

Business Process Automation and Advanced Event Mesh

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Your Hosts

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Goals

- Understand how to use BPA to review event exceptions

- Understand how to use a Dead Message Queue
- Introduction to Rest Deliver Points

Prerequisites

- SAP Business Process Automation Activated
- Access to SAP BTP Cockpit and ability to create BTP Destinations
- Access to Cloud Integration and ability to create development artifacts
- Access to the AEM Console

Scenario Overview

In the world of Event Driven Asynchronous messaging, sometimes events cannot be successfully processed by a consumer and as a result, they need to be dealt with on an exception basis. As a result, there is built in capability within the broker referred to as a Dead Messages Queue. Essentially, messages can be placed into a special queue where they can later be reviewed and properly dealt with. Should you wish to read more on the concept of Dead Message Queues, please refer to the following link.

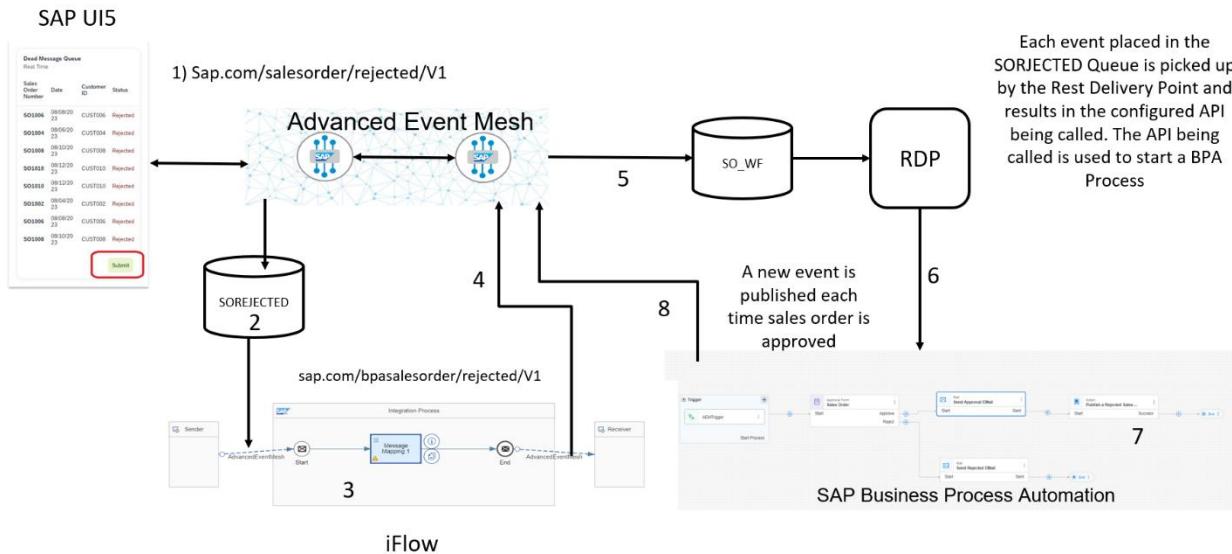
[Link to Blog](#)

In our scenario, we will artificially create a situation where messages cannot be delivered to the endpoint. As a result, they end up in the Dead Message Queue and the application shown below has an integration card on it called "Dead Message Queue". This card is a very simple Queue browser. It displays the messages without removing them from the Queue unless you hit the submit button. The steps and diagram below walk through the exact flow you will be implementing.

In the following diagram, you can see the flow you are about to implement.

- Step 1 -> The user decides to investigate the item displayed in the dead message queue so they hit the submit button which causes the message to be published on the topic shown.
- Step 2 -> There a queue that you will create called **SOREJECTED** that has a subscription to attract these events.
- Step 3 -> The cloud integration iFlow is listening on the **SOREJECTED** queue for these events.
- Step 4 -> The iFlow is responsible for transforming the message into a different format that can be used later by the BPA API.
- Step 5 -> The SO_WF queue is attracting events with this new format.
- Step 6 -> A rest delivery point will use the information in the event to call the API for starting the BPA process
- Step 7 -> The BPA Process will place an entry in the Inbox for Approval
- Step 8 -> Once the SalesOrder is approved via the Form, it will be re-published for processing which triggers an update on the original screen that started the entire process.

Process Automation scenario



Creating the Queues for BPA Scenario

The following tool is provided to you to save time creating objects via the Web Console. Should you wish to know more about how this tool was created, please ask Sumeet Koshal, he wrote it for us and is supporting the workshop this week.

Note: If you prefer not to use the CI/CD tool, check out the Appendix further down to find instructions to do it manually.

[Link to CI/CD Tool](#)



The screenshot shows the AEM Rapid Pilot interface with the title "AEM Rapid Pilot - Automatic Configuration". At the top, there are tabs for "aem-north-america" and "aem-north-america-admin". Below the tabs, there is a JSON configuration window containing the following code:

```
[{"Queues": [ { "name": "SO_WF", "owner": "#rdp/RDP1", "access-type": "non-exclusive", "redelivery": true, "try-forever": false, "max-redelivery-count": 3, "non-owner-permission": "consume", "subscriptions": [ "sap.com/bpasalesorder/rejected/V1" ] } ]},
```

Below the JSON window is a "Create Configuration" button. To the right of the JSON window, there is a vertical scroll bar. At the bottom of the interface, there is a log window displaying the following output:

```
Creating Queue :SO_WF ...
Queue :SO_WF Created Successfully ...
Adding Subscription :sap.com/bpasalesorder/rejected/V1 ...
sap.com/bpasalesorder/rejected/V1 subscription added to the Queue...
Creating Queue :SOREJECTED ...
Queue :SOREJECTED Created Successfully ...
Adding Subscription :sap.com/salesorder/rejected/V1 ...
sap.com/salesorder/rejected/V1 subscription added to the Queue...
Tasks Complete, process will now exit...
```

Below you will find the JSON structure to paste into the window. The only other thing you will need is the SEMP (Solace Element Management Protocol) Connection details. Details to find the SEMP API will be provided after the JSON Structure.

```
{ "Queues": [ { "name": "SO_WF", "owner": "#rdp/RDP1", "access-type": "non-exclusive", "redelivery": true, "try-forever": false, "max-redelivery-count": 3, "non-owner-permission": "consume", "subscriptions": [ "sap.com/bpasalesorder/rejected/V1" ] }, { "name": "SOREJECTED", "access-type": "exclusive", "owner": "", "redelivery": true, "non-owner-permission": "consume", "subscriptions": [ "sap.com/salesorder/rejected/V1" ] } ]}
```

}

From the Connect Tab, within the web console, towards the bottom, you will see "Connect Using Management Tools".

The screenshot shows the Solace Cluster Manager interface. At the top, there's a navigation bar with 'Default' and 'Cluster Manager > Service Details'. Below that, a sub-navigation bar shows 'Service Details: MontrealBroker-10.1' with tabs for Status, Connect (which is underlined), Manage, Monitoring, Configuration, and Try Me!. The main content area is titled 'Service Details: MontrealBroker-10.1'. It contains several sections:

- Connect with Node.js:** Solace Node.js API over SMF, AMPQP10 Open Source over AMQP.
- Connect with .NET:** Solace .NET API over SMF, Paho over MQTT.
- Technology Library Protocol** table:

Technology	Library	Protocol
	Solace .NET	smf
	Solace REST Messaging API	rest
	Eclipse Paho .NET Client	mqtt
- Connect with Spring:** Spring Cloud Stream, Spring Boot.
- Connect Using Management Tools:** A section where users can select a management tool to view connection information and credentials.
 - SEMP - REST API:** The Solace Element Management Protocol (SEMP) is a REST API that you can use to manage the Event Broker Service.
 - Broker Manager - Web Application:** The PubSub+ Broker Manager is a browser-based administration console that you can use to manage the Event Broker Service.

Click on "SEMP - REST API" section. From there, you can find the 4 pieces of information you need to execute the tool above.

Service Details: MontrealBroker-10.1

Connect with Node.js
Solace Node.js API over SMF, AMQP10 Open Source over AMQP

Connect with .NET
Solace .NET API over SMF, Paho over MQTT

Technology	Library	Protocol	Action
solace•	Solace .NET	smf	Get Started
solace•	Solace REST Messaging API	rest	Get Started
paho	Eclipse Paho .NET Client	mqtt	Get Started

Connect with Spring
Spring Cloud Stream, Spring Boot

Connect Using Management Tools
Select a management tool to view connection information and credentials.

SEMP - REST API

- The Solace Element Management Protocol (SEMP) is a REST API that you can use to manage the Event Broker Service.

Manage with SEMP

Secured SEMP Config URI
<https://mr-connection-qhgik3f2ezp.messaging.solace.cloud:943/SEMP/v2/config>

<https://montrealbroker.messaging.solace.cloud:943/SEMP/v2/config>

Copy/paste those details into the tool above along with the JSON structure and press the "Create Configuration" Button and voila, you should have your 2 queues and subscriptions created.

**** When copying the details over, make sure not to copy over extra spaces like I did on my first 3 attempts :-(****

**** Of course, it would be a great idea to check the queues on the console and verify that you have 2 new queues **SOREJECTED** and **SO_WF** :-(****

Creating the Rest Delivery Point

*** PLEASE NOTE: This is the one section of the 4 days that folks have the most trouble with. Might be workshop fatigue, might be your attention to detail LOL, might be the instructions (I doubt that because I wrote them) or because this section has a bunch of steps to complete that all need to be completed. SOOOOO, don't skip any steps and pay careful attention to the next few pages ***



RDP or Rest Delivery Point is a frequently used feature on the AEM broker. Essentially, based on receipt of a certain event type, the broker can be configured to directly call a Rest Service.

Navigate to the clients tab as shown on the left and then click the + Rest Delivery Point Button.. The name of the RDP is "RDP1"

The screenshot shows the SAP Solace Broker UI. On the left, there's a sidebar with options like 'Change VPN', 'Message VPN', 'Clients', 'Queues', 'Connectors', and 'Access Control'. The main area has tabs for 'Clients Summary', 'Solace Clients', 'MQTT', 'REST', and 'AMQP'. The 'REST' tab is selected. A modal window titled 'Create REST Delivery Point' is open, showing a search bar and two input fields: 'RDP Name' containing 'RDP1' and 'RDP1' below it. There are 'Cancel' and 'Create' buttons at the bottom. To the right of the modal, a table shows 'Operational State' as 'Up' and 'Connections Blocked (%)' as '0'.

**** PLEASE BE SURE TO ENABLE THE RDP ****

The screenshot shows the 'REST Delivery Points | RDP1' settings page. At the top, there are tabs for 'Summary', 'Settings' (which is selected), 'REST Consumers', 'Queue Bindings', and 'Stats'. Under the 'Settings' tab, there are several configuration fields: 'Enabled' (with a blue toggle switch highlighted by a yellow circle), 'Client Profile' (set to 'default'), 'Service' (set to 'REST'), and 'Vendor' (set to 'Custom').

You will now create a Rest Consumer that will be the target for your Events.

The screenshot shows the SAP BTP Cockpit interface for a subaccount named 'montrealbroker-10-1...'. The 'REST Consumers' tab is selected. At the top right, there is a blue button labeled '+ REST Consumer' with a red box drawn around it. Below the header, there is a search bar and several filter options: 'REST Consumer Name', 'Enabled', 'Operational State', and 'Outgoing Connections (Up/Configured)'.

Enter "SO_WF_REST_CONSUMER" and press "Create".

This screenshot shows a modal dialog titled 'Create REST Consumer'. In the 'REST Consumer Name' field, the value 'SO_WF_REST_CONSUMER' is entered. At the bottom right of the dialog, there is a large blue 'Create' button with a red box drawn around it. To its left is a 'Cancel' button.

In order to fill out the information for the Rest_Consumer, we need to get the authentication information for the Rest Consumer.

