IBM® DB2® Warehouse Manager

Installation Guide

Version 7

IBM

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Before using this information and the product it supports, be sure to read the general information under "Notices" on page 117.

Contents

About this book

This book provides the information that you need to install the following Warehouse Manager components: Information Catalog Manager, warehouse agents, and warehouse transformers. Be sure to read the readme file that is included with DB2 Universal Database for important updates to product information.

Who should read this book

You should read this book if you are an Information Catalog Manager administrator or if you are responsible for installing Warehouse Manager components on workstations. You should be familiar with database concepts, client/server architectures, TCP/IP connectivity, and networking concepts.

Prerequisite publications

The following publications contain information that you need before and during the installation of Warehouse Manager components:

- *Data Warehouse Center Administration Guide*
- *Information Catalog Manager Administration Guide*
- *Information Catalog Manager User's Guide*
- *Information Catalog Manager Programming Guide and Reference*
- *Message Reference*

See "Appendix D. Using the DB2 Library" on page 99 for information about printing or ordering these publications.

How to send your comments

Your feedback helps IBM to provide quality information. Please send any comments that you have about this book or other Information Catalog Manager publications. Send your comments from the Web. Visit the Web site at http://www.ibm.com/software/data/vw/

The Web site has a feedback page that you can use to enter and send comments.

Chapter 1. Overview of the Warehouse Manager components

The Warehouse Manager package contains components that enhance the warehousing capability provided by the Data Warehouse Center, which is a part of DB2 Universal Database. Before you install any Warehouse Manager components, you should be familiar with the function each component provides, and the hardware and software prerequisites for each component.

The Warehouse Manager package includes the following components:
- Information Catalog Manager
- Warehouse agents
- Warehouse transformers
- Warehouse Manager Connectors
- Query Patroller

Installation and usage information about Query Patroller can be found in the *DB2 Query Patroller Installation Guide*, *DB2 Query Patroller User's Guide*, and *DB2 Query Patroller Administration Guide*. Use the Query Patroller installation CD in the Warehouse Manager package to install Query Patroller.

Information Catalog Manager

The Data Warehouse Center is a metadata-driven system. Metadata, or information about your data, provides administrators and business users with descriptions of the data that is stored in the data warehouse. You can create information catalogs that describe business metadata in business terms, organize the metadata into subject areas, and customize it to your workgroup or enterprise's needs. Then, you can use the Information Catalog Manager to provide a graphical representation of data relationships and object definitions for warehouse steps.

The Information Catalog Manager provides a powerful, business-oriented solution to help users locate, understand, and access enterprise data. It enables business users to view aggregations, histories, data derivations, data sources, and descriptions of data.

The Information Catalog Manager consists of the following components: Information Catalog Manager Tools, Information Catalog Administrator, Information Catalog User, and the Information Catalog Manager for the Web.

Warehouse Manager overview

The Information Catalog Manager Tools component includes the Information Catalog Administrator component and the information catalog initialization utility. You must run the information catalog initialization utility to create your information catalogs.

You can use the Information Catalog Administrator component to enable metadata exchange and to keep your information catalog current with the warehouse control database. The Information Catalog Administrator component includes utilities that extract descriptive data from many popular data and information sources, such as Oracle and Microsoft® Excel. The Information Catalog Administrator component also includes a sample information catalog with data. See the *Information Catalog Manager Administration Guide* for more information about extractors and the sample information catalog.

After you install the Information Catalog Administrator component, you can access functions for both the Information Catalog Administrator component and the Information Catalog User component. The Information Catalog User component helps the business user understand the warehouse data through a browse-and-search interface. Using this interface, business users can launch any program or command file required to display the data or business object.

You can use the Information Catalog Manager for the Web to access information catalogs and obtain descriptions of available data, including format, currency, owner, and location. From any Web browser, users can run available helper applications to view data.

Warehouse agents

Warehouse agents manage the flow of data between the data sources and the target warehouses. Warehouse agents are available for the Solaris Operating Environment and on Windows NT®, Windows 2000, AIX®, OS/2®, OS/390®, and AS/400® operating systems. Warehouse agents use Open Database Connectivity (ODBC) drivers or DB2 CLI to communicate with different databases. Several warehouse agents can handle the transfer of data between sources and target warehouses.

Warehouse transformers

Warehouse transformers are stored procedures and user-defined functions that you can use to transform data in a warehouse step. In the Data Warehouse Center, you use steps to create and maintain a warehouse. Steps control how data is transformed into meaningful business information. You can use warehouse transformers in a step to clean, invert, and pivot data; generate primary keys and period tables; and calculate various statistics.

Warehouse Manager Connectors

The DB2 Warehouse Manager provides the following Connectors to help you to extract data and metadata from e-business repositories:

- DB2 Warehouse Manager Connector for i2 TradeMatrix BPI
- DB2 Warehouse Manager Connector for SAP R/3
- DB2 Warehouse Manager Connector for the Web

With the Connector for i2 TradeMatrix BPI, you can schedule updates to i2 business models, distributed datamarts, and OLAP cubes. With the Connector for SAP R/3, you can add the extracted data to a data warehouse, transform it using the DB2 Data Warehouse Center, or analyze it using DB2 tools or other vendors' tools. With the Connector for the Web, you can bring "clickstream" data from IBM WebSphere Site Analyzer into a data warehouse.

See "Chapter 7. DB2 Warehouse Manager Connectors" on page 81 for more information.

Chapter 2. Software requirements

This chapter describes the software requirements for the Warehouse Manager components.

Warehouse Manager components require a Version 7 DB2 client or DB2 server, depending on the component. Unless otherwise mentioned, the Version 7 DB2 client is installed when you install Warehouse Manager components, if the DB2 client is not already installed. See the *Quick Beginnings* for your operating system for hardware and software requirements for DB2 clients and DB2 servers.

To establish communication between Data Warehouse Center components and Warehouse Manager components, you need to install connectivity software. See the *Quick Beginnings* books for information about the communication protocols that can be used between DB2 clients and DB2 servers.

Information Catalog Manager components

This section describes the software requirements for the following components: Information Catalog Manager Tools, Information Catalog Administrator, Information Catalog User, and the Information Catalog Manager for the Web.

Information Catalog Manager Tools component

To install the Information Catalog Manager Tools component, you need 50 MB of fixed disk space.

Information Catalog Administrator component

To install the Information Catalog Administrator component, you need 47 MB of fixed disk space.

The Information Catalog Administrator component requires one of the Windows 32-bit operating systems (Windows NT, Windows 95, Windows 98, or Windows 2000).

Information catalogs can be hosted on DB2 Universal Database Version 5.2 (including fixpacks or CSDs) for OS/2, AIX, or Windows NT, if those information catalogs are not included in the same database as the warehouse control database.

Software requirements

Information catalogs can also be hosted on Version 6.1 or later of the following DB2 family databases:
- DB2 Universal Database for Windows NT
- DB2 Universal Database for AIX
- DB2 Universal Database for OS/2
- DB2 Universal Database for OS/390
- DB2 Universal Database for AS/400
- DB2 Universal Database for Solaris Operating Environment

If your information catalog is located remotely in an OS/390 or an AS/400 database, you must install DB2 Connect.

You also need a connection to your LAN.

Information Catalog User component

To install the Information Catalog User component, you need 26 MB of fixed disk space.

The Information Catalog User component requires one of the Windows 32-bit operating systems (Windows NT, Windows 95, Windows 98, or Windows 2000).

Information Catalog Manager for the Web

To install the Information Catalog Manager for the Web, you need 500 KB of fixed disk space.

The following products are required on the Web server onto which you will install the Information Catalog Manager for the Web:
- Web server software
- Net.Data® Version 2 or later (and the latest fixpack for languages other than English)
- Perl 5 Interpreter

  You can download Perl executable files for many operating systems from http://www.perl.com/reference/query.cgi?binaries

You must also install the appropriate software to establish connectivity from your Web server to the workstation where your information catalogs reside.

The Web server can be the same workstation as the database server, or a different workstation.

To access the Information Catalog Manager for the Web, the client workstation must have a Web browser that is enabled for HTML 3.2, such as Netscape Navigator 3.0 or Microsoft Internet Explorer 3.0.

Warehouse agent sites

The Warehouse Manager supports the following operating systems as agent sites:

- Microsoft Windows NT Workstation or Windows NT Server Version 4.0 with Service Pack 5 or later.
- Microsoft Windows 2000.
- IBM AIX Version 4.2 or later.
- IBM OS/2 Warp Version 4 or later.
- IBM OS/390 Version 2.6 or later.
- IBM AS/400 Version 4.2 or later, with any prerequisite software fixpacks and PTFs. For a current maintenance list, see the readme file. To determine what software is installed on your AS/400 workstation, enter DSPSFWRSC at an AS/400 command prompt.
- Solaris Operating Environment Version 2.6 or later.

For AS/400, you must have a user ID that has ALLOBJ and JOBCTL authority. This level of authority is required for both the AS/400 RSTLICPGM command and the STRVWD and ENDVWD commands. Also, the user profile that starts the warehouse agent daemon should also have *PGMR (bind capability) as the User Class.

Fixed disk space

Warehouse agents on AIX, OS/2, Windows NT, and the Solaris Operating Environment require 50 MB each of fixed disk space.

The OS/390 warehouse agent requires approximately 95 MB of HFS space.

Fixed disk space is not applicable to warehouse agents on AS/400.

Accessing non-DB2 source databases using ODBC

You can access several non-DB2 warehouse sources from agent sites by using ODBC drivers. Data Warehouse Center ODBC drivers and driver manager for Windows NT, OS/2, AIX, and the Solaris Operating Environment are installed when you install a warehouse agent on one of these operating systems. The Data Warehouse Center ODBC drivers and driver manager are the DataDirect Connect ODBC drivers and driver manager provided by Merant.

To avoid errors, do not configure Informix databases with Oracle or Sybase databases on the same workstation.

For information about setting up database client software, see the *Data Warehouse Center Administration Guide*.

Software requirements

Ensuring that UNICODE support is available

If you are using an OS/390, AIX, or Solaris Operating Environment warehouse agent, you must ensure that UNICODE support is available on your system.

Verifying UNICODE support on OS/390

Iconv supports conversion to and from UCS-2 in all releases of OS/390 that support the OS/390 warehouse agent.

Verifying UNICODE support on AIX

To verify that UNICODE support is available on AIX, enter:

```
lslpp -al | grep -i iconv
```

Ensure that the following filesets are listed:

bos.iconv.ucs.com
    UNICODE base converters

bos.iconv.ucs.pc
    UNICODE converters for PC code sets

You must also install the language converter for your language. For more information, go to http://www.austin.ibm.com/resource/aix_resource/Pubs or see the *AIX Packaging Guide for LPP Installation*.

Verifying UNICODE support on the Solaris Operating Environment

To verify UNICODE support on the Solaris Operating Environment, enter:

```
pkginfo | grep -i iconv
```

If UNICODE support is available, you should see the following package:

```
SUNWuiu8 -- Iconv modules for UTF-8 Locale
```

If you are using a national language version of the warehouse agent, ensure that you installed the proper code set and iconv module.

Establishing ODBC connections for the AIX and Solaris Operating Environment warehouse agents

When you install the AIX or Solaris Operating Environment warehouse agent, two ODBC connection types are available:

DB2 CLI
    This connection type accesses the following sources:
    - DB2 family
    - Heterogeneous data sources through DataJoiner®, including:
        - Oracle
        - Sybase

- Microsoft SQL Server
- Informix
- VSAM
- IMS™

If you use the DB2 CLI connection type, you must have DataJoiner for heterogeneous data access. VSAM and IMS source access also requires DataJoiner Classic Connect.

Merant-enabled ODBC

This connection type accesses the following sources:

- DB2 family
- Oracle
- Sybase
- Microsoft SQL Server
- Informix
- Data file

Both connection types support the following warehouse target databases:

- DB2 Universal Database Enterprise Edition
- DB2 Universal Database Enterprise - Extended Edition
- DB2 Universal Database for AS/400
- DB2 for MVS/ESA™
- DataJoiner
- Oracle (through DataJoiner)
- Sybase (through DataJoiner)
- Informix (through DataJoiner)

Both connection types include executable files.

Warehouse transformers

Warehouse transformers are stored procedures and user-defined functions that you can use to transform data in a warehouse step. To use warehouse transformers, you must install them at the agent site and enable them for use at the target warehouse.

For details on installing and enabling warehouse transformers, see "Chapter 6. Preparing for and installing warehouse transformers" on page 75.

The Java Developer's Kit (JDK) Version 1.2.2 or later must be installed on the database where you plan to use the warehouse transformers. The DB2

Software requirements

Application Development Client includes the JDK for AIX, OS/2, and
Windows NT. For information about obtaining the JDK for other operating
systems, see "Chapter 6. Preparing for and installing warehouse transformers"
on page 75.

Chapter 3. Installing Information Catalog Manager components

This chapter describes the installation process for the Information Catalog Manager Tools component, the Information Catalog Administrator component, the Information Catalog User component, and the Information Catalog Manager for the Web.

You need to install the Information Catalog Manager Tools component, which includes the Information Catalog Administrator component, on Windows NT workstations that your administrators will use to create an information catalog or to migrate existing information catalogs. Then, you can choose to install the Information Catalog Administrator component or the Information Catalog User component on additional workstations running any Windows 32-bit operating systems (Windows NT, Windows 95, Windows 98, or Windows 2000). These workstations must have connectivity to the workstation where your DB2 Universal Database is located.

After you install the Information Catalog Administrator component (separately from the Information Catalog Manager Tools component) or the Information Catalog User component, you must register the server node and any remote information catalogs. See the *Information Catalog Manager User's Guide* for more information.

You can use the Information Catalog Manager for the Web to access metadata in your information catalogs from any operating system that supports DB2 Universal Database and Net.Data. The workstation where you install the Information Catalog Manager for the Web must also have Net.Data Live Connection Manager and Net.Data Perl Language Environment (LE) installed.

Installing the Information Catalog Manager Tools component

The Information Catalog Manager Tools component includes the Information Catalog Administrator component and the information catalog initialization utility.

Installing the Information Catalog Manager Tools component

You can install the Information Catalog Manager Tools component on a Windows NT or Windows 2000 workstation that has connectivity to your DB2 Universal Database.

Installing Information Catalog Manager components

To install the Information Catalog Manager Tools component:

1. Insert the Warehouse Manager CD-ROM into your CD-ROM drive. The launchpad opens.
2. Click **Install** from the launchpad.
3. In the Select Products window, ensure that the **DB2 Warehouse Manager** check box is selected, then click **Next**.
4. In the Select Type of Install window, click **Custom**, then click **Next**.
5. In the Select DB2 Components window, clear all the check boxes except the **Information Catalog Manager Tools** component.
6. Click **Next** to continue the installation program. The installation program completes.
7. If you are installing the Information Catalog Manager Tools component on AS/400 or OS/390, locate the files `createic.bak` and `flgnmwcr.bak` and rename them to `createic.exe` and `flgnmwcr.exe`, respectively.
8. Run the information catalog initialization utility. See "Running the information catalog initialization utility" for more information.

Running the information catalog initialization utility

Before you can use the Information Catalog Administrator component, you must create an information catalog or migrate existing information catalogs. You do this by running the information catalog initialization utility.

To run the information catalog initialization utility:

1. Create a database in DB2 Universal Database, or locate an existing database that contains an information catalog.
2. Click **Start → Programs → IBM DB2 → Information Catalog Manager → Initialize Information Catalog**. The Initialize Information Catalog window opens.
3. Select a type of information catalog, then click **OK**. The Define Catalog on DB2 UDB for Windows NT window opens.
4. Type the necessary information, then click **Define**. The Connect to Information Catalog window opens.
5. Type the user ID and password for the information catalog that you specified, then click **Connect**.

Installing the Information Catalog Administrator component

To install the Information Catalog Administrator component (separately from the Information Catalog Manager Tools component) on any Windows 32-bit operating systems (Windows NT, Windows 95, Windows 98, or Windows 2000):

1. Insert the DB2 Universal Database CD-ROM into your CD-ROM drive. The launchpad opens.

2. Click **Install** from the launchpad.
3. In the Select Products window, select either the **DB2 Enterprise Edition Server** check box (or the **DB2 Enterprise - Extended Edition Server** check box, if appropriate) or the **DB2 Administrative Client** check box, then click **Next**.
4. In the Select Type of Install window, click **Custom**, then click **Next**.
5. In the Select DB2 Components window, select the check box for the **Data Warehousing tools** component, then click **Subcomponents**.
6. In the Select Subcomponents window, select the check box for the **Information Catalog Administrator** subcomponent.
7. Click **Continue** to return to the Select DB2 Components window, then click **Next** to continue the installation program.
8. When the installation program completes, install the Information Catalog Manager Tools component from the Warehouse Manager CD-ROM and run the information catalog initialization utility (if you have not done so already). See "Installing the Information Catalog Manager Tools component" on page 11 for more information.

Installing the Information Catalog User component

To install the Information Catalog User component on any Windows 32-bit operating systems (Windows NT, Windows 95, Windows 98, or Windows 2000):

1. Insert the DB2 Universal Database CD-ROM into your CD-ROM drive. The launchpad opens.
2. Click **Install** from the launchpad.
3. In the Select Products window, select the **DB2 Administrative Client** check box, clear the **DB2 Enterprise Edition Server** check box (or the **DB2 Enterprise - Extended Edition Server** check box, if appropriate), then click **Next**.
4. In the Select Type of Install window, click **Custom**, then click **Next**.
5. In the Select DB2 Components window, clear all the check boxes except the **Data Warehousing Tools** component, then click **Subcomponents**.
6. In the Select Subcomponents window, select the check box for the **Information Catalog User** subcomponent.
7. Click **Continue** to continue the installation program.
8. When the installation program completes, register the server node and any remote information catalogs. See the *Information Catalog Manager User's Guide* for more information.

Installing the Information Catalog Manager for the Web

You can install the Information Catalog Manager for the Web on any operating system that supports DB2 Universal Database and Net.Data. The operating system must also support Net.Data Live Connection Manager and Perl LE. These operating systems include Windows NT, OS/2, AIX, DYNIX/PTX ,and the Solaris Operating Environment.

For information about setting MIME types to launch programs, see the *Information Catalog Manager Administration Guide*.

Security considerations

You must enable authentication on the Web server. After you enable authentication, each user must enter a user ID and password to access the Information Catalog Manager for the Web. Because the Net.Data Live Connection Manager manages the database connections, users do not need to know the database user ID and password.

Depending on the sensitivity of the information in the information catalog, you need to implement the appropriate level of security for your Web server. For additional security beyond the authentication function in the Web server, you can install security packages with encryption and keys. For information about advanced Web server security, see the documentation for IBM SecureWay® (part of the Websphere family).

Installing the Information Catalog Manager for the Web on a Windows NT Websphere IBM HTTP Web server

Before you begin to install the Information Catalog Manager for the Web:
1. Make sure that the IBM HTTP Web server is installed.
2. Check the Web server port number. If the Web server has a port other than 80 (the usual default), append the port number to the host name in the Web address when you configure the domain name. For example:
   `http://hostname:portnumber/`
3. Create a directory named `icm` on the Web server to contain the Net.Data executable files (for example, `\IBM HTTP Server\icm`). Point to this directory as the Net.Data cgi-bin directory. Place the executable file `db2www.exe` in this directory.

To install the Information Catalog Manager for the Web:
1. Install the Information Catalog Manager for the Web files onto your Web server:
   a. Insert the DB2 Universal Database CD-ROM into the CD-ROM drive on the Web server workstation. The launchpad opens.
   b. Click **Install** from the launchpad.

    c. In the Select Products window, select the **DB2 Administration Client** check box, then click **Next**.

    d. In the Select Type of Install window, click **Custom**, then click **Next**.

    e. In the Select DB2 Components window, clear the check boxes for all components except the **Data Warehousing Tools** component.

    f. Click **Subcomponents**.

    g. In the Select Subcomponents window, ensure that the check box for the **Information Catalog Manager for the Web** is selected and that all other check boxes are cleared.

    h. Click **Continue**.

    i. In the Select Components window, clear the check boxes for the **Communication Protocols** component, the **Application Development Interfaces** component, and the **Administration and Configuration Tools** component. Make sure that the **Data Warehousing Tools** component remains selected.

    j. Click **Next** to continue with the installation. The installation program creates files in the following directories:

- `program files\sqllib\icmweb\macro`
- `program files\sqllib\icmweb\html`
- `program files\sqllib\icmweb\icons`

2. Copy all the *.mac and *.hti files from the `program files\sqllib\icmweb\macro` directory to the Net.Data macro directory (usually `\db2www\macro`).

3. Copy all the *.htm and *.gif files from the `program files\sqllib\icmweb\html` to the document root directory on the Web server (usually `\IBM HTTP Server\htdocs`).

4. Copy all the dg*.gif files from the `program files\sqllib\icmweb\icons` directory to the image directory on the Web server (usually `\IBM HTTP Server\icons`). This directory will be the value for the image_path variable in the `dg_config.hti` file.

5. Edit the `dg_config.hti` file to include the directories where you copied the files and the server name. The macro_path variable uses the alias that is set up on your Web server to control user access. The `dg_config.hti` file should look like this:

```
%DEFINE {
        server_name="http://winntserver.ibm.com/"
        image_path="$(server_name)icons/"
        macro_path="$(server_name)icm/db2www.exe/"
        help_path="$(server_name)"
%}
```

6. Add a link to an existing Web page, or create a Web page with a link to the Information Catalog Manager for the Web home page.

    To create a Web page, edit the file `icm.html` and add the following lines:

Installing the Information Catalog Manager for the Web

```
<html><head>
<title>Information Catalog Manager for the Web</title>
</head>
<body bgcolor=white>
<p><a href=/icm/db2www.exe/dg_home.mac/Logon>
Information Catalog Manager for the Web</a>
</body>
</html>
```

Place the file in the HTML default directory (usually \IBM HTTP Server\htdocs).

7. Enable basic user authentication on your Web server for each Information Catalog Manager for the Web user.

When users access the Information Catalog Manager for the Web home page, they are prompted for their user ID and password. When they enter these values, the HTTP environment variable REMOTE_USER is set. This variable is used to prompt users for their user ID and password and to create, update, and delete comments.

a. Set up an alias.

Create an alias named `icm` for the directory where the Net.Data CGI program DB2WWW is located. The macro_path variable that is defined in the dg_config.hti file uses this alias:

```
macro_path="$(server_name)icm/db2www.exe/"
```

The alias directory `icm` should have the user ID and password authentication enabled. To enable authentication, edit the httpd.conf file. This file is usually located in \IBM HTTP Server\conf directory. Add a ScriptAlias directive, like this:

```
ScriptAlias /icm/ "c:/IBM HTTP Server/icm/"
```

Also make sure that the httpd.conf file contains a directive that defines the access file name, like this:

```
AccessFileName .htaccess
```

b. Create a password file that will contain the authorized user ID and password for each Information Catalog Manager for the Web user. Use the htpasswd command to create and edit the password file.

For example, to create the password file c:/IBM HTTP Server/icmweb.pwd for the user ID ADMIN, enter the following command:

```
htpasswd -c c:/IBM HTTP Server/icmweb.pwd ADMIN
```

Specifying the -c option ensures that you enter a password when you create a password file.

When you are prompted for the password, enter ADMINPW.

To add another user ID, ADMIN2, with the password ADMINPW2, enter the following command:

```
htpasswd c:/IBM HTTP Server/icmweb.pwd ADMIN2 ADMINPW2
```

The user ID must be 8 characters or less in length, because it is stored in the information catalog tables when a comment is created.

c. Restrict access to the \IBM HTTP Server\icm\ directory.

