SeeBeyond™ eBusiness Integration Suite

e*Way Intelligent Adapter for ADABAS User's Guide

Release 4.5.2

SEEBEYOND™

Version 20020304145047.

Contents

Chapter 1

Introduction

This document describes how to install and configure the e*Way Intelligent Adapter for ADABAS.

1.1 Overview

The ADABAS e*Way enables e*Gate Integrator to exchange data with an external ADABAS file system. The ADABAS e*Way is similar to other Database e*Ways, such as Oracle, DB2/UDB, SQL Server and Sybase. The ADABAS e*Way uses the Multi-Mode e*Way, e*Way Connections, and Java Collaborations to enable ADABAS data integration. The ADABAS e*Way enables e*Gate Integrator running on Windows and UNIX systems to communicate with ADABAS files on the OS/390 Host system via TCP/IP. This e*Way utilizes a third-party software component that allows you to view and access ADABAS as if they were a standard Relational Database system.

1.1.1 Intended Reader

The reader of this guide is presumed:

- to be a developer or system administrator with the responsibility of maintaining the e*Gate system.
- to have expert-level knowledge of Windows or UNIX operations and administration.
- to be thoroughly familiar with SQL functions.
- to be thoroughly familiar with Windows-style GUI operations.

1.1.2 Components

The e*Way comprises the following components:

- e*Way Connections: The ADABAS e*Way Connections provide access to the information necessary for connecting to a specified collection of ADABAS files.
- Java client-side drivers: Third-party drivers that enable the e*Way to connect out from the Windows or UNIX environment to the OS/390 system where the ADABAS files reside.

- ADABAS Server: A third-party product that is installed and configured to access ADABAS files on the OS/390 Host system.
- ODBC Driver: Is utilized by the DBWizard to enable it to connect to the OS/390 server and obtain ADABAS metadata for creation of the ETDs.
- JDBC Driver (**sljc_brand.jar, sljcx.jar**): File that contains the logic required by the e*Way to interact with the external ADABAS data.
- DataMapper.

A complete list of installed files appears in **Table 1 on page 20**.

1.2 Operational Overview

The ADABAS e*Way uses Java Collaborations to interact with one or more external ADABAS file systems. By using the Java Collaboration Service it is possible for e*Gate components to connect to external ADABAS data and execute business rules written entirely in Java.

1.3 Technical Overview

The ADABAS server runs as a Batch Job or Started Task on the OS/390 system and requires a TCP/IP port for it to listen on connections from the e*Ways on Windows and UNIX. The number of concurrent and maximum users are configurable, the software can be configured to support multiple users in a single address space, or you can distribute the load across multiple address spaces.

The following ADABAS features are supported:

- ADABAS constructs:
  - PE: Periodic Groups
  - MU: Multiple-Value fields
- Descriptors, super descriptors and sub-descriptors in indexing
- Online transaction processing with integrity by accessing ADABAS from its own address and space or partition
- Manges mainframe security through SAF, therefore supporting RACF, ACF2, and so on
- Manages and monitor ADABAS using existing system tools
- Supports TCP/IP. LU6.2, and MQ Series connectivity
- Provides a meta data-driven implementation with automated integration with PREDICT
- Complex filtering via views and logical tables

1.4 Supported Operating Systems

Although the ADABAS e*Way components will run on the supported platforms listed below, the ETD Editor and Collaboration Editor require Windows NT or Windows 2000.

The ADABAS e*Way is available on the following operating systems:

- Windows 2000, Windows 2000 SP1, and Windows 2000 SP2
- Windows NT 4.0 SP6a
- Solaris 2.6, 7, and 8
- HP-UX 11.0 and HP-UX 11i
- AIX 4.3.3

1.5 System Requirements

To use the ADABAS e*Way, you need the following:

- An e*Gate Participating Host, version 4.5.1 or later. For AIX, you need an e*Gate Participating Host, version 4.5.1.
- A TCP/IP network connection.

Windows 2000 or Windows NT Requirements

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

- The DataMapper. Used to map the target data files.
- The Merant ODBC drivers.
- The Merant SequeLink 5.2 for Legacy Server. Runs on the PC where the ODBC data source is required.
- The Merant JDBC drivers (required to connect to the external ADABAS files if you are installing the ADABAS e*Way on a Windows 2000 or Windows NT environment).

UNIX Requirements

If you are installing the ADABAS e*Way on a UNIX system, you will need the following:

- The Merant JDBC drivers (required to connect to the external ADABAS files).

The DataMapper, Merant ODBC driver, A Merant SequeLink 5.2 for Legacy Server, and the e*Gate GUI must be installed on Windows 2000 or Windows NT.

1.6 External System Requirements

1.6.1 OS/390 Requirements

- The ADABAS Server. Installed via 3480 cartridge tape or CD-ROM. ADABAS Server is synonymous with eXadas Server.
- OS/390 Release 2.9 or 2.10

1.6.2 Additional External System Requirements

- The Merant SequeLink 5.2 for Legacy Server

Chapter 2

Installation

This chapter describes how to install the ADABAS e*Way. Unlike other e*Ways, you must install ADABAS in the following order. Once installed, you may want to pass a small amount of data to assure you have a working connection.

- Install the eXadas Server. ADABAS Server is synonymous with eXadas Server.
- Install the Merant Sequelink 5.2 for Legacy Server.
- Install the Merant JDBC driver.
- Install the Merant ODBC driver.
- Install the DataMapper.
- Install the ADABAS e*Way.

2.1 Installing the ADABAS Server

This section describes how to complete a new installation of the eXadas Server.

1 Copy sample install jobs from the distribution tape.

- Use JCL similar to the example at the end of this step, with the following changes:
  - Replace **TVOL** with the VOL=SER (volume serial number) of the distribution tape.
  - Replace **TUNIT** with the tape drive unit type such as, CART or TAPE.
  - Replace **DUNIT** with the device name for DASD storage.
  - Replace **HILV** with the high-level qualifier(s) for the eXadas data sets.
  - Replace **VRM** with the version/release/modification level for this eXadas version, release, and modification level.

    The form for this qualifier is V*v*R*r*M*mm*. For example:

    V2R1M00
- Insert a valid job card.

Submit the job for batch execution. This step requires the distribution tape. When this installation step is complete, the members specified on the SELECT MEMBER=

statements have been copied from the distribution tape to the specified INSTALL library. A copy of job JCL CXAXCOPY follows.

```
//CXAXCOPY JOB .
//CXAXCOPY EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=**SYSOUT**
//BASE DD UNIT=**TUNIT**,VOL=SER=**TVOL**,
// DSN=CXA220B.F1,
// LABEL=(2,SL,EXPDT=98000),DISP=OLD
//INSTALL DD UNIT=**DUNIT**,
// SPACE=(TRK,(5,5,10),RLSE),
// DSN=**HILEV**.**VRM**.INSTALL,
// RECFM=FB,LRECL=80,BLKSIZE=27920,
// DISP=(NEW,CATLG)
//SYSIN DD *
COPY INDD=BASE,OUTDD=INSTALL
SELECT MEMBER=CXAXPREP
SELECT MEMBER=CXAXALLO
SELECT MEMBER=CXAXREC
SELECT MEMBER=CXAXAPP
SELECT MEMBER=CXAXACC
SELECT MEMBER=CXAXPOST
SELECT MEMBER=CXAXEPRM
SELECT MEMBER=CXAXFPRM
SELECT MEMBER=CXAXPARM
SELECT MEMBER=CXAXREJ
SELECT MEMBER=CXAXREST
SELECT MEMBER=CXAXDEL
SELECT MEMBER=CXAXCOPY
/*
//
```

2 Edit the CXAXPARM member in the INSTALL library.

CXAXPARM contains installation specific information required by the JCL tailoring EXEC.

Information in CXAXPARM is case-sensitive and must be uppercase. Enter your changes to the right of the equal sign (=). The CXAXPARM variables include:

- JOBCARD.1 is a JOB statement.
- JOBCARD.2 is a JOB statement.
- JOBCARD.3 is a JOB statement.
- JOBCARD.4 is a JOB statement.
- JOBCARD.5 is a JOB statement.
- JOBCARD.6 is a JOB statement.
- JOBCARD.7 is a JOB statement.
- JOBCARD.8 is a JOB statement.
- JOBNAMES= specifies whether to replace the job name entered in the JOBCARD.1 field or not. The selections include:
  - N: do not replace the job name with the PDS member name where the JCL resides. The system uses the jobname in JOBCARD.1 for all jobs.
  - Y: replace the job name with the PDS member name where the JCL resides.
- SYSOUT is the SYSOUT class for all installation job streams.

- DISKVOLU is the disk volume VOL=SER where the SMP/E and eXadas data sets are to be allocated.
- DISKUNIT is the generic unit related to diskvolu.
- TEMPUNIT is the generic unit to be used for all SMP/E temporary data sets.
- TAPEVOLU is the distribution tape VOL=SER. The VOL=SER can be found on the packing list and tape label sent with your eXadas shipment.
- TAPEUNIT is the generic unit related to tapevolu.
- SMPEHILV is the SMP/E data set high-level qualifier(s).
- CXAFHILV is the eXadas data set high-level qualifier(s).
- CXAFVVRM is the eXadas version, release, and modification level, in the form VvRrMmm, for example V2R1M00.
- TARGET is the eXadas SMP/E target zone name.
- DISTRIB is the eXadas SMP/E distribution zone name.

Important: *When editing SCXASAMP and SCXACONF members, make sure that line numbers are not automatically inserted by the editor. (Under ISPF, set NUM OFF in the edit profile.)*

3 Run the JCL tailoring REXX EXEC.

From the command line in ISPF, enter the following command, replacing CXAFHILV and CXAFVVRM with the values entered in the JCL in step 1.

TSO EX ‘cxafhilv.cxafvvrm.INSTALL(CXAXEPRM)

CXAXEPRM updates the following members in INSTALL data set with information contained in CXAXPARM as entered in step 2:

- CXAXPREP,
- • CXAXALLO,
- • CXAXREC,
- • CXAXAPP,
- • CXAXACC,
- • CXAXPOST,
- • CXAXREJ,
- • CXAXREST, and
- • CXAXDEL.’

The message:

Customization of installation JCL complete

appears when CXAXEPRM completes the update.

