

## Business Process Automation and Advanced Event Mesh

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### Your Hosts

|   |   |  |
|---|---|--|
|  |  |  |
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|  |  |  |
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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.

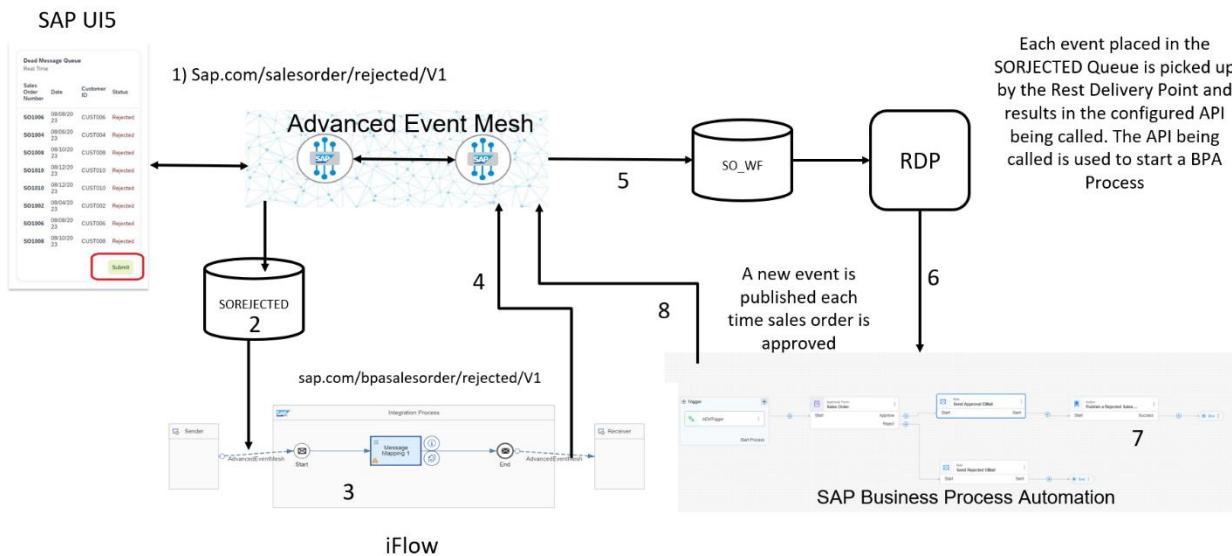
[Link to Blog](#)

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 configuration window with a JSON editor 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" ] } ] }
```

Next to the JSON editor is a "Create Configuration" button. Below the configuration window is a log pane 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 manage tab within the web console, towards the bottom, you will see "Other Management Tools", expand the "SEMP - REST API" section. From there, you can find the 4 pieces of information you need to execute the tool above.

The screenshot shows the Solace Event Broker Service Settings page. At the top, there are sections for Authentication (Enabled), Certificate Authorities (0 Client Certificate Authorities, 1 Domain Certificate Authority), and Client Profiles (1 Client Profile). Below this is a row of quick settings for Message VPN, Clients, Queues, Access Control, and Bridges. Under "Other Management Tools", the "SEMP - REST API" section is expanded, showing the base path to the config API (https://mr-connection-qhgik3f2ezp.messaging.solace.cloud:943/SEMP/v2/config) and the URL for the SEMP configuration (https://montrealbroker.messaging.solace.cloud:943/SEMP/v2/config). To the right, under "SEMP Credentials", are fields for "Message VPN Name" (montrealbroker-10-1), "Username" (montrealbroker-10-1-admin), and "Password" (\*\*\*\*\*). The "Username" and "Password" fields are highlighted with red boxes.

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 \*\*\*

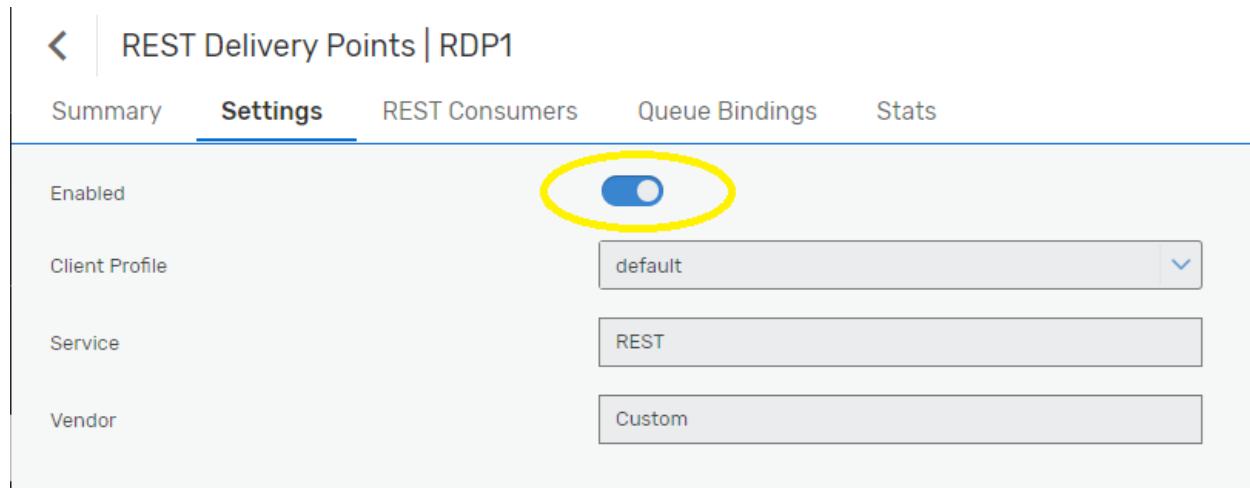


RDP or Rest Delivery Point is a frequently used feature on the AEM broker. Essentially, based on receipt of a certain event type, the broker can be configured to directly call a Rest Service.

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 AEM Broker web interface. On the left, there's a sidebar with navigation links: 'MontrealBroker-10.1', 'montréalbroker-10-1', 'Change VPN', 'Messaging' (with 'Message VPN' dropdown), 'Clients' (which is currently selected), 'Queues', 'Connectors', and 'Access Control'. The main content area has tabs at the top: 'Clients Summary', 'Solace Clients', 'MQTT', 'REST' (which is highlighted in blue), and 'AMQP'. Below these tabs, there's a search bar and two checkboxes labeled 'RDPs' and 'RDP1'. A central modal window titled 'Create REST Delivery Point' contains a 'RDP Name' input field with 'RDP1' typed into it. At the bottom right of the modal are 'Cancel' and 'Create' buttons. To the right of the modal, there's a summary card with 'Operational State: Up', 'Time: 0', and 'Connections Blocked (%): 0'. At the very top right, there's a user icon and the text 'montrealbroker-10-1-'.

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



REST Delivery Points | RDP1

Summary    **Settings**    REST Consumers    Queue Bindings    Stats

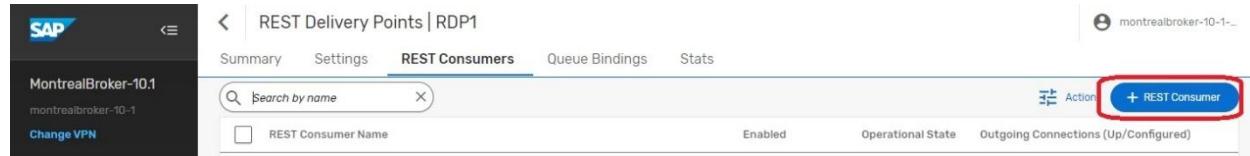
Enabled

Client Profile: default

Service: REST

Vendor: Custom

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



REST Delivery Points | RDP1

Summary    Settings    **REST Consumers**    Queue Bindings    Stats

+ REST Consumer

Enter "SO\_WF\_REST\_CONSUMER" and press "Create".