1) To require authentication when users access the \IBM HTTP Server\icm\ directory, edit the httpd.conf file. This file is usually located in the \IBM HTTP Server\conf directory. Add a directory directive for the \IBM HTTP Server\icm directory, like this:

```
<Directory "c:/IBM HTTP Server/icm">
AllowOverride AuthConfig
Options None
</Directory>
```

2) Create a file that is named .htaccess in the \IBM HTTP Server\icm directory with the AuthName, AuthType, AuthUserFile, and require directives that are set like this:

```
AuthName ICMWeb
AuthType Basic
AuthUserFile "c:/IBM HTTP Server/icmweb.pwd"
require valid-user
```

Because some editors require a file name and a file extension, you might need to create the file with the name htaccess.txt and rename it to .htaccess after you save it.

You must stop and restart the Web server for these changes to take effect.

Note: This is one way that you can enable authentication on an IBM HTTP Web server. You can set up more complex directory structures, user groups, and permissions, if necessary, along with additional security packages. More information about setting up basic authentication is available in the IBM HTTP Web server documentation. For information about advanced Web server security, see the documentation for IBM SecureWay (part of the Websphere family).

8. Set up Net.Data to run Live Connection Manager for the databases that are used by the Information Catalog Manager for the Web.

a. Edit the Net.Data file \db2www\connect\dtwcm.cnf, and add a CLIETTE DTW_SQL block for each database that the Information Catalog Manager for the Web will use.

Installing the Information Catalog Manager for the Web

To add the database ICMSAMP with a minimum of one process, a maximum of three processes, starting with private port number 7100, and starting with public port number 7110, add the following block:

```
CLIETTE DTW_SQL:ICMSAMP{
MIN_PROCESS=1
MAX_PROCESS=3
START_PRIVATE_PORT=7100
START_PUBLIC_PORT=7110
EXEC_NAME=./dtwcdb2
DATABASE=ICMSAMP
BINDFILE=NOT_USED
LOGIN=*USE_DEFAULT
PASSWORD=*USE_DEFAULT
}
```

Six ports (7100, 7101, 7102, 7110, 7111, 7112) are allocated to the ICMSAMP database. Make sure that these ports are free and not in use by another application. You must use different port number ranges for each CLIETTE DTW_SQL block. See the *Net.Data Administration and Programming Guide* for more information.

b. Set the LOGIN value to the user ID for the database, and set the PASSWORD value to the password for the database. If the database is local, you can use *USE_DEFAULT.

c. Set up the Net.Data initialization file to use Live Connection Manager for the SQL calls. Edit the DB2WWW.INI file in the document root directory on the Web server. Make sure that the ENVIRONMENT DTW_SQL statement ends with CLIETTE "DTW_SQL:$(DATABASE)".

For example:

```
ENVIRONMENT (DTW_SQL) DTWSQL(IN DATABASE,LOGIN,PASSWORD,
    TRANSACTION_SCOPE,SHOWSQL,ALIGN,START_ROW_NUM)
    CLIETTE "DTW_SQL:$(DATABASE)"
```

d. Start Live Connection Manager by using the executable file /DB2WWW/CONNECT/dtwcm.exe. Live Connection Manager must be running so that the Information Catalog Manager for the Web can access the databases. After Live Connection Manager is started, you can minimize the Live Connection Manager window on the Web server. See the *Net.Data Administration and Programming Guide* for more information.

Follow the steps in "Post-installation customization" on page 27 before using the Information Catalog Manager for the Web.

Installing the Information Catalog Manager for the Web on an AIX Websphere IBM HTTP Web server

Before you begin to install the Information Catalog Manager for the Web:

1. Make sure that IBM HTTP Web server is installed.

2. Check the Web server port number. If the Web server has a port other than 80 (the usual default), append the port number to the host name in the Web address when you configure the domain name. For example:
   `http://hostname:portnumber/`

3. Create a directory named `icm` on the Web server to contain the Net.Data executable files (for example, /usr/lpp/HTTPServer/share/icm/). Point to this directory as the Net.Data cgi-bin directory. Place the executable file `db2www` (usually found in the `/usr/lpp/internet/server_root/cgi-bin` directory) into this directory.

4. Copy the `db2www.ini` file (usually found in the `/usr/lpp/internet/server_root/pub/` directory) to the document root directory (usually `/usr/lpp/HTTPServer/share/htdocs`). Edit the `db2www.ini` file and update the DB2 instance and path:

```
DB2INSTANCE db2
MACRO_PATH /usr/lpp/internet/db2www/macro
INCLUDE_PATH /usr/lpp/internet/db2www/macro
HTML_PATH /usr/lpp/HTTPServer/share/htdocs
EXEC_PATH /usr/lpp/internet/db2www/macro
DTW_LOG_DIR /usr/lpp/internet/db2www/logs
```

To install the Information Catalog Manager for the Web:

1. Log in as a user with root authority.

2. Insert and mount the DB2 Universal Database CD-ROM. For information about mounting a CD-ROM, see *DB2 for UNIX Quick Beginnings*.

3. Change to the directory where the CD-ROM is mounted by entering `cd /cdrom`, where *cdrom* is the mount point of your product CD-ROM.

4. Enter the `./db2setup` command. After a few moments, the Install DB2 V7 window opens.

5. Select the products that you want to install and are licensed to install. Press the Tab key to change the highlighted option. Press the Enter key to select or deselect an option. When you select an option, an asterisk is displayed next to it.

   To select or deselect optional components for a DB2 product that you want to install, select the **Customize** option. To go back to a previous window at any time, select the **Cancel** option.

6. When you have finished selecting the DB2 product and its components, select **OK** to continue with the installation.

   For more information or assistance during the installation of any DB2 product or component, select the Help option.

   The installation program creates files in the following directories:
   - `program files\sqllib\icmweb\macro`
   - `program files\sqllib\icmweb\html`
   - `program files\sqllib\icmweb\icons`

Installing the Information Catalog Manager for the Web

7. Copy all the *.mac and *.hti files from the `program files\sqllib\icmweb\macro` directory on the Windows NT workstation to the Net.Data macro directory on the Web server (usually `/usr/lpp/internet/db2www/macro`. To set the permissions on these files to public read, enter `chmod ugo+r *`.

8. Copy all the *.htm and *.gif files from the `program files\sqllib\icmweb\html` directory on the Windows NT workstation to the document root directory on the Web server (usually `/usr/lpp/HTTPServer/share/htdocs`). To set the permissions on these files to public read, enter `chmod ugo+r *`.

9. Copy all the dg*.gif files from the `program files\sqllib\icmweb\icons` directory on the Windows NT workstation to the image directory on the Web server (usually `/usr/lpp/HTTPServer/share/icons`). This directory will be the value for the image_path variable in the `dg_config.hti` file. To set the permissions on these files to public read, enter `chmod ugo+r *`.

10. Edit the `dg_config.hti` file to include the directories where you copied the files and the server name. The macro_path variable uses the alias that is set up on your Web server to control user access. The `dg_config.hti` file should look like this:

```
%DEFINE {
        server_name="http://aixserver.ibm.com/"
        image_path="$(server_name)icons/"
        macro_path="$(server_name)icm/db2www/"
        help_path="$(server_name)"
%}
```

11. Add a link to an existing Web page, or create a Web page with a link to the Information Catalog Manager for the Web home page.

    To create a Web page, edit the file `icm.html` and add the following lines:

```
<html><head>
<title>Information Catalog Manager for the Web</title>
</head>
<body bgcolor=white>
<p><a href=/icm/db2www/dg_home.mac/Logon>
Information Catalog Manager for the Web</a>
</body>
</html>
```

    Place the file in the document root directory (usually `/usr/lpp/HTTPServer/share/htdocs`).

12. Enable basic user authentication on your Web server for each Information Catalog Manager for the Web user.

    When users access the Information Catalog Manager for the Web home page, they are prompted for their user ID and password. When they enter these values, the HTTP environment variable REMOTE_USER is set. This variable is used to prompt users for their user ID and password and to create, update, and delete comments.

a. Set up an alias.

Create an alias named `icm` for the directory where the Net.Data CGI program DB2WWW is located. The macro_path variable that is defined in the `dg_config.hti` file uses this alias:

```
macro_path="$(server_name)icm/db2www/"
```

The alias directory `icm` should have the user ID and password authentication enabled. To enable authentication, edit the `httpd.conf` file. This file is usually located in the `/usr/lpp/HTTPServer/etc/` directory. Add a ScriptAlias directive, like this:

```
ScriptAlias /icm/ /usr/lpp/HTTPServer/share/icm
```

Also make sure that the `httpd.conf` file contains a directive that defines the access file name, like this:

```
AccessFileName .htaccess
```

b. Create a password file that will contain the authorized user ID and password for each Information Catalog Manager for the Web user. Use the htpasswd command to create and edit the password file.

For example, to create the password file `/usr/lpp/HTTPServer/share/icmweb.pwd` for the user ID ADMIN, enter the following command:

```
htpasswd -c /usr/lpp/HTTPServer/share/icmweb.pwd ADMIN
```

Specifying the `-c` option ensures that you enter a password when you create a password file.

When you are prompted for the password, enter ADMINPW.

To add another user ID, ADMIN2, with the password ADMINPW2, enter the following command:

```
htpasswd /usr/lpp/HTTPServer/share/icmweb.pwd ADMIN2 ADMINPW2
```

The user ID must be 8 characters or less in length, because it is stored in the information catalog tables when a comment is created.

c. Restrict access to the `/usr/lpp/HTTPServer/share/icm` directory.

1) To require authentication when users access the `/usr/lpp/HTTPServer/share/icm` directory, edit the `httpd.conf` file. This file is usually located in the `/usr/lpp/HTTPServer/etc/` directory. Add a directory directive for the `/usr/lpp/HTTPServer/share/icm` directory, like this:

```
<Directory /usr/lpp/HTTPServer/share/icm>
AllowOverride AuthConfig
Options None
</Directory>
```

Installing the Information Catalog Manager for the Web

2) Create a file that is named `.htaccess` in the `/usr/lpp/HTTPServer/share/icm` directory with the AuthName, AuthType, AuthUserFile, and require directives that are set like this:

```
AuthName ICMWeb
AuthType Basic
AuthUserFile /usr/lpp/HTTPServer/share/icmweb.pwd
require valid-user
```

Because some editors require a file name and a file extension, you might need to create the file with the name `htaccess.txt` and rename it to `.htaccess` after you save it.

You must stop and restart the Web server for these changes to take effect.

Note: This is one way that you can enable authentication on an IBM HTTP Web server. You can set up more complex directory structures, user groups, and permissions, if necessary, along with additional security packages. More information about setting up basic authentication is available in the IBM HTTP Web server documentation. For information about advanced Web server security, see the documentation for IBM SecureWay (part of the Websphere family).

13. Set up Net.Data to run Live Connection Manager for the databases that are used by the Information Catalog Manager for the Web.

a. Edit the Net.Data file `/usr/lpp/internet/db2www/db2/dtwcm.cnf`, and add a CLIETTE DTW_SQL block for each database that the Information Catalog Manager for the Web will use.

To add the database ICMSAMP with a minimum of one process, a maximum of three processes, starting with private port number 7100, and starting with public port number 7110, add the following block:

```
CLIETTE DTW_SQL:ICMSAMP{
MIN_PROCESS=1
MAX_PROCESS=3
START_PRIVATE_PORT=7100
START_PUBLIC_PORT=7110
EXEC_NAME=./dtwcdb2
DATABASE=ICMSAMP
BINDFILE=NOT_USED
LOGIN=*USE_DEFAULT
PASSWORD=*USE_DEFAULT
}
```

Six ports (7100, 7101, 7102, 7110, 7111, 7112) are allocated to the ICMSAMP database. Make sure that these ports are free and not in use by another application. You must use different port number

ranges for each CLIETTE DTW_SQL block. See the *Net.Data Administration and Programming Guide* for more information.

b. Set the LOGIN value to the user ID for the database, and set the PASSWORD value to the password for the database. If the database is local, you can use *USE_DEFAULT.

c. Set up the Net.Data initialization file to use Live Connection Manager for the SQL calls. Edit the DB2WWW.INI file in the document root directory on the Web server (usually /usr/lpp/HTTPServer/share/htdocs). Make sure that the ENVIRONMENT DTW_SQL statement ends with CLIETTE "DTW_SQL:$(DATABASE)".

For example:

```
ENVIRONMENT (DTW_SQL) DTWSQL(IN DATABASE,LOGIN,PASSWORD,
   TRANSACTION_SCOPE,SHOWSQL,ALIGN,START_ROW_NUM)
   CLIETTE "DTW_SQL:$(DATABASE)"
```

d. Start Live Connection Manager by using the executable file /usr/lpp/internet/db2www/db2/dtwcm. Live Connection Manager must be running so that the Information Catalog Manager for the Web can access data from the databases. After Live Connection Manager is started, you can minimize the Live Connection Manager window on the Web server. See the *Net.Data Administration and Programming Guide* for more information.

Note: Live Connection Manager must be started with the DB2 instance that is specified in the db2www.ini file. The DB2 environment must be set up before you run the dtwcm executable file.

14. Log out.

Follow the steps in "Post-installation customization" on page 27 before using the Information Catalog Manager for the Web.

Installing the Information Catalog Manager for the Web on any Web server

Before you begin to install the Information Catalog Manager for the Web:

1. Make sure that the Web server software is installed on the Web server.

2. If the Web server has a port number other than 80 (the usual default), append the port number to the host name in the Web address: http://hostname:portnumber/

3. When you install Net.Data, you are prompted for the Web server's CGI-BIN and HTML directories. Make sure that you specify the Web server's directory where the CGI programs are run, and the document root directory for HTML files. The Net.Data CGI program db2www is placed in this CGI-BIN directory. The Net.Data DB2WWW.INI file is placed in the document root directory.

Installing the Information Catalog Manager for the Web

To install the Information Catalog Manager for the Web:

1. Install the Information Catalog Manager for the Web files onto your Web server or Windows NT workstation:

   a. Insert the DB2 Universal Database CD-ROM into the CD-ROM drive on the Web server workstation. The launchpad opens.

   b. Click **Install** from the launchpad.

   c. In the Select Products window, select the **DB2 Administration Client** check box, then click **Next**.

   d. In the Select Type of Install window, click **Custom**, then click **Next**.

   e. In the Select DB2 Components window, clear the check boxes for all components except the **Data Warehousing Tools** component.

   f. Click **Subcomponents**.

   g. In the Select Subcomponents window, ensure that the check box for the **Information Catalog Manager for the Web** is selected and that all other check boxes are cleared.

   h. Click **Continue**.

   i. In the Select Components window, clear the check boxes for the **Communication Protocols** component, the **Application Development Interfaces** component, and the **Administration and Configuration Tools** component. Make sure that the **Data Warehousing Tools** component remains selected.

   j. Click **Next** to continue with the installation. The installation program creates files in the following directories:

      - `program files\sqllib\icmweb\macro`
      - `program files\sqllib\icmweb\html`
      - `program files\sqllib\icmweb\icons`

2. Copy or use FTP to transfer as binary all the *.mac and *.hti files from the `program files\sqllib\icuweb\macro` directory to the `\db2www\macro` directory on the Web server. Set the file permissions to allow public read access.

3. Copy or use FTP to transfer as binary all the *.htm and *.gif files from the `program files\sqllib\icuweb\html` directory to the document root directory on the Web server. Set the file permissions to allow public read access.

4. Copy or use FTP to transfer as binary all the dg_*.gif files from the `program files\sqllib\icuweb\icons` directory to the icons directory on the Web server. Set the file permissions to allow public read access.

5. Edit the `dg_config.hti` file. Add the names of the directories where you copied the files and the server name. The macro_path variable can be set to an alias that is set up on your Web server to control user access.

   - Use the server_name variable to identify your Web server.

- Map the value for the image_path variable to the ICONS directory that is defined in the Web server configuration file.
- Use the value of the macro_path variable to specify the path icm/db2www.

On UNIX® operating systems, the dg_config.hti file will look like this:

```
%DEFINE {
        server_name="http://server.ibm.com/"
        image_path="$(server_name)icons/"
        macro_path="$(server_name)icm/db2www/"
        help_path="$(server_name)"
%}
```

On Windows NT and OS/2 operating systems, the dg_config.hti file will look like this:

```
%DEFINE {
        server_name="http://server.ibm.com/"
        image_path="$(server_name)icons/"
        macro_path="$(server_name)icm/db2www.exe/"
        help_path="$(server_name)"
%}
```

6. Add a link to an existing Web page, or create a Web page with a link to the Information Catalog Manager for the Web home page.

   To create a Web page, edit the file *document_root*\icm.html (where *document_root* is the Web server's document root directory). Set the file permission to allow public read access.

   - On UNIX operating systems, add the following lines:

     ```
     <html><head>
     <title>Information Catalog Manager for the Web</title>
     </head>
     <body bgcolor=white>
     <p><a href=/icm/db2www/dg_home.mac/Logon>
     Information Catalog Manager for the Web</a>
     </body>
     </html>
     ```

   - On Windows NT and OS/2 operating systems, add the following lines:

     ```
     <html><head>
     <title>Information Catalog Manager for the Web</title>
     </head>
     <body bgcolor=white>
     <p><a href=/icm/db2www.exe/dg_home.mac/Logon>
     Information Catalog Manager for the Web</a>
     </body>
     </html>
     ```

7. Enable basic user authentication on your Web server for each Information Catalog Manager for the Web user.

   When users access the Information Catalog Manager for the Web home page, they are prompted for their user ID and password. When they enter

these values, the HTTP environment variable REMOTE_USER is set. This variable is used to prompt users for their user ID and password and to create, update, and delete comments.

The user ID must be 8 characters or less, because it is stored in the information catalog tables when a comment is created.

a. Create an alias named `icm` for the directory where the Net.Data CGI program `db2www` is located.

- On UNIX operating systems, the macro_path variable that is defined in the `dg_config.hti` file uses this alias:

  ```
  macro_path="$(server_name)icm/db2www/"
  ```

- On Windows NT and OS/2 operating systems, the macro_path variable that is defined in the `dg_config.hti` file uses this alias:

  ```
  macro_path="$(server_name)icm/db2www.exe/"
  ```

b. Enable user ID and password authentication for the alias directory `icm` and set the proper permissions.

See the Web server documentation for more information about enabling authentication.

8. Set up Net.Data to run Live Connection Manager for the databases that are used by the Information Catalog Manager for the Web.

a. Edit the Net.Data file `dtwcm.cnf`, and add a CLIETTE DTW_SQL block for each database that will be used by the Information Catalog Manager for the Web.

To add the database ICMSAMP with a minimum of one process, a maximum of three processes, starting with private port number 7100 and starting with public port number 7110, add the following block:

```
CLIETTE DTW_SQL:ICMSAMP{
MIN_PROCESS=1
MAX_PROCESS=3
START_PRIVATE_PORT=7100
START_PUBLIC_PORT=7110
EXEC_NAME=./dtwcdb2
DATABASE=ICMSAMP
BINDFILE=NOT_USED
LOGIN=*USE_DEFAULT
PASSWORD=*USE_DEFAULT
}
```

This block allocates six ports (7100, 7101, 7102, 7110, 7111, 7112) to the database ICMSAMP. Make sure that these ports are free and not in use by another application. You must use different port number ranges for each CLIETTE DTW_SQL block. See the *Net.Data Administration and Programming Guide* for more information.

b. Set the LOGIN value to the user ID and PASSWORD value to the password for the database. If you are using a local database, then you can use the `*USE_DEFAULT` value.

c. Set the Net.Data initialization file to use Live Connection Manager for the SQL calls. Edit the `db2www.ini` file in the Web server's document root directory. Make sure that the environment DTW_SQL statement has `CLIETTE "DTW_SQL:$(DATABASE)"` at the end.

For example:

```
ENVIRONMENT (DTW_SQL) DTWSQL(IN DATABASE,LOGIN,PASSWORD,
    TRANSACTION_SCOPE,SHOWSQL,ALIGN,START_ROW_NUM)
    CLIETTE "DTW_SQL:$(DATABASE)"
```

d. Start Live Connection Manager by using the executable file `dtcmf` in the Net.Data directory. Live Connection Manager must be running so that the Information Catalog Manager for the Web can access data in the databases. After Live Connection Manager is started, you can minimize the Live Connection Manager window on the Web server. See the *Net.Data Administration and Programming Guide* for more information.

Follow the steps in "Post-installation customization" before using the Information Catalog Manager for the Web.

Post-installation customization

After you install the Information Catalog Manager for the Web, complete the following steps to customize the Information Catalog Manager for the Web for your users:

1. Edit the file `dg_home.hti`. Add a link for each information catalog that you want users to access from the Information Catalog Manager for the Web. Use the following format for the links:

   `<LI><A HREF=$(macro_path)dg_frame.mac/frame?DATABASE=xxxx> zzzz </A>`

   xxxx   The information catalog database name (for example, `ICMSAMP`)

   zzzz   A descriptive comment that is displayed on the Web page (for example, `CelDial sample catalog`)

   You can add HTML tags to the dg_home.hti file either before or after the information catalog list. These tags can include links, images, text, or other valid HTML 3.2 tags that you want to add.

2. Catalog the server node and databases by using the necessary DB2 client function. See the *Installation and Configuration Supplement* for more information. From the DB2 Command Line Processor, verify that the Web server can connect successfully to the databases.

Installing the Information Catalog Manager for the Web

Before you access information catalogs through the Information Catalog Manager for the Web, make sure that the database manager is started on the database servers, Live Connection Manager is started on the Web server, and the Web server is started.

Notify users of their user IDs and passwords, and inform them of the Web address that they can use to access the Information Catalog Manager for the Web.

Creating a sample information catalog

The Information Catalog Administrator provides a sample program to help you verify that the installation was successful. The program installs the sample data that is included with the Information Catalog Administrator. This sample data is used in the scenarios in the *Information Catalog Manager User's Guide*.

The *Information Catalog Manager Administration Guide* describes how to create the sample information catalog.

Chapter 4. Installing warehouse agents

When you install the warehouse server with DB2 Universal Database on
Windows NT or Windows 2000, a default agent is installed. If you require a
warehouse agent that is remote from the warehouse server, you can install
another warehouse agent using the DB2 Warehouse Manager.

Your warehouse server and all of your warehouse agents must be at the
Version 7 level.

Before you install any DB2 Version 7 warehouse agents, you must remove any
warehouse agents from Visual Warehouse Version 5.2 or earlier that are
located on that workstation.

Warehouse agents are available for the Windows NT, Windows 2000, OS/2,
AIX, AS/400, and OS/390 operating systems, and for the Solaris Operating
Environment. When you install warehouse agents on Windows NT, Windows
2000, OS/2, AIX, and the Solaris Operating Environment, the Data Warehouse
Center ODBC drivers and driver manager are also installed.

To remove a DB2 Version 7 warehouse agent, see "Removing DB2 Version 7
warehouse agents" on page 67.

Preparing to install warehouse agents

Warehouse agent sites must have access to warehouse sources and warehouse
targets. You must register these source and target databases with ODBC as
system DSNs. On AIX or the Solaris Operating Environment, you must
specify them in the .ODBC.INI file. This applies also to the server workstation
for data that is accessed by the default local agent. See the *Data Warehouse
Center Administration Guide* for more information.

You must install TCP/IP on the warehouse agent site to establish connectivity
between the warehouse agent site and the warehouse server. See "Establishing
connectivity" on page 65 for information about setting up connectivity.

If you want to serve a remote client from a DB2 server, set the DB2COMM
environment variable on the DB2 server:

```
db2set -i instance DB2COMM=TCPIP
```

This setting allows the server to accept TCP/IP requests from remote clients.

