SYBASE®

Configuration and User's Guide

RepConnector™

15.0

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Contents

About This Book

Audience

This book is intended for System Administrators and Database Administrators who want to configure, manage, or administer a RepConnector™ system.

How to use this book

This manual contains the following chapters:

- Chapter 1, “Overview,” introduces RepConnector and how it integrates with your systems.
- Chapter 2, “Overview of RepConnector Configuration,” describes how to configure RepConnector.
- Chapter 3, “Configuring Replication Server for RepConnector,” describes how to configure Replication Server® to communicate with RepConnector.
- Chapter 4, “Configuring the Messaging System,” describes how to configure an EAServer messaging system to work with RepConnector.
- Chapter 5, “Getting Started with RepConnector Manager,” describes how to begin using RepConnector Manager, the graphic user interface (GUI) for creating, configuring, and managing RepConnector connections.
- Chapter 6, “Configuring RepConnector,” describes how to configure a RepConnector environment.
- Chapter 7, “Managing RepConnector Connections,” describes how to manage a RepConnector connection.
- Chapter 8, “Using the ratool Utility,” describes how to use ratool—the command line utility—to create, configure, and manage RepConnector connections.
- Chapter 9, “Using Unwired Orchestrator with RepConnector,” describes how to use Unwired Orchestrator with RepConnector.
- Chapter 10, “Customizing the Sender and Formatter Processors,” describes how to use the RepConnector API to create customized sender and formatter processors that work with RepConnector.

- Chapter 11, “Customizing the Message Generator for TIBCO AECM,” describes how to use the RepConnector API to create a customized message generator that works with RepConnector.
- Appendix A, “Configuration Worksheets” contains worksheets that can assist you while you configure a RepConnector environment.
- Appendix B, “Troubleshooting” describes how to troubleshoot the RepConnector environment.

Related documents

Document sets for Adaptive Server® Enterprise, Replication Server, and EAServer are included with this product.

Other sources of information

Use the Sybase Getting Started CD, the SyBooks CD, and the Sybase Product Manuals Web site to learn more about your product:

- The Getting Started CD contains release bulletins and installation guides in PDF format, and may also contain other documents or updated information not included on the SyBooks CD. It is included with your software. To read or print documents on the Getting Started CD, you need Adobe Acrobat Reader, which you can download at no charge from the Adobe Web site using a link provided on the CD.
- The SyBooks CD contains product manuals and is included with your software. The Eclipse-based SyBooks browser allows you to access the manuals in an easy-to-use, HTML-based format.

  Some documentation may be provided in PDF format, which you can access through the PDF directory on the SyBooks CD. To read or print the PDF files, you need Adobe Acrobat Reader.

  Refer to the *SyBooks Installation Guide* on the Getting Started CD, or the *README.txt* file on the SyBooks CD for instructions on installing and starting SyBooks.
- The Sybase Product Manuals Web site is an online version of the SyBooks CD that you can access using a standard Web browser. In addition to product manuals, you will find links to EBFs/Maintenance, Technical Documents, Case Management, Solved Cases, newsgroups, and the Sybase Developer Network.

  To access the Sybase Product Manuals Web site, go to Product Manuals at http://www.sybase.com/support/manuals/.

Sybase certifications on the Web

Technical documentation at the Sybase Web site is updated frequently.

❖ **Finding the latest information on product certifications**

1. Point your Web browser to Technical Documents at http://www.sybase.com/support/techdocs/.
2. Click Certification Report.
3. In the Certification Report filter select a product, platform, and timeframe and then click Go.
4. Click a Certification Report title to display the report.

❖ **Finding the latest information on component certifications**

1. Point your Web browser to Availability and Certification Reports at http://certification.sybase.com/.
2. Either select the product family and product under Search by Base Product; or select the platform and product under Search by Platform.
3. Select Search to display the availability and certification report for the selection.

❖ **Creating a personalized view of the Sybase Web site (including support pages)**

Set up a MySybase profile. MySybase is a free service that allows you to create a personalized view of Sybase Web pages.

1. Point your Web browser to Technical Documents at http://www.sybase.com/support/techdocs/.
2. Click MySybase and create a MySybase profile.

Sybase EBFs and software maintenance

❖ **Finding the latest information on EBFs and software maintenance**

1. Point your Web browser to the Sybase Support Page at http://www.sybase.com/support.
2. Select EBFs/Maintenance. Enter user name and password information, if prompted (for existing Web accounts) or create a new account (a free service).
3. Select a product.
4. Specify a time frame and click Go.
5. Click the Info icon to display the EBF/Maintenance report, or click the product description to download the software.

Conventions

This manual uses these style conventions:

- Commands that you enter exactly as shown appear in a Courier font.

  On Windows:

  ```
  set SYBASE = c:\sybase
  ```

  On UNIX:

  ```
  setenv SYBASE /work/sybase
  ```

- Words you replace with the appropriate value for your installation appear in italics.

  ```
  isql -Uyour_username -Pyour_password
  ```

- The names of files, volumes, and directories appear in italics:

  On UNIX: */work/sybase*

  On Windows: *\work\sybase*

- The names of programs, utilities, stored procedures, databases, and commands appear in a sans serif font:

  ratool

- Items within a graphical pull-down menu appear with vertical bars showing the menu hierarchy:

  File | Print

Syntax conventions

Syntax formatting conventions are summarized as follows. Examples that combine these elements follow the table.

Key	Definition
variable	Variables (words that stand for values that you fill in) appear in italics.
{ }	Curly braces mean that you must choose at least one of the enclosed options. Do not include braces in the command.
[ ]	Brackets mean that you may choose or omit enclosed options. Do not include brackets in the command.
|	Vertical bars mean that you may choose no more than one option, which must be enclosed in braces or brackets.
,	Commas mean that you may choose as many options as you need. Options must be enclosed in braces or brackets. Separate your choices with commas. Commas may also be required in other syntax contexts.
( )	Parentheses are typed as part of the command.
...	An ellipsis (three dots) means that you may repeat the last unit as many times as necessary.

Required choices

- Curly braces and vertical bars – choose one and only one option.

  {red | yellow | blue}

- Curly braces and commas – choose one or more options. If you choose more than one, separate your choices with commas.

  {cash, check, credit}

Optional choices

- One item in square brackets – choose or omit it.

  [anchovies]

- Square brackets and vertical bars – choose none or only one.

  [beans | rice | sweet_potatoes]

- Square brackets and commas – choose none, one, or more options. If you choose more than one, separate your choices with commas.

  [extra_cheese, avocados, sour_cream]

Repeated elements

An ellipsis (...) means that you may repeat the last unit as many times as necessary. For example, when you use the alter function replication definition command, you can list one or more parameters and their datatypes for the add clause or the add searchable parameters clause:

```
alter function replication definition function_rep_def
    {deliver as 'proc_name' |
    add @parameter datatype [, @parameter datatype]... |
    add searchable parameters @parameter [, @parameter]... |
    send standby {all | replication definition}
    parameters}
```

Accessibility features

This document is available in an HTML version that is specialized for accessibility. You can navigate the HTML with an adaptive technology such as a screen reader, or view it with a screen enlarger.

Sybase RepConnector 15.0 and the HTML documentation have been tested for compliance with U.S. government Section 508 Accessibility requirements. Documents that comply with Section 508 generally also meet non-U.S. accessibility guidelines, such as the World Wide Web Consortium (W3C) guidelines for Web sites.

For information on using this product without a mouse, see “Using keyboard shortcuts (Windows only)” on page 39.

Note You might need to configure your accessibility tool for optimal use. Some screen readers pronounce text based on its case; for example, they pronounce ALL UPPERCASE TEXT as initials, and MixedCase Text as words. You might find it helpful to configure your tool to announce syntax conventions. Consult the documentation for your tool.

For information about how Sybase supports accessibility, see Sybase Accessibility at http://www.sybase.com/accessibility. The Sybase Accessibility site includes links to information on Section 508 and W3C standards.

Section 508 compliance statement for RepConnector, Sybase Accessibility at http://www.sybase.com/accessibility.

If you need help

Each Sybase installation that has purchased a support contract has one or more designated people who are authorized to contact Sybase Technical Support. If you cannot resolve a problem using the manuals or online help, please have the designated person contact Sybase Technical Support or the Sybase subsidiary in your area.

CHAPTER 1

Overview

This chapter covers general information about Sybase RepConnector.

Introduction

RepConnector brings together traditional data integration with message-level integration.

RepConnector extends the reach of enterprise integration by detecting business events occurring in existing applications. It monitors databases for business events of interest, transforms them into XML, and routes them to Java components, integration servers, business process engines, and other applications. RepConnector delivers detected events through TIBCO Rendezvous™ and IBM Websphere MQ™ messaging infrastructures, as well as any J2EE-compliant JMS messaging systems, for transport to applications and users across the enterprise.

RepConnector enables you to reverse the direction of delivery: RepConnector detects message events in a messaging system, transforms those events to SQL statements, and sends them to the configured database tables.

RepConnector nonintrusively links automated business processes with existing database applications. As a result, you can integrate existing database applications with various nonintrusive EAI and business process management systems through RepConnector. Using RepConnector with messaging infrastructures, you can transmit events from existing applications to other applications in your enterprise.

Features of RepConnector:

- Delivers database events through Replication Server with the META information from Replication Server to the configured destination
- Follows transactional behavior
- Provides two tools that manage connections:
  - RepConnector Manager, which is an easy-to-use graphic user interface (GUI) in the Eclipse framework
  - ratool, which is a command line utility
- Groups database events into a single transaction
- Supports text and image datatypes
- Parses replication events and generates XML documents
- Shares a queue among multiple RepConnectors
- Transforms the incoming database events into XML messages, and routes them into the configured message queue
- Enables you to transform incoming database events into their application specific format
- Enables you to route incoming database events to any other destination
- Detects message events and routes them to database tables
- Supports EAServer 5.2 as well as WebLogic 8.1 Application Server

RepConnector architecture

RepConnector is designed based on the JCA (Java Connector Architecture) specification of J2EE. It runs in the J2EE-compliant application server environment. The architecture consists of three modules:

- Event Capture Module – listens for events from Replication Server or from the messaging system. For Replication Server, the module provides a TCP socket that listens for Replication Server events. For the messaging system, the module acts as a client and listens on the messaging bus for messaging events.

- Event Transformation Module – transforms an event before the event is routed to its destination. In real time messaging, RepConnector transforms the event to XML. Alternatively, you can customize the module to add a customized transformer plug-in. In the reverse case (messaging to database), RepConnector transforms the event to a SQL statement.
- Event Sender Module – routes the even to a messaging system, in the case of real time messaging, or to a database for reverse direction. Alternatively, you can customize the module to add a customized message sender plug-in.

For real-time messaging, RepConnector uses Replication Server technology to detect business events that occur in the database. Upon receiving events from Replication Server, RepConnector transforms those events to XML-formatted messages, then sends the XML messages to the configured messaging systems. RepConnector guarantees that the message routing is transactional.

In the reverse direction, RepConnector detects events from any of the supported messaging systems, transforms those events to SQL statements, and sends them to the configured database. These incoming events are in either SQL commands or an XML representation of SQL commands.

Connection management tools

RepConnector Manager is a GUI tool that runs in the Eclipse framework. It enables you to configure, manage and control connections in the RepConnector runtime environment.

You can also use a command line tool called ratool to configure, manage, and control connections in the RepConnector runtime environment.

RepConnector process flow

RepConnector participates in two different process flows:

- Routing database events from Replication Server to messaging systems
- Routing events from messaging systems to database tables

Routing database events from Replication Server to messaging systems

RepConnector routes database events from Replication Server to a messaging system as follows:

1 When an event occurs in the database, Replication Server detects the event and pushes it to RepConnector's Event Capture Module, which is listening for such events.

2 When the Replication Server event arrives from the Event Capture Module, the Event Transformation Module transforms the event into XML.

You can customize the Event Transformation Module by developing your own transformation module to replace the default XML transformation if you want to transform messages into an application-specific format. See Chapter 10, “Customizing the Sender and Formatter Processors” and Chapter 11, “Customizing the Message Generator for TIBCO AECM,” for more information.

3 After the message is transformed to XML, the Message Sender Module sends the XML message to the configured message system.

You can customize the Message Sender Module by developing your own sender class to route the message to other destinations if the supported messaging system is not the destination of the message. See Chapter 10, “Customizing the Sender and Formatter Processors,” for more information.

Routing events from messaging systems to database tables

RepConnector routes events from messaging systems to database tables as follows:

1 The Event Capture Module listens for messages arriving in the configured messaging system. (Messages can be in either standard SQL format or XML format.)

2 When a message arrives, the Event Capture Module receives the message and triggers the Event Transformation Module.

3 The Event Transformation Module analyzes the message and transforms it to SQL format, if needed.

4 After the message is transformed to SQL, the Message Sender Module sends the SQL statement to the database table.

Transaction rollback

RepConnector offers transaction rollback in the event of failure through atomic event processing. Event processing between RepConnector modules is atomic and handled as follows:

1 At any point of failure, the transaction is rolled back.

2 Then RepConnector logs any messages in the log file and stops the processing of any new events.

3 After you fix the failure, the rolled-back events are reprocessed. This guarantees that RepConnector does not lose a transaction.

Status and error reporting

When routing message events to database tables, RepConnector reports status and errors through a status queue. Client applications can monitor the status queue and retrieve status or error messages that occur during the entire process.

CHAPTER 2

Overview of RepConnector Configuration

Configuring RepConnector requires the configuration of other servers and software in your RepConnector environment. This chapter describes the entire configuration process at a high level. Subsequent chapters describe the details of each configuration step.

Basic steps

The environment where RepConnector resides contains many components. These components include Sybase products as well as other third-party products. Each of these components needs specific configuration before you can create RepConnector connections.

The following basic steps are required to configure the RepConnector environment:

1 Set up your database server and Replication Server to send replicated events to RepConnector.

See Chapter 3, “Configuring Replication Server for RepConnector,” for information about configuring Replication Server in the RepConnector environment.

See Chapter 6, “Configuring RepConnector,” for information about configuring the database in the RepConnector environment.

2 Configure your messaging system.

See Chapter 4, “Configuring the Messaging System,” for information about configuring the messaging system in the RepConnector environment.

3 Create and configure your RepConnector connection.

See Chapter 5, “Getting Started with RepConnector Manager,” and Chapter 6, “Configuring RepConnector,” for information about creating and configuring the RepConnector environment.

4 Configure runtime control.

See Chapter 7, “Managing RepConnector Connections,” for more information about how your configuration of the RepConnector environment can influence your runtime control and management of RepConnector connections.

See Chapter 3, “Configuring Replication Server for RepConnector,” for more information.

CHAPTER 3

Configuring Replication Server for RepConnector

This chapter provides a high-level description of the tasks required to set up a Replication Server to replicate to RepConnector.

You or your system administrator must establish the RepConnector connection in Replication Server before configuring RepConnector. For more information, see the Replication Server documentation.

This chapter assumes that you have already configured a Replication Server environment, have added the primary database to the replication system (including updating the interfaces file with the connection information for the database server), and have marked the primary tables and procedures for replication. If you have not completed these tasks see the Replication Server Configuration Guide to configure the Replication Server environment before you proceed.

To configure Replication Server to replicate to RepConnector:

1 Add an entry for RepConnector in the Replication Server interfaces file.

2 Verify that Replication Server is up and running.

3 Create a database connection in Replication Server to communicate with RepConnector.

4 Create a replication definition in Replication Server to identify the data to be replicated.

5 Create a subscription in Replication Server to identify the location to which the data will be replicated.

6 Resume the database connection.

When you complete these steps, a connection is established between RepConnector and Replication Server.

As you work through this chapter, use the Configuration Worksheet in Appendix A, Configuration Worksheets, to record the values used to configure the RepConnector connection at Replication Server.

Updating the interfaces file

The interfaces file contains network information that Replication Server must have to connect to RepConnector. Therefore, for Replication Server to communicate with RepConnector, you must first add a RepConnector connection entry to the Replication Server interfaces file. An entry must exist for each unique RepConnector connection that Replication Server will communicate with.

Understanding the information required

You need the following information to add the RepConnector connection entry to the Replication Server interfaces file. Either record this information on the worksheet provided in as you go through the procedure, or complete the worksheet first, then use it in the procedure.

- Server name – the name of the data server. This name should be unique and case-sensitive. Use the value recorded on line 3.a of the worksheet.

This is also the RepConnector connection's DSI name, which you will need later when you configure the RepConnector connection in Chapter 5.

Note For simplicity, Sybase recommends that you use a name that clearly identifies this connection as allowing Replication Server to communicate with RepConnector, and which distinguishes it from either a traditional connection between Replication Server or a data server and its corresponding database.

- Protocol – the network protocol for the DSI connection. Use the value recorded on on line 3.b of the worksheet in the Appendix, "Configuration Worksheets." For example, on Windows, use `RepConnector`.

  You can use either the Transmission Control Protocol (TCP) or the NLWNSCK protocol on Windows, and either TCP or the Transport Layer Interface (TLI) TCP protocol on UNIX.

  For example, on Windows, use `TCP`.

- Host name – the machine name where the RepConnector connection will be running. Use the value recorded on on line 3.c of the worksheet.

  For example, on Windows use `localhost`.

- Port Number – the number of the port on which the RepConnector connection will be listening. This must be an unused port number on the host machine. Use the value recorded on line 3.d of the worksheet.

  For example, on Windows, use `7000`.

Adding a RepConnector entry to the interfaces file

You must create a new entry for the RepConnector connection in the interfaces file at the machine on which Replication Server is running. See "Understanding the information required" on page 10 for details about the information you need to create this entry.

To add the interfaces entry, use dsedit, a utility that is part of the Replication Server installation and resides in the *OCS-15_0\bin* subdirectory.

Note You can also manually add the information to the interfaces file, but Sybase recommends that you use dsedit to maintain the integrity of the interfaces file.

See the *Adaptive Server Utility Guide* for more information about the dsedit utility and editing interfaces files.

Verifying the interfaces file entry

After you update the interfaces file, view the file to verify that your entry is correct.

The location of the Replication Server interfaces file is *%SYBASE%\ini\sql.ini* for Windows and *$SYBASE/interfaces* for UNIX, where *%SYBASE%* and *$SYBASE* are the locations of the Replication Server installation.

On UNIX, in *interfaces*:

```
server_name
master protocol machine_name port_number
query protocol machine_name port_number
```

On Windows, in *sql.ini*:

```
[server_name]
master=protocol,machine_name,port_number
query=protocol,machine_name,port_number
```

where:

- *server_name* is the DSI name as recorded on your worksheet in 3a. This name should be unique and case sensitive.
- *protocol* is the network protocol for the DSI connection as recorded on your worksheet in 3.b
- *protocol* is the network protocol for the DSI connection as recorded on your worksheet in 3.b
- *port_number* is the number of the port on which the RepConnector connection will be listening as recorded on your worksheet in 3d.

Examples

The following are examples of interfaces entries for the RepConnector connection:

On Windows:

```
[RepConnector]
master=TCP,localhost,7000
query=TCP,localhost,7000
```

On UNIX:

```
RepConnector
```

```
master tcp ether localhost 7000
query tcp ether localhost 7000
```

Note If you plan to create more than one RepConnector connection, each entry to the interfaces file must have a unique name and port number.

Verifying that Replication Server is running

You can verify the status of your Replication Server with these methods:

- Use the Replication Manager plug-in to Sybase Central. See the Replication Manager help for instructions on verifying the status of your Replication Server using Sybase Central.
- Use the isql utility to log in to Replication Server. If the login succeeds, you know the server is running. The isql utility is located in the Replication Server installation directory in *OCS-15_0\bin* on Windows or *OCS-15_0/bin* on UNIX. See the Adaptive Server *Utility Guide* for more information about isql.

  To log in to Replication Server and verify that it is up and running, at the command line enter:

  ```
  isql -U <user> -P <pwd> -S <server_name>
  ```

  where:

  - *user* is the user ID with sa permission in the Replication Server.
  - *pwd* is the password for the user ID.
  - *server_name* is the name of the Replication Server.

If Replication Server is not up and running, start Replication Server. Refer to the *Replication Server Administration Guide* for instructions.

Creating the connection to RepConnector

A data connection defines the information that Replication Server uses to connect to RepConnector for replicating data. The following procedure adds the RepConnector connection to the replication system and sets the configuration parameters for the connection.

Note The worksheet referred to in the following procedures is in Appendix A, "Configuration Worksheets."

Before creating the connection

Before you can create the connection, you must gather the following information:

- The location of the isql utility, which is in the Replication Server installation directory under *OCS-15\bin* on Windows or *OCS-15/bin* on UNIX.
- The DSI name for the RepConnector connection (from line 3.a on your worksheet; it is also the same name added to the interfaces file)
- A user name to connect to the RepConnector connection (from line 3.e on your worksheet)
- A password for this user name (from line 3.f on your worksheet)

❖ **Creating a new RepConnector connection in Replication Server**

1 Using the isql utility, log in to the Replication Server with the user ID that has System Administrator permission:

```
isql -U <username> -P <pwd> -S <server_name>
```

where:

- *username* is the user ID with sa permission in the Replication Server.
- *pwd* is the password for the user ID.
- *server_name* is the server name of the Replication Server.

2 Using the create connection command, create the connection, and define the user ID and password for the RepConnector connection:

```
create connection to <dataserver>.<database>
set error class to rs_sqlserver_error_class
set function string class to rs_sqlserver_function_class
set username <dsi_username>
set password <dsi_password>
set batch to 'off'
```

```
set dsi_xact_group_size to '-1'
with dsi_suspended
```

where:

- *dataserver* is the RepConnector connection's DSI name. This is the same name you added to the Replication Server interfaces file. Use the name recorded in 3.a on your worksheet; for example, `RepConnector`.
- *database* is the name of the database to which you are replicating. However, RepConnector does not use the database name; the database name here is a placeholder to meet Replication Server syntax requirements.

  Because a RepConnector connection is the destination instead of an actual database, Sybase recommends you use a name that is unique and that represents the RepConnector connection.

  Note When you create this connection in Replication Server, you must designate it with the *dataserver.database* data pair value. However, the database name in Replication Server is just a placeholder, and RepConnector does not use that name. Therefore, if you use a name that clearly designates the replicate or destination, in this case, RepConnector, it might help you to manage the RepConnector connection in an environment where you are also managing traditional Replication Server connections, whose destinations are actually databases. For example, designate the connection as `RepConnector.RepCondb`.

  Record this value in 3.j on the worksheet. For example, `RepCondb`.
- *dsi_username* is the user ID that is used to connect to the RepConnector connection. Use the value recorded in 3.e on your worksheet.
- *dsi_password* is the password for the user ID. Use the value recorded in 3.f on your worksheet.
- set batch to 'off' is required by RepConnector. This instructs Replication Server not to batch the commands to send to RepConnector.

- set dsi_xact_group_size to '-1' is required by RepConnector. This instructs Replication Server not to group the transactions as a single transaction before sending them to RepConnector.

Note RepConnector does not support the batching of commands in Replication Server. Therefore, you must set the batch and dsi_xact_group_size parameters to disable batching of commands for the connection to RepConnector. If you have already created the connection, you can use the configure connection and alter connection commands to set the batch and dsi_xact_group_size parameters. See the *Replication Server Reference Manual* for the exact syntax of the configure connection and alter connection commands.

For example:

```
create connection to RepConnector.RepCondb
set error class to rs_sqlserver_error_class
set function string class to
     rs_sqlserver_function_class
set username sa
set batch to 'off'
set dsi_xact_group_size to '-1'
with dsi_suspended
```

Creating the replication definition

A replication definition describes the data that can be replicated for a table or stored procedure defined in the primary database. RepConnector supports replication of DML commands and stored procedures. You can skip the following procedure if you have already defined a replication definition.

Note If you have not already done so, you must mark primary tables or stored procedures for replication before continuing.

❖ **Creating a table replication definition in Replication Server**

At the Replication Server, create the replication definition for the table you want to replicate. You must know the Adaptive Server name and database name in which the primary table resides. Record the information in Appendix A, “Configuration Worksheets.”

To create the replication definition:

1 Gather the following information and record it on your worksheet where appropriate:

- Primary data server name (in 3.k)
- Primary database name (in 3.j)
- Table names and column field name(s)

2 Create the table replication definition using the create replication definition command:

```
create replication definition
     <replication_definition_name>
with primary at
     <dataserver>.<database>
with all tables named '<table_name>'
( <column_name> <column_datatype>,
     …)
primary key (<column name>,..))
searchable columns (<column_name>,..)
```

where:

- *replication_definition_name* is the name for the replication definition.
- *dataserver* is the name of the server containing the primary data (3.k).
- *database* is the name of the database containing the primary data (3.j).
- *table_name* is the name of the primary table containing the data.
- *column_name* is the column name from the primary table.
- *column_datatype* is the datatype for the column name.
- *primary key* is a primary key, or a set of primary keys, defined in the table.

