SeeBeyond™ eBusiness Integration Suite

e*Way Intelligent Adapter for Oracle Financials User's Guide

Release 4.5.2

Version 20020222152132.

Contents

Chapter 1

Introduction

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

1.1 Overview

The Oracle Financials e*Way enables the e*Gate system to exchange data with external financial databases through the use of the Java library and issued SQL statements.

1.1.1 Intended Reader

The reader of this guide is presumed:

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

1.1.2 Components

The Oracle Financials e*Way is composed of the following:

- **e*Way Connections**: e*Way Connections provide access to the information necessary for connecting to a specified external database system.
- **stcjdbcx.jar**: this file provides the logic required by the e*Way to interact with the external databases.

1.2 Supported Operating Systems

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

- Windows 2000, Windows 2000 SP1, or Windows 2000 SP2
- Windows NT 4.0 SP6a

- Solaris 2.6, 7, or 8
- AIX 4.3.3
- HP-UX 11.0 or HP-UX 11i

1.3 System Requirements

To use the Oracle Financials e*Way, you need the following:

- An e*Gate Participating GUI Host, version 4.5 or later. For AIX operating systems, you need a Participating Host, version 4.5.1.
- A TCP/IP network connection.

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

1.3.1 Host System Requirements

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

GUI Host Requirements

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

- The Oracle client library: Oracle11i. The Oracle client library must be installed on Windows NT or Windows 2000 to utilize the build tool
- The Merant 4.0 ODBC driver included on the driver installation disk. To install this driver, see the readme file included on the disk.
- Microsoft Data Access Components (MDAC) RTM version 2.6 or later. This component is included in the Windows 2000 installation routine. Windows NT users can obtain MDAC 2.6 RTM from the following location:

  http://www.microsoft.com/data/download.htm

If the GUI host machine will also be executing the Oracle Financials e*Way, the host machine must also meet the following requirements.

Participating Host Requirements

- The Merant JDBC 2.2 driver included on the driver installation disk. To install this driver, see the readme file included on the installation disk

1.4 External System Requirements

The Oracle Financials e*Way supports the following external systems:

- Oracle Applications 11.5.3

  For more information regarding Oracle products, refer to the Oracle website:

  http://www.oracle.com

Chapter 2

Installation

This chapter describes how to install the Oracle Financials e*Way.

2.1 Installing the Oracle Financials e*Way on Windows NT or Windows 2000

The following information will help guide you through the installation process.

2.1.1 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. You must have Administrator privileges to install this e*Way.

2.1.2 Installation Procedure

To install the Oracle Financials e*Way on a Windows NT or Windows 2000 system:

1. Log in as an Administrator on the workstation you want to install the e*Way on.
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.**

2.2 Installing the Oracle Financials e*Way on UNIX

2.2.1 Pre-installation

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

2.2.2 Installation Procedure

To install the Oracle Financials e*Way on a UNIX system:

1. Log in on the workstation containing the CD-ROM drive. If necessary, mount the CD-ROM drive.
2. Insert the CD-ROM into the 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.**

2.3 Files/Directories Created by the Installation

The Oracle Financials 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)
bin\	jcscomp.jar stcjintegra.jar xerces.jar
Classes\	stcjcs.jar stcjdbcx.jar
configs\oracle	oracle.def

e*Gate Directory	File(s)
etd\	oracle.ctl dbwizard.ctl
etd/oracle/	Com_stc_jdbcx_oraclecfg.java Com_stc_jdbcx_oraclecfg.xsc
ThirdParty\sun\classes	jdbc2_0-stdext.jar
ThirdParty\oracle\classes\	classes12.zip
ThirdParty\merant\classes	DGbase.jar