From the BTP Cockpit, we need to find the service key for the BPA Service. Navigate to the sub-account where you can find the BPA service. From there, click on the "Instances and Subscriptions" and navigate to the 3 "..." at the end.

This screenshot shows the 'Instances and Subscriptions' section of the BTP Cockpit. On the left, there is a sidebar with various service categories like Services, Cloud Foundry, and Security. The main area displays a table for 'Subaccount: USEASTBPA - Instances and Subscriptions' with one item listed. Below this, there is a table for 'Applications to which your subaccount is currently subscribed' with one entry. Further down, there is a table for 'Instances (1)' with one entry. At the bottom right of the 'Instances (1)' table, there is a red box drawn around a three-dot menu icon ('...').

To the right of the service key, you should again see 3 "..." where you can click "View". This will display the service key.

Subaccount: USEASTBPA - Instances and Subscriptions

All 3

Search All Services

Subscriptions (1)

Applications to which your subaccount is currently subscribed

Application	Status
SAP Build Process ...	Subscribed

Instances (1)

Service instances created in: Cloud Foundry | Kyma/Kubernetes | Other environments

Instance	Status
SOLACEBPA	Created

Environments (1)

Environment instances created in this subaccount.

Name	Status
useastbpa-p8xih3g...	Created

SOLACEBPA

Instance ID: 737dae08-62f6-47fc-9e51-065e04c5139c

Service: SAP Build Process Automation (process-automation-service)

Plan: standard

Runtime Environment: Cloud Foundry

Scope: SOLACEDEVBPA

Status: Created

Bound Applications (0) Service Keys (1) Labels (0)

Name Status

No bound applications.

Service Keys (1)

Name Status

BPAServiceKey Created

Labels (0)

View Download Delete

The service key has all the information you need. In this screenshot, copy from the Service Key as shown in this screenshot to configure the oAuth authentication. Pay attention to the detail that outlines the necessary information to be added to the Token URL

Notice there is no visible spot for clientsecret, once you place this screen into Edit mode, you will see a “change client secret”. Use this option to enter the secret.

Service Key from BTP

```
{
  "endpoints": {
    "api": "https://spa-api-gat...[REDACTED]"
  },
  "html5-apps-repo": {
    "app_host_id": "9060e053-050b-4654-a599-30de519f64b4",
    "app_host_ip": "ad4b900b-4bf1-4965-a6a6-d71ce7fc5300",
    "app_host_port": "90de-3se17718e6e1,3be0da62-2508-4651-8794-579a6dd30303"
  },
  "aaaservertryenable": true,
  "sap.cloud.service": "com.sap.spa.processautomation",
  "sap.cloud.service.alias": "spa",
  "users": [
    {
      "clientid": "737dae08-62f6-47fc-9e51-065e04c5139c",
      "clientsecret": "J3TpwXU192w7sFOCizNkH7IUL9AmF3Jc",
      "identityzone": "useastbpa-p8xih3g",
      "identityzonename": "e349f1cc-8212-402c-8f39-f869fa3eal1",
      "password": "e349f1cc-8212-402c-8f39-f869fa3eal1",
      "tenantid": "spa",
      "suburl": "https://internal-xusae.authentication.us10.hana.ondemand.com",
      "apiurl": "https://api.authentication.us10.hana.ondemand.com",
      "verificationkey": "-----BEGIN PUBLIC KEY-----\nKEY:-----\n-----END PUBLIC KEY-----",
      "xpparams": "737dae08-62f6-47fc-9e51-065e04c5139c:b195441|usaaa|b49390",
      "subdomainid": "e349f1cc-8212-402c-8f39-f869fa3eal1",
      "usedomain": "authentication.us10.hana.ondemand.com",
      "zoneid": "e349f1cc-8212-402c-8f39-f869fa3eal1",
      "credential-type": "binding-secret"
    }
  ]
}
```

Settings TLS Options OAuth Options Stats

Remote

Port: 443

Proxy Name:

HTTP Method: POST

TLS Enabled:

Outgoing Connection Count: 1

Retry

Max Response Wait Time (sec): 60

Connection Retry Delay (sec): 3

Authentication Schema: OAuth 2.0 Client Credentials

OAuth 2.0 Client Credentials Authentication

Client ID: 737dae08-62f6-47fc-9e51-065e04c5139c

Client Secret: [REDACTED]

Token Endpoint URL: https://useastbpa-p8xih3g/authentication.us10.hana.ondemand.com/oauth/token

Token Expiry Default: 60

Scope:

Notice that the URL used for “Token Endpoint URL” needs to have “/oauth/token” appended to the end.

So, after you have finished providing all the various data for each of the fields, one last thing to check:

****DON'T forget to ENABLE the REST CONSUMER with the little slider at the top****

REST Consumers | SO_WF_REST_CONSUMER

Settings

TLS Options

OAuth Options

Stats

Enabled



Remote

Host

spa-api-gateway-bpi-us-
prod.cfapps.us10.hana.ondemand.com

Port

443

Proxy Name

(dropdown menu)

HTTP Method

POST

TLS Enabled



Outgoing Connection Count

3

Retry

Max Response Wait Time (sec)

30

Connection Retry Delay (sec)

3

Authentication Scheme

OAuth 2.0 Client Credentials

OAuth 2.0 Client Credentials Authentication

Client ID

sb-737dae08-62f6-47fc-9e51-
065e04c5139clb195441|xsuaalb49390

Token Endpoint URL

<https://useastbpa-p8xih3g4.authentication.us10.hana.ondemand.com/oauth/token>

Token Expiry Default

60

Next you will create the connection between the Rest Consumer and the Queue that it will use. Select Queue Bindings and then click the "+Queue Binding".

The screenshot shows the SAP REST Delivery Points interface for a system named "MontrealBroker-10.1". The "Queue Bindings" tab is highlighted with a red box. In the top right corner, there is a blue button labeled "+ Queue Binding".

From the dropdown, select the previously created Queue "SO_WF".

The dialog box is titled "Create Queue Binding". It has a dropdown menu labeled "Queue Name" containing the option "SO_WF", which is highlighted with a red box. At the bottom right is a blue "Create" button, also highlighted with a red box.

This is where you will enter the remainder of the endpoint...aka the endpoint for creating the Workflow Instances. This should be the same so you can use the same value
"/workflow/rest/v1/workflow-instances"

The screenshot shows the "Queue Bindings | SO_WF" settings page. The "Settings" tab is selected. Under "Post Request Target", the value "/workflow/rest/v1/workflow-instances" is entered in a text input field, which is highlighted with a red box. Below it, the "Request Target Evaluation" dropdown is set to "None".

The type of content that we will send to the API is of JSON format. In order to indicate this, we need to create a request header called "Content-Type" and set the value to "application/json".



This next step is the step that many many people have either:

- Forgotten completely
- Mispelled
- Incorrect Copy Paste

***** IF THIS HEADER IS NOT included, it will not work *****

A screenshot of the SAP Fiori interface. The left sidebar shows navigation options: MontrealBroker-10.1, Change VPN, Messaging (Message VPN, Clients, Queues, Connectors), and a user icon. The main area is titled "Queue Bindings | SO_WF" and shows tabs for Settings, Request Headers (which is selected), Protected Request Headers, and Stats. Under the Request Headers tab, there is a search bar and a table with two rows. The first row has columns "Header Name" (empty) and "Header Value" (empty). The second row has "Header Name" as "Content-Type" and "Header Value" as "application/json". There are "Action" and "+ Request Header" buttons at the bottom of the table.

Last but not least, one last small change. The RDP process will be the owner of this queue so now that we have the RDP Created, lets ensure that we set the owner properly. Modify the owner of the SO_WF as per the following screenshot.

Queues | SO_WF

Summary **Settings** Subscriptions Consumers Messages Queued Stats

Incoming	<input checked="" type="checkbox"/>
Outgoing	<input checked="" type="checkbox"/>
Access Type	<input checked="" type="button"/> Exclusive <input type="button"/> Non-Exclusive
Messages Queued Quota (MB)	5000
Owner	#rdp/RDP1
Non-Owner Permission	No Access
Maximum Consumer Count	1000

At this point, you should have a functioning RDP. The operational status on the screen should say Up for all components with the exception of the RDP Client. If any of them indicate "Down", you will need to Troubleshoot, go back and double check your settings. There is also a Stats link that you can use to see the Error Messages.

REST Delivery Points | RDP1

montréalbroker-10-1-...

Summary Settings REST Consumers Queue Bindings Stats

RDP1 Assets Search by name

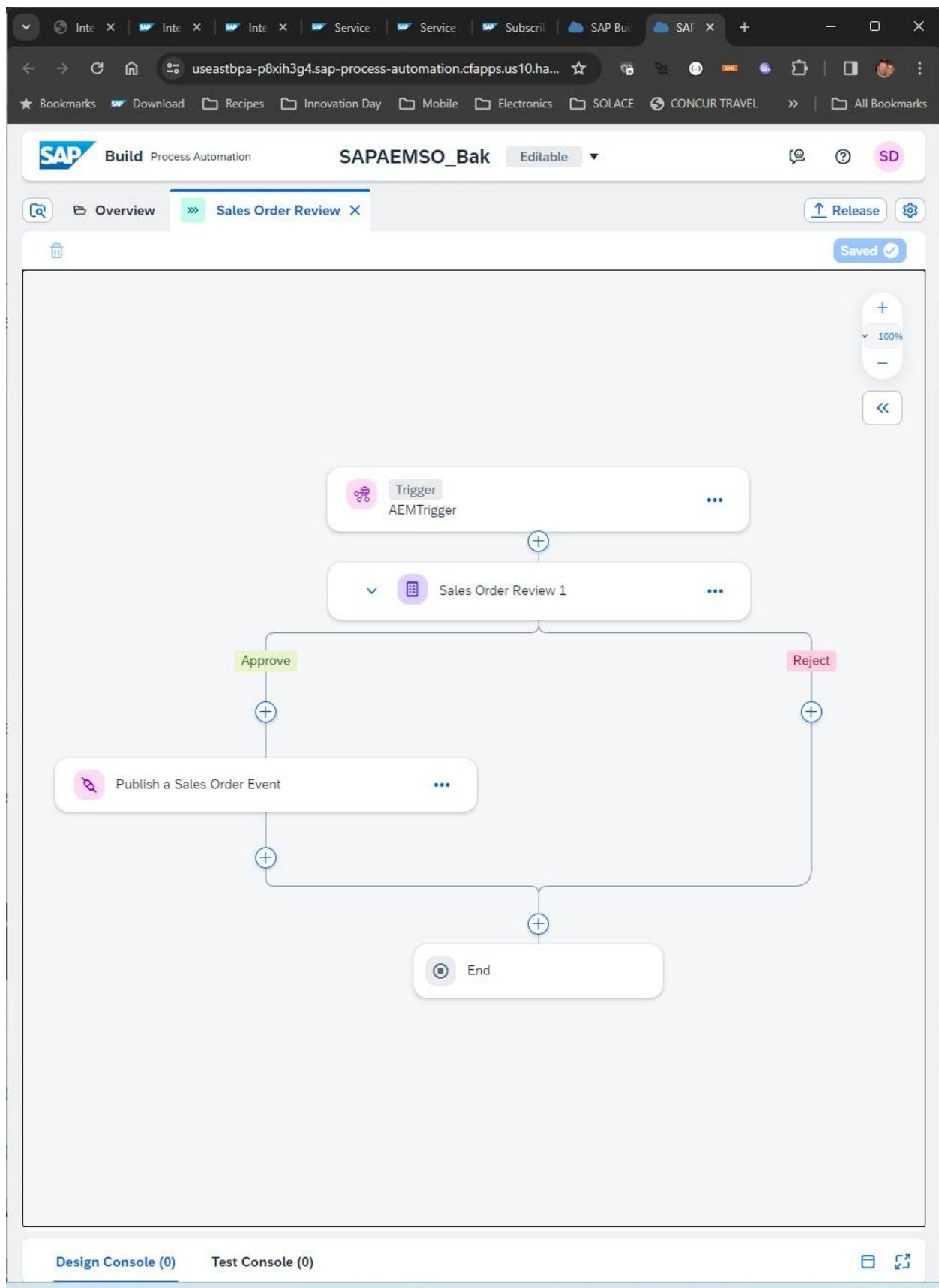
Asset Type	Asset Name	Action	Operational State
Connector / RDP	RDP1		Up
RDP Client	#rdp/RDP1		N/A
REST Consumer	SO_WF_REST_CONSUMER		Up
Queue	SO_WF		Up
Queue Binding	SO_WF		Up

Congratulations, you have completed setup of the Rest Delivery Point. Each time a message is placed into the Queue, it will automatically call the API associated with the RDP.

