SeeBeyond™ eBusiness Integration Suite

e*Way Intelligent Adapter for DB2 Universal Database User's Guide

Release 4.5.4

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Chapter 1

Introduction

This document describes how to install and configure the Java-enabled e*Way Intelligent Adapter for DB2 Universal Database.

This Chapter Includes:

1.1 Overview

The DB2 Universal Database e*Way enables the e*Gate system to exchange data with external DB2 databases. This document describes how to install and configure the Java-enabled version of the DB2 Universal Database e*Way.

The DB2 Universal Database e*Way uses the Java library to issue SQL statements to interact with DB2 databases.

1.1.1 Components

The following components comprise the Java-enabled version of the DB2 Universal Database e*Way:

- **e*Way Connections:** Provide access to the information necessary for connecting to a specified external system.
- **stcjdbcx.jar:** Contains the logic required by the e*Way to interact with the external databases.

1.2 Operational Overview

The Java-enabled DB2 Universal Database e*Way uses Java Collaborations to interact with one or more external databases. By using the Java Collaboration Service it is possible for e*Gate components—such as e*Way Intelligent Adapters (e*Ways) and Business Object Brokers (BOBs)—to connect to external databases and execute business rules written entirely in Java.

1.3 Supported Operating Systems

Although the DB2 Universal Database e*Way components run on the platforms listed below, the Java-enabled ETD Editor and Collaboration Editor require the Windows operating system.

The DB2 Universal Database e*Way is available on the following operating systems:

- Windows XP with e*Gate 4.5.3
- Windows 2000, Windows 2000 SP1, Windows 2000 SP2, and Windows 2000 SP3
- Windows NT 4.0 SP6a
- Solaris 2.6, 7, and 8
- AIX 4.3.3 and 5.1
- HP-UX 11.0 and HP-UX 11i
- OS/390 V2R10
- z/OS 1.2, 1.3, and 1.4
- Connecting to AS/400 R5V1. Supported with e*Gate 4.5.2 and later.

1.4 System Requirements

To use the DB2 Universal Database e*Way, you need the following:

- An e*Gate Participating Host, version 4.5.1 or later, with the exception of the following operating systems:
  - The Windows XP operating system is supported with e*Gate version 4.5.3.
- A TCP/IP network connection.

The client components of the databases with which the e*Way interfaces have their own requirements; see that system's documentation for more details.

1.4.1 Host System Requirements

The external system requirements are different for a GUI host machine—specifically a machine running the ETD Editor and the Java Collaboration Editor GUIs—versus a participating host which is used solely to run the e*Gate schema.

Note: *Open and review the Readme.txt for any additional requirements prior to installation. The Readme.txt is located on the Installation CD_ROM.*

Using DataDirect Drivers on Windows or Unix Operating Systems

GUI Host Requirements Using DataDirect Drivers

To enable the GUI editors to communicate with the external system, the following items must be installed on any host machines running the GUI editors:

- DataDirect ODBC 4.1 wire protocol driver included on the driver installation cd.
- If the GUI host machine will also be executing the DB2 Universal Database e*Way, the host machine must also meet the **"Participating Host Requirements Using DataDirect Drivers" on page 13**.

Participating Host Requirements Using DataDirect Drivers

The DB2 Universal Database e*Way requires that the following items be installed on the Participating Host:

- DataDirect JDBC 3.2 drivers. These drivers are installed with e*Gate.

Note: *When using DataDirect drivers, the number of ResultSets returned is one.*

Using IBM Drivers on Windows or Unix Operating Systems

GUI Host Requirements Using IBM Drivers for DB2

If you have chosen not to use the DataDirect ODBC wire protocol drivers because of pre-existing DB2 4.5.2 collaborations, you will need to assure you have the following components installed and configured appropriately. Please note that if you do select to use the IBM Drivers, you will not be able to take advantage of the new enhanced features of the DB2 4.5.2 e*Way.

To enable the GUI editors to communicate with the external system, the following items must be installed on any host machines running the GUI editors:

- DB2 Universal Database (UDB) version 7.2 client library with FixPak 4, Service Level WR21270 available from IBM.
- The DB2 UDB client library must be installed on Windows to utilize the build tool.
- Java JDK 1.3. The JDK can be installed during the e*Gate GUI installation process if it has not already been installed.
- Microsoft Data Access Components (MDAC) RTM version 2.6 or greater. This component is included in the e*Gate installation routine. If the GUI host machine will also be executing the DB2 UDB e*Way, the host machine must also meet the **"Participating Host Requirements Using DataDirect Drivers" on page 13**.

Participating Host Requirements Using IBM Drivers for DB2

If you have chosen not to use the DataDirect JDBC wire protocol drivers because of pre-existing DB2 4.5.2 collaborations or if you want to access DB2 on an OS/390, you will need to assure you have the following components installed and configured appropriately on the Participating Host.

The DB2 Universal Database e*Way Installation program installs the Type 4 JDBC drivers required to connect to the external DB2 UDB database. These drivers, available from IBM, will be appropriate for most DB2 UDB implementations. However, for

implementations using protocols other than Type 4, the appropriate client drivers must be installed.

A complete list of drivers from third party vendors can be found at:

http://industry.java.sun.com/products/jdbc/drivers

- The DB2 Universal Database client library version 7.2 with FixPak4, Service Level WR21270. The client must be configured to communicate with the DB2 database.
- The most recent IBM DB2 software updates must be installed. These updates provide support for the latest Java functionality.

Note: *If you have chosen to use the IBM drivers for DB2, please be aware that these drivers do not support updatable ResultSets.*

Using IBM Drivers for an OS/390 or z/OS Operating System

Host Requirements for an OS/390 or z/OS Operating System

To use the DB2 Universal Database e*Way connecting to an OS/390 operating system, you must meet the requirements for the GUI Host and the Participating Host using the IBM for DB2 drivers. Additional configuration considerations need to be implemented. Please see **"Additional System Configurations" on page 41**.

Using IBM Drivers on an AS/400 Operating system

Host Requirements for an AS/400 Operating System

To use the DB2 Universal Database e*Way connecting to an AS/400 operating system, you must meet the requirements for the GUI Host and the Participating Host using the IBM for DB2 drivers. Additional configuration considerations need to be implemented. Please see **"Additional System Configurations" on page 41**.

Note: *If you have chosen to use the IBM drivers for DB2, please be aware that these drivers do not support scrollable ResultSets. It is recommended that you use a prepared statement to update and insert data.*

1.5 External System Requirements

The DB2 e*Way supports the following external systems:

- DB2 Universal Database (UDB) version 7.2 with FixPak 4, Service Level WR21270. FixPak 4 is available directly from IBM. For more information on FixPak 4, please review IBM's "FixPak for IBM DB2 Universal Database* Version 7.2" Readme.txt.
- DB2 Universal Database (UDB) version 6.1 when connecting to DB2 running on an OS/390 operating system when using DataDirect drivers.
- DB2 Universal Database (UDB) version 7.1 when connecting to DB2 running on an OS/390 operating system when using the IBM native drivers.

- DB2 Universal Database (UDB) version 5.1 when connecting to DB2 running on an AS/400 operating system.
- Additionally, for XA support, DB2 Connect version 7.2 with FixPak 4, Service Level WR21270 and the configuration of SyncPoint Manager are required.

At-A-Glance Operating System Driver Configuration

The following table should help you in determining your specific driver configuration. For more detail information regarding specific driver versions as well as additional system requirements, please see **System Requirements** on page 12 of this document.

Table 1 At-a-Glance Operating System Driver Configuration

Operating System	DataDirect ODBC	DataDirect JDBC	IBM's DBConnect ODBC (available from IBM)	IBM's DBConnect JDBC (available from IBM)	IBM's SyncPoint Manager (available from IBM)	DB Native Drivers
Windows, NT	X	X				
UNIX	X	X				
OS/390	X	X				
OS/390						X
OS/390 Connecting to			X	X		
AS/400 Connecting to			X	X		

If you are using XA, one of the following driver configurations are recommended.

Note: *Please note that XA running on an OS/390 or connecting to an AS/400 is not supported.*

Table 2 At-a-Glance XA Operating System Driver Configuration

Operating System	DataDirect ODBC	DataDirect JDBC	IBM's DBConnect ODBC (available from IBM)	IBM's DBConnect JDBC (available from IBM)	IBM's SyncPoint Manager (available from IBM)
Windows, NT			X	X	
UNIX			X	X	
OS/390	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported
OS/390 Connecting to			X	X	X
AS/400 Connecting to	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported

Chapter 2

Installation

This chapter describes how to install the DB2 Universal Database e*Way.

This Chapter Includes:

Important: *Open and review the Readme.txt for the DB2 e*Way for any additional information or requirements, prior to installation. The Readme.txt is located on the Installation CD_ROM at setup\addons\ewdb2.*

2.1 Installing the DB2 Universal Database e*Way on Windows

2.1.1 Pre-installation

1. Quit all Windows-based programs before running the setup program, including any anti-virus applications.
2. You must have Administrator privileges to install this e*Way.
3. To use the DB2 e*Way, you must also setup your DB2 environment. This is required, because the e*Way connection configuration will look for the database name in the database directory of the DB2 client configuration on the system.

2.1.2 Installation Procedure

To install the DB2 Universal Database e*Way on a Windows operating system

1. Log in as an Administrator on the workstation on which you want to install the e*Way.
2. Insert the e*Gate installation CD-ROM into the CD-ROM drive.
3. If the CD-ROM drive's "Autorun" feature is enabled, the setup application should launch automatically; skip ahead to step 4. Otherwise, use Windows Explorer or the

Control Panel's **Add/Remove Applications** feature to launch the file **setup.exe** on the CD-ROM drive.

4 The InstallShield setup application will launch. Follow the on-screen instructions to install the e*Way.

Note: *Be sure to install the e*Way files in the suggested "client" installation directory. The installation utility detects and suggests the appropriate installation directory.* ***Unless you are directed to do so by SeeBeyond support personnel, do not change the suggested "installation directory" setting.***

2.2 Installing the DB2 Universal Database e*Way on UNIX

2.2.1 Pre-installation

You do not require root privileges to install this e*Way. Log in under the user name that you wish to own the e*Way files. Be sure that this user has sufficient privilege to create files in the e*Gate directory tree.

To use the DB2 e*Way, you must also setup your DB2 environment. This is required, because the e*Way connection configuration will look for the database name in the database directory of the DB2 client configuration on the system.

2.2.2 Installation Procedure

To install the DB2 Universal Database e*Way on a UNIX system

1 Log in on the workstation containing the CD-ROM drive, and insert the CD-ROM into the drive.

2 If necessary, mount the CD-ROM drive.

3 At the shell prompt, type

cd /cdrom

4 Start the installation script by typing:

setup.sh

5 A menu of options will appear. Select the "install e*Way" option. Then, follow any additional on-screen directions.

Note: *Be sure to install the e*Way files in the suggested "client" installation directory. The installation utility detects and suggests the appropriate installation directory.* ***Unless you are directed to do so by SeeBeyond support personnel, do not change the suggested "installation directory" setting.***

2.3 Files/Directories Created by the Installation

The DB2 Universal Database e*Way installation process will install the following files within the e*Gate directory tree. Files will be installed within the "egate\client" tree on the Participating Host and committed to the "default" schema on the Registry Host.

Table 3 Files created by the installation

e*Gate Directory	File(s)
	stcewdb2.ctl
etd\db2	com_stc_jdbcx_db2cfg.java
etd\db2	com_stc_jdbcx_db2cfg.xsc
ThirdParty\merant\classes	DGbase.jar
ThirdParty\merant\classes	DGdb2.jar
ThirdParty\merant\classes	DGutil.jar
ThirdParty\merant\classes	spy.jar
server\registry\repository\configs\db2	DB2.def
server\registry\repository\default\etd\	db2.ctl
server\registry\repository\default\etd	dbwizard.ctl

2.4 The db2cli.ini File for Use With the IBM DB2 Native Drivers

To use a Clob/Blob while using the IBM DB2 native drivers, you will need to set the LONGDATACOMPAT = 0 in the file db2cli.ini under the DB2 root directory. This will disable the LongVarChar, LongVarBinary, and LongVarGraphic. Refer to the IBM Installation and Configuration Supplement for more information.

2.5 The db2java.zip File

The DB2 Universal Database e*Way uses the drivers contained in the **db2java.zip** file. To add the drivers, do the following:

Assure that the **db2java.zip** file from your DB2 Client software is installed into / Program Files/SQLLib/Java

From the e*Gate Enterprise Manager, click **File** on the tool bar. Click **Commit to Sandbox...** from the drop down menu and enter a file location. Browse to the /Program Files/SQLLib/Java folder and select the **db2java.zip** file. Click **Open**

From the e*Gate Collaboration, click **Tools** on the tool bar. Click **Options** from the drop down menu. **Add** the **db2java.zip** file.

2.6 Usejdbc2.bat File for Use With the DB2 Native JDBC Drivers

If you have chosen to use the DB2 native JDBC drivers, you will need to do the following to assure you have JDBC 2.0 compliance. If you have any questions regarding this file, please consult your IBM DB2 Universal Database documentation:

1. From a command line, change your working directory to sqllib\java12 and enter **usejdbc2.bat**.

   This command performs the following tasks:

   - Creates a sqllib\java11 directory for the 1.22 driver files
   - Backs up the JDBC 1.22 driver files into the sqllib\java11 directory
   - Copies the JDBC 2.0 driver files from the sqllib\java12 directory into the appropriate directories

To switch back to the JDBC 1.22 driver, execute the usejdbc1 batch file from the sqllib\java12 directory.

2.7 Installing the DB2 Universal Database e*Way on OS/390 or z/OS

Installing DB2 on an OS/390 or z/OS

To install the DB2 e*Way on an OS/390 or z/OS operating system, please refer to the e*Gate Integrator Installation Guide.

Configuring an OS/390 or z/OS Participating Host with a Registry on another Host

Configuring an OS/390 or z/OS Participating Host with a Registry on another Host when using DataDirect Drivers

When running the Registry Host on another machine, do the following to assure communication between the Registry Host and the Participating Host:

1. Run JDBC Test. See **"JDBC Test" on page 27**.
2. From the Unix System Services, create a working directory.
3. From a command prompt shell to the newly created working directory.
4. FTP the following files from the Registry Host to the newly created working directory

   A. The following file is in ASCII mode:

```
egate/server/registry/repository/default/ThirdParty/merant/db2bind/
db2bind.sh
```

These files are in Binary mode and copied to

```
egate/server/registry/repsitory/default/ThirdParty/:
merant/db2bind/db2bind.class
sun/classes/jdbc2_0-stcdext.jar
classes/DGbase.jar
classes/DGdb2.jar
classes/DGutil.jar
classes/sljc_brand.jar
classes/sljcx.jar
classes/spy.jar
```

5 Customize the file:

```
egate/server/registry/repository/default/ThirdParty/merant/db2bind/
db2bind.sh
```

by un commenting the following:

```
# export CLASSPATH=.:$PWD/jdbc2_0-stdext.jar:$PWD/spy.jar:$PWD/
DGbase.jar:$PWD/DGdb2.jar:$PWD/DGutil.jar
```

For example:

```
export CLASSPATH=.:$PWD/jdbc2_0-stdext.jar:$PWD/spy.jar:$PWD/
DGbase.jar:$PWD/DGdb2.jar:$PWD/DGutil.jar
```

Once you have completed the un-commenting of the db2bind.sh script, you will need to customize the script by doing the following:

```
java db2bind USERID PASSWORD OS390r29.STC.COM S39LOC 446 E390COL
```

6 E390PACIssue the chmod command to assure the **db2bind.sh** script is executable.

```
chmod +x db2bind.sh
```

7 Run the db2bind.sh script to re-bind the DB2 Collections and Package for the OS/390. See OS/390 Binding on page 27

USERID	DB2Userid that has Bind Authority
PASSWORD	Password for the DB2 Userid
OS390R290.stc.com	Host name that DB2 is currently installed on
S390LOC DB2 DDCS/DRDA	Location Name
446 DB2 DDCS/DRDA	Port Name
E390COL DB2	Collection name (must not exceed 12 characters)
E390PAC DB2	Package name (must not exceed 7 characters)

Configuring the OS/390 or z/OS

Configuring the OS/390 when using the DB2 Native Drivers

To use the DB2 e*Way running on an OS/390, you need make the following configurations.

Create a jar file that contains the DB2 JDBC serialized profile.

1. From a command line, navigate to your /usr/lpp/db2/db2710/classes folder and locate the DSNJDBC_JDBCProfile.ser file.
2. Copy this file to a working directory.
3. Create a jar file using the following command:

```
jar cvf db2jdbcser.jar DSNJDBC_JDBCProfile.ser
```

4. Copy the newly created db2jdbcser.jar file into the following directories:

```
/egate/client/classes
/egate/server/registry/repository/default/classes
```

5. Navigate to /egate/server/registry/repository/default/classes and locate the stcjcsbootstrap.ctl file.
6. Open and modify the stcjcsbootstrap.ctl file by adding an entry for the db2jdbcser.jar file you created in step 3 above.

```
jcsbootstrap.jar, classes, FILETYPE_BINTEXT
jcert.jar, ThirdParty/jsse/jsse1.0.2/classes, FILETYPE_BINTEXT
jnet.jar, ThirdParty/jsse/jsse1.0.2/classes, FILETYPE_BINTEXT
jsse.jar, ThirdParty/jsse/jsse1.0.2/classes, FILETYPE_BINTEXT
db2jdbcser.jar, classes, FILETYPE_BINTEXT
```

2.7.1 Prepending the Class Files for DB2 on the OS/390 or z/OS

When using DB2 native JDBC drivers with the OS/390 or z/OS, you need to commit db2j2classes.zip and db2sqljruntime.zip files to your Java Collaboration.

1. Navigate to your IBM /usr/lpp/db2/db2710/classes folder and locate

```
db2j2classes.zip
db2sqljruntime.zip
```

2. FTP these files to your workstation using binary mode.
3. Prepend these files to e*Gate\Thirdparty\ibmdb2\classes. For more information on how to prepend class paths within e*Gate, please see the *e*Gate Integrator Users Guide*.

2.7.2 Creating External Links

External links need to be created for the OS/390 or z/OS when using the IBM native JDBC drivers:

1. Create an IBM directory under your egate/client/bin directory.
2. Copy the file DSNAQLD5 from /usr/lpp/db2/lib/IBM to the new IBM file you created in step 1 /egate/client/bin/IBM.
3. Create the following links in the egate/client/bin directory as follows:

```
ln -e DSNX9LDJ libdb2dsnx9ldj.so
ln -e DSNAQLD6 libdb2os390j1BFP_.so
ln -e DSNAQLD7 libdb2os390j1BFP_g.so
ln -e DSNAQLDA libdb2os390j2.so
ln -e DSNAQLDB libdb2os390j2_g.so
```

```
ln -e DSNAQLD8 libdb2os390j2comp.so
ln -e DSNAQLD9 libdb2os390j2comp_g.so
ln -e DSNAQLD0 libdb2os390sqljjdbc.so
ln -e DSNAQLD0 libdb2os390sqljjdbc_g.so
```

Load Libraries

You may also find it necessary to add the DB2 Load libraries to your STEBLIB environment variable before starting the Control Broker:

```
DSN710.SDSNLOAD
DSN710.SDSNLOD2
```

For example:

```
export STEPLIB=$STEPLIB:DSN710.SDSNLOAD:DSN710.SDSNLOD2
```

This is not required if these libraries are already in System LNKLST.

Chapter 3

Connectivity

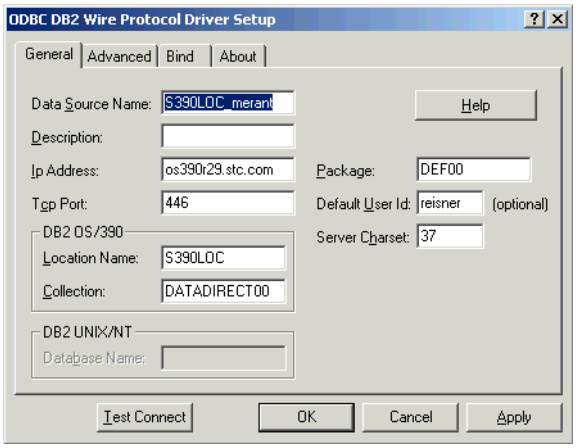
Before you can configure your DB2 e*Way, you will need to test the connectivity. Follow the instructions provided to assure connectivity.

3.1 Registering the DataSource

To register your datasource, do the following:

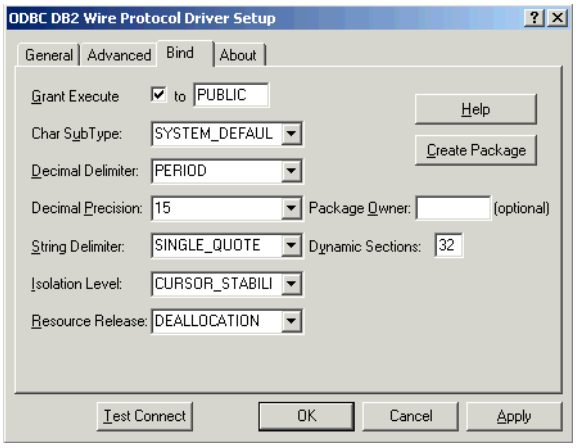
1. Install the DataDirect 4.1 ODBC drivers. To do this, follow the installation instructions provided with the drivers.
2. On the task bar, click the **Start** button, and then click **Control Panel**.
3. Click **Administrative Tools**.
4. Click **Data Sources (ODBC)**.
5. In the ODBC Data Source Administrator window, click the **User DSN** tab.
6. Click **Add**.
7. Select **DataDirect 4.1 32BIT DB2 Wire Protocol** and click **Finish**.
8. In the ODBC DB2 Wire Protocol and Driver Setup window, select the **General** tab. Enter the appropriate system information for your DB2 installation. See Figure 1.

Figure 1 ODBC DB2 Wire Protocol Driver Setup General Tab



9 Click on the **Bind** tab. See Figure 2.

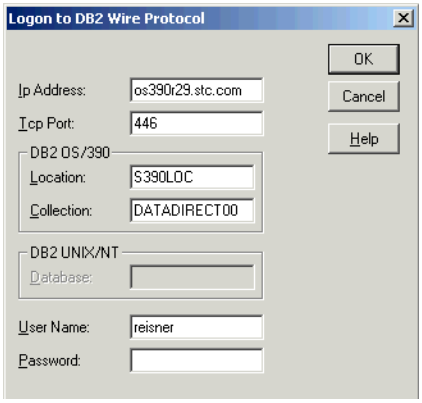
Figure 2 ODBC DB2 Wire Protocol Driver Setup Bind Tab



10 Enter all the information required to make a connection to your database. Once completed, test the connection by clicking the **Test Connection** button.

11 Verify that the information in the Logon to DB2 Wire Protocol window is correct. Click the **OK** button. See Figure 3.

Figure 3 Logon to DB2 Wire Protocol



12 If the connection was successful, you will see **Connection Established!** in the Test Connect window. Click **OK**. See Figure 4.

Figure 4 Test Connect

3.2 ODBC Test

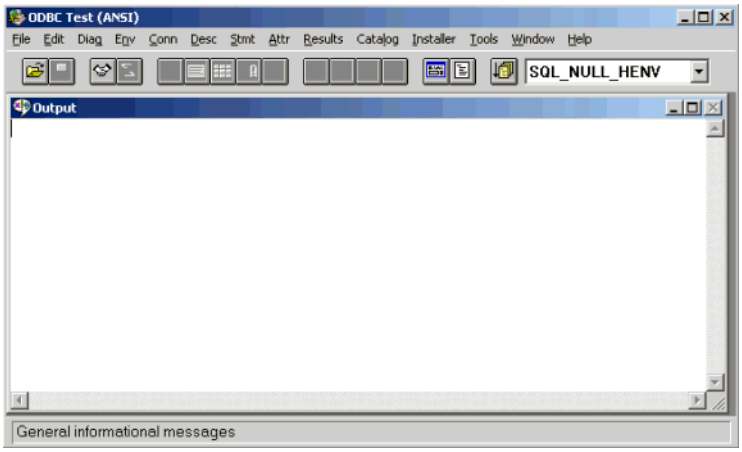
ODBC Test is a utility available from Microsoft. To use this utility, you will need to download it from www.microsoft.com.

1 Download ODBC Test and follow the online instructions provided by Microsoft to install this utility.

Once installed do the following:

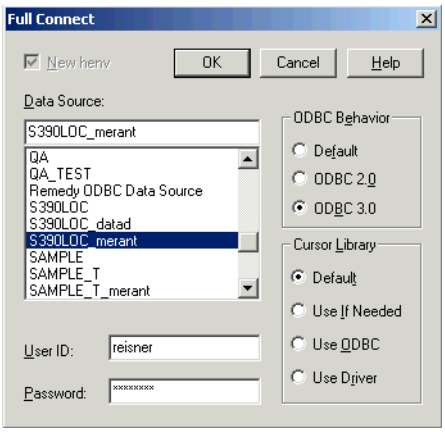
2 In the ODBC Test (ANSI) window, click the **Handshake** button on the toolbar to open the connection. See Figure 5.

Figure 5 ODBC Test - Handshake



3 In the Data Source dialog box, select the ODBC data source. Enter your **User ID** and **Password**. See Figure 6.

Figure 6 Full Connect



4 Click **OK**.

5 Once a connection has been established, the SeeBeyond ODBC driver must be unlocked for use with ODBC Test by setting two attributes. From the **Attr** menu,

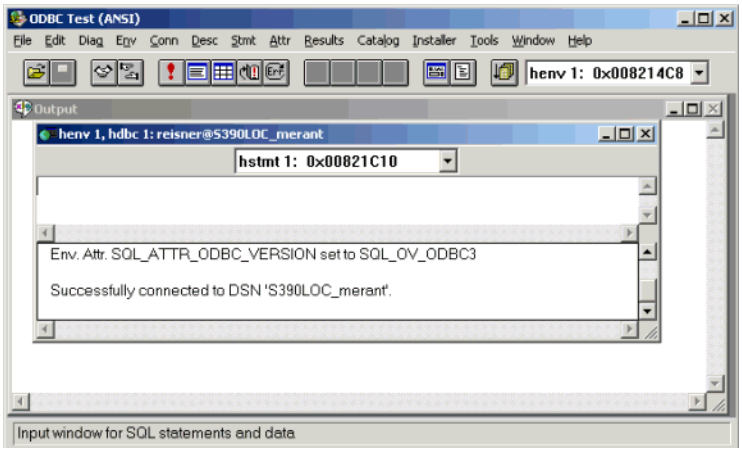
select **SQLSetConnectionOption**. Enter the following values. These values are case-sensitive and must be entered exactly as shown:

fOption: 1041, **vParam:** IVdg.LIC

fOption: 1042, **vParam:** STCDART2UI1DATAGATEQQQQQ

6 Click **OK**. See **Figure 7**.

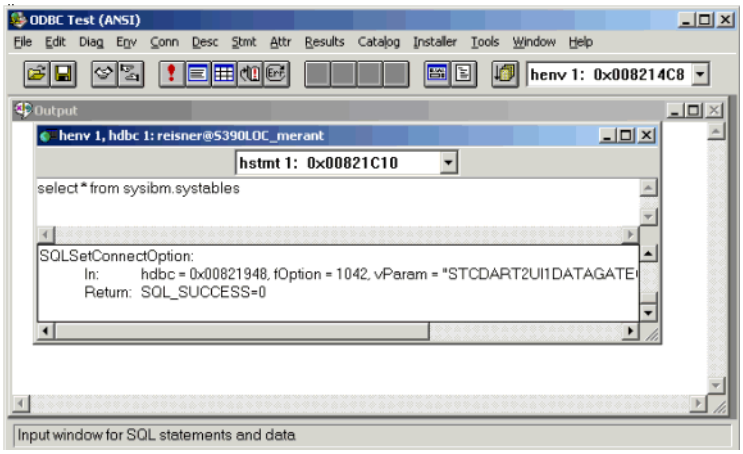
Figure 7 ODBC Test (ANSI) - Connection Established



7 Enter the following statement in the **Connection** dialog box. See Figure 8.

```
select * from sysibm.systables
```

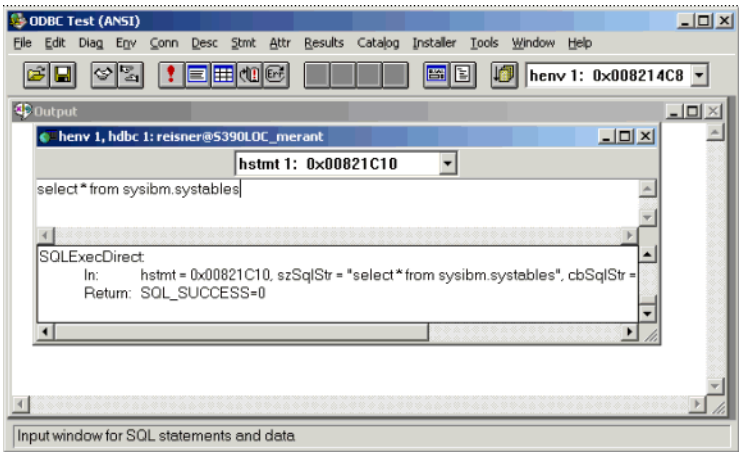
Figure 8 ODBC Test (ANSI) - Select Statement



8 On the toolbar, click the **Execute** button.

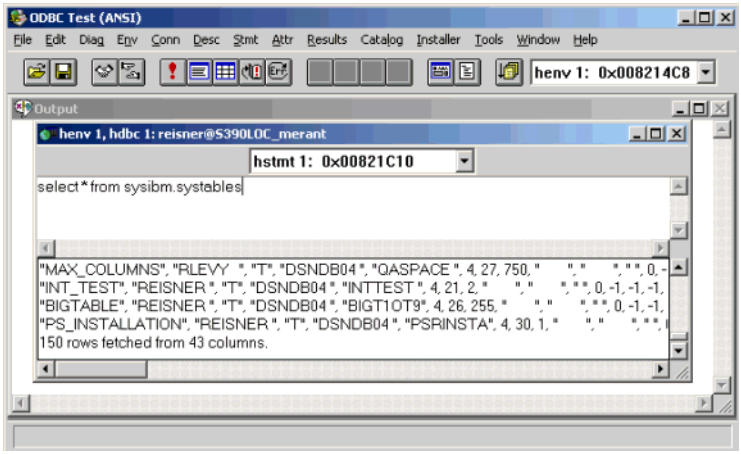
9 If the connection was successful, you will see the **SQLExecDirect** return statement in the **Connection** dialog box. See Figure 9

Figure 9 ODBC Test (ANSI) - Connection Successful



10 To view the data returned, click the **Get Data** button. The data returned by the query will display in the **Connection** dialog box. See Figure 10.