Chapter 3

e*Way Connection Configuration

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

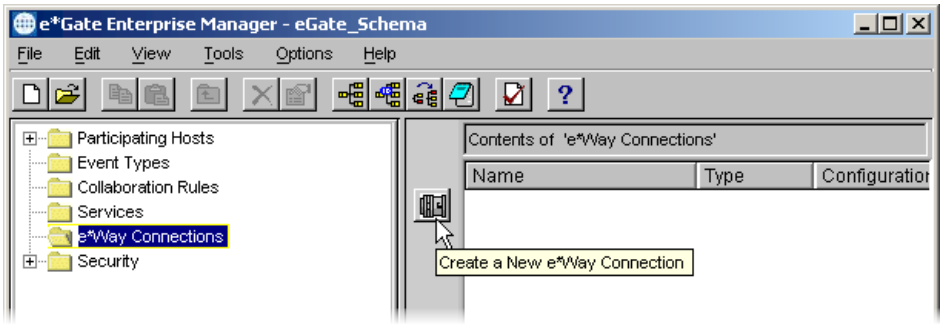
3.1 Create e*Way Connections

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

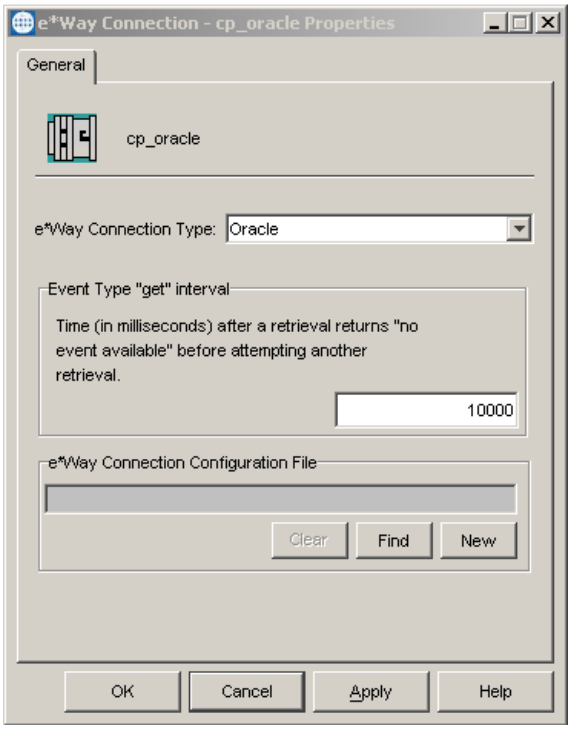


2 On the Palette, click the **New e*Way Connection** icon.

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. See **Figure 2 on page 16**.

Figure 2 e*Way Connection Properties Dialog Box



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

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
- Connector

3.1.1 DataSource Settings

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

class

Description

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

Required Values

A valid class name.

The default is **oracle.jdbc.pool.OracleConnectionPoolDataSource**.

Additional Information

Use the **oracle.jdbc.xa.client.OracleXADataSource** class for XA compliant implementations.

To use XA in Oracle 8i and Oracle9i, your Database Administrator needs to GRANT SELECT ON DBA_PENDING_TRANSACTIONS TO PUBLIC.

Note: *XA functionality is not supported on Oracle 8.0.5 databases. For more information on implementing the Oracle e*Way in an XA compliant environment, see the e*Gate Integrator User's Guide.*

DriverType

Description

Specifies the JDBC driver type for Oracle. All other JDBC drivers are ignored.

Oracle implicitly issue a commit statement even if auto commit is set to false and no explicit commit or rollback is executed. Please see Chapter 3 of Oracle 8.1.7 JDBC Developer's Guide and Reference:

Any DDL operation, such as CREATE or ALTER, always includes an implicit COMMIT. If auto-commit mode is disabled, this implicit COMMIT will not only commit the DDL statement, but also any pending DML operations that had not yet been explicitly committed or rolled back.

Required Values

A valid driver type name.

The default is "**thin" "oci8"**.

ServerName

Description

Specifies the host name of the external database server.

Required Values

Any valid string.

PortNumber

Description

Specifies the I/O port number on which the server is listening for connection requests.

Required Values

A valid port number. The default is 1521.

DatabaseName

Description

Specifies the name of the database instance.

Required Values

Any valid string.

user name

Description

Specifies the user name the e*Way will use to connect to the database.

Required Values

Any valid string.

password

Description

Specifies the password used to access the database.

Required Values

Any valid string.

timeout

Description

Specifies the login timeout in seconds.

Required Values

Any valid string. The default is 300 seconds.

