

TIBCO ActiveMatrix BusinessWorks™ Plug-in for Amazon SQS and SNS User's Guide

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TIBCO Documentation and Support Services

How to Access TIBCO Documentation

Documentation for TIBCO products is available on the TIBCO Product Documentation website, mainly in HTML and PDF formats.

The TIBCO Product Documentation website is updated frequently and is more current than any other documentation included with the product. To access the latest documentation, visit <https://docs.tibco.com>.

Product-Specific Documentation

The following documents for this product can be found on the TIBCO Documentation site:

- TIBCO ActiveMatrix BusinessWorks™ Plug-in for Amazon SQS and SNS Installation.
- TIBCO ActiveMatrix BusinessWorks™ Plug-in for Amazon SQS and SNS User's Guide.
- TIBCO ActiveMatrix BusinessWorks™ Plug-in for Amazon SQS and SNS Release Notes.

How to Contact TIBCO Support

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- For an overview of TIBCO Support, visit <http://www.tibco.com/services/support>.
- For accessing the Support Knowledge Base and getting personalized content about products you are interested in, visit the TIBCO Support portal at <https://support.tibco.com>.
- For creating a Support case, you must have a valid maintenance or support contract with TIBCO. You also need a user name and password to log in to <https://support.tibco.com>. If you do not have a user name, you can request one by clicking Register on the website.

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Plug-in Overview

Amazon Simple Queueing Service (SQS) is a distributed messaging queue service from Amazon. Messages are composed of text and optional attributes, all of which are supported by the plug-in. Once messages are sent, they can be received either in batches or one at a time.

Amazon Simple Notification Service (SNS) is a flexible, fully managed pub/sub messaging service for co-ordinating the delivery of messages to the subscribing endpoints and clients.

TIBCO ActiveMatrix BusinessWorks™ Plug-in for Amazon SQS and SNS integrates into TIBCO ActiveMatrix BusinessWorks™.

It provides following features:

- **Amazon Connection Shared Resource:**

You can use the Amazon connection shared resource to connect to the Amazon SQS or SNS instance. The shared resource is used by the Amazon SQS and SNS activities.

- **SQS and SNS palette:**

By using SQS activities, you can create and delete a queue, send messages to a queue, receive messages from a queue.

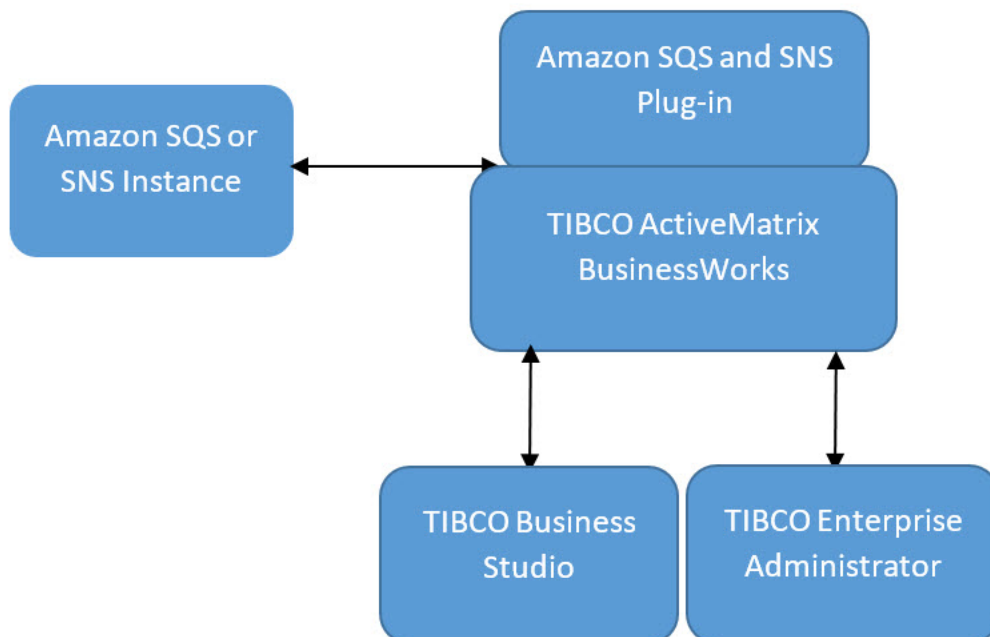
By using SNS activities, you can create and destroy topics, publish messages on the topics.

- **Auto and manual delete of messages once they are received.**

Plug-in Architecture

The following figure describes the relationship between Amazon SQS or SNS Instance, ActiveMatrix BusinessWorks™ Plug-in for Amazon SQS and SNS and TIBCO Business Studio.

Plug-in Architecture



The following list describes each item in the Plug-in Architecture figure and the relationship between them:

- Amazon SQS or SNS instance with which ActiveMatrix BusinessWorks Plug-in for Amazon SQS and SNS communicates.
- ActiveMatrix BusinessWorks Plug-in for Amazon SQS and SNS plugs into ActiveMatrix BusinessWorks and connects to Amazon SQS or SNS instance.
- ActiveMatrix BusinessWorks is easy-to-use integration product suite for enterprise applications.
- TIBCO Business Studio is the graphical user interface (GUI) used by ActiveMatrix BusinessWorks and the plug-in, to design business processes, and the process engine is used to execute them.
- TIBCO® Enterprise Administrator provides a centralized administrative interface to manage and monitor the plug-in applications deployed in an enterprise application.

Getting Started

A typical workflow for using the plug-in to achieve different goals includes creating a process, testing it in the debugger, and deploying the application.

TIBCO ActiveMatrix BusinessWorks™ uses the Eclipse graphical user interface (GUI) provided by TIBCO Business Studio™ to define business processes and generate Enterprise Archives (EAR files).

The EAR file is then deployed and run in the ActiveMatrix BusinessWorks™ runtime.

The ActiveMatrix BusinessWorks application is managed by using TIBCO® Enterprise Administrator (TEA).

The typical workflow for using the plug-in is:

1. [Creating a Project](#)
2. [Creating Amazon SQS and SNS Connection](#)
3. [Configuring a Process](#)
4. [Debugging and Running a Process](#)
5. [Deploying Applications](#)

Creating a Project

Projects are BusinessWorks application modules that are created in TIBCO Business Studio™. A project contains various resources.