Figure 10 ODBC Test (ANSI) - Get Data



3.3 JDBC Test

JDBC Test is a utility provided by DataDirect for creating the packages used by JDBC and to test connectivity.

1 Run JDBC Test from a command line by typing the following:

From Windows

```
c:\eGate\Server\registry\repository\default\ThirdParty\
merant\jdbctest\jdbctest.bat
```

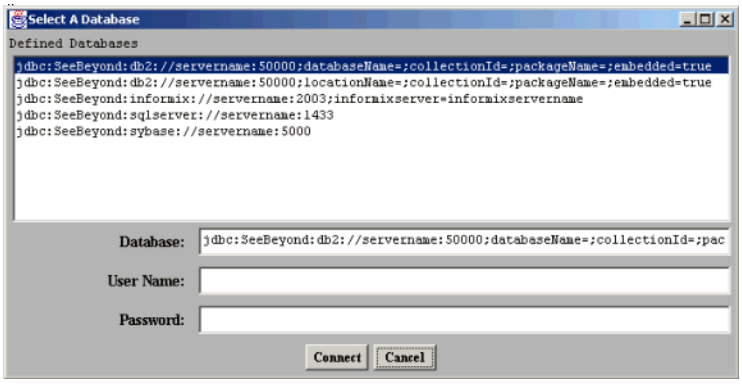
From UNIX

```
c:/eGate/Server/registry/repository/default/ThirdParty/
```

```
merant/jdbctest/jdbctest.sh
```

2 On the **Connection** menu, click **Connect to DB**.

Figure 11 Select a Database



3 For DB2 on Windows or UNIX, select the first line.

4 For DB2 on a mainframe system e.g. OS/390, select the second line.

5 Enter the information for each of the parameters that corresponds to the DB2 database you are connecting to at the **Database**: prompt.

Note: *If you are connecting to a database for the first time using JDBC, you must first create the necessary packages to assure connectivity. You must have package creation privileges on the server.*

6 To create the packages, add the following two parameters to the connection string:

Note: *If creating the package for the first time, replacePackge=TRUE should be excluded.*

```
createDefaultPackage=TRUE;replacePackage=TRUE
```

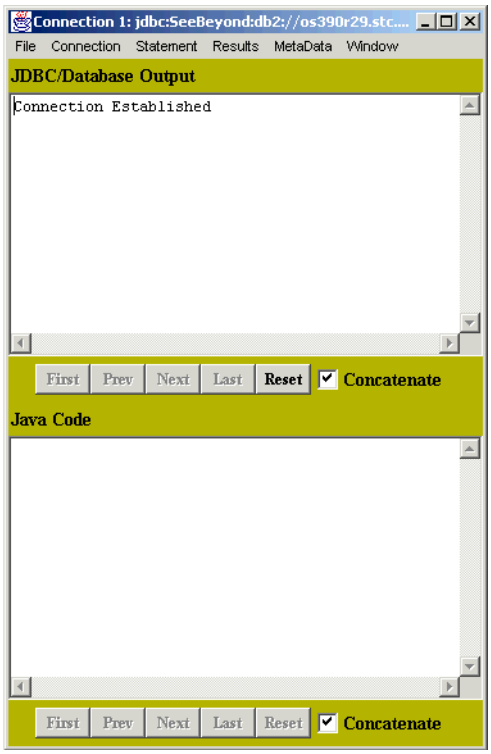
For example:

```
jdbc:SeeBeyond:db2://os390r29.stc.com:446;locationName=S390LOC;
collectionId=JDBCPKG;packageName=JDBCPKG;embedded=true;
createDefaultPackage=TRUE;replacePackage=TRUE
```

7 Enter a **User Name:** and **Password:**

8 Click **Connect**.

Figure 12 Connection 1 - Connection Established



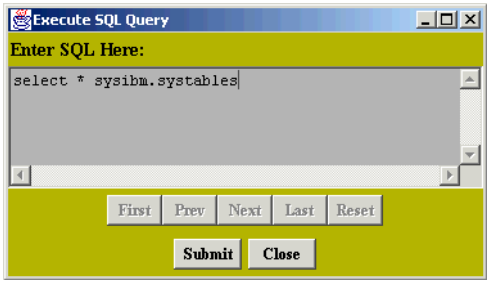
9 On the **Connection** menu, click **Create Statement**.

10 On the **Statement** menu, click **Execute Stmt Query**.

11 Enter the following SQL statement. See Figure 13:

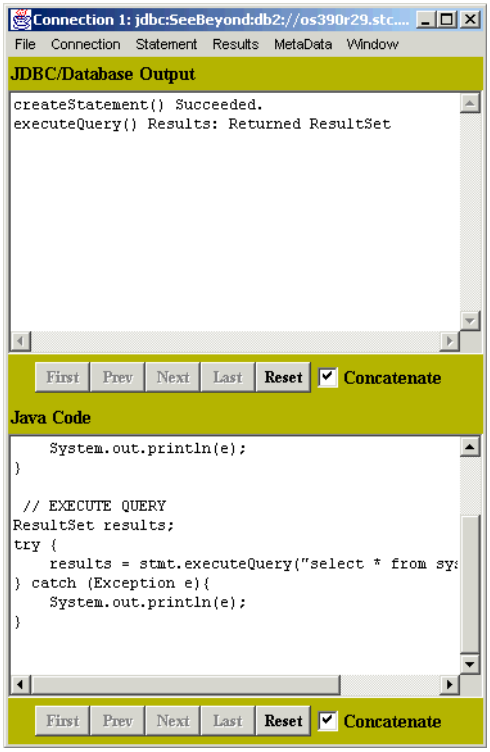
```
select*from sysibm.systables
```

Figure 13 Execute SQL Query



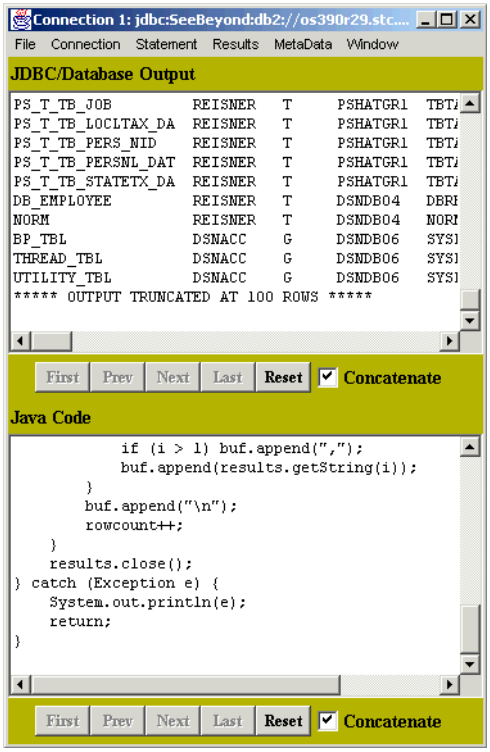
12 Click **Submit**.

Figure 14 Connection 1 - Connection Succeeded



13 On the **Results** menu, click **Show All Results** to see the results of the query. See Figure 15.

Figure 15 Connection 1 - Results



3.3.1 OS/390 Binding

If you are running the DB2 4.5.2 e*Way on an OS/390 operating system and you are upgrading to the DB2 4.5.3 e*Way, you will need to re-bind the Collections and Package that you just created using **jdbctest**. To re-bind the Collections and Package, you will need to log into your OS/390 host system and run the **db2bind** script that is located in the **egate/client/ThirdParty/db2bind** directory. You will need to edit the USERID and PASSWORD to read as follows prior to running the script:

```
USERID PASSWORD OS390R29.stc.com S390LOC 446 E390COL E390PAC
```

Chapter 4

e*Way Connection Configuration

This chapter describes how to configure the DB2 Universal Database e*Way Connections.

This Chapter Includes:

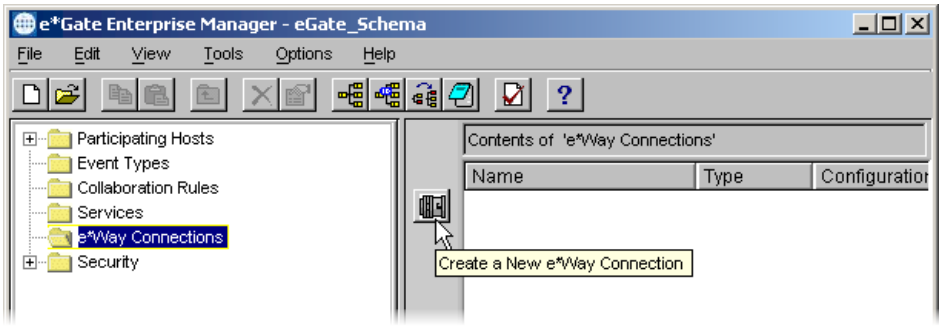
4.1 Create e*Way Connections

The e*Way Connections are created and configured in the Enterprise Manager.

To create and configure the e*Way Connections

1 In the Enterprise Manager's Component editor, select the e*Way Connections folder.

Figure 16 The e*Way Connections Folder

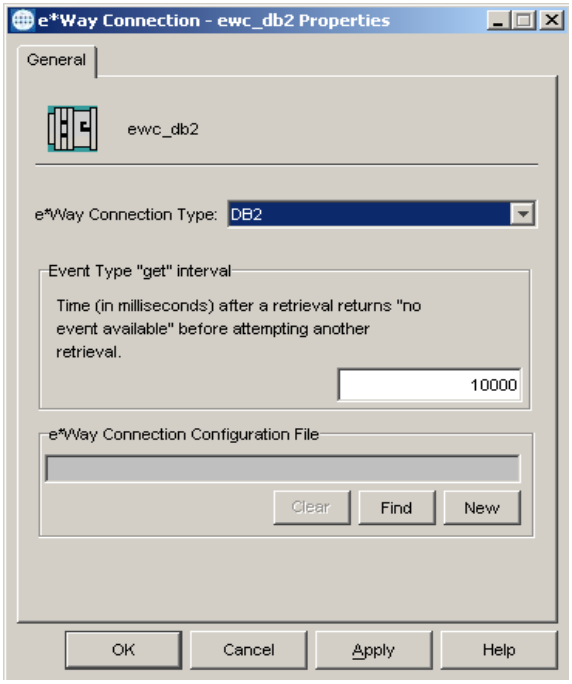


2 On the Palette, click the **New e*Way Connection** button .

3 The **New e*Way Connection Configuration** dialog box opens. Enter a name for the e*Way Connection and click **OK**.

4 Double-click the new e*Way Connection to open the e*Way Connection Properties dialog box. See **Figure 17 on page 33**.

Figure 17 e*Way Connection Properties Dialog Box



5 In the **e*Way Connection Type** list, click **DB2**.

6 In the **Event Type "get" interval** box, enter an interval.

7 Click **New** to create a new e*Way Connection Configuration File.

The e*Way Connection Configuration File Editor will appear.

The e*Way Connection configuration file parameters are organized into the following sections:

- DataSource Settings
- connector

4.1.1 DataSource Settings

The DataSource settings define the parameters used to interact with the external database.

class

Description

Specifies the Java class in the JDBC driver that is used to implement the ConnectionPoolDataSource interface.

Required Values

A valid class name.

The default is **com.SeeBeyond.jdbcx.db2.DB2DataSource**.

For OS/390, select **COM.ibm.db2.jdbc.DB2ConnectionPoolDataSourc**e

For IBM Native OS/390 drivers, select COM.ibm.db2os390.sqlj.jdbc.DB2SQLJDriver

For XA, select **COM.ibm.db2.jdbc.DB2XADataSource**

Note: *XA running on an OS/390 or connecting to an AS/400 is not supported.*

For connecting to the AS/400, you will need to add to the Class by typing **COM.ibm.db2.jdbc.DB2ConnectionPoolDataSource** at the class entry line.

Connection Method

Specifies which method is used to connect to the database server:

Pooled Data Source - A ConnectionPoolDataSource object for creating PooledConnection objects. A PooledConnection object represents a physical connection and is cached in memory for reuse, which saves the overhead of establishing a new connection. This is implemented by the driver.

XA Data Source - An XADataSource object for creating XAConnection objects, connections that can be used for distributed transaction.

You should make sure that the class specified in the ”class” parameter supports the connection method that is used here.

Required Values

The default is ”Pooled Data Source”

jdbc url

Description

A list of separated attribute-value pairs. This is used to identify the database and set the connection properties. The attribute name should be exactly the same as the one that is specified in the driver docuemntation and the value should be a valid one. The whole list will be used to specify the connection properties. To disable an attribute, simply uncheck it.

This URL will not be used if the \”connection method” section is specified as \”URL”.

The separator used in this parameter should match the one specified in the \”data source attribute value pair separator\” section.

The default separator used is \”!”.

For OS/390 or z/OS: jdbc url jdbc:db2os390sqlj:<database-location> where database-location is the name of the database defined in the DB2 BSD (bootstrap dataset).

For example: jdbc:db2os390sqlj:S390LOC

If no database-location is specified, the JDBC Driver will connect to the default DB2 sub-system.

Required Values

A valid URL. For example PortNumber!8888

CollectionID

Description

The collection or group of packages to which a package is bound.

Required Values

Any valid string.

DatabaseName

Description

Specifies the name or alias of the database instance. The alias must match the database alias in the DB2 client's database directory If you are using IBM's DB2 JDBC driver, you will need to enter the database alias name that is configured on the DB2 client.

Required Values

Any valid string.

LocationName

Description

The name of the DB2 location that you want to access. Used with OS/390.

Required Values

Any valid string.

PackageName

Description

Specifies the name, 7 character limit, of the package that the drive uses to process static and dynamic SQL.

Required Values

Any valid string.

user name

Description

Specifies the case-insensitive user name the e*Way uses to connect to the database.

Required Values

Any valid string.

password

Description

Specifies the password used to access the database.

Required Values

Any valid string.

PortNumber

Description

The TCP port number. PortNumber is used for DataSource connections only.

Required Values

Any valid string.

ServerName

Description

The IP address used for DataSource connections only. If you are using IBM's DB2 JDBC driver enter the name of your local machine.

If you are using the IBM DB2 Connect JDBC driver and no Hostname is specified, then the IBM DB2 Connect JDBC Type 2 driver will be invoked.

If you are using the IBM DB2 Connect JDBC driver and a Hostname is specified, then the IBM DB2 Connect JDBC Type 3 driver will be invoked.

It should be noted that XA is only supported with the IBM DB2 Connect JDBC Type 2 driver.

Required Values

Any valid string.

timeout

Description

Specifies the login timeout in seconds.

Required Values

Any valid string. The default is 300 seconds.

data source attribute value pair separator

Description

This entry specifies the character separator used to separate the attribute-value pair used in the ”data source attributes” section. For example, the attribute-value pair ”ServerName!myHost” has ”!” as a separator.

One should select a separator that will NOT be part of the attribute-name or the attribute-value.

Required Values

The default value is ”!”.

data source attributes

A list of separated attribute-value pairs. This information is used to identify the database and set the connection properties. The attribute name should be exactly the same as the one that is specified in the driver documentation and the value should be a valid one. The whole list will be used to specify the connection properties. To disable an attribute, simply un check it.

For example: PortNumber! 8888

The separator used in this parameter should match the one specified in the ”data source attribute value pair separator” section. By default, the separator used is ”!”.

Required Values

Any separated attribute-value pair.

4.1.2 Connector Settings

The Connector settings define the high-level characteristics of the e*Way Connection.

type

Description

Specifies the type of e*Way Connection. The current available type for JDBC connections is **DB**.

Required Values

The default is DB.

class

Description

Specifies the JAVA class name of the JDBC connector object.

Required Values

The default is **com.stc.eways.jdbcx.DbConnector**.

transaction mode

This parameter specifies how a transaction should be handled.

- **Automatic** — e*Gate will take care of transaction control and users should not issue a commit or rollback. If you are using XA, you must set your **connection establishment mode** and your **transaction mode** both to **Automatic**.
- **Manual** — You will manually take care of transaction control by issuing a commit or rollback.

Required Values

The required values are **Automatic** or **Manual**. The default is set to **Automatic**.

Mixing XA-Compliant and XA-Noncompliant e*Way Connections

A Collaboration can be XA-enabled if and only if all its sources and destinations are XA-compliant e*Way Connections. However, XA-related advantages can accrue to a Collaboration that uses one (and only one) e*Way Connection that is transactional but not XA-compliant—in other words, it connects to exactly one external system that supports commit/rollback (and is thus transactional) but does not support two-phase commit (and is thus not XA-compliant). Please see the *e*Gate User's Guide* for usage and restrictions.

connection establishment mode

This parameter specifies how a connection with the database server is established and closed.

- **Automatic** indicates that the connection is automatically established when the collaboration is started and keeps the connection alive as needed. If you are using XA, you must set your **connection establishment mode** and your **transaction mode** both to **Automatic.**
- **OnDemand** indicates that the connection will be established on demand as business rules requiring a connection to the external system are performed. The connection will be closed after the methods are completed.
- **Manual** indicates that the user will explicitly call the connection connect and disconnect methods in their collaboration as business rules.

If running e*Gate version 4.5.1 or earlier, this option is ignored.

Required Values

The required values are **Automatic**, **OnDemand** or **Manual**. The default is set to **Automatic**.

Note: *If you are using **Manual connection establishment mode**, you must also use **Manual transaction mode**.*

connection inactivity timeout

Description

This value is used to specify the timeout for the Automatic connection establishment mode. If this is set to 0, the connection will not be brought down due to inactivity. The connection is always kept alive; if it goes down, re-establishing the connection will automatically be attempted. If a non-zero value is specified, the connection manager

will try to monitor for inactivity so that the connection is brought down if the timeout specified is reached.

If running e*Gate version 4.5.1 or earlier, this option is ignored.

Required Values

Any valid string.

connection verification interval

Description

This value is used to specify the minimum period of time between checks for connection status to the database server. If the connection to the server is detected to be down during verification, your collaboration's onDown method is called. If the connection comes up from a previous connection error, your collaboration's onUp method is called.

If running e*Gate version 4.5.1 or earlier, this option is ignored.

Required Values

Any valid string. Default is 60000 ms.

4.2 Connection Manager

The Connection Manager allows you to define the connection functionality of your e*Way. You choose:

- When an e*Way connection is made.
- When to close the e*Way connection and disconnect.
- What the status of your e*Way connection is.
- When the connection fails, an OnConnectionDown method is called by the Collaboration

The Connection Manager was specifically designed to take full advantage of e*Gate 4.5.2 and higher's enhanced functionality. If you are running e*Gate 4.5.1 or earlier, this enhanced functionality is visible but will be ignored.

The Connection Manager is controlled in the e*Way configuration as described in **Connector Settings** on page 37. If you choose to manually control the e*Way connections, you may find the following chart helpful.

Figure 18 e*Way Connection Control methods

	Automatic	On-Demand	Manual
onConnectionUp	yes	no	no
onConnectionDown	yes	yes only if the connection attempt fails	no
Automatic Transaction (XA)	yes	no	no
Manual Transaction	yes	no	no
connect	no	no	yes
isConnect	no	no	yes
disconnect	no	no	yes
timeout or connect	yes	yes	no
verify connection interval	yes	no	no

Controlling When a Connection is Made

As a user, you can control when a connection is made. Using Connector Settings, you can choose to have e*Way connections controlled manually — through the Collaboration, or automatically — through the e*Way Connection Configuration. If you choose to control the connection you can specify the following:

- To connect when the Collaboration is loaded.
- To connect when the Collaboration is executed.
- To connect by using an additional connection method in the ETD.
- To connect by overriding any custom values you have assigned in the Collaboration.
- To connect by using the isConnected() method. The isConnected() method is called per connection if your ETD has multiple connections.

Controlling When a Connection is Disconnected

In addition to controlling when a connection is made, you can also manually or automatically control when an e*Way connection is terminated or disconnected. To control the disconnect you can specify:

- To disconnect at the end of a Collaboration.
- To disconnect at the end of the execution of the Collaborations Business Rules.
- To disconnect during a timeout.
- To disconnect after a method call.

Controlling the Connectivity Status

You can control how often the e*Way connection checks to verify if it is still alive and you can set how often it checks. See **Connector Settings** on page 37.

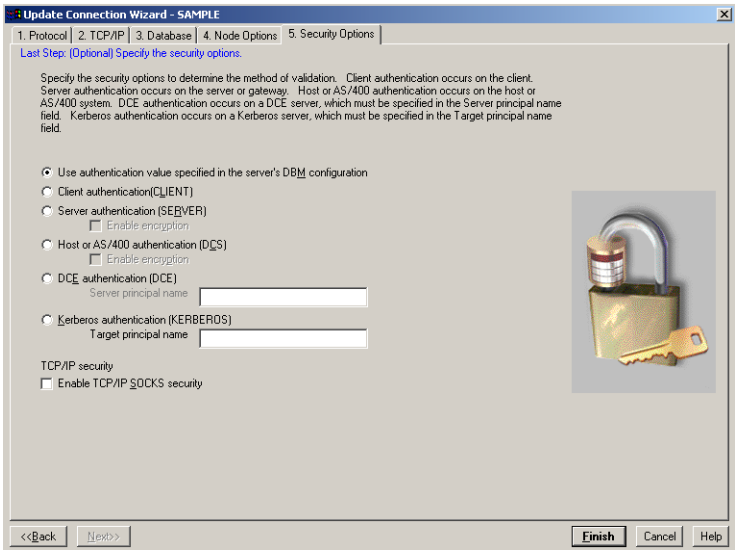
4.3 Additional System Configurations

We recommend the following configuration considerations.

4.3.1 Configuration Considerations for Non-OS/390 Operating Systems

If you are using the DB2 Connect 7.2 client on a **non**-OS/390 or AS/400 operating system and you are running in XA mode, you will need to set your **Add Database Wizard Security** option to use the authentication value specified in your Server's DBM configuration:

Figure 19 Add Database Wizard - Security for **non**-OS/390 Operating Systems



4.3.2 Configuring your e*Way to Connect to an External OS/390 System

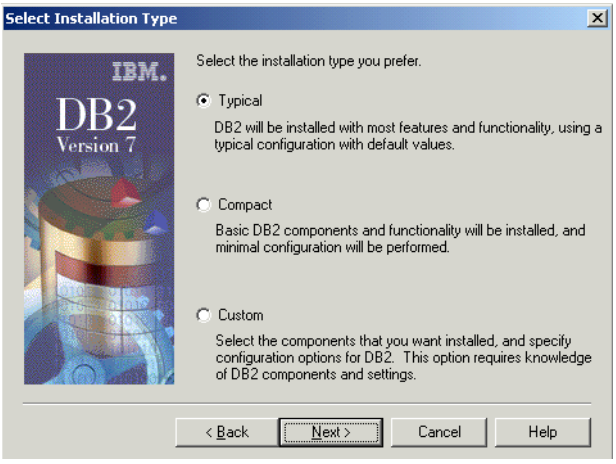
If you are connecting to an external OS/390 system, and you want to run XA, we recommend you try using the following configuration. However, every system is set up differently and this configuration may not be best suited for your application. This is only a recommendation and does not suggest or imply that this is the only method or solution for running XA. For more information on how to best configure your particular system, please refer to IBM's Red Book or contact your IBM System Administrator to discuss your specific needs.

For our sample implementation, the following steps must be followed in the order they appear. Skipping steps or proceeding in any other order then what is presented here will produce unacceptable results.

1. Install DB2 Universal Database Personal Edition, Version 7.2 for Windows. XA is only available using Version 7.2.

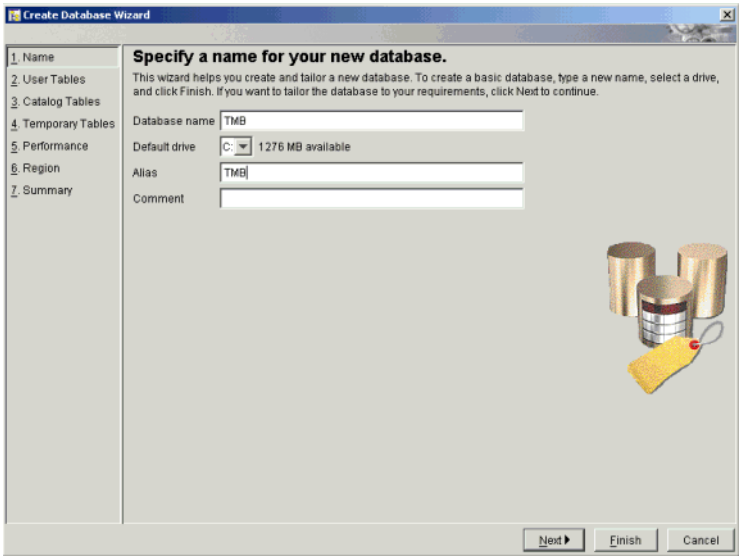
2 From the **Select Installation Type** window, click **Typical**. Click **Next**.

Figure 20 DB2 - Select Installation Type



3 From the **Create Database Wizard** window, create a new database by entering a database, the default drive, alias, and any comments. Click **Next**.

Figure 21 DB2 - Create Database Wizard



4 Continue through the Installation process accepting all the default values for all remaining Wizard windows.

5 At a DB2 Command Line Processor window type:

```
db2 => update database manager configuration using tm_database TMB
```

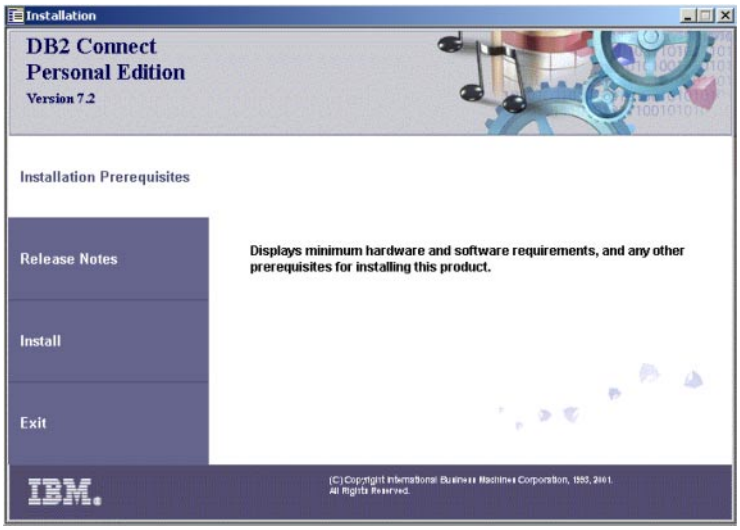
6 Reboot your machine.

Installing DB2 Connect Personal Edition Version 7.2 for Windows

1 Place the DB2 Connect Personal Edition Version 7.2 installation disk in your CD-ROM.

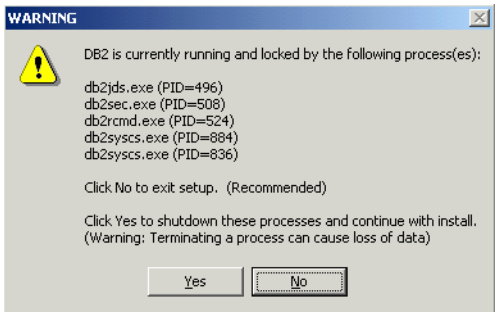
2 From the **Installation** window, click **Install**.