Installing a Windows NT warehouse agent

Before you install a Windows NT warehouse agent, you must remove the Visual Warehouse Version 5.2 or earlier Windows NT agent that is located on that workstation.

Removing a Visual Warehouse Windows NT agent

To remove a Visual Warehouse Windows NT agent:

1. Click **Start → Settings → Control Panel**.
2. Double-click the **Add/Remove Programs** icon.
3. On the Install/Uninstall page, click **Visual Warehouse**, then click the **Add/Remove** button.

   The Confirm Removal window opens.
4. Click **Remove**.
5. Delete the VWSWIN directory:
   a. Open Windows NT Explorer.
   b. Locate the VWSWIN directory on the drive where you installed the Visual Warehouse Windows NT agent.
   c. Delete the VWSWIN directory.
6. Remove Visual Warehouse from the Windows NT registry:
   a. Click **Start → Run**.
   b. In the **Open** field, type `regedit`, then click **OK**.
   c. Expand the **HKEY_LOCAL_MACHINE** folder.
   d. Expand the **Software** folder.
   e. Expand the **IBM** folder.
   f. Delete the **Visual Warehouse** folder.

Installing a Windows NT warehouse agent

Before you install a Windows NT warehouse agent, ensure that you are using a Windows NT user ID that has administrator privileges. If DB2 Universal Database is installed on the warehouse agent site, it must be at Version 7.

To install a Windows NT warehouse agent:

1. Close all Windows programs.
2. Insert the Warehouse Manager CD-ROM into your CD-ROM drive. The launchpad opens.
3. Click **Install** from the launchpad.
4. In the Select Products window, ensure that the **DB2 Warehouse Manager** check box is selected, then click **Next**.
5. In the Select Installation Type window, click **Custom**, then click **Next**.

6. In the Select DB2 Components window, select the **Warehouse Agent** check box, then click **Next**.

7. In the Start Copying Files window, review your selections. If you want to change any of your selections, click **Back** to return to the window where you can change the selection. Click **Next** to begin copying files.

8. In the Setup Complete window, click **Finish** to restart the workstation.

After you install the warehouse agent, click **Start ⟶ Settings ⟶ Control Panel ⟶ ODBC** to register your source and target databases as system DSNs.

Installing the OS/2 warehouse agent

Before you install the OS/2 warehouse agent, you must remove the Visual Warehouse Version 5.2 or earlier OS/2 agent that is located on that workstation.

Removing the Visual Warehouse OS/2 agent

To remove the Visual Warehouse OS/2 agent components from your workstation:

- For Visual Warehouse Version 3.1, start the **Uninstall** program icon in the Visual Warehouse Agent folder on the desktop.
- For Visual Warehouse Version 5.2, use the Installation Utility in the Visual Warehouse folder.

Installing the OS/2 warehouse agent

Installing a warehouse agent on OS/2 consists of installing the warehouse agent code and cataloging the databases that will be accessed by the agent as ODBC data sources. You can do this by using the ODBC Administrator. To access non-DB2 databases with the installed Data Warehouse Center ODBC drivers, you must install licensed clients for those database types, and the clients must be accessible by the warehouse agent, on the node where the warehouse agent runs.

Before you install the OS/2 warehouse agent:

1. Verify that the DB2 ODBC driver and driver manager (available from the DB2 Universal Database CD-ROM) are installed in the \OS2 directory of your boot drive.

2. To access databases with the installed Data Warehouse Center ODBC drivers, ensure that the correct client software is installed for the data sources that you plan to use. See the *Data Warehouse Center Administration Guide* for information on supported data sources.

Installing warehouse agents

To install the warehouse agent and executable versions of the sample programs:

1. Insert the Warehouse Manager CD-ROM into your CD-ROM drive.
2. Run *f*:\install.exe, where *f* is your CD-ROM drive.
3. If you are upgrading from Visual Warehouse, find the file ODBC.DLL in the \SQLLIB\BIN directory, and rename it to ODBC.BAK. Doing this will ensure that the ODBC driver manager in the \OS2 directory on your boot drive will be used.
4. Restart your workstation.

You must catalog the DB2 nodes and databases, and register each source and warehouse database that you want to use with the warehouse agent as a system DSN. See the *Installation and Configuration Supplement* for more information.

When you install the warehouse agent, the warehouse agent daemon is added to your OS/2 Startup folder. When the warehouse agent daemon starts from the OS/2 Startup folder, the daemon runs in a window in a foreground session. While the daemon is running, this window provides status information about the daemon. You can end this session by closing the window.

The warehouse agent creates log files in the directory that is specified by the VWS_LOGGING environment variable. The default value for this variable is C:\SQLLIB\LOGGING.

Installing the OS/390 (zSeries) warehouse agent

This section contains the following information:

Overview of the zSeries warehouse agent

DB2 Warehouse Manager for z/OS and OS/390 includes a zSeries warehouse agent. You can use the agent to communicate between DB2 Universal

Database for z/OS and OS/390 and other databases, including DB2 databases on other operating systems and non-DB2 databases. The warehouse agent can communicate with supported data sources that use an Open Database Connectivity (ODBC) connection. The warehouse agent runs on Unix Systems Services, requires OS/390 Version 2 Release 7 or later, and is compatible with DB2 for OS/390 Versions 5 and 6, and DB2 for z/OS and OS/390 Version 7.

The zSeries warehouse agent supports the following tasks:

- Copy data from a DB2 database source to a DB2 database target
- Produce sample contents from a table or file
- Run user-defined programs
- Access non-DB2 databases through IBM DataJoiner
- Access VSAM or IMS data through Cross Access Classic Connect
- Run DB2 Universal Database for z/OS and OS/390 utilities
- Run the apply job for IBM Data Propagator
- Execute warehouse-supplied transformers

Software requirements

This section contains information about the software, authorities, and Program Temporary Fixes (PTFs) that are required to install the zSeries warehouse agent.

Software requirements

- OS/390 Version 2.7 or later
- DB2 Universal Database for OS/390 Version 5 or later
- OS/390 Unix System Services

The zSeries warehouse agent is included on the DB2 Universal Database for z/OS and OS/390 Version 7 product. The *DB2 Warehouse Manager Program Directory* is also included in this product, and contains information about requirements for storage, programming, and your driving and target systems.

Authority requirements

- User ID with Authorized Program Facility (APF) authority (to work with Unix System Services)
- EXECUTE authority on plan DSNAOCLI
- READ and WRITE authority to the logging and ODBC trace directories (optional)

APAR requirements

Table 1 shows the APARs that you must apply to your DB2 subsystem before installing the OS/390 agent.

Installing warehouse agents

Table 1. Requisite APARs

DB2 Universal Database Version	Requisite APAR
DB2 for OS/390 Version 5	PQ36586
DB2 for OS/390 Version 6	PQ36585

No APARs are required if DB2 for z/OS and OS/390 Version 7 is installed on your system.

Table 2 shows the PTFs that you must apply to your DB2 subsystem if you plan to set up Java stored procedures.

Table 2. Requisite PTFs

DB2 Universal Database Version	Requisite PTF
DB2 for OS/390 Version 5	UQ46170
DB2 for OS/390 Version 6	UQ46114
DB2 for z/OS and OS/390 Version 7	UQ53028

Installing the zSeries warehouse agent

To install the zSeries warehouse agent:

1. Unload the code for the warehouse agent from the SMP/E tape. For information about installing using SMP/e, see the *Program Directory for IBM DB2 Universal Database Server for z/OS and OS/390 DB2 Warehouse Manager*, or the *Program Directory for IBM DB2 Warehouse Manager Sourcing Agent*. The program directory is supplied with the product.

   One of the target libraries that results from the SMP/e installation is a Unix Systems Services directory, which contains the wareexecutables program, which has a default name of /usr/lpp/DWC. This directory contains the executable files for the warehouse agent.

2. Set up a home directory within UNIX Systems Services for each user ID that will start the agent. Update the environment variables in your .profile file. The variables point the agent to various DB2 libraries, for example output directories.

   This example shows the contents of a sample .profile file:

```
export VWS_LOGGING=/usr/lpp/DWC/logs
export VWP_LOG=/usr/lpp/DWC/vwp.log
export VWS_TEMPLATES=usr/lpp/DWC
export DSNAOINI=/u/userid/dsnaoini
export LIBPATH=usr/lpp/DWC/ :$LIBPATH
export PATH=/usr/lpp/DWC/ :$PATH
export STEPLIB=DSN710.SDSNEXIT:DSN710.SDSNLOAD
```

The .profile file defines the environment variables, and must be in the home directory of the user who starts the agent daemon.

3. Set up kernel and daemon connections. To set up these connections, add the following lines to your /etc/servicesfile or TCPIP.ETC.SERVICES file:

```
vwkernel 11000/tcp
vwd 11001/tcp
vwlogger 11002/tcp
```

To set up connections between the zSeries warehouse agent and databases, add any remote databases to your z/OS and OS/390 communications database.

This example shows sample CDB inserts to connect a database that is running on Windows NT to an OS/390 agent:

```
INSERT INTO SYSIBM.LOCATIONS
(LOCATION, LINKNAME, PORT)
VALUES
('NTDB','VWNT704','60002');
INSERT INTO SYSIBM.IPNAMES
(LINKNAME, SECURITY_OUT, USERNAMES, IPADDR)
VALUES
('VWNT704', 'P', 'O', 'VWNT704.STL.IBM.COM');
INSERT INTO SYSIBM.USERNAMES
(TYPE, AUTHID, LINKNAME, NEWAUTHID, PASSWORD)
VALUES
('O', 'MVSUID', 'VWNT704', 'NTUID', 'NTPW');
```

For more information about setting up connections and updating your communications database, see the *DB2 Universal Database for z/OS and OS/390 Installation Guide*.

4. Bind ODBC locally and to any remote databases. Because the OS/390 agent uses ODBC to communicate with DB2, you must bind your CLI plan to all of the local and remote databases that your agent will access.

If your local system is named *DWC6*, this example shows some sample bind package statements for a local DB2 for z/OS and OS/390 database:

```
DSN SYSTEM(DWC6)
BIND PACKAGE (DWC6CLI) MEMBER(DSNCLICS) ISO(CS)
BIND PACKAGE (DWC6CLI) MEMBER(DSNCLINC) ISO(NC)
BIND PACKAGE (DWC6CLI) MEMBER(DSNCLIRR) ISO(RR)
BIND PACKAGE (DWC6CLI) MEMBER(DSNCLIRS) ISO(RS)
BIND PACKAGE (DWC6CLI) MEMBER(DSNCLIUR) ISO(UR)
BIND PACKAGE (DWC6CLI) MEMBER(DSNCLIQR) ISO(QR)
BIND PACKAGE (DWC6CLI) MEMBER(DSNCLIMS)
BIND PACKAGE (DWC6CLI) MEMBER(DSNCLIC1)
BIND PACKAGE (DWC6CLI) MEMBER(DSNCLIC2)
BIND PACKAGE (DWC6CLI) MEMBER(DSNCLIF4)
```

The following example shows some sample bind package statements for a remote DB2 for z/OS or OS/390 database, where *REMLOC* is the location

name of the remote DB2 for z/OS or OS/390 system which has been registered in the Communications Database:

```
DSN SYSTEM(DWC6)
BIND PACKAGE (REMLOC.DWC6CLI) MEMBER(DSNCLICS) ISO(CS)
BIND PACKAGE (REMLOC.DWC6CLI) MEMBER(DSNCLINC) ISO(NC)
BIND PACKAGE (REMLOC.DWC6CLI) MEMBER(DSNCLIRR) ISO(RR)
BIND PACKAGE (REMLOC.DWC6CLI) MEMBER(DSNCLIRS) ISO(RS)
BIND PACKAGE (REMLOC.DWC6CLI) MEMBER(DSNCLIUR) ISO(UR)
BIND PACKAGE (REMLOC.DWC6CLI) MEMBER(DSNCLIQR) ISO(QR)
BIND PACKAGE (REMLOC.DWC6CLI) MEMBER(DSNCLIMS)
BIND PACKAGE (REMLOC.DWC6CLI) MEMBER(DSNCLIC1)
BIND PACKAGE (REMLOC.DWC6CLI) MEMBER(DSNCLIC2)
BIND PACKAGE (REMLOC.DWC6CLI) MEMBER(DSNCLIF4)
```

The following example shows some sample bind package statements for a DB2 Universal Database that is running on Windows NT:

```
BIND PACKAGE (NTDB.DWC6CLI) MEMBER(DSNCLICS) ISO(CS)
BIND PACKAGE (NTDB.DWC6CLI) MEMBER(DSNCLINC) ISO(NC)
BIND PACKAGE (NTDB.DWC6CLI) MEMBER(DSNCLIRR) ISO(RR)
BIND PACKAGE (NTDB.DWC6CLI) MEMBER(DSNCLIRS) ISO(RS)
BIND PACKAGE (NTDB.DWC6CLI) MEMBER(DSNCLIUR) ISO(UR)
BIND PACKAGE (NTDB.DWC6CLI) MEMBER(DSNCLIC1)
BIND PACKAGE (NTDB.DWC6CLI) MEMBER(DSNCLIC2)
BIND PACKAGE (NTDB.DWC6CLI) MEMBER(DSNCLIQR)
BIND PACKAGE (NTDB.DWC6CLI) MEMBER(DSNCLIF4)
BIND PACKAGE (NTDB.DWC6CLI) MEMBER(DSNCLIV1)
BIND PACKAGE (NTDB.DWC6CLI) MEMBER(DSNCLIV2)
```

Here is a sample bind statement to bind the CLI packages for all locations together in a plan:

```
DSN SYSTEM(DWC6)
BIND PLAN(DWC6CLI) PKLIST(*.DWC6CLI.* )
```

When you complete binding the CLI packages, verify that the DSNAOINI environment variable in your .profile file points to the ODBC initialization file that uses the CLI plan that you just bound.

For example, if the CLI plan is named DWC6CLI and the local system is named DWC6, the ODBC initialization file should contain the following information:;SUBSYSTEM stanza [DWC6] MVSATTACH=CAF PLANNAME=DWC6CLI

5. Set up your ODBC initialization file. A sample ODBC initialization file, INISAMP, is included in the usr/lpp/DWC/ directory. You can edit this file to work with your system, or you can create your own file.

   To be sure that the file works correctly, verify that it is properly configured:

   - The DSNAOINI environment variable must point to the initialization file.
   - The file must include CONNECTTYPE=2 in the common stanza.

- The file must include MVSATTACHTYPE=CAF in the subsystem stanza.

Ensure that you have a data source stanza for your DB2 system. It should specify the location name of the local DB2 system.

This is an example of a DSNAOINI file:

```
[COMMON]
MVSDEFAULTSSID=DWC6
CONNECTTYPE=2
;APPLTRACE=1
;APPLTRACEFILENAME=/usr/lpp/DWC/logs/application.CLITRACE
;TRACEFLUSH=1
;Example SUBSYSTEM stanza for V71A subsystem
[DWC6]
MVSATTACHTYPE=CAF
PLANNAME=DWC6CLI
;DATA SOURCE stanza for ISC710P1 data source
[ISC710P1]
```

To turn on ODBC tracing, remove the three commented lines in the COMMON section. For more information about binding ODBC and the DSNAOINI file, see the *DB2 Universal Database for z/OS and OS/390 ODBC Guide and Reference*.

6. Set up authorizations so that the user has the following authorizations:
   - Authority to run the agent daemon.
   - Execute authority on plan DSNAOCLI.
   - READ and WRITE authority to the logging and ODBC trace directories, if needed.

The zSeries warehouse agent is a daemon process. Because the agent daemon uses the _password( ) function, define these agent executable programs to RACF program control:

```
libtls4d.dll
iwhcomnt.dll
vwd
```

To define the executable programs to RACF program control, change to the directory where the Data Warehouse Center executable files are stored and run the following commands:

```
extattr +p libtls4d.dll
extattr +p iwhcomnt.dll
extattr +p vwd
```

To use the extattr command with the +p parameter, you must have at least READ access to the BPX.FILEATTR.PROGCTL FACILITY class.

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This example shows the RACF command that is used to give this
permission to user ID JOEUSER:

```
RDEFINE FACILITY BPX.FILEATTR.PROGCTL UACC(NONE)
PERMIT BPX.FILEATTR.PROGCTL CLASS(FACILITY) ID(JOEUSER)
ACCESS(READ)
SETROPTS RACLIST(FACILITY) REFRESH
```

For more information about authorizations see *z/OS and OS/390 UNIX
System Services Planning*.

7. After you finish configuring the system, start the agent daemon. Use telnet
   to connect to OS/390 UNIX Systems Services through the z/OS and
   OS/390 host name and USS port.

Starting the agent daemon
To start the daemon in the foreground, enter vwd on a command line under a
Unix Systems Services shell.

To start the daemon in the background, enter vwd>/usr/lpp/DWC/logs/vwd.log
2>&1 & on a command line under a Unix Systems Services shell.

To verify that the zSeries warehouse agent daemon is running, enter ps -e |
grep vwd on a UNIX shell command line.

Or, enter D OMVS,a=all on the z/OS or OS/390 console and search for the
string vwd.

Setting up user-defined programs

The DB2 Warehouse Manager package includes the following user-defined
programs:

- VWPFTP runs an FTP command file.
- VWPMVS submits a JCL jobstream.
- VWPRCPY copies a file using FTP.
- XTClient is a client trigger program.
- ETIDLMVS is a utility from ETI (Evolutionary Technologies International)
  that deletes files on MVS.
- ETIRCMVS is a utility from ETI that runs FTP on an MVS host.
- ETIEXMVS is a utility from ETI that runs JCL on MVS.

In addition, you can create user-defined programs and stored procedures in
the Data Warehouse Center. The zSeries warehouse agent supports any
executable programs that run under UNIX Systems Services.

A user-defined program is assigned to one or more steps. When you run a
user-defined program, the following actions occur:

- The agent runs the user-defined program.

- The user-defined program returns a return code and a feedback file to the agent.
- The agent returns the results to the kernel.

ETI programs on z/OS or OS/390 require a minimum level of DB2 Universal Database Version 7.1, Fixpack 2. Use the VWP_LOG environment variable to define a directory where the user-defined programs can write output.

To use a user-defined program to transfer a job with FTP, you must first create the JCL and data that you want to submit. The job name in the JCL must be USERID*X*, where *X* is a 1-character letter or number (example: JOEUSER*A*). The output class for the MSGCLASS and SYSOUT files that are contained in your JCL must specify a JES-held output class.

The maximum LRECL for the submitted job is 254 characters. JES scans only the first 72 characters of JCL.

Changing the Data Warehouse Center template for FTP support
The Data Warehouse Center installs a JCL template for transferring files using FTP. If you plan to use the FTP commands GET or PUT to transfer files from a z/OS or OS/390 host to another remote host, you need to change the account information in the JCL template for your z/OS or OS/390 system.

To change the account information in the JCL template for your z/OS or OS/390 system:

1. Log on with an ID that has authority to copy and update files in the `/usr/lpp/DWC` directory.
2. Find the `ftp.jcl` file and copy it with the new file name *systemname*`.ftp.jcl`, where *systemname* is the name of the z/OS or OS/390 system.
3. Create a copy of this file for each z/OS or OS/390 system on which you plan to run the conversion programs VWPMVS or ETI extract.

   For example, if you want to run either of these programs on STLMVS1, create a copy of the file named *STLMVS1*`.ftp.jcl`.
4. Use a text editor to customize the JCL to meet your requirements.
5. Change the account information to match the standard account information for your OS/390 MVS system. Do not change any parameters that are contained in brackets, such as `[USERID]` and `[FTPFILE]`. The brackets are the hexadecimal characters X'AD' and X'BD', respectively. If your TSO terminal type is not set to 3278A in SPF Option 0, these values might display as special characters rather than as brackets. This is not a problem if you do not change the X'AD' or the X'BD', or any of the data that is between the characters.

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6. Update the environment variable VWS_TEMPLATES to point to the directory of the copied template file.

The Data Warehouse Center includes this sample JCL template:

```
//[USERID]A JOB , 'PUT/GET',
//* THE NAME OF THE JOB MUST BE THE NAME OF THE
//* MVS USER ID FOLLOWED BY ONE ALPHANUMERIC
//* CHARACTER.  THIS IS A RESTRICTION OF FTP/MVS.
// CLASS=A,
// USER=&SYSUID,
// NOTIFY=&SYSUID,
// TIME=(,30),
// MSGCLASS=H
//STEP1 EXEC PGM=FTP,PARM='( EXIT'
//INPUT DD DSN=[FTPFILE],DISP=SHR
//OUTPUT DD SYSOUT=*
//SYSPRINT DD SYSOUT=*
```

Producing sample contents of a table or file

Using the zSeries warehouse agent, you can produce sample contents of DB2 tables and flat files such as OS/390 UNIX Systems Services files and z/OS or OS/390 native flat files. You can also produce sample contents of IMS or VSAM files with Classic Connect using the zSeries warehouse agent. Sampling contents of flat files is a limited capability. The warehouse only displays character data from flat files. In addition, when you set the file as a source, you must define the individual fields in the file definition so that the agent can display the data at the correct offset and length for each field.

Scheduling warehouse steps with the trigger program (XTClient)

Use the trigger program to schedule warehouse steps from z/OS or OS/390. You or an OS/390 job scheduler can submit a job that triggers a step in the Data Warehouse Center. If the step is successful, the trigger step in the JCL returns a return code of 0.

You must have Java Development Kit (JDK) 1.1.8 or later installed on your Unix Systems Services to use the trigger program.

To start the trigger program, start XTServer on the computer where your warehouse server is running. This process is described in the *Data Warehouse Center Administration Guide*.

When XTServer is started on Microsoft Windows NT, start the XTClient on Unix System Services.

This is a sample JCL to start the trigger:

```
//DBA1A JOB 1,'XTCLIENT',CLASS=A,MSGCLASS=H,
// MSGLEVEL=(1,1),REGION=4M,NOTIFY=&SYSUID
//*********************************************
//* submit iwhetrig
//*********************************************
//BRADS EXEC PGM=BPXBATCH,
// PARM=('sh cd /usr/lpp/DWC/; java XTClient 9.317.171.133 1100x
// 9 drummond pw bvmvs2nt 1 1 100')
//STDOUT DD PATH='/tmp/xtclient.stdout',
// PATHOPTS=(OWRONLY,OCREAT),
// PATHMODE=SIRWXU
//STDERR DD PATH='/tmp/xtclient.stderr',
// PATHOPTS=(OWRONLY,OCREAT),
// PATHMODE=SIRWXU
//
```

The previous sample JCL shows that the parameters continue to a new line. Type the parameters up to column 71, put an X in column 72 and continue in column 16 on the next line. The first part of the parameter (cd /usr/lpp/DWC/;) is a statement that changes to the directory where the zSeries warehouse agent is installed.

The second part of the parameter starts XTClient and passes the following parameters:
- Your DWC server host name or IP address
- Your DWC server port (normally 11009)
- Your DWC user ID
- Your DWC password
- The name of the step to run
- A DWC server command, where:
  - 1 = populate the step
  - 2 = promote the step to test mode
  - 3 = promote the step to production mode
  - 4 = demote the step to test mode
  - 5 = demote the step to development mode
- The option whether to wait for the step completion, where 1= yes and 0 = no
- The maximum number of rows (use 0 or blank to fetch all rows)

Transformers

The Data Warehouse Center includes transformers, which are Java stored procedures that provide some basic data transformations. To run transformers, you must first set up Java stored procedures on your DB2 subsystem.

Installing warehouse agents

Additional information about transformers is available in the *IBM DB2 Universal Database Data Warehouse Center Administration Guide*, SC26-9993.