Procedure

1. Start TIBCO Business Studio.
2. Click **File > New > BusinessWorks Resources**.
3. Click **BusinessWorks Application Module** in the BusinessWorks Resource dialog box. Click **Next**.



There are several ways to open the New BusinessWorks Application Module dialog box and create a new project in TIBCO Business Studio. For more information, refer the TIBCO ActiveMatrix BusinessWorks™ documentation.

4. Type a name for the project that you are creating in the **Project name** field.
5. Keep the **Use default location**, **Create empty process**, and **Create Application** check boxes selected. Click **Finish**.

Result

A project and an application are created and displayed in the **Project Explorer** view. The Process editor opens automatically.

Creating Amazon SQS and SNS Connection

This shared resource is required by all SQS and SNS activities as it provides the Amazon Web Services (AWS) client object which mediates all interactions with the AWS messaging system.

Procedure


1. Expand the created project in the **Project Explorer** view.
2. Right-click the **Resources** folder and select **New > Amazon SQS and SNS Connection**.

3. Type a name in the **Resource Name** field in the Amazon SQS and SNS Connection dialog box. Click **Finish**.
4. Configure the Amazon SQS and SNS Connection resource in the displayed editor, as described in [Amazon SQS and SNS Connection](#).

Configuring a Process

Processes define the business logic. Once a project is created, you need to configure the process by adding activities, conditions, and services.

Procedure

1. Select an activity from the Palette view and drop it in the Process editor.
For example, select and drop the **Timer** activity from the General Activities palette and the **CreateQueue** activity from the SQS and SNS palette.
2. Select the **Timer** activity in the Process Editor.
3. Click  to create links between the activities and configure the condition types.
4. Configure the added activities, as described in [SQS and SNS Palette](#).



An Amazon SQS and SNS Connection resource is required, when configuring the activities. For more details, refer to [Creating Amazon SQS and SNS Connection](#).

5. Click **File > Save** to save the project.

Debugging and Running a Process

Debug the application you have configured, to ensure that the application configuration is correct.

Procedure

1. Open the process you have configured in TIBCO Business Studio.
2. On the toolbar, click **Run > Debug Configurations**.
3. Click **BusinessWorks Application > BWApplication** in the left panel.
4. Ensure that only the application you want to debug and run is selected in the **Applications** tab in the right panel.
5. Click the **Advanced** tab and click **Browse** to locate the logback file.
By default, the log file resides in the `TIBCO_HOME/bw/version_number/config/design/logback` directory and error logs are captured. For more details, refer [Managing Logs](#).
6. Click **Debug**.
TIBCO Business Studio changes to the **Debug** perspective. Logs are displayed in the **Console** view.

Checking Output of an Activity

After debugging the application, you can check the output of activities.

Procedure

1. In the **Debug** perspective, expand **BWApplication** and click the activity in the upper left panel.
2. In the upper right panel, click the **Job Data** view and click **Output**.

Result

The output of the activity is displayed.



You can also check the activity output in the plug-in logs. For more information, refer [Managing Logs](#).

Deploying Applications

After deploying applications, you can manage BusinessWorks applications by using TIBCO Enterprise Administrator.

Prerequisites

The following tasks are required before deploying applications:

- [Creating a Project](#).
- [Generating an EAR File](#).

A typical workflow of deployment includes:

1. Upload an EAR file.
2. Deploy an application.
3. Configure an application.
4. Start an application.

You can deploy an application EAR file by using the command-line mode with the **bwadmin** utility. For more information about how to deploy an application, refer *TIBCO ActiveMatrix BusinessWorks Administration* guide.

Generating an EAR File

Application archives are enterprise archive (EAR) files that are created in the TIBCO Business Studio™. An EAR file is required when deploying an application.


Prerequisites

An application project has already been created, as described in [Creating a Project](#).



There are many ways to generate an EAR file. The following procedure is one of the methods. For more information, refer *TIBCO ActiveMatrix BusinessWorks Administration* guide.

Procedure



1. Go to the **File Explorer** view and click the **Open Directory to Browse**  icon.
2. Select the folder where you want to generate the EAR file and click **OK**.
The new folder is displayed in the **File Explorer** view.
3. Drag the application from the **Project Explorer** view to the new folder in the **File Explorer** view.
The EAR file is generated with the name `<name>.<application>_<version>.ear`.

Amazon SQS and SNS Connection

This shared resource is required by all SQS and SNS activities as it provides the AWS client object that mediates all interactions with the AWS messaging system.

General

This section includes the following fields:

Field	Description
Package	Name of the package. By default, the value of the field is the name of the package in which resource is created. You can change the field value by clicking on the bulb icon  .
Name	Name of the connection. You can change the field value by clicking on the bulb icon  .
Description	The user can provide additional description about the connection.

SQS Client Configuration

Field	Description
AWS Key ID	This is the ID of the secret key for AWS. Keys can be created via the AWS console and downloaded as csv files or to your ~/.aws/credentials file.
AWS Secret	This is the encrypted secret key for access to AWS.
AWS Region Name	The name of the AWS region to connect to. See http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/using-regions-availability-zones.html for a complete list of regions as it changes as Amazon adds new datacenters.

Custom Client Config

SQS Default Client Config choose between one of the predefined configurations or create a custom configuration.



The DynamoDB and SimpleWorkFlow configurations are provided in case the client defaults for those clients who closely match your desired configuration.

For other situations where the default configuration is not optimal, use the custom config.

For detailed descriptions of custom configuration, refer to [Client Configuration](#) page on Amazon documentation site.

SQS and SNS Palette

The SQS and SNS palette contains activities that you can add to your business processes.

The palette contains the following shared connection:

[Amazon SQS and SNS Connection](#)

The palette also contains the following activities:


- [Create Queue](#)
- [Delete Queue](#)
- [Get Queue Message](#)
- [Put Queue Message](#)
- [Receive](#)
- [Inquire Queues](#)
- [Create Topic](#)
- [Destroy Topic](#)
- [Publish](#)

Create Queue

The CreateQueue activity is used to create a SQS queue.

General

In the **General** tab, you can select shared resource to establish a connection to the Amazon server. The following table lists the configurations in the **General** tab of the **CreateQueue** activity.

Field	Module Property?	Description
Name	No	Name to be displayed as a label for the activity in the process.
SQS Client	Yes	Select SQS Client configuration either from an existing resource or create a new resource, by using the Choose/Create Default Resource icon  .