For example:

```
create replication definition authors_rep
with primary at primary_ase.pubs2
with all tables name 'authors' (
     au_id varchar(11),
     au_lname varchar(40),
     au_fname varchar(20),
     phone char(12),
     address varchar(40),
     city varchar(20),
```

```
        state char(2),
        country varchar(12),
        postalcode char(10))
primary key (au_id)
searchable columns(au_id)
```

For more information about the create replication definition command, see the *Replication Server Administration Guide* and the *Replication Server Reference Manual*.

❖ **Creating a function replication definition**

To create a function replication definition in Replication Server:

1 Gather the following information and record it on your worksheet, in Appendix A, "Configuration Worksheets," where appropriate:

- Primary data server name (in line 3.k)
- Primary database name (in line 3.j)
- Procedure and parameter name(s)

2 Create the function replication definition using the create function replication definition command:

```
create function replication definition
<relication_definition_name>
with primary at <dataserver>.<database>
deliver as '<procedure_name>' (
     <@param_name> <datatype>,
     …)
searchable parameters (<@param_name>,..>)
```

where:

- *replication_definition_name* is the name for the function replication definition.
- *dataserver* is the name of the server containing the primary data.
- *database* is the name of the database containing the primary data.
- *procedure_name* is the name of the stored procedure in the primary dataserver.
- *param_name* is the parameter name from the function.

For example:

```
create function replication definition ins_authors
with primary at primary_ase.pubs2(
```

```
        @au_id varchar(11),
        @au_lname varchar(40),
        @au_fname varchar(20),
        @phone char(12),
        @address varchar(40),
        @city varchar(20),
        @state char(2),
        @country varchar(12),
        @postalcode char(10))
    )
    searchable parameters(@au_id)
```

For more information about the create function replication definition command, see the *Replication Server Administration Guide* and the *Replication Server Reference Manual*.

Creating and verifying the subscription

A subscription instructs Replication Server to copy data from the primary table to the specified RepConnector connection. The subscription describes the replicated information that RepConnector can accept.

The following procedure describes how to create and then validate a subscription. You must verify that the subscription is valid *both* at the primary table and at the RepConnector connection.

❖ **Creating and validating the subscription at Replication Server**

Create the subscription using the RepConnector connection name as the parameter value for the with replicate at command. This is the name of the connection you created in the previous section.

All values in the following procedure refer to the worksheet entries in Appendix A, “Configuration Worksheets.”

1 Gather the following and record it on your worksheet where appropriate:

- Name of the RepConnector connection (3.a) you created in “Creating the connection to RepConnector” on page 14
- Name of the replication definition

2 Create the database subscription using the create subscription command:

```
create subscription <subscription_name>
for <replication_definition_name>
```

```
with replicate at <dataserver>.<database>
without materialization
```

where:

- *subscription_name* is the name of your subscription.
- *replication_definition_name* is the name of the replication definition.
- *dataserver* is the name of the database connection you created to connect to RepConnector.
- *database* is the name of the database to which you are replicating. However, RepConnector does not use the database name; the database name here is a placeholder to meet Replication Server syntax requirements.

  Because a RepConnector connection is the destination instead of an actual database, Sybase recommends you use a name that is unique and that represents the RepConnector connection.

For example:

```
create subscription authors_sub
for authors_rep
with replicate at RepConnector.RepCondb
without materialization
```

3 Use the check subscription command to verify that the subscription is valid at the primary database and at the replicate database:

```
check subscription <subscription_name>
for <replication_definition_name>
with replicate at <dataserver>.<database>
```

where:

- *subscription_name* is the name of the subscription.
- *replication_definition_name* is the name of the table or function replication definition the subscription is for.
- *dataserver* is the name of the RepConnector connection (3a).
- *database* is the name of the database to which you are replicating. RepConnector does not use the database name and this is a placeholder to meet Replication Server syntax requirements.

For example:

```
check subscription authors_sub
for authors_rep
```

```
with replicate at RepConnector.RepCondb
```

Resuming the connection to RepConnector

To ensure that Replication Server replicates commands to RepConnector, you must resume the connection from Replication Server to RepConnector.

❖ **Resuming the connection**

To resume the RepConnector connection in Replication Server:

1 Gather the following information:

- The name of the RepConnector connection
- The database name you used when you created the connection at Replication Server

2 To resume a database connection from the command line, enter:

```
resume connection to <dataserver>.<database>
```

where:

- *dataserver* is the name of the connection you have created in previous steps.
- *database* is the name of the database to which you are replicating. However, RepConnector does not use the database name; the database name here is a placeholder to meet Replication Server syntax requirements. This is the same value you used when you created the connection in “Creating the connection to RepConnector” on page 14.

For example:

```
resume connection to RepConnector.RepCondb
```

For information about resuming a connection in Sybase Central Replication Manager, refer to the Replication Server plug-in and Replication Manager documentation and online help.

A connection has now been established between RepConnector and Replication Server.

Note This connection does not show an active status until the RepConnector connection has successfully started.

CHAPTER 4

Configuring the Messaging System

This chapter provides an overview about the requirements and procedures for configuring each messaging system RepConnector supports.

The specific configuration details for the messaging system in your environment depend on which messaging system you are using. This chapter does not attempt to cover all of those details. See the documentation for your messaging system for more information.

The procedures in this chapter refer to values that you can record in Appendix A, “Configuration Worksheets,” which can make the configuration process easier.

The configuration of a RepConnector connection requires one messaging system configured at one end of the route, either from the Replication Server to a messaging queue or from a message queue to the database.

You can configure a RepConnector connection to deliver the database replication events from the Replication Server to the target messaging system, or to read the Data Manipulation Language (DML) operations from the messaging system and execute them over the target database system. In any connection configuration, you must configure the messaging system to communicate with the RepConnector connection. To route the replication events to the target messaging system, you must configure the messaging system to be the outbound end of the connection. To execute SQL commands over the target database, you must configure the messaging system as the inbound end of the connection.

If your messaging system requires you to load libraries and you use EAServer 5.2 as your application server, take these steps to load the libraries:

1 Copy the messaging system *jar* files to the *java/classes* directory on EAServer.

2 Use EAServer Manager to connect to your EAServer instance. See the EAServer documentation for specific information.

   Then, go to the *Servers/<your server>* directory and select the Server Properties menu. From the pop-up, select the Java Classes tab and click Add to add the name of the *jar* file, such as *mycustom.jar*. Click OK.

3 Inn EAServer Manager, right-click on the Servers/Jaguar icon and select Properties.

4 Select “Java Classes” from the tabs and add the names of the *jar* files you copied in Step One. Include the extension *.jar* when adding these names.

The following sections describe some fundamental structure about the configuration of each specific type of RepConnector connections.

Note Both the inbound and outbound systems must be configured and available before you can configure and run the RepConnector connection.

JMS connections

RepConnector supports the Java Messaging Service (JMS) queue and topic connections that conform to the J2EE standard JNDI binding to connection factories, destination queues, or destination topics. It also supports non-J2EE binding with TIBCO JMS and SonicMQ JMS.

Configuring connections with specific JMS providers

There are multiple providers for this JMS standard, such as:

- Sybase EAServer
- BEA WebLogic
- TIBCO
- SonicMQ

The following sections describe sample configurations with several different JMS providers. After configuring the destination queue or topic, verify that your client application can access the destination and listen at the destination for replication events, or can send the database commands.

Before you configure the connection

Before you configure your JMS connections:

1 Use Table A-2 on page 142 as a worksheet to gather the following information about the JMS queue or topic before configuring it:

- The URL to the JMS provider
- InitialNamingContext
- ConnectionFactory:
  - QueueConnectionFactory (for queues)
  - TopicConnectionFactory (for topics)
- Destination:
  - Queue name (for queues)
  - Topic name (for topics)
- User name and password (when required by the JMS provider)

For detailed information, see the configuration guide for the specific JMS provider you are using. Example values for various JMS providers are also available in configuration files located in the RepConnector installation under the *samples/conf* directory. For example, on Windows *c:\sybase\EAServer\repra\sample\conf*

2 Verify that the naming context factory, the connection factory, and the destination are defined and available.

3 If the JMS provider requires a user name and a password to access the configured JMS destination, verify the login information.

4 Configure the JMS queue or topic with the JMS provider.

JMS configurations

The following sections provides details of several configurations with different JMS providers. Configuring other J2EE-compliant JMS providers will be similar to one of the following examples.

❖ **Configuring JMS for Sybase EAServer**

1 From Jaguar Manager, check the target queue or topic status.

2 From Jaguar Manager, connect to the server select Message Service.

If the message service is not available, you must configure it before proceeding.

3 Right-click Configured Queues or Configured Topics under the Message Service folder, then select Add and enter the name of the queue or topic.

4 After you have created the queue or the topic, right-click it and select Config Queue Properties for a queue or Config Topic Properties for a topic to set its properties, if needed.

For more information, see the user documentation for EAServer online at *http://<easerver hostname>:<easerver http port>*. For example, *http://localhost:8080/docs/index.html*.

Note The user name and password are the same as the Jaguar Manager's administrator user name and the password.

❖ **Configuring JMS for BEA WebLogic**

Use the WebLogic Administration Console to configure the target queue or topic.

1 Enter the URL to the WebLogic Administration Console. For example:

```
http://localhost:7001/console
```

2 From the Administration Console, go to *<your domain folder>/Services/JMS*.

3 If the JMS configuration is not available, you must configure the store and the server before proceeding.

4 Create a new connection factory under the Connection Factories folder or use the existing one.

5 Create the destination queue or topic under *Services/JMS/Servers/<yourJMSserver>/Destinations*.

6 Use the right-side window of the Administration Console to set the properties of your JMS objects, if needed.

7 Verify the queue or topic status from the WebLogic Administration Console.

For more information, see the user documentation for the WebLogic Server at http://www.bea.com.

❖ **Configuring for TIBCO JMS**

Use the tibjmsadmin utility to administer the TIBCO Enterprise for JMS objects. This information about these objects are required for configuring the RepConnector inbound and outbound properties.

1 Start TIBCO Enterprise for JMS Server.

2 Start the TIBCO Enterprise for JMS Administration tool. This tool is located in the TIBCO Enterprise for JMS installation's bin directory. The utility is *tibjmsadmin.exe* for Windows, and *tibjmsadmin* for UNIX.

Note Use tibjmsadmin -help to display information about start up parameters for tibjmsadmin.

---

3 Connect to the JMS server. If a user name or password is not provided, you are prompted to enter a user name and password. An administrator is the admin user, any user in the $admin group, or any user that has administrator permission enabled.

```
connect [<server-url><admin user name> <password>
```

For example:

```
>connect tcp://mymachine:7222 admin
```

Note To access the command line documentation from tibjmsadmin, enter `'help create'`. For example:

```
tcp://mymachine:7222 > help create
```

---

4 Create the connection factory. A connection factory is the object a client uses to create a connection with a provider.

```
create factory [ <factory-name> <type> <password> ] [URL [clientID] ]
```

For example:

```
tcp://mymachine:7222 > create factory
com.tibco.tibjms.TibjmsQueue.ConnectionFactory queue
```

5 Create a JMS destination. A destination is the object a client uses to specify the target messages it processes, and the source of messages it consumes.

In a point-to-point (PTP) messaging domain, destinations are called queues:

```
create queue <queue-name> [<properties>]
```

For example:

```
tcp://mymachine:7222> create queue sampleQ1
```

In a publish/subscribe messaging domain, destinations are called topics:

```
create topic <topic-name> [<properties>]
```

For example:

```
tcp://mymachine:7222> create topic sampleT1
```

6 Verify the status of queue or topic.

❖ **Configuring SonicMQ JMS**

Use the SonicMQ Management Console to configure the target queue or topic.

1 Start the SonicMQ Management Console.

2 Go to the *Brokers/<your broker name>/Queues* or *Brokers/<your broker name>/Topics* folder.

3 Enter the queue or topic name to create a new queue or topic.

4 Set the properties of the queue or topic.

5 Verify the status of the queue or topic from the Management Console.

For detailed information, see the SonicMQ documentation.

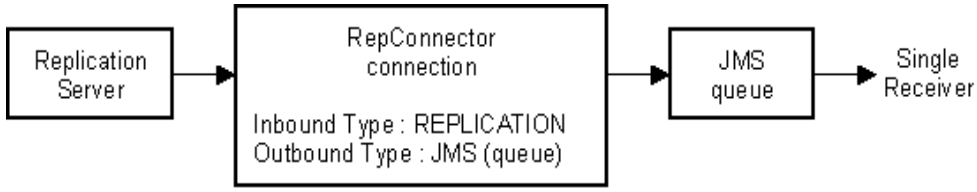
Routing with JMS messaging

The following sections describe some of the connections that include a JMS messaging system.

JMS queue

In this configuration, the RepConnector connection reads the replication events from Replication Server, formats them to the XML document, then sends the JMS Bytes Messages to the target JMS queue, to the single receiver running in the client application.

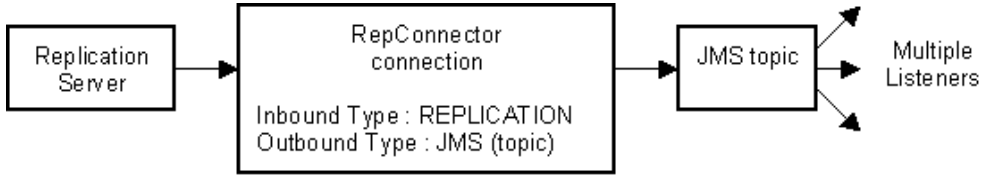
Figure 4-1: Routing replication events to the JMS queue



Routing from replication system to JMS topic

In this configuration, the RepConnector connection reads the replication events from Replication Server, formats them into XML, then sends the JMS BytesMessages to the target JMS topic for the multiple listeners running in the client application.

Figure 4-2: Routing replication events to the JMS topic



TIBCO RV, RVCM, and AECM connections

The TIBCO Rendezvous (RV) messaging system must be installed on your local machine to configure a RepConnector connection with RV or RV Certified Messaging (CM) inbound/outbound types. To route the replication event to a TIBCO ActiveEnterprise (AE) subscriber, the TIBCO ActiveEnterprise SDK must be installed and configured with the customized wire-message format.

RepConnector supports RV and RVCM messaging with a local or remote RV daemon, and AE Certified Messaging (CM) with the local TIBCO SDK installation. This section describes some basic instructions and samples of the RV configuration. See Chapter 6, “Configuring RepConnector,” for information about configuring AECM connections..

❖ **Running an rvd process on the local or remote machine.**

If you run the rvd process on a remote machine, you must also run the rvrd process on the local machine to deliver the messages to the remote rvd process.

1 Navigate to the TIBCO Rendezvous installation *bin* directory. For example:

- On UNIX, enter:

```
cd /opt/tibco/tibrv/bin
```

- On Windows, enter:

```
cd C:\TIBCO\TIBRV\bin
```

2 Invoke the rvd daemon process by entering:

```
rvd
```

❖ **Configuring the RV routing daemon**

To deliver the message from the RepConnector connection to the remote RV daemon:

Note You can skip this procedure if you use the local RV daemon for either the inbound or outbound messaging system.

---

1 Navigate to the TIBCO Rendezvous installation location *bin* directory.

- On UNIX, enter:

```
cd /opt/tibco/tibrv/bin
```

- On Windows, enter:

```
cd C:\TIBCO\TIBRV\bin
```

2 Invoke the rvrd daemon process.

- On UNIX, enter:

```
rvrd -store ./storefile
```

where *./storefile* is the name of the local storage file for rvrd.

- On Windows, enter:

```
rvrd -store .\storefile
```

where .*storefile* is the name of the local storage file for rvrd.

Note If you are configuring to use the routing daemon, supply the following:

- Service name for the local daemon
- Network value for the machine where the RV routing daemon process is running
- Daemon value for where the rvd process is running when you are defining the RepConnector connection

---

See the sample RepConnector connection configuration files supplied with the RepConnector runtime component for information about defining the values with TIBCO messaging. The sample files reside under the RepConnector installation *sample\conf* directory. For example, on Windows, *c:\sybase\EAServer\repra\sample\conf*. For more information, refer to the user documentation for TIBCO as well.

Routing with TIBCO RV messaging

The different routes that you can configure with TIBCO RV are:

- Routing replication events to an RV subject
- Routing replication events to the RVCM subject
- Routing replication events to the TIBCO ActiveEnterprise CM subscriber
- Routing JDBC commands from a RV subject to the database
- Routing JDBC commands from a RVCM subject to the database

IBM WebSphere MQ connections

You can configure IBM WebSphere MQ connections using either the local or remote MQ server. The MQJMS configuration uses the MQJMS bridge to connect the MQ queue configured for the RepConnector connection.

RepConnector supports MQ messaging and the queue connection of the JMS bridge for IBM WebSphere MQ messaging system.

❖ **Setting the environment for MQ and MQJMS**

You can use the WebSphere MQ Explorer to configure the MQ messaging system.

1 If no queue manager is available for your application, create a new one.

2 To create a new target queue, go to the *<queue manager>/Queues* folder and enter the queue name.

3 To configure the new queue, use the MQ Explorer to set its properties.

4 To create a new channel, go to the *<queue manager>/Advanced/Channels* folder.

To configure the channel for the server connection, set the properties with the MQ Explorer.

5 To connect to the remote MQ daemon from your local RepConnector connection, set the *MQSERVER* environment variable in *$REPRA_HOME/bin/repra_env.sh* on UNIX or *%REPRA_HOME%\bin\repra_env.bat* on Windows.

```
MQSERVER=<Channel_name>/TCP/'<hostname>(<port_number>)'
```

where:

- *channel_name* is the name of the channel that you have defined for your server connection.
- *hostname* is the name of the machine where your IBM WebSphere MQ Server is running.
- *Port_number* is the port number that the IBM WebSphere MQ Queue Manager is listening on.

For example, on UNIX, enter:

```
MQSERVER=CHANNEL1/TCP/'remotehostname(1414)'
export MQSERVER
```

On Windows:

```
SET MQSERVER=CHANNEL1/TCP/'remotehostname(1414)'
```

Example values for IBM messaging are available in configuration files located in the RepConnector installation directory, *<AppServer>\repra\samples\conf*. For more information, see the user documentation for IBM WebSphere MQ.

CHAPTER 5

Getting Started with RepConnector Manager

This chapter describes how to get started using RepConnector Manager to create, configure, and manage RepConnector connections.

RepConnector Manager is a plug-in to the Eclipse framework that you can use to manage the RepConnector runtime component's activities. You can run RepConnector Manager on the local machine where the RepConnector runtime component is installed, or on any remote machine that can access the machine on which the RepConnector runtime component is installed. To access the remote machine, verify that the HTTP connection to the application server on which the RepConnector runtime component is deployed and running, is available throughout the network.

See the Eclipse documentation for more information about how to use Eclipse framework.

Starting RepConnector Manager

Start RepConnector Manager by running the batch or script file that starts Eclipse, then starts the RepConnector Manager view within Eclipse.

❖ **Starting Eclipse and RepConnector Manager**

1 At the operating system prompt, navigate to the RepConnector Manager installation directory.

For example, on UNIX, enter:

```
cd /opt/sybase/EAServer/repra/eclipse
```

On Windows, enter:

```
cd C:\sybase\EAServer\repra\eclipse
```

2 Run the UNIX script file *RepConnectorManager.sh*, or the Windows batch file *RepConnectorManager.bat*.

For example, on UNIX, enter:

```
RepConnectorManager.sh
```

On Windows, enter:

```
RepConnectorManager.bat
```

When you invoke RepConnector Manager, the Eclipse workbench opens and displays the Sybase RepConnector Manager Welcome page.

3 Workspace Launcher displays.

```
Workspace:C:\Sybase\EAServer\repra\eclipse\workspace
```

❖ **Starting the Sybase RepConnector Manager and Properties views**

1 If the RepConnector Manager Welcome window does not display, select *Help* | *Welcome*.

2 To add the view RepConnector Manager to your workbench, select the RepConnector Manager icon.

3 If you do not see the view RepConnector Manager, select *Window/Show View/Other/Sybase/RepConnector Manager*.

❖ **Testing and deploying RepConnector Manager to Unwired Orchestrator**

If the Welcome Page is not visible, got to Help | Welcome | Unwired Orchestrator.

1 From the Unwired Orchestrator Welcome Page, select Database Event Management. The Replication Roadmap appears.

2 Follow the instructions in the Replication Roadmap to display the Sybase RepConnector Manager view.

❖ **Displaying the Sybase RepConnector Manager view from the Eclipse menu bar**

1 From the Eclipse menu bar, select Windows | Show View | Other.

2 In the Show View dialog box, find Sybase/RepConnector Manager.

3 Select Sybase RepConnector Manager.

The Sybase RepConnector Manager view displays.

4 Resize or relocate the RepConnector tree view within the Eclipse Workbench, if needed.

Managing connection profiles

A RepConnector profile contains the connection property information needed to connect to the RepConnector runtime instance. It manages all the configured RepConnector connections defined for the installed RepConnector instance running on an application server. You can configure as many RepConnector profiles as necessary to manage the local or remote RepConnector installations from one RepConnector Manager installation.

When you install RepConnector Manager, the installation provides two sample default profiles you can use to connect to your RepConnector runtime:

- `EAServer:8080` for Sybase EAServer
- `WebLogic:7001` for BEA WebLogic Server

❖ **Creating a new profile**

1 Right-click the Sybase RepConnector folder and select New Connection Profile to create a new RepConnector runtime profile.

2 When the New RepConnector Profile dialog box displays, enter:

- Profile Name – the name of the RepConnector profile. This name must be unique within this instance of RepConnector Manager. The name of the profile can contain alphanumeric characters, ":", ".", "-", and "_". It cannot contain any white space. The default is `localhost:8080`.
- Host – the HTTP host name of the machine where the target RepConnector runtime is running. The default is `localhost`.
- Port – the HTTP port number where the target RepConnector runtime is listening. The default is `8080` for EAServer and `7001` for BEA Weblogic Server.

- User – the RepConnector administrator user ID to connect to the RepConnector runtime. The default user ID is `repraadmin`.

Note See "Setting up the RepConnector runtime administrator login" on page 37 for more information about changing the default user name and password.

3 Select OK to create a new profile, or Cancel to cancel the action.

For example, enter:

```
Profile Name: EAServer:8080
Host: myhost
Port: 8080
User: rcuser1
```

❖ **Renaming a profile**

To rename a profile name:

1 Right-click the profile to rename, and select Rename Profile.

2 The Profile dialog box displays. Enter a new profile name that is unique within the same RepConnector Manager instance.

3 Select OK to rename the profile with a new name, or Cancel to cancel the action.

❖ **Editing the profile properties**

To modify the connection properties of a profile:

1 Right-click the profile to modify, and select Edit Profile Properties.

2 The RepConnector Profile Properties dialog box displays. Modify the fields as needed.

3 Select OK to save the new properties, or Cancel to cancel the operation.

❖ **Deleting a profile**

Note This procedure deletes a profile from the RepConnector Manager tree view only. It does not make changes to the runtime configuration.

To delete a profile:

1 Right-click the profile to delete and select Delete Profile.

2 Select OK to delete the profile from the tree view, or Cancel to cancel the action.

❖ **Setting up the RepConnector runtime administrator login**

Each RepConnector instance has one administrator login. The default administrator login is "repraadmin" with no password. Sybase recommends that you change the administrator login and password and secure access to the RepConnector runtime.

- The login name and the password must be alphanumeric.
- The length of the password must be equal to or less than 30 characters.

To modify the login:

1 Navigate to the RepConnector runtime installation location's *bin* directory.

- For example, on UNIX, enter:

```
cd /opt/sybase/EAServer/repra/bin
```

- For example, on Windows, enter:

```
cd c:\sybase\EAServer\repra\bin
```

2 Invoke the *setlogin.sh* script (on UNIX) or the *setlogin.bat* batch file (on Windows) to change the user name and password.

- On UNIX, enter:

```
setlogin.sh <old_user_name> <old_password> \
<new_user_name> <new_user_password>
```

- On Windows, enter:

```
setlogin.bat old_user_name> <old_password> \
<new_user_name> <new_user_password>
```

❖ **Logging in to the RepConnector runtime**

When the profile you have created has all of the required properties and the RepConnector runtime is running on the application server, you can log in to the RepConnector runtime control to configure and manage the connections.