3.1.2 Connector Settings

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

Connector type

Description

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

Required Values

The default is **DB**.

class

Description

Specifies the 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.
- 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.
- 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**.

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 18. 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 may 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 is still live and you can set how often it checks. See **Connector Settings** on page 18.

Chapter 4

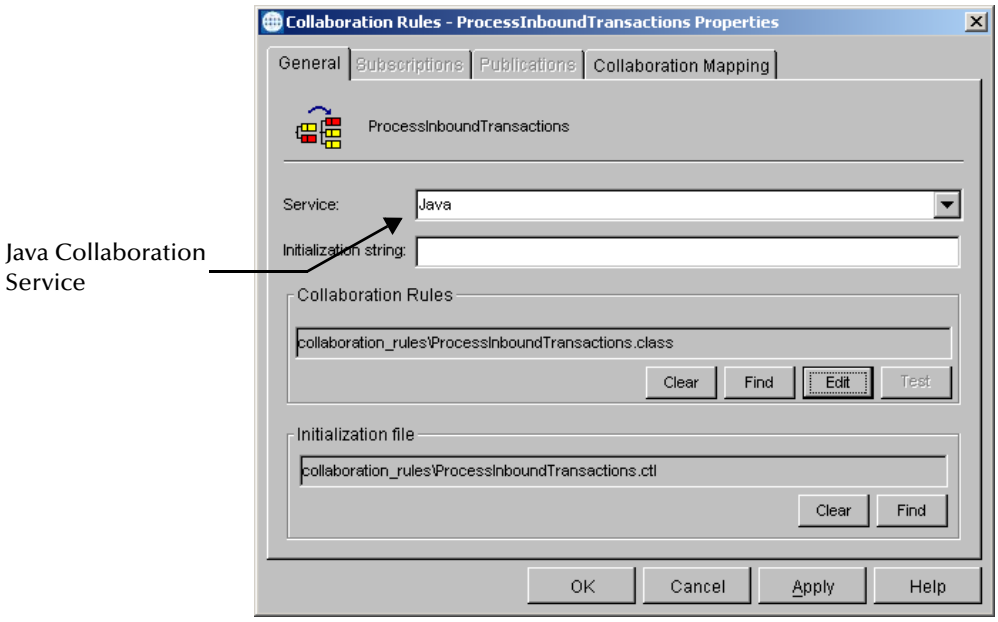
Implementation

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

4.1 Implementing Java-enabled Components

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

Figure 4 The Java Collaboration Service



4.1.1 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.

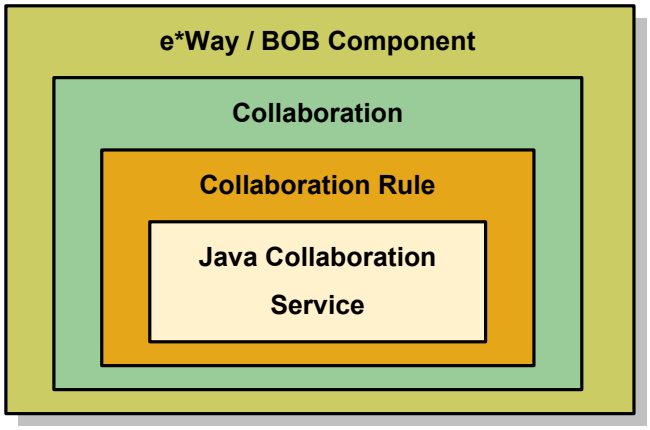
For more information on the Java Collaboration Service and subcollaborations, see the *e*Gate Integrator Collaboration Services Reference Guide*. For more information on the Java ETD Editor and the Java Collaboration Editor, see the *e*Gate Integrator User's Guide*.

4.1.2 Java-enabled Components

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

Figure 5 illustrates the relationship between the higher level e*Gate component and the Collaboration Service.

Figure 5 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 database and generates the ETD corresponding to the external tables and procedures.

4.2.1 The Parts of the ETD

There are four possible parts to the Java-enabled Event Type Definition as shown in Figure 6.