Create REST Consumer

REST Consumer Name: SO\_WF\_REST\_CONSUMER

Cancel    **Create**

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

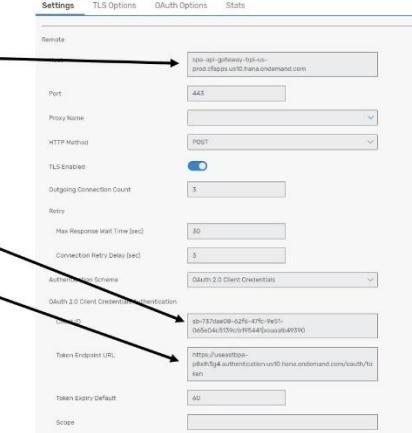
From the BTP Cockpit, we need to find the service key for the BPA Service. Navigate to the sub-account where you can find the BPA service. From there, click on the "Instances and Subscriptions" and navigate to the 3 "..." at the end.

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

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

## Service Key from BTP

```
"endpoints": {
    "api": "https://spa-api-gat[REDACTED]"
},
"html5-apps-repo": {
    "app_host_id": "90e605-e05b-4654-a999-90de519f64b4,ad+b900b-4bf1-4965-a6a-d71ce7fc5300,9cd6ff5e-f33f-459e-90de-35e1b719e61,3be0da2-2508-4691-8794-575a6dd30303"
},
"maasregistryenabled": true,
"spacloud.service": "com.sap.spa.processautomation",
"spacloud.service.alias": "spa",
"uaa": [
    {
        "clientid": "sb-737date08-62f6[REDACTED]",
        "clientsecret": "e99592d[REDACTED]JRTpWaXu192w7sFOCiZNkHT1ULSYamF3Jc==",
        "url": "http://usestable-p8xih3y1.authentication.us10.hana.ondemand.com",
        "identityzoneid": "e349f1cc-8212-402c-8f39-f869fa3eaa1",
        "tenantid": "e349f1cc-8212-402c-8f39-f869fa3eaa1",
        "tenantmode": "shared",
        "suburi": "https://internal-xmua.authentication.us10.hana.ondemand.com",
        "apiuri": "https://api.authentication.us10.hana.ondemand.com",
        "verificationkey": "...-BEGIN PUBLIC KEY-----MIIBIjANBQghkiG9W0BAECEAAQSAMIIIBQCAEAXpi3cz3sDf7tY9aJDX/nExr4cNj86StKu1KdC6oW6t9SHWf4Wz4DkgdXhWVW/KDR16mPd6I8WvHmnKCNJSh10RdbKJwuRGuBub6lCwUpzNfQ0TzUtxYm8GK0XV23eINnQ2z2/30/241/ANR05dkC/mfBvW/24f66VRNmuXhs10RdbKJwuRGuBub6lCwUpzNfQ0TzUtxYm8GK0XV23e2Daq7STUzC/73jJR16CgeCHNFne5L5LCKJ+f4mp+PbX+9Kz2a0eedaFl/apsRdr0koFNBQg+Jf9f4Brk1Vld17QF4/AMfeVIz2S+Df7tY9aJDX/nExr4cNj86StKu1KdC6oW6t9SHWf4Wz4DkgdXhWVW/KDR16mPd6I8WvHmnKCNJSh10RdbKJwuRGuBub6lCwUpzNfQ0TzUtxYm8GK0XV23e-----END PUBLIC KEY-----",
        "subaccountid": "e349f1cc-8212-402c-8f39-f869fa3eaa1",
        "uaadomain": "authentication.us10.hana.ondemand.com",
        "zoneid": "e349f1cc-8212-402c-8f39-f869fa3eaa1",
        "credential-type": "binding-secret"
    }
]
```



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-  
065e04c5139c1b195441|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. A search bar and a "Request Header" button are at the top. Below is a table with two rows:

| Header Name  | Header Value     |
|--------------|------------------|
| Content-Type | application/json |

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

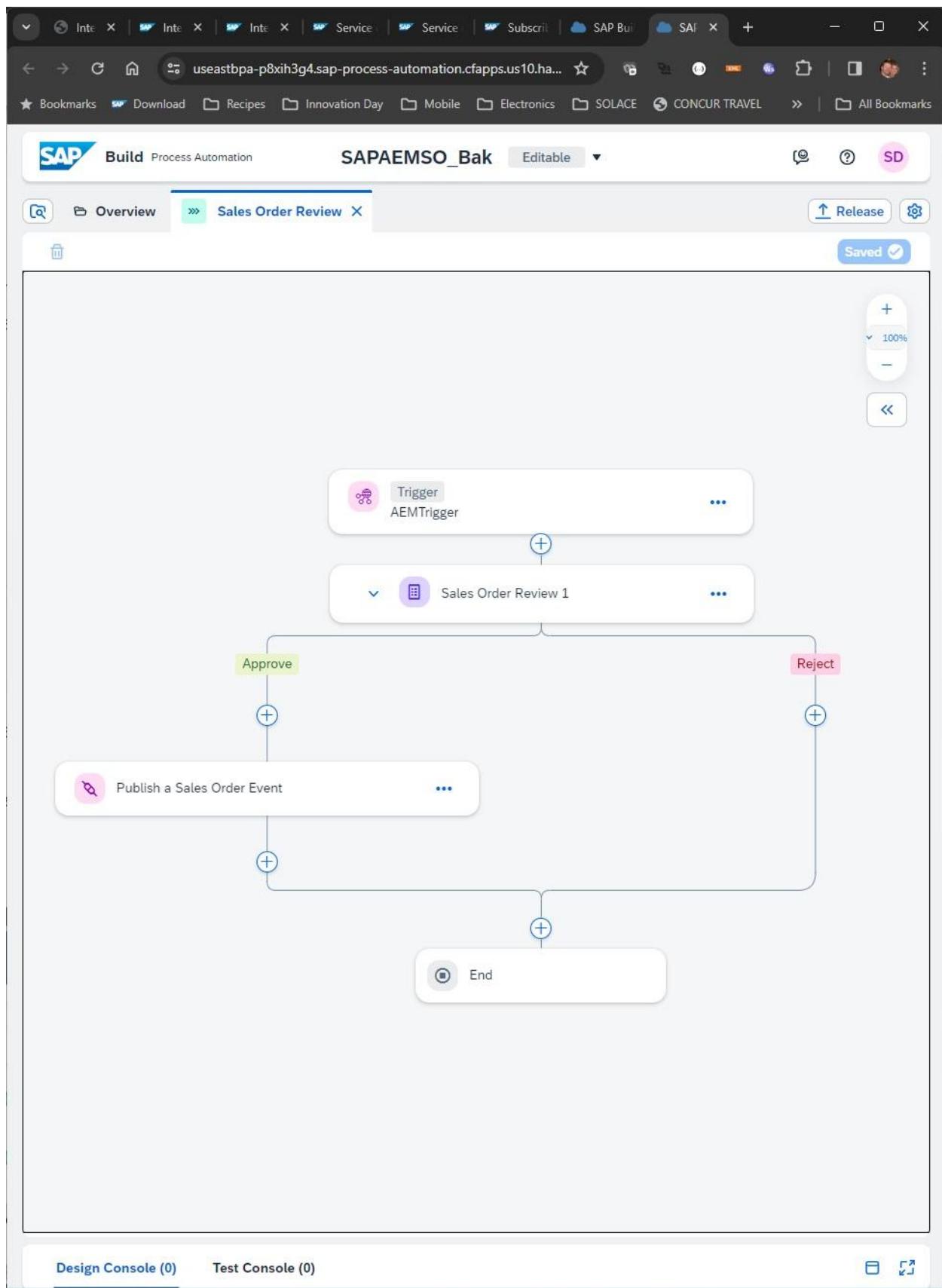
| Asset Type      | Asset Name          | Action | Operational State |
|-----------------|---------------------|--------|-------------------|
| Connector / RDP | RDP1                |        | Up                |
| RDP Client      | #rdp/RDP1           |        | N/A               |
| REST Consumer   | 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.

