc+8=Image      Esc+9=Shell         Esc+0=Exit         /=Find
n=Find Next
```

14. Press **F10** to exit SMITTY.

15. Unmount the CD by running the `umount` command.

This completes the applying the Net.Commerce 3.1.2.2 FixPak.

2.3.1.6 Installing WebSphere application server

Important

Make sure that you installed Domino Go Webserver 4.6.2.51 without following the previous steps in this book. You must uninstall the Java servlet component (all `internet.java*` files) of Domino Go Webserver before installing the WebSphere application server.

1. Ensure you are logged on as the root user. The command `id` can be used to verify this.

2. Type the following on the command line:

```
# export JAVA_HOME=JDK_install_path
```

where:

`JDK_install_path` is the directory where you installed JDK 1.1.6. The

default location is /usr/jdk_base. You can verify that your JDK_install_path is default path by typing the following on the command line.

```
# cd /usr/jdk_base
# ls
AIXDemos      COPYRIGHT    README.ADK  demo        fixes.lst   lib
CHANGES.ADK  README      bin         dt          jni_example
#export JAVA_HOME=/usr/jdk_base
#
```

3. Mount the CD entitled *IBM WebSphere Application Server*.

4. Change the directory to /cdrom/AIX/IBMWebAS as follows:

```
# mount /cdrom
# cd /cdrom/AIX/IBMWebAS
# ls
.toc                IBMWebAS.fr_FR      IBMWebAS.zh_CN
IBMWebAS.base       IBMWebAS.it_IT      IBMWebAS.zh_TW
IBMWebAS.de_DE     IBMWebAS.ja_JP      WebSphereInstallAIX.sh
IBMWebAS.en_US      IBMWebAS.ko_KR      http_server.base
IBMWebAS.es_ES      IBMWebAS.pt_BR      responseAIX.res
#
```

5. Start SMITTY.

6. Place the cursor on **Software Installation and Maintenance** from the System Management menu and press **Enter**.

7. Place the cursor on **Install and Update Software** from the Software Installation and Maintenance menu and press **Enter**.

8. Place the cursor on **Install/Update From ALL Available Software** from the Install and Update Software menu and press **Enter**.

9. Type ./ in the INPUT device / directory for software field and press **Enter**.

10. Place the cursor in the **SOFTWARE to install** field on the next screen that comes up. Press **F4** to list the file sets available for installation. Use the cursor keys to move up and down and **F7** to select the following file sets:

- IBMWebAS Admin
- IBMWebAS Base Release
- IBMWebAS CORBA Support (optional)
- IBMWebAS Plugins - Go Webserver 4.6.x Plugin
- IBMWebAS Samples (optional)
- IBMWebAS.en_US

11. Press **Enter** when you have made all your selections. This will bring you back to the previous screen. You should now see the following window:

```
Install and Update from ALL Available Software

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                [Entry Fields]
INPUT device / directory for software      ./
SOFTWARE to install                       [+ 1.1.0.0  IBMWebAS Ad> +
PREVIEW only? (install operation will NOT occur)  no      +
COMMIT software updates?                   yes     +
SAVE replaced files?                      no      +
AUTOMATICALLY install requisite software?  yes     +
EXTEND file systems if space needed?       yes     +
OVERWRITE same or newer versions?         no      +
VERIFY install and check file sizes?      no      +
DETAILED output?                          yes     +
Process multiple volumes?                 yes     +

F1=Help      F2=Refresh      F3=Cancel      F4=List
Esc+5=Reset  Esc+6=Command  Esc+7=Edit    Esc+8=Image
Esc+9=Shell  Esc+0=Exit    Enter=Do
```

12. Press **Enter** twice to start the installation.

An OK indication will be displayed in the upper left hand corner after a successful installation as follows:

```

COMMAND STATUS

Command: OK          stdout: yes          stderr: no

Before command completion, additional instructions may appear below.

[MORE...2517]
-----
Name                  Level          Part          Event          Result
-----
IBMWebAS.en_US.core  1.1.0.0       USR           APPLY          SUCCESS
IBMWebAS.base.core   1.1.0.0       USR           APPLY          SUCCESS
IBMWebAS.base.samples 1.1.0.0       USR           APPLY          SUCCESS
IBMWebAS.base.admin   1.1.0.0       USR           APPLY          SUCCESS
IBMWebAS.base.Go46x   1.1.0.0       USR           APPLY          SUCCESS
IBMWebAS.base.CORBA   1.1.0.0       USR           APPLY          SUCCESS
IBMWebAS.en_US.resources 1.1.0.0       USR           APPLY          SUCCESS
IBMWebAS.en_US.doc    1.1.0.0       USR           APPLY          SUCCESS

[BOTTOM]

F1=Help          F2=Refresh          F3=Cancel          Esc+6=Command
Esc+8=Image      Esc+9=Shell         Esc+0=Exit         /=Find
n=Find Next

```

13. Press **F10** to exit SMITTY.

14. Unmount the CD by running the `umount` command.

15. Start and stop Web server by typing the following command:

```

# startsrc -s httpd
0513-059 The httpd Subsystem has been started. Subsystem PID is 23524.
# stopsrc -s httpd
0513-044 The stop of the /usr/sbin/httpd Subsystem was completed
successfully.
#

```

This completes the installation of the IBM WebSphere application server.

2.3.1.7 Installing Net.Commerce Hosting Server

Follow the step give below to install the Net.Commerce Hosting Server.

1. Ensure you are logged on as the root user. The command `id` can be used to verify that.
2. Mount the CD entitled *IBM Net.Commerce Hosting Server, Version 3.1.1*. (It is called Version 3.1.1, even though the entire installation will be Net.Commerce Hosting Server Version 3.1.2)

3. Change directory to /cdrom/CHS as follows:

```
cd /cdrom/CHS
```

4. Start SMITTY with the fastpath `install_all`:

```
# smitty install_all
```

5. Type `./` in the INPUT device / directory for software field and press **Enter**.

Install and Update from ALL Available Software

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

	[Entry Fields]	
INPUT device / directory for software	./	
SOFTWARE to install	[all]	+
PREVIEW only? (install operation will NOT occur)	no	+
COMMIT software updates?	yes	+
SAVE replaced files?	no	+
AUTOMATICALLY install requisite software?	yes	+
EXTEND file systems if space needed?	yes	+
OVERWRITE same or newer versions?	no	+
VERIFY install and check file sizes?	no	+
DETAILED output?	no	+
Process multiple volumes?	yes	+

F1=Help	F2=Refresh	F3=Cancel	F4=List
Esc+5=Reset	Esc+6=Command	Esc+7=Edit	Esc+8=Image
Esc+9=Shell	Esc+0=Exit	Enter=Do	

6. Press **Enter** twice to start the installation.

An OK indication will be displayed in the upper left hand corner after a successful installation.

```

COMMAND STATUS

Command: OK          stdout: yes          stderr: no

Before command completion, additional instructions may appear below.

[MORE...5764]

+-----+
                          Summaries:
+-----+

Installation Summary
-----
Name                            Level            Part            Event           Result
-----
NetCommerce3.CHS.en_US          3.1.0.0         USR             APPLY           SUCCESS
NetCommerce3.CHS.base          3.1.0.0         USR             APPLY           SUCCESS

[BOTTOM]

F1=Help          F2=Refresh          F3=Cancel          Esc+6=Command
Esc+8=Image      Esc+9=Shell         Esc+0=Exit         /=Find
n=Find Next

```

7. Press **F10** to exit SMITTY.

The installation of Net.Commerce Hosting Server is complete.

2.3.2 Creating your Net.Commerce Hosting Server instance

This section describes how to configure a Net.Commerce Hosting Server instance.

Note

Net.Commerce Hosting Server 3.1.2 only supports the existence of a single instance. Attempting to create multiple instances on a single Net.Commerce Hosting Server machine will corrupt the first instance, and you will not be able to start the instance.

To create and configure a Net.Commerce Hosting Server instance, perform the following:

1. Log on as user ID root.
2. Switch to your DB2 instance ID using the DB2 instance user ID you created in the steps provided in Step15. on page 39.

Our example used db2inst1; hence, we will type:

```
# su - db2inst1
```

3. Ensure that DB2 and the DB2 Text Extenders have been started. To check this, using your DB2 instance ID, start the DB2 instance with the `db2start` command and the DB2 extenders with the `txstart` command as the following example shows:

```
$ db2start
SQL1063N DB2START processing was successful.
$ txstart
db2txss - search service controller

-----
db2txss: Informational message:
        Search service started.
```

4. Type `exit` to return to user ID `root`.
5. To start the Net.Commerce Configuration Manager, switch to the `/usr/lpp/NetCommerce3/server/bin` directory and type the `./start_admin_server` command. You should receive the following status messages:

```
/usr/lpp/NetCommerce3/server/bin> ./start_admin_server

License Manager
All rights reserved.
(C) Copyright IBM Corp. 1998, All rights reserved.

Found valid license key for product db2

License Manager
All rights reserved.
(C) Copyright IBM Corp. 1998, All rights reserved.

Found valid license key for product db2

Using default port 4444 ...

en_US is the locale being used
#####
### Starting Net.Commerce Server Administrator on port 4444
### To configure Net.Commerce open URL http://chs1:4444/
#####
/usr/lpp/NetCommerce3/server/bin>
```

Note that if the server is already started, it will be restarted with a new process ID.

6. From the Windows machine running the required software, access the Configuration Manager by doing the following:

1. Open your Web browser and go to `http://host_name:4444`. In our example, it will be `http://dbsvr2:4444`.
2. When prompted, enter your Configuration Manager user ID and password. If you have not yet changed them, your user ID is `webadmin` and your password is `webibm`.
3. On the Configuration Manager main window (Figure 6 on page 60), click **New** to create a new instance.

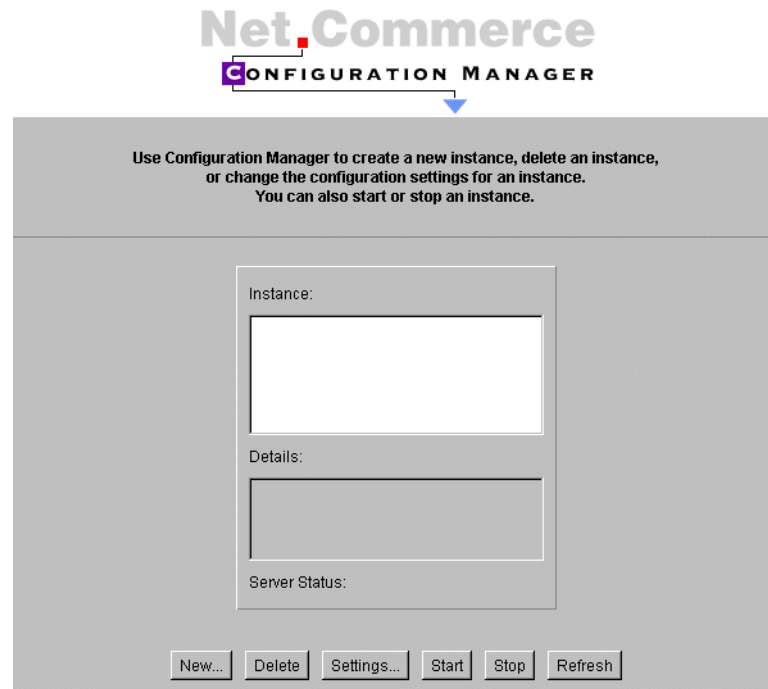


Figure 6. Net.Commerce Configuration Manager main window

7. The Configuration Manager displays the following window:

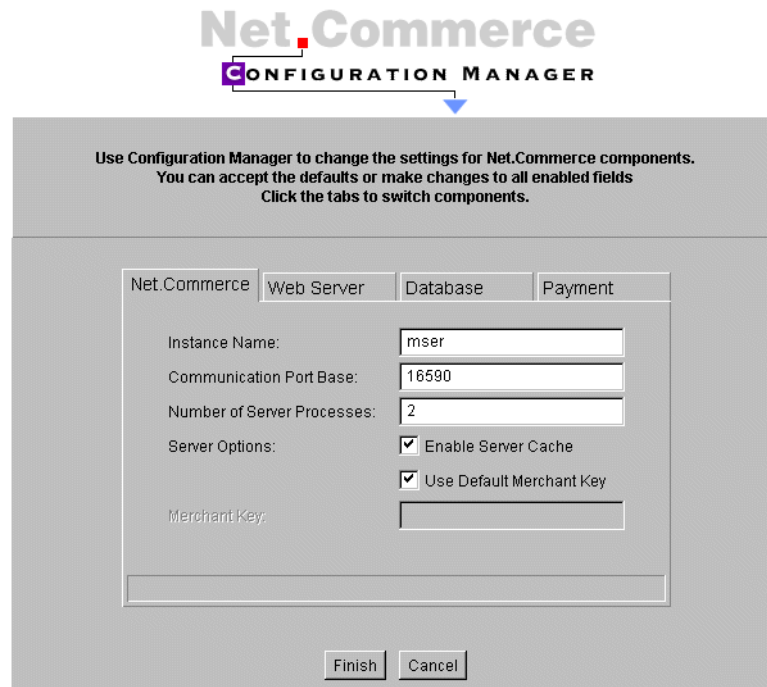


Figure 7. Net.Commerce Configuration Manager Net.Commerce tab

This window includes four tabs that allow you to review and update a variety of configuration settings for your Net.Commerce Hosting Server components. You can also update many of them later after you have installed and configured Net.Commerce Hosting Server. See *Configuration Manager* in the Net.Commerce Hosting Server online information for details.

The first tab, Net.Commerce, lets you change settings for the Net.Commerce Hosting Server commerce server. Complete the fields as follows:

- **Instance Name**

Accept the default or type an alphanumeric name for the Net.Commerce Hosting Server instance that you want to create. The Net.Commerce Hosting Server will store its logs in the `/usr/lpp/NetCommerce3/instance/instance_name/logs` directory, where `instance_name` is the name you type in this field.

- **Communication Port Base**

Accept the default or type the base port address that you want the commerce server to use to communicate with your Web server.

This address will be used by the first server process. Each additional process will use consecutive port addresses starting at this address. Therefore, you must ensure that there are a sufficient number of free addresses above the base address to accommodate the number of processes you intend to create. If you are using Payment Server, note that it uses five port addresses.

The default port address allows room for at least two processes to be defined.

Note

The base address must be greater than 1024. The range of addresses, starting at the base, cannot include 1080 or 8080, and the highest address in the range cannot be greater than 65535.

- **Number of Server Processes**

Accept the default or type the number of processes that you want started for this Net.Commerce Hosting Server instance. A higher number will allow the Net.Commerce Hosting Server to process more transactions simultaneously, but the load on the machine will be increased.

- **Server Options**

If you intend to use Domino Go Webserver as your Web server, ensure that **Enable Server Cache** is selected to enable caching for this Net.Commerce Hosting Server instance. Caching reduces the time it takes for the Net.Commerce Hosting Server to display frequently used dynamic pages.

In our example, we are using Domino Go Webserver; hence, this option has been selected.

- **Use Default Merchant Key**

If you want the Configuration Manager to prompt you for a key to encrypt the shopper and administrator passwords in the Net.Commerce Hosting Server database, ensure that this checkbox is *not* selected. If you want the Configuration Manager to generate the key itself, ensure that this box is selected.

- **Merchant Key**

If you have deselected the **Use Default Merchant Key** checkbox, the Merchant Key field becomes enabled. Type a 16-digit hexadecimal number for the Configuration Manager to use as the encryption key. Keep a record of this number as you will need it if you reconfigure your system later.

8. Click the second tab, **Web Server**, to review and update the Web server settings. The following window is displayed:



Figure 8. Net.Commerce Configuration Manager Web Server tab

Complete the fields as follows:

- **Host Name**

Accept the default or type the *fully qualified* host name of your Net.Commerce Hosting Server machine (for example, `www.ibm.com`).

- **Web Server**

From the drop-down list, select the name of the Web server that you intend to use.

- **HTML Path**

Accept the default, which is provided only if you are using Domino Go Webserver, or type the path of your Web server HTML document root.

If you intend to use Netscape Enterprise Server, and you used the default path when you installed it, type `/usr/netscape/suitespot/docs` (This path is also known as the *primary document root*).

- **CGI Path**

Accept the default, which is provided only if you are using Domino Go Webserver, or type the path in which you intend to store the Net.Commerce Hosting Server CGI programs.

If you intend to use Netscape Enterprise Server, type `/usr/lpp/NetCommerce3/cgi-bin` or the path in which you intend to store the Net.Commerce Hosting Server CGI programs.

- **Macro Path**

Accept the default or type the path in which you intend to store your Net.Data macros.

9. Click the third tab, **Database**, to review and update the database settings. The following window is displayed:



Figure 9. Net.Commerce Configuration Manager Database tab

Complete the fields as follows:

- **Database Name**

Accept the default or type the name you wish to assign to your database. The name must be eight characters in length or less.

- **DBMS**

From the drop-down list, select **IBM Universal Database**.

- **Instance Owner ID**

This field is not enabled.

- **Database User Logon**

Type the name of the DB2 instance ID that you created in steps provided in Step15. on page 39.

- **Database Logon Password**

Type the password of the user ID that you specified in the Database User Logon field.

- **Confirm Password**

Type the password again.

- **Database Option**

Leave this box unchecked when you are installing your first instance of the Net.Commerce Hosting Server.

10. Click the fourth tab, **Payment**, to configure the Payment Server settings. The following window is displayed:

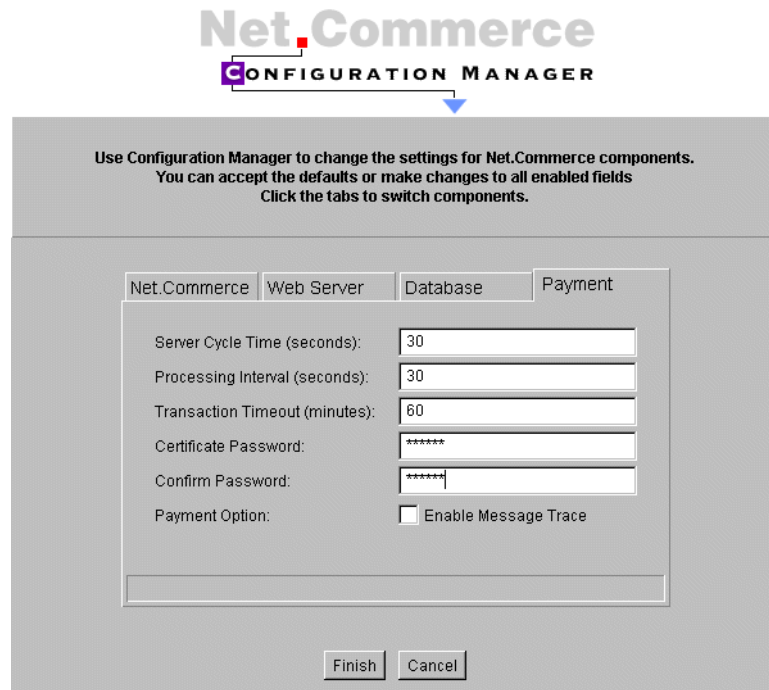


Figure 10. Net.Commerce Configuration Manager Payment Server tab

Complete the fields as follows:

- **Server Cycle Time**

Accept the default or type the number of seconds you want the payment server to wait between polls for work.

- **Processing Interval**

Accept the default or type the number of seconds you want the payment server to wait between the execution of consecutive jobs waiting in the queue.

- **Transaction Timeout**

Accept the default or type the number of minutes you want transactions to stay in a pending state before the commerce server checks the database for data that has not been received directly from the Payment Server machine.

- **Certificate Password**

Type the password that you want the payment server to use to access your certificate files (which are also known as key files).

If you do not type in a password, you will be prompted, when finished, to confirm the use of a blank SET certificate password.

In our example, we will use the password kim123.

- **Confirm Password**

Type the password again.

- **Payment Option**

Select the **Enable Message Trace** box if you want the payment server to write log entries as it processes transactions.

11. Click **Finish**. Your Net.Commerce Hosting Server instance will be configured according to your selection.

When finished, the Net.Commerce Configuration Manager window will be as follows:



Figure 11. Creating NCHS database

Click on **OK** to return to the main Net.Commerce Configuration Manager window.

12. In an AIX command window, switch to the /etc directory on the NCHS server and add the following line to the environment file:

```
DB2INSTANCE=db2inst_owner
```

where `db2inst_owner` is the DB2 instance owner ID.

It is important that this environment variable is set for the user ID that will be used to start the Web server. If it is not set, the MerchantAdmin servlet will not load properly.

13. From the main Configuration Manager window, highlight your Net.Commerce Hosting Server instance and click **Start**.

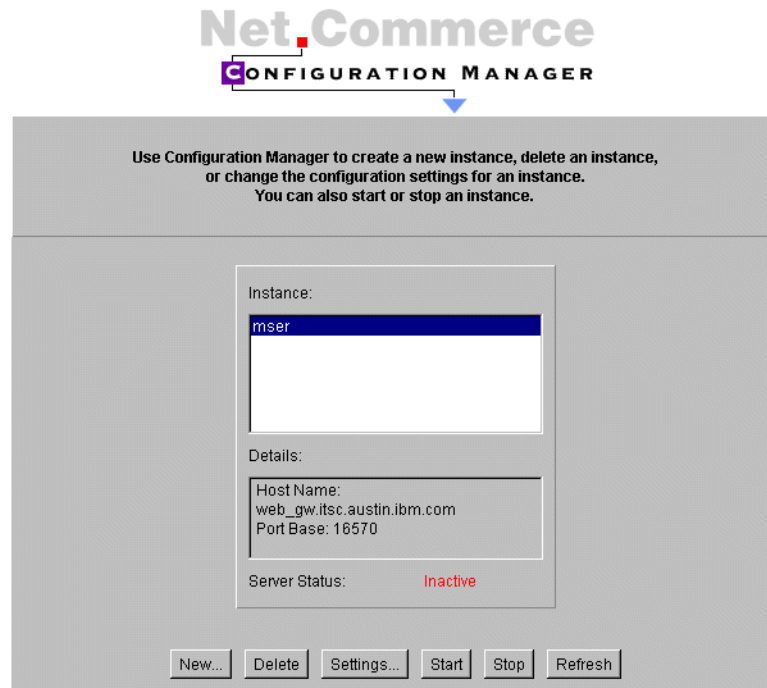


Figure 12. Starting NCHS instance

A status window will be displayed where the Net.Commerce Configuration Manager will attempt to start the Net.Commerce Server specified. If successful, the following window is displayed:

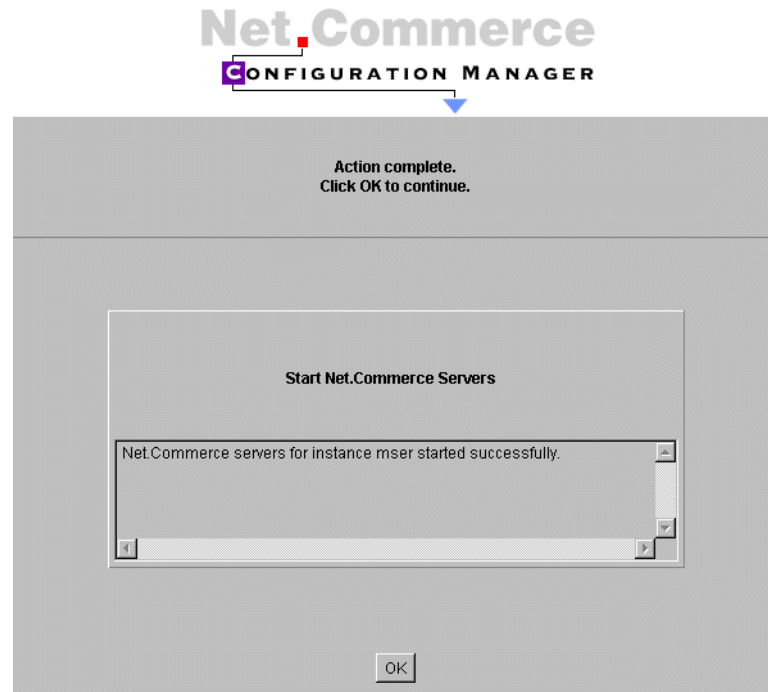


Figure 13. Confirm message after starting NCHS instance

Click **OK** to return to the Net.Commerce Configuration Manager main window where the status of your Net.Commerce Hosting Server instance will now be Active .

2.3.3 Verifying a successful installation

Once you have completed the steps in this chapter, you can perform a quick verification test by loading the Web server servlet, which will be a good indicator of whether your installation was successful.

To load the Web server servlet, do the following:

1. On your Windows machine, open your browser and go to the following URL:

```
http://hostname:9090
```

In our example, it will be `http://dbsvr2:9090`. The IBM WebSphere Application Server Manager page should appear as shown in Figure 14. If

it does not, the WebSphere Application Server may not have been installed successfully, or it failed to load when the Web server was started.

2. On the IBM WebSphere Application Server Manager page, log on using the user ID and password admin as shown in Figure 14.



Figure 14. WebSphere logon page

Note

If you wish to change the password after you log on, click the **Properties** button, and on the Admin Password tab, enter your new password.

3. On the window that appears after you log on, select the servlet for your Web server. In our following example , it is servlet -- Lotus Domino Go Web/1.1.

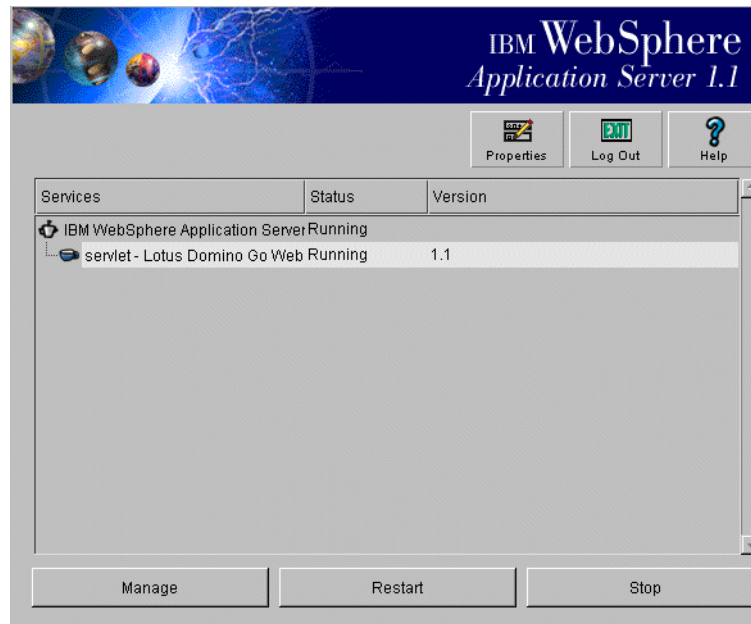


Figure 15. Selecting servlets

4. Click **Manage**. A new window appears.
5. On the new window, click **Servlets**. The following window appears:

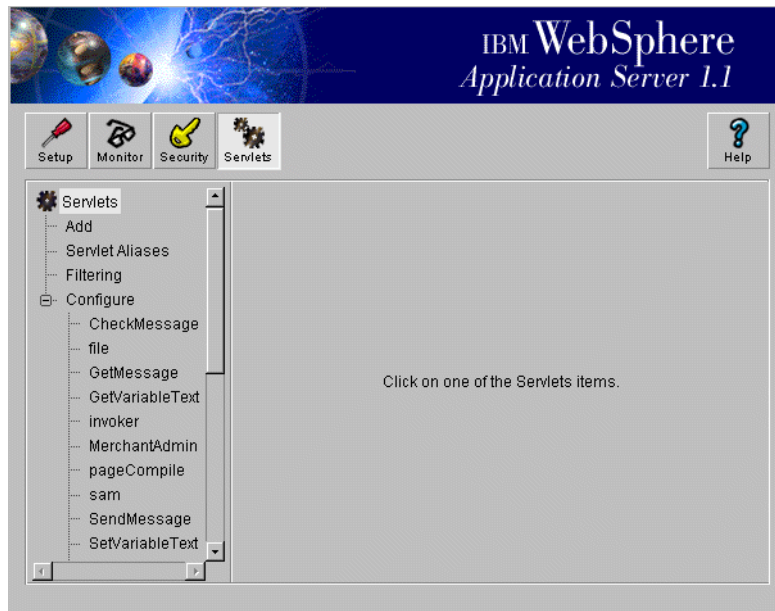


Figure 16. Select Merchant Admin servlet

6. In the tree view frame on the left side of the window, under the Configure option, select **MerchantAdmin**.
7. On the right side of the window, under the Configuration tab, click **Load**.

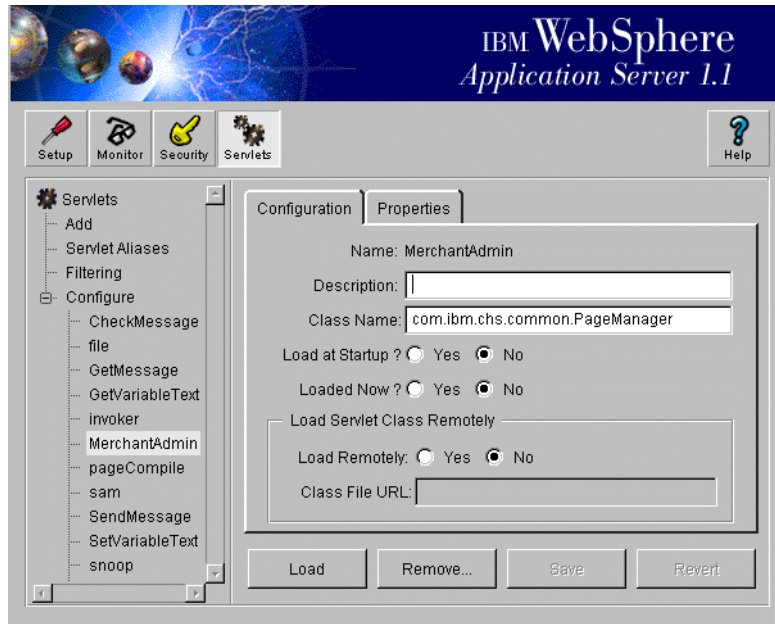


Figure 17. Configuring MerchantAdmin servlet

The Load button will change to Unload when the servlet has been loaded, and the status Loaded Now will change to Yes. If the servlet fails to load, you will be presented with an error message. If you cannot resolve the problem based on the information provided in the error message, refer to the "Troubleshooting" section in the readme.txt file located at the root of the Net.Commerce Hosting Server CD.

8. Close the window to return to the main window.
9. Click **Log Out** and close the IBM WebSphere Application Server Manager window.

2.3.4 Enabling SSL on Domino Go Webserver for test

Secure Sockets Layer (SSL) is a security protocol that allows a client to authenticate a server and all data and requests to be encrypted. The URL of a secure server protected by SSL begins with `https` (rather than `http`). Because HTTPS (HTTP + SSL) and HTTP are different protocols and usually use different ports (443 and 80, respectively), you can run both SSL and non-SSL requests at the same time. As a result, you can choose to provide information to all users using no security and give specific information only to browsers who make secure requests. This is how a retail company on the

Internet can allow users to look through the merchandise without security but then fill out order forms and send their credit card numbers using security.

In the following sections, we will explain enabling SSL for mostly testing . Therefore, the security key-pair and certificate that you will create cannot prevent shopper transactions from being viewed by unauthorized individuals. Because the key-pair is not authorized by a widely known authority, other participants in the Internet cannot authenticate a server and all data, and the site name stored in certificate is not registered.

Therefore, before you open your site to shoppers, you must enable SSL for commercial business by following the steps in "Enabling SSL for Production on Domino Go Webserver" (see the page 47 of "*Installing and Getting Started Guide*", GC09-2808-01) or see 2.3.5, "Requesting a production key ring certificate" on page 85. If you receive a certificate from a well-known authority, such as VeriSign, you can protect the critical data, such as a credit card information. VeriSign is the provider of Public Key Infrastructure (PKI) and digital certificate solutions used by enterprises, Web sites, and consumers to conduct secure communications and transactions over the Internet and private networks.

2.3.4.1 Creating a security key ring for testing

To create a security key ring for testing, do the following:

1. Ensure that Domino Go Webserver is started by typing `lssrc -s httpd` on an AIX command line.

```
# lssrc -s httpd
Subsystem      Group          PID           Status
httpd          tcpip         4934         active
```

Clear all disk and memory caching, set caching to zero, and disable all proxy servers (or socks servers).

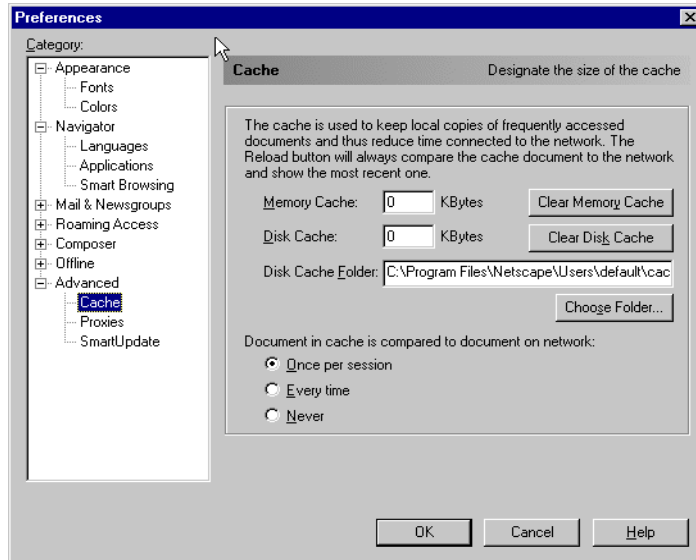


Figure 18. Disable memory and disk cache of your browser

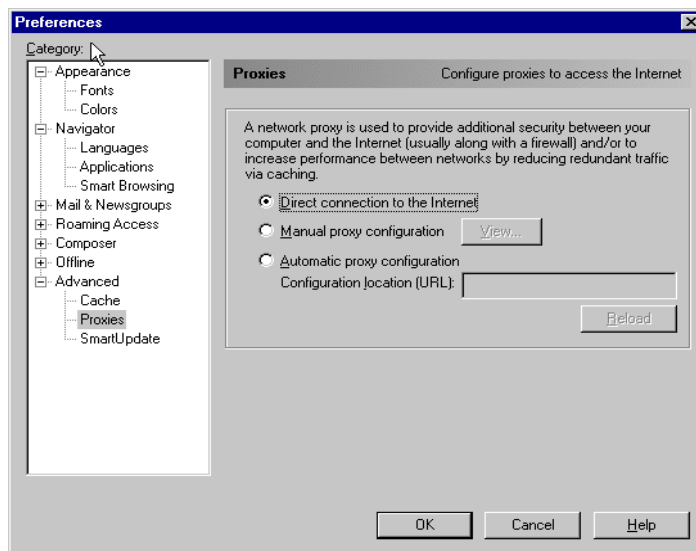


Figure 19. Disable Proxy Server

2. Type `http://host_name/path` on the browser, where `path` is the name of your Web server's front page, if required on your system.

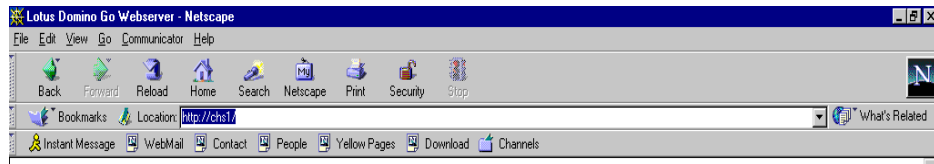


Figure 20. Go to Domino Go Webserver front page

3. Click **CONFIGURATION AND ADMINISTRATION FORMS**, and when prompted, type your Web server administration user ID and password. The default administration user ID is `webadmin` and password is `webibm`. Click **OK**.
4. If you have not changed the password, do so now by following the steps in "Change Your Domino Go Webserver Password" (see the page 43 of "Installing and Getting Started Guide", GC09-2808-01)
5. On the Configuration and Administration Forms page under Security, click **Create Keys**.
6. On the Create Key and Request Certificate form, select a certificate type of **Other** and click **Apply**.

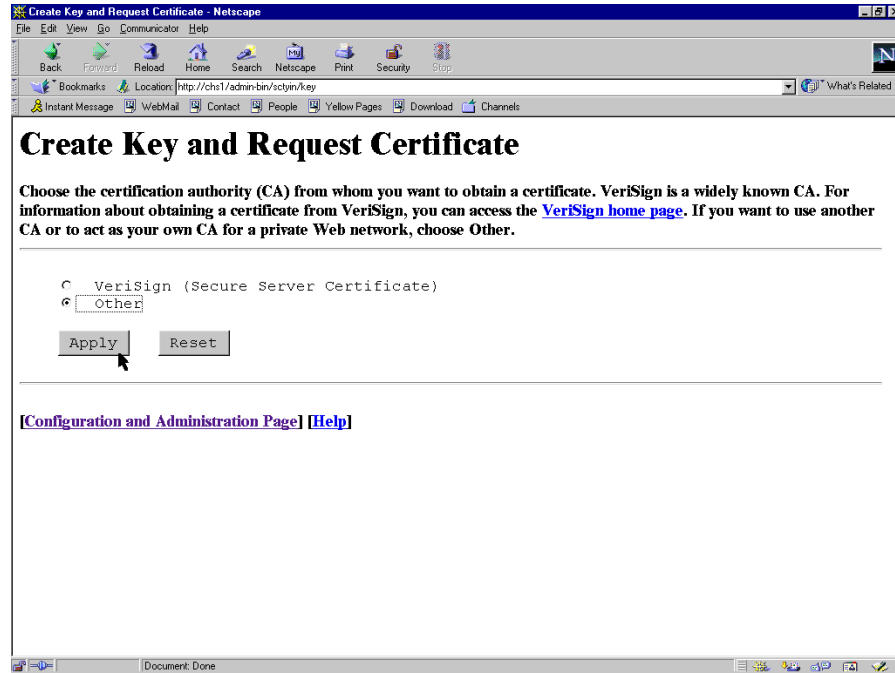


Figure 21. Certificate authority selection

7. On the Other Certificate form, in the Key name field, type `testnetc`. In the Key ring field, type `/usr/lpp/internet/server_root/testnetc.kyr` and change the Size field to the highest setting that is available. Under Key Ring Password, in both Password fields, type a key ring password of your choice and click the **Automatic login** box.

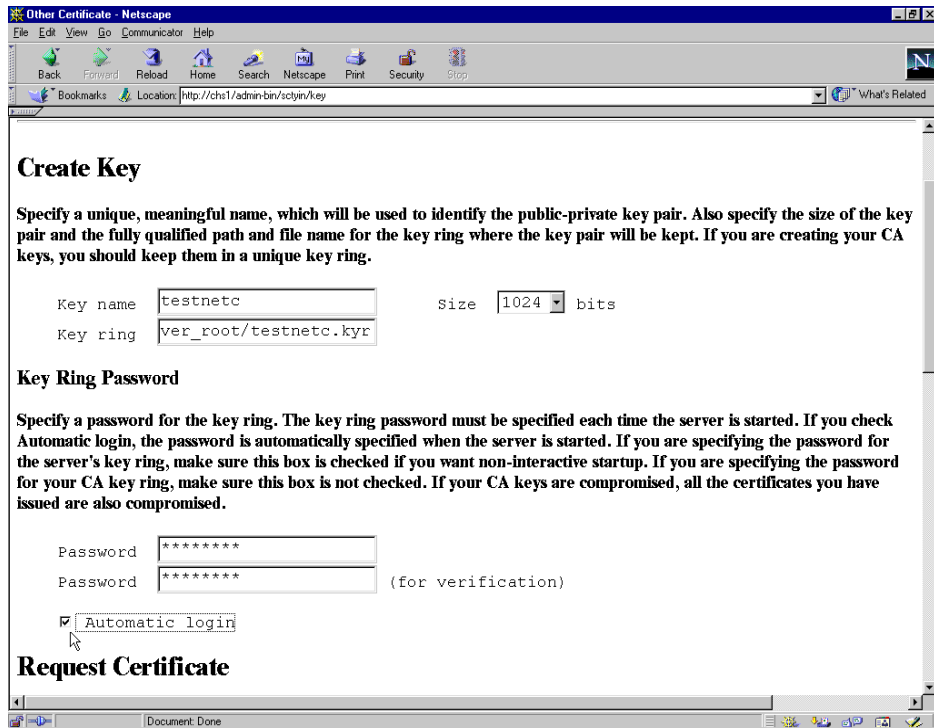


Figure 22. Key creation forms

8. Complete the fields under Distinguished Name. For Server name, use the fully qualified name on your Net.Commerce server. And under Mail To, select Don't mail. And under Save Copy, in the Save certificate request to file fields, type `/usr/lpp/internet/server_root/testnetc.txt` and click **Apply**.

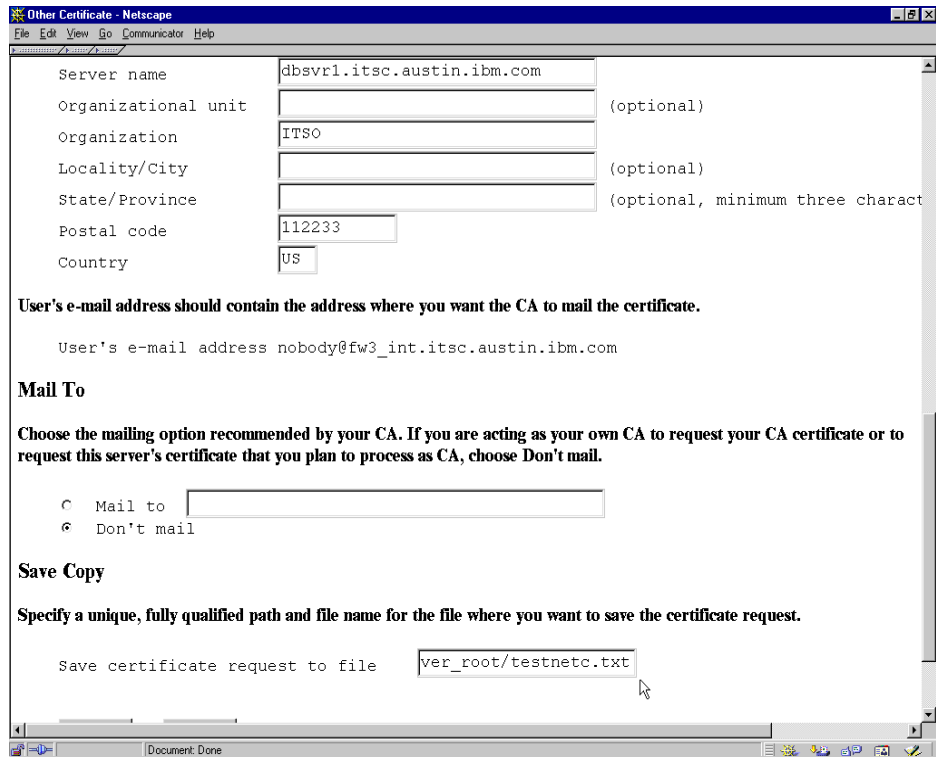


Figure 23. Distinguished name and other information decision

9. Figure 24 shows a confirmation page indicating that you have successfully created your public-private key pair and certificate request.

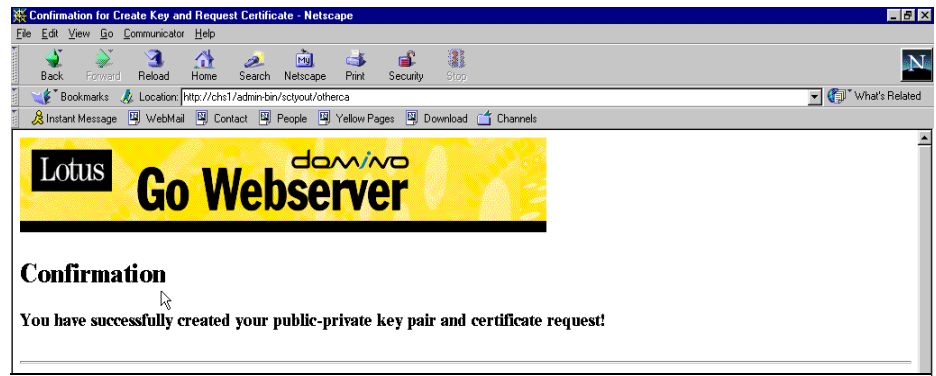


Figure 24. Confirmation page for key creation and certificate request

2.3.4.2 Setting your test key ring as the current key ring

To make the Web server use your test key ring, do the following:

1. Return to the Configuration and Administration Forms page by clicking **Configuration Page** at the bottom of the confirmation page.
2. Under Security, click **Security Configuration**.
3. On the Security Configuration form under Key ring, type `/usr/lpp/internet/server_root/testnetc.kyr`, and select **Set selected key ring as current key ring** and click **Apply**.

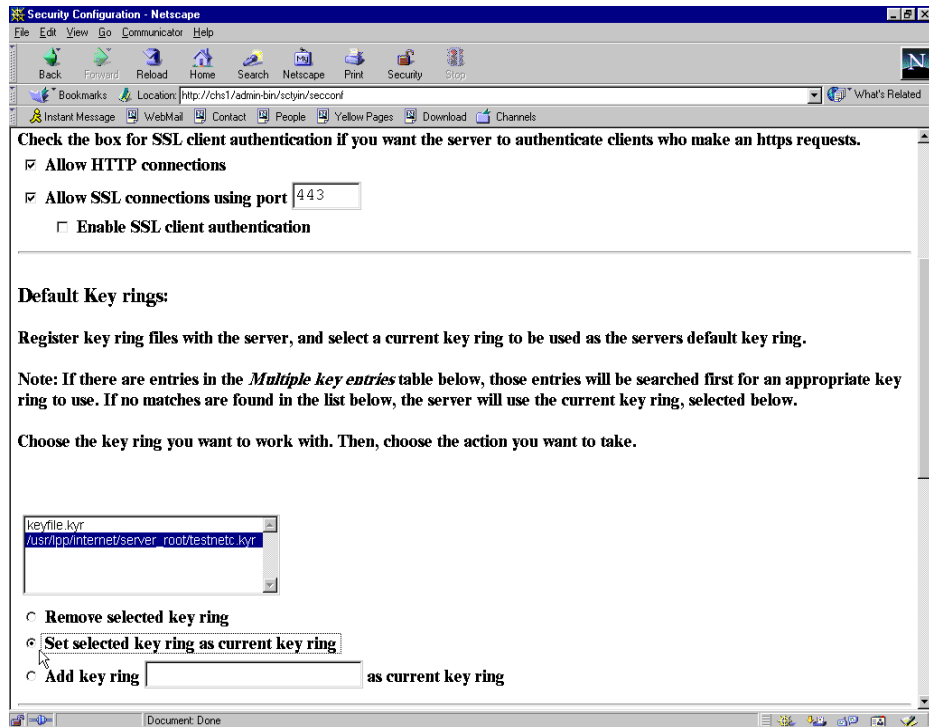


Figure 25. Key ring selection

2.3.4.3 Receiving and testing the test key ring certificate.

To receive and test your test key ring certificate, do the following:

1. Return to the Configuration and Administration Forms page by clicking **Configuration Page** at the bottom of the confirmation page.
2. On the Configuration and Administration Forms page under Security, click **Receive Certificate**.

3. On the Receive Certificate form in the Name of file containing certificate field, type `/usr/lpp/internet/server_root/testnetc.txt`. In the Key ring field, type `/usr/lpp/internet/server_root/testnetc.kyr`, and in the **Key ring password** field, type the password you used to create the key ring in step 8 in Section 2.3.4.1, “Creating a Security Key Ring for Testing” on page 74 and click **Apply**.

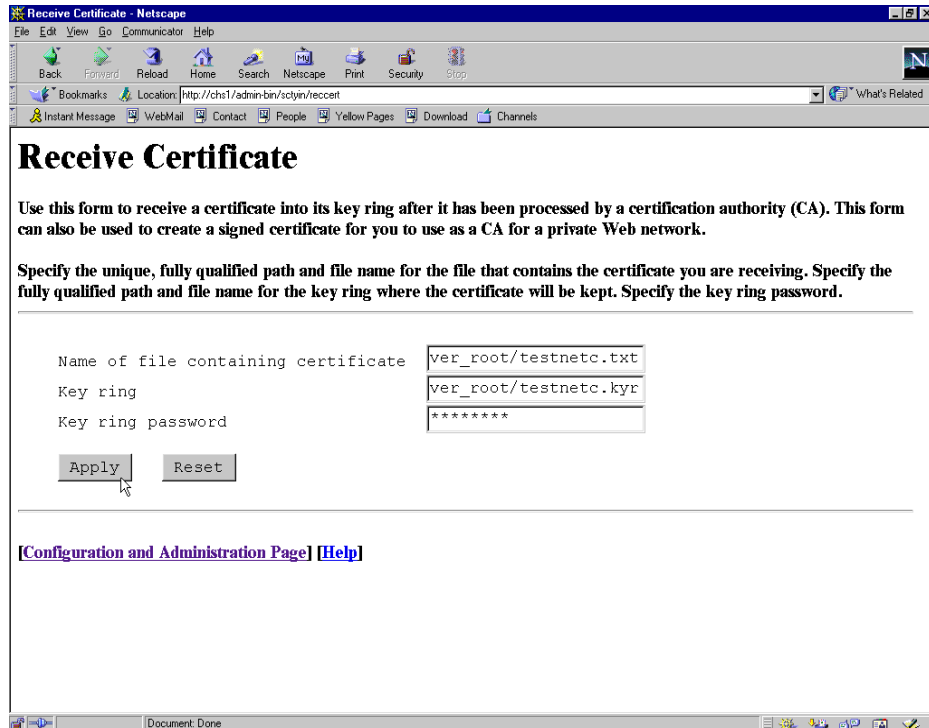


Figure 26. Receive Certificate Form 1

4. Make sure to get a confirmation page indicating the certificate was successfully received.
5. Return to the Configuration and Administration Forms page by clicking **Configuration Page** at the bottom of the confirmation page.
6. Under Security, click **Key Management**.
7. On the Key Management form in the Key Ring Password field, type the password you used to create the key ring in Step 8 in Section 2.3.4.1, “Creating a Security Key Ring for Testing” on page 74. Then select **Designate Trusted Keys** and click **Apply**.

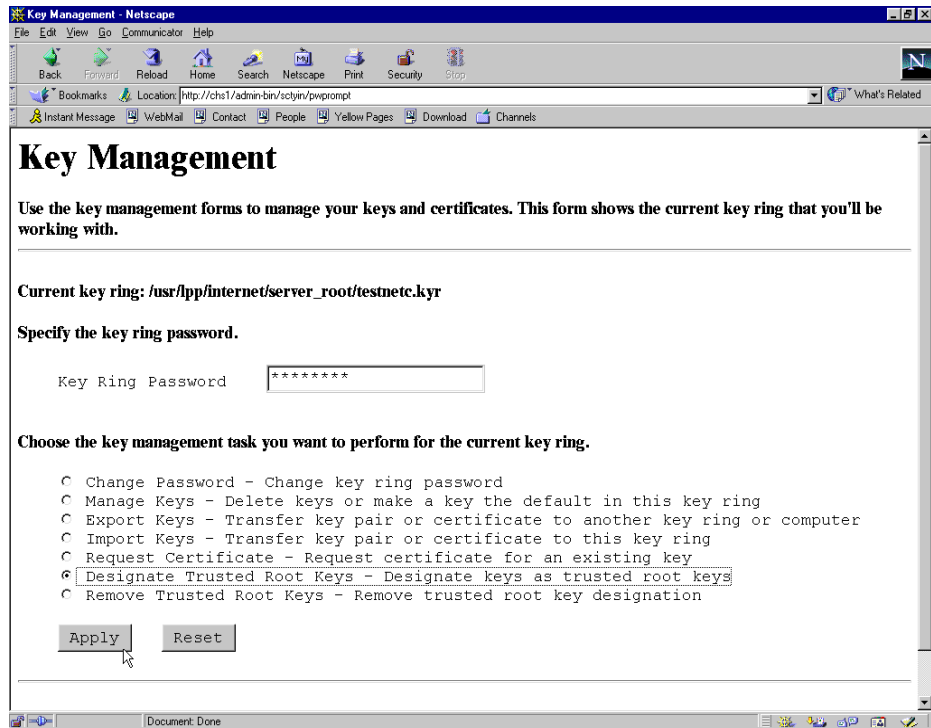


Figure 27. Key Management under security

8. On the Designate Trusted Root Keys form under Keys, select **testnetc** from the list and click **Apply**. A confirmation message will follow.

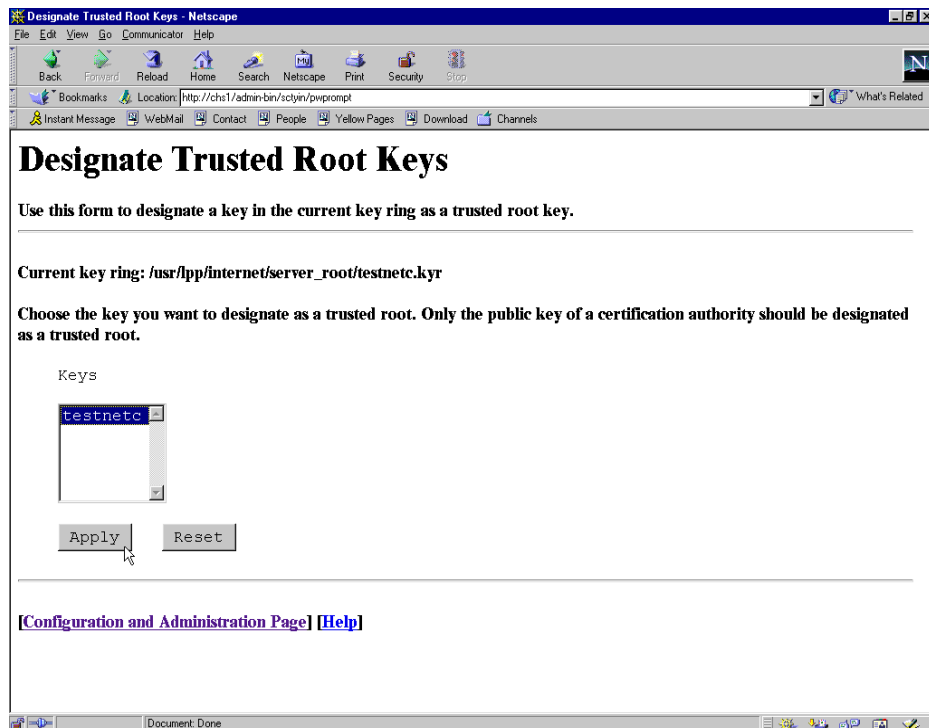


Figure 28. Select key name

9. Stop and start the Web server.