Figure 6 The Java-enabled ETD

- **Element** – 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 Oracle Financial Wizard ETD Builder

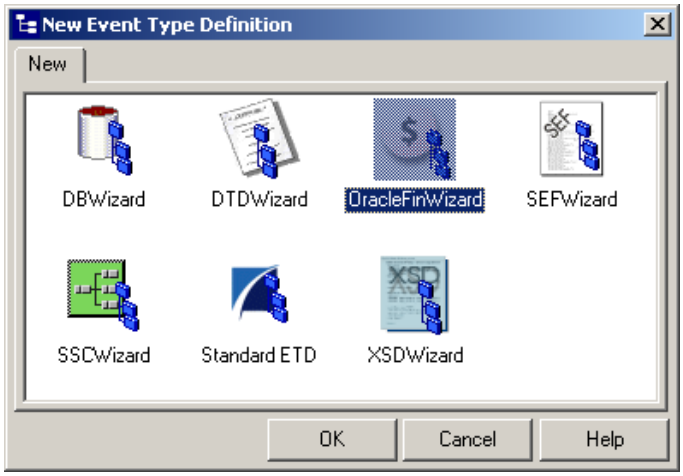
The Oracle Financial Wizard ETD Builder generates Java-enabled ETDs by connecting to external data sources and creating corresponding Event Type Definitions. The ETD Builder can create ETDs based on any combination of tables, stored procedures, or prepared SQL statements.

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.

To create a new ETD using the Oracle Financial Wizard

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.