SAP | MontrealBroker-10.1

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

Connect Using a Supported Client Library

Select a connection point and supported client library below to start messaging.

View by: Protocol Expand all

- > Solace Messaging Start messaging with client libraries that use the Solace Message Format (SMF) protocol over TCP.
- > Solace Web Messaging Start messaging with client libraries that use the Solace Message Format (SMF) protocol over Web Sockets or HTTP.
- > AMQP Start messaging with open APIs that use the AMQP.
- > MQTT Start messaging with open APIs that use the MQTT protocol.
- > REST Start messaging with the Solace Messaging REST API.

**solace•**

**solace•**

**AMQP**

**MQTT**

**REST**

**Client Libraries**

**solace•** Solace REST Messaging API REST Get Started

**Connection Details**

Username: solace-cloud-client

Password: 3cp8ujsrcu9776rrt0dos20

Secured REST Host: 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" with two rows:

| Type | Name          | Authentication      | ProxyType  |
|------|---------------|---------------------|--|
| HTTP | AEMBROKERREST | BasicAuthentication | Internet<br>https://montrealbroker.messaging.solace.cloud:9443 |

Below the table is another table titled "Destination Configuration" for the "AEMBROKERREST" destination:

| Name:           | AEMBROKERREST                                      | Additional Properties  |      |
|-----------------|--|--|------|
| Type:           | HTTP   | sap.applicationde...   | true |
| Description:    | Rest Endpoint for AEM Broker                       | sap.processaut...  | true |
| URL:            | https://montrealbroker.messaging.solace.cloud:9443 | <input checked="" type="checkbox"/> Use default JDK truststore |      |
| Proxy Type:     | Internet   |  |      |
| Authentication: | BasicAuthentication                                |  |      |
| User:           | solace-cloud-client                                |  |      |
| Password:       | *****  |  |      |

At the bottom of the configuration section are buttons: 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](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

- Learning: Access our SAP Build Learning Journeys
- Learning: Usability & Layout Improvements in the Process Editor
- Template: Create a Change and Innovation Approval Process

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

- Learning: Access our SAP Build Learning Journeys
- Learning: Usability & Layout Improvements in the Process Editor

All Projects (1)

| Name     | Versions                     | Type               | Last Accessed  | Members | Options |
|----------|------------------------------|--------------------|----------------|---------|---------|
| SAPAEMSO | 2 Available<br>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 interface with the 'Destinations' section selected. The 'Destinations' table lists one item:

| Name & Description                            | Type | Host Address                   | Authentication Type | Actions              |
|---|------|--------------------------------|---------------------|----------------------|
| AEMBROKERREST<br>Rest Endpoint for AEM Broker | HTTP | https://montrealbroker.mess... | BasicAuthentication | <a href="#">Edit</a> |

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 'Welcome to SAP Build' with the subtext '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 'All Projects (1)' with a table:

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

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 'SAP Build Process Automation' page for the 'SAPAEMSO' project. At the top right, there's a red box around the 'Release' button. The main content area shows project details like 'Last updated on: October 14, 2023' and 'Created on: October 14, 2023'. Below this is a table of artifacts:

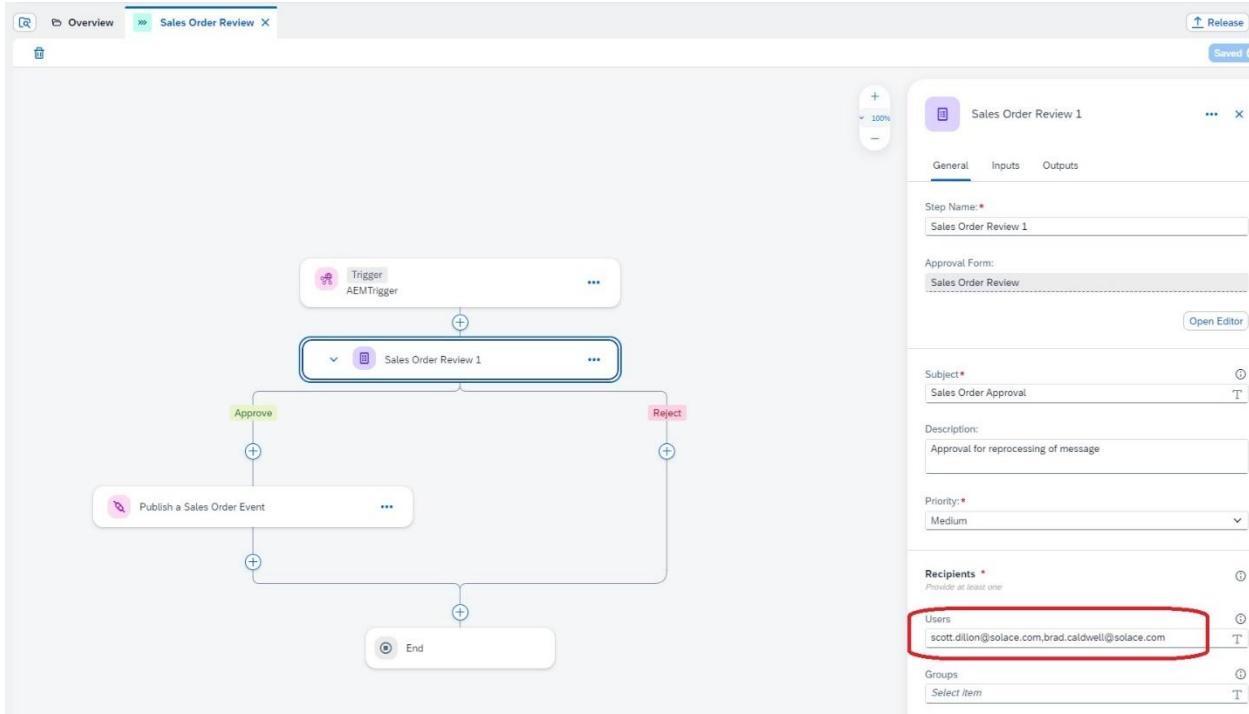
| Name                      | Description | Type      | Last edited | Last edited by          | Created On       |
|---------------------------|-------------|-----------|-------------|-------------------------|------------------|
| customer                  |             | Data Type | 2 days ago  | scott.dillon@solace.com | October 14, 2023 |
| End                       |             | Process   | 2 days ago  | scott.dillon@solace.com | October 14, 2023 |
| orderHeader               |             | Data Type | 2 days ago  | scott.dillon@solace.com | October 14, 2023 |
| orderHeaderList           |             | Data Type | 2 days ago  | scott.dillon@solace.com | October 14, 2023 |
| orderItem                 |             | Data Type | 2 days ago  | scott.dillon@solace.com | October 14, 2023 |
| orderSchedule             |             | Data Type | 2 days ago  | scott.dillon@solace.com | October 14, 2023 |
| <b>Sales Order Review</b> |             | Process   | 2 days ago  | scott.dillon@solace.com | October 14, 2023 |
| Sales Order Review        |             | Form      | 2 days ago  | scott.dillon@solace.com | October 14, 2023 |
| SalesOrderItem            |             | Data Type | 2 days ago  | scott.dillon@solace.com | October 14, 2023 |
| TestForm                  |             | Form      | 2 days ago  | scott.dillon@solace.com | October 14, 2023 |

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 navigation bar with the SAP logo, 'Build Process Automation', and a dropdown menu showing 'SAPAEMSO 3.1.1 Released'. Below the navigation bar, there is a section titled 'SAPAEMSO 3.1.1 Released' with a 'Creation' button. This section includes details like 'Created On: February 26, 2024', 'Agent version: No value', and 'Collaborators: You'. Below this, there are tabs for 'Artifacts (9)', 'Triggers (1)', and 'Dependencies (3)'. At the bottom, there is a search bar for 'All Artifacts' and columns for 'Name', 'Description', and 'Type'. To the right of the main content, a modal dialog box titled 'Choose an Environment' is open. It contains a search bar and a list with a single item: 'Public'. A note below the list states: 'This public environment can be accessed by all registered users for this tenant.' and 'Active Version Deployed 3.0.0: (See 10 inactive)'. At the bottom of the modal are two buttons: 'Upgrade' (highlighted with a red box) and 'Undeploy'.

