SYBASE®

Sybase CEP Option R4

Contents

Contents

Introduction

Sybase® CEP supplies WebSphere MQ adapters that enable you to read and write to and from the WebSphere MQ queue and Sybase CEP stream.

The Sybase CEP WebSphere MQ adapters permit a WebSphere MQ server to read and write to the Sybase CEP engine. You can customize these in-process adapters to suit your needs. Both the read to and write to adapters are available in guaranteed delivery mode. Adapters in guaranteed delivery mode have a "GD" designation.

Because WebSphere MQ messages are unstructured, you must properly define a schema and prepare the MQ messages. The full range of Sybase CEP data types is permitted in the schema definition. You can send binary data, XML data, strings, and so on, into and out of the Sybase CEP engine. Sybase CEP provides example projects (also known as query modules) that demonstrate how to use these adapters. These can be found under the Sybase CEP Repository in the directory \examples\EnterpriseAdapters.

Configuring Requirements

MQ Client Adapters must have MQ V7.0 Client software installed; failure to match the adapter to installed software results in errors.

The WebSphere MQ adapters are designed to work with WebSphere MQ client software on the same host computer as Sybase CEP Server. The WebSphere MQ server, however, may reside on the same computer or on another computer.

All WebSphere MQ adapters require a CEP server package license. Before installing the adapters, ensure that you have licensed the Sybase CEP server. For information, see Licensing Sybase CEP in the *Installation Guide*.

Configuring Queues

The following sample code illustrates a standard MQ server configuration that provides:

• A default queue manager called queue.manager.1.

• A local server queue called QUEUE1.

• A channel called CHANNEL1.

• A listener called LISTENER1 on TCP/IP port 2001

```
Create a default queue manager called queue.manager.1 and
start it:
crtmqm -q queue.manager.1
strmqm
dspmq # display list of active queues
Now create a local queue, a channel and a listener:
runmqsc
define qlocal(QUEUE1)
5
define channel (channel1) chltype (svrconn) trptype (tcp)
\
mcauser ('mqm')
define listener (listener1) trptype (tcp) control (qmgr) \
port (2001)
start listener (listener1)
end
```

Note: In the configuration example above, backslashes (\) are used in lines due to space constraint. When configuring queues in the system, keep this information on one line.

Running Examples

To run the WebSphere MQ examples:

• A WebSphere client must be installed on the workstation running the example.

• The WebSphere client must be capable of communicating WebSphere MQ messages to a WebSphere MQ server. The WebSphere MQ server may be on the local machine or on another machine.

• The WebSphere client must have the appropriate WebSphere MQ authorization and authentication in place before WebSphere MQ will process messages.

Refer to the comments in the query module files for specific instructions on running the examples.

Output Adapter

The default output WebSphere MQ adapter publishes a string in CSV format. The WebSphere MQ adapter does not produce a header line because the schema of the stream publishing to the adapter determines the order and data types of the fields. Columns are published in the default display format for the appropriate data type.

Ensure the WebSphere MQ output adapter is pointing to the $SYCEP location, `/remote/supreme2/SYCEP/SybaseC8/server/SybaseC8Repository/examples/FeatureExamples/Data/stock-trades.csv`.

Configure the following properties as necessary to customize the output string of your WebSphere MQ Adapter:

Property Name (screen)	Property Name (Attach Adapter)	Type	Description	Required?
Queue Name	QueueName	String	The name of the queue on the server to send messages. This queue must be managed by the indicated Queue Manager Name.	Required
Queue Manager Name	QueueManagerName	String	The name of the queue manager on the server to send messages.	Required
MQ System Name	SystemName	String	The name of the MQ server system. This may be a symbolic name or an IP address.	Required
Port	Port	String	The port number on the MQ server system to which the MQ server queue listener is attached.	Required
MQ Channel	Channel	String	The name of the MQ server channel associated with the queue.	Required
CSV Field Separator	CsvSeparatorChar	String	The CSV field separator. Must be a single character. Defaults to a comma.	No
CSV Escape Character	CsvEscapeChar	String	The character to escape the meaning of special characters, including the field separator, escape character, and quote character. Defaults to a back-slash.	No

CSV Quote Character	CsvQuoteChar	String	The character to delineate the beginning and end of a field, which can include anything. Any embedded quote characters are escaped. Defaults to a double quote.	No
Timestamp Column Format	TimestampColumnFormat	String	The format for timestamp values. See "Timestamp Format Codes" in the Sybase CEP CCL Reference for more information. If omitted, defaults to "YYYY/MM/DD HH24:MI:SS.FF". If blank, timestamps are published as the number of microseconds since No 7 the epoch (midnight, January 1, 1970).	No

Note: This adapter uses TCP/IP for transfers. If you want to use other protocols, you must determine the appropriate configuration and interface parameters for those protocols.

Input Adapter

The default input WebSphere MQ adapter reads a string in CSV format. The order of the data in the message must match the schema of the input stream to which the adapter is attached.