Figure 7 New Event Type Definition

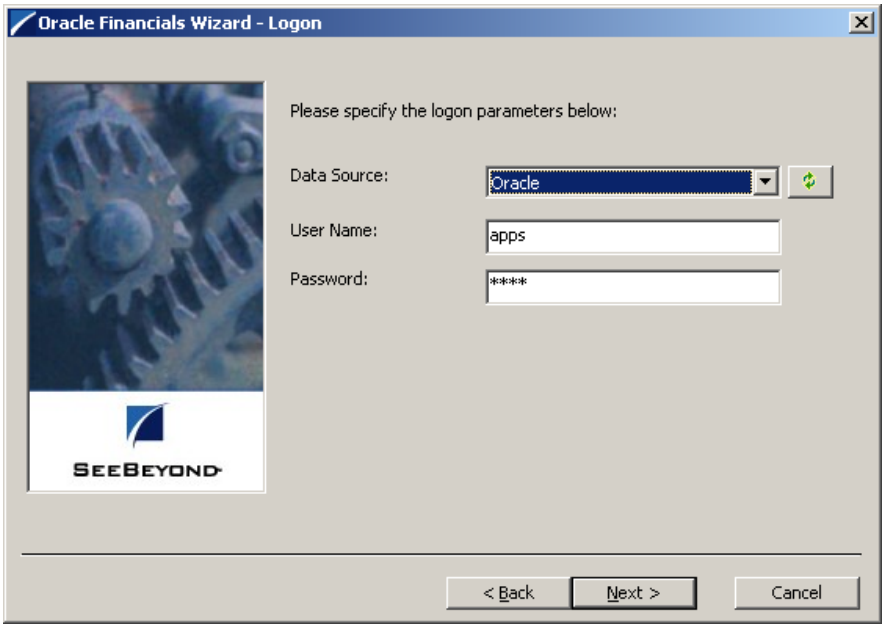


5 Select the **Oracle Financial Wizard** icon and click **OK**. The **Oracle Financial Wizard** opens (see Figure 8).

Figure 8 Oracle Financial Wizard Introduction

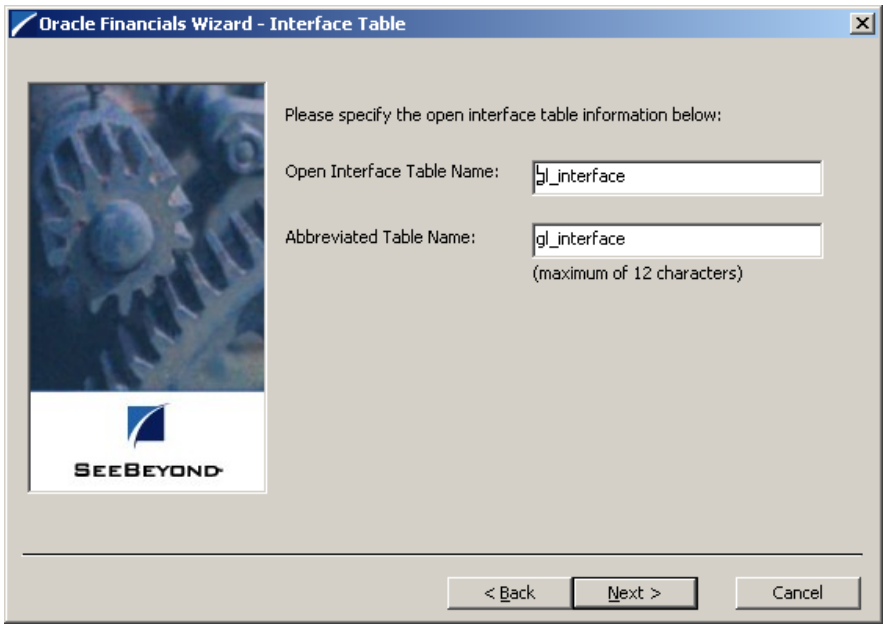
6 Click Next to continue. The **Logon** dialog box opens. Select the data source from the drop-down box. In the second field enter the **User Name** and in the third field enter the **Password** (see Figure 9).

Figure 9 Oracle Financial Wizard Logon



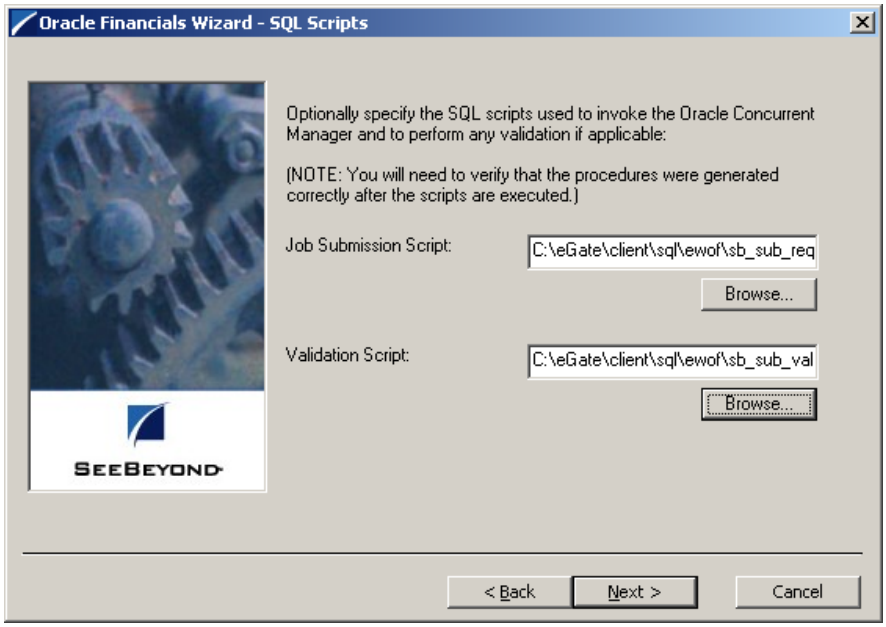
7 Click **Next** to continue. The **Interface Table** dialog box opens. Enter the Open Interface Table Name in the first field. In the second field enter an abbreviated table name of 12 characters or less (see Figure 10).