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 Automation interface. The main title bar reads "SAP Build Process Automation" and "SAPAEMSO - SAP Build Process". The status bar indicates "SAPAEMSO 3.0.2 DEPLOYED". The main content area is titled "Overview" and displays the process details for "SAPAEMSO 3.0.2 (DEPLOYED) (ACTIVE)". It includes sections for "Update" (last updated on October 16, 2023), "Creation" (created on October 14, 2023), "Bundle Size" (60.27 KB), "Agent version" (No value), and "Collaborators" (You). Below this, there are tabs for "Artifacts (10)", "Triggers (1)", and "Dependencies (1)". The "Artifacts (10)" tab is selected, showing a table with 10 entries:

| 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      |

At the bottom, there is a "Deployment Console (0)" section.

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. The left sidebar has navigation links: Home, Discover, Design (selected), Integrations, Monitor, Inspect, and Settings. The main area shows a content package named 'Integrations / SOLACE-TIGER-TEAM / SOLACE-TIGER-TEAM'. It displays the following details: Package to be used by Tiger Team Members, Vendor, Mode: Editable, Version: 1.0. Below this, there are tabs for Overview, Artifacts (21) (selected), Documents, and Tags. A 'Filter Artifacts' input field is present. The 'Artifacts' table lists 21 entries, each with a checkbox, Name, Type, Version, and Actions (represented by a copy icon). The entries include:

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

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 (21) 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 components: 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: \*

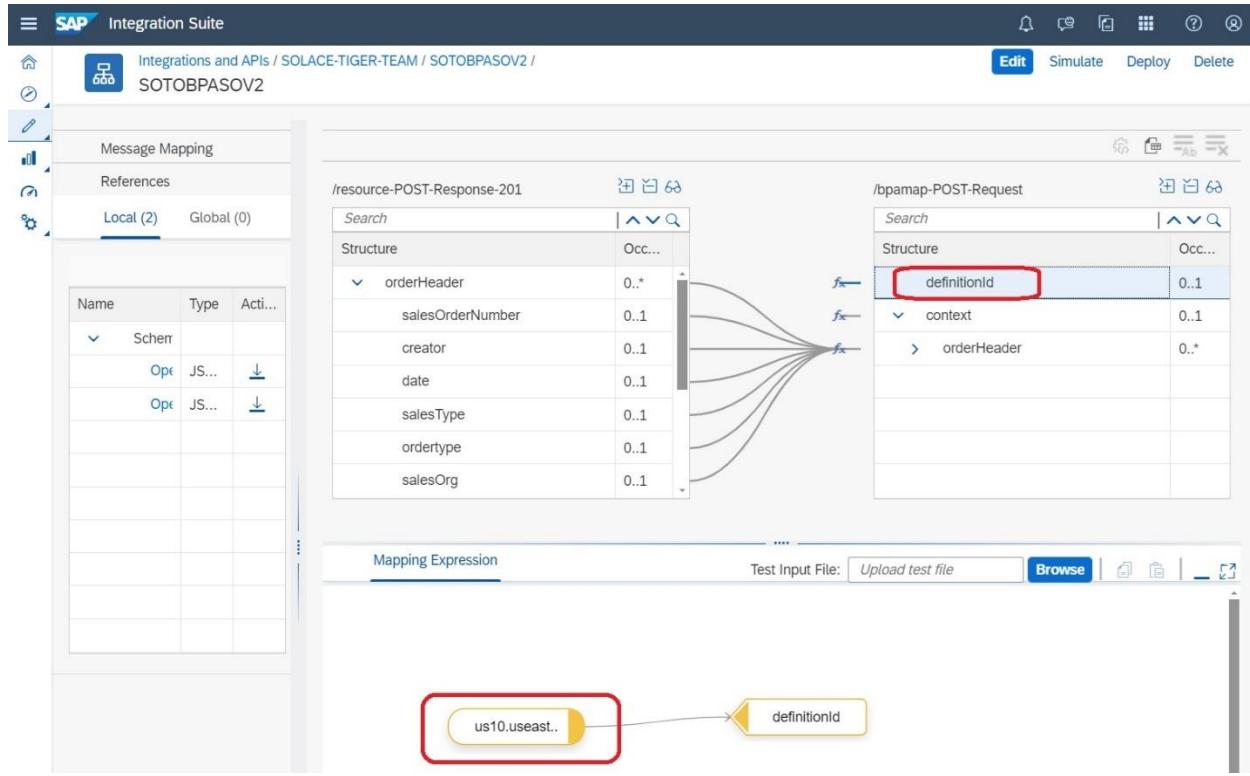
*Description*

Description:

[Add and Open in Editor](#)

[Cancel](#)

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. From there, on the left side, Click "Monitoring" and then "Processes and Workflows".

The screenshot shows the SAP Build interface with the 'Monitoring' tab selected in the sidebar. The main area is titled 'Monitor' and contains four cards:

- Process and Workflow Instances**: Shows 0 failed today.
- Automation Jobs**: Shows 0 errors today.
- Acquired Events**: Shows 0 errors today.
- Automation Overview**: Shows a heart rate monitor icon.

Below these cards is a section titled 'Automation Concurrent Quota Usage Today' with two rows of data:

| Simultaneous execution |     |
|------------------------|-----|
| Unattended             | 0/0 |
| Attended               | 0/0 |

At the bottom is a 'Manage' section with three cards:

- Processes and Workflows**: Shows 3 deployed.
- Visibility Scenarios**: Shows 0 deployed.
- Business Rules**: Shows a gear icon.

You should now see the "Sales Order Review" process listed and right below it you should see the ID. This is the ID you want to copy and paste into the iFlow mapping section. 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. \*\*\* If for some reason, the Sales Order Review process is not visible, select "Navigation" at the top to select Sales Order Review.

The screenshot shows the SAP Build interface with the 'Navigation' tab selected in the sidebar. The main area displays the 'Sales Order Review' process details:

- Navigation**: Shows the path: Monitoring / Process and Workflow Definition / Sales Order Review.
- Sales Order Review**: Shows the process name.