You can run the following transformers with the zSeries agent:
- IWH.CLEAN
- IWH.PERIODTABLE
- IWH.KEYTABLE
- IWH.CHISQUARE
- IWH.CORRELATION
- IWH.STATISTICS
- IWH.INVERTDATA
- IWH.PIVOTDATA
- IWH.REGRESSION
- IWH.ANOVA
- IWH.SUBTOTAL
- IWH.MOVINGAVERAGE

Setting up Java stored procedures on your DB2 subsystem

The following are a brief version of the complete instructions on how to set up Java stored procedures. See the *DB2 Universal Database for z/OS and OS/390 Application Programming Guide and Reference for Java*, SC26-9932 for complete instructions.

To set up Java stored procedures on your DB2 subsystem:
1. Apply any needed PTFs to DB2 as shown in Table 2 on page 34.
2. Install Visual Age for Java 2.0 or later on your OS/390 or z/OS system.
3. Install Java Database Connectivity (JDBC) and bind the JDBC packages in your DB2 subsystem.
4. Set up the Revised Report on Scheme (RRS) and DB2 Work Load Manager (WLM) stored procedures for your DB2 subsystem.
5. Set up Java stored procedures for your DB2 subsystem. This includes creating a Java WLM startup procedure for the Java stored procedures address space.
6. Under WLM, associate your Java WLM startup procedure with a WLM environment name.
7. Associate the environment name with the JCL procedure, using the WLM application environment.
8. Specify the WLM application environment name for the WLM_ENVIRONMENT option on CREATE or ALTER PROCEDURE to associate a stored procedure or user-defined function with an application environment.

9. Ensure that the owner of your DB2 subsystem's started tasks has access to the libraries in the Java WLM startup procedure.

Setting up warehouse transformers

The following instructions describe how to set up the warehouse transformers on DB2 for z/OS and OS/390. For complete instructions on how to use the transformers after they are set up, see the *Data Warehouse Center Administration Guide*.

To set up warehouse transformers on DB2 for z/OS and OS/390:

1. Define your transformer sources to the warehouse. If you have not applied FixPak 3 to DB2 Universal Database for NT Version 7, you must update the warehouse control database to TRANSREGISTERED = 1 and TRANSFENCED=1.

   To update the warehouse control database, enter the following SQL statement in the DB2 Command Line Processor:

   ```
   CONNECT TO your_vw_control_database
   UPDATE IWH.INFORESOURCE SET TRANSREGISTERED = '1' WHERE SUBDBTYPE = 'DB2 MVS'
   UPDATE IWH.INFORESOURCE SET TRANSFENCED = '1' WHERE SUBDBTYPE = 'DB2 MVS'
   ```

   where *your_vw_control_database* is the name of your DWC control database.

2. To define the transformers to DB2 for z/OS and OS/390, locate your DB2 Universal Database version in Table 3 and go to the corresponding directory to find and apply the required SQL statement.

Table 3. SQL statement location according to DB2 Universal Database version

DB2 Universal Database Version	SQL statements location
DB2 for OS/390 Version 5	Use commented SQL statements in the/usr/lpp/DWC/createXfSQL directory (comment out all of the CREATE PROCEDURE statements; then remove comments and use the INSERT INTO SYSIBM.SYSPROCEDURES statements to define the transformers to DB2 for OS/390 Version 5)
DB2 for OS/390 Version 6	Use SQL statements in the /usr/lpp/DWC/createXfSQL directory
DB2 for z/OS and OS/390 Version 7	Use SQL statements in the /usr/lpp/DWC/createXfSQLV7 directory

When you set up Java stored procedures, use WLM to associate the Java WLM startup procedure with a WLM environment name. The environment name is specified in the WLM ENVIRONMENT option of the CREATE PROCEDURE statement. DSNWLMJ is the WLM environment name included with the transformer definitions. You can either add a WLM association name of DSNWLMJ, or change the WLM

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ENVIRONMENT option for each transformer definition to a name that is already associated with your startup procedure.

3. Set up links from UNIX Systems Services to the transformer load modules in IWH710.SIWHLOAD:

   a. Use telnet to connect to UNIX Systems Services on your OS/390 or z/OS host system.

   b. Change to the directory where you installed the zSeries warehouse agent. The default installation directory is /usr/lpp/DWC.

   c. If you are using DB2 V7, go to step 3e. If you are using DB2 Version 5 or Version 6, edit the trlinks data set in the installed directory.

   d. Make this line a comment by putting a pound sign (#) in column 1. For example: #ln -e IWHXF xf.jll;. Remove the comment from this line by removing the pound sign(#) in column 1. For example: ln -e IWHXFV7 xf.jll;. Save your changes.

   e. Type trlinks and press Enter. An xf.jll link is created in the /usr/lpp/DWC/com/ibm/data directory. The link will direct the agent to load either the IWHXF or IWHXFV7 modules.

4. APF-authorize IWH710.SIWHPDSE, then add it to the STEPLIB concatenation in your DB2 Java stored procedures startup procedure.

5. Add the directory where the xf.jll link is (the default is /usr/lpp/DWC) to the CLASSPATH and LIBPATH environment variables in the WLM environment data set. To find the WLM environment data set, look in the DB2 Java stored procedures startup procedure. The WLM environment data set is the one that your JAVAENV DD card points to.

6. Start the stored procedures, then create and run your warehouse steps.

Considerations for Java stored procedures

When you install JDBC, you run the installVAJDLL command. This command creates an sqlj.jll link to the JDBC driver. The name of the directory where you installed this sqlj.jll link must be added to the CLASSPATH and LIBPATH statements in your environment variable data set.

SQLJ is included in a Java package named /COM/ibm/db2os390/. For example, if your sqlj.jll link is in the /usr/lpp/db2710/COM/ibm/db2os390/ directory, you need to add /usr/lpp/db2710/ to your CLASSPATH and LIBPATH statements.

The environment variable data set cannot contain more than 244 characters.

To reduce the number of characters in the environment variable data set:

1. Create a directory such as /u/userid/links. Include both the JDBC link and the transformer link in the /u/userid/links directory:

```
/u/userid/links/com/ibm/data/xf.jll
/u/userid/links/COM/ibm/db2os390/sqlj.jll
```

2. Change your LIBPATH statement to LIBPATH=/u/userid/links.
3. Change your CLASSPATH statement to /u/userid/links.

If you move the links, you must execute authorities again for your .jll files so that the extended bit is on.

To determine whether the extended bit is on:

1. Go to the directory that contains the links, and enter the command ls -lt.

   The permission bit contains e in the high-order bit position. For example, erwxrwxrwx.
2. If the high order bit is l (for example, lwxrwxrwx), and you are running DB2 for OS/390 Version 5 or Version 6, you need to create the link again using the command:

   ```
   ln -e DSNAQJLL sqlj.jll
   ln -e IWHXF xf.jll
   ```

   If the high order bit is l, and you are running DB2 for z/OS and OS/390 Version 7, create the link again using the command:

   ```
   ln -e IWHXFV7 xf.jl
   ```

Java objects in the signature of a stored procedure are supported only in DB2 for z/OS and OS/390 Version 7. In DB2 for OS/390 Version 5 and Version 6, the transformers do not support null values in their parameters. In these versions, if you pass a null parameter, it is considered a zero. DB2 Version 5 and Version 6 transformers treat zero parameters like null strings.

DB2 supports the COMMIT SQL statement in stored procedures only in DB2 for z/OS and OS/390 Version 7. The INVERTDATA stored procedure drops and recreates a table within the stored procedure; therefore, it requires a COMMIT statement. IWH.INVERTDATA is not supported in DB2 for OS/390 Version 5 or Version 6.

DB2 for z/OS and OS/390 does not support Java user-defined functions, so IWH.FORMATDATE is not supported on the S/390 platform.

This is a sample startup procedure for Java stored procedures:

```
//DSNWLMJ PROC DB2SSN=DSN,NUMTCB=5,APPLENV=DSNWLMJ
//*********************************************
//* THIS PROC IS USED TO START THE WLM-ESTABLISHED SPAS *
//* ADDRESS SPACE FOR THE DSNWLMJ APPLICATION ENVIRONMENT *
//* V WLM,APPLENV=DSNWLMJ,RESUME *
//*********************************************
//DSNWLMJ EXEC PGM=DSNX9WLM,TIME=1440,REGION=0M,
// PARM='&DB2SSN, &NUMTCB, &APPLENV'
```

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```
//STEPLIB  DD DSN=DSN.TESTLIB,DISP=SHR
//         DD DSN=IWH710.SIWHPDSE,DISP=SHR
//         DD DSN=DSN.HPJSP.PDSE.JDBC,DISP=SHR
//         DD DSN=SYS1.PP.PDSELINK,DISP=SHR
//         DD DSN=DSN710.SDSNEXIT,DISP=SHR
//         DD DSN=DSN710.SDSNLOAD,DISP=SHR
//         DD DSN=SYS1.SCEERUN,DISP=SHR
//         DD DSN=DSN.PDSE,DISP=SHR
//JAVAENV  DD DSN=DSN.WLMENVJ.JSPENV,DISP=SHR
//CEEDUMP  DD SYSOUT=A
//DSSPRINT DD SYSOUT=A
//JSPDEBUG DD SYSOUT=A
//SYSABEND DD SYSOUT=A
//SYSPRINT DD SYSOUT=A
```

In this example, the IWH710.SIWHPDSE library contains the transformer load
modules. DSN.HPJSP.PDSE.JDBC contains the High Performance Java (HPJ)
DLLs from HPJ setup. In DB2 for zSeries Version 7, this library is named
DSN710.SDSNLOD2. SYS1.PP.PDSELINK and contains the HPJ runtime
libraries. DSN.PDSE contains HPJ setup information. DSN.WLMENVJ.JSPENV
contains the environment variables.

This is an environment variable data set:

```
ENVAR("TZ=PST07",
"DB2SQLJPROPERTIES=/usr/lpp/db2/jdbc/db2710/classes/db2sqljjdbc.properties",
"LIBPATH=/usr/lpp/DWC",
"VWSPATH=/usr/lpp/DWC",
"CLASSPATH=/usr/lpp/db2/jdbc/db2710/classes:/usr/lpp/DWC:/usr/lpp/hpj/lib"),
MSGFILE(JSPDEBUG)
```

National language support for transformers
Most messages produced by the zSeries warehouse agent are sent to the
Windows NT system to be interpreted, so in most cases the message language
is dependent on how DB2 Universal Database for Windows NT was installed.

Transformers are an exception. For transformers, the message language is not
dependent on how DB2 Universal Database for Windows NT was installed.
The zSeries warehouse agent includes the following message files for the
transformers:

Table 4. National language support message files for transformers

File name	Language
Xf.properties_Fi_FI	Finnish
Xf.properties_No_NO	Norwegian
Xf.properties_Ru_RU	Russian
Xf.properties_Zh_CN	Simplified Chinese
Xf.properties_Zh_TW	Traditiional Chinese

Table 4. National language support message files for transformers (continued)

Xf.properties_Da_DK	Danish
Xf.properties_De_DE	German
Xf.properties_En_US	U.S. English
Xf.properties_Es_ES	Spanish
Xf.properties_Fr_FR	French
Xf.properties_It_IT	Italian
Xf.properties_Ja_JP	Japanese
Xf.properties_Ko_KR	Korean
Xf.properties_Pt_BR	Brazilian Portugese
Xf.properties_Sv_SE	Swedish

If your transformer messages are in a language other than English, select one of the files in Table 4 on page 46 and copy its contents to the Xf.properties file.

Accessing databases outside of the DB2 family

To access non-DB2 Universal Database systems, the zSeries agent uses DataJoiner. DataJoiner enables the agent to use a normal Distributed Relational Database Architecture (DRDA) flow to it as if it were a DB2 Universal Database database. If an ODBC request is directed to a non-DB2 family database source, DataJoiner invokes an additional layer of code to access the database.

DataJoiner can access Oracle, Sybase, Informix, Microsoft SQL Server, Teradata, and any other database that has an ODBC driver that runs on Windows NT, AIX, or the Solaris Operating Environment. The zSeries agent can access DataJoiner as a source, but not as a target. DataJoiner does not support two-phase commit. Although DataJoiner Versions 2.1 and 2.1.1 support TCP/IP as an application requester, it does not have an application server. Because the zSeries agent requires an application server to use TCP/IP, you must use an SNA connection instead to access DataJoiner from OS/390 or z/OS.

Accessing IMS and VSAM on OS/390 or z/OS

The zSeries warehouse agent can access IMS and VSAM through the Classic Connect ODBC driver. With Classic Connect, you can set up a DB2-like definition of IMS and VSAM data sets, and then access them using ODBC. You must purchase and install Classic Connect separately from the warehouse agent.

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The zSeries warehouse agent loads the correct ODBC driver based on whether a request is directed to Classic Connect or DB2. If you are accessing a DB2 source, the agent loads the DB2 ODBC driver. If you are accessing a VSAM or IMS source, the agent loads the Classic Connect ODBC driver. The agent request is then processed.

Setting up the Classic Connect ODBC driver and warehouse access

With Classic Connect, you can view a single file or a portion of a file as one or more relational tables. You can map the IMS and VSAM data for Classic Connect to access it. You can map the data manually or use the Microsoft Windows Classic Connect nonrelational data mapper.

To set up the Classic Connect ODBC driver and warehouse access:

1. Install Classic Connect Data Server on OS/390.
2. Optional: Install the Classic Connect Data Mapper product on Windows NT.
3. Define the Classic Connect logical tables so that Classic Connect can access data relationally. You can use the data mapper to create the definitions for IMS and VSAM structures, or create the definitions manually.
4. Set up access to your warehouse:
   a. Create a Classic Connect `.ini` file. A sample Classic Connect application configuration file `cxa.ini` is in the `/usr/lpp/DWC/` directory:

   ```
   * national language for messages
   NL = US English
   * resource master file
   NL CAT = usr/lpp/DWC/v4r1m00/msg/engcat
   FETCH BUFFER SIZE = 32000
   DEFLOC = CXASAMP
   USERID = uid
   USERPASSWORD = pwd
   DATASOURCE = DJX4DWC tcp/9.112.46.200/1035
   MESSAGE POOL SIZE = 1000000
   ```

   b. Update the DATASOURCE line in the `.ini` file. This line contains a data source name and a protocol address. The data source name must correspond to a Query Processor name that is defined on the Classic Connect Data Server, which is located in the QUERY PROCESSOR SERVICE INFO ENTRY in the data server configuration file. The protocol address is in the same file in the TCP/IP SERVICE INFO entry. The USERID and USERPASSWORD in this file are used when defining a warehouse data source.
   c. In your .profile file, export the CXA_CONFIG environment variable to your Classic Connect ODBC driver program files, which are usually in the same directory as your `.ini` file.
   d. In your .profile file, update your LIBPATH environment variable to include the path to your Classic Connect ODBC driver program files, which are usually in the same directory as your `.ini` file.

e. Optional: Verify the installation with the test program CXASAMP. Enter cxasamp from the directory that contains your .ini file. The location /uid/pwd is the data source *name/userid/userpassword* that is defined in your .ini file.

f. Define a data source to the warehouse in the same way that you define any DB2 data source.

You do not need to update your dsnaoini file, because DB2 for z/OS and OS/390 does not have a driver manager. The driver manager for Classic Connect is built into the zSeries warehouse agent.

Running DB2 for z/OS and OS/390 utilities

You must apply APAR PQ44904 to the zSeries warehouse agent before you can use the agent to run utilities. DSNUTILS is a DB2 for z/OS and OS/390 stored procedure that runs in a WLM and RRS environment. The DB2 Warehouse Manager provides an interface to DSNUTILS so that you can include DB2 utilities in Data Warehouse Center steps. You can use DSNUTILS to run any installed DB2 utilities by using the user-defined stored procedure interface. The DB2 for z/OS and OS/390 LOAD, REORG, and RUNSTATS utilities have property sheets that you can use to change how the utility runs.

To change the utilities' properties, right-click the utility in the Process Modeler window, and click **Properties**.

To set up the DSNUTILS stored procedure:

1. Run the DSNTIJSG job when you install DB2 to set and bind the DSNUTILS stored procedure. Make sure that the definition of DSNUTILS includes PARAMETER STYLE GENERAL.
2. Enable the WLM-managed stored procedures.
3. Set up your RRS and WLM environments.
4. Optional: Run the sample batch DSNUTILS programs supplied by DB2.
5. Bind the DSNUTILS plan with the DSNCLI plan so that the ODBC can call the stored procedure:

   BIND PLAN(DSNAOCLI) PKLIST(*.DSNAOCLI.*, *.DSNUTILS.*)

6. Set up a step using the Data Warehouse Center and run the step. The population type must be APPEND. If it is not, the Data Warehouse Center deletes everything in the table before it runs the utility.

For more information on setting up DSNUTILS, see *DB2 Universal Database for OS/390 Version 6 Management Tools Package*.

Copying data between DB2 for z/OS and OS/390 tables using the LOAD utility

When you want to copy a table by unloading it into a flat file, then loading the flat file to a different table, you normally have to unload the data, edit the

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load control statements that unload produces, then load the data. Using the zSeries warehouse agent, you can specify that you want to reload data to a different table without stopping between steps and manually edit the control statements.

To copy data between DB2 for z/OS and OS/390 tables using the LOAD utility:

1. Use the Generic interface to create a step that unloads a file using the UNLOAD utility or the REORG TABLESPACE utility. Both of these utilities produce two output data sets, one with the table data and one with the utility control statement that can be added to the LOAD utility.

   Ths is an example of the DSNUTILS parameters you might use for the Reorg Unload step:

   ```
   UTILITY_ID REORGULX
   RESTART NO
   UTSTMT REORG TABLESPACE DBVW.USAINENT UNLOAD EXTERNAL
   UTILITY_NAME REORG TABLESPACE
   RECDSN DBVW.DSNURELD.RECDSN
   RECDEVT SYSDA
   RECSPACE 50
   PNCHDSN DBVW.DSNURELD.PNCHDSN
   PNCHDEVT SYSDA
   PNCHSPACE 3
   ```

2. Use the Generic DSNUTILS interface to create a load step. The DSNUTILS utility statement parameter specifies a utility control statement. The warehouse utility interface allows a file name in the utility statement field. You can specify the file that contains the valid control statement using the keyword :FILE:, and the name of the table that you want to load using the keyword :TABLE:.

3. To use the LOAD utility to work with the output from the previous example, apply the following parameter values in the LOAD properties:

   ```
   UTILITY_ID LOADREORG
   RESTART NO
   UTSTMT :FILE:DBVW.DSNURELD.PNCHDSN:TABLE:[DBVW].INVENTORY
   UTILITY_NAME LOAD
   RECDSN DBVW.DSNURELD.RECDSN
   RECDEVT SYSDA
   ```

4. In the UTSTMT field, type either a load statement or the name of the file that was produced from the REORG utility with the UNLOAD EXTERNAL option. The previous example will work for any DB2 for z/OS and OS/390 source table or target table, whether these tables are on the same or different DB2 subsystems. The control statement flat file can be either HFS or native MVS files.

For more detailed information about DSNUTILS and the DB2 utilities available for OS/390 or z/OS, see the *DB2 for z/OS and OS/390 Utility Guide and Reference*.

Replication

You can use the zSeries warehouse agent to automate your Data Propagator replication apply steps. Replication requires a source database, a control database, and a target database. These can be different databases or the same. A capture job reads the DB2 log to determine which of the rows in the source database are added, updated, or changed. The job then writes the changes to a change-data table. An apply job is then run to apply the changes to a target database. The DB2 Warehouse Manager package can automate the apply job by creating a replication step. Use DB2 Warehouse Manager to define the type of apply job to run and when to run it. You need to export the SASNLINK library to the `steplib` environment variable.

Adding replication support to the DWC template

Data Warehouse Center includes a JCL template for replication support. If you plan to use the zSeries warehouse agent to run the Apply program, you need to change the account and data set information in this template for your OS/390 or z/OS system.

To change the template:

1. Log on with an ID that has authority to copy and update files in the `/usr/lpp/DWC/` directory.

2. Find the `apply.jcl` file and copy it as *systemname*.`apply.jcl`, where systemname is the name of the OS/390 MVS system.

   For example, on STLMVS1, create a copy of the file named `STLMVS1.apply.jcl`.

3. Use a text editor to customize the JCL to meet your requirements. Change the account information to match the standard account information, and change the data set for STEPLIB DD and MSGS DD for your OS/390 MVS system.

4. If necessary, change the program name on the EXEC card. For details on changing program names, see the *DB2 Replication Guide and Reference*.

   Do not change any parameters that are contained in brackets, such as [USERID] and [APPLY_PARMS]. The brackets are the hexadecimal characters X'AD' and X'BD', respectively. If your TSO terminal type is not set to 3278A in SPF Option 0, these values might display as special characters rather than as brackets. This is not a problem if you do not change the XAD or the X BD, or any of the data that is between the characters.

5. Update the environment variable VWS_TEMPLATES to point to the directory of the copied template file.

   This is the JCL template that is included with the Data Warehouse Center:

```
//[USERID]A JOB ,MSGCLASS=H,MSGLEVEL=(1,1),
// REGION=2M,TIME=1440,NOTIFY=&SYSUID
//* DON'T CHANGE THE FIRST LINE OF THIS TEMPLATE.
//* THE REMAINING JCL SHOULD BE MODIFIED FOR YOUR SITE.
```

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```
//*********************************************
//* RUN APPLY/MVS ON OS/390 DB2 6.1 *
//*********************************************
//ASNARUN EXEC PGM=ASNAPV66,REGION=10M,
// [APPLY_PARMS]
//STEPLIB DD DISP=SHR,DSN=DPROPR.V6R1M0.SASNLINK
// DD DISP=SHR,DSN=DSN610.SDSNLOAD
//MSGS DD DSN=DPROPR.V2R1M0A.MSGS,DISP=SHR
//ASNASPL DD DSN=&ASNASPL
,DISP=(NEW,DELETE,DELETE),
// UNIT=SYSDA,SPACE=(CYL,(10,1)),
// DCB=(RECFM=VB,BLKSIZE=6404)
//SYSTERM DD SYSOUT=*
//SYSTSPRT DD SYSOUT=*
//SYSPRINT DD SYSOUT=*
//
```

Agent logging

Many DB2 Warehouse Manager components such as the server, the logger, agents, and some Data Warehouse Center programs write logs to the logging directory, which is specified in the VWS_LOGGING environment variable. These log files are plain text.

To start agent logging from the Data Warehouse Center:

1. From the left pane, right-click **Warehouse**, and click **Properties**.
2. On the Trace Level page, change the settings to the trace level that you want.

   The agent trace supports levels 0-4:

   Level 1 - entry/exit tracing
   Level 2 - level 1 plus debugging trace
   Level 3 - level 2 plus data tracing
   Level 4 - internal buffer tracing

When trace is set higher than level 1, performance will decrease. Turn on tracing only for debugging purposes. The tracing information is stored in the file AGNTxxx.LOG. Environment information is stored in the file AGNTxxx.SET.

Installing the AS/400 (iSeries) warehouse agent

This section contains the following information:

- "Security" on page 56
- "Troubleshooting" on page 56

Before installing the iSeries warehouse agent

Before you install the warehouse agent, you must define security and privileges for your warehouse. For information about defining warehouse security, see the *Data Warehouse Center Administration Guide* and the Data Warehouse Center online help. You must also remove any previously installed iSeries warehouse agent.

To remove iSeries warehouse agent code, at an iSeries command prompt, enter the following command DLTLICPGM LICPGM(*PRODUCT ID*), where *PRODUCT ID* is any iSeries or AS/400 version previously installed.

This command performs the following actions:
- Removes the SRVTBLE entries
- Removes the IFS directory
- Removes the /QIBM/ProdData/IWH subdirectory
- Stops the daemon
- Deletes the product

Software requirements

This section contains information about the software, authorities, and PTFs (program temporary fixes) required to install the iSeries warehouse agent.