Figure 10 Oracle Financial Wizard Interface Table



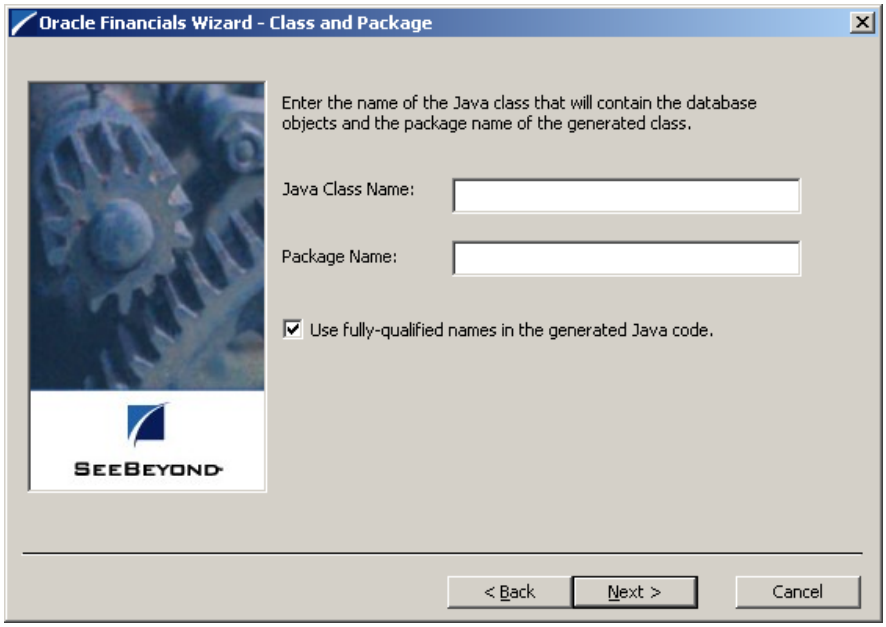
8 Click **Next** to continue. The Oracle Financial Wizard Interface Table dialog box opens. Type in or use the **Browse** option, to enter the absolute path for the **Job Submission Script** in the first field (for example, C:\eGate\client\sql\ewof\sb_sub_req_gl_interface.sql) and for the **Validation Script** in the second field.

Figure 11 Oracle Financial Wizard SQL Scripts



9 Click **Next** to continue. The Oracle Financial Wizard Class and Package dialog box opens. Enter the **Java Class Name** that will contain the selected tables and/or procedures in the first field and the **Package Name** of the generated classes in the second field (see Figure 12).

Figure 12 Oracle Financial Wizard Class and Package



Click **Next** to continue. Review the summary of the database wizard information. If everything is correct click **Finish** to generate the new ETD.

4.3 Using the Oracle Financials e*Way

The Oracle Financials e*Way provides an interface between Oracle Financials and other open interface database tables. Once the Oracle Financial e*Way is installed, a new schema must be created. While it is possible to use the default schema, it is recommended that you create a separate schema for testing purposes.

4.3.1 Importing the Sample Schema

A sample schema, **ewof.zip**, is included on the CD-ROM. To import the sample schema once the Oracle Financial e*Way is installed, do the following:

1 Start the e*Gate Enterprise Manager GUI.

2 When the Enterprise Manager prompts you to log in, select the host that you specified during installation and enter your password.

3 You will then be prompted to select a schema. Click **New**.

4 Enter a name for the new Schema. In this case, for the sample, enter **ewofSample**, or any name as desired.

5 Select **Create from export**. Click **Find** and navigate to following folder on the CD-ROM **\eGate\samples\ewof** and select **ewof.zip**.

6 Click open to import the sample schema. The e*Gate Enterprise Manager opens to the new schema. The schema must be configured to match the specific system before it can run.

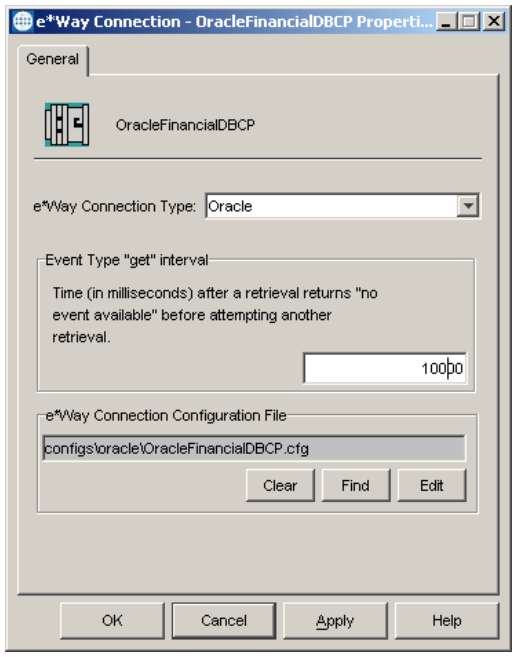
4.3.2 Configuring the Sample Schema

Continue through the following procedures to configure the Oracle Financial e*Way for your specific system. See **e*Way Connection Configuration** on page 15for more specific information on configuring the e*Way Connection parameters.