- ID: us10.useastbpa-pbx**: The process ID is highlighted with a red box.
- Show Instances**, **Start New Instance**, and **Download Model** buttons are visible.
- Version: 13** and **Project: SAPAEMSO v3.1.1** are displayed at the bottom.

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                             | Type                               | Status  |
|----------------------------------|------------------------------------|---------|
| AEM_ONBOARDING_SCENARIO          | Point to Point Onboarding Scenario | Created |
| AEMBusinessPartnerAddressCheck   | Created                            |         |
| AEMBusinessPartnerTransformUpper | Created                            |         |
| AEMLegacyInputAdapter            | Created                            |         |
| AEMLegacyOutputAdapter           | Created                            |         |
| AEMSalesOrderAddressCheck        |                                    |         |
| <b>Integration Flow</b>          |                                    |         |
| 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: \*

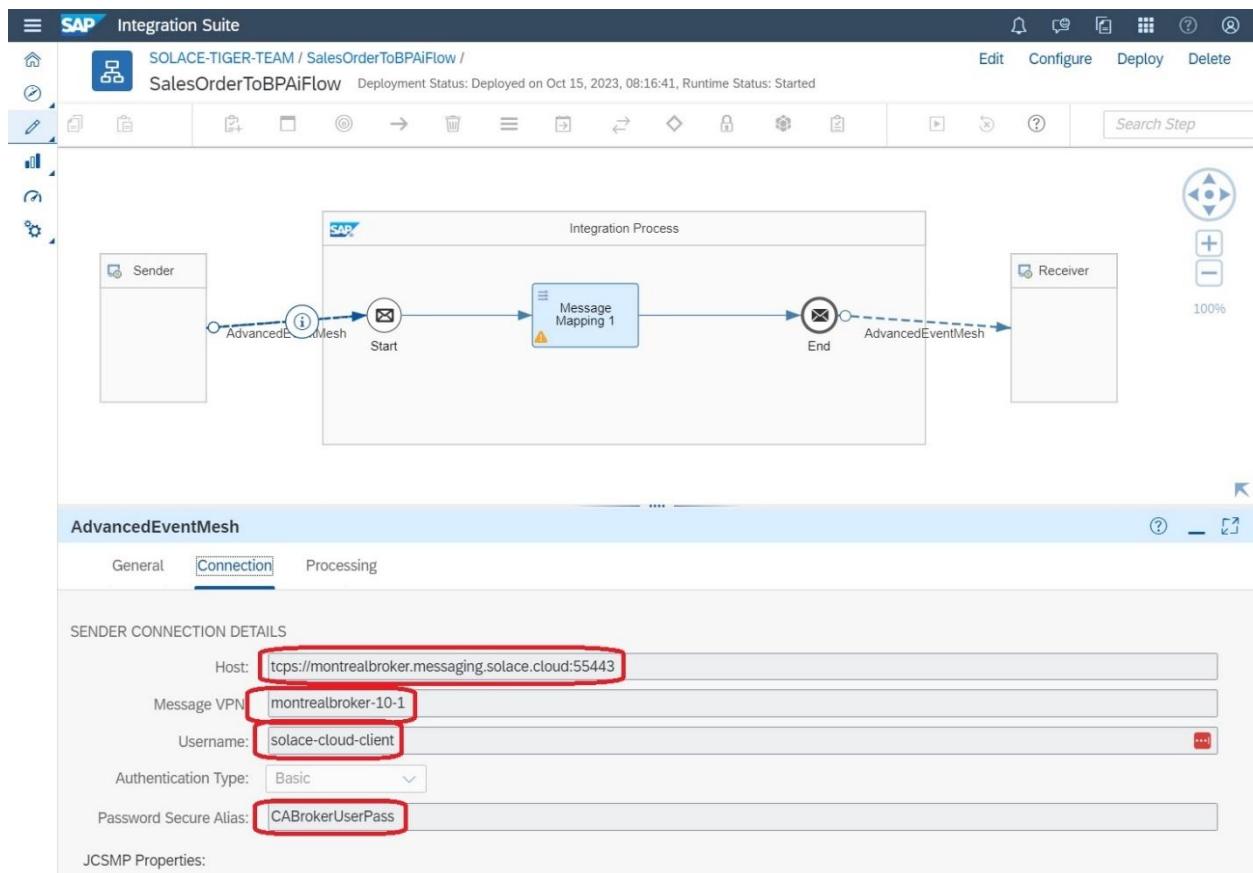
ID: \*

Description:

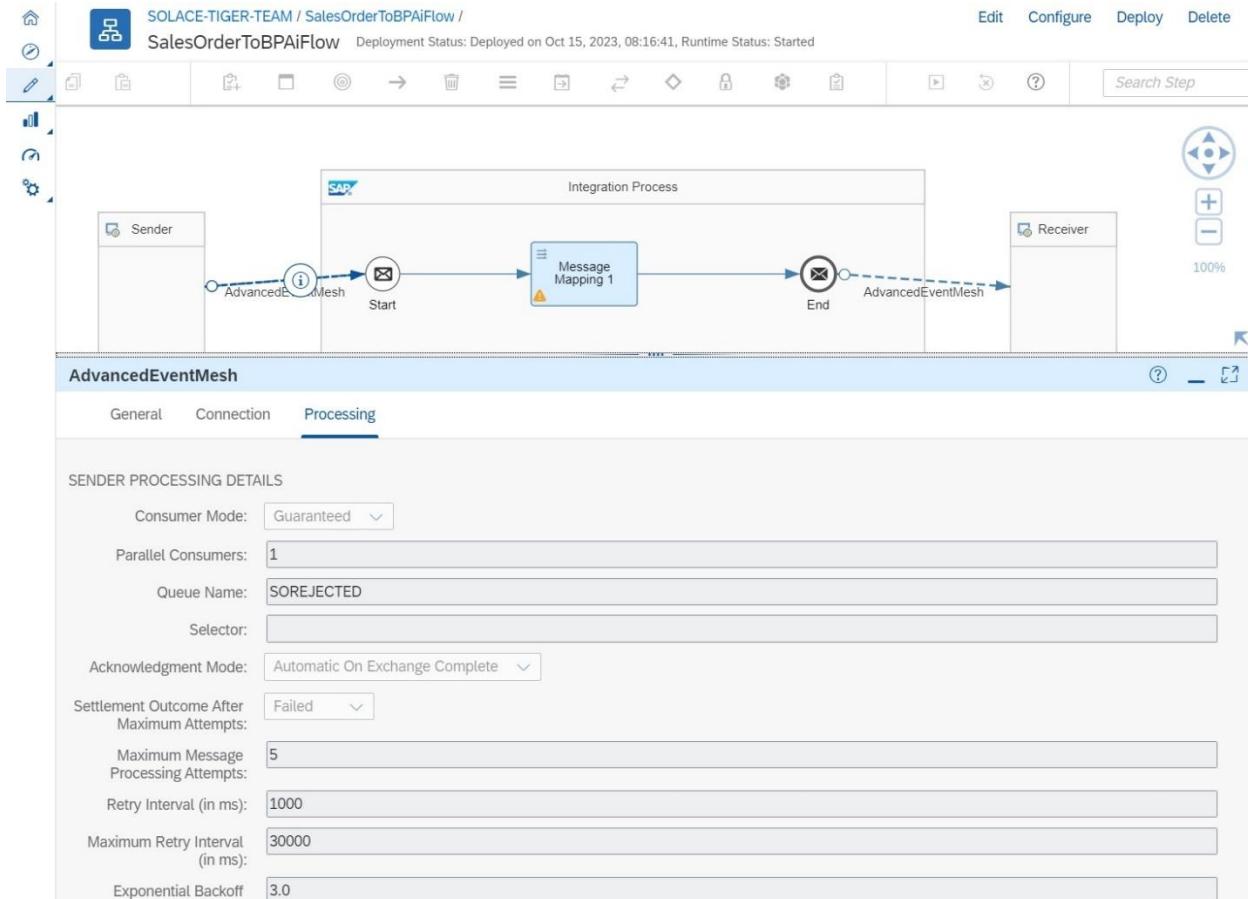
Sender:

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.