1 Right-click the login profile, then select Login.

2 Expand the profile folder to view the list of configured RepConnector connections. By default, RepConnector runtime installation installs a 'sample_repconnector' RepConnector connection.

A pop-up box appears, displaying all the RepConnector properties and an empty password field. Enter your password and select Login.

If you have successfully logged in, you can see the connections configured with the RepConnector runtime.

❖ **Refreshing the profile**

You can refresh the tree view under the profile folder any time that it is connected to the RepConnector runtime. After you refresh the profile, the profile tree view shows the current status of the runtime.

To refresh the profile:

1 Right-click the profile.

2 Select Refresh View from the profile folder.

❖ **Logging out of the profile and the RepConnector runtime**

When you log out of the RepConnector profile, you disconnect from the RepConnector runtime, and the tree view of the profile folder collapses to a single folder object. You can log out of the RepConnector runtime from the profile only if the profile is connected to the runtime.

1 Right-click the connection profile to log out of.

2 Select Logout.

3 Select OK to log out of the profile from the runtime, or select Cancel to cancel the action.

Using the Properties view

From the Properties view, you can see the values of properties and the current status of the profiles and the connections configured with each profile. The property information is updated when you change the selection of a profile or a connection.

❖ **Displaying the Properties view**

1 Select Windows | Show View.

2 Select Properties from the Eclipse menu bar while the tree view of RepConnector displays.

3 Resize or relocate the Properties view within the Eclipse Workbench, if needed.

Using keyboard shortcuts (Windows only)

On Windows, to access the *context menu* for an object (for example, a Sybase RepConnector connection), use the Application key.

CHAPTER 6

Configuring RepConnector

This chapter discusses how to configure the RepConnector environment and how to create a RepConnector connection.

In this chapter, you will use RepConnector Manager to create and configure RepConnector connections. See the Eclipse online help for more information about Eclipse.

This section assumes you have already started RepConnector Manager, created a connection profile, and connected to a RepConnector runtime instance.

You can create a RepConnector connection to listen for events from a database and then route those events to a messaging system, or to listen for events from a messaging system and then route the events to a database.

Inbound and outbound types

To configure a RepConnector connection to listen for events from a database and then route the events to a messaging system, select REPLICATION as the *inbound type* and one of the messaging system (JMS, TIBCO, IBMMQ) as the *outbound type*. The inbound type is the source from which RepConnector is listening for. The outbound type is the destination to which the RepConnector connection routes the data.

To configure a RepConnector connection to listen for events from a database and then route the events to a user-defined sender processor (for example, to a file), select REPLICATION as the inbound type and CUSTOM as the outbound type.

To configure a RepConnector connection to listen for events from a messaging system and then route the events to a database, select one of the messaging system (JMS, TIBCO, IBMMQ) as the inbound type and select DATABASE as the outbound type.

Before configuring connections

1 Check the requirements for your RepConnector installation. See Chapter 2 in the *RepConnector 15.0 Installation Guide*.

2 Install RepConnector Manager and verified the installation. See Chapter 2 in the *RepConnector 15.0 Installation Guide*.

3 Complete the post-installation tasks in Chapter 3 of the *RepConnector 15.0 Installation Guide*.

4 Start your application server and set up the messaging system. See Chapter 4, “Configuring the Messaging System.”

Configuring the RepConnector

This section describes how to configure your RepConnector environment to communicate with a messaging system, a database, or a custom plug-in class.

Before you can validate your new RepConnector connection, you must configure your RepConnector environment and restart your application server.

Select your environment:

- If you are configuring a JMS Messaging System, go to “Configuring RepConnector for JMS Messaging Systems” on page 43.

  Note You can skip this step if you are using EAServer JMS.

- If you are configuring a TIBCO Messaging System, see “Configuring RepConnector for TIBCO” on page 45.
- If you are configuring a IBM WebSphere MQ Messaging System, see “Configure RepConnector for IBM WebSphere MQ” on page 48.
- If you are configuring for routing events from messaging to database, see “Configuring RepConnector for your database” on page 50.

- If you are configuring a customized plug-in, see "Configuring the environment for a custom sender or formatter" on page 51.

Note To set the environment for any messaging system, you must modify *$REPRA_HOME/bin/repra_env.sh* (on UNIX) or *%REPRA_HOME%\bin\repra_env.bat* (on Windows) where *$REPRA_HOME* or *%REPRA_HOME%* is the installation directory for RepConnector.

Configuring RepConnector for JMS Messaging Systems

This section provides instructions for setting up the RepConnector environment so that RepConnector can communicate with the following JMS Messaging Systems:

- WebLogic Server (WLS) JMS
- SonicMQ JMS

Note Instructions for EAServer JMS and TIBCO JMS messaging systems are not included in this section:

- No other instruction is required for EAServer JMS if you are running RepConnector on EAServer.
- Instructions for TIBCO JMS are in "Configuring RepConnector for TIBCO" on page 45.

Sybase recommends that you configure your environment before you proceed with configuring the RepConnector connection. This enables you to ping the JMS Messaging System during configuration to verify that you have configured it properly. If you do not configure your RepConnector environment before configuring the RepConnector connection, RepConnector Manager allows you to create the connection even if the ping has failed. However, you must go back to verify this once you have set up the RepConnector environment.

❖ **Configuring WebLogic Server JMS**

If you are using RepConnector on EAServer and you are configuring a RepConnector connection to send events to a WebLogic JMS server, modify the RepConnector batch or script file to correctly configure a connection to a WebLogic server using JMS queues.

Note No additional steps are required if you are running RepConnector on WebLogic Server.

---

1 Verify that the lines in *repra_env.bat* (Windows) or *repra_env.sh* (UNIX) that add the *weblogic.jar* library file to the CLASSPATH/BOOTCLASSPATH variable setting are *not* commented out and are correct for your environment:

- On Windows:

```
d:\bea\weblogic81\server\lib\weblogic.jar;%CLASSPATH%
d:\bea\weblogic81\server\lib\weblogic.jar;%BOOTCLASSPATH%
```

- On UNIX:

```
/work/bea/weblogic81/server/lib/weblogic.jar:$CLASSPATH
/work/bea/weblogic81/server/lib/weblogic.jar:$BOOTCLASSPATH
```

2 To effect the changes, restart EAServer.

3 Create a RepConnector connection or, if one already exists, use RepConnector Manager to validate the connection configuration. See "Creating RepConnector connections" on page 53 for more information.

❖ **Configuring for SonicMQ JMS**

Verify that the path to the SonicMQ library files are defined correctly in the RepConnector environment batch or script files:

1 Verify that the lines in *repra_env.bat* (Windows) or *repra_env.sh* (UNIX) that define the SONICMQ_HOME environment variable are *not* commented out and point to the installation location for SonicMQ.

- On Windows:

```
set SONICMQ_HOME=c:\SonicSoftware\SonicMQ
```

- On UNIX:

```
SONICMQ_HOME= /work/SonicSoftware/SonicMQ
```

2 Verify that the lines that define the directory structure for the SonicMQ library file, *sonic_Client.jar*, are *not* commented out and are correct for your environment.

- On Windows:

```
CLASSPATH=%CLASSPATH%;%SONICMQ_HOME%\lib\sonic_
Client.jar
BOOTCLASSPATH=%BOOTCLASSPATH%;%SONICMQ_HOME%\li
b\sonic_Client.jar
```

- On UNIX:

```
REPRA_CLASSPATH=$SONICMQ_HOME/lib/sonic_Client.
jar
CLASSPATH=$CLASSPATH:$REPRA_CLASSPATH
BOOTCLASSPATH=$BOOTCLASSPATH:$REPRA_CLASSPATH
```

3 To effect the changes, restart your application server.

Configuring RepConnector for TIBCO

This section describes how to set up the RepConnector environment so that RepConnector can communicate with following TIBCO messaging systems:

- TIBCO RV
- TIBCO RVCM
- TIBCO AECM
- TIBCO Enterprise for JMS

Sybase recommends that you configure your environment before you configure the RepConnector connection. This enables you to ping the TIBCO Messaging System during configuration to verify that you have configured it properly. If you do not configure your RepConnector environment before configuring the RepConnector connection, RepConnector Manager allows you to create the connection even if the ping has failed. However, you must go back to verify this after you have set up the RepConnector environment.

❖ Configuring TIBCO RV, RVCM

Follow these steps to configure your environment for TIBCO Rendezvous.

1 Verify that the lines in *repra_env.bat* (Windows) or *repra_env.sh* (UNIX) that define the TIBCO_HOME environment variable are *not* commented out and point to the installation location for the TIBCO Rendezvous.

- On Windows:

```
TIBCO_HOME=c:\tibco71
```

- On UNIX:

```
TIBCO_HOME=/work/tibco71
```

2 Verify that the lines that define the directory structure for the TIBCO Rendezvous library file, *tibrvj.jar*, are *not* commented out and are correct for your environment.

- On Windows:

```
REPRA_CLASSPATH=%TIBCO_HOME%\lib\tibrvj.jar
set CLASSPATH=%CLASSPATH%;%REPRA_CLASSPATH%
BOOTCLASSPATH=%BOOTCLASSPATH%;%REPRA_CLASSPATH%
```

- On UNIX:

```
REPRA_CLASSPATH=$TIBCO_HOME/lib/tibrvj.jar:$REPRA_CLASSPATH
CLASSPATH=$CLASSPATH:$REPRA_CLASSPATH
BOOTCLASSPATH=$BOOTCLASSPATH:$REPRA_CLASSPATH
```

3 To effect the changes, restart your application server.

❖ **Configuring TIBCO AECM**

Follow these steps to configure your environment for TIBCO AECM.

1 Verify that the lines in *repra_env.bat* (Windows) or *repra_env.sh* (UNIX) that define the TIBCO_HOME environment variable are *not* commented out and point to the installation location for TIBCO Active Enterprise.

- On Windows:

```
TIBCO_HOME=c:\tibco71
```

- On UNIX:

```
TIBCO_HOME=/work/tibco71
```

2 Verify that the lines that define the directory structure for the TIBCO Active Enterprise Certified Messaging library files, *Maverik4.jar* and *TIBRepoClient4.jar*, are *not* commented out and are correct for your environment.

- On Windows:

```
REPRA_CLASSPATH=%TIBCO_HOME%\Adapter\SDK\java\Maverik4.jar
REPRA_CLASSPATH=%REPRA_CLASSPATH%;%TIBCO_HOME%\Adapter\SDK\java\TIB
RepoClient4.jar
CLASSPATH=%CLASSPATH%;%REPRA_CLASSPATH%;
```

```
BOOTCLASSPATH=%BOOTCLASSPATH%;%REPRA_CLASSPATH%
```

- On UNIX:

```
REPRA_CLASSPATH=$TIBCO_HOME/Adapter/SDK/java/Maverick4.jar:$REPRA_C
LASSPATH
REPRA_CLASSPATH=$REPRA_CLASSPATH:$TIBCO_HOME/Adapter/SDK/java/TIBRe
poClient4.jar
CLASSPATH=$CLASSPATH:$REPRA_CLASSPATH
BOOTCLASSPATH=$BOOTCLASSPATH:$REPRA_CLASSPATH
```

3 To effect the changes, restart your application server.

❖ **Configuring TIBCO Enterprise for JMS**

1 Verify that the lines in *repra_env.bat* (Windows) or *repra_env.sh* (UNIX) that define the TIBCO_HOME environment variable are *not* commented out and point to the installation location for the TIBCO Enterprise for JMS environment.

- On Windows:

```
TIBCO_HOME=c:\tibco71
```

- On UNIX:

```
TIBCO_HOME=/work/tibco71
```

2 Verify that the lines that define the directory structure for the TIBCO Enterprise for JMS library files (*tibrvjms.jar*, *tibjms.jar*, *jms.jar*) are *not* commented out and are defined correctly for your environment.

- On Windows:

```
REPRA_CLASSPATH=%REPRA_CLASSPATH%;%TIBCO_HOME%\JMS\Clients\java\jms
.jar
REPRA_CLASSPATH=%REPRA_CLASSPATH%;%TIBCO_HOME%\JMS\Clients\java\tib
rvjms.jar
REPRA_CLASSPATH=%REPRA_CLASSPATH%;%TIBCO_HOME%\JMS\Clients\java\tib
jms.jar
CLASSPATH=%CLASSPATH%;%REPRA_CLASSPATH%
BOOTCLASSPATH=%BOOTCLASSPATH%;%REPRA_CLASSPATH%
```

- On UNIX:

```
REPRA_CLASSPATH=$TIBCO_HOME/jms/clients/java/jms.jar
REPRA_CLASSPATH=$TIBCO_HOME/jms/clients/java/tibrvjms.jar:$REPRA_CL
ASSPATH
REPRA_CLASSPATH=$TIBCO_HOME/jms/clients/java/tibjms.jar:$REPRA_CLAS
SPATH
CLASSPATH=$CLASSPATH:$REPRA_CLASSPATH
```

```
BOOTCLASSPATH=$BOOTCLASSPATH:$REPRA_CLASSPATH
```

3 To effect the changes, restart your application server.

Configure RepConnector for IBM WebSphere MQ

This section describes how to set up the RepConnector environment so that RepConnector can communicate with the IBM WebSphere MQ or MQ JMS Messaging System.

Sybase recommends that you configure your environment before you configure the RepConnector connection. This enables you to ping the IBM Websphere MQ Messaging System during configuration to verify that you have configured it properly. If you do not configure your RepConnector environment before configuring the RepConnector connection, RepConnector Manager allows you to create the connection even if the ping has failed. You must go back to verify this once you have set up the RepConnector environment.

❖ **Configuring IBM WebSphere MQ**

To configure your environment for IBM WebSphere MQ:

1 Verify that the lines in *repra_env.bat* (Windows) or *repra_env.sh* (UNIX) that define the IBMMQ_HOME environment variable are *not* commented out and point to the installation location for the IBM Websphere MQ environment.

- On Windows:

```
IBMMQ_HOME=c:\Program Files\IBM\WebSphere MQ
```

- On UNIX:

```
IBMMQ_HOME=/opt/mqm
```

2 Verify that the lines that define the directory structure for the IBM WebSphere MQ library files, *mq.jar* and *mqbind.jar*, are *not* commented out and are defined correctly for your environment.

- On Windows:

```
REPRA_CLASSPATH=%IBMMQ_HOME%\Java\lib\com.ibm.mq.jar;
REPRA_CLASSPATH=%IBMMQ_HOME%\Java\lib\com.ibm.mqbind.jar;%REPRA_CLA
SSPATH%
CLASSPATH=%CLASSPATH%;%REPRA_CLASSPATH%
BOOTCLASSPATH=%BOOTCLASSPATH%;%REPRA_CLASSPATH%
```

- On UNIX:

```
REPRA_CLASSPATH=$IBMMQ_HOME/java/lib/com.ibm.mq.jar
REPRA_CLASSPATH=$IBMMQ_HOME/java/lib/com.ibm.mqbind.jar:$REPRA_CLAS
SPATH
CLASSPATH=$CLASSPATH:$REPRA_CLASSPATH
BOOTCLASSPATH=$BOOTCLASSPATH:$REPRA_CLASSPATH
```

3 If you are connecting to the remote MQ daemon, verify that the MQ Server environment variable is defined correctly in *repra_env.bat* (Windows) or *repra_env.sh* (UNIX). If the environment variable is not defined correctly, modify it as follows:

- On Windows, at the command line, where CHANNEL1 is the name you have defined for the channel for the server connection, enter:

```
set MQSERVER=CHANNEL1/TCP/'mymachine(1414)'
```

- On UNIX, at the command line, where CHANNEL1 is the name you have defined for the channel for the server connection, enter:

```
MQSERVER=CHANNEL1/TCP/'mymachine1(1414)'
export MQSERVER
```

See Chapter 4, “Configuring the Messaging System,” for more information.

4 To effect the changes, restart your application server.

Note To configure EAServer, see the EAServer documentation.

❖ **Configuring MQ JMS**

To configure your environment for MQ JMS:

1 Verify that the lines in *repra_env.bat* (Windows) or *repra_env.sh* (UNIX) that define the IBMMQ_HOME environment variable are *not* commented out and point to the installation location for the IBM WebSphere MQ JMS.

- On Windows:

```
IBMMQ_HOME=c:\Program Files\IBM\WebSphere MQ
```

- On UNIX:

```
IBMMQ_HOME=/opt/mqm
```

2 Verify that the lines that define the directory structure for the IBM WebSphere MQ JMS library files, *mq.jar* and *mqbind.jar*, are *not* commented out and are defined correctly for your environment.

- On Windows:

```
REPRA_CLASSPATH=%IBMMQ_HOME%\Java\lib\com.ibm.mq.jar;
REPRA_CLASSPATH=%IBMMQ_HOME%\Java\lib\com.ibm.mqbind.jar;%REPRA_CLA
SSPATH%
REPRA_CLASSPATH=%IBMMQ_HOME%\Java\lib\com.ibm.mqjms.jar;%REPRA_CLAS
SPATH%
REPRA_CLASSPATH=%IBMMA_HOME%\Java\lib;%REPRA_CLASSPATH%
CLASSPATH=%CLASSPATH%;%REPRA_CLASSPATH%
BOOTCLASSPATH=%BOOTCLASSPATH%;%REPRA_CLASSPATH%
```

- On UNIX:

```
REPRA_CLASSPATH=$IBMMQ_HOME/java/lib/com.ibm.mq.jar
REPRA_CLASSPATH=$IBMMQ_HOME/java/lib/com.ibm.mqbind.jar:$REPRA_CLAS
SPATH
REPRA_CLASSPATH=$IBMMQ_HOME/java/lib/com.ibm.mqjms.jar:$REPRA_CLASS
PATH
REPRA_CLASSPATH=$IBMMQ_HOME/java/lib:$REPRA_CLASSPATH
CLASSPATH=$CLASSPATH:$REPRA_CLASSPATH
BOOTCLASSPATH=$BOOTCLASSPATH:$REPRA_CLASSPATH
```

3 If you are connecting to the remote MQ daemon, verify that the MQ Server environment variable is defined correctly in *repra_env.bat* (Windows) or *repra_env.sh* (UNIX). If the environment variable is not defined correctly, modify it as follows:

- On Windows, at the command line, where CHANNEL1 is the name you have defined for the channel for the server connection, enter:

```
set MQSERVER=CHANNEL1/TCP/'remotemachine1(1414)'
```

- On UNIX, at the command line, where CHANNEL1 is the name you have defined for the channel for the server connection, enter:

```
MQSERVER=CHANNEL1/TCP/'remotemachine1(1414)'
export MQSERVER
```

See Chapter 4, “Configuring the Messaging System,” for more information.

4 To effect the changes, restart your application server.

Configuring RepConnector for your database

This section provides instructions for setting up the RepConnector environment so that RepConnector can communicate with the database to send SQL events that it receives from the messaging system.

Sybase recommends that you configure your environment configure the RepConnector connection. This enables you to ping the database during configuration to verify that you have configured the connection properly. If you do not configure your RepConnector environment before configuring the RepConnector connection, RepConnector Manager allows you to create the connection even if the ping has failed. You must go back to verify this once you have set up the RepConnector environment.

Note There are no additional steps required for RepConnector to communicate with Sybase Adaptive Server.

❖ **Configuring for an Oracle database**

To configure your environment if you are using an Oracle database:

1 Verify that the lines in *repra_env.bat* (Windows) or *repra_env.sh* (UNIX) that define the CLASSPATH/BOOTCLASSPATH environment variable are *not* commented out and point to the installation location for your database environment.

- On Windows:

```
CLASSPATH=d:\oracle\ora92\jdbc\lib\ojdbc14.jar;%CLASSPATH%
BOOTCLASSPATH=d:\oracle\ora81\jdbc\lib\ojdbc14.jar;%CLASSPATH%
```

- On UNIX:

```
CLASSPATH= /work/oracle/ora92/jdbc/lib/ojdbc.jar:$CLASSPATH
BOOTCLASSPATH=\
/work/oracle/ora92/jdbc/lib/ojdbc14.jar:$BOOTCLASSPATH
```

2 To effect the changes, restart your application server.

Configuring the environment for a custom sender or formatter

This section provides instructions for setting up the RepConnector environment so that RepConnector can load customized classes for message transformation or message destination routing.

Sybase recommends that you configure your environment before you proceed with configuring the RepConnector connection.

See Chapter 10, “Customizing the Sender and Formatter Processors,” for more detailed information about using the custom sender and formatter features.

❖ **Configuring an EAServer for a custom sender or formatter processor**

If you are running RepConnector on EAServer and plan to use a customized sender or formatter processor, define the full path name to the *jar* file containing the customized sender processor or message formatter class or classes for the Java Classes property in EAServer's server configuration property:

1 Start EAServer Manager *jagmgr.bat* (Windows) or *jagmgr* (UNIX) which resides under the EAServer's installation's bin directory.

2 Select Jaguar Manager.

3 Select Tools | Connect

The Login window displays.

4 Enter the user name, password, host name, and port number to connect to your EAServer.

By default, the user name is "jagadmin" with no password, the host name is "localhost" and the port number is 9000.

5 Click Connect to connect to EAServer.

6 Select Servers to expand the folder.

7 Right-click Jaguar and select Server Properties. The Server Properties window displays.

8 Select the Java Classes tab.

9 Click Add to add the SenderProcessor/Formatter *jar* file. A row is added to the Java Classes.

10 Enter the full path to the *jar* file containing the sender processor/message formatter classes.

For example, at the command line, enter:

- On Windows:

```
d:\sybase\EAServer\repra\sample\client\sample.jar
```

- On UNIX:

```
/work/sybase/EAServer/repra/sample/client/sample.jar
```

11 Click OK to save the value.

12 To effect the changes, restart your application server.

❖ **Configuring a WebLogic for a custom sender processor or custom formatter**

To configure your environment if you are running RepConnector on WebLogic Server:

1 Verify that the CLASSPATH variable setting in the *repra_env.bat* (for Windows) or *repra_env.sh* (for UNIX) includes the full path of the *jar* file containing the customized sender processor or message formatter classes.

- On Windows:

```
CLASSPATH=d:\bea\repra\sample\client\sample.jar;%CLASSPATH%
```

- On UNIX:

```
CLASSPATH=/work/bea/repra/sample/client/sample.jar:$CLASSPATH
```

2 To effect the changes, restart your Weblogic Server.

Creating RepConnector connections

This section describes how to create RepConnector connections.

❖ **Adding and configuring a new connection**

This procedure includes all the steps required to add a new connection; however, some steps are described only in summary. Subsequent procedures give the details of these steps and are referred to from this procedure.

See Chapter 5, “Getting Started with RepConnector Manager,” to log in to the connection profile you want to use to create the connection.

1 Right-click the connection profile.

For example, right-click the EAServer:8080 connection profile to create a RepConnector connection defined by the EAServer:8080 connection profile.

2 Select Add a New Connection.

The New Connection wizard starts and the Create a New Connection page displays.

3 On the Create a New Connection page:

a Enter a unique name in the Connection Name field. Do not use dashes or spaces.

b Select the Inbound Type from the drop-down list. The Inbound Type is the origin or source of the data.

The Inbound Type you select determines what options are available in the Outbound Type drop-down list.

Select one of the following inbound sources:

- REPLICATION if this connection will accept inbound data from Replication Server. When you select REPLICATION as the Inbound Type, you can select JMS, TIBCO, or IBMMQ as the Outbound Type.
- JMS if this connection will accept inbound data from a JMS message queue. When you select JMS as the Inbound Type, you can select only DATABASE as the Outbound Type.
- TIBCO if this connection will accept inbound data from a TIBCO message queue. When you select TIBCO as the Inbound Type, you can select only DATABASE as the Outbound Type.
- IBMMQ if this connection is to accept inbound data from an IBM Websphere MQ message queue. When you select IBMMQ as the Inbound Type, you must select DATABASE as the Outbound Type.

c Select the Outbound Type from the drop-down list. The Outbound Type is the target or destination for the data.

Select one of the following outbound targets:

- JMS if this connection is to push outbound data to a JMS message queue. This option is available when you select REPLICATION as the Inbound Type.
- TIBCO if this connection is to push outbound data to a TIBCO message queue. This option is available when you select REPLICATION as the Inbound Type.
- IBMMQ if this connection will push outbound data to an IBM Websphere MQ message queue. This option is available when you select REPLICATION as the Inbound Type.
- CUSTOM if this connection will push outbound data to a target other than the specific message queues listed in the Outbound Types field. This option is available when you select REPLICATION as the Inbound Type.