Description

In the **Description** tab, you can provide a short description for the **CreateQueue** activity.

Input

In the **Input** tab, you can specify input values for the **CreateQueue** activity. The following table lists the input elements in the **Input** tab of the **CreateQueue** activity.

Input Item	Data Type	Description
QueueName	String	Required. The name of the queue to create. This name will be incorporated into the queue URL returned.
FIFOQueue	Boolean	Optional. This flag needs to be set to true if the user wants to create the FIFO queue. The name of the queue should have .fifo as a suffix.
ContentBasedDeduplication	Boolean	Optional. This field is used for enabling or disabling content based deduplication for the FIFO queue.
DelaySeconds	Int	Optional. The time in seconds for which the delivery of all messages in the queue is delayed. It is an integer value ranging from 0 to 900 seconds (15 minutes). The default for this attribute is 0 (zero).
MaximumMessageSize	Int	Optional. The number of bytes a message can contain before Amazon SQS rejects it. It is an integer value ranging from 1024 bytes (1 KiB) up to 262144 bytes (256 KiB). The default value for this attribute is 262144 (256 KiB).
MessageRetentionPeriod	Int	Optional. The number of seconds for which Amazon SQS retains a message. It is an integer value in seconds, ranging from 60 seconds (1 minute) to 1209600 seconds (14 days). The default value is 345600 seconds (4 days).
Policy	String	Optional. The queue's policy. A valid AWS policy. For more information about policy structure, refer to Overview of AWS IAM Policies in the Amazon IAM User Guide.
ReceiveMessageWaitTimeSeconds	Int	Optional. The time for which a ReceiveMessage call will wait for a message to arrive. It is an integer value ranging from 0 to 20 (seconds). The default value for this attribute is 0.
RedrivePolicy	String	Optional. The parameters for dead letter queue functionality of the source queue. For more information about RedrivePolicy and dead letter queues, refer to Using Amazon SQS Dead Letter Queues in the Amazon SQS Developer Guide.

Input Item	Data Type	Description
VisibilityTimeout	Int	Optional. The visibility timeout for the queue is a period of time, during which SQS prevents other consuming components from receiving and processing that queue. This is an integer value which can range from 0 to 43200 seconds (12 hours). The default value for this attribute is 30 seconds.
Permissions	Complex	Optional. Permissions contribute to the policy for the queue. Permissions permit queues to be shared with other principles (userIDs).
Label	String	An arbitrary label for the permission.
AccountId	String	One or more Amazon Account IDs for which the permission is to be applied.
Action	String	One or more actions the client wants to allow for the specified principals. The following values are valid values: * SendMessage ReceiveMessage DeleteMessage ChangeMessageVisibility GetQueueAttributes GetQueueUrl.



If you enter a value in any one of the fields Label, AccountId, or Action, then you need to enter values for remaining two fields, as these fields become required fields.

Output

In the **Output** tab, you can find the output value of the **CreateQueue** activity. The following table lists the output elements in the **Output** tab of the **CreateQueue** activity.

Output Item	Data Type	Description
QueueName	String	Provides the queue name from the input schema.
QueueUrl	String	The URL for the created SQS queue.

Fault

The **Fault** tab lists exceptions that are generated by this activity.

Fault	Data Type	Description
SQSException		Any exception generated by the activity after execution. It has the following fields: ErrorCode and ErrorMessage .
ErrorCode	String	The plug-in error code for the exception. For more information, refer to Error Codes topic.


Fault	Data Type	Description
ErrorMessage	String	The plug-in error message for the exception. It contains the error message from the AWS SQS API call that failed.

Delete Queue

The SQS DeleteQueue activity deletes a queue from the AWS backend.

General

In the **General** tab, you can establish a connection to the Amazon server. The following table lists the configurations in the **General** tab of the **DeleteQueue** activity.

Field	Module Property	Description
Name	No	Name to be displayed as a label for the activity in the process.
SQS Client	Yes	Select SQS Client configuration either from an existing resource or create a new resource, by using the Choose/Create Default Resource icon  .

Description

In the **Description** tab, you can provide a short description for the **DeleteQueue** activity.

Input

In the **Input** tab, you can specify input values for the **DeleteQueue** activity. The following table lists the input element in the **Input** tab of the **DeleteQueue** activity.

Input Item	Data Type	Description
QueueName	String	Required. The name of the queue to be deleted.

Output

This activity does not generate any output.

Fault

The **Fault** tab lists exceptions that are generated by this activity.

Fault	Data Type	Description
SQSException		Any exception generated by the activity after execution. It has the following fields: ErrorCode and ErrorMessage .
ErrorCode	String	The plug-in error code for the exception. For more information, refer to Error Codes topic.



Fault	Data Type	Description
ErrorMessage	String	The plug-in error message for the exception. This frequently contains the error message from the AWS SQS API call that failed.

Get Queue Message

This activity is used to receive one or more messages from a SQS Queue. The **GetQueueMessage** activity can be configured to use long polling by setting the **WaitTime** to be greater than zero (0). However the activity returns almost immediately, if there are messages on the queue. The number of messages returned are usually be smaller than the **MaxMessages** parameter (unless it is 1) and it is usually necessary to loop on the **Get** to retrieve all the messages in the queue. This is normal within the context of SQS messaging. The only time that the activity is blocked for the full **WaitTime** period, is if the queue is empty.

General

In the **General** tab, you can select shared resource to establish a connection to the Amazon server. The following table lists the configurations in the **General** tab of the **GetQueueMessage** activity.

Field	Module Property?	Description
Name	No	Name to be displayed as a label for the activity in the process.
SQS Client	Yes	Select SQS Client configuration either from an existing resource or create a new resource, by using the Choose/Create Default Resource icon  .
ManualDelete	No	<p>If enabled, use confirm activity to delete the messages. By default, the check box is not selected.</p> <div>  <p>Always use confirm activity to delete messages within visibility timeout. If the messages are deleted after visibility timeout, then there could be an exception or duplicate messages received.</p> </div>

Description

In the **Description** tab, you can provide a short description for the **GetQueueMessage** activity.

Input

In the **Input** tab, you can specify input values for the **GetQueueMessage** activity. The following table lists the input elements in the **Input** tab of the **GetQueueMessage** activity.