```
>stopsrc -s httpd
0513-044 The stop of the /usr/sbin/httpd Subsystem was completed
successfully.
```

```
> lssrc -s httpd
Subsystem      Group          PID           Status
httpd          tcpip         8266         inoperative
```

```
> startsrc -s httpd
0513-059 The httpd Subsystem has been started. Subsystem PID is 8266.
```

```
> lssrc -s httpd
Subsystem      Group          PID           Status
httpd          tcpip         8266         active
```

10. To test the key, type `https://host_name/path` on your browser, where `path` is the name of your Web server's front page, if required on your system.

Note

Be sure to type `https`, not `http`.

11. If your key is defined correctly, you will see several messages concerning your secure connection. If you are asked whether you want to accept the certificate, respond affirmatively.

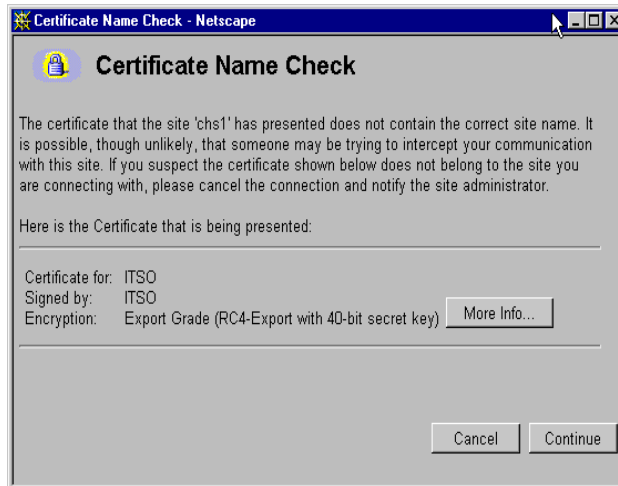


Figure 29. Certificate Check screen

12. Restore your caching and proxy (or socks) server settings to their original states.

2.3.5 Requesting a production key ring certificate

To create a production key ring, complete the following steps:

1. Create a security key ring for production.
2. Request a secure certificate from a certifying authority.
3. Set your production key ring as the current key ring.
4. Receive the certificate and test the production key ring.

Most processes are similar to Section 2.3.4, “Enabling SSL on Domino Go Webserver for test” on page 74 except the following:

- **Creating a security key ring** - When you create a security key ring, you have to select **certifying authority** as follows:

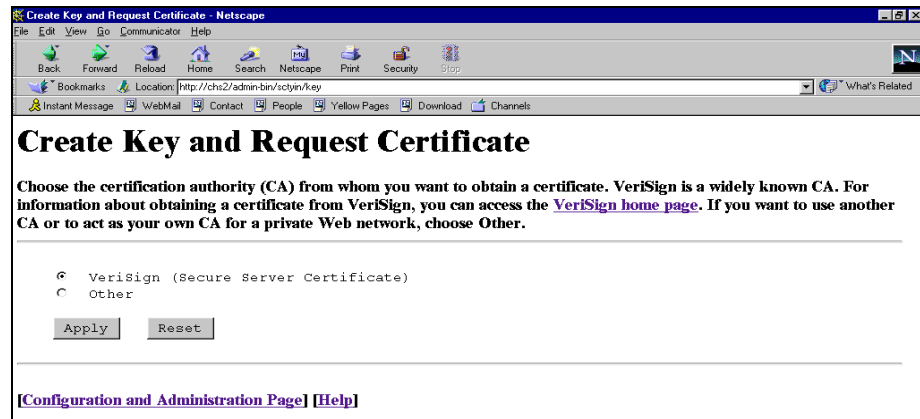


Figure 30. Certificate authority selection for production

If you are using VeriSign as your CA, you must save the secure server certificate request in a file and manually mail it to VeriSign.

- **Requesting a security certificate** - To validate the security key ring that you just created in the previous "creating a security key ring step, you need a certificate from a widely known certifying authority (CA), such as VeriSign. To request a secure server certificate from VeriSign, type the <http://www.verisign.com/ibm> on your browser and follow the instructions (see Figure 31 on page 87).

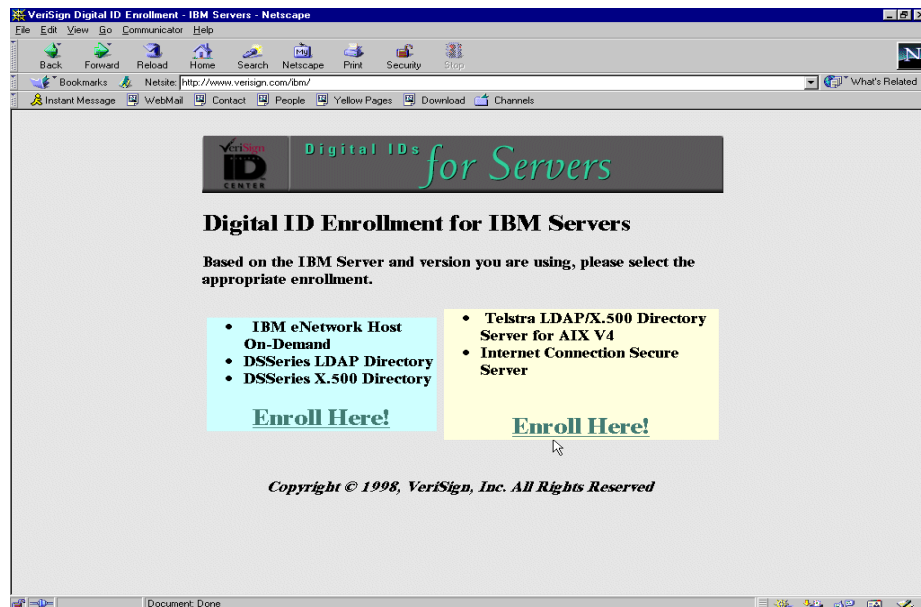


Figure 31. VeriSign enrollment screen

You will receive the secure server certificate through e-mail in three to five business days.

- **Receiving the certificate and testing the production key ring** - After the certificate arrives from CA, you have to save the e-mail as an ASCII text file called `xxxxx.crt` and use a FTP program to copy the file to the directory that is selected in the creating step. The rest of the processes are same as Section 2.3.4.3, “Receiving and Testing the Test Key Ring Certificate.” on page 80, except that you have to select **Manage key** and **Set as Default** in the Key Management step.

2.4 Installation for a distributed configuration

This section describes how to install all of the Net.Commerce Hosting Server components in a distributed configuration.

In the following example, we will use the components bundled with NCHS to be installed on two servers as follows:

1. The Net.Commerce Hosting Server database will be maintained on a separate machine running DB2 Universal Database Workgroup Edition. For our example, this database server machine will be hosted on an

RS/6000 7025-F50. It has a fully qualified hostname of `dbsvr1.itsc.austin.ibm.com`. We will refer to it abbreviated as `dbsvr1`.

The Model F50 uses the 332 MHz processor upgrade, in a four-way processor configuration and excels as a multiuser application, database, and Internet server.

2. The rest of the Net.Commerce Hosting Server components, for example, Net.Commerce, Domino Go Webserver, IBM Payment server, and Net.Commerce Hosting Server itself, will be hosted on a separate machine. For our example, this Net.Commerce Hosting server machine is an RS/6000 43P with a fully qualified hostname of `chs1.itsc.austin.ibm.com`. We will refer to it abbreviated as `chs1`.

To clarify once again, for the distributed installation example in this chapter, we will be using Domino Go Webserver as the Web server and the DB2 Universal Database Server as the database server. These products are included with the Commerce Hosting Server Version 3.1.2.

2.4.1 Pre-installation steps

Complete the steps described 2.2, “Pre-installation” on page 30. Once you have completed the steps in that section, you are ready to continue. We will install the software in the following order:

1. Domino Go Webserver
2. DB2 UDB and the DB2 UDB July FixPak
3. Net.Commerce
4. IBM Payment Server
5. Installing Net.Commerce FixPak
6. Finalizing DB2 Remote Setup
7. Net.Commerce Hosting Server
8. Verifying a successful installation

2.4.2 Installing Domino Go Webserver

This section explains how to install Domino Go Webserver 4.6.2.51 on your Net.Commerce Hosting Server commerce server. To complete the steps in this chapter, you will need to the Lotus Domino Go Webserver 4.6.2.51 CD.

The steps that follow use the SMITTY command. Our example, NCHS commerce server, will be the server `chs1`.

1. Log on to your AIX system, which will be the Web Server (in our example, chs1), as the user `root`. You can verify that you are actually the root user by issuing the `id` command. Notice the `uid=0 (root)` in the example below.

```
# id
uid=0 (root) gid=0 (system)
groups=2 (bin) , 3 (sys) , 7 (security) , 8 (cron) , 10 (audit)
```

2. Mount the CD entitled *Lotus Domino Go Webserver, Version 4.6.2.51* and change to the directory `/cdrom/usr/sys/inst.images`.

```
# mount /cdrom
# cd /cdrom/usr/sys/inst.images
# ls
.toc                               internet_server.loc.fr_FR
NetQ.cgi                           internet_server.msg.Es_ES
NetQ.pkg                            internet_server.msg.fr_FR
internet_server.base               internet_server.msg.en_US
internet_server.java               internet_server.msg.es_ES
internet_server.loc.Es_ES          internet_server.msg.fr_FR
internet_server.loc.fr_FR          internet_server.security.common
internet_server.loc.es_ES          internet_server.security.us_secure
```

You can list the contents of the directory and verify that you are in the right place as shown above.

The Web server will be installed using SMITTY, but you could use SMIT instead. However, the following description will only refer to SMITTY.

3. Run SMITTY with the `install_all` fastpath as follows:

```
# smitty install_all
```

4. Type `.` in the INPUT device / directory for software field and press **Enter**.

```

Install and Update from ALL Available Software

Type or select a value for the entry field.
Press Enter AFTER making all desired changes.

                                [Entry Fields]
* INPUT device / directory for software      [.]          +

F1=Help      F2=Refresh      F3=Cancel      F4=List
Esc+5=Reset  Esc+6=Command  Esc+7=Edit    Esc+8=Image
Esc+9=Shell  Esc+0=Exit    Enter=Do

```

5. Place the cursor in the **SOFTWARE to install** field on the next screen that comes up. (The cursor should already be in that field.)

```

Install and Update from ALL Available Software

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                [Entry Fields]
* INPUT device / directory for software      .
* SOFTWARE to install                       []          +
PREVIEW only? (install operation will NOT occur)  no          +
COMMIT software updates?                     yes         +
SAVE replaced files?                         no          +
AUTOMATICALLY install requisite software?      yes         +
EXTEND file systems if space needed?          yes         +
OVERWRITE same or newer versions?            no          +
VERIFY install and check file sizes?         no          +
DETAILED output?                            no          +
Process multiple volumes?                    yes         +

F1=Help      F2=Refresh      F3=Cancel      F4=List
Esc+5=Reset  Esc+6=Command  Esc+7=Edit    Esc+8=Image
Esc+9=Shell  Esc+0=Exit    Enter=Do

```

Press **F4** to list the filesets available for installation. Use the cursor keys to move up and down and **F7** to select the following file sets:

- internet_server.base
- internet_server.loc.lang
(*lang* could be substituted with a language of your choice. In the following we use en_US.)
- internet_server.msg.lang
- internet_server.security.common
- internet_server.security.us_secure
(This file set only appears and should only be selected if you have the North American edition of the NCHS.)
- internet_server.security.export
(This file set only appears and should only be selected if you have the Export edition of the NCHS.)

Do Not Install Java!

Make sure you do *not* select and install the fileset internet_server.java.

The following screen shows the selection of internet_server.base (indicated by the > character):

```

Install and Update from ALL Available Software

Ty+-----+
Pr|                SOFTWARE to install
|
| Move cursor to desired item and press Esc+7. Use arrow keys to scroll.
| *   ONE OR MORE items can be selected.
| *   Press Enter AFTER making all selections.
|
| [MORE...24]
| + 1.1.0.0  it_IT Webserver Search Engine CGI executables + icons
| + 1.1.0.0  pt_BR Webserver Search Engine CGI executables + icons
|
| > internet_server.base                                ALL
| + 4.6.2.51 Lotus Domino Go Webserver
| + 4.6.2.51 Lotus Domino Go Webserver Administration
| + 4.6.2.51 Lotus Domino Go Webserver Documentation
|
| [MORE...59]
|
| F1=Help           F2=Refresh           F3=Cancel
| F1| Esc+7=Select   Esc+8=Image       Esc+0=Exit
| Es| Enter=Do       /=Find              n=Find Next
Es+-----+

```

6. Press **Enter** when you have made all your selections. This will bring you back to the previous screen.
7. Press **Enter** to start the installation. Press **Enter** again at the confirmation screen to proceed with the installation.

Preview Installation

Optionally, you can do a preview of the installation by setting the PREVIEW only? field to Yes.

An OK indication will be displayed in the upper left hand corner after a successful installation.

```

                                COMMAND STATUS
Command: OK                      stdout: yes                      stderr: no

Before command completion, additional instructions may appear below.

[TOP]
installp -acgNqwX -d ./ -f File 2>&1

File:
  internet_server.base.admin      4.6.2.51
  internet_server.base.doc        4.6.2.51
  internet_server.base.httpd      4.6.2.51
  internet_server.msg.en_US.httpd 4.6.2.51
  internet_server.security.common.httpd 4.6.2.51
  internet_server.security.us_secure.httpd 4.6.2.51

+-----+
                        Pre-installation Verification...
[MORE...132]

F1=Help          F2=Refresh          F3=Cancel          Esc+6=Command
Esc+8=Image      Esc+9=Shell         Esc+0=Exit        /=Find
n=Find Next
```

8. Press **F10** to exit SMITTY.
9. Unmount the CD by running the `umount` command.

This completes the installation of the Web server. The next step is the installation of DB2 UDB and the UDB July Fixpak.

2.4.3 Installing DB2 Universal Database 5.0 and UDB July FixPak

For this distributed configuration scenario, we will install only the DB2 Client Application Enabler on our Net.Commerce Hosting Server machine, chs1,

and install DB2 UDB Workgroup Edition on our database server machine, dbsvr1. Following each of these two steps of installation, we will install the DB2 UDB July FixPak for each machine.

Finally, we will continue the Net.Commerce Hosting Server distributed configuration for DB2 by creating the Net.Commerce Hosting Server database on the database server and configure the DB2 CAE on the Net.Commerce Hosting Server commerce server for remote access.

Disable NIS

If you are using NIS, you must disable it before installing DB2. If you do not disable NIS, the DB2 instance will not be created.

2.4.3.1 DB2 Client Application Enabler installation

1. Ensure you are logged on as the root user (verify with the `id` command), on the machine that will be your Net.Commerce Hosting Server machine (verify with the `hostname` command; in our example, the output should be `chs1.itsc.austin.ibm.com`).
2. Mount the CD entitled *IBM Net.Commerce START for AIX, Version 3.1.1*.
3. Change directory to `/cdrom/NetCommerce3` and confirm the contents. The following screen shows the mount, change of directory, and contents listing:

```
# mount /cdrom
# cd /cdrom/NetCommerce3
# ls
.toc      aix.apar  db2ext    db2setup  runtime
DOC       aix.ptf   db2extfix ics       start
Netscape  db2       db2fix    ifor      sysChk
```

4. You are now ready to run the installation program `db2setup`. Type the following on the command line:

```
# ./db2setup
```

The installation program will check that your system has the necessary PTFs installed before the actual installation begins. If you do not, then the program will ask if you want them installed or not. It will look something like this:

You are required to install additional PTFs for your operating system.
Your system may fail if you do not apply these fixes:

OS Level	APAR/PTF#	RUN-TIME PROCESSOR	File Name
AIX4.2	U453611	MultiProcessor	./aix.PTF/AIX4.2.1/SMP/bos.mp.4.2.1.9.bff
AIX4.2	U453426	UniProcessor	./aix.PTF/AIX4.2.1/UNI/bos.up.4.2.19.bff
AIX4.3	IX72273	MultiProcessor	./aix.APAR/AIX4.3/bos.mp.4.3.0.1.bff
AIX4	U453695	xlC++ runtime	./runtime/ptf_4_2_1

Would you like to install the PTFs automatically now (y/n) ?

5. Answer `y` to automatically install the PTFs.

Some additional information will be shown during the installation of the PTFs.

6. You are then requested to reboot your AIX system. Change to the root directory, then run the `bosboot -a` and `shutdown -Fr` commands to reboot, as follows:

```
/> cd /
/> bosboot -a
bosboot: Boot image is 6266 512 byte blocks.
/> shutdown -Fr
```

Your machine will now reboot.

7. Log on as root when your system comes back online.
8. Mount the CD in the CD-ROM drive.
9. Change directory to `/cdrom/NetCommerce3`
10. Run the DB2 install program again (`db2setup`).
11. The installation program will now display the following window:


```

----- Install DB2 V5 -----

Select the products you are licensed to install. Your Proof of
Entitlement and License Information booklet identify the products for
which you are licensed.

To see the preselected components or customize the selection, select
Customize for the product.
[ ] DB2 Client Application Enabler           [ Customize... ]
[ ] DB2 UDB Workgroup Edition                : Customize... :
: : DB2 UDB Enterprise Edition              : Customize... :
: : DB2 Connect Enterprise Edition          : Customize... :
: : DB2 UDB Extended Enterprise Edition     : Customize... :
: : DB2 Software Developer's Kit           : Customize... :

To choose a language for the following components, select Customize for
the product.
  DB2 Product Messages                       [ Customize... ]
  DB2 Product Library                        [ Customize... ]

[ OK ]                [ Cancel ]                [ Help ]

```

12. Use the cursor keys to move up and down and the spacebar to select **DB2 Client Application Enabler**.

```

----- Install DB2 V5 -----

Select the products you are licensed to install. Your Proof of
Entitlement and License Information booklet identify the products for
which you are licensed.

To see the preselected components or customize the selection, select
Customize for the product.
[*] DB2 Client Application Enabler           [ Customize... ]
[ ] DB2 UDB Workgroup Edition                : Customize... :
: : DB2 UDB Enterprise Edition              : Customize... :
: : DB2 Connect Enterprise Edition          : Customize... :
: : DB2 UDB Extended Enterprise Edition     : Customize... :
: : DB2 Software Developer's Kit           : Customize... :

To choose a language for the following components, select Customize for
the product.
  DB2 Product Messages                       [ Customize... ]
  DB2 Product Library                        [ Customize... ]

[ OK ]                [ Cancel ]                [ Help ]

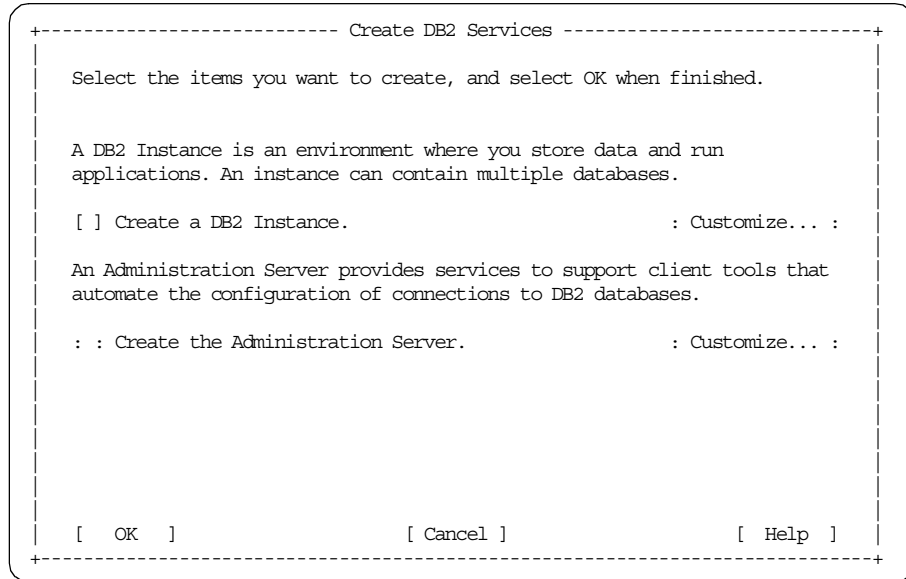
```

- Optionally, you could install DB2 messages in languages other than English. To do this, you select **Customize** next to DB2 Product

Message and choose whatever language you prefer in the window that pops up.

13.To continue, highlight **OK** and press **Enter** in the window entitled Install DB2 V5.

14.The Create DB2 Services window appears.



15.Highlight **Create a DB2 Instance** and press **Enter**. This will bring you to the following window:

```

+----- Create DB2 Services -----+
|+--- DB2 Instance -----+
|
| Authentication:
|   Enter User ID, Group ID, Home Directory and Password that
|   will be used for the DB2 Instance.
|   User Name      [db2inst1]
|   User ID       :      :      [*] Use default UID
|   Group Name    [db2iadm1]
|   Group ID     :      :      [*] Use default GID
|   Home Directory [/home/db2inst1 ]
|   Password     [      ]
|   Verify Password [      ] [ Default ]
|
| Protocol:
|   Select Customize to change the default      : Customize... :
|   communication protocol.
|
| : : Auto start DB2 Instance at system boot.
| : : Create a sample database for DB2 Instance.
|
| [ OK ] [ Cancel ] [ Help ]
+-----+

```

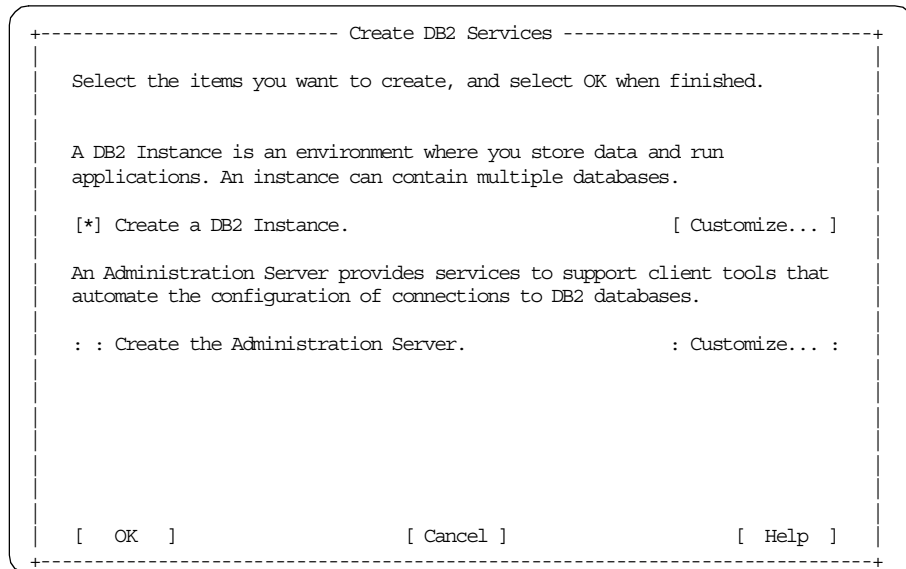
For our example, we will accept and use the defaults as shown. Highlight the **OK** button and press **Enter**. The default password generated by the DB2 installation program for the user db2inst1 will be ibmdb2. Press **Enter** to confirm this and continue with the installation.

```

||
|| +--- Notice -----+
|| |
|| | (!) A system-generated password, ibmdb2, will be used
|| |     for user, db2inst1.
|| |
|| | [ OK ]
|| |
|| | t UID
|| | t GID
|| +-----+
||

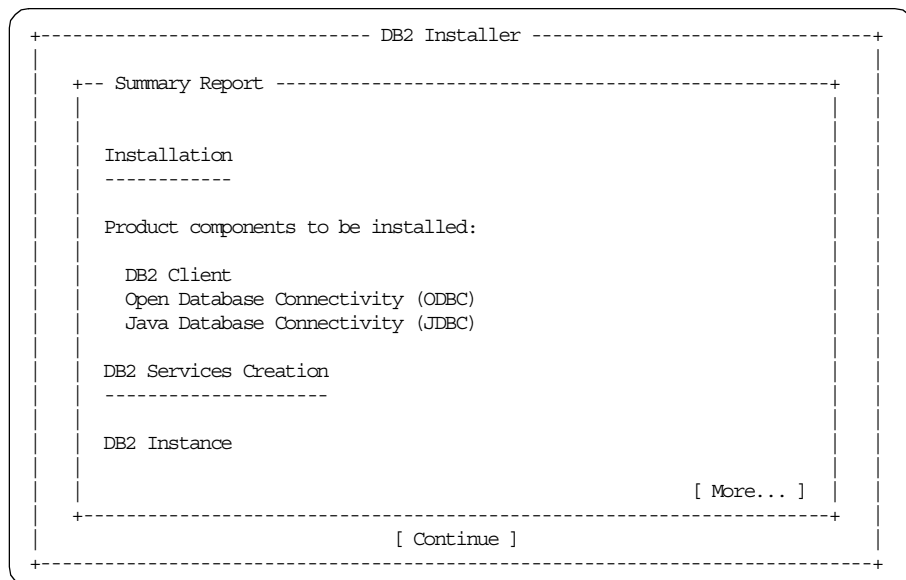
```

16.The Create DB2 Services window is displayed.



Notice that only **Create a DB2 Instance** is selected. Highlight **OK** and press **Enter**.

17.A summary report appears listing the components that will be installed. Highlight **Continue** and press **Enter**.



18. A warning appears advising you that this is your last chance to stop the installation. Highlight **OK** and press **Enter**.

```

Product+--- Warning -----+
DB2 C | (X) This is your last chance to stop.
Open  |
Java  | Select OK to start, or Cancel to abort.
DB2 Ser| [ OK ] [ Cancel ]
-----+

```

19. The installation begins. The selected components will be installed and your instance ID created.

20. You will see a Notice window when the installation completes. Highlight **OK** and press **Enter**.

21. The Status Report window is displayed. Scan the Status Report to ensure that all components were installed successfully. Highlight **OK** and press **Enter** to close the window.

```

----- DB2 Installer -----+
+--- Status Report -----+
Installation
-----
DB2 Client                SUCCESS
Open Database Connectivity (ODBC)  SUCCESS
Java Database Connectivity (JDBC)   SUCCESS

DB2 Services Creation
-----

DB2 Instance

Group Name                SUCCESS
User Name                 SUCCESS
[ More... ]

[ View Log ] [ OK ]
-----+

```

22. You are back to the DB2 Installer window. Highlight **Close** and press **Enter**.

23. A final notice appears advising that you are leaving the DB2 Installer. Highlight **OK** and press **Enter**.

24. Change to the DB2 instance user (db2inst1) you have just created by typing the following on the command line:

```
# su - db2inst1
```

25. Use a text editor, for example vi, to edit the .profile file. Add the following line to the bottom of the file:

```
. sqllib/db2profile
```

An example of how the .profile file should look as follows:

```
PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:$HOME/bin:/usr/bin/X11:/sbin:.  
  
export PATH  
  
if [ -s "$MAIL" ]           # This is at Shell startup. In normal  
then echo "$MAILMSG"       # operation, the Shell checks  
fi                          # periodically.  
  
. sqllib/db2profile
```

26. Type the following on the command line to ensure that the new .profile does not contain errors:

```
$ . .profile
```

27. Type `exit` to return to user ID root and unmount the CD by running the command:

```
# umount /cdrom
```

This completes the installation of DB2 CAE. The next step is to install the DB2 FixPak.

2.4.3.2 DB2 Client Application Enabler FixPak installation

The DB2 July FixPak will update the DB2 CAE components. To verify this, you can use the `lslpp -l` command to look at the specific DB2 components as follows:

```
$ lslpp -l | grep db2  
db2_05_00.client          5.0.0.2 COMMITTED DB2 Client Application Enabler  
db2_05_00.cnvucs          5.0.0.2 COMMITTED Code Page Conversion Tables -  
db2_05_00.jdbc            5.0.0.2 COMMITTED Java Database Connectivity  
db2_05_00.odbc            5.0.0.2 COMMITTED Open Database Connectivity
```

Note the component listings and their current level. We now proceed with the FixPak installation.

1. Ensure the current user ID is root. Mount the CD entitled *DB2 Universal Database July FixPak*.
2. Change to the FixPak directory by running the following command:

```
# cd /cdrom
```
3. The FixPak will be installed using SMITTY and with the `update_all` fastpath. Run this command:

```
# smitty update_all
```
4. Type `.` in the INPUT device / directory for software field and press **Enter**.
5. You should now see the window shown below. Press **Enter** to start the installation.

```

Update Installed Software to Latest Level (Update All)

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                [Entry Fields]
INPUT device / directory for software      .
SOFTWARE to update                        _update_all
PREVIEW only? (update operation will NOT occur)  no      +
COMMIT software updates?                  yes      +
SAVE replaced files?                      no      +
AUTOMATICALLY install requisite software?  yes      +
EXTEND file systems if space needed?       yes      +
VERIFY install and check file sizes?      no      +
DETAILED output?                          no      +
Process multiple volumes?                 yes      +

F1=Help      F2=Refresh      F3=Cancel      F4=List
Esc+5=Reset  Esc+6=Command  Esc+7=Edit    Esc+8=Image
Esc+9=Shell  Esc+0=Exit    Enter=Do

```

Press **Enter** again to confirm installation of the FixPak.

6. When the installation completes with an `OK` indication in the upper left hand corner, exit SMITTY by pressing **F10**.
7. You now have to update the database instance with the `db2iupdt` command. Do this by running the command:

```
/usr/lpp/db2_05_00/instance/db2iupdt db2inst1
```

For example:

```
# /usr/lpp/db2_05_00/instance/db2iupdt db2inst1
```

DBI1070I Program db2iupdt completed successfully.

The installation of both DB2 CAE and the DB2 FixPak is now completed.

To verify that the various DB2 CAE components have been updated, use the `lslpp -l` command again as follows:

```
$ lslpp -l | grep db2
db2_05_00.client          5.0.0.26 COMMITTED DB2 Client Application Enabler
db2_05_00.cnvucs         5.0.0.26 COMMITTED Code Page Conversion Tables -
db2_05_00.jdbc           5.0.0.26 COMMITTED Java Database Connectivity
db2_05_00.odbc           5.0.0.2  COMMITTED Open Database Connectivity
```

Note the change in version level for the various client components from 5.0.0.2 to 5.0.0.26 (except for the ODBC component).

2.4.3.3 DB2 UDB Workgroup Edition Installation

1. Ensure you are logged on as the root user (verify with the `id` command), on the machine that will be your database server machine (verify with the `hostname` command; in our example the output should be:
`dbsvr1.itsc.austin.ibm.com`).
2. Mount the CD entitled *IBM Net.Commerce START for AIX, Version 3.1.1*.
3. Change the directory to `/cdrom/NetCommerce3` and confirm the contents. The following screen shows the mount, change of directory, and contents listing:

```
# mount /cdrom
# cd /cdrom/NetCommerce3
# ls
.toc      aix.apar  db2ext    db2setup  runtime
DOC       aix.ptf   db2extfix ics       start
Netscape  db2       db2fix    ifor      sysChk
```

4. You are now ready to run the installation program `db2setup`. Type the following on the command line:

```
# ./db2setup
```

The installation program will check that your system has the necessary PTFs installed before the actual installation begins. If you do not, then the program will ask if you want them installed or not. It will look something like the following:

You are required to install additional PTFs for your operating system.
Your system may fail if you do not apply these fixes:

OS Level	APAR/PTF#	RUN-TIME PROCESSOR	File Name
AIX4.2	U453611	MultiProcessor	./aix.PTF/AIX4.2.1/SMP/bos.mp.4.2.1.9.bff
AIX4.2	U453426	UniProcessor	./aix.PTF/AIX4.2.1/UNI/bos.up.4.2.19.bff
AIX4.3	IX72273	MultiProcessor	./aix.APAR/AIX4.3/bos.mp.4.3.0.1.bff
AIX4	U453695	xlC++ runtime	./runtime/ptf_4_2_1

Would you like to install the PTFs automatically now (y/n) ?

5. Answer `y` to automatically install the PTFs.

Some additional information will be shown during the installation of the PTFs.

6. You are then requested to reboot your AIX system. Change to the root directory, then run the `bosboot -a` and `shutdown -Fr` commands to reboot as follows:

```
# cd /
# bosboot -a
bosboot: Boot image is 6266 512 byte blocks.
# shutdown -Fr
```

Your machine will now reboot.

7. Log on as root when your system comes back online.
8. Mount the CD in the CD-ROM drive.
9. Change directory to `/cdrom/NetCommerce3`
10. Run the DB2 install program again (`db2setup`).
11. The installation program will now display the following window:

```

----- Install DB2 V5 -----
Select the products you are licensed to install. Your Proof of
Entitlement and License Information booklet identify the products for
which you are licensed.

To see the preselected components or customize the selection, select
Customize for the product.
[ ] DB2 Client Application Enabler           [ Customize... ]
[ ] DB2 UDB Workgroup Edition                : Customize... :
: : DB2 UDB Enterprise Edition              : Customize... :
: : DB2 Connect Enterprise Edition          : Customize... :
: : DB2 UDB Extended Enterprise Edition     : Customize... :
: : DB2 Software Developer's Kit           : Customize... :

To choose a language for the following components, select Customize for
the product.
  DB2 Product Messages                       [ Customize... ]
  DB2 Product Library                        [ Customize... ]

[ OK ]                [ Cancel ]                [ Help ]

```

12. Use the cursor keys to move up and down and the spacebar to select **DB2 UDB Workgroup Edition**.

```

----- Install DB2 V5 -----
Select the products you are licensed to install. Your Proof of
Entitlement and License Information booklet identify the products for
which you are licensed.

To see the preselected components or customize the selection, select
Customize for the product.
[ ] DB2 Client Application Enabler           [ Customize... ]
[*] DB2 UDB Workgroup Edition                : Customize... :
: : DB2 UDB Enterprise Edition              : Customize... :
: : DB2 Connect Enterprise Edition          : Customize... :
: : DB2 UDB Extended Enterprise Edition     : Customize... :
: : DB2 Software Developer's Kit           : Customize... :

To choose a language for the following components, select Customize for
the product.
  DB2 Product Messages                       [ Customize... ]
  DB2 Product Library                        [ Customize... ]

[ OK ]                [ Cancel ]                [ Help ]

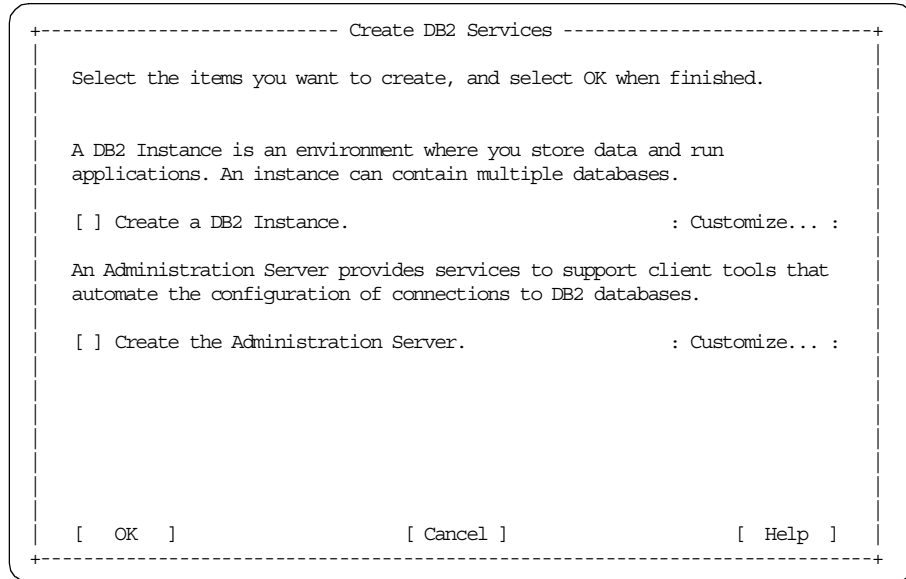
```

- Optionally you could install DB2 messages in languages other than English. To do this , you select **Customize**, which is next to DB2

Product Message and choose whatever language you prefer in the window that pops up.

13.To continue, highlight **OK** and press **Enter** in the window entitled Install DB2 V5.

14.The Create DB2 Services window appears:



15.Highlight **Create a DB2 Instance** and press **Enter**. This will bring you to the following window:

```

+----- Create DB2 Services -----+
|+--- DB2 Instance -----+
|
| Authentication:
|   Enter User ID, Group ID, Home Directory and Password that
|   will be used for the DB2 Instance.
|   User Name      [db2inst1]
|   User ID       :      :      [*] Use default UID
|   Group Name    [db2iadm1]
|   Group ID     :      :      [*] Use default GID
|   Home Directory [/home/db2inst1 ]
|   Password     [      ]
|   Verify Password [      ] [ Default ]
|
| Protocol:
|   Select Customize to change the default      [ Customize... ]
|   communication protocol.
|
| [*] Auto start DB2 Instance at system boot.
| [ ] Create a sample database for DB2 Instance.
|
| [ OK ] [ Cancel ] [ Help ]
+-----+

```

16. For now, we will accept the defaults as shown. Note that the default password generated by the DB2 installation program for the user db2inst1 will be ibmdb2.

Make sure **Auto start DB2 Instance at system boot.** is selected.

17. Highlight **OK** and press **Enter**. Confirm the DB2 installation program generated password as mentioned above and press **Enter** to continue.

```

||
|| +--- Notice -----+
||
|| (!) A system-generated password, ibmdb2, will be used
||     for user, db2inst1.
||
|| [ OK ]
||
|| t UID
|| t GID
||
|| +-----+

```

18. The User-Defined Functions window appears.

```

+----- Create DB2 Services -----+
|+--- User-Defined Functions -----+
|
| Fenced User-Defined Functions enable application developers to
| create their own suite of functions specific to their application
| or domain.
|
| Authentication:
|   Enter User ID, Group ID, Home Directory and Password that
|   will be used for the fenced User-Defined Functions.
|   User Name      [db2fenc1]
|   User ID       :           :      [*] Use default UID
|   Group Name    [db2fadm1]
|   Group ID     :           :      [*] Use default GID
|   Home Directory [/home/db2fenc1 ]
|   Password     [           ]
|   Verify Password [           ]      [ Default ]
|
| Note: It is not recommended to use the DB2 Instance user ID for
|       security reasons.
|
| [ OK ]           [ Cancel ]           [ Help ]
+-----+

```

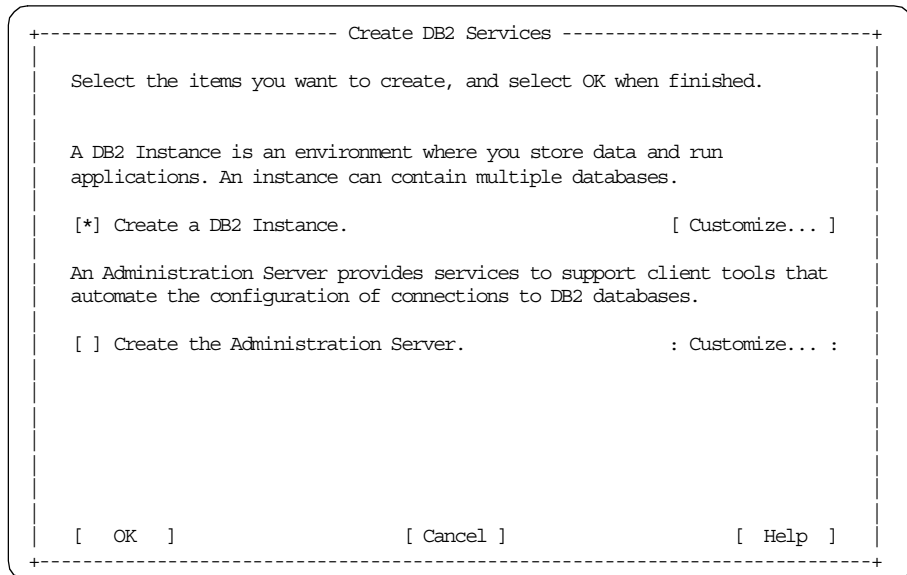
19. Once again, we will accept the defaults as shown. Note that the default password generated by the DB2 installation program for the user db2fenc1 will be ibmdb2. Highlight **OK** and pressing **Enter**.

```

||
|| +--- Notice -----+
|| |
|| | (!) A system-generated password, ibmdb2, will be used
|| | for user, db2fenc1.
|| |
|| | [ OK ]
|| |
|| |t UID
|| |t GID
|| +-----+

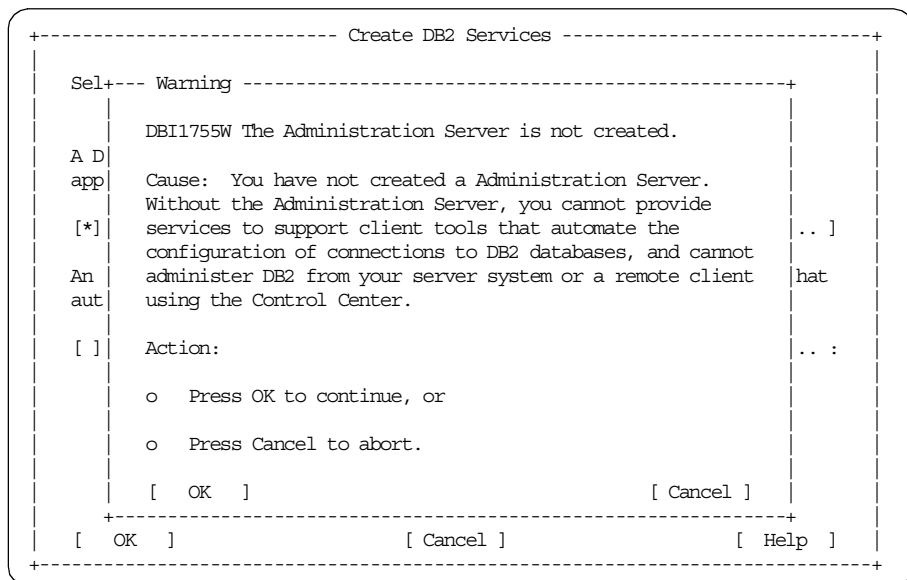
```

20. The Create DB2 Services window is displayed:



Notice that only **Create a DB2 Instance** is selected. Highlight **OK** and press **Enter**.

21. A warning indication that the Administration Server is not created appears. Ignore the warning by highlighting **OK** and pressing **Enter**.



22. A summary report appears listing the components that will be installed. Highlight **Continue** and press **Enter**.

```

+----- DB2 Installer -----+
|                               |
| +-- Summary Report -----+  |
|                               |
| Installation                 |
| -----                     |
|                               |
| Product components to be installed: |
|                               |
| DB2 Client                   |
| Open Database Connectivity (ODBC)|
| Java Database Connectivity (JDBC)|
| DB2 Run-time Environment     |
| DB2 Engine                   |
| DB2 Communication Support - TCP/IP|
| Administration Server       |
| DB2 Communication Support - SNA |
| DB2 Communication Support - DRDA Application Server |
|                               |
|                               | [ More... ] |
|                               |
|                               | [ Continue ] |
|                               |
+-----+

```

23. Confirm your intention to install DB2 UDB Workgroup Edition on this machine, by highlighting **OK** on the next screen and press **Enter**.

```

| | Product | +-- Warning -----+ | |
| |         | (X) This is your last chance to stop. | |
| | DB2 C   |                               | |
| | Open    |                               | |
| | Java    | Select OK to start, or Cancel to abort. | |
| |         |                               | |
| | DB2 Ser | [ OK ]                               | [ Cancel ] |
| |         |                               | |
+-----+

```

24. The installation begins. The selected components will be installed and your instance ID created. This installation process can take up to 15 minutes depending on the speed of your system.

25. You will see a Notice window when the installation completes. Highlight **OK** and press **Enter**.

26. The Status Report window is displayed. Confirm the success of your installation, highlight **OK**, and press **Enter** to close the window.

```

+----- DB2 Installer -----+
+-- Status Report -----+
|
| Installation
| -----
|
| DB2 Client                               SUCCESS
| Open Database Connectivity (ODBC)        SUCCESS
| Java Database Connectivity (JDBC)        SUCCESS
| DB2 Run-time Environment                 SUCCESS
| DB2 Engine                              SUCCESS
| DB2 Communication Support - TCP/IP      SUCCESS
| Administration Server                   SUCCESS
| DB2 Communication Support - SNA         SUCCESS
| DB2 Communication Support - DRDA Application Server SUCCESS
| DB2 Communication Support - IPX/SPX    SUCCESS
| Replication                             SUCCESS
|
| [ More... ]
|
+-----+
| [ View Log ]                               [ OK ] |
+-----+

```

27. You are back to the DB2 Installer window. Highlight **Close** and press **Enter**.

28. A final notice appears advising that you are leaving the DB2 Installer. Highlight **OK** and press **Enter**.

29. Change to the DB2 instance user (db2inst) you have just created by typing the following on the command line:

```
# su - db2inst1
```

30. Use a text editor, for example vi, to edit the .profile file.

31. Add the following line to the bottom of the file:

```
. sqllib/db2profile
```

An example of how the .profile file should look like is shown as follows:

```

PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:$HOME/bin:/usr/bin/X11:/sbin:.

export PATH

if [ -s "$MAIL" ]           # This is at Shell startup.  In normal
then echo "$MAILMSG"       # operation, the Shell checks
fi                          # periodically.

. sqllib/db2profile

```


32. Type the following on the command line to ensure that the new .profile does not contain errors:

```
$ . .profile
```

33. You can verify that the environment of the instance user (db2inst1) works by attempting to start the database instance with the db2start command. The following illustrates the steps. First, check that the DB2 instance (the contents of the DB2INSTANCE environment variable) is the right instance, db2inst1, and second, run the db2start command to see it successfully start this instance:

```
$ echo $DB2INSTANCE
db2inst1
$ db2start
SQL1063N  DB2START processing was successful.
```

34. Type exit to return to user ID root. Unmount the CD by running the command:

```
# umount /cdrom
```

This completes the installation of the DB2 Workgroup Edition. The next step is to install the DB2 FixPak.

2.4.3.4 DB2 UDB Workgroup Edition FixPak installation

The DB2 July FixPak will update the DB2 Workgroup Edition components. To verify this, you can use the `lslpp -l` command to look at the specific DB2 components as follows:

```
$ lslpp -l | grep db2
db2_05_00.client          5.0.0.2  COMMITTED  DB2 Client Application Enabler
db2_05_00.cnvucs         5.0.0.2  COMMITTED  Code Page Conversion Tables -
db2_05_00.conv.jp        5.0.0.2  COMMITTED  Code Page Conversion Tables -
db2_05_00.conv.kr        5.0.0.2  COMMITTED  Code Page Conversion Tables -
db2_05_00.conv.sch       5.0.0.2  COMMITTED  Code Page Conversion Tables -
db2_05_00.conv.tch       5.0.0.2  COMMITTED  Code Page Conversion Tables -
db2_05_00.cs.dirda       5.0.0.2  COMMITTED  DB2 Communication Support for
db2_05_00.cs.ipx         5.0.0.2  COMMITTED  DB2 Communication Support for
db2_05_00.cs.rte         5.0.0.2  COMMITTED  DB2 Communication Support for
db2_05_00.cs.sna         5.0.0.2  COMMITTED  DB2 Communication Support for
db2_05_00.das            5.0.0.2  COMMITTED  Administration Server
db2_05_00.db2.engn       5.0.0.2  COMMITTED  DB2 Engine
db2_05_00.db2.rte        5.0.0.2  COMMITTED  DB2 Run-time Environment
db2_05_00.db2.samples    5.0.0.2  COMMITTED  DB2 Sample Database Source
db2_05_00.jdbc           5.0.0.2  COMMITTED  Java Database Connectivity
db2_05_00.odbc           5.0.0.2  COMMITTED  Open Database Connectivity
db2_05_00.repl           5.0.0.2  COMMITTED  DB2 Replication
db2_05_00.wsrv           5.0.0.2  COMMITTED  License Support for DB2 UDB
```

Note the component listing and their current level. We now proceed with the FixPak installation.

1. Switch to user db2inst1.
2. Stop DB2 by running the following commands in sequence:

```
$ db2 force application all
```

This forces local or remote users or applications off the system to allow for maintenance on a database server.

```
$ db2 terminate
```

This explicitly terminates the command line processor's back-end process.

```
$ db2stop
```

This stops the current DB2 database server manager.

For example:

```
$ db2 force application all
DB20000I The FORCE APPLICATION command completed successfully.
DB21024I This command is asynchronous and may not be effective immediately.
$ db2 terminate
DB20000I The TERMINATE command completed successfully.
$ db2stop
SQL1064N DB2STOP processing was successful.
```

3. Type `exit` to return to user ID root. All DB2 processes should be stopped now and you should be the root user.
4. Mount the CD entitled *DB2 Universal Database July FixPak*.
5. Change to the FixPak directory by running the command:

```
# cd /cdrom
```
6. The FixPak will be installed using SMITTY with the `update_all` fastpath. Run this command:

```
# smitty update_all
```
7. Type `.` in the INPUT device / directory for software field and press **Enter**.
8. You should now see the following window. Press **Enter** to start the installation.