NOTE: In 8/10 cases where the RDP does not say "UP" it's because folks have not "Enabled" the RDP or have not "Enabled" the Rest Consumer. The RDP will not say up unless the other pieces are configured properly. Step 1....go check to make sure that the Rest Consumer is "Enabled" and the RDP is "Enabled" 😊

Creating a BTP Destination for BPA

The business process that we will deploy is activated by an API Trigger which can be seen in the diagram and the last step of the process is the publishing of an event. This process uses a Rest Call to the broker that is encapsulated in the SAP BPA "Action" which can be seen in the screenshot immediately following the "Approve" action.



The "Action" component needs to be associated with a destination. In order to create the destination, you will need "REST" connectivity information from your broker. Navigate to your AEM Cloud Console, you will select the Cluster Manager and then you will select your broker. From there, you will select the "Connect" option at the top. On this screen, make sure that the "View By" is set to Protocol as the first step. From there, expand the REST protocol and everything you need to create the destination will be visible.

The screenshot shows the SAP AEM Cloud Console interface. The left sidebar includes links for Mission Control, Cluster Manager (selected), Mesh Manager, Event Portal, Designer, Catalog, Runtime Manager, and Event Insights. The main content area is titled 'MontrealBroker-10.1' and has tabs for Status, Connect (selected), Manage, Monitoring, Configuration, and Try Me!. Under 'Connect Using a Supported Client Library', the 'Protocol' dropdown is set to 'Protocol'. The 'REST' section is expanded, showing 'Solace REST Messaging API' and a 'Get Started' button. To the right, connection details are listed:

- Username:** solace-cloud-client
- Password:** 3cp8ujsjrcu9776rrt0dos20
- Public Internet:**
 - https://mr-connection-qhgik3f2ezp.messaging.solace.cloud:9443
 - https://montrealbroker.messaging.solace.cloud:9443

Navigate to the BTP Cloud Cockpit

Once you have the connectivity information, Navigate to the Destinations Section within the BTP Cockpit, Select the "New Destination" option. You will be creating a destination called "AEMBROKERREST".

Type	Name	Authentication	ProxyType	URL
HTTP	AEMBROKERREST	BasicAuthentication	Internet	https://montrealbroker.messaging.solace.cloud:9443

You will populate the Destination information as shown below and you will add two properties that are both set to true.

- sap.applicationdevelopment.actions.enabled – true
- sap.processautomation.enabled – true

When your destination is created, double check to make sure both properties are there.

The screenshot shows the Solace configuration interface. At the top, there are tabs: New Destination, Import Destination, Certificates, Download Trust, Download IDP Metadata, and Renew Trust. Below this is a table titled "Basic Properties". It contains two rows:

Type	Name	Authentication	ProxyType
HTTP	AEMBROKERREST	BasicAuthentication	Internet https://montrealbroker.messaging.solace.cloud:9443
MAIL	sap_process_automation_mail	mail.user	aem-poc-automated-email@solace.com
		ProxyType	Internet

Below the table is a section titled "Destination Configuration" which contains detailed settings for the AEMBROKERREST destination. On the right, under "Additional Properties", there are two entries: "sap.applicationde..." and "sap.processaut..." both set to "true". There is also a checked checkbox for "Use default JDK truststore".

At the bottom of the configuration section are buttons for Edit, Clone, Export, Delete, and Check Connection.

Creating the SAP BPA Project

For the SAP BPA setup, we will be importing 1 File that contains several components:

- 11 Artifacts
- 1 Trigger
- 1 Dependency for the Action Group that represents the action group
- a project of type "Process Automation"

We will import the SAPAEMSO_EDIT.mtar file. Select the import option which is highlighted by the red square. When prompted, select the SAPAEMSO_EDIT.mtar file for import. Once it's successfully imported, you will see 1 project listed *** You can download the file here

https://github.com/SolaceLabs/aem-sap-integration/blob/main/deployable/SAPAEMSO_EDIT.mtar

Welcome to SAP Build

Create apps, automate processes, and build business sites using productivity or no-code tools.

Quick Start

All Projects (1)

Name	Versions	Type	Last Accessed	Members	Options
SAPAEMSO		Process Automation	Dec 5, 1:03 pm	Me	...

In order to deploy the BPA project, you need to associate the project with the Destination that you have already created in BTP. The deployment process will ask you to select a Destination so you need to register the destination with the BPA tooling. Expand the menu options on the top left.

Lobby

Connectors

Store

Monitoring

Control Tower

Welcome to SAP Build

Create apps, automate processes, and build business sites using productivity or no-code tools.

Quick Start

All Projects (1)

Name	Versions	Type	Last Accessed	Members	Options
SAPAEMSO	2 Available Latest: 1.0.1	Process Automation	Dec 5, 8:18 pm	Me	...

Click on the Control Tower and Select Destinations

The screenshot shows the SAP Build Control Tower interface. On the left sidebar, under the 'Control Tower' section, there is a 'Destinations' icon. The main area is divided into three sections: 'Tenant Configuration' (with a search bar), 'Backend Configuration' (with icons for Mail Server, SAP Cloud ALM, Destinations, and External Authentication), and 'Agent Configuration' (with icons for Agents, Agent Groups, Agent Management, Agent Attributes, Mass Registrations, Agent Update, and External IP Safelist).

When you click "New Destination", you should see the Destination you created in BTP called "AEMBROKERREST", if you don't, you have not specified the properties correctly and you will need to investigate. Select the Destination and you should see it populate in the UI. Now, we can deploy the project.

The screenshot shows the SAP Build Control Tower Destinations page. The sidebar has a 'Destinations' icon under the 'Control Tower' section. The main area displays a table of destinations:

	Name & Description	Type	Host Address	Authentication Type	Actions
	AEMBROKERREST Rest Endpoint for AEM Broker	HTTP	https://montrealbroker.mess...	BasicAuthentication	

Head back to the Lobby and Click on the project.

The screenshot shows the SAP Build interface. On the left, there's a sidebar with links to 'Lobby', 'Connectors', 'Store', 'Monitoring', and 'Control Tower'. The main area features a purple header with the text 'Welcome to SAP Build' and a sub-header 'Create apps, automate processes, and build business sites using productivity or no-code tools.' Below this is a 'Quick Start' section with two cards: 'Access our SAP Build Learning Journeys' (with a document icon) and 'Usability & Layout Improvements in the Process Editor' (with a server icon). The central part of the screen displays a table titled 'All Projects (1)'. The table has columns for Name, Versions, Type, Last Accessed, Members, and Options. There is one project listed: 'SAPAEMSO' (Process Automation, 2 Available versions, Latest: 1.0.1, Last Accessed: Dec 5, 8:18 pm, Members: Me, Options: three dots).

Prior to releasing the project, we have to make a small change to the project. Let's start by clicking on the "Sales Order Review" Process.

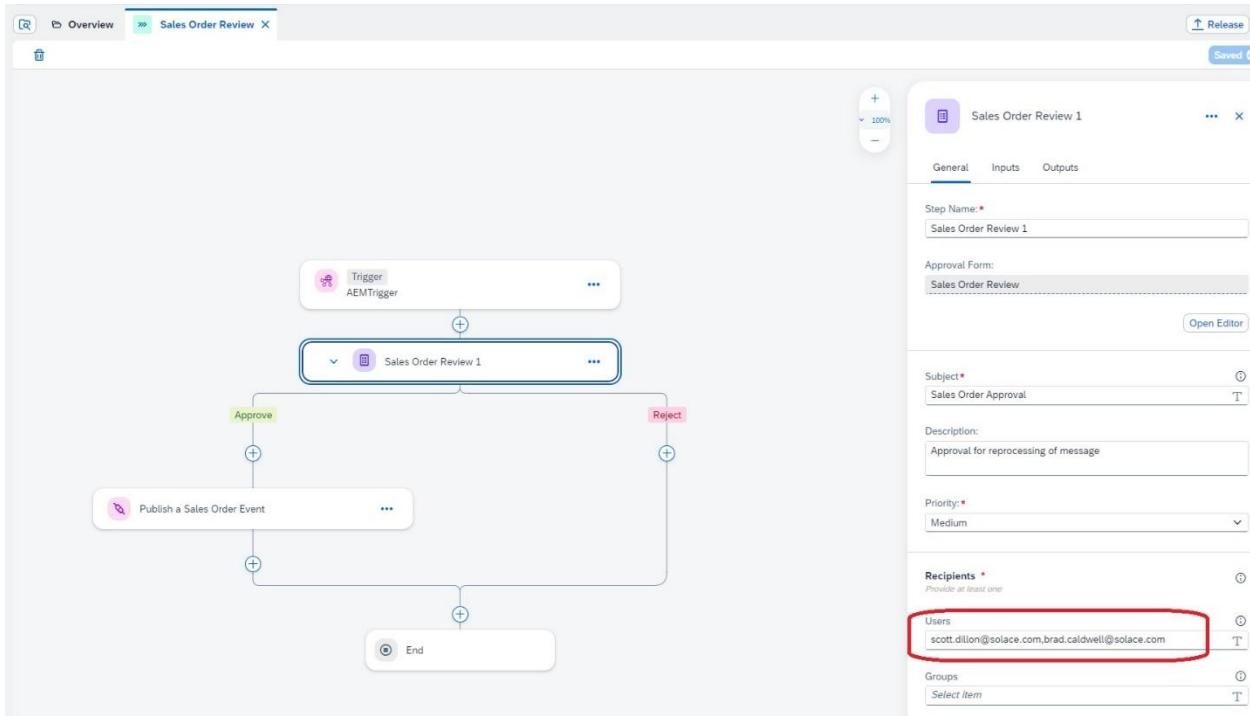
The screenshot shows the 'Process Automation' overview for the 'SAPAEMSO' project. At the top, there are tabs for 'Overview' and 'Dependencies (1)'. On the right, there are buttons for 'Release' (highlighted with a red box), 'Edit', and 'SD'. Below the tabs, there's a summary section with details like 'Update' (Last updated on: October 14, 2023, By: You), 'Creation' (Created on: October 14, 2023, By: You), and 'Bundle Size' (Project Size: 57.14 KB, Estimated Package Size: 45.55 KB). Under 'Artifacts (10)', there's a table listing various artifacts: 'customer' (Data Type, 2 days ago, scott.dillon@solace.com, Created On: October 14, 2023), 'End' (Process, 2 days ago, scott.dillon@solace.com, Created On: October 14, 2023), 'orderHeader' (Data Type, 2 days ago, scott.dillon@solace.com, Created On: October 14, 2023), 'orderHeaderList' (Data Type, 2 days ago, scott.dillon@solace.com, Created On: October 14, 2023), 'orderItem' (Data Type, 2 days ago, scott.dillon@solace.com, Created On: October 14, 2023), 'orderSchedule' (Data Type, 2 days ago, scott.dillon@solace.com, Created On: October 14, 2023), 'Sales Order Review' (Process, 2 days ago, scott.dillon@solace.com, Created On: October 14, 2023), 'Sales Order Review' (Form, 2 days ago, scott.dillon@solace.com, Created On: October 14, 2023), 'SalesOrderItem' (Data Type, 2 days ago, scott.dillon@solace.com, Created On: October 14, 2023), and 'TestForm' (Form, 2 days ago, scott.dillon@solace.com, Created On: October 14, 2023). The 'Sales Order Review' row is highlighted with a red box.