Properties

The following table describes the adapter properties:

Property Name (screen)	Property Name (Attach Adapter)	Type	Description	Required?
Queue Name	QueueName	String	The name of the queue on the server to send messages. This queue must be managed by the indicated Queue Manager Name.	Required
Queue Manager Name	QueueManagerName	String	The name of the queue manager on the server to send messages.	Required
MQ System Name	SystemName	String	The name of the MQ server system. This may be a symbolic name or an IP address.	Required
Port	Port	String	The port number on the MQ server system to which the MQ server queue listener is attached.	Required
MQ Channel	Channel	String	The name of the MQ server channel associated with the queue.	Required
Maximum Input Buffer Size	MaxBufferSize	Integer	The maximum size of the buffer, in bytes.	No
CSV Delimiters	CsvSeparators	String	The CSV field separators. Can be multiple characters. Defaults to a comma.	No
CSV Escape Characters	CsvEscapeChars	String	The character that escapes the meaning of special characters, including the delimiters, escape characters, and quote characters. Can be multiple characters. Defaults to a backslash.	No

CSV Quote Characters	CsvQuote-Chars	String	The characters to delineate the beginning and end of a field. Defaults to single and double quotes.	No
Perform CSV Trimming	CsvTrimming	Boolean	If true, the default, strips spaces from the beginning and end of each field. If true, a quoted field containing nothing but spaces is interpreted as NULL.	
Timestamp Column Format	Timestamp-ColumnFormat	String	The format for timestamp values. See "Timestamp Format Codes" in the Sybase CEP CCL Reference for more information. If omitted, defaults to "YYYY/MM/DD HH24:MI:SS.FF". If blank, timestamps are expected as the number of microseconds since the epoch (midnight, January 1, 1970).	No

Note: Each input stream has a property that can specify whether to use the current server timestamp value instead of the row timestamp set by the adapter. If this stream property is set to true, it overrides any row timestamp set by the adapter.

Websphere MQ Server Queue Manager

The WebSphere MQ server has a queue manager named "queue.manager.1' with a queue named 'QUEUE1'. The ADL file creating this display is the normal ADL XML formatted file.

You can adapt defaults, labels, and so on to suit your needs. In particular, you can add missing or additional properties to the ADL file as part of the customization process. Use the standard C8GetAdapterGetParam() routines to access property values from the Sybase CEP MQ Adapter's Properties.

For more information about ADL, see "Adapter Definition Language" in the *Sybase CEP Integration Guide*.

Websphere MQ Server Queue Manager

Guaranteed Delivery

A guaranteed delivery (GD) system ensures that messages are processed exactly once, completely, in order, and with resiliency to failure. Sybase CEP provides GD functionality for Websphere MQ input and output adapters.

The GD mode Websphere MQ input adapter performs the following actions:

- Initializes a Websphere transaction queue.
- Establishes a connection to Sybase CEP Engine with a unique session ID.
- Receives messages from the transaction queue; sends messages in a batch, each with a unique batch ID, and waits for acknowledgment of that batch from the subscriber.
- Uses transactions to commit or rollback queue operations:
    - If Sybase CEP Engine successfully receives the batch, commits the queue operations.
    - If Sybase CEP Engine does not receive the batch, performs rollback on the queue operations.
- In cases of connection failure, and Sybase CEP Engine crash and restart:
    - Detects a return after the failure and re-establishes the connection to Sybase CEP Engine with the same session ID.
    - If there are duplicate messages, skips and commits the messages.

The GD mode Websphere MQ output adapter performs the following actions:

- Initializes a Websphere transaction queue.
- Establishes a connection to Sybase CEP Engine with a unique session ID.
- Subscribes to messages with unique batch IDs in CEP Engine, and sends messages to transaction queue.
- Uses transactions to commit or rollback queue operations:
    - If queue successfully receives the batch, commits the queue operations.
    - If queue does not receive the batch, performs rollback on the queue operations.
- Uses CEP persistence to store the messages with a unique batch ID.
- In cases of connection failure, and Sybase CEP Engine crash and restart:
    - Detects a return after the failure and re-establishes the connection to Sybase CEP Engine with the same session ID.
    - Restores messages from CEP persistence, and sends the messages to the transaction queue.

Persistence in Sybase CEP does not support all crash scenarios. In some instances of Sybase CEP Engine crash and restart, duplicate messages are sent to an outsource application. The outsource application should filter the duplicate messages.

Guaranteed processing asks to confirm each input and output message in Sybase CEP Engine. As a result, Guaranteed processing-enabled adapters have lower performance speed than adapters without Guaranteed delivery enabled.

WSMQ Input Adapter Example

Run this example to read messages from a WebSphere messaging queue and send the messages to a CSV file.

Locate the file in `\examples\EnterpriseAdapters\WebSphereMQInputAdapter`.

Before you run the example file, configure the following WSMQ components:

- Manager
- Queue
- Channel
- Listener

Optionally, modify the following WSMQ input adapter properties in CCL to match the environment:

- "QUEUENAME"
- "SYSTEMNAME"
- "PORT"
- "CHANNEL"

WSMQ Input Adapter Example

WSMQ Output Adapter Example

Run this example to read messages from a CSV file and send the messages to a WebSphere messaging queue.

Locate the example file in `\examples\EnterpriseAdapters \WebSphereMQOutputAdapter`.

Before you run the example file, configure the following WSMQ components:

- Manager
- Queue
- Channel
- Listener

Optionally, modify the following WSMQ output adapter properties in CCL to match the environment:

- "QUEUENAME"
- "SYSTEMNAME"
- "PORT"
- "CHANNEL"

WSMQ Output Adapter Example

WSMQ GD Adapters Recovery Test

Run this example to test guaranteed delivery of WebSphere MQ messages in the event of system crash.

Locate the example in\examples\EnterpriseAdapters \WebSphereMQGDAdapter.

Before you run the example file, configure the following WSMQ components:

- Manager
- Queue
- Channel
- Listener

Optionally, modify the following WSMQ input/output adapter properties in CCL to match the environment:

- "QUEUENAME"
- "SYSTEMNAME"
- "PORT"
- "CHANNEL"

To complete the recovery test:

1. Prepare messages in one queue as the input data. You can use the "WSMQ Output Adapter example" to prepare the input data.
2. Crash and restart the CEP Server several times; each time you restart the Server, verify that no messages are lost. You can use the "WSMQ Input Adapter example" to complete verification.

WSMQ GD Adapters Recovery Test