Input Item	Data Type	Description
QueueName	String	Required. The name of the queue from which messages are to be received.
MaxMessages	Int	Optional. Indicates the maximum number of messages to be received in one operation. The default value is 1 and the maximum value is 10.
WaitTime	Int	Optional. The duration (in seconds) for which the call waits for a message to arrive before returning. If no message arrives in the allowed time, an <code>SQSException</code> is thrown indicating that a timeout condition has occurred. If Amazon server is down, plug-in keeps trying to reconnect to the server till WaitTime.
PollingInterval	Int	Optional. The duration after which plug-in tries to reconnect to the server before timeout.

Output

In the **Output** tab, you can find the output value of the **GetQueueMessage** activity. The following table lists the output elements in the **Output** tab of the **GetQueueMessage** activity.

Output Item	Data Type	Description
SqsMessage	Complex	Encodes 1 to 10 messages.
SenderId	String	Returns the IAM Role or user ID of the sender.
MessageId	String	The message ID assigned to the message when it was originally sent.
SentTimeStamp	String	The timestamp when the message was sent.
Body	String	The message body.
MessageGroupId	String	It specifies that a message belongs to a specific message group.
MessageDeduplicationId	String	It is used for avoiding a duplication of the sent messages.
SequenceNumber	String	The large, non-consecutive number that Amazon SQS assigns to each message.
MessageAttrs	Complex	Encodes the message attributes to be sent as part of the message. Each attribute is composed of a Name, Type, and Value.
Name	String	The name of the attribute.
Type	String	The type of the attribute.
Value	String	A string representation of the attribute value.

Fault

The **Fault** tab lists exceptions that are generated by this activity.


Fault	Data Type	Description
SQSException		Any exception generated by the activity after execution. It has the following fields: ErrorCode and ErrorMessage .
ErrorCode	String	The plug-in error code for the exception. For more information, refer to Error Codes topic.
ErrorMessage	String	The plug-in error message for the exception. It contains the error message from the AWS SQS API call that failed.

Put Queue Message

The PutQueueMessage activity puts a message on the SQS queue.

General

In the **General** tab, you can select shared resource to establish a connection to the Amazon server. The following table lists the configurations in the **General** tab of the **PutQueueMessage** activity.

Field	Module Property?	Description
Name	No	Name to be displayed as a label for the activity in the process.
SQS Client	Yes	Select SQS Client configuration either from an existing resource or create a new resource, by using the Choose/Create Default Resource icon  .

Description

In the **Description** tab, you can provide a short description of the **PutQueueMessage** activity.

Input

In the **Input** tab, you can specify input values for the **PutQueueMessage** activity. The following table lists the input elements in the **Input** tab of the **PutQueueMessage** activity.

Input Item	Data Type	Description
QueueName	String	Required. The name of the queue on which the message is to be placed.
MessageGroupId	String	Optional. Required for FIFO queue only. It specifies that a message belongs to a specific message group.

Input Item	Data Type	Description
MessageDeduplication Id	String	Required when ContentBasedDeduplication is set as False. Optional when ContentBasedDeduplication is set as True. It is used for avoiding a duplication of a sent messages.
SqsMessage	Complex	Required. Encodes the body and attributes of the message.
Body	String	Required. The message body.
MessageAttrs	Complex	Encodes the message attributes to be sent as part of the message. Each attribute is composed of a Name, Type, and Value.
Name	String	The name of the attribute.
Type	String	The type of the attribute.
Value	String	A string representation of the attribute value.



If you enter a value in any one of the fields Name, Type, or Value, then you need to enter values for the remaining two fields, as these fields become required fields.

Output

In the **Output** tab, you can find the output value of the **PutQueueMessage** activity. The following table lists the output element in the **Output** tab of the **PutQueueMessage** activity.

Output Item	Data Type	Description
MessageId	String	Contains the message identifier for the message.

Fault

The **Fault** tab lists exceptions that are generated by this activity.



Fault	Data Type	Description
SQSException		Any exception generated by the activity after execution. It has the following fields: ErrorCode and ErrorMessage .
ErrorCode	String	The plug-in error code for the exception. For more information, refer to Error Codes topic.
ErrorMessage	String	The plug-in error message for the exception. It contains the error message from the AWS SQS API call that failed.

Receive

This is an event source activity that starts a TIBCO ActiveMatrix BusinessWorks™ process when one or more messages are received.

General

Because an event source has no input transition, all parameters for the receiver are static literals, process properties, or module properties.

Field	Module Property?	Description
Name	No	Name to be displayed as a label for the activity in the process.
SQS Client	Yes	Select SQS Client configuration either from an existing resource or create a new resource, by using the Choose/Create Default Resource icon  .
QueueName	Yes	Required. This is the queue on which the receiver listens.
Maximum Messages	Yes	Required. Enter the number of messages to be processed by each newly created TIBCO ActiveMatrix BusinessWorks™ job. The minimum value is 1, and the maximum value is 10.
ManualDelete	No	<p>If enabled, use confirm activity to delete the messages. By default, the check box is not selected.</p> <div>  <p>Always use confirm activity to delete messages within visibility timeout. If the messages are deleted after visibility timeout, then there would be an exception or duplicate messages would be received.</p> </div>
Create Queue If Not Exist	No	If enabled, the receiver creates a queue with the default configuration, if the named queue does not exist. The queue is owned by the AWS ID specified on the SQS Client shared resource and cannot be accessed by others. By default, the check box is not selected.
ContentBased Deduplication	No	This check box appears only when QueueName is entered and Create Queue If Not Exist check box is selected. This check box is applicable for FIFO queue only.

Description

In the **Description** tab, you can provide a short description for the **Receive** activity.

Advanced

The **Advanced** tab has the following fields:

Field	Description
Sequence Key	Optional. This field can contain an XPath expression that specifies the order in which processes should run. Process instances with sequencing keys that evaluate to the same value are run in the order, the process instances were created.
Custom Job Id	Optional. This field can contain an XPath expression that specifies a custom ID for the process instance.

Input

There are no input fields for the activity.

Output

In the **Output** tab, you can find the output value of the **Receive** activity. The following table lists the output elements in the **Output** tab of the **Receive** activity.