In the business process, we must indicate which users will have the notification delivered to their inbox. Click on the Approval Form for Sales Order. You will see properties appear on the right side of the screen. Specify the userid of users who should have the notification sent to their inbox. In this case, I have specified 2 IDs separated by a comma. Once you have made the change, we now need to release and deploy the project. Click the "Release" option in the upper right.

******NOTE:** In my case, my email address is my ID. In some cases, it is not your email address. If you deploy your project and don't see any items appearing in your inbox, you might have not

specified the correct ID in this field. This has been a popular GOTCHA in previous workshops. Also, the email addresses are **Case Sensitive so please check your BTP console to ensure which spelling you used. One out of place Upper Case letter will cause a problem 😊 ******

******NOTE 2: In order to receive the notification, you also need to have the correct roles assigned to the user. They need to have the BPA participant role as a minimum******



You can select the appropriate version with either of the radio boxes and then press the release button.

Release Project

Version:

- Contains only patches
- Contains minor changes
- Contains significant changes which may impact dependent projects

Version Number:

3.0.2

Version Comment:

Enter a comment to easily identify your different package versions

Optimize for faster execution. For more information, click here.

Release

Cancel

Once the project is released, you now need to deploy. On the top of the screen, you need to select the dropdown menu where it says "Editable" and select the most recent released version. Once you do that, you will see the deploy option.

Press it to reveal a new feature that will ask you to select an environment. Select the "Public" environment and press "Upgrade". **Note, in my case, I have several versions already deployed, so if it's the first deployment, it might not say "upgrade" as in the screenshot.**

The screenshot shows the SAP Build Process Automation interface. At the top, there is a dropdown menu labeled 'SAPAEEMSO 3.1.1 Released'. Below this, a 'Choose an Environment' dialog box is open, showing a list with 'Public' selected. The main interface shows a project named 'SAPAEEMSO' with version 3.1.1, status 'Released'. It displays creation details (Created On: February 26, 2024, By: You), artifact counts (Artifacts: 9, Triggers: 1, Dependencies: 3), and a search bar for artifacts. A 'Deploy' button is visible at the top right of the main screen.

You will likely get a warning message that indicates this deployment could have an affect on already deployed triggers..." press deploy.

Effect on Triggers

Deploying this project version affects triggers that have already been created.



AEMTrigger

Will be updated

Executes



Sales Order Review

Deploy

Cancel

Here you must select your destination for the action. If your destination is not in the dropdown, something has not been configured properly in the Settings of the project.

Define Variables

"AEMBROKERREST" in "SAPAEMSO 3.1.1"

Data type: Destination

[Set new value](#) [Use existing value](#)

Destination:

AEMBROKERREST

X ▾

[Deploy](#) [Cancel](#)

This is the last step to deploy your business process, click Deploy.

1 Overview — 2 Runtime Variables — 3 Triggers

Triggers

Name	Type	Changes	Will execute
AEMTrigger	API	Will be updated	Sales Order Review

Back

Deploy

You should now see "Deployed" and "Active" on the top left of the screen and your process should now be running.

The screenshot shows the SAP Build Process Overview page for the process **SAPAEMSO**, version 3.0.2, which is currently **DEPLOYED**. The page includes the following sections:

- Deployment Details:** Shows the process was last updated on October 16, 2023, and created on October 14, 2023. It has a bundle size of 60.27 KB and no collaborators.
- Artifacts (10):** A table listing ten artifacts with their names, descriptions, and types:

Name	Description	Type
customer		Data Type
End		Process
orderHeader		Data Type
orderHeaderList		Data Type
orderItem		Data Type
orderSchedule		Data Type
Sales Order Review		Process
Sales Order Review		Form
SalesOrderItem		Data Type
TestForm		Form
- Triggers (1):** Shows one trigger named **Sales Order Review**.
- Dependencies (1):** Shows one dependency named **Sales Order Review**.
- Deployment Console (0):** Shows zero items in the deployment console.

The process should now be running. Now we need to add an iFlow to transform messages so that they can be used to Trigger the process.

Integration Suite Setup

In the Business Process Automation scenario, we will activate an instance each time a record from the Dead Message Queue is submitted for review. The Sales Order Event from the Queue will need to be augmented with some additional metadata that is required for the BPA API. In order to augment the message with the additional elements, we will use 2 Cloud Integration Artifacts to do this:

- SOTOBPASOV2 – This message mapping artifact will map the incoming Sales Order Event to the Structure required for the BPA API
- <https://github.com/SolaceLabs/aem-sap-integration/blob/main/deployable/SOTOBPASOV2.zip>
- SalesOrderToBPAiFlow – This iFlow will connect to the Advanced Event Mesh and pull in all orders that have been submitted for processing from the UI5 application. Technically, the iFlow connects to a Queue that you will create on the broker. Once the Sales Order event is received, it will be routed through the mapping and then published onto a new topic with the augmented schema.
- <https://github.com/SolaceLabs/aem-sap-integration/blob/main/deployable/SalesOrderToBPAiFlow.zip>

For this next part, you will be importing an artifact, not an entire business package full of iFlows.

So, you need to first be in a content package before you do the import. You can add this next iFlow to the same package you created yesterday or you can create a brand new package.

The screenshot shows the SAP Integration Suite interface. On the left is a navigation sidebar with options: Home, Discover, Design (selected), Integrations, Monitor, Inspect, and Settings. The main area displays a content package named 'SOLACE-TIGER-TEAM'. The package details are: Vendor: (empty), Mode: Editable, Version: 1.0. Below this, there are tabs for Overview, Artifacts (21) (selected), Documents, and Tags. A table lists the artifacts, with columns for Name, Type, Version, and Actions. The table contains the following data:

Name	Type	Version	Actions
AEM_ONBOARDING_SCENARIO Point to Point Onboarding Scenario Created	Integration Flow	1.0.4	[Edit]
AEMBusinessPartnerAddressCheck Created	Integration Flow	1.1.4	[Edit]
AEMBusinessPartnerTransformUpper Created	Integration Flow	Draft	[Edit]
AEMLegacyInputAdapter Created	Integration Flow	1.0.5	[Edit]
AEMLegacyOutputAdapter Created	Integration Flow	1.0.6	[Edit]

Once you have the package, place it in edit mode, select the DropDown under "Add" and select "Message Mapping".

The screenshot shows the SAP Integration Suite interface. On the left, there's a navigation sidebar with options like Home, Discover, Design, Monitor, Inspect, and Settings. The main area shows a breadcrumb path: Integrations / SOLACE-TIGER-TEAM / SOLACE-TIGER-TEAM. Below this, there are tabs for Header, Overview, Artifacts (21), Documents, and Tags. The Artifacts tab is selected. At the top right, there are buttons for Add, Migrate, and Delete. A dropdown menu is open under the 'Add' button, listing various integration types: Integration Flow, SOAP API, Value Mapping, OData API, Script Collection, REST API, Message Mapping (which is highlighted with a blue border), Function Libraries, Integration Adapter, Data Type, and Message Type.

At the top of this form, you will select "Upload" and then you will select the zip file with the name "SOTOBAPSOV2" for Message Mapping.

Add Message Mapping

1 Add

1. Add

Create

Upload

ES Repository

Message Mapping: *

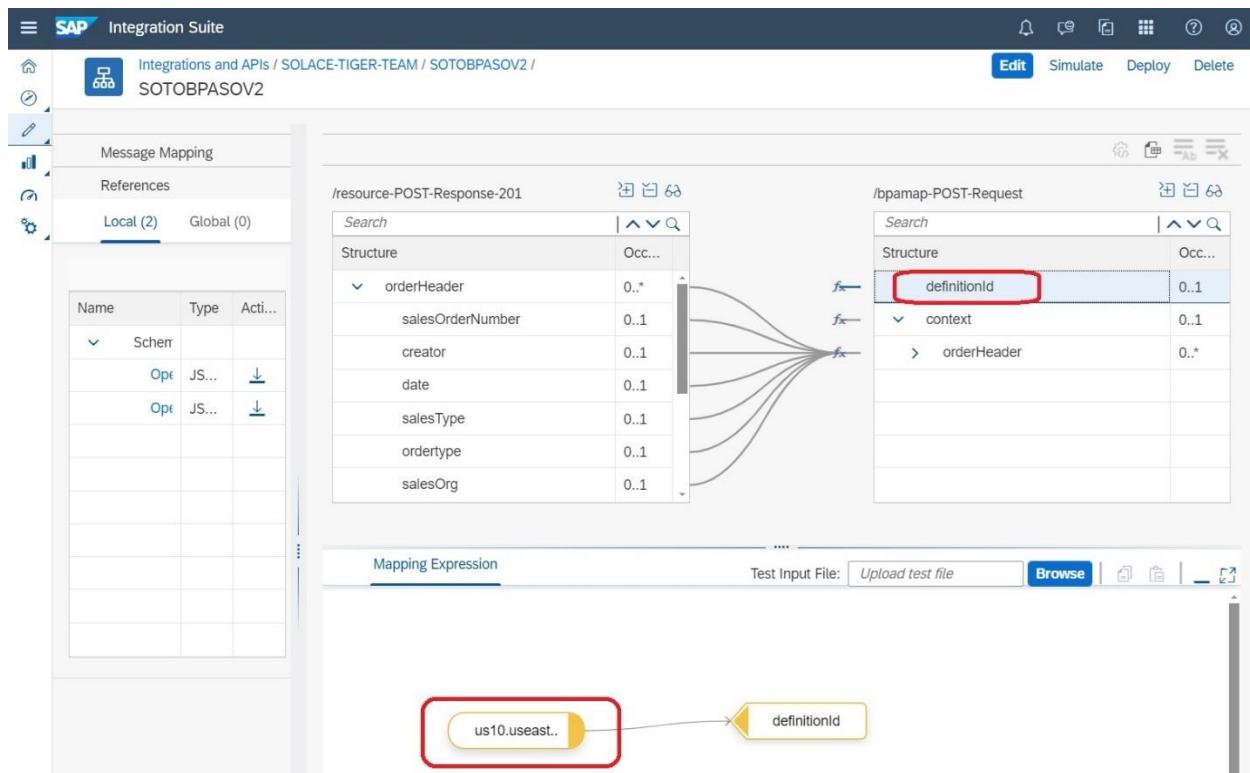
Name: *

ID: *

Description

Description:

Once the artifact is uploaded, you will open it up and edit one of the properties. You will see one of the attributes in the target mapping is "DefinitionID". This is the unique ID of the Business Process Automation process that we will be activating. This ID will be taken from the BPA environment. Within the BPA environment, navigate to the Monitor section, find your business process and you will find the ID that needs to be entered. (** Go see the next screenshot to see specific details on how to find ID**) Once you have modified the ID, be sure to hit Save at the top and then you can hit "Deploy" from there or back from the main screen as shown below.



Navigate Back to the SAP Business Process Automation Environment temporarily. From the Business Process environment, navigate to the "Monitoring" section. To find this, simply click on the SAP Icon at the top to reveal the main menu.

On the left side, Click "Control Tower" and then "Environments".

The screenshot shows the SAP Build interface. On the left, there's a sidebar with the following navigation options:

- Lobby
- Connectors
- Store
- Monitoring
- Control Tower** (highlighted with a blue box)

The main content area is divided into several sections:

- Tenant Configuration**: Contains 'Tenant Details' and 'Environments' sections.
- Backend Configuration**: Contains 'Destinations', 'Mail Server', 'SAP Cloud ALM', and 'External Authentication' sections.
- Agent Configuration**: Shows icons for a double arrow, an envelope, a cloud, and a key.