Important: *CXAXEPRM must only be executed once. If an error occurs, delete all data sets and restart the installation at Step 1.*

4 Submit member CXAXPREP.

This job allocates and prepares SMP/E control data sets.

5 Submit member CXAXALLO.

This job allocates ADABAS data sets.

6 Submit member CXAXREC.

This job RECEIVEs the eXadas component(s) using SMP/E. This step requires the distribution tape.

7 Submit member CXAXAPP.

This job APPLYs the eXadas component(s) into the target libraries using SMP/E.

8 Submit member CXAXACC.

This job ACCEPTs the eXadas server component(s) into the distribution libraries using SMP/E.

9 Submit member CXAXPOST.

This job copies the error message catalog SCXAMENU into an FBS Sequential file for access by all eXadas server components and also creates an environment for the eXadas IVP process. A eXadas data cluster is created, along with the eXadas Meta Data Catalogs required for IVP data access.

Note: *All of the batch jobs submitted in steps 4 through 9 must end in a Condition Code 0 for installation to be completed successfully. Any job that does not end in Condition Code 0 requires investigation and resolution before proceeding to the next step. (Bypassing ++HOLD statements, if necessary, during step 7 and step 8 results in a Condition Code 4 for these steps. This is an acceptable code in these situations).*

10 APF-authorize the SCXALOAD and SCXASASC libraries, if needed.

11 Grant authority to the eXadas data sets.

Grant execute authority to SCXALOAD and SCXASASC, update authority to SCXACONF, SCXASAMP, and SCXAMAC, and read authority to all other eXadas data sets.

Minimally, you need to grant this authority to all developers who will be using, installing, and/or maintaining the eXadas server. You may want to grant universal access of read to these data sets (execute access for SCXALOAD and SCXASASC).

For additional information, refer to the eXadas documentation included on the e*Gate installation CD-ROM.

2.2 Installing the eXadas Client

To install the eXadas Client on your SequeLink server machine, insert the installation CD-ROM into your CD-ROM drive. Navigate to your CD-ROM drive and to the eXadas folder located on the installation CD-ROM. Select the appropriate folder for your specific platform and follow the installation shield instructions.

Refer to the eXadas Client documentation located on the installation CD-ROM for additional information.

2.3 Installing the Sequelink Server

To install the Sequelink server on your machine, insert the installation CD-ROM into your CD-ROM drive. Navigate to your CD-ROM drive and to the Sequelink folder located on the installation CD-ROM. Select the appropriate folder for your specific platform and follow the installation shield instructions. This only needs to be installed on your Sequelink server machine.

Refer to the Sequelink documentation located on the installation CD-ROM for further instruction.

2.4 Installing the JDBC Driver

To install the Merant JDBC driver on your machine, insert the installation CD-ROM into your CD-ROM drive. Navigate to your CD-ROM drive and to the JDBC driver for you specific platform. Follow the instructions given on the installation shield.

Please refer to the Merant documentation located on the e*Gate installation CD-ROM for further instruction.

2.5 Installing ODBC / OLE DB Driver

To install the Merant ODBC/OLE DB drivers on your machine, insert the installation CD-ROM into your CD-ROM drive. Navigate to your CD-ROM drive and follow the instructions given on installation shield.

Please refer to the Merant documentation located on the e*Gate installation CD-ROM for further instruction.

2.6 Installing the DataMapper

This section describes installing DataMapper for Windows NT and Windows 2000. The DataMapper must be installed on Windows NT or a Windows 2000 system.

To install the DataMapper, follow these steps.

1. Insert the CD-ROM into the CD-ROM drive and select **Run** from the **Start** button.
2. Type the following line in the Command Line field (drive is the name of the drive on your computer from which you are installing the DataMapper, for example D:).

   ```
   drive:setup
   ```

3. Click **OK** (or click Enter for Windows NT).

   There are three optional sets of files for installation.

   - Program files, which are the executables and runtime system for running the DataMapper.
   - Help files that comprise the Help system for the DataMapper.
   - Sample files that include Sample COBOL Copybooks and IMS/DL/I DBDs and IDMS schema and subschema for testing the DataMapper's features. CrossAccess recommends installing all three sets of files. The minimum requirement is installing the program files in option 1.

When installation is complete, a program group named eXadas is created in Windows. The group contains the program items for the DataMapper, the DataMapper Help system, and the DataMapper README file. To start the DataMapper, double-click the mouse on the DataMapper icon in the eXadas program group.

Refer to the eXadas DataMapper documentation located on the e*Gate installation CD-ROM for further instruction.

2.7 Installing the ADABAS e*Way on Windows 2000 or Windows NT

The following information will guide you through installing the e*Way.

2.7.1 Pre-installation

Before beginning the installation process, you must do the following:

1. Exit all Windows programs before running the setup program, including any anti-virus applications.
2. Assure that you have Administrator privileges before installing this e*Way.

2.7.2 Installation Procedure

To install the ADABAS e*Way on a Windows NT or Windows 2000 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.

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.**

2.8 Installing the ADABAS e*Way on UNIX

2.8.1 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 privileges to create files in the e*Gate directory tree.

2.8.2 Installation Procedure

To install the ADABAS 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.

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.

2.9 Files/Directories Created by the Installation

The ADABAS 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 1 Files created by the installation

e*Gate Directory	File(s)
classes\	stcjdbcx.jar
configs\ADABAS\	adabas.def
etd\	adabas.ctl vsam.ctl
etd\vsam	Com_stc_jdbcx_vsamcfg.java Com_stc_jdbcx_vsamcfg.xsc
ThirdParty\merant\classes	sljc_brand.jar sljcx.jar spy.jar
ThirdParty\sun\classes	jdbc2_0-stdext.jar

Chapter 3

e*Way Connection Configuration

This chapter describes how to configure the ADABAS e*Way Connections.

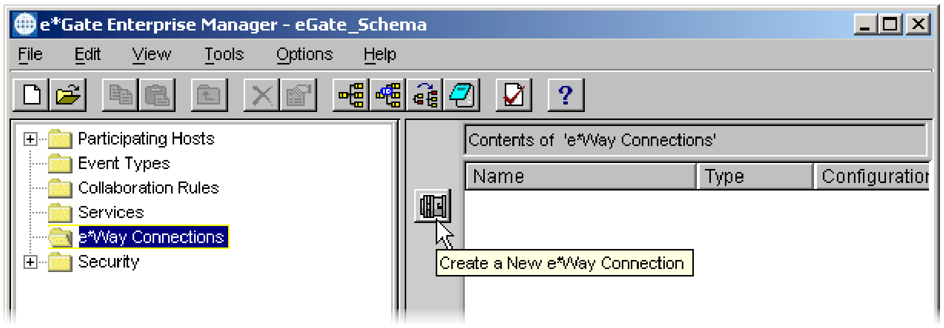
3.1 Create e*Way Connections

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

To create and configure the e*Way Connections:

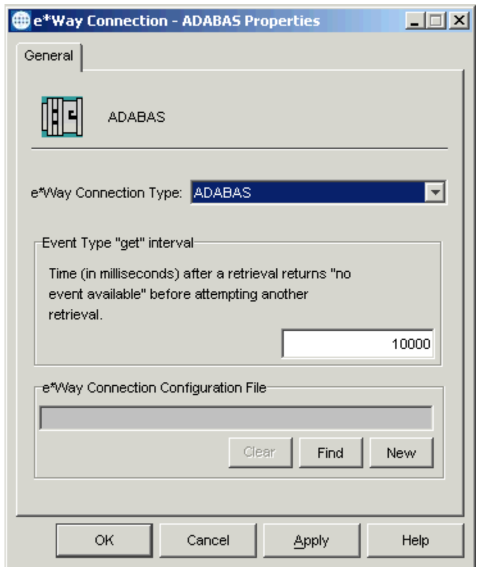
1. In the Enterprise Manager’s Component editor, select the e*Way Connections folder.

Figure 1 The e*Way Connections Folder



2. On the Palette, click the **New e*Way Connection** icon.
3. The **New e*Way Connection Component** 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.

Figure 2 e*Way Connection Properties Dialog Box


e*Way Connection - ADABAS Properties
General
ADABAS

e*Way Connection Type: ADABAS

Event Type "get" interval

Time (in milliseconds) after a retrieval returns "no event available" before attempting another retrieval.

10000

e*Way Connection Configuration File
Clear
Find
New
OK
Cancel
Apply
Help

5 From the e*Way Connection Type dropdown box, select **ADABAS**.

6 Enter the **Event Type "get" interval** in the dialog box provided.

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 Settings

3.1.1 DataSource Settings

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

Driver

Description

Specifies the Java class in the JDBC driver.

Required Values

A valid driver.

The default is **com.merant.sequelink.jdbc.SequeLinkDriver**

JDBC URL

Description

This is the JDBC URL necessary to gain access to the ADABAS database. Typically, the ADABAS JDBC URL looks like this.

jdbc:sequelink://<host>:<port>;Datasource=<database>

Where <host> is the IP address or node name of the SequeLink server. Where <port> is the number of the Sequelink server. Where <database> is the name of the data source on the Sequelink server. The datasource parameter is not required if the datasource is the default datasource configured on the Sequelink server. Any other source will require this parameter.

Required Values

A valid JDBC URL.

User Name

Description

This is the case-insensitive user name used to connect to your ADABAS files.

Required Values

Any valid string.

Password

Description

This is the password the e*Way uses to connect to the database.

Required Values

A valid string encryption.

3.1.2 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 connection is **DB**.

Required Values

The default is **DB**.

class

Description

Specifies the 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.

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

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.

Required Values

Any valid string.

connection verification interval

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.

Required Values

Any valid string.

3.2 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'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 23. If you choose to manually control the e*Way connections, you may find the following chart helpful.

Figure 3 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 (XA)	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 23.

Chapter 4

Implementation

This chapter discusses how to implement the ADABAS e*Way in a production environment. Also included is a sample configuration.

4.1 The Java Collaboration Service

The Java Collaboration Service makes it possible to develop external Collaboration Rules that will 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 subcollaborations, 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*.