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.

| Artifact Name                                 | Type             | Status | Version                  | Action                        |
|---|------------------|--------|--------------------------|-------------------------------|
| DevTest1                                      |                  |        |                          | <a href="#">Edit</a>          |
| Created                                       |                  |        |                          |                               |
| halitest                                      |                  |        |                          | <a href="#">Edit</a>          |
| Created   Locked by: brad.caldwell@solace.com | Message Mapping  | 1.0.0  | <a href="#">View</a>     | <a href="#">More</a>          |
| JPTest  |                  |        |                          | <a href="#">Edit</a>          |
| Created   Unsaved Changes                     | Integration Flow | 1.0.0  | <a href="#">View</a>     | <a href="#">More</a>          |
| mmNotifTechnician                             |                  |        |                          | <a href="#">Edit</a>          |
| Created                                       | Message Mapping  | 1.0.2  | <a href="#">View</a>     | <a href="#">More</a>          |
| NotificationsToWF                             |                  |        |                          | <a href="#">Edit</a>          |
| Created                                       | Integration Flow | 1.0.2  | <a href="#">View</a>     | <a href="#">More</a>          |
| NotificationsToWF_copy                        |                  |        |                          | <a href="#">Edit</a>          |
| Created                                       | Integration Flow | 1.0.5  | <a href="#">View</a>     | <a href="#">More</a>          |
| NotificationsViaAMQP                          |                  |        |                          | <a href="#">Edit</a>          |
| Created                                       | Integration Flow | 1.0.2  | <a href="#">View</a>     | <a href="#">More</a>          |
| PubSubPlusAdapterSample                       |                  |        |                          | <a href="#">Edit</a>          |
| Created                                       | Integration Flow | Draft  | <a href="#">View</a>     | <a href="#">More</a>          |
| SalesOrderOrchestration                       |                  |        |                          | <a href="#">Edit</a>          |
| Created                                       | Integration Flow | Draft  | <a href="#">View</a>     | <a href="#">More</a>          |
| SalesOrderOrchestration                       |                  |        |                          | <a href="#">Edit</a>          |
| Created                                       | Integration Flow | Draft  | <a href="#">View</a>     | <a href="#">More</a>          |
| SalesOrderToBPASalesOrderMM                   |                  |        |                          | <a href="#">Edit</a>          |
| Created                                       | Message Mapping  | Draft  | <a href="#">Copy</a>     | <a href="#">View metadata</a> |
|   |                  |        | <a href="#">Download</a> | <a href="#">Configure</a>     |
|   |                  |        | <a href="#">Deploy</a>   |                               |

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         | Entries |
| Keystore          | 10      |

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

Create [Upload](#) [Edit](#) [Delete](#) [Filter by Name or Deployed By](#) [Search](#) [Settings](#)

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 <▼ **Red Box**

Inspect >

Settings >

Integrations / Design

Packages (11)

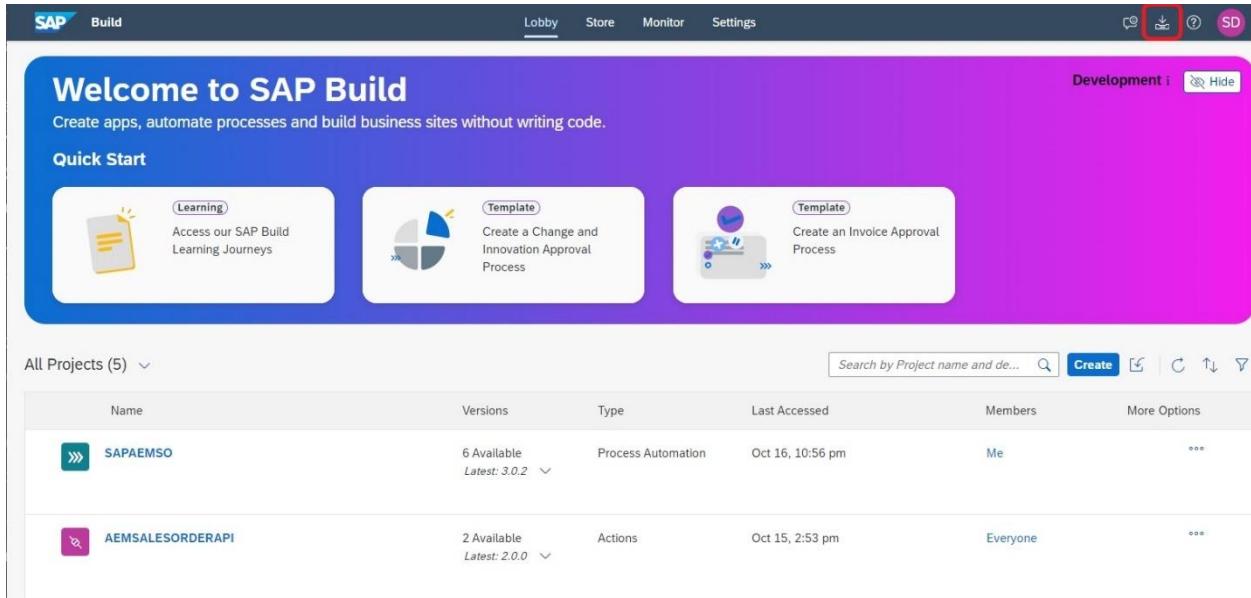
| Name              | Mode     |
|-------------------|----------|
| AEM-Rapid-Pilot   | Editable |
| AEMAdapter-EATest | Editable |

# 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 several icons, including one for inbox messages which is highlighted with a red box. Below the navigation bar is a purple header section 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 purple header is a search bar labeled "Search by Project name and de..." with a magnifying glass icon, a "Create" button, and other filter icons. A dropdown menu shows "All Projects (5) ▾". The main content area displays a table of projects:

| Name             | Versions                     | Type               | Last Accessed    | Members  | More Options |
|------------------|------------------------------|--------------------|------------------|----------|--------------|
| SAPAEMSO         | 6 Available<br>Latest: 3.0.2 | Process Automation | Oct 16, 10:56 pm | Me       | ***          |
| AEMSALESORDERAPI | 2 Available<br>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)

C

|                       |        |
|-----------------------|--------|
| Sales Order Review    | Medium |
| sb-clone-390ed564-... |        |

### Sales Order

## AEM RAPID PILOT - BPA Sales Order Sample

#### Sales Order Header

Sales Order Number \*

SalesType

Date

Sales Org

Distribution Channel

#### Customer Details

Customer

| Customer Id | Customer Name | ZipCode |
|-------------|---------------|---------|
| CUST002     | XYZ Ltd       | 54321   |

#### Sales Order Items

Order Items

| Item    | Material | Material Type |
|---------|----------|---------------|
| ITEM002 | MAT002   | Service       |

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.

