

Event Enable SAP Using SAP Advanced Event Mesh - Day 3

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Event Enable SAP Using SAP Advanced Event Mesh - Day 3

1. What you'll learn: Overview

Day 3 of 5. Topics covered :

- Configuring an AEM brokers' queues and topic subscriptions.
- Event enabling integration flows and connecting them to AEM brokers to create event-driven integration flows.
- How to use the broker's config APIs to automate configuration and enable CI/CD pipelines.
- Fine-grained security access in AEM.

2. What you need: Prerequisites

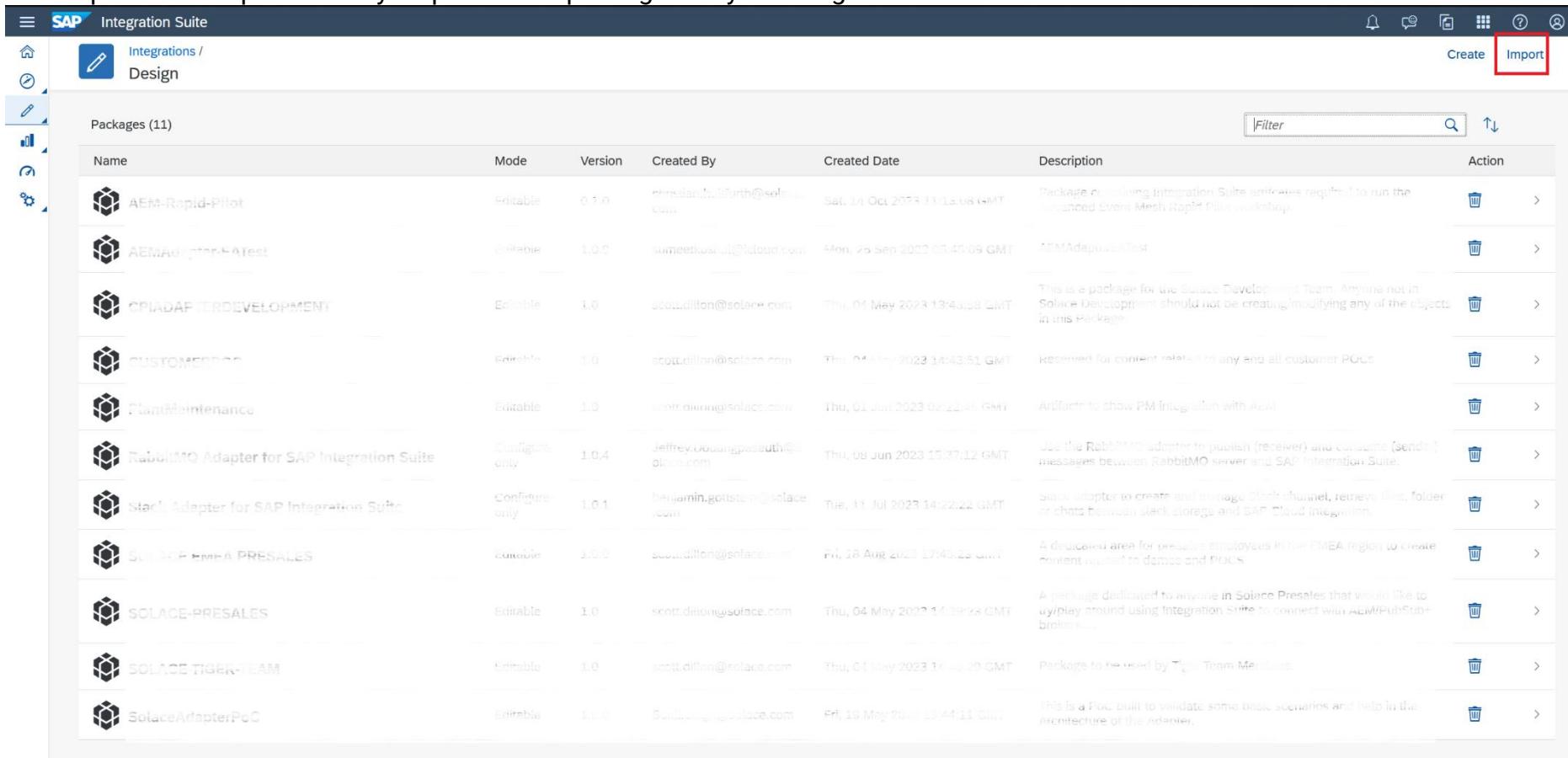
- Complete all activities in day 1 & 2.
You access and use the same broker you setup previously as well as the simulator to push events for testing.
- Have access to an active Integration Suite Cloud Integration tenant.
- Have an SFTP server and account credentials if you want to test successful integration of events to a file based interface of a legacy system (**optional**).
- Access to SAP Data Quality Management for location data via a provided service instance (by your hosts) or permission to activate or use your own instance.
(We'll show you how to activate one, if you don't have it already). (**optional**)

3. Set up Integration Suite and Import Event Enabled Integration Flows

A) Download and import the template integration flows package

Download [AEM-Rapid-Pilot-day3.zip](#)

And Import AEM-Rapid-Pilot-day3.zip as a new package into your Integration Suite tenant:



The screenshot shows the SAP Integration Suite interface. The top navigation bar includes icons for Home, Integrations / Design, Create, and Import (which is highlighted with a red box). The main content area displays a table titled "Packages (11)". The table has columns for Name, Mode, Version, Created By, Created Date, Description, and Action. Each row represents a different package, such as "AEM-Rapid-Pilot", "AEMAdapter-A-test", "CPIADAPTERDEVELOPMENT", etc. The "Import" button in the top right corner is specifically highlighted.

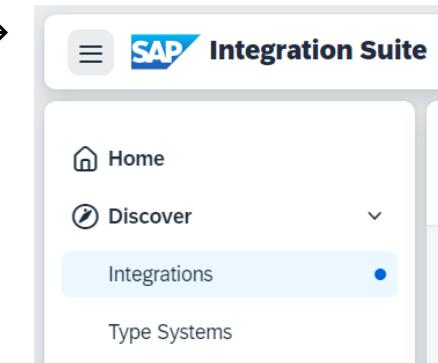
Name	Mode	Version	Created By	Created Date	Description	Action
AEM-Rapid-Pilot	Editable	0.1.0	christian.murth@solace.com	Sat, 14 Oct 2023 10:14:08 GMT	Package containing Integration Suite artifacts required to run the Advanced Event Mesh Rapid Pilot workshop.	
AEMAdapter-A-test	Editable	1.0.0	someetkumar@cloud.sap.com	Mon, 25 Sep 2023 03:45:09 GMT	AEMAdapter-A-test	
CPIADAPTERDEVELOPMENT	Editable	1.0	scott.dillon@solace.com	Thu, 04 May 2023 13:43:00 GMT