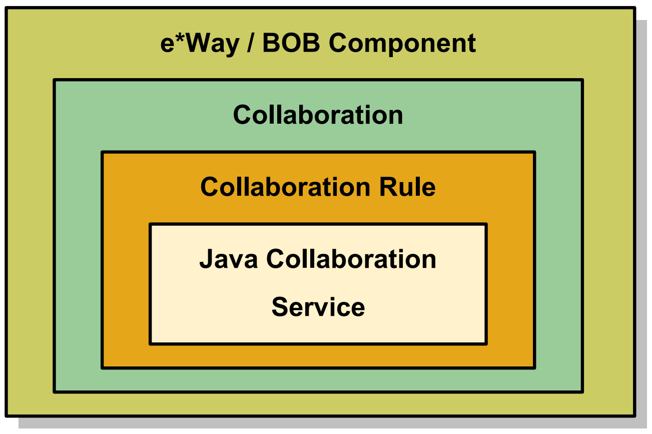
4.1.1 Java Components

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/BOB and the Collaboration Service.

Before working with the collaborations, you will need to import your Java packages **intersolv.sequelink.*** and **intersolv.jdbc.sequelink.***. To do this click **Tools**, **Import** and then select these files from the drop down list.

Figure 4 illustrates the relationship between the higher level e*Gate component and the Collaboration Service.

Figure 4 Component Relationship



The e*Way/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.

4.2 The Java ETD Builder

The Java ETD Builder is used to generate a Java-enabled ETD. The ETD Builder connects to the external ADABAS file system as if it where connecting to a database and generates the ETD corresponding to the external tables and procedures.

Purpose of ETDs

Each ETD serves the following important purpose and function in the e*Gate system:

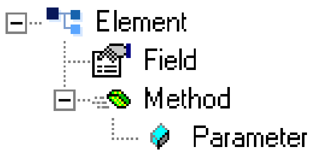
- An ETD is a structural representation of an Event (package of data). It is an actual blueprint of data to be processed in e*Gate. The run-time components use ETDs to parse, validate, and (if necessary) transform Events.
- Event Types and ETDs contain the instructions which e*Gate uses to identify Events. You build ETDs on individual Event Type specifications, and they become the foundation of e*Gate data processing.
- A major advantage of ETDs is their reusability. If there are formats that recur in many of your Events, you can create definitions for those formats and use them as templates in other ETDs.

An ETD is a graphical representation of data. You will need to determine which Events will be used within e*Gate to process data. You build a specific ETD for each and all Events that pass through the e*Gate environment. Each ETD is the skeleton or blueprint of the type of data needed to be parsed, and describes to the system how to locate data within an Event. These parsing instructions are stored in an ETD.

4.2.1 The Parts of the ETD

There are four possible parts to the Java-enabled Event Type Definition as shown in Figure 5.

Figure 5 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 methods' parameters.

4.2.2 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.

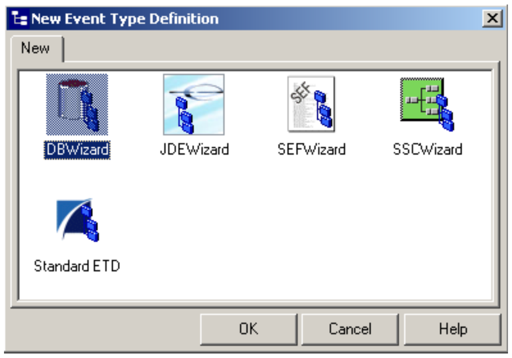
Field nodes are added to the ETD based on the tables in the external data source. Java method and parameter nodes are added to provide the appropriate JDBC functionality. For more information on the Java methods, refer to your JDBC developer's reference.

Note: *Event Type Definitions created by the ETD DBWizard are read-only. The contents of the generated ETD cannot be edited.*

To create a new ETD using the DBWizard

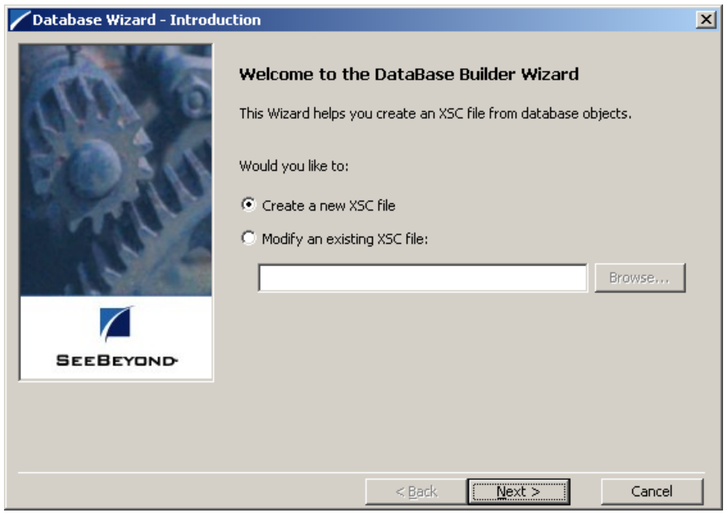
1. From the **Options** menu of the Enterprise Manager, choose **Default Editor…**.
2. Verify that **Java** is selected, then click **OK**.
3. Click the **ETD Editor** button to launch the Java ETD Editor.
4. In the **Java ETD Editor**, click the **New** button to launch the New Event Type Definition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

Figure 6 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 7 Database Wizard - Introduction


Database Wizard - Introduction

Welcome to the DataBase Builder Wizard

This Wizard helps you create an XSC file from database objects.

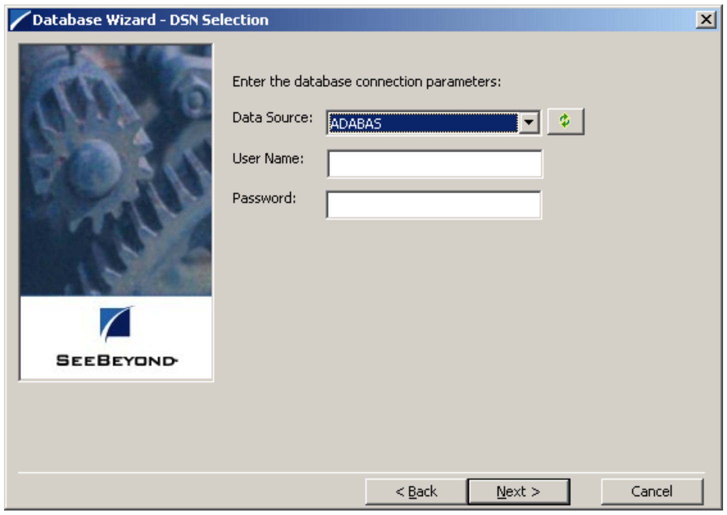
Would you like to:

(●) Create a new XSC file

( ) Modify an existing XSC file:

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

Figure 8 Database Wizard - DSN Selection


Database Wizard - DSN Selection

Enter the database connection parameters:

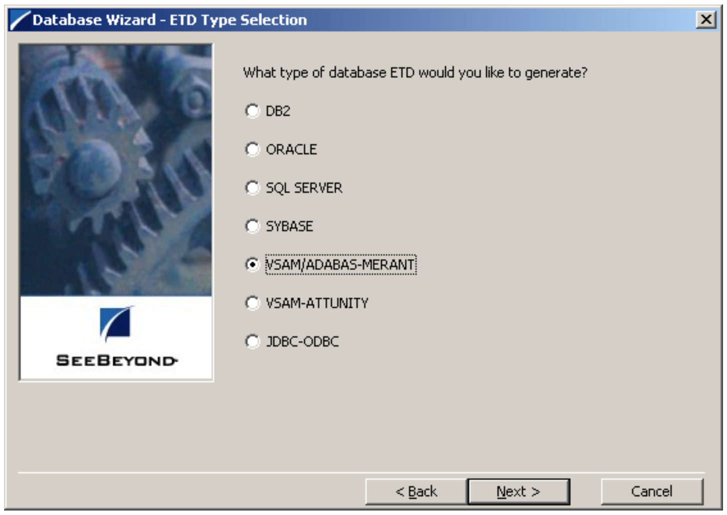
Data Source: ADABAS

User Name:

Password:

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*.

Figure 9 Database Wizard - ETD Type Selection

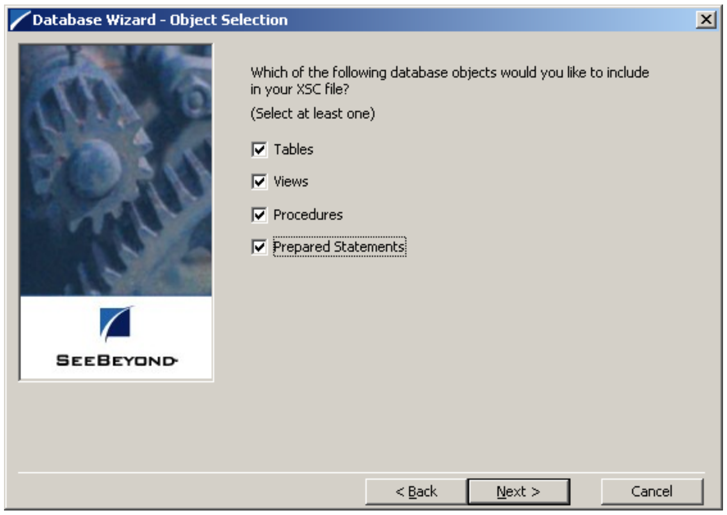

Database Wizard - ETD Type Selection

What type of database ETD would you like to generate?

- DB2
- ORACLE
- SQL SERVER
- SYBASE
- [✓ VSAM/ADABAS-MERANT]
- VSAM-ATTUNITY
- JDBC-ODBC

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 10 Database Wizard - Object Selection



Which of the following database objects would you like to include in your XSC file?