Software requirements
- IBM DB2 Warehouse Manager Version 7.2 or DB2 Warehouse Manager Version 7.1 FixPak 3
- IBM OS/400 Version 4 Release 2 or later

Authority requirements
- *ALLOBJ (to use the RSTLICPGM command to install the product)
- *JOBCTL (to use the STRVWD and ENDVWD commands)
- *SECOFR (optional for installation but necessary if you want to verify installation). You can also run the DSPSFWRSC command.
- *USE object authority (to access all commands)

You can use any user class to create and populate collections and tables.

PTF requirements
Table 5 on page 54 shows the required PTFs for the OS/400 version that you are using.

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Table 5. PTF requirements

OS/400 system	Product ID	Required PTF	PTFs for VWPLOADI or VWPLOADR
Version 4 Release 2	5769SS1	SF51534	SF46911, SF46976, SF49466
Version 4 Release 3	5769SS1	SF51535	SF49467
Version 4 Release 4	5769SS1	none	SF56124

In OS/400 Version 4 Release 5 and later, both warehouse and statistical transformers are supported. If you plan to use transformers, make sure that the latest Java Virtual Machine (JVM) and JDBC PTFs for the respective release are installed. Contact IBM Software Support for information about the most recent PTFs that are available.

Considerations for installing the iSeries warehouse agent on non-U.S. English iSeries systems

Only one language version of the iSeries warehouse agent can be present on the iSeries system. The iSeries warehouse agent is language independent. All data is represented internally in Unicode.

All traces and messages created by the STRVWD and ENDVWD commands are displayed in U.S. English on non-U.S. English systems. Messages the agent creates are interpreted on the workstation; messages are displayed in the language that your version of DB2 Warehouse Manager supports.

The user profile that you use to start the daemon must be set to the correct locale for the CCSID that is being used. If the correct locale is not selected, the agent might stop with the error IWH9149, particularly if you are using a DBCS computer.

You can obtain a list of all the available *LOCALE files on your system by entering the command WRKOBJPDM QSYS *ALL *LOCALE.

Scroll down until you find the name of the locale that corresponds to the CCSID under which you are running the iSeries warehouse agent. To configure your user profile for the locale that you selected, use the CHGUSRPRF command. On the Change User Profile screen, press F10 to display more options. Scroll down until you find the LOCALE option. Enter the fully qualified locale path using the following syntax:

/QSYS.LIB/*your_locale*.LOCALE

where *your_locale* is the locale that corresponds to the CCSID that you selected for your user profile. For example, the locale path for CCSID 500 is:/QSYS.LIB/FR_CA.LOCALE

Use the following command to install the U.S. English iSeries warehouse agent on your non-US English iSeries system:

```
RSTLICPGM LICPGM(5724B08) DEV(OPT01) LNG(2924)
```

where *OPT01* is the name of the CD-ROM drive.

Installing the iSeries warehouse agent

To install the iSeries warehouse agent:

1. Insert the DB2 Warehouse Manager CD-ROM into your iSeries CD-ROM drive.
2. Log on to iSeries.
3. At an iSeries command prompt, enter:

   ```
   RSTLICPGM LICPGM(5724B08) DEV(OPT01)
   ```

   where `OPT01` is the CD-ROM drive. The /QIBM/UserData/IWH subdirectory and the /QIBM/ProdData/IWH subdirectory are created by the install process. Traces are written to the /QIBM/UserData/IWH subdirectory.
4. To verify that you successfully installed the iSeries warehouse agent, use the Work with Licensed Programs screen. From the iSeries command prompt, enter `GO LICPGM` to use Option 10 (Display Licensed Installed Programs).

Post-installation considerations

The warehouse agent currently performs all step functions in a single unit of work. IBM DB2 for iSeries limits the number of rows that can be inserted in a single commit scope to 4 million. If you have queries that exceed this size, either subdivide the queries, or use the VWPFTP, VWPRCPY, VWPLOADI, and VWPLOADR programs to move your data.

Recommendation: Using these programs will result in large increases (as much as a factor of 10) in query performance. Use these programs for any large movement of data, especially across a network.

All parameters that the Data Warehouse Center passes to warehouse programs are passed as string parameters. If you have applications that require packed decimal parameters, wrap the applications in a CL script that converts the input parameters to a non-string format.

SQL-driven processes are not supported for the flat-file LAN source information resource type. Because there is no equivalent to the ODBC flat-file driver on the iSeries system, you cannot use SQL to retrieve data from, for example, comma-delimited files. Most files on the iSeries system are DB2 tables. However, many applications produce fixed-field or comma-delimited text files. To address the need to load these files into DB2 tables, see the

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instructions in "Working with flat files on the iSeries" on page 7 to transfer data using FTP from either a local flat file or a remote flat file into a local DB2 target table. You can complete the transfer using the warehouse programs that are included with the iSeries warehouse agent.

You cannot use DBCS step names with the iSeries warehouse agent. Also, DB2 for iSeries does not support DBCS object names, including column names, table names, and schema names.

Security

The QIWH library, where you install the DB2 Warehouse Manager product, contains a file named FTPCMD. The DB2 Warehouse Manager uses this file for sample programs VWPFTP and VWPRCPY. The *QSYS user owns this file, and grants *PUBLIC and *CHANGE authority to this file so that any user profile can run the DB2 Warehouse Manager programs. However, using the VWPRCPY program increases your risk for a security exposure. During the operation of VWPRCPY, the program creates a temporary command file that contains the user ID and password of the remote system that you are connecting to.

Troubleshooting

To diagnose and solve problems with the iSeries warehouse agent (or any other DB2 Warehouse Manager component), follow these steps:

1. Look up the error message in the *DB2 Warehouse Manager Online Messages* book.
2. Look at the appropriate DB2 Warehouse Manager trace.
3. Check the iSeries job log.

After you locate the relevant error message, use the information in the *DB2 Warehouse Manager Online Messages* book to determine the source of the problem and the course of action that is required to fix it. The information in the book about your error message should be the first information that you provide to IBM Software Support when you report a problem.

The RC 2 error field

The RC2 error field is a multipurpose field, with different meanings in different contexts. It can store a Data Warehouse Center error code (which starts with *VW*), a system code, or an application return code, depending on what the primary error (RC 1) was.

- When there is an error during normal agent processing, the warehouse server will always issue an RC 1 = 7356 error. When the server issues a 7356 error, check the RC2 field, which will contain the error number that was reported by the agent.
- When a failure occurs while a warehouse program is running, RC 1 = 8410 and RC 2 = the application return code.

- When there is a communications failure or a failure to run some system function, the Data Warehouse Center error codes are in the 6000 and 9000 ranges. RC 2 usually contains the error number returned by the iSeries system C/C++ language environment. These error numbers ("errno" values) can help you to pinpoint the cause of an error.

TCP/IP connectivity errors

While installing the iSeries warehouse agent, you might get this error message:

Return Code = 7183 (Method = VWRemoteAgent::Initialize; Secondary Code = 9117) Message: *The warehouse server tried to spawn an agent but did not receive a valid start up acknowledgement from either the agent or the daemon.*

The most common cause of RC7183 is improper configuration of TCP/IP connectivity between the warehouse server and the iSeries warehouse agent. Communication between the server and the agent is bidirectional; the server sends messages to the agent, and the agent sends messages back to the server. Ensure that the warehouse server workstation is connected to the iSeries warehouse agent and vice versa.

To test that communication between the server and the agent is bidirectional:

1. Ping the TCP/IP host name. Your host name is specified on the Parameters page for the iSeries warehouse agent site definition, which you can locate from your warehouse server workstation.

   If the ping fails, check that:

   - The iSeries system is registered with your domain name server or that there is an entry for the system in the TCP/IP HOSTS file in the `\winnt\system32\drivers\etc` directory.
   - The iSeries system is running.
   - The network is active.

2. Ping the fully qualified TCP/IP host name for the warehouse server workstation from the iSeries command line. You must use the fully qualified name (hostname.domain), for example *yourmachine.yourcompany.com*. The fully qualified host name is the return address that the server gives the agent.

   If the ping fails, be sure that:

   - The warehouse server workstation is registered with your domain name server or has a host table entry on the iSeries warehouse agent computer. Use the CFGTCP command to check that you are using the correct fully qualified TCP/IP host name.
   - The warehouse server workstation is running.
   - The network is active.

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If both of the ping attempts were successful, verify that the numeric IP address returned by the ping is actually the IP address of the workstation that you are trying to connect to.

Error when connecting to a local database from an iSeries database

If you get an error message when connecting to a local database from an iSeries database, follow these steps to determine the source of the connection error:

1. Add your local database in RDBDIRE on iSeries. Be sure to use the correct port number. To find the correct port number, go to the `C:\WINNT\system32\drivers\etc` directory and open the Services folder. Look for the port that is defined for DB2 instance.
2. Check that your iSeries database is in the Client Configuration Assistant. If not, add it.
3. To test the connection, open the Interactive SQL Assistant and try to connect to your local database using the correct user name and password.

Data Warehouse Center trace files

Many Data Warehouse Center trace files are stored in the iSeries Integrated File System. To edit these trace files, you can either use FTP to move these files to the workstation or use Client Access for iSeries.

To view files with Client Access for iSeries:

1. Add your system connection in the Client Access Operations Navigator.
2. Expand your system name.
3. Expand the File Systems tree.
4. Right-click on **Integrated File System** and click **Properties**. Select all file extensions, for example `.log, .iwh4msgq, .trc` and click **Add**.
5. Click **OK**.

Tables 2 through 5 give information about the trace files that are produced by the message queue process.

Table 6. Agent trace file

Agent trace	Shows all the information that is passed to the agent from the warehouse server and the command steps that are completed
Location	/QIBM/UserData/IWH directory (root of IFS).
File name	AGNTxxxxx.LOG, where xxxxx is the process ID of the agent instance.
When to use	Check this trace file first if the error message does not give enough information to solve the problem.

Table 6. Agent trace file (continued)

How to use	You can view the trace with any text editor. Scroll down until you find the operation that failed. The parameters sent from the warehouse server for that operation appear below the line that contains the failing operation. This information can help you solve most problems.

Table 7. Message queue trace

Message queue trace	Traces the functions of the message queue process and prints dumps of received message buffers both before and after code page conversion.
Location	/QIBM/UserData/IWH directory (root of IFS).
File name	VWxxxxxx.IWH4MSGQ, where xxxxxx is the process ID of the process that started the message queue process.
When to use	Useful for communications problems that cannot be diagnosed with the error code information alone. Can also be used for Cancel and Get Row Count problems.
How to use	This trace is started automatically when tracing is turned on for either the agent or the daemon. To read this trace, use Microsoft Wordpad or any other unicode enabled editor. This trace might contain non-printable characters and will not format correctly on a basic text editor like Notepad.

An additional trace file can be produced by the message queue process. The msgq_err.log file is a cumulative trace file that records all nonrecoverable message queue errors. This file is useful for tracking down terminations of the message queue process that cannot be recorded in the regular message queue trace file.

Table 8. Daemon trace

Daemon trace	A cumulative trace that records operations that the daemon could not complete successfully.
Location	/QIBM/UserData/IWH directory (root of IFS).
File name	vwd_err.log
When to use	Most useful for diagnosing problems where the agent terminated or abended before it could begin its own trace. Also useful for diagnosing nonrecoverable errors in the daemon.
How to use	This trace is automatically appended when the daemon encounters any error condition during processing.

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You can also activate message queue tracing for the daemon by starting the daemon process from the command line with one parameter rather than using the STRVWD command. For example:

```
CALL PGM(QIWH/IWHVWD) PARM('1')
```

This additional trace is useful if you suspect problems within the daemon itself.

Table 9. Sample Data Warehouse Center program traces

Sample warehouse program traces	Functional traces of the major events during the execution of a sample iSeries warehouse program.
Location	/QIBM/UserData/IWH
File name	VWxxxxxx.yyyyyyyy, where xxxxxx is the process ID under which the warehouse program was started and yyyyyyyy is the name of the warehouse program. If the warehouse program is started by the agent process, it will run in the same job as the agent process, so it will share the same process ID. The message queue trace, agent trace, and the warehouse program trace will all share the same xxxxxx value.
When to use	Use this trace to determine the cause of a non zero return code.

Working with flat files on the iSeries system

To use the iSeries parallel load utility (used for flat-file warehouse sources), apply the PTFs listed in Table 5 on page 54 to the iSeries warehouse agent site. You must apply these PTFs if you plan to use the sample warehouse programs VWPLOADI or VWPLOADR.

Use the following steps to define a process to load a local file into a local table. This process will start the warehouse program AS/400 Load with Replace and load the local table with the local file:

1. Define a flat-file warehouse source for your source file. In the **File name** field, type the fully qualified file name (see iSeries Load with Replace documentation for naming rules).
2. Create a step with the warehouse-supplied AS/400 Load with Replace program.
3. Select your flat-file source, and add the source file to the step.

    Restrictions: You cannot use SQL statements on flat files. SQL is not supported in Version 7 of the iSeries warehouse agent. You also cannot use

sample contents of a flat file using the iSeries warehouse agent. The data must be transferred using the AS/400 Load with Replace warehouse program.

4. Select your target table from warehouse target and connect with the step.

5. Promote the step to test mode and run it. The target table now contains all the source data from your flat file.

Defining a warehouse step using FTP to get a text file and load it into a local table

The warehouse step that you create will start two warehouse programs. The first program, Copy File using FTP, copies the file from a remote system to the local iSeries system. After the file is copied successfully, the second program, iSeries Load with Replace, loads the transferred file to the local table. The target table must reside on the agent site workstation.

To define a warehouse step using FTP to get a text file and load it into a local table, follow these steps:

1. Define a remote flat-file source for your source file. On the Files page, click **Advanced**, and specify the host name, user ID, and password.

   Restrictions: You cannot use SQL statements on flat files. SQL is not supported in Version 7 of the iSeries warehouse agent.

2. Define a local flat file target on iSeries.

3. Create a step with the warehouse Copy File using FTP program.

4. Connect the step to a remote source and local target.

5. Link this step to the AS/400s Load with Replace step.

6. Connect the local target file as a source to the AS/400 Load with Replace step.

7. Connect the local target table to the step.

The two combined steps can load a remote flat file on a local file on iSeries and then load data into a table.

Before using transformers with the iSeries warehouse agent

Warehouse transformers are Java stored procedures. Both warehouse and statistical transformers are supported on iSeries V4R5 and later. Before using warehouse transformers, you must create the Java stored procedures in the IWH collection. Check that the IWH collection exists on your iSeries system by entering WRKLIB IWH on an iSeries command line. If the IWH collection does not exist, create the collection IWH on the iSeries SQL Interactive screen by using the CREATE COLLECTION IWH SQL statement.

You must also complete these steps before you use the transformers with the iSeries warehouse agent:

1. Set the environment.

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2. Register the stored procedures.
3. Enable the target database for transformers.

Set the environment

Verify that Java Development Kit (JDK) 1.1.8 and all JVM options are installed on iSeries.

To set the environment, follow these steps:

1. Enter WRKENVVAR on an iSeries command line to verify that CLASSPATH and PATH are set up properly.
2. Copy the XF.PROPERTIES file from your local SQLLIB/FUNCTION DB2 directory to the QIBM/USERDATA/OS400/SQLLIB/FUNCTION IFS directory on iSeries.

Register the stored procedures

Run the two SQL scripts DROPXFSQL and CREATEXFSQL provided in the QIBM/PRODDATA/IWH/SQLLIB/FUNCTION/COM/IBM/DATA/XF directory in the iSeries IFS.

If Client Access is installed, follow these steps to run SQL scripts:

1. Using Windows Explorer, map a network drive to your QIBM directory in the iSeries IFS.
2. Start the Client Access Operations Navigator and expand your system name that is listed in My Connections.
3. Right-click on **Database**, and click **Run SQL Scripts**. The Run SQL Script window opens.
4. Open the Script file from the QIBM directory and issue the DROPXFSQL command. This command drops any procedures that are already registered in the IWH collection.
5. On the iSeries command line, enter CREATEXFSQL to register all stored procedures in the IWH collection.

If Client Access is not installed on your system, follow these steps to run SQL scripts:

1. Use FTP to move the two script files DROPXFSQL and CREATEXFSQL to your workstation from the iSeries IFS.
2. Using the DB2 Client Configuration Assistant, catalog your iSeries database on your workstation.
3. Open the DB2 command window and connect to the iSeries database by using your iSeries user ID and password.
4. Run the script by entering the following commands:
   ```
   db2 -tvf dropxfsql
   db2 -tvf createxfsql
   ```

Enable the target database for transformers

To enable the target database for transformers, follow these steps:

1. Open the DB2 Command Center or a command window on your workstation.
2. Connect to the Data Warehouse Center control database.
3. Run the following two SQL statements: UPDATE IWH.INFORESOURCE SET TRANSFENCED = 1 WHERE DBNAME = *localdbname* and UPDATE IWH.INFORESOURCE SET TRANSREGISTERED = 1 WHERE DBNAME = *localdbname*.

Substitute your iSeries local database name for *localdbname*. To find the database name, enter the WRKRDBDIRE command on an iSeries command line.

You can now use the warehouse and statistical transformers.

The IWH.LOGTABLE file contains troubleshooting information and additional traces that are generated by the transformer. The SQL function JULIAN_DAY is not supported on OS/400 V4R5. Because of this incompatibility, the Generate Period Table transformer does not generate any output in the Julian_day column.

Installing the AIX and Solaris Operating Environment warehouse agents

Before you install the AIX or Solaris Operating Environment warehouse agents, you must remove any Visual Warehouse Version 5.2 or earlier AIX or Solaris Operating Environment agents that are located on that workstation.

Removing the Visual Warehouse AIX agent

To remove the Visual Warehouse AIX agent:

1. Log on to AIX as *root*.
2. Enter smit.

   The System Management window opens.
3. Select **Software Installation and Maintenance**.

   The Software Installation and Maintenance window opens.
4. Select **Maintain Installed Software**.

   The Maintain Installed Software window opens.
5. Select **Remove Software Products**.

   The Remove Software Products window opens.
6. Click the arrow next to the **Software Name** field.
7. Select **IWH.agent** from the list.
8. Click **OK**.

   The Remove Software Products configuration window opens.

Installing warehouse agents

9. Type No in the **Preview only?** field.
10. Click **OK**.

    A confirmation window opens.
11. Click **OK** to confirm your selection.

After the Visual Warehouse AIX agent is removed, the Output window opens. The Results column at the bottom of the Output window displays the status of the removal process. If the removal process fails, contact IBM Software Support.

Removing the Visual Warehouse Solaris Operating Environment agent

To remove the Visual Warehouse Solaris Operating Environment agent, enter the following command at a command prompt:

```
usr/sbin/pkgrm IBMiwh
```

To confirm the removal of the Visual Warehouse Solaris Operating Environment agent, enter yes in the confirmation display.

Installing the AIX or the Solaris Operating Environment warehouse agents

Use the db2setup utility to install a warehouse agent on AIX.

See "Appendix C. Warehouse agent environment structures" on page 97 for information about the AIX and Solaris Operating Environment directory structure.

Before you install the warehouse agent, you should create and configure at least one DB2 instance. For more information, see *DB2 for UNIX Quick Beginnings*.

To install the warehouse agent using the db2setup utility:

1. Log in as a user with root authority.
2. Insert and mount the Warehouse Manager CD-ROM. For information about mounting a CD-ROM, see *DB2 for UNIX Quick Beginnings*.
3. Change to the directory where the CD-ROM is mounted by entering cd /cdrom, where *cdrom* is the mount point of your product CD-ROM.
4. Enter the ./db2setup command. After a few moments, the Install DB2 V7 window opens.
5. Select the products that you want to install and are licensed to install. Press Tab to change the highlighted option. Press Enter to select or deselect an option. When you select an option, an asterisk is displayed next to it.

   To select or deselect optional components for a DB2 product that you want to install, select the **Customize** option. To go back to a previous window at any time, select the **Cancel** option.

6. When you have finished selecting the DB2 product and its components, select **OK** to continue with the installation.

   For more information or assistance during the installation of any DB2 product or component, select the Help option.

7. Log out.

When the installation process completes, your warehouse agent is installed in the following directory:

- On AIX, the `/usr/lpp/db2_07_01` directory
- On the Solaris Operating Environment, the `/opt/IBMdb2/V7.1/` directory

Follow the instructions in "Chapter 5. Configuring the AIX and Solaris Operating Environment warehouse agent environments" on page 69 to configure the warehouse agent environment and to catalog the DB2 nodes and databases.

If the installation failed, contact IBM Software Support.

Establishing connectivity

You must establish connectivity from the warehouse agent sites to the warehouse sources and targets.

To access your warehouse sources and targets, you need the Data Warehouse Center ODBC drivers or DB2 Connect, connectivity software (such as TCP/IP), and database clients on your warehouse agent sites.

ODBC drivers

Data Warehouse Center ODBC drivers for several non-DB2 databases are installed when you install a warehouse agent. Your DB2 Universal Database CD-ROM also includes ODBC drivers for DB2.

Connectivity products

Install the connectivity products that are needed to access remote warehouse sources and targets. This might include TCP/IP or NetBIOS customization, SNA Client for Windows NT, or SNA Server for Windows NT.

You need to install the connectivity products on the warehouse server (if you are using a local warehouse agent) and on your warehouse agent sites. For example, you can access a DB2 family database through TCP/IP or NetBIOS. You can also access a DB2 for MVS/ESA database through TCP/IP or NetBIOS if a DB2 Connect gateway is accessible on the network with connectivity to the host database that you need.

Installing warehouse agents

For more information about non-DB2 source databases and defining warehouse sources and targets within the Data Warehouse Center, see the *Data Warehouse Center Administration Guide*.

See the *Data Warehouse Center Administration Guide* for connectivity requirements when you are using IBM Classic Connect to access IMS databases or VSAM data sets on MVS™.

Database clients

Install the client component of a remote non-DB2 database on your warehouse agent sites and on your warehouse server (if you are using a local warehouse agent). See the *Data Warehouse Center Administration Guide* for more information, or refer to the documentation for the database.

For the DB2 family of databases, the necessary DB2 client function is included with DB2 Universal Database.

Testing connectivity

Test TCP/IP connectivity between the following workstations:

- Warehouse server to the warehouse agent sites
- Warehouse agent sites to the warehouse server
- Data Warehouse Center administrative client to the warehouse server
- Warehouse server to the Data Warehouse Center administrative client

To test the connectivity, enter ping *hostname* where *hostname* is the TCP/IP host name of the warehouse server, Data Warehouse Center administrative client, or warehouse agent site. On AIX and Windows 32-bit operating systems, you will see several messages in the window that verify the TCP/IP connection, similar to those shown in Figure 1.

```
[C:\]ping dgntserv2.stl.ibm.com
PING dgntserv2.stl.ibm.com: 56 data bytes
64 bytes from 9.112.46.127: icmp_seq=1. time=0. ms
64 bytes from 9.112.46.127: icmp_seq=2. time=0. ms
64 bytes from 9.112.46.127: icmp_seq=3. time=0. ms
64 bytes from 9.112.46.127: icmp_seq=4. time=0. ms

----dgntserv2.stl.ibm.com PING Statistics----
5 packets transmitted, 4 packets received, 20% packet loss
round-trip (ms)  min/avg/max = 0/0/0
```

Figure 1. Sample response from PING command

On the Solaris Operating Environment, the ping command will return the following information:

```
host is alive
```

For a workstation with OS/2 or AIX warehouse agents, make sure that you can ping the workstation using only the host name without the local domain name. For example, enter `ping dgntserv2` instead of `ping dgntserv2.stl.ibm.com`. You might need to add an entry in the /etc/hosts file such as:

```
123.45.67.89        dgntserv2        dgntserv2.stl.ibm.com
```

Test ODBC connectivity between any non-DB2 database clients and servers. If you are using a Windows NT warehouse agent, verify that connectivity can be established as a Windows NT system process.