Click on the Public Environment

The screenshot shows the SAP Control Tower interface. On the left, a sidebar lists navigation options: Lobby, Connectors (Actions, Events, Automation SDK), Store, Monitoring, and Control Tower (which is selected). The main content area is titled "Control Tower / Environments". A sub-section titled "Environments (1)" is displayed. A table with three columns ("Name & Description", "Members", "Type") shows one entry: "Public" (1 member, Type: Public). A note below the table states: "This public environment can be accessed by all registered users for this tenant."

Click on “Processes and Workflows”. Under the section where it says “Process and Workflow Definitions”, you will search to find your Sales Order Review, select it. Within the red circle you will find the definition ID that you need to add to your iFlow. Take note of it for the next step.

The screenshot shows the "Control Tower / Environments / Public" page. The sidebar remains the same. The main content area shows the "Public" environment details and then switches to the "Processes and Workflows" tab. Under "Process and Workflow Definitions (10)", a search bar and dropdown are shown. A list of workflows is displayed, with "Sales Order Review" highlighted. A red box surrounds the "ID: us10.useastbipa-p8xih3g4.sapaemso.test" value, which is also copied to the clipboard. Other workflows listed include "Price Approval Flow", "QuoteReviewProcess", and "Sales Order Review" (which is highlighted).

You will take the ID and you will use it in the iFlow to uniquely identify the Workflow to be started. Essentially, the API from SAP is very generic. You call the API with the ID of the workflow to be started with the payload and voila, you can start the process.

Now we will import the iFlow using the same approach we just followed for the Message Mapping.

SAP Integration Suite

Integrations / SOLACE-TIGER-TEAM / SOLACE-TIGER-TEAM

Header Overview Artifacts (21) Documents Tags

Add Migrate Delete

Name

- AEM_ONBOARDING_SCENARIO
- Point to Point Onboarding Scenario
- Created
- AEMBusinessPartnerAddressCheck
- Created
- AEMBusinessPartnerTransformUpper
- Created
- AEMLegacyInputAdapter
- Created
- AEMLegacyOutputAdapter
- Created
- AEMSalesOrderAddressCheck

Integration Flow

- SOAP API
- Value Mapping
- OData API
- Script Collection
- REST API
- Message Mapping
- Function Libraries
- Integration Adapter
- Data Type
- Message Type

Select the "Upload" checkbox and use the 2nd zip file called "SalesOrderToBPAiFlow.zip".

Add Integration Flow

Create Upload

Integration Flow: *

Name: *

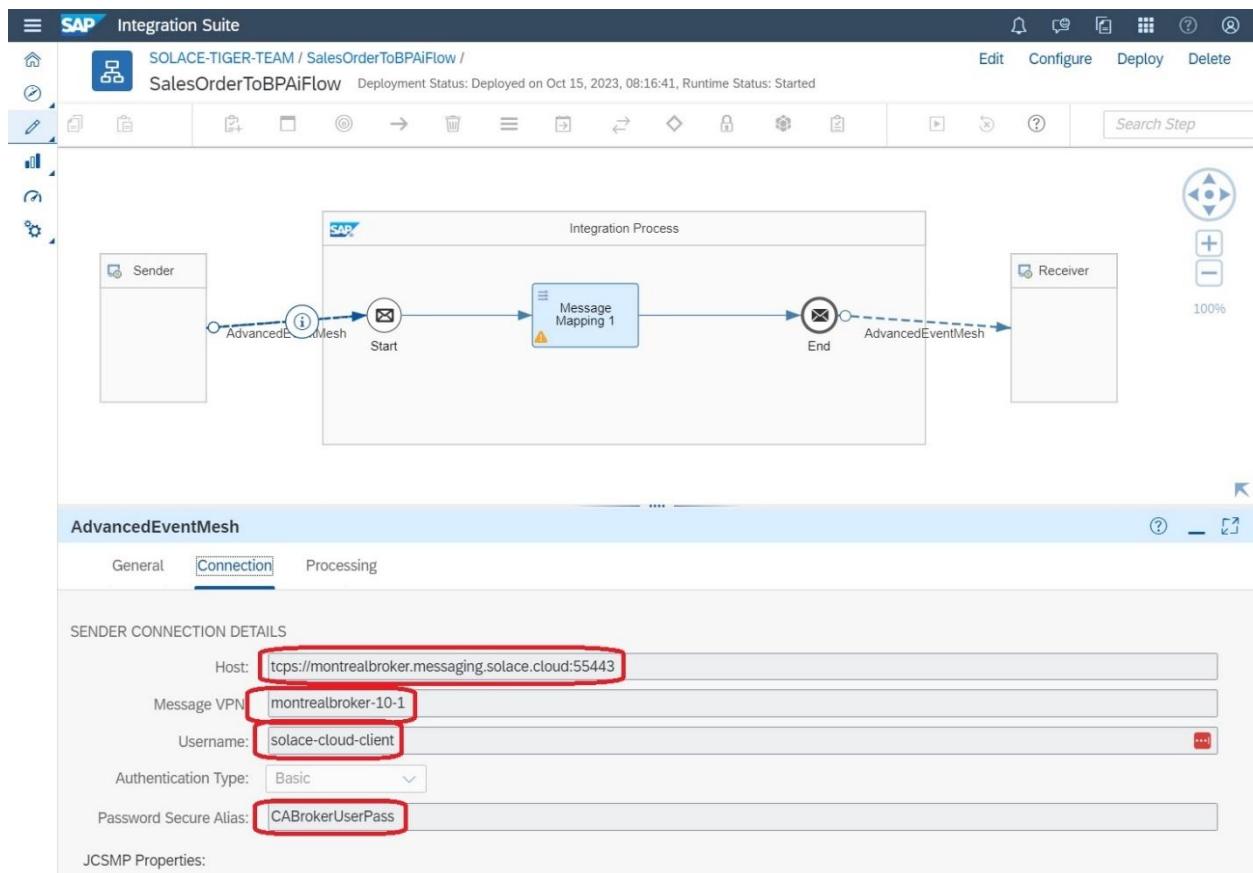
ID: *

Description:

Sender:

Receiver:

Once the iFlow is successfully imported, we need to configure the appropriate connection information to connect to the AEM Service. You should know where to find this information now :)



On this screen, we will configure the iFlow to be watching the Queue "SOREJECTED"....short for Sales Orders Rejected.

SOLACE-TIGER-TEAM / SalesOrderToBPAiFlow /
SalesOrderToBPAiFlow Deployment Status: Deployed on Oct 15, 2023, 08:16:41, Runtime Status: Started
 Edit Configure Deploy Delete Search Step

The screenshot shows a process flow titled "Integration Process". It starts with a "Sender" node connected to a dashed "AdvancedEventMesh" line, which then connects to a "Start" event node. This leads to a "Message Mapping 1" step, followed by an "End" event node, and finally a dashed "AdvancedEventMesh" line leading to a "Receiver" node. The "Message Mapping 1" step is highlighted with a yellow warning icon.

AdvancedEventMesh

- General
- Connection
- Processing**

SENDER PROCESSING DETAILS

Consumer Mode:	Guaranteed
Parallel Consumers:	1
Queue Name:	SOREJECTED
Selector:	
Acknowledgment Mode:	Automatic On Exchange Complete
Settlement Outcome After Maximum Attempts:	Failed
Maximum Message Processing Attempts:	5
Retry Interval (in ms):	1000
Maximum Retry Interval (in ms):	30000
Exponential Backoff:	3.0

Now we need to configure the publishing component of the iFlow. It will be the same connection information as the consumer above.

SOLACE-TIGER-TEAM / SalesOrderToBPAiFlow /
 SalesOrderToBPAiFlow Deployment Status: Deployed on Oct 15, 2023, 08:16:41, Runtime Status: Started

Edit Configure Deploy Delete Search Step

AdvancedEventMesh

- General
- Connection**
- Processing
- Message Properties

RECEIVER CONNECTION DETAILS

Host:	tcp://montrealbroker.messaging.solace.cloud:55443
Message VPN:	montrealbroker-10-1
Username:	solace-cloud-client
Authentication Type:	Basic
Password Secure Alias:	CABrokerUserPass

JCSMP Properties:

Now we configure the iFlow. We will publish to a topic called "sap.com/bpasalesorder/rejected/V1". The thought here is that we still have a Sales Order but it's been formated for the Business Process Automation API. Earlier in the exercise you setup a Queue listening for this event so it's really important that these 2 topics match so that all BPA rejected sales orders get attracted into the right Queue. You could add another level to the Topic to reflect the use case or embed something in the name like I have done.

SOLACE-TIGER-TEAM / SalesOrderToBPAiFlow /
 SalesOrderToBPAiFlow Deployment Status: Deployed on Oct 15, 2023, 08:16:41, Runtime Status: Started

Edit Configure Deploy Delete Search Step

AdvancedEventMesh

- General
- Connection
- Processing**
- Message Properties

PUBLISHER PROCESSING DETAILS

Delivery Mode:	Direct
Endpoint Type:	Topic
Destination Name:	sap.com/bpasalesorder/rejected/V1
Message Type:	Automatic

SYNCHRONOUS REQUEST PROCESSING DETAILS

Convert Publish Into Synchronous Requestor?:

Now that both the message mapping and the iFlow have been imported and configured, you need to deploy them both. You have a few ways to deploy an artifact. As you are editing within the editor and have saved your changes, you can deploy from within the editor. The 2nd option is from the list of artifacts within the folder.

The screenshot shows the Solace Integration Cloud interface with the 'Artifacts (25)' tab selected. A context menu is open over the 'SalesOrderToBPASalesOrderMM' artifact, which is highlighted with a blue selection bar. The menu options are: Copy, View metadata, Download, Configure, and Deploy. The 'Deploy' button is highlighted with a blue border.

Artifact Name	Type	Status	Version	Action
DevTest1	Integration Flow	Draft		
Created				
halitest	Message Mapping	1.0.0		
Created Locked by: brad.caldwell@solace.com				
JPTest	Integration Flow	1.0.0		
Created Unsaved Changes				
mmNotifTechnician	Message Mapping	1.0.2		
Created				
NotificationsToWF	Integration Flow	1.0.2		
Created				
NotificationsToWF_copy	Integration Flow	1.0.5		
Created				
NotificationsViaAMQP	Integration Flow	1.0.2		
Created				
PubSubPlusAdapterSample	Integration Flow	Draft		
Created				
SalesOrderOrchestration	Integration Flow	Draft		
Created				
SalesOrderOrchestration	Integration Flow			
Created				
SalesOrderToBPASalesOrderMM	Message Mapping			
Created				

Once both of the artifacts have been deployed, your last step is to create the secure parameter. Under "Monitor" Select Integrations.

SAP Integration Suite

Overview

Manage Integration Content

All 13
Started 12

Manage Security

Security Material 23
Artifacts

Keystore 10
Entries

From here, you will create a Secure Parameter and you will use the name "CABrokerUserPass" **or you can use another name, just be sure to use the same one in the iFlow** You will enter the corresponding password for the solace-cloud-client Username.