Output Item	Data Type	Description
ReceiveOut	Complex	Serves as an anchor node for multiple SqsMessage nodes. SqsMessages ranging from 1 to 10 may be sent as an input to a new job.
SqsMessage	Complex	Encodes upto 10 messages.
SenderId	String	Returns the IAM Role or user ID of the sender.
MessageId	String	The message ID assigned to the message when it was originally sent.
SentTimeStamp	String	The time stamp when the message was sent.
Body	String	The content of the message.
MessageGroupId	String	It specifies the message group to which the message belongs.
MessageDeduplicationId	String	It is used for avoiding a duplication of sent messages.
SequenceNumber	String	The large, nonconsecutive number that the Amazon SQS assigns to each message.
MessageAttrs	Complex	Any message attributes that were included with the message. Each attribute is composed of a Name, Type and Value.
Name	String	The name of the attribute.
Type	String	The type of the attribute.

Output Item	Data Type	Description
Value	String	A string representation of the attribute value.

Fault

The **Fault** tab lists exceptions that are generated by this activity.


Fault	Data Type	Description
SQSException		Any exception generated by the activity after the execution. It has the following fields: ErrorCode and ErrorMessage .
ErrorCode	String	The plug-in error code for the exception. For more information, refer to Error Codes topic.
ErrorMessage	String	The plug-in error message for the exception. It contains the error message from the AWS SQS API call that failed.

Inquire Queues

The InquireQueue activity queries the queue to discover its attributes and message depth.

General

In the **General** tab, you can select shared resource to establish a connection to the Amazon server. The following table lists the configurations in the **General** tab of the **InquireQueue** activity.

Field	Module Property?	Description
Name	No	Name to be displayed as a label for the activity in the process.
SQS Client	Yes	Select SQS Client configuration either from an existing resource or create a new resource, by using the Choose/ Create Default Resource icon  .

Description

In the **Description** tab, you can provide a short description for the **InquireQueue** activity.

Input

In the **Input** tab, you can specify input values for the **InquireQueue** activity. The following table lists the input element in the **Input** tab of the **InquireQueue** activity.

Input Item	Data Type	Description
QueueName	String	Required. The name of the queue from which properties are to be retrieved.

Output

In the **Output** tab, you can find the output value of the **InquireQueue** activity. The following table lists the output elements in the **Output** tab of the **InquireQueue** activity.

Output Item	Data Type	Description
QueueName	String	A copy of the input schema QueueName.
QueueUrl	String	The URL of the named queue.
ApproximateNumberOfMessages	Int	The approximate number of messages on the queue.
ApproximateNumberOfMessagesNotVisible	Int	The approximate number of messages that are currently hidden. This happens when a client receives a message and when deletes it.
VisibilityTimeout	Int	The number of seconds a message can be hidden before it becomes visible, regardless of the actions of the client that received it.
CreatedTimeStamp	String	The times tamp of when the queue was created.
LastModifiedTimeStamp	String	The time stamp of when the queue was most recently modified.
Policy	String	Any security policies in place for the queue.
MaximumMessageSize	Int	The maximum message size permitted for the queue.
MessageRetentionPeriod	Int	The duration (in seconds) for which a message remains on the queue before being deleted.
QueueArn	String	The Amazon Resource Name for the queue.
ApproximateNumberOfMessagesDelayed	Int	The approximate number of messages which have been placed on the queue, for which there is a delay in effect, such that they are not yet visible.
DelaySeconds	Int	The duration (in seconds) for which the delivery of all messages in the queue will be delayed.

Output Item	Data Type	Description
ReceiveMessageWaitTimeSeconds	Int	The duration for which a ReceiveMessage call must wait for a message to arrive.
RedrivePolicy	String	The parameters for dead letter queue functionality of this queue.
ContentbasedDeduplication	Boolean	For FIFO queue, it displays whether content-based deduplication is enabled or disabled.

Fault

The **Fault** tab lists exceptions that are generated by this activity.


Fault	Data Type	Description
SQSException		Any exception generated by the activity after execution. It has the following fields: ErrorCode and ErrorMessage .
ErrorCode	String	The plug-in error code for the exception. For more information, refer to Error Codes topic.
ErrorMessage	String	The plug-in error message for the exception. It contains the error message from the AWS SQS API call that failed.

Create Topic

The CreateTopic activity is used to create the SNS topic. If the topic already exists, its topicARN will be returned.

General

In the **General** tab, you can select a shared resource to establish a connection to the Amazon server. The following table lists the configurations in the **General** tab of the **CreateTopic** activity.

Field	Module Property?	Description
Name	No	Name to be displayed as a label for the activity in the process.
SNS Client	Yes	The SNS activities use the same client shared resource configuration as the SQS activities. Select SNS Client configuration either from an existing resource or create a new resource, by using the Choose/Create Default Resource icon  .

Description

In the **Description** tab, you can provide a short description of the **CreateTopic** activity.

Input

In the **Input** tab, you can specify input values for the **CreateTopic** activity. The following table lists the input elements in the **Input** tab of the **CreateTopic** activity.

Input Item	Data Type	Description
Name	String	Required. The name of the topic to be created. This name is incorporated into the TopicARN value returned.
Permissions	Complex	Permissions contribute to the policy for the queue. Permissions control whether queues can be shared with other principles (userIDs).
Label	String	An arbitrary label for the permission.
AccountId	Int	One or more Amazon Account IDs for which the permission is to be applied.
Action	String	One or more actions the client wants to allow for the specified principals. The following values are valid values: Publish Subscribe Receive.



If you enter a value in any one of the fields Label, AccountId, or Action, then you need to enter values for remaining two fields, as these fields become required fields.

Output

In the **Output** tab, you can find the output value of the **CreateTopic** activity. The following table lists the output element in the **Output** tab of the **CreateTopic** activity.

Output Item	Data Type	Description
TopicARN	String	The AWS Resource Name for the newly created topic. This is the value that must be used when publishing to or deleting the topic.

Fault

The **Fault** tab lists exceptions that are generated by this activity.

Fault	Data Type	Description
SQSException		Any exception generated by the activity after execution. It has the following fields: ErrorCode and ErrorMessage .
ErrorCode	String	The plug-in error code for the exception. For more information, refer to Error Codes topic.


Fault	Data Type	Description
ErrorMessage	String	The plug-in error message for the exception. It contains the error message from the AWS SQS API call that failed.

Destroy Topic

The DestroyTopic activity is used to delete a SNS topic.

General

In the **General** tab, you can select shared resource to establish a connection to the Amazon server. The following table lists the configurations in the **General** tab of the **DestroyTopic** activity.