Removing DB2 Version 7 warehouse agents

To remove DB2 Version 7 warehouse agents, see the section on removing DB2 products in the *Quick Beginnings* for your operating system.

To remove the DB2 Version 7 OS/390 warehouse agent, use SMP/E. For more information, see the *Program Guide for DB2 Warehouse Manager* and the *DB2 Version 7 Program Directory*.

Chapter 5. Configuring the AIX and Solaris Operating Environment warehouse agent environments

After you install an AIX or Solaris Operating Environment warehouse agent, you must configure the warehouse agent environment and catalog the DB2 nodes and databases. This chapter describes how to configure the warehouse agent environment.

Configuring the warehouse agent environment

This section describes the environment variables that you need to set in your IWH.environment file. All the environment variables that you must change are located between the START and END comment lines. Figure 2 on page 70 displays the configurable portion of a sample IWH.environment file.

The following rules apply to both ODBC and DB2 CLI users:

1. You must set the DB2INSTANCE variable in all situations.
2. For DB2 CLI access, you need to set only the variables in the DB2 environment section.

   To access warehouse sources or targets in DB2 databases, you must configure the variables in the DB2 environment section.
3. You must remove the comment characters (#) for the variables that you set.

The following rules apply to ODBC users:

1. For ODBC access, you must set the IS_ODBC variable to the ODBC install path. This variable must not have comments.

   On AIX, the default path is `/usr/lpp/db2_07_01/odbc`. On the Solaris Operating Environment, the default path is `/opt/IBMdb2/V7.1/odbc`.
2. Set the ODBC environment variables for any databases that you selected.

When you change settings in the IWH.environment file, you must restart the warehouse agent daemon.

Configuring warehouse agent environments

```
# !!!!!!!!!!!!!!!!!!!!!!!!!!! ATTENTION !!!!!!!!!!!!!!!!!!!!!!!!!!!!
# !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
# !      START OF MUST SET ENVIRONMENT VARIABLES SECTION       !
# !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
# ! DB2 environment section. Please set DB2 instance id        !
#
DB2INSTANCE=<.... your DB2 instance id ....>
LANG=en_US
LC_ALL=en_US
DB2CODEPAGE=819
export DB2INSTANCE LANG LC_ALL DB2CODEPAGE

# ! If using Data Warehouse Center ODBC drivers, set the
# ! IS_ODBC environment variable to the path for
# ! Data Warehouse Center ODBC drivers directory.
#
# IS_ODBC=<....your ODBC base install directory>
# Should have path for Data Warehouse Center ODBC drivers odbc dir

# ! For essbase udp, set the following path :                  !
#
# ARBORPATH=<..../essbase>
# export ARBORPATH

# ! If using Oracle ODBC driver, set the following paths: !
#
# ORACLE_HOME=<.... your Oracle client HOME dir ....>
# TNS_ADMIN=<.... your TNS_ADMIN dir ....>
# ORACLE_SID=<.... your ORACLE_SID ....>
# export ORACLE_HOME TNS_ADMIN ORACLE_SID

# ! If using Sybase ODBC driver, set the following paths: !
#
# SYBASE=<.... your Sybase client dir ....>
# DSQUERY=<.... your DSQUERY value ....>
# export SYBASE DSQUERY

# ! If using Informix ODBC driver, set the following paths:!
#
# INFORMIXDIR=<.... your Informix client dir ....>
# INFORMIXSERVER=<.... your Informix Server ....>
# export INFORMIXDIR INFORMIXSERVER

# Environment variables for JCL templates and logs.
# You can choose to change values for following environment variables !
#
VWSPATH=<... the warehouse agent base install directory ...>
VWS_LOGGING=/var/IWH/                    # default path
export VWS_LOGGING VWSPATH

# !!!!!!!!!!!!!!!!!!!!!!!!!!! ATTENTION !!!!!!!!!!!!!!!!!!!!!!!!!!!!
# !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
# !      END OF MUST SET ENVIRONMENT VARIABLES SECTION         !
# !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
```

Figure 2. Sample IWH.environment file

To configure the warehouse agent environment:

1. Set the connection type:

   a. Log on as `root`.

   b. Change to the bin subdirectory in the install directory by entering one of the following commands:

      - On AIX, enter `cd /usr/lpp/db2_07_01/bin`

      - On the Solaris Operating Environment, enter `cd /opt/IBMdb2/V7.1/bin`

   c. Establish the correct soft link to IWH2AGNT. To do this, run the IWH.agent.db.interface command. The syntax for this command is:

      `IWH.agent.db.interface [ odbc | db2cli ]`

      The warehouse agent executable file has two versions:

      - The IWH2AGNT.db2cli file is the DB2 CLI link. Use this link to access DB2 family and heterogeneous data through DataJoiner (Oracle, Sybase, Microsoft SQL Server, Informix, VSAM, and IMS).

        This is the default link.

      - The IWH2AGNT.ivodbc file is the ODBC link. Use this link to access DB2 family, Oracle, Sybase, and Informix databases, and data files.

2. To access DB2 or DataJoiner source or target data, set the following variables in your IWH.environment file. On AIX, the file is located in the `/usr/lpp/db2_07_01/bin` directory. On the Solaris Operating Environment, the file is located in the `/opt/IBMdb2/V7.1/bin` directory. You need to set these variables whether you use a double-byte character set (DBCS) or a single-byte character set (SBCS).

   - DB2INSTANCE = the name of the DB2 instance on which you plan to run the warehouse agent

     If you have multiple DB2 instances, you must choose one instance to be the master DB instance.

   - LANG = your local locale

   - LC_ALL = your local locale

     The LANG and LC_ALL environment variables direct the warehouse agent to set the locale to your local locale.

   - DB2CODEPAGE = the code page of the client database

     The DB2CODEPAGE variable overrides the system code page. This variable is used to communicate with servers that cannot interpret the default code page from the client. The DB2CODEPAGE variable sets the default code page to a code page that the server supports. For more information, see the *Installation and Configuration Supplement*.

3. To access ODBC data using the Data Warehouse Center ODBC drivers, set the following variables in your IWH.environment file:

Configuring warehouse agent environments

- IS_ODBC = the base directory where you installed the Data Warehouse Center ODBC drivers
- To access Oracle data, set the following environment variables:
  - ORACLE_HOME
  - TNS_ADMIN
  - ORACLE_SID
- To access Sybase data, set the following environment variables:
  - SYBASE
  - DSQUERY
- To access Informix data, set the following environment variables:
  - INFORMIXDIR
  - INFORMIXSERVER

4. To access Essbase or DB2 OLAP Server™ data, set the ARBORPATH environment variable in your IWH.environment file.

5. Optional: Customize your environment further by setting the following variables in your IWH.environment file:
   - VWS_LOGGING = the directory where the warehouse agent trace files, program output logs, and environment output files are stored.

     The default directory is /var/IWH.
   - VWSPATH = the warehouse agent base install directory.
   - ODBCINI = the default .odbc.ini file for ODBC users.
   - VWA_LOCALE_TABLE = locale conversion table.

     If you are using a national language version of the Solaris Operating Environment warehouse agent, you might need to choose a user-defined conversion table that the agent can use for string conversions. To do this, add the environment variable VWA_LOCALE_TABLE to the IWH.environment file and set its value to the code set that you want to use (for example, 8859-1 for en_US).

6. If you are using a shared /etc/services file in the NIS or AFS environment, add the following services to the shared /etc/services file.

   If these port numbers are already in use in your operating environment, you can change them in the /etc/services file on your system. However, you must also change the same port numbers on the workstation where the Data Warehouse Center administrative client and warehouse server are installed, and on all the associated warehouse agent sites.

You must add these services because the install process updates only your local /etc/services file.

Port Name	Port Number
vwd	11001/tcp
vwlogger	11002/tcp

7. For these changes to take effect, stop and restart the warehouse agent daemon:

   a. Determine the daemon process ID by entering:

      ```
      ps -e | grep vwdaemon
      ```

   b. Stop the daemon by entering:

      ```
      kill pid
      ```

      where `pid` is the daemon process ID.

      After you stop the daemon, it will restart automatically.

Cataloging the DB2 nodes and databases

After you install the AIX or Solaris Operating Environment warehouse agent and configure the warehouse agent environment, you must configure the DB2 nodes and databases:

1. Log on to the DB2 instance ID.

2. Catalog the DB2 nodes and databases that you plan to access. See the *Installation and Configuration Supplement* for more information.

   If you have multiple DB2 instances on the same workstation, note the value of the DB2INSTANCE variable in the IWH.environment file. Any databases that are not created on this instance must be cataloged as remote.

3. For ODBC users: When you define the DB2 data source in the appropriate .odbc.ini file, ensure that the DSN is the true name of the DB2 database name or database alias name. The .odbc.ini file must reside in the home directory of the user ID that is used on the agent site.

Tip: If you are using Data Warehouse Center ODBC drivers, see the sample .odbc.ini file. On AIX, this file is located in the `/usr/lpp/db2_07_01/odbc` directory. On the Solaris Operating Environment, this file is located in the `/opt/IBMdb2/V7.1/odbc` directory. The name of the file is .ODBC.INI.

Chapter 6. Preparing for and installing warehouse transformers

This chapter describes how to install and enable warehouse transformers.

Preparing your environment

Before you enable the warehouse transformers, you must:

- Install a warehouse agent. See "Chapter 4. Installing warehouse agents" on page 29 for more information.
- Install the JDK for your operating system.
- Update the environment variables.
- Update the database manager configuration for the target DB2 instance.
- Update the database configuration for the target database.

Obtaining the JDK

The DB2 Application Development Client includes the JDK for AIX, OS/2, and Windows NT.

- When you install the DB2 Application Development Client on AIX, the JDK is installed if an earlier version of the JDK is not detected.
- When you install the DB2 Application Development Client on OS/2, the JDK is not installed. See the *Installation and Configuration Supplement* for information about installing the JDK.
- When you install the DB2 Application Development Client on Windows NT, the JDK is always installed.

For more information, see the *Installation and Configuration Supplement*.

To obtain and install the JDK for the Solaris Operating Environment, go to http://www.sun.com/java/products/platform.html and follow the instructions provided.

Updating the environment variables

This section contains steps for updating environment variables on Windows NT, AIX, and the Solaris Operating Environment.

Updating environment variables on Windows NT
To update the Path and CLASSPATH environment variables:

1. Open the Windows NT Control Panel.
2. Double-click **System**.

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3. Click the **Environment** tab to view the variables.
4. Click the **Path** system variable and add the path of the JDK bin subdirectory to the end of the path. The default path is `c:\sqllib\java\jdk`.
5. Click **Set**.
6. Click the **CLASSPATH** system variable. Add the path where the transformers are installed, and the path of the directory that contains the DB2 Java support classes. Separate the path names with a semicolon. If the CLASSPATH variable does not exist, you must define it.

   For example, you might add `C:\SQLLIB\FUNCTION;C:\SQLLIB\JAVA\DB2JAVA.ZIP;` to your CLASSPATH variable.
7. Click **Set**.
8. Click **OK** to close the window.

Updating environment variables on AIX
Make sure that the current directory is in the CLASSPATH variable by entering the following command:

```
$ echo $CLASSPATH
```

For example:

```
 .:/INSTHOME/sqllib/java/db2java.zip
```

where */INSTHOME* is the home directory of the instance owner.

Enter the following commands to change the CLASSPATH variable:

```
CLASSPATH=.:$CLASSPATH
export CLASSPATH
```

Make sure that the PATH variable includes /sqllib/bin. For example:

```
/INSTHOME/sqllib/bin
```

where */INSTHOME* is the home directory of the instance owner.

Make sure that the LIBPATH variable includes /sqllib/lib. For example:

```
/INSTHOME/sqllib/lib
```

where */INSTHOME* is the home directory of the instance owner.

Updating environment variables on the Solaris Operating Environment
Update the db2profile file, located in the sqllib subdirectory (for example, /home/db2inst1/sqllib), to include *jdk11_path*/lib/sparc/native_threads in the LD_LIBRARY_PATH variable, where *jdk11_path* is the subdirectory where the JDK is installed.

Make sure that the current directory is in the CLASSPATH variable by entering the following command:

```
$ echo $CLASSPATH
```

For example:

```
 .:/INSTHOME/sqllib/java/db2java.zip
```

where */INSTHOME* is the home directory of the instance owner.

Enter the following commands to change the CLASSPATH variable:

```
CLASSPATH=.:$CLASSPATH
export CLASSPATH
```

Make sure that the PATH variable includes sqllib/bin. For example:

```
/INSTHOME/sqllib/bin
```

where */INSTHOME* is the home directory of the instance owner.

Updating the database manager configuration

To update the database manager configuration, use the DB2 Command Line Processor to change the following database settings:

- Set the JDK path parameter (JDK11_PATH) to the subdirectory where the JDK is installed:

```
UPDATE DATABASE MANAGER CONFIGURATION USING JDK11_PATH path
```

where *path* is the subdirectory where the JDK is installed.

- Set the Java Virtual Machine heap size parameter (JAVA_HEAP_SZ) to 4096:

```
UPDATE DATABASE MANAGER CONFIGURATION USING JAVA_HEAP_SZ 4096
```

Updating the database configuration

To update the database configuration for the target database, use the DB2 Command Line Processor to set the default application heap parameter (APPLHEAPSZ) for this database to 1024:

```
UPDATE DATABASE CONFIGURATION FOR warehouse_database_name USING APPLHEAPSZ 1024
```

Setting up authorities and privileges

Warehouse transformers are stored procedures. Before you enable the warehouse transformers, certain authorization levels are needed for the database in which the target warehouse resides. The authorization ID of the statement must hold at least one of the following authorities or privileges:

- SYSADM or DBADM authority
- IMPLICIT_SCHEMA authority on the database, if the implicit or explicit schema name of the procedure does not exist

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- CREATEIN privilege on the schema, if the schema name of the procedure refers to an existing schema

To create a fenced stored procedure, no additional authorities or privileges are required.

To create a not-fenced stored procedure, the authorization ID of the statement must also hold one of the following authorities:

- CREATE_NOT_FENCED authority on the database
- SYSADM or DBADM authority

Installing warehouse transformers

To install warehouse transformers:

1. Insert the Warehouse Manager CD-ROM into your CD-ROM drive. The launchpad opens.
2. Click **Install** on the launchpad.
3. In the Select Products window, ensure that the **DB2 Warehouse Manager** check box is selected, then click **Next**.
4. In the Select Installation Type window, click **Custom**, then click **Next**.
5. In the Select DB2 Components window, select the **Warehouse Transformers** check box, then click **Next**.
6. In the Start Copying Files window, review your selections. If you want to change any of your selections, click **Back** to return to the window where you can change the selection. Click **Next** to begin copying files.
7. In the Setup Complete window, click **Finish** to restart the workstation.

Enabling warehouse transformers

To enable warehouse transformers for use by the warehouse target:

1. Start the Data Warehouse Center:
   a. Start the Control Center by clicking **Start** ⟶ **Programs** ⟶ **IBM DB2** ⟶ **Control Center**.
   b. Click the **Data Warehouse Center** icon in the Control Center toolbar.
2. In the tree view on the left, locate the warehouse target for which you want to enable warehouse transformers, and open the Properties notebook.
3. On the Database page, in the **Target database** area, click either **Create transformers and register as fenced** or **Create transformers and register as unfenced**. See the online help or the *SQL Reference* for more information about fenced and unfenced stored procedures.
4. In the **Warehouse target** area, click **Enable target for transformers**.
5. Click **OK**.

6. Close the notebook.

A single database can contain several warehouse targets; however, you must enable the warehouse transformers for each warehouse target. If you have multiple warehouse targets in a single database and you change these settings for one warehouse target, the other warehouse targets in that database will be affected.

For example, if you drop the warehouse transformers after enabling them for several warehouse targets, a message is displayed, indicating that this change will affect other warehouse targets defined to the database. The names of the other warehouse targets will be listed in the message. You can choose to cancel the drop procedure or to continue. If you continue, any processes or steps in those warehouse targets that use warehouse transformers will not run, unless you recreate the warehouse transformers.

If you change the warehouse transformers from fenced to unfenced, or from unfenced to fenced, and there are multiple warehouse targets defined to the database, a message is displayed, indicating that this change will affect other warehouse targets defined to the database. The names of the other warehouse targets will be listed in the message. You can choose to cancel the change or to continue. If you continue, the transformers will be dropped, then recreated as specified.

Chapter 7. DB2 Warehouse Manager Connectors

The DB2 Warehouse Manager provides the following Connectors to help you to extract data and metadata from e-business repositories:

- DB2 Warehouse Manager Connector for i2® TradeMatrix™ BPI
- DB2 Warehouse Manager Connector for SAP® R/3®
- DB2 Warehouse Manager Connector for the Web

With the Connector for i2 TradeMatrix BPI, you can schedule updates to i2 business models, distributed datamarts, and OLAP cubes. With the Connector for SAP R/3, you can add the extracted data to a data warehouse, transform it using the DB2 Data Warehouse Center, or analyze it using DB2 tools or other vendors' tools. With the Connector for the Web, you can bring "clickstream" data from IBM WebSphere Site Analyzer into a data warehouse.

To install any of the Connectors, insert the DB2 Warehouse Manager Connectors CD-ROM into your CD drive, and follow the on-screen instructions. For installation prerequisites, see the sections in this chapter for each of the specific Connectors. All of the Connectors require DB2 Warehouse Manager.

Connector for i2 TradeMatrix BPI

The i2 TradeMatrix Business Process Intelligence (BPI) products are an enterprise-wide analytical and reporting solution from i2 Technologies, Inc. With BPI, you create Online Analytical Processing (OLAP) definitions for dimensions, measures (facts), hierarchies, levels, and so on, using the i2 TradeMatrix BPI Engine. These definitions are stored in a corporate model in the i2 Business Repository. You create business models from the definitions that are stored in the corporate model in the i2 Business Repository. You can deploy business models to create star schema dimension and fact tables in a distributed data mart (DDM). From these star schema tables, you can create OLAP cube structures for reporting and analysis.

With the Connector for i2 TradeMatrix BPI, you can:

- Import changes to the metadata of a deployed BPI business model.
- Update the BPI distributed datamart and an i2 OLAP cube for the business model.

The Connector for i2 TradeMatrix BPI generates the steps that manage the loading of the i2 dimension and fact tables from existing input files (in standard BPI comma-separated variable (CSV) format), as well as the loading

of the OLAP cube. After you import the metadata for i2 sources, the Data Warehouse Center creates and populates the **Processes** folder for the i2 load steps. Because the i2 load steps are controlled by the Data Warehouse Center, you can control when and how often they run, or run them on demand.

The Connector for i2 TradeMatrix BPI runs on Microsoft Windows NT or Windows 2000. The i2 TradeMatrix business-model source can be on any supported platform.

Installation prerequisites

Before you install the Connector for i2 TradeMatrix BPI, complete the following tasks:

- Catalog the i2 TradeMatrix BPI Business Repository database on the same workstation that runs the Data Warehouse Center. This database must be a DB2 Universal Database version 7 (or later) database.
- Install i2 TradeMatrix BPI Engine version 5.0.5 or later on the same workstation that runs the Connector for i2 and the warehouse agent. The i2 TradeMatrix BPI Engine includes i2 TradeMatrix BPI Client batch-command executable files used by the Connector for i2.
- Define the i2 TradeMatrix BPI Distributed Data Mart (DDM) target database as a warehouse target before you run an i2 step. The warehouse target must have a warehouse agent assigned to it.
- Install the Java runtime environment, version 1.2.2 or later. If you do not already have Java installed, you can install it from the Data Warehouse Connectors installation CD.

After you install the Connector for i2 TradeMatrix BPI and the i2 TradeMatrix BPI Engine, complete the following tasks:

- Ensure that the Connector for i2 TradeMatrix BPI jar file, db2_vw_i2.jar, is included in the CLASSPATH environment variable for the session where the warehouse agent runs.
- Include the i2 TradeMatrix BPI Engine base directory that contains the i2 TradeMatrix BPI batch files in the PATH environment variable for the session.
- Update the TMP environment variable to specify a directory to which the warehouse agent can read and write.

Importing metadata for i2 sources

To import metadata for i2 sources into the Data Warehouse Center:

1. Right-click the **Warehouse** folder, click **Import Metadata**, and click **i2**.

   You can only import metadata from deployed i2 business models into the Data Warehouse Center.

2. On the Connection page of the Import Metadata window, type the database name of the DB2 database that contains the i2 TradeMatrix BPI

Business Repository, the schema name for the i2 Business Repository, and the user ID and password you use to connect to the database.

3. On the Target page of the Import Metadata window, select the agent site, the subject area, the process, the warehouse target, and the schema name for target. Select the deployed business model from which you want to import metadata.

   The warehouse agent site is the workstation where the Connector for i2 TradeMatrix BPI runs, where the i2 TradeMatrix BPI Engine is installed, and where the DDM is cataloged.

Creating the i2 steps

After you import the metadata for i2 sources, the Data Warehouse Center creates and populates the **Processes** folder for the i2 load steps. When you open the Process Model window, the steps are already added to the canvas and serve as a template for running the i2 load steps.

Restriction: The i2 step to update the BPI Business Model fact table and OLAP cube can only refer to deployed BPI Business Models that are associated with a single fact table and OLAP cube. The i2 steps do not support Business Models that have been deployed to multiple fact tables and OLAP cubes.

To define the properties for the steps, right-click one of the i2 Steps on the canvas, and click **Properties**, or double-click one of the i2 Steps.

In the Properties window for the step that loads the i2 dimension and fact tables, you must specify values for the following parameters:

Dimension name
> The name of the dimension table.

Dimension type
> The type of dimension. It can be either Conformed or Non-Conformed.

Member File Name
> The name of the file in the BPI Import directory that contains changes to members of the dimension.

Hierarchy File Name
> The name of the file in the BPI Import directory that contains hierarchy changes for the dimension.

Alias File Name
> The name of the file in the BPI Import directory that contains alias changes for the dimension.

Attribute File Name

    The name of the file in the BPI Import directory that contains changes to the OLAP attributes of the dimension.

Business Model

    The name of the business model that is associated with the step.

Identity Type

    How the member data is imported:

0	By code
1	By unique name
2	By family

Hierarchy Format

    Relationships among members of the hierarchy:

0	Parent-child relationship
1	Flat hierarchy relationship
2	Snow flake relationship

Quotes for String

    Whether the data in the input file has quotation marks:

True	Strings have quotation marks.
False	Strings do not have quotation marks.

Fixed Length

    Whether the data in the input file has a fixed length:

True	Data has a fixed length.
False	Data does not have a fixed length.

Delimiter

    How data in the input file is separated:

0	The data is separated by commas (,).
1	The data is separated by pipe characters (| or ¦).
2	The data is separated by tab characters.

In the Properties window for the step that loads the i2 OLAP cube, you must specify values for the following parameters:

Business Model

    The name of the business model that is associated with the step.

Definition File Name

    The name of the file in the BPI Import directory that describes the dimensions and measures of the data contained in the data file.

Data File Name

    The name of the file in the BPI Import directory that contains changes to the fact table data.

Identity Type

    How the member data is imported:

0	By code
1	By unique name
2	By family

Data File Format

The format for the input file:

0	Data is for a mono-column fact table.
1	Data is for a multi-column fact table.

Quotes for String

Whether the data in the input file has quotation marks:

True	Strings have quotation marks.
False	Strings do not have quotation marks.