Figure 22 DB2 Connect Personal Edition Version 7.2 for Windows - Install



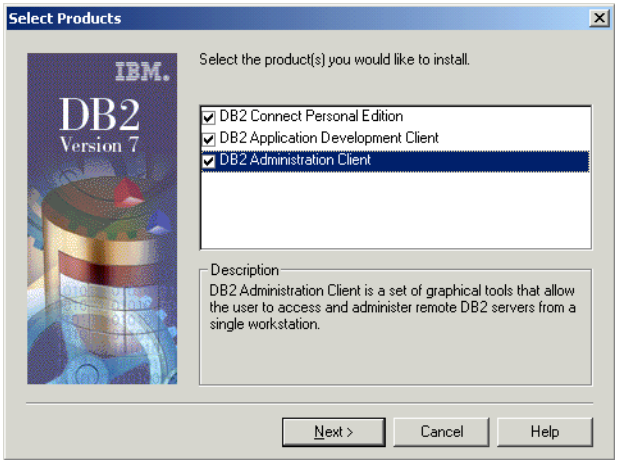
3 If you encounter the following warning window, click **Yes** to continue.

Figure 23 Warning Window



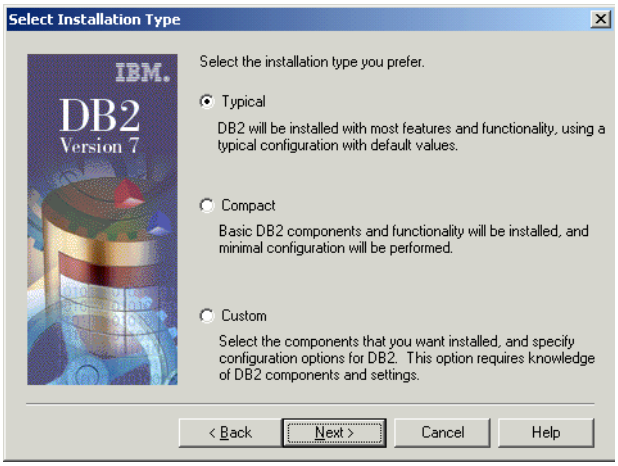
4 From the **Select Products** window, select all products to install.

Figure 24 DB2 - Select Products



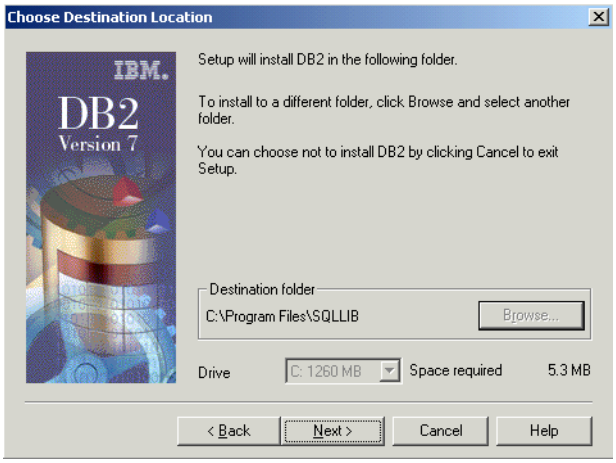
5 From the **Select Installation Type** window, click **Typical**. Click **Next**.

Figure 25 DB2 - Select Installation Type



6 Choose the folder you wish to install DB2 from the **Choose Destination Location** window. Click **Next**.

Figure 26 DB2 - Choose Destination Location



7 From the **Start Copying Files** window, click **Next**. DB2 will begin to copy files to location you specified.

8 Once the process has completed, reboot your machine.

Stopping the DB2 Related Services

1 On the desktop **Start** menu, click **Settings**, **Control Panel**.

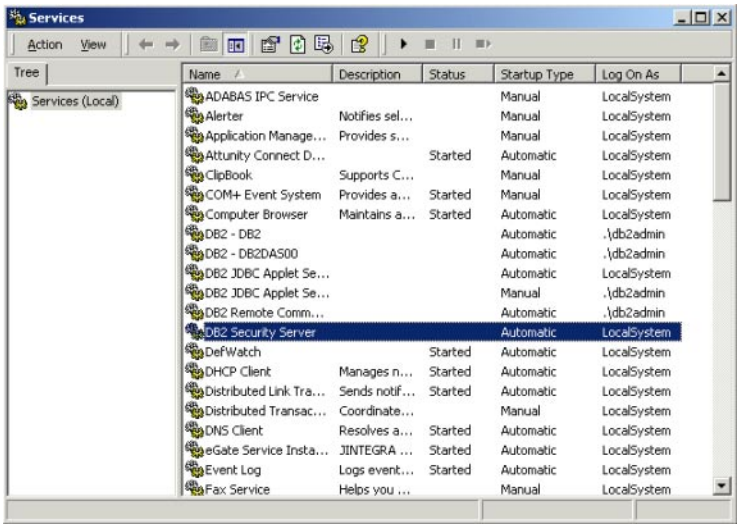
2 On the **Control Panel**, click **Administrative Tools**.

3 On the **Administrative Tools** window, click **Component Services**.

4 From the **Component Services Tree** menu, click **Services (Local)**.

5 From the list of Services, make sure that all DB2 services have been stopped.

Figure 27 Windows Services Window - All DB2 Security Services Stopped



6 From a command line prompt, execute the following:

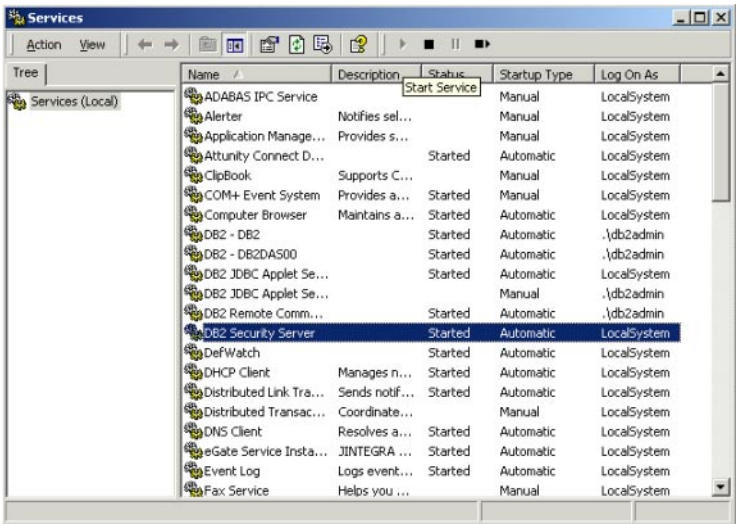
```
C:\Program Files\SQLLIB\java12>usejdbc2
```

7 The following output should display without any error messages:

```
UnZipSFX 5.31 of 31 May 1997, by Info-ZIP(Zip-Bugs@lists.wku.edu)
   inflating: db2java.zip
   inflating: db2jdbc.dll
   inflating: db2ccs.exe
   inflating: db2jd.exe
   inflating: db2jds.exe
      1 file(s) copied
      1 file(s) copied
      1 file(s) copied
      1 file(s) copied
      1 file(s) copied
      1 file(s) copied
```

8 Restart the DB2 Security Server services.

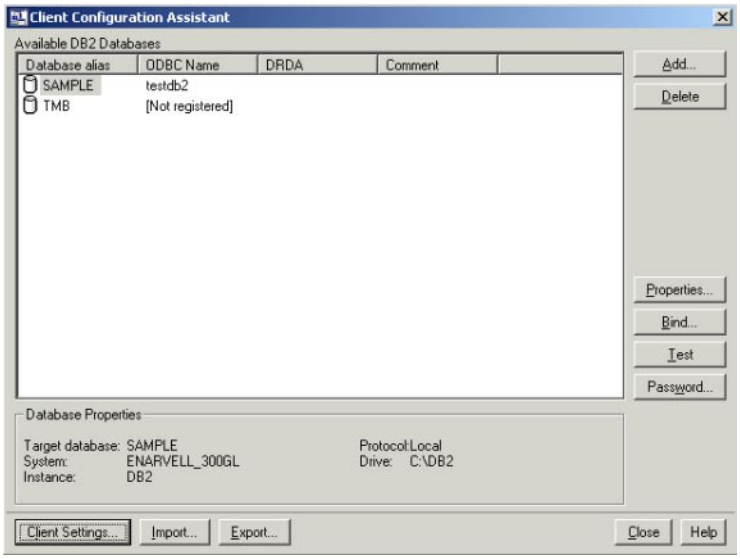
Figure 28 Windows Services Window - DB2 Security Server Restarted



4.3.3 Creating a Connection to DB2 on the OS/390

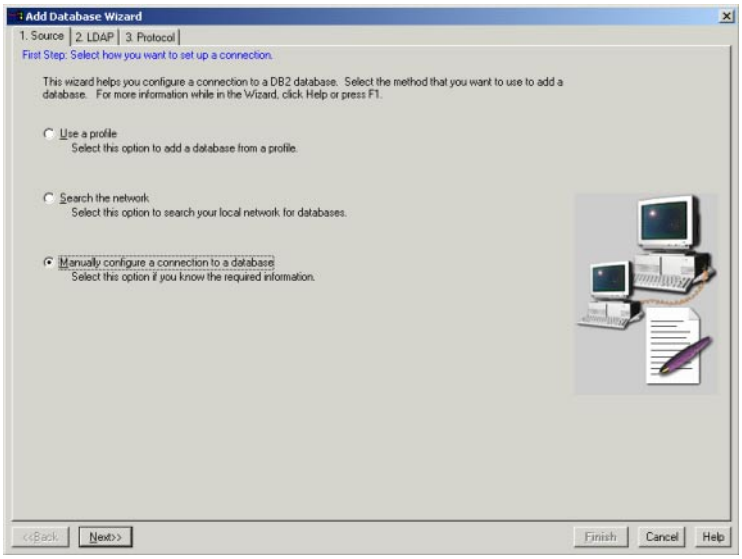
1 From the **IBM DB2 Client Configuration Assistant** window, click **Add**.

Figure 29 Client Configuration Assistant



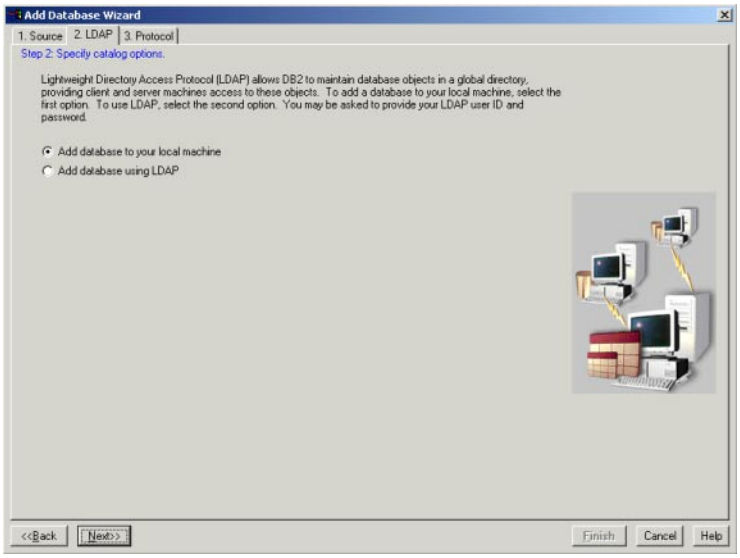
2 From the **Add Database Wizard** window's **Source** tab, click **Manually configure a connection to a database**. Click **Next**.

Figure 30 Add Database Wizard - Source Tab



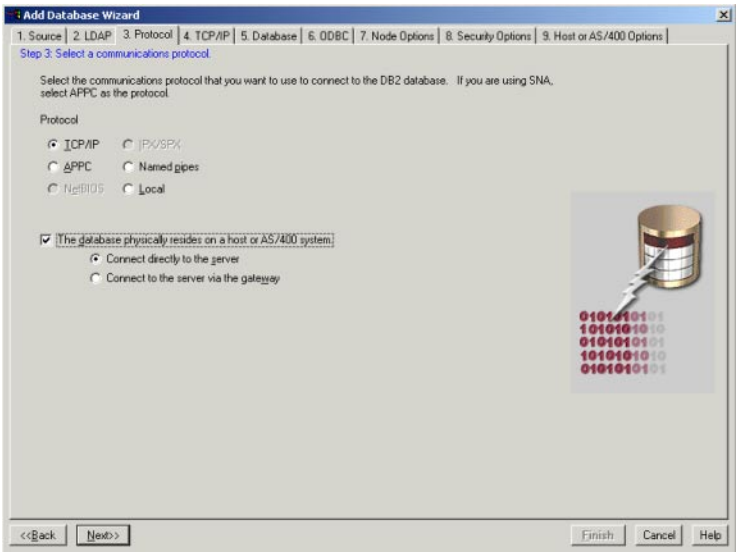
3 From the **Add Database Wizard** window's **LDAP** tab. Click **Add database to your local machine**. Click **Next**.

Figure 31 Add Database Wizard - LDAP Tab



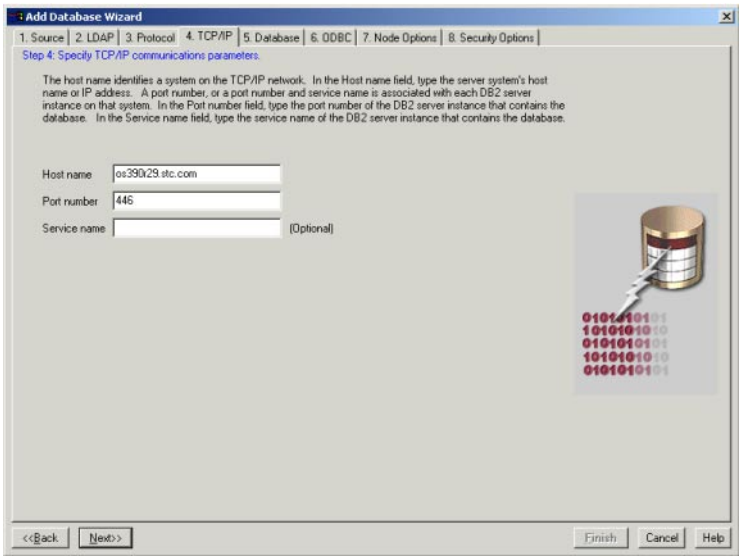
4 From the **Add Database Wizard** window's **Protocol** tab. Click **TCP/IP** from the Protocol dialog box. Select **The database physically resides on a host or AS/400 system**. Click **Connect directly to the server**. Click **Next**.

Figure 32 Add Database Wizard - Protocol Tab



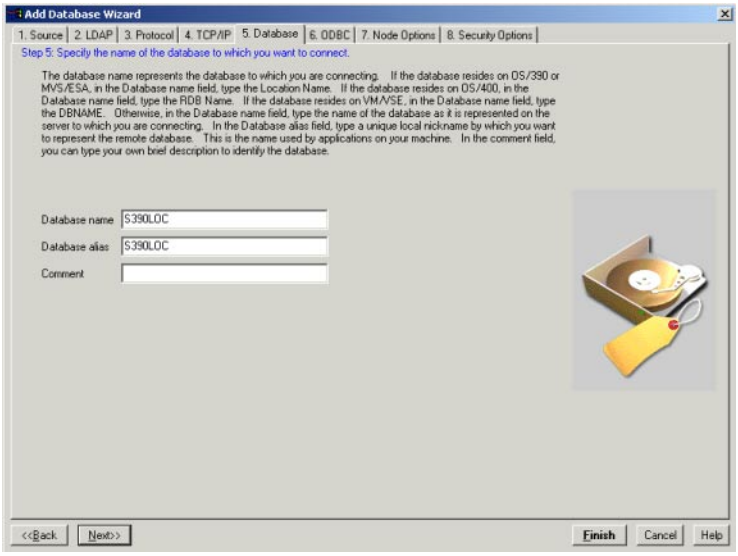
5 From the **Add Database Wizard** window's **TCP/IP** tab. Enter the **Host name** and **Port** number. Click **Next**.

Figure 33 Add Database Wizard - TCP/IP Tab



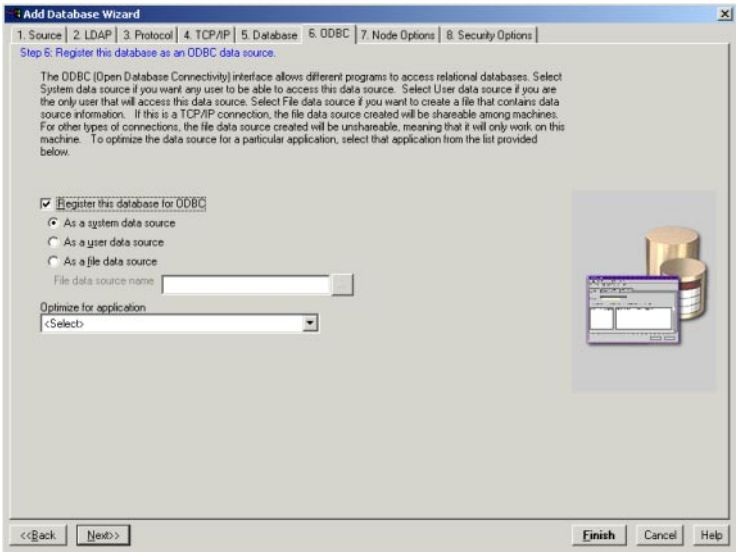
6 From the **Add Database Wizard** window's **Database** tab. Enter the name of your database, the database's alias, and any comments. Click **Next**.

Figure 34 Add Database Wizard - Database Tab



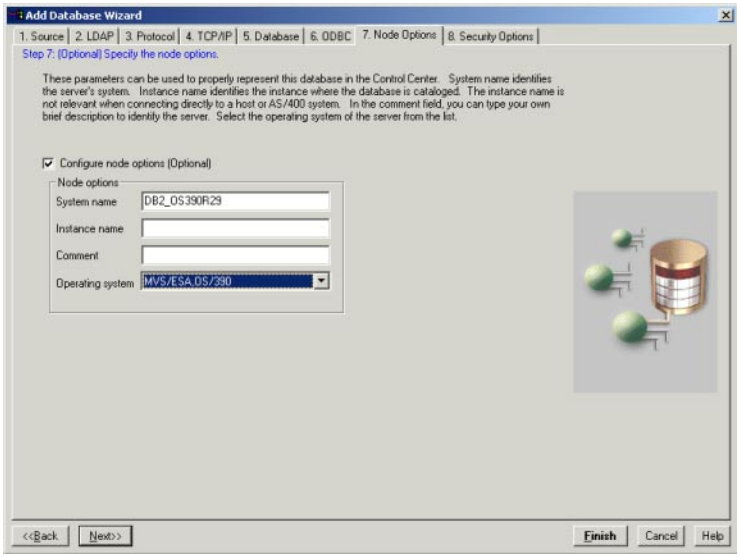
7 From the **Add Database Wizard** window's **ODBC** tab. Select **Register this database for ODBC** and click **As a system data source**. Click **Next**.

Figure 35 Add Database Wizard - ODBC



8 From the **Add Database Wizard** window's **Node Options** tab. Select **Configure node options (Optional)**. In the **Node options** dialog box, enter your system name and the operating system. Click **Next**.

Figure 36 Add Database Wizard - Node Options



9 From the **Add Database Wizard** window's **Security Options** tab. Select **Configure security option (Optional)**. Click **Host on AS/400 authentication (DCS)**. Click **Finish**.

Test the Connection

1 From the **Confirmation - S390LOC** window, click **Test Connection**. If a connection is not made, click **Change** to return to the wizard. If the connection was successful, click **Close**.

4.3.4 For Pre-Existing OS/390 Connections

If you have pre-existing DB2 connections to an OS/390, you will need to reconfigure your connection paths to recognize this new configuration.

4.3.5 Configuring Your e*Way to Connect to an AS/400 Operating System

To connect to an AS/400, follow the Configuration parameters listed above substituting the following:

class

Description

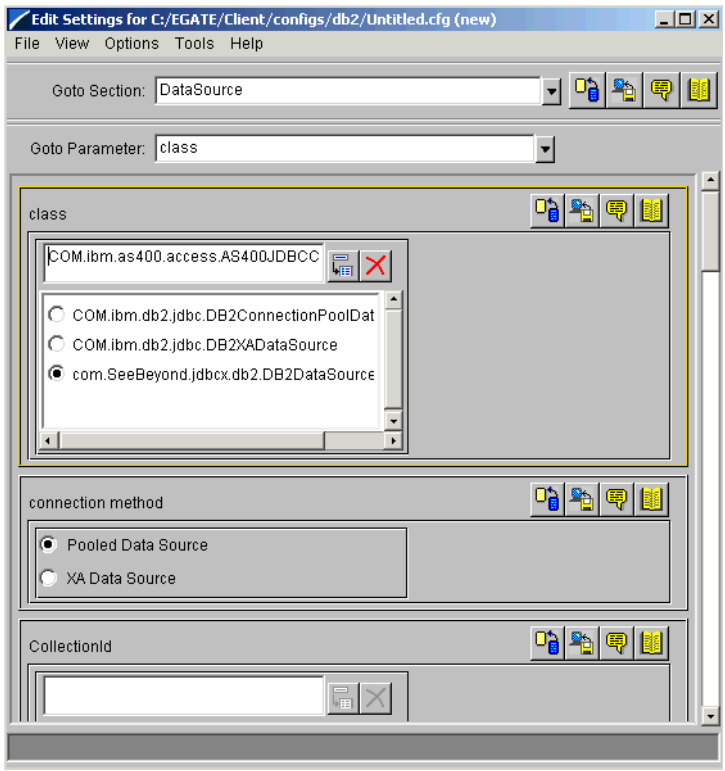
Specifies the Java class in the JDBC driver that is used to implement the ConnectionPoolDataSource interface.

Required Values

A valid class name.

The default is **com.SeeBeyond.jdbcx.db2.DB2DataSource**.

Add **COM.ibm.db2.jdbc.DB2ConnectionPoolDataSource** to the list of classes.



PortNumber

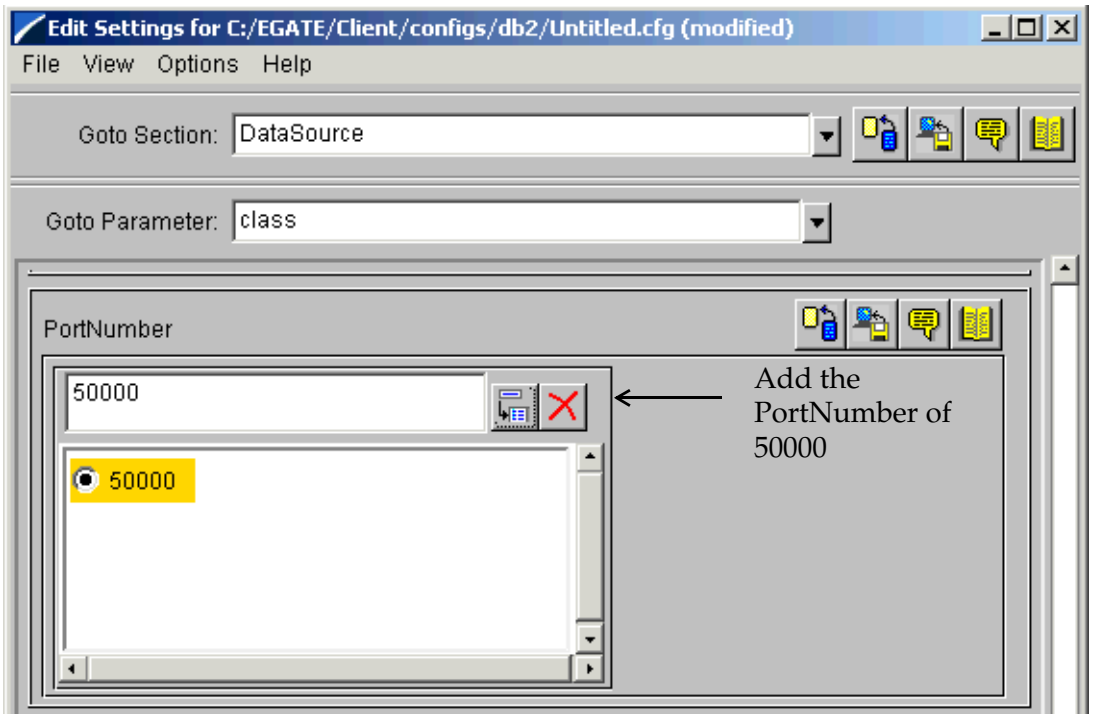
Description

The TCP port number. PortNumber is used for DataSource connections only.

Required Values

Any valid string. Set the port number to 50,000.

Figure 37 PortNumber Configuration



timeout

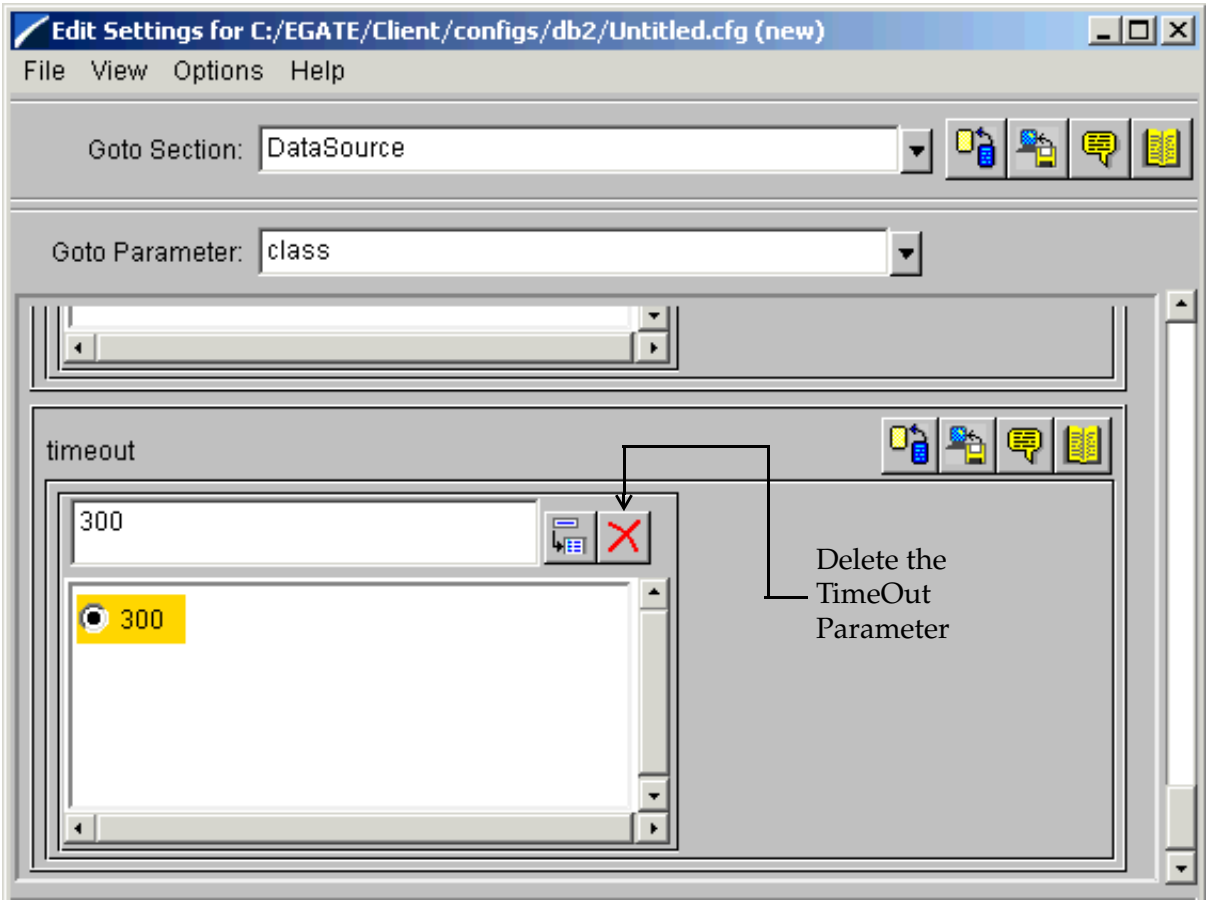
Description

Specifies the login timeout in seconds.

Required Values

Any valid string. The default is 300 seconds. Delete this parameter from within the e*Way Connection's Properties Window. Select the e*Way Connection Type. From the e*Way Connection Configuration File dialog box, click **New**. Delete the TimeOut parameter by clicking the **Delete** button.

Figure 38 TimeOut Configuration



Naming

Description

The system naming for the AS/400. If your naming convention is SQL, you will need to do nothing. If if is not, you will need to add the system name to the .def file.