Field	Module Property?	Description
Name	No	Name to be displayed as a label for the activity in the process.
SNS Client	Yes	Required. The SNS activities use the same client shared resource configuration as the SQS activities. Select SNS Client configuration either from an existing resource or create a new resource, by using the Choose/Create Default Resource icon  .

Description

In the **Description** tab, you can provide a short description for the DestroyTopic activity.

Input

In the **Input** tab, you can specify input values for the **DestroyTopic** activity. The following table lists the input elements in the **Input** tab of the **DestroyTopic** activity.

Input Item	Data Type	Description
TopicARN	String	Required. The Amazon Resource Name for the topic.

Output

The activity has no output schema. If the delete operation fails, an exception will be generated.

Fault

The **Fault** tab lists exceptions that are generated by this activity.

Fault	Data Type	Description
SQSException		Any exception generated by the activity after execution. It has the following fields: ErrorCode and ErrorMessage .


Fault	Data Type	Description
ErrorCode	String	The plug-in error code for the exception. For more information, refer to Error Codes topic.
ErrorMessage	String	The plug-in error message for the exception. It contains the error message from the AWS SQS API call that failed.

Publish

The Publish activity is used to publish a message on a SNS Topic.

General

In the **General** tab, you can select shared resource to establish a connection to the Amazon server. The following table lists the configurations in the **General** tab of the **Publish** activity.

Field	Module Property?	Description
Name	No	Name to be displayed as a label for the activity in the process.
SNS Client	Yes	Required. The SNS activities use the same client shared resource configuration as the SQS activities. Select SNS Client configuration either from an existing resource or create a new resource, by using the Choose/Create Default Resource icon  .

Description

In the **Description** tab, you can provide a short description for the **Publish** activity.

Input

In the **Input** tab, you can specify input values for the **Publish** activity. The following table lists the input elements in the **Input** tab of the **Publish** activity.

Input Item	Data Type	Description
TopicARN	String	Optional. The Amazon Resource Name for the topic. Either TopicARN or TargetARN must be specified but not both.
TargetARN	String	Optional. The Amazon Resource Name for the endpoint to which you want to publish the output. Either TopicARN or TargetARN must be specified but not both.
Subject	String	Optional. The value to be used as the subject line when the message is delivered to email endpoints.
MessageStructure	String	Optional. Set MessageStructure to JSON, if you want to send a different message for each protocol.

Input Item	Data Type	Description
PhoneNumber	String	Optional. The phone number to which you want to deliver an SMS message.
SnsMessage	String	The message you want to send to the topic.
Body	String	Required. Content of the message.
MessageAttrs	Complex	Any message attributes that were included with the message. Each attribute is composed of a Name, Type, and Value.
Name	String	The name of the attribute.
Type	String	The type of the attribute.
Value	String	A string representation of the attribute value.



If you enter a value in any one of the fields Name, Type, or Value, then you need to enter values for remaining two fields, as these fields become required fields.

Output

In the **Output** tab, you can find the output value of the **Publish** activity. The following table lists the output element in the **Output** tab of the **Publish** activity.

Output Item	Data Type	Description
MessageId	String	Contains the message identifier for the message.

Fault

The **Fault** tab lists exceptions that are generated by this activity.

Fault	Data Type	Description
SQSException		Any exception generated by the activity after execution. It has the following fields: ErrorCode and ErrorMessage .
ErrorCode	String	The plug-in error code for the exception. For more information, refer to Error Codes topic.
ErrorMessage	String	The plug-in error message for the exception. It contains the error message from the AWS SQS API call that failed.

Working with Sample Projects

TIBCO ActiveMatrix BusinessWorks™ Plug-in for Amazon SQS and SNS is packaged with a sample project. After installing the plug-in, sample projects can be found in the `TIBCO_HOME\bw\palettes\awsm\6.1\samples` directory.

Importing Sample Projects

Before running the project, you need to import the sample projects to TIBCO Business Studio™.

Procedure

1. Start TIBCO Business Studio.
2. Click **File > Import**.
3. In the Import dialog box, expand the **General** folder and select the **Existing Studio Projects into Workspace** item, and click **Next**.
4. Click **Browse** next to the **Select archive file** field to locate the samples, and click **Finish**.

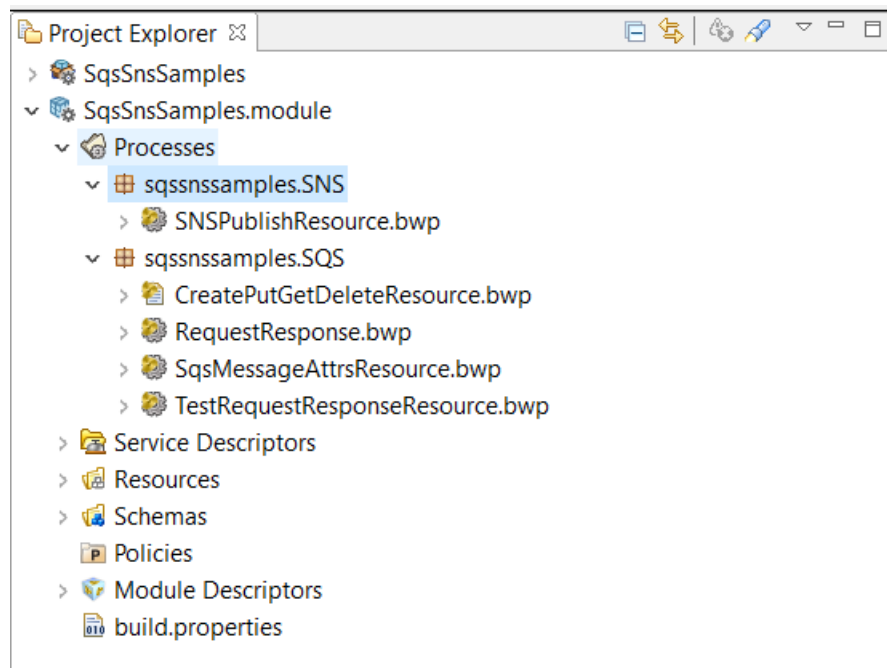


The `SqsSnsSamples.zip` file is located in the `TIBCO_HOME\bw\palettes\awsm\6.1\samples` directory.

Result

The sample project is imported to the TIBCO Business Studio.