The screenshot shows the SAP Integration Cloud Mesh Manager interface. On the left, there's a sidebar with icons for Mesh Manager, Event Portal, Designer, Catalog, Runtime Manager, Event Insights, and Insights. The main area has two tabs: 'Publisher' and 'Subscriber'. Both tabs show 'Endpoint Connectivity' with a dropdown set to 'Public Endpoint (Public Internet)'. Under the 'Publisher' tab, there's a 'Result' section with three tabs: 'HTML', 'SCSS', and 'Babel' (selected), and a 'CodePen' button. It shows a step-by-step process: 1. Establish connection (with 'Connect' and 'Disconnect' buttons), 2. Publish (Topic: sap.com/salesorder/rejected/V1, Message: JSON structure with 'orderHeader' and 'salesOrderNumber' fields, binary/text radio button, and 'Publish' button). Below it is a 'Publish Status' box stating '2 message(s) published'. Under the 'Subscriber' tab, there's also a 'Result' section with 'HTML', 'SCSS', 'Babel' tabs and a 'CodePen' button. It shows a step-by-step process: 1. Establish connection (with 'Connect' and 'Disconnect' buttons), 2. Subscribe (Add Topic: sap.com/bpasalesorder/rejected/V1, 'Subscribe' button). Below it is a 'Messages' section with a log entry: '11:31:03 PM [Topic sap.com/bpasalesorder/rejected/V1]'. The log shows a hex dump of the received message.

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**

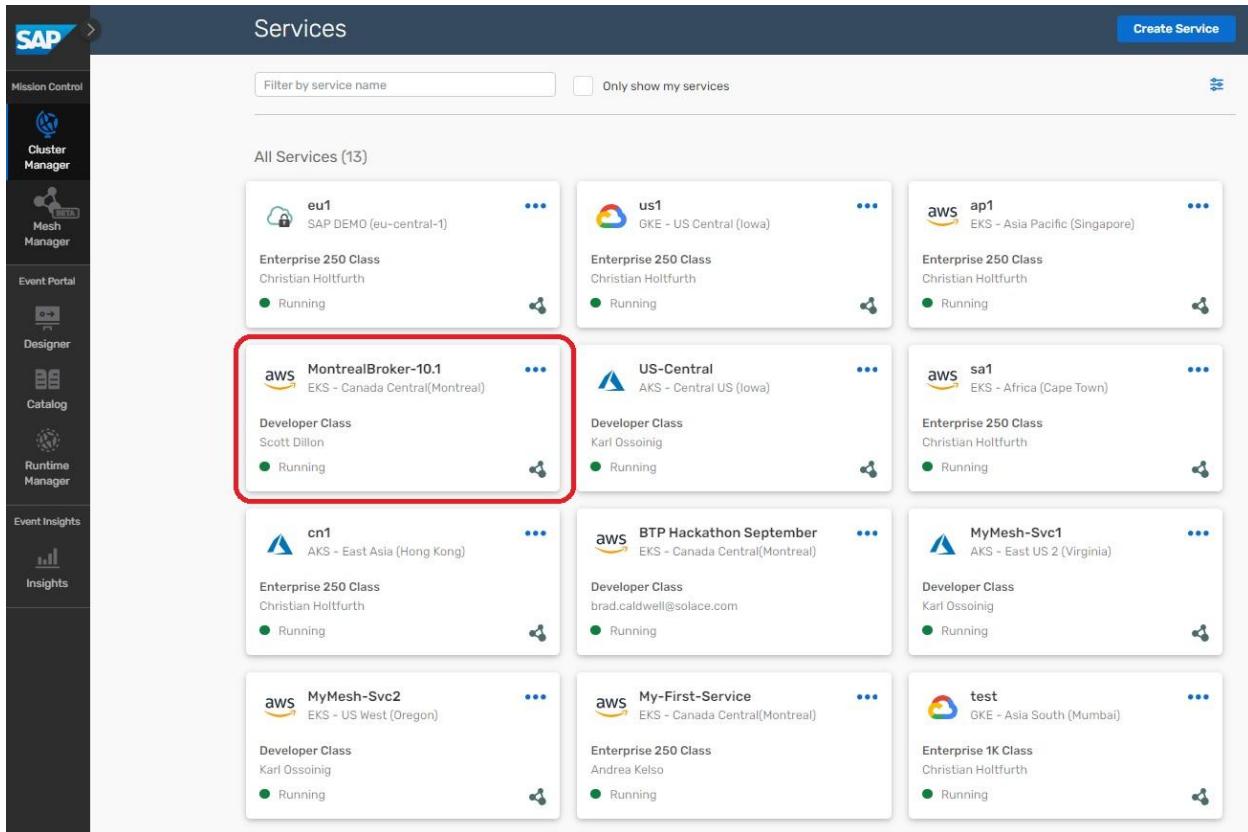
# Debugging an RDP Error

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 Console Services page. 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<br>Christian Holtfurth<br>Running |
| us1                         | GKE           | - US Central (Iowa)        | Enterprise 250 Class<br>Christian Holtfurth<br>Running |
| aws ap1                     | EKS           | - Asia Pacific (Singapore) | Enterprise 250 Class<br>Christian Holtfurth<br>Running |
| aws sa1                     | EKS           | - Africa (Cape Town)       | Enterprise 250 Class<br>Christian Holtfurth<br>Running |
| aws MyMesh-Svc1             | AKS           | - East US 2 (Virginia)     | Developer Class<br>Karl Ossoinig<br>Running            |
| aws MyFirst-Service         | EKS           | - Canada Central(Montreal) | Enterprise 250 Class<br>Andrea Kelso<br>Running        |
| aws test                    | GKE           | - Asia South (Mumbai)      | Enterprise 1K Class<br>Christian Holtfurth<br>Running  |
| aws BTP Hackathon September | EKS           | - Canada Central(Montreal) | Developer Class<br>brad.caldwell@solace.com<br>Running |
| aws MyMesh-Svc2             | AKS           | - US West (Oregon)         | Developer Class<br>Karl Ossoinig<br>Running            |
| aws cn1                     | AWS           | - East Asia (Hong Kong)    | Enterprise 250 Class<br>Christian Holtfurth<br>Running |
| aws US-Central              | AKS           | - Central US (Iowa)        | Developer Class<br>Karl Ossoinig<br>Running            |
| aws Developer Class         | Amazon Lambda | -                          | Developer Class<br>Scott Dillon<br>Running             |

Select Manage and then Advanced Options

Event Broker Service Settings

**Advanced Options**

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.

The screenshot shows the Solace Broker Manager interface for the broker "MontrealBroker-10.1".

**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 <span style="color: red;">*</span> Default | Public Internet   | ...    |
| montrealbroker.messaging.solace.cloud   | Public Internet   | ...    |

**Port Configuration:**

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

MontrealBroker-10.1

Status    Connect    Manage    Monitoring    Configuration    Terminal

Hostnames    Edit Endpoint

Creating an event endpoint requires you to define one or more hostnames. These hostnames will be used to identify your broker to external clients.

Hostname

mr-connection-tester.montrealbroker.solacecloud.com

Port Configuration

You can configure port settings for each endpoint. You can also manage port settings for all endpoints.

Endpoints

> Public Endpoints

SEMP Requests

Solace Element Management Port (SEMP) requests are sent to the broker using the SEMP protocol. When enabled, clients can connect to the broker using the SEMP protocol without changing their application code.

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

Open Broker Manager    ...