Required Values

You will need to add the parameter **Name** with a value of **System** to the eGate\client\configs\db2.def file.

4.3.6 Additional AS/400 Configuration Considerations

Prior to connecting to the AS/400, you must install the DB2 Connect ODBC driver.

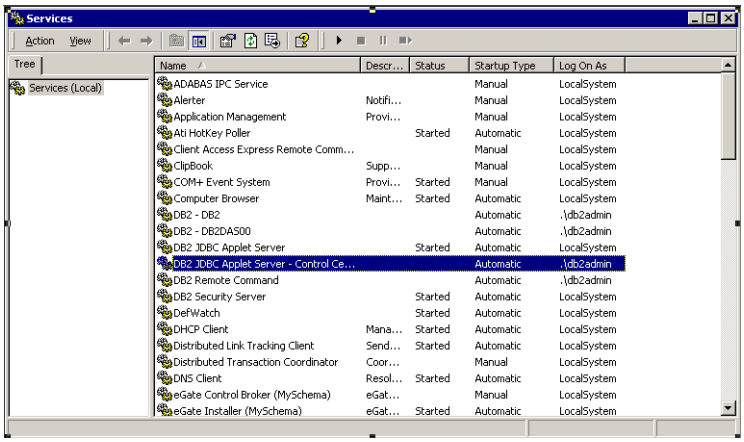
4.4 DB2 JDBC Applet Server

If you have chosen to use the native IBM JDBC drivers for DB2 or you are connecting to an OS/390 or an AS/400 you must start the DB2 JDBC Applet Server.

To do this do the following:

1. From the Start menu, click Settings, Control Panel.
2. Click Administrative Tools.
3. Click Services.
4. Select and Start DB2 JDBC Applet Server

Figure 39 DB2 JDBC Applet Server



4.5 Using Large ResultSets

If you have chosen to use the DataDirect ODBC drivers, and you plan to use very large ResultSets with your DB2 e*Way you will need to also configure the data block size of the driver. To do this:

1. Click Start, Settings, Control Panel.
2. Click Administrative Tools.
3. Click Data Sources (ODBC).
4. Select the DataDirect ODBC 4.1 wire protocol from the list of drivers. Click Configure.
5. Click the Advanced tab on the ODBC DB2 Wire Protocol Driver Setup window. In the Query Block Size: field, enter 32.
6. Click OK.

4.6 Creating Bindings When Using AIX Operating Systems

If you have chosen to use the DataDirect ODBC drivers, and you are also using an AIX operating system, you will need to bind the data package. To do this:

1. Click Start, Settings, Control Panel.
2. Click Administrative Tools.
3. Click Data Sources (ODBC).
4. From the ODBC Data Source Administrator, click on the User DSN tab.
5. From the User Data Sources name list, click Add.
6. From the Name name list, select ODBC 4.1 DB2 Wire Protocol and click Finish.
7. From the ODBC DB2 Wire Protocol Driver Setup window, click the Bind tab.
8. On the Bind tab, click the Create Package button.

Click OK.

Chapter 5

Implementation

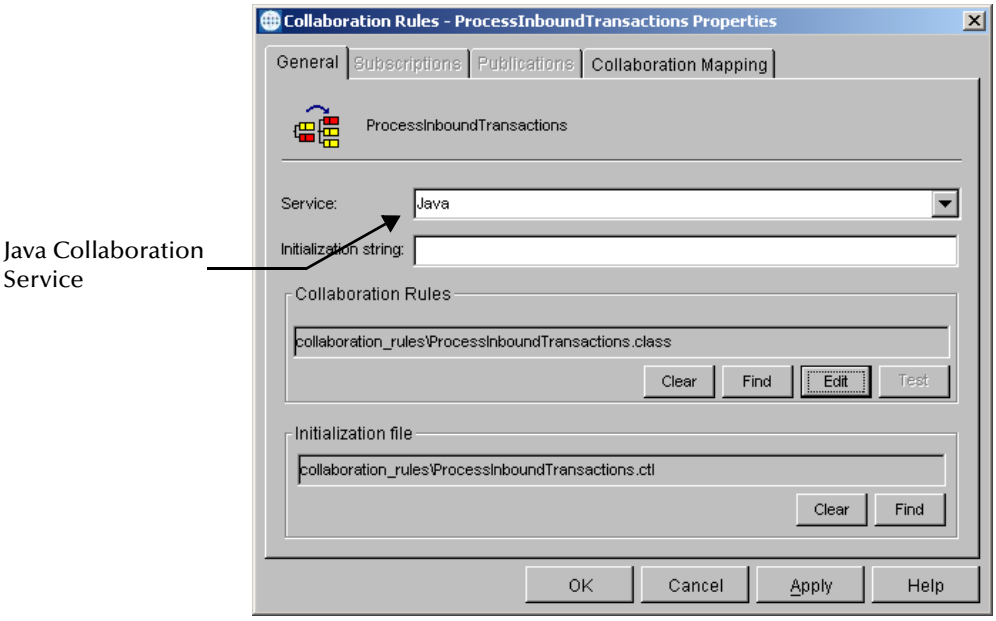
This chapter discusses how to implement the Java-enabled DB2 Universal Database e*Way in a production environment. Also included is a sample configuration. This chapter assumes that the DB2 Universal Database e*Way has been successfully installed.

This Chapter Includes:

5.1 Implementing Java-enabled Components

An e*Way or a BOB can be Java-enabled by selecting the Java Collaboration Service in the Collaboration Rules Properties. Either of these components can use e*Way Connections to exchange data with external systems.

Figure 40 The Java Collaboration Service



5.1.1 The Java Collaboration Service

The Java Collaboration Service makes it possible to develop external Collaboration Rules that execute e*Gate business logic using Java code. Using the Java Collaboration Editor, you create Java classes that utilize the **executeBusinessRules()**, **userTerminate()**, and **userInitialize()** methods.

For more information on the Java Collaboration Service and sub collaborations, see the *e*Gate Integrator Collaboration Services Reference Guide*. For more information on the Java ETD Editor and the Java Collaboration Editor, see the *e*Gate Integrator User's Guide*.

5.1.2 Java-enabled Components

To make an e*Gate component Java-enabled, the component's Collaboration Rule must use the Java Collaboration Service. This requires all the intermediate components to also be configured correctly, since there is not a direct relationship between the e*Way or BOB and the Collaboration Service.

The e*Way or BOB requires one or more Collaborations. The Collaboration uses a Collaboration Rule. The Collaboration Rule uses a Collaboration Service. In order for the e*Way or BOB to be Java-enabled, the component's Collaboration Rule must use the Java Collaboration Service.

5.2 The Java ETD Builder

The Java ETD Builder is used to generate a Java-enabled ETD. The ETD Builder connects to the external database and generates the ETD corresponding to the external tables and procedures.

Note: *Database ETDs are not messagable. For more information on messagable ETDs please see the e*Gate Integrator's Guide*

5.2.1 The Parts of the ETD

There are four possible parts to the Java-enabled Event Type Definition as shown in Figure 41.

Figure 41 The Java-enabled ETD

- **Element** – This is the highest level in the ETD tree. The element is the basic container that holds the other parts of the ETD. The element can contain fields and methods.

- **Field** – Fields are used to represent data. A field can contain data in any of the following formats: string, boolean, int, double, or float.
- **Method** – Method nodes represent actual Java methods.
- **Parameter** – Parameter nodes represent the Java method's parameters.

5.2.2 Using the DBWizard ETD Builder

The DBWizard ETD Builder generates Java-enabled ETDs by connecting to external data sources and creating corresponding Event Type Definitions. The ETD Builder can create ETDs based on any combination of tables, stored procedures, or prepared SQL statements.

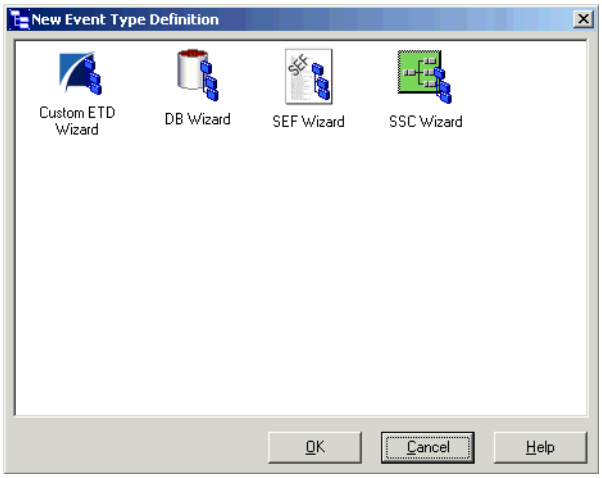
Field nodes are added to the ETD based on the tables in the external data source. Java method and parameter nodes are added to provide the appropriate JDBC functionality. For more information on the Java methods, refer to your JDBC developer's reference.

Please note that the DBWizard is using ODBC standard data types. Specific data types that are not ODBC standard will not be supported.

To create a new ETD using the DBWizard

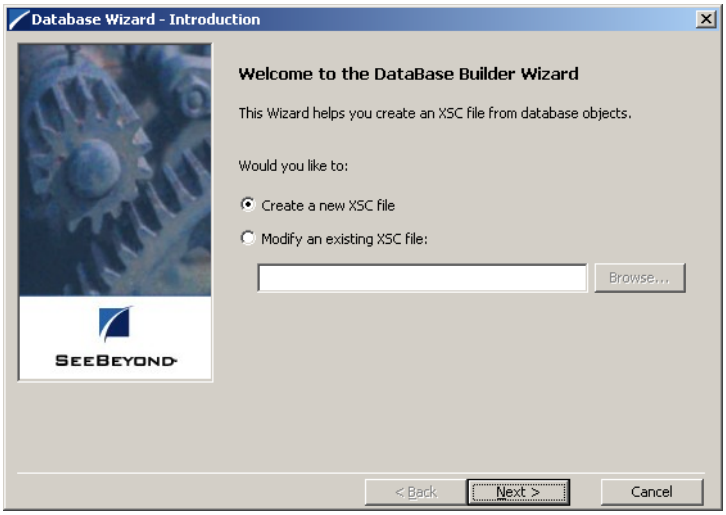
1. From the **Options** menu of the Enterprise Manager, choose **Default Editor…**.
2. Verify that **Java** is selected, then click **OK**.
3. Click the **ETD Editor** button to launch the Java ETD Editor.
4. In the **Java ETD Editor**, click the **New** button to launch the New Event Type Definition Wizard.
5. In the **New Event Type Definition Wizard**, select the **DBWizard** and click **OK** to continue.

Figure 42 New Event Type Definition



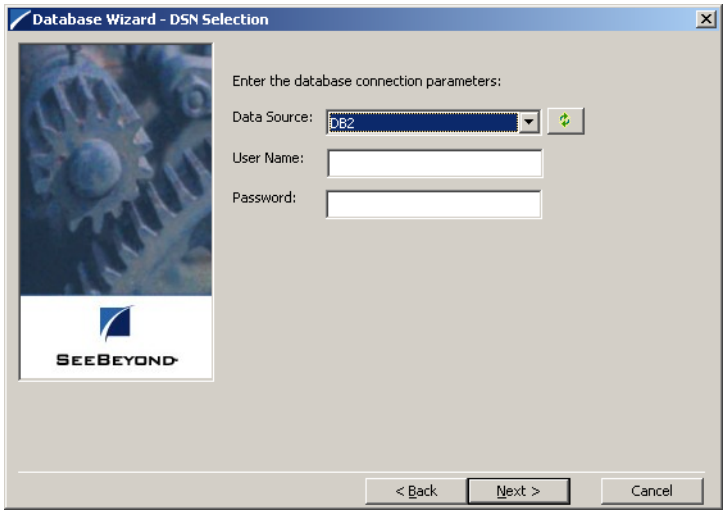
6. Enter the name of the new .xsc file you want to create or enter the name of the .xsc file you want to edit by browsing to its location.

Figure 43 Database Wizard - Introduction



7 Select your **Data Source:** from the drop down list and enter your **User Name:** and **Password:**.

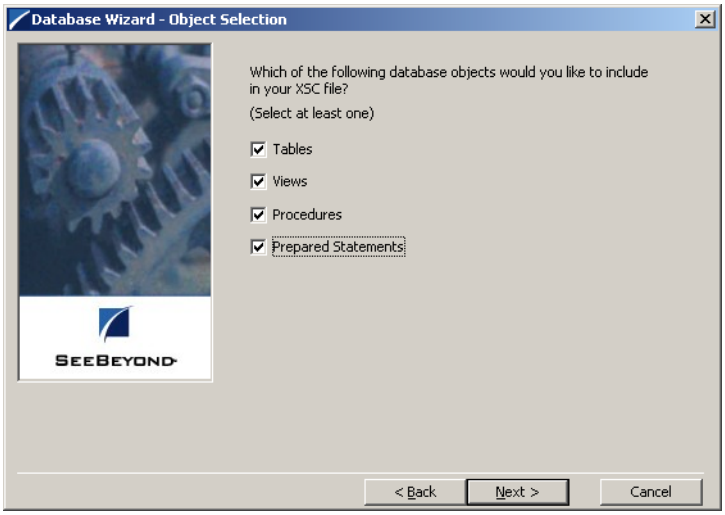
Figure 44 Database Wizard - DSN Selection



8 Select what type of database ETD you would like to generate. The data source you selected in the **Database Wizard - DSN Selection** window is the default. *Note: Do not change this unless instructed to do so by SeeBeyond personnel*.

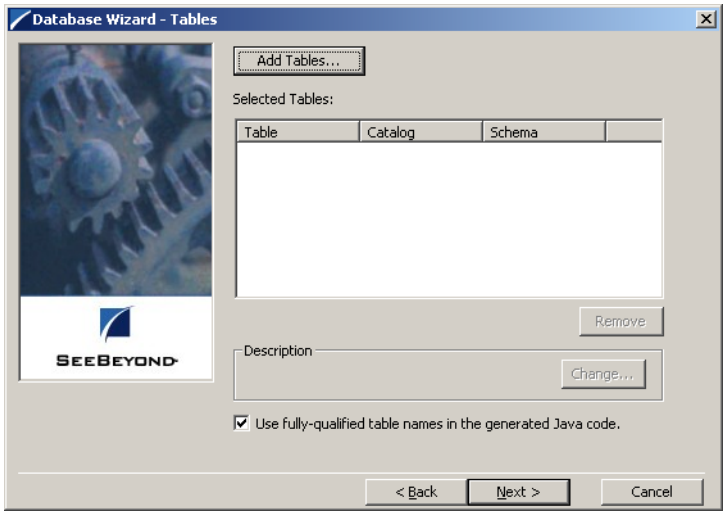
9 In the **Database Wizard - Object Selection** window, select any combination of **Tables**, **Views**, **Procedures**, or **Prepared Statements** you would like to include in your .xsc file. Click **Next** to continue.

Figure 45 Database Wizard - Object Selection



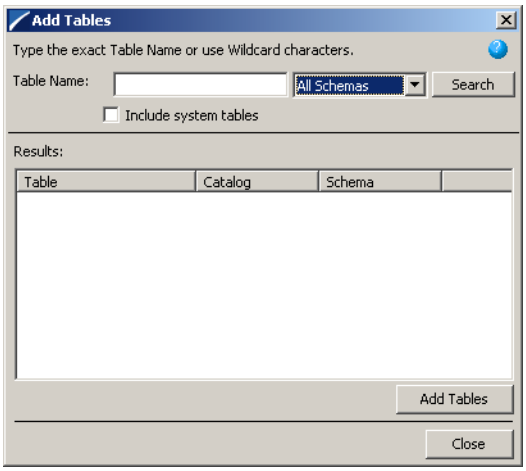
10 In the **Database Wizard - Tables** window, click **Add Tables**.

Figure 46 Database Wizard - Tables



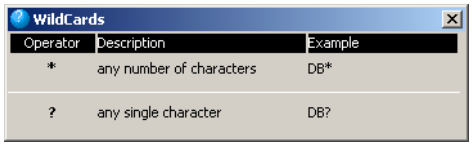
11 In the **Add Tables** window, type the exact name of the database table or use wildcard characters to return table names.

Figure 47 Add Tables



12 To see a list of valid wildcard characters, click the round ball with a question mark located in its center.

Figure 48 Wildcards

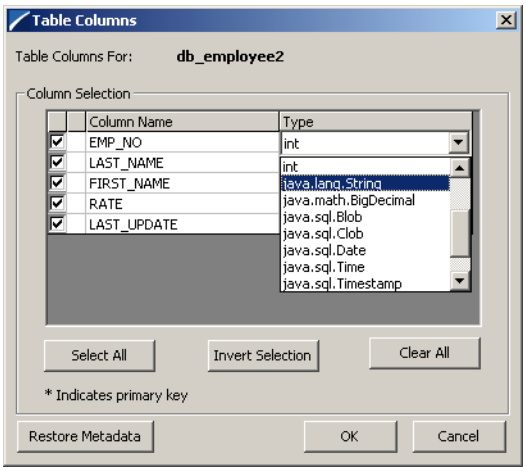


13 Select **Include System Tables** if you wish to include them and click **Search**. If your search was successful, you will see the results in the Results window. To select the name of the tables you wish to add to your .xsc, double click on the table name or highlight the table names and click **Add Tables**. You may also use adjacent selections or nonadjacent selections to select multiple table names. When you have finished, click **Close**.

14 In the **Database Wizard - Tables** window, review the tables you have selected. If you would like to change any of the tables you have selected, click **Change**.

15 In the **Columns Selection** window, you can select or deselect your table choices. You can also change the data type for each table by highlighting the data type and selecting a different data type from the drop down list. Once you have completed your choices, click **OK**.

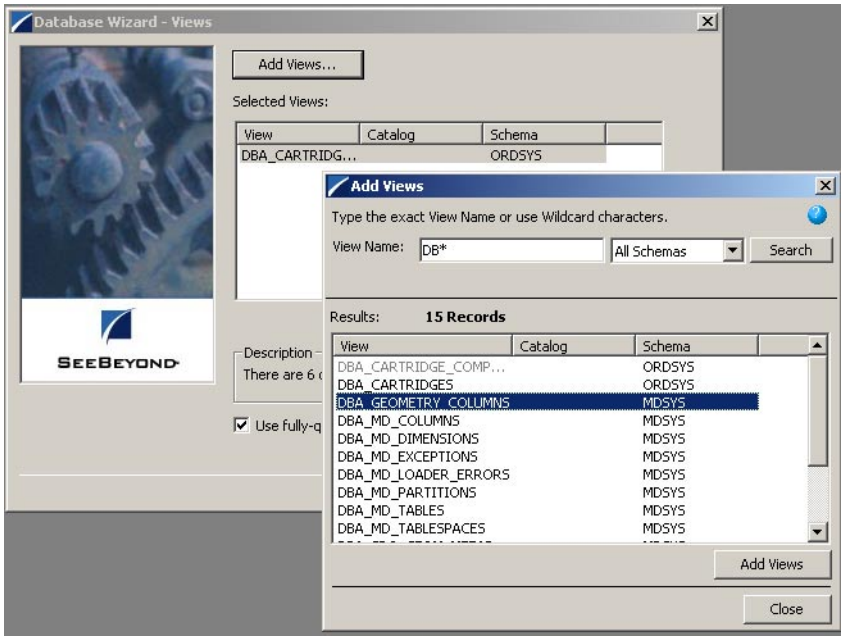
Figure 49 Columns Selection



16 In the **Database Wizard - Tables** window, review the tables you have selected. If you do not want to use fully-qualified table names in the generated Java code, click to clear the check box and click **Next** to continue.

17 If you selected **Views** on the **Database Wizard - Object Selection** window, you are presented with the **Database Wizard - Views** window. Follow steps 9 - 15 to select and add views to your .xsc. Views are read-only.

Figure 50 Database Wizard - Views



18 If you selected **Procedures** on the **Database Wizard - Object Selection** window, you are presented with the **Database Wizard - Procedures** window. Follow steps 9 - 15 to select and add **Procedures** to your .xsc. If you do not want to use fully-qualified

procedure names in the generated Java code, click to clear the check box and click **Next** to continue.

The DBWizard provides three different ways to generate the ResultSet nodes of a Stored Procedure. They are "By Executing", "Manually", and "With Assistance" modes.

"By Executing" mode executes the specified Stored Procedure with default values to generate the ResultSet(s). Depending on the business logic of the Stored Procedure, zero or more ResultSets can be returned from the execution. In the case that there are multiple ResultSets and "By Executing" mode does not return all ResultSets, one should use the other modes to generate the ResultSet nodes. **This mode is not recommend for use with the OS/390**.

"With Assistance" mode allows users to specify a query and execute it to generate the ResultSet node. To facilitate this operation, the DBWizard will try to retrieve the content of the specified Stored Procedure and display it. However, content retrieval is not supported by all types of Stored Procedures. We can roughly classify Stored Procedures into two types: SQL and external. SQL Stored Procedures are created using CREATE PROCEDURE SQL statements while external Stored Procedures are created using host languages (e.g. Java). Since external Stored Procedures do not store their execution plans in the database, content retrieval is impossible. When using "Assist" mode, highlight the execute statement up to and including the table name(s) before executing the query.

When using "With Assistance" mode on the OS/390 you should use the unqualified table names that were specified during the bind process of the Stored Procedure:

```
SELECT
   DEPT.DEPTNO AS DEPTNO
   DEPT.DEPTNAME AS DEPTNAME,
   DEPT.MGRNO AS MGRNO,
   DEPT.ADMRDEPT AS ADMRDEPT,
   DEPT.LOCTION AS LOCATION
FROM
   SALES'
SELECT
   EMP.EMPNO AS EMPNO,
   EMP.FIRSTNME AS FIRSTNME,
   EMP.MIDINIT AS MIDINIT,
   EMP.LASTNAME AS LASTNAME,
   EMP.WORKDEPT AS WORKDEPT,
   EMP.PHONENO AS PHONENO,
   EMP.HIREDATE AS HIREDATE,
   EMP.JOB AS JOB,
   EMP.EDLEVEL AS EDLEVEL,
   EMP.SEX AS SEX,
   EMP.BIRTHDTE AS BIRTHDATE,
   EMP.SALARY AS SALARY,
   EMP.BONUS AS BONUS,
   EMP.COMM AS COMM
FROM
   EMP;
//*****************************************************************
//*  STEP 3:  Register MULTIRS in SYSIBM.SYSROUTINES
//*           and Bind the package for MEDRS
//*****************************************************************
//STEP3    EXEC PGM=IKJEFT01,DYNAMNBR=20,
```

```
//             COND=(4,LT)
//DBRMLIB  DD  DSN=DSN610.DBRMLIB.DATA(MEDRS),DISP=SHR
//SYSTSPRT DD  SYSOUT=*
//SYSTSIN  DD  *
 DSN SYSTEM(DSN1)
  RUN PROGRAM(DSNTIAD) PLAN(DSNTIA61) -
       LIB('DSN610.RUNLIB.LOAD')
  BIND PACKAGE(MEDRS) -
       QUALIFIER(Q) -
       MEMBER(MEDRS) ACT(REP) ISO(CS)
 END
//SYSPRINT DD  SYSOUT=*
//SYSUDUMP DD  SYSOUT=*
//SYSIN    DD  DSN=&&SPDDL,DISP=(OLD,DELETE)   <- From preceding step
//*
```

The schema qualifier name for the DEPT and EMP table is “DSM8610”. The SALES table does not exist.

When using “With Assistance” mode, you must insert a table qualifier of “SSM8610” to generate the ResultSet for EMP and DEPT table correctly for this Stored Procedure:

```
SELECT
   DEPTNO AS DEPTNO
   DEPTNAME AS DEPTNAME,
   MGRNO AS MGRNO,
   ADMRDEPT AS ADMRDEPT,
   LOCTION AS LOCATION
FROM
   SALES’
SELECT
   EMPNO AS EMPNO,
   FIRSTNME AS FIRSTNME,
   MIDINIT AS MIDINIT,
   LASTNAME AS LASTNAME,
   WORKDEPT AS WORKDEPT,
   PHONENO AS PHONENO,
   HIREDATE AS HIREDATE,
   JOB AS JOB,
   EDLEVEL AS EDLEVEL,
   SEX AS SEX,
   BIRTHDTE AS BIRTHDATE,
   SALARY AS SALARY,
   BONUS AS BONUS,
   COMM AS COMM
FROM
   EMP;
```

“Manually” mode is the most flexible way to generate the result set nodes. It allows users to specify the node name, original column name and data type manually. One drawback of this method is that users need to know the original column names and data types. This is not always possible. For example, the column name of 3*C in this query:

```
SELECT A, B, 3*C FROM table T
```

is generated by the database. In this case, “With Assistance” mode is a better choice.

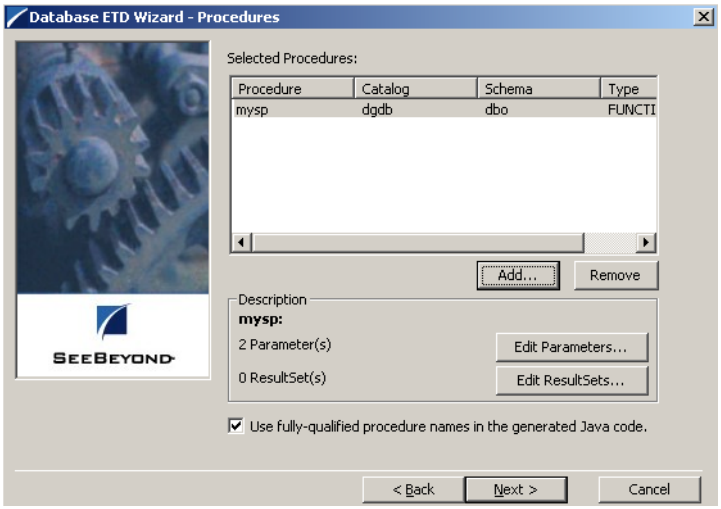
Note: *If you modify the ResultSet generated by the “Execute” mode of the Database Wizard you will need to make sure the indexes match the Stored Procedure. This will assure your ResultSet indexes are preserved,*

Please note that Stored Procedures without associated parameters will not appear in the list. For example:

Create procedure testProcNoParam – this will not appear in the list because there are no in or out parameters.

Create procedure testProcParam(IN var int) – this will appear in the list because there are in or out parameters.

Figure 51 Database Wizard - Procedures



19 If you selected **Prepared Statements** on the **Database Wizard - Object Selection** window, you are presented with the **Database Wizard - Prepared Statement** window. To add **Prepared Statements** to your .xsc. complete the following steps:

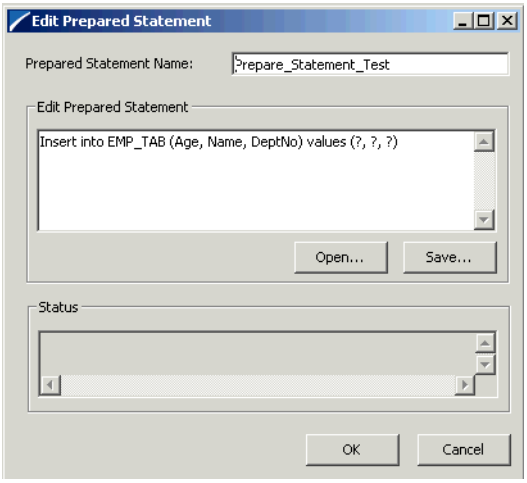
A Click **Add** to add a new prepared statement

B Enter a prepared SQL statement.

C Enter the **Prepared Statement Name** to be used by the statement.

D Use the **Open…** or **Save…** buttons to open pre-existing statements or save the current one. SeeFigure 52.

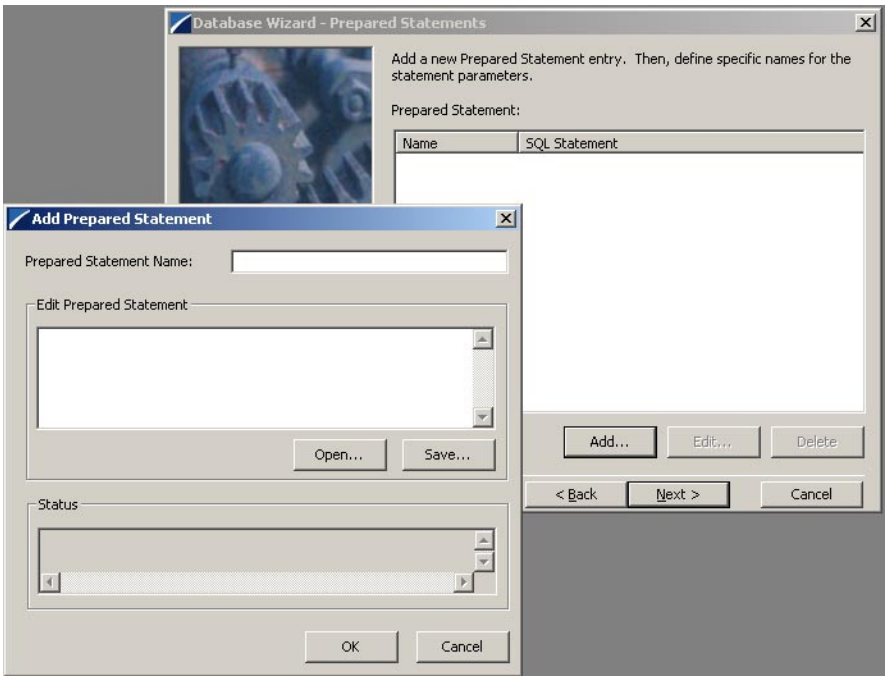
Figure 52 Add Prepared Statement



E Click **OK** to return to the **Database Wizard - Prepared Statements** window.