- DATABASE if this connection will push outbound data to a database. This option is available when you select a message queue (JMS, TIBCO, or IBMMQ) as the Inbound Type.

4 Click Next to continue. The General Connection Information wizard page is displayed.

5 On the General Connection Information Page:

a Verify or modify the Uniform Resource Locator (URL) in the DBEventStream XSD URL field.

This is the URL for exposing the XML Schema Definition (XSD) over the network.

The default URL is:

http://<host_name>:<port_number>/RepraWebApp/dtds/dbeventstream.xsd

where:

- <*host_name*> is the host name of the target server's http listener.
- <*port_number*> is the port number of the target.

The default host name is "localhost" and the default port number is 8080. The default URL is:

http://localhost:8080/RepraWebApp/dtds/dbeventstream.xsd

If the default information is incorrect, change *localhost* to the host name of the target server's http listener and *8080* to the port number on which the target server's http listener is listening.

For example, if the host name is "mymachine" which is listening at port 8090, the URL is:

http://mymachine:8090/RepraWebApp/dtds/dbeventstream.xsd

b Select the logging level to use for this connection. Log Level defines the level, or type, of logging in the RepConnector log file, *repra.log*. The level you choose depends on whether you want to see only error messages or detailed messages in the log. The log file resides in the *<AppServer>\repra\logs* directory on Windows and the *<AppServer>\repra\logs* directory on UNIX. The default logging level is INFO.

Choose:

- FATAL to see information about very severe error events that could lead the application to abort.
- ERROR to see general errors related to events that could allow the RepConnector environment to continue running, as well as fatal errors.
- INFO to see informational messages that highlight the progress of the application at a high level, as well as fatal errors and general errors.
- WARNING to see warnings about potentially harmful situations, as well as fatal errors, general errors, and informational messages.
- DEBUG to see details about general events that can help during debugging, as well as fatal errors, general errors, informational messages, and warnings.

c Choose Auto Start Connection, to start the connection automatically whenever the application server starts. By default, Auto Start Connection is not selected.

In a production environment, you might want to start the connection automatically when the application server starts because you need to do the minimal amount of intervention when restarting servers.

If you are developing and testing your RepConnector connections, you might not want to automatically start the connection when your application server restarts. Once you have tested a connection, that is, the connection starts successfully and you can send messages to it, you can change the connection properties so that the connection starts automatically.

Note When you start a RepConnector connection, Replication Server attempts to connect to it. When a RepConnector connection is stopped, suspend the connection at Replication Server because Replication Server continually attempts to connect to it, even though it is stopped.

---

d Choose Custom Plug-in Class if you plan to use a user-defined message formatter with RepConnector rather than the RepConnector default XML formatter.

See Chapter 10, “Customizing the Sender and Formatter Processors,” for information about how creating a user-defined message formatter.

e Choose encrypted data option if the data from the messaging system is encrypted by Adaptive Server 15.0 encryption.

6 Click Next to continue.

7 The next page displayed depends on what you selected for inbound type on the Create a New Connection page.

If you selected:

- Replication, the Replication Server Inbound Information page is displayed. See "Configuring replication information for REPLICATION inbound types" on page 58.
- JMS, the JMS Information wizard page is displayed. See "Configuring JMS information" on page 61.
- TIBCO, the TIBCO Messaging Information wizard page is displayed. See "Configuring TIBCO Information" on page 64.
- IBMMQ, the MQ Messaging Information wizard page is displayed. See "Configuring IBM Websphere MQ Information" on page 66.

8 Select Ping to verify that you have entered the information correctly.

A Pinging Connection Status pop-up provides status on whether you have configured the information correctly.

Note You must update the *repra_env.bat* (Windows) or *repra_env.sh* (UNIX) file to include the messaging system's libraries in the environment and restart your application server before you can use ping. See "Configuring the RepConnector" on page 42 for more information.

Click OK to exit the ping connection status pop-up window.

9 Click Next to continue.

10 The next page displayed depends on what you selected for outbound type on the Create a New Connection page.

If you selected:

- JMS message queue or topic, the JMS Information page displays. See "Configuring JMS information" on page 61.
- TIBCO RV or RVCM message queue or topic, the TIBCO Messaging Information page displays. See "Configuring TIBCO Information" on page 64.

- TIBCO AECM message queue, the TIBCO Messaging Information page displays. See “Configuring TIBCO Information” on page 64.
- IBM Websphere MQ queues, the MQ Messaging Information page displays. See “Configuring IBM Websphere MQ Information” on page 66.
- CUSTOM, and selected Custom Plug-in Class in the General Connection Information wizard page, the Plug-in wizard page displays. See “Configuring custom plug-in information” on page 67.
- DATABASE, the Database Connection Information displays. See “Configuring database connection information” on page 68.

11 Click Next to continue. The Summary page wizard page displays.

The Summary Page displays, which summarizes the values you entered for the new connection. These values are saved in a properties file on your local machine called *connection_name.props*, where *connection_name* is the name of the connection. This file resides in the *repra/conf* directory in your application server installation directory structure.

12 Verify the connection configuration information and select Finish to create the new connection.

The information displayed on the summary page wizard is read only. To change the connection configuration information, select Back to the specific configuration information wizard page you would like to modify and then navigate back to this Summary page and select Finish to create the new connection.

The Summary Page information pop-up window displays with message “Connection was created successfully.” if the new connection is successfully created.

Configuring replication information for REPLICATION inbound types

You must enter the Replication Server inbound information and the Replication Server System Database information if your inbound type is REPLICATION.

Configuring Replication Server inbound information

❖ **Entering Replication Server inbound information**

Follow these steps to define the name of the Data Server Interface (DSI) and the port number that the RepConnector connection will listen on, along with the user ID and password use for Replication Server to connect to RepConnector connection.

The values required for this procedure can be found in Appendix A, "Configuration Worksheets" and are designated in parenthesis in the steps that follow.

1 On the Replication Server inbound information page, enter the name of the Data Server Interface (DSI) in the DSI Name field. This is the same as the name of the connection you created for RepConnector at Replication Server (3.a). For example, enter `RepConnector`.

2 Enter a unique port number for the machine in the DSI Port field.

This is the same port number you used when you added an interface entry for RepConnector in the Replication Server interfaces file (3.d). See Chapter 3, "Configuring Replication Server for RepConnector."

For example, enter `7000`.

3 Enter the user name and password for the RepConnector connection in the User Name and the Password fields, respectively.

This user name and password must be the same as the user name and password you used when you created the DSI connection for RepConnector at Replication Server (3.e and 3.f).

4 Click Next.

The Replication Server System Database wizard page is displays.

Return to "Adding and configuring a new connection" on page 53.

Configuring Replication Server System Database (RSSD) information

This section describes how to define the information that RepConnector uses to connect to the Replication Server System Database (RSSD) to gather metadata information for use in processing the events that RepConnector receives from Replication Server.

This section also describes how to designate whether RepConnector groups all the commands in a specific transaction into a single XML message or sends each command in that transaction to a separate XML message.

❖ **Entering Replication Server System Database information**

1 On the Replication Server System Database Information page, enter the JDBC URL string that connects to the RSSD in the RSSD URL field.

The syntax for the RSSD URL string is:

```
jdbc:sybase:Tds:<RSSD host machine name>:
  < RSSD port number >/< RSSD database name>
```

where:

- *jdbc:sybase:Tds* is the URL prefix.
- <*RSSD host machine name*> is the name of the host machine on which the RSSD is running.
- < *RSSD port number* > is the port number on which the RSSD is listening.
- < *RSSD database name*> is the RSSD database name.

For example:

```
jdbc:sybase:Tds:mymachine:4501/SAMPLE_RS_RSSD
```

2 Enter the user name and password to connect to the RSSD in the User Name and the Password fields, respectively.

3 Select your message grouping preference using the Message Grouping Preference check boxes.

- Individual – each command in a transaction sent as separate XML message or event.
- Group – all the commands in a transaction grouped into a single XML message or event.

Note If you use RepConnector to replicate tables containing large text or image type fields, Sybase recommends that you do not use the Group option. With large text or image data groupings, your system may run out of memory after accumulating only several messages. This is a limitation in RepConnector.

Go back to step 10 in “Adding and configuring a new connection” on page 53.

Configuring JMS information

If your messaging system is a JMS messaging system, enter the JMS connection information and destination type and name in the JMS Information page of the Create Connection wizard. RepConnector supports EAServer JMS, Web Logic Server JMS, TIBCO Enterprise for JMS, SonicMQ JMS, and any J2EE-compliant JMS system.

See your JMS Server product document for more information.

Before you configure your JMS queue, verify that your application server is started. If you are using EAServer, verify that the message service is configured. See Chapter 4, “Configuring the Messaging System,” for more information.

If your connection is to a JMS message queue or topic, enter the following information on the JMS Information page of the Create Connection wizard.

1 Choose the destination type:

- Queue – to use point-to-point messaging.
- Topic – to use publish and subscribe messaging.

  See your JMS documentation for more information about destination type.

2 Enter the JMS provider URL in the JMS Provider URL field.

  This URL is the host name and port number that will be used to connect to the JMS Server.

- If you are using EAServer JMS, enter:

  iiop://<host_name >:port_number

  where:

  - *host_name* is the name of the machine on which the server is running.
  - *port_number* is the port number at which the server is listening.

  For example: `iiop://my_machine:9000`

- If you are using WebLogic Server JMS, the protocol type must be ‘t3’, WebLogic’s multitier JDBC driver.

  where:

  - *host_name* is the name of the machine on which the server is running.

- *port_number* is the port number at which the server is listening:

  ```
  t3://<host_name>:<port_number>
  ```

  For example: `t3://mymachine:7001`

- If you are using TIBCO JMS or SonicMQ JMS, enter:

  ```
  tcp://<host name>:<port number>
  ```

  where:

  - *host_name* is the name of the machine on which the server is running.
  - *port_number* is the port number at which the server is listening.

  For example: `tcp://localhost:7222`

3 Enter the class name of the specific JMS provider's initial naming context factory in the Initial Naming Context Factory field or select a value from the drop-down list.

- If you are using EAServer JMS, select or enter:

  ```
  com.sybase.jms.InitialContextFactory
  ```

- If you are using WebLogic Server JMS, select or enter:

  ```
  weblogic.jndi.WLInitialContextFactory
  ```

- If you are using TIBCO JMS, select or enter:

```
com.tibco.tibjms.naming.TibjmsInitialContextFactory
```

- For SonicMQ JMS, if the destination type is a queue enter or select:

  ```
  progress.message.jclient.QueueConnectionFactory
  ```

  if the destination type is a topic:

  ```
  progress.message.jclient.TopicConnectionFactory
  ```

4 Enter the name of the connection factory administered object in the Connection Factory field or, select a value from the drop-down list.

- If you are using EAServer JMS and the destination type is a queue, select or enter:

  ```
  javax.jms.QueueConnectionFactory
  ```

  If destination type is a topic, select or enter:

  ```
  javax.jms.TopicConnectionFactory
  ```

- If you are using WebLogic Server JMS and the destination type is a queue, select or enter:

  ```
  weblogic.jms.QueueConnectionFactory
  ```

  If destination type is a topic, select or enter:

  ```
  weblogic.jms.TopicConnectionFactory
  ```

  Note This name is a merely a name for the Connection Factory administered object. Make sure that this Connection Factory administered object name exists in your WebLogic Server or change the value here to match the name of the connection factory administered object you have created in WebLogic Server.

- For TIBCO JMS if the destination type is a queue, select or enter:

```
com.tibco.tibjms.TibjmsQueueConnectionFactory
```

  If destination type is a topic, select or enter:

```
com.tibco.tibjms.TibjmsTopicConnectionFactory
```

  Note This name is a merely a name for the Connection Factory administered object. Make sure that this Connection Factory administered object name exists in your TIBCO JMS Server or change the value here to match the name of the connection factory administered object you have created in TIBCO JMS Server.

- For SonicMQ JMS, If the destination type is a queue, select or enter:

  ```
  progress.message.jclient.QueueConnectionFactory
  ```

  If the destination type is a topic, select or enter:

  ```
  progress.message.jclient.TopicConnectionFactory
  ```

5 Enter the name of the destination, for example, if the destination is a JMS queue, enter:

  ```
  JMS_Queue
  ```

6 Enter the user name and password for the queue or topic, for example, enter `jagadmin` with no password.

7 If you have selected Topic as the destination type, enter the name of one or more durable subscribers in the Topic Subscribers field, separated by commas.

Durable subscribers are subscribers who are interested in receiving messages from the selected published topic. For example, enter:

```
JMSTSub1,JMSTSub2,JMSSub1
```

Note The list of durable subscribers must be separated by commas and cannot contain spaces between each name.

8 If you are routing events from messaging to database, enter name of the destination in the Status Destination field.

The status destination queue or topic you define is used for a client application to listen for an error message (if any) that may result in the event sent to the database.

If you have just configured inbound information, go back to step 10 in "Adding and configuring a new connection" on page 53.

Configuring TIBCO Information

See your TIBCO documentation for more information about TIBCO product.

If you are using a TIBCO messaging system, enter the following information on the TIBCO Messaging Information page of the Create Connection wizard:

1 In the TIBCO Message Type field, choose:

- RV – to configure a TIBCO Rendezvous reliable messaging message. Proceed to the next step.
- RVCM – to configure a TIBCO Rendezvous Certified Messaging (RVCM) message. Proceed to the next step.
- AECM – to configure a TIBCO Rendezvous Active Enterprise Wired Format messaging message. Proceed to step 3.

2 If you selected RV or RVCM as the TIBCO Message Type:

a Enter the name of the RV and RVCM transport in the Service Name field. The service name can be either a string value or a port number. By default, the value is 7500.

b Enter the name of the host name or IP address where the TIBCO Rendezvous daemon is running in the Network field.

For example, enter `job1-srvr`.

c Enter the TIBCO Rendezvous daemon value in the Daemon field in the form:

```
protocol:hostname:port
```

For example, enter `tcp:my_machine:7500`.

If you do not specify a value for the host name, it defaults to "localhost."

The default value is tcp:7500 which defaults to "localhost" on port 7500.

If your TIBCO Rendezvous Daemon is running on a separate machine than RepConnector, you must specify the host name; for example, enter:

```
tcp:mymachine:7500
```

d Enter the name of the subject or destination at which the client application is listening in the Subjects field. For example, enter `sample.subject`.

You can specify more than one subject name separated by commas.

e If you are using a RVCM message type, enter the name of the certified messaging names in the CM Names field. For example, enter `SAMPLE.CM1`

You can specify more than one subject name separated by commas.

f If you are using RVCM message type, enter in the CM Duration field minutes that TIBCO message system stores the unread messages in the *cmledger*.

The default value is 0, which means the messaging system keeps messages in the *cmledger* forever.

For example, enter `10` to have the messaging system keep unread messages for 10 minutes.

3 If you selected AECM as the TIBCO Message Type, enter the information for AECM.

- Enter the name of the AE Configuration file you are using in the AE Configuration file field. Or, click Browse to search for this file.

- If you want RepConnector to use your customized message generator, enter the class name for your customized message generator in the AE Message Generator field. For example, enter

  `sample.MyMsgGenerator`

4 If you are routing events from messaging system to database, enter the destination name in the Status Destination field. The status destination queue or topic you define is used for client application to listen an error message (if any) that may result in the event being sent to the database.

If you have just configured inbound information, go back to step 10 in "Adding and configuring a new connection" on page 53.

Configuring IBM Websphere MQ Information

If you are using an IBM WebSphere MQ messaging system, enter the following information on the MQ Messaging Information page of the Create Connection wizard.

1 Choose a WebSphere MQ Message Type:

- MQ for IBM WebSphere MQ Messaging System
- MQJMS for IBM WebSphere MQ JMS Messaging System

2 Choose whether RepConnector is configured to connect directly to MQ Server or to an MQ Client:

- Local Server, if you are running the MQ server daemon (IBM Websphere MQ server) on your local machine.
- Local Client, if you are running the MQ client daemon (IBM Websphere MQ client) on your local machine.

Select the encoding type you want to use for the message:

- Default – to use standard character encoding.
- UTF – to use the UTF character encoding.

3 In the Host Name field, enter the host name where the MQ Server daemon is running . For example, enter `mqbiz2-pc`.

4 In the Channel field, enter the channel name for the IBM WebSphere MQ server connection.

If you have selected MQ JMS as the MQ Message Type, enter the port number in the channel field. For example, enter `1414` .

5 In the Queue Manager/Factory field, enter the name of the IBM WebSphere MQ queue manager. For example, enter `MQBiz2QM`.

6 In the Queue Name field, enter the name of the IBM Websphere MQ destination. For example, enter `MQBiz2Queue`.

7 Enter the user name and password to the connect to IBM WebSphere MQ Server.

Note Verify that this user name and password combination has permissions to connect to the queue manager defined in the Queue Manager/Factory field and for the destination name defined in Queue Name field.

8 If you are routing events from a messaging system to a database, enter the error queue name in the Status Destination field.

The status destination queue is used by client applications to catch error messages, which may stop applications from sending events to the database.

If you have just configured inbound information, go back to step 10 in "Adding and configuring a new connection" on page 53.

If you have just configured outbound information, go back to step 13 in "Adding and configuring a new connection" on page 53.

Configuring custom plug-in information

If you are using a user-defined message formatter or message sender processor, you must enter the following information in the Plug-in Information page of the Create Connection wizard.

1 If you have selected Custom Plug-in Class in the General Connection Information wizard page, enter the class name for your customized message formatter. For example, enter:

```
sample.MyMessageFormatter
```

2 Enter the path to the property file associated with this customized message formatter:

```
MyMessageFormatter.prop
```

3 If you have selected CUSTOM as your outbound type,

a Enter the class for your customized message sender processor in the Sender Processor Plug-in Class field:

```
sample.FileClient
```

b Enter the path to the property file information associated with this sender processor plug-in:

```
FileClient.prop
```

4 If you have just configured outbound information, go back to step 13 in "Adding and configuring a new connection" on page 53.

Configuring database connection information

If your outbound connection is to a database, you must enter the following information in the Database Information page of the Create Connection wizard.

See "Configuring RepConnector for your database" on page 50 for more information on how to configure your environment.

- Enter the JDBC URL information to connect to the database in the JDBC Connection URL field.

  For example, to connect to ASE, enter, where testmachine is the name of the machine where the dataserver is running on and 5000 is the port number that the dataserver is listening on:

  ```
  jdbc:sybase:Tds:testmachine:5000
  ```

- Enter the name of the JDBC driver class that will be used to connect to the database in the Driver class field.

  For example, the jdbc driver to connect to Sybase ASE is:

  ```
  com.sybase.jdbc3.jdbc.SybDriver
  ```

- Enter the user ID that will be used to connect to the database in the User Name field.

  Enter the password for the user ID to connect to the database in the Password field.

Return to "Adding and configuring a new connection" on page 53.

CHAPTER 7

Managing RepConnector Connections

This chapter describes using RepConnector Manager to manage your RepConnector connections.

Note You can also use the command line utility, ratool, to manage your RepConnector connections. See Chapter 8, “Using the ratool Utility” for more information.

This chapter assumes you have already started RepConnector Manager and have connected to the RepConnector instance. If you have not, see Chapter 5, “Getting Started with RepConnector Manager.”

Managing a connection

This section describes how to start, stop, refresh, rename, copy, delete, and validate a connection. It also describes how to view and modify the properties of a connection as well as how to view both the connection log and the runtime log.

❖ Starting a connection

If a RepConnector connection is already started, an attempt to start the connection results in a warning message indicating that the connection is already started.

1 Right-click the connection and select Start Connection.The Start Connection Status pop-up window displays the connection status.

2 Click OK to exit the pop-up window.

If the connection fails to start, see the RepConnector connection log for information about the failure. See “Viewing connection log information” on page 72.

❖ **Stopping a connection**

If a RepConnector connection is already stopped, an attempt to stop the connection results in a warning message indicating the connection is already stopped.

1 Right-click the connection and select Stop Connection. The Stop Connection pop-up window displays.

2 Click Yes to stop the connection. Click No to cancel the operation.

The Stop Connection Status window displays the connection status.

3 Click OK to exit the pop-up window.

If the connection fails to stop, check the RepConnector connection log for more information. See “Viewing connection log information” on page 72.

❖ **Refreshing a connection**

This procedure refreshes a running RepConnector connection by reloading the connection properties and restarting the RepConnector connection. If you have a running connection, you can modify the connection properties, and then select Refresh Connection to restart the connection with the newly modified connection properties.

1 Right-click the connection and select Refresh Connection. The Refresh Connection Status pop-up window displays the connection status.

2 Click OK to exit the pop-up window.

If the connection fails to refresh, see the RepConnector connection log for more information. See “Viewing connection log information” on page 72.

❖ **Renaming a connection**

You can rename an existing connection; however, you must first stop the connection.

1 Right-click the connection and select Rename Connection.

2 Enter the new connection name in the text field.

3 Click OK to exit the Rename Connection window.

❖ **Deleting a connection**

You can delete an existing connection; however, you must first stop the connection before you can delete it.

1 Right-click the connection and select Delete.

2 Click OK to delete the connection. Click Cancel to cancel the delete operation.

❖ **Copying a connection (Save As)**

You can create a new RepConnector connection by copying the connection properties of an existing connection.

1 Right-click the connection and select Save As.

2 Enter the new connection name in the text field.

3 Click OK to exit the Save As window.

❖ **Validating a connection**

You can validate your connection configuration information. This procedure validates both the inbound and outbound configuration properties and returns the status of the validation.

1 Right-click the connection and select Validate Connection. The Validation Connection status pop-up window displays the connection status.

2 Click OK to exit the pop-up window.

If the connection fails validation, refer to the RepConnector connection log for more information. See “Viewing connection log information” on page 72.

❖ **Viewing or modifying properties for an existing connection**

You can view or modify the connection properties for an existing connection. If the connection is already running, select Refresh Connection to reload the connection properties.

1 Right-click the connection and select Properties.

The Properties window displays. The left pane contains a tree structure with four categories of connection property information.

- Select General Properties to view general information about the connection.
- Select Inbound Type Properties to view inbound configuration information.

- Select Outbound Type Properties to view outbound configuration information.
- Select User Defined Plug-in Properties if this connection contains a customized plug-in.

2 Modify the values in the right pane.

3 Click Restore Defaults to restore the previous values.

4 Click Apply to save the values.

5 Click OK to save the values to the connection property repository.

❖ **Viewing connection log information**

1 Right-click the connection and select View Log.

For example, you can right-click sample_repconnector and select View Log.

The View Connection Log window displays.

2 Click the X in the top right corner of the window to exit the View Connection Log window.

Note To view any updates to the connection log since you last opened the View Connection Log window, exit the current view log window, then right-click the connection and select View Log.

❖ **Viewing the runtime log information**

1 Right-click the connection profile and select View Log.

For example, you can right-click the EAServer:8080 connection profile and select View Log.

The View Runtime Log window displays.

2 Click X on the top right corner of the window to exit the View Connection Log window.

Note To view any updates to the runtime log since you last opened the view log window, exit the current View Runtime Log window, then right-click on the profile and select View Log.

❖ **Refreshing the connection view display**

You can refresh the connection view to update the view of a RepConnector runtime instance. If you have added a new connection from another RepConnector Manager or through the command line tool, select Refresh View to see newly added connections for the RepConnector runtime instance.

1 Right-click the connection profile.

2 Select Refresh View.

The connection view for the RepConnector instance is refreshed.

CHAPTER 8

Using the *ratool* Utility

This chapter describes the syntax for the ratool utility, including all command line flags and command options available.

The RepConnector command line utility (ratool) provides an alternative to RepConnector Manager.

You can use the ratool utility to administer and configure your connection. You can start, stop, refresh, add, delete, and validate a connection; list all connections, and display status for the connection.

Sybase recommends that you use the RepConnector Manager for all configurations. However, in the case of batch processing, ratool can be useful.

ratool utility

The ratool utility is an alternative way to administer and configure your connection.

Note Command options are case sensitive.

Syntax

ratool [-host *hostname*] [-port *portnumber*] [-user <*username*>] [-password <*password*>] [-help] [-loglevel <*loglevel_type*>] [<Command_option>]

Options

This table shows the valid options of ratool.