1 In the Enterprise Manager's Component editor, select the e*Way Connections folder. The OracleFinancialDBCP e*Way Connection is displayed in the Enterprise Manager's Editor Pane.

2 Double-click the The OracleFinancialDBCP e*Way Connection to open the e*Way Connection's Properties dialog box (Figure 13).

Figure 13 e*Way Connections Properties Dialog Box



3 The e*Way Connection Properties dialog box opens. Under the e*Way Connection Configuration File field click **Edit**. The e*Way Connections Editor opens.

4 Change the following settings to match those of the specific system.

- Change the ServerName to your Oracle Financial DB server host name.
- Change the PortNumber to your Oracle Financial DB IO port number.

- Change the DatabaseName to your Oracle Financial DB SID.
- Change the user name to your Oracle Financial DB GL user name.
- Change the password to your Oracle Financial DB GL password.

5 From the File menu click Save to save the new settings, then click Promote to Run Time to move the file to the Run-Time environment. Click OK to acknowledge that the file has been promoted, and the Editor closes.

6 Click OK to close the e*Way Connection Properties dialog box.

7 Create the following directory: C:\DATA\input\ewof. Copy the contents of the C:\eGate\Server\registry\repository\<Sample Schema Name>\runtime\testdata directory into C:\DATA\input\ewof.

Invoking Oracle Financials' Concurrent Manager

Before you begin using the Oracle Financials e*Way, you must provide your own pre-validated tables and import them invoking the Oracle Financials Concurrent Manager's stored procedures. If you do not have these, you may use a dummy procedure. The dummy procedures provided do not perform any validation and do not invoke the Oracle Financial Concurrent Manager. The Concurrent Manager must be scheduled to run from within the Oracle application and cannot be invoked from within e*Gate. Samples are provided for the **gl_interface**, **gl_budget_interface**, and **gl_daily_rates_interface** open interface tables. These will not work with other open interface tables.

Naming Conventions

The procedures must follow the naming convention **sb_sub_validate_<short name>** and **sb_sub_req_<short name>**.sql. Where short name is the name of your file in 12 characters or less. These files should be placed in the same directory as the other sql scripts **client\sql\ewof.** These procedures are the basis for the **sb_validate_<short name>** and **sb_run_import_<short name>** stored procedures.

Samples of Dummy Procedures

Samples of the dummy procedures include:

sb_sub_validate_invoices.sql and sb_sub_req_invoices.sql: Where invoices is the **<short name>**.

```
create or replace
PROCEDURE sb_sub_validate_invoices(p_resp_name varchar2, p_user_name
varchar2)
AS
BEGIN
null;
END sb_sub_validate_invoices;

sb_sub_req_invoices.sql:
create or replace
PROCEDURE sb_sub_req_invoices(p_set_of_books_id number,
p_je_source_name varchar2,
p_user_name varchar2, p_resp_name varchar2,
```

```
p_resp_appl_id number,
p_printer_name varchar2) IS
BEGIN
null;
END sb_sub_req_invoices;
```

Standard ETDs for the input and output must be generated, based on the data being processed. The input ETD essentially consists of a repeat node and fields underneath it that correspond to the columns in the sample data. The type may be left as java.lang.String. The necessary conversions will be made in the collaboration. The output ETD will have most of the same fields as the input but will not have the repeating element. There are also three additional fields, **SbPassOrFail**, **SbErrorCode**, and **SbErrorMessage** to handle the error codes and messages for the defective messages that are sent to the output file.