(Select at least one)

☑ Tables

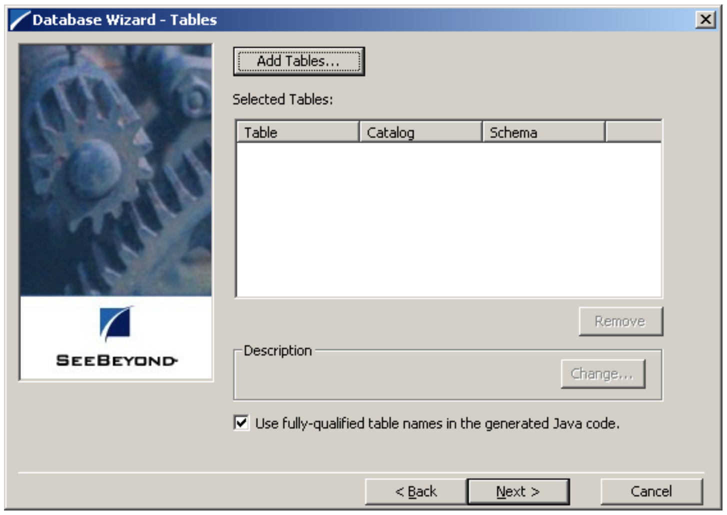
☑ Views

☑ Procedures

☑ Prepared Statements

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

Figure 11 Database Wizard - Tables



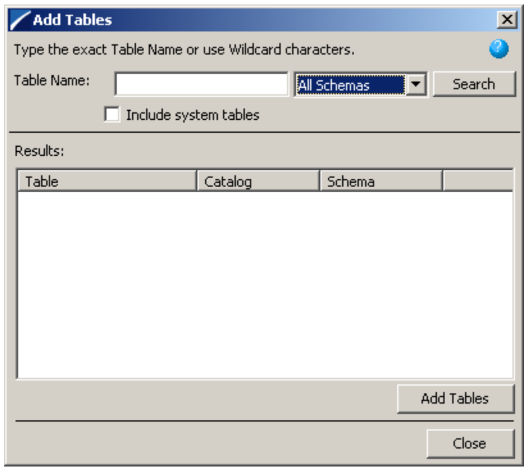
Selected Tables:

Table	Catalog	Schema

☑ Use fully-qualified table names in the generated Java code.

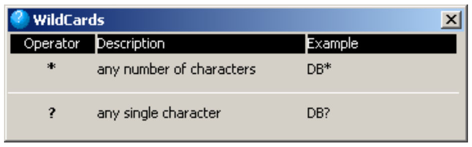
11 In the **Add Tables** window, type the exact name of the database table or use wildcard characters to return table names.

Figure 12 Add Tables



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

Figure 13 Wildcards



WildCards

Operator	Description	Example
*	any number of characters	DB*
?	any single character	DB?

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 14 Columns Selection

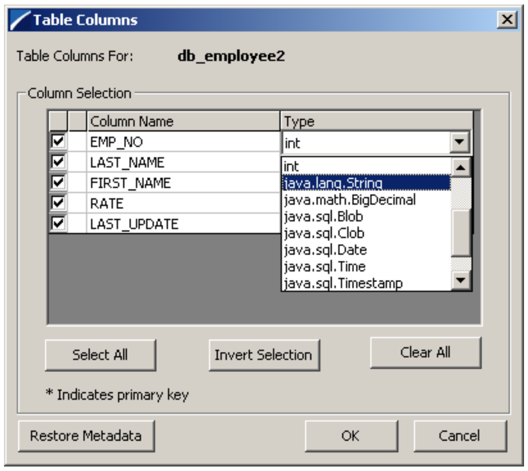


Table Columns

Table Columns For: **db_employee2**

Column Selection

	Column Name	Type
✓	EMP_NO	int
✓	LAST_NAME	
✓	FIRST_NAME	
✓	RATE	
✓	LAST_UPDATE	

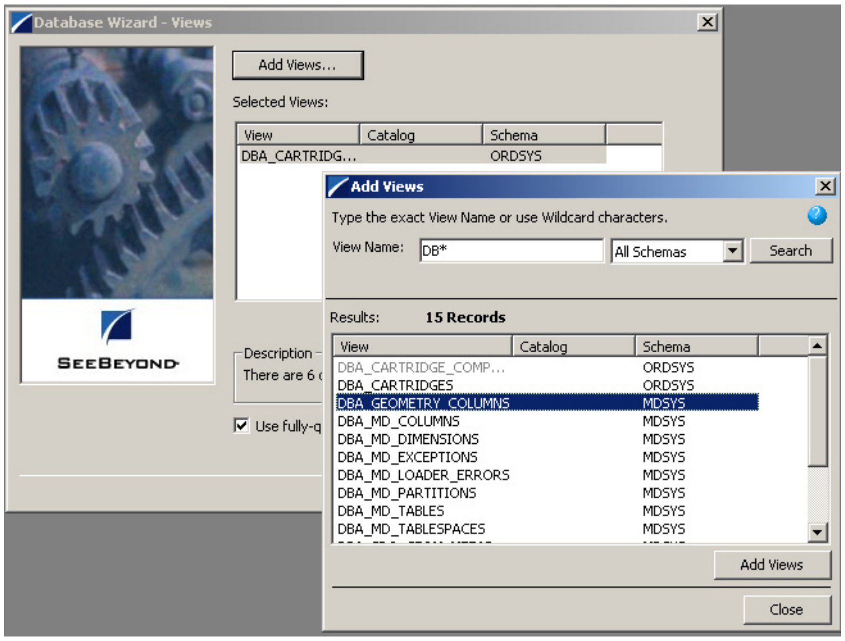
int
java.lang.String
java.math.BigDecimal
java.sql.Blob
java.sql.Clob
java.sql.Date
java.sql.Time
java.sql.Timestamp

* Indicates primary key

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 15 Database Wizard - Views


Database Wizard - Views

Selected Views:

View	Catalog	Schema
DBA_CARTRIDG...		ORDSYS

Description
There are 6

✓ Use fully-q

Add Views

Type the exact View Name or use Wildcard characters.

View Name: DB* All Schemas

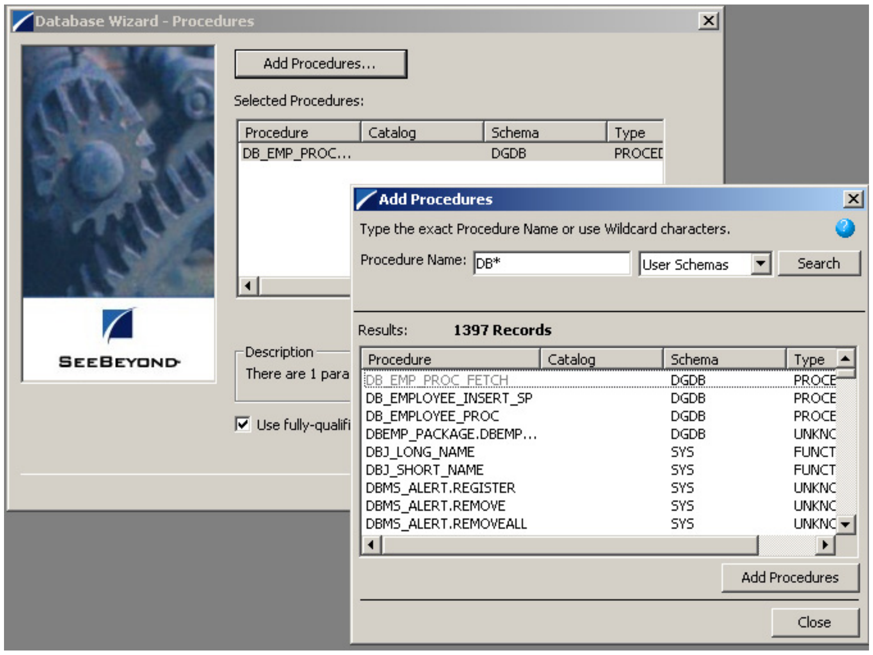
Results: **15 Records**

View	Catalog	Schema
DBA_CARTRIDGE_COMP...		ORDSYS
DBA_CARTRIDGES		ORDSYS
DBA_GEOMETRY_COLUMNS		MDSYS
DBA_MD_COLUMNS		MDSYS
DBA_MD_DIMENSIONS		MDSYS
DBA_MD_EXCEPTIONS		MDSYS
DBA_MD_LOADER_ERRORS		MDSYS
DBA_MD_PARTITIONS		MDSYS
DBA_MD_TABLES		MDSYS
DBA_MD_TABLESPACES		MDSYS

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.

Figure 16 Database Wizard - Procedures



Procedure	Catalog	Schema	Type
DB_EMP_PROC...		DGDB	PROCED

Procedure	Catalog	Schema	Type
DB_EMP_PROC_FETCH		DGDB	PROCE
DB_EMPLOYEE_INSERT_SP		DGDB	PROCE
DB_EMPLOYEE_PROC		DGDB	PROCE
DBEMP_PACKAGE.DBEMP...		DGDB	UNKNC
DBJ_LONG_NAME		SYS	FUNCT
DBJ_SHORT_NAME		SYS	FUNCT
DBMS_ALERT.REGISTER		SYS	UNKNC
DBMS_ALERT.REMOVE		SYS	UNKNC
DBMS_ALERT.REMOVEALL		SYS	UNKNC

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.

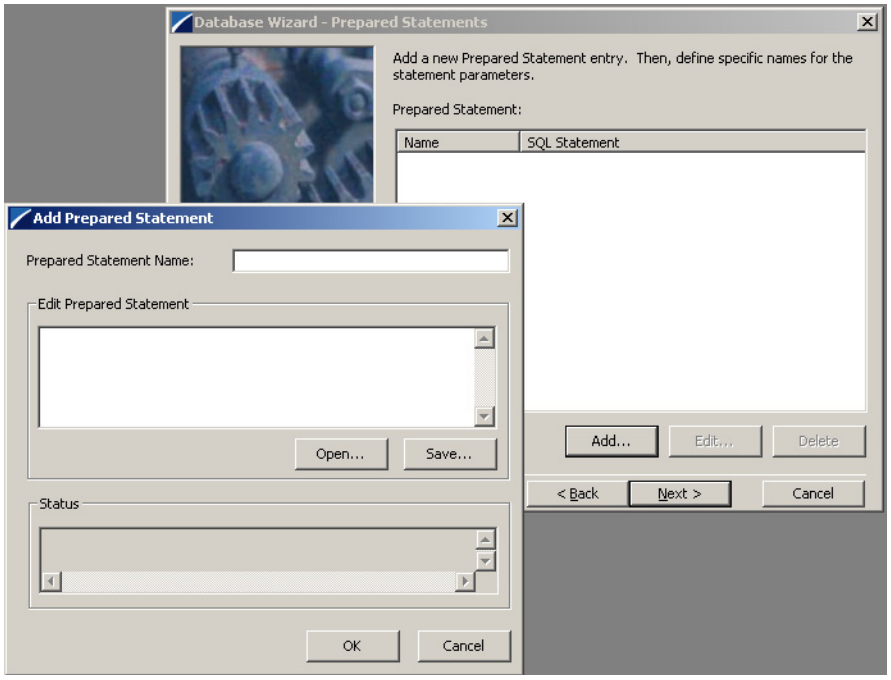
C Enter the **Prepared Statement Name** to be used by the statement.