```

Update Installed Software to Latest Level (Update All)

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                [Entry Fields]
INPUT device / directory for software      .
SOFTWARE to update                        _update_all
PREVIEW only? (update operation will NOT occur)  no      +
COMMIT software updates?                  yes      +
SAVE replaced files?                      no      +
AUTOMATICALLY install requisite software?  yes      +
EXTEND file systems if space needed?      yes      +
VERIFY install and check file sizes?      no      +
DETAILED output?                         no      +
Process multiple volumes?                 yes      +

F1=Help      F2=Refresh      F3=Cancel      F4=List
Esc+5=Reset  Esc+6=Command  Esc+7=Edit    Esc+8=Image
Esc+9=Shell  Esc+0=Exit    Enter=Do

```

Press **Enter** again to confirm installation of the FixPak.

9. When the installation completes with an OK indication in the upper left hand corner, exit SMITTY by pressing **F10**.

10. You now have to update the database instance with the `db2iupdt` command. Do this by running the command:

```
/usr/lpp/db2_05_00/instance/db2iupdt db2inst1
```

For example:

```
# /usr/lpp/db2_05_00/instance/db2iupdt db2inst1
DBI1070I Program db2iupdt completed successfully.
```

11. Switch to the instance owner (`db2inst1`) by using the `su - db2inst1` command.
12. Start DB2 by running the `db2start` command from the command prompt.

The installation of both DB2 and the DB2 FixPak is now completed.

To verify that the various DB2 Workgroup Edition components have been updated, use the `ls1pp - l` command again as follows:

```

$ lsipp -l | grep db2
db2_05_00.client          5.0.0.26 COMMITTED DB2 Client Application Enabler
db2_05_00.cnvucs          5.0.0.26 COMMITTED Code Page Conversion Tables -
db2_05_00.conv.jp         5.0.0.2  COMMITTED Code Page Conversion Tables -
db2_05_00.conv.kr        5.0.0.26 COMMITTED Code Page Conversion Tables -
db2_05_00.conv.sch       5.0.0.26 COMMITTED Code Page Conversion Tables -
db2_05_00.conv.tch       5.0.0.2  COMMITTED Code Page Conversion Tables -
db2_05_00.cs.drda        5.0.0.26 COMMITTED DB2 Communication Support for
db2_05_00.cs.ipx         5.0.0.26 COMMITTED DB2 Communication Support for
db2_05_00.cs.rte         5.0.0.26 COMMITTED DB2 Communication Support for
db2_05_00.cs.sna         5.0.0.26 COMMITTED DB2 Communication Support for
db2_05_00.das            5.0.0.26 COMMITTED Administration Server #
db2_05_00.db2.engn       5.0.0.26 COMMITTED DB2 Engine #
db2_05_00.db2.rte        5.0.0.26 COMMITTED DB2 Run-time Environment #
db2_05_00.db2.samples    5.0.0.2  COMMITTED DE2 Sample Database Source
db2_05_00.jdbc           5.0.0.26 COMMITTED Java Database Connectivity
db2_05_00.odbc           5.0.0.2  COMMITTED Open Database Connectivity
db2_05_00.repl           5.0.0.26 COMMITTED DB2 Replication #
db2_05_00.wsrv           5.0.0.26 COMMITTED License Support for DB2 UDB

```

Again, note the change in version levels from 5.0.0.2 to 5.0.0.26 for most of the components.

2.4.3.5 DB2 distributed configuration

We now continue the distributed configuration for DB2 with the following steps:

- Create the Net.Commerce database
- Configure the UDB CAE for remote access

Creating the Net.Commerce database

We will create the Net.Commerce database on the database server with the following steps:

1. On the database server, log on as user ID root.
2. Switch to the db2 instance ID. In our example, we will use db2inst1; hence, the command is:

```
# su - db2inst1
```

3. Ensure the DB2 database server is started by issuing the `db2start` command.
4. Create the database with the command:

```
$ db2 create database db_name
```

where `db_name` is the name of your Net.Commerce database. In our example, we will use a database named kim; hence, the command is:

```
$ db2 create database kim
```

At this point, do *not* populate the database.

5. View the `/etc/services` file and find the last two lines that have comments referring to your DB2 instance connection ports. They should be of the form:

```
db2cdb2inst1 50000/tcp # Connection port for DB2 instance db2inst1
db2idb2inst1 50001/tcp # Interrupt port for DB2 instance db2inst1
```

6. Take note of these two entries. We will use them in the next step.

DB2 connection port

The above two entries in the `/etc/services` file are the connection port (specified by a prefix of `db2c`) and the interrupt port (specified by a prefix of `db2i`), respectively. Both entries are required for DB2 TCP/IP connectivity.

However, the connection port is the port used when cataloging DB2 TCP/IP nodes.

Configuring the UDB CAE for remote access

To configure the remote DB2 connection, do the following on the Net.Commerce Hosting server machine where you installed the DB2 UDB CAE.

1. Log on as user ID `root` to your NCHS server: `chs1.itsc.austin.ibm.com`

```
# host chs1
chs1.itsc.austin.ibm.com is 9.3.187.192
```

2. Add the two entries you previously copied from the `/etc/services` file of the database server to the `/etc/services` file of this server.
3. Switch to the DB2 instance ID (with the `su - db2inst1` command).
4. Catalog the DB2 TCP/IP node with the following command:

```
db2 catalog tcpip node node_name remote host_name server port_num
```

where:

- `node_name`

A unique name of your choice that DB2 will use to identify the TCP/IP node.

- `host_name`

The host name of the machine on which the Net.Commerce Hosting Server database resides.

- port_num

The DB2 connection port number that you recorded before.

Our example will be as follows:

```
$ db2 catalog tcpip node dbsvr1 remote dbsvr1 server 50000
```

Confirm the catalog node command with the `db2 list node directory` command, for example:

```
$ db2 list node directory

Node Directory

Number of entries in the directory = 1

Node 1 entry:

Node name           = DBSVR1
Comment             =
Protocol            = TCPIP
Hostname            = dbsvr1
Service name        = 50000
```

5. Now catalog the remote database with two entries as follows:

```
$ db2 catalog database db_name as db_alias at node node_name
$ db2 catalog database db_name at node node_name
```

where:

- db_name

The name of the Net.Commerce database you created before.

- db_alias

The name of your Net.Commerce database prefixed with a `r`. For example, a database cataloged with a database name of `kim` (and, hence, a default alias of `kim`) must have another entry with an alias of `rkim`.

Unique database names

If your database names are eight characters long, and only unique for the last letter, you will not be able to use this default convention.

You will have to edit the `ncommerce.conf` and `scheduler.conf` files found in the HTML path directory of the Net.Commerce Hosting Server machine (by default `/usr/lpp/internet/server_root/pub`). The remote connection name is specified in the lines containing `IC_JDBC_URL`.

Change these entries to contain your database alias instead of `r<database name>`.

In our example, issue the following commands:

```
$ db2 catalog database kim as rkim at node dbsvr1
DB20000I  The CATALOG DATABASE command completed successfully.
DB21056W  Directory changes may not be effective until the directory
cache is refreshed.
$ db2 catalog database kim at node dbsvr1
DB20000I  The CATALOG DATABASE command completed successfully.
DB21056W  Directory changes may not be effective until the directory
cache is refreshed.
```

You should now have two database catalog entries: One with an alias of your database name as you would like to use for remote connectivity, and one with an alias of the same name but prefixed with an `r`. Confirm these catalog database commands with the `db2 list database` command.

Our example will result in the following screen shot:

```

$ db2 list database directory

System Database Directory

Number of entries in the directory = 2

Database 1 entry:

Database alias           = RKIM
Database name            = KIM
Node name                = DBSVR1
Database release level   = 8.00
Comment                  =
Directory entry type     = Remote
Catalog node number     = -1

Database 2 entry:

Database alias           = KIM
Database name            = KIM
Node name                = DBSVR1
Database release level   = 8.00
Comment                  =
Directory entry type     = Remote
Catalog node number     = -1

```

r<db_name>?

The alias of the form r<db_name> is required for the operation of the Net.Commerce Hosting Server servlets due to a limitation of the DB2 server. Hence, the requirement is for two database entries to be cataloged.

Note, however, that whenever we refer to a database name in this document, we refer to the <db_name> portion of r<db_name>.

If you choose to alias your database with other than the database name, you must change the other database alias appropriately. For example, to use an alias of `ncdb`, you will use the following commands to catalog two database entries:

```

db2 catalog database kim as rncdb at node dbsvr1
db2 catalog database kim as ncdb at node dbsvr1

```

The database name on the NCHS commerce server, in this example,

6. You should now be able to test connectivity to the remote database as follows:

```

db2 connect to db_alias user db_user using db_password

```


where:

- `db_alias`

The database alias from the previous `catalog database` commands.

- `db_user`

The DB2 instance ID on the machine on which the Net.Commerce Hosting Server database resides.

- `db_password`

The password of the aforementioned DB2 instance ID.

Make sure to test the connection to both database aliases (with and without the `r` prefix). For our example, to test the connectivity of the `rkim` database catalog, we will issue the following connect command:

```
$ db2 connect to rkim user db2inst1 using ibmdb2
```

```
Database Connection Information
```

```
Database product      = DB2/6000 5.0.0  
SQL authorization ID  = DB2INST1  
Local database alias  = RKIM
```

We have now created our Net.Commerce Hosting database server, created a remote connection, and tested this remote connection. At this point, further Net.Commerce Hosting Server components must be installed before we proceed with populating the database and perform other steps necessary to finalize the configuration of this database.

2.4.4 Installing Net.Commerce 3.1.1

This section deals with the installation of Net.Commerce and the DB2 Text Extenders.

Net.Commerce Software pre-requisites

Ensure that you have installed your Web server, DB2 UDB, and the UDB July FixPak before you install Net.Commerce 3.1.1.

2.4.4.1 Installing Net.Commerce

Net.Commerce will be installed on the Net.Commerce Hosting Server machine. For our example, this will be server `chs1`.

1. Ensure you are logged on as the root user. The command `id` can be used to verify this.
2. Mount the CD entitled *IBM Net.Commerce START for AIX, Version 3.1.1*.
3. Change the directory to `/cdrom/NetCommerce3` as follows:

```
# mount /cdrom
# cd /cdrom/NetCommerce3
# ls
.toc      aix.apar  db2ext    db2setup  runtime
DOC       aix.ptf   db2extfix ics       start
Netscape  db2       db2fix    ifor      sysChk
```

4. Start SMITTY with the fastpath `install_all`:
`smitty install_all`
5. Type `./` in the INPUT device / directory for software field and press **Enter**.
6. Place the cursor in the **SOFTWARE to install** field on the next screen that comes up. (The cursor should already be in that field). Press **F4** to list the filesets available for installation.
7. Select the following filesets using the cursor keys to move up and down and **F7** to select the following:
 - NetCommerce3.Mall
 - NetCommerce3.Server
 - NetCommerce3.html
 - NetCommerce3.loc.en_US
 - NetCommerce3.msg.en_US

The following screen shows an example of this selection, where `Net.Commerce3.Mall` and `NetCommerce3.Server` have been selected (notice the `>` character indicating selection).

```

Install and Update from ALL Available Software

Ty+-----+
Pr|          SOFTWARE to install          |
|                                         |
| Move cursor to desired item and press F7. Use arrow keys to scroll. |
| *   ONE OR MORE items can be selected. |
| *   Press Enter AFTER making all selections. |
|                                         |
| [MORE...8] |
| > NetCommerce3.Mall |
|   + 3.1.1.0 NetCommerce Business Mall |
|   + 3.1.1.0 NetCommerce Grocery Mall |
|                                         |
| > NetCommerce3.Server |
|   + 3.1.1.0 NetCommerce Admin Runtime |
|   + 3.1.1.0 NetCommerce Application Dev. Toolkit (ADT) |
|   + 3.1.1.0 NetCommerce Payments - SET |
| [MORE...145] |
|                                         |
| F1=Help          F2=Refresh          F3=Cancel |
| F7=Select        F8=Image            F10=Exit  |
| Es| Enter=Do     /=Find              n=Find Next |
| F9+-----+

```

6. Press **Enter** when you have made all your selections. This will bring you back to the previous screen.
7. Press **Enter** to start the installation.
8. Press **Enter** again to confirm you wish to start the installation. The installation will now proceed.

An OK indication will be displayed in the upper left hand corner after a successful installation.

2.4.4.2 Installing DB2 Text Extenders

The DB2 Text Extenders must be installed on the Net.Commerce Hosting Server machine *as well as* the database machine.

Database Server

The DB2 Text Extenders must be installed on the database server that will be your Net.Commerce Hosting Server database machine.

1. Log on to this machine as user ID root. For our example, we will log on to the machine dbsvr1 as user ID root.
2. Mount the CD entitled *IBM Net.Commerce START for AIX, Version 3.1.1*.
3. Change the directory to /cdrom/NetCommerce3 as follows:

```

# mount /cdrom
# cd /cdrom/NetCommerce3

```

```
# ls
.toc      aix.apar  db2ext    db2setup  runtime
DOC       aix.ptf   db2extfix ics      start
Netscape  db2       db2fix    ifor      sysChk
```

4. Ensure that DB2 has been started. Change user to the instance owner (db2inst1) and start the database manager. See the following for a way of doing this:

```
# su - db2inst1
$ db2start
SQL1026N The database manager is already active.
$
```

Notice that the database manager may already be active as shown above.

5. Exit back to the root user. Type `exit` on the command line.
6. Start SMITTY with the fastpath `install_all`:

```
smitty install_all
```
7. Type `./` in the INPUT device / directory for software field and press **Enter**.
8. Place the cursor in the **SOFTWARE to install** field on the next screen that comes up. (The cursor should already be in that field.) Press **F4** to list the file sets available for installation.
9. Select the following filesets using the cursor keys to move up and down and **F7** to select the following:

- db2ext
- db2tx_05_00

The following screen shows an example of this selection, where db2ext has been selected (notice the `>` character indicating selection).

```

Install and Update from ALL Available Software

Ty+-----+
Pr|          SOFTWARE to install          |
|                                         |
| Move cursor to desired item and press F7. Use arrow keys to scroll. |
| *   ONE OR MORE items can be selected. |
| *   Press Enter AFTER making all selections. |
|                                         |
| [MORE...55] |
| > db2ext |
| + 5.0.0.7246 IBM DB2 Extenders Base Client |
| + 5.0.0.7246 IBM DB2 Extenders Base Server |
| + 5.0.0.7246 IBM DB2 Extenders Client |
| + 5.0.0.7246 IBM DB2 Extenders Common Base |
| + 5.0.0.7246 IBM DB2 Extenders Cross-Industry Client |
| + 5.0.0.7246 IBM DB2 Extenders Cross-Industry Server |
| + 5.0.0.7246 IBM DB2 Extenders En_US English documents |
| [MORE...98] |
|                                         |
| F1=Help          F2=Refresh          F3=Cancel |
| F7=Select        F8=Image            F10=Exit  |
| Es| Enter=Do     /=Find              n=Find Next |
| F9+-----+

```

6. Press **Enter** when you have made all your selections. This will bring you back to the previous screen.
 7. Press **Enter** to start the installation.
 8. Press **Enter** again to confirm you wish to start the installation. The installation will now proceed.
- An **OK** indication will be displayed in the upper left hand corner after a successful installation.

9. Press **F10** to exit SMITTY.

The next step is to configure the DB2 Text Extenders.

1. Make sure you are still the root user. Use the command `id` to verify.
2. Change directory as follows:


```
cd /usr/lpp/db2ext/instance
```
3. Run `DMBINSTANCE` as follows:


```
./dmbinstance db2inst1
```
4. The configuration program will prompt you to confirm a number of questions. Answer yes to all the questions as the following example shows:

```

/usr/lpp/db2ext/instance> ./dmbinstance db2inst1
Do you wish to create an instance for the IAV Extenders Client? (yes)
yes
Creating the IAV Extenders Client instance . . .
Do you wish to create an instance for the Text Extender? (yes)
yes
To use the Text Extender, this instance id must belong to the smadmin
group. Do you want the smadmin group added to this id's group list? (yes)
yes
./dmbinstance[36]: group: parameter null or not set
Creating the Text Extender instance . . .
descfgsv - configure server communication

-----
descfgsv: Informational message:
      Configuration saved: /home/db2inst1/db2tx/txinst/
descfgcl - configure client communication
descfgcl - configure client communication

-----
descfgcl: Informational message:
      Configuration saved: /home/db2inst1/db2tx/
descrmt - create master table

-----
descrmt: Informational message:
      Master table created: /home/db2inst1/db2tx/txinst/desmastr.dat
Program dmbinstance completed successfully.

```

5. Log on as the database instance owner (db2inst1) by typing:

```
su - db2inst1
```

6. Use a text editor, for example vi, to edit the .profile file.
7. Add the following two lines to the .profile file:

```
export LANG=en_US
. dmb/dmbprofile
```

An example of how the .profile file should look is shown as follows:

```

PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:$HOME/bin:/usr/bin/X11:/sbin:.

export PATH

if [ -s "$MAIL" ]           # This is at Shell startup. In normal
then echo "$MAILMSG"       # operation, the Shell checks
fi                           # periodically.

. sqlllib/db2profile

export LANG=en_US
. dmb/dmbprofile

```

Net.Commerce Hosting Server

The DB2 Text Extenders must also be installed on the server that will be your Net.Commerce Hosting Server machine.

1. Log on to this machine as user ID root. For our example, we will log on to the machine chs1 as user ID root.
2. Mount the CD entitled *IBM Net.Commerce START for AIX, Version 3.1.1*.
3. Change directory to /cdrom/NetCommerce3 as follows:

```

# mount /cdrom
# cd /cdrom/NetCommerce3
# ls
.toc      aix.apar  db2ext    db2setup  runtime
DOC       aix.ptf   db2extfix ics       start
Netscape  db2       db2fix    ifor      sysChk
#

```

4. Start SMITTY with the fastpath `install_all`:


```
smitty install_all
```
5. Type `./` in the INPUT device / directory for software field and press **Enter**.
6. Place the cursor in the **SOFTWARE to install** field on the next screen that comes up. (The cursor should already be in that field.) Press **F4** to list the filesets available for installation.
7. Select the following filesets using the cursor keys to move up and down and **F7** to select the following:
 - db2ext
 - db2tx_05_00

The following screen shows an example of this selection, where db2ext has been selected (notice the > character indicating selection).

```

Install and Update from ALL Available Software

Ty+-----+
Pr|          SOFTWARE to install          |
|                                         |
| Move cursor to desired item and press F7. Use arrow keys to scroll. |
| *   ONE OR MORE items can be selected. |
| *   Press Enter AFTER making all selections. |
|                                         |
| [MORE...55] |
| > db2ext |
| + 5.0.0.7246 IBM DB2 Extenders Base Client |
| + 5.0.0.7246 IBM DB2 Extenders Base Server |
| + 5.0.0.7246 IBM DB2 Extenders Client |
| + 5.0.0.7246 IBM DB2 Extenders Common Base |
| + 5.0.0.7246 IBM DB2 Extenders Cross-Industry Client |
| + 5.0.0.7246 IBM DB2 Extenders Cross-Industry Server |
| + 5.0.0.7246 IBM DB2 Extenders En_US English documents |
| [MORE...98] |
|                                         |
| F1=Help          F2=Refresh          F3=Cancel |
| F7=Select        F8=Image            F10=Exit  |
| Es Enter=Do      /=Find              n=Find Next |
F9+-----+

```

6. Press **Enter** when you have made all your selections. This will bring you back to the previous screen.
7. Press **Enter** to start the installation.
8. Press **Enter** again to confirm that you wish to start the installation. The installation will now proceed.

A failed indication will be displayed in the upper left hand corner after a successful installation. The failed file-sets are:

```

db2ext.base.server 5.0.0.7246
db2ext.cross.server 5.0.0.7246
db2ext.extender.server 5.0.0.7246

```

This is because these filesets require db2_05_00.db2.rte as a prerequisite but we only installed the DB2 CAE. Therefore ignore the error message and make sure the client components of the DB2 Text Extenders have been installed successfully with the following command:

```

# lsllpp -l db2ext*
Fileset          Level State      Description
-----
Path: /usr/lib/objrepos
db2ext.base.client 5.0.0.7246 COMMITTED IBM DB2 Extenders Base Client
db2ext.common      5.0.0.7246 COMMITTED IBM DB2 Extenders Common Base
db2ext.cross.client 5.0.0.7246 COMMITTED IBM DB2 Extenders
db2ext.doc.En_US   5.0.0.7246 COMMITTED IBM DB2 Extenders En_US
db2ext.extender.client 5.0.0.7246 COMMITTED IBM DB2 Extenders Client

```

9. Press **F10** to exit SMITTY.

The next step is to configure the DB2 Text Extenders.

1. Make sure you are still the root user. Use the command `id` to verify.
2. Change directory as follows:

```
cd /usr/lpp/db2ext/instance
```

3. Run `dmbinstance` as follows:

```
./dmbinstance db2inst1
```

4. The configuration program will prompt you to confirm a number of questions. Answer `yes` to all the questions as the following example shows:

```
/usr/lpp/db2ext/instance> ./dmbinstance db2inst1
Do you wish to create an instance for the IAV Extenders Client? (yes)
yes
Creating the IAV Extenders Client instance . . .
Do you wish to create an instance for the Text Extender? (yes)
yes
To use the Text Extender, this instance id must belong to the smadmin
group. Do you want the smadmin group added to this id's group list? (yes)
yes
./dmbinstance[36]: group: parameter null or not set
Creating the Text Extender instance . . .
descfgsv - configure server communication

-----
descfgsv: Informational message:
      Configuration saved: /home/db2inst1/db2tx/txinst/
descfgcl - configure client communication
descfgcl - configure client communication

-----
descfgcl: Informational message:
      Configuration saved: /home/db2inst1/db2tx/
descrmt - create master table

-----
descrmt: Informational message:
      Master table created: /home/db2inst1/db2tx/txinst/desmastr.dat
Program dmbinstance completed successfully.
```

5. Log on as the database instance owner (`db2inst1`) by typing:

```
su - db2inst1
```

6. Use a text editor, for example `vi`, to edit the `.profile` file.
7. Add the following two lines to the `.profile` file:

```
export LANG=en_US
. dmb/dmbprofile
```

An example of how the .profile file should look is shown as follows:

```
PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:$HOME/bin:/usr/bin/X11:/sbin:.  
  
export PATH  
  
if [ -s "$MAIL" ]           # This is at Shell startup. In normal  
then echo "$MAILMSG"       # operation, the Shell checks  
fi                           # periodically.  
  
. sqllib/db2profile  
  
export LANG=en_US  
. dmb/dmbprofile
```

2.4.4.3 DB2 Extenders FixPak

The next step is to install the DB2 Text Extenders FixPak on both database and Net.Commerce Hosting Server systems.

1. First, DB2 and the DB2 Text Extenders must be stopped. Log on to both systems as user ID root, then switch to the database instance ID (db2inst1) and run the following commands:

```
$ txstop  
$ db2 force applications all  
$ db2 terminate  
$ db2stop
```

Note that some of these commands will not apply on the Net.Commerce Hosting Server machine where only the DB2 CAE has been installed. The only commands that will work on the DB2 CAE installation are:

```
$ txstop  
$ db2 terminate
```

2. Exit back to the root user by typing `exit`.
3. The DB2 Text Extender FixPak comes as a compressed file. You need to find a place on a file system where there is more than 60 MB of free space, in order to decompress this file.

You can use the `df -k` command to view your file systems. It will show the following:

```
# df -k
Filesystem      1024-blocks    Free %Used    Iused %Iused Mounted on
/dev/hd4         221184        202472    9%      1045    1% /
/dev/hd2        1392640        563816   60%     31176   9% /usr
/dev/hd9var       8192          6960    16%      179    9% /var
/dev/hd3         24576         23444    5%        68    2% /tmp
/dev/hd1        212992        125548   42%      794    2% /home
/dev/cd0         612804         0    100%    306402  100% /cdrom
```

The free space on each file system is shown in kilobytes in the Free column. As you can see from the screen capture above, there is enough space in either /, /usr, or /home. If you do not have a file system with enough free space, then you must expand a file system or create a new one. Use SMITTY to either expand or create a file system.

Since we had enough space in /home, we simply created a temporary directory in /home called temp. We will, therefore, assume in the following that there is a directory called /home/temp with at least 60 MB of free space.

4. Change directory as follows:

```
cd /home/temp
```

(You should, of course, change to whatever directory you have created for this purpose.)

5. Uncompress the files needed for the DB2 Text Extender FixPak as follows:

```
uncompress -c /cdrom/NetCommerce3/db2extfix/u454574.pkg.Z > u454574.pkg
```

6. This should create one file in your current directory.

```
# ls -al
total 112706
drwxr-xr-x  2 root    system    512 Jun 16 11:43 .
drwxr-xr-x  7 bin     bin       512 Jun 16 09:09 ..
-rw-r--r--  1 root    system    57702400 Jun 16 11:45 u454574.pkg
#
```

7. Start SMITTY with the fastpath `install_latest`:

```
smitty install_latest
```

8. Type `.` in the INPUT device / directory for software field and press **Enter**.

9. Press **Enter** twice to start the installation.

An OK indication will be displayed in the upper left hand corner after a successful installation, and your SMITTY window should look like the following:

```
COMMAND STATUS

Command: OK           stdout: yes           stderr: no

Before command completion, additional instructions may appear below.

[TOP]
installp -acgNQqWX -d ./ -f File 2>&1

File:
  db2tx_05_00.client.rte           5.0.2.0
  db2tx_05_00.rte.com              5.0.2.0
  db2tx_05_00.nls.client          5.0.2.0
  db2tx_05_00.nls.server          5.0.2.0
  db2tx_05_00.server.rte         5.0.2.0

-----+
                               Pre-installation Verification...
-----+
[MORE...54]

F1=Help           F2=Refresh       F3=Cancel         Esc+6=Command
Esc+8=Image       Esc+9=Shell      Esc+0=Exit        /=Find
n=Find Next
```

10. Press **F10** to exit SMITTY.

This completes the installation of DB2 Text Extenders. The next step is to install the IBM Payment Server.

2.4.5 Installing IBM Payment Server 1.2

The IBM Payment Server software will be installed on the Net.Commerce Hosting Server machine. In our example, this is the server chs1.

1. Ensure you are logged on as the root user. The `id` command can be used to verify this .
2. Mount the CD entitled *IBM Net.Commerce 3.1.2.2 FixPak*.
3. Change the directory to `/cdrom/payment_server` as follows:

```
# mount /cdrom
# cd /cdrom/payment_server
# ls
.toc           PTF_U300066.pkg  U300066.inf      eTill_en_US.pkg
PTF_U300064.pkg  U300064.inf     eTill.pkg
```

4. Start SMITTY.
5. Place the cursor on **Software Installation and Maintenance** in the System Management menu and press **Enter**.

12. Unmount the CD by running the `umount` command.

This completes the installation of the IBM payment server.

2.4.6 Applying the Net.Commerce 3.1.2.2 FixPak

This will be applied to the Net.Commerce installation we have completed on the Net.Commerce Hosting Server machine. In our example, it is server `chs1`.

1. Log on to the DB2 instance user(`db2inst1`).
2. Ensure that the following statements have been added to the `.profile` file under the DB2 instance home directory:
`. sqllib/db2profile`
3. Ensure that the `LIBPATH` environment variable has `/usr/lib` included in it. If it does not, add it.

An example of how the `.profile` file should look like is as follows:

```
PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:$HOME/bin:/usr/bin/X11:/sbin: .

export PATH
export LIBPATH=$LIBPATH:/usr/lib

if [ -s "$MAIL" ]           # This is at Shell startup.  In normal
then echo "$MAILMSG"       # operation, the Shell checks
fi                          # periodically.

. sqllib/db2profile

export LANG=en_US
. dmb/dmbprofile

~
```

4. Log out from the DB2 instance user by typing `exit` on the command line.
5. Ensure you are logged on as the root user. The command `id` can be used to verify that.
6. Ensure that all Net.Commerce instances are stopped by typing the following on the command line:

```
ps -ef | grep NetCommerce
```

Refer to 5.2, "How to start/stop NCHS components" on page 257 regarding starting and stopping Net.Commerce.

7. Mount the CD entitled *IBM Net.Commerce 3.1.2.2 FixPak*.

8. Change directory to /cdrom/start as follows:

```
# mount /cdrom
# cd /cdrom/start
# ls
.toc                NetCommerce3.html      NetCommerce3.ps
NetCommerce3.Mall   NetCommerce3.loc.en_US
NetCommerce3.Server NetCommerce3.msg.en_US
```

9. Start SMITTY with fastpath `update_all`.

10. Type `.` in the INPUT device / directory for software field and press **Enter**.

11. You should now see the window shown below. Press **Enter** to start the update.

```
Update Installed Software to Latest Level (Update All)

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                     [Entry Fields]
INPUT device / directory for software      ./
SOFTWARE to update                         _update_all
PREVIEW only? (update operation will NOT occur) no      +
COMMIT software updates?                  yes          +
SAVE replaced files?                      no           +
AUTOMATICALLY install requisite software? yes          +
EXTEND file systems if space needed?      yes          +
VERIFY install and check file sizes?      no           +
DETAILED output?                          yes          +
Process multiple volumes?                 yes          +

F1=Help          F2=Refresh      F3=Cancel       F4=List
Esc+5=Reset      Esc+6=Command  Esc+7=Edit      Esc+8=Image
Esc+9=Shell      Esc+0=Exit     Enter=Do
```

Press **Enter** again to confirm the installation of the Net.Commerce 3.1.2 FixPak. The installation will now proceed.

An OK indication will be displayed in the upper left hand corner after a successful update as follows:

```
COMMAND STATUS

Command: OK          stdout: yes          stderr: no

Before command completion, additional instructions may appear below.

[TOP]
installp -acgNqwX -d ./ -V2 -f File 2>&1

File:
NetCommerce3.Mall.business      3.1.2.0
NetCommerce3.Mall.groce         3.1.2.0
NetCommerce3.Server.admin       3.1.2.0
NetCommerce3.Server.adt         3.1.2.0
NetCommerce3.Server.pyset       3.1.2.0
NetCommerce3.Server.rte         3.1.2.0
NetCommerce3.Server.tedit       3.1.2.0
NetCommerce3.Server.txavp       3.1.2.0
NetCommerce3.html.en_US         3.1.2.0
[MORE...4385]

F1=Help          F2=Refresh          F3=Cancel          Esc+6=Command
Esc+8=Image      Esc+9=Shell         Esc+0=Exit         /=Find
n=Find Next
```

12. Press **F10** to exit SMITTY.

13. Unmount the CD by running the `umount` command.

This completes the application of the Net.Commerce 3.1.2.2 FixPak.

2.4.7 Finalizing DB2 remote setup

We now complete the DB2 setup in this distributed environment with the following steps, relating to populating Net.Commerce database, DB2 Text Extenders, and the DB2 database configuration. Be aware that NCHS database will be created under `/home` directory by default if you follow the below steps. If you want to place the busiest NCHS tables on an optimized location, refer to 4.2, “Optimizing NCHS database layout” on page 212.

2.4.7.1 Populating the Net.Commerce Database

In this step the tablespaces and the tables for NCHS are created. Note that the database schema and sql scripts reside on the NCHS machine, not on the database machine.

1. Copy the file `netcpswd` from `/usr/lpp/NetCommerce3/bin/` on your Net.Commerce Hosting Server machine to the `sqllib/function` directory in the DB2 instance directory on your database machine.

Ensure the permissions are correct as follows:


```
/home/db2inst1/sqllib/function> hostname
dbsvr1
/home/db2inst1/sqllib/function> ls -l netcpswd
-r-xr-xr-x  1 db2inst1 db2iadml   2819 Aug 19 16:16 netcpswd
```

For our example, this file will be copied from the `/usr/lpp/NetCommerce3/bin` directory on our Net.Commerce Hosting Server machine `chs1`, to the `/home/db2inst1/sqllib/function` directory on our database machine `dbsvr1`.

2. On your database machine (`dbsvr1`), add the `$HOME/sqllib/function` directory to the `PATH` environment variable of the DB2 instance ID.
3. Add the encrypted default password of the Net.Commerce Administrator. To determine the encrypted password, use the `nc3_crypt` command in the following manner:

1. Log on your Net.Commerce Hosting Server machine as user ID `root`. At a shell prompt, type the following:

```
cd /usr/lpp/NetCommerce3/bin
/usr/lpp/NetCommerce3/bin> ./nc3_crypt -e ncadmin [merchant_key]
```

where `merchant_key` is the merchant key you used when you configured Net.Commerce. If you used the default merchant key, omit this parameter.

2. The system responds with two character strings, one in ASCII and one in hexadecimal. Copy the ASCII character string to the clipboard and paste it into the proper position in the `remote_schema` command.

The following is an example of what results:

```
/> cd /usr/lpp/NetCommerce3/bin
/usr/lpp/NetCommerce3/bin> ./nc3_crypt -e ncadmin [merchant_key]

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Encrypted string (ASCII): KDRiGCv9hAM=
Encrypted string (hex): 4B4452694743763968414D3D
```

4. On your Net.Commerce Hosting Server machine, logon as the DB2 instance ID and populate the Net.Commerce Hosting Server database by

typing the following to change the directory to the net commerce schema directory. Then running the `remote_schema` command:

```
cd /usr/lpp/NetCommerce3/nc_schema/db2
remote_schema.sh db_name db_user db_password N NCAAdmin_password
[log_file]
```

where:

- `db_name`
The name of your remote database.
- `db_user`
Your DB2 instance ID.
- `db_password`
The password of the DB2 instance ID that you specified above.
- `NCAAdmin_password`
The encrypted Net.Commerce administrator password obtained above.
- `log_file`
The file into which you want the command to write log records as it populates the database.

Using the results of the `nc3_crypt` command, we use the `remote_schema` command on our example database as follows (the output is quite verbose and, hence, is shortened here for illustration purposes):

```

$ ./remote_schema.sh rkim db2inst1 ibmdb2 N KDRiGCv9hAM= ~/kimlog.txt
db2inst1 ibmdb2 user db2inst1 using ibmdb2
7
Begin to create the Net.Commerce Version 3 Database Schema...

Creating tables in database rkim
DB20000I The ACTIVATE DATABASE command completed successfully.

Connecting to rkim

Executing the script file 'mall_schema.db2.sql'

Disconnecting from rkim

Connecting to rkim

Executing the script file 'merchant_schema.db2.sql'

Disconnecting from rkim
.... etc ...
Disconnecting from rkim
SQL1495W Deactivate database is successful, however, there is still a
connection to the database.

END: ---- Check the log files ----

```

5. When the command completes, check the log file for errors. In our example, we check the log file kimlog.txt, located in /home/db2inst1, for errors.

2.4.7.2 DB2 Text Extenders

The following changes are necessary for DB2 Text Extender.

1. On your database machine, log on as user ID root.
2. Edit the /etc/rc.db2 file and add the following:

```

if [ -x ${DB2EXT?}/bin/dmbstart ]; then
    ${DB2EXT?}/bin/dmbstart
fi

```

3. Copy the file searchext.sh from the Net.Commerce Hosting Server (chs1) directory /usr/lpp/NetCommerce3/nc_schema/db2 to the home directory of the database instance ID (/home/db2inst1) on your database machine (dbsvr1).
4. Ensure the permissions are correct to allow searchext.sh to run while using the database instance ID (that is, for our example, db2inst1).

5. Log in as the database instance ID. Run `searchext.sh` in the following format:

```
searchext.sh db_name log_file db2inst_ID db2inst_passwd
```

where:

- `db2_name`
The name of your Net.Commerce Hosting Server database
- `log_file`
A log file where errors and other information will be written to.
- `db2inst_id`
Your DB2 instance ID.
- `db2inst_passwd`
The password of the database instance ID that you specified above.

6. The following shows execute permission being granted on the `searchext.sh` file followed by execution of this script with our example database and associated parameters:

```
$ chmod u+x searchext.sh
$ ./searchext.sh kim kim.log db2inst1 ibmdb2

db2txss - search service controller

-----
db2txss: Informational message:
        Search service started.
```

2.4.7.3 DB2 Database Configuration

The default setting for the `applheapsz` parameter, in the database configuration for the Net.Commerce Hosting Server database, must be increased.

We do this with the `db2 update db cfg` command at the database server as follows:

```
db2 update db cfg for db_name using applheapsz 2048
```

where `db_name` is the name of the Net.Commerce Hosting Server database.

For our example, the following is used with the resulting output:

```
$ db2 update db cfg for kim using applheapsz 2048
DB20000I The UPDATE DATABASE CONFIGURATION command completed successfully.
DB21026I All applications must disconnect from this database before the
changes become effective.
```

You will then have to restart the DB2 instance for this parameter change to take effect.

2.4.8 Installing Net.Commerce Hosting Server

This section deals with the installation of the WebSphere Application Server and Net.Commerce Hosting server on the Net.Commerce Hosting Server commerce server. In our example, this is machine chs1.

Important

1. You must have a Web server, JDK 1.1.6, DB2, DB2 Text Extenders and Net.Commerce installed before beginning the steps in this section.
2. Do not install the version of JDK that is on the Websphere CD.

2.4.8.1 Installing WebSphere Application Server

1. Ensure you are logged on as the root user on machine chs1. The command `id` can be used to verify this.
2. Type the following on the command line:

```
export JAVA_HOME=JDK_install_path
```

where:

JDK_install_path is the directory where you installed JDK 1.1.6. The default location is `/usr/jdk_base`. You can verify that your `JDK_install_path` is the default path by typing the following on the command line.

```
# cd /usr/jdk_base
# ls
AIXDemos      COPYRIGHT    README.ADK  demo        fixes.lst   lib
CHANGES.ADK  README      bin         dt          jni_example
#export JAVA_HOME=/usr/jdk_base
#
```

3. Mount the CD entitled *IBM WebSphere Application Server*.
4. Change the directory to `/cdrom/AIX/IBMWebAS` as follows:

```
# mount /cdrom
# cd /cdrom/AIX/IBMWebAS
```

```
# ls
.toc                IBMWebAS.fr_FR    IBMWebAS.zh_CN
IBMWebAS.base      IBMWebAS.it_IT    IBMWebAS.zh_TW
IBMWebAS.de_DE     IBMWebAS.ja_JP    WebSphereInstallAIX.sh
IBMWebAS.en_US     IBMWebAS.ko_KR    http_server.base
IBMWebAS.es_ES     IBMWebAS.pt_BR    responseAIX.res
#
```

5. Start SMITTY.
6. Place the cursor on **Software Installation and Maintenance** in the System Management menu and press **Enter**.
7. Place the cursor on **Install and Update Software** in the Software Installation and Maintenance menu and press **Enter**.
8. Place the cursor on **Install/Update From ALL Available Software** in the Install and Update Software menu and press **Enter**.
9. Type **./** in the INPUT device / directory for software field and press **Enter**.
10. Place the cursor in the **SOFTWARE to install** field on the next screen that comes up. Press **F4** to list the file sets available for installation. Use the cursor keys to move up and down and **F7** to select the following file sets:
 - IBM WebAS Admin
 - IBMWebAS Base Release
 - IBMWebAS CORBA Support (optional)
 - IBMWebAS Plugins - Go Webserver 4.6.x Plugin
 - IBMBMWebAS Samples (optional)
 - IBMWebAS.en_US

The following screen shot shows this selection process, with components IBMWebAS Admin, IBMWebAS Base Release, IBMWebAS CORBA Support, and IBMWebAS Plugins - Go Webserver 4.6.x Plugin selected.

```

Install and Update from ALL Available Software

Type-----+
Pr |                SOFTWARE to install                |
|
| Move cursor to desired item and press Esc+7. Use arrow keys to scroll.
| * ONE OR MORE items can be selected.
| * Press Enter AFTER making all selections.
|
| [MORE...7]
| IBMWebAS.base                                         ALL
| > + 1.1.0.0 IBMWebAS Admin
| > + 1.1.0.0 IBMWebAS Base Release
| > + 1.1.0.0 IBMWebAS CORBA Support
| + 1.1.0.0 IBMWebAS Plugins - Apache 1.3.1 Plugin
| > + 1.1.0.0 IBMWebAS Plugins - Go Webserver 4.6.x Plugin
| + 1.1.0.0 IBMWebAS Plugins - Netscape 2.01 Plugin
| + 1.1.0.0 IBMWebAS Plugins - Netscape 3.01 Plugin
| [MORE...57]
|
| F1=Help          F2=Refresh          F3=Cancel
Fl | Esc+7=Select    Esc+8=Image    Esc+0=Exit
Es | Enter=Do        /=Find          n=Find Next
Es+-----+

```

11. Press **Enter** when you have made all your selections. This will bring you back to the previous screen.

You should now see the window shown below.

```

Install and Update from ALL Available Software

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

INPUT device / directory for software                [Entry Fields]
SOFTWARE to install                                ./
PREVIEW only? (install operation will NOT occur)    [+ 1.1.0.0 IBMWebAS Ad> +
COMMIT software updates?                            no +
SAVE replaced files?                                yes +
AUTOMATICALLY install requisite software?           no +
EXTEND file systems if space needed?                yes +
OVERWRITE same or newer versions?                   yes +
VERIFY install and check file sizes?                yes +
DETAILED output?                                    yes +
Process multiple volumes?                            yes +

F1=Help          F2=Refresh          F3=Cancel          F4=List
Esc+5=Reset      Esc+6=Command    Esc+7=Edit        Esc+8=Image
Esc+9=Shell      Esc+0=Exit       Enter=Do

```

12. Press **Enter** twice to start the installation.

An OK indication will be displayed in the upper left hand corner after a successful installation as shown below.

```
COMMAND STATUS

Command: OK          stdout: yes          stderr: no

Before command completion, additional instructions may appear below.

[MORE...2517]
-----
Name                  Level           Part            Event           Result
-----
IBMWebAS.en_US.core   1.1.0.0        USR             APPLY           SUCCESS
IBMWebAS.base.core    1.1.0.0        USR             APPLY           SUCCESS
IBMWebAS.base.samples 1.1.0.0        USR             APPLY           SUCCESS
IBMWebAS.base.admin   1.1.0.0        USR             APPLY           SUCCESS
IBMWebAS.base.Go46x   1.1.0.0        USR             APPLY           SUCCESS
IBMWebAS.base.CORBA   1.1.0.0        USR             APPLY           SUCCESS
IBMWebAS.en_US.resources 1.1.0.0        USR             APPLY           SUCCESS
IBMWebAS.en_US.doc    1.1.0.0        USR             APPLY           SUCCESS

[BOTTOM]

F1=Help          F2=Refresh          F3=Cancel          Esc+6=Command
Esc+8=Image      Esc+9=Shell         Esc+0=Exit         /=Find
n=Find Next
```

13. Press **F10** to exit SMITTY.

14. Unmount the CD by running the `umount` command.

15. Start and stop the Web server by typing the command shown below:

```
# startsrc -s httpd
0513-059 The httpd Subsystem has been started. Subsystem PID is 23524.
# stopsrc -s httpd
0513-044 The stop of the /usr/sbin/httpd Subsystem was completed successfully.
```

This completes the installation of the IBM WebSphere Application Server.

2.4.8.2 Installing Net.Commerce Hosting Server

The Net.Commerce Hosting Server software will be installed on the machine you have designated as the Net.Commerce Hosting Server machine. In our example, this is machine chs1.

1. Ensure you are logged on as the root user. The command `id` can be used to verify this.

2. Mount the CD entitled *IBM Net.Commerce Hosting Server, Version 3.1.1*. (It is called Version 3.1.1 even though the entire installation will be Net.Commerce Hosting Server version 3.1.2.)
3. Change directory to `/cdrom/CHS` as follows:

```
cd /cdrom/CHS
```
4. Start SMITTY with the fastpath `install_all`:

```
smitty install_all
```
5. Type `./` in the INPUT device / directory for software field and press **Enter**.
6. Type `all` in the SOFTWARE to install field and press **Enter**.

Install and Update from ALL Available Software

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

	[Entry Fields]	
INPUT device / directory for software	./	
SOFTWARE to install	[all]	+
PREVIEW only? (install operation will NOT occur)	no	+
COMMIT software updates?	yes	+
SAVE replaced files?	no	+
AUTOMATICALLY install requisite software?	yes	+
EXTEND file systems if space needed?	yes	+
OVERWRITE same or newer versions?	no	+
VERIFY install and check file sizes?	no	+
DETAILED output?	no	+
Process multiple volumes?	yes	+

F1=Help	F2=Refresh	F3=Cancel	F4=List
Esc+5=Reset	Esc+6=Command	Esc+7=Edit	Esc+8=Image
Esc+9=Shell	Esc+0=Exit	Enter=Do	

7. Press **Enter** to start the installation.
8. Press **Enter** again to confirm the installation.
9. An **OK** indication will be displayed in the upper left hand corner after a successful installation. Scan through the installation summary to confirm that all components have been successfully installed.

```
COMMAND STATUS

Command: OK           stdout: yes           stderr: no

Before command completion, additional instructions may appear below.

[MORE...5764]

+-----+
|                               Summaries:                               |
+-----+

Installation Summary
-----
Name                    Level      Part      Event     Result
-----
NetCommerce3.CHS.en_US  3.1.0.0   USR       APPLY    SUCCESS
NetCommerce3.CHS.base  3.1.0.0   USR       APPLY    SUCCESS

[BOTTOM]

F1=Help      F2=Refresh   F3=Cancel   Esc+6=Command
Esc+8=Image  Esc+9=Shell  Esc+0=Exit  /=Find
n=Find Next
```

10. Press **F10** to exit SMITTY.

11. The installation of the Net.Commerce Hosting Server is complete.

2.4.8.3 Creating your Net.Commerce Hosting Server instance

This section describes how to configure a Net.Commerce Hosting Server instance.

Multiple Instances

Net.Commerce Hosting Server 3.1.2 only supports the existence of a single instance. Attempting to create multiple instances on a single Net.Commerce Hosting Server machine will corrupt the first instance, and you will not be able to start the instances.

To create and configure a Net.Commerce Hosting Server instances, do the following:

- 1. On your database server, log on as user ID root. In our example, the database server is host dbsvr1.
- 2. Switch to your DB2 instance ID by typing:

```
# su - db2inst1
```

where `db2inst1` is the DB2 instance user ID you created for your Net.Commerce Hosting Server database.

3. Ensure that DB2 and DB2 Text Extenders have been started. To check this, using your DB2 instance ID, start the DB2 instance with the `db2start` command and the DB2 extenders with the `txstart` command as the following example shows:

```
$ db2start
SQL1063N  DB2START processing was successful.
$ txstart
db2txss - search service controller

-----
db2txss: Informational message:
        Search service started.
```

4. Log on to the Net.Commerce Hosting Server machine, as user ID `root`. In our example, this server is called `chs1`.
5. To start the Net.Commerce Configuration Manager, switch to the `/usr/lpp/NetCommerce3/server/bin` directory and type the `./start_admin_server` command. You should receive the following status messages:

```
/usr/lpp/NetCommerce3/server/bin> ./start_admin_server

License Manager
All rights reserved.
(C) Copyright IBM Corp. 1998, All rights reserved.

Found valid license key for product db2

License Manager
All rights reserved.
(C) Copyright IBM Corp. 1998, All rights reserved.

Found valid license key for product db2

Using default port 4444 ...

en_US is the locale being used
#####
### Starting Net.Commerce Server Administrator on port 4444
### To configure Net.Commerce open URL http://chs1:4444/
#####
/usr/lpp/NetCommerce3/server/bin>
```

Note that if the server is already started, it will be restarted with a new process ID.

6. From the Windows machine running the required software, access the Configuration Manager by doing the following:
 1. Open your Web browser and go to `http://host_name:4444`. In our example, it will be `http://chs1:4444`.
 2. When prompted, enter your Configuration Manager user ID and password. If you have not yet changed them, your user ID is `webadmin` and your password is `webibm`.
 3. On the Configuration Manager main window (Figure 32), click **New** to create a new instance.



Figure 32. Net.Commerce Configuration Manager main window

7. The Configuration Manager displays the following window:



Figure 33. Net.Commerce Configuration Manager Net.Commerce tab

This window includes four tabs that allow you to review and update a variety of configuration settings for your Net.Commerce Hosting Server components. You can also update many of them later after you have installed and configured Net.Commerce Hosting Server. See *Configuration Manager* in the Net.Commerce Hosting Server online information for details.

The first tab, Net.Commerce, lets you change settings for the Net.Commerce Hosting Server commerce server. Complete the fields as follows:

- **Instance Name**

Accept the default or type an alphanumeric name for the Net.Commerce Hosting Server instance that you want to create. The Net.Commerce Hosting Server will store its logs in the `/usr/lpp/NetCommerce3/instance/instance_name/logs` directory where `instance_name` is the name you type in this field.

- **Communication Port Base**

Accept the default or type the base port address that you want the commerce server to use to communicate with your Web server.

This address will be used by the first server process. Each additional process will use consecutive port addresses starting at this address. Therefore, you must ensure that there are a sufficient number of free addresses above the base address to accommodate the number of processes you intend to create. If you are using Payment Server, note that it uses five port addresses.

The default port address allows room for at least two processes to be defined.

Base Address Range

The base address must be greater than 1024. The range of addresses, starting at the base, cannot include 1080 or 8080, and the highest address in the range cannot be greater than 65535.

- **Number of Server Processes**

Accept the default or type the number of processes that you want started for this Net.Commerce Hosting Server instance. A higher number will allow the Net.Commerce Hosting Server to process more transactions simultaneously, but the load on the machine will be increased.

- **Server Options**

If you intend to use Domino Go Webserver as your Web server, ensure that **Enable Server Cache** is selected to enable caching for this Net.Commerce Hosting Server instance. Caching reduces the time it takes for the Net.Commerce Hosting Server to display frequently used dynamic pages.

In our example, we are using Domino Go Webserver; hence, this option has been selected.

- **Use Default Merchant Key**

If you want the Configuration Manager to prompt you for a key to encrypt the shopper and administrator passwords in the Net.Commerce Hosting Server database, ensure that this checkbox is *not* selected. If you want the Configuration Manager to generate the key itself, ensure that this box is selected.

- **Merchant Key**

If you have deselected the **Use Default Merchant Key** checkbox, the Merchant Key field becomes enabled. Type a 16-digit hexadecimal number for the Configuration Manager to use as the encryption key. Keep a record of this number as you will need it if you reconfigure your system later.

8. Click the second tab, **Web Server**, to review and update the Web server settings. The following window is displayed:

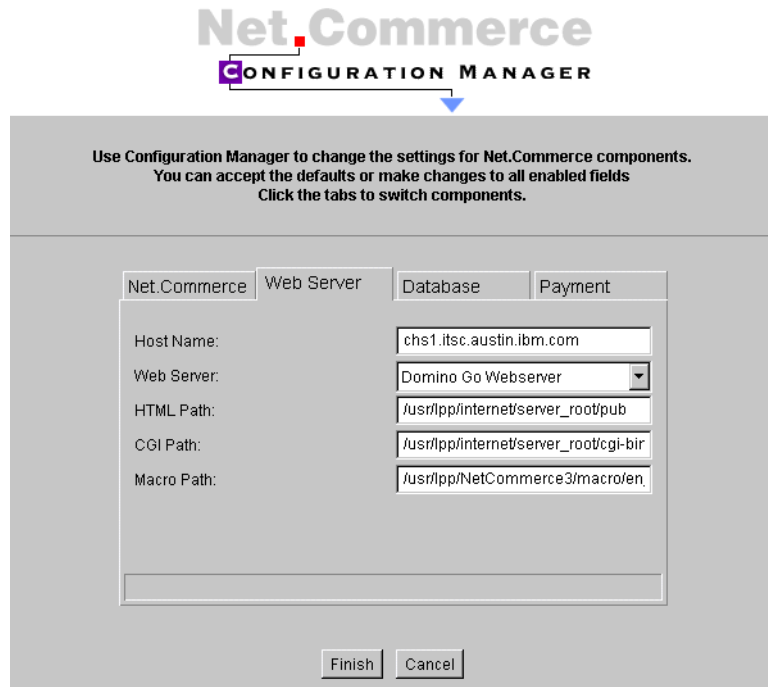


Figure 34. Net.Commerce Configuration Manager Web Server tab

Complete the fields as follows:

- **Host Name**

Accept the default or type the *fully qualified* host name of your Net.Commerce Hosting Server machine (for example, `www.ibm.com`).

Our example shows the fully qualified host name of our machine:

`chs1.itsc.austin.ibm.com`

- **Web Server**

From the drop-down list, select the name of the Web server that you intend to use.

- **HTML Path**

Accept the default, which is provided only if you are using Domino Go Webserver, or type the path of your Web server HTML document root.

If you intend to use the Netscape Enterprise Server, and you used the default path when you installed it, type `/usr/netscape/suitespot/docs` (The primary document root).

- **CGI Path**

Accept the default, which is provided only if you are using Domino Go Webserver, or type the path in which you intend to store the Net.Commerce Hosting Server CGI programs.

If you intend to use the Netscape Enterprise Server, type `/usr/lpp/NetCommerce3/cgi-bin` or the path in which you intend to store the Net.Commerce Hosting Server CGI programs.

- **Macro Path**

Accept the default or type the path in which you intend to store your Net.Data macros.

9. Click the third tab, **Database**, to review and update the database settings. The following window is displayed:

Net.Commerce CONFIGURATION MANAGER

Use Configuration Manager to change the settings for Net.Commerce components.
You can accept the defaults or make changes to all enabled fields
Click the tabs to switch components.

Net.Commerce Web Server Database Payment

Database Name: kim

DBMS: IBM Universal Database

Instance Owner ID: db2inst1

Database User Logon: db2inst1

Database Logon Password: *****

Confirm Password: *****

Database Option: Use Staging Server

Finish Cancel

Figure 35. Net.Commerce Configuration Manager Database tab

Complete the fields as follows:

- **Database Name**

Accept the default or type the name you wish to assign to your database. The name must be eight characters in length or less. In our example, we are using the database kim; hence, we type `kim` in this field.

Database Name or Alias?

Remember that we cataloged two database entries on the NCHS server, one as the database name `<db_name>`, the other with a database alias of the form `r<db_name>`. This entry requires the database name, hence enter the name as `<db_name>`.

- **DBMS**

From the drop-down list, select **IBM Universal Database** if not already selected.

- **Instance Owner ID**

This field is not enabled.

- **Database User Logon**

Type the name of the DB2 instance ID that you created for the Net.Commerce Hosting Server database. In our example, it is `db2inst1`.

- **Database Logon Password**

Type the password of the user ID that you specified in the Database User Logon field. Remember that our example used `ibmdb2`.

- **Confirm Password**

Type the password again.

- **Database Option**

Leave this box unchecked when you are installing your first instance of the Net.Commerce Hosting Server.

10. Click the fourth tab, **Payment**, to configure the Payment Server settings. The following window is displayed:

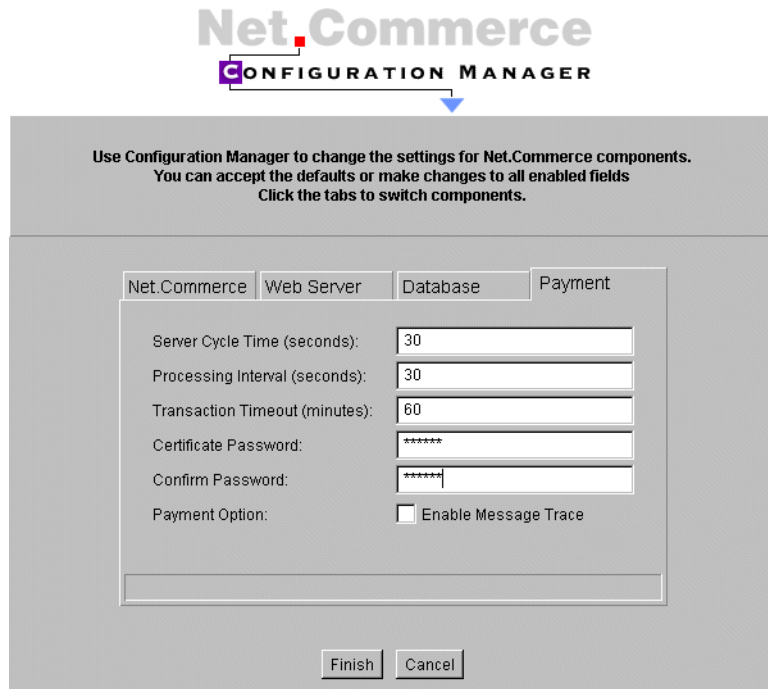


Figure 36. Net.Commerce Configuration Manager Payment Server tab

Complete the fields as follows:

- **Server Cycle Time**

Accept the default or type the number of seconds you want the payment server to wait between polls for work.

- **Processing Interval**

Accept the default or type the number of seconds you want the payment server to wait between the execution of consecutive jobs waiting in the queue.

- **Transaction Timeout**

Accept the default or type the number of minutes you want transactions to stay in a pending state before the commerce server checks the database for data that has not been received directly from the Payment Server machine.

- **Certificate Password**

Type the password that you want the payment server to use to access your certificate files (which are also known as key files).

If you do not type in a password, you will be prompted, when finished, to confirm the use of a blank SET certificate password.

In our example, we will use the password kim123.

- **Confirm Password**

Type the password again.

- **Payment Option**

Select the **Enable Message Trace** box if you want the payment server to write log entries as it processes transactions.

11. Click **Finish**. Your Net.Commerce Hosting Server instance will be configured according to your selection.

When finished, the Net.Commerce Configuration Manager Window will be as follows:



Figure 37. Net.Commerce Configuration Manager create instance action status

Database Error

Only the DB2 Client Application Enabler has been installed on the Net.Commerce Hosting Server machine. Hence, the Configuration Manager will issue an error message as it tries to create your database. Click **OK** to remove the error message window.

Click on **OK** to return to the main Net.Commerce Configuration Manager window.

12. In an AIX command window, switch to the /etc directory on the NCHS server and add the following line to the environment file:

```
DB2INSTANCE=db2inst_owner
```

where `db2inst_owner` is the DB2 instance owner ID.

It is important that this environment variable is set for the user ID that will be used to start the Web server. If it is not set, the MerchantAdmin servlet will not load properly.

13. Reboot the NCHS server. Then enter:

```
# su - db2inst1
$ txstart
$ exit
# cd /usr/lpp/NetCommerce3/server/bin
# ./start_admin_server
```

14. From the main Configuration Manager window, highlight your Net.Commerce Hosting Server instance and click **Start**.

Net.Commerce CONFIGURATION MANAGER

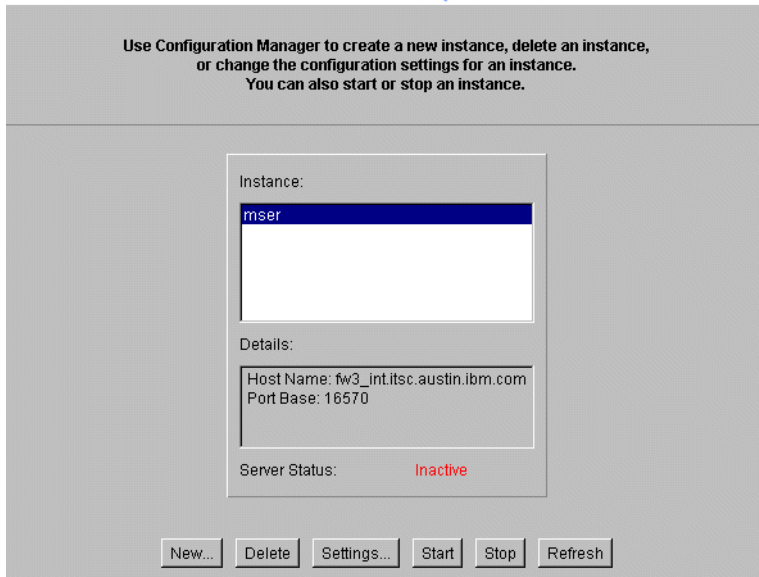


Figure 38. Net.Commerce Configuration Manager Net.Commerce instance status

A status window will be displayed where Net.Commerce Configuration Manager will attempt to start the Net.Commerce server specified. If successful, the following window is displayed:

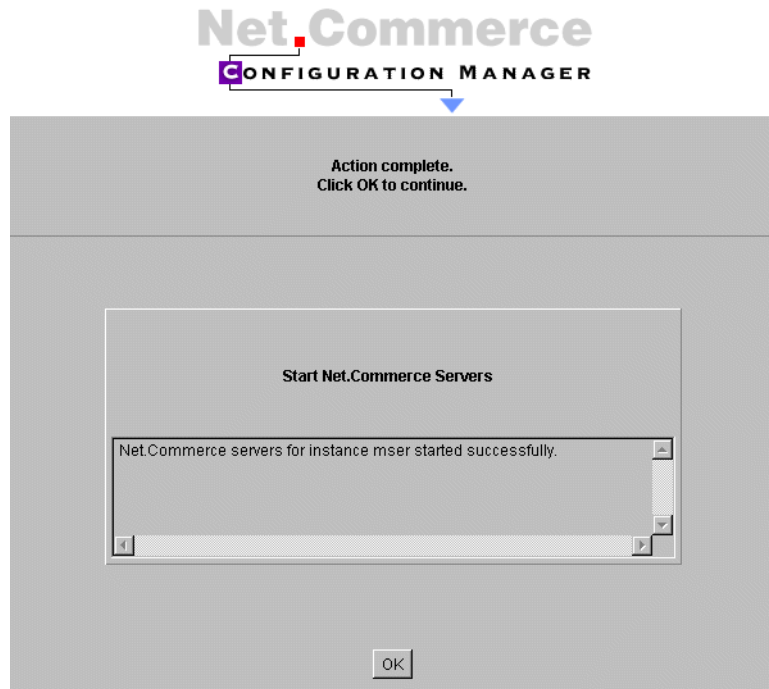


Figure 39. Net.Commerce Configuration Manager start instance action status

Click **OK** to return to the Net.Commerce Configuration Manager main window where the status of your Net.Commerce Hosting Server instance will now be Active .

2.4.9 Verifying a successful installation

Once you have completed the steps in this chapter, you can perform a quick verification test by loading the Web server servlet, which will be a good indicator of whether your installation was successful.

To load the Web server servlet, do the following:

1. On your Windows machine, open your browser and go to the following URL:

`http://hostname:9090`

In our example, it will be `http://chs1:9090`. The IBM WebSphere Application Server Manager page should appear as shown in Figure 40 on page 158. If it does not, WebSphere Application Server may not have

been installed successfully, or it failed to load when the Web server was started.

2. On the IBM WebSphere Application Server Manager page, log on using the user ID and password admin, as shown below:



Figure 40. IBM WebSphere logon window

Changing Password

If you wish to change the password after you log on, click the **Properties** button, and on the **Admin Password** tab, enter your new password.

3. On the window that appears after you log on, select the servlet for your Web server. In our example, it is servlet -- Lotus Domino Go Web/1.1.



Figure 41. IBM WebSphere Lotus Domino servlet choice

4. Click **Manage**. A new window appears.
5. On the new window, click **Servlets**. The following window appears:



Figure 42. IBM Websphere servlet choice

6. In the tree view frame on the left side of the window, under the Configure option, select **MerchantAdmin**.
7. On the right side of the window, under the Configuration tab, click **Load**.

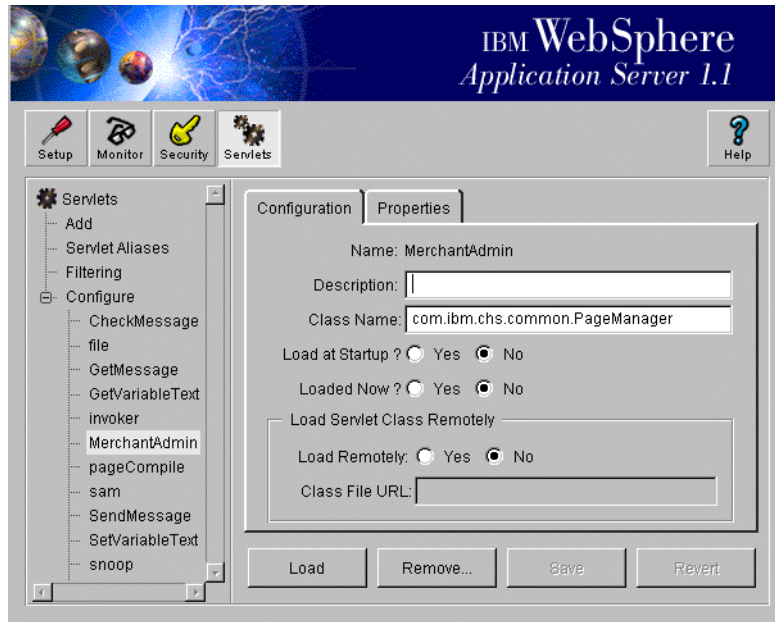


Figure 43. IBM WebSphere load MerchantAdmin servlet

The Load button will change to Unload when the servlet has been loaded, and the status Loaded Now will change to Yes. If the servlet fails to load, you will be presented with an error message. If you cannot resolve the problem based on the information provided in the error message, refer to Troubleshooting section in the readme.txt file located at the root of the Net.Commerce Hosting Server CD.

8. Close the window to return to the main window.
9. Click **Log Out** and close the IBM WebSphere Application Server Manager window.

2.4.10 Next steps

Steps to configure SSL are the same as what was described in 2.3.4, "Enabling SSL on Domino Go Webserver for test" on page 74.

2.5 Load balancing among multiple NCHS servers

In this section we study a scenario that consists of multiple NCHS servers and a database server and explore the way how to balance workload among the multiple NCHS servers.

The test configuration is shown in Figure 44.

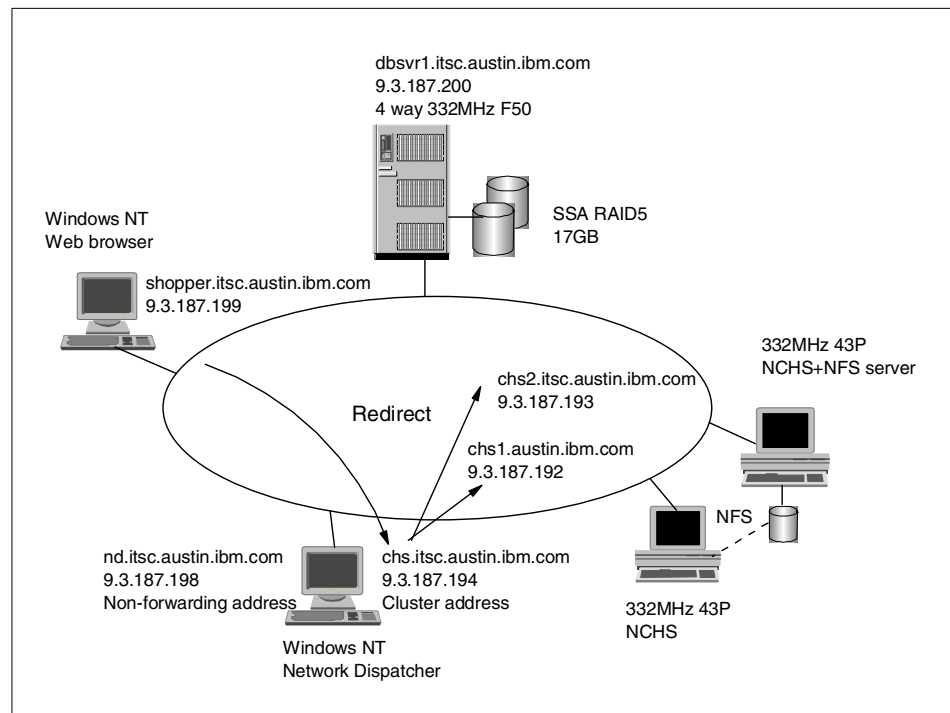


Figure 44. Multiple NCHS server test configuration

In the above configuration (Figure 44), a Windows NT machine is used to balance the workload between two NCHS servers, that is, chs1 and chs2. chs2 is configured as NFS server, and chs1 mounts a few directories from chs2. The special consideration to be made in implementing multiple NCHS server configurations is that there are files that must be shared among the NCHS servers. Most of these files contain information about merchant stores. If these are not shared, shoppers cannot have uniform access to the merchant store. They are:

- HTML files under /usr/lpp/internet/server_root/pub
- Net.Data macro files /usr/lpp/NetCommerce3/macro/<locale>

- Image files under /usr/lpp/NetCommerce3/CHS/public/images
- Default store layout under /usr/lpp/NetCommerce3/CHS/source

There are two optional choices to share the files mentioned above. The first way is to use NFS, which is a standard feature of AIX, and the other way is to use AFS. AFS is an acronym of Andrew File System and is a component of the IBM WebSphere performance Pack. Although AFS provides better scalability and availability than NFS, the procedure for installation and management is more complicated than that of NFS. It can be thought that AFS fits ideally with a large operation environment that consists of many NCHS servers, for example, five or more. Since NFS is relatively simple and costs no extra money, it fits better with a small operation environment. We thought a small operation environment would be more typical in NCHS user community. For this reason, we chose NFS to provide file sharing. More information about AFS can be found in the ITSO redbook *IBM WebSphere Performance Pack Usage and Administration*, SG24-5233.

Load balancing is provided by the IBM SeureWay Network Dispatcher. It provides us a flexible way to balance the workloads of multiple NCHS servers. For further information about configuring Network Dispatcher in NCHS environment, refer to the Chapter 14 "Configuring eNetwork Dispatcher" of *Installing and Getting Started Guide for Net.Commerce Hosting Server for AIX 3.1.2*, GC09-2808.

2.5.1 File sharing using NFS

Most of the NCHS configuration files are kept in the /usr/lpp/internet/server_root/pub directory. Once this directory is mounted to NFS client machines from the NFS file server, these files are masked by the files with the same file names on the NFS file server. To preserve the configuration files on NFS client machines, do the following steps at the machines; in our case, chs1.

1. Create a directory and give all users read/write access.

```
# cd /usr/lpp/NetCommerce3
# mkdir conf
# chmod ugo+rw conf
# ls -ld conf
drwxrwxrwx  2 root      system      512 Aug 20 13:03 conf
```

2. Move the following configuration files to this directory
 srvctrl.conf, pay_cyber.conf, scheduler.conf, ncommerce.conf.
 Then copy db2www.ini to this directory.

```

# mv /usr/lpp/internet/server_root/pub/*.conf
/usr/lpp/NetCommerce3/conf
# ls -l
total 96
-rw-rw-rw- 1 root      system      1929 Aug 19 19:04 ncommerce.conf
-rw-rw-rw- 1 root      system      1929 Aug 19 19:04 ncommerce.old.conf
-rw-r--r-- 1 db2inst1 db2iadm1    500 Aug 19 19:04 pay_back.conf
-rw-r--r-- 1 db2inst1 db2iadm1    500 Aug 19 18:18 pay_back.old.conf
-rw-r--r-- 1 db2inst1 db2iadm1    504 Aug 19 19:04 pay_cyber.conf
-rw-r--r-- 1 db2inst1 db2iadm1    504 Aug 19 18:18 pay_cyber.old.conf
-rw-r--r-- 1 db2inst1 db2iadm1    786 Aug 19 19:04 pay_etill.conf
-rw-r--r-- 1 db2inst1 db2iadm1    786 Aug 19 18:18 pay_etill.old.conf
-rw-r--r-- 1 db2inst1 db2iadm1   1151 Aug 19 19:04 scheduler.conf
-rw-r--r-- 1 db2inst1 db2iadm1   1150 Aug 19 18:18 scheduler.old.conf
-rw-r--r-- 1 db2inst1 db2iadm1    560 Aug 19 19:04 srvrctrl.conf
-rw-r--r-- 1 db2inst1 db2iadm1    472 Aug 19 18:18 srvrctrl.old.conf
# cp -p /usr/lpp/internet/server_root/pub/db2www.ini .
# ls -l db2www.ini
-rw-r--r-- 1 db2inst1 db2iadm1    1291 Aug 19 19:04 db2www.ini

```

3. Edit the `srvrctrl.conf` in this directory to change the `CONTROL_POOL_CONFIG` directive. Make it point to the new directory.

```

MS_HOSTNAME chs2.itsc.austin.ibm.com
CONTROL_DENAME kim
CONTROL_DBINST db2inst1
CONTROL_DBPASS lmeuecPNBIU=
CONTROL_DB_RETRY_LIMIT 1
CONTROL_DB_RETRY_INTERVAL 20
MERCHANT_KEY QunGZnDUqUDK7yW0cEnk38vOvgkAO1Ym
CONTROL_ERR_TOLERANCE 1
CONTROL_SERVICE nmsr
CONTROL_POOL_CONFIG /usr/lpp/NetCommerce3/conf/ncommerce,/usr/lpp/NetCommerce3/conf/pay_back,/usr/lpp/NetCommerce3/conf/pay_etill,/usr/lpp/NetCommerce3/conf/pay_cyber,/usr/lpp/NetCommerce3/conf/scheduler
MS_LOGPATH /usr/lpp/NetCommerce3/instance/mser/logs
MS_LOGLEVEL 2

```

4. Change to `/usr/lpp/IBMWebAS/properties/server/servlet/servletservice` and edit the `servlets.properties` file. Change the `servlet.MerchantAdmin.initArgs` directive to point to the new directory.

```

# cd /usr/lpp/IBMWebAS/properties/server/servlet/servletservice
# vi servlets.properties

```

```
# Servlets added by the user
servlet.MerchantAdmin.code=com.ibm.chs.common.PageManager
servlet.MerchantAdmin.initArgs=configfile=/usr/lpp/NetCommerce3/conf/ncommerce.conf
```

5. The next step is to export the directories that will be shared. These directories must be writable by everybody.

```
# ls -ld /usr/lpp/internet/server_root/pub
drwxrwxrwx  5 db2inst1 db2iadml  1024 Aug 20 13:08
/usr/lpp/internet/server_root/pub
# ls -ld /usr/lpp/NetCommerce3/macro/en_US
drwxrwxrwx 14 db2inst1 db2iadml   512 Aug 19 18:52
/usr/lpp/NetCommerce3/macro/en_US
# ls -ld /usr/lpp/NetCommerce3/CHS/source
drwxrwxrwx  4 bin      bin      512 Aug 19 19:11
/usr/lpp/NetCommerce3/CHS/source
# ls -ld /usr/lpp/NetCommerce3/CHS/public/images
drwxrwxrwx  6 bin      bin      2560 Aug 19 18:45
```

Export these directory names.

```
/usr/lpp/NetCommerce3/CHS/public/images
# mknfsexp -d /usr/lpp/internet/server_root/pub -t rw -B
# mknfsexp -d /usr/lpp/NetCommerce3/macro/en_US -t rw -B
# mknfsexp -d /usr/lpp/NetCommerce3/CHS/source -t rw -B
# mknfsexp -d /usr/lpp/NetCommerce3/CHS/public/images -t rw -B
```

6. Verify the directories were exported with right permission.

```
# exportfs
/usr/lpp/NetCommerce3/macro/en_US      -rw
/usr/lpp/NetCommerce3/CHS/source      -rw
/usr/lpp/NetCommerce3/CHS/public/images -rw
/usr/lpp/internet/server_root/pub     -rw
```

7. Write a shell script to mount the directories.

```
# cat /usr/local/bin/mount.sh
#!/bin/ksh
mount chs2.itsc.austin.ibm.com:/usr/lpp/internet/server_root/pub\
  /usr/lpp/internet/server_root/pub
mount chs2.itsc.austin.ibm.com:/usr/lpp/NetCommerce3/macro/en_US\
  /usr/lpp/NetCommerce3/macro/en_US
mount chs2.itsc.austin.ibm.com:/usr/lpp/NetCommerce3/CHS/source\
  /usr/lpp/NetCommerce3/CHS/source
mount chs2.itsc.austin.ibm.com:/usr/lpp/NetCommerce3/CHS/public/images\
  /usr/lpp/NetCommerce3/CHS/public/images

# /usr/local/bin/mount.sh
# mount
node      mounted      mounted over  vfs      date      options
```

```

-----
/dev/hd4      /          jfs      Aug 20 11:37 rw,log=/dev/hd8
/dev/hd2     /usr      jfs      Aug 20 11:37 rw,log=/dev/hd8
/dev/hd9var  /var      jfs      Aug 20 11:37 rw,log=/dev/hd8
/dev/hd3     /tmp     jfs      Aug 20 11:37 rw,log=/dev/hd8
/dev/hd1     /home    jfs      Aug 20 11:38 rw,log=/dev/hd8
chs2.itsc.austin.ibm.com /usr/lpp/internet/server_root/pub /usr/lpp/internet/se
chs2.itsc.austin.ibm.com /usr/lpp/NetCommerce3/macro/en_US /usr/lpp/NetCommerce
chs2.itsc.austin.ibm.com /usr/lpp/NetCommerce3/CHS/source /usr/lpp/NetCommerce3
chs2.itsc.austin.ibm.com /usr/lpp/NetCommerce3/CHS/public/images
/usr/lpp/NetCommerce3

```

8. In order to mount the directories whenever the NFS client machines are rebooted, add this script in /etc/inittab of the client machines.

2.5.2 Load balancing using Network Dispatcher

This section describes how to install and configure the Network Dispatcher for use with Net.Commerce Hosting Server in a system configuration consisting of multiple NCHS server machines. Network Dispatcher is available on Windows NT, AIX, and Solaris. But Windows NT was selected because Windows NT can be thought of as a more economical platform for a small scale configuration.

We will show you how to install and configure Network Dispatcher on a Windows NT machine. For more information about Network Dispatcher, refer to *SecureWay Network Dispatcher User's Guide Version 2.1*, GC31-8496.

Important note

If you have existing merchant stores, and you decide to implement a multi-Web server configuration with Network Dispatcher, all existing stores must be republished after you implement Network Dispatcher. Merchant stores will not be available to shoppers until they have been republished.

2.5.2.1 Prerequisites

The following lists the hardware and the software prerequisites for Network Dispatcher.

- Any Intel x86 PC supported by Microsoft Windows NT, Version 4.0 and Version 4.0 Service Pack 3
- 20 MB of available disk space for installation
- Java Runtime Environment (JRE) Version 1.1.6 or higher.

Set up your workstations so that they are on the same LAN segment. Ensure that network traffic between the three machines does not have to pass through any routers or bridges.

Ensure that your NT workstation can ping to your NCHS servers and vice versa.

Ensure that the content is identical on the two Web servers. This can be done by using a shared file system such as NFS, or AFS can used for the same purpose. Test with a Web browser to request pages directly from:

`http://chs1.itsc.austin.ibm.com` and `http://chs2.itsc.austin.ibm.com`

Obtain another valid IP address for this LAN segment. This is the address representing the cluster of multiple NCHS servers. In our example, Figure 44 on page 162, it is `chs.itsc.austin.ibm.com` and `9.3.187.194`. The following table shows the list of the IP addresses.

Table 2. IP addresses used for Network Dispatcher

Function	Hostname	IP address
NCHS server1	<code>chs1.itsc.austin.ibm.com</code>	<code>9.3.187.192</code>
NCHS server2	<code>chs2.itsc.austin.ibm.com</code>	<code>9.3.187.193</code>
cluster address	<code>chs.itsc.austin.ibm.com</code>	<code>9.3.187.194</code>
Network Dispatcher server	<code>nd.itsc.austin.ibm.com</code>	<code>9.3.187.198</code>

2.5.2.2 Installing Network Dispatcher on Windows NT

Most of the Network Dispatcher software is written in Java, and the Java runtime environment is shipped with the Network Dispatcher installation CD. The first step is to install the Java Development Kit (JDK) 1.1.6 from the CD on your NT machine.

On your NT desktop, go to Start -> Run -> Open, then enter `Z:\nt\jdk\setup.exe` where `Z` is the CD-ROM device of your machine. After following instructions on the screen, you will be prompted to select components to install. Install the following components as shown below.

- Program files
- Library and headers files
- Demo applets

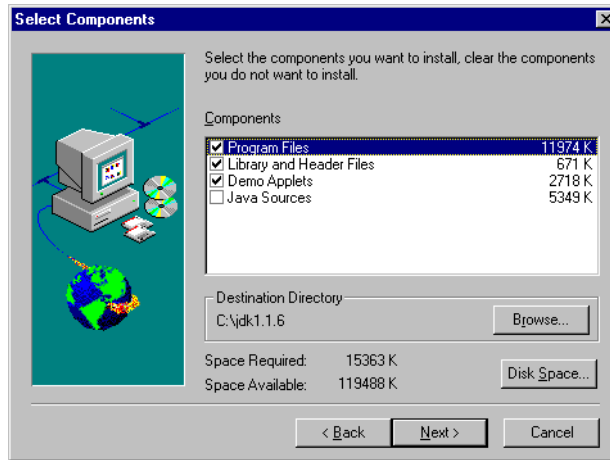


Figure 45. Select components for JDK

Next, it is necessary to change the Path system variable to include the bin directory of JDK. This can be accomplished by:

1. Opening the Control Panel by selecting **Settings** from the Start menu.
2. Double click on the **System** icon.
3. Click the **Environment** tag at the top of the System window.
4. Select the **Path environment** variable and append C:\jdk1.1.6\bin to the current value into the Value box where C:\jdk1.1.6 is the directory you installed JDK.
5. Click the **Set** button.
6. Click either **Apply** or **OK**.

Refer to Figure 46.

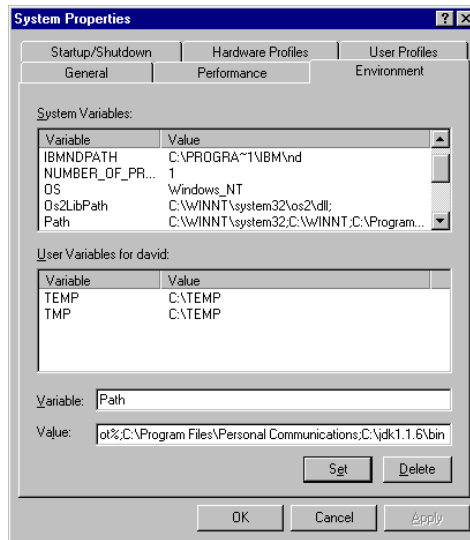


Figure 46. Add JDK path

To install SecureWay Network Dispatcher:

1. Insert the SecureWay Network Dispatcher CD-ROM into your CD-ROM drive, and the install window should come up automatically.
2. Click on **Start** -> **Run**. Specify the CD-ROM disk drive followed by setup.exe, for example: E:/setup.
3. Select the language in which to read the install process. Click **OK**.
4. Follow the instructions of the setup program. You will be prompted to enter the destination directory. If you want to change the drive or directory destination, click **Browse**.



Figure 47. Specify destination directory

5. You have the choice of selecting **All of the ND product** or **Your choice of components**, and then select what you want.

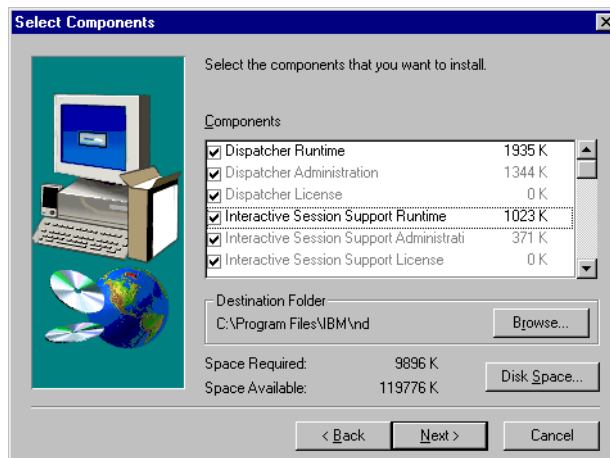


Figure 48. Select Network Dispatcher components to install

6. After installation is completed, a message will tell you to reboot your system before using SecureWay Network Dispatcher.

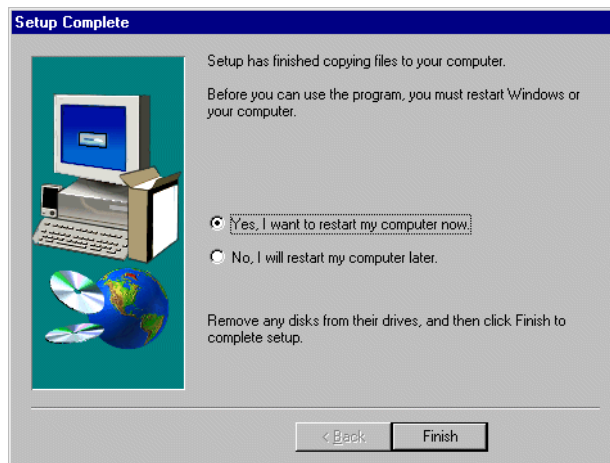


Figure 49. Reboot after finishing installation

The default license key files are copied to\dispatcher\conf and ...\.iss\conf during the installation procedure. After rebooting, you can start Network Dispatcher by clicking **Start -> Program -> SecureWay Network Dispatcher**. You are presented with the following screen. Select **Connect to Host**. If the connection fails, first check the license key.

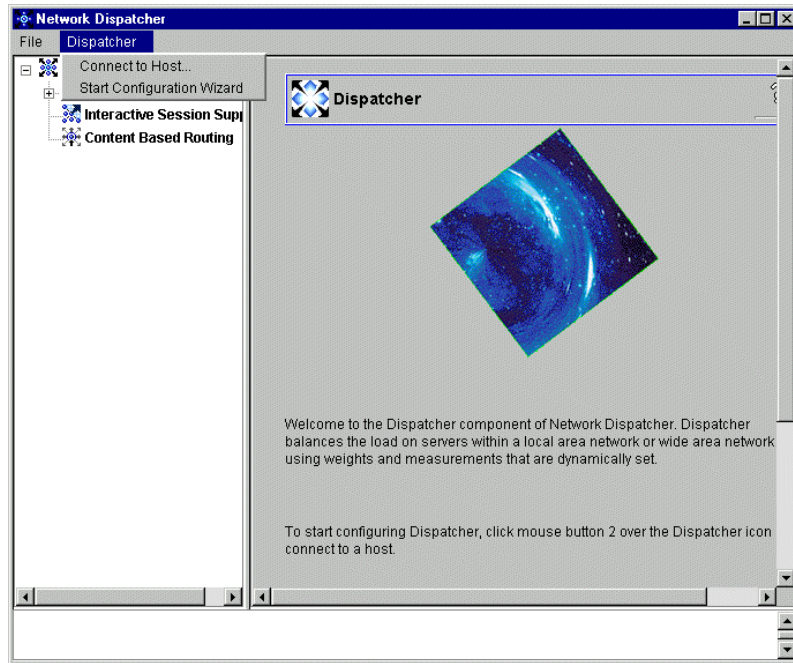


Figure 50. Initial screen of Network Dispatcher GUI

The important directories to note are `...\dispatcher\logs` because this is the default log directory, and `...\dispatcher\bin` because all scripts have to be located in this directory. For the ISS, there is the `...\iss\logs` directory that will store all the log files.

You can look into the overall Network Dispatcher configuration and the status of each port by clicking **port objects** as shown in Figure 51 on page 173. You can also find advisors for http and ssl are configured.

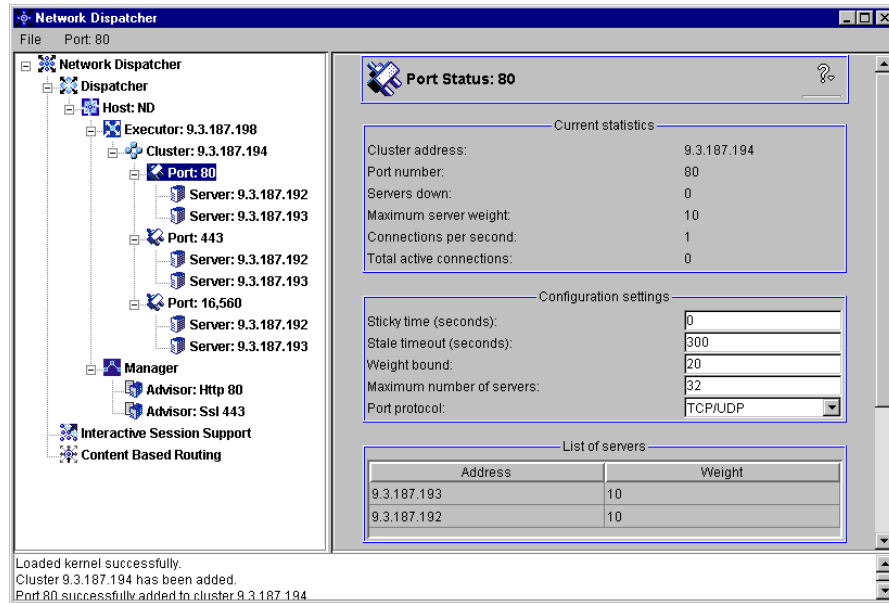


Figure 51. Verify overall configuration

After verifying all configurations are correct, save the current configuration by clicking **Host** -> **Save Configuration File As** in order not to lose the current configuration information.

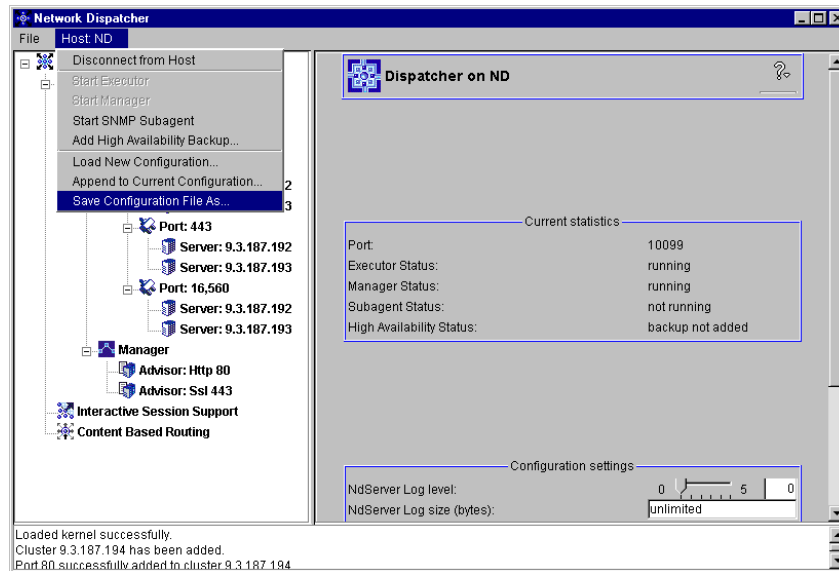


Figure 52. Save ND configuration

2.5.2.3 Configuring Network Dispatcher

Note that Network Dispatcher server requires two IP addresses. One IP address is the cluster IP address (the address to which clients connect); the second IP address is the non-forwarding IP address. For more information, refer to *SecureWay Network Dispatcher User's Guide, Version 2.1*, GC31-8496.

On the Network Dispatcher on Windows NT, log in with an NT user ID with administrator authority. Open a MS-DOS command prompt window and do the following:

1. Add an alias to the cluster address so that the Network Dispatcher can accept all packets and forward them to the NCHS servers. This can be done by entering:

```
C:\> ndconfig tr0 alias chs.itsc.austin.ibm.com netmask 255.255.255.0
```

2. Start the Network Dispatcher executor by entering:

```
C:\> ndcontrol executor start
Loaded kernel successfully.
```

3. Add the cluster address by entering:

```
C:\> ndcontrol cluster add chs.itsc.austin.ibm.com
```


Cluster 9.3.187.194 has been added

4. Add the port numbers that the Network Dispatcher will listen to by entering:

```
C:\> ndcontrol port add chs.itsc.austin.ibm.com:80+443+16560
Port 80 successfully added to cluster 9.3.187.194.
Port 443 successfully added to cluster 9.3.187.194.
Port 16560 successfully added to cluster 9.3.187.194.
```

Where port 80 is for HTTP, and 443 for SSL.

5. Add the names of the NCHS servers to the ports defined above.

```
C:\> ndcontrol server add
chs.itsc.austin.ibm.com:80+443+15560:chs1.itsc.austin.ibm.com+chs2.itsc.aus
tin.ibm.com
Server 9.3.187.192 was added to port 80 of cluster 9.3.187.194
Server 9.3.187.193 was added to port 80 of cluster 9.3.187.194
Server 9.3.187.192 was added to port 443 of cluster 9.3.187.194
Server 9.3.187.193 was added to port 443 of cluster 9.3.187.194
Server 9.3.187.192 was added to port 16,560 of cluster 9.3.187.194
Server 9.3.187.193 was added to port 16,560 of cluster 9.3.187.194
```

6. Configure the workstation to accept traffic headed for the cluster address

```
C:\> ndcontrol cluster configure chs.itsc.austin.ibm.com
Cluster 9.3.187.194 has been configured.
```

7. Start the manager of the Network Dispatcher.

```
C:\> ndcontrol manager start
The manager has been started
```

8. Start the advisor and tell the manager to use the advisor information.

```
C:\> ndcontrol advisor start http 80
Advisor 'http' has been started on port 443.
ndcontrol advisor start ssl 80
Advisor 'ssl' has been started on port 443.
```

2.5.2.4 Configuring each NCHS server

1. On each NCHS machine that you have, add an alias to accept traffic for the cluster address that you set up in Step 1 on page 174 by typing the following on a command line. This is because the Network Dispatcher only redirects packets to the NCHS servers not changing any IP addresses. AIX must be informed to accept these packets.

```
# ifconfig network_interface alias cluster_hostname netmask
255.255.255.0
```

where:

`network_interface` is your loopback interface, and `cluster_hostname` is the cluster address that shoppers use to access your Web site.

In our example,

```
# ifconfig lo0 alias chs.itsc.austin.ibm.com netmask 255.255.255.0
```

Repeat the same step on each NCHS machine.

- Using a text editor, edit the Hostname directive for each of the *.conf files you moved in Step 1 on page 163. Change the MS_HOSTNAME from the individual Net.Commerce Hosting Server host name to the cluster host name. For example, edit the netcommerce.conf file and change the MS_HOSTNAME as

```
MS_HOSTNAME chs.itsc.austin.ibm.com
```

Repeat the same step on each NCHS machine.

Do not change IC_JDBC_NETURL and ETILL_HOSTNAME.

- Edit the /etc/httpd.conf file making the following changes:
 - Append the new directory path to the end of the ServerInit directive.
 - Change the Hostname directive from the individual machine's host name to the Cluster host name. Change the IP addresses from the individual machine's IP address to the Cluster IP address.

2.5.2.5 Configuring Payment server

If you are using IBM Payment Server 1.2, you must perform the following steps to configure your Payment Server machines for Network Dispatcher:

Note

These instructions assume that Payment Server is installed on the same machines as the Net.Commerce Hosting Server. You must perform the steps below on each Payment Server machine.

- Move the pay_back.conf and pay_etill.conf files from the HTML root directory to the directory you created in the step 1 on page 163.
- Edit the pay_back.conf and pay_etill.conf files, changing the MS_HOSTNAME parameter from the local host name to the cluster host name. Do not change the host name for the ETILL_HOSTNAME and USEREXIT_HOSTNAME parameters.
- Rename pay_cyber.conf to pay_cyber_bak.conf. If this file is not renamed, the Payment Wizard will only display CyberCash information.

Chapter 3. Creating and customizing the NCHS environment

Many things can be customized with NCHS. In this chapter, we will discuss what the basic level of customization is and how you customize. Our starting point will be a sample Internet Service Provider (ISP) who is looking for new ways to retain and attract customers. They intent to do this by introducing new value-added services facilitating e-commerce.

The sample ISP is called HiwayNet Inc. and, we will use their name, address, and logo to illustrate how the basic customization of NCHS can be done.

Note

The customization tips contained in this chapter work with the plugin tool for NCHS 3.1.2.

3.1 Customizing the merchant tool

The way a merchant manages his/her store is through the NCHS merchant tool. Only a web browser is needed to operate the merchant tool, but has to be capable of running Java because some of the tools are Java applets.

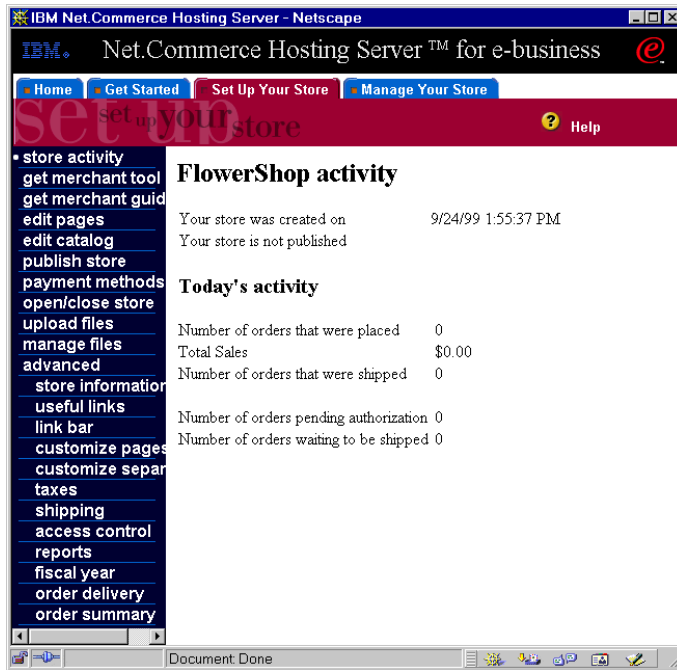


Figure 53. Out-of-the-box merchant administration interface

The screenshot in Figure 53 is what is installed as the out-of-the-box merchant administration interface. Our sample ISP HiwayNet can use this interface as it is except for the logos and title at the top of the screen.

3.1.1 Changing the logos

The logos at the top of the merchant tool are in a separate HTML frame. The HTML for this frame can be found in the directory `/usr/lpp/NetCommerce3/Tools/public/html/nchs/<locale>` and the file is called `banner.html`.

Directory naming convention

A certain convention about directory names is used in all the text about customization of NCHS. To keep the directory names short, we omit the always leading `/usr/lpp/NetCommerce3`. Hence, a reference to `CHS/public/en_US` would give a full path of `/usr/lpp/NetCommerce3/CHS/public/en_US`.

The HTML part of banner.html is shown below, and the three highlighted sections make up the logos and text at the top of the merchant tool (see Figure 53 on page 178). /NCtools stands for /usr/lpp/NetCommerce3/public.

```
<HTML>
<BODY BGCOLOR="#000000">

<TABLE BORDER=0 CELLSPACING=0 CELLPADDING=0 BGCOLOR="#000000" WIDTH="100%">
<TR>
  <TD><IMG SRC="/NCtools/images//ibm.gif" WIDTH=56 HEIGHT=35 ALT="" BORDER=0></TD>
  <TD ALIGN="CENTER"><FONT SIZE="5" COLOR="#E7E7E7">Net.Commerce Hosting Server <SUP><
FONT SIZE="2">TM</FONT></SUP> for e-business</FONT></TD>
  <TD ALIGN="RIGHT"><IMG SRC="/NCtools/images/ebusiness.gif" WIDTH=44 HEIGHT=35 ALT=""
BORDER=0></TD>
</TR>
</TABLE>

</BODY>
</HTML>
```

The entire HTML section can be altered if desired, but we can also just modify the text and change the two images, which is what we will do.

There are two images, and we have to change them both because it should look like a HiwayNet site. We exchange the IBM logo with one from HiwayNet. The red e-business logo is a trademark of IBM; so, it is exchanged with a site related logo instead:

The following information about the two images can be gathered by reading the HTML in the banner.html file.

- The one to the left, which is an IBM logo, is a GIF image with a width of 56 pixels and a height of 35 pixels. The file name is ibm.gif.
- The one to the right, which is the IBM e-business logo, is a GIF image with a width of 44 pixels and a height of 35 pixels. The file name is ebusiness.gif.

The easiest thing would be to start your favorite image editor (for example, Paint Shop Pro) and create two new images of similar size. The images should have a black background unless you change the HTML background color (BGCOLOR="#000000").

When you have made two new images, copy them to /CHS/public/images. For this purpose, we created two images called hiwaynet_logo.gif and e-shop.gif. Since the hiwaynet_logo.gif is wider than the 56 pixels reserved for it in the HTML file, we will have to make a small change in the HTML describing the image file.

The banner.html must be changed to reflect the new names of the image files. Use a text editor to edit banner.html, but make a backup first. Change the file names, as shown below, and you should also change the text between the logos. The only limit to the text is the length. Save and exit the text editor when all editing is complete.

All the changes we made to banner.html are shown in bold.

```
<HTML>
<BODY BGCOLOR="#000000">

<TABLE BORDER=0 CELLSPACING=0 CELLPADDING=0 BGCOLOR="#000000" WIDTH="100%">
<TR>
  <TD><IMG SRC="/NCTools/images//hiwaynet_logo.gif" WIDTH=86 HEIGHT=35 ALT=""
BORDER=0></TD>
  <TD ALIGN="CENTER"><FONT SIZE="5" COLOR="#E7E7E7">HiwayNet e-commerce Shop
System</FONT></TD>
  <TD ALIGN="RIGHT"><IMG SRC="/NCTools/images/e-shop.gif" WIDTH=44 HEIGHT=35 ALT="" B
ORDER=0></TD>
</TR>
</TABLE>

</BODY>
</HTML>
```

The new service banner, with the images for HiwayNet, can be seen in Figure 54.

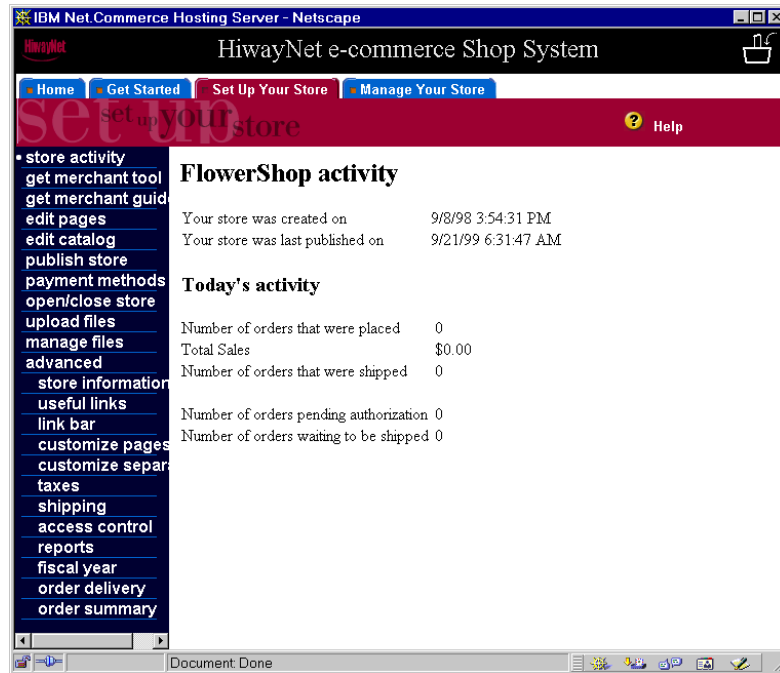


Figure 54. Customized merchant tool

3.1.2 Configuring the payment wizard

The seventh menu item to the left in Figure 54 is *payment methods*. This function provides the merchant with a payment wizard that allows the merchant to select the credit cards they will support. The Payment Wizard displays the following credit card images by default: Visa, MasterCard, American Express, Novus. But the basic installation only provides names and graphics for four credit card brands: VISA, Master Card, American Express and, Discover Card. Merchants may want to support another number of credit cards and maybe different brands. The CSP should configure the payment wizard to fit the region or the merchant types they have. NCHS provides graphics for the four previous mentioned credit cards, and the CSP, therefore, has to get graphics for all other brands.

To change the credit card images displayed, or the order in which they are displayed, do the following:

Open the following file in a text editor.

/usr/lpp/NetCommerce3/Tools/xml/nchs/payment/paymentWizard.xml

Locate the lines in the file that begin with <creditCard name =, change the values as shown in the below example, substituting your in your own values:

```
<!--
    Define the available credit cards to be used in the wizard. You may
    delete or add cards depending on your site.
-->

<creditCard name = "visa"
            image = "images/visa.gif"
            text = "Visa"
            SETSuffix = "Visa" />

<creditCard name = "mast"
            image = "images/mc.gif"
            text = "Master Card"
            SETSuffix = "Master Card" />

<creditCard name = "amex"
            image = "images/amex.gif"
            text = "American Express"
            SETSuffix = "American Express" />

<creditCard name = "dine"
            image = "images/dine.gif"
            text = "Diners"
            SETSuffix = "Diners Card" />
```

where <credit_card_name> is the name of the credit card,
<credit_card_image> is the name of the image file, <name_of_credit_card> is
the name of the credit card that will appear in the Payment Setup Wizard and
<SET_suffix_for_credit_card> is the suffix used by SET for the credit card.

When you add a new card brand, you should also provide a 58x39 pixel GIF
image of the card logo for the wizard and the payment page to display. Add
the credit card image in .gif format to
/usr/lpp/NetCommerce3/CHS/public/images directory. Stop and restart the
web server in order for the web server to reflect the changes in the
paymentWizard.xml file.

Also, do not forget to set the file permissions correctly.


```
# cd /usr/lpp/NetCommerce3/CHS/public/images
# ls -al diners.gif
-r--r--r--  1 bin      bin          1878 Dec 11 1998 diners.gif
#
```

If you do not place a copy of the image in this directory the Payment Wizard displays a generic credit card image.

The paymentWizard.xml file is reflected in the payment wizard window shown on Figure 55. Notice that, if you forget to select **Accept orders with payment information (on-line payment)** in the second window of payment wizard, you will not see the window shown in Figure 55.

Provide credit card information

Check to allow shoppers to provide credit card information with their orders.

Note: Credit card images, trademarks, and trade names provided should be used only by merchants authorized to accept payment from these credit cards.

Authorization by CyberCash
Select to enable credit card authorization through CyberCash. (You must have a CyberCash account to select this option.)

Help Cancel << Previous Next >>

Figure 55. Window 4 of the payment wizard

3.1.3 Create, modify, or delete galleries and themes

A part of NCHS is a fairly large collection of images from which the merchants can choose images from when they design their pages. These images are grouped together in what is called galleries. The reason for this is that it

makes it much easier for merchants to find the kind of images they are looking for.

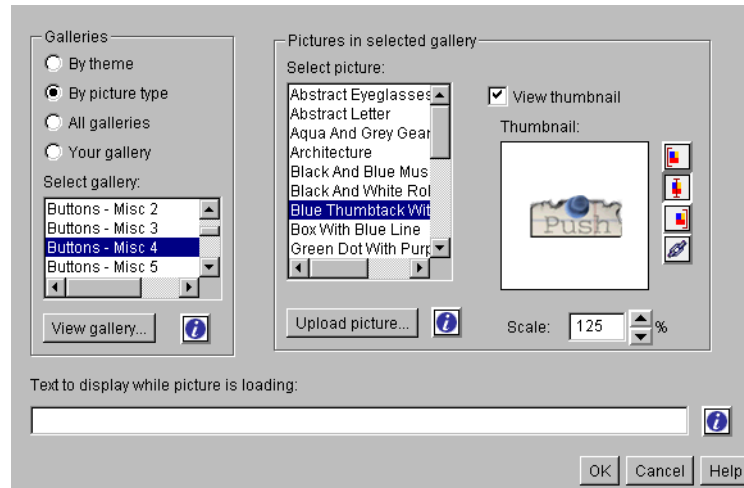


Figure 56. The Select Picture window

Images are grouped in two types of galleries as seen in the upper left hand corner of Figure 56. The two types are:

- Themes : A group of images that have a common association. Themes could, for example, be animals, clothier, or gears.
- Types : A group of images that can be used for the same purpose on a Web page. Examples are buttons, backgrounds, and letterheads.

An image can be included in multiple galleries.

A CSP may want to supply their own galleries of images for use by merchants, or they may choose to delete or rearrange the galleries supplied by NCHS. The following is a description on how to do this.

A gallery is defined by a map file that is located in the directory CHS/galleries. A map file is a text file that describes what kind of gallery it is, where the images are located, optional thumbnail¹ images, and the names of images. An example of a gallery is shown below:

¹ A thumbnail image is a small version of the full image and is, therefore, faster to download. The thumbnail image is only used to preview the full image.