Fixed Length

Whether the data in the input file has a fixed length:

True	Data has a fixed length.
False	Data does not have a fixed length.

Delimiter

How data in the input file is separated:

0	The data is separated by commas (,).
1	The data is separated by pipe characters (∣ or ¦).
2	The data is separated by tab characters.

Important: If you do not want to assign a value to a particular parameter, you must assign it the value NULL. You cannot leave it blank.

The Connector for i2 TradeMatrix BPI does not create the comma-separated variable (CSV) files that are used as source data for the i2 steps. The CSV files must exist in the BPI Import directory at the warehouse agent site before you can run the i2 steps.

Connector for SAP R/3

SAP R/3 is an enterprise-wide business repository from SAP AG that integrates business processes, such as those for Enterprise Resource Planning or Customer Relationship Management.

With the Connector for SAP R/3 you can bring SAP business objects that are stored in SAP R/3 systems into a DB2 data warehouse. Business objects and business components, provide an object-oriented view of R/3 business functions. You can then use the power of DB2 and DB2 Warehouse Center for data analysis, data transformation, or data mining.

You define the data extraction step from the Data Warehouse Center by simply clicking and dropping an SAP object onto the process modeler. When you define an SAP source, you see all the metadata about the SAP object,

including key fields, parameter names, data types, precision, scale, length, and mandatory parameters. You also see all basic and detailed parameters that are associated with the SAP business object.

The Connector for SAP R/3 runs on Microsoft Windows NT or Windows 2000 (with Service Pack 1 or later). The SAP R/3 server can be on any supported platform.

Installation prerequisites

Before you install the Connector for SAP R/3, complete the following tasks:

- Install RFC Runtime modules from the Presentation CD (included with SAP clients) on the same workstation on which you plan to install the Connector for SAP.
- Optionally, install SAPGUI for troubleshooting.

The Connector for SAP R/3 works with any release of the Presentation CD; IBM recommends using release 4.6D or later.

Defining an SAP source

To define a new SAP source to the Data Warehouse Center:

1. Right-click the **Warehouse Sources** folder, and click **Define**, then click **SAP**.

   The SAP business object must exist in the R/3 system before you can define it in the Data Warehouse Center.

2. On the Warehouse Source page of the Define Warehouse Source window, type the business object name, and optionally the administrator name, description, and notes for the SAP source.

3. On the Agent Sites page of the Define Warehouse Source window, move one or more agent sites to the Selected agent sites box.

4. On the SAP Source page of the Define Warehouse Source window, choose whether the connection type for the SAP source is an application server or a group of servers (as defined to R/3).

   For an application server, supply the application server name, the server's system number (as defined to R/3). You can also optionally supply its gateway host and service, and the specific destination (file on the local workstation).

   For a group of servers, supply the server's system ID, message server number, group name, and optionally, its destination.

   For either an application server or a group of servers, supply the client number, the user ID, and password for connecting to the R/3 server.

5. On the Business Objects page of the Define Warehouse Source window, select the specific SAP business objects that you want to define as part of this warehouse source from a list of business objects defined on the selected R/3 system.

It might take several minutes for the Data Warehouse Center to retrieve the list of business objects from the R/3 system, depending on network traffic and workload on the R/3 system.

After defining the SAP source to the Data Warehouse Center, you can define properties for each source business object:

1. Expand the list of SAP source objects in the tree, click the **Business Objects** folder for an SAP source, right-click one of the business objects in the details view of the navigator and click **Properties**.

2. On the Source Business Object page of the Properties window, you can see the business object name and its description. You can edit the description.

3. On the Parameters page of the Properties window, you can see the parameters that were defined for the selected business object in the R/3 system, with the data type, length, precision, and scale (if applicable). You can also see which parameters are key fields and which are mandatory.

4. On the Parameter Mapping page of the Properties window, you must map key fields for the business object to export parameters from the business object's GetList method (part of the Business Application Programming Interface) if you want detailed information for the business object. Click the box to the right of a key field and the box to the left of an export parameter to map the two together. You must map all key fields, but not all of the export parameters need to be mapped.

Creating an SAP step

To create an SAP data extract step, open the Process Model window and select the **SAP** icon to add the SAP step to the canvas. Be sure to link the step to an existing SAP source. To define the properties for the step:

1. Right-click on the SAP Step on the canvas, and click **Properties**.

   You can also define or change the properties from the Data Warehouse Center tree view by right-clicking **SAP Data Extract Step** in the **Processes** folder for the subject area, or from the **SAP** folder in the **Programs and Transforms** folder under the **Administration** folder.

2. On the SAP page of the Properties window, type the name for the SAP step, and optionally the administrator name, description, and notes for the SAP step.

3. On the Input Parameters page of the Properties window, you see a list of the parameters, with the data type, length, precision and scale (if applicable), default value, and an indication of whether the parameter is mandatory. You can edit the values, if necessary, to specify the filtering criteria for the data to be imported from the SAP system.

4. On the Output Parameters page, select the parameters that you want to include in this extract step from the list of available parameters for the business object.

5. On the Column Mapping page, you can either generate a default table to match the selected output parameters or map the output parameters to an existing table. The output parameters are treated as source columns to be mapped to columns in the warehouse target. Click **Generate Default Table** to select an existing table or to define a new target table. To map columns from the SAP source to the target table, click the box to the right of the source column, click the box to the left of the target column, and click **Map**.

If you return to the Output Parameters page to select more parameters and want to map them to the target table, click **Add Columns and Maps** on the Column Mapping page to automatically map the newly added parameters.

6. On the Processing Options page, select the population type, agent site, commit count, and retry count and interval. The commit count specifies that the SAP step will issue an SQL **COMMIT** statement after inserting the specified number of records into the target table. The default commit count is 0, which means that the SAP step will insert all records in one unit of work and then issue the **COMMIT** statement.

Connector for the Web

IBM WebSphere Site Analyzer (WSA) is part of the IBM WebSphere family of Web servers and application servers. WSA helps you analyze the traffic to and from your Web site.

The Connector for the Web allows you to extract data from a WebSphere Site Analyzer database, or webmart, into a data warehouse. The Connector for the Web provides a polling step that checks whether WSA copied Web traffic data from its data imports (log files, tables, and clickstream data) to the webmart. After this check is successful, an SQL step could copy the Web traffic data from the webmart into a warehouse target. You can then use the power of DB2 and DB2 Warehouse Manager for data analysis, data transformation, or data mining. You can also incorporate WebSphere Commerce data with the Web traffic data for a more complete analysis of your Web site.

After defining a Web traffic source, you can define the Web traffic polling step from the Data Warehouse Center by simply clicking and dropping a Web object onto the process modeler.

The Connector for the Web runs on the same platform as the warehouse agent: Windows NT, Windows 2000, AIX, or Sun Solaris.

Installation prerequisites

Before you install the Connector for the Web, complete the following tasks:

- Install and configure WebSphere Application Server version 3.5 (with FixPak 2) or later.
- Install and configure WebSphere Site Analyzer version 4 or later. See *WebSphere Site Analyzer Installation Guide* for more information.
- Install the Java run-time environment, version 1.2.2 or later. If you do not have Java installed, you can install it from the Data Warehouse Connectors installation CD.

Your programs must run on the same workstation where the warehouse agent is installed.

After you install the Connector for the Web, ensure that the Connector for the Web jar file, db2_vw_web.jar, is included in the CLASSPATH environment variable for the session where the warehouse agent runs.

Defining a Web traffic source

To define a new Web traffic source to the Data Warehouse Center:

1. Right-click the **Warehouse Sources** folder, and click **Define**, then click **WebSphere Site Analyzer**.

   The WebSphere Site Analyzer data imports and database must exist on the WebSphere Site Analyzer system before you can define them in the Data Warehouse Center.

   Important: Be sure to configure WebSphere Site Analyzer before you define a Web traffic source.

2. On the Warehouse Source page of the Define Warehouse Source window, type the business name, and optionally the administrator name, description, and notes for the Web traffic source.

3. On the Agent Sites page of the Define Warehouse Source window, move one or more agent sites to the Selected agent sites box.

4. On the Database page of the Define Warehouse Source window, fill in the database-related fields for a DB2 database, or customize the ODBC connect string if the WSA webmart is an Oracle database.

   For the WebSphere Site Analyzer properties area of the Database page, type the following information:

   Site name
   > The name that you specified when you created the Web site in WSA for which you are collecting Web traffic data. The site name can be the URL, IP address, or descriptive text name for the Web site.

   Host name
   > The host name of the workstation on which IBM WebSphere Site Analyzer is installed.

Port number

The number of the port to which IBM WebSphere Site Analyzer listens. The default is port 8080. This field is optional.

User ID

The user ID that you use to log on to IBM WebSphere Site Analyzer. The user ID must be less than 128 characters in length. This field is optional, depending on the configuration of IBM WebSphere Site Analyzer.

Password

The password for the user ID that you use to log on to IBM WebSphere Site Analyzer. The password must be less than 64 characters in length. This field is optional, depending on the configuration of IBM WebSphere Site Analyzer.

5. On the Web Source Data page of the Define Warehouse Source window, select from a list of available data imports, tables, and views those specific items that you want to include in this new warehouse source.

Creating a Web traffic polling step

To create a Web traffic polling step, open the Process Model window and click the **Web Traffic** icon to add the Web traffic polling step to the canvas. To define the properties for the step:

1. Right-click the Web Traffic Polling Step on the canvas, and click **Properties**. You can also define or change the properties from the Data Warehouse Center tree view by right-clicking the **Web Traffic Polling Step** in the **Processes** folder for the subject area, or from the **Web Traffic Polling** folder within the **Web Traffic Programs** folder in the **Programs and Transforms** folder under the **Administration** folder.

2. On the Web Traffic Program page of the Properties window, type the business name, and optionally the administrator name, description, and notes for the Web traffic step.

3. On the Parameters page of the Properties window, select the warehouse source name. Move one or more of the available data imports that you want to poll as part of this step to the list of Selected data imports. The available data imports are the ones that you selected when you defined the Web traffic source.

4. On the Processing Options page of the Properties window, select the agent site, polling interval and duration, and agent site retry count and interval.

   The polling interval and polling duration specify how often the Web traffic polling step checks whether WSA copied Web traffic data from its data imports. The polling duration must be greater than the polling interval. The default for the polling duration is 60 minutes, and the default for the polling interval is 20 minutes. When the polling duration and the polling interval are set to the default values, the Web traffic step polls the WSA

server three times. The step terminates successfully if the WSA data import processing terminated successfully.

After the duration is complete, the step returns the result of the last poll. The step remains enabled and is activated when the step is scheduled to run.

Appendix A. Environment structure for Information Catalog Manager components

When you install the Information Catalog Manager Tools component, the Information Catalog Administrator component, or the Information Catalog User component, entries are added or modified for the several Windows NT environment variables and user variables. In Table 10 and Table 11, the drive letter C indicates a local drive.

Table 10. Environment variable updates for Information Catalog Manager components

The environment variable:	Is added to, or modified, to include:
PATH	C:\SQLLIB\BIN
LOCPATH	C:\SQLLIB\LOCALE
DGWPATH	C:\SQLLIB\DGWIN
VWSPATH	C:\SQLLIB
VWS_FOLDER	DB2 Universal Database folder name (for example, IBM DB2)
LIB	C:\SQLLIB\LIB
INCLUDE	C:\SQLLIB\LIB
MDIS_PROFILE	If this variable does not exist, it is added and set as C:\SQLLIB\METADATA\PROFILES. If the variable exists, it is not changed.
VWS_TEMPLATES	C:\SQLLIB\TEMPLATES
VWS_LOGGING	C:\SQLLIB\LOGGING
LC_ALL	If this variable does not exist, it is added and set as ll_cc, where ll is the language code and cc is the country code (see Table 12 on page 95). If the variable exists, it is not changed.

Table 11. User variable updates for the Information Catalog Manager

The user variable:	Is added to, or modified, to include:
LOCPATH	%LOCPATH%
LIB	%LIB%
INCLUDE	%INCLUDE%

Environment structure for Information Catalog Manager components

Appendix B. National language support considerations for the Information Catalog Manager

If you install the English version of the Information Catalog Manager on a non-English system, and you want to enter text in a language other than English, you can change the Information Catalog Manager LC_ALL environment variable. When the English version of the Information Catalog Manager is installed, the LC_ALL environment variable is set to EN_US. The LC_ALL environment variable is set in the AUTOEXEC.BAT file in Windows 95 and Windows 98, and in the system environment variables in Windows NT and Windows 2000.

To change the value of the variable for Windows 95 and Windows 98, include the following statement in your AUTOEXEC.BAT file:

```
SET LC_ALL=language
```

where *language* is the value in Table 12 for the language that you want to use.

To change the value of the variable for Windows NT and Windows 2000:
1. Click **Start** ⟶ **Settings** ⟶ **Control Panel.**
2. Double-click the **System** icon.
3. Click the **Environment** tab in the System Properties window.
4. In the **System Variables** list, click the **LC_ALL** variable.
5. In the **Value** field, type the value given in Table 12 for the language that you want to use.
6. Click **Set**.
7. Click **Apply**.
8. Close the window. Restart your workstation for the change to take effect.

Table 12. Language identifiers

Language - country/region	LC_ALL value
Arabic - Arabic	AR_AA
Bulgarian - Bulgaria	BG_BG
Chinese - China	ZH_CN
Chinese - Taiwan	ZH_TW
Croatian - Croatia	HR_HR
Czech - Czech Republic	CS_CZ
Danish - Denmark	DA_DK

National language support considerations

Table 12. Language identifiers (continued)

Language - country/region	LC_ALL value
Dutch - Belgium	NL_BE
Dutch - Netherlands	NL_NL
English - Great Britain	EN_GB
English - Japan	EN_JP
English - United States	EN_US
Finnish - Finland	FI_FI
French - Belgium	FR_BE
French - Canada	FR_CA
French - France	FR_FR
French - Switzerland	FR_CH
German - Germany	DE_DE
German - Switzerland	DE_CH
Greek - Greece	EL_GR
Hebrew - Israel	IW_IL
Hungarian - Hungary	HU_HU
Icelandic - Iceland	IS_IS
Italian - Italy	IT_IT
Japanese - Japan	JA_JP
Korean - Korea	KO_KR
Macedonian - Macedonia	MK_MK
Norwegian - Norway	NO_NO
Polish - Poland	PL_PL
Portuguese - Brazil	PT_BR
Portuguese - Portugal	PT_PT
Romanian - Romania	RO_RO
Russian - Russian Federation	RU_RU
Slovak - Slovak Republic	SK_SK
Slovenian - Slovenia	SL_SI
Spanish - Spain	ES_ES
Swedish - Sweden	SV_SE
Thai - Thailand	TH_TH
Turkish - Turkey	TR_TR

Appendix C. Warehouse agent environment structures

The information in this appendix describes the structure of the AIX and Solaris Operating Environment warehouse agent environments. Use this information to help you configure the AIX and Solaris Operating Environment warehouse agent environments.

Table 13 shows the directory structures for the AIX and Solaris Operating Environment warehouse agents.

Table 13. Directory structures for the warehouse agents

On this operating system:	This directory:	Contains:
AIX	/usr/bin/IWH.startup	Agent daemon startup file.
	/usr/bin/IWH2AGNT /usr/bin/vwdemon /usr/bin/iwhetrig	Soft links.
	/usr/lpp/db2_07_01/bin	Agent, ETI, and user-defined program executable files, and the environment setup file. This is the default install directory.
	/usr/lpp/db2_07_01/odbc	Sample .odbc.ini file and Data Warehouse Center ODBC drivers.
	/var/IWH	Trace files. This is the default directory for the daemon traces, agent traces, and user-defined program output files.
Solaris Operating Environment	/usr/bin/IWH.startup	Agent daemon startup file.
	/usr/bin/IWH2AGNT /usr/bin/vwdemon /usr/bin/iwhetrig	Soft links.
	/opt/IBMdb2/V7.1	Default install base directory.
	/opt/IBMdb2/V7.1/bin	Agent, ETI, and user-defined program executable files, and the environment setup file.
	/opt/IBMdb2/V7.1/odbc	Sample .odbc.ini file and Data Warehouse Center ODBC drivers.
	/opt/IBMdb2/V7.1/lib	Solaris Operating Environment run-time library.
	/var/IWH	Trace files. This is the default directory for the daemon traces, agent traces, and user-defined program output files.

Warehouse agent environments

Appendix D. Using the DB2 Library

The DB2 Universal Database library consists of online help, books (PDF and HTML), and sample programs in HTML format. This section describes the information that is provided, and how you can access it.

To access product information online, you can use the Information Center. For more information, see "Accessing Information with the Information Center" on page 113. You can view task information, DB2 books, troubleshooting information, sample programs, and DB2 information on the Web.

DB2 PDF Files and Printed Books

DB2 Information

The following table divides the DB2 books into four categories:

DB2 Guide and Reference Information
> These books contain the common DB2 information for all platforms.

DB2 Installation and Configuration Information
> These books are for DB2 on a specific platform. For example, there are separate *Quick Beginnings* books for DB2 on OS/2, Windows, and UNIX-based platforms.

Cross-platform sample programs in HTML
> These samples are the HTML version of the sample programs that are installed with the Application Development Client. The samples are for informational purposes and do not replace the actual programs.

Release notes
> These files contain late-breaking information that could not be included in the DB2 books.

The installation manuals, release notes, and tutorials are viewable in HTML directly from the product CD-ROM. Most books are available in HTML on the product CD-ROM for viewing and in Adobe Acrobat (PDF) format on the DB2 publications CD-ROM for viewing and printing. You can also order a printed copy from IBM; see "Ordering the Printed Books" on page 109. The following table lists books that can be ordered.

On OS/2 and Windows platforms, you can install the HTML files under the `sqllib\doc\html` directory. DB2 information is translated into different

languages; however, all the information is not translated into every language. Whenever information is not available in a specific language, the English information is provided

On UNIX platforms, you can install multiple language versions of the HTML files under the doc/%L/html directories, where *%L* represents the locale. For more information, refer to the appropriate *Quick Beginnings* book.

You can obtain DB2 books and access information in a variety of ways:

Table 14. DB2 Information

Name	Description	Form Number PDF File Name	HTML Directory
DB2 Guide and Reference Information			
Administration Guide	*Administration Guide: Planning* provides an overview of database concepts, information about design issues (such as logical and physical database design), and a discussion of high availability.	SC09-2946 db2d1x70	db2d0
	Administration Guide: Implementation provides information on implementation issues such as implementing your design, accessing databases, auditing, backup and recovery.	SC09-2944 db2d2x70	
	Administration Guide: Performance provides information on database environment and application performance evaluation and tuning.	SC09-2945 db2d3x70	
	You can order the three volumes of the *Administration Guide* in the English language in North America using the form number SBOF-8934.		
Administrative API Reference	Describes the DB2 application programming interfaces (APIs) and data structures that you can use to manage your databases. This book also explains how to call APIs from your applications.	SC09-2947 db2b0x70	db2b0

Table 14. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
Application Building Guide	Provides environment setup information and step-by-step instructions about how to compile, link, and run DB2 applications on Windows, OS/2, and UNIX-based platforms.	SC09-2948 db2axx70	db2ax
APPC, CPI-C, and SNA Sense Codes	Provides general information about APPC, CPI-C, and SNA sense codes that you may encounter when using DB2 Universal Database products. Available in HTML format only.	No form number db2apx70	db2ap
Application Development Guide	Explains how to develop applications that access DB2 databases using embedded SQL or Java (JDBC and SQLJ). Discussion topics include writing stored procedures, writing user-defined functions, creating user-defined types, using triggers, and developing applications in partitioned environments or with federated systems.	SC09-2949 db2a0x70	db2a0
CLI Guide and Reference	Explains how to develop applications that access DB2 databases using the DB2 Call Level Interface, a callable SQL interface that is compatible with the Microsoft ODBC specification.	SC09-2950 db2l0x70	db2l0
Command Reference	Explains how to use the Command Line Processor and describes the DB2 commands that you can use to manage your database.	SC09-2951 db2n0x70	db2n0
Connectivity Supplement	Provides setup and reference information on how to use DB2 for AS/400, DB2 for OS/390, DB2 for MVS, or DB2 for VM as DRDA application requesters with DB2 Universal Database servers. This book also details how to use DRDA application servers with DB2 Connect application requesters. Available in HTML and PDF only.	No form number db2h1x70	db2h1

Table 14. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
Data Movement Utilities Guide and Reference	Explains how to use DB2 utilities, such as import, export, load, AutoLoader, and DPROP, that facilitate the movement of data.	SC09-2955 db2dmx70	db2dm
Data Warehouse Center Administration Guide	Provides information on how to build and maintain a data warehouse using the Data Warehouse Center.	SC26-9993 db2ddx70	db2dd
Data Warehouse Center Application Integration Guide	Provides information to help programmers integrate applications with the Data Warehouse Center and with the Information Catalog Manager.	SC26-9994 db2adx70	db2ad
DB2 Connect User's Guide	Provides concepts, programming, and general usage information for the DB2 Connect products.	SC09-2954 db2c0x70	db2c0
DB2 Query Patroller Administration Guide	Provides an operational overview of the DB2 Query Patroller system, specific operational and administrative information, and task information for the administrative graphical user interface utilities.	SC09-2958 db2dwx70	db2dw
DB2 Query Patroller User's Guide	Describes how to use the tools and functions of the DB2 Query Patroller.	SC09-2960 db2wwx70	db2ww
Glossary	Provides definitions for terms used in DB2 and its components. Available in HTML format and in the *SQL Reference*.	No form number db2t0x70	db2t0
Image, Audio, and Video Extenders Administration and Programming	Provides general information about DB2 extenders, and information on the administration and configuration of the image, audio, and video (IAV) extenders and on programming using the IAV extenders. It includes reference information, diagnostic information (with messages), and samples.	SC26-9929 dmbu7x70	dmbu7
Information Catalog Manager Administration Guide	Provides guidance on managing information catalogs.	SC26-9995 db2dix70	db2di

Table 14. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
Information Catalog Manager Programming Guide and Reference	Provides definitions for the architected interfaces for the Information Catalog Manager.	SC26-9997 db2bix70	db2bi
Information Catalog Manager User's Guide	Provides information on using the Information Catalog Manager user interface.	SC26-9996 db2aix70	db2ai
Installation and Configuration Supplement	Guides you through the planning, installation, and setup of platform-specific DB2 clients. This supplement also contains information on binding, setting up client and server communications, DB2 GUI tools, DRDA AS, distributed installation, the configuration of distributed requests, and accessing heterogeneous data sources.	GC09-2957 db2iyx70	db2iy
Message Reference	Lists messages and codes issued by DB2, the Information Catalog Manager, and the Data Warehouse Center, and describes the actions you should take. You can order both volumes of the Message Reference in the English language in North America with the form number SBOF-8932.	Volume 1 SC09-2978 db2m1x70 Volume 2 SC09-2979 db2m2x70	db2m0
OLAP Integration Server Administration Guide	Explains how to use the Administration Manager component of the OLAP Integration Server.	SC27-0782 db2dpx70	n/a
OLAP Integration Server Metaoutline User's Guide	Explains how to create and populate OLAP metaoutlines using the standard OLAP Metaoutline interface (not by using the Metaoutline Assistant).	SC27-0784 db2upx70	n/a
OLAP Integration Server Model User's Guide	Explains how to create OLAP models using the standard OLAP Model Interface (not by using the Model Assistant).	SC27-0783 db2lpx70	n/a
OLAP Setup and User's Guide	Provides configuration and setup information for the OLAP Starter Kit.	SC27-0702 db2ipx70	db2ip
OLAP Spreadsheet Add-in User's Guide for Excel	Describes how to use the Excel spreadsheet program to analyze OLAP data.	SC27-0786 db2epx70	db2ep