Sample Project

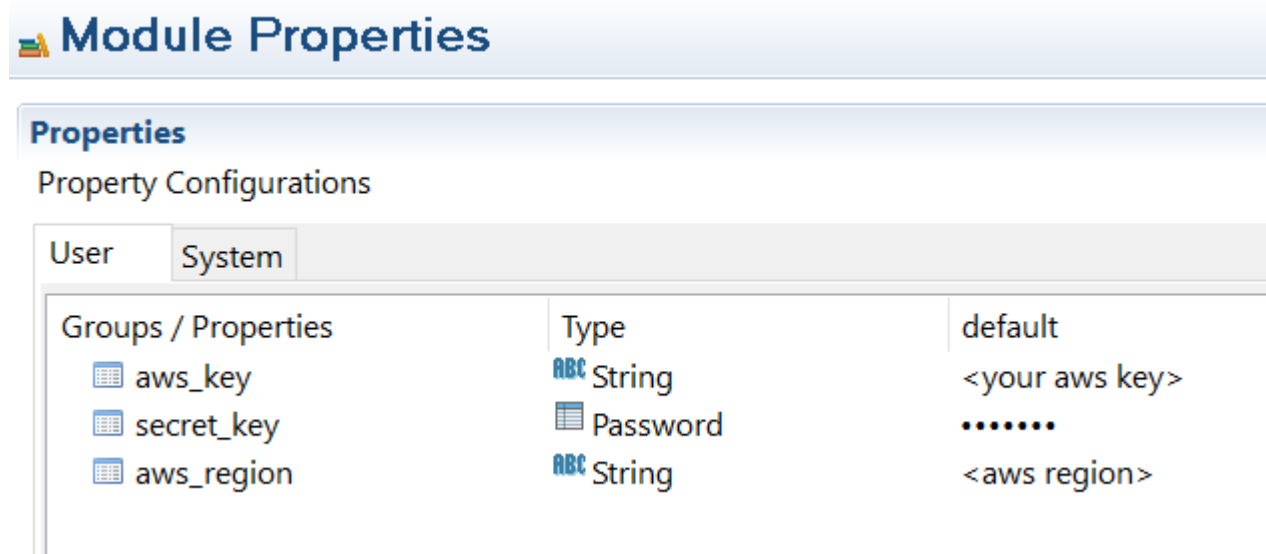



Configuring Module Properties

After importing the `SqsSnsSamples.zip` file, you must configure the module properties in TIBCO Business Studio™ and then run the processes.

1. In the **Project Explorer** view, double-click **Module Descriptors > Module Properties**

- In the Module Properties pane, configure the module property values.



2. On the toolbar, click the **Save** icon  to save your changes.

Configuring SNS Sample Process

The sns package has one process that explains the usage of SNS activities

Prerequisites

Ensure that project is imported successfully and the process associated with the sns package does not contain any error.

SnsPublishService.bwp

This process creates a topic, publishes a message and deletes the topic.

Configuring SQS Sample Processes

The sqs package has five processes that explain the usage of SQS activities.

Prerequisites

Ensure that the project is imported successfully and the processes associated with sqs package do not contain any error.

CreatePutGetDeleteResource.bwp

This process performs the following tasks:

- Creates a standard or FIFO queue.
- Puts a message on the queue.
- Reads a message from the queue.
- Deletes the queue.

RequestResponse.bwp

The TestRequestResponse.bwp process triggers this process. This process performs the following task:

- Uses receiver as starter activity and then puts a reply to the other queue.

SqsMessageAttrsResource.bwp

This process performs the following tasks:

- Creates a standard queue.
- Puts a message in the queue with message attributes.
- Reads the message from the queue.
- Deletes the queue.

TestRequestResponse.bwp

This process performs the following tasks:

- Creates a standard queue.
- Puts a message on the queue which triggers the receiver in RequestResponse.bwp.
- Reads the message from the queue.
- Deletes the queue with the wait time configuration.


Running the Sample Project

You can run the process in the sample project to see how to perform different operations.

Prerequisites

Ensure that you have imported the sample project to TIBCO Business Studio as described in the [Importing Sample Projects](#) section and configured module properties as described in the [Configuring Module Properties](#) section.

Procedure

1. From the menu, click **Run > Run Configurations**.
2. In the Run Configurations window, expand **BusinessWorks Application** and click **BW Application**.
3. On the right side pane, click the **Applications** tab and select the **SqsSnsSamples.application** checkbox.
Check boxes for all of the processes from SqsSnsSamples.application will be selected.
4. Click **Run** to run the process.
5. Run **lrestdoc** command from **console** tab.
This command gives the REST endpoint for the process. You will get the URL in the **console** tab.
6. Run the URL in browser.
The swagger UI page is displayed in the browser.
7. Provide parameter and values as shown in the Example value.
8. Click the **Try it out** button to run the process.
9. Click the **Terminate** icon  to stop the process.

Managing Logs

Logs are used to trace and troubleshoot the plug-in exceptions. You can use the log status settings to specify log levels, log file name, and the location of the log file.

A `logback.xml` file is located in the `TIBCO_HOME\bw\version_number\config\design\logback` directory. You need to update this file. For more information, refer to [Setting Up Log Levels](#) and [Exporting Logs to a File](#) topics.

Log Levels

The plug-in captures logs at different levels. The level tag defines the log level.

Log Level	Description
Info	Indicates normal plug-in operations. No action is needed. A tracing message tagged with Info indicates that a significant processing step is reached and logged for tracking or auditing purposes. Only info messages preceding a tracking identifier are considered as significant steps.
Warn	Indicates that an abnormal condition is found. Processing continues, but special attention from an administrator is recommended.
Error	Indicates that an unrecoverable error has occurred. Depending on the error severity, the plug-in may continue with the next operation or may stop altogether.
Debug	Indicates a developer-defined tracing message.
Trace	Includes all the information regarding the running process.

Setting Up Log Levels

By default, the log level is **Error**. The plug-in allows you to change the log level to trace different messages.



If neither the plug-in log nor the BusinessWorks log is configured in the `logback.xml` file, the error logs of the plug-in will be displayed in the **Console** view by default.

If the plug-in log is not configured but the BusinessWorks log is configured in the `logback.xml` file, the configuration for the BusinessWorks log is implemented by the plug-in.

Procedure

1. Navigate to the `TIBCO_HOME\bw\version\config\design\logback` directory and open the `logback.xml` file.
2. Add the following node in the Console Appender area to specify the log level for the plug-in.