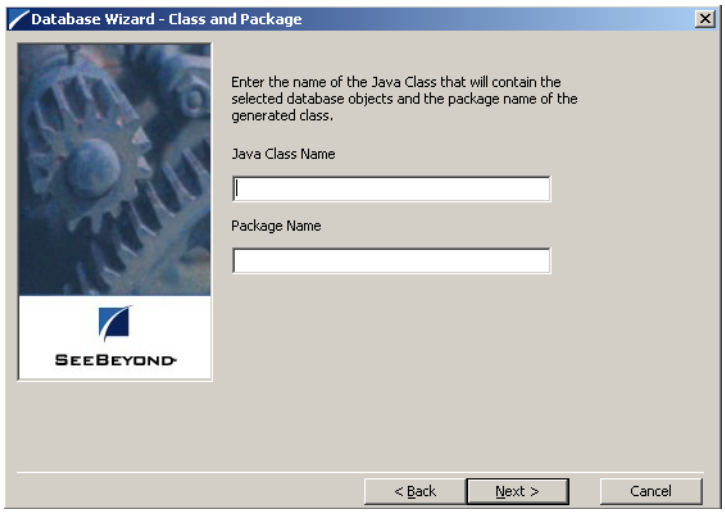
20 Repeat steps A–E to add additional prepared statements or click **Next** to continue.

Figure 53 Database Wizard - Prepared Statements



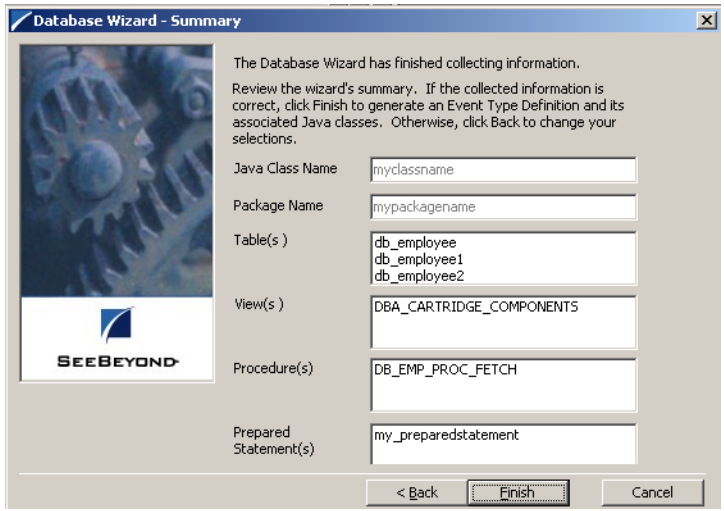
21 Enter the **Java Class Name** that will contain the selected tables and/or procedures and the **Package Name** of the generated classes.

Figure 54 Database Wizard - Class and Package



22 View the summary of the database wizard information and click **Finish** to begin generating the ETD.

Figure 55 Database Wizard - Summary



5.2.3 The Generated ETDs

The DataBase Wizard ETD builder can create three editable Event Type Definitions (ETDs) and one non-editable Event Type Definition (ETD). These types of ETDs can also be combined with each other. The four types of ETDs are:

- **The Table ETD** – The table ETD contains fields for each of the columns in the selected table as well as the methods required to exchange data with the external data source. To edit this type of ETD, you will need to open the .xsc in the DataBase Wizard.

- **The View ETD** - The view ETD contains selected columns from selected tables. View ETD's are read-only.
- **The Stored Procedure ETD** – The stored procedure ETD contains fields which correspond to the input and output fields in the procedure. To edit this type of ETD, you will need to open the .xsc in the DataBase Wizard
- **The Prepared Statement ETD** – The prepared statement ETD contains a result set for the prepared statement. To edit this type of ETD, you will need to open the .xsc in the DataBase Wizard

5.2.4 Editing an Existing .XSC Using the Database Wizard

If you choose to edit an existing .xsc that you have created using the Database Wizard, do the following:

1. From the **Options** menu of the Enterprise Manager, choose **Default Editor…**.
2. Verify that **Java** is selected, then click **OK**.
3. From the **Tools** menu, click **ETD Editor...**
4. From the ETD Tool menu click **File** and click **New**.
5. From the **New Event Type Definition** window, select **DBWizard** and click **OK**.
6. On the Database Wizard - Introduction window, select **Modify an existing XSC file:** and browse to the appropriate .xbs file that you would like to edit.

You are now able to edit your .xsc file.

Note: *When you add a new element type to your existing .xsc, you must reselect any pre-existing elements or you will loose them when the new .xsc is created.*

If you attempt to edit an .xsc whose elements no longer exist in the database, you will see a warning and the element will be dropped from the ETD.

5.3 Using ETDs with Tables, Views, Stored Procedures, and Prepared Statements

The Insert, Delete, Update, and Execute Methods are common methods used within the Collaboration Editor. Though our sample schema doesn't include these methods, we thought it would be helpful to show them to you.

5.3.1 The Table

Tables, Views, Stored Procedures and Prepared Statements are manipulated through ETDs. Common operations include insert, delete, update, and query.

A table ETD represents a database table. It consists of fields and methods. Fields correspond to the columns of a table while methods are the operations that you can

apply to the ETD. This allows you to perform query, update, insert and delete SQL operations in a table.

Using the select() method, you can specify the following types of ResultSets:

- TYPE_FORWARD_ONLY
- TYPE_SCROLL_INSENSITIVE

You can also specify ResultSets with a type of Concurrency:

- CONCUR_READ_ONLY
- CONCUR_UPDATABLE

To perform the update, insert or delete operation, the type of the ResultSet returned by the select() method must be CONCUR_UPDATABLE. Instead of specifying the type of ResultSet and concurrency in the select() method, you can also use the following methods:

- SetConcurrencytoUpdatable
- SetConcurrentlytoRead Only
- SetScrollTypetoForwardOnly
- SetScrollTypetoScrollSensitive
- SetScrollTypetoInsensitive

The methods should be called before executing the select() method. For example,

```
getDBEmp().setConcurToUpdatable();
getDBEmp().setScroll_TypeToForwardOnly();
getDBEmp().getDB_EMPLOYEE().select("");
```

Note: *DataDirect Drivers do not support TYPE_SCROLL_SENSITIVE and will implicitly downgrade TYPE_SCROLL_SENSITIVE to TYPE_SCROLL_INSENSITIVE if TYPE_SCROLL_SENSITIVE is used.*

The query Operation

To perform a query operation on a table:

1. Execute the select() method with the "where" clause specified if necessary.
2. Loop through the ResultSet using the "next" method.
3. For each loop, process the return record.

For example:

```
getDBEmp().getDB_EMPLOYEE().select("");
While(getDBEmp().getDB_EMPLOYEE().next());
{ //Process the returning record
    getGenericOut.SetPayLoad(getDBEmp().getDB_Employee().
    getDBEmp().getFirstName());
}
```

If you want to check if the last value read was SQL NULL or not, you can use the wasNull() method. It is most useful for native data types like "int". Note that a getxxx method should be called before wasNull() is called.

For example:

```
int empNo = getDBEmp().getDB_EMPLOYEE().getEMP_NO();
if (getDBEMP().getDB_EMLOYEE().wasNULL())
{ //Check to see if empNo is SQL NULL
 //Do something if empNo is SQL NULL
}
else
{ //Do something if empNo is not SQL NULL
}
```

The insert Operation

To perform an insert operation on a table, do the following:

1. Execute the select() method. You can specify the following types of ResultSets:
   - TYPE_FORWARD_ONLY
   - TYPE_SCROLL_INSENSITIVE

   You must specify ResultSets with:
   - CONCUR_UPDATABLE
2. Move to the insert row by the moveToInsertRow method.
3. Set the fields of the table ETD
4. Insert the row by calling insertRow

   This example inserts an employee record.

```
getDBEmp().getDB_EMPLOYEE(ResultSet.TYPE_SCROLL_SENSITIVE,
ResultSet.CONCUR_UPDATABLE).select("");
getDBEmp().getDB_EMPLOYEE().moveToInsertRow();
getDBEmp().getDB_EMPLOYEE().setEMP_NO(123);
. . .
getDBEmp().getDB_EMPLOYEE().setRATE(123.45);
getDBEmp().getDB_EMPLOYEE().insertRow();
```

Table ResultSet Behavior

To make repeated insertions using a “select” into the table ResultSet without having to re-populate all the column values do the following:

Before the schema runs, we have

```
SQL> select * from MARKET_TEMP;
```

Where:

```
C1 C2       C3
-- -------- --------
1  A1       B1
```

After the schema runs we have:

```
SQL> select * from MARKET_TEMP;
```

Becomes:

```
C1 C2       C3
```

```
--  -------- --------
1  A1       B1
2  A2       B1
3  A3       B1
```

Buffer the value of the selected column by:

```
String buf3 = getTempTbl().getMARKET_TEMP().getC3();
```

Call moveToInsertRow()

```
getTempTbl().getMARKET_TEMP().moveToInsertRow();
```

Set all the columns the first time

```
getTempTbl().getMARKET_TEMP().setC1("2");;
getTempTbl().getMARKET_TEMP().setC2("A2");
getTempTbl().getMARKET_TEMP().setC3(buf3);
```

Call insertRow()

```
getTempTbl().getMARKET_TEMP().insertRow();
```

Set all the columns except the unchanged column.

```
getTempTbl().getMARKET_TEMP().setC1("3");
getTempTbl().getMARKET_TEMP().setC2("A3");
```

Call insertRow()

```
getTempTbl().getMARKET_TEMP().insertRow();
```

In the above example, column C3 will always have the same value (buf3).

Figure 56 Insert Method Business Rule

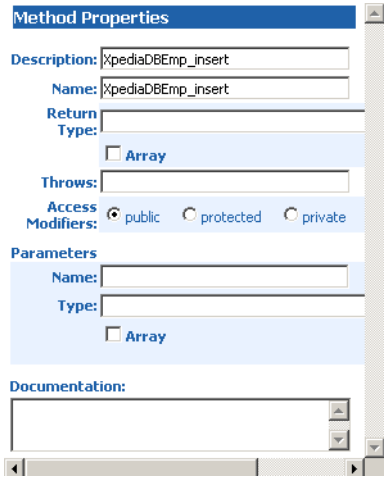
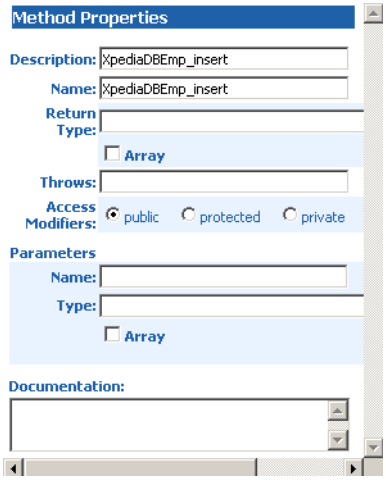


Figure 57 Insert Method Properties



The update Operation

To perform an update operation on a table, do the following:

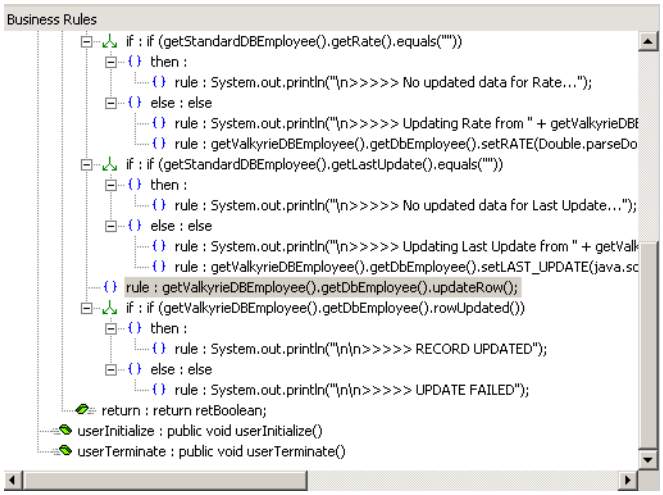
1. Execute the select() method. You can specify the following types of ResultSets:
   - TYPE_FORWARD_ONLY
   - TYPE_SCROLL_INSENSITIVE

   You must specify ResultSets with:
   - CONCUR_UPDATABLE
2. Move to the row that you want to update.
3. Set the fields of the table ETD
4. Update the row by calling **updateRow**.

In this example, we move to the third record and update the EMP_NO and RATE fields.

```
getDBEmp().getDB_EMPLOYEE(ResultSet.TYPE_SCROLL_SENSITIVE,
ResultSet.CONCUR_UPDATABLE).select("");
getDBEmp().getDB_EMPLOYEE().absolute(3);
getDBEmp().getDB_EMPLOYEE().setEMP_NO(123);
getDBEmp().getDB_EMPLOYEE().setRATE(123.45);
getDBEmp().getDB_EMPLOYEE().updateRow();
```

Figure 58 Update() Method Business Rule



The delete Operation

To perform a delete operation on a table do the following:

1. Execute the select() method. You can specify the following types of ResultSets:
   - TYPE_FORWARD_ONLY
   - TYPE_SCROLL_INSENSITIVE

   You must specify ResultSets with:
   - CONCUR_UPDATABLE
2. Move to the row that you want to delete.
3. Set the fields of the table ETD
4. Delete the row by calling **deleteRow**.

   In this example DELETE the first record of the result set.

```
getDBEmp().getDB_EMPLOYEE(ResultSet.TYPE_SCROLL_SENSITIVE,
ResultSet.CONCUR_UPDATABLE).select("");
getDBEmp().getDB_EMPLOYEE().first();
getDBEmp().getDB_EMPLOYEE().deleteRow();
```

5.3.2 The View

Views are used to look at data from selected columns within selected tables. Views are read-only.

For query operations, please refer to "Tables" sub section.

5.3.3 The Stored Procedure

A Stored Procedure ETD represents a database stored procedure. Fields correspond to the arguments of a stored procedure while methods are the operations that you can apply to the ETD. It allows you to execute a stored procedure. Remember that while in the Collaboration Editor you can drag and drop nods from the ETD's into the Collaboration Editor.

Note: *BLOB and CLOB data types are not supported when using the DataDirect drivers.*

Please note that Stored Procedures without associated parameters will not appear in the list.

To retrieve a list of stored procedures, those that have no parameters will not show up in the list. For example, stored procedures like this cannot be retrieved: getEmpNo() because there is no input or output parameters.

Executing Stored Procedures

Assuming that you have the following procedure:

```
CREATE PROCEDURE DB2ADMIN.LookupGlobal ( IN inlocalID varchar(10),
                                         OUT outglobalProductID
varchar(10) )
    SPECIFIC DB2ADMIN.LookupGlobal
    LANGUAGE SQL
P1: BEGIN
    DECLARE ENDTABLE INT DEFAULT 0;
DECLARE cursor1 CURSOR FOR
        select globalProductID from SimpleLookup where localID =
inlocalID;
SET ENDTABLE = 1;
OPEN cursor1;
    SET ENDTABLE = 0;
    WHILE ENDTABLE = 0 DO
        FETCH cursor1 INTO outglobalProductID;
    END WHILE;
    CLOSE cursor1;
END P1
```

The ETD represents the Stored Procedure "LookUpGlobal" with two parameters, an inbound parameter (INLOCALID) and an outbound parameter (OUTGLOBALPRODUCTID) can be generated by the DBWizard as shown in Figure 59. Representing these as nodes in an ETD allows you to drag values from other ETD's to the input parameters, execute the call, and collect the output parameter data by dragging from it's node to elsewhere.

Below are the steps for executing the Stored Procedure:

1 Specify the input values.

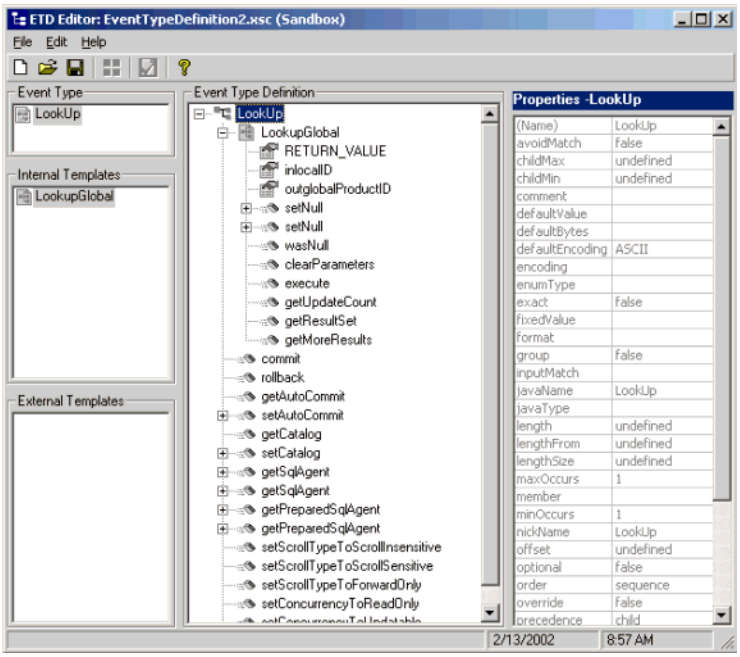
2 Execute the Stored Procedure.

3 Retrieve the output parameters if any.

For example:

```
getLookUp().getLookUpGlobal().setIntlocalID("123");
getLookUp().getLookUPGlobal().execute();
String s =
getLookUp().getLookUpGlobal.getOutGlobelProductID;
```

Figure 59 Stored Procedure LookUpGlobal



Manipulating the ResultSet and Update Count Returned by Stored Procedure

For Stored Procedures that return ResultSets and Update Count, the following methods are provided to manipulate the ResultSet:

- enableResultSetOnly
- enableUpdateCountsOnly
- enableResultSetandUpdateCounts
- resultsAvailable
- next
- getUpdateCount
- available

The **resultsAvailable()** method, added to the PreparedStatementAgent class, simplifies the whole process of determining whether any results, be it update Counts or ResultSets, are available after a Stored Procedure has been executed. JDBC provides

three methods **(getMoreResults()**, **getUpdateCount()**, and **getResultSet()**) to access the results of a Stored Procedure call, the information returned from these methods at times, can be confusing. You can simply call **resultsAvailable()** and if Boolean true is returned, you can expect either a valid Update Count when **getUpdateCount()** is called and/or the next ResultSet has been retrieved and made available to one of the ResultSet nodes defined for the Stored Procedure ETD, when that node's **available()** method returns true.

Frequently, Update Counts information that is returned from a Stored Procedures is insignificant. You will want to only process returned ResultSet information and avoid looping through all of the Update Counts. The following three methods control exactly what information should be returned from a Stored Procedure call. The **enableResultSetsOnly()** method, added to the PreparedStatement Agent class allows only ResultSets to be returned and thus every **resultsAvailable()** called will only return Boolean true if a ResultSet is available. Likewise, the **enableUpdateCountsOnly()** will cause **resultsAvailable()** to return true only if an Update Count is available. The default case of **enableResultsetsAndUpdateCount()** method allows both ResultSets and Update Counts to be returned.

Collaboration Usability for a Stored Procedure ResultSet

The Column data of the ResultSets can be dragged-and-dropped from their XSC nodes to the Business Rules. Below is a code snippet that can be generated by the Collaboration Editor:

```
// resultsAvailable() will be true if there's an update count and/or a
result set available.
// note, it should not be called indiscriminantly because each time
the results pointer is
// advanced via getMoreResults() call.
while (getSPIn().getSpS_multi().resultsAvailable())
{
  // check if there's an update count
if (getSPIn().getSpS_multi().getUpdateCount() > 0)
  {
    System.err.println("Updated
"+getSPIn().getSpS_multi().getUpdateCount()+" rows");
  }

  // each result set node has an available() method (similar to ETD's)
that tells the user
  // whether this particular result set is available.  note, JDBC does
support access to
  // not more than one result set at a time, i.e., cannot drag from 2
distinct result sets
  // simultaneously
  if (getSPIn().getSpS_multi().getNormRS().available())
  {
    while (getSPIn().getSpS_multi().getNormRS().next())
    {
      System.err.println("Customer Id   =
"+getSPIn().getSpS_multi().getNormRS().getCustomerId());
      System.err.println("Customer Name =
"+getSPIn().getSpS_multi().getNormRS().getCustomerName());
      System.err.println();
    }
    System.err.println("===");
  }
  else if (getSPIn().getSpS_multi().getDbEmployee().available())
  {
```

```
    while (getSPIn().getSpS_multi().getDbEmployee().next())
    {
System.err.println("EMPNO    =
"+getSPIn().getSpS_multi().getDbEmployee().getEMPNO());
      System.err.println("ENAME    =
"+getSPIn().getSpS_multi().getDbEmployee().getENAME());
      System.err.println("JOB      =
"+getSPIn().getSpS_multi().getDbEmployee().getJOB());
      System.err.println("MGR      =
"+getSPIn().getSpS_multi().getDbEmployee().getMGR());
      System.err.println("HIREDATE =
"+getSPIn().getSpS_multi().getDbEmployee().getHIREDATE());
      System.err.println("SAL      =
"+getSPIn().getSpS_multi().getDbEmployee().getSAL());
      System.err.println("COMM     =
"+getSPIn().getSpS_multi().getDbEmployee().getCOMM());
      System.err.println("DEPTNO   =
"+getSPIn().getSpS_multi().getDbEmployee().getDEPTNO());
      System.err.println();
    }
    System.err.println("===");
  }
}
```

Note, **resultsAvailable()** and **available()** cannot be indiscriminately called because each time they move ResultSet pointers to the appropriate locations.

After calling "**resultsAvailable()**", the next result (if available) can be either a **ResultSet** or an **UpdateCount** if the default "**enableResultSetsAndUpdateCount()**" was used.

The definition of '**UpdateCount**' is JDBC driver dependent. Some drivers send the row count in the previous ResultSet back as an update count. While other drivers e.g., the DataDirect JDBC 3.0 driver can only return the number of rows that actually were updated in the database as the '**UpdateCount**'.

Because of limitations imposed by some DBMSs, it is recommended that for maximum portability, all of the results in a ResultSet object should be retrieved before OUT parameters are retrieved. Therefore, you should retrieve all ResultSet(s) and update counts first followed by retrieving the OUT type parameters and return values.

ResultSet Behavior

The following list includes specific ResultSet behavior that you may encounter:

- The method **resultsAvailable()** implicitly calls **getMoreResults()** when it is called more than once. You should not call both methods in your java code. Doing so may result in skipped data from one of the ResultSets when more than one ResultSet is present.
- The methods **available()** and **getResultSet()** can not be used in conjunction with multiple ResultSets being open at the same time. Attempting to open more the one ResultSet at the same time will close the previous ResultSet. The recommended working pattern is:
  - Open one Result Set, ResultSet_1 and work with the data until you have completed your modifications and updates. Open ResultSet_2, (ResultSet_1 is now closed) and modify. When you have completed your work in ResultSet_2, open any additional ResultSets or close ResultSet_2.

- If you modify the ResultSet generated by the **Execute** mode of the Database Wizard, you will need to assure the indexes match the Stored Procedure. By doing this, your ResultSet indexes will be preserved.
- The methods **resultsAvailable()** and **available()** when called on a table that contains no records, will return an empty ResultSet.

Supported Data Types Using DB2

The following data types are supported by the ResultSet of a Stored Procedure using DB2 on Windows and Unix operating systems:

- Bigint
- Char
- Date
- Decimal
- Double
- Float
- Integer
- Long Varchar
- Numeric
- Real
- Smallint
- Time
- Timestamp
- Varchar
- Char for Bit Data
- Long Varchar for Bit Data
- Varchar for Bit Data

Data types supported by the ResultSet of a Stored Procedure using DB2 on an OS/390 operating system:

- Char
- Date Decimal
- Double
- Float
- Integer
- Long Varchar
- Numeric
- Real
- Smallint

- Time
- Timestamp
- Varchar
- Char for Bit Data
- Long Varchar for Bit Data
- Varchar for Bit Data

Data types supported by the ResultSet of a Stored Procedure using DB2 connecting to an AS/400 operating system:

- Bigint
- Character
- Date
- Decimal
- Float
- Integer
- Numeric
- Smallint
- Time
- Timestamp
- Varchar

Attempting To Get Output Values While Using DataDirect Drivers

Attempting to get output values from a Stored Procedure when a ResultSet is Not Present

When attempting to retrieve a ResultSet from a Stored Procedure that has input and output parameters but no ResultSet, try retrieving the ResultSet first. For example:

```
getTestdb2SPSDBEmp().getDB_EMPLOYEE_SELECT().execute();
        while
(getTestdb2SPSDBEmp().getDB_EMPLOYEE_SELECT().resultsAvailable())
        {
           if
(getTestdb2SPSDBEmp().getDB_EMPLOYEE_SELECT().getUpdateCount() > 0)
           {

EGate.traceln(EGate.TRACE_COLLABSERVICE,EGate.TRACE_EVENT_INFORMATION
,">>>>> Update Count is greate than 0! <<<<<");
           }
           else
           {
           }
        }

getgenout().setPayload(getTestdb2SPSDBEmp().getDB_EMPLOYEE_SELECT().g
etEMPNO_OUT() + "|" +
getTestdb2SPSDBEmp().getDB_EMPLOYEE_SELECT().getLASTNAME_OUT() + "|"
+ getTestdb2SPSDBEmp().getDB_EMPLOYEE_SELECT().getFIRSTNAME_OUT()  +
"|" + getTestdb2SPSDBEmp().getDB_EMPLOYEE_SELECT().getRATE_OUT() +
```

```
"|" +
getTestdb2SPSDBEmp().getDB_EMPLOYEE_SELECT().getLASTUPDATE_OUT());
```

5.3.4 Prepared Statement

A Prepared Statement ETD represents a SQL statement that has been compiled. Fields in the ETD correspond to the input values that users need to provide.

Prepared Statements can be used to perform insert, update, delete and query operations. A Prepared Statement uses a question mark (?) as a place holder for input. For example:

```
insert into EMP_TAB(Age, Name, Dept No) value(?, ?, ?)
```

To execute a Prepared Statement, set the input parameters and call **executeUpdate()** and specify the input values if any.

```
getPrepStatement().getPreparedStatementTest().setAge(23);
getPrepStatement().getPreparedStatementTest().setName("Peter Pan");
getPrepStatement().getPreparedStatementTest().setDeptNo(6);
getPrepStatement().getPreparedStatementTest().executeUpdate();
```

5.3.5 Batch Operations

While the Java API used by SeeBeyond does not support traditional bulk insert or update operations, there is an equivalent feature that can achieve comparable results, with better performance. This is the "Add Batch" capability. The only modification required is to include the **addBatch()** method for each SQL operation and then the **executeBatch()** call to submit the batch to the database server. Batch operations apply only to Prepared Statements.

```
getPrepStatement().getPreparedStatementTest().setAge(23);
getPrepStatement().getPreparedStatementTest().setName("Peter Pan");
getPrepStatement().getPreparedStatementTest().setDeptNo(6);
getPrepStatement().getPreparedStatementTest().addBatch();

getPrepStatement().getPreparedStatementTest().setAge(45);
getPrepStatement().getPreparedStatementTest().setName("Harrison
Ford");
getPrepStatement().getPreparedStatementTest().setDeptNo(7);
getPrepStatement().getPreparedStatementTest().addBatch();
getPrepStatement().getPreparedStatementTest().executeBatch();
```

5.3.6 Database Configuration Node

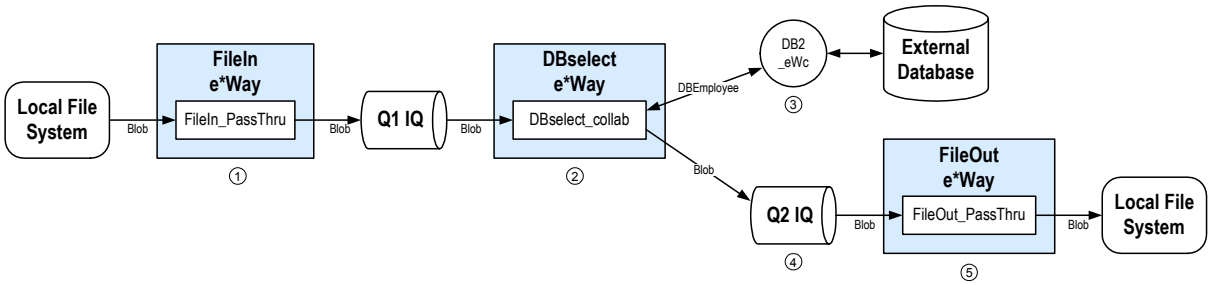
The Database Configuration node allows you to manage the "transaction mode" through the Collaboration if you have set the mode to manual in the e*Way connection configuration. See **"Connector Settings" on page 21**.