Add

Manage

Add Endpoint

Manage

Save

**Edit Endpoint**

**Protocols and Management**

- > Solace Messaging    1 of 3 enabled
- > Solace Web Messaging    1 of 2 enabled    **Disable all**
- > AMQP    1 of 2 enabled    **Disable all**
- > MQTT    2 of 4 enabled    **Disable all**
- > REST    1 of 2 enabled    **Disable all**

**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

Cancel    Save

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, a red box highlights the 'Back to Management' link. The main content area is divided into three sections:

- Syslog Forwarding: Inactive**: A table with columns for Forwarding Destination Name, Hostname/IP Address, Port Number, Protocol Type, Syslog Facilities, and Manage. It shows "No configured Syslog Facilities." and includes an "Add" button.
- Distributed Tracing: Disabled**: Includes a status message "Distributed tracing can help you track event movement across your mesh. [Learn more about distributed tracing](#)" and an "Enable" button.
- Rotate Broker Passwords**: A section with instructions: "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." It asks "Pick the role on broker you would like to rotate:" and lists two options: "Rotate messaging editor permissions" and "Rotate messaging viewer permissions". It also features a "Rotate Password" button.

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

The screenshot shows the Solace Broker Manager interface for the service "MontrealBroker-10.1". The top navigation bar includes "Status", "Connect", "Manage", "Monitoring", "Configuration", "Try Me", "Open Broker Manager", and a "..." button. Below the navigation is a horizontal menu with tabs: "Message VPN", "Clients", "Queues", "Access Control", and "Bridges". A section titled "Other Management Tools" lists "SEMP - REST API", "Broker Manager - Web Application", and "SolAdmin - Desktop Application". The "Broker Manager - Web Application" section contains steps to manage with the Broker Manager, including a URL (redacted) and credentials for "montrealbroker-10-1-admin" and "montrealbroker-10-1-view". To the right, there are sections for "Broker Manager Credentials" and "Viewers Credentials", both with redacted fields. Icons for each tool are shown on the right.

## 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' and shows a grid of 13 services. Each service entry includes a logo, name, provider, location, class, owner, status, and three-dot options. The service 'MontrealBroker-10.1' (AWS, EKS - Canada Central(Montreal)) is highlighted with a red box. Other visible services include 'eu1' (SAP DEMO, eu-central-1), 'us1' (GKE - US Central (Iowa)), 'ap1' (EKS - Asia Pacific (Singapore)), 'us-central' (AKS - Central US (Iowa)), 'sa1' (EKS - Africa (Cape Town)), 'cn1' (AKS - East Asia (Hong Kong)), 'BTP Hackathon September' (EKS - Canada Central(Montreal)), 'MyMesh-Svc1' (AKS - East US 2 (Virginia)), 'MyMesh-Svc2' (EKS - US West (Oregon)), 'My-First-Service' (EKS - Canada Central(Montreal)), and 'test' (GKE - Asia South (Mumbai)).

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) | Consumed | Replay State | Dura... |
|--------------------------|-----------|----------|---------------|-----------------|---|------------------------|----------------------|----------------------------|----------|--------------|---------|
| #amack/dmq               | On        | On       | Exclusive     | 0               | <div style="width: 0%;"></div>                              | 0                      | 0                    | 5,000                      | 0        | N/A          | Yes     |
| #cluster:58b2ca385481... | On        | On       | Exclusive     | 0               | <div style="width: 0%;"></div>                              | 0                      | 0                    | 800,000                    | 1        | N/A          | Yes     |
| AEMPILOTASAPIO           | On        | On       | Exclusive     | 0               | <div style="width: 100%; background-color: #0070C0;"></div> | 161,575                | 69.12                | 5,000                      | 0        | N/A          | Yes     |
| AEMSALESORDERADDR...     | On        | On       | Exclusive     | 0               | <div style="width: 0%;"></div>                              | 0                      | 0                    | 5,000                      | 0        | N/A          | Yes     |
| BradDMQ                  | On        | On       | Exclusive     | 0               | <div style="width: 0%;"></div>                              | 2                      | 0.0012               | 5,000                      | 0        | N/A          | Yes     |
| BradDemo                 | On        | On       | Non-Exclusive | 0               | <div style="width: 0%;"></div>                              | 0                      | 0                    | 5,000                      | 0        | N/A          | Yes     |
| BradTest                 | On        | On       | Non-Exclusive | 0               | <div style="width: 0%;"></div>                              | 0                      | 0                    | 5,000                      | 0        | N/A          | Yes     |
| CIBusinessPartner        | On        | On       | Exclusive     | 0               | <div style="width: 10%; background-color: #0070C0;"></div>  | 57                     | 0.0190               | 50                         | 0        | N/A          | Yes     |
| CIBusinessPartnerChec... | On        | On       | Exclusive     | 0               | <div style="width: 10%; background-color: #0070C0;"></div>  | 45                     | 0.0155               | 50                         | 0        | N/A          | Yes     |
| CIBusinessPartnerChec... | On        | On       | Exclusive     | 0               | <div style="width: 10%; background-color: #0070C0;"></div>  | 28                     | 0.0095               | 50                         | 0        | N/A          | Yes     |
| CIBusinessPartnerChec... | On        | On       | Exclusive     | 0               | <div style="width: 0%;"></div>                              | 0                      | 0                    | 50                         | 2        | N/A          | Yes     |
| CIBusinessPartnerChec... | On        | On       | Exclusive     | 0               | <div style="width: 0%;"></div>                              | 2                      | 0.0006               | 50                         | 0        | N/A          | Yes     |
| CIBusinessPartnerConv... | On        | On       | Exclusive     | 0               | <div style="width: 0%;"></div>                              | 0                      | 0                    | 50                         | 0        | N/A          | Yes     |
| CLLegacyAdapterIn        | On        | On       | Exclusive     | 0               | <div style="width: 0%;"></div>                              | 0                      | 0                    | 50                         | 2        | N/A          | Yes     |
| CLLegacyAdapterInDMQ     | On        | On       | Exclusive     | 0               | <div style="width: 10%; background-color: #0070C0;"></div>  | 38                     | 0.0230               | 50                         | 1        | N/A          | Yes     |
| CLLegacyAdapterOut       | On        | On       | Exclusive     | 0               | <div style="width: 0%;"></div>                              | 3                      | 0.0001               | 50                         | 0        | N/A          | Yes     |
| CISalesOrder             | On        | On       | Exclusive     | 0               | <div style="width: 10%; background-color: #0070C0;"></div>  | 461                    | 0.2874               | 50                         | 0        | N/A          | Yes     |
| CISalesOrderChecked      | On        | On       | Exclusive     | 0               | <div style="width: 0%;"></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) | Consumed | Replay State | Dura... |
|----------------------|-----------|----------|-------------|-----------------|---|------------------------|----------------------|----------------------------|----------|--------------|---------|
| AEMSALESORDERADDR... | On        | On       | Exclusive   | 0               | <div style="width: 0%;"></div>                              | 0                      | 0                    | 5,000                      | 0        | N/A          | Yes     |
| S4SALESORDERS        | On        | On       | Exclusive   | 0               | <div style="width: 100%; background-color: #0070C0;"></div> | 12,435                 | 6.99                 | 5,000                      | 0        | N/A          | Yes     |
| <b>SOREJECTED</b>    | On        | On       | Exclusive   | 0               | <div style="width: 0%;"></div>                              | 0                      | 0                    | 5,000                      | 2        | N/A          | Yes     |
| SO_WF                | On        | On       | Exclusive   | 0               | <div style="width: 0%;"></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 'sap.com/salesorder/rejected/V1' entry in the list of topics.

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 'sap.com/bpasalesorder/rejected/V1' entry in the list of topics under the 'Subscriptions' tab.

## 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