Table 8-1: ratool options

-host <*hostname*>	Identifies the name of the host where the RepConnector runtime is running. The default is "localhost".
-port <*portnumber*>	The port number where the RepConnector runtime instance is listening. The default value is 8080.
-user <*username*>	The RepConnector administrator login user ID. The default administrator user name is repraadmin.
password<*password*>	The password for RepConnector administrator login. By default, there is no administrator password.
-help	Displays a usage message. If used alone, displays help on all ratool commands. If used with the name of a command line flag or command option, displays help for that command line flag or command option.
help <*command_option*>	Displays the help information for a specific ratool *command_option*. If a *command_option* is not specified, it displays a list of the available command options. **Note** Do not include "-" before the help command flag when you display help information for a command option.
-logfile <*file_name*>	Sends the logging information for ratool to a specified file.
-loglevel <*loglevel_type*>	Determines the level of logging information to display. Valid values are: FATAL ERROR WARNING INFO DEBUG
Command Options	
-start <*conn_name*>	Starts a specific connection.

-startAll	Starts all connections
-stop <*conn_name*>	Stops a specific connection.
-stopAll	Stops all running connections.
-refresh <*conn_name*>	Refreshes a specific connection.
-refreshAll	Refreshes all connections.
-import <*conn_name*> <*conn_prop_file*> [-override]	Adds a new connection. If -override is specified, this command option updates the connection property information for an existing connection.
-delete <*conn_name*>	Deletes a connection.
-rename <*conn_name*> <*new_conn_name*>	Renames a connection name.
-copy <*conn_name*> <*new_conn_name*>	Copies a connection name to a new connection name.
-validate <*conn_prop_file*>| | <*conn_name*>	Validates a new connection profile or an existing connection.
-list	Lists all known connections.
-status <*conn_name*>	Lists connection status. If no connection name is specified, this command option gives the status of all known connections. Valid values are: STARTING, RUNNING , STOP.
-getLogInfo <*connName*> [-file <*logFile*>]	Displays the logging information for a specified connection. If -file is specified, this option writes the logging information to a file specified by *logFile*.
-getProperty <*connName*> [-file <*propfile*>]	Displays the connection properties for a specific connection. If -file is specified, this option writes the connection property information to a file specified by *propfile*.
-ping <*connName*> <*pingType*>	Verifies the connection is configured correctly. Valid values are: ALL IBMMQ TIBCO JMS DATABASE REPLICATION INBOUND OUTBOUND The default value is ALL.

-copy

Description — Copies the connection name.

Syntax — ratool -copy <*src_connection_name*> <*dest_connection_name*>

Parameters

src_connection_name
The name of the connection to copy.

dest_connection_name
This is the name of the connection you are creating from the source connection.

Examples — To copy the connection named RepToJMS to a new connection named RepToJMS2:

```
ratool -copy RepToJMS NewRepToJMS
```

Usage — If the destination connection already exists, this error message displays:

```
RaCommand[ERROR]: Copy connection failed. Error
Message: com.sybase.connector.repra.RaException:
java.lang.Exception: The destination connection already
exists.
```

-delete

Description — Deletes a specified connection.

Syntax — ratool -delete <*connection_name*>

Parameters

connection_name
The name of the connection that you want to delete.

Examples — To delete a connection RepToJMS:

```
ratool -delete RepToJMS
```

Usage — If the connection is running, this option returns this message.

```
RaCommand[Error]: Delete Connection failed. Error
Message: com.sybase.repra.util.RaException:
java.lang.Exception: The connection cannot be deleted
since it is currently in a STARTING or RUNNING state.
```

-getLogInfo

Description — Retrieves the connection log information for a specified connection.

Syntax — ratool -getLogInfo <*connection_name*> [-file <*log_file*>]

Parameters

connection_name
The name of the connection for which you want log information.

log_file
The name of the log file to which you are sending the connection log information.

Examples

Example 1 To get the connection log information for connection RepToJMS:

```
ratool -getLogInfo RepToJMS
```

Example 2 To get the connection log information for connection RepToJMS and send log information to *RepToJMS.log*:

```
ratool -getLogInfo RepToJMS -file RepToJMS.log
```

Example 3 To get the connection log information for connection RepToJMS and send log information to the default log file (*defaultRepToJMS.log*):

```
ratool -getLogInfo RepToJMS -file
```

Usage — By default, the log information displays to a standard output screen. If you specify -file, log information is sent to the specified file name. If you specify -flag without a file name, log information is sent to a default file name. The default file name is *default*<*connection_name*>*.log*.

-getProperty

Description — Retrieves the connection property information for a connection.

Syntax — ratool -getProperty <*connection_name*> [-file <*props_file*>]

Parameters

connection_name
The name of the connection for which you want log information.

props_file
The name of the connections property file to which you are sending the connection property information.

Examples

Example 1 To get the connection property information for connection RepToJMS:

```
ratool -getProperty RepToJMS
```

Example 2 To get the connection property information for connection RepToJMS and send it to *RepToJMS.props*:

```
ratool -getProperty RepToJMS -file RepToJMS.props
```

Example 3 To get the connection property information for connection RepToJMS and send it to the default connection properties file (*defaultRepToJMS.props*):

```
ratool -getProperty RepToJMS -file
```

Usage

The information returned is in the form of a *name/value* pair. By default, the information is sent to standard output (*stdout*). If you specify -file, the connection property information is sent to the specified file name. If you specify -flag without a corresponding file name, the log information is sent to a default file. The default file name is *default*<*connection_name*>*.props*.

-import

Description

Imports connection properties from an existing connection properties file to create anew connection or update an existing connection.

Syntax

ratool -import <*connection_name*> <*connection_prop_filename*> [-override]

Parameters

connection_name
The name of the connection to import.

connection_prop_filename
The name of the connection properties file that contains the properties to import.

-override
This option overrides the existing connection information. If you do not specify -override and there is an existing connection, this option returns a failure message.

```
RaCommand[ERROR] Import connection failed. Error
message: com.sybase.connector.repra.RaException:
java.lang.Exception: The existing connection cannot be
overriden
```

Examples

Example 1 To add a new connection using the properties in *RepToJMS.props*:

```
ratool -import RepToJMS d:\repraconf\RepToJMS.props
```

Example 2 To update an existing connection using the properties in *RepToJMS.props*:

```
ratool -import RepToJMS d:\repraconf\RepToJMS.props -
override
```

Usage

See the sample configuration property files in the RepConnector *sample/conf* directory for information about property names and values.

-list

Description

Lists all known connections.

Syntax

ratool -list

Examples

To list all connections.

```
ratool -list
```

Usage

This option returns a list of known connections.

-ping

Description

Verifies that the connection configuration information is configured successfully by pinging the connection.

Syntax

ratool -ping <*connection_name*> <*ping_type*>

Parameters

connection_name

The name of the connection for which you are verifying the configuration information.

ping_type

The type of connection you are pinging to verify connection configuration information. Valid values for *ping_type* are:

- ALL – inbound and outbound routes.
- IBMMQ – IBM Websphere MQ messaging system.
- TIBCO – TIBCO messaging system.
- JMS – JMS messaging system.
- DATABASE – server in which the database resides.
- REPLICATION – Replication Server System Database (RSSD).
- INBOUND – inbound source configuration (for example, server or messaging system).
- OUTBOUND – outbound destination configuration (for example, server or messaging system).

Examples

Example 1 To verify both the inbound and outbound configuration for the connection RepToJMS by pinging both inbound and outbound routes:

```
ratool -ping RepToJMS
ratool -ping RepToJMS ALL
```

Example 2 To verify the inbound configuration for connection RepToJMS by pinging the inbound device (for example, server or messaging system):

```
ratool -ping RepToJMS INBOUND
```

Example 3 To verify the outbound configuration for connection to RepToJMS by pinging the outbound destination device (for example, server or messaging system):

```
ratool -ping RepToJMS OUTBOUND
```

Example 4 To verify the replication configuration for a connection to RepToJMS by pinging Replication Server:

```
ratool -ping RepToJMS REPLICATION
```

Example 5 To verify the JMS configuration for connection to RepToJMS by pinging the JMS messaging system:

```
ratool -ping RepToJMS JMS
```

Usage

If you do not specify *ping_type*, the value defaults to ALL.

-refresh

Description — Refreshes a specified connection.

Syntax — ratool -refresh <*connection_name*>

Parameters — *connection_name*
The name of the connection to refresh.

Examples — To refresh the connection RepToJMS:

```
ratool -refresh RepToJMS
```

Usage — This option reloads the connection properties if they have changed, and restarts the connection. refresh applies only to running connections. If the connection is not running, this option returns a warning message.

-refreshAll

Description — Refreshes all running connections.

Syntax — ratool -refreshAll

Examples — To refresh all the running connections.

```
ratool -refreshAll
```

Usage — This option reloads the connection properties if they have changed, and restarts the connection. refreshAll applies only to running connections.

-rename

Description — Renames a connection.

Syntax — ratool -rename <*old_connection_name*> <*new_connection_name*>

Parameters — *old_connection_name*
The name of the connection to rename.

new_connection_name
The new name for the connection.

Examples — To rename connection RepToJMS to RepToJMS2:

```
ratool -rename RepToJMS NewRepToJMS
```

Usage

If you attempt to rename a connection that is running, the following error message displays:

```
RaCommand[ERROR]: Rename connection failed. Error
Message: com.sybase.connector.repra.util.RaException:
java.lang.Exception: The connection cannot be renamed
since it is running.
```

If the new connection name already exists, the following failure message displays:

```
RaCommand[ERROR]: Rename connection failes. Error
message: com.sybase.connector.repra.util.RaException:
java.lang.Exception: The destination name already
exist.
```

-start

Description

Starts a specified connection.

Syntax

ratool -start <*connection_name*>

Parameters

connection_name
The name of the connection to start.

Examples

To start a connection called RepToJMS:

```
ratool -start RepToJMS
```

Usage

If the connection is already running, ratool returns a warning message.

```
RaCommand[WARN]: The connection is already running.
```

-startAll

Description

Starts all the connections.

Syntax

ratool -startAll

Examples

To start all known connections.

```
ratool -startAll
```

Usage

Use -startALL to start connections.

-status

Description — Gets the status of a specific connection.

Syntax — ratool -status [<*connection_name*>]

Parameters — *connection_name*
The name of the connection you want to status for.

Examples — **Example 1** To get the status of RepToJMS:

```
ratool -status RepToJMS
```

Example 2 To get the status of all configured RepConnector connections for RepConnector running on "localhost", listening on port 8080, connecting as user "repraadmin" with no password:

```
ratool -status
```

Example 3 If you have configured your application server to listen on a different port, for example, 8888, you can issue this command to display the status of all configured RepConnector connections:

```
ratool -port 8888 -status
```

Example 4 If you have changed the default user name "repraadmin" with no password to the new user "newuser" with password "newpassword" for connecting to RepConnector running on "machine1" and port 8888, you can issue this command to get the status of the RepConnector connection:

```
 ratool -host machine1 -port 8888 -user  newuser -password newpassword -
status
```

Example 5 To connect to RepConnector that is running on remote "machine1" listening on default port 8080, connecting as the default user/password, issue one of these commands:

```
ratool -host machine1 -status
```

```
ratool -host machine1 -port 8080 -status
```

```
ratool -host machine1 -port 8080 -user repraadmin -status
```

Example 6 To display debug logging information while running ratool, issue:

```
ratool -host machine1 -port 8888 -user newuser -password newpassword -
loglevel DEBUG -status
```

Note By default, if -logfile is not specified, logging information is sent to standard output.

Example 7 To send the debug logging information to a log file while running ratool, issue:

```
ratool -host machine1 -port 8888 -user newuser -password newpassword -
loglevel DEBUG -logfile ratool.log -status
```

Example 8 If you are connecting to RepConnector running on BEA's default 7001 port you can run ratool:

```
ratool -port 7001 -user repraadmin -status
```

Usage

If you do not specify a connection name, the status of allconnections displays. Status values for the connection are:

- RUNNING – the connection is running.
- STOP – the connection is not running.

-stop

Description

Stops a specified connection.

Syntax

ratool -stop <*connection_name*>

Parameters

connection_name
The name of the connection to start.

Examples

To stop connection RepToJMS

```
ratool -stop RepToJMS
```

Usage

If the connection is already stopped, this option returns a warning message:

```
RaCommand[WARN]: The connection is stooped already.
```

-stopAll

Description

Stops all running connections.

Syntax

ratool -stopAll

Examples

To stop all known connections:

```
ratool -stopAll
```

Usage

If the connection is not running, this option returns a warning message.

```
RaCommand[WARN]: Failed to refresh the connection.
Unable to refresh a connection that is already stopped.
```

CHAPTER 9

Using Unwired Orchestrator with RepConnector

This chapter describes how to use Unwired Orchestrator with RepConnector.

Unwired Orchestrator is the Sybase development environment for business integration solutions. It offers intuitive, easy-to-use tools for creating and optimizing business processes that take advantage of Sybase's suite of integration products.

The runtime deployment environment provides application integration, data transformation, and business process management.

Unwired Orchestrator provides Web Services extensibility. It has graphical support for both simple (WSDL, UDDI, SOAP) and collaborative (ebXML) Web services.

Unwired Orchestrator business processes are launched by the arrival of a database event message on a queue. The launched process can transform, aggregate, and republish the original database event to systems, or coordinate the application of updates to non-database systems. This ability to push significant database events into the overall business is what makes RepConnector an excellent companion to Unwired Orchestrator.

Building business processes that interface with RepConnector

Unwired Orchestrator does not support recursive element references. You must make sure that RepConnector events will not deliver data that is recursive.

There are potentially many configurations of message queue topologies that can be used to interface replication events with Unwired Orchestrator business processes. At least one message queue is required to deliver replication data to Unwired Orchestrator business processes. The message queue may be a TIBCO, MQ, or JMS message queue, since each type is supported by RepConnector and Unwired Orchestrator. The maximum number of message queues is at the designer's discretion; however, remember that one RepConnector instance is required for each message queue.

Managing single events using a single message queue

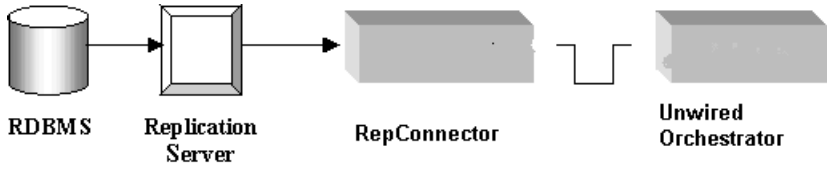
A single message queue can be the interface for all RepConnector replication events. In this case, the business process must be designed so that it manages all possible replication event types it needs to process. For example, a database event delivered in a RepConnector dbStream can be a tranBegin, tranCommit, tranAbort, insert, update, delete, execBegin, execEnd, or execSQL event.

To process the incoming replication events, you must know:

- The types of events delivered to each message queue based on the configuration of all of the RepConnector instances
- The database replication activity for each RepConnector, based on the application design
- All the RepConnector events that each Unwired Orchestrator process requires
- The scope of the business process, which may require knowledge of insert, update, and delete in to fulfill the required processing

Figure 9-1 shows RepConnector-to-Unwired Orchestrator single queue management, in which the flow of a message is delivered to a queue by RepConnector, and picked up by Unwired Orchestrator.

Figure 9-1: Message flowr



Note This technique simplifies the replication environment but increases the complexity of the Unwired Orchestrator business process, because the business process must handle different message types. The process designer may want to distribute these events using multiple message queues. In this case, a RepConnector runs for each queue.

Unwired Orchestrator considerations

Unwired Orchestrator must know RepConnector event XML formats so replication data can be transformed and used. Unwired Orchestrator recognizes foreign data formats, such as RepConnector replication data, by importing their descriptions in the form of a XML DTD or Schema. So, for Unwired Orchestrator to know RepConnector data formats, a description of the replication data must be imported. The RepConnector 15.0 product provides an XSD that contains the schema for all of its event formats. This XSD is located in *<ApplicationServer>\repra\dtds\dbeventstream.xsd.*

This is how RepConnector replication events interface with an Unwired Orchestrator business process:

- RepConnector sends a Replication Server event to the appropriate message system such as EAServer JMS, TIBCO JMS or MQ Series depending on column information in the primary table.
- You can configure the Unwired Orchestrator business process to use endpoints configured for these messaging systems.
- You can configure the Unwired Orchestrator Business process using an service interaction endpoint configured for EAServer JMS, TIBCO Enterprise for JMS, or IBM Websphere MQ Series.

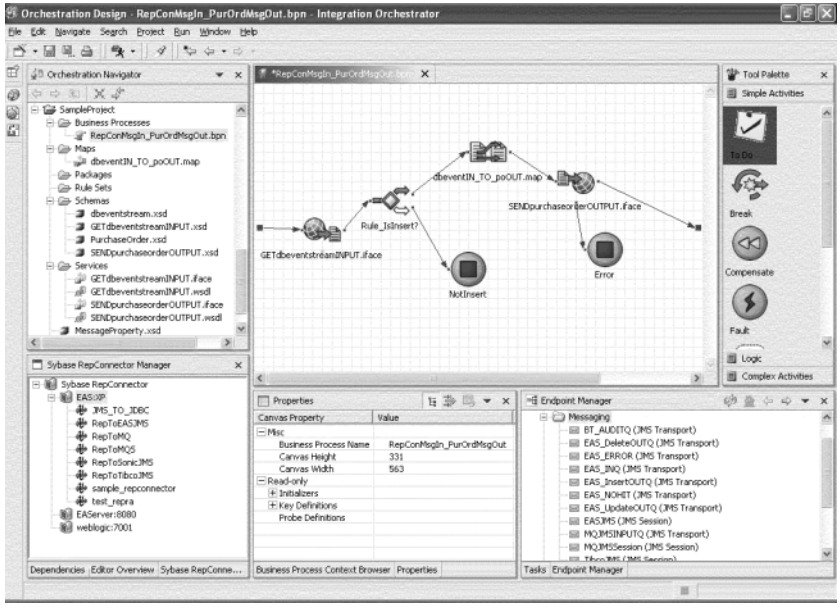
A simple business process

An Unwired Orchestrator Service interaction identifies the XML message from the appropriate RepConnector message queue using a rule that determines if the record is an insert, update, or delete from the appropriate table.

For example, based on the XML message sent from the RepConnector, an insert message can be mapped and reformatted to a purchase order message which can then be sent along to another queue or process.

In Figure 9-2, an orchestration design with integratedRepConnector shows the flow of Unwired Orchestrator, which picks up the message delivered to the input queue by RepConnector, evaluates the message with a single rule, maps and transforms the input message to a different output message, and places the transformed message into another queue for further processing. shows the flow of Unwired Orchestrator, which picks up the message delivered to the input queue by RepConnector, evaluates the message with a single rule, maps and transforms the input message to a different output message, and places the transformed message into another queue for further processing.

Figure 9-2: Orchestration design with RepConnector integrated



To create a simple business process:

1 Using the procedures in Chapter 6, “Configuring RepConnector,” configure a RepConnector connection to place an XML message onto an EAServer JMS queue.

2 In Unwired Orchestrator, create a new project (accept all defaults).

3 In the new project, create a New Business Process.

4 Import RepConnector schema, *dbeventstream.xsd*, from *<ApplicationServer>\repra\dtds*.

5 Import another schema or DTD; for example, *PurchaseOrder.xsd*.

6 Using the Endpoint Manager, add a JMS Session and JMS Transports as endpoints.

7 Create a new messaging service by adding a notification (receive) operation and the RepConnector schema (*dbeventstream.xsd*) to the service. This creates a *wsdl* and an *iface* file in the Services folder.

   To

   a open the *iface* file, use the Service Interaction Editor and extract the schema from the *wsdl*.

   b Open the *wsdl* file with the Service Editor to add a port and associate a messaging queue with that port.

8 Create a map, adding the *dbevenstream.xsd* as the input schema and the *PurchaseOrder.xsd* as the target schema.

   See Figure 9-3 on page 94 for more information about mapping the RepConnector schema.

9 Create another new messaging service by adding a one-way (send) operation and the PurchaseOrder schema (*purchaseorder.xsd*) to the service. This creates another *wsdl* and an *iface* file in Services folder.

   a Open the .*iface* file (use the Service Interaction Editor) and extract the schema from the *wsdl*.

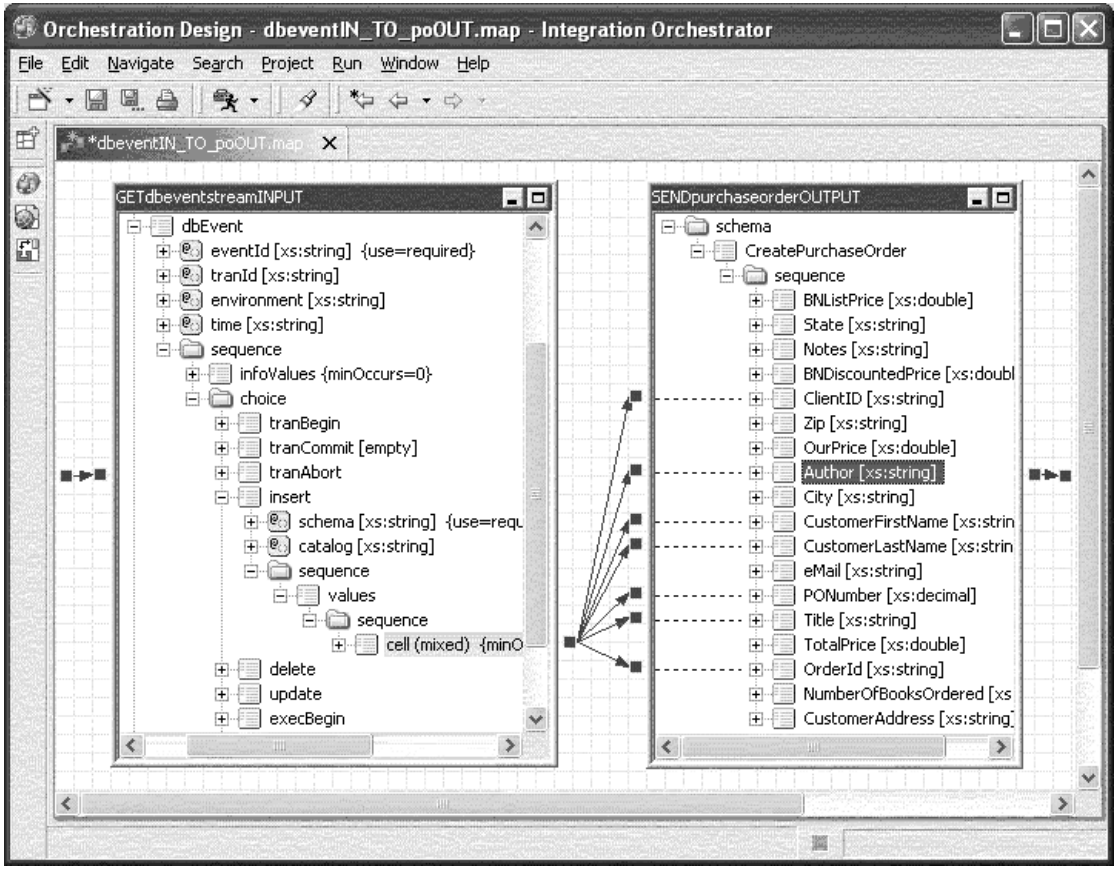
   b Open the *wsdl* file with the Service Editor to add a port and to associate a messaging queue with that port.

10 Complete your business process design by adding a rule and end nodes.

Mapping example using RepConnector Schema

Figure 9-3 shows an example of mapping array data (cell) from the RepConnector-extracted *iface* schema as the source, to strongly-typed data in the Purchase Order-extracted *iface* schema as the target.

Figure 9-3: Mapping example using a RepConnector schema



DbeventIN_TO_poOUT.map:

- Converts RepConnector replication data to Purchase Order input data.

- Reformats the RepConnector data from the source table format to the target table format. Reformatting from one table to another requires the map to move source columns to target columns, which is not straight-through mapping. While converting from replication data to Purchase Order data, the map is converting RepConnector array data to Purchase Order data.

Two schemas are required to do the mapping:

- The schema named *GETdbeventstreamINPUT.xsd,* which is generated from the GETdbeventstreamINPUT Service Interaction for the source schema in the map.
- The schema named *SENDpurchaseorderOUTPUT.xsd*, which is generated from SENDpurchaseorderOUTPUT Service Interaction as the target.

The sequence of cells is an unbounded array, meaning there can be any number of cells. Each cell corresponds to a table column in the source database and has a name, type, and isNull attribute. The type and isNull attributes are not used in the map, but knowing their expected values is important when creating the parameters for the deliverApproval operation. However, the name attribute does the actual mapping.

To do the mapping, connections are made from the cell element to all of the input parameters in the target schema. You can edit each connection by double-clicking the connector. This opens a mapping XPath editor, which defaults to the cell's XPath. All XPaths must be modified to indicate which column in the source database is mapped to which input parameter of the deliverApproval operation. The column names in the source database must be known to complete this process.