5.4 Sample Scenario—Polling from a DB2 Database

This section describes how to use the Java-enabled DB2 Universal Database e*Way in a sample implementation. This sample schema demonstrates the polling of records from a DB2 database and converting the records into e*Gate Events.

Figure 60 shows a graphical overview of the sample schema.

Figure 60 The Database Select Scenario—Overview



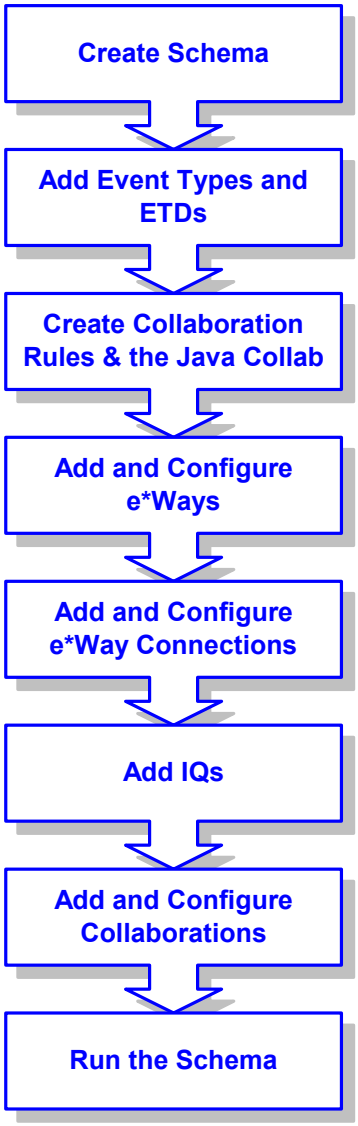
1. The **FileIn** e*Way retrieves an Event (a text file) containing the database select criteria and publishes it to the **Q1** IQ.
2. The **DBselect** e*Way retrieves the Generic Event (**Blob**) from the IQ. This triggers the rest of the Collaboration which has two parts.
3. The information in **Blob** is used to retrieve information from the database via the **DB2_eWc** e*Way Connection. This e*Way Connection contains information used by the Collaboration to connect to the DB2 database.
4. The information retrieved from the database is copied to the Generic Event (**Blob**) and published to the **Q2** IQ.
5. The **FileOut** e*Way retrieves the Generic Event (**Blob**) from the **Q2** IQ then writes it out to a text file on the local file system.

Overview of Steps

The sample implementation follows these general steps:

- **"Create the Schema" on page 83**
- **"Add the Event Types and Event Type Definitions" on page 83**
- **"Create the Collaboration Rules and the Java Collaboration" on page 86**
- **"Add and Configure the e*Ways" on page 90**
- **"Add and Configure the e*Way Connections" on page 92**
- **"Add the IQs" on page 93**
- **"Add and Configure the Collaborations" on page 93**
- **"Run the Schema" on page 95**

Figure 61 Schema Configuration Steps



External Database Tables

The sample uses a simple external DB2 database with a table called **DB_EMPLOYEE**. The table contains the following columns:

Table 4 The DB_EMPLOYEE Table

Column	Format	Description
EMP_NO	INTEGER	The employee number.
LAST_NAME	VARCHAR2	The employee's last name.
FIRST_NAME	VARCHAR2	The employee's first name.
RATE	FLOAT	The employee's pay rate.
LAST_DATE	DATETIME	The last transaction date for the employee.

5.4.1 Create the Schema

The first step in the sample implementation is creating a new schema. After installing the DB2 Universal Database e*Way, do the following:

1. Start the e*Gate Enterprise Manager GUI.
2. Log in to the appropriate Registry Host.
3. From the list of schemas, click **New** to create a new schema.
4. For this sample implementation, enter the name **DBSelect** and click **Open**.

   The Enterprise Manager starts and the newly created schema appears.

5.4.2 Add the Event Types and Event Type Definitions

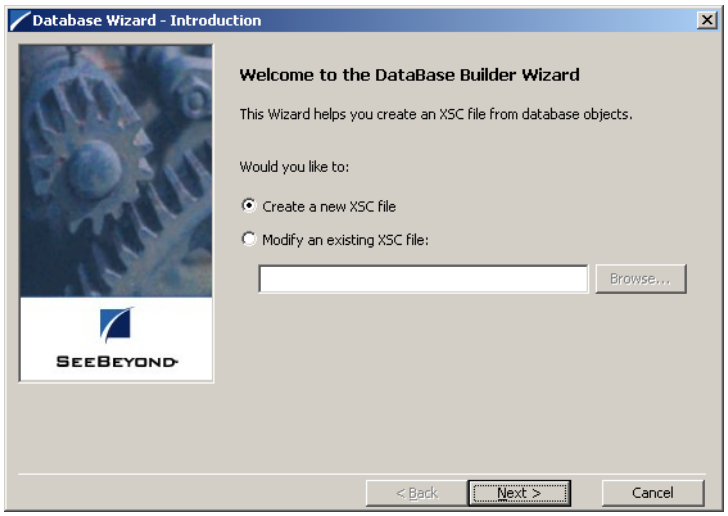
Two Event Types and Event Type Definitions are used in this sample.

- **DBEmployee** – This Event Type represents the layout of the employee records in the **DB_Employee** table. The Event Type uses the **DBEmployee.xsc** Event Type Definition. The ETD will be generated by using the Java ETD Editor's Database Wizard (DBWizard).
- **GenericBlob** – This Event Type is used to pass records with no specific format (blob). The Event Type uses the **GenericBlob.xsc** ETD. The ETD will be manually created as a fixed-length ETD.

To create the DBEmployee Event Type and ETD

1. From the **Options** menu of the Enterprise Manager, choose **Default Editor…**.
2. Verify that **Java** is selected, then click **OK**.
3. In the **Components** pane of the Enterprise Manager, select the **Event Types** folder.
4. Click the **New Event Type** button to add a new Event Type.
5. Enter the name **DBEmployee** and click **OK**.
6. Double-click the new **DBEmployee** Event Type to display its properties.
7. Select your **Data Source:** from the drop down list and enter your **User Name:** and **Password:**.
8. From the **File** menu, choose **New**. The New Event Type Definition dialog box will appear.
9. In the New Event Type Definition dialog box, select **DBWizard** and click **OK**.
10. Select Create a new .XSC file. Click **Next** to continue. See Figure 62.

Figure 62 Database Wizard Introduction



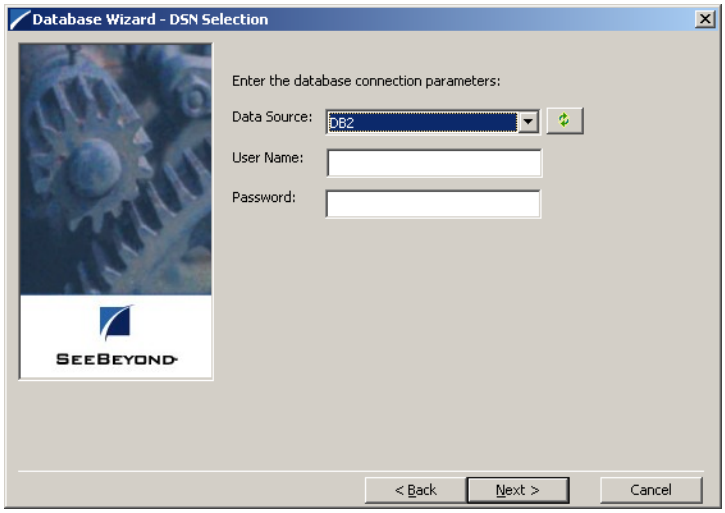
11 Enter the database DNS source and login information.

A Select the **Data Source** from the dropdown list of ODBC data sources.

B Enter the **User Name** and **Password** used to log into the database.

Click **Next** to continue. See Figure 63

Figure 63 Database Wizard - DSN Selection



12 The **Database Wizard - ETD Type Selection** window appears. The DNS source you selected on the previous window is the default selection for this window. Do not change this selection type unless instructed to do so by SeeBeyond support personal. Click **Next** to continue.

13 This scenario uses a table rather than a procedure. Select **Table** and click **Next** to continue.

14 From the **Database Wizard - Tables** window, click **Add Tables...** Enter the exact **Table Name** or enter any valid wildcards. From the drop down list select the appropriate database schema and click **Search**. The wizard connects to the data source and display a list of tables.

15 Select the table to be included in the ETD and click **Next**.

16 The Java Class Name/ Package Name dialog box will appear. Enter the Group and Package information.

A Enter your database name as the **Java Class Name**.

B Enter **DBEmployee** for the Package Name and click **Next** to continue.

17 Click **Finish** to complete the Wizard. The Wizard will generate and display the ETD.

18 From the **File** menu, choose **Save**.

19 Name the ETD **DBEmployee.xsc** and click **OK**.

20 From the **File** menu, choose **Promote to Run Time** and click **OK** when finished.

21 From the **File** menu, choose **Close** to exit the ETD Editor.

To create the GenericBlob Event Type and ETD

1 In the **Components** pane of the Enterprise Manger, select the **Event Types** folder.

2 Click the **New Event Type** button to add a new Event Type.

3 Enter the name **GenericBlob** and click **OK**.

4 Double-click the new **GenericBlob** Event Type to display its properties.

5 Click the **New** button to create a new Event Type Definition. The Java Event Type Definition Editor appears.

6 From the **File** menu, choose **New**. The New Event Type Definition dialog box appears.

7 In the New Event Type Definition dialog box, select **Custom ETD** and click **OK**.

8 Read the Introduction screen, then click **Next** to continue. The Package Name dialog box appears.

9 Enter **GenericBlobPackage** for the **Package Name** and click **Next** to continue.

10 Read the summary information and click **Finish** to generate the ETD.

11 In the **Event Type Definition** pane, right-click the root node, point to **Add Field** in the shortcut menu, and click **As Child Node**.

12 Enter the properties for the two nodes as shown in Table 5.

Table 5 GenericBlob ETD Properties

Node	Property	Value
Root Node	Name	GenericBlob
	Structure	fixed
	Length	0

Node	Property	Value
Child Node	Name	Data
	Structure	fixed
	Length	0

Note: *To use a Blob, you will need to set the LONGDATACOMPAT = 0 in the file db2cli.ini under the DB2 root directory. This will disable the LongVarChar, LongVarBinary, and LongVarGraphic. Refer to the IBM Installation and Configuration Supplement for more information.*

13 From the **File** menu, choose **Save**.

14 Enter the name **GenericBlob.xsc** and click **OK**.

15 From the **File** menu, choose **Compile**.

16 From the **File** menu, choose **Promote to Run Time** and click **OK** when finished.

17 From the **File** menu, choose **Close** to exit the ETD Editor.

18 In the Event Type properties dialog box, click **OK** to save and close the Event Type.

5.4.3 Create the Collaboration Rules and the Java Collaboration

The sample scenario uses two Collaboration Rules and one Java Collaboration:

- **GenericPassThru** – This Collaboration Rule is used to pass the GenericBlob Event Type through the schema without modifying the Event.
- **DBSelect** – This Collaboration Rule is used to convert the inbound Event's selection criteria into a SQL statement, poll the external database, and return the matching records as an outbound Event.
- **DBSelectCollab** – This Java Collaboration contains the logic required to communicate with the external database.

To create the GenericPassThru Event Type

1 In the components pane of the Enterprise Manager, select the **Collaboration Rules** folder.

2 Click the **New Collaboration Rules** button to add a new Collaboration Rule.

3 Name the Collaboration Rule **GenericPassThru** and click **OK**.

4 Click the **Properties** button to display the Collaboration Rule's properties.

5 Click the **Subscriptions** tab, select the **GenericBlob** Event Type, and click the right arrow.

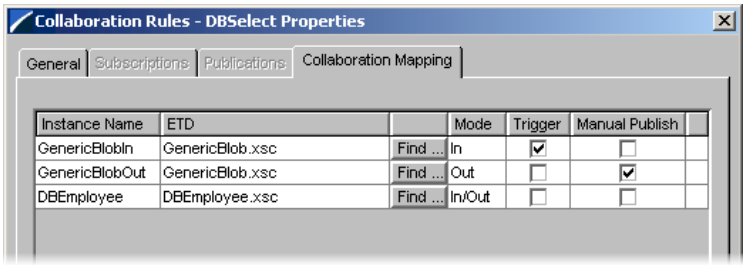
6 Click the **Publications** tab, select the **GenericBlob** Event Type, and click the right arrow.

7 Click **OK** to save the Collaboration Rule.

To create the DBSelect Event Type

1. In the components pane of the Enterprise Manager, select the **Collaboration Rules** folder.
2. Click the **New Collaboration Rules** button to add a new Collaboration Rule.
3. Name the Collaboration Rule **DBSelect** and click **OK**.
4. Click the **Properties** button to display the Collaboration Rule's properties.
5. In the **Service** list, click **Java**.
6. Click the **Collaboration Mapping** tab.
7. Add three instances as shown in Figure 64 below:

Figure 64 DBSelect Instances

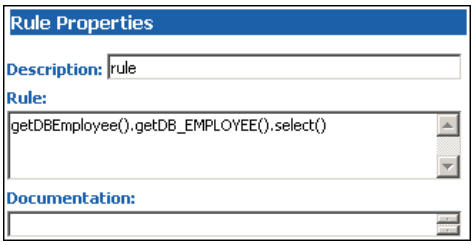


8. Click **Apply** to save the current changes.
9. Click the **General** tab.
10. Click **New** to create the new Collaboration file.

    The Java Collaboration Editor appears. Note that Source and Destination Events are already supplied based on the Collaboration Rule's Collaboration Mapping (see Figure 64).
11. From the **View** menu, choose **Display Code**.

    This displays the Java code associated with each of the Collaboration's rules.
12. In the Business Rules pane, select the **retBoolean** rule and click the **rule** button to add a new rule.
13. In the **Destination Events** pane, expand the **DBEmployee** Event Type until the **select** method is visible.
14. Drag the **select** method into the **Rule** field of the **Rule Properties** pane. Click **OK** to close the dialog box without entering any criteria. (See Figure 65).

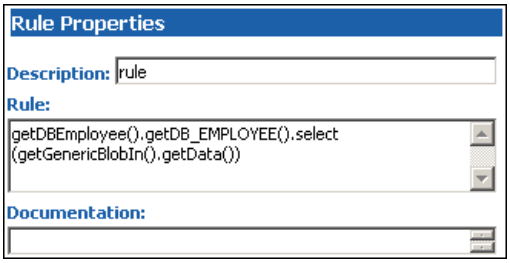
Figure 65 Rule Properties



15 In the **Source Events** pane, expand the **GenericBlobIn** Event Type until the **Data** node is visible.

16 In the Rule Properties pane, position the cursor inside the parentheses of the select method. Then drag the Data node from the Source Events pane into the select method's parentheses. (See Figure 66).

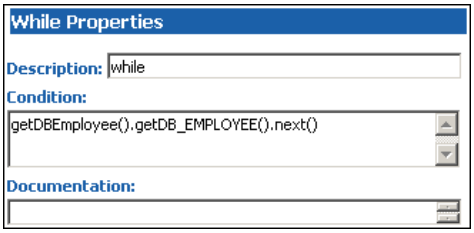
Figure 66 Rule Properties (Continued)



17 Select the newly edited rule in the **Business Rules** pane and click the **while** button to add a new while loop beneath the current rule.

18 Drag the next method from the Destination Events pane into the Condition field of the While Properties pane. (See Figure 67).

Figure 67 While Properties

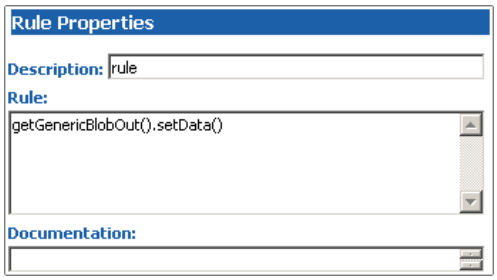


19 Select the newly edited while loop in the Business Rules pane and click the **rule** button to add a new rule as a **child** to the while loop.

20 In the **Destination Events** pane, expand the **GenericBlobOut** Event Type until the **Data** node is visible.

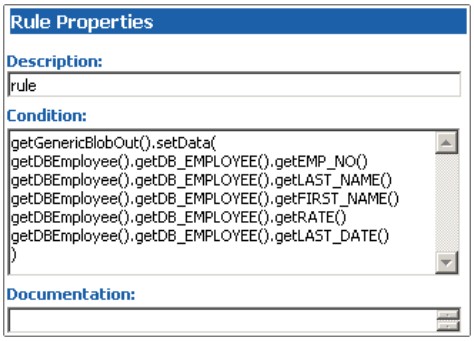
21 Drag the Data node into the Rule field of the Rule Properties pane. (See Figure 68).

Figure 68 Rule Properties



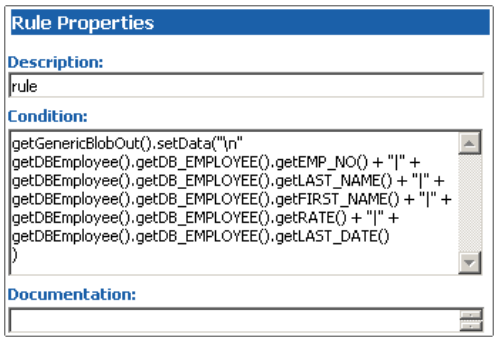
22 In the Rule Properties pane, position the cursor inside the parentheses of the setData() method. Then drag each of the five data nodes of DB_EMPLOYEE from the Source Events into the parentheses of the rule. (See Figure 69).

Figure 69 Rule Properties (Continued)



23 Edit the text of the condition to add a newline character and pipe (|) delimiters between each of the five data nodes. (See Figure 70).

Figure 70 Rule Properties (Continued)

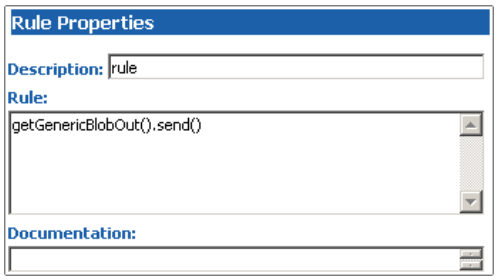


24 Select the newly edited rule in the **Business Rules** pane and click the **rule** button to add a new rule inside the while loop.

25 Drag the root node of the **GenericBlobOut** Event into the rule field in the **Rule Properties** pane.

26 Edit the rule; add a **send()** method as shown in Figure 71.

Figure 71 GenericBlobOut send()



27 From the **File** menu, choose **Save** to save the file.

28 From the **File** menu, choose **Compile** to compile the Collaboration.

View the **Output** pane to ensure that there were no compiler errors.

29 From the **File** menu, choose **Close** to close the Java Collaboration Editor and return to the Collaboration Rule.

Note that the **Collaboration Rules** and **Initialization file** fields have been completed by close the Java Collaboration Editor.

30 Click **OK** to save and close the **DBSelect** Collaboration Rule.

5.4.4 Add and Configure the e*Ways

The sample scenario uses three e*Ways:

- **FileIn** – This e*Way retrieves an Event (text file) containing the database select criteria and publishes it to the **Q1** IQ.
- **DBSelect** – This e*Way retrieves the Generic Event (**Blob**) from the **Q1** IQ. This triggers the e*Way to request information from the external database (via the e*Way Connection) and publishes the results to the **Q2** IQ.
- **FileOut** – This e*Way retrieves the Generic Event (**Blob**) from the **Q2** IQ then writes it out to a text file on the local file system.

To create the FileIn e*Way

1 In the Components pane of the Enterprise Manager, select the Control Broker and click the **New e*Way** button.

2 Enter **FileIn** for the component name and click **OK**.

3 Select the newly created e*Way and click the **Properties** button to display the e*Way's properties.

4 Use the **Find** button to select **stcewfile.exe** as the executable file.

5 **Click New** to create a new configuration file.

6 Enter the parameters for the e*Way as shown in Table 6.

Table 6 FileIn e*Way Parameters

Section Name	Parameter	Value
General Settings	AllowIncoming	YES
	AllowOutgoing	NO
	PerformanceTesting	default
Outbound (send) settings	All	default
Poller (inbound) settings	PollDirectory	c:\egate\data\dbSelect_In
	All Others	default
Performance Testing	All	default

7 Select **Save** from the **File** menu. Enter **FileIn** as the file name and click **Save**.

8 Select **Promote to Run Time** from the **File** menu. Click **OK** to close the e*Way configuration file editor.

9 In the **Start Up** tab of the e*Way properties, select the **Start automatically** check box.

10 Click **OK** to save the e*Way properties.

To create the DBSelect e*Way

1 In the Components pane of the Enterprise Manager, select the Control Broker and click the **New e*Way** button.

2 Enter **DBSelect** for the component name and click **OK**.

3 Select the newly created e*Way and click the **Properties** button to display the e*Way's properties.

4 Use the **Find** button to select **stceway.exe** as the executable file.

5 Click **New** to create a new configuration file.

6 Enter the parameters for the e*Way as shown in Table 7.

Table 7 DBSelect e*Way Parameters

Section Name	Parameter	Value
JVM Settings	CLASS Prepend	Specify the path to the **db2java.zip** file.
	All others	default

7 Select **Save** from the **File** menu. Enter **DBSelect** as the file name and click **Save**.

8 Select **Promote to Run Time** from the **File** menu. Click **OK** to close the configuration file editor.

9 In the **Start Up** tab of the Business Object Broker properties, select the **Start automatically** check box.

10 Click **OK** to save the e*Way's properties.

To create the FileOut e*Way

1. In the Components pane of the Enterprise Manager, select the Control Broker and click the **New e*Way** button.
2. Enter **FileOut** for the component name and click **OK**.
3. Select the newly created e*Way and click the **Properties** button to display the e*Way's properties.
4. Use the **Find** button to select **stcewfile.exe** as the executable file.
5. Click **New** to create a new configuration file.
6. Enter the parameters for the e*Way as shown in Table 8.

Table 8 FileOut e*Way Parameters

Section Name	Parameter	Value
General Settings	AllowIncoming	NO
	AllowOutgoing	YES
	PerformanceTesting	default
Outbound (send) settings	OutputDirectory	c:\egate\data\dbSelect_Out
	OutputFileName	dbSelect%d.dat
Poller (inbound) settings	All	default
Performance Testing	All	default

7. Select **Save** from the **File** menu. Enter **FileOut** as the file name and click **Save**.
8. Select **Promote to Run Time** from the **File** menu. Click **OK** to close the e*Way configuration file editor.
9. In the **Start Up** tab of the e*Way properties, select the **Start automatically** check box.
10. Click **OK** to save the e*Way properties.

5.4.5 Add and Configure the e*Way Connections

The sample scenario uses one e*Way Connection:

- **DB2_eWc** – This e*Way Connection connects the **DBSelect** component to the external database and returns the requested records to be published to the Q2 IQ.

To create the e*Way Connection

1. In the Components pane of the Enterprise Manager, select the e*Way Connections folder.
2. Click the **New e*Way Connection** button to add a new e*Way Connection.
3. Enter **DB2_eWc** for the component name and click **OK**.
4. Select the newly created e*Way Connection and click the **Properties** button to display the e*Way Connection's properties.
5. Select **DB2** from the e*Way Connection Type dropdown list.

6 Click **New** to create a new configuration file.

7 Enter the parameters for the e*Way Connection as shown in Table 9.

Table 9 DB2_eWc e*Way Connection Parameters

Section Name	Parameter	Value
DataSource	class	default
	DatabaseName	Use the database name listed in your ODBC entry.
	user name	Use local settings.
	password	Use local settings.
	retry interval	default
connector	All	default

8 Select **Save** from the **File** menu. Enter **DB2_eWc** as the file name and click **Save**.

9 Select **Promote to Run Time** from the **File** menu. Click **OK** to close the e*Way Connection configuration file editor.

10 Click **OK** to save the e*Way Connection's properties.

5.4.6 Add the IQs

The sample scenario uses two IQs:

- **Q1** – This IQ queues the inbound Events for the DBSelect e*Way.
- **Q2** – This IQ queues the outbound Events for the FileOut e*Way.

To add the IQs

1 In the components pane of the Enterprise Manager, select the IQ Manager.

2 Click the **New IQ** button to add a new IQ.

3 Enter the name **Q1** and click **Apply** to save the IQ and leave the New IQ dialog box open.

4 Enter the name **Q2** and click **OK** to save the second IQ.

5 Select the IQ Manager and click the **Properties** button.

6 Select the **Start automatically** check box and click **OK** to save the properties.

5.4.7 Add and Configure the Collaborations

The sample scenario uses three Collaborations:

- **FileIn_PassThru** – This Collaboration uses the **GenericPassThru** Collaboration Rule.
- **DBSelect_collab** – This Collaboration uses the **GenericEventToDatabase** Collaboration Rule to execute the **dbCollab.class** Java Collaboration file.

- **FileOut_PassThru** – This Collaboration uses the **GenericPassThru** Collaboration Rule.

To add the FileIn_PassThru Collaboration

1. In the components pane of the Enterprise Manager, select the **FileIn** e*Way.
2. Click the **New Collaboration** button to create a new Collaboration.
3. Enter the name **FileIn_PassThru** and click **OK**.
4. Select the newly created Collaboration and click the **Properties** button.
5. Select **GenericPassThru** from the dropdown list of Collaboration Rules.
6. Click the upper **Add** button to add a new Subscription.
7. Select the **GenericEvent** Event Type and the **<External>** source.
8. Click the lower **Add** button to add a new Publication.
9. Select the **GenericEvent** Event Type and the **Q1** destination.
10. Click **OK** to close the Collaboration's properties.

To add the DBselect_collab Collaboration

1. In the components pane of the Enterprise Manager, select the **DBSelect** e*Way.
2. Click the **New Collaboration** button to create a new Collaboration.
3. Enter the name **DBselect_collab** and click **OK**.
4. Select the newly created Collaboration and click the **Properties** button.
5. Select **GenericEventToDatabase** from the dropdown list of Collaboration Rules.
6. Click the upper **Add** button to add a new Subscription.
7. Select the **GenericEvent** Event Type and the **FileIn_PassThru** source.
8. Click the lower **Add** button to add a new Publication.
9. Select the **DBEmployee** Event Type and the **DB2_eWc** destination.
10. Click the lower **Add** button to add a new Publication.
11. Select the **GenericEvent** Event Type and the **Q2** destination.
12. Click **OK** to close the Collaboration's properties.

To add the FileOut_PassThru Collaboration

1. In the components pane of the Enterprise Manager, select the **FileOut** e*Way.
2. Click the **New Collaboration** button to create a new Collaboration.
3. Enter the name **FileOut_PassThru** and click **OK**.
4. Select the newly created Collaboration and click the **Properties** button.
5. Select **GenericPassThru** from the dropdown list of Collaboration Rules.
6. Click the upper **Add** button to add a new Subscription.
7. Select the **GenericEvent** Event Type and the **DBSelect_collab** source.

8 Click the lower **Add** button to add a new Publication.

9 Select the **GenericEvent** Event Type and the **<External>** destination.

10 Click **OK** to close the Collaboration's properties.

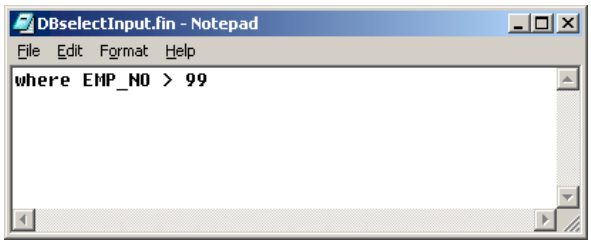
5.4.8 Run the Schema

Running the sample Schema requires that a sample input file be created. Once the input file has been created, you can start the Control Broker from a command prompt to execute the Schema. After the Schema has been run, you can view the output text file to verify the results.

The sample input file

Use a text editor to create an input file to be read by the inbound file e*Way (**FileIn**). This simple input file contains the criteria for the **dbSelect.class** Collaboration's select statement. An example of an input file is shown in Figure 72.