Table 14. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
OLAP Spreadsheet Add-in User's Guide for Lotus 1-2-3	Describes how to use the Lotus 1-2-3 spreadsheet program to analyze OLAP data.	SC27-0785 db2tpx70	db2tp
Replication Guide and Reference	Provides planning, configuration, administration, and usage information for the IBM Replication tools supplied with DB2.	SC26-9920 db2e0x70	db2e0
Spatial Extender User's Guide and Reference	Provides information about installing, configuring, administering, programming, and troubleshooting the Spatial Extender. Also provides significant descriptions of spatial data concepts and provides reference information (messages and SQL) specific to the Spatial Extender.	SC27-0701 db2sbx70	db2sb
SQL Getting Started	Introduces SQL concepts and provides examples for many constructs and tasks.	SC09-2973 db2y0x70	db2y0
SQL Reference, Volume 1 and Volume 2	Describes SQL syntax, semantics, and the rules of the language. This book also includes information about release-to-release incompatibilities, product limits, and catalog views. You can order both volumes of the *SQL Reference* in the English language in North America with the form number SBOF-8933.	Volume 1 SC09-2974 db2s1x70 Volume 2 SC09-2975 db2s2x70	db2s0
System Monitor Guide and Reference	Describes how to collect different kinds of information about databases and the database manager. This book explains how to use the information to understand database activity, improve performance, and determine the cause of problems.	SC09-2956 db2f0x70	db2f0
Text Extender Administration and Programming	Provides general information about DB2 extenders and information on the administration and configuring of the text extender and on programming using the text extenders. It includes reference information, diagnostic information (with messages) and samples.	SC26-9930 desu9x70	desu9

Table 14. DB2 Information (continued)

Name	Description	Form Number / PDF File Name	HTML Directory
Troubleshooting Guide	Helps you determine the source of errors, recover from problems, and use diagnostic tools in consultation with DB2 Customer Service.	GC09-2850 / db2p0x70	db2p0
What's New	Describes the new features, functions, and enhancements in DB2 Universal Database, Version 7.	SC09-2976 / db2q0x70	db2q0
DB2 Installation and Configuration Information			
DB2 Connect Enterprise Edition for OS/2 and Windows Quick Beginnings	Provides planning, migration, installation, and configuration information for DB2 Connect Enterprise Edition on the OS/2 and Windows 32-bit operating systems. This book also contains installation and setup information for many supported clients.	GC09-2953 / db2c6x70	db2c6
DB2 Connect Enterprise Edition for UNIX Quick Beginnings	Provides planning, migration, installation, configuration, and task information for DB2 Connect Enterprise Edition on UNIX-based platforms. This book also contains installation and setup information for many supported clients.	GC09-2952 / db2cyx70	db2cy
DB2 Connect Personal Edition Quick Beginnings	Provides planning, migration, installation, configuration, and task information for DB2 Connect Personal Edition on the OS/2 and Windows 32-bit operating systems. This book also contains installation and setup information for all supported clients.	GC09-2967 / db2c1x70	db2c1
DB2 Connect Personal Edition Quick Beginnings for Linux	Provides planning, installation, migration, and configuration information for DB2 Connect Personal Edition on all supported Linux distributions.	GC09-2962 / db2c4x70	db2c4
DB2 Data Links Manager Quick Beginnings	Provides planning, installation, configuration, and task information for DB2 Data Links Manager for AIX and Windows 32-bit operating systems.	GC09-2966 / db2z6x70	db2z6

Table 14. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
DB2 Enterprise - Extended Edition for UNIX Quick Beginnings	Provides planning, installation, and configuration information for DB2 Enterprise - Extended Edition on UNIX-based platforms. This book also contains installation and setup information for many supported clients.	GC09-2964 db2v3x70	db2v3
DB2 Enterprise - Extended Edition for Windows Quick Beginnings	Provides planning, installation, and configuration information for DB2 Enterprise - Extended Edition for Windows 32-bit operating systems. This book also contains installation and setup information for many supported clients.	GC09-2963 db2v6x70	db2v6
DB2 for OS/2 Quick Beginnings	Provides planning, installation, migration, and configuration information for DB2 Universal Database on the OS/2 operating system. This book also contains installation and setup information for many supported clients.	GC09-2968 db2i2x70	db2i2
DB2 for UNIX Quick Beginnings	Provides planning, installation, migration, and configuration information for DB2 Universal Database on UNIX-based platforms. This book also contains installation and setup information for many supported clients.	GC09-2970 db2ixx70	db2ix
DB2 for Windows Quick Beginnings	Provides planning, installation, migration, and configuration information for DB2 Universal Database on Windows 32-bit operating systems. This book also contains installation and setup information for many supported clients.	GC09-2971 db2i6x70	db2i6
DB2 Personal Edition Quick Beginnings	Provides planning, installation, migration, and configuration information for DB2 Universal Database Personal Edition on the OS/2 and Windows 32-bit operating systems.	GC09-2969 db2i1x70	db2i1
DB2 Personal Edition Quick Beginnings for Linux	Provides planning, installation, migration, and configuration information for DB2 Universal Database Personal Edition on all supported Linux distributions.	GC09-2972 db2i4x70	db2i4

Table 14. DB2 Information (continued)

Name	Description	Form Number PDF File Name	HTML Directory
DB2 Query Patroller Installation Guide	Provides installation information about DB2 Query Patroller.	GC09-2959 db2iwx70	db2iw
DB2 Warehouse Manager Installation Guide	Provides installation information for warehouse agents, warehouse transformers, and the Information Catalog Manager.	GC26-9998 db2idx70	db2id
Cross-Platform Sample Programs in HTML			
Sample programs in HTML	Provides the sample programs in HTML format for the programming languages on all platforms supported by DB2. The sample programs are provided for informational purposes only. Not all samples are available in all programming languages. The HTML samples are only available when the DB2 Application Development Client is installed. For more information on the programs, refer to the *Application Building Guide*.	No form number	db2hs
Release Notes			
DB2 Connect Release Notes	Provides late-breaking information that could not be included in the DB2 Connect books.	See note #2.	db2cr
DB2 Installation Notes	Provides late-breaking installation-specific information that could not be included in the DB2 books.	Available on product CD-ROM only.	
DB2 Release Notes	Provides late-breaking information about all DB2 products and features that could not be included in the DB2 books.	See note #2.	db2ir

Notes:

1. The character *x* in the sixth position of the file name indicates the language version of a book. For example, the file name db2d0e70 identifies the English version of the *Administration Guide* and the file name db2d0f70 identifies the French version of the same book. The following letters are used in the sixth position of the file name to indicate the language version:

   Language   **Identifier**
   Brazilian Portuguese   b

Bulgarian	u
Czech	x
Danish	d
Dutch	q
English	e
Finnish	y
French	f
German	g
Greek	a
Hungarian	h
Italian	i
Japanese	j
Korean	k
Norwegian	n
Polish	p
Portuguese	v
Russian	r
Simp. Chinese	c
Slovenian	l
Spanish	z
Swedish	s
Trad. Chinese	t
Turkish	m

2. Late breaking information that could not be included in the DB2 books is available in the Release Notes in HTML format and as an ASCII file. The HTML version is available from the Information Center and on the product CD-ROMs. To view the ASCII file:

- On UNIX-based platforms, see the `Release.Notes` file. This file is located in the `DB2DIR/Readme/%L` directory, where `%L` represents the locale name and `DB2DIR` represents:
  - `/usr/lpp/db2_07_01` on AIX
  - `/opt/IBMdb2/V7.1` on HP-UX, PTX, Solaris, and Silicon Graphics IRIX
  - `/usr/IBMdb2/V7.1` on Linux.
- On other platforms, see the `RELEASE.TXT` file. This file is located in the directory where the product is installed. On OS/2 platforms, you can also double-click the **IBM DB2** folder and then double-click the **Release Notes** icon.

Printing the PDF Books

If you prefer to have printed copies of the books, you can print the PDF files found on the DB2 publications CD-ROM. Using the Adobe Acrobat Reader, you can print either the entire book or a specific range of pages. For the file name of each book in the library, see Table 14 on page 100.

You can obtain the latest version of the Adobe Acrobat Reader from the Adobe Web site at http://www.adobe.com.

The PDF files are included on the DB2 publications CD-ROM with a file extension of PDF. To access the PDF files:

1. Insert the DB2 publications CD-ROM. On UNIX-based platforms, mount the DB2 publications CD-ROM. Refer to your *Quick Beginnings* book for the mounting procedures.
2. Start the Acrobat Reader.
3. Open the desired PDF file from one of the following locations:
   - On OS/2 and Windows platforms:

     `x:\doc\`*language* directory, where *x* represents the CD-ROM drive and *language* represent the two-character country code that represents your language (for example, EN for English).
   - On UNIX-based platforms:

     /cdrom`/doc/%L` directory on the CD-ROM, where */cdrom* represents the mount point of the CD-ROM and *%L* represents the name of the desired locale.

You can also copy the PDF files from the CD-ROM to a local or network drive and read them from there.

Ordering the Printed Books

You can order the printed DB2 books either individually or as a set (in North America only) by using a sold bill of forms (SBOF) number. To order books, contact your IBM authorized dealer or marketing representative, or phone `1-800-879-2755` in the United States or `1-800-IBM-4YOU` in Canada. You can also order the books from the Publications Web page at http://www.elink.ibmlink.ibm.com/pbl/pbl.

Two sets of books are available. SBOF-8935 provides reference and usage information for the DB2 Warehouse Manager. SBOF-8931 provides reference and usage information for all other DB2 Universal Database products and features. The contents of each SBOF are listed in the following table:

Table 15. Ordering the printed books

SBOF Number	Books Included	
SBOF-8931	• Administration Guide: Planning • Administration Guide: Implementation • Administration Guide: Performance • Administrative API Reference • Application Building Guide • Application Development Guide • CLI Guide and Reference • Command Reference • Data Movement Utilities Guide and Reference • Data Warehouse Center Administration Guide • Data Warehouse Center Application Integration Guide • DB2 Connect User's Guide • Installation and Configuration Supplement • Image, Audio, and Video Extenders Administration and Programming • Message Reference, Volumes 1 and 2	• OLAP Integration Server Administration Guide • OLAP Integration Server Metaoutline User's Guide • OLAP Integration Server Model User's Guide • OLAP Integration Server User's Guide • OLAP Setup and User's Guide • OLAP Spreadsheet Add-in User's Guide for Excel • OLAP Spreadsheet Add-in User's Guide for Lotus 1-2-3 • Replication Guide and Reference • Spatial Extender Administration and Programming Guide • SQL Getting Started • SQL Reference, Volumes 1 and 2 • System Monitor Guide and Reference • Text Extender Administration and Programming • Troubleshooting Guide • What's New
SBOF-8935	• Information Catalog Manager Administration Guide • Information Catalog Manager User's Guide • Information Catalog Manager Programming Guide and Reference	• Query Patroller Administration Guide • Query Patroller User's Guide

DB2 Online Documentation

Accessing Online Help

Online help is available with all DB2 components. The following table describes the various types of help.

Type of Help	Contents	How to Access...
Command Help	Explains the syntax of commands in the command line processor.	From the command line processor in interactive mode, enter: 　　? *command* where *command* represents a keyword or the entire command. For example, ? `catalog` displays help for all the CATALOG commands, while ? `catalog database` displays help for the CATALOG DATABASE command.
Client Configuration Assistant Help *Command Center Help* *Control Center Help* *Data Warehouse Center Help* *Event Analyzer Help* *Information Catalog Manager Help* *Satellite Administration Center Help* *Script Center Help*	Explains the tasks you can perform in a window or notebook. The help includes overview and prerequisite information you need to know, and it describes how to use the window or notebook controls.	From a window or notebook, click the **Help** push button or press the **F1** key.
Message Help	Describes the cause of a message and any action you should take.	From the command line processor in interactive mode, enter: 　　? *XXXnnnnn* where *XXXnnnnn* represents a valid message identifier. For example, ? `SQL30081` displays help about the SQL30081 message. To view message help one screen at a time, enter: 　　? *XXXnnnnn* `| more` To save message help in a file, enter: 　　? *XXXnnnnn* `> filename.ext` where *filename.ext* represents the file where you want to save the message help.

Type of Help	Contents	How to Access...
SQL Help	Explains the syntax of SQL statements.	From the command line processor in interactive mode, enter: `help statement` where *statement* represents an SQL statement. For example, `help SELECT` displays help about the SELECT statement. **Note:** SQL help is not available on UNIX-based platforms.
SQLSTATE Help	Explains SQL states and class codes.	From the command line processor in interactive mode, enter: `? sqlstate` or `? class code` where *sqlstate* represents a valid five-digit SQL state and *class code* represents the first two digits of the SQL state. For example, `? 08003` displays help for the 08003 SQL state, while `? 08` displays help for the 08 class code.

Viewing Information Online

The books included with this product are in Hypertext Markup Language (HTML) softcopy format. Softcopy format enables you to search or browse the information and provides hypertext links to related information. It also makes it easier to share the library across your site.

You can view the online books or sample programs with any browser that conforms to HTML Version 3.2 specifications.

To view online books or sample programs:
- If you are running DB2 administration tools, use the Information Center.
- From a browser, click **File —>Open Page**. The page you open contains descriptions of and links to DB2 information:
  - On UNIX-based platforms, open the following page:
    ```
    INSTHOME/sqllib/doc/%L/html/index.htm
    ```

    where `%L` represents the locale name.
  - On other platforms, open the following page:
    ```
    sqllib\doc\html\index.htm
    ```

    The path is located on the drive where DB2 is installed.

If you have not installed the Information Center, you can open the page by double-clicking the **DB2 Information** icon. Depending on the system you are using, the icon is in the main product folder or the Windows Start menu.

Installing the Netscape Browser

If you do not already have a Web browser installed, you can install Netscape from the Netscape CD-ROM found in the product boxes. For detailed instructions on how to install it, perform the following:

1. Insert the Netscape CD-ROM.

2. On UNIX-based platforms only, mount the CD-ROM. Refer to your *Quick Beginnings* book for the mounting procedures.

3. For installation instructions, refer to the CDNAV*nn*.txt file, where *nn* represents your two character language identifier. The file is located at the root directory of the CD-ROM.

Accessing Information with the Information Center

The Information Center provides quick access to DB2 product information. The Information Center is available on all platforms on which the DB2 administration tools are available.

You can open the Information Center by double-clicking the Information Center icon. Depending on the system you are using, the icon is in the Information folder in the main product folder or the Windows **Start** menu.

You can also access the Information Center by using the toolbar and the **Help** menu on the DB2 Windows platform.

The Information Center provides six types of information. Click the appropriate tab to look at the topics provided for that type.

Tasks   Key tasks you can perform using DB2.

Reference   DB2 reference information, such as keywords, commands, and APIs.

Books   DB2 books.

Troubleshooting
       Categories of error messages and their recovery actions.

Sample Programs
       Sample programs that come with the DB2 Application Development Client. If you did not install the DB2 Application Development Client, this tab is not displayed.

Web   DB2 information on the World Wide Web. To access this information, you must have a connection to the Web from your system.

When you select an item in one of the lists, the Information Center launches a viewer to display the information. The viewer might be the system help viewer, an editor, or a Web browser, depending on the kind of information you select.

The Information Center provides a find feature, so you can look for a specific topic without browsing the lists.

For a full text search, follow the hypertext link in the Information Center to the **Search DB2 Online Information** search form.

The HTML search server is usually started automatically. If a search in the HTML information does not work, you may have to start the search server using one of the following methods:

On Windows

Click **Start** and select **Programs —> IBM DB2 —> Information —> Start HTML Search Server**.

On OS/2

Double-click the **DB2 for OS/2** folder, and then double-click the **Start HTML Search Server** icon.

Refer to the release notes if you experience any other problems when searching the HTML information.

Note: The Search function is not available in the Linux, PTX, and Silicon Graphics IRIX environments.

Using DB2 Wizards

Wizards help you complete specific administration tasks by taking you through each task one step at a time. Wizards are available through the Control Center and the Client Configuration Assistant. The following table lists the wizards and describes their purpose.

Note: The Create Database, Create Index, Configure Multisite Update, and Performance Configuration wizards are available for the partitioned database environment.

Wizard	Helps You to...	How to Access...
Add Database	Catalog a database on a client workstation.	From the Client Configuration Assistant, click **Add**.
Back up Database	Determine, create, and schedule a backup plan.	From the Control Center, right-click the database you want to back up and select **Backup —> Database Using Wizard**.

Wizard	Helps You to...	How to Access...
Configure Multisite Update	Configure a multisite update, a distributed transaction, or a two-phase commit.	From the Control Center, right-click the **Databases** folder and select **Multisite Update**.
Create Database	Create a database, and perform some basic configuration tasks.	From the Control Center, right-click the **Databases** folder and select **Create —> Database Using Wizard**.
Create Table	Select basic data types, and create a primary key for the table.	From the Control Center, right-click the **Tables** icon and select **Create —> Table Using Wizard**.
Create Table Space	Create a new table space.	From the Control Center, right-click the **Table Spaces** icon and select **Create —> Table Space Using Wizard**.
Create Index	Advise which indexes to create and drop for all your queries.	From the Control Center, right-click the **Index** icon and select **Create —> Index Using Wizard**.
Performance Configuration	Tune the performance of a database by updating configuration parameters to match your business requirements.	From the Control Center, right-click the database you want to tune and select **Configure Performance Using Wizard**.
		For the partitioned database environment, from the Database Partitions view, right-click the first database partition you want to tune and select **Configure Performance Using Wizard**.
Restore Database	Recover a database after a failure. It helps you understand which backup to use, and which logs to replay.	From the Control Center, right-click the database you want to restore and select **Restore —> Database Using Wizard**.

Setting Up a Document Server

By default, the DB2 information is installed on your local system. This means that each person who needs access to the DB2 information must install the same files. To have the DB2 information stored in a single location, perform the following steps:

1. Copy all files and subdirectories from \sqllib\doc\html on your local system to a Web server. Each book has its own subdirectory that contains all the necessary HTML and GIF files that make up the book. Ensure that the directory structure remains the same.

2. Configure the Web server to look for the files in the new location. For information, refer to the NetQuestion Appendix in the *Installation and Configuration Supplement*.

3. If you are using the Java version of the Information Center, you can specify a base URL for all HTML files. You should use the URL for the list of books.

4. When you are able to view the book files, you can bookmark commonly viewed topics. You will probably want to bookmark the following pages:
   - List of books
   - Tables of contents of frequently used books
   - Frequently referenced articles, such as the ALTER TABLE topic
   - The Search form

For information about how you can serve the DB2 Universal Database online documentation files from a central machine, refer to the NetQuestion Appendix in the *Installation and Configuration Supplement*.

Searching Information Online

To find information in the HTML files, use one of the following methods:

- Click **Search** in the top frame. Use the search form to find a specific topic. This function is not available in the Linux, PTX, or Silicon Graphics IRIX environments.
- Click **Index** in the top frame. Use the index to find a specific topic in the book.
- Display the table of contents or index of the help or the HTML book, and then use the find function of the Web browser to find a specific topic in the book.
- Use the bookmark function of the Web browser to quickly return to a specific topic.
- Use the search function of the Information Center to find specific topics. See "Accessing Information with the Information Center" on page 113 for details.

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BookManager	OS/390
CICS	OS/400
C Set++	PowerPC
C/370	QBIC
DATABASE 2	QMF
DataHub	RACF
DataJoiner	RISC System/6000
DataPropagator	RS/6000
DataRefresher	S/370
DB2	SP
DB2 Connect	SQL/DS
DB2 Extenders	SQL/400
DB2 OLAP Server	System/370
DB2 Universal Database	System/390
Distributed Relational	SystemView
Database Architecture	VisualAge
DRDA	VM/ESA
eNetwork	VSE/ESA
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Bibliography

This bibliography contains publications that you might find useful while working with the Warehouse Manager package.

DB2 Universal Database information

- *Data Warehouse Center Administration Guide* (SC26-9993)
- *DB2 Universal Database for OS/390 Version 6 Management Tools Package* (SG24-5759)
- *DB2 for Windows Quick Beginnings* (GC09-2971)
- *Program Directory for IBM DB2 Universal Database Server for z/OS and OS/390 DB2 Warehouse Manager* (GI10-8221)
- *Program Directory for IBM DB2 Warehouse Manager Sourcing Agent* (GI10-8244)
- *z/OS and OS/390 UNIX System Services Planning* (SC28-1890)
- *DB2 Universal Database for z/OS and OS/390 ODBC Guide and Reference* (SC26-9005)
- *DB2 Universal Database for z/OS and OS/390 Installation Guide* (GC26-9008)
- *Installation and Configuration Supplement* (GC09-2957)
- *Connectivity Supplement* (online only)

Query Patroller information

- *DB2 Query Patroller Installation Guide*
- *DB2 Query Patroller Administration Guide*
- *DB2 Query Patroller User's Guide*

AIX installation information

- *AIX Packaging Guide for LPP Installation*,

http://www.rs6000.ibm.com/doc_link/
en_US/a_doc_lib/aixins/inslppkg/toc.htm

Web computing information

- *Net.Data Administration and Programming Guide*,

  http://www-4.ibm.com/software/data/
  net.data/library.html
- *A Comprehensive Guide to Virtual Private Networks, Volume I: IBM Firewall, Server and Client Solutions*, SG24-5201
- IBM Redbook: Network Computing Framework Component Guide,

  http://www-4.ibm.com/software/
  ebusiness/sg242119.html
- IBM SecureWay Firewall products,

  http://www-4.ibm.com/software/
  security/firewall/
- IBM Distributed File System Web Secure,

  http://www-4.ibm.com/software/network/
  dce/about/dfsws.html

Bibliography

Index

Contacting IBM

If you have a technical problem, please review and carry out the actions suggested by the *Troubleshooting Guide* before contacting DB2 Customer Support. This guide suggests information that you can gather to help DB2 Customer Support to serve you better.

For information or to order any of the DB2 Universal Database products contact an IBM representative at a local branch office or contact any authorized IBM software remarketer.

If you live in the U.S.A., then you can call one of the following numbers:
- 1-800-237-5511 for customer support
- 1-888-426-4343 to learn about available service options

Product Information

If you live in the U.S.A., then you can call one of the following numbers:
- 1-800-IBM-CALL (1-800-426-2255) or 1-800-3IBM-OS2 (1-800-342-6672) to order products or get general information.
- 1-800-879-2755 to order publications.

http://www.ibm.com/software/data/
　　The DB2 World Wide Web pages provide current DB2 information about news, product descriptions, education schedules, and more.

http://www.ibm.com/software/data/db2/library/
　　The DB2 Product and Service Technical Library provides access to frequently asked questions, fixes, books, and up-to-date DB2 technical information.

　　Note: This information may be in English only.

http://www.elink.ibmlink.ibm.com/pbl/pbl/
　　The International Publications ordering Web site provides information on how to order books.

http://www.ibm.com/education/certify/
　　The Professional Certification Program from the IBM Web site provides certification test information for a variety of IBM products, including DB2.

ftp.software.ibm.com

Log on as anonymous. In the directory `/ps/products/db2`, you can find demos, fixes, information, and tools relating to DB2 and many other products.

comp.databases.ibm-db2, bit.listserv.db2-l

These Internet newsgroups are available for users to discuss their experiences with DB2 products.

On Compuserve: GO IBMDB2

Enter this command to access the IBM DB2 Family forums. All DB2 products are supported through these forums.

For information on how to contact IBM outside of the United States, refer to Appendix A of the *IBM Software Support Handbook*. To access this document, go to the following Web page: http://www.ibm.com/support/, and then select the IBM Software Support Handbook link near the bottom of the page.

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