Table 9-1 shows the modified XPaths that map the source database columns to Purchase Order parameters. In this example, each source column maps to a single input parameter.

Table 9-1: RepConnector to Purchase Order Map Xpaths example

Parameter in PO	Cell-mapping XPath
ClientID	*/dbStream/dbEvent/insert/values/cell[@name='CustomerID'*]
Author	*/dbStream/dbEvent /insert/values/cell[@name='AuthorLastName']*
CustomerFirstName	*/dbStream/dbEvent /insert/values/cell[@name='FirstName']*
CustomerLastName	*/dbStream/dbEvent /insert/values/cell[@name='LastName']*
PONumber	*/dbStream/dbEvent /insert/values/cell[@name='PurchaseOrderNumber']*
Title	*/dbStream/dbEvent /insert/values/cell[@name='Title']*
OrderID	*/dbStream/dbEvent /insert/values/cell[@name='OrderNumber']*

See the Unwired Orchestrator online documentation for more information.

CHAPTER 10

Customizing the Sender and Formatter Processors

This chapter describes how you can create customized sender and message formatter processors. For information about how to customize a message generator for use with TIBCO ActiveEnterprise for Wired Message Format, see Chapter 11, “Customizing the Message Generator for TIBCO AECM.”

RepConnector allows you to customize the sender processor and the formatter processor for routing the incoming replication events to meet your application needs. To do this, you must:

- Develop your own Java class implementing APIs that are provided by RepConnector
- Define the class in your connection configuration
- Modify the server environment

Customizing the sender processor

Note You must indicate that you will be using a customized sender processor when you configure the RepConnector connection. See Chapter 6, “Configuring RepConnector,” for more information about configuring RepConnector connections.

To create a customized sender processor that runs within the RepConnector environment:

1 Create a sender processor for your application by implementing the *com.sybase.connector.repra.RepraClient* interface. If you want to use RepConnector to load a property page, implement *com.sybase.connector.repra.RepraCustomClient*.

2 Use the RepConnector Manager Add Connection Wizard to create a RepConnector connection that routes events to the custom sender processor.

3 On the first wizard page, select Replication for the Inbound type when you configure the new connection, and select Custom for the outbound type.

4 On the fifth wizard page, enter the name of your custom class. If your custom class loads a property page, enter the full path as well as the file name of the property page.

5 Modify the system environment to add the customized sender processor.

   You must define the full path of the *jar* file or the directory containing the customized sender processor:

   - For EAServer – the Java classes properties.
   - For WebLogic – CLASSPATH in *repra_env.bat* (for Windows) or *repra_env.sh* (UNIX) file.

   For detailed steps, see “Building the runtime environment for the customized formatter processor” on page 105.

6 Shut down and restart the application server. You must restart the application server before accessing the customized sender processor.

RepraClient interface

```
package com.sybase.connector.repra;

public interface RepraClient
{
     /**
     *configures the sender properties and connects the sender/receiver of the
     *target messaging system.
     */
```

```
     public void configureClient() throws Exception;

     /**
     *send out the rep messages to the connection.
     *@param String repmsg the text stream of the XML document containing
     *the metadata and replication event.
     */
     public boolean sendEvent (Object repmsg) throws Exception;

     /**
     *return true if the connection is healthy.
     */
     public boolean isReady();

     /**
     *close the client connection.
     */
     public void close();

     /**
     *sets the default logger
     */
     public void setLogger (RaLogger log);
}
```

Sample implementation of the RepraClient interface

```
package com.mycompany;

import com.sybase.connector.repra.RepraClient;
import com.sybase.connector.repra.logging.RaLogger;
import java.io.*;

public class SampleClient implements RepraClient
{
     BufferedWriter _fout;
     String _filename = "myCustomOut.dat"

     // This method creates an instance of the BufferedWriter object
     public void configureClient() throws Exception
     {
          _fout = new BufferedWriter(new FileWriter(_filename, true));
     }

     // You can do whatever you want in this method.
```

```
    // This sample appends the String value of the message to the file.
    public boolean sendEvent(Object repmsg) throws Exception
    {
         _fout.write(repmsg.toString(), 0, repmsg.toString().length());

         _fout.newLine();
         _fout.flush();

         return true;
    }

    //It returns true if the client channel is ready.
    //Otherwise, it returns false.
    public boolean isReady()
    {
         if (_fout != null)
         {
              return true;
         }
         return false;
    }

    // This method closes the client channel.
    public void close()
    {
         if (isReady())
         {
             try
             {
                  _fout.close();
             }
             catch (Exception ex)
             {
                  ex.printStackTrace();
             }
         }
    }

    // This method sets the default logger. In this sample, it
    // does nothing.
    public void setLogger(RaLogger log)
    {
    }
}
```

❖ **Compiling the customized sender processor**

To compile your sender processor:

1 Change to the directory of your sender processor.

Use the Java compiler by defining the -classpath parameter with the required libraries to compile the customized class.

- For Windows:

```
cd C:\work\custom
md customclasses
c:\jdk141\bin\javac -classpath .;C:\sybase\EAServer\repra\
lib\repraconn.jar \
-d customclasses com\mycompany\SampleClient.java
```

- For UNIX:

```
cd /work/custom
mkdir customclasses
/usr/jdk141/bin/javac -classpath .:/opt/sybase/EAServer/repra/
lib/repraconn.jar \
-d customclasses com/mycompany/SampleClient.java
```

2 Verify the compilation.

When the compilation finishes without any error messages, go to the *customclasses* directory to see if *SampleClient.class* is under *com\mycompany* (Windows) or *com/mycompany* (UNIX).

❖ **Building the runtime environment for the customized sender processor**

To use a jar file that includes the customized sender processor, go to the *customclasses* directory and use the jar command to build a jar file from the com directory. Otherwise, you can use the directory path to set up your environment.

Note Sybase recommends that you use *jar* file format for the customization.

---

1 Build a *jar* file.

- For Windows:

```
cd C:\work\custom\customclasses
C:\jdk141\bin\jar -cf mycustom.jar com
```

- For UNIX:

```
cd /work/custom/customclasses
/usr/jdk141/bin/jar -cf mycustom.jar com
```

- For EAServer:
  a Copy the *jar* file or the directory structure containing the Java classes created from the previous step to the EAServer *java/classes* (Windows) or *java/classes* (UNIX) directory.
  b If you are using the *jar* file, start EAServer and connect to it from EAServer Manager.

    Then, go to the *Servers/<your server>* directory and select the Server Properties menu. From the pop-up, select the Java Classes tab and click Add to add the name of the *jar* file, such as *mycustom.jar*. Click OK.
  c Add *repra.con.jar* to the Server Properties.
- For WebLogic:
  a Shut down the application server if it is running.
  b Modify the *%BEA_HOME%\repra\bin\repra_env.bat* (Windows) or *$BEA_HOME/repra/bin/repra_env.sh* (UNIX) file to add the full path of *mycustom.jar* or the *customclasses* directory to CLASSPATH at the ending part of the CLASSPATH definition.

    For Windows:

```
set CLASSPATH=C:\work\custom\customclasses;%CLASSPATH%
or
set CLASSPATH=C:\work\custom\customclasses\mycustom.jar;%CLASSPATH%
```

    For UNIX:

```
set CLASSPATH=/work/custom/customclasses:$CLASSPATH
or
set CLASSPATH=/work/custom/customclasses/mycustom.jar;$CLASSPATH
```

  c Start the WebLogic Server to activate the new environment change.

Note For information on creating new custom sender and formatter classes, see “Creating new custom sender and custom formatter classes” on page 107.

Customizing the formatter processor

You can create your own customized formatter processor for your application by implementing the interface *com.sybase.connector.repra.rep.RepTransactionFormatter*. This is the same property page option as RepraCustomClient and RepraCustomTransactionFormatter, but you can use these new interfaces to create a customized formatter processor that also loads a custom property page. See "Creating new custom sender and custom formatter classes" on page 107.

1 Configure the connection using the Configure Connection wizard in RepConnector Manager. See Chapter 6, "Configuring RepConnector," for more information.

2 On the Configure Replication window, set the inbound type to REPLICATION.

3 On the General Properties window, select Customized Plug-in Class.

4 Modify the system environment to add the customized formatter processor.

   You must define the full path of the *jar* file or the directory containing the customized formatter processor:

   - For EAServer – Java classes properties for EAServer.
   - For WebLogic – CLASSPATH in *repra_env.bat* (Windows) or *repra_env.sh* (UNIX)

5 Shut down and restart the application server.

RepTransactionFormatter interface

```
package com.sybase.connector.repra.rep;

import com.sybase.connector.repra.logging.RaLogger

public interface RepTransactionFormatter
{
     /**
     returns an Object formatted by this formatter implementation.
     rse - the internal Object containing a replication event.
     */
     publicObject format(RepEvent rse) throws RepraException;
```

```
    /**
    returns an Object formatted by this formatter implementation.
    rse - The internal Object containing a replication event.
    */
    public Object formatTransaction(RepEvent[] events)
         throws RepraException;

    /**
    Return true if RepEvent metadata is required for formatting.
    If it returns true, the RepEvent will contain the data type of
    each field. Otherwise, the data type will be ignored for this
    RepEvent.
    */
    public boolean requiresMetaData();

    /**
    Return true if RepEvent is required to be parsed to be a standard
    RepEvent that the RepEventParser can handle. If it returns false,
    the RepEvent will contain a text stream of the RepEvent only for the
    messaging client to parse it.
    */
    public boolean requiresParse();

    /**
    sets the default logger
    */
    public void setLogger(RaLogger log);
}
```

Sample implementation of the RepTransactionFormatter interface

Use the *MessageFormatter.java* file under <*AppServer location*>*repra**sample**client* (Windows) or <*AppServer location*>/*repra/sample/client* (UNIX) directory as a sample of the customized message formatter. The sample uses the DBEventParser utility to retrieve data and metadata from the replication event. For detailed information about DBEventParser, see “Using the DBEventParserFactory” on page 107.

❖ **Compiling the customized formatter processor**

To compile your formatter processor.

1 Go to the directory where your formatter processor is located.

On Windows:

```
cd c:\work\custom
```

On UNIX:

```
cd /work/custom
```

2 Use the Java compiler, the -classpath parameter, and the required libraries to compile your customized class.

On Windows:

```
md customclasses
c:\jdk141\bin\javac -classpath .;c:\sybase\EAServer\repra\lib\
repraconn.jar \
-d customclasses com\mycompany\SampleFormatter.java
```

On UNIX:

```
 mkdir customclasses
/usr/jdk141/bin/javac -classpath.:/opt/sybase/EAServer/repra/
lib/repraconn.jar\
-d customclasses com/mycompany/SampleFormatter.java
```

3 Verify the compilation.

When the compilation finishes without any error messages, go to the *customclasses* directory to see if the *SampleFormatter.class* is under *com\mycompany* (Windows) or *com/mycompany* (UNIX).

❖ **Building the runtime environment for the customized formatter processor**

To include the customized formatter processor in a *jar* file, go to the *customclasses* directory and use the jar command to build a *jar* format from the *com* directory. Otherwise, you can use the directory path for setting up your environment.

Note Sybase recommends that you use the *jar* file format for your customization.

---

1 Build a *jar* file

On Windows:

```
cd C:\work\custom\customclasses
C:\jdk141\bin\jar -cf mycustom.jar com
```

On UNIX:

```
cd /work/custom/customclasses
/usr/jdk141/bin/jar -cf mycustom.jar com
```

2 Shut down and restart your application server.

For EAServer:

1 Copy the *jar* file, or the directory structure containing the Java classes created from the previous step, to the EAServer *java\classes* (Windows) or *java/classes* (UNIX) directory.

2 Run EAServer and connect to it from EAServer Manager.

3 If you are using the *jar* file, go to the *Servers/<your server>* directory and select Server Properties. From the pop-up, select the Java Classes tab. Click Add to add the name of the *jar* file, such as *mycustom.jar*, and click OK.

4 Shut down the EAServer, and then restart it to activate the new environment change.

For WebLogic:

1 Shut down the application server if it is running.

2 Add the full path of *mycustom.jar* or the *customclasses* directory to CLASSPATH at the end of the CLASSPATH definition in *%BEA_HOME%\repra\bin\repra_env.bat* (Windows) or *$BEA_HOME/repra/bin/repra_env.sh* (UNIX):

On Windows:

```
set CLASSPATH=C:\work\custom\customclasses;%CLASSPATH%
or
set CLASSPATH=C:\work\custom\customclasses\mycustom.jar;%CLASSPATH%
```

On UNIX:

```
set CLASSPATH=/work/custom/customclasses:$CLASSPATH
or
set CLASSPATH=/work/custom/customclasses/mycustom.jar;$CLASSPATH
```

3 Start the WebLogic Server to activate the new environment change.

Creating new custom sender and custom formatter classes

To create and manipulate a user-defined property page, you must implement two new interfaces, RepraCustomClient and RepraCustomTransactionFormatter. Both add the same two new methods to the methods already implemented by RepraClient and RepTransactionFormatter:

```
public void setConfigProps(String custPropsFile):
public String getConfigProps();
```

setConfigProps sets the user-defined property page, while getConfigProps gets it.

These new interfaces provide two new samples, *CustomMessageFormatter.java*, and *MailClientCustom.java*, to the RepConnector installation's sample/client directory. MailClientCustom uses a custom configuration file named *sender.props*, also in the sample directory.

Using the *DBEventParserFactory*

RepConnector provides a utility called DBEventParserFactory to extract both the metadata and the actual data from a single or grouped replication event. This utility is intended to be used with the customized formatter for extracting and reformatting data before sending it to the destination. This utility can also be used by an end-user application that has received the XML representation of the event.

To obtain a parser instance, enter:

```
DBEventParser=dbe=DBEventParserFactory.get EventParser (xmldoc or repevent)
```

DBEventParser APIs

Your customized formatter can use the retrieved information to regenerate a new message in a customized format to send to the sender processor. The following section describesthe APIs of the DBEventParser utility.

package com.sybase.connector.repra.util; setSource(Object obj) throws Exception

Description — Sets the source event. Must be set prior to calling other methods to retrieve information. The obj that is passed the setSource is a repevent[] object or a string representation of the XML event.

Syntax

```
setDatabaseType (int dbType)
    DBEventParser.DBTYPE_ORACLE
                  DBType_SYBASE
```

int size()

Description — Returns the number of operations in the transaction.

String getDSName() throws Exception

Description — Returns the DSI name defined for the connection.

String setDBName() throws Exception

Description — Returns the database name defined for the connection.

String getEventId() throws Exception

Description — Returns the unique event ID of this transaction.

String getOperation(int elemAt)

Description — Returns the operation (valid returns are insert, delete, update, and exec) at the position of elemAt. If there is only one element, use 0.

Examples

```
int msgSize = size();
for (int ido = 0; ido < msgSize; ido++)
{
    // prints out the operation name of the (ido)th
    // operation
    System.out.println("MyMsgGenerator-Operation : " +
```

```
                    dbe.getOperation(ido));
}
```

String getSchemaName(int elemAt) throws Exception

Description

Returns the table name or the procedure name of the operation at the position of elemAt.

Examples

```
int msgSize = size();
for (int ido = 0; ido < msgSize; ido++)
{
   // prints out the table name of the (ido)th operation
   System.out.println("MyMsgGenerator-TableName : " +
         dbe.getSchemaName(ido));
}
```

String getStatement() throws Exception

Description

Returns the SQL statement of the entire transaction. If the transaction contains only one operation, this returns only one statement. If there are multiple operations in the transaction, this returns multiple statements separated by the newline character (“\n”).

Example

```
int msgSize = size();
if (msgSize > 0)
{
System.out.println (dbe.getStatement());
}
```

Sample output:

```
insert into REP4 values (1, "code 1", "name 1")
insert into REP4 values (2, "code 2", "name 2")
update REP4 set repCode = "code 1111" where repId=1
```

String setStatement(int elemAt) throws Exception

Description

Returns a single SQL statement belonging to the operation at the position of elemAt.

Example

```
int msgSize = size();
for (int ido = 0; ido < msgSize; ido++)
```

```
{
    // prints out the statement of the (ido)th operation
    System.out.println("MyMsgGenerator-Statement : " +
         dbe.getStatement(ido));
}
```

String getOwner(int elemAt) throws Exception

Description

Returns the owner of the table or procedure used in this operation.

Example

```
dbe.getOwner(0);
```

Vector getData(int elemAt) throws Exception

Description

Returns a vector containing hash tables which represent the names, types, and values of the fields belonging to the operation at the position of elemAt. This method is meaningful only for insert, update, and stored procedure operations.

The hash table has the following information:

```
DBEventParser.FIELD_NAME=(String) <field name>
DBEventParser.FIELD_TYPE=(Integer) <field type>
DBEventParser.FIELD_VALUE=(Object) <field value>
```

where:

```
DBEventParser.FIELD_NAME = "FieldName",
DBEventParser.FIELD_TYPE = "FieldType",
DBEventParser.FIELD_VALUE = "FieldValue".
```

Example

```
// Gets the fields of the first operation
Vector dataVector = dbe.getData(0);
Hashtable dataField = null;
if (dataVector != null)
{
   System.out.println("MyMsgGenerator-DataSize : " +
   dataVector.size());
   for (int ido = 0; ido < dataVector.size(); ido++)
   {
     // returns a Hashtable containg the name, type, and
     // value of the (ido)th field
     dataField = (Hashtable)
     dataVector.elementAt(jdo);
     // Do something to retrieve the name, type and
     // value of the field
```

```
      ........
   }
}
```

Vector getKeys(int elemAt) throws Exception

Description

Returns a Vector containing hash tables which represent the names, types, and values of the key field belonging to the operation at the position of elemAt. This method is meaningful only for update and delete operations.

The hash table has the following information:

```
DBEventParser.FIELD_NAME=(String) <field name>
DBEventParser.FIELD_TYPE=(Integer) <field type>
DBEventParser.FIELD_VALUE=(Object) <field value>
```

where:

```
DBEventParser.FIELD_NAME = "FieldName",
DBEventParser.FIELD_TYPE = "FieldType",
DBEventParser.FIELD_VALUE = "FieldValue".
```

Example

```
// Gets the fields of the first operation
Vector keyVector = dbe.getKeys(0);
Hashtable keyField = null;
if (keyVector != null)
{
   System.out.println("MyMsgGenerator-KeySize : " +
   keyVector.size());
   for (int ido = 0; ido < keyVector.size(); ido++)
   {
     // returns a Hashtable containg the name, type,
     // and value of the (ido)th key field
     keyField = (Hashtable) keyVector.elementAt(jdo);
     // Do something to retrieve the name, type and
     // value of the key field
     .......
   }
}
```

String getFieldName(Hashtable field) throws Exception

Description

Returns the field name of this column as a string value of DBEventParser.

int getFieldType(Hashtable field) throws Exception

Description

Returns the field type of this column as an *int* value of DBEventParser.

See the following table for the field types (JDBC datatypes) and their *int* values:

JDBC datatype constant	Constant value (int)
DBEventParser.CHAR	0
DBEventParser.UNICHAR	25
DBEventParser.UNIVARCHAR	110
DBEventParser.BINARY	1
DBEventParser.TEXT	4
DBEventParser.UNITEXT	29
DBEventParser.IMAGE	5
DBEventParser.TINYINT	6
DBEventParser.SMALLINT	7
DBEventParser.INT	8
DBEventParser.BIGINT	30
DBEventParser.USMALLINT	31
DBEventParser.UINT	32
DBEventParser.UBIGINT	33
DBEventParser.REAL	9
DBEventParser.FLOAT	10
DBEventParser.BIT	11
DBEventParser.DATETIME	12
DBEventParser.SMALLDATETIME	13
DBEventParser.MONEY	14
DBEventParser.SMALLMONEY	15
DBEventParser.NUMERIC	16
DBEventParser.DECIMAL	17
DBEventParser.VARCHAR	18
DBEventParser.VARBINARY	19
DBEventParser.DATE	27
DBEventParser.TIME	28

Object getFieldValue(Hashtable field) throws Exception

Description

Returns the field value of this column as an object.

The subtype of the object is determined by the following mapping:

Java object	JDBC datatype
Boolean	DBEventParser.BIT
ByteArrayInputStream	DBEventParser.BINARY
	DBEventParser.SMALLBINARY
	DBEventParser.IMAGE
Double	DBEventParser.REAL
Float	DBEventParser.FLOAT
Integer	DBEventParser.TINYINT
	DBEventParser.SMALLINT
	DBEventParser.INT
	DBEventParser.USMALLINT
	DBEventParser.UINT
java.math.BigDecimal	DBEventParser.UBIGINT
Long	DBEventParser.BIGINT
String	DBEventParser.CHAR
	DBEventParser.VARCHAR
	DBEventParser.UNICHAR
	DBEventParser.UNIVARCHAR
	DBEventParser.UNITEXT
	DBEventParser.DATETIME
	DBEventParser.SMALLDATETIME
	DBEventParser.MONEY
	DBEventParser.SMALLMONEY
	DBEventParser.NUMERIC
	DBEventParser.DECIMAL
	DBEventParser.TEXT
	DBEventParser.DATE
	DBEventParser.TIME

Example

This example shows getFieldName, getFieldType and getFieldValue.

```
int msgSize = size();
// This iteration visits all of the operations
for (int ido = 0; ido < msgSize; ido++)
{
```

```
System.out.println("MyMsgGenerator-Statement:" +
  getStatement(ido));
System.out.println("MyMsgGenerator-Operation:" +
  getOperation(ido));
System.out.println("MyMsgGenerator-TableName:" +
  getSchemaName(ido));
Vector dataVector = getData(ido);
Hashtable dataField = null;
if (dataVector != null)
{
  System.out.println("MyMsgGenerator-DataSize: " +
  dataVector.size());
  // This iteration visits the fields of the
  // operation
  for (int jdo = 0; jdo < dataVector.size(); jdo++)
  {
    dataField = (Hashtable) dataVector.elementAt(jdo);
    if (dataField == null)
    {
      break;
    }
    System.out.println("MyMsgGenerator-FieldName:"+
      getFieldName(dataField));
    System.out.println("MyMsgGenerator-FieldType:"+
      getFieldType(dataField));
    System.out.println("MyMsgGenerator-FieldValue:" +
      getFieldValue(dataField).toString);
      }
    }
  }
```

String toXMLText(String dtdURL) throws Exception

Description

Returns an XML text-type (a string) containing the events of the transaction.

Example

```
. . .
System.out.println(toXMLText
    (http://yjeongw2k:8080/RepraWebApp/dtds
    /dbeventStream.xsd));
```

Sample output:

```
<!DOCTYPE dbStream SYSTEM
  'http://yjeongw2k:8080/RepraWebApp/dtds/dbeventstream.xsd'>
<dbStream environment="repraJMS2.repdb">
  <tran eventId=
```

```
"102:0000000000000ab200003e10004b00003e1000490000937300dda25000000000000
10001">
       <update schema="REP4">
         <values>
           <cell name="repId" type="INT">2</cell>
           <cell name="repName" type="VARCHAR">name 11</cell>
           <cell name="repCode" type="VARCHAR">code 11</cell>
         </values>
         <oldValues>
           <cell name="repId" type="INT">11</cell>
         </oldValues>
       </update>
     </tran>
   </dbStream>
```

Using the RaXMLBuilder utility

The RaXMLBuilder utility helps user applications that send a message containing database events to RepConnector. This utility generates an XML message format, containing the database events that the user application sends to RepConnector for routing to the database.This section documents the API for this utility.

RaXMLBuilder()

Syntax — Package: com.sybase.connector.repra.utility
Constructor RaXMLBuilder()

Description — The default constructor.

createTranDocument() throws Exception

Description — Creates a document with the <tran> element, to contain multiple database operations in a transaction. Returns a String, the Element of the current event.

Syntax —
```
org.dom4j.Element createTranDocument
    (java.lang.String uri,java.lang.String dbname,
     java.lang.String eventId)
```

Parameters — *uri* – The URI of *dbevenstream.xsd*

dbname – The name of the database on which the operation executes.

eventId – The event ID of the current transaction. The uniqueness of eventId is the responsibility of the sending client.

createEventDocument() throws Exception

Description — Creates a document with the element to contain a single database operation. Returns a String, the Element of the current event.