Figure 72 Sample Input File



To start the Control Broker

From a command prompt, type the following command:

```
stccb -ln logical_name -rh registry -rs DBSelect -un user_name
-up password
```

where

logical_name is the logical name of the Control Broker,

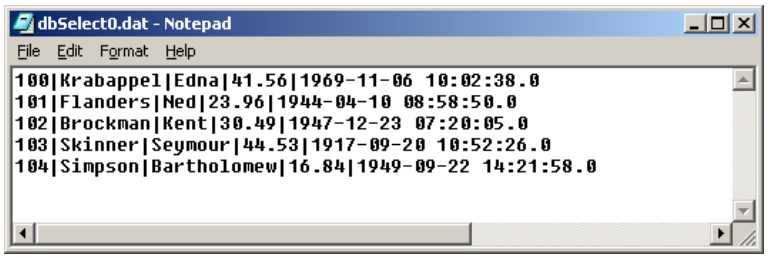
registry is the name of the Registry Host, and

user_name and ***password*** are a valid e*Gate username/password combination.

To verify the results

Use a text editor to view the output file **c:\eGate\data\dbSelect_out\dbSelect0.dat**. Figure 73 shows an example of the records that were returned by the sample schema.

Figure 73 Sample Output File



5.4.9 Importing the OS/390 Sample Schema

To import the OS/390 sample schema included on the e*Gate Installation CD-ROM, do the following:

1. On the **Enterprise Manager** toolbar, click **File**, **Import Definitions from File...**
2. Review the information provided in the **Import Wizard - Introduction** window. Click **Next**.
3. On the **Import Wizard - Step 1** window, select **Schema** and click **Next**.
4. On the **Import Wizard - Step 2** window, browse to the **ewdb2** sample folder.
5. Double click the **ewdb2** sample folder and select the **db2sample_OS390.zip** file.
6. Click **Open**.
7. On the **Import Wizard - Step 2** window, click **Next**.
8. On the **Import Wizard - Step 3** window, you can rename the host or change the port. This step is optional.
9. Click **Next**.
10. On the **Import Wizard - Finish** window, click **Finish**.
11. Follow the instructions provided for the Polling Sample Schema to run your schema.

Chapter 6

DB2 e*Way Methods

The DB2 e*Way contains Java methods that are used to extend the functionality of the e*Way. These methods are contained in the following classes:

6.1 com.stc.eways.jdbcx.StatementAgent Class

```
java.lang.Object
|
+ - - com.stc.eways.jdbcx.StatementAgent
```

All Implemented Interfaces

ResetEventListener, SessionEventListener

Direct Known Subclasses

PreparedStatementAgent, SQLStatementAgent, TableResultSet

```
public abstract class StatementAgent
```

extends java.lang.Object

Implements SessionEventListener, ResetEventListener

Abstract class for other Statement Agent.

Methods of the StatementAgent

resultSetTypeToString

This method gets the symbol string corresponding to the ResultSet type enumeration.

```
public static java.lang.String resultSetTypeToString(int type)
```

Name	Description
type	ResultSet type.

Returns

Enumeration symbol string.

resultSetDirToString

This method gets the symbol string corresponding to the ResultSet direction enumeration.

```
public static java.lang.String resultSetDirToString(int dir)
```

Name	Description
dir	ResultSet scroll directions.

Returns

Enumeration symbol string.

resultSetConcurToString

This method gets the symbol string corresponding to the ResultSet concurrency enumeration.

```
public static java.lang.String resultSetConcurToString(int concur)
```

Name	Description
concur	ResultSet concurrency.

Returns

Enumeration symbol string.

isClosed

This method returns the statement agent's close status.

```
public boolean isClosed()
```

Returns

True if the statement agent is closed.

queryName

This method supplies the name of the listener.

```
public java.lang.String queryName()
```

Specified By

queryName in interface SessionEventListener.

Returns

The listener's class name.

queryDescription

This method gives a description of the query.

```
public java.lang.String queryDescription()
```

Returns

The description of the query.

sessionOpen

Opens the session event handler.

```
public void sessionOpen(SessionEvent evt)
```

Specified by

sessionOpen in interface SessionEventListener

Name	Description
evt	Session event.

sessionClosed

Closes the session event handler.

```
public void sessionClosed(SessionEvent evt)
```

Specified by

sessionClosed in interface SessionEventListener

Name	Description
evt	Session event.

resetRequested

Resets the event handler.

```
public void resetRequested(ResetEvent evt)
```

Specified by

resetRequested in interface ResetEventListener

Name	Description
evt	Requested Reset event.

Throws

java.sql.SQLException

getResultSetType

Returns the result set scroll type.l

```
public int getResultSetType()
```

Returns

ResultSet type

Throws

java.sql.SQLException

getResultSetConcurrency

Returns the result set concurrency mode.

```
public int getResultSetConcurrency()
```

Returns

ResultSet concurrency

Throws

java.sql.SQLException

setEscapeProcessing

Sets escape syntax processing

```
public void setEscapeProcessing (boolean bEscape)
```

Name	Description
bEscape	True to enable False to disable

Throws

java.sql.SQLException

setCursorName

Sets result set cursor name.

```
public void setCursorName(java.lang.String sName)
```

Name	Description
sName	Cursor name.

Throws

java.sql.SQLException

setQueryTimeout

Returns query timeout duration.

```
public int getQueryTimeout()
```

Returns

The number of seconds to wait before timeout.

Throws

java.sql.SQLException

setQueryTimeout

Sets the query timeout duration

```
public void setQueryTimeout(int nInterval)
```

Name	Description
nInterval	The number of seconds before timeout.

Throws

java.sql.SQLException

getFetchDirection

Returns result set fetch direction.

```
public int getFetchDirection()
```

Returns

The fetch direction of the ResultSet: FETCH_FORWARD, FETCH_REVERSE, FETCH_UNKNOWN.

Throws

java.sql.SQLException

setFetchDirection

Sets result set fetch direction.

```
public void setFetchDirection (int iDir)
```

Name	Description
iDir	The fetch direction of the ResultSet: FETCH_FORWARD, FETCH_REVERSE, FETCH_UNKNOWN.

Throws

java.sql.SQLExeption

getFetchSize

Returns the result set prefetch record count.

```
public int getFetchSize()
```

Returns

The fetch size this StatementAgent object set.

Throws

java.sql.SQLException

getMaxRows

Returns the maximum number of fetch records.

```
public int getMaxRows()
```

Returns

The maximum number of rows that a ResultSetAgent may contain.

Throws

java.sql.SQLException

setMaxRows

Sets the maximum number of fetch records.

```
public void setMaxRows (int nRow)
```

Name	Description
nRow	The maximum number of rows in the ResultSetAgent.

Throws

java.sql.SQLException

getMaxFieldSize

Returns the maximum field data size.

```
public int getMaxFieldSize()
```

Returns

The maximum number of bytes that a ResultSetAgent column may contain; 0 means no limit.

Throws

java.sql.SQLException

setMaxFieldSize

Sets the maximum field data size.

```
public void setMaxFieldSize (int nSize)
```

Name	Description
nSize	The maximum size for a column in a ResultSetAgent.

Throws

java.sql.SQLException

getUpdateCount

Returns the records count of the last executed statement.

```
public int getUpdateCount()
```

Returns

The number of rows affected by an updated operation. O if no rows were affected or the operation was a DDL command. -1 if the result is a ResultSetAgent or there are no more results.

Throws

java.sql.SQLException

getResultSet

Returns the result set of the last executed statement.

```
public ResultSetAgent getResultSet()
```

Returns

The ResultSetAgent that was produced by the call to the method execute.

Throws

java.sql.SQLExcetpion

getMoreResults

Returns if there are more result sets.

```
public boolean getMoreResults()
```

Returns

True if the next result is a ResultSetAgent; False if it is an integer indicating an update count or there are no more results).

Throws

java.sql.SQLException

clearBatch

Clears the batch operation.

```
public void clearBatch()
```

Throws

java.sql.SQLException

executeBatch

Executes batch statements.

```
public int[] executeBatch ()
```

Returns

An array containing update counts that correspond to the commands that executed successfully. An update count of -2 means the command was successful but that the number of rows affected is unknown.

Throws

java.sql.SQLException

cancel

Cancels a statement that is being executed.

```
public void cancel()
```

Throws

java.sql.SQLException

getWarnings

Returns SQL warning object.

```
public java.sql.SQLWarning getWarnings()
```

Returns

The first SQL warning or null if there are no warnings.

Throws

java.sql.SQLException

clearWarnings

Clear all SQL Warning objects.

```
public void clearWarnings()
```

Throws

java.sql.SQLException

stmtInvoke

Invokes a method of the database Statement object of this ETD.

```
public java.lang.Object stmtInvoke (java.lang.String methodName,
java.lang.Class[] argsCls, java.lang.Object[] args)
```

Name	Description
methodName	The name of the method.
argsCls	Class array for types of formal arguments for method, in the declared order. Can be null if there are no formal arguments. However, cannot invoke constructor here.
args	Object array of formal arguments for method in the declared order. Can be null if there are no formal arguments. However, cannot invoke constructor here.

Returns

The Object instance resulting from the method invocation. Can be null if nothing is returned (void return declaration).

Throws

java.lang.Exception. Whatever exception the invoked method throws.

6.2 com.stc.eways.jdbcx.PreparedStatementAgent Class

```
java.lang.Object
|
+ --com.stc.eways.jdbcx.StatementAgent
   |
    + -- com.stc.eways.jdbcx.PreparedStatementAgent
```

All Implemented Interfaces

ResetEventListener, SessionEventListener

Direct Known Subclasses

CallableStatementAgent

```
public class PreparedStatementAgent
```

extends StatementAgent

Agent hosts PreparedStatement Object

Methods of the PreparedStatementAgent

sessionOpen

Opens the session event handler.

```
public void sessionOpen(SessionEvent evt)
```

Overrides

sessionOpen in class StatementAgent

Name	Description
evt	Session event.

setNull

Nullify value of indexed parameter.

```
public void setNull(int index, int type)
```

Name	Description
index	Parameter index starting from 1.
type	A JDBC type defined by java.sql.Types

Throws

java.sql.SQLException

setNull

Nullify value of indexed parameter.

```
public void setNul(int index, int type, java.lang.String tname)
```

Name	Description
index	Parameter index starting from 1.
type	A JDBC type defined by java.sql.Types
tname	The fully-qualified name of the parameter being set. If type is not REF, STRUCT, DISTINCT, or JAVA_OBJECT, this parameter will be ignored.

Throws

java.sql.SQLException

setObject

Sets value of indexed parameter with an object.

```
public void setObject(int index, java.lang.Object ob)
```

Name	Description
index	Parameter index starting from 1.
ob	An instance of a Java Object containing the input parameter value.

Throws

java.sql.SQLException

setObject

Sets value of indexed parameter with an object.

```
public void setObject(int index, java.lang.Object ob, int iType)
```

Name	Description
index	Parameter index starting from 1.
ob	An instance of a Java Object containing the input parameter value.
iType	A JDBC type defined by java.sql.Types

Throws

java.sql.SQLException

setObject

Sets value of indexed parameter with an object.

```
public void setObject(int index, java.lang.Object ob, int iType, int
iScale)
```

Name	Description
index	Parameter index starting from 1.
ob	An instance of a Java Object containing the input parameter value.
iType	A JDBC type defined by java.sql.Types
iScale	The number of digits to the right of the decimal point. Only applied to DECIMAL and NUMERIC types

Throws

java.sql.SQLException

setBoolean

Sets the boolean value of the indexed parameter.

```
public void setBoolean(int index, boolean b)
```

Name	Description
index	Parameter index starting from 1.
b	true or false.

Throws

java.sql.SQLException

setByte

Sets the byte value of the indexed parameter.

```
public void setByte(int index, byte byt)
```

Name	Description
index	Parameter index starting from 1.
byt	The byte parameter value to be set.

Throws

java.sql.SQLException

setShort

Sets the short value of the indexed parameter.

```
public void setShort(int index, short si)
```

Name	Description
index	Parameter index starting from 1.
si	The short parameter value to be set.

Throws

java.sql.SQLException

setInt

Sets the integer value of the indexed parameter.

```
public void setInt(int index, int i)
```

Name	Description
index	Parameter index starting from 1.
i	The integer parameter value to be set.

Throws

java.sql.SQLException

setLong

Sets the long value of the indexed parameter.

```
public void setLong(int index, long l)
```

Name	Description
index	Parameter index starting from 1.
l	The long parameter value to be set.

Throws

java.sql.SQLException

setFloat

Sets the float value of the indexed parameter.

```
public void setFloat(int index, float f)
```

Name	Description
index	Parameter index starting from 1.
f	The float parameter value to be set.

Throws

java.sql.SQLException

setDouble

Sets the double value of the indexed parameter.

```
public void setDouble(int index, double d)
```

Name	Description
index	Parameter index starting from 1.
d	The double parameter value to be set.

Throws

java.sql.SQLException

setBigDecimal

Sets the decimal value of the indexed parameter.

```
public void setBigDecimal(int index, java.math.BigDecimal dec)
```

Name	Description
index	Parameter index starting from 1.
dec	The BigDecimal parameter value to be set.

Throws

java.sql.SQLException

setDate

Sets the date value of the indexed parameter.

```
public void setDate(int index, java.sql.Date date)
```

Name	Description
index	Parameter index starting from 1.
date	The Date parameter value to be set.

Throws

java.sql.SQLException

setDate

Sets the date value of indexed parameter with time zone from calendar.

```
public void setDate(int index, java.sql.Date date, java.util.Calendar
cal)
```

Name	Description
index	Parameter index starting from 1.
date	The Date parameter value to be set.
cal	The calender object used to construct the date.

Throws

java.sql.SQLException

setTime

Sets the time value of the indexed parameter.

```
public void setTime(int index, java.sql.Time t)
```

Name	Description
index	Parameter index starting from 1.
t	The Time parameter value to be set.

Throws

java.sql.SQLException

setTime

Sets the time value of the indexed parameter.

```
public void setTime(int index, java.sql.Time t, java.util.Calendar
cal)
```

Name	Description
index	Parameter index starting from 1.
t	The Time parameter value to be set.
cal	The Calendar object used to construct the time.

Throws

java.sql.SQLException

setTimestamp

Sets the timestamp value of the indexed parameter.

```
public void setTimestamp(int index, java.sql.Timestamp ts)
```

Name	Description
index	Parameter index starting from 1.
ts	The Timestamp parameter value to be set.

Throws

java.sql.SQLException

setTimestamp

Sets the timestamp value of the indexed parameter with the time zone from the calendar.

```
public void setTimestamp(int index, java.sql.timestamp ts,
java.util.Calendar cal)
```

Name	Description
index	Parameter index starting from 1.
ts	The Timestamp parameter value to be set.
cal	The Calendar object used to construct the timestamp.

Throws

java.sql.SQLException

setString

Sets the string value of the indexed parameter.

```
public void setString(int index, java.lang.String s)
```

Name	Description
index	Parameter index starting from 1.

Name	Description
s	The String parameter value to be set.

Throws

java.sql.SQLException

setBytes

Sets the byte array value of the indexed parameter.

```
public void setBytes(int index, byte[] bytes)
```

Name	Description
index	Parameter index starting from 1.
bytes	The byte array parameter value to be set.

Throws

java.sql.SQLException

setAsciiStream

Sets the character value of the indexed parameter with an input stream and specified length.

```
public void setAsciiStream(int index, java.io.InputStream is, int
length)
```

Name	Description
index	Parameter index starting from 1.
is	The InputStream that contains the Ascii parameter value to be set.
length	The number of bytes to be read from the stream and sent to the database.

Throws

java.sql.SQLException

setBinaryStream

Sets the binary value of the indexed parameter with an input stream and specified length.

```
public void setBinaryStream(int index, java.io.InputStream is, int
length)
```

Name	Description
index	Parameter index starting from 1.
is	The InputStream that contains the binary parameter value to be set.
length	The number of bytes to be read from the stream and sent to the database.

Throws

java.sql.SQLException

setCharacterStream

Sets the character value of the indexed parameter with a reader stream and specified length.

```
public void setCharacterStream(int index, java.io.Reader rd, int
length)
```

Name	Description
index	Parameter index starting from 1.
rd	The Reader that contains the Unicode parameter value to be set.
length	The number of characters to be read from the stream and sent to the database.

Throws

java.sql.SQLException

setArray

Sets the Array value of the indexed parameter.

```
public void setArray(int index, java.sql.Array a)
```

Name	Description
index	Parameter index starting from 1.
a	The Array value to be set.

Throws

java.sql.SQLException

setBlob

Sets the Blob value of the indexed parameter.

```
public void setBlob(int index, java.sql.Blob blob)
```

Name	Description
index	Parameter index starting from 1.
blob	The Blob value to be set.

Throws

java.sql.SQLException

setClob

Sets the Clob value of the indexed parameter.

```
public void setClob(int index, java.sql.Clob clob)
```

Name	Description
index	Parameter index starting from 1.
clob	The Clob value to be set.

Throws

java.sql.SQLException

setRef

Sets the Ref value of the indexed parameter.

```
public void setRef(int index, java.sql.Ref ref)
```

Name	Description
index	Parameter index starting from 1.
ref	The Ref parameter value to be set.

Throws

java.sql.SQLException

clearParameters

Clears the parameters of all values.

```
public void clearParameters()
```

Throws

java.sql.SQLException

addBatch

Adds a set of parameters to the list of commands to be sent as a batch.

```
public void addBatch()
```

Throws

java.sql.SQLException

execute

Executes the Prepared SQL statement.

```
public void execute()
```

Throws

java.sql.SQLException

executeQuery

Executes the prepared SQL query and returns a ResultSetAgent that contains the generated result set.

```
public ResultSetAgent executeQuery()
```

Returns

ResultSetAgent or null.

Throws

java.sql.SQLException

executeUpdate

Executes the prepared SQL statement and returns the number of rows that were affected.

```
public int executeUpdate()
```

Returns

The number of rows affected by the update operation; 0 if no rows were affected.

Throws

java.sql.SQLException

6.3 com.stc.eways.jdbcx.PreparedStatementResultSet Class

java.lang.Object

|

+ -- **com.stc.eways.jdbcx.PreparedStatementResultSet**

```
public abstract class PreparedStatementResultSet
```

extends java.lang.Object

Base class for Result Set returned from a Prepared Statement execution.

Constructors of PreparedStatementResultSet

PreparedStatementResultSet

Methods of PreparedStatementResultSet

isLast on page 125
last on page 124
next on page 123
previous on page 123
refreshRow on page 165
relative on page 124
getFetchDirection on page 121
getFetchSize on page 122
updateRow on page 144
wasNull on page 143

Constructor PreparedStatementResultSet

Constructs a Prepared Statement Result Set object.

```
public PreparedStatementResultSet(ResultSetAgent rsAgent)
```

Name	Description
rsAgent	The ResultSetAgent underlying control.

getMetaData

Retrieves a ResultSetMetaData object that contains ResultSet properties.

```
public java.sql.ResultSetMetaData getMetaData()
```

Returns

ResultSetMetaData object

Throws

java.sql.SQLException

getConcurrency

Gets the concurrency mode for this ResultSet object.

```
public int getConcurrency()
```

Returns

Concurrency mode

Throws

java.sql.SQLException

getFetchDirection

Gets the direction suggested to the driver as the row fetch direction.

```
public int getFetchDirection()
```

Returns

Row fetch direction

Throws

java.sql.SQLException

setFetchDirection

Gives the driver a hint as to the row process direction.

```
public void setFetchDirection(int iDir)
```

Name	Description
iDir	Fetch direction to use.

Throws

java.sql.SQLException

getFetchSize

Gets the number of rows to fetch suggested to the driver.

```
public int getFetchSize()
```

Returns

Number of rows to fetch at a time.

Throws

java.sql.SQLException

setFetchSize

Gives the drivers a hint as to the number of rows that should be fetched each time.

```
public void setFetchSize(int nSize)
```

Name	Description
nSize	Number of rows to fetch at a time.

Throws

java.sql.SQLException

getCursorName

Retrieves the name for the cursor associated with this ResultSet object.

```
public java.lang.String getCursorName()
```

Returns

Name of cursor

Throws

java.sql.SQLException

close

Immediately releases a ResultSet object's resources.

```
public void close()
```

Throws

java.sql.SQLException

next

Moves the cursor to the next row of the result set.

```
public boolean next()
```

Returns

true if successful

Throws

java.sql.SQLException

previous

Moves the cursor to the previous row of the result set.

```
public boolean previous()
```

Returns

true if successful

Throws

java.sql.SQLException

absolute

Moves the cursor to the specified row of the result set.

```
public boolean absolute(int index)
```

Returns

true if successful

Throws

java.sql.SQLException

relative

Moves the cursor to the specified row relative to the current row of the result set.

```
public boolean relative(int index)
```

Returns

true if successful

Throws

java.sql.SQLException

first

Moves the cursor to the first row of the result set.

```
public boolean first()
```

Returns

true if successful

Throws

java.sql.SQLException

isFirst

Determines whether the cursor is on the first row of the result set.

```
public boolean isFirst()
```

Returns

true if on the first row.

Throws

java.sql.SQLException

last

Moves the cursor to the last row of the result set.

```
public boolean last()
```

Returns

true if successful

Throws

java.sql.SQLException

isLast

Determines whether the cursor is on the last row of the result set.

```
public boolean isLast()
```

Returns

true if on the last row

Throws

java.sql.SQLException

beforeFirst

Moves the cursor before the first row of the result set.

```
public void beforeFirst()
```

Throws

java.sql.SQLException

isBeforeFirst

Determines whether the cursor is before the first row of the result set.

```
public boolean isBeforeFirst()
```

Returns

true if before the first row

Throws

java.sql.SQLException

afterLast

Moves the cursor after the last row of the result set.

```
public void afterLast()
```

Throws

java.sql.SQLException

isAfterLast

Determines whether the cursor is after the last row of the result set.

```
public boolean isAfterLast()
```

Returns

true if after the last row

Throws

java.sql.SQLException

getType

Retrieves the scroll type of cursor associated with the result set.

```
public int getType()
```

Returns

Scroll type of cursor.

Throws

java.sql.SQLException

findColumn

Returns the column index for the named column in the result set.

```
public int findColumn(java.lang.String index)
```

Name	Description
index	Column name.

Returns

Corresponding column index.

Throws

java.sql.SQLException

getObject

Gets the object value of the specified column.

```
public java.lang.Object getObject(int index)
```

Name	Description
index	Column index.

Returns

Object form of column value.

Throws

java.sql.SQLException

getObject

Gets the object value of the specified column.

```
public java.lang.Object getObject(java.lang.String index)
```

Name	Description
index	Column index.

Returns

Object form of column value.

Throws

java.sql.SQLException

getObject

Gets the object value of the specified column using the given type map.

```
public java.lang.Object getObject(int index, java.util.Map.map)
```

Name	Description
index	Column index.
map	Type map.

Returns

Object form of column value.

Throws

java.sql.SQLException

getObject

Gets the object value of the specified column using the given type map.

```
public java.lang.Object getObject(java.lang.String index,
java.util.Map map)
```

Name	Description
index	Column index.
map	Type map.

Returns

Object form of column value.

Throws

java.sql.SQLException

getBoolean

Gets the boolean value of the specified column.

```
public boolean getBoolean(int index)
```

Name	Description
index	Column index.

Returns

Boolean value of the column.

Throws

java.sql.SQLException

getBoolean

Gets the boolean value of the specified column.

```
public boolean getBoolean(java.lang.String index))
```

Name	Description
index	Column name.

Returns

Boolean value of the column.

Throws

java.sql.SQLException

getByte

Gets the byte value of the specified column.

```
public byte getByte(int index)
```

Name	Description
index	Column index.

Returns

Boolean value of the column.

Throws

java.sql.SQLException

getShort

Gets the short value of the specified column.

```
public short getShort(int index)
```

Name	Description
index	Column index.

Returns

Short value of the column.

Throws

java.sql.SQLException

getShort

Gets the short value of the specified column.

```
public short getShort(java.lang.String index)
```

Name	Description
index	Column name.

Returns

Short value of the column.

Throws

java.sql.SQLException

getInt

Gets the integer value of the specified column.

```
public int getInt(int index)
```

Name	Description
index	Column index.

Returns

Int value of the column.

Throws

java.sql.SQLException

getInt

Gets the integer value of the specified column.

```
public int getInt(java.lang.String index)
```

Name	Description
index	Column name.

Returns

Int value of the column.

Throws

java.sql.SQLException

getLong

Gets the long value of the specified column.

```
public long getLong(int index)
```

Name	Description
index	Column index.

Returns

Long value of the column.

Throws

java.sql.SQLException

getLong

Gets the long value of the specified column.

```
public long getLong(java.lang.String index)
```

Name	Description
index	Column name.

Returns

Long value of the column.

Throws

java.sql.SQLException

getFloat

Gets the float value of the specified column.

```
public float getFloat(int index)
```

Name	Description
index	Column index.

Returns

Float value of the column.

Throws

java.sql.SQLException

getFloat

Gets the float value of the specified column.

```
public float getFloat(java.lang.String index)
```

Name	Description
index	Column name.

Returns

Float value of the column.

Throws

java.sql.SQLException

getDouble

Gets the double value of the specified column.

```
public double getDouble(int index)
```

Name	Description
index	Column index.

Returns

Double value of the column.

Throws

java.sql.SQLException

getBigDecimal

Gets the decimal value of the specified column.

```
public java.math.BigDecimal getBigDecimal(int index)
```

Name	Description
index	Column index.

Returns

Big decimal value of the column.

Throws

java.sql.SQLException

getBigDecimal

Gets the decimal value of the specified column.

```
public java.math.BigDecimal getBigDecimal(java.lang.String index)
```

Name	Description
index	Column name.

Returns

Big decimal value of the column.

Throws

java.sql.SQLException

getDate

Gets the date value of the specified column.

```
public java.sql.Date getDate(int index)
```

Name	Description
index	Column index.

Returns

Date value of the column.

Throws

java.sql.SQLException

getDate

Gets the date value of the specified column.

```
public java.sql.Date getDate(java.lang.String index)
```

Name	Description
index	Column name.

Returns

Date value of the column.

Throws

java.sql.SQLException

getDate

Gets the date value of the specified column using the time zone from the calendar.

```
public java.sql.Date getDate(java.lang.String index,
java.util.Calendar calendar)
```

Name	Description
index	Column name.
calendar	Calendar to use.

Returns

Date value of the column.

Throws

java.sql.SQLException

getTime

Gets the time value of the specified column.

```
public java.sql.Time getTime(int index)
```

Name	Description
index	Column index.

Returns

Time value of the column.

Throws

java.sql.SQLException

getTime

Gets the time value of the specified column.

```
public java.sql.Time getTime(java.lang.String index)
```

Name	Description
index	Column name.

Returns

Time value of the column.

Throws

java.sql.SQLException

getTime

Gets the time value of the specified column.

```
public java.sql.Time getTime(int index, java.util.Calendar calendar)
```

Name	Description
index	Column index.
calendar	Calendar to use.

Returns

Time value of the column.

Throws

java.sql.SQLException

getTime

Gets the time value of the specified column.

```
public java.sql.Time getTime(java.lang.String index,
java.util.Calendar calendar)
```

Name	Description
index	Column name.
calendar	Calendar to use.

Returns

Time value of the column.

Throws

java.sql.SQLException

getTimestamp

Gets the timestamp value of the specified column.

```
public java.sql.Timestamp getTimestamp(int index)
```

Name	Description
index	Column index.

Returns

The timestamp value of the column.

Throws

java.sql.SQLException

getTimestamp

Gets the timestamp value of the specified column.

```
public java.sql.Timestamp getTimestamp(java.lang.String index)
```

Name	Description
index	Column name.

Returns

The timestamp value of the column.

Throws

java.sql.SQLException

getTimestamp

Gets the timestamp value of the specified column using the time zone from the calendar.

```
public java.sql.Timestamp getTimestamp(int index, java.util.Calendar
calendar)
```

Name	Description
index	Column index.

Returns

The timestamp value of the column.

Throws

java.sql.SQLException

getTimestamp

Gets the timestamp value of the specified column using the time zone from the calendar.

```
public java.sql.Timestamp getTimestamp(java.lang.String index,
java.util.Calendar calendar)
```

Name	Description
index	Column name.
calendar	Calendar to use.

Returns

The timestamp value of the column.

Throws

java.sql.SQLException

getString

Gets the string value of the specified column.

```
public java.lang.String getString(int index)
```

Name	Description
index	Column index.

Returns

Returns the String value of the column.

Throws

java.sql.SQLException

getString

Gets the string value of the specified column.

```
public java.lang.String getString(java.lang.String index)
```

Name	Description
index	Column name.

Returns

Returns the String value of the column.

Throws

java.sql.SQLException

getBytes

Gets the byte array value of the specified column.

```
public byte[] getBytes(int index)
```

Name	Description
index	Column index.

Returns

Byte array value of the column.

Throws

java.sql.SQLException

getBytes

Gets the byte array value of the specified column.

```
public byte[] getBytes(java.lang.String index)
```

Name	Description
index	Column name.

Returns

Byte array value of the column.

Throws

java.sql.SQLException

getAsciiStream

Retrieves the value of the specified column value as a stream of ASCII characters.

```
public java.io.InputStream getAsciiStream(int index)
```

Name	Description
index	Column index.