```
theme|Body
images/stock/buttons/8/btg8_024.gif, Blue Chicklet
images/stock/headers/ShortBar/hdb3_133.gif(images/stock/headers/ShortBar/
hdb3_133.thumb.gif, Body Silhouette
images/stock/rules/medium/hrm9_174.gif(images/stock/rules/medium/
hrm9_174.thumb.gif, Multi-Colored Bar
images/stock/bullets/4/png4_343.gif, Peach Square
```

The map file shown above describes a theme gallery called `Body`, and the theme contains four images. The format of a map file is that the first line contains type and name information about the gallery, and the following lines each describe an image in the gallery. The format of an image line is:

```
<path to image>[(path to thumbnail image), <image title>
```

The text enclosed in `<>` is mandatory, and text in `[]` is optional. Examples with and without thumbnail image are as such:

```
images/new/baseball.gif(images/new/baseball_thumbnail.gif, Baseball
images/stock/buttons/8/btg8_024.gif, Blue Chicklet
```

The root of the image path is the directory `CHS/public`; so, the full path to the `Blue Chicklet` image is `CHS/public/images/stock/buttons/8/btg8_024.gif`.

The thumbnail images are only used if the merchant selects **View gallery...** (see Figure 56 on page 184). The preview image shown to the right in Figure 56 is generated automatically by NCHS from the full image.

If you have many images in gallery, you should consider making thumbnail images to decrease the download time when a merchant uses the **View gallery...** function.

The two supported file formats for the images are GIF and JPEG.

An example of a gallery that contains a type of image (buttons) instead of a theme is shown here to complete the map file discussion:

```
type|Bullets - Circles 1
images/stock/bullets/1/png1_022.gif, Brown Dot
images/stock/bullets/1/png1_024.gif, 8 Ball
images/stock/bullets/png4_000.gif, Blue Gradient Dot
images/stock/bullets/4/png4_004.gif, Black Dot
```

It is only the first five lines of the map file `Bullets_-_Circles_1.map`, and the only difference from a theme gallery is the first line where it says `type` instead of `theme`.

Creating a new gallery

To create a new gallery, you should go to the directory `CHS/galleries` and create a new map file (for example, `Baseball.map`). Let us say we have three images we would like to include:

- Image of a pitcher, `pitcher.gif`.
- Image of a stadium, `stadium.gif`, which requires a thumbnail, `stadium_thumb.gif`.
- Image of a baseball bat, `bat.gif`.

The `Baseball.map` file should then look like this:

```
theme|Baseball
images/baseball/pitcher.gif, Pitcher
images/baseball/stadium.gif(images/baseball/stadium_thumb.gif, Stadium
images/baseball/bat.gif, Baseball bat
```

Make sure the file has the right permissions:

```
# ls -al Baseball.map
-rw-r--r--  1 root  system      161 Jun 22 14:55 Baseball.map
# chown bin:bin Baseball.map
# chmod 444 Baseball.map
# ls -al Baseball.map
-r--r--r--  1 bin   bin        161 Jun 22 14:55 Baseball.map
#
```

Now, the image files should be copied to the specified directory. In our case, this is `CHS/public/images/baseball`. We have to create the baseball directory, since it does not exist, and set the file permissions, and then copy the four files (three full images and one thumbnail image) into the directory.

To see it work, you will have to restart the Webserver.

```
# stopsrc -s httpd
0513-044 The stop of the /usr/sbin/httpd Subsystem was completed successfully.
# startsrc -s httpd
0513-059 The httpd Subsystem has been started. Subsystem PID is 23042.
#
```

Modifying and deleting a gallery

To modify a gallery, you simply edit one of the map files in CHS/galleries by adding or removing images. You could also change the title of a gallery or change its type.

There are three map files you should not modify. They are: applet_.map, counter_.map, and javaApplets_.map. They are not used as the normal map files.

Deleting a gallery is fairly simple. Just delete the map file, then the merchants will not be able to see it. To cleanup, you should also remove the image files, but make sure they are not included in other galleries before deleting them.

3.2 Customizing messaging and reporting templates

The messaging system in NCHS allows the CSP to set up and manage the delivery of all messages for site and stores. The messaging system comprises the default message delivery method, e-mail, with which the following types of messages may be transmitted: System errors, usage reports, order deliveries, order summaries, quarterly and monthly commerce reports, password resets, and broadcast e-mails.

The NCHS uses the default templates to create these messages. Therefore, the CSP can customize the contents of messages by editing the default templates. For example, the CSP can insert its name, address, welcome message, and so forth in the default templates. These templates are provided by CSP level. There are no templates customizable by each merchant.

3.2.1 What is a template?

The NCHS uses templates for e-mail messages. Templates are a new function in Net.Commerce 3.1.2 and NCHS. They provide a simple token replacement system that substitutes dynamically created data for token strings in the template.

There are three types of tokens:

- Text token:

`$$Token_Name$`

- Repetitive block:

`$$ {START`

`$$Token_Name A$ $$Toekn_Name B$`

\$\$}\$

- Comments:

\$\$# Comment text \$

The following file is an example of a default order summary template that is named odsummary.tpl:

\$\$#-----

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The source code for this program is not published or otherwise divested of its trade secrets, irrespective of what has been deposited with the US Copyright Office.

Store: \$\$STORE_NAME\$

This is the daily summary of orders for your store. Compare this summary with the orders that you have received. If you are missing any orders, use the Order Delivery Log feature of the Merchant Tool to request the order to be re-sent. If you are not receiving any orders, contact your service provider.

The following orders were sent to you on \$\$REPORT_DATE\$:

\$\${ORDER\$

Order number	\$\$ORDER_NUMBER\$
Order placed	\$\$TIME_UPDATED\$
Currency	\$\$ORDER_CURRENCY\$
Product subtotal	\$\$TOTAL_PRODUCT_PRICE\$
Product tax	\$\$PRODUCT_TAX\$
Total shipping charges	\$\$TOTAL_SHIPPING_CHARGES\$
Tax on Shipping	\$\$SHIPPING_TAX\$
Order total	\$\$TOTAL_PRICE\$

\$\$}\$

You can find this file in the directory /usr/lpp/NetCommerce3/templates/en_US. This example shows the default template for the end of day order summary sent to a merchant. This includes a repetitive block that is processed for each order that was placed that day.

The tokens are defined by the function that uses the template. This means that you can not invent a new piece of token for creating information that you want to be inserted in the output. You can change any of the static text in the template and also remove tokens for information that you do not want to display. If you add an invalid token into a template, an error message will appear in the output.

3.2.2 Default messaging and reporting templates

The messaging and reporting system in NCHS includes order deliveries, order summaries, password resets, broadcast e-mails, system errors, usage reports, and commerce reports.

When an order is processed, an e-mail message will automatically be sent to the shopper. Merchants can also receive notification. At the end of each day, the scheduler runs to generate for each store a summary of all orders placed that day and sends it to the store's e-mail address.

Usage reports feature allows a CSP to monitor each merchant's activity on a monthly basis for operational and billing purpose. Usage reports include information about how a store is utilizing system resources, such as number of order and payment transactions, catalog size, and disk space usage. A CSP may use the information in the reports, for example, to determine how to charge merchants for different levels of service and for hardware growth and planning.

Commerce reports allow a CSP to view and analyze information about its site's traffic and sales. Commerce reports include region reports, click retail reports, search queries reports, and browsers used reports. The region and click trails reports help determine where to advertise regionally and by Web site. The search report results can help a CSP name its store categories. A CSP may analyze its site using the most popular browser used by shoppers and adjust its offering to help merchants accommodate the commonly used Web browser.

Automated reports are available in both text file and comma-separated data file formats. Text file reports are in an easy-to-read format, while comma-separated data files may be imported into spreadsheets for further analysis.

Default templates for messaging and reporting are stored in the directory `/usr/lpp/NetCommerce3/templates/en_US`. The following table summarizes the name of template file and its content for each template.

Table 3. Default messaging templates

Filename	Description
eorder.tpl	Order notification to merchant (e-mail)
poorder.tpl	Order notification to merchant (plain file)
odsummary.tpl	End of day order summary to merchant
odempty.tpl	Order summary when no orders placed that day to merchant
orderNotify.tpl	Order notification to shopper
order_acpt.tpl	Payment accepted message to shopper
order_rej.tpl	Payment rejected message to shopper
order_rec.tpl	Order received message(no payment processing) to shopper
sbm.tpl	Broadcast mail to shopper
errmsgadmin.tpl	Site error notification
errmsgmer.tpl	Merchant error notification
pwdresetmsg.tpl	Password reset notification

Table 4. Default reporting templates

Filename	Description
CSV_MT_SI.tpl	comma_separated data file, monthly report for the site
CSV_MT_ST.tpl	comma_separated data file, monthly report for the store
CSV_QT_SI.tpl	comma_separated data file, quarterly report for the site
CSV_QT_ST.tpl	comma_separated data file, quarterly report for the store
PT_MT_SI.tpl	Plain text, monthly report for the site
PT_MT_ST.tpl	Plain text, monthly report for the store
PT_QT_SI.tpl	Plain text, quarterly report for the site
PT_QT_ST.tpl	Plain text, quarterly report for the store
billingrpt.tpl	Automated usage report for billing

3.2.3 How to customize the template

You can customize the content of messages by editing the default template file. You may delete a token and its plain text label, move a token and its plain text by cut and paste, and change or insert text not associated with tokens.

But, you must not insert tokens that are not present in the default template. If you do so, an error message will appear in the output. And do not include specific store information, such as a store name, in the default template because the default template is applied with all stores. There is no method to change the default message template of specific stores.

As an example for customizing a template, we will insert our sample ISP name, HiwayNet Inc., and its address in the order summary report for the merchant. First of all, change directory to `/usr/lpp/NetCommerce3/templates/en_US` as shown below:

```
# cd /usr/lpp/NetCommerce3/templates/en_US
# ls
CSV_MT_SI.tpl          eorder.tpl            porder.tpl
CSV_MT_ST.tpl          errmsgadmin.tpl      pwdresetmsg.tpl
CSV_QT_SI.tpl          errmsgmer.tpl         reports.tpl
CSV_QT_ST.tpl          odseempty.tpl        reports_site.tpl
PT_MT_SI.tpl           odsummary.tpl         sbm.tpl
PT_MT_ST.tpl           orderNotify.tpl       search_stopwords.lst
PT_QT_SI.tpl           order_acpt.tpl        searchdisplay.tpl
PT_QT_ST.tpl           order_rec.tpl         shipRules
billingrpt.tpl         order_rej.tpl         taxRules
#
```

You can see the file name `odsummary.tpl` for the order summary report. It is better to save the original file under a different directory. This allows you to restore the original version if required. The following is an example of making a new directory under the directory and copying the original file:

```
# mkdir original
# cp odsummary.tpl original
# ls original
odsummary.tpl
#
```

After you saved original file under the safe directory, add the following lines to the bottom of `odsummary.tpl` file using a text editor, for example `vi`:

```
HiwayNet Inc.
11400 Burnet Road
Austin, Texas 78758-3493
```

TEL) (512)123-4567

Save the file and exit the text editor. when all editing is complete. The following is the odsummary.tpl file after editing. All changes you have made are shown in bold. You can compare this file to the original file in the 3.2.1, "What is a template?" on page 187.

##-----

5648-B47

(c) Copyright IBM Corp. 1997, 1998

The source code for this program is not published or otherwise divested of its trade secrets, irrespective of what has been deposited with the US Copyright Office.

Store: \$STORE_NAME\$

This is the daily summary of orders for your store. Compare this summary with the orders that you have received. If you are missing any orders, use the Order Delivery Log feature of the Merchant Tool to request the order to be re-sent. If you are not receiving any orders, contact your service provider.

The following orders were sent to you on \$REPORT_DATE\$:

}\${ORDER\$

Order number	\$ORDER_NUMBER\$
Order placed	}\${TIME_UPDATED\$
Currency	}\${ORDER_CURRENCY\$
Product subtotal	}\${TOTAL_PRODUCT_PRICE\$
Product tax	}\${PRODUCT_TAX\$
Total shipping charges	}\${TOTAL_SHIPPING_CHARGES\$
Tax on Shipping	}\${SHIPPING_TAX\$
Order total	}\${TOTAL_PRICE\$

}\${\$

HiwayNet Inc.
11400 Burnet Road
Austin, Texas 78758-3493
TEL) (512)123-4567

You can view your updated order summary after midnight and at 1:00 a.m. when it is automatically generated and sent to you via e-mail. Here is the sample of updated order summary message:

store: Garden Stuff

This is the daily summary of orders for your store. Compare this summary with the orders that you have received. If you are missing any orders, use the Order Delivery Log feature of the Merchant Tool to request the order to be re-sent. If you are not receiving any orders, contact your service provider.

The following orders were sent to you on 1998-06-22:

Order number	1077
Order placed	1998-06-22 13:49:08.239716
Currency	USD
Product subtotal	10.00
Product tax	0.00
Total shipping charges	0.00
Tax on Shipping	0.00
Order total	10.00

Order number	1052
Order placed	1998-06-22 13:56:49.365924
Currency	USD
Product subtotal	28.00
Product tax	0.00
Total shipping charges	0.00
Tax on Shipping	0.00
Order total	28.00

HiwayNet Inc.
11400 Burnet Road
Austin, Texas 78758-3493
TEL) (512)123-4567

You can, by the same way, customize the other default templates for messaging and reporting that you have seen in 3.2.2, “Default messaging and reporting templates” on page 189.

Chapter 4. Managing NCHS database

In this chapter, we will discuss two database management issues. The first topic is how to populate the busiest NCHS tables over multiple disk drives in order to achieve optimal performance. The second is how to create database backups.

4.1 Installing DB2 Control Center

DB2 Universal Database offers Smartguides to help with some administrative tasks by taking each task at step at a time. These Smartguides are accessed through the DB2 Control Center.

Before we proceed to make changes to the NCHS database, we will install the DB2 Control Center to make use of this tool.

DB2 Control Center

The DB2 Control Center is a graphical user interface tool. It can use the services provided by the DB2 Administration Server (DAS), on a remote database server, to administer DB2 instances and databases

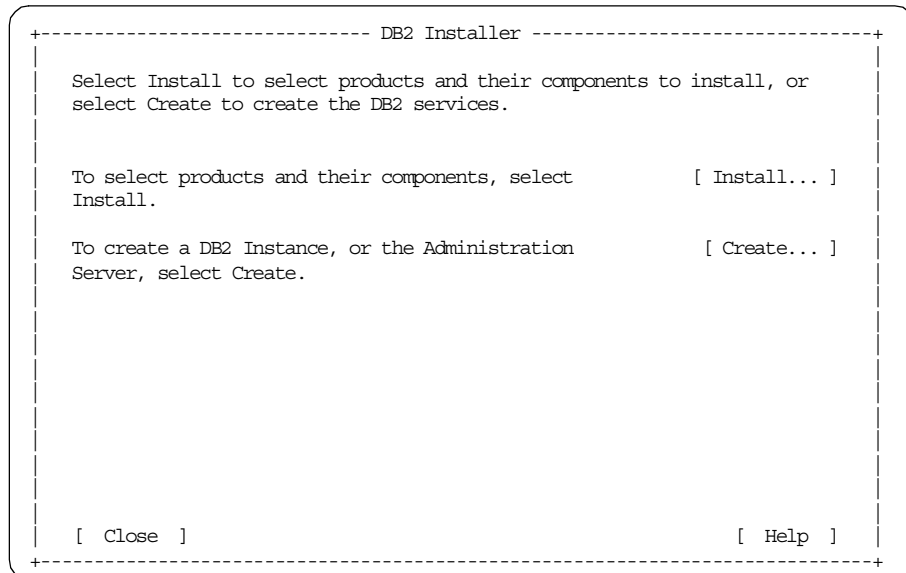
Two of the Smartguides we will use in this section are the Create Table Space Smartguide and the Performance Configuration Smartguide. In order to facilitate this, we will detail instructions on creating the DB2 Administration Server and use the DB2 Control Center to access the Net.Commerce Hosting Server remote database.

4.1.1 Creating the DB2 Administration Server

The DB2 Administration Server (DAS) is a DB2 instance that enables remote administration of DB2 servers. The Administration Server instance is created and used in a similar fashion to any other DB2 instance. You can only have one DAS on a machine.

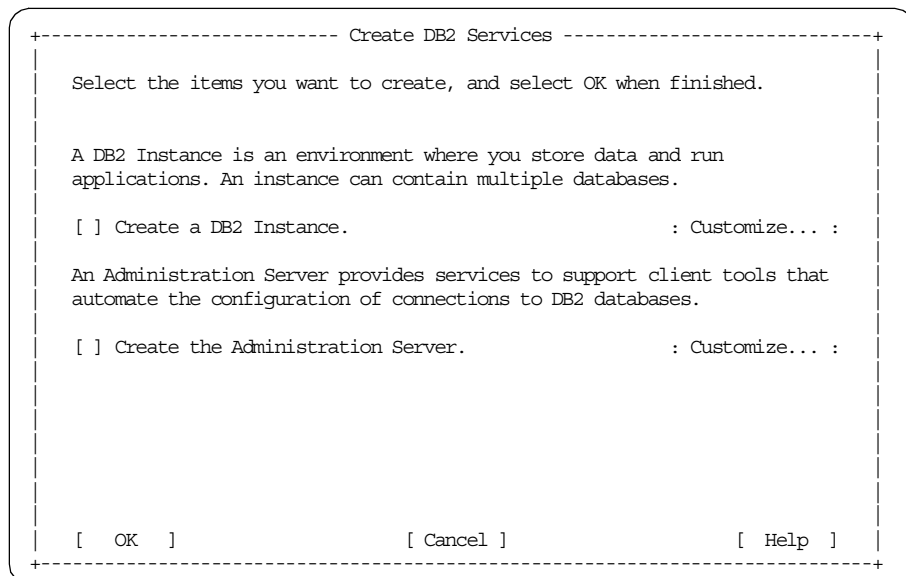
To create the DAS instance, do the following steps:

1. Ensure you are logged in as user ID root.
2. Mount the CD entitled *IBM Net.Commerce START for AIX, Version 3.1.1*.
3. Change directory to `/cdrom/NetCommerce3` and execute the `./db2setup` command. You will be presented with the DB2 Installer screen as follows:



Using the cursor keys, select **Create** on the line that states To create a DB2 instance, or the Administration Server, select Create, and press **Enter**.

4. The Create DB2 Services window will appear.



- Select **Create the Administration Server** and press **Enter**. The following screen will appear.

```
+----- Create DB2 Services -----+
+--- Administration Server ---+
Authentication:
Enter User ID, Group ID, Home Directory and Password that
will be used for the Administration Server.
User Name      [db2as  ]
User ID        :           :           [*] Use default UID
Group Name     [db2asgrp]
Group ID       :           :           [*] Use default GID
Home Directory  [/home/db2as  ]
Password       [           ]
Verify Password [           ]           [ Default ]

Protocol:
Select Customize to change the default           [ Customize... ]
communication protocol.

Note: It is not recommended to use the DB2 Instance user ID for
security reasons.

[ OK ]           [ Cancel ]           [ Help ]
++-----++
```

- For now, accept all defaults. Select **OK** and press **Enter**. You will receive a notice regarding the default password.

```
+--- Notice -----+
(!) A system-generated password, ibmdb2, will be used   |t  GID
for user, db2as.                                       |ult |
[ OK ]                                                  +-----+
Prot+-----+
```

The DB2 installation script generates a default password ibmdb2. Be sure to note this, then press **Enter** to continue.

```
Group ID+--- Notice -----+ default GID
Home Dir|
Password| (!) DB2SYSTEM will be set to "dbsvr1".       |
Verify P| [ Default ]
[ OK ]
Protocol: +-----+
```

- A further notice pops up. This time it is to inform that the DB2 variable DB2SYSTEM is set to dbsvr1 (that is, the hostname of this system). This variable is used to identify the system in the DB2 Control Center. Press

Enter to acknowledge this, and return back to the Create DB2 Services screen.

```
+----- Create DB2 Services -----+
|
| Select the items you want to create, and select OK when finished.
|
| A DB2 Instance is an environment where you store data and run
| applications. An instance can contain multiple databases.
|
| [ ] Create a DB2 Instance.                : Customize... :
|
| An Administration Server provides services to support client tools that
| automate the configuration of connections to DB2 databases.
|
| [*] Create the Administration Server.     [ Customize... ]
|
|
|
|
| [ OK ]                [ Cancel ]                [ Help ]
|
+-----+
```

8. To start the creation process, select **OK** and press **Enter**. You will now be presented with the DB2 Installer Summary Report screen.

```
+----- DB2 Installer -----+
|
| +-- Summary Report -----+
|
| DB2 Services Creation
| -----
|
| Administration Server
|
| Group Name                db2asgrp
| User Name                 db2as
| Home Directory            /home/db2as
| Password                  ibmdb2
| Port Number               523
| Update DEM configuration file for TCP/IP
|
| Administration Server, db2as, will be created.
|
| [ More... ]
|
| [ Continue ]
|
+-----+
```


Verify the selection, and then select **Continue** and press **Enter**.

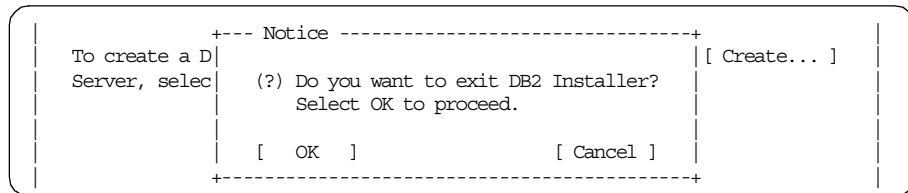
```
Adminis+--- Warning -----+
Group| (X) This is your last chance to stop. |db2asgrp
User | |db2as
Home | Select OK to start, or Cancel to abort. |me/db2as
Passw| |ibmdb2
Port | [ OK ] | [ Cancel ] | 523
Updat+-----+
```

9. Select **OK**, and then press **Enter** to acknowledge the warning and to start the installation.
10. After the creation of the DB2 Database Administration Server instance, a summary log will be presented as follows:

```
----- DB2 Installer -----+
+--- Status Report -----+
DB2 Services Creation
-----
Administration Server
Group Name SUCCESS
User Name SUCCESS
Home Directory SUCCESS
Password SUCCESS
Port Number
Update DBM configuration file for TCP/IP SUCCESS
Administration Server Creation SUCCESS
Start Administration Server SUCCESS
[ More... ]
[ View Log ] [ OK ]
```

Verify the successful creation of the DAS instance, then select **OK** and press **Enter**.

11. At the next screen, select **CLOSE** and press **Enter**.
12. Finally, go back to DB2 Installer main panel and click **OK** to exit.



13. Acknowledge the notice that you will exit the DB2 Installer by selecting **OK** and pressing **Enter** to confirm exit of the DB2 installer.

We have now finished the creation of the DB2 Database Administration Server instance.

4.1.2 Installing DB2 CAE

To use the DB2 Smartguides, we require access to the DB2 Control Center, one of the tools provided in a DB2 Client Application Enabler installation. For our use, we will install the DB2 Client Application Enabler on a Windows NT Workstation to use the DB2 Control Center with the following steps:

1. Run the setup executable for the DB2 CAE component.
2. Click **OK** on the DB2 CAE initial screen to start installation.
3. Ensure that you have selected **Install components required to administer remote servers.**

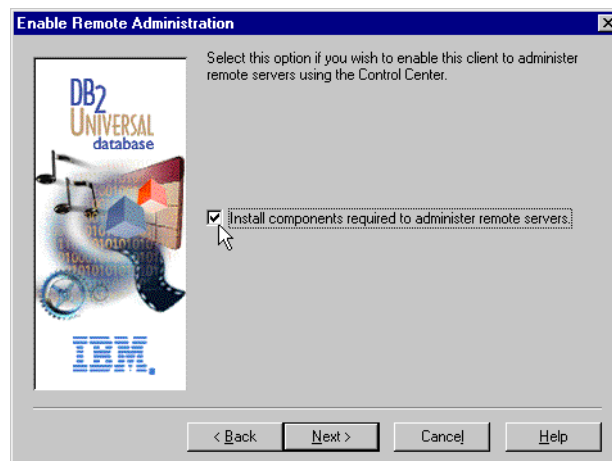


Figure 57. DB2 CAE install remote administration component

Click **Next** to continue.

- At the Select Installation Type panel, click on **Custom**. This will give the most flexibility regarding component installation.

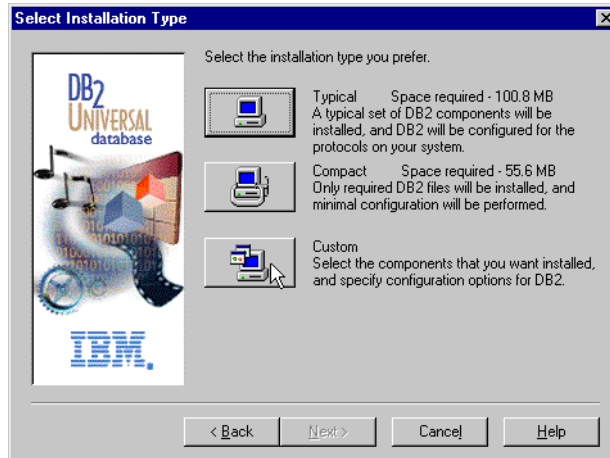


Figure 58. DB2 CAE selection installation type

- At the Select DB2 components panel, verify that **Graphical Tools** with all components has been selected.

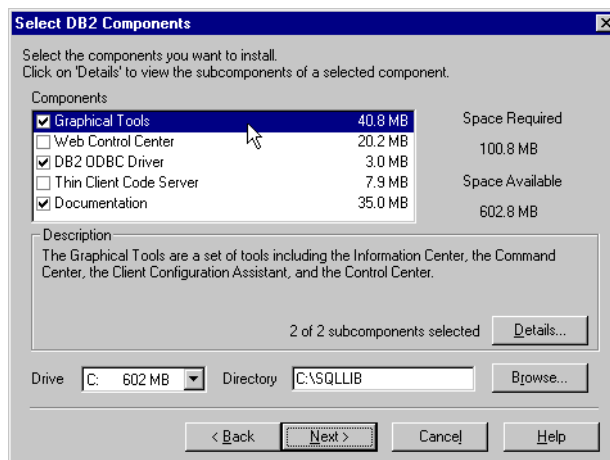


Figure 59. DB2 CAE select DB2 components

Verify also that you have enough disk space on the installation directory to install the components chosen. Click **Next** to continue.

6. You can elect to have the DB2 control center start on system startup. In this example, we elect not to do so and, hence, take the check out of the check box as shown.

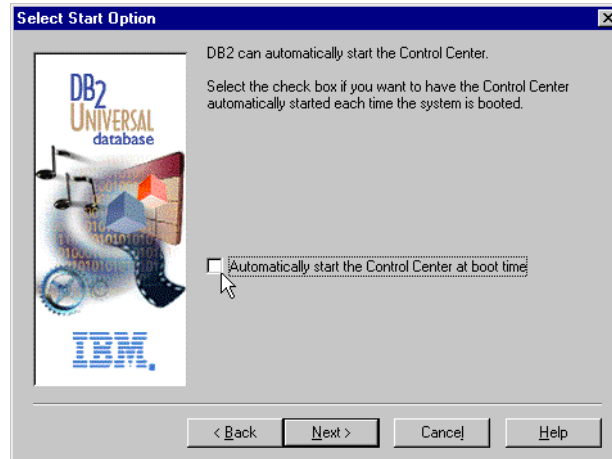


Figure 60. DB2 CAE select start option

Click on **Next** to continue installation.

7. The Start Copying Files panel will appear. This panel lists the current settings you have chosen for the installation.

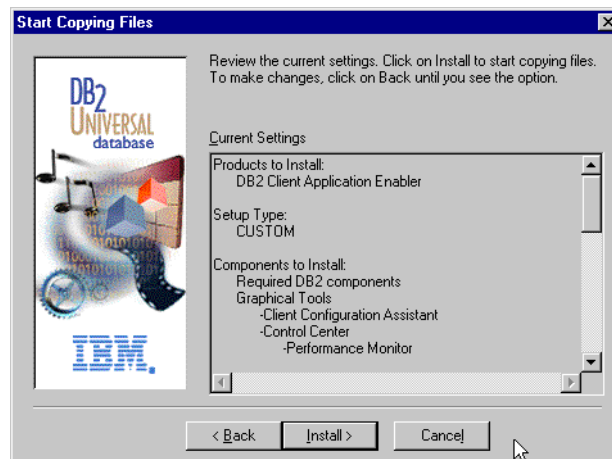


Figure 61. DB2 CAE start copying files

Verify your settings for this installation. Once satisfied, click on **Install**. The DB2 installer will start the installation, and a progress meter will appear for you to track the progress of the CAE.

8. After the setup is complete, the Complete Setup screen is shown. The default is to reboot and start the Client Configuration Assistant. In this example, we select the **Exit and reboot at a later time** option. Now click on **Finish**.

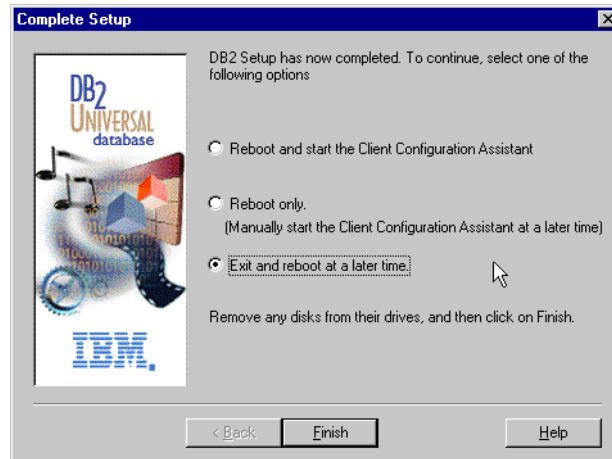


Figure 62. DB2 CAE installation complete

9. At this point, the CAE has been successfully installed. Close all your applications, then reboot your workstation for the DB2 CAE installation to be finalized.

4.1.3 DB2 environment settings

The DB2 environment is controlled, with a few exceptions, by registry values stored in the DB2 profile registries. Use the `db2set` command to update registry values without rebooting. This information is stored immediately in the profile registries.

In this section, we will check on the DB2COMM DB2 profile registry value. This registry value specifies the communications managers that are started when the DB2 database manager is started. For more information about this profile registry and the DB2 environment, please refer to the *IBM DB2 Universal Database Administration Guide, Version 5.0*, S10J-8157.

The `db2set` command allows the setting and listing of the various profile registry values used by DB2. Use `db2set -?` to get help information about this command. The `db2set` command is run in a command window on a server where DB2 has been installed.

You can check the current DB2 profile registry settings with the `db2set -all` command. This command option to the `db2set` command displays all occurrences of the local environment variables as defined in:

- The environment, denoted by [e]
- The node level registry, denoted by [n]
- The instance level registry, denoted by [i]
- The global level registry, denoted by [g]

For example, running `db2set -all` in a Windows NT command window shows the following:

```
C:\>db2set -all
[i] DB2NBADAPTERS=0
[i] DB2INSTPROF=C:\SQLLIB
[g] DB2PATH=C:\SQLLIB
[g] DB2INSTDEF=DB2
```

In our example, the information displayed has one glaring omission; the `DB2COMM` profile registry has no value set. Hence, no communications manager will have been started by DB2.

In our example, we are using TCP/IP; therefore, we must set this profile registry value with the `db2set db2comm=tcpip` command, then check that the registry has been set with the `db2set -all` command, as the following example shows:

```
C:\>db2set db2comm=tcpip
C:\>db2set -all
[i] DB2NBADAPTERS=0
[i] DB2INSTPROF=C:\SQLLIB
[i] DB2COMM=tcpip
[g] DB2PATH=C:\SQLLIB
[g] DB2INSTDEF=DB2
```

Without this change, we would not have been able to use the DB2 Client Configuration Assistant to add and test the connection to a remote database.

4.1.4 Client Configuration Assistant

We will now add the KIM database, created beforehand as our Net.Commerce Hosting Server database, to the list of databases the DB2 Control Center can remotely control.

1. Start the DB2 Client Configuration Assistant found in the DB2 folder (or via the start bar Start -> DB2 for Windows NT -> Client Configuration Assistant).
2. Click on **Add Database** at the CCA welcome screen.



Figure 63. DB2 CCA welcome screen

3. We will use the automatic search facility of DB2 UDB. Select the **Search the Network** option, then click on **Next**.

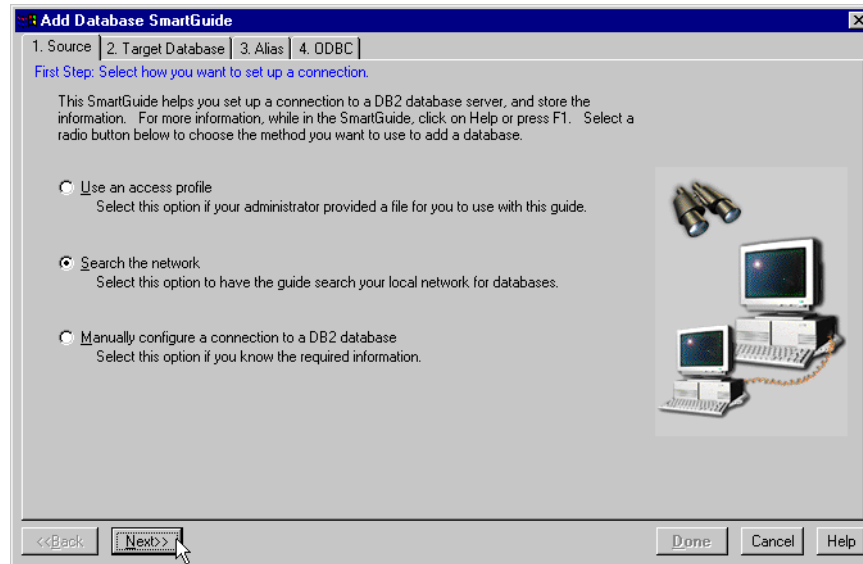


Figure 64. DB2 CCA database server source selection

4. We must now add the database server to the list of known systems (in order that the database be listed under that system) in the Step 2: Select the target database from the list panel. To do so, click on **Add System**.

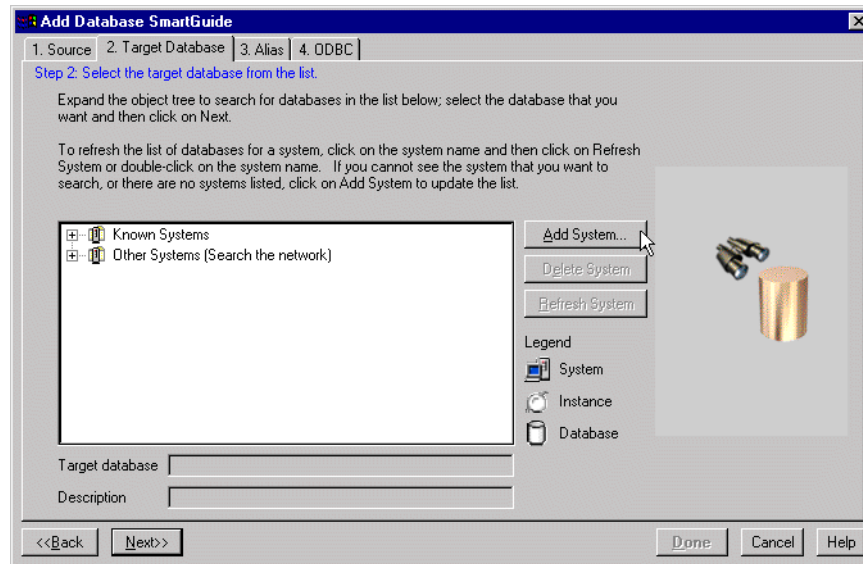


Figure 65. DB2 CCA target database selection

5. We now need to fill in the communications protocol parameters for the DB2 CCA to find the server. In this example, our protocol is TCP/IP, and we fill in the hostname of `dbsvr1`. Click **OK** to continue.

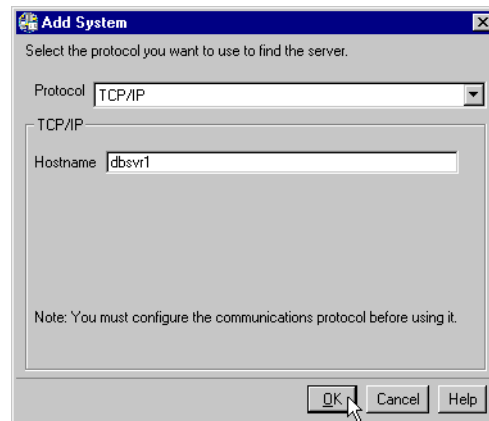


Figure 66. DB2 CCA add server communications protocol

6. Back to the window in Step 2, we can now expand the subtree under the Known Systems list, find our server `dbsvr1`, and find database KIM under that subtree list of databases.

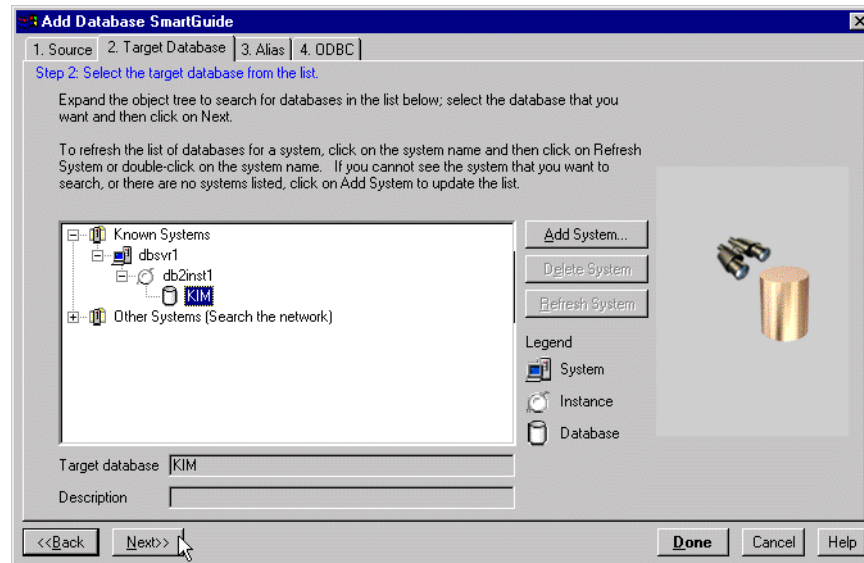


Figure 67. DB2 CCA database server found

Click on **Next** to continue.

7. You now need to specify the local name to access the aforementioned database. This is also known as a database alias. We will use the alias KIM again to refer to our database KIM on the database server.

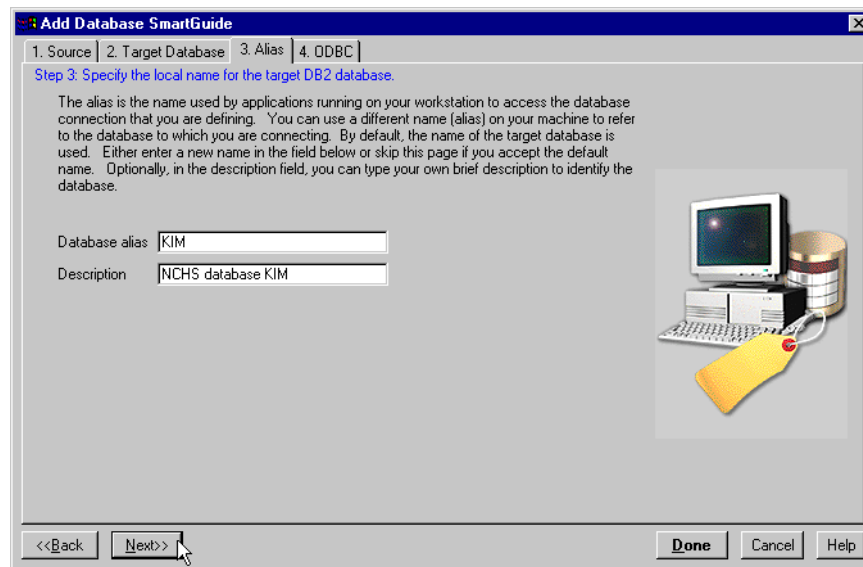


Figure 68. DB2 CCA database alias

There is an optional description field for the local database alias, which we have filled in with NCHS database KIM. Click on **Next** to continue.

8. Finally, the last step to configuring the database is the option to register it as an ODBC source. By default, the option is checked as an ODBC system data source.

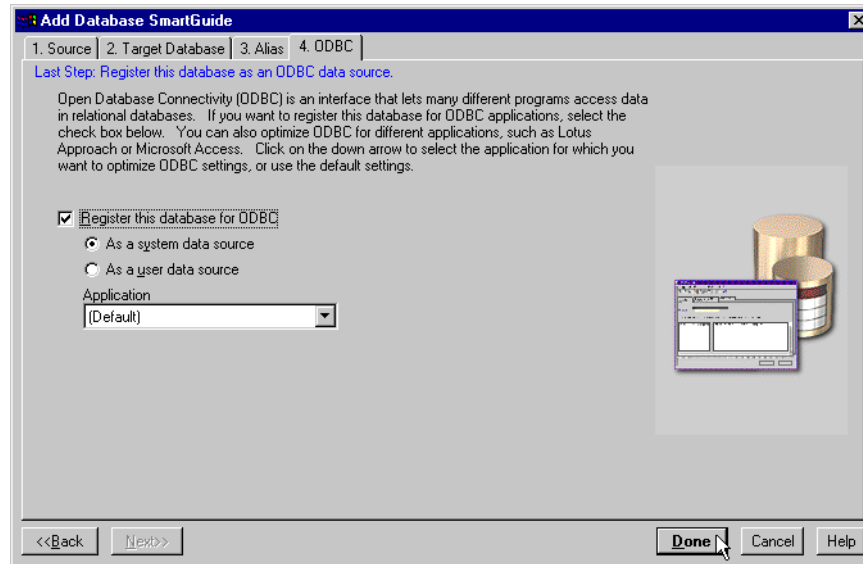


Figure 69. DB2 CCA ODBC choice

For now, accept the defaults as shown and click on **Done**.

The database has now been configured for remote access from this Windows NT workstation. The following panel is displayed on success.

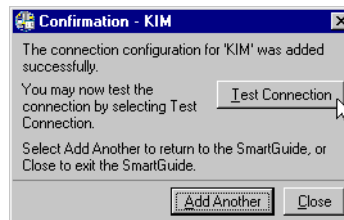


Figure 70. DB2 CCA database configuration success

To ensure the database has been cataloged correctly, click on **Test Connection**.

1. The Connect to DB2 Database panel is shown. Fill in the User ID and Password used to connect to your Net.Commerce Hosting Server database.

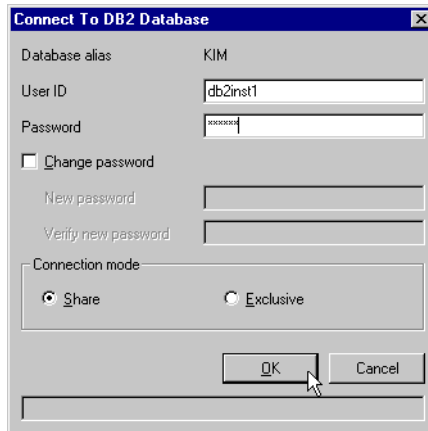


Figure 71. DB2 CCA test connection userid and password

In our example, we fill these values in with the User ID of db2inst1, a Password of ibmdb2, then click on **OK**.

2. If the connection is successful, the following panel is shown.

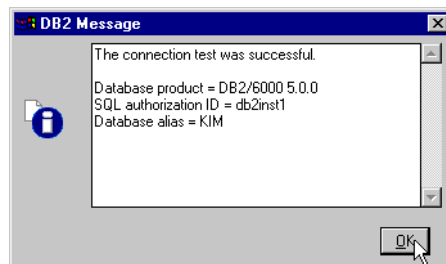


Figure 72. DB2 CCA test connection success

Click on **OK**.

You can now repeat this process to add another database or click on **Close** to close the CCA confirmation window.

Confirm that the CCA now has the databases as the following screen shot shows.

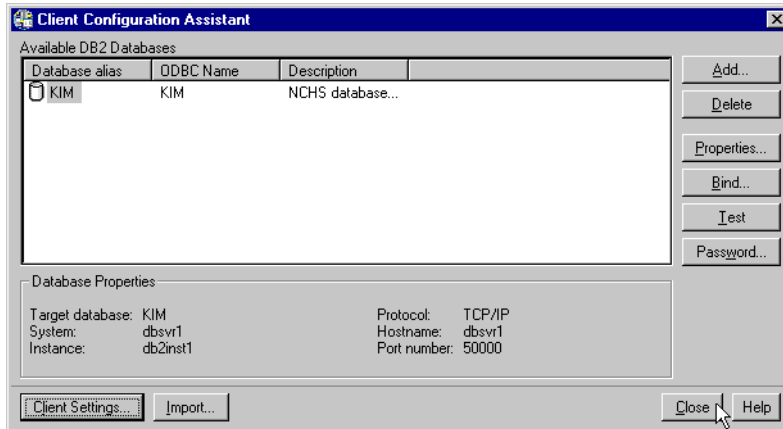


Figure 73. DB2 CCA database list

Click on **Close** to close the CCA.

4.2 Optimizing NCHS database layout

It is important to identify which tables are the busiest in order to develop a performance optimized database layout. Once having this information, we will create new tablespaces that are striped over multiple disk spindles to maximize I/O performance and then create the busiest tables in these tablespaces.

4.2.1 Identifying the busiest tables

Before we proceed with a practical example of DMS table space use, we must first decide which tables are most frequently accessed. To help gather this information, from a database point of view, we can use the DB2 UDB database system monitors.

Built into the database manager is the ability to collect data about its operation and performance and that of the applications using it. The database manager maintains information at the following levels:

- Database manager
- Database
- Application (database connection)
- Table
- Table space

- Buffer pool
- Transaction
- Statement
- Subsection

Collecting some of this data introduces some processing overhead. For example, in order to calculate the execution time of an SQL statement, the database manager must make a call to the operating system to obtain timestamps before and after statement execution. These types of system calls are generally expensive. In order to minimize the overhead involved in maintaining monitoring information, monitor switches control the collection of potentially expensive data by the database manager.

DB2 System Monitor

The DB2 Database Manager is instrumented to gather data on its operation and performance. This data can be used to:

- Monitor database activities
- Assist in problem determination
- Analyze performance
- Help configure the system.

The DB2 DBMS function that collects this data is called the database system monitor. Refer to the *IBM DB2 Universal Database System Monitor Guide and Reference, Version 5.0*, S10J-8164, for more details.

4.2.1.1 Accessing DB2 Monitor Data

There are two ways to access the monitor data collected by the database manager:

- **Snapshot monitoring**

Taking a snapshot gives you information for a specific point in time. A snapshot is a picture of the current state of activity in the database manager for a particular object or group of objects.

- **Event monitors**

You can request the database manager to automatically log monitor data to files or a named pipe when specific events occur. This allows you to collect information about transient events that are difficult to monitor through snapshots, such as deadlocks and transaction completions.

For our purposes, we will use snapshot monitoring. More specifically, we will switch on the monitor switches for the following types (DB2 parameter keywords are in brackets):

- Database (`database`)

A database snapshot returns database level information and counters for a database. Information is returned only if there is at least one application connected to the database.

Database snapshot information is automatically recorded.

- Table (`table`)

A table snapshot returns table activity information at the database and application level for each application connected to the database and at the table level for each table that was accessed by an application connected to the database.

This requires the table switch be turned on.

- Table Space (`bufferpool`)

A table space snapshot returns information about table space activity at the database level, the application level for each application connected to the database, and the table space level for each table space that has been accessed by an application connected to the database.

This required the buffer pool switch be turned on.

- Buffer pool (`bufferpool`)

A buffer pool snapshot returns information about buffer pool activity counters.

This requires the buffer pool switch be turned on.

We switch on or off the database monitor switches with the `db2 update monitor switches` command as follows (ensure you are logged in as the DB2 instance owner):

- To switch on the buffer pool monitor:

```
$ db2 update monitor switches using bufferpool on
DB20000I The UPDATE MONITOR SWITCHES command completed successfully.
```

- To switch off the table monitor:

```
$ db2 update monitor switches using table off
DB20000I The UPDATE MONITOR SWITCHES command completed successfully.
```

To determine the status of the DB2 monitor switches, log in as the DB2 instance owner and use the `db2 get monitor switches` as follows:


```
$ db2 get monitor switches
```

Monitor Recording Switches

```
Buffer Pool Activity Information (BUFFERPOOL) = ON  
Lock Information (LOCK) = OFF  
Sorting Information (SORT) = OFF  
SQL Statement Information (STATEMENT) = OFF  
Table Activity Information (TABLE) = OFF  
Unit of Work Information (UOW) = OFF
```

Hence, we turn on the monitor switches required with the following commands:

```
db2 update monitor switches using bufferpool on  
db2 update monitor switches using table on
```

To get all available monitor information on our database kim, we use the `db2 get snapshot monitor` command as follows

```
db2 get snapshot monitor for all on kim
```

Please see Appendix A “Sample database table activities” on page 297 for an example of the expected output.

Assumed workload

The output of the snapshot monitor was generated by monitoring an example Net.Commerce Hosting Server site where the majority of workload was based on unregistered shoppers browsing the CSP site.

Ensure that when you do performance tuning, you use workload relevant to what is expected at your CSP site.

As an example, we use the snapshot information on tables to determine which tables are most commonly accessed. Refer to the *IBM DB2 Universal Database System Monitor Guide and Reference, Version 5.0, S10J-8164*, for more information on other tuning tips.

4.2.1.2 Most commonly accessed tables

From the output of the DB2 snapshot monitor for tables, we can determine the most commonly accessed Net.Commerce Hosting Server tables in terms of rows read and written. The following is a listing of these tables with a short description of their purpose within the context of the Net.Commerce Hosting Server. More information about what these tables are can be found in *IBM*

Net.Commerce Hosting Server Commands, Tasks, Overridable Functions, and Database Tables, Version 3.1.2 that is available in the NCHS CD.

- **USRTRAFFIC**

The table USRTRAFFIC contains information about the activities of visitors to your site. This table is, therefore, appended to frequently.
- **PROFILES**

The table PROFILES stores profile data used by the messaging system. Profiles for messages that are not sent immediately are stored temporarily and have negative IDs that are the same as the message IDs of the corresponding messages. These temporary profiles are deleted upon removal of their corresponding messages from the queue.
- **CATEGORY**

The table CATEGORY contains information that describes the product categories and subcategories for each store. Each row describes one category.
- **PRODATR**

The table PRODATR associates attribute names with attribute values for products. Each product can have any number of associations defined in this table. Each row describes one attribute and one attribute value.
- **PRODPRCS**

The table PRODPRCS contains the prices of all products and items in all stores. Each product (with a SKU) and item has at least one row in this table. Additional rows may be added if different prices are offered to shoppers in different groups and if an item has a different price for a defined period of time. To determine the correct price of an item, the Net.Commerce system collects all the price entries for the item that are valid for the appropriate shopper group (or for all shoppers if no shopper group is applicable) at the current date and time. The correct price is the one with the highest precedence value from column PPPRE.
- **MCSPINFO**

This database table contains additional information about merchant sites for use in a Net.Commerce Hosting Server scenario.
- **PRODUCT**

The table PRODUCT describes all the products and items available at all stores. An item is a product that must be qualified by one or more attributes to be resolved into a SKU. A SKU (Stock Keeping Unit) is an

orderable item. In this table, items are distinguished by having a non-null PRPRFNBR. Each row contains information on one product or item.

- ACC_MODE

The table ACC_MODE defines the relationship between a merchant and a command. Access groups are used to designate which users are to be allowed access to sets of commands. The Access Mode table determines how, and whether, access control is to be enabled for a particular command. Each row in this table contains either information about the relationship between a single command and a single merchant or, if the merchant field is null, indicates that the command can access all resources.

- SHOPPER

The table SHOPPER contains information needed to identify each shopper and user to the Net.Commerce system. It also contains some basic contact and classification information. (More contact and classification information is in tables SHOPDEM and SHADDR.)

One row is defined for each shopper (whether or not the shopper is registered) and for each user. Therefore, this table is appended to frequently.

- TASK_MER_OF

The table TASK_MER_OF describes a relationship between a task, a merchant, and an overridable function or functions. Each row in this table defines a specific overridable function used by a particular merchant to perform a certain task. A merchant can have multiples entries in this table to describe how a task is implemented using a combination of overridable functions. The SEQUENCE column specifies in incremental order, the sequence by which to execute a combination of overridable functions for a particular task and merchant.

- TASKS

The table TASKS defines the name and scope of each task.

- KEYS

The table KEYS contains the current maximum values of the primary keys for a number of tables including ORDERS, SHIPTO, SHOPPER, SHADDR, TASKS, TAXCGRY, SHIPMODE, STRCGRY, MERCHANT, MSHIPMODE, ACC_GROUP, PRSPCODE, SHIPPING, SHOPGRP, PRODUCT, PRODPRCS, CATEGORY, SCALE, DISCCODE, STAGLOG, and ACC_MODE.

The Net.Commerce system uses this information to set primary keys for new rows. Hence, it is updated frequently.

- CMDS

The table CMDS contains information about all the commands that are available within the system.

- MALL

The table MALL contains the basic information needed to run the mall. It also contains the mall-wide tax rates that are applied to any stores for which no customized tax rates are found. The table contains only one row.

The USRTRAFFIC and SHOPPER tables are the largest, in row size, and most frequently accessed in a write mode. For this example, we will choose to place these two tables on a separate tablespace from the other tables.

4.2.2 Creating new tablespaces

Our database layout will consist of the following table spaces:

- The DB2 system catalog of type SMS.
- Temporary tablespace of type SMS.
- The USRTRAFFIC and SHOPPER tables whose containers are distributed amongst physically distinct DASDs of type DMS.
- All other Net.Commerce Hosting Server tables whose containers are distributed amongst physically distinct DASDs of type DMS.

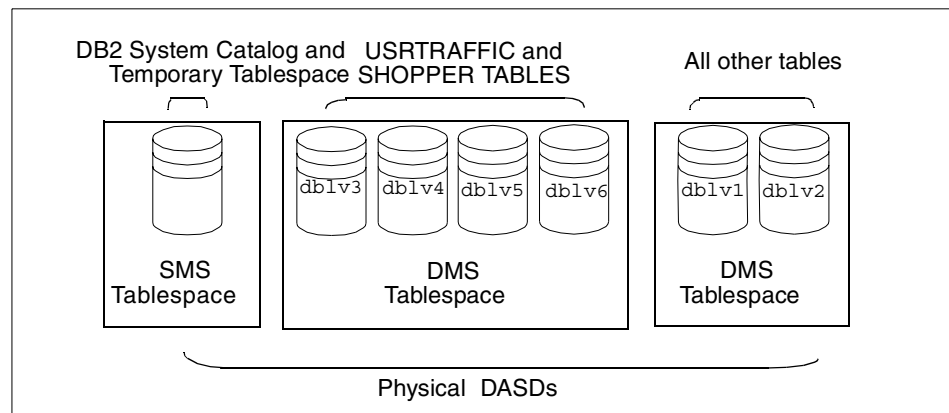


Figure 74. Physical allocation of DASDs amongst table spaces

System and Temporary Table Space

We have previously discussed our reasons for choosing DMS table space for our Net.Commerce Hosting Server tables. Please refer to the *IBM DB2 Universal Database Administration Guide, Version 5.0*, S10J-8157 for a discussion on why SMS table space is more suitable for

4.2.2.1 DMS Implementation

The system and temporary table spaces are created, by default, as SMS table spaces. In this section, we will discuss how to create new table spaces of type DMS, and place the SHOPPER and USRTRAFFIC Net.Commerce Hosting Server tables in a separate DMS table space.

Before we begin, we must first explain the table space rules used by DB2 to determine which table space to place a table when it is first created. The rule is:

```
IF table space IBMDEFAULTGROUP exists with sufficient page size
  THEN use it
ELSE IF user created table space exists with sufficient page
size
  THEN use it
ELSE IF USERSPACE1 exists with sufficient page size
  THEN use it
ELSE issue an error (SQLSTATE 42727).
```

We wish to have one table space where all the Net.Commerce Hosting Server tables are placed (we will name this tablespace CLAUS) and another for the SHOPPER and USRTRAFFIC tables (named DAISY). Hence, we will use the DB2 Control Center Create Table Space Smartguide to create these two DMS table spaces.

Referential Integrity and other DB2 Obstacles

We can create table spaces before a database is populated with tables or after (and then move tables into these newly created table spaces). There is, however, additional complexity involved in doing the latter.

Referential Integrity, amongst other DB2 concepts, will prevent a table from being moved via a copy and rename process. The solution, in this case, is to note all such references, export and drop the table, import the table into the new table, then re-create all references to it. The full details of this process are outside the scope of this document.

For our example, since we merely wish to demonstrate the use of table spaces, we will create the table space definitions before we populate the new database with the modified Net.Commerce Hosting Server remote database population script and, hence, avoid any complicated procedures.

This procedure should be performed just before the finalization of the DB2 remote setup as outlined in Section 2.4.7, “Finalizing DB2 remote setup” on page 134.

First, log in to the database server, `dbsvr1`, with `root`, then create a volume group called `dbvg`. Allocate as many disks as possible to balance I/O traffic over multiple disk spindles. We had six disks.