SAP Integration Suite

Overview / Manage Security Material

Security Material (23)

MarkusPassAlias	Secure Parameter	Deployed	markus.hebach@s olace.com	Aug 24, 2023, 12:24:49	Edit Delete
amack.us1.aem.pwd	Secure Parameter	Deployed	andrew.mackenzie @solace.com	Aug 18, 2023, 02:37:42	Edit Delete
known.hosts	SSH Known Hosts	Deployed	christian.holtfurther @solace.com	Aug 11, 2023, 07:55:30	Edit Delete
sftpuser	User Credentials	Deployed	christian.holtfurther @solace.com	Aug 08, 2023, 12:24:49	Edit Delete
BradCred	User Credentials	Deployed	brad.caldwell@s olace.com	Jul 18, 2023, 12:45:44	Edit Delete
dh-production-adapter	Secure Parameter	Deployed	benjamin.gottstein @solace.com	Jul 18, 2023, 02:37:42	Edit Delete
DQMCred	OAuth2 Client Credentials	Deployed	scott.dillon@s olace.com	Jul 12, 2023, 07:55:30	Edit Delete
CABrokerUserPass	Secure Parameter	Deployed	christian.holtfurther @solace.com	Jul 11, 2023, 09:45:27	Edit Delete

Create [Upload](#) [Edit](#) [Delete](#) [Filter by Name or Deployed By](#) [Search](#) [User Credentials](#) [OAuth2 Client Credentials](#) [OAuth2 SAML Bearer Assertion](#) [OAuth2 Authorization Code](#) [Secure Parameter](#)

Before proceeding, please check the monitor to ensure that both artifacts have been deployed successfully.

SAP Integration Suite

- Home
- Discover >
- Design < ▾
- Integrations < ▾
- Monitor < ▾
- Integrations < ▾
- Inspect
- Settings >

Integrations / Design

Packages (11)

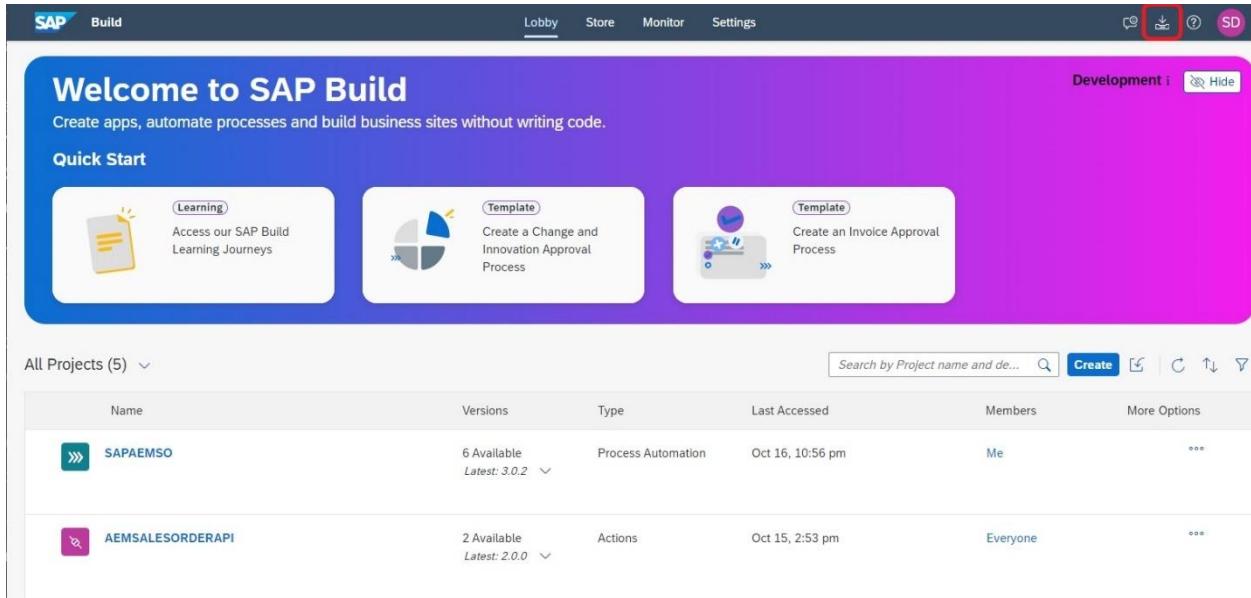
Name	Mode
AEM-Rapid-Pilot	Editable
AEMAdapter-EATest	Editable

Testing the Components

At the moment, you should have a fully integrated scenario.

From the Sales Order Dashboard, hit "Submit" on the "Dead Message Queue" card to send a message for review. Now we to check if the event triggered a creation of an Inbox Item.

From the main screen of the BPA Lobby, you can see in the upper right, a little inbox symbol...Click It.



The screenshot shows the SAP Build Lobby interface. At the top, there's a navigation bar with tabs: Lobby (which is selected), Store, Monitor, and Settings. To the right of the tabs are icons for Help, Logout, and SD. Below the navigation bar is a purple header with the text "Welcome to SAP Build" and a sub-instruction: "Create apps, automate processes and build business sites without writing code.". Underneath this is a "Quick Start" section with three cards: "Access our SAP Build Learning Journeys" (Learning), "Create a Change and Innovation Approval Process" (Template), and "Create an Invoice Approval Process" (Template). Below the quick start section is a table titled "All Projects (5) ▾". The table has columns: Name, Versions, Type, Last Accessed, Members, and More Options. It lists two projects: "SAPAEMSO" (Process Automation, 6 Available, Latest: 3.0.2) and "AEMSALESORDERAPI" (Actions, 2 Available, Latest: 2.0.0). A search bar at the top right of the lobby area contains the placeholder "Search by Project name and de...".

Name	Versions	Type	Last Accessed	Members	More Options
SAPAEMSO	6 Available Latest: 3.0.2	Process Automation	Oct 16, 10:56 pm	Me	***
AEMSALESORDERAPI	2 Available Latest: 2.0.0	Actions	Oct 15, 2:53 pm	Everyone	***

Now you will see the form that we created to display the contents of a Sales Order Event.

SAP My Inbox

All Tasks (1)	
Sales Order Review sb-clone-390ed564-... <small>Medium</small>	<input type="text" value="Search"/> <input type="button" value="C"/>

Sales Order

AEM RAPID PILOT - BPA Sales Order Sample

Sales Order Header

Sales Order Number *

SalesType

Date

Sales Org

Distribution Channel

Customer Details

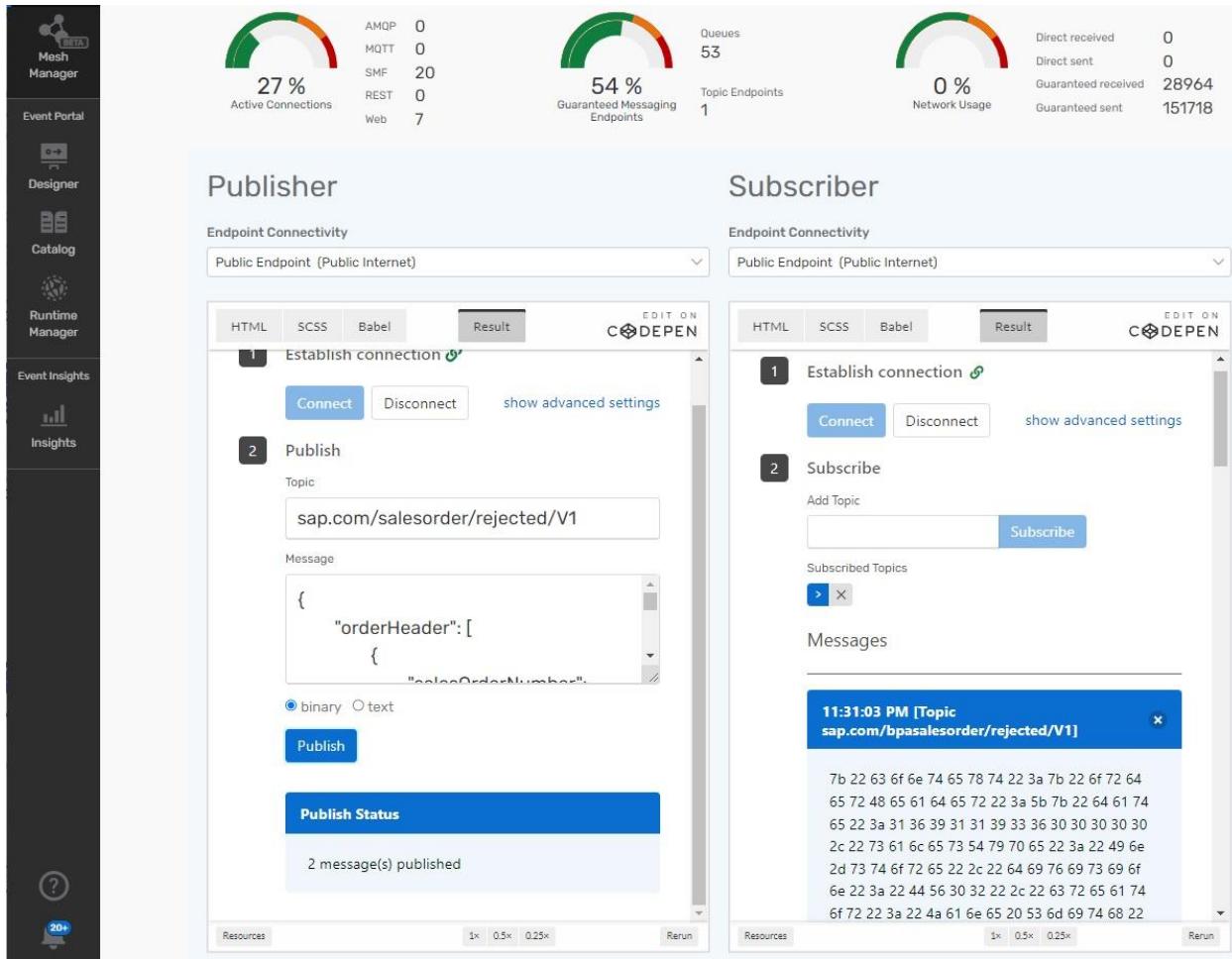
Customer	+ Enter search term
Customer Id <input type="text" value="CUST002"/> Customer Name <input type="text" value="XYZ Ltd"/> ZipCode <input type="text" value="54321"/>	<input type="button" value="Delete"/>

Sales Order Items

Order Items	+ Enter search term
Item <input type="text" value="ITEM002"/> Material <input type="text" value="MAT002"/> Material Type <input type="text" value="Service"/>	<input type="button" value="Delete"/>

Of course, this is the Happy Path :-) Everything Worked. However, what if you don't see the item in the inbox ?

My first suggestion would be to use the "Try Me" tab on the broker with the configured Rest Delivery Point and let's do some simple tests.



On this screen, we can test several things. For starters, we can confirm that the iFlow that we deployed is working and successfully transforming our message. On the publisher side, connect to the broker and use "sap.com/salesorder/rejected/V1" as the topic and for the message use the following structure. This will simulate an event being submitted for Review from the Integration Card.

```
{
  "orderHeader": [
    {
      "salesOrderNumber": "S01001",
      "creator": "John Doe",
      "date": "2023-08-04",
      "salesType": "Online",
      "ordertype": "Standard",
      "salesOrg": "SA01",
      "distributionChannel": "DC01",
      "division": "DV01",
      "netvalue": 375,
      "currency": "USD",
      "customer": [
        {
          "customerId": "CUST001",
        }
      ]
    }
  ]
}
```

```

        "customerName": "ABC Corp",
        "zipCode": "12345",
        "street": "Main Street",
        "phone": "555-123-4567",
        "country": "USA",
        "city": "New York",
        "emailAddress": [
            {
                "email":
"john.doe@abccorp.com"
            }
        ]
    ],
    "orderItem": [
        {
            "item": "ITEM001",
            "material": "MAT001",
            "materialType": "Product",
            "itemType": "Standard",
            "itemDescription": "Rocky Ridge
Mountain bike",
            "orderSchedule": [
                {
                    "scheduleNumber":
"SCH001",
                    "quantity": 100,
                    "uom": "EA"
                }
            ]
        }
    ]
}

```

On the subscriber side, connect to the broker and use ">" as your topic. This will show everything. When you publish your message, you should immediately see a message appear in the subscriber window and you should be looking for a couple of things:

- The message that you published above
- A new message with a different Topic - sap.com/bpasalesorder/rejected/V1
- The body of the message should essentially be the same BUT it has a new wrapper called "context" and a new attribute called "definitionId". If you don't see both of these things, something is wrong with the iFlow. It's important that the "definitionID" is populated with the definition ID that represents your process or it won't work.
- After you publish the event, you should see a new item in your inbox. If the message appears to have the right structure in the subscriber window, then your iFlow is working as designed. If the iFlow is working then the next place to look is the configuration of the Rest Delivery

Point. The RDP will be listening for these rejected messages and then calling the API to start the BPA process. Below we have a section that outlines how to see the logs associated with the rest delivery point. Last but not least, check to see if messages are accumulating in SO_WF.