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

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

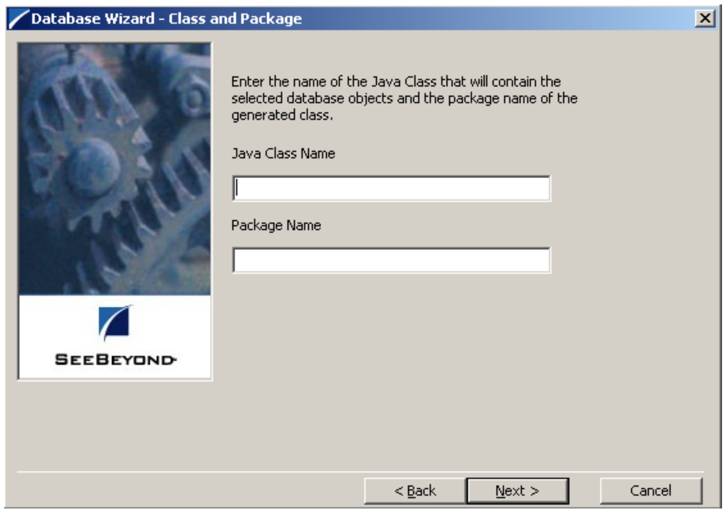
20 Repeat steps A–E to add additional prepared statements or click **Next** to continue.

Figure 17 Database Wizard - Prepared Statements



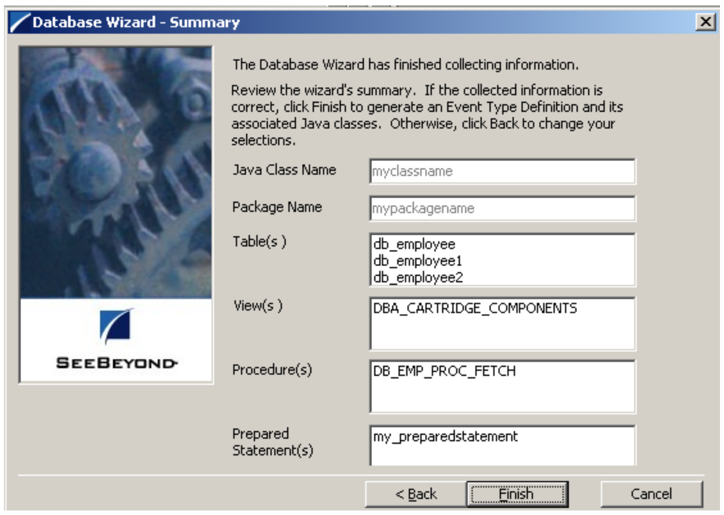
21 Enter the **Java Class Name** that will contain the selected tables and/or procedures and the **Package Name** of the generated classes.

Figure 18 Database Wizard - Class and Package


Database Wizard - Class and Package
Enter the name of the Java Class that will contain the selected database objects and the package name of the generated class.
Java Class Name
Package Name
SEEBEYOND
< Back
Next >
Cancel

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

Figure 19 Database Wizard - Summary



The Database Wizard has finished collecting information.

Review the wizard's summary. If the collected information is correct, click Finish to generate an Event Type Definition and its associated Java classes. Otherwise, click Back to change your selections.

Java Class Name: myclassname
Package Name: mypackagename
Table(s): db_employee, db_employee1, db_employee2
View(s): DBA_CARTRIDGE_COMPONENTS
Procedure(s): DB_EMP_PROC_FETCH
Prepared Statement(s): my_preparedstatement

4.2.3 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.

4.2.4 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.

4.3 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.

4.3.1 The Table

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 select, update, insert and delete SQL operations in a table.

The select() Method

To preform a select operation on a table, add a new method in the Collaboration Editor by clicking on the **method** button. In the Method Properties box, define the method. Add a rule to the method by clicking on the **rule{}** button. The Rule Properties dialog box appears. Select the node and drag and drop it into the dialog box. This method takes an empty string or a WHERE clause. For example:

```
getDBEmp().getDB_EMPLOYEE().select("EMP_NO = 123");
```

The insert() Method

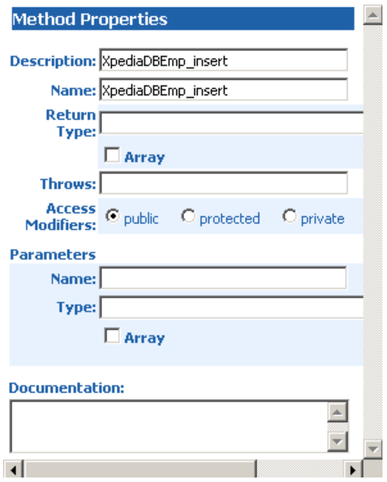
To preform a insert operation on a table, do the following:

1. From the Collaboration Editor, click the **method** button. Execute the select method with the right concurrency for example CONCUR_UPDATABLE and scroll sensitivity for example TYPE_SCROLL_INSENSITIVE, TYPE_SCROLL_SENSITIVE.
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();
```

Figure 20 Insert Method Business Rule



Method Properties

Description: XpediaDBEmp_insert

Name: XpediaDBEmp_insert

Return Type:

☐ Array

Throws:

Access Modifiers: [✓ public] protected private

Parameters

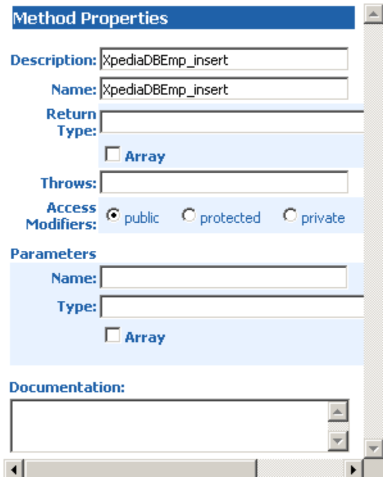
Name:

Type:

☐ Array

Documentation:

Figure 21 Insert Method Properties



Method Properties

Description: XpediaDBEmp_insert

Name: XpediaDBEmp_insert

Return Type:

☐ Array

Throws:

Access Modifiers: [✓ public] protected private

Parameters

Name:

Type:

☐ Array

Documentation:

The update() Method

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

1 Execute the **select** method with the right concurrency for example CONCUR_UPDATEABLE and scroll sensitivity for example TYPE_SCROLL_INSENSITIVE, TYPE_SCROLL_SENSITIVE.

2 Move to the row that you want to update.

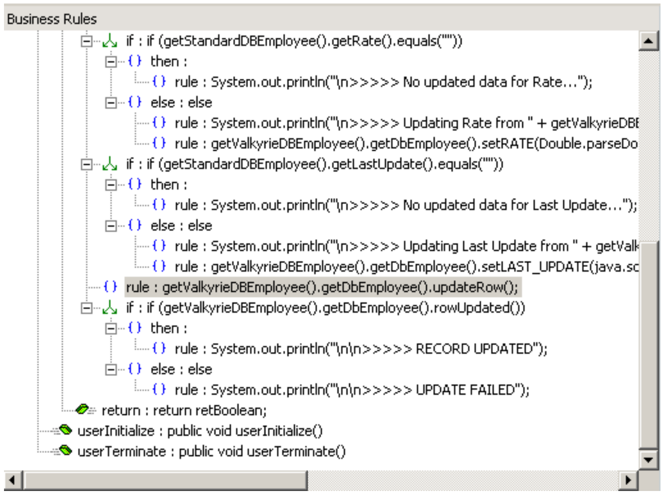
3 Set the fields of the table ETD

4 Insert the row by calling **insertRow**.

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 22 Update() Method Business Rule



```
Business Rules
if : if (getStandardDBEmployee().getRate().equals(""))
  then :
    rule : System.out.println("\n>>>>> No updated data for Rate...");
  else : else
    rule : System.out.println("\n>>>>> Updating Rate from " + getValkyrieDBE
    rule : getValkyrieDBEmployee().getDbEmployee().setRATE(Double.parseDo
if : if (getStandardDBEmployee().getLastUpdate().equals(""))
  then :
    rule : System.out.println("\n>>>>> No updated data for Last Update...");
  else : else
    rule : System.out.println("\n>>>>> Updating Last Update from " + getValk
    rule : getValkyrieDBEmployee().getDbEmployee().setLAST_UPDATE(java.sc
rule : getValkyrieDBEmployee().getDbEmployee().updateRow();
if : if (getValkyrieDBEmployee().getDbEmployee().rowUpdated())
  then :
    rule : System.out.println("\n\n>>>>> RECORD UPDATED");
  else : else
    rule : System.out.println("\n\n>>>>> UPDATE FAILED");
return : return retBoolean;
userInitialize : public void userInitialize()
userTerminate : public void userTerminate()
```

The delete() Method

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

1 Execute the **select** method with the right concurrency for example CONCUR_UPDATEABLE and scroll sensitivity for example TYPE_SCROLL_INSENSITIVE, TYPE_SCROLL_SENSITIVE.

2 Move to the row that you want to delete.

3 Set the fields of the table ETD

4 Insert the row by calling **insertRow**.

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();
```

4.3.2 The View

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

4.3.3 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.

To execute a stored procedure, do the following:

1. Populate the argument fields of the stored procedure ETD
2. Call the **execute** method

   For example, execute the stored procedure with input arguments ID and Name.

```
getDBEmp().getDB_EMPLOYEE_PROC().setID(1234);
getDBEmp().getDB_EMPLOYEE_PROC().setName("TOM TAYLOR");
getDBEmp().getDB_EMPLOYEE_PROC().execute();
```

A stored procedure in database can perform update and select operations. The application checks what operation has been performed. The following methods allow you to ascertain this information:

getUpdateCount:

This method should be called only after a call to **execute** or g**etMoreResults**, and should be called only once per result. An int greater than 0 represents the number of rows affected by an operation. A value of 0 means no rows were affected or the operation is a DDL command. -1 means the result is a result set or there are no more results.

getResultSet:

When the **execute** method has been used to execute the stored procedure. This method returns the current result set if there is one. Otherwise, it returns a null value which indicates the result is an update count or there are no more results.

getMoreResults:

Moves to the next result. This method returns true if it gets the next result set. It returns false if it is an update count or there are no more results.