```
# mkvg -f -y'dbvg' hdisk3 hdisk4 hdisk5 hdisk6 hdisk7 hdisk8
```

Create a logical volume on each disk of the same size, for example, 100 MB each. We created six logical volumes and named them `dbl1`, `dbl2`, and so on.

```
# mklv -y'dbl1' -a'c' dbvg 25 hdisk3
```

Repeat the same step to create the other logical volumes. Finally you get the following:

```
# lsvg -l dbvg
dbvg:
LV NAME          TYPE      LPs   PPs   PVs  LV STATE    MOUNT POINT
dbl1             jfs      25    25    1    closed/syncd  N/A
dbl2             jfs      25    25    1    closed/syncd  N/A
dbl3             jfs      25    25    1    closed/syncd  N/A
dbl4             jfs      25    25    1    closed/syncd  N/A
dbl5             jfs      25    25    1    closed/syncd  N/A
dbl6             jfs      25    25    1    closed/syncd  N/A
```

Be sure to change the ownership of the device files as follows:

```
# chown db2inst1.db2iadm /dev/rdbl1
# ls -l /dev/rdbl1
crw-rw----  1 db2inst1 db2iadm1  22,  3 Aug 19 15:54 /dev/rdbl1
```

Repeat the same step for the other raw device files.

DB2 Control Center

The following sections make extensive use of the DB2 Control Center. Ensure you have created the DAS instance on the remote database server and have installed the DB2 CAE and graphical tools to administer a remote database, on a workstation, as per the steps outlined in Sections 4.1.1, “Creating the DB2 Administration Server” on page 195 and 4.1.2, “Installing DB2 CAE” on page 200.

4.2.2.2 Creating new table spaces

We have previously defined six logical volumes, named dblv1 through to dblv6, 100 MB each, on separate physical DASDs. With the DB2 Control Center, we will now use the Create Table Space Smartguide and use these six logical volumes as the containers for our new table spaces. Ensure that these logical volumes are accessible by the instance owner; in our case, db2inst1. We will first create the CL AUS tablespace, where the majority of our tables will reside, using two of the six logical volumes.

Raw Devices

UNIX devices are classified into two categories: Character serial devices and block-structured devices. For all file system devices, it is normal to have a corresponding character serial device (or raw device) for each block device (or cooked device). The block-structured devices are typically designated by names similar to hd0 or fd0. The character serial devices are typically designated by names similar to rhd0, rfd0, or rmt0. These character serial devices have faster access than block devices. The character serial device names should be used on the `CREATE TABLESPACE` command and not block device names.

1. Start the DB2 Control Center on the Windows NT Workstation, using the Windows NT Start Bar Start \mathcal{A} Programs \mathcal{A} DB2 for Windows NT \mathcal{A} Administrative Tools -> Control Center.
2. You will be presented with the DB2 Control Center interface, as shown in the following figure.

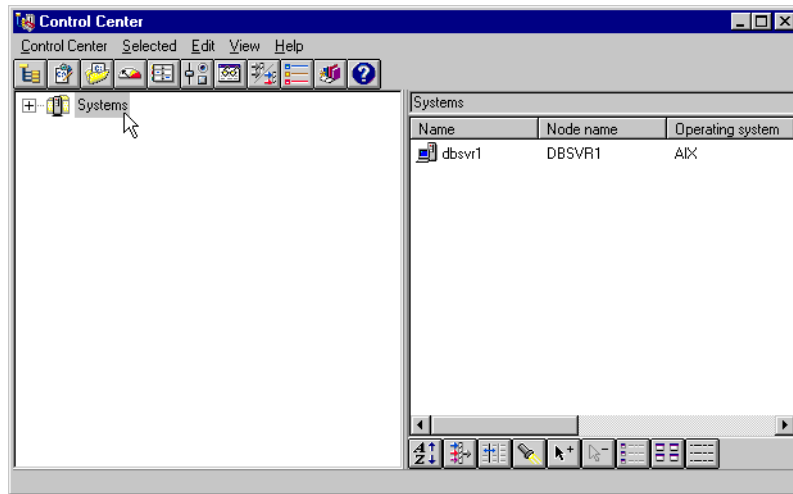


Figure 75. DB2 CC systems panel

Expand the subtree under **Systems**, **dbsvr1**, **Instances**, **db2inst1**, and you will find the database KIM that we previously added using the DB2 CCA.

3. Among the objects listed under the KIM subtree, you will find an object labelled Table Space. Select this object, and the right hand panel of the DB2 Control Center will present a list of defined table space as the following screen shows:

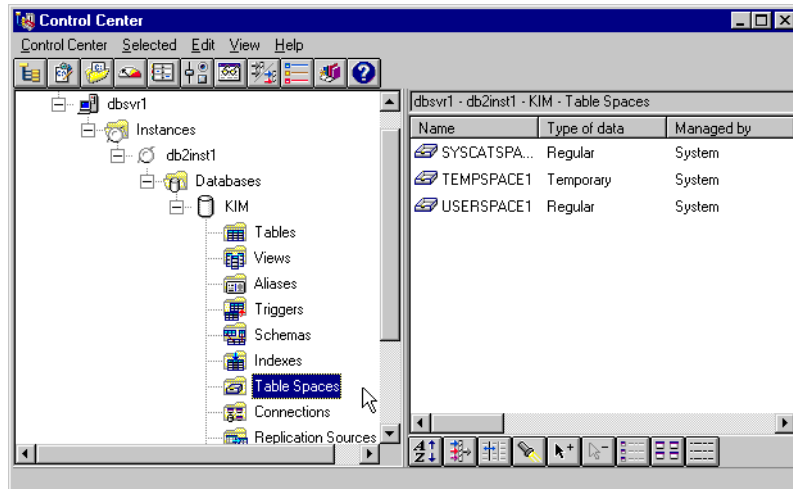


Figure 76. DB2 CC table space object

- To create a new tablespace, right click on **Table Spaces** and choose **Create, Table space using Smartguide** as the following screen shows:

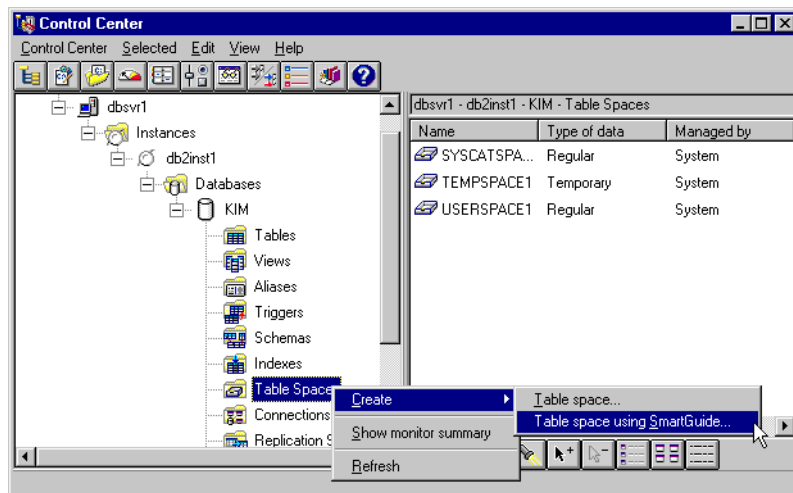


Figure 77. DB2 CC create table space using Smartguide

- You will be presented with the Create Table Space Smartguide as shown below:



Figure 78. DB2 CC table space name

6. The first tab allows us to name the table space. We will fill in the name **CLAUS** and click on **Next**.
7. The next tab allows us to choose the type of data that will be stored in this table space. We plan to store regular data in our table space **CLAUS**. Ensure this option is chosen, then click on **Next** to continue.

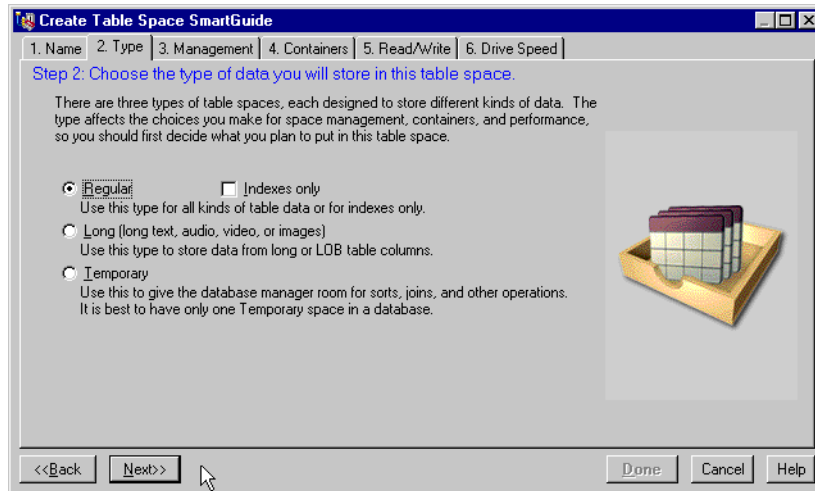


Figure 79. DB2 CC table space type

- The next tab allows us to choose the type of table space that will be used. Remember that we have decided on Database Managed Storage table space for our frequently accessed tables. Choose **High Performance** and click on **Next** to continue.

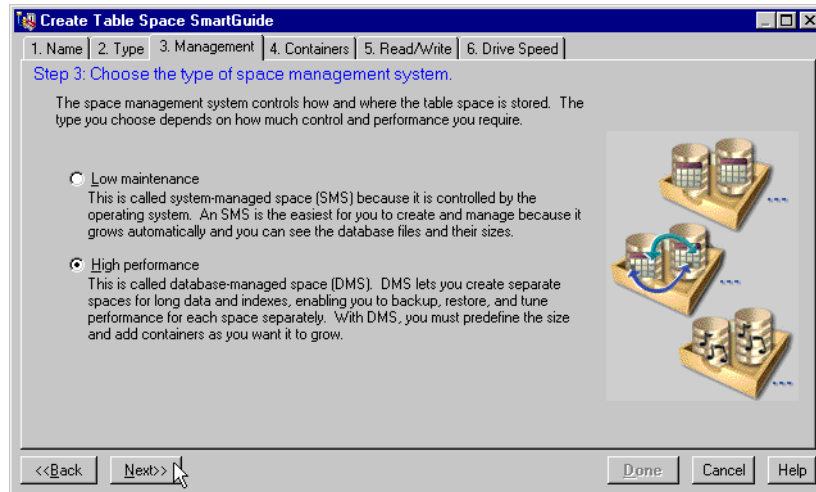


Figure 80. DB2 CC table space management type

- Now we can define the containers to be used in the CLAUS table space. Click on the **Add** button, and you will be presented with the Add Container panel as shown below.

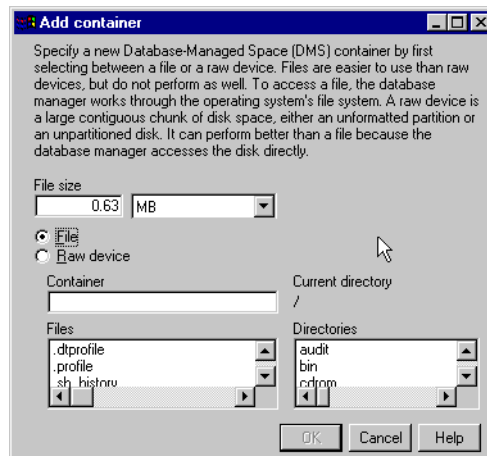


Figure 81. DB2 CC table space container definition

10. We will use the previously defined logical volume containers, dblv1 and dblv2. Each of these logical volumes is 100 MB in size, and the raw device names are rdblv1 and rdblv2. Hence, fill in 100 MB for file size, click on **Raw device**, and fill in the container path as appropriate, that is, /dev/rdblv1 for the rdblv1, and /dev/rdblv2 for rdblv2. Remember that DMS table spaces can have more containers added to it at a later date.

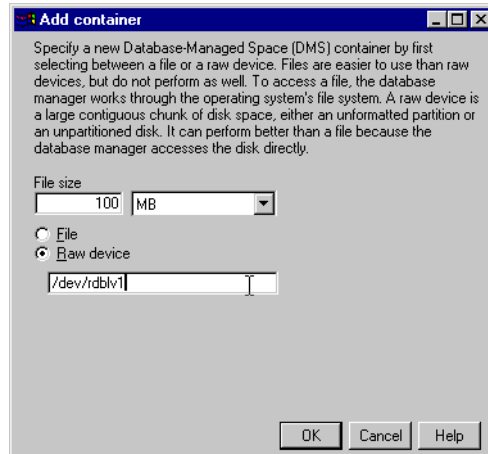


Figure 82. DB2 CC table space container raw devices choice

Click **OK** after each container definition. Back at CREATE, once all containers have been defined, the Define containers for this table space tab should look like the following:

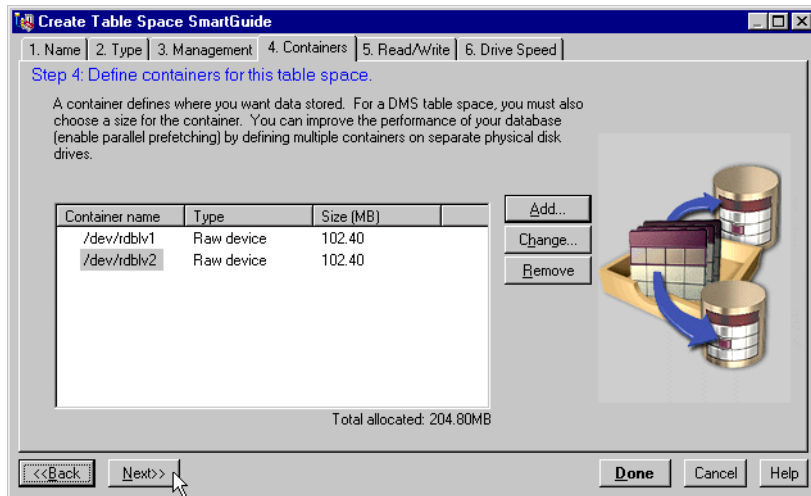


Figure 83. DB2 CC table space container list

Click on **Next** to continue.

- The Read/Write tab poses two questions: The average size of a table in this table space and the number of physically distinct containers (that is, containers that are located on physically distinct DASDs). We expect that the tables will be larger than 2 MB. Each of the two containers we have allocated are on distinct physical DASDs. Therefore, we answer the questions appropriately as the following screen shot shows:

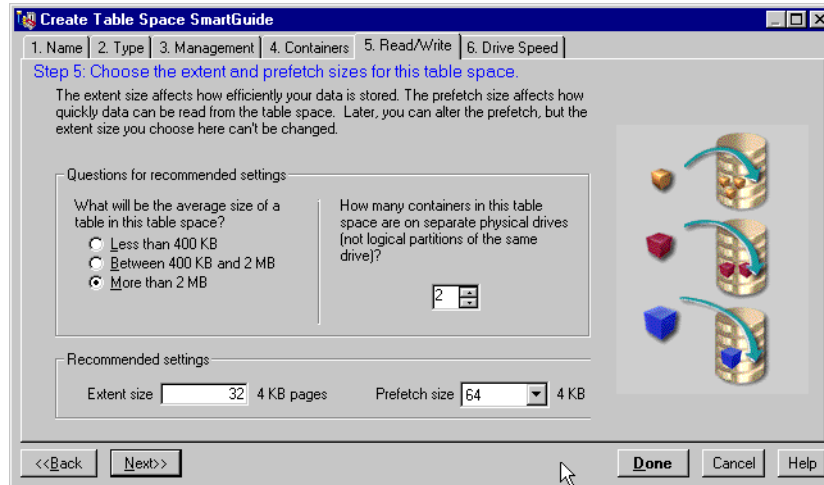


Figure 84. DB2 CC table space extent and prefetch values

Note that the Create Table Space Smartguide automatically calculates the recommended values for the extent and prefetch sizes. Accept these values and click on **Next** to continue.

12. Finally, we have three questions to answer with regards to the Drive Speed tab. They are:

- How big is the physical drive?

Each of our physical drives is slightly more than 1 GB in size (and are high performance drives). Hence, select the check box for **More than 1 GB**.

- How old is the physical drive?

The physical drives are dated 1995 or newer. Hence, select this check box.

- Is the physical drive in a high performance server?

Our drives are located on a high performance server; so, select this check box. The tab should be filled out as shown in the following screen shot:

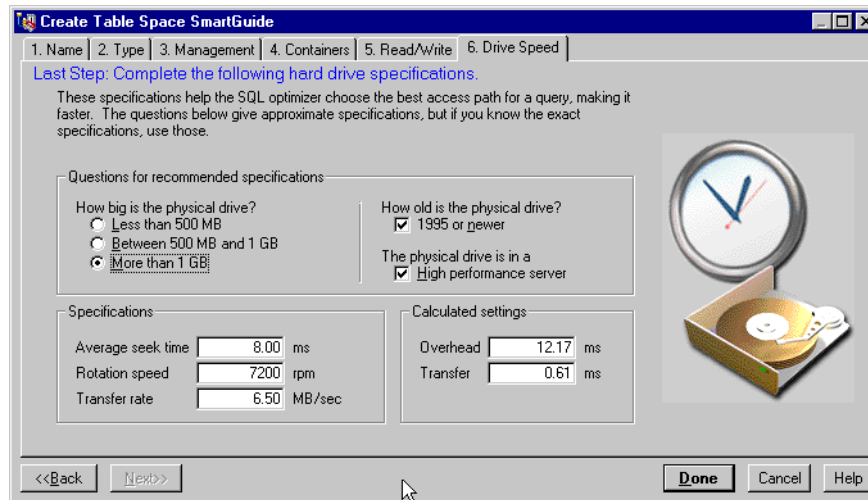


Figure 85. DB2 CC table space hard drive specifications

13. Notice, once again, that the Create Table Space Smartguide generates the recommended values for the drive Specifications and Calculated settings. Accept these values and click on **Done**.

The Create Table Space Smartguide will create the table space CLAU with the settings chosen.

Go through the same steps again to create a new table space called DAISY. This time, we use the logical volumes dblv3 through to dblv6 (remember to use the raw devices, that is, /dev/rdblv3 through /dev/rvldb6). Notice the change in prefetch size for step 11 on page 227 of the process since we are now using four containers.

You can verify the result of the above step by entering:

```

$ db2 list tablespaces
Tablespace ID          = 3
Name                   = CLAUD
Type                   = Database managed space
Contents               = Any data
State                  = 0x0000
  Detailed explanation:
    Normal

Tablespace ID          = 4
Name                   = DAISY
Type                   = Database managed space
Contents               = Any data
State                  = 0x0000
  Detailed explanation:
    Normal

$ db2 list tablespace containers for 3

          Tablespace Containers for Tablespace 3

Container ID           = 0
Name                   = /dev/rdbl1
Type                   = Disk

Container ID           = 1
Name                   = /dev/rdbl2
Type                   = Disk

$ db2 list tablespace containers for 4

          Tablespace Containers for Tablespace 4

Container ID           = 0
Name                   = /dev/rdbl3
Type                   = Disk

Container ID           = 1
Name                   = /dev/rdbl4
Type                   = Disk

Container ID           = 2
Name                   = /dev/rdbl5
Type                   = Disk

Container ID           = 3
Name                   = /dev/rdbl6
Type                   = Disk

$

```

We should now have two new table spaces listed under the TABLE SPACE object as follows:

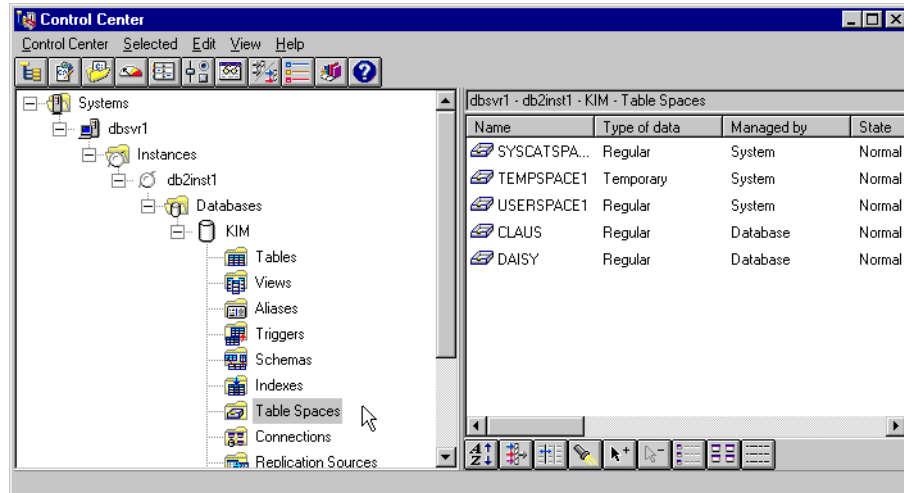


Figure 86. DB2 CC database KIM table space list

Ensure that CLAUS is the first user created table space listed. Right click on **Table spaces** and select **Refresh**. If CLAUS is now the first user created table space listed, it is the *default* table space where user created tables will be placed, unless otherwise specified, as per the rules set out on page 219.

If CLAUS is not the first user created table space listed, restart the table space creation process again by deleting all the user created table spaces (CLAUS and DAISY), and create the CLAUS table space first before creating DAISY. You can delete a table space by selecting it, then right click on the **object** and select **Drop**.

4.2.3 Populating NCHS database tables

4.2.3.1 Editing Net.Commerce schema scripts

Based on the table space rules for table population, running the Net.Commerce Hosting Server `remote_schema.sh` script to populate the Net.Commerce Hosting Server database KIM will place the tables in the first user created table space, which, in our example, is named CLAUS.

To ensure that the SHOPPER and USRTRAFFIC tables are placed in the DAISY table space rather than CLAUS, we will need to edit the Net.Commerce Hosting Server SQL script that creates these tables when the `remote_schema.sh` script is run. These scripts are located in the directory `/usr/lpp/NetCommerce3/nc_schema/db2` on the NCHS server (in our example, it is server chs1).

The SHOPPER table SQL script is called shopper_schema_db2.sql. Do the following:

1. Log in to server chs1 as user ID root and change to directory /usr/lpp/NetCommerce3/nc_schema/db2.
2. Check that the file shopper_schema.db2.sql has write permission for user ID root.
3. Edit the file and add in the keywords `IN DAISY` at the end of the create table statement. The following screen shot shows an example (the addition is in **bold**):

```
echo =====
====;
create table shopper      ( shrfnbr      integer not null,
                           shlogid     char(31) not null,
                           shlpswd     char(32) for bit data,
                           shshtyp     char(4) not null,
                           shcomm      char(2),
                           shphlst     smallint,
                           shlvstmp    timestamp,
                           shlostmp    timestamp,
                           shrstmp     timestamp,
                           shcstmp     timestamp,
                           shlustmp    timestamp,
                           shcntct     integer,
                           shchaque    varchar(254),
                           shchaans    varchar(254),
                           shfield1    varchar(254),
                           shfield2    varchar(254),
                           constraint  p_shopper primary key (shrfnbr)
                           ) in DAISY;
create unique index ui_shopper on shopper (shlogid);
```

4. Save the file.

Now we need to edit the USRTRAFFIC file. The USRTRAFFIC table SQL script is called usertraffic_schema.db2.sql and is located in the same directory. Perform the following steps:

1. Check that the file has write permission for user ID root.
2. Edit the file and add the keyword `IN DAISY` at the end of the create table statement as the following screen shot shows (the addition is in **bold**):

```

create table USRTTRAFFIC (  refnum          integer not null,
                           shrfnbr         integer,
                           shlustmp       timestamp,
                           stmp           timestamp,
                           remaddr        varchar(254),
                           climeth        char(8),
                           servname       varchar(64),
                           script        varchar(64),
                           pathinfo      varchar(254),
                           querystring   varchar(254),
                           bragent       varchar(254),
                           refurl        varchar(254),
                           https         char(1),
                           result        char(1),
                           redir         varchar(254),
                           viewtask      varchar(32),
                           constraint     p_utraffic primary key (refnum),
                                           constraint     f_shrfnbr fo
                                           references shopper (shrfnbr
) on delete cascade ) in DAISY;

```

3. Save the file and exit the editor.

We can now populate the Net.Commerce Hosting Server database with the remote_schema.sh script using the steps listed in Section 2.4.7.1, “Populating the Net.Commerce Database” on page 134.

After the population, we can use the DB2 Control Center to check the list of tables in the database KIM. It should look as follows:

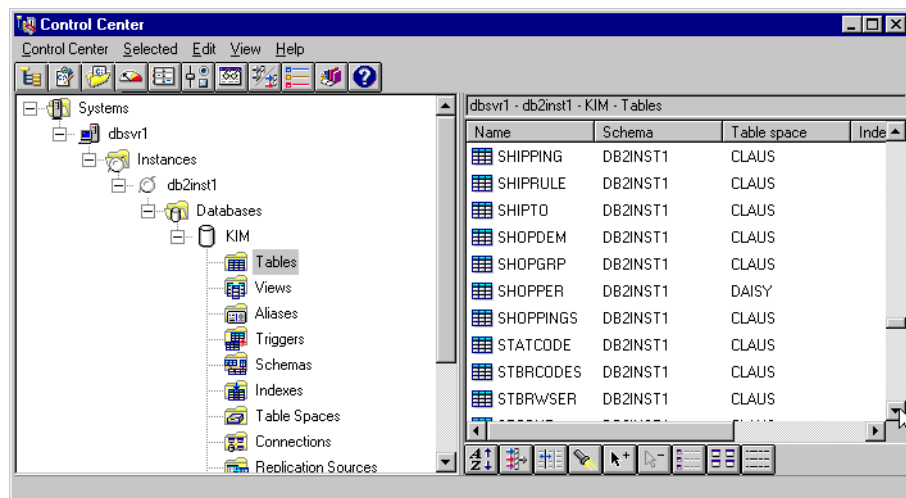


Figure 87. DB2 CC database KIM table list showing table spaces

Notice that most of the Net.Commerce Hosting Server database tables are in table space CLAUS, while tables SHOPPER and USRTRAFFIC are in table space DAISY.

We have now created a database where the majority of user created tables are located on a user created table space of type DMS, while several frequently accessed tables are located on another user created DMS table space optimized for faster access.

4.3 Creating database backups

A database can become unusable because of hardware or software failure, and the different failure situations may require different recovery actions. There should be a strategy in place to protect your database against the possibility of these failure situations.

Rehearse Recovery

When designing a strategy, you should also rehearse it. This will allow you to detect any shortcomings in the plan and avoid problems when you have to recover the database.

In the following sections, we will briefly discuss the types of database recovery strategies and database backups associated with these strategies within the context of DB2 UDB. We will then concentrate on implementing online backups associated with a roll-forward recovery strategy as this is the ideal recovery strategy for a Net.Commerce Hosting Server database.

For further details about these recovery strategies, in particular the roll-forward recovery strategy with DB2 UDB, please refer to the *IBM DB2 Universal Database Administration Guide, Version 5.0*, S10J-8157.

4.3.1 Database recovery strategies

You need to know the strategies available to help you when there are problems with the database. Typically, you will deal with media and storage problems, power interruptions, and application failures. You need to know that you can back up your database, or individual table spaces, and then rebuild them should they be damaged or corrupted in some way. The rebuilding of the database is called recovery. There are three ways recovery of a damaged database can take place: Crash recovery, restore, and roll-forward.

1. Crash recovery is the method that protects a database from being left in an inconsistent, or unusable, state. Transactions, or units of work, against the database can be interrupted unexpectedly. For example, should a failure (power interruption, application failure) occur before all of the changes that are part of the unit of work are completed and committed, the database is left in an inconsistent and unusable state.

The database then needs to be moved to a consistent and usable state. This is done by rolling back incomplete transactions and completing committed transactions that were still in memory when the crash occurred.

You can do this by entering a `RESTART DATABASE` command. If you want this done in every case of a failure, then you should consider the use of the automatic restart enable (autorestart) configuration parameter. The default for this configuration parameter is that the `RESTART DATABASE` routine will be started every time it is needed. When autorestart is enabled, the next connect request to the database after the failure causes `RESTART DATABASE` to be executed.

Crash recovery always moves the database to a consistent and usable state. If crash recovery occurs for a database that is enabled for forward recovery (that is, the `logretain` or `userexit` configuration parameter is on for the database), and an error occurs during crash recovery that is attributable to an individual table space, that table space is taken off-line. Crash recovery continues. The table space taken off-line is placed in a roll-forward pending state.

At the completion of crash recovery, the other table spaces in the database are still usable and connections to the database can be established. (There are exceptions involving the table spaces that have the temporary tables or the system catalog tables. These will be discussed under roll-forward recovery).

Following crash recovery, you may need to take additional action. You may need to work with the table spaces taken off-line as mentioned above. You may need to conduct a restore recovery and/or a roll-forward recovery depending on the error.

2. Restore recovery (also known as version control) allows for the restoration of previous versions or images of the database that were made using the `BACKUP` command.

A database restore will rebuild the entire database using a backup of the database made at some point earlier. A backup of the database allows you to restore a database to a state identical to the time when the backup was made. Every unit of work from the time of the backup to the time of the failure is lost. (The need to re-create these units of work introduces the

possibility of the next recovery method, roll-forward recovery, which is discussed later.)

Using the database restore recovery method, you must schedule and perform a full backup of the database on a regular basis. This type of backup is called an off-line backup, where the database is exclusively under the use of the backup utility, and is considered off-line for the purposes of all other users and applications.

3. Roll-forward recovery may be the next task to be done following a restore depending on the state of the database. For roll-forward recovery to be possible on a database, the database must be recoverable and must be in the roll-forward pending state at the end of the restore.

Recoverable databases have either the *logretain* or *userexit* (or both) database configuration parameters turned on. This allows for active and archived logs to be kept and results in the ability for the database to have roll-forward recovery. Table space BACKUP and RESTORE, and online BACKUP and RESTORE, are applicable to recoverable databases only.

Non-recoverable databases have both *logretain* and *userexit* turned off. Only active logs are kept for crash recovery; no roll-forward recovery is allowed. Restore recovery using off-line backups is the primary means of recovery for problems with this mode of database.

Database roll-forward recovery follows the restore of the database with the application of database logs. The database logs record all changes made to the database. This method completes the recovery of the database to a state identical to the time just before the failure.

Therefore, to use the database roll-forward recovery method, you must have created a backup of the database as well as archiving the logs by enabling either *logretain* or *userexit*. There are decisions that you must make regarding the logging procedure that you use. (Logging is discussed in more detail later. See Section 4.3.1.1, “Database logs” on page 236.)

4.3.1.1 Database logs

All databases have logs associated with them. These logs keep records of database changes. Some logs, called active logs, are used by crash recovery to prevent a failure (system power, application error) from leaving a database in an inconsistent state. Changes already made, but not committed because of the failure, are rolled back. All committed units of work, which may not have been physically written to disk because of the failure, are redone. These actions ensure the integrity of the database.

Roll-forward recovery can use both the active logs and logs that have been archived to rebuild a database either to the end of the logs or to a specific

point in time. The roll-forward function achieves this by reapplying changes that are found in the archived and active logs to the restored database.

- Active logs

Active logs contain transactions that have been committed but may not have been physically written from memory (buffer pool) to disk (database containers). These logs contain information necessary to roll-back any active transaction not committed during normal processing. The `RESTART DATABASE` command uses the active logs, if needed, to move the database to a consistent and usable state by means of crash recovery. The `ROLLFORWARD` command may also use the active logs, if needed, during a point-in-time recovery or a recovery to the end of the logs. Active logs are located in the database log path directory.

- Online archived logs

When all changes in the active log are no longer needed for normal processing, the log is closed and becomes an archived log. An archived log is said to be online when it is stored in the database log path directory.

- Off-line archived logs

You also have the ability to store archived logs in a location other than the database log path directory by using a user exit program (for example, the ADSTAR Distributed Storage Manager). An archived log is said to be off-line when it is not stored in the database log path directory.

Two parameters in the database configuration file allow you to change where archived logs are stored: The `newlogpath` parameter and the `userexit` parameter. Changing the `newlogpath` parameter also affects where active logs are stored.

To determine which log extents in the database log path directory are archived logs, check the value of the database configuration file parameter `loghead`. This parameter indicates the lowest numbered log that is active. Those logs with sequence numbers less than that of this log are archived logs and can be moved.

Active Database Logs are Important

1. If you erase an active log, the database becomes unusable and must be restored before it can be used again. Also, you will be able to roll forward the changes from the logs only up to the first log that was erased.
2. If you are concerned that your active logs may be damaged (due to a disk crash), you should consider mirroring the volumes on which the logs are stored. By having multiple copies of the logs, you will not lose any transactions, which may happen when active logs are damaged.

Considerations for managing log files

There are some items to be considered when managing database logs.

- The numbering scheme for archived logs starts with S0000000.LOG and goes through S9999999.LOG (10 000 000 logs). The database manager restarts using S0000000.LOG under these conditions:
 - When a database configuration file is changed to enable the roll-forward function.
 - When a database configuration file is changed to disable the roll-forward function.
 - When the logs wrap, that is, after log S9999999.LOG is used.

When the roll-forward recovery method completes successfully, the last log is truncated, and logging begins with the next sequential log. The practical effect is that any log in the log path directory with a sequence number greater than the last log used for roll-forward recovery is reused. You should keep a copy of the logs elsewhere if you want to be able to re-execute the `ROLLFORWARD` command using these old logs. (You may use a user exit program to copy the logs to another location.)

Hence, you can have duplicate names for different logs because:

- The database manager starts renaming logs with S0000000.LOG (as described above).
- The database manager reuses log names after restoring a database (with or without roll-forward recovery).

The database manager ensures that an incorrect log is not applied during roll-forward recovery, but it cannot detect the location of the required log. You must ensure that the correct logs are available for roll-forward recovery.

- If you moved log files to a location other than that specified by the logpath database configuration parameter, use the OVERFLOW LOG PATH parameter of the ROLLFORWARD command to specify the additional path to them.

If you are rolling forward changes in a database or table space and the roll-forward operation cannot find the next log, the log name is returned in the SQLCA indicating the next log file needed, and roll-forward recovery stops. At this time, if there are no more logs available, you can use the ROLLFORWARD command to stop processing.

If you terminate the roll-forward recovery (by specifying the STOP option on the ROLLFORWARD command), and the log containing the completion of a transaction has not been applied to the database or table space, the incomplete transaction will be rolled back to ensure that the database or table space is left in a consistent state.

- Archived logs are placed in the SQLOGDIR subdirectory by default. To place them elsewhere, either enable the database for user exit or use the OVERFLOW LOG PATH parameter of the ROLLFORWARD command to point to them when you roll forward.
- If you enable a user exit by changing the database configuration file, the archived logs can be redirected to a user-defined storage device, such as a tape drive. Also, you can use a user exit program to manage the storage of archived logs.
- If you change the newlogpath parameter, any existing archived logs are unaffected. You must keep track of the location of the logs.
- If a database enabled for roll-forward recovery is restored, either without being rolled forward or with being rolled forward to a specific time, an archived log may be associated with two or more different log sequences of a database because log names are reused. Before discarding an archived log, you must ensure that you do not need it.
- If, during a full database recovery, you have rolled forward to a point in time and stopped in the middle of the logs, you have created a new log sequence. The two (2) log sequences cannot be combined. If you have an online backup that spans through the first log sequence, you must use the first log sequence to complete the roll forward recovery.
- If you have created a new log sequence after recovery, any table space backups taken in the old log sequence are invalidated. Restore rejects the table space backups in this case. There may be instances where restore fails to recognize that the backup is no longer valid (particularly for online backups), and the restore is successful. However, roll-forward for the table space will fail, and the table space is left in a roll-forward pending state.

- A log uses a timestamp associated with the completion of a unit of work. The timestamp in the logs uses the Coordinated Universal Time (CUT), which helps to avoid having the same timestamp associated with different logs (because of a change in time associated with daylight savings time, for example). The timestamp used on the backup is based on the local time. As a result, when you call the `ROLLFORWARD` command, you must specify the time in Coordinated Universal Time.

Current Timezone

The special register, `CURRENT TIMEZONE`, holds the difference between CUT and the local time at the application server database. Local time is the CUT plus the current timezone contents.

Losing logs

Under certain conditions, database logs can be lost. The following items explain these situations:

- Dropping a database erases all logs in the current database log path directory. Hence, before dropping a database, you may need to make copies of the logs.
- If you are rolling forward a database to a point-in-time, the last log used in the roll-forward recovery and all existing logs following are reused. You lose the ability to recover past that particular point-in-time. Therefore, you should copy all the logs in the current database log path directory before beginning a point-in-time recovery.

When the roll-forward processing completes, the log file with the last committed transaction is truncated, and logging begins with the next sequential log. If you do not have a copy of the log before it was truncated and those with higher sequence numbers, you cannot recover the database past the specified point-in-time. (Once normal database activity occurs following the roll-forward, new logs are created that can then be used in any subsequent recovery.)

- If you change the log path directory and then remove the subdirectory or erase any logs in that subdirectory called for in the log path, the database manager will look for the logs in the default log path, `SQLLOGDIR`, when the database is opened. If the logs are not found, the database will enter a backup pending state, and you must back up the database before it is usable.

This backup must be made even if the subdirectory contained empty logs.

- If you lose the log containing the point-in-time of the end of the online backup, and you are rolling forward the corresponding restored image, the database will not be usable. To make the database usable, you must restore the database from a different backup and all associated logs.

You may encounter a situation similar to the following: You would like to do a point-in-time recovery on a full database, but you are concerned that you might lose a log during the recovery process. (This scenario could occur if you have an extended number of archived logs between the time of the last backup database image and the point-in-time where you would like to have the database recovered.)

First, you should copy all of the applicable logs to a safe location. Then you can run the `RESTORE` command and use the roll-forward recovery method to the point-in-time you wish for the database. If any of the logs that you need is damaged or lost during this process, you have a backup copy of all of the logs elsewhere. You can then perform the `RESTORE` command again, copy these backup logs back to the `SQLLOGDIR` directory, and reapply the roll-forward recovery method.

ADSM

DB2 has built in support in backup, restore, and log archiving for the ADSTAR Distributed Storage Manager (ADSM). The complexity of ADSM precludes any discussion within this document. However, we recommend you investigate the use of ADSM with user exits for automated log archiving.

4.3.1.2 Point of recovery

The restore and roll-forward methods provide different points of recovery. The restore-only method involves making an off-line, full database backup copy of the database at scheduled times. With this method, the backup copy of the database is only as current as the time that the last backup was made. For instance, if you make a backup copy at the end of each day, and you lose the database midway through the next day, you will lose a half-day's worth of changes.

In the roll-forward recovery method, changes made to the database are retained in logs. With this method, you first restore the database or table space(s) using a backup copy; then you use the logs to reapply changes that were made to the database since the backup copy was created.

With roll-forward recovery enabled, you can take advantage of online backup and table space level backup. For full database and table space roll-forward recovery, you can choose to recover to the end of the logs or to a specified point-in-time. For instance, if an application corrupted the database, you could start with a restored copy of the database and roll-forward changes up until just before that application started. All units of work in the logs after the time specified will not be reapplied.

You can also roll forward table spaces to the end of the logs or to a specific point in time. For more information about rolling forward table spaces, please refer to the *IBM DB2 Universal Database Administration Guide, Version 5.0*, S10J-8157.

4.3.2 Online backups

You can do a backup while the database is either online or off-line. If it is online, other applications or processes can continue to connect to the database as well as read and modify data while the backup task is running. If the backup is performed off-line, only the backup task can be connected to the database. The implication of off-line backup is that no other applications can connect to the database while the backup task is running.

To reduce the time when the database is not available, consider using online backups. Online backups are supported only if roll-forward recovery is enabled. If roll-forward recovery is enabled, and you have a complete set of logs, you can rebuild the database should the need arise.

While the online backup operation is running, changes can also be occurring on the tables. The roll-forward recovery method is used to ensure that all table changes are captured.

4.3.2.1 Implementing online backups

When you first create a database, only circular logging is enabled for it. This means that logs are reused (in a circular fashion) and are not saved or archived. With circular logging, roll-forward recovery is not possible. Only crash recovery or a restore of the database to the time of the last backup is enabled.

When log archiving is performed, however, roll-forward recovery is possible because the logs record changes to the database after the time that the backup was taken. You perform log archiving by activating either (or both) of the `logretain` and `userexit` database configuration parameters. When either of these parameters are enabled, the database is enabled for roll-forward recovery.

The following section will show you how to use the DB2 Control Center to activate logretain, and then backup the database, before reactivating the database.

4.3.2.2 Enabling database kim for roll-forward recovery

1. Start the DB2 Control Center.
2. On the left hand panel of the DB2 Control Center, expand the subtree under the dbsvr1 system, db2inst1 instance, to the database KIM.

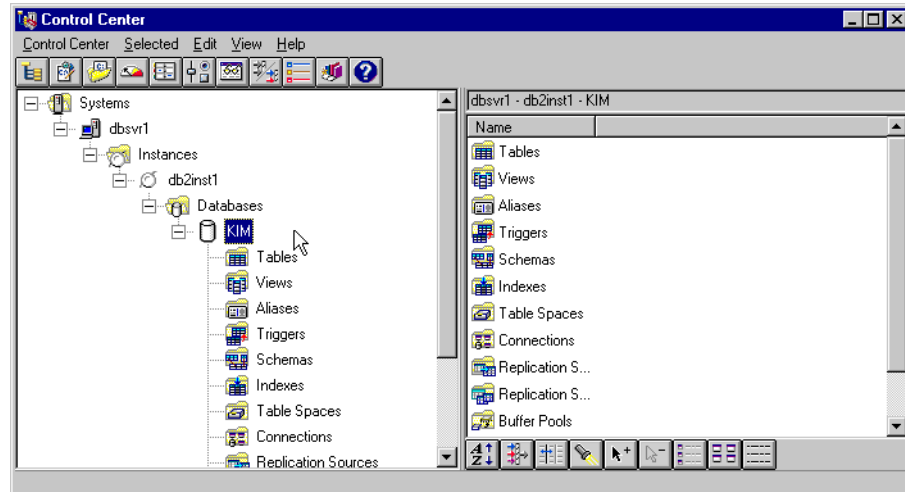


Figure 88. DB2 CC database KIM

3. Select the database **KIM**, right click, and then select **Configure**.
4. On the Configure Database - KIM panel, choose the **Logs** tab, then scroll down the list of DB2 database parameters and select **Retain log files for roll-forward recovery**.

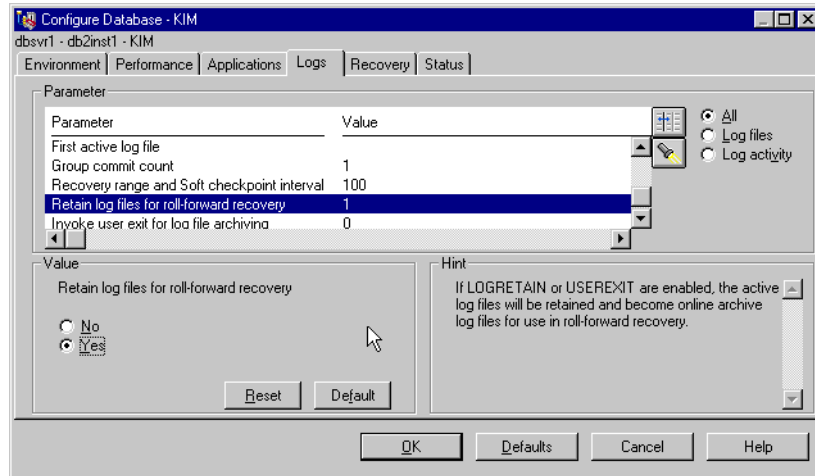


Figure 89. DB2 CC database KIM configure for log-retain

On the lower left hand panel, change this value to Yes, which should reflect as a value of 1. Click on **OK** to finish.

5. A warning message will appear.

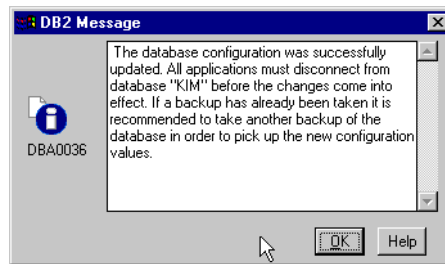


Figure 90. DB2 CC database KIM database configuration updated

Click on **OK** to continue.

You must now stop the Net.Commerce Hosting Server instance and disconnect all applications from database KIM before the change will take effect.

6. Use your browser to stop the Net.Commerce Hosting Server instance. Our Net.Commerce Hosting Server is hosted on server chs1, hence, we will use our browser to visit <http://chs1:4444> and stop the instance with the Net.Commerce configuration manager.

7. Log in to the database server, which, in our example, is dbsvr1, as the DB2 instance owner (in our example, user ID db2inst1). Type the following command:

```
$ db2 force application all
DB20000I The FORCE APPLICATION command completed successfully.
DB21024I This command is asynchronous and may not be effective
immediately.
```

8. Check that no applications are now connected to the database with the command:

```
$ db2 list application
SQL1611W No data was returned by Database System Monitor.
```

9. At this point in time, since we have just turned on logretain, our example database KIM will be in backup pending mode (Backup pending = NO). To check this, use the db2 get db cfg command as follows:

```
$ db2 get db cfg for kim

      Database Configuration for Database kim

Database configuration release level           = 0x0800
Database release level                       = 0x0800

Database territory                           = en_US
Database code page                           = 819
Database code set                            = ISO8859-1
Database country code                        = 1

Directory object name                        (DIR_OBJ_NAME) =
Discovery support for this database          (DISCOVER_DB) = ENABLE

Degree of parallelism                        (DFT_DEGREE) = 1
Default query optimization class            (DFT_QUERYOPT) = 5
Continue upon arithmetic exceptions          (DFT_SQLMATHWARN) = NO
Number of frequent values retained          (NUM_FREQVALUES) = 10
Number of quantiles retained                (NUM_QUANTILES) = 20

Backup pending                               = YES

Database is consistent                       = YES
Rollforward pending                         = NO
Restore pending                             = NO

Multi-page file allocation enabled          = NO

Log retain for recovery status              = NO
```

```
User exit for logging status = NO
```

10. Notice that Log retain for recovery status is set to NO. This parameter value will not be updated until after we have performed the requisite backup of the database.

11. Now back up the database KIM. For our example, we will back up database KIM to a directory called backup, which is located in the home directory of db2inst1, with the following command (and resulting success message):

```
$ db2 backup database kim to /home/db2inst1/backup/  
Backup successful. The timestamp for this backup image is :  
19990708105628
```

12. Check the database configuration for database KIM again with the command (and subsequent information):

```
$ db2 get db cfg for kim
```

Database Configuration for Database kim

```
Database configuration release level = 0x0800  
Database release level = 0x0800  
  
Database territory = en_US  
Database code page = 819  
Database code set = ISO8859-1  
Database country code = 1  
  
Directory object name (DIR_OBJ_NAME) =  
Discovery support for this database (DISCOVER_DB) = ENABLE  
  
Degree of parallelism (DFT_DEGREE) = 1  
Default query optimization class (DFT_QUERYOPT) = 5  
Continue upon arithmetic exceptions (DFT_SQLMATHWARN) = NO  
Number of frequent values retained (NUM_FREQVALUES) = 10  
Number of quantiles retained (NUM_QUANTILES) = 20  
  
Backup pending = NO  
  
Database is consistent = YES  
Rollforward pending = NO  
Restore pending = NO  
  
Multi-page file allocation enabled = NO  
  
Log retain for recovery status = YES  
User exit for logging status = NO
```


13. The database is now out of backup pending mode (Backup pending = NO), and logretain is enabled (Log retain for recovery status = YES). The database is now available for roll-forward recovery mode.

14. Restart the Net.Commerce Hosting Server instance.

4.3.3 Table level backup

There are certain situations where you may need to take a table backup, rather than a database backup. A DB2 database backup cannot be used to restore at a table level, that is, restore a single table out of the entire database. We must use a different mechanism to back up and restore individual tables. This is the DB2 EXPORT utility.

4.3.3.1 Export

The DB2 EXPORT utility exports data from a database into an operating system file. The output file has the format specified by the data format parameter.

The following information is required when exporting data:

- A SELECT statement specifying the data to be exported.
- The path and name of the operating system file that stores the exported data.
- The format of the data in the input file. This format can be IXF, WSF, or DEL. See section 4.3.3.2, “EXPORT file formats” on page 250, for further detail about these formats.
- A message file name.

You may also provide the following information:

- A method that allows you to specify new column names when exporting to IXF or WSF files. If this method is not specified, the column names from the table or view are used in the exported file.
- A file type modifier to specify additional format information when creating DEL and WSF files.

You must have SYSADM authority, DBADM authority, CONTROL privilege, or SELECT privilege for each table participating in the export.

EXPORT exports data

The EXPORT utility only exports data based on the SELECT statement used. The file storing the exported data, regardless of format (IXF, WSF, or DEL), cannot be used to recreate views, triggers, user defined types, referential integrity, constraints, and other database objects, since such data is never stored in the first place.

Some database objects can be re-created with the DB2LOOK utility (see Section 4.3.3.3, “DB2LOOK” on page 251). Other database objects must be re-created manually with the appropriate SQL statements.

A table may be saved by using the EXPORT utility and specifying the IXF file format. The saved table may be re-created using the IMPORT utility (DEL and WSF formats require the table be already defined). The EXPORT utility will fail if the data you want to export exceeds the space available on the file system on which the exported file will be created. In this case, you should limit the amount of data selected by specifying conditions on the WHERE clause so that the export file will fit on the target file system. You will have to run the EXPORT utility multiple times to export all the data you desire.

Database Connection

Before running the export utility, you must be connected or connected implicitly to the database from which the data will be exported. Also, the utility will issue a COMMIT statement; therefore, you should complete all transactions and release all locks by performing either a COMMIT or ROLLBACK before calling it.

DB2 Command Line Processor

The following is an example of the command line processor syntax for the EXPORT command:

```
db2 export to merchant.ixf of ixf select * from db2inst1.merchant
```

This example specifies an export system file name, of type IXF, a SELECT statement of everything, from the MERCHANT table, with a schema of db2inst1. With the command line processor, the message file is optional, as any messages will be displayed in the command line window.

For a comprehensive look at this command, please refer to the *IBM DB2 Universal Database Command Reference, Version 5.0, S10J-8166*.

DB2 Control Center

Using the DB2 Control Center, we can select the table to be exported. Right click and select **Export** to start the EXPORT utility

In the following example, we will export the table called merchant from the database KIM, on server dbsvr1, to an IXF format file called MERCHANT.IXF. We will place any messages from the `Export` command into a file called MERCHANT.MSG.

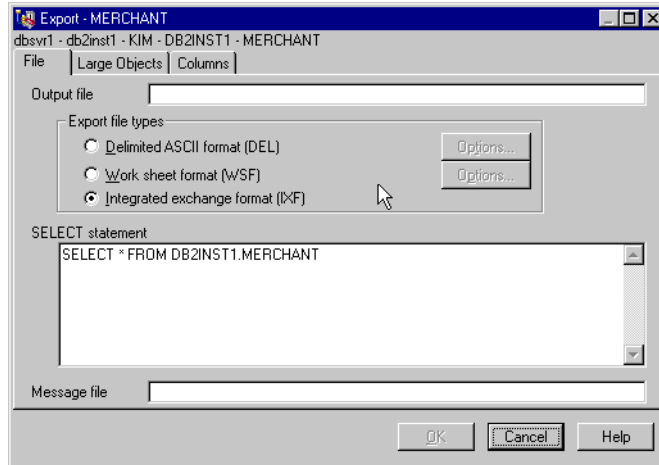


Figure 91. DB2 CC export table MERCHANT panel

1. By default, the Export file types option is set to Integrated file format (IXF).
2. In the Output file name, type in the fully qualified file name and path. We will store the file MERCHANT.IXF on our Windows NT workstation in `c:\tmp`. Hence, we type in `c:\tmp\MERCHANT.IXF`.
3. The SELECT statement, by default, will save the entire table. We will use this default.
4. The message file will also be placed in the `c:\tmp` directory. We type in the full path `c:\tmp\MERCHANT.MSG`. Note that, using the DB2 Control Center EXPORT table tool, this field is mandatory.
5. The Export - MERCHANT window should look as follows:

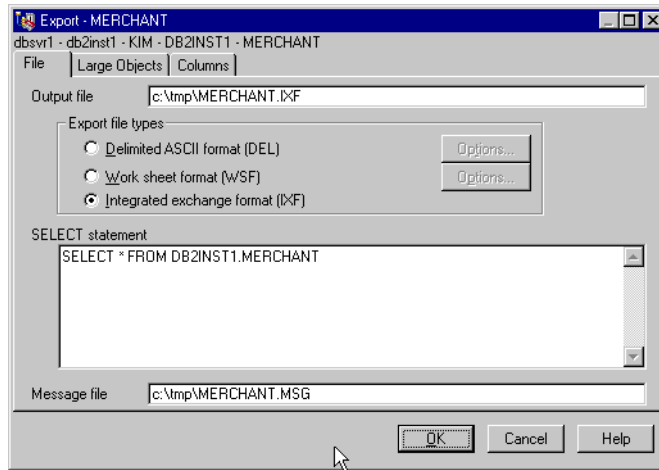


Figure 92. DB2 CC export table MERCHANT details

6. Once all the fields have been filled in, you will be allowed to click on **OK** to start the EXPORT. You will see a progress meter, and then a success message on successful completion of the EXPORT command.
7. Ensure you check the message file (MERCHANT.MSG) for any errors during the export.

For more detailed information about the use of this tool in the DB2 Control Center, click on the **Help** button of the EXPORT - table window.

4.3.3.2 EXPORT file formats

Three file types can be exported. The type indicates the format of the data within the operating system file. The supported file formats are:

- DEL

Delimited ASCII, for exchanging files with a wide variety of industry applications especially other database products. This is a commonly used way of storing data that separates column values with a special delimiting character.
- WSF

Work-Sheet formats, for exchange with products, such as Lotus 1-2-3 and Symphony. The DB2 LOAD utility does not support this data type. The database manager supports WSF files generated and/or supported by:

 - Lotus 1-2-3 Release 1, 1A, 2, and 2J

- Lotus Symphony Release 1.0 and 1.1
- IXF
PC version of the Integrated Exchange Format, the preferred method for exchange within the database manager. Use PC/IXF to export data from a table so that it can be imported later into the same or another table.

For DEL and WSF data file formats, define the table, including its column names and data types, before importing the file. The data types in the operating system file fields are converted into the corresponding type of data in the database table. The IMPORT utility accepts data with minor incompatibility problems, including character data imported with possible padding or truncation, and numeric data imported into different types of numeric fields.

For IXF data file formats, the table does not need to exist before beginning the import. It can be automatically created when the data is imported. User-defined distinct types (UDTs) are not made part of the new table column types, instead, the base type is used. Similarly, when exporting to the IXF data file format, UDTs are stored as base data types in the IXF file.

There are advantages and disadvantages to each of these formats. Please refer to the *IBM DB2 Universal Database Administration Guide, Version 5.0*, S10J-8157 for more details.

4.3.3.3 DB2LOOK

There are situations where you may need to re-create a database, table, or index without using a database backup or having access to an IXF format export file. You may also wish for help in automating the re-creation of certain database objects, for example, views, constraints, and keys. In this case, you can use the db2look tool to help in the writing of the Data Definition language (DDL) for the re-creation of these database objects.

The db2look productivity tool is included with DB2 UDB. It works by extracting DDL statements with the `-e` option. You can then run the command processor script created from this command against another database to re-create the database.

For example, to re-create the MERCHANT table in the database KIM, you would type the following:

```
db2look -e -d kim -t merchant
```

A sample output is provided in Appendix B., “DB2LOOK sample output” on page 303. Note that, apart from the DDL for the MERCHANT table, DDL is

also generated to re-create the database layout (in terms of table spaces and their containers), primary and foreign keys, constraints, and database views.

Please refer to the *IBM DB2 Universal Database Command Reference, Version 5.0*, S10J-8166, for more information about the db2look tool.

Triggers and UDFs

Currently, DB2LOOK does not support:

- Creation of Triggers
- Creation of UDFs (User Defined Functions)
- Reference to UDFs

You will have to re-create these database objects manually with the appropriate SQL statements.

Chapter 5. CSP site administration

In this chapter, we discuss the issues related with NCHS site administration. These subjects are how to delete obsolete stores, how to back up the database, how to tune an NCHS system, and other miscellaneous tips.

5.1 How to delete stores

An important function for the CSP is the ability to remove stores. These could be stores that were created for evaluation and never purchased or stores for merchants who choose not to continue their hosted operation.

To completely remove a store, all of its data in the database and all of its files on disk must be deleted. Deleting a store consists of two parts. First, you must manually delete all the HTML files and Net.Data macro files related with the store. Second, you must delete the records in the NCHS database by using the `ncclean` utility.

Note

If you just created a store but did not publish or open it, the files for the store are not created yet. So, you do not have to delete them.

There are three directories under `/usr/lpp/NetCommerce3/macro/` as follows:

```
/usr/lpp/NetCommerce3/macro> ls  
C      en_US  prime
```

They have same sub-directories and files of a specific store. But, you do not have to delete them one by one. If you delete one directory of them, the rest are deleted together.

For example, we made a sample store CHStore (see, Figure 93 on page 254).

Net.Commerce

Store Records

Store Name

Store State

Company Information

Currency Store Category

Store Directory Name (Do Not Use)

Store Domain Name (e.g. www.mystore.com)

Store Description

Store Number	Store Name	Currency	State	Domain Name	Path
2826	CHStore	USD	New		CHStore
251	David	USD	Open		david

Figure 93. Sample store CHStore information

If you want to delete a store, you must do the following steps:

- Identify the store number of the store. One of the ways to identify the store number is by Net.Commerce administrator as shown in Figure 96.
- Remove the store number directory under `/usr/lpp/NetCommerce3/CHS/source`

```
/usr/lpp/NetCommerce3/CHS/source> ls -l
total 32
drwxrwxrwx  3 nobody  nobody    512 Jun 24 10:33 251
drwxrwxrwx  3 nobody  nobody    512 Jul  2 17:03 2826
drwxrwxrwx  2 nobody  nobody    512 Jun 23 14:53 null
dr-xr-xr-x  3 bin     bin       512 Jun 23 14:53 sample
```

```
/usr/lpp/NetCommerce3/CHS/source> rm -r 2826
```

- Remove the store directory under `/usr/lpp/internet/server_root/pub/`.

```
/usr/lpp/internet/server_root/pub> ls -l
total 448
drwxrwxrwx  3 nobody  nobody    512 Jun 24 10:36
-rw-r--r--  1 db2inst1 db2iadml    0 Jul  2 14:06 11104.ncpid
-rw-r--r--  1 db2inst1 db2iadml    0 Jul  2 14:06 12156.ncpid
```



```

.....
-rw-r--r-- 1 db2inst1 db2iadml      0 Jun 07 21:37 23040.ncpid
drwxrwxrwx 2 nobody  nobody      512 Jul 02 17:04 CHStore
-rw-r--r-- 1 bin    bin          2824 Nov 04 1998 Frntpage.html
.....

```

```
/usr/lpp/internet/server_root/pub> rm -r CHStore
```

- Remove the store directory under /usr/lpp/NetCommerce3/macro/en_US.

```

/usr/lpp/NetCommerce3/macro/en_US> ls -l
total 112
drwxrwxrwx 2 nobody  nobody      1024 Jul 02 17:04 CHStore
drwxrwxrwx 2 bin    bin          1024 Jun 23 14:51 CSPstoremodel
dr-xr-xr-x 2 bin    bin          1024 Jun 23 14:51 bus2bus
drwxrwxrwx 6 bin    bin          1024 Jul 06 15:36 category
dr-xr-xr-x 2 bin    bin          512 Jun 23 14:51 cspmall
drwxrwxrwx 2 nobody  nobody      1024 Jun 24 10:36 david
dr-xr-xr-x 2 bin    bin          512 Jun 23 14:51 demomall
dr-xr-xr-x 3 bin    bin          512 Jun 23 14:51 euomall
drwxr-xr-x 2 bin    bin          512 Jun 23 14:51 general
dr-xr-xr-x 3 bin    bin          1024 Jun 23 14:51 grocery
dr-xr-xr-x 7 bin    bin          512 Jun 23 14:51 ncadmin
dr-xr-xr-x 2 bin    bin          2048 Jun 23 14:51 ncsample
drwxrwxrwx 6 bin    bin          512 Jul 06 15:36 product
dr-xr-xr-x 3 bin    bin          1024 Jun 23 14:51 tutorial

```

```
/usr/lpp/NetCommerce3/macro/en_US> rm -r CHStore
```

- Remove the sub-directory under /usr/lpp/NetCommerce3/macro/en_US/product/.

```

/usr/lpp/NetCommerce3/macro/en_US/product> ls -l
total 208
drwxrwxrwx 2 nobody  nobody      512 Jul 02 17:04 CHStore
dr-xr-xr-x 2 bin    bin          512 Jun 23 14:51 CSPstoremodel
drwxrwxrwx 2 nobody  nobody      512 Jun 24 10:35 david
-r--r--r-- 1 bin    bin          2619 Dec 09 1998 g_itemdsp.d2w
-r--r--r-- 1 bin    bin          5687 Dec 09 1998 product1.d2w
-r--r--r-- 1 bin    bin          5981 Dec 09 1998 product2.d2w
-r--r--r-- 1 bin    bin          6395 Dec 09 1998 productNG.d2w
-r--r--r-- 1 bin    bin          2821 Jun 04 1998 t_itemdsp.d2w
-r--r--r-- 1 bin    bin          4812 Dec 09 1998 tempbas1.d2w
-r--r--r-- 1 bin    bin          7132 Dec 09 1998 tempclo2.d2w
-r--r--r-- 1 bin    bin          7167 Dec 09 1998 tempclo3.d2w
-r--r--r-- 1 bin    bin          5701 Dec 09 1998 tempclot.d2w
-r--r--r-- 1 bin    bin          5730 Dec 09 1998 tempcomp.d2w
-r--r--r-- 1 bin    bin          5765 Dec 09 1998 temphard.d2w
-r--r--r-- 1 bin    bin          3886 Dec 09 1998 tempite2.d2w
-r--r--r-- 1 bin    bin          7094 Dec 09 1998 tempitem.d2w

```

```
/usr/lpp/NetCommerce3/macro/en_US/product> rm -r CHStore
```

- Remove the sub-directory under /macro/en_US/category/.

```

/usr/lpp/NetCommerce3/macro/en_US/category> ls -l |more
total 456
drwxrwxrwx 2 nobody  nobody      512 Jul 02 17:04 CHStore
dr-xr-xr-x 2 bin    bin          512 Jun 23 14:51 CSPstoremodel
-r--r--r-- 1 bin    bin          2882 Dec 09 1998 b_catalog.d2w
-r--r--r-- 1 bin    bin          9406 Dec 09 1998 b_subgroup.d2w
-r--r--r-- 1 bin    bin          3095 Dec 09 1998 cat_bas1.d2w

```

.....

```
/usr/lpp/NetCommerce3/macro/en_US/category> rm -r CHStore
```

- Remove the store data from the database.

```
# su - db2inst1
```

```
/usr/lpp/NetCommerce3/bin> ncclean -merchant "CHStore" -db kim -dbuser  
db2inst1 -dbpasswd ibmdb2
```

Database Cleanup Utility for Net.Commerce Version 3.1

(c) Copyright IBM Corporation 1997, 1998. All rights reserved.

```
19990706170752  
Tue Jul 6 17:07:52 1999  
CMN1501I Database Cleanup Utility started.  
19990706170752CMN1601I For utility processing details, see the log file  
dbclog  
.txt.  
19990706170752  
Tue Jul 6 17:07:59 1999  
CMN1502I Database Cleanup Utility completed.
```

If you delete store data from your database successfully, you will see the following log file:

```
/usr/lpp/NetCommerce3/bin> pg dbclog.txt  
Tue Jul 6 17:07:52 1999
```

```
CMN1501I Database Cleanup Utility started.  
19990706170752CMN1533I 0 Row(s) from onqueue table deleted successfully.  
.....  
19990706170753CMN1533I 24 Row(s) from macros table deleted successfully.  
19990706170753CMN1533I 0 Row(s) from apis table deleted successfully.  
19990706170753CMN1533I 0 Row(s) from cachlog table deleted successfully.  
19990706170753CMN1533I 0 Row(s) from shipto table deleted successfully.  
19990706170753CMN1533I 0 Row(s) from orders table deleted successfully.  
19990706170753CMN1533I 0 Row(s) from shoppings table deleted successfully.  
19990706170753CMN1533I 3 Row(s) from catesgp table deleted successfully.  
19990706170753CMN1533I 5 Row(s) from prodsgp table deleted successfully.  
19990706170753CMN1533I 0 Row(s) from proddstatr table deleted successfully.  
19990706170753CMN1533I 18 Row(s) from prodatr table deleted successfully.  
19990706170753CMN1533I 5 Row(s) from prodprcs table deleted successfully.  
19990706170754CMN1533I 5 Row(s) from cgprrel table deleted successfully.  
19990706170754CMN1533I 3 Row(s) from cgryrel table deleted successfully.  
19990706170754CMN1533I 5 Row(s) from product table deleted successfully.  
19990706170754CMN1533I 3 Row(s) from category table deleted successfully.  
19990706170755CMN1533I 0 Row(s) from discalc table deleted successfully.  
19990706170755CMN1533I 0 Row(s) from disccode table deleted successfully.  
19990706170755CMN1533I 0 Row(s) from scale table deleted successfully.  
19990706170755CMN1533I 0 Row(s) from shipping table deleted successfully.  
19990706170755CMN1533I 0 Row(s) from prspcode table deleted successfully.  
19990706170755CMN1533I 0 Row(s) from mshipmode table deleted successfully.  
.....  
19990706170755CMN1533I 1 Row(s) from merchant table deleted successfully.  
19990706170758
```

```
*****
STATUS CMN0003S: Database 'mser' has been committed.
*****

19990706170759

Tue Jul 6 17:07:59 1999
CMN1502I Database Cleanup Utility completed.
19990706170759
=====
```

Note

For the Database Cleanup utility to function properly in AIX, you must define the `/usr/lpp/NetCommerce3/bin` path in the `.profile` file of your home directory.

By default, the Database Cleanup utility will write to a log file on the current directory. Make sure the directory is writable or use the `-log` option to define a new location for the log file.

5.2 How to start/stop NCHS components

This section describes how to start and stop each component that is provided as part of the Net.Commerce Hosting Server package. Refer to this section if you want to stop and start any component.

5.2.1 Starting and stopping Net.Commerce Hosting Server

The follow sections show how to start and stop each component of the Net.Commerce Hosting Server.

5.2.1.1 Starting NCHS from the Configuration Manager

To start Net.Commerce Hosting Server from the Configuration Manager, do the following:

1. Ensure that DB2 is started. For more information, refer to Section 5.2.3, "Starting and stopping DB2" on page 262.

```
$ db2start
SQL1026N The database manager is already active.
```

2. To start the Configuration Manager, while logged on as user ID root, on an AIX command line, switch to the `/usr/lpp/NetCommerce3/server/bin` directory and type: `./start_admin_server`

```
/usr/lpp/NetCommerce3/server/bin> ./start_admin_server
```

```
License Manager
All rights reserved.
(C) Copyright IBM Corp. 1998, All rights reserved.
```

Found valid license key for product db2

```
License Manager
All rights reserved.
(C) Copyright IBM Corp. 1998, All rights reserved.
```

Found valid license key for product db2

Using default port 4444 ...

```
en_US is the locale being used
#####
####
### Starting Net.Commerce Server Administrator on port 4444
### To configure Net.Commerce open URL http://chs2:4444/
#####
```

If the Configuration Manager has already started, you do not need to start the Administration server.

3. Open your Web browser and go to: http://host_name:4444

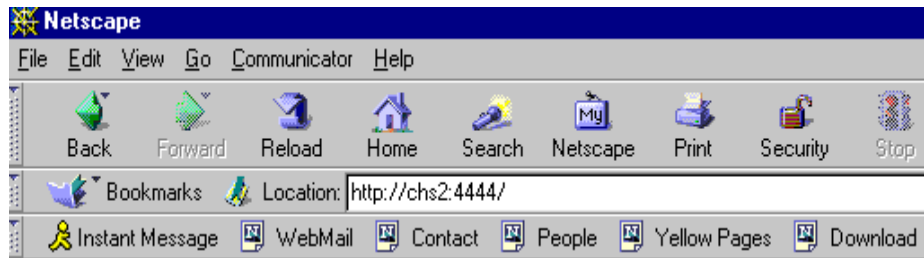


Figure 94. Loading configuration manager screen

4. When prompted, enter your Configuration Manager user ID and password. The default user ID is webadmin, and the password is webibm, if you have not changed yet.
5. From the list of instances, select the instance you want to start and click **Start**. If the Net.Commerce Hosting Server instance is started, it will indicate an Active status.



Figure 95. Configuration Manager screen (Active status)

5.2.1.2 Starting NCHS from the command line

To start Net.Comemrce Hosting Server from the command line, do the following:

1. Ensure that DB2 is started. For information on starting DB2, refer to Section 5.2.3, “Starting and stopping DB2” on page 262.

```
$ db2start
SQL1026N The database manager is already active.
```

2. While logged on as your DB2 instance ID or the Instance Owner ID, on an AIX command line, switch to the /usr/lpp/NetCommerce3/bin directory and execute `srvrctrl` as follows:

```
/> su - db2inst1
$ pwd
/home/db2inst1
$ cd ../../usr/lpp/NetCommerce3/bin
$ pwd
/usr/lpp/NetCommerce3/bin
$ srvrctrl -i /usr/lpp/internet/server_root/pub/srvrctrl.conf
```

where:

/usr/lpp/internet/server_root/pub is the document root for this instance of Net.Commerce Hosting Server.

5.2.1.3 Stopping NCHS using the Configuration Manager

To stop Net.Commerce Hosting Server using the Configuration Manager, do the following:

1. To start the Configuration Manager, while logged on as user ID root, on and AIX command line, switch to the /usr/lpp/NetCommerce3/server/bin directory and type: /start_admin_server (see Step 2 in Section 5.2.1.1, “Starting NCHS from the Configuration Manager” on page 257)
2. Open your Web browser and go to: http://host_name:4444 (see Figure 94 on page 258.)
3. When prompted, enter your Configuration Manager user ID and password. The default user ID is webadmin, and the password is webibm, if you have not changed yet.
4. From the list of instances, select the instance you want to stop and click **Stop**. The state should indicate Inactive.



Figure 96. Configuration Manager screen (Inactive status)

5.2.1.4 Stopping NCHS from the command line

Stopping Net.Commerce Hosting Server requires:

1. Stopping the Net.Commerce Hosting Server server controller process as follows:

From the shell prompt, switch to the document root directory for your instance. If the server control is running, you would see the `svrctrl.pid` file that contains the process ID of the running Net.Commerce Hosting Server Server controller. To terminate the process, type the following:

```
/usr/lpp/internet/server_root/pub> pg svrctrl.pid
15764 Ready
/usr/lpp/internet/server_root/pub> kill 15764
```

where:

15764 is the process ID. If the `svrctrl.pid` file is missing, and your instance's `svrctrl` process is running, use the command:

```
/usr/lpp/internet/server_root/pub> ps -ef | grep svrctrl
```

You can perform an explicit terminate using the `kill` command as described above.

2. Stopping all processes spawned by the server controller as follows:

Each process invoked by the server controller creates a `ncpid` file indicates the process ID that it belongs to. The `ncpid` files are in the document root directory.

From the shell prompt in the document root directory, list all `ncpid` files by typing: `ls -l *.ncpid`

```
/usr/lpp/internet/server_root/pub> ls -l *.ncpid
-rw-r--r-- 1 db2inst1 db2iadml 0 Jul 08 10:48 15232.ncpid
-rw-r--r-- 1 db2inst1 db2iadml 0 Jul 08 10:48 15484.ncpid
-rw-r--r-- 1 db2inst1 db2iadml 0 Jul 08 10:48 17804.ncpid
-rw-r--r-- 1 db2inst1 db2iadml 0 Jul 08 10:48 18062.ncpid
```

Use the `kill` command to terminate each of the process.

```
/usr/lpp/internet/server_root/pub> kill 15232
/usr/lpp/internet/server_root/pub> kill 15484
/usr/lpp/internet/server_root/pub> kill 17804
/usr/lpp/internet/server_root/pub> kill 18062
```

If the `ncpid` file is missing, use the following command to determine if Net.Commerce Hosting Server instance processes are running.

```
/usr/lpp/internet/server_root/pub> ps -ef | grep db2inst1 | grep
NetCommerce3
```

If they are, terminate each of the Net.Commerce Hosting Server processes using the `kill` command

where:

`db2inst1` is the Net.Commerce Hosting Server instance owner ID.

3. The Payment Server of Net.Commerce Hosting Server starts java processes. Stop all Java processes invoked by Net.Commerce Hosting Server as follows:

To list the Java processes, use the following command:

```
ps -ef | grep db2inst1 | grep java
```

Terminate each of the process using the `kill` command as in Step 2

where:

`db2inst1` is the Net.Commerce Hosting Server instance owner ID.

5.2.2 Starting and stopping Domino Go Webserver

To start the Domino Go Webserver, while logged on as user ID `root`, type:

```
/> whoami
root
/> startsrc -s httpd
0513-059 The httpd Subsystem has been started. Subsystem PID is 5426.
```

To stop Domino Go Webserver, while logged on as user ID `root`, type:

```
/> whoami
root
/> stopsrc -s httpd
0513-044 The stop of the /usr/sbin/httpd Subsystem was completed
successfully.
```

To check the Domino Go Webserver status, type:

```
/> lssrc -s httpd
Subsystem      Group      PID      Status
httpd          tcpip     5426     active
```

5.2.3 Starting and stopping DB2

To start DB2, while logged on as your database instance ID, type: `db2start`

```
/> su - db2inst1
$ db2start
SQL1063N  DB2START processing was successful.
```


To stop DB2, do the following:

1. Stop Net.Commerce Hosting Server according to the instructions in 5.2.1, “Starting and stopping Net.Commerce Hosting Server” on page 257.
2. While logged on as your database instance ID, type as following:

```
$ db2 force applications all
DB20000I The FORCE APPLICATION command completed successfully.
DB21024I This command is asynchronous and may not be effective
immediately.

$ db2 terminate
DB20000I The TERMINATE command completed successfully.

$ db2stop
SQL1064N DB2STOP processing was successful.
```

5.2.4 Starting and stopping Payment Server

By default, if Net.Commerce Hosting Server and Payment Server are installed on the same machine, Payment Server starts automatically when you start Net.Commerce Hosting Server, and it stops automatically when you stop Net.Commerce Hosting Server.

Note that after you install Payment Server in this configuration, you must allow it to start automatically at least once so the database can be automatically prepared.

After you have allowed it to start automatically once, if you want to prevent it from starting automatically, open the file

`/usr/lpp/internet/server_root/html/srvrctrl.conf` and remove `pay_etill` from the list of names on the `CONTROL_POOL_CONFIG` directive, along with its path name and the preceding comma.

```
/usr/lpp/internet/server_root/pub> pg srvrctrl.conf | more
MS_HOSTNAME fw3_int_boot.itsc.austin.ibm.com
CONTROL_DBNAME mser
CONTROL_DBINST db2inst1
CONTROL_DBPASS lmeuecPNBIU=
CONTROL_DB_RETRY_LIMIT 1
CONTROL_DB_RETRY_INTERVAL 20
MERCHANT_KEY QunGZnDUqUDK7yW0cEnk38vOvgkA01Ym
CONTROL_ERR_TOLERANCE 1
CONTROL_SERVICE ncmser
CONTROL_POOL_CONFIG
/usr/lpp/internet/server_root/pub/ncommerce,/usr/lpp/internet/server_root/
```

```
pub/pay_back, /usr/lpp/internet/server_root/pub/pay_etill, /usr/lpp/internet
/server_root/pub/pay_cyber, /usr/lpp/internet/server_root/pub/scheduler
MS_LOGPATH /usr/lpp/NetCommerce3/instance/mser/logs
MS_LOGLEVEL 2
```

Then, do the following to start Payment Server manually:

1. While logged on as the DB2 instance ID, switch to the `/usr/lpp/NetCommerce3/instance/mser/bin` directory, where `mser` is the name of Net.Commerce Hosting Server instance.
2. Type the following:

```
/usr/lpp/NetCommerce3/instance/mser/bin> ./ETill ibmdb2
```

where `ibmdb2` is the password you entered on the Database tab when you configured your Net.Commerce Hosting Server instance.

If you have installed Payment Server on a separate machine from Net.Commerce Hosting Server, and you have copied the ETill startup script to your Payment Server machine and modified it as described in Chapter 13, "Installing Payment Server on a Separate Machine" on page 57 in *the Installing at Getting Started Guide*, start Payment Server while logged on as your DB2 instance ID by switching to the `/usr/lpp/IBM_Payment_Server` directory and running `./ETill` as described above.

To stop Payment Server manually, whether it is running on the same machine as the Net.Commerce Hosting Server or on a separate machine, bring the Payment Server window into focus and press **Ctrl+C** on your keyboard. You can also use the `kill` command to kill the Payment Server process.

5.2.5 Starting and stopping DB2 Extenders

To start DB2 Text Extenders:

```
/> su - db2inst1
$ txstart
```

To stop DB2 Text Extenders:

```
/> su - db2inst1
$ txstop
```

5.3 Migrating a Net.Commerce Hosting Server instance

You may need to move your NCHS instance merchants and their respective stores from one server to another where a new NCHS instance resides. In such a case, it would not be wise to simply copy the entire file system where the Net.Commerce Hosting Server instance and DB2 database instances reside over to the new server.

Instead, you must move the merchants and stores in two parts:

1. Copy the physical directories that contain definitions and sources for the merchant Web pages, catalogs, products, categories, and so on, to the new server.
2. Backup the Net.Commerce Hosting Server database, and restore it to the new server.

The new server we refer to may actually consist of two servers: One server for the NCHS instance and one server as the backend NCHS database server. In the following example, we will assume this scenario and separate the NCHS instance server from the NCHS database server.

Please also refer to the *IBM DB2 Universal Database Administration Guide, Version 5.0, S10J-8157* for more information about moving data, from a DB2 database viewpoint, between systems.

5.3.1 Directories

On the NCHS server, the following directories must be copied over to the new NCHS server in the same directory structure:

- Under the `/usr/lpp/NetCommerce3/` directory, they are:
 1. `CHS/source/storeid`
 2. `macro/en_US/storedir`
 3. `macro/en_US/product/storedir`
 4. `macro/en_US/category/storedir`
- `/usr/lpp/internet/server_root/pub directory/storedir`

where:

- *storeid* is the store ID generated by NCHS when the store is created.
- *storedir* is the store directory name as specified by the merchant on store creation.

The storeid and storedir values can also be found from the MCSPINFO table, in the Net.Commerce Hosting Server database. For example, issue the following SQL `select` command (with resultant example output):

```
$ db2 select MPMENBR, MPDIRNAME from MCSPINFO
MPMENBR MPDIRNAME
-----
176      clausstore
177      daisystore
178      kimstore
179      phingstore
```

where:

- storeid = MPMENBR in the MCSPINFO table.
- storedir = MPDIRNAME in the MCSPINFO table.

5.3.2 NCHS database

On the old NCHS database server, we wish to minimize downtime of the database. To achieve this, we can perform an online database backup, transfer the backup file over to the new NCHS database server, and copy all active logs in the SQLOGDIR path of the current NCHS database server to the SQLOGDIR path on the new NCHS database server. Finally, we can then roll-forward the database through to all the transactions captured in the database logs that have occurred since the database backup.

5.3.2.1 Database logs

Before we start the online backup, we must know which database logs to start saving from, in order to capture all transactions that have occurred since the online backup was started.

To do so, you must log on to the NCHS database server as the database instance owner and issue the `db2 get database configuration` command. For example, to get the database configuration for the database KIM, we type:

```
$ db2 get db cfg for kim
... output truncated for brevity ...
Path to log files          =
/home/db2inst1/db2inst1/NODE0000/SQLO0001/SQLOGDIR/
Next active log file      = S0000002.LOG
First active log file     = S0000000.LOG
... and so on ...
```

Among the list of values presented, we are interested in two:

- The Path to the log files. This tells us where to find the log files used by DB2.
- The First active log file. This tells us which log file is the currently active log file and, hence, the first of the series of log files that we must then copy over to the new database server when the restore of the online backup is to be performed.

5.3.2.2 Online database backup

There are two ways to perform an online backup; using the DB2 command line processor, or using the DB2 Control Center.

Online backup with DB2 command line processor

To back up the database KIM to a directory called /home/db2inst1/backup, issue the following command (with expected result):

```
$ db2 backup database kim online to /home/db2inst1/backup/
Backup successful. The timestamp for this backup image is : 19990709114204
```

For further information about the DB2 BACKUP command, please refer to the *IBM DB2 Universal Database Command Reference, Version 5.0*, S10J-8166.

Online backup with DB2 Control Center

To backup the database KIM to a directory called /home/db2inst1/backup, start up the DB2 Control Center, then select and right click on the **KIM** database.

1. Choose **Backup** → **Database** (you may also choose to use the Backup database smartguide).
2. You will be presented with the Backup database panel as shown in the following screen shot.

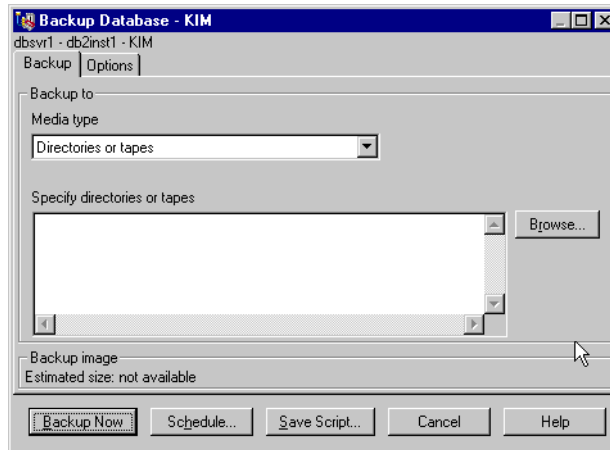


Figure 97. DB2 CC backup database KIM panel

3. We wish to save the backup on a directory called `/home/db2inst1/backup`. Therefore, ensure that the **Media type** parameter is set to **Directories or tapes**.
4. Click on **Browse** for the Specify directory or tape option and type in a path of `/home/db2inst1/backup` when the Path browser panel appears. Click **OK** to accept the value. You should now have the following Backup database - KIM panel:

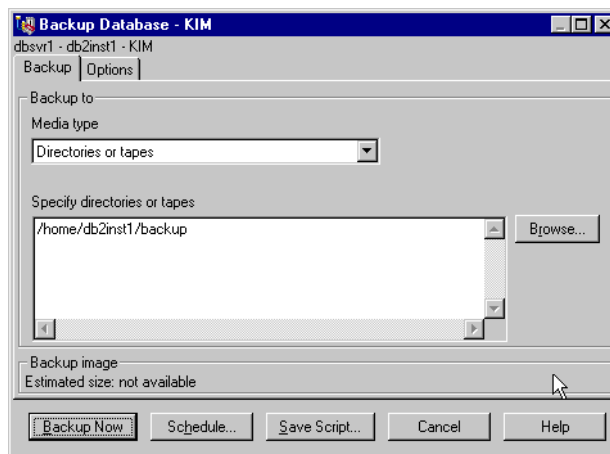


Figure 98. DB2 CC backup database KIM details

5. To choose this to be an online backup, click on the **Options** tab.
6. Choose the **Process while Online** option.

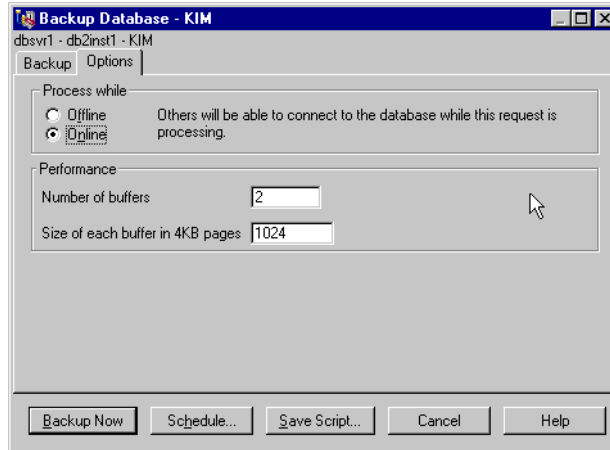


Figure 99. DB2 CC backup database KIM online option

7. Finally, click on **Backup Now** to start the backup. If prompted, type in the user ID of your database instance and password.

5.3.2.3 Copy database log files

After the online backup has completed, remember to copy the database log files associated with this online backup. As mentioned in 5.3.2.1, “Database logs” on page 266, start from the first active log and copy it and all subsequent logs to a backup location that is associated with your online backup image.

You will need these logs for our restore from the online backup example.

5.3.2.4 Restore with roll-forward from an online backup

You can perform the restore from either the DB2 command line processor or by using the DB2 Control Center. Ensure the backup file has been copied from the current database server to the new database server and that the file and directory permissions allow access for the DB2 instance owner on the new database server.

In the following section, we will perform a database restore using the DB2 command line processor. For information on how to perform a restore using the DB2 control center, please refer to the respective Help button of the DB2 Control Center / Restore database option.

Restore with DB2 command line processor

Let us assume the database KIM has had an online backup (see , “Online backup with DB2 command line processor” on page 267) taken. We wish to restore this to another database server while maintaining the same table space container structures (for information regarding redirecting table space containers, please refer to the *DB2 Command Reference*).

Ensure the logical volumes are defined and available for use by the database instance owner on our new database server. The logical volume container raw devices must be named the same as they are on the old database server, that is, /dev/rdblv1 through to /dev/rdblv6, and the database instance owner db2inst1 must have read/write permission on these containers. The DB2 IMPORT utility will then use the IXF file information to re-create the table spaces with their respective containers.

We will also copy the backup files from our old database server to the new server together with the log files found in /home/db2inst1/db2inst1/NODE0000/SQL00001/SQLLOGDIR (the Path to log files), immediately after the online backup was taken. These files will be placed in a directory called backup on our new database server in the instance home directory.

Now we are ready to restore the database KIM, roll forward, and bring the database out of roll-forward pending mode to be accessed on our new database server.

1. Log on as the database instance owner, db2inst1, and type the following:

```
db2 restore database KIM from /home/db2inst1/backup taken at
19990709114204
```

The timestamp, indicated by the `taken at` keyword, can be identified by the backup file. In our example, the KIM online backup has a file name of KIM.0.db2inst1.NODE0000.CATN0000.19990709114204.001. Therefore, the timestamp is 19990709114204.

2. Once the restore completes, you can check the roll-forward status of the KIM database by issuing the following `db2 rollforward` command (with expected result):

```
$ db2 rollforward database KIM
```

```
Rollforward Status
```

```
Input database alias           = kim
Number of nodes have returned status = 1
```



```
Node number                = 0
Rollforward status         = DB pending
Next log file to be read   = S0000000.LOG
Log files processed        = -
Last committed transaction = 1999-07-09-11.40.27.000000
```

This shows that database KIM is in roll-forward pending mode and, hence, cannot be accessed until the database logs have been copied over.

3. Copy the log files over from the backup directory into the log file path as indicated by the Path to log files parameter of the new database configuration. Use the `db2 get db cfg for KIM` command to determine the path to log files. See section 5.3.2.1, "Database logs" on page 266, for an example of the DB CFG output.

For our example, we will copy the S0000000.LOG through to S0000002.LOG files from the backup directory to the /home/db2inst1/NODE0000/SQL00001/SQLOGDIR directory.

4. We can now roll-forward to the end of logs and stop the database roll-forward mode with the following command:

```
db2 rollforward db KIM to end of logs and stop
```

Rollforward Status

```
Input database alias       = kim
Number of nodes have returned status = 1

Node number                = 0
Rollforward status         = not pending
Next log file to be read   =
Log files processed        = S0000000.LOG - S0000002.LOG
Last committed transaction = 1999-07-9-11.40.27.000000
```