For SQS:

```
<logger name="com.tibco.tci.plugin.aws.sqs.runtime">
  <level value="DEBUG"/>
</logger>
```

For SNS:

```
<logger name="com.tibco.tci.plugin.aws.sns.runtime">
  <level value="DEBUG"/>
</logger>
```

The `level` tag defines the log level and the value is Error or Debug.



When the `level` is set to Debug, the input and output for the plug-in activities are also displayed in the **Console** view. For more details, refer [Log Levels](#).

- Optional: Optional: Add the following node in BusinessWorks Palette and Activity loggers area to control the log level for an activity:

```
<logger name="com.tibco.tci.plugin.aws.sqs.runtime.create.CreateActivity">
  <level value="DEBUG"/>
</logger>
<logger name="com.tibco.tci.plugin.aws.sqs.runtime.delete.DeleteActivity">
  <level value="DEBUG"/>
</logger>
<logger name="com.tibco.tci.plugin.aws.sqs.runtime.inquire.InquireActivity">
  <level value="DEBUG"/>
</logger>
<logger name="com.tibco.tci.plugin.aws.sqs.runtime.put.PutActivity">
  <level value="DEBUG"/>
</logger>
<logger name="com.tibco.tci.plugin.aws.sqs.runtime.receive.ReceiveActivity">
  <level value="DEBUG"/>
</logger>
<logger name="com.tibco.tci.plugin.aws.sns.runtime.create.CreateActivity">
  <level value="DEBUG"/>
</logger>
<logger name="com.tibco.tci.plugin.aws.sns.runtime.destroy.DestroyActivity">
  <level value="DEBUG"/>
</logger>
<logger name="com.tibco.tci.plugin.aws.sns.runtime.publish.PubActivity">
  <level value="DEBUG"/>
</logger>
```



Activities that are not configured with specific log levels, still inherit the log level configured for the plug-in or TIBCO ActiveMatrix BusinessWorks™.

- Save the file.

Exporting Logs to a File

Modify the `logback.xml` file to export plug-in logs to a file.

Procedure

- Navigate to the `TIBCO_HOME\bw\version\config\design\logback` directory and open the `logback.xml` file.



When deploying an application in TIBCO® Enterprise Administrator, you need to navigate to the `TIBCO_HOME\bw\domains\mydomain\appnodes\myspace\mynode` directory to find the `logback.xml` file.

- Add the following node to specify the file location.

```
<appender name="FILE" class="ch.qos.logback.core.FileAppender">
  <file>c:/bw6.log</file>
  <encoder>
    <pattern>%d{HH:mm:ss.SSS} [%thread] %-5level %logger{36}-%msg%n</pattern>
  </encoder>
</appender>
```

The `file` tag defines the location to which the log is exported, and the value is the absolute path of the file.



You also need to add the file name in the file path.

3. Add the following node to the `root` node at the end of the `logback.xml` file, to enable exporting the logs to a file.

```
<appender-ref ref="FILE" />  
  
<root level="ERROR">  
  <appender-ref ref="STDOUT" />  
  <appender-ref ref="FILE" />  
</root>
```

4. Save the file.

Error Codes

The exceptions that are thrown by the plug-in are listed with corresponding descriptions and resolutions.

Error Code and Error Message	Role	Category	Description	Resolution
BW-AMAZON-SQSSNS-503000 Resource exception creating connection shared resource	errorRole	BW-Plug-in	Exception while creating connection shared resource	Correct the shared resource definition such that it can be instantiated.
BW-AMAZON-SQSSNS-503001 Failed to create the AmazonSQSClient	errorRole	BW-Plug-in	Cannot create AWS credentials based on the provided KeyId and KeySecret, or the default configuration	Correct the shared resource definition such that the client can be instantiated.
BW-AMAZON-SQSSNS-503002 Failed to create the AmazonSQSClient because the custom client configuration is not correctly configured.	errorRole	BW-Plug-in	The Amazon SQSClient cannot be created because the custom client configuration is not correctly configured.	Correct the shared resource definition such that the client can be instantiated.
BW-AMAZON-SQSSNS-503003 Failed to create the AmazonSQSClient because a KeyId is provided and a KeySecret wasn't	errorRole	BW-Plug-in	The Amazon SQSClient cannot be created because a KeyId is provided but a KeySecret is not provided.	Correct the shared resource definition such that the client can be instantiated
BW-AMAZON-SQSSNS-502002 The get operation failed to return a message for the reason: "{error}"	errorRole	BW-Plug-in	The get operation fails to return a message. It shows error message thrown by Amazon SQS	Resolve the problem based on the exception information provided.
BW-AMAZON-SQSSNS-502003 The put operation failed to send a message for reason: "{error}"	errorRole	BW-Plug-in	The get operation fails to return a message. It shows error message thrown by Amazon SQS	Resolve the problem based on the exception information provided.

Error Code and Error Message	Role	Category	Description	Resolution
BW-AMAZON-SQSSNS-502005 The create operation failed to create queue for the reason: "{error}"	errorRole	BW-Plug-in	The create operation failed to create a message. It shows error message thrown by Amazon SQS	Resolve the problem based on the exception information provided.
BW-AMAZON-SQSSNS-502006 The delete operation failed for reason: "{error}"	errorRole	BW-Plug-in	The delete operation fails. It shows error message thrown by Amazon SQS	Resolve the problem based on the exception information provided.
BW-AMAZON-SQSSNS-502007 The inquire operation failed for the reason: "{error}"	errorRole	BW-Plug-in	The inquire operation fails. It shows error message thrown by Amazon SQS	Resolve the problem based on the exception information provided.
BW-AMAZON-SQSSNS-502020 The create topic operation failed for reason:{reason}	errorRole	BW-Plug-in	The create topic operation fails. It shows error message thrown by Amazon SQS.	Resolve the problem based on the exception information provided.
BW-AMAZON-SQSSNS-502021 The publish operation failed to send a message for reason:{reason}	errorRole	BW-Plug-in	The publish operation fails to send a message. It shows error message thrown by Amazon SQS.	Resolve the problem based on the exception information provided.
BW-AMAZON-SQSSNS-502022 The destroy topic operation failed for reason: {reason}	errorRole	BW-Plug-in	The publish operation fails. It shows error message thrown by Amazon SQS.	Resolve the problem based on the exception information provided.