This example prints out the update count and result sets that are returned from the stored procedures.

```
int iRow;
com.stc.eways.jdbcx.ResultSetAgent rs;
getpoller().getMrsSp().execute();

do
{
   iRow = getpoller().getMrsSp().getUpdateCount();
```

```
            System.out.println("\n*********iRow = " +
Integer.toString(iRow));

            if (iRow >= 0)
            {
               getblobout().setField1("Number of rows affected: " +
Integer.toString(iRow));
               getblobout().send();
            }
            else
            {
               rs = getpoller().getMrsSp().getResultSet();
               while (rs.next())
               {
                  getblobout().setField1("Col5 = " +
Integer.toString(rs.getInt(1)) + ", Col6 = " +
Integer.toString(rs.getInt(2)) );
                  getblobout().send();
               }
            }
         }
         while (getpoller().getMrsSp().getMoreResults());
```

Use an outbound parameter to enrich another ETD.

4.3.4 Prepared Statement

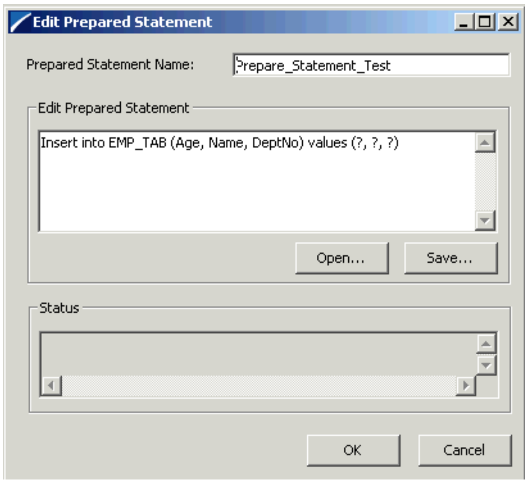
To Create a prepared statement from the DataBase Wizard:

1 Select the **Prepared Statement** option in the DataBase Wizard and complete the following steps:

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

   B Enter a prepared SQL statement as shown. The question marks serve as place holders that are later defined as the parameters in **Figure 24 on page 43**

Figure 23 Add Prepared Statement



Prepared Statement Name: Prepare_Statement_Test

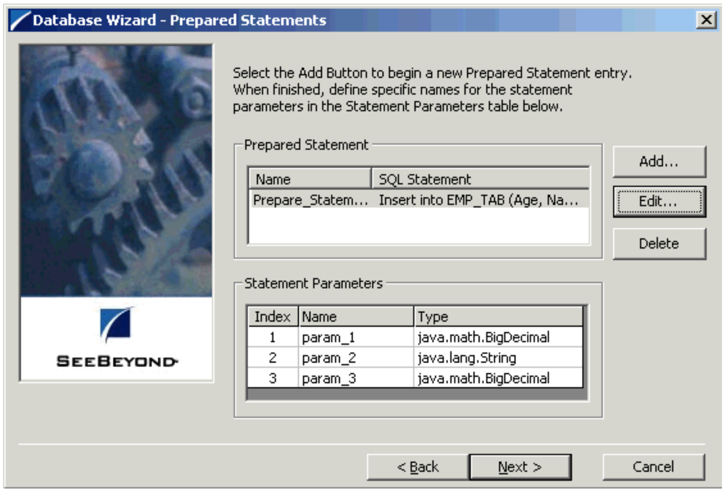
Insert into EMP_TAB (Age, Name, DeptNo) values (?, ?, ?)

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 create and save the current one.

2 Figure 24 on page 43 shows the statement along with a table of the parameters. You can give each parameter an appropriate name and data type. These parameters become nodes in the prepared statement ETD and fields within the generated Java object.

Figure 24 Prepared Statement Summary and Parameter Modification



Select the Add Button to begin a new Prepared Statement entry. When finished, define specific names for the statement parameters in the Statement Parameters table below.

Prepared Statement

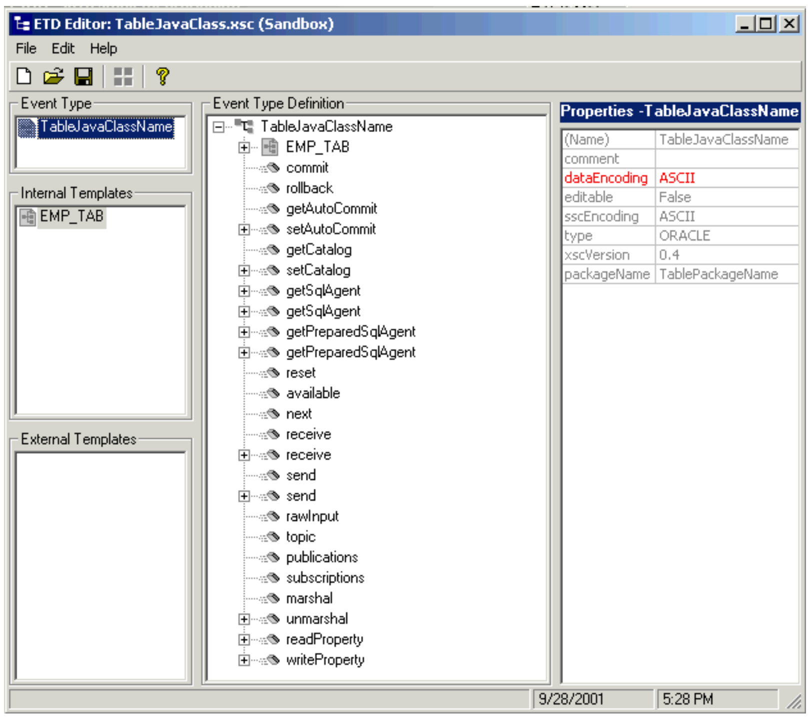
Name	SQL Statement
Prepare_Statem…	Insert into EMP_TAB (Age, Na…

Statement Parameters

Index	Name	Type
1	param_1	java.math.BigDecimal
2	param_2	java.lang.String
3	param_3	java.math.BigDecimal

3 From the ETD Editor, save the Prepared Statement you just created.

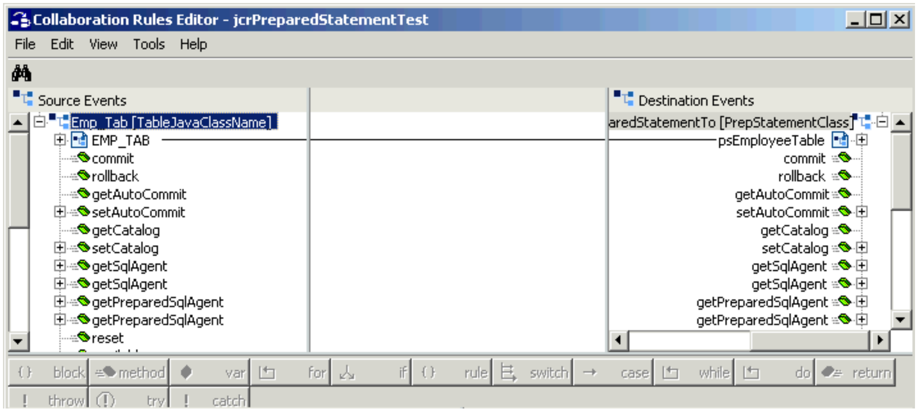
Figure 25 TableJavaClass



Properties -TableJavaClassName

(Name)	TableJavaClassName
comment	
dataEncoding	ASCII
editable	False
sscEncoding	ASCII
type	ORACLE
xscVersion	0.4
packageName	TablePackageName

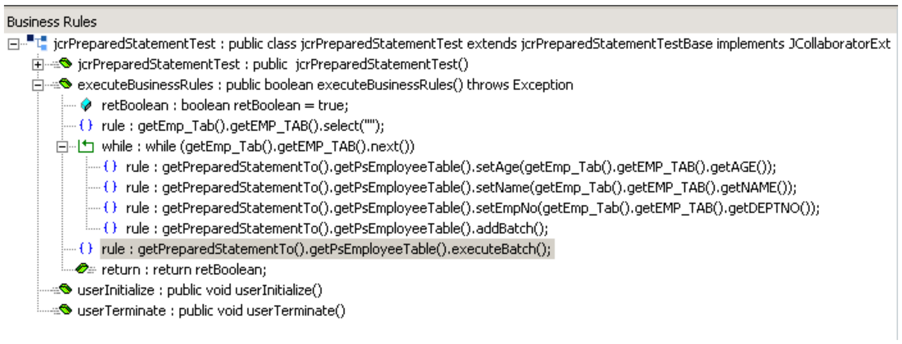
Figure 26 Collaboration Rule Editor



4 Map the fields you would like to populate the table with from the Source Events to the Destination Events.

5 Create your rules by dragging and dropping each node into the Rules window. This particular example shows the Age, Name and Department Number of three employees.

Figure 27 Collaboration Business Rules



```
Business Rules
jcrPreparedStatementTest : public class jcrPreparedStatementTest extends jcrPreparedStatementTestBase implements JCollaboratorExt
    jcrPreparedStatementTest : public  jcrPreparedStatementTest()
    executeBusinessRules : public boolean executeBusinessRules() throws Exception
        retBoolean : boolean retBoolean = true;
        rule : getEmp_Tab().getEMP_TAB().select("");
        while : while (getEmp_Tab().getEMP_TAB().next())
            rule : getPreparedStatementTo().getPsEmployeeTable().setAge(getEmp_Tab().getEMP_TAB().getAGE());
            rule : getPreparedStatementTo().getPsEmployeeTable().setName(getEmp_Tab().getEMP_TAB().getNAME());
            rule : getPreparedStatementTo().getPsEmployeeTable().setEmpNo(getEmp_Tab().getEMP_TAB().getDEPTNO());
            rule : getPreparedStatementTo().getPsEmployeeTable().addBatch();
        rule : getPreparedStatementTo().getPsEmployeeTable().executeBatch();
        return : return retBoolean;
    userInitialize : public void userInitialize()
    userTerminate : public void userTerminate()
```

6 Run the schema and verify the new content in Employee database.

4.3.5 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.

```
getDBEmp().getDB_EMPLOYEE().select("");
          while (getDBEmp().getDB_EMPLOYEE().next())
          {

getPSDBEmp().getDbEmployeeUpdate().setEmployeeNo(getDBEmp().getDB_EMP
LOYEE().getEMP_NO());
             getPSDBEmp().getDbEmployeeUpdate().setNewTime(ts);
             getPSDBEmp().getDbEmployeeUpdate().addBatch();
          }
          getPSDBEmp().getDbEmployeeUpdate().executeBatch();
```

4.3.6 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 20**.