IF YOU SEE MESSAGES IN THE INBOX....WOOHOO

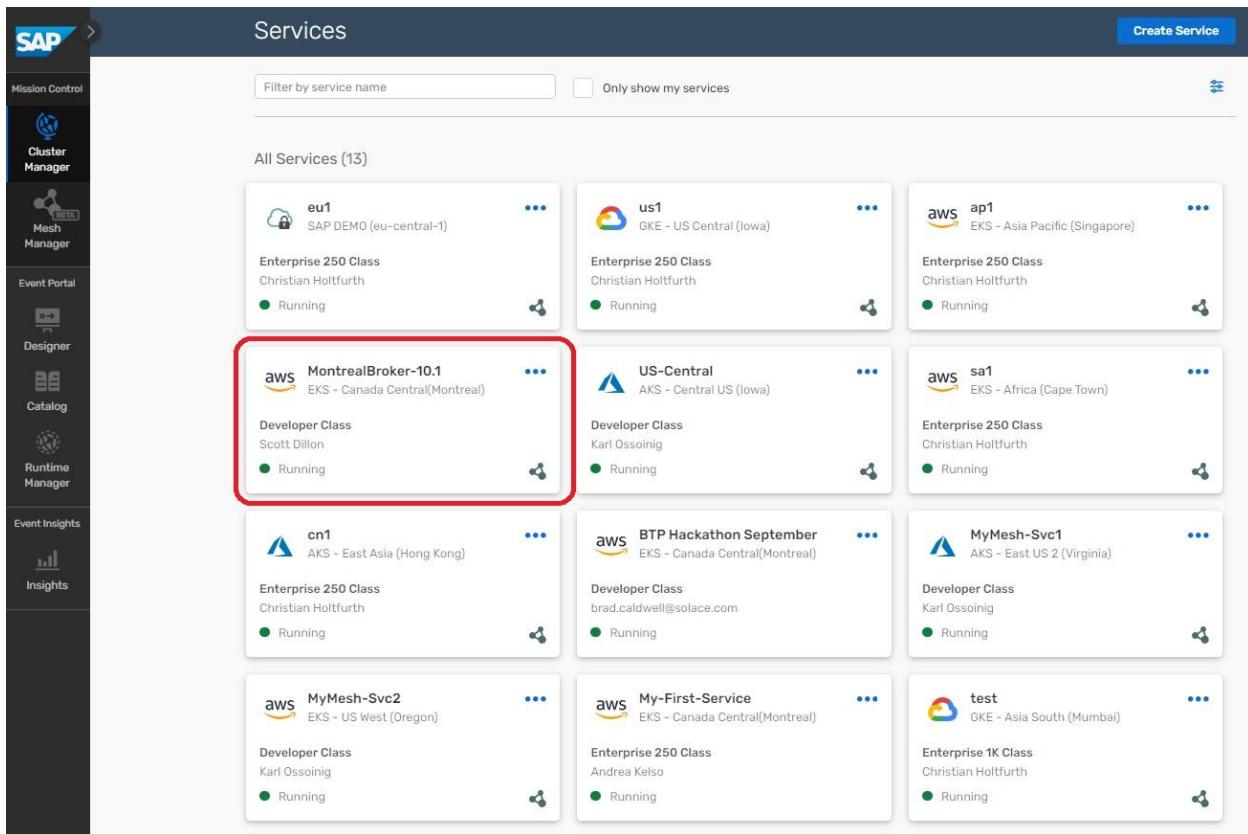
Debugging an RDP Error

Below steps will allow you to connect to AEM CLI console and look at the logs.

Enable the Access to Port 22

Before accessing the CLI, we need to make sure that access to port 22 (default ssh port) is open

From the SAP AEM Console, select your service that you want to debug



The screenshot shows the SAP AEM Services interface. On the left, there's a sidebar with icons for Mission Control, Cluster Manager, Mesh Manager, Designer, Catalog, and Runtime Manager. The main area is titled 'Services' and shows a grid of 13 services. One service, 'aws MontrealBroker-10.1', is highlighted with a red box. The service details are as follows:

Service Name	Type	Region	Description
eu1	SAP DEMO	(eu-central-1)	Enterprise 250 Class Christian Holtfurth Running
us1	GKE	- US Central (Iowa)	Enterprise 250 Class Christian Holtfurth Running
aws ap1	EKS	- Asia Pacific (Singapore)	Enterprise 250 Class Christian Holtfurth Running
aws sa1	EKS	- Africa (Cape Town)	Enterprise 250 Class Christian Holtfurth Running
aws MyMesh-Svc1	AKS	- East US 2 (Virginia)	Developer Class Karl Ossoinig Running
aws My-First-Service	EKS	- Canada Central(Montreal)	Enterprise 250 Class Andrea Kelso Running
aws BTP Hackathon September	EKS	- Canada Central(Montreal)	Developer Class brad.caldwell@solace.com Running
aws BTP Hackathon September	EKS	- Canada Central(Montreal)	Developer Class brad.caldwell@solace.com Running
aws cn1	AKS	- East Asia (Hong Kong)	Enterprise 250 Class Christian Holtfurth Running
aws MyMesh-Svc2	EKS	- US West (Oregon)	Developer Class Karl Ossoinig Running
test	GKE	- Asia South (Mumbai)	Enterprise 1K Class Christian Holtfurth Running

Select Manage and then Advanced Options

Event Broker Service Settings

Authentication
Enabled

Certificate Authorities
0 Client Certificate Authorities
1 Domain Certificate Authority

Client Profiles
1 Client Profile

Broker Manager Quick Settings

- Message VPN
- Clients
- Queues
- Access Control
- Bridges

This will open up New Advanced Management Options Page

Syslog Forwarding: Inactive

Add

Enable syslog forwarding to receive event, command and system service logs on a configured syslog server

Forwarding Destination Name	Hostname/IP Address	Port Number	Protocol Type	Syslog Facilities	Manage
No configured Syslog Facilities.					

Distributed Tracing: Disabled

Enable

Distributed tracing can help you track event movement across your mesh. [Learn more about distributed tracing](#)

Rotate Broker Passwords

This action will rotate the password used for this Event Broker Service and automatically update the console links with the new credentials. Rotating passwords does not change the password for your SAP Integration Suite, advanced event mesh Console login.

Pick the role on broker you would like to rotate:

Rotate messaging editor permissions
 Rotate messaging viewer permissions

Rotate Password

Scroll down to "Port Configuration" Section. On the Public Endpoint section, select "..." to edit the port configuration.

MontrealBroker-10.1

Status Connect Manage Monitoring Configuration Try Me! Open Broker Manager ...

Hostnames

Creating an event broker service automatically creates a unique hostname for the service. You can add five additional hostnames as alternatives. You can set any of these hostnames as the default and use it to access the Broker Manager.

Hostname	Assigned Endpoint	Manage
mr-connection-qhgik3f2ezp.messaging.solace.cloud * Default	Public Internet	...
montrealbroker.messaging.solace.cloud	Public Internet	...

Port Configuration

Add Endpoint

You can configure the ports of the protocols and endpoints that clients use to connect event broker services using the public Internet. [Learn more about port configuration](#)

Endpoints	Connectivity	Description	Manage
> Public Endpoint	Public Internet		...

SEMP Request Over Message Bus - Show Commands: Enabled

Solace Element Management Protocol (SEMP) Request Over Message Bus allows client applications to make SEMP requests over the message bus using defined topics. When enabled, only Show commands on the specified Message VPN are allowed. By enabling this, messaging applications that use APIs can only view your settings without changing them. [Learn more in the SEMP documentation](#)

Scroll down to "Management" and check the "Enable Secured CLI Host (SSH), use port" option. This will allow access to the broker command line utility

Edit Endpoint

Protocols and Management

To reduce security risks, we recommend that you disable the Secured CLI Host (SSH) port where your services have public connectivity.

Enable Secured Broker Management Host (SEMP), use port: 943

Enable Secured CLI Host (SSH), use port: 22

Save

Cluster Name: cluster-eks-ca-central-1a-b59k2gtd2i7

Go back to Manage Tab from Advanced Management Options page.

The screenshot shows the MontrealBroker-10.1 management interface. At the top, there is a navigation bar with links for Status, Connect, Manage, Monitoring, Configuration, and Try Me!. On the right side of the header, there are buttons for Open Broker Manager and more options. Below the header, there is a red box highlighting the < Back to Management link.

Syslog Forwarding: Inactive

Enable syslog forwarding to receive event, command and system service logs on a configured syslog server

Forwarding Destination Name	Hostname/IP Address	Port Number	Protocol Type	Syslog Facilities	Manage
No configured Syslog Facilities.					

Distributed Tracing: Disabled

Distributed tracing can help you track event movement across your mesh. [Learn more about distributed tracing](#)

Rotate Broker Passwords

This action will rotate the password used for this Event Broker Service and automatically update the console links with the new credentials. Rotating passwords does not change the password for your SAP Integration Suite, advanced event mesh Console login.

Pick the role on broker you would like to rotate:

Rotate messaging editor permissions
 Rotate messaging viewer permissions

[Rotate Password](#)

Get the hostname, management userid and password of the service. Make sure to get the viewer credentials

MontrealBroker-10.1

Status Connect Manage Monitoring Configuration Try Me!

Message VPN Clients Queues Access Control Bridges

Other Management Tools

- > SEMP - REST API
The Solace Element Management Protocol (SEMP) is a REST API that you can use to manage the Event Broker Service.
- < Broker Manager - Web Application
The Broker Manager is a browser-based administration console that you can use to manage the Event Broker Service.

Steps to Manage with Broker Manager

The steps below are for directly accessing the Broker Manager for this service which will require you to log in with the Broker Manager Credentials on the right. Please consider instead to use the buttons at the top of this page which will automatically log you into the Broker Manager.

- ① Access Broker Manager URL
<https://mr-connection-qhgik3f2ezp.messaging.solace.cloud:943/#/msg-vpns/bw9udH2lYWxlcmtZXItMTAMQ==>
TIP: All pages in the Broker Manager are able to be bookmarked for direct access.
- ② Enter Broker Manager Credentials
Username: montrealbroker-10-1-admin Password: *****

SolAdmin - Desktop Application
SolAdmin is a legacy desktop application that you can use to manage the Event Broker Service.