Syntax

```
org.dom4j.Element createEventDocument
    (java.lang.String uri, java.lang.String dbname,
     java.lang.String eventId)
```

Parameters

uri – The URI of *dbeventstream.xsd*

dbname – The name of the database on which the operation is executed.

eventId – The event ID of the current transaction. The uniqueness of eventID is the responsibility of the sending client.

addOperation() throws Exception

Description — Adds the database operation to the current event, either <tran> element or <dbEvent> element. If the event type exists and it already contains an operation, it returns null. Otherwise, it returns a String, the Element of the current operation.

syntax

```
org.dom4j.Element addOperation(java.lang.String operName,
                               java.lang.String schemaName)
```

Parameters

operName – The name of the SQL operation, such as insert, update, delete, exec.

schemaName – The name of the target table.

addValue() throws Exception

Description — Adds field data to the operation.

Syntax

```
void addValue (org.dom4j.Element operElem,java.lang.String fieldName,
               java.lang.String fieldType, java.lang.String fieldValue)
```

Parameters

operElem – Element

fieldName – String

fieldType – String. The JDBC-SQL datatype.

fieldValue – String. All of the value must be passed as String.

addInValue() throws Exception

Description: Adds the data of the input field to the operation for a stored procedure.

Syntax:

```
void addInValue(org.dom4j.Elem operElem,
                java.lang.String fieldName,
                java.lang.String fieldType,
                 java.lang.String fieldValue
```

addOutValue() throws Exception

Description: Adds the data of the output field to the operation for a stored procedure.

Syntax:

```
void addOutValue(org.dom4j.Elem operElem,
                java.lang.String fieldName,
                java.lang.String fieldType,
                 java.lang.String fieldValue
```

addWhere() throws Exception

Description: Adds a where clause to the operation, using AND as the default condition and = as the default operator.

Syntax:

```
void addWhere(org.dom4j.Elem operElem,
                java.lang.String fieldName,
                java.lang.String fieldType,
                 java.lang.String fieldValue)
```

```
void addWhere(org.dom4j.Elem operElem,
                java.lang.String fieldName,
                java.lang.String fieldType,
                java.lang.String fieldValue,
                java.lang.String condition,
                java.lang.String operator)
```

Parameters

condition – One of the SQL condition, either AND or OR.

operator – A SQL operator.

write() throws Exception

Description	Prints the XML text to the specified file.
Syntax	void write(java.lang.String filename)
Parameters	*filename* – The name of the target file.

xmlDocByteArray() throws Exception

Description	Returns a ByteArrayOutputStream containing the XML data.
Syntax	java.io.ByteArrayOutputStream xmlDocByteArray()

xmlDocString() throws Exception

Description	Returns a String containing the XML data.
Syntax	java.lang.String xmlDocString()

cancelOperation() throws Exception

Description	Drops the operation element from the root event.
Syntax	void cancelOperation(org.dom4j.Element elem)
Parameters	*elem* – The operation element to be cancelled.

getErrorEventId() throws Exception

Description	Returns the event ID of the message that caused the error message.
Syntax	static java.lang.String getErrorEventId(java.lang.String xmlText)
Parameters	*xmlText* – The String value of the error document.

getErrorStatusCode() throws Exception

Description	Returns the error code from the error document.
Syntax	static java.lang.String getErrorStatusCode(java.lang.String xmlText

getErrorMessage() throws Exception

Description Returns the error message from the error document.

Syntax static java.lang.String getErrorMessage(java.lang.String xmlText

String getOwner(int elementAt) throws Exception

Description Retrieves the owner name of the replication event.

Example

```
System.out.println("Owner of the table:"+_parser.getOwner(0));
```

Configuring the RaXMLBuilder

You must include the *repraconn.jar* file in your CLASSPATH environment variable setting.

For Unix enter:

- For bsh:

  CLASSPATH =$REPRA_HOME/lib/repraconn.jar:$CLASSPATH
  export CLASSPATH

- For csh:

  setenv CLASSPATH $REPRA_HOME/lib/repraconn.jar:$CLASSPATH

For Windows, enter:

SET CLASSPATH=%REPRA_HOME%\lib\repraconn.jar;/%CLASSPATH%

Using RaXMLBuilder in your code

To use this utility in your own code, follow these steps.

❖ **Using the RaXML utility in your code**

1 Import the essential modules:

```
import org.dom4j.Element;
import com.sybase.connector.repra.util.*;
```

2 Create an instance of RaXMLBuilder:

```
RaXMLBuilder raXML = new RaXMLBuilder();
```

3 Get the event body, which requires three parameters:

- The URI of the *xsd.* file
- The name of the database
- The event ID of the current event, which can be any string value

If you want the transaction (<tran>) type to contain multiple database operations, enter:

```
foo.createTranDocument("file://dbeventstream.xsd",
                "pubs2"","00001001");
```

If you want the event (<dbevent>) type to contain a single database operation, enter:

```
foo.createEventDocument("file://dbeventstream.xsd",
                "pubs2"","00001001");
```

4 Add an operation, which requires two parameters:

- the necessary command
- the name of the schema

For example:

```
Element oper1=foo.addOperation("update","authors"):
```

5 Add data to the operation, which requires four parameters:

- the operation *element*
- *fieldName*
- *fieldType*
- *fieldValue*, the string value of the field

For example:

```
foo.addValue(operl,"au_id","CHAR","0001");
foo.addValue(oper1,"au_num","INT","1");
```

The field types, as SQL datatypes, are:
TEXT, DATETIME, SMALLDATETIME, MONEY, SMALLMONEY,
NUMERIC, DECIMAL, VARCHAR, CHAR, DATE, TIME
BINARY, IMAGE, VARBINARY
TINYINT, SMALLINT, INT
REAL
FLOAT
BIT
UNICHAR, UNIVARCHAR
UNITEXT
BIGINT, USMALLINT, UINT, UBIGINT

6 Add a where clause to the operation, which requires six parameters:

- the operation element
- *fieldName*
- *fieldType*
- *fieldValue*
- SQL condition: either AND or OR
- SQL operator: =, <,>, NOT, and so forth

For example:

```
foo.addWhere(oper1,"au_id","CHAR","0002","AND","=");
```

7 Create an XML file:

```
foo.write(fileName);
```

8 Get the String value of the event from the current XML document:

```
String dataStr=foo.xmlDocString();
```

Your application must send the dataStr object to the RepConnector connection.

Running a sample implementation

A sample implementation, *UseXMLBuilder.java*, is included n RepConnector's installation sample/client directory. When you compile and run the sample, include the *repraconn.jar* file in your CLASSPATH. For example:

- for UNIX and Linux, enter

java-classpath.:$REPRA_HOME/lib/repraconn.jar:$REPR_HOME/lib/dom4j-full.jar UseXMLBuildertext.xml

- For Windows, enter

  java-classpath.:%REPRA_HOME%/lib/repraconn.jar:%REPR_HOME%/lib/dom4j-full.jar UseXMLBuildertext.xml

The result looks like the following:

```
Output of multiple update db events in a single transaction:
         <?xml version="1.0" encoding="UTF-8"?>


  dbStream xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
   xsi:noNamespaceSchemaLocation="file://dbeventstream.xsd"
   environment="pubs2">
   <tran eventId="00001001">
   <update schema="authors">
    <values>
     <cell name="au_id" type="CHAR">0001</cell>
     <cell name="address" type="VARCHAR">1 Sybase</cell>
   <values>
   <oldValues>
    <cell name="au_id" type="CHAR" operator="=">0002</cell>
    <cell name="address" type="VARCHAR" condition="AND"
operator="=">3 Sybase</cell>

   </oldValues>
    </update>
    <delete schema="authors">
     <values>
       <cell name="au_id" type="CHAR">0001</cell>
       <cell name="address" type="VARCHAR">1 Sybase</cell>
     </values
   </oldValues>
     <cell name="au_id" type="CHAR" operator="=">0002</cell>
     <cell name="address" type="VARCHAR" condition="AND"
operator="=">3 Sybase</cell>
     </oldValues>
    </delete>
    </update>
   </tran>
  </dbStream>

Output of multiple dbevents in a transaction:
```

```
<?xml version="1.0" encoding="UTF-8"?>

   dbStream xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
   xsi:noNamespaceSchemaLocation="file://dbeventstream.xsd"
   environment="pubs3">
 <tran eventId="00001002">
   <update schema="stores">
    <values>
     <cell name="au_id" type="CHAR">0002</cell>
     <cell name="address" type="VARCHAR">1 Sybase</cell>
   <values>
   </oldValues>
  </update>
 <exec schema="storesProcedure1">
   <inValues>
     <cell name="au_id" type="CHAR">0002</cell>
   </inValues>
   <outValues>
     <cell name="au_id" type="CHAR">0002</cell>
   </outValues
  </exec>
 </dbEvent>
</dbStream>


Output of a stored procedure:
<?xml version="1.0" encoding="UTF-8"?>
   dbStream xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
   xsi:noNamespaceSchemaLocation="file://dbeventstream.xsd"
   environment="pubs3">
 <dbEventId="00001003">
   <update schema="storesProcedure1">
<inValues>
     <cell name="au_id" type="CHAR">0002</cell>
   </inValues>
   <outValues>
     <cell name="au_id" type="CHAR">0002</cell>
   </outValues
  </exec>
 </dbEvent>
</dbStream>
```

Handling error messages

RepConnector sends any errors it encounters while processing an event to your Configure Status message queue. When you receive an error message from the status queue, you can parse the error message for the eventId, errorCode, and the message itself. For example:

```
System.out.println("Error EventId:"+
   RaXMLBuilder.getErrorEventId(err));
System.out.println("Error StatusCode:"+
   RaXMLBuilder.getErrorStatusCode(err));
System.out.println("Error Message:"+
      RaXMLBuilder.getErrorMessage(err));
```

Compiling and running the sample

When you build and send XML data to the TIBJMS queue, the following files help you compile and run the sample JMS client.

- For UNIX and Linux, enter:

  $REPRA_HOME/sample/client/tibjmsClientSender.java
  $REPRA_HOME/sample/client/tibjmssetup.sh
  $REPRA_HOME/sample/client/runTIBJMSQSender.bat

- For Windows, enter:
  %REPRA_HOME%\sample\client\tibjms
  %REPRA_HOME%\sample\client\tibjmssetup.bat
  %REPRA_HOME%\sample\client\runTIBJMSQSender.bat

Handling ownership information

The XML utility schema allows you to handle ownership information about tables with the same name but different owners. To use a copy of the *dbeventstream.dtd* or *dbeventstream.xsd* to parse XML data generated by RepConnector, after you install this API you must upgrade the file in the directory *%REPRA_HOME%\dtds*. *%REPRA_HOME%* is the installation location of RepConnector.

For example:

```
<your application server installation directory>\repra directory>
```

If you configure a replication definition for ownership of the table, RepConnector includes the owner name of the table or stored procedure in the output XML data.

Example 1 Output XML data without ownership information:

```
<?xml version="1.0" encoding="UTF-8"?>
<dbStream xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance
xsi:noNamespaceSchemaLocation="http://localhost:8080/RepraWebApp/dtds
    /dbeventstream.xsd" environment="RepConn.repdb">
<tran eventId=
    "102:0000000000028cfc000007d8000f000007d8000c0000955700c0789e0
00000000001001">
<delete schema=RepTable3">
 <oldValues>
  <cell name="repId" type="INT">1</cell>
 </oldValues
</delete>
</tran>
</dbStream>
```

Example 2 Output XML data with ownership information:

```
<?xml version="1.0" encoding="UTF-8"?>
<dbStream xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance
xsi:noNamespaceSchemaLocation="http://localhost:8080/RepraWebApp/dtds
    /dbeventstream.xsd" environment="RepConn.repdb" owner="dbo">
<tran eventId=
    "102:0000000000028cfc000007d8000f000007d8000c0000955700c0789e0
00000000001001">
<delete schema=RepTable3">
 <oldValues>
  <cell name="repId" type="INT">1</cell>
 </oldValues
</delete>
</tran>
</dbStream>
```

CHAPTER 11

Customizing the Message Generator for TIBCO AECM

This chapter describes how to customize the message generator for use with TIBCO Active Enterprise for wired message format.

RepConnector supports the TIBCO Active Enterprise wire format feature, which allows you to customize and generate a TIBCO Active Enterprise message. The TIBCO adapter uses the customized message generator to send the message to the TIBCO RV bus.

This chapter describes the basic implementation of the base class, the structure of a customized class to extend the base class, and the APIs defined in the base class to retrieve the metadata and data from the message source. RepConnector loads the TIBCO AECM client, which loads the SDK repository information. The user exit is where you can create your own Java implementation to customize a wire-formatted message.

Configuring properties for RepConnector

To use the TIBCO AECM feature along with the message generator customization class, you must configure the properties for the RepConnector connection, along with the Active Enterprise properties required to connect to the TIBCO SDK repository and to generate the customized wire-format message.

Connection configuration

Table 11-1 lists the parameters for using the TIBCO Active Enterprise feature and the customized message generator:

Table 11-1: Parameters for TIBCO Active Enterprise

Property name	Description
Inbound Type	The Inbound Type must be set to REPLICATION. For example: `Inbound Type=REPLICATION`
Outbound Type	The type of sender the client processor uses for sending out messages. In this case, select TIBCO. For example: `Outbound Type=TIBCO`
TIBCO Message Type	The transport type for TIBCO must be selected as AECM.
AE Configuration file	Active Enterprise configuration properties. Full path name to where the property file is located. This property file contains connection information to the SDK repository, as well as the properties required for customizing the message. For example: `AppConfig=C:/Sybase/EAS/repra/conf/ae.props`
AE Message Generator	The Customized Message Generator class name, and Active Enterprise-specific property. For example: `MsgGenerator=sample.MyMsgGenerator`

Property file containing the *Active Enterprise Connection/Customization (ae.props)*

Table 11-2 lists the properties that are required to connect to the SDK Repository. Additional properties can be customized for your message generator, such as the schema class name. Use the full path of this file as the value of the AE Configuration file property of the connection.

Table 11-2: Properties for connection to SDK

Property name	Description
application_name	The application name of your SDK adapter. For example: `application_name=simpleSDK_adapter`
application_version	The application version of your SDK adapter. For example: `application_version=1.0`
application_info	The application description of your SDK adapter. For example: `application_info=fileadapterinfo`
config_URL	The location of your application inside the SDK repository. For example: `config_URL=/tibco/private/adapter/sdkTest_Adapters/simpleSDK_adapter`
remote_repository	The location (full path) to the SDK repository. For example: `remote_repository=d:/Sybase/eas/repra/conf/sampleSDK.dat`
data_publish_name	The name of the publisher that this application is using. For example: `data_publish_name=myPub`
pub_subject	The subject name that the publisher is going to publish on. For example: `pub_subject=repraTest.subject1`
pre_registered_subscribers	The list of subscribers to preregister is separated by a comma. For example: `pre_registered_subscribers=myCmListener,myCmListener2`
command_args	(Must be entered as a single line.) The command line argument to initialize the SDK application. For example: `command_args=-system:repourl ../repra/conf/sampleSDK.dat-system:configurl/tibco/private/adapter/sdkTest_Adapters/simpleSDK_adapter`

Using the base class APIs

This section describes the base class APIs that you can use to build a custom TIBCO AECM message generator.

Default TIBCO AECM message generator

By default, the message generator base class converts a RepEvent object to a well-formed M-tree object in a simple format. In this case, the default is to put the XML text stream into the data field of the Active Enterprise message and to add it to the M-tree node.

Customized TIBCO AECM message generator

You can generate a customized message generator to create a well-formed M-tree object of a certain wire format. To do this, extend the base class MsgGenerator and implement your own createMInstance method.

The parameter to createMInstance() is a RepEvent object. The following APIs defined in the base class allow you to retrieve specific information for your customization. You must extend this base class to customize your message generator.

There are public methods to help you retrieve the data object information, Active Enterprise customized user properties, and the MclassRegistry.

Following are the required methods for the customized message generator:

```
public class MsgGenerator implements WireFormatGenerator
{
    /** This method returns a well-formed MTree of a certain
    * WireFormat. You will need to extend this method
    * to customized your MsgGenerator.
    */
    public MTree createMInstance(Object repEvent) throws Exception

    /* Other APIs provided for retrieving information from
    * the RepEvent Object provided in the next section.
    */
...
}
```

The extending class must have a public constructor without any input argument.

Example

```
import com.sybase.connector.repra.tibrv.MsgGenerator;
import com.sybase.connector.repra.util.*;
public class MyMsgGenerator extends MsgGenerator
{
...
// This is the default constructor
public MyMsgGenerator()
{
}
...
}
```

To customize the message format, use the extending class implementation of the createMInstance() method.

Example

```
public MTree createMInstance(Object repmsg)
throws Exception
{
    MTree mTree = new MTree("msg");
    ...
    // do something to build the message MTree
    return mTree;
}
```

APIs for a customized, wire-format message generator

This section describes the APIs (embedded in the base class MsgGenerator) that you can use to build a custom TIBCO AECM Message Generator. The following APIs are used to retrieve information from the RepEvent object.

MClassRegistry getClassRegistry()

Description Returns the current MClassRegistry object.

setClassRegistry(MClassRegistry reg)

Description Sets the current MClassRegistry with the input object.

String getOwner(int elementAt) throws Exception

Description — Retrieves the owner name of the replication event, when extending the base message generator *com.sybase.connector.repra.tibrv.MsgGenerator*.

Example

```
System.out.println("Owner of the table : "+getOwner(0));
```

String getProperty(String key)

Description — Returns a string value with the given key from the properties file defined as the AE Configuration file of the connection configuration. It returns a null value if the key is not found.

String getProperty(String key, String defValue)

Description — Returns a String value with the given key from the properties file defined AE Configuration file of the connection configuration. It returns the defValue if the key is not found.

setProperties(Properties props)

Description — Sets the current properties with the input Properties object.

Properties getProperties()

Description — Returns the current properties.

MTree createMInstance(Object repmsg) throws Exception

Description — Builds the M-Tree for the TIBAECM client and returns it. The MPublisher sends out this MTree object to MSubscribers.

APIs retrieving information from the source event

The base class MsgGenerator also provides additional APIs to retrieve the metadata and replication data from the replication events. See “Using the DBEventParserFactory” on page 107 for details about APIs.

Configuring and using the default wire-formatted message generator

Configuring connections

Example

```
Inbound Type = REPLICATION
Outbound Type = TIBCO
TIBCO Message Type = AECM
AE Configuration File = d:\sybase\eas\conf\ae.props
AE Message Generator =
```

SDK application configuration with d:\sybase\eas\repra\conf\ae.props

application_name=simpleSDK_adapter

application_version=1.0

application_info=fileadapterinfo

config_URL=*/tibco/private/adapter/sdkTest_Adapters/simpleSDK_adapter*

remote_repository=*D:/Sybase/eas/repra/conf/sampleSDK.dat*

data_publish_name=myPub

pub_subject=repraTest.subject1

pre_registered_subscribers=myCmListener,myCmListener2

command_args=
-system:repourl ../repra/conf/sampleSDK.dat -system:configurl
/tibco/private/adapter/sdkTest_Adapters/simpleSDK_adapter

Example output

By default, the message format is an XML text-stream representation of the RepEvent. In a Tibrv Listener, the format is:

Note The following message has been formatted for readability.

```
message = {
^pfmt^ = 10
^ver^ = 30
^type^ =1
^encoding^ =1
^tracking^={^id^="5rRX7g5jVWROok8EujzzwB3Uzzw"}
^data^={
    data={RepEvent="<?xml version="1.0" encoding="UTF-8"?>
      <!DOCTYPE dbStream SYSTEM
```

```
            'http://yjeongw2k:8080/repra/dtds/dbeventstream.dtd'>
      <dbStream environment="repraJMS2.repdb">
            <tran
eventId="102:000000000000c8d500007fe7003900007fe70036000093bd00bf1c0c00000
00000010001">
              <insert schema="REP4">
                 <values>
                   <cell name="repId" type="INT">2</cell>
                   <cell name="repName" type="VARCHAR">name 2</cell>
                   <cell name="repCode" type="VARCHAR">code 2</cell>
                 </values>
              </insert>
            </tran>
      </dbStream>"}
}
}
```

Configuring and using the customized wire-formatted message generator

This section has a summarized overview of the different components from the back-end server, Adaptive Server Enterprise, and Replication Server. Then it explains how to configure the RepConnector to deliver a TIBCO AE message to a TIBCO message bus.

Note This section assumes you have knowledge of the back end server and the SDK design.

We have created a table called REP4 in a database called repdb that resides in Adaptive Server Enterprise. This table contains two columns called repName and repCode that will be replicated.

Example

```
Inbound Type=REPLICATION
Outbound Type=TIBCO
TIBCO Message Type=AECM
AEConfiguration=d:\sybase\eas\repra\conf\ae.props
AE Message Generator =MyMsgGenerator
```

SDK application configuration sample

The SDK application configuration file contains information that is required to connect to the SDK repository, and user-defined parameters that can be used by the customized message generator.

Here is an example of the contents of the SDK application configuration file:

```
application_name=simpleSDK_adapter
application_version=1.0
application_info=fileadapterinfo
config_URL=/tibco/private/adapter/sdkTest_Adapters/sim
pleSDK_adapter
remote_repository=F:/EAS 52/repra/conf/sampleSDK.dat
data_publish_name=myPub
pub_subject=repraTest.subject1
pre_registered_subscribers=myCmListener,myCmListener2
command_args=-system:repourl
../repra/conf/sampleSDK.dat -system:configurl /tibco
/private/adapter/sdkTest_Adapters/simpleSDK_adapter
context_schema_class=SybContext
native_schema_class=SybNATIVEMSG
commonmsg_schema_class=SybCommonMSG_UDS
ContextKeys=repName,repCode
```

In this example, we have defined three schema class names and the Context Keys that maps with the definition in the customized SDK repository design.

Code sample

Refer to the *$REPRA_HOME/sample/client/MyMsgGenerator.java* (UNIX) or *%REPRA_HOME%\sample\client\MyMsgGenerator.java* (Windows) file for an example for the customized AE message generator class where *$REPRA_HOME* and *%REPRA_HOME%* are the directories of the RepConnector installation.

❖ **Compiling the customized message generator**

1 Change directory to the location of your message generator.

- On Windows:

```
cd C:\work\custom
```

- On UNIX:

```
cd /work/custom
```

2 Use the Java compiler to define the -classpath parameter with the required libraries to compile the customized class. For example:

- On Windows, enter:

```
md customclasses <enter>
c:\jdk141\bin\javac -classpath .; C:\sybase\
EAServer\repra\lib\repraconn.jar
-d customclasses
com\mycompany\MyMsgGenerator.java
```

- On UNIX, enter:

```
mkdir customclasses<enter>
/usr/jdk141/bin/javac -classpath
.:/opt/sybase/EAServer/repra/lib/repraconn.jar
<enter>
-d customclasses
com/mycompany/MyMsgGenerator.java
```

❖ **Verifying the compilation**

1 If the compilation command finishes without any error messages, go to the *customclasses* directory.

2 Verify that *MyMsgGenerator.class* is under *com\mycompany* (Windows) or *com/mycompany* (for UNIX).

3 If the *MyMsgGenerator.class* is not under *com\mycompany* or the compilation finished with errors, review the design or see your SDK designer/developer.

Building the runtime environment for the customized message generator

To use a *jar* file including the customized message generator, go to the *customclasses* directory and use the jar command to build a *jar* format from the *com* directory. Otherwise, you can use the directory path to set up your environment.

Note Sybase recommends that you use *jar* file format for the customization.

❖ **Building a *jar* file**

1 Go to the *customclasses* directory.

- On Windows:

```
cd C:\work\custom\customclasses
```

- On UNIX:

```
cd /work/custom/customclasses
```

2 Build the *jar* file.

- On Windows:

```
C:\jdk141\bin\jar -cf mycustom.jar com
```

- On UNIX:

```
/usr/jdk141/bin/jar -cf mycustom.jar com
```

3 Add the path to *mycustom.jar* to your environment.

- For EAServer:

  a Copy the *jar* file or the directory structure containing the Java classes created from the previous step to the *java\classes* (Windows) or *java/classes* (UNIX) directory for EAServer.

  b Run EAServer and connect to it from Jaguar Manager.

  c If you are using the *jar* file, go to the *Servers/<your server>* directory and select the Server Properties menu. From the pop-up, select the Java Classes tab and click Add to add the name of the *jar*file, such as *mycustom.jar*.

  d Click OK.

  e Shut down and restart EAServer to activate the environment changes.

- For WebLogic:

  a Shut down the application server if it is running.

  b Modify *%BEA_HOME%\repra\bin\repra_env.bat* (Windows) or *$BEA_HOME/repra/bin/repra_env.sh* (UNIX) to add the full path of *mycustom.jar* or the *customclasses* directory to CLASSPATH at the end of the CLASSPATH definition.