4.4 Sample Scenario—Polling from a Database

This section describes how to use the ADABAS e*Way in a sample implementation. This sample schema demonstrates the polling of records from a ADABAS file system and converting the records into e*Gate Events.

1 The **FileIn** e*Way retrieves an Event (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 **ADABAS_eWc** e*Way Connection. This e*Way Connection contains information used by the Collaboration to connect to the ADABAS database.

4 The information retrieved from the database is copied to the Generic Event (**Blob**) and published to the **Q2** IQ.

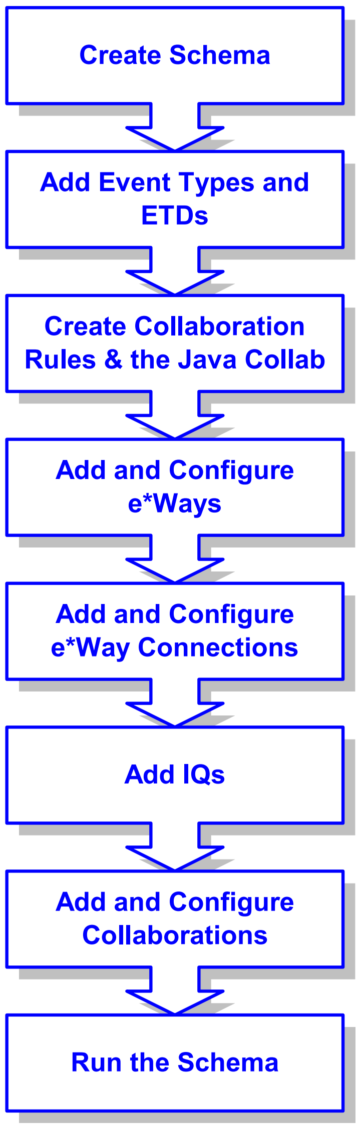
5 The **FileOut** e*Way retrieves the Generic Event (**Blob**) from the **Q2** IQ then writes it out to a text file on the local file system.

Overview of Steps

The sample implementation follows these general steps:

- Create the Schema
- Add the Event Types and Event Type Definitions
- Create the Collaboration Rules and the Java Collaboration
- Add and Configure the e*Ways
- Add and Configure the e*Way Connections
- Add the IQs
- Add and Configure the Collaborations
- Run the Schema

Figure 28 Schema Configuration Steps


Create Schema
Add Event Types and ETDs
Create Collaboration Rules & the Java Collab
Add and Configure e*Ways
Add and Configure e*Way Connections
Add IQs
Add and Configure Collaborations
Run the Schema

External Database Tables

The sample uses a simple external ADABAS file system with a table called **DB_EMPLOYEE**. The table contains the following columns:

Table 2 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

4.4.1 Create the Schema

The first step in deploying the sample implementation is to create a new schema. After installing the ADABAS e*Way Intelligent Adapter, do the following:

1. Launch the e*Gate Enterprise Manager GUI.
2. Log into 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 will launch and display the newly the created schema.

4.4.2 Add the Event Types and Event Type Definitions

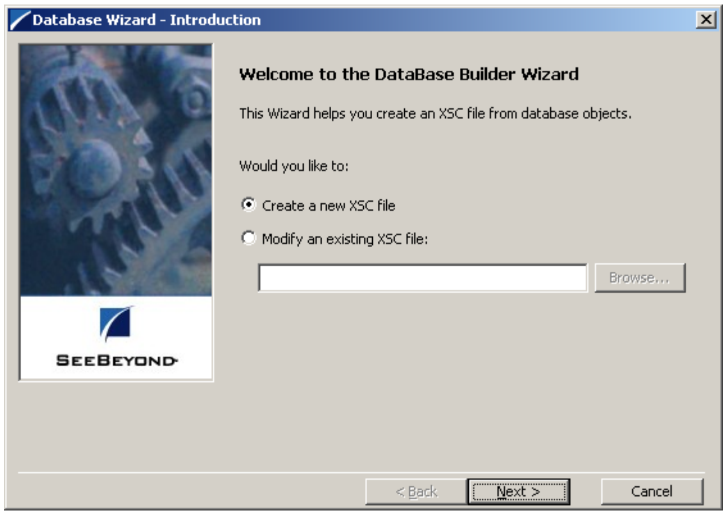
Two Event Types and Event Type Definitions are used in this sample.

- **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 29.

Figure 29 Database Wizard Introduction



Welcome to the DataBase Builder Wizard

This Wizard helps you create an XSC file from database objects.

Would you like to:

[✓ Create a new XSC file]

Modify an existing XSC file:

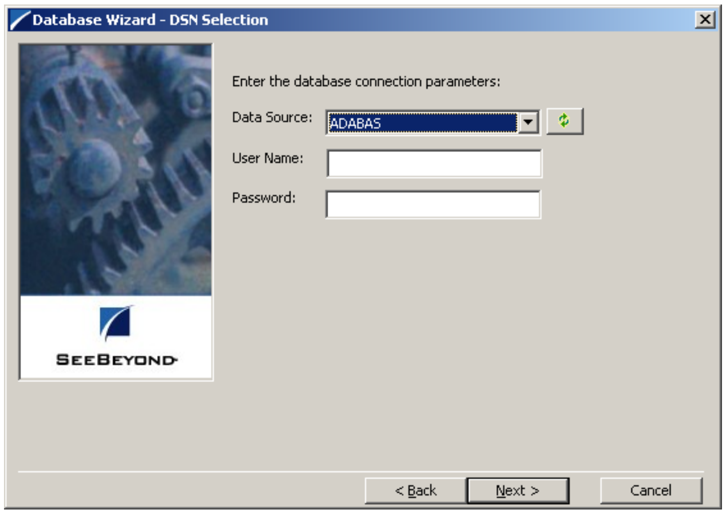
11 Enter the database DNS source and login information.

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 30

Figure 30 Database Wizard - DSN Selection



Enter the database connection parameters:

Data Source: ADABAS

User Name:

Password:

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 Manager, 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 will appear.

6 From the **File** menu, choose **New**.

   The New Event Type Definition dialog box will appear.

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

8 Read the introductory screen, then click **Next** to continue. The Package Name dialog box will appear.

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 3.

Table 3 GenericBlob ETD Properties

Node	Property	Value
Root Node	Name	GenericBlob
	Structure	fixed
	Length	0
Child Node	Name	Data
	Structure	fixed
	Length	0

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

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

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

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

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

4.4.3 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**.

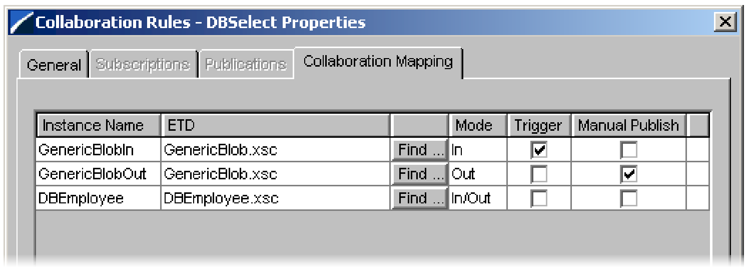
4 Click the **Properties** button to display the Collaboration Rule's properties.

5 In the **Service** list, click **Java**.

6 Click the **Collaboration Mapping** tab.

7 Add three instances as shown in Figure 31:

Figure 31 DBSelect Instances



Instance Name	ETD		Mode	Trigger	Manual Publish
GenericBlobIn	GenericBlob.xsc	Find ...	In	✓	☐
GenericBlobOut	GenericBlob.xsc	Find ...	Out	☐	✓
DBEmployee	DBEmployee.xsc	Find ...	In/Out	☐	☐

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.

11 From the **View** menu, choose **Display Code**.

This displays the Java code associated with each of the Collaboration's rules.

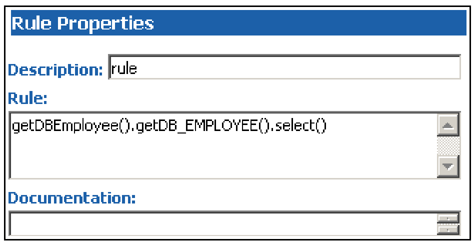
12 From the **Tools** menu, choose **Options**, and then click **Add File…**. Select **.\eGate\client\classes\stcjdbcx.jar** and click **OK** to close each of the dialog boxes.

13 In the Business Rules pane, select the **retBoolean** rule and click the **rule** button to add a new Rule.

14 In the **Destination Events** pane, expand the **DBEmployee** Event Type until the **select** method is visible.

15 Drag the **select** method into the **Rule** field of the **Rule Properties** pane. Click **OK** to close the dialog box without entering any criteria. Figure 32.

Figure 32 Rule Properties



Description: rule

Rule:

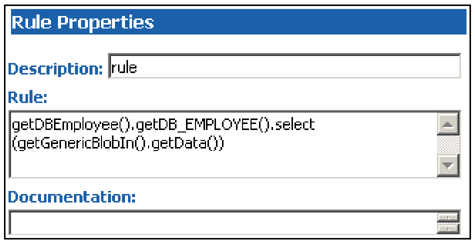
```
getDBEmployee().getDB_EMPLOYEE().select()
```

Documentation:

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

17 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 33

Figure 33 Rule Properties (Continued)


Rule Properties

Description: rule

Rule:

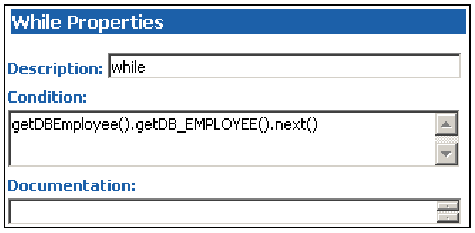
```
getDBEmployee().getDB_EMPLOYEE().select
(getGenericBlobIn().getData())
```

Documentation:

18 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.