Returns

ASCII output stream value of the column.

Throws

java.sql.SQLException

getAsciiStream

Retrieves the value of the specified column value as a stream of ASCII characters.

```
public java.io.InputStream getAsciiStream(java.lang.String index)
```

Name	Description
index	Column name.

Returns

ASCII output stream value of the column.

Throws

java.sql.SQLException

getBinaryStream

Retrieves the value of the specified column as a stream of uninterpreted bytes.

```
public java.io.InputStream getBinaryStream(int index)
```

Name	Description
index	Column index.

Returns

Binary out steam value of the column.

Throws

java.sql.SQLException

getBinaryStream

Retrieves the value of the specified column as a stream of uninterpreted bytes.

```
public java.io.InputStream getBinaryStream(java.lang.String index)
```

Name	Description
index	Column name.

Returns

Binary out steam value of the column.

Throws

java.sql.SQLException

getCharacterStream

Retrieves the value of the specified column as a Reader object.

```
public java.io.Reader getCharacterStream(int index)
```

Name	Description
index	Column index.

Returns

Reader for value in the column.

Throws

java.sql.SQLException

getArray

Gets the Array value of the specified column.

```
public java.sql.Array getArray(int index)
```

Name	Description
index	Column index.

Returns

Array value of the column.

Throws

java.sql.SQLException

getBlob

Gets the Blob value of the specified column.

```
public java.sql.Blob getBlob(int index)
```

Name	Description
index	Column index.

Returns

Blob value of the column.

Throws

java.sql.SQLException

getBlob

Gets the Blob value of the specified column.

```
public java.sql.Blob getBlob(java.lang.String index)
```

Name	Description
index	Column name.

Returns

Blob value of the column.

Throws

java.sql.SQLException

getClob

Gets the Clob value of the specified column.

```
public java.sql.Clob getClob(int index)
```

Name	Description
index	Column index.

Returns

Clob value of the column.

Throws

java.sql.SQLException

getClob

Gets the Clob value of the specified column.

```
public java.sql.Clob getClob(java.lang.String index)
```

Name	Description
index	Column name.

Returns

Clob value of the column.

Throws

java.sql.SQLException

getRef

Gets the Ref value of the specified column.

```
public java.sql.Ref getRef(int index)
```

Name	Description
index	Column index.

Returns

Ref value of the column.

Throws

java.sql.SQLException

getRef

Gets the Ref value of the specified column.

```
public java.sql.Ref getRef(java.lang.String index)
```

Name	Description
index	Column name.

Returns

Ref value of the column.

Throws

java.sql.SQLException

wasNull

Checks to see if the last value read was SQL NULL or not.

```
public boolean wasNull()
```

Returns

true if SQL NULL.

Throws

java.sql.SQLException

getWarnings

Gets the first SQL Warning that has been reported for this object.

```
public java.sql.SQLWarning getWarnings()
```

Returns

SQL warning.

Throws

java.sql.SQLException

clearWarnings

Clears any warnings reported on this object.

```
public void clearWarnings()
```

Throws

java.sql.SQLException

getRow

Retrieves the current row number in the result set.

```
public int getRow()
```

Returns

Current row number

Throws

java.sql.SQLException

refreshRow

Replaces the values int the current row of the result set with their current values in the database.

```
public void refreshRow()
```

Throws

java.sql.SQLException

insertRow

Inserts the contents of the insert row into the result set and the database.

```
public void insertRow()
```

Throws

java.sql.SQLException

updateRow

Updates the underlying database with the new contents of the current row.

```
public void updateRow()
```

Throws

java.sql.SQLException

deleteRow

Deletes the current row from the result set and the underlying database.

public void deleteRow()

Throws

java.sql.SQLException

6.4 com.stc.eways.jdbcx.SqlStatementAgent Class

java.lang.Object

|

+ -- com.stc.eways.jdbcx.StatementAgent

|

+ -- **com.stc.eways.jdbcx.SqlStatementAgent**

All Implemented Interfaces

ResetEventListener, SessionEventListener

public class SqlStatementAgent

extends StatementAgent

SQLStatement Agent that hosts a managed Statement object.

Constructors of the SqlStatementAgent

SqlStatementAgent

SqlStatementAgent

Methods of the SqlStatementAgent

addBatch on page 147
execute on page 146
executeQuery on page 146
executeUpdate on page 147

Constructor SqlStatementAgent

Creates new SQLStatementAgent with scroll direction TYPE_FORWARD_ONLY and concurrency CONCUR_READ_ONLY.

```
public SqlStatementAgent(Session session)
```

Name	Description
session	Connection session.

Constructor SqlStatementAgent

Creates a new SQLStatementAgent.

```
public SqlStatementAgent(Session session, int iScroll, int iConcur)
```

Name	Description
session	Connection session.
iScroll	Scroll direction: TYPE_FORWARD_ONLY, TYPE_SCROLL_INSENSITIVE, TYPE_SCROLL_SENSITIVE.
iConcur	Concurrency: CONCUR_READ_ONLY, CONCUR_UPDATABLE.

execute

Executes the specified SQL statement.

```
public boolean execute(java.lang.String sSql)
```

Name	Description
sSql	SQL statement.

Returns

true if the first result is a ResultSetAgent or false if it is an integer.

Throws

java.sql.SQLException

executeQuery

Executes the specified SQL query and returns a ResultSetAgent that contains the generated result set.

```
public ResultSetAgent executeQuery(java.lang.String sSql)
```

Name	Description
sSql	SQL statement.

Returns

A ResultSetAgent or null

Throws

java.sql.SQLException

executeUpdate

Executes the specified SQL statement and returns the number of rows that were affected.

```
public int executeUpdate(jave.lang.String sSql)
```

Name	Description
sSql	SQL statement.

Returns

The number of rows affected by the update operation; 0 if no rows were affected.

Throws

java.sql.SQLException

addBatch

Adds the specified SQL statement to the list of commands to be sent as a batch.

```
public void addBatch(java.lang.String sSql)
```

Name	Description
sSql	SQL statement.

Throws

java.sql.SQLException

6.5 com.stc.eways.jdbcx.CallableStatementAgent Class

java.lang.Object
|
+ -- com.stc.eways.jdbcx.StatementAgent
|
+ -- com.stc.eways.jdbcx.PreparedStatementAgent
|
+ -- **com.stc.eways.jdbcx.CallableStatementAgent**

All Implemented Interfaces

ResetEventListener, SessionEventListener

Direct Known Subclasses

StoredProcedureAgent

```
public abstract class CallableStatementAgent
```

extends PreparedStatementAgent

Agent hosts CallableStatement interface

Constructors of the CallableStatementAgent

CallableStatementAgent

CallableStatementAgent

CallableStatementAgent

Methods of the CallableStatementAgent

Constructor CallableStatementAgent

Creates new CallableStatementAgent with scroll direction TYPE_FORWARD_ONLY and concurrency CONCUR_READ_ONLY.

```
public CallableStatementAgent(Session session, java.lang.String
sCommand)
```

Name	Description
session	Connection session.
sCommand	The Call statement used to invoke a stored procedure.

Constructor CallableStatementAgent

Creates a new CallableStatementAgent.

```
public CallableStatementAgent(Session session, int iScroll, int
iConcur)
```

Name	Description
session	Connection session.
iScroll	Ignored.
iConcur	Ignored

Constructor CallableStatement Agent

Creates a new CallableStatementAgent.

```
public CallableStatementAgent(Session session, java.lang.String
sCommand, int iScroll, int iConcur)
```

Name	Description
session	Connection session.
sCommand	The Call statement used to invoke a stored procedure.
iScroll	Scroll direction: TYPE_FORWARD_ONLY, TYPE SCROLL_INSENSITIVE, TYPE_SCROLL_SENSITIVE
iConcur	Concurrency: CONCUR_READ_ONLY, CONCUR_UPDATEABLE

sessionOpen

Opens the session event handler.

```
public void sessionOpen(SessionEvent evt)
```

Overrides

sessionOpen in class PreparedStatementAgent

Name	Description
evt	Session event.

registerOutParameter

Registers the indexed OUT parameter with specified type.

```
public void registerOutParameter(int index, int iType)
```

Name	Description
index	Parameter index starting from 1.
iType	A JDBC type defined by java.sql.Typesjava.sql.Types.

Throws

java.sql.SQLException

registerOutParameter

Registers the indexed OUT parameter with specified type and scale.

```
public void registerOutParameter(int index, int iType, int iScale)
```

Name	Description
index	Parameter index starting from 1.
iType	A JDBC type defined by java.sql.Types.
iScale	The number of digits to the right of the decimal point. Only applied to DECIMAL and NUMERIC types.

Throws

java.sql.SQLException

registerOutParameter

Registers the indexed OUT parameter with specified user-named type or REF type.

```
public void registerOutParameter(int index, int iType,
java.lang.String sType)
```

Name	Description
index	Parameter index starting from 1.
iType	A JDBC type defined by java.sql.Types.

Name	Description
tName	The fully-qualified name of the parameter being set. It is intended to be used by REF, STRUCT, DISTINCT, or JAVA_OBJECT.

Throws

java.sql.SQLException

wasNull

Returns whether or not the last OUT parameter read had the SQL NULL value.

```
public boolean wasNull()
```

Returns

true if the parameter read is SQL NULL; otherwise, false

Throws

java.sql.SQLException

getObject

Gets the value of the indexed parameter as an instance of Object.

```
public java.lang.Object getObject(int index)
```

Name	Description
index	Parameter index starting from 1.

Returns

The Object value

Throws

java.sql.SQLException

getObject

Gets the value of the indexed parameter as an instance of Object and uses map for the customer mapping of the parameter value.

```
public java.lang.Object getObject(int index, java.util.Map map)
```

Name	Description
index	Parameter index starting from 1.

Name	Description
map	A Map object for mapping from SQL type names for user-defined types to classes in the Java programming language.

Returns

An Object value

Throws

java.sql.SQLException

getBoolean

Gets the boolean value of the indexed parameter.

```
public boolean getBoolean(int index)
```

Name	Description
index	Parameter index starting from 1.

Returns

A boolean value

Throws

java.sql.SQLException

getByte

Gets byte value of the indexed parameter.

```
public byte getByte(int index)
```

Name	Description
index	Parameter index starting from 1.

Returns

A byte value

Throws

java.sql.SQLException

getShort

Gets short value of the indexed parameter.

```
public short getShort(int index)
```

Returns

A short value

Throws

java.sql.SQLException

getInt

Gets integer value of the indexed parameter.

```
public int getInt(int index)
```

Name	Description
index	Parameter index starting from 1.

Returns

A int value

Throws

java.sql.SQLException

getLong

Gets long value of the indexed parameter.

```
public long getLong(int index)
```

Name	Description
index	Parameter index starting from 1.

Returns

A long value

Throws

java.sql.SQLException

getFloat

Gets float value of the indexed parameter.

```
public float getFloat(int index)
```

Name	Description
index	Parameter index starting from 1.

Returns

A float value

Throws

java.sql.SQLException

getDouble

Gets double value of the indexed parameter.

```
public double getDouble(int index)
```

Name	Description
index	Parameter index starting from 1.

Returns

A float value

Throws

java.sql.SQLException

getBigDecimal

Gets decimal value of the indexed parameter.

```
public java.math.BigDecimal getBigDecimal(int index)
```

Name	Description
index	Parameter index starting from 1.

Returns

A BigDecimal object

Throws

java.sql.SQLException

getDate

Gets date value of the indexed parameter.

```
public java.sql.Date getDate(int index)
```

Name	Description
index	Parameter index starting from 1.

Returns

A Date object

Throws

java.sql.SQLException

getDate

Gets date value of the indexed parameter with time zone from calendar.

```
public java.sql.Date getDate(int index, java.util.Calendar calendar)
```

Name	Description
index	Parameter index starting from 1.
cal	The Calendar object used to construct the timestamp.

Returns

A Date object

Throws

java.sql.SQLException

getTime

Gets time value of the indexed parameter.

```
public java.sql.Time getTime(int index)
```

Name	Description
index	Parameter index starting from 1.

Returns

A Time object

Throws

java.sql.SQLException

getTime

Gets time value of the indexed parameter with time zone from calendar.

```
public java.sql.Time getTime(int index, java.util.Calendar calendar)
```

Name	Description
index	Parameter index starting from 1.
cal	The Calendar object used to construct the timestamp.

Returns

A Time object

Throws

java.sql.SQLException

getTimestamp

Gets timestamp value of the indexed parameter.

```
public java.sql.timestamp getTimestamp(int index)
```

Name	Description
index	Parameter index starting from 1.

Returns

A Timestamp object

Throws

java.sql.SQLException

getTimestamp

Gets timestamp value of the indexed parameter.

```
public java.sql.timestamp getTimestamp(int index, java.util.Calendar
calendar)
```

Name	Description
index	Parameter index starting from 1.
cal	The Calendar object used to construct the timestamp.

Returns

A Timestamp object

Throws

java.sql.SQLException

getString

Gets string value of the indexed parameter.

```
public java.lang.String getString(int index)
```

Name	Description
index	Parameter index starting from 1.

Returns

A String object

Throws

java.sql.SQLException

getBytes

Gets byte array value of the indexed parameter.

```
public byte[] getBytes(int index)
```

Name	Description
index	Parameter index starting from 1.

Returns

An array of bytes

Throws

java.sql.SQLException

getArray

Gets Array value of the indexed parameter.

```
public java.sql.Array getArray(int index)
```

Name	Description
index	Parameter index starting from 1.

Returns

An Array object

Throws

java.sql.SQLException

getBlob

Gets Blob value of the indexed parameter.

```
public java.sql.Blob getBlob(int index)
```

Name	Description
index	Parameter index starting from 1.

Returns

A Blob object

Throws

java.sql.SQLException

getClob

Gets Clob value of the indexed parameter.

```
public java.sql.Clob getClob(int index)
```

Name	Description
index	Parameter index starting from 1.

Returns

A Blob object

Throws

java.sql.SQLException

getRef

Gets Ref value of the indexed parameter.

```
public java.sql.Ref getRef(int index)
```

Name	Description
index	Parameter index starting from 1.

Returns

A Ref object

Throws

java.sql.SQLException

6.6 com.stc.eways.jdbcx.TableResultSet Class

java.lang.Object

|

+ -- com.stc.eways.jdbcx.StatementAgent

|

+ -- **com.stc.eways.jdbcx.TableResultSet**

All Implemented Interfaces

ResetEventListener, SessionEventListener

```
public abstract class TableResultSet
```

extends StatementAgent

ResultSet to map selected records of table in the database

Methods of the TableResultSet

select

Select table records.

```
public void select(java.lang.String sWhere)
```

Name	Description
sWhere	Where condition for the query.

Throws

java.sql.SQLException

next

Navigate one row forward.

```
public boolean next()
```

Returns

true if the move to the next row is successful; otherwise, false.

Throws

java.sql.SQLException

previous

Navigate one row backward. It should be called only on ResultSetAgent objects that are TYPE_SCROLL_SENSITIVE or TYPE_SCROLL_INSENSITIVE.

```
public boolean previous()
```

Returns

true if the cursor successfully moves to the previous row; otherwise, false.

Throws

java.sql.SQLException

absolute

Move cursor to specified row number. It should be called only on ResultSetAgent objects that are TYPE_SCROLL_SENSITIVE or TYPE_SCROLL_INSENSITIVE.

Name	Description
row	An integer other than 0.

Returns

true if the cursor successfully moves to the specified row; otherwise, false.

Throws

java.sql.SQLException

relative

Move the cursor forward or backward a specified number of rows. It should be called only on ResultSetAgent objects that are TYPE_SCROLL_SENSITIVE or TYPE_SCROLL_INSENSITIVE.

```
public boolean relative(int rows)
```

Name	Description
rows	The number of rows to move the cursor, starting at the current row. If the rows are positive, the cursor moves forward; if the rows are negative, the cursor moves backwards.

Returns

true if the cursor successfully moves to the number of rows specified; otherwise, false.

Throws

java.sql.SQLException

first

Move the cursor to the first row of the result set. It should be called only on ResultSetAgent objects that are TYPE_SCROLL_SENSITIVE or TYPE_SCROLL_INSENSITIVE.

```
public boolean first()
```

Returns

true if the cursor successfully moves to the first row; otherwise, false.

Throws

java.sql.SQLException

isFirst

Check if the cursor is on the first row. It should be called only on ResultSetAgent objects that are TYPE_SCROLL_SENSITIVE or TYPE_SCROLL_INSENSITIVE.

```
public boolean isFirst()
```

Returns

true if the cursor successfully moves to the first row; otherwise, false.

Throws

java.sql.SQLException

last

Move to the last row of the result set. It should be called only on ResultSetAgent objects that are TYPE_SCROLL_SENSITIVE or TYPE_SCROLL_INSENSITIVE.

```
public boolean last()
```

Returns

true if the cursor successfully moves to the last row; otherwise, false.

Throws

java.sql.SQLException

isLast

Check if the cursor is positioned on the last row. It should be called only on ResultSetAgent objects that are TYPE_SCROLL_SENSITIVE or TYPE_SCROLL_INSENSITIVE.

```
public boolean isLast()
```

Returns

true if the cursor is on the last row; otherwise, false

Throws

java.sql.SQLException

beforeFirst

Move the cursor before the first row. It should be called only on ResultSetAgent objects that are TYPE_SCROLL_SENSITIVE or TYPE_SCROLL_INSENSITIVE.

```
public void beforeFirst()
```

Throws

java.sql.SQLException

isBeforeFirst

Check if the cursor is positioned before the first row. It should be called only on ResultSetAgent objects that are TYPE_SCROLL_SENSITIVE or TYPE_SCROLL_INSENSITIVE.

```
public boolean isBeforeFirst()
```

Returns

true if the cursor successfully moves before the first row; otherwise, false

Throws

java.sql.SQLException

afterLast

Move the cursor after the last row.It should be called only on ResultSetAgent objects that are TYPE_SCROLL_SENSITIVE or TYPE_SCROLL_INSENSITIVE.

```
public void afterLast()
```

Throws

java.sql.SQLException

isAfterLast

Returns true if the cursor is positioned after the last row. It should be called only on ResultSetAgent objects that are TYPE_SCROLL_SENSITIVE or TYPE_SCROLL_INSENSITIVE.

```
public boolean isAfterLast()
```

Returns true if the cursor successfully moves after the last row; otherwise, false.

Throws

java.sql.SQLException

findColumn

Finds the index of the named column.

public int findColumn(java.lang.String index)

Throws

java.sql.SQLException

getAsciiStream

Returns the column data as an AsciiStream.

```
public java.io.InputStream getAsciiStream(int index)
```

Throws

java.sql.SQLException

getAsciiStream

Returns the column data as an AsciiStream.

```
public java.io.InputStream getAsciiStream(java.lang.String
columnName)
```

Throws

java.sql.SQLException

getBinaryStream

Returns the column data as BinaryStream.

```
public java.io.InputStream getBinaryStream(int index)
```

Throws

java.sql.SQLException

getBinaryStream

Returns the column data as BinaryStream.

```
public java.io.InputStream getBinaryStream(java.lang.String
columnName)
```

Throws

java.sql.SQLException

getCharacterStream

Returns the column data as CharacterStream.

```
public java.io.Reader getCharacterStream(int index)
```

Throws

java.sql.SQLException

getCharacterStream

Returns the column data as CharacterStream.

```
public java.io.Reader getCharacterStream(java.lang.String columnName)
```

Throws

java.sql.SQLException

refreshRow

Refreshes the current row with its most recent value from the database.

```
public void refreshRow()
```

Throws

java.sql.SQLException

insertRow

Inserts the contents of the current row into the database.

```
public void insertRow()
```

Throws

java.sql.SQLException

updateRow

Updates the contents of the current row into the database.

```
public void updateRow()
```

Throws

java.sql.SQLException

deleteRow

Deletes the contents of the current row from the database.

```
public void deleteRow()
```

Throws

java.sql.SQLException

moveToInsertRow

Moves the current position to a new insert row.

```
public void moveToInsertRow()
```

Throws

java.sql.SQLException

moveToCurrentRow

Moves the current position to the current row. It is used after you insert a row.

```
public void moveToCurrentRow()
```

Throws

java.sql.SQLException

cancelRowUpdates

Cancels any updates made to this row.

```
public void cancelRowUpdates()
```

Throws

java.sql.SQLException

rowInserted

Returns true if the current row has been inserted.

```
public boolean rowInserted()
```

Throws

java.sql.SQLException

rowUpdated

Returns true i the current row has been updated.

```
public boolean rowUpdated()
```

Throws

java.sql.SQLException

rowDeleted

Returns true if the current row has been deleted.

```
public boolean rowDeleted()
```

Throws

java.sql.SQLException

wasNull

Returns true if the last data retrieved is NULL.

```
public boolean wasNull()
```

Throws

java.sql.SQLException

6.7 $DB Configuration Node Methods

The following methods are associated with the $DB configuration node in the Collaboration. These methods are driver and database specific and will vary from database to database. It is recommended that you consult your specific databases documentation.

These methods are contained in the following classes:

- **com_stc_jdbcx_db2cfg.DataSource** on page 167
- **com_stc_jdbcx_db2cfg** on page 177

6.8 com_stc_jdbcx_db2cfg.DataSource

Java.lang.Object

|

+ - - com_stc_jdbcx_db2cfg.Com_stc_jdbcx_db2cfg.DataSource

Direct Known Subclasses

```
public class Com_stc_jdbcx_db2cfg.DataSource
```

extends java.lang.Object

Methods of the db2cfg.DataSource

getClass

Retrieves the name of the Java class in the JDBC driver that implements the ConnectionPoolDataSource.

```
public java.lang.String getClass_()
```

Returns

java.lang.String

setClass

Sets the name of the Java class in the JDBC driver that implements the ConnectionPoolDataSource interface.

```
public void setClass_(java.lang.string val)
```

Returns

None.

hasClass

Returns true if the java class name has been set.

```
public boolean hasClass_()
```

Returns

True.

omitClass

Sets the java class name to null.

```
public void omitClass_()
```

Returns

None.

getConnectionMethod

Retrieves the connection method.

```
public java.lang.String getConnectionMethod()
```

Returns

java.lang.String

setConnectionMethod

Specifies which method is used to connect to the database server.

Pooled Data Source - a ConnectionPoolDataSource object for creating PooledConnection objects. A PooledConnection object represents a physical connection and is cached in memory for reuse which saves the overhead of establishing a new connection. This is implemented by the driver.

XA Data Source - an XADataSource object for creating XAConnection objects, connections that can be used for distributed transactions.

One should make sure that the class specified in "class" parameter supports the connection method that is used.

The default is "Pooled Data Source".

```
public void setConnectionMethod(java.lang.String val)
```

Returns

None.

hasConnectionMethod

Returns true if the connection method has been set.

```
public boolean hasConnectionMethod()
```

Returns

True.

omitConnectionMethod

Sets the connection method to null.

```
public void omitConnectionMethod()
```

Returns

None.

getCollectionID

Retrieves the connection ID.

```
public java.lang.String getCollectionID()
```

Returns

java.lang.String.

setCollectionID

Sets the collection (group of packages) to which the package is bound.

```
public void setCollectionID(java.lang.String val)
```

Returns

None.

hasCollectionID

Returns true if the collection ID has been set.

```
public boolean hasCollecitonID()
```

Returns

True.

omitCollectionID

Sets the collection ID to null.

```
public void omitCollectionID()
```

Returns

None.

getDatabaseName

Retrieves the database name.

```
public java.lang.String getDatabaseName()
```

Returns

java.lang.String

setDatabaseName

The alias name of the database which you want to connect to. Normally, this would be used with UDB.

```
public void setDatabaseName(java.lang.String val)
```

Returns

None.

hasDatabaseName

Returns true if the database name has been set.

```
public boolean hasDatabaseName()
```

Returns

True.

omitDatabaseName

Sets the Database name to null.

```
public void omitDatabaseName()
```

Returns

None.

getLocationName

Retrieves the name of the DB2 location that you want to access. Used with an OS/390 operating system.

```
public.java.lang.String getLocationName()
```

Returns

java.lang.String.

setLocationName

Sets the name of the DB2 location that you want to access. Used with an OS/390 operating system.

```
public void setLocationName(java.lang.String val)
```

Returns

None.

hasLocationName

Returns true if the location name has been set.

```
public boolean hasLocationName()
```

Returns

True.

omitLocationName

Sets the location name to null.

```
public void omitLocationName()
```

Returns

None.

getPackageName

Retrieves the name of the package that the driver uses to process static and dynamic SQL.

```
public java.lang.String getPackagName()
```

Returns

java.lang.String

setPackageName

Set the name (7-character limit) of the package that the driver uses to process static and dynamic SQL.

```
public void setPackageName(java.lang.String val)
```

Return

None.

hasPackageName

Returns true if the Package Name has been set.

```
public boolean hasPackageName()
```

Returns

True.

omitPackageName

Sets the Package Name to null.

```
public void omitPackageName()
```

Returns

None.

getUserName

Retrieves the case-insensitive user name used to connect to your DB2 database.

```
public java.lang.String getUserName()
```

Returns

`java.lang.String`.

setUserName

Sets the case-insensitive user name used to connect to your DB2 database.

```
public void setUserName(java.lang.String val)
```

Returns

None.

hasUserName

Returns true if the User Name has been set.

```
public boolean hasUserName()
```

Returns

True.

omitUserName

Sets the user name to null.

```
public void omitUserName()
```

Returns

None.

getPassword

Retrieves the password the e*Way uses to connect to the database.

```
public java.lang.String getPassword()
```

Returns

`java.lang.String`.

setPassword

Sets the password (will be encrypted internally) the e*Way uses to connect to the database.

```
public void setPassword (java.lang.String val)
```

Returns

None.

setPassword_AsIs

Sets the password (will not be encrypted internally) the e*Way uses to connect to the database.

```
public void setPassword_AsIs (java.lang.String val)
```

Returns

None.

hasPassword

Returns true if password has been set.

```
public boolean hasPassword()
```

Returns

True.

omitPassword

Sets the password to null.

```
public void omitPassword()
```

Returns

None.

getPortNumber

Retrieves the TCP port (use for DataSource connections only).

```
public java.lang.String getPortNumber()
```

Returns

`java.lang.String`.

setPortNumber

Sets the TCP port (use for DataSource connections only).

```
public void setPortNumber(java.lang.String val)
```

Returns

None.

hasPortNumber

Returns true if the port number has been set.

```
public boolean hasPortNumber()
```

Returns

True.

omitPortNumber

Sets the port number to null.

```
public void omitPortNumber()
```

Returns

None.

getServerName

Retrieves the IP address (use for DataSource connections only).

```
public java.lang.String getServerName()
```

Returns

`java.lang.String`.

setServerName

Sets the IP address (use for DataSource connections only).

```
public void setServerName (java.lang.String val)
```

Returns

None.

hasServerName

Returns true if the server name has been set.

```
public boolean hasServerName()
```

Returns

True.

omitServerName

Sets the server Name to null.

```
public void omitServerName()
```

Returns

None.

getTimeout

Retrieves the login timeout in seconds.

```
public java.lang.String getTimeout()
```

Returns

`java.lang.String`.

setTimeout

Sets the login timeout in seconds.

```
public void setTimeout(java.lang.String val)
```

Returns

None.

hasTimeout

Returns true if the login time out has been set.

```
public boolean hasTimeout()
```

Returns

True.

omitTimeout

Sets the time out to null.

```
public void omitTimeout()
```

Returns

None.

6.9 com_stc_jdbcx_db2cfg

com_stc_jdbcx_db2cfg.Com_stc_jdbcx_db2cfg

Direct Known Subclasses

```
public class Com_stc_jdbcx_db2cfg
```

Methods of the db2cfg

getDataSource on page 177	**setDataSource** on page 177

getDataSource

Retrieves the DataSource object.

```
public Com_stc_jdbcx_db2cfg.DataSource getDataSource()
```

Returns

None.

setDataSource

Sets the DataSource object.

```
public void setDataSource (Com_stc_jdbcx_db2cfg.DataSource val)
```

Returns

None.

Appendix A

Appendix

A.1 ADO/ODBC Calls

These calls are made by the DBWizard for metadata discovery.

A.1.1 ADO Calls

OpenSchema(adSchemaTables	Retrieves the list of tables.
OpenSchema(adSchemaColumns)	Retrieves the column information for a table.
OpenSchema(adSchemaProcedures)	Retrieves the list of stored procedures.
OpenSchema(adSchemaProcedureParameters)	Retrieves the parameter information of a stored procedure.

A.1.2 ODBC Calls

SQLDataSources	Retrieves the list of DSNs.
SQLPrepared	Used to prepare a SQL prepared statement string.
SQLNumParams	Retrieves the number of parameters in a prepared statement.
SQLDescribeParam	Retrieves information about a prepared statement parameter.
SQLNumResultCols	Retrieves the number of resultset columns in a prepared statement.
SQLDescribeCol	Retrieves information about a resultset column in a prepared statement.

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