With all of the necessary ETDs generated, input, output, and combined, the schema and corresponding collaborations may be built. The basic schema consists of an input e*Way, stcewfile, output e*Way, stcewfile, and an Oracle connection e*Way, stceway. The Collaboration Rules used for input and output are pass-throughs that pass the input and output ETDs. The Oracle connection e*Way will use a Java Collaboration. The inbound instance will be the input ETD, and the combined ETD and output ETD are used for the outbound instances. In the Java Collaboration, the user will copy the data from the inbound instance to the staging table. Some additional logic may be necessary to handle null values for non-null columns. Code to handle data conversion is also done at this time.

After all of the data is copied to the staging table, the stored procedures, function, and prepared statement are executed. They are executed in the following order: sb_validate_<short name>, sb_count_err_<short name>, prepared statement to select the invalid records which are then copied to the outbound instance, sb_copy_<short name>, sb_delete_invalid_<short name>, sb_delete_all_<short name>, sb_run_import_<short name>. The details of the implementation will vary from open interface to open interface table. Any e*Way connection will be required for the instance using the combined ETD.

After running the schema, the valid records are copied to the open interface table and are transferred to the Oracle Financials system. Invalid records, as determined by the sb_validate_<short name> stored procedure, will appear in the output along with any error handling codes or messages configured in the pre-validation stored procedure.

4.3.3 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 Collaboration's select statement.

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.

Chapter 5

Oracle Financials e*Way Methods

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

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

cancel

clearBatch

clearWarnings

executeBatch

getFetchDirection

getFetchSize

getMaxFieldSize

getMaxRows

getMoreResults

getQueryTimeout

getResultSet

getResultSetConcurrency

getResultSetType

getUpdateCount

getWarnings

isClosed

queryDescription

queryName

resetRequested

resultSetConcurToString

resultSetDirToString

resultSetTypeToString

sessionClosed

sessionOpen

setCursorName

setEscapeProcessing

setFetchDirection

setFetchSize

setMaxFieldSize

setMaxRows

setQueryTimeout

stmtInvoke

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.

Name	Description
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

addbatch

clearParameters

execute

executeQuery

executeUpdate

sessionOpen

setArray

setAsciiStream

setBigDecimal

setBinaryStream

setBlob

setBoolean

setByte

setBytes

setCharacterStream

setClob

setDate

setDate

setDouble

setFloat

setInt

setLong

setNull

setObject

setObject

setObject

setRef

setShort

setString

setTime

setTime

setTimestamp

setTimestamp

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.
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.

Name	Description
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

afterlast

beforeFirst

clearWarnings

close

deleteRow

findColumn

first

getArray

getArray

getAsciiStream

getAsciiStream

getBigDecimal

getBigDecimal

getBinaryStream

getBinaryStream

getBlob

getBlob

getBoolean

getBoolean

getByte

getByte

getBytes

getBytes

getCharacterStream

getCharacterStream

getClob

getClob

getConcurrency

getCursorName

getDate

getDate

getDate

getDate

getDouble

getDouble

getFetchDirection

getFetchSize

getFloat

getFloat

getInt

getInt

getLong

getLong

getMetaData

getObject

getObject

getObject

getObject

getRef

getRef

getRow

getShort

getShort

getString

getString

getTime

getTime

getTime

getTime

getTimestamp

getTimestamp

getTimestamp

getTimestamp

getType

getWarnings

insertRow

isAfterLast

isBeforeFirst

isFirst

isLast

last

next

previous

refreshRow

relative

setFetchDirection

setFetchSize

updateRow

wasNull

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

execute

executeQuery

executeUpdate

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

getBigDecimal

getBlob

getBoolean

getByte

getBytes

getClob

getDate

getDate

getDouble

getFloat

getInt

getLong

getObject

getObject

getRef

getShort

getString

getTime

getTimestamp

getTimestamp

registerOutParameter

registerOutParameter

registerOutParameter

sessionOpen

wasNull

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.

Name	Description
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

absolute

afterlast

beforeFirst

cancelRowUpdates

deleteRow

findColumn

first

getAsciiStream

getAsciiStream

getBinaryStream

getBinaryStream

getCharacterStream

getCharacterStream

insertRow

isAfterLast

isBeforeFirst

isFirst

isLast

last

moveToCurrentRow

moveToInsertRow

next

previous

refreshRow

relative

rowDeleted

rowInserted

rowUpdated

select

updateRow

wasNull

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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