19 Drag the **next()** method from the **Destination Events** pane into the **Condition** field of the **While Properties** pane. See Figure 34.

Figure 34 While Properties


While Properties

Description: while

Condition:

```
getDBEmployee().getDB_EMPLOYEE().next()
```

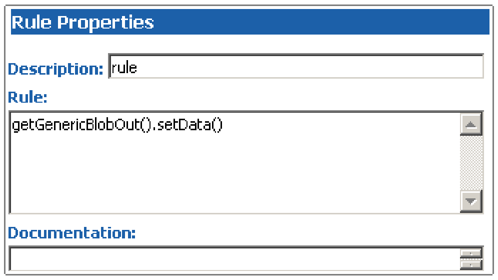
Documentation:

20 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.

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

22 Drag the **Data** node into the **Rule** field of the Rule Properties pane. See Figure 35.

Figure 35 Rule Properties


Rule Properties

Description: rule

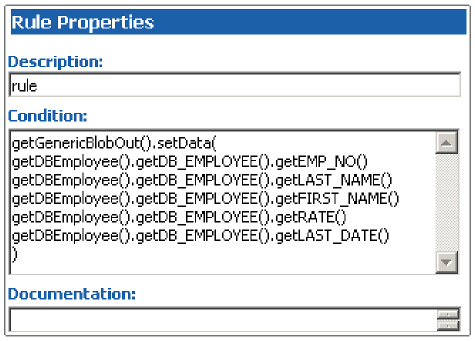
Rule:

```
getGenericBlobOut().setData()
```

Documentation:

23 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 36.

Figure 36 Rule Properties (Continued)

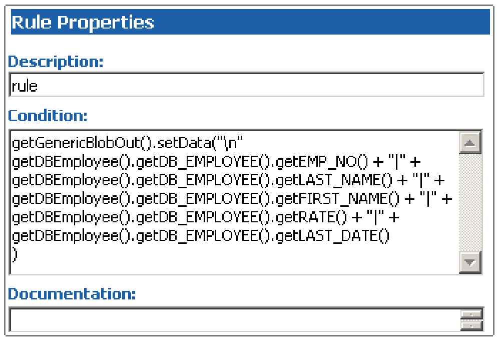


```
rule
```

```
getGenericBlobOut().setData(
getDBEmployee().getDB_EMPLOYEE().getEMP_NO()
getDBEmployee().getDB_EMPLOYEE().getLAST_NAME()
getDBEmployee().getDB_EMPLOYEE().getFIRST_NAME()
getDBEmployee().getDB_EMPLOYEE().getRATE()
getDBEmployee().getDB_EMPLOYEE().getLAST_DATE()
)
```

24 Edit the text of the condition to add a newline character and pipe (|) delimiters between each of the five data nodes. See Figure 37.

Figure 37 Rule Properties (Continued)



```
rule
```

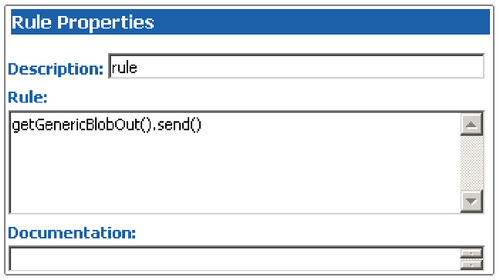
```
getGenericBlobOut().setData("\n"
getDBEmployee().getDB_EMPLOYEE().getEMP_NO() + "|" +
getDBEmployee().getDB_EMPLOYEE().getLAST_NAME() + "|" +
getDBEmployee().getDB_EMPLOYEE().getFIRST_NAME() + "|" +
getDBEmployee().getDB_EMPLOYEE().getRATE() + "|" +
getDBEmployee().getDB_EMPLOYEE().getLAST_DATE()
)
```

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

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

27 Edit the rule; add a **send()** method as shown in Figure 38.

Figure 38 GenericBlobOut iqPut()



```
rule
```

```
getGenericBlobOut().send()
```

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

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

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

30 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 closing the Java Collaboration Editor.

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

4.4.4 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 4.

Table 4 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 5.

Table 5 DBSelect e*Way Parameters

Section Name	Parameter	Value
JVM Settings	All	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 6.

Table 6 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 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.

4.4.5 Add and Configure the e*Way Connections

The sample scenario uses one e*Way Connection:

- **ADABAS_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 **ADABAS_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 **ADABAS** 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 7.

Table 7 ADABAS_eWc e*Way Connection Parameters

Section Name	Parameter	Value
DataSource	Driver	default
	JDBC URL	A valid JDBC URL
	user name	Use local settings.
	password	Use local settings.
connector	type	default

Section Name	Parameter	Value
	class	default

8 Select **Save** from the **File** menu. Enter **ADABAS_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.

4.4.6 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 Manger and click the **Properties** button.

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

4.4.7 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 **ADABAS_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.

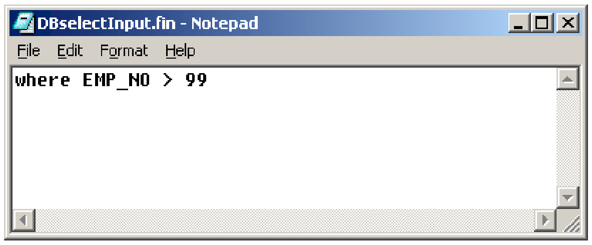
4.4.8 Run the Schema

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 39.

Figure 39 Sample Input File



```
where EMP_NO > 99
```

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,

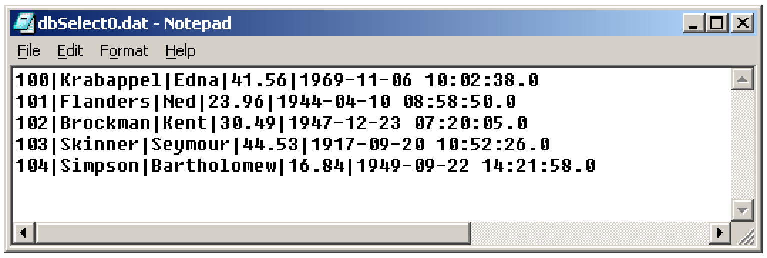
registry is the name of the Registry Host, and

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 40 shows an example of the records that were returned by the sample schema.

Figure 40 Sample Output File



```
100|Krabappel|Edna|41.56|1969-11-06 10:02:38.0
101|Flanders|Ned|23.96|1944-04-10 08:58:50.0
102|Brockman|Kent|30.49|1947-12-23 07:20:05.0
103|Skinner|Seymour|44.53|1917-09-20 10:52:26.0
104|Simpson|Bartholomew|16.84|1949-09-22 14:21:58.0
```

ADABAS e*Way Methods

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

- **com.stc.eways.jdbcx.StatementAgent Class** on page 61
- **com.stc.eways.jdbcx.PreparedStatementAgent Class** on page 71
- **com.stc.eways.jdbcx.PreparedStatementResultSet Class** on page 83
- **com.stc.eways.jdbcx.SqlStatementAgent Class** on page 109
- **com.stc.eways.jdbcx.CallableStatementAgent Class** on page 111
- **com.stc.eways.jdbcx.TableResultSet Class** on page 123

5.1 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.

5.2 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 inava.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 inava.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 inava.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 inava.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

5.3 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

absolute on page 87	**afterLast** on page 89
beforeFirst on page 89	**clearWarnings** on page 107
close on page 87	**deleteRow** on page 108
findColumn on page 90	**first** on page 88
getArray on page 104	**getArray** on page 104
getAsciiStream on page 103	**getAsciiStream** on page 103
getBigDecimal on page 96	**getBigDecimal** on page 97
getBinaryStream on page 103	**getBinaryStream** on page 104
getBlob on page 105	**getBlob** on page 105
getBoolean on page 92	**getBoolean** on page 92
getByte on page 93	**getByte** on page 93
getBytes on page 102	**getBytes** on page 102
getCharacterStream on page 104	**getCharacterStream** on page 104
getClob on page 105	**getClob** on page 106
getConcurrency on page 85	**getCursorName** on page 87
getDate on page 97	**getDate** on page 97
getDate on page 98	**getDate** on page 98
getDouble on page 96	**getDouble** on page 96
getFetchDirection on page 85	**getFetchSize** on page 86
getFloat on page 95	**getFloat** on page 96
getInt on page 94	**getInt** on page 94
getLong on page 94	**getLong** on page 95
getMetaData on page 85	**getObject** on page 90
getObject on page 91	**getObject** on page 91
getObject on page 92	**getRef** on page 106
getRef on page 107	**getRow** on page 108
getShort on page 93	**getShort** on page 93
getString on page 101	**getString** on page 101
getTime on page 98	**getTime** on page 98
getTime on page 99	**getTime** on page 99
getTimestamp on page 100	**getTimestamp** on page 100
getTimestamp on page 100	**getTimestamp** on page 101
getType on page 90	**getWarnings** on page 107
insertRow on page 108	**isAfterLast** on page 90
isBeforeFirst on page 89	**isFirst** on page 88

isLast on page 89	**last** on page 88
next on page 87	**previous** on page 87
refreshRow on page 129	**relative** on page 88
getFetchDirection on page 85	**getFetchSize** on page 86
updateRow on page 108	**wasNull** on page 107

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

5.4 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 111	**execute** on page 110
executeQuery on page 110	**executeUpdate** on page 111

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

5.5 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

getArray on page 121	**getBigDecimal** on page 118
getBlob on page 122	**getBoolean** on page 116
getByte on page 116	**getBytes** on page 121
getClob on page 122	**getDate** on page 118
getDate on page 119	**getDouble** on page 118
getFloat on page 117	**getInt** on page 117
getLong on page 117	**getObject** on page 115
getObject on page 115	**getRef** on page 123
getShort on page 116	**getString** on page 121
getTime on page 119	**getTimestamp** on page 120
getTimestamp on page 120	**registerOutParameter** on page 114
registerOutParameter on page 114	**registerOutParameter** on page 114
sessionOpen on page 113	**wasNull** on page 115

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 inava.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 inava.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 inava.sql.Types.
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.
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

5.6 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

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