Broker Manager Credentials

Username: montrealbroker-10-1-admin

Password: *****

Viewers Credentials

Username: montrealbroker-10-1-view

Password: *****

Accessing AEM Service Command Line Utility

8. Use any commandline utility and ssh to the service using valid hostname, userid and password as below:

```
ssh userid@hostname
```

```
nehasinha@NehaSinha ~ % ssh us-central-view@mr-connection-71adn5h/gpz.messaging.solace.cloud
The authenticity of host 'mr-connection-71adn5h/gpz.messaging.solace.cloud (20.84.193.164)' can't be established.
ECDSA key fingerprint is SHA256:76S4TDtsUSvULcUtt3g5ogwYmJuup+tU4AAcpKJctNo.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'mr-connection-71adn5h/gpz.messaging.solace.cloud' (ECDSA) to the list of known hosts.
Solace PubSub+ Enterprise
(us-central-view@mr-connection-71adn5h/gpz.messaging.solace.cloud) Password:

Solace PubSub+ Enterprise Version 10.2.1.32

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Operating Mode: Message Routing Node

developer-production-9g0t46eb3od-solace-primary-0>
```

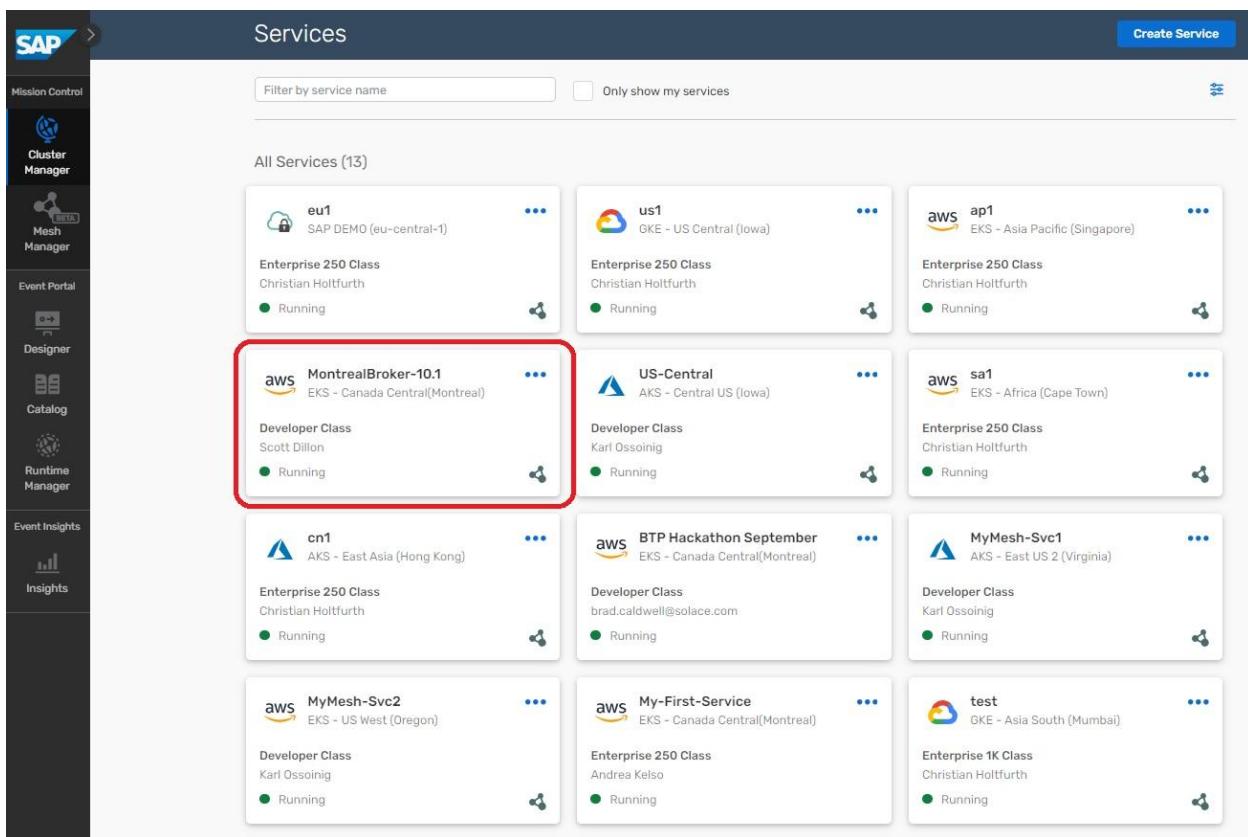
8. Now you can view the rdp error logs using the command

```
show log rest rest-delivery-point errors
```

This command will give you HTTP error (if any) that you might have received from BPA web endpoint.

Appendix – Creating Queues Manually for Section 4

If you want extra practice creating queues via the web console, you can follow these instructions and then return to section 4 to finish your configuration. Navigate to the main console and go to the cluster manager. From there, select the broker where you will be configuring your Rest Delivery Point.



The screenshot shows the SAP Cluster Manager Services page. On the left, there's a sidebar with icons for Mission Control, Cluster Manager (selected), Mesh Manager, Event Portal, Designer, Catalog, Runtime Manager, and Event Insights. The main area is titled 'Services' with a 'Create Service' button. A search bar and a 'Only show my services' checkbox are at the top. Below is a section titled 'All Services [13]' containing 13 items:

- eu1** SAP DEMO (eu-central-1)
Enterprise 250 Class
Christian Holtfurth
Running
- us1** GKE - US Central (Iowa)
Enterprise 250 Class
Christian Holtfurth
Running
- aws ap1** EKS - Asia Pacific (Singapore)
Enterprise 250 Class
Christian Holtfurth
Running
- aws MontrealBroker-10.1** EKS - Canada Central(Montreal)
Developer Class
Scott Dillon
Running
- US-Central** AKS - Central US (Iowa)
Developer Class
Karl Ossoinig
Running
- aws sa1** EKS - Africa (Cape Town)
Enterprise 250 Class
Christian Holtfurth
Running
- cn1** AKS - East Asia (Hong Kong)
Enterprise 250 Class
Christian Holtfurth
Running
- aws BTP Hackathon September** EKS - Canada Central(Montreal)
Developer Class
brad.caldwell@solace.com
Running
- MyMesh-Svc1** AKS - East US 2 (Virginia)
Developer Class
Karl Ossoinig
Running
- aws MyMesh-Svc2** EKS - US West (Oregon)
Developer Class
Karl Ossoinig
Running
- aws My-First-Service** EKS - Canada Central(Montreal)
Enterprise 250 Class
Andrea Kelso
Running
- test** GKE - Asia South (Mumbai)
Enterprise 1K Class
Christian Holtfurth
Running

The service 'MontrealBroker-10.1' is highlighted with a red box.

From this screen, you will select the manage option at the top.

You will then select "Queues" towards the middle of the screen. Selecting the Queue option will now re-direct you to a different screen and will open the Broker Manager for the selected broker.

On this screen, we will start by creating a Queue and Subscription that will be used to capture the items from the DMQ that users would like to start review processes for. Click on the "+Queue" option.

SAP Integration Hub - MontrealBroker-10-1

Queues

Queue Name	Incomming	Outgoing	Access Type	Partition Count	Messages Queued (%)	Messages Queued (msgs)	Messages Queued (MB)	Messages Queued Quota (MB)	Consumers	Replay State	Dura...
#amack/dmq	On	On	Exclusive	0	<div style="width: 0%; background-color: #ccc;"></div>	0	0	5,000	0	N/A	Yes
#cluster:58b2ca385481...	On	On	Exclusive	0	<div style="width: 0%; background-color: #ccc;"></div>	0	0	800,000	1	N/A	Yes
AEMPILOTASAPIO	On	On	Exclusive	0	<div style="width: 100%; background-color: #000;"></div>	161,575	69:12	5,000	0	N/A	Yes
AEMSALESORDERADDR...	On	On	Exclusive	0	<div style="width: 0%; background-color: #ccc;"></div>	0	0	5,000	0	N/A	Yes
BradDMQ	On	On	Exclusive	0	<div style="width: 0%; background-color: #ccc;"></div>	2	0.0012	5,000	0	N/A	Yes
BradDemo	On	On	Non-Exclusive	0	<div style="width: 0%; background-color: #ccc;"></div>	0	0	5,000	0	N/A	Yes
BradTest	On	On	Non-Exclusive	0	<div style="width: 0%; background-color: #ccc;"></div>	0	0	5,000	0	N/A	Yes
CIBusinessPartner	On	On	Exclusive	0	<div style="width: 100%; background-color: #000;"></div>	57	0.0190	50	0	N/A	Yes
CIBusinessPartnerChec...	On	On	Exclusive	0	<div style="width: 100%; background-color: #000;"></div>	45	0.0155	50	0	N/A	Yes
CIBusinessPartnerChec...	On	On	Exclusive	0	<div style="width: 100%; background-color: #000;"></div>	28	0.0095	50	0	N/A	Yes
CIBusinessPartnerChec...	On	On	Exclusive	0	<div style="width: 0%; background-color: #ccc;"></div>	0	0	50	2	N/A	Yes
CIBusinessPartnerChec...	On	On	Exclusive	0	<div style="width: 0%; background-color: #ccc;"></div>	2	0.0006	50	0	N/A	Yes
CIBusinessPartnerConv...	On	On	Exclusive	0	<div style="width: 0%; background-color: #ccc;"></div>	0	0	50	0	N/A	Yes
CLLegacyAdapterIn	On	On	Exclusive	0	<div style="width: 0%; background-color: #ccc;"></div>	0	0	50	2	N/A	Yes
CLLegacyAdapterInDMQ	On	On	Exclusive	0	<div style="width: 100%; background-color: #000;"></div>	38	0.0230	50	1	N/A	Yes
CLLegacyAdapterOut	On	On	Exclusive	0	<div style="width: 0%; background-color: #ccc;"></div>	3	0.0001	50	0	N/A	Yes
CISalesOrder	On	On	Exclusive	0	<div style="width: 100%; background-color: #000;"></div>	461	0.2874	50	0	N/A	Yes
CISalesOrderChecked	On	On	Exclusive	0	<div style="width: 0%; background-color: #ccc;"></div>	0	0	50	0	N/A	Yes

Create a new Queue with the name "SOREJECTED".

SAP Integration Hub - MontrealBroker-10-1

Queues

Queue Name	Incomming	Outgoing	Access Type	Partition Count	Messages Queued (%)	Messages Queued (msgs)	Messages Queued (MB)	Messages Queued Quota (MB)	Consumers	Replay State	Dura...
AEMSALESORDERADDR...	On	On	Exclusive	0	<div style="width: 0%; background-color: #ccc;"></div>	0	0	5,000	0	N/A	Yes
S4SALESORDERS	On	On	Exclusive	0	<div style="width: 100%; background-color: #000;"></div>	12,495	6.99	5,000	0	N/A	Yes
SOREJECTED	On	On	Exclusive	0	<div style="width: 0%; background-color: #ccc;"></div>	0	0	5,000	2	N/A	Yes
SO_WF	On	On	Exclusive	0	<div style="width: 0%; background-color: #ccc;"></div>	0	0	5,000	1	N/A	Yes

Now we will create a subscription that will capture all the messages that are being pushed out from the Integration Card. Messages are published from the Integration Card and then removed from the Queue. Add a Subscription by Clicking the "+Subscription" button and then add the subscription "sap.com/salesorder/rejected/V1". Once messages are received into this Queue, they will be picked up by the Integration Flow that will augment the schema of the message. This iFlow will publish a message that will be used to activate the Business Process Automation process.

The screenshot shows the SAP Fiori interface for managing queues. The left sidebar is for 'MontrealBroker-10.1' and includes 'Change VPN', 'Messaging' (with 'Message VPN' and 'Clients' options), and 'Queues'. The main area is titled 'Queues | SOREJECTED' and has tabs for 'Summary', 'Settings', 'Subscriptions' (which is active), 'Consumers', 'Messages Queued', and 'Stats'. Below the tabs is a search bar with placeholder 'Search by topic'. A red box highlights the first subscription entry: 'sap.com/salesorder/rejected/V1'.

Repeat the process to add another Queue called "SO_WF". Add a subscription for "sap.com/bpasalesorder/rejected/V1". The iFlow that enriches the SalesOrder publishes the new message using that topic.

This screenshot shows the same SAP Fiori interface as the previous one, but for a queue named 'SO_WF'. The left sidebar and top navigation are identical. The main area is titled 'Queues | SO_WF' and has the same tabs. A red box highlights the second subscription entry: 'sap.com/bpasalesorder/rejected/V1'.

Takeaways

- Understand concept of Dead Message Queues
- Understand how to use SAP BPA to process Dead Messages
- Understand how to use an iFlow with an Event for transformations
- Understand how to setup a Rest Delivery Point