```
DB20000I The ROLLFORWARD command completed successfully.
```

5. The online backup of database KIM has been restored and rolled forward to a successful completion. The database can now be accessed.

5.4 NCHS performance tuning

There are four primary areas for tuning NCHS:

- Database
- Web server
- Net.Commerce server

- Dynamic page caching

We will explore each subject one by one in the following sections.

5.4.1 Tuning NCHS database

Among the above items, database tuning is the broadest and the most complicated subject. To make it easier, we begin with how to use the DB2 Control Center to tune the database.

5.4.1.1 Using DB2 Performance Smartguide

In this section, we discuss the use of the DB2 Performance Configuration Smartguide, in the performance tuning of the various database and database manager parameters within DB2 UDB.

We will use the Performance Configuration Smartguide to initialize the DB2 configuration parameters for Net.Commerce Hosting Server purposes.

To access the DB2 Control Center Performance Configuration Smartguide tool, you will use the DB2 Control center in the following fashion:

1. Start up the DB2 Control Center using the Windows NT Start Bar Start Æ Programs Æ DB2 for Windows NT Æ Administrative Tools -> Control Center.
2. You will be presented with the DB2 Control Center interface as shown in the following figure.

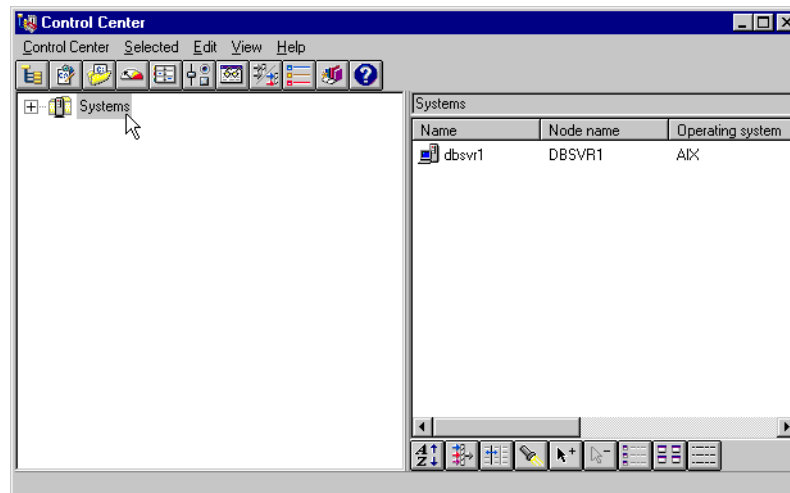


Figure 100. DB2 CC panel

Expand the subtree under Systems, dbsvr1, Instances, db2inst1, and you will find the database KIM that we previously added using the DB2 CCA.

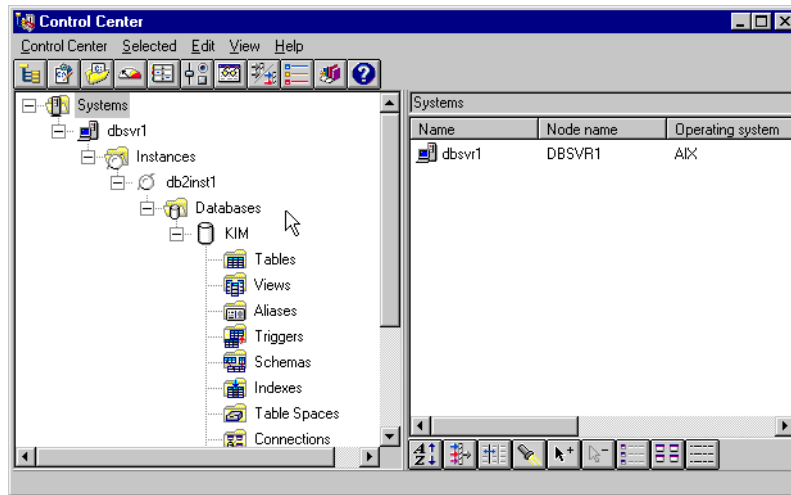


Figure 101. DB2 CC database KIM

3. Select database KIM, then click the right mouse button and select **Configure for Performance**.

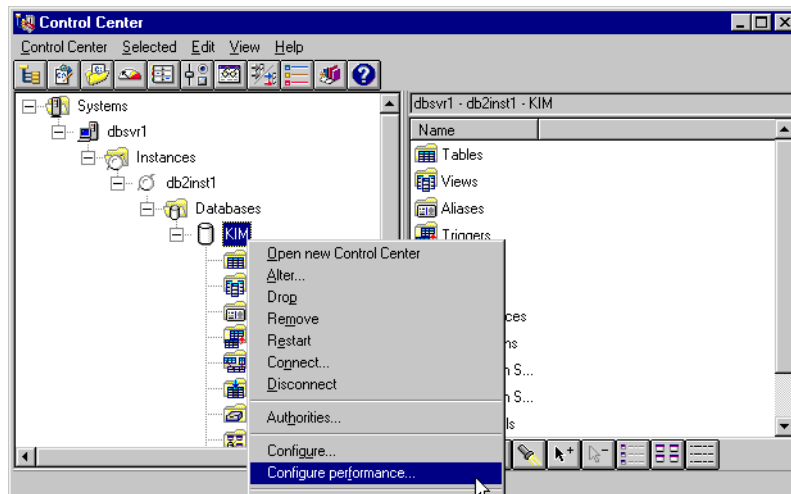


Figure 102. DB2 CC Configure performance smartguide choice

4. You will now be presented with the DB2 UDB Performance Configuration Smartguide.

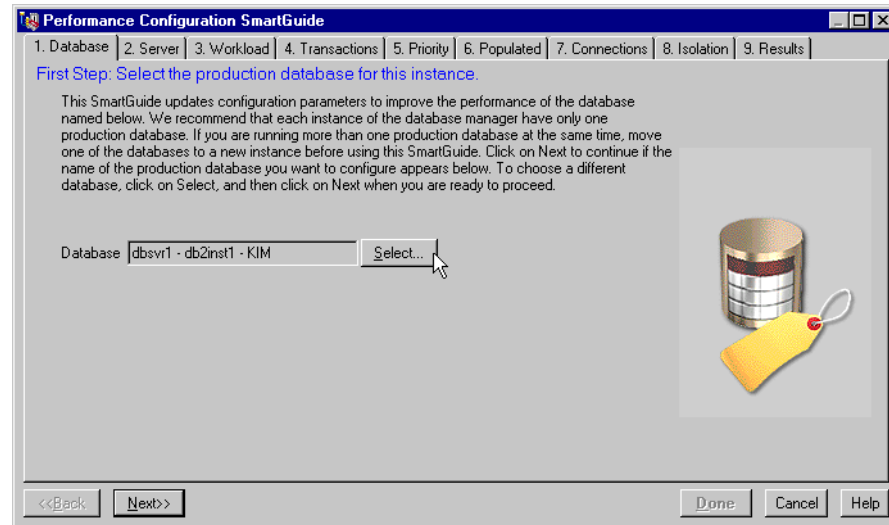


Figure 103. DB2 CC Performance Configuration Smartguide

This interface will allow us to configure the selected DB2 database for performance tuning. We will now go through each of the tabs:

1. The first step is to select the appropriate database to be configured. It is a recommendation that you only have one database per instance.
If it is not already selected, click on **Select**, choose the database you wish to optimize, and then click on **Next**.
2. The next panel allows you to configure the amount of memory for DB2 to use on the database server. Accept the default, and click on **Next** to continue.
3. The workload panel is next. This panel allows you to optimize the database for mostly queries, transactions, or a mixture of the both.

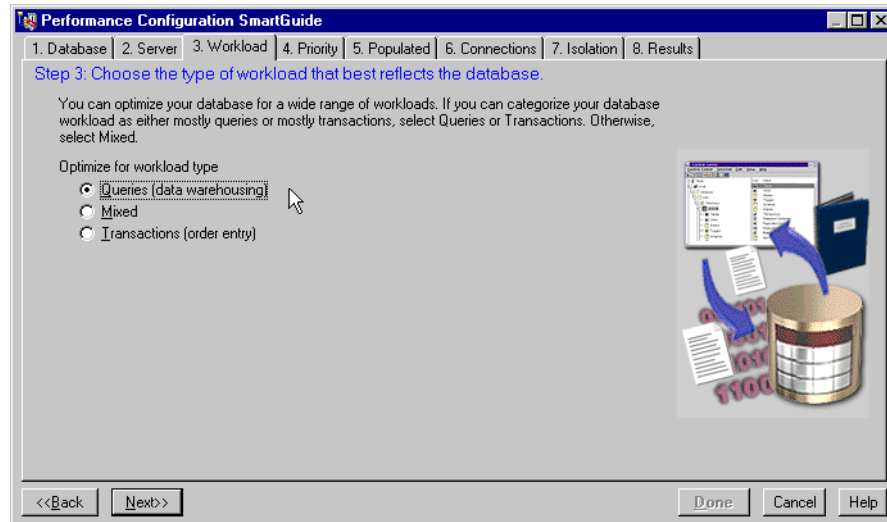


Figure 104. Define type of workload

DB2 performance analysis of typical Net.Commerce Hosting Server workload suggests that the majority of work on a database are reads. Therefore, we will select **Queries** to reflect the majority of workload. Notice the change in tabs on the DB2 Performance Configuration Smartguide when this option is chosen.

Click on **Next** to continue.

4. The next tab allows us to configure the database administration priority, choosing in importance between faster transaction time or faster recovery time. Accept the default (both are equally important) and click on **Next** to continue.
5. If the database is currently populated, this next tab in the DB2 Performance Configuration Smartguide will use the database data volume to refine certain optimization values.

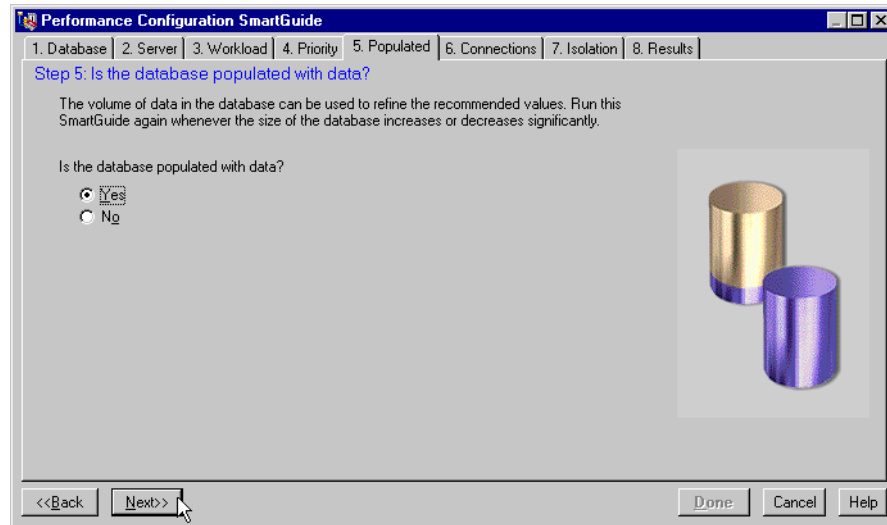


Figure 105. Choose data population

Be sure to rerun this Smartguide if database data volume significantly increases or decreases.

For now, click on **Next** to accept the default (**Yes**) and continue.

6. The next tab allows you to estimate the expected average number of concurrently held connections to the database. You can use the DB2 performance monitor to get more accurate data.

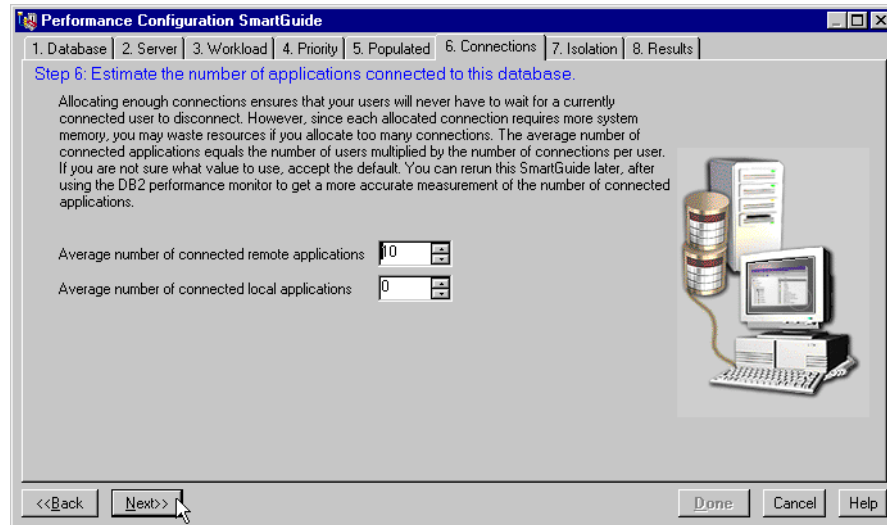


Figure 106. Define estimated concurrent connections

For now, accept the default presented by this panel. Click on **Next** to continue.

7. The second to last tab for the Smartguide allows us to choose an appropriate isolation level to apply to the database. In general, there are many locks held for only a short duration within a Net.Commerce Hosting Server database.

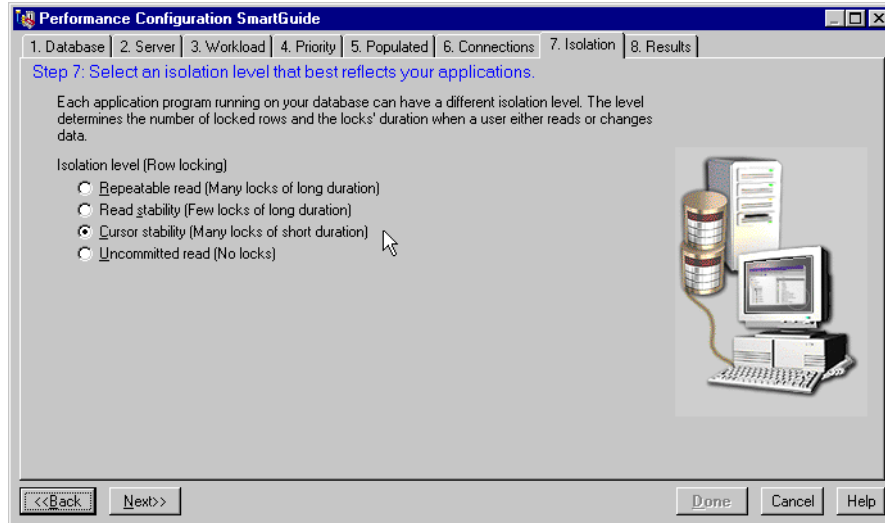


Figure 107. Define isolation level

Select **Cursor Stability** and click on **Next** to continue.

8. Our last panel displays the results of our choices in the preceding panels.

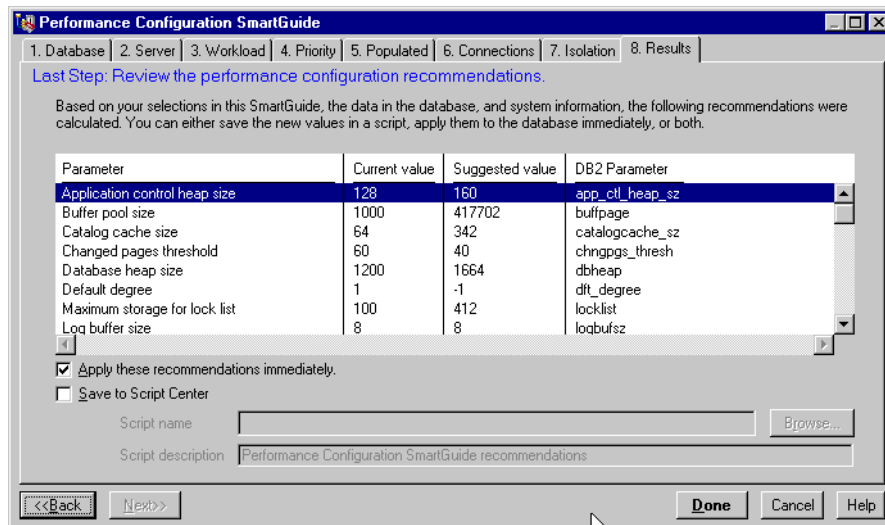


Figure 108. Recommended configuration

Click on **Done** to apply these changes immediately. Once this operation is complete, you are finished with the DB2 Performance Configuration Smartguide. You may choose to rerun the DB2 Performance Configuration Smartguide again at a later date.

DB2 System Resource Usage

Many of the configuration parameters available in DB2 effect memory usage on the system. Some may effect memory on the server, some on the client, and some on both. Furthermore, memory is allocated and de-allocated at different times and from different areas of the system.

Therefore , ensure you have sufficient system resources for the DB2 configuration parameters chosen. Refer to the section on Operational Performance in the *IBM DB2 Universal Database Administration Guide, Version 5.0*, S10J-8157 for more details.

For example, some UNIX operating systems allocate swap space when a process allocates memory and not when it is paged out to swap space. In this case, allocating a large buffer pool requires that you have sufficient paging space to back up the use of virtual memory.

5.4.1.2 Top database tuning points

The following points should be checked first to maintain the performance of the database.

- Ensure that there are an adequate number of disk drives for the database. four to six drives will be a good starting point.
- Since the database is constantly writing to its logs, the database logs should be dedicated to separate disk drives to reduce I/O contention. Two drives for logs is a moderate choice.
- Ensure to define adequate bufferpool size.
- Execute `db2 runstats` regularly to generate updated table statistics. This allows to generate more optimal access plan.
- The key database tables should be reorganized regularly. When a row in a table is deleted, the space occupied by the row is not necessarily reclaimed until the table is reorganized.

5.4.1.3 Major NCHS Database tuning parameters

We will discuss the various parameters that we wish to tune, for both the DB2 UDB database manager for our instance db2inst1, and the Net.Commerce Hosting Server database, KIM.

Configuring DB2

For further detail on these parameters, please refer to the chapter on Configuring DB2 in the *IBM DB2 Universal Database Administration Guide, Version 5.0*, S10J-8157.

These DB2 parameters are:

- **INTRA_PARALLEL**

This parameter specifies whether the database manager can use intra-partition parallelism.

In a symmetric multiprocessor (SMP) environment, the default for this parameter is YES. In a non-SMP environment, the default for this parameter is NO.

The `intra_parallel` parameter should be set to YES if low CPU utilization is expected, combined with more complex SQL. It should be set to NO if high CPU utilization is expected and mainly for OLTP transactions.

- **NUM_INITAGENTS**

This parameter determines the initial number of idle agents that are created in the agent pool at DB2START time.

It should be set to the average number of expected concurrent users.

- **CPUSPEED**

The CPU speed, in milliseconds per instruction, is used by the SQL optimizer to estimate the cost of performing certain operations. The value of this parameter is set automatically when you install the database manager.

You can explicitly set this value to model a production environment on your test system or to assess the impact of upgrading hardware. By setting it to -1, `cpuspeed` will be recomputed.

- **SHEAPTHRES**

This parameter is used to control the total amount of memory that can be allocated across the database manager instance for sort heaps. When the total amount of memory allocated to all sort heaps exceeds the threshold, the maximum sort heap that can be allocated to subsequent requests will be reduced.

Ideally, you should set this parameter to a reasonable multiple of the largest `sorheap` parameter you have in your database manager instance.

This parameter should be 10 times or more the largest sort heap defined for any database within the instance.

- **MAX_QUERYDEGREE**

This parameter specifies the maximum degree of intra-partition parallelism that is used for any SQL statement executing on this instance of the database manager. An SQL statement will not use more than this number of parallel operations within a partition when the statement is executed. The default value for this configuration parameter is -1. Take the default in most cases. This value means that the system uses the degree of parallelism determined by the optimizer; otherwise, the user-specified value is used.

- **DFT_DEGREE**

This parameter specifies the default value for the CURRENT DEGREE special register and the DEGREE bind option.

A value of 1 means no intra-partition parallelism. A value of -1 means the optimizer determines the degree of intra-partition parallelism based on the number of processors and the type of query. This value of -1 (ANY) is the recommended setting.

This option only takes effect if the INTRA_PARALLEL parameter is set to YES.

- **DFT_QUERYOPT**

The query optimization class is used to direct the optimizer to use different degrees of optimization when compiling SQL queries. This parameter provides additional flexibility by setting the default query optimization class used when neither the SET CURRENT QUERY OPTIMIZATION statement nor the QUERYOPT bind command are used.

The query optimization classes currently defined are:

0 - Minimal query optimization.

1 - Roughly comparable to DB2 Version 1.

2 - Slight optimization. Specifies a level of optimization higher than that of Version 1 but at significantly less optimization cost than levels 3 and above especially for very complex queries.

3 - Moderate query optimization.

5 - Significant query optimization with heuristics to limit the effort expended on selecting an access plan. This is the default.

7 - Significant query optimization.

9 - Maximum query optimization

For most Net.Commerce Hosting Server implementations, choosing a DFT_QUERYOPT parameter value of 2 will reduce compile time somewhat, yet still give excellent plans.

- **BUFFPAGE**

Each database has at least one buffer pool (IBMDEFAULTBP (which is created when the database is created) and can have more. All buffer pools reside in global memory, which is available to all applications using the database. The memory is allocated on the machine where the database is located. If the buffer pools are large enough to keep the required data in memory, less disk activity will occur. Conversely, if the buffer pools are not large enough, the overall performance of the database can be severely curtailed, and the database manager can become I/O-bound as a result of the high amount of disk activity (I/O) required to process the data your application requires.

Because this parameter can have a major impact on performance, you should consider the following factors to ensure that excessive page swapping does not occur:

- The amount of installed memory on your machine.
- The memory required by other applications running concurrently with the database manager on the same machine.

The buffpage parameter controls the size of a buffer pool when the CREATE BUFFERPOOL or ALTER BUFFERPOOL statement was run with NPAGES -1; otherwise, the buffpage parameter is ignored, and the buffer pool will be created with the number of pages specified by the NPAGES parameter.

It is recommended to use a single buffer pool and set the NPAGES parameter to a value of -1. You may also use the database system monitor to calculate the buffer pool hit ratio, which can help you tune your buffer pools.

- **SORTHEAP**

This parameter defines the maximum number of private memory pages to be used for private sorts, or the maximum number of shared memory pages to be used for shared sorts.

If the sort is a private sort, then this parameter effects agent private memory. If the sort is a shared sort, then this parameter effects the database shared memory. Each sort has a separate sort heap that is allocated, as needed, by the database manager. This sort heap is the area where data is sorted. If directed by the optimizer, a smaller sort heap than

the one specified by this parameter is allocated using information provided by the optimizer.

When increasing the value of this parameter, you should examine whether the SHEAPTHRES parameter in the database manager configuration file also needs to be adjusted.

- **LOGFILSIZ**

The value of LOGFILSIZ should be increased if the database has a large number of update, delete, and/or insert transactions running against it, which will cause the log file to become full very quickly. This situation is typical for OLTP transaction workloads. A recommendation is 5000 x 4 K pages in size (that is, 20 MB).

Be aware of the trade-off in choosing smaller or larger LOGFILSIZ values:

- A log file that is too small can affect system performance because of the overhead of archiving old log files, allocating new log files, and waiting for a usable log file. However, the value of the LOGFILSIZ should be reduced if disk space is scarce since primary logs are preallocated at this size.
- A log file that is too large can reduce your flexibility when managing archived log files and copies of log files since some media may not be able to hold an entire log file.

- **LOGPRIMARY**

The primary log files establish a fixed amount of storage allocated to the recovery log files. This parameter allows you to specify the number of primary log files to be preallocated.

For Net.Commerce Hosting Server, we should attempt to allocate most, if not all, of the log files that are used as primary logs, and keep the use of secondary logs to a minimum.

- **LOGBUFSZ**

This parameter allows you to specify the amount of the database heap (defined by the DBHEAP parameter) to use as a buffer for log records before writing these records to disk.

- **MINCOMMIT**

This parameter allows you to delay the writing of log records to disk until a minimum number of commits have been performed. This delay can help reduce the database manager overhead associated with writing log records and, as a result, improve performance when you have multiple applications running against a database and many commits are requested by the applications within a very short time frame.

This grouping of commits will only occur when the value of this parameter is greater than one and when the number of applications connected to the database is greater than, or equal to, the value of this parameter. When commit grouping is being performed, application commit requests are held until either one second has elapsed or the number of commit requests equals the value of this parameter.

For our purposes, we will keep this parameter small, no higher than two to three.

5.4.1.4 Optimizing NCHS Database

Database Manager configuration

In this section, we will use the DB2 Control Center to configure the various DB2 Database Manager Configuration parameters discussed previously.

1. To begin, start the DB2 Control Center, if not started already, and expand the subtree to our instance, db2inst1.
2. Click on the instance **db2inst1**, then right click and select **Configure**.
3. You will be presented with the Configure Instance - db2inst1 panel as shown below.

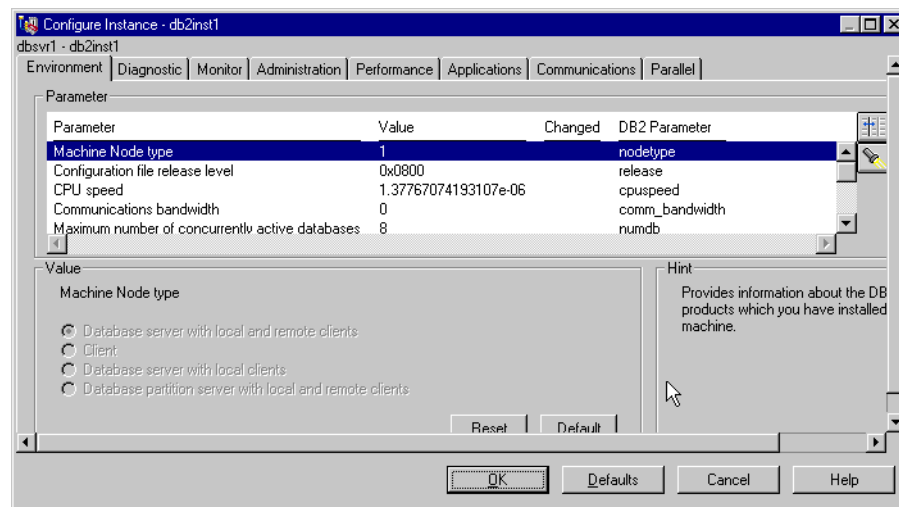


Figure 109. DB2 CC Configure instance db2inst1 environment

Each of the tabs shown in the panel lists a set of DB2 Database Manager parameters associated with the tab heading (for example, Environment,

Diagnostic, or Performance) and also allow you to change these parameters where possible.

Notice that the parameters also have associated with them the DB2 Parameter name. For example, CPU speed has the DB2 parameter name of cpuspeed. If you choose to change the parameter via the DB2 command line processor, instead of the DB2 Control Center, the parameter name must be referred to by the DB2 parameter name.

4. The Environment tab, which is the initial tab shown, has one parameter which we will check. This is the CPU speed parameter (cpuspeed). To reset this parameter, click on it and put in a value of -1 in the field presented for this purpose, in lower left hand side, as shown on the following screen shot:

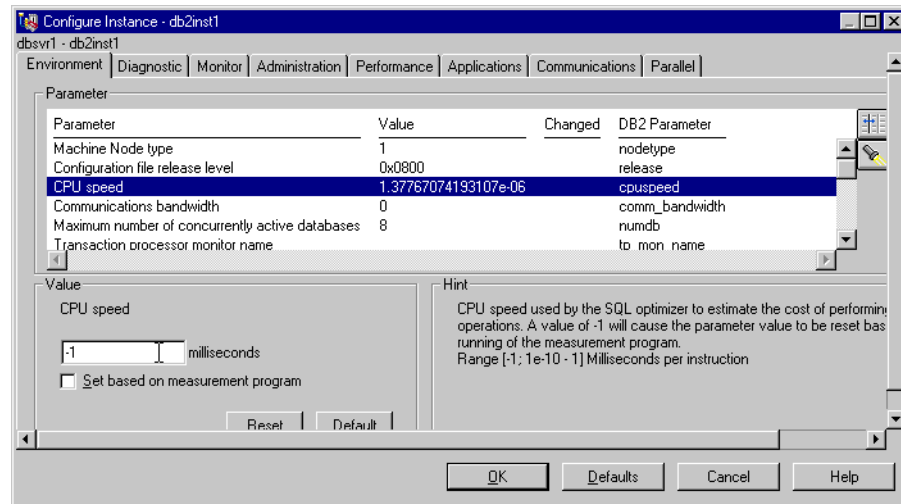


Figure 110. DB2 Control Center Configure instance db2inst1 CPU speed

Now, select another parameter to reflect the new setting on CPU Speed.

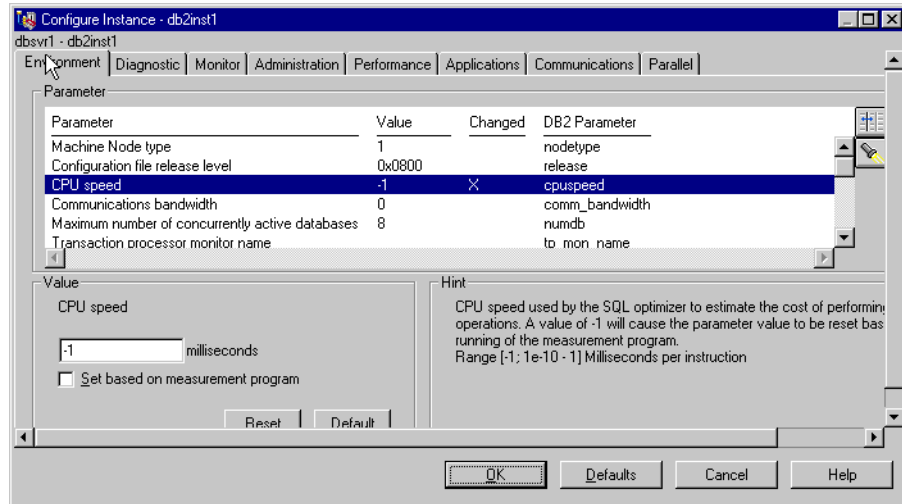


Figure 111. DB2 Control Center Configure instance db2inst1 CPU speed changed

Notice that the value is now set to -1, and the **Changed** field shows an X.

- Click on **OK** to close the Configure Instance - db2inst1 panel and note the warning about restarting the DB2 instance before any changed settings will take effect.

We have several more parameters to check and change; so, before restarting the DB2 instance db2inst1, bring up the Configure instance - db2inst1 panel again (right click on the **db2inst1** instance and select **Configure**).

- This time, choose the **Performance** tab by clicking on it. Choose the **Sort Heap Threshold** by clicking on it.

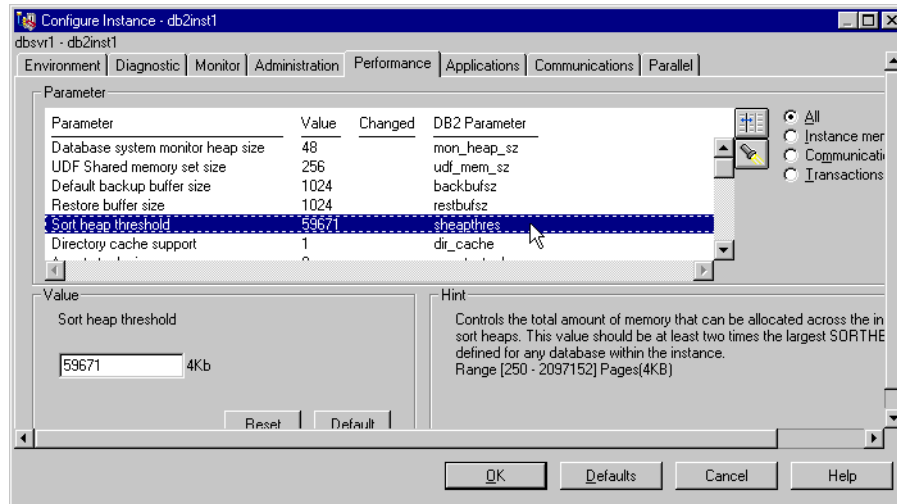


Figure 112. DB2 Control Center Configure instance db2inst1 sort heap threshold

The sheapres parameter should be at least ten times or more that of the sortheap parameter. The sortheap parameter is found in the DB2 Database Configuration for a database. We will check the sortheap parameter in the next section. Therefore, for now, take note, but do not change this parameter.

7. Click on the **Application** tab, and select **Initial number of agents in pool** (num_initagents). Ensure this parameter is set to a sufficient large value to accommodate the average number of expected concurrent users.
8. Now click on the **Parallel** tab. There are two parameters of interest to us in this section. They are:
 - Enable inter-partition parallelism (intra_parallel)
Ensure this parameter is set to Yes (1).

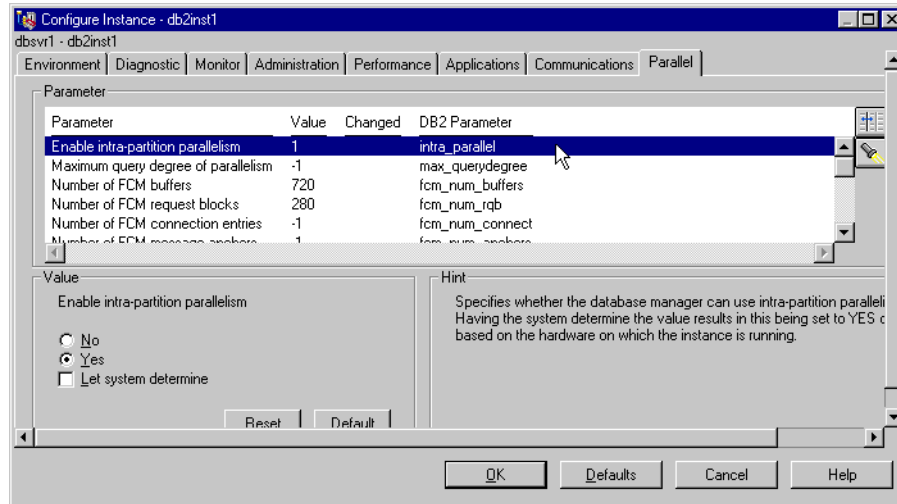


Figure 113. Enable intra-partition parallelism

- Maximum query degree of parallelism (max_querydegree)

Ensure this parameter is set to -1, that is, let the optimizer decide. You will notice that if the check box Let optimizer decide is used, you will not be able to change the value from -1.

9. Click on **OK** to exit the Configure instance - db2inst1 panel. Stop the Net.Commerce Hosting Server instance (for our example, use a browser to go to the URL <http://chs1:4444>), then restart the db2inst1 instance by right clicking on it and choosing **stop**, then right click and start again.

We will now continue to the Database configuration.

Database Configuration

In this section, we will use the DB2 Control Center to configure the various DB2 Database configuration parameters discussed previously.

1. To access the Database Configuration panel, click on the database within the Control Center (in our example it is KIM), right click, and select **Configure**. If prompted, enter the instance user ID and password (in our example, it is db2inst1 with a password of ibmdb2). You will see the Configure Database - KIM panel as shown un the following screen shot:

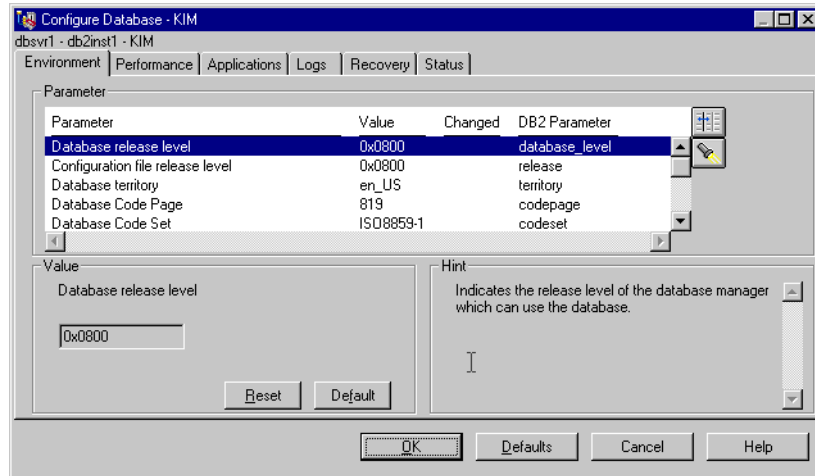


Figure 114. DB2 Control Center Configure database KIM panel

As with the Database Manager Configuration panel, each of the tabs shown in the panel lists a set of DB2 Database parameters associated with the tab heading (for example, Environment, Performance, Applications) and also allow you to change these parameters, where possible.

Notice that the parameters also have associated with them the DB2 Parameter name. For example, Database Code Page has a DB2 parameter name of codepage. The parameter name must be referred to by the DB2 parameter name, if you choose to change the parameter via the DB2 command line processor, instead of the DB2 Control Center.

2. Scroll down the list of parameters shown and check the environment parameter Default degree (dft_degree).

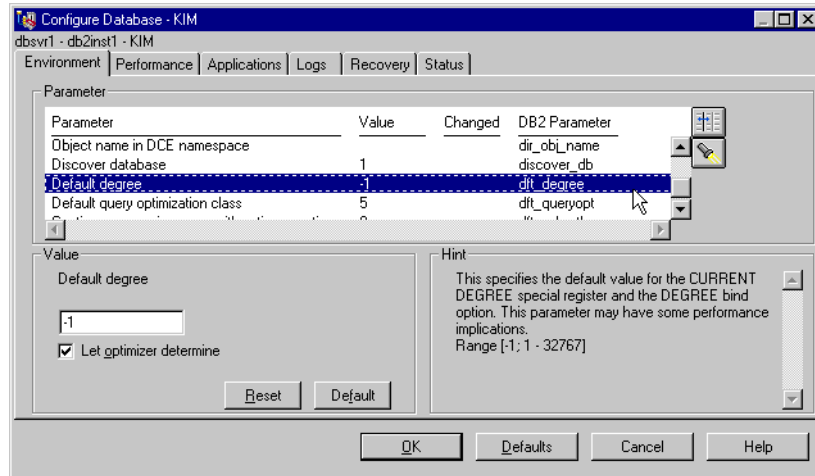


Figure 115. DB2 CC Configure database KIM default degree

This parameter should be set to -1. Notice that if the check box **Let optimizer decide** is selected, the value is set to -1 and cannot be changed.

3. Similarly, check the value of Default query optimization class (dft_queryopt). This should have a value of 2. Change it if necessary by selecting the parameter and changing the value in the field presented on the lower left hand side of the Configure Database - KIM panel.
4. Now Select the **Performance** tab and check the following parameters:

- Buffer pool size (buffpage)

Ensure this is at least 1000 (4 KB pages) in value. Since we have run the DB2 Performance Smartguide tool, the buffpage parameter should already have an appropriate value.

The buffpage parameter controls the size of a buffer pool when the `create bufferpool` or `alter bufferpool` command is run with a parameter of `npages -1`. Ensure that any buffer pools you may choose to create or migrate have the parameter `npages` set to -1.

- Sort heap size (sortheap)

As with the buffpage parameter, the sortheap parameter already has an appropriate value chosen when the DB2 Performance Smartguide tool was run.

Remember the sheapres parameter in the Database Manager Configuration that had to be noted? Check that this parameter is at least ten times that of the sortheap parameter. If not, go back to the Database Manager Configuration panel and change the sheapres parameter.

- Log buffer size (logbufsz)

This parameter should have a value of at least 128. Change it if necessary.

5. Finally, select the **Logs** tab and check the following parameters:

- Log file size (logfilisz)

This parameter should have a value of at least 5000.

- Number of primary log files (logprimary) and Number of secondary log files (logsecondary)

We should try to use mostly primary log files and keep the secondary log files in case of emergencies. Therefore, instead of a small number of primary log files and a larger number of secondary log files, we will increase the number of primary log files to 20, keeping the number of secondary log files at 10, as shown in the following screen:

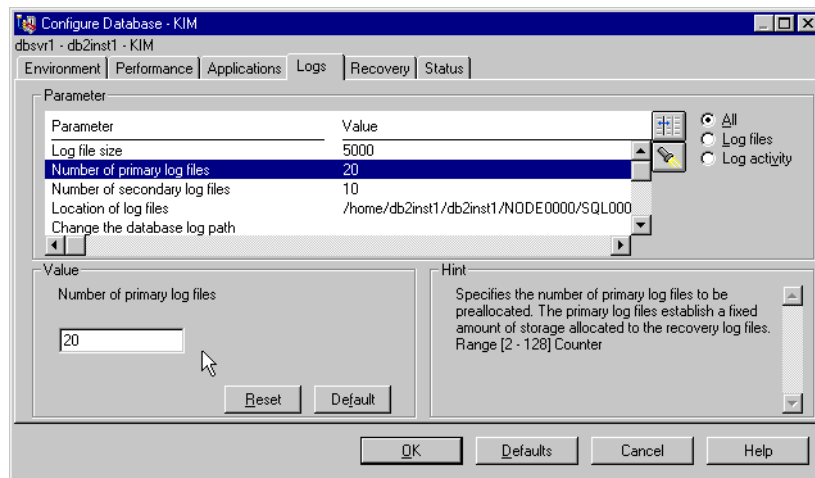


Figure 116. DB2 CC Configure database KIM number of primary log files

- Group commit count (mincommit)

This parameter is currently set to 1. There is no real need to change this unless it is greater than 2 or 3.

6. To finalize the changes, click on **OK**. You will be warned that changes will not take effect until all applications have been disconnected from the database KIM.

5.4.2 Tuning Web server

The following tuning tips can be applied by manipulating the values of the directives specified in `/etc/httpd.conf`. For further information, refer to the *Domino Go Webserver Webmaster's Guide*.

- **CacheLocalFile**

Use this directive to specify the names of files you want to load into the server's memory each time you start the server. You can have multiple occurrences of this directive in the configuration file. By keeping your most frequently requested files loaded in the server's memory, you can improve your server's response time for those files. Cache has as many HTML files and graphics files as your Web server can allow. Be sure to cache the highly requested graphics files.

- **CacheLocalMaxFiles and CacheMaxBytes**

`CacheLocalMaxFiles` specifies the maximum number of files you want to be cached at one time.

`CacheMaxBytes` specify the maximum amount of memory you want to allow for file caching. You can specify the memory in kilobytes (K) or megabytes (M).

You must still use the `CacheLocalFiles` directive to indicate which files you want cached. Optimize the size of the static cache by manipulating these two directives. Their limits depend on the size of the memory of the Web server.

- **Remove the unnecessary PASS directives.** It minimizes the execution path of the Web server for each request.

- **MaxActiveThreads**

Use this directive to set the maximum number of threads that you want to have active at one time. If the maximum is reached, the server holds new requests until another request finishes and threads become available. Generally, the more power your machine has, the higher the value you should use for this directive. If your machine starts to spend too much time on overhead tasks, such as swapping memory, try reducing this value.

- **Avoid collecting unnecessary access logging information.** It can be done by access log filter directives, such as `AccessLogExcludeURL`.

An example of `/etc/httpd.conf` is shown as follows:

```

#      CacheLocalMaxFiles and CacheLocalMaxBytes directive:
#
#      Use these directives to:
#          * limit the number of files which can be cached in memory
#          * limit the amount of memory used to cache files in memory
#      These are useful when wildcards are used in CacheLocalFile
#      directives. Use a value of 0 to indicate no maximum.
#
#      Default: 200
#      Syntax:  CacheLocalMaxFiles <num>
#
#      Default: 2 M
#      Syntax:  CacheLocalMaxBytes <num> <K | M>
CacheLocalMaxFiles 200
CacheLocalMaxBytes 2 M

#      CacheLocalFile directive:
#
#      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 characters.
#
#      The URL is optional. If you tell us the URL corresponding to this file,
#      response time will improve significantly.
#
#
#      Default:  CacheLocalFile  /usr/lpp/internet/server_root/pub/Frntpage.html
#               /Frntpage.html
#               CacheLocalFile  /usr/lpp/internet/server_root/Admin/lgmast.gif
#               /Admin/lgmast.gif
#               CacheLocalFile  /usr/lpp/internet/server_root/Admin/lgsplash
#               .gif             /Admin/lgsplash.gif
#      Syntax:  CacheLocalFile <file path> <URL>
#
#
#      Syntax:  CacheLocalFile <file path> <URL>
#
#      Example:
#      CacheLocalFile  /example/path/index.html /index.html
#
#      CacheLocalFile  /usr/lpp/internet/server_root/pub/Frntpage.html      /
#      Frntpage.html
#      CacheLocalFile  /usr/lpp/internet/server_root/Admin/lgmast.gif      /
#      Admin/lgmast.gif
#
#      MaxActiveThreads directive:
#
#      Defines the maximum number of threads in system thread pool.
#
#      Default: 50
#      Syntax:  MaxActiveThreads <num>
MaxActiveThreads 50

```

5.4.3 Tuning Net.Commerce Server

The Net.Commerce Server configuration file, `/usr/lpp/internet/server_root/pub/ncommerce.ini`, contains directives that affect the way the Net.Commerce system operates. You can change any directive by editing the configuration file in a text editor. The `PROCESS` directive can also be changed through the Net.Commerce Configuration Manager.

- **PROCESS**

The number of processes that the Net.Commerce Server starts to handle requests from the Net.Commerce director. Higher numbers allow Net.Commerce to process more transactions simultaneously, but the load on the machine is increased. This number must be from 2 to 99. Increase it if you anticipate heavy traffic on your site.

- **MS_TRANS_COUNT**

The number of transactions the Net.Commerce Server processes before restarting. Set it to force the server to perform periodic cleanups. This setting is optional. If not provided, the server does not restart automatically.

- **MS_LOGLEVEL**

The level of logging this server is to perform. Level 0 performs error logging only, and higher numbers denote more detail logging. This should be set to 0 in production environment. Its default value is 2

5.4.4 Dynamic page caching

Use the Net.Commerce Caching utility to cache dynamically generated Web pages. Caching reduces the time it takes for Net.Commerce to display frequently used pages. To activate and configure caching for the NetCommerce instance, go to `http://hostname:4444` with your Web browser, select the **NetCommerce** tab, then select the **checkbox** at Server Options - Enable Server Cache.

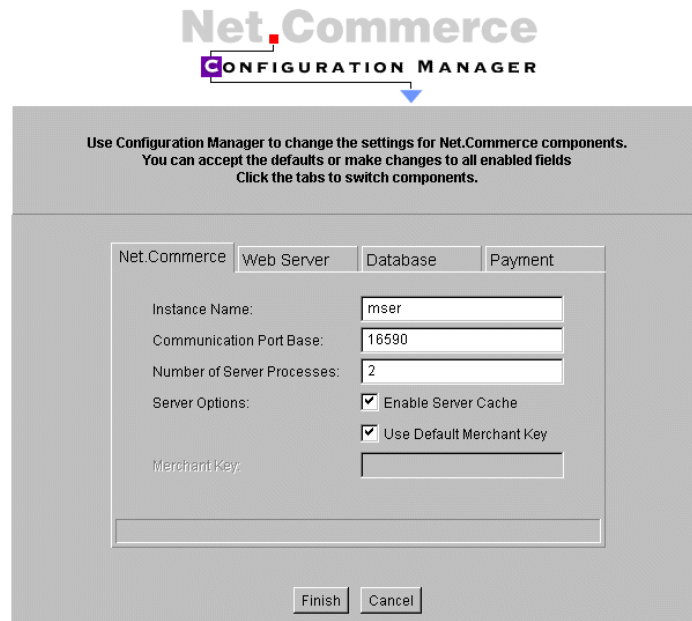


Figure 117. Enabling dynamic caching by configuration manager

5.5 Miscellaneous tips

The following contains other useful tips in administering the Net.Commerce Hosting Server.

5.5.1 Reenforcing security

To reenforce security of your hosting server, you may refer to the Net.Commerce security related bulletin board maintained by IBM. It is recommended to check out this information and to review if any updates are required on your site. The bulletin board is posted on a Web site and its URL is: <http://www.software.ibm.com/commerce/net.commerce/security.html>

5.5.2 Fixing Web server problems

Users of NCHS sometimes get the intermittent connection reset by peer message especially when they are using the merchant tool over a very slow (14.4 bps) connection. This problem can make the merchant tool and the applets unusable. However, it does not occur under LAN environments with fast response time.

To fix this problem, you must tune a timeout parameter on Domino Go Web server. Go to your Web server's home page, then follow the links:

Configuration and Administration Forms -> System Management -> Performance

Under Persistent Connections, change Persistent Connection Timeout from 10 sec to a larger number (for example, 60 sec). Apply, and restart the Web server. The example screen is shown below.

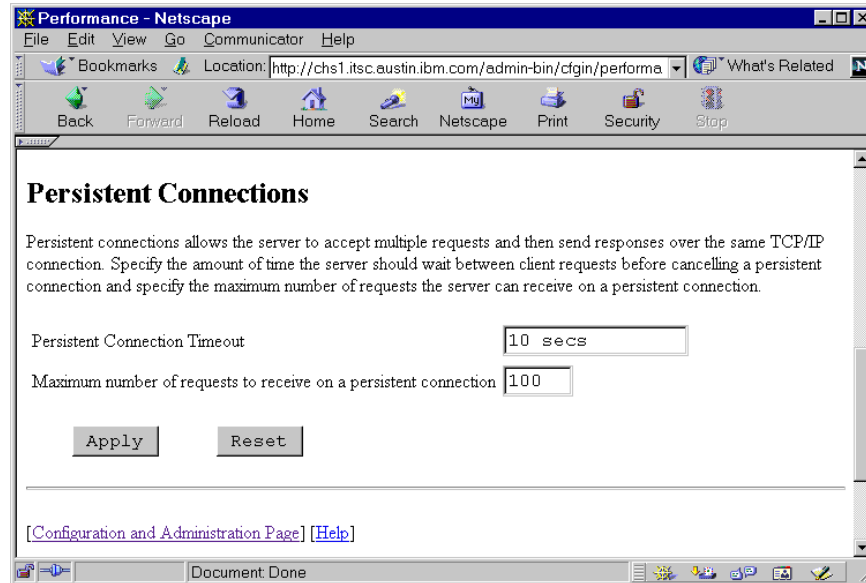


Figure 118. Increasing timeout value

Appendix A. Sample database table activities

The following is a sample output of database snapshot. You can identify tables which have busier database activities than others from this result.

```
Database Snapshot

Database name                = KIM
Database path                = /home/db2inst1/db2inst1/NODE0000/SQL00001/
Input database alias        = KIM
Database status              = Active
Catalog node number         = 0
Catalog network node name   =
Operating system running at database server= AIX
Location of the database     = Local
First database connect timestamp = 06-25-1999 10:17:14.030513
Last reset timestamp         =
Last backup timestamp        =
Snapshot timestamp          = 06-25-1999 10:50:00.801321

High water mark for connections = 16
Application connects          = 85
Secondary connects total     = 0
Applications connected currently = 13
Appls. executing in db manager currently = 0
Agents associated with applications = 13
Maximum agents associated with applications= 85
Maximum coordinating agents   = 85

Locks held currently         = 2
Lock waits                   = 10
Time database waited on locks (ms) = 123
Lock list memory in use (Bytes) = 6192
Deadlocks detected           = 0
Lock escalations             = 0
Exclusive lock escalations   = 0
Agents currently waiting on locks = 0
Lock Timeouts                = 0

Total sort heap allocated    = 0
Total sorts                   = 22019
Total sort time (ms)         = 7700
Sort overflows                = 0
Active sorts                  = 0

High water mark for database heap = 575977

Buffer pool data logical reads = 1314923
Buffer pool data physical reads = 304
Asynchronous pool data page reads = 53
Buffer pool data writes       = 387
Asynchronous pool data page writes = 0
Buffer pool index logical reads = 211925
Buffer pool index physical reads = 204
Asynchronous pool index page reads = 0
Buffer pool index writes      = 99
Asynchronous pool index page writes = 0
Total buffer pool read time (ms) = 1771
Total buffer pool write time (ms) = 10358
Total elapsed asynchronous read time = 153
Total elapsed asynchronous write time = 0
```

```

Asynchronous read requests          = 8
LSN Gap cleaner triggers            = 0
Dirty page steal cleaner triggers   = 0
Dirty page threshold cleaner triggers = 0
Time waited for prefetch (ms)      = 0
Direct reads                        = 43978
Direct writes                       = 0
Direct read requests                = 25564
Direct write requests               = 0
Direct reads elapsed time (ms)      = 1504
Direct write elapsed time (ms)      = 0
Database files closed               = 0
Data pages copied to extended storage = 0
Index pages copied to extended storage = 0
Data pages copied from extended storage = 0
Index pages copied from extended storage = 0

Commit statements attempted         = 4260
Rollback statements attempted       = 183
Dynamic statements attempted        = 325873
Static statements attempted         = 4443
Failed statement operations         = 1
Select SQL statements executed      = 62515
Update/Insert/Delete statements executed = 4262
DDL statements executed              = 3

Internal automatic rebinds          = 0
Internal rows deleted               = 0
Internal rows inserted              = 0
Internal rows updated               = 0
Internal commits                     = 143
Internal rollbacks                  = 14
Internal rollbacks due to deadlock  = 0

Rows deleted                        = 224
Rows inserted                       = 7384
Rows updated                        = 1282
Rows selected                       = 67284

Binds/precompiles attempted        = 0

Maximum secondary log space used (Bytes) = 0
Maximum total log space used (Bytes) = 3265379
Secondary logs allocated currently   = 0
Log pages read                      = 1
Log pages written                   = 5062

Package cache lookups               = 66782
Package cache inserts               = 47413
Application section lookups         = 325873
Application section inserts         = 64804

Catalog cache lookups               = 57619
Catalog cache inserts               = 50
Catalog cache overflows              = 0
Catalog cache heap full              = 0

Bufferpool Snapshot

Bufferpool name                     = IBMDEFAULTBP
Database name                       = KIM
Database path                       = /home/db2inst1/db2inst1/NODE0000/SQL00001/

```

```

Input database alias           = KIM
Buffer pool data logical reads = 1314923
Buffer pool data physical reads = 304
Buffer pool data writes        = 387
Buffer pool index logical reads = 211925
Buffer pool index physical reads = 204
Total buffer pool read time (ms) = 1771
Total buffer pool write time (ms) = 10358
Asynchronous pool data page reads = 53
Asynchronous pool data page writes = 0
Buffer pool index writes        = 99
Asynchronous pool index page reads = 0
Asynchronous pool index page writes = 0
Total elapsed asynchronous read time = 153
Total elapsed asynchronous write time = 0

```

```

Asynchronous read requests     = 8
Direct reads                   = 43978
Direct writes                   = 0
Direct read requests           = 25564
Direct write requests          = 0
Direct reads elapsed time (ms) = 1504
Direct write elapsed time (ms) = 0
Database files closed          = 0

```

```

Data pages copied to extended storage = 0
Index pages copied to extended storage = 0
Data pages copied from extended storage = 0
Index pages copied from extended storage = 0

```

Tablespace Snapshot

```

First database connect timestamp = 06-25-1999 10:17:14.030513
Last reset timestamp             =
Snapshot timestamp               = 06-25-1999 10:50:00.801321
Database name                    = KIM
Database path                    = /home/db2inst1/db2inst1/NODE0000/SQL00001/
Input database alias             = KIM
Number of accessed tablespaces   = 3

```

```

Tablespace name                  = SYSCATSPACE

```

```

Buffer pool data logical reads   = 7616
Buffer pool data physical reads  = 21
Asynchronous pool data page reads = 0
Buffer pool data writes          = 0
Asynchronous pool data page writes = 0
Buffer pool index logical reads  = 44753
Buffer pool index physical reads  = 21
Asynchronous pool index page reads = 0
Buffer pool index writes         = 0
Asynchronous pool index page writes = 0
Total buffer pool read time (ms) = 225
Total buffer pool write time (ms) = 0
Total elapsed asynchronous read time = 0
Total elapsed asynchronous write time = 0
Asynchronous read requests       = 0

```

```

Direct reads                     = 36742
Direct writes                     = 0
Direct read requests              = 18328
Direct write requests             = 0

```

```

Direct reads elapsed time (ms)           = 1137
Direct write elapsed time (ms)           = 0
Number of files closed                    = 0

Data pages copied to extended storage    = 0
Index pages copied to extended storage    = 0
Data pages copied from extended storage   = 0
Index pages copied from extended storage  = 0

Tablespace name                          = TEMPSPACE1

Buffer pool data logical reads            = 0
Buffer pool data physical reads           = 0
Asynchronous pool data page reads        = 0
Buffer pool data writes                   = 0
Asynchronous pool data page writes       = 0
Buffer pool index logical reads           = 0
Buffer pool index physical reads          = 0
Asynchronous pool index page reads       = 0
Buffer pool index writes                  = 0
Asynchronous pool index page writes       = 0
Total buffer pool read time (ms)         = 0
Total buffer pool write time (ms)        = 0
Total elapsed asynchronous read time     = 0
Total elapsed asynchronous write time    = 0
Asynchronous read requests               = 0

Direct reads                              = 0
Direct writes                             = 0
Direct read requests                      = 0
Direct write requests                    = 0
Direct reads elapsed time (ms)           = 0
Direct write elapsed time (ms)           = 0
Number of files closed                    = 0

Data pages copied to extended storage    = 0
Index pages copied to extended storage    = 0
Data pages copied from extended storage   = 0
Index pages copied from extended storage  = 0

Tablespace name                          = USERSPACE1

Buffer pool data logical reads            = 1307307
Buffer pool data physical reads           = 283
Asynchronous pool data page reads        = 53
Buffer pool data writes                   = 387
Asynchronous pool data page writes       = 0
Buffer pool index logical reads           = 167172
Buffer pool index physical reads          = 183
Asynchronous pool index page reads       = 0
Buffer pool index writes                  = 99
Asynchronous pool index page writes       = 0
Total buffer pool read time (ms)         = 1546
Total buffer pool write time (ms)        = 10358
Total elapsed asynchronous read time     = 153
Total elapsed asynchronous write time    = 0
Asynchronous read requests               = 8

Direct reads                              = 7236
Direct writes                             = 0
Direct read requests                      = 7236
Direct write requests                    = 0
Direct reads elapsed time (ms)           = 367

```

```

Direct write elapsed time (ms)      = 0
Number of files closed              = 0

Data pages copied to extended storage = 0
Index pages copied to extended storage = 0
Data pages copied from extended storage = 0
Index pages copied from extended storage = 0

```

Table Snapshot

```

First database connect timestamp    = 06-25-1999 10:17:14.030513

Last reset timestamp                =
Snapshot timestamp                  = 06-25-1999 10:50:00.801321
Database name                       = KIM
Database path                       = /home/db2inst1/db2inst1/NODE0000/SQL00001/
Input database alias                = KIM
Number of accessed tables           = 39

```

Table Schema	Table Name	Table Type	Rows Written	Rows Read	Overflows
DB2INST1	USRTRAFFIC	User	3600	0	0
DB2INST1	CGRYREL	User	0	565	0
DB2INST1	PROFILES	User	0	17080	0
DB2INST1	PRODIMAGE	User	0	1283	0
DB2INST1	CGPRREL	User	0	1283	0
DB2INST1	CATESGP	User	0	776	0
DB2INST1	CATEGORY	User	0	3823	0
DB2INST1	PRODATR	User	0	28931	0
DB2INST1	PRODPRCS	User	0	4249	0
DB2INST1	PRODSGP	User	0	1483	0
DB2INST1	MCSPINFO	User	0	80063	0
DB2INST1	PRODUCT	User	0	16370	0
DB2INST1	NVSTORAGE	User	0	226	0
DB2INST1	METHDES	User	0	12	0
DB2INST1	ACC_MODE	User	0	1186535	0
DB2INST1	ETCASSETTECFG	User	0	2	0
DB2INST1	SHOPPER	User	3621	5890	0
DB2INST1	SCHCONFIG	User	0	11	0
SYSIBM	SYSFUNCTIONS	Catalog	0	7220	0
DB2INST1	CURRCCACHE	User	291	178	0
DB2INST1	SCHSTATUS	User	14	11541	0
DB2INST1	CURRFCACHE	User	92	46	0
DB2INST1	CURRCONV	User	0	220	0
DB2INST1	SETCURR	User	0	638	0
DB2INST1	CURRFORMAT	User	0	240	0
DB2INST1	MERCHANT	User	0	3987	0
DB2INST1	ETSETCFG	User	2	6	0
DB2INST1	ETILLCONFIG	User	2	6	0
DB2INST1	TASK_MER_OF	User	0	3248	0
DB2INST1	TASKS	User	0	3360	0
DB2INST1	OFS	User	0	2184	0
DB2INST1	KEYS	User	1268	3804	0
DB2INST1	CMDS	User	0	3470	0
DB2INST1	POOLS	User	0	88	0
DB2INST1	MALL	User	0	3623	0
SYSIBM	SYSTABLES	Catalog	0	50	3
SYSIBM	SYSDBAUTH	Catalog	0	168	0
SYSIBM	SYSTABLESPACES	Catalog	0	168	0
SYSIBM	SYSPLAN	Catalog	0	1	0

Appendix B. DB2LOOK sample output

The following shows a sample output from DB2LOOK utility. You can use this result to recreate constraints on a table.

```
$ db2look -e -d kim -t merchant

% No userid specified, try to use $USER
% USER is: DB2INST1
% Process specific table
% Creating DDL for table(s)
-- This CLP file was created using DB2LOOK Version 5.0
-- Timestamp          : Fri Jul  9 10:36:29 1999
-- Database name      : KIM
-- DBM Version        : DB2/6000 Version 5.0.0
-- Database Codepage  : 819

CONNECT TO KIM;

-----
-- DDL Statements for TABLESPACES --
-----

CREATE REGULAR TABLESPACE CLAU IN NODEGROUP IBMDEFAULTGROUP PAGESIZE 4096
MANAGED BY DATABASE
    USING (DEVICE '/dev/rdbl1'25600,
           DEVICE '/dev/rdbl2'25600)
    EXTENTSIZE 32
    PREFETCHSIZE 64
    BUFFERPOOL IBMDEFAULTBP
    OVERHEAD 12.170000
    TRANSFERRATE 0.610000;

CREATE REGULAR TABLESPACE DAISY IN NODEGROUP IBMDEFAULTGROUP PAGESIZE 4096
MANAGED BY DATABASE
    USING (DEVICE '/dev/rdbl3'25600,
           DEVICE '/dev/rdbl4'25600,
           DEVICE '/dev/rdbl5'25600,
           DEVICE '/dev/rdbl6'25600)
    EXTENTSIZE 32
    PREFETCHSIZE 128
    BUFFERPOOL IBMDEFAULTBP
    OVERHEAD 12.170000
    TRANSFERRATE 0.610000;

-----
```

```
-- DDL Statements for table "DB2INST1"."MERCHANT"
```

```
-----  
CREATE TABLE "DB2INST1"."MERCHANT"  
    ("MERFNBR" INTEGER NOT NULL,  
     "MENAME" CHAR(80),  
     "MECLNAM" CHAR(30) NOT NULL,  
     "MECFNAM" CHAR(30) NOT NULL,  
     "MECMNAM" CHAR(30),  
     "MECTITLE" CHAR(30),  
     "MECPH1" CHAR(30) NOT NULL,  
     "MECPH2" CHAR(30),  
     "MECFAX" CHAR(30),  
     "MECMAIL1" CHAR(254),  
     "MECMAIL2" CHAR(254),  
     "MEPHONE" CHAR(30) NOT NULL,  
     "MEADDR1" CHAR(50),  
     "MEADDR2" CHAR(50),  
     "MEADDR3" CHAR(50),  
     "MECITY" CHAR(30) NOT NULL,  
     "MESTATE" CHAR(20) NOT NULL,  
     "MECNTRY" CHAR(30) NOT NULL,  
     "MEZIPC" CHAR(20),  
     "MESTNAME" CHAR(80) NOT NULL,  
     "MESTDESC" VARCHAR(1000),  
     "MESCNBR" INTEGER,  
     "METHMB" CHAR(254),  
     "METHEAD" CHAR(254),  
     "METFOOT" CHAR(254),  
     "METBASE" CHAR(254),  
     "MECUR" CHAR(10) NOT NULL,  
     "MEFIELD1" VARCHAR(254),  
     "MEFIELD2" VARCHAR(254),  
     "MEROID" CHAR(36)) IN CLAU ;
```

```
-- DDL Statements for primary keys on "DB2INST1"."MERCHANT"
```

```
ALTER TABLE "DB2INST1"."MERCHANT"  
    ADD CONSTRAINT "P_MERCHANT" PRIMARY KEY  
    ("MERFNBR");
```

```
-- DDL Statements for foreign keys on "DB2INST1"."MERCHANT"
```

```
ALTER TABLE "DB2INST1"."MERCHANT"  
    ADD CONSTRAINT "FSC_MERCHANT" FOREIGN KEY  
    ("MESCNBR")  
    REFERENCES "DB2INST1"."STRCGRY"
```

```

        ("SCRFNBR")
        ON DELETE NO ACTION
        ON UPDATE NO ACTION;

-----

-- DDL Statements for views

create view API_TASK as select tkname, tkscope, name, vendor, product,
version, merchant_rn from tasks, task_mer_of, ofs where
task_mer_of.task_rn = tkrfnbr and task_mer_of.of_rn = ofs.refnum;

create view CATEGORY_PUB as select * from CATEGORY where cgpud = 1;

create view CONSTVD (vdconstnm, vdtabnm, vdremarks, vdcolnm, vdcolseq)
as select D.constname, D.tabname, D.remarks, DC.colname, DC.colseq from
syscat.tabconst D, syscat.keycoluse DC where D.type = 'F' and DC.constname
= D.constname and DC.constname != 'FCG1_CGRYREL' and DC.constname !=
'FDCO_PRODUCT'
and (D.tabname = 'MERCHANT' or D.tabname = 'STRCGRY' or D.tabname =
'CATEGORY'
or D.tabname = 'CGRYREL' or D.tabname = 'PRODUCT' or D.tabname = 'CGPREL'
or D.tabname = 'PRODPRCS' or D.tabname = 'CATESGP' or D.tabname =
'PRODSGP');

create view CONSTVP (vpconstnm, vptabnm) as select constname, tabname from
syscat.tabconst where type not in ('F');

create view ICTABLES as select TABNAME, TYPE from SYSCAT.TABLES where
tabname like 'IC%';

create view KEYCOL_V (constname, colname, colseq) as select constname,
colname, colseq from syscat.keycoluse;

create view ORDER_COMP as select * from ORDERS where orstat = 'C';

create view ORDER_PEND as select * from ORDERS where orstat = 'P';

create view PRODUCT_PUB as select * from PRODUCT where prpub = 1;

create view SHADDR_PERM as select * from SHADDR where saadrflg = 'P';

create view SHIPTO_COMP as select * from SHIPTO where ststat = 'C';

create view SHIPTO_PEND as select * from SHIPTO where ststat = 'P';

```

```
create view TAB_V (tabname, remarks) as select tabname, remarks from
syscat.tables
  where definer <> 'SYSIBM' and type = 'T' and ( tabname = 'MERCHANT' or
  tabname = 'STRCGRY' or tabname = 'CATESGP' or tabname = 'PRODSGP' or
  tabname = 'CATEGORY' or tabname = 'CGRYREL' or tabname = 'PRODUCT' or
  tabname = 'CGPRREL' or tabname = 'PRODPRCS' );

create view TCOL_V as select T.tabschema, T.tabname, C.colname, C.remarks
  from SYSCAT.TABLES T, SYSCAT.COLUMNS C where T.definer not in ('SYSIBM')
  and T.tabname=C.tabname and T.tabschema=C.tabschema and T.type='T';

COMMIT WORK;

CONNECT RESET;

TERMINATE;
```

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- *Building e-commerce Solutions with Net.Commerce: A Project Guidebook*, SG24-5417
- *RS/6000 Models E30, F40, F50, and H50 Handbook*, SG24-5143
- *IBM WebSphere Performance Pack Usage and Administration*, SG24-5233

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RS/6000 Redbooks Collection (PDF Format)	SK2T-8043
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IBM Enterprise Storage and Systems Management Solutions	SK3T-3694

D.3 Other publications

These publications are also relevant as further information sources:

- *IBM Net.Commerce Hosting Server for AIX 3.1.2: Installing and Getting Started*, GC09-2808
- *IBM Net.Commerce Technologies*, G310-0705
- *IBM DB2 Universal Database Administration Guide, Version 5.0*, S10J-8157
- *IBM DB2 Universal Database Command Reference, Version 5.0*, S10J-8166
- *IBM DB2 Universal Database SQL Reference, Version 5.0*, S10J-8165
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- <http://dbsvr2:4444>
- <http://dbsvr2:9090>
- http://host_name/path
- <http://www.verisign.com/ibm>
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- <http://hostname:9090>

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