  - On Windows, do *one* of the following:

    - Enter:

```
set
CLASSPATH=C:\work\custom\customclasses;%CLAS
SPATH%
```

    - Or, enter:

```
set
```

```
CLASSPATH=C:\work\custom\customclasses\mycus
tom.jar;%CLASSPATH%
```

- On UNIX, do *one* of the following:
  - Enter:

```
CLASSPATH=/work/custom/customclasses:$CLASSP
ATH
```

  - Or, enter:

```
CLASSPATH=/work/custom/customclasses/mycusto
m.jar;$CLASSPATH
```

c Start the WebLogic Server to activate the environment changes.

Example output for TIBRV Listener and Active Enterprise wire format

TIBRV listener

For a TIBRV listener, the output is as follows.

Note The following message has been formatted for readability.

```
message={
^pfmt^=10
^ver^=30
^type^=1
^encoding^=1
^tracking^={^id^="UX78vPDLVW/dR-lS9GzzwA0kzzw"}
^data^={
    SybCONTEXT={^class^="Context"
            repName="name 2"
            repCode="code 2"}
            SybNATIVEMSG=[588 opaque bytes]
            SybCOMMONMSG=[36 opaque bytes]
}
}
```

Active Enterprise wire format

For an Active Enterprise wire-formatted message generator, the output is as follows.

Note The following message has been formatted for readability.

```
Data Received:
{, M_TREE {
```

```
{^tracking^, M_TREE {
  {^id^, M_STRING, "UX78vPDLVW/dR-lS9GzzwA0kzzw"}
  }}
  {CONTEXT, M_TREE {
      {^class^, M_STRING, "Context"}
        {repName, M_STRING, "name 2"}
        {repCode, M_STRING, "code 2"}
  }}
  SybNATIVEMSGdbeventy?!<?xml version="1.0" encoding="UTF-8"?>
  <!DOCTYPE dbStream SYSTEM
        'http://yjeongw2k:8080/repra/dtds/dbeventstream.dtd'>
  <dbStream environment="repraJMS2.repdb">
      <tran
          eventId="102:000000000000c8d500007fe7002a00007fe70028000093b
  d00bd716e0000000000010001">
         <insert schema="REP4">
             <values>
                <cell name="repId" type="INT">2</cell>
                <cell name="repName" type="VARCHAR">name 2</cell>
                <cell name="repCode" type="VARCHAR">code 2</cell>
             </values>
          </insert>
      </tran>
  </dbStream>
  }
  {SybCOMMONMSG, M_BINARY, $ +Ue^class^?SybCommonMSG_UDS }
  }}
```

APPENDIX A

Configuration Worksheets

This appendix contains worksheets on which you can record all configuration information for your RepConnector environment: Replication Server information, database information, application server information, messaging system information, and RepConnector information.

Fill out the worksheets as you configure each component in the system. Make a copy for each RepConnector connection profile or messaging system you have. See Chapter 2, “Overview of RepConnector Configuration,” for more information.

Table A-1: Replication Server information (Chapter 3)

	Current value	Example	Maps to
DSI info			
1) Used by Replication Server to identify where RepConnector connection will run. This information is added to the Replication Server *interfaces* file. 2) Used in create connection command executed at Replication Server to add the connection...set user name/password. 3) Used in subscription for RepConnector at Replication Server.			
DSI Name	3.a	RepConnector	Replication Server Inbound Information page of New Connection wizard
Protocol	3.b	TCP	
DSI Host Name	3.c	localhost	
DSI Port	3.d	7000	
DSI User Name	3.e	sa	
DSI Password	3.f		
Replication Server System Database information			
1) Used by Replication Server. 2) Used by RepConnector.			
RSSD Name	3.g	RepServer_RSSD	Replication Server System Database Information window of New Connection wizard
RSSD Host Name	3.h	localhost	
RSSD Port Number	3.i	5000	

	Current value	Example	Maps to
Replicated Database information needed by Replication Server			
1) Used in create table for replication at database. 2) Used in create replication definition for RepConnector at Replication Server.			
Primary DB to be replicated	3.j	pubs2	Not needed in New Connection wizard
Host Name of Database Server	3.k	primary_ase	
Port Number Where DB is Listening	3.l	5000	
User Name	3.m	sa	
Password	33.n		

Table A-2: JMS System information

	Current value	Example	Maps to
Destination Type		queue	Outbound or inbound messaging – JMS information
JMS Provider URL		iiop://localhost:9000	
Initial Naming Context Factory		com.sybase.jms.IntialContextFactory	
Connection Factory		javax.jms.QueueConnectionFactory	
Destination Name		sampleQueue	
User Name		jagadmin	
Password			
Topic Subscribers			
Status Destination			

Table A-3: TIBCO RBV Messaging System information

	Current value	Example	Maps to
Message Type		RCVM	Outbound or inbound messaging – TIBCO messaging information
MQ Daemon		7500	
Encoding Type		localhost	
Host Name		tcp\:7500	
Channel		sample.Subject	
Queue Manager/Factory			
Queue Name		SAMPLE.CM1	
User Name		0	
Password			
Status Definition			

Table A-4: IBM WebSphereMQ Messaging System information

	Current value	Example	Maps to
Message Type		MQ	Outbound or inbound messaging – MQ messaging information
MQ Daemon			
Encoding Type		utf	
Host Name		localhost	
Channel		Channel1	
Queue Manager/Factory		MyManager	
Queue Name		SAMPLEQ	
Username		mquser	
Password		mqpass	
Status Definition			

Table A-5: Database system information

	Current value	Example	Maps to
JDBC Connection URL		jdbc:sybase:Tds:localhost:5000	See worksheet for Chapter 3
Driver Class		com.sybase.jdbc2.jdbc.SybDriver	
User Name		sa	
Password			

Table A-6: Customization information (Chapter 6)

	Current value	Example	Maps to
Message Formatter Plug-in Class		sample.MyMessageFormatter	Customization
Message Formatter Properties		sample.MyMessageFormatter.prop	
Sender Processor Plug-in Class		sample.FileClient	
Sender Processor Properties		sample.FileClient.prop	

Table A-7: RepConnector profile properties

	Current value	Example	Maps to
Profile Name		EAS:onXP	See worksheet for Chapter 3
Host Name		localhost	
Port Number		8080	
User Name		repraadmin	
Password			

Table A-8: RepConnector connection: General properties

	Current value	Example	Maps to
Inbound Type		Replication	Used by RepConnector
Outbound Type		JMS	
DBEventStream XSD URL		http://localhost:8080/RepraWebApp/dtds/dbeventstream.xsd	
Log Level		INFO	
Auto Start Connection		FALSE	
Customized Plug-in Class		FALSE	

Table A-9: Inbound RepConnector connection: DSI properties

	Current value	Example	Maps to
DSI Name		RepConnector	See worksheet for Chapter 3
DSI Port		7000	
User Name		sa	
Password			

Table A-10: Inbound RepConnector connection: RSSD properties

	Current value	Example	Maps to
RSSD URL		jdbc:sybase:Tds:userXP2:5000/rs/125XP_RSSD	See worksheet for Chapter 3
User Name		sa	
Password			
Grouping		FALSE	

APPENDIX B

Troubleshooting

This appendix discusses troubleshooting for scenarios you may encounter in the RepConnector environment.

When the profile login or ratool fails

This section describes the steps you should take if you cannot log in to the RepConnector connection profile.

Verifying application server environment

Verify that the application server is up and running, and has successfully called *repra_env.bat* (Windows) or *repra_env.sh* (UNIX).

For EAServer

- On Windows:
  a Open the *user_set.bat*:

```
wordpad %JAGUAR%\bin\user_setenv.bat
```

  b In *user_sentenv.bat*, verify that *repra_env.bat* is called by looking for the line:

```
if exist "%JAGUAR%\repra\bin\repra_env.bat" \
CALL "%JAGUAR%\repra\bin\repra_env.bat"
```

  c Add an echo statement to *repra_env.bat* to ensure that the RepConnector values are picked up when the application server is started. For example:

```
echo SERVER_TYPE : %SERVER_TYPE%
```

- On UNIX:

  a Open the *user_setenv.sh* file with an editor:

  ```
  vi $JAGUAR/bin/user_setenv.sh
  ```

  b In *user_sentenv.sh*, verify that the *repra_env.sh* is called by looking for these lines:

  ```
  if [ -f $JAGUAR/repra/bin/repra_env.sh ]
       then
       . $JAGUAR/repra/bin/repra_env.sh
  fi
  ```

  c Add an echo statement to *repra_env.sh* to ensure that the RepConnector values are picked up when the application server is started. For example:

  ```
  echo SERVER_TYPE : %SERVER_TYPE%
  ```

For WebLogic Server

- On Windows:

  a Open the <*domain_name*>*startWebLogic.cmd* file with an editor:

```
wordpad
%BEA_HOME%\user_projects\domains\<domain_name>\startWebLogic.cmd
```

  b Verify that *repra_env.bat* is called. For example, the following lines should appear above the server start line:

  ```
  if exist "c:\bea\repra\bin\repra_env.bat" \
  CALL " c:\bea\repra\bin\repra_env.bat"
  ```

  c Add an echo statement to *repra_env.bat* to verify that the RepConnector values are picked up when the application server is started. For example:

  ```
  echo SERVER_TYPE : %SERVER_TYPE%
  ```

- On UNIX:

  a Open the <*domain_name*>*/startWebLogic.sh* file with an editor:

```
vi $BEA_HOME/user_projects/domains/<domain_name>/startWebLogic.sh
```

  b Verify that *repra_env.sh* is called. For example, the following lines should appear above the server start line:

  ```
  if [ -f /opt/bea/repra/bin/repra_env.sh ]
       then
       . /opt/bea/repra/bin/repra_env.sh
  fi
  ```

c Add an echo statement to *repra_env.sh* to ensure that the RepConnector values are read when the application server is started. For example:

```
echo "SERVER_TYPE : $SERVER_TYPE"
```

Verifying that the application server is called

Verify that *repra_env.bat* (Windows) or *repra_env.sh* (UNIX) has the correct application server identified:

For EAServer

- On Windows, at the command line:
  a Open the following file with an editor:

    ```
    %JAGUAR%\repra\bin\repra_env.bat
    ```

  b Verify that SERVER_TYPE is defined. If it is not, define the variable by entering:

    ```
    SET SERVER_TYPE=EAS
    ```

- On UNIX, at the command line:
  a Open the following file with an editor:

    ```
    $JAGUAR/repra/bin/repra_env.sh
    ```

  b Verify that SERVER_TYPE is defined. If it is not, define the variable by entering:

    ```
    SERVER_TYPE=EAS
    ```

For WebLogic Server

- On Windows, at the command line:
  a Open the following file with an editor:

    ```
    %BEA_HOME%\repra\bin\repra_env.bat
    ```

  b Verify that SERVER_TYPE is defined. If it is not, define the variable by entering:

    ```
    SET SERVER_TYPE=WEBLOGIC
    ```

- On UNIX, at the command line:
  a Open the following file with an editor:

    ```
    $BEA_HOME/repra/bin/repra_env.sh
    ```

  b Verify that SERVER_TYPE is defined. If it is not, define the variable by entering:

```
SERVER_TYPE=WEBLOGIC
```

Configuring RepConnector for debugging

❖ **Setting the logging level to DEBUG for RepConnector runtime**

1 Navigate to the RepConnector runtime installation location's *bin* directory.

- On UNIX, enter:

```
cd /opt/sybase/EAServer/repra/bin
```

- On Windows, enter:

```
cd c:\sybase\EAServer\repra\bin
```

2 In the *repra.properties* file, change the runtime log level from INFO to DEBUG:

```
RuntimeLogLevel=DEBUG
```

3 Shut down and restart the application server for the values to take effect.

❖ **Setting the logging level to *debug* for each RepConnector connection**

1 Log in to RepConnector runtime component using RepConnector Manager.

2 Modify the connection properties to change the logging level (LogLevel) for the connection to debug. Save the new connection properties.

3 Start or refresh the connection.

Note Setting the log level to debug creates many debugging messages in the *repra.log* file. You can use this information to troubleshoot failures, but be aware that it causes performance degradation.

Verifying machine name and port number

View the following logs to troubleshoot or verify the machine name and port number for your application servers:

For EAServer

- On Windows, *%JAGUAR%\bin\Jaguarhttpservlet.log*, where *%JAGUAR%* points to the EAServer installation location. For example; `c:\sybase\EAServer`.

- On UNIX, *$JAGUAR/bin/Jaguarhttpservlet.log*, where *$JAGUAR* points to the EAServer installation location. For example; `/opt/sybase/EAServer`.

For WebLogic Server

- On Windows, *%BEA_HOME%\user_projects\domains\<DomainName>\<DomainNameServer>\<DomainNameServer>.log*, where *%BEA_HOME%* points to the WebLogic Server installation location. For example; `c:\bea`.
- On UNIX, *$BEA_HOME/user_projects/domains/<DomainName>/<DomainNameServer>/<DomainNameServer>.log*, where *$BEA_HOME* points to the WebLogic Server installation location. For example; `/opt/bea`.

Verifying user name and password

The default user name for RepConnector Manager is "repraadmin" with a null password. If you change the default, you must run *setlogin.bat* (Windows) or *setlogin.sh* (UNIX) before you attempt to log in to RepConnector Manager. See Chapter 5, "Getting Started with RepConnector Manager," for more information.

When a connection fails

When a connection fails, look at the logs to troubleshoot connection and validation failure. To ensure that the log captures events, turn on debug mode. See "Configuring RepConnector for debugging" on page 150 for instructions.

Example from repra.log

```
[RepToEASJMS]: 09:35:32 [INFO] [REP.RepAdapterImpl]: Starting Connection
RepToEASJMS.
[RepToEASJMS]: 09:35:33 [INFO] [JMS.JMSQueueClient]: Starting the JMS Queue
Client.
[RepToEASJMS]: 09:35:33 [INFO] [JMS.JMSQueueClient]: JMS Client is
configured successfully to be able to send event(s) to queue: INQ for
provider iiop://cmercer-xp:9000.
[RepToEASJMS]: 09:35:33 [DEBUG] [REP.RepAdapterImpl]: Successfully
established client connection.
[RepToEASJMS]: 09:35:33 [DEBUG] [REP.RepMetaConnection]: Executing query:
>>>> select dbname from rs_databases where dsname = 'RC25XPEAS'
```

```
[RepToEASJMS]: 09:35:33 [DEBUG] [REP.RepMetaConnection]: Got the new
instance of SybDriver
[RepToEASJMS]: 09:35:33 [DEBUG] [REP.RepMetaConnection]: Got a RSSD
connection to URL: jdbc:sybase:Tds:cmercer-
pc2:5000/rs125pc_RSSD?SQLINITSTR=set quoted_identifier off Login: sa
[RepToEASJMS]: 09:35:33 [DEBUG] [REP.RepMetaConnection]: Executing query:
>>>> select distinct rs_objects.objname, rs_subscriptions.subid,
rs_objects.objid, rs_objects.phys_tablename, rs_objects.deliver_as_name,
rs_objects.dbid from rs_repdbs, rs_subscriptions, rs_objects where ((dsname
= 'RC25XPEAS' and dbname = 'EAS422') and rs_repdbs.dbid =
rs_subscriptions.dbid and rs_subscriptions.type < 8 and
rs_subscriptions.objid = rs_objects.objid)  union select distinct
rs_objects.objname, rs_subscriptions.subid, rs_objects.objid,
rs_objects.phys_tablename, rs_objects.deliver_as_name, rs_objects.dbid from
rs_repdbs, rs_articles, rs_subscriptions, rs_objects where  ((dsname =
'RC25XPEAS' and dbname = 'EAS422') and rs_repdbs.dbid =
rs_subscriptions.dbid and rs_subscriptions.type > 8 and
rs_articles.articleid = rs_subscriptions.objid and rs_objects.objid =
rs_articles.objid)
[RepToEASJMS]: 09:35:33 [DEBUG] [REP.RepMetaConnection]: Executing query:
>>>> select * from rs_columns where objid = 0x010000650000007A order by
colnum
[RepToEASJMS]: 09:35:33 [DEBUG] [REP.DataServer]: A new RepListener was
added to the RepEventStream.
[RepToEASJMS]: 09:35:33 [DEBUG] [REP.RepEventStream]: Added a Listener
without RequiredGroup option
[RepToEASJMS]: 09:35:33 [DEBUG] [REP.RepEventStream]: RepAdapterListener
requires parsing and meta-data formatting.
[RepToEASJMS]: 09:35:33 [DEBUG] [REP.DataServer]: A new listener is added
to the stream object.
[RepToEASJMS]: 09:35:34 [DEBUG] [REP.ReplicateDB]: Created the dsi (.ser)
file : C:\Program Files\Sybase\EAServer\repra\sers\DSI_RC25XPEAS_EAS422.ser
[RepToEASJMS]: 09:35:34 [DEBUG] [REP.RepMetaConnection]: Executing query:
>>>> select dsname, dbname from rs_databases where dsname = 'RC25XPEAS' and
dbname = 'EAS422'
[RepToEASJMS]: 09:35:34 [DEBUG] [REP.DataServer]: Put the DB connection to
the Hashtable of ReplicationDBs.
[RepToEASJMS]: 09:35:34 [DEBUG] [REP.RepAdapterImpl]: DataServer is now
ready.
[RepToEASJMS]: 09:35:34 [DEBUG] [REP.DSIReceiver]: jTDS server for DSI
RC25XPEAS is ready to listen on port 7051.
```

Verifying connection information

The URL of the schema file, *dbeventstream.xsd*, should be set to the application server's HTTP host name and port number of the application server with the location of RepraWebApp. For example:

```
http://localhost:8080/RepraWebApp/dtds/dbeventstream.xsd
```

This URL is placed in the XML message when it is generated, and states where the *xsd* can be found.

Verifying Replication Server inbound information

- Verify DSI Name – must be the exact name added to Replication Server *sql.ini* file (Windows) or to the *interfaces* file (UNIX) and the connection name used when creating the connection in Replication Server.
- Verify Port – can be any available port; however, it should be the port identified in the Replication Server *sql.ini* file (Windows) or in the *interfaces* file (UNIX).
- Verify User Name/Password – the same name identified when you created the connection in Replication Server.

See Chapter 3, "Configuring Replication Server for RepConnector" and Table A-1 on page 141.

Verifying Replication Server system database information

- Verify RSSD URL – should be in this format: `jdbc:Sybase:Tds:<ServerName>:port` for the location of the Replication Server.
- Verify User Name/Password – the user name and password used in Replication Server for connectivity.

  Use the ping feature in RepConnector Manager GUI connection to validate user name and password.

Verifying inbound/outbound messaging systems

This section identifies three common verification error messages and provides a solution for each.

Error

Repra.log example entry: java.lang.ClassNotFoundException.

Solution

Check the RepConnector environment file, *repra_env.bat* (Windows) or *repra_env.sh* (UNIX). The RepConnector environment files are located in the RepConnector runtime installation's *bin* directory. On UNIX, for example: `/opt/sybase/EAServer/repra/bin`.

Note On UNIX, directory names are case sensitive.

Error

Failed to get the JMS queue: test.sample for provider.

Solution

Verify that the JMS Server is running and that the queue or topic has been correctly identified.

Error

ping fails for IBMMQ when all information is correct.

Solution

Stop any queue managers that are running and restart the queue manager you are identifying.

Use the ping feature in the RepConnector Manager to validate the status of inbound/outbound messaging systems.

Verifying database connection information

Verify that the JDBC Connection URL is in this format: `jdbc:Sybase:Tds:<ServerName>:port`.

Verify the user name and password.

Use the ping feature in the RepConnector Manager to validate the status of the database connection information.

Troubleshooting the replication system

This section provides troubleshooting techniques for Adaptive Server Enterprise and Replication Server.

Sybase Adaptive Server Enterprise (primary data base)

Use *error.log* to see a detailed problem description.

On Windows, the error log file is *%SYBASE_ASE%\install\error.log*, where *%SYBASE_ASE* and *$SYBASE_ASE* point to the Adaptive Server Enterprise directory in the installation location.

On UNIX, the error log file is *$SYBASE_ASE/install/error.log*, where *%SYBASE_ASE* and *$SYBASE_ASE* point to the Adaptive Server Enterprise directory in the installation location.

To investigate the configuration of the primary database, log in to the primary database with isql, using this syntax:

```
isql -S <Server_name> -U <username> -P <password>
```

For example, enter:

```
isql -S primary_db -U sa _P sa_pass
```

Table B-1: Adaptive Server commands

Command	Action
sp_start_rep_agent <dbname>	Start RepAgent
sp_stop_rep_agent <dbname>	Stop RepAgent
sp_setreplicate <tablename>, “true”	Set table for replication
sp_setreplicate	Gives status of replicated tables
sp_setrepproc <proc_name>,function	Set proc for replication

Replication Server

Use the Replication Server log file to see a detailed problem description.

On Windows, the log file is *%SYBASE%\REP-12_6\install\ <RepServerName>.log*, where *%SYBASE_REP%* points to the Replication Server installation.

On UNIX, the log file is *$SYBASE/REP-12_6/install/<RepServerName>.log*, where *$SYBASE_REP* points to the Replication Server installation.

To see information about the connections configured with Replication Server, log in to Replication Server with isql, using this syntax:

```
isql -S <RepServerName> -U <username> -P <password>
```

For example, enter:

```
isql -S SAMPLE_RS -U sa _P sa_pass
```

Table B-2: Replication Server commands

Command	Action
admin who	Show status of connections
admin who_is_down	Show status of connections that are down
admin who_is_up	Show status of connections that are up
resume connection to <connection_name>	Resume connection
suspend connection to <connection_name>	Suspend connection
create connection to <connectionname>	Create connection
create replication definition <replication_definition_name>	Create replication definition for table
create function replication definition <replication_definition_name>	Create replication definition for procedure
create subscription <subscription_name for <replication_definition_name> with replicate at <Repconnection_Name>.<database_name>without materialization	Create subscription
trace “on”, DSI, DSI_BUF_DUMP	Set trace for DSI
trace “on”, SQT,SQT_TRACE_COMMANDS	Set trace for SQT

Using *admin who* for your connection

admin who shows the current status of connections. The example below shows that connection RC25XPEAS.EAS422 is running and waiting for the next event.

Name	State	Information
DSI EXEC	Awaiting Command	118(1)RC25XPEAS.EAS422
DSI	Awaiting Command	118RC25XPEAS.EAS422
SQM	Awaiting Message	118:0RC25XPEAS.EAS422

Changing connection grouping mode

If you change the connection from individual to group messages on the Inbound Message Grouping Preference tab, you must suspend and resume the connection in Replication Server before the change takes effect in RepConnector.

Restarting components and connections

Sometimes, for troubleshooting purposes, you should restart all of the Replication Server and RepConnector components: Replication Server, EAServer, and the RepConnector connection.

Then suspend and resume all connections. Such a restart often clears what may be preventing a successful connection.

Purging Replication Server queues

When messages get delayed in Replication Server, you can purge the queue. See the *Replication Server Reference Manual* commands for purging Replication Server queues.

Freeing transaction log space

When the database transaction log is full, RepConnector and Replication Server may not work properly until space is freed up. See the *Adaptive Server Enterprise Reference Manual: Commands* for information about freeing transaction log space.

Verifying sent messages

This section describes how to verify that Replication Server has sent a message to RepConnector.

1 Enter:

```
admin who,sqm
```

2 Check the output from the admin who, sqm command as follows:

- First Seg.Block
- The physical address of the beginning of the queue
- Last Seg.Block
- The physical address of the end of the queue
- Next Read

- How far the Replication Server has read between the First Seg.Block and Last Seg.Block.

  The Next Read is usually one more than the LAST Seg.Block if the Replication Server has read all of the information in that queue. The difference between the First Seg.Block and the Last Seg.Block is the amount of information in the queue in MB. Purging the queue sets the First Seg.Block and the Last Seg.Block to zero.

3 Determine the database ID and the queue type:

```
1> admin who,sqm
2> go
```

4 Put Replication Server into single-user mode using:

```
1> sysadmin hibernate_on
2> go
```

5 If hibernate does not work, shut down Replication Server and restart it using the -M command (single-user).

6 Purge the queue:

```
1> sysadmin sqm_purge_queue,106,0
2> go
1> admin who,sqm
2> go
```

In this example the database ID is 106, and the outbound queue is always 0.

7 Turn hibernate off:

```
1> sysadmin hibernate_off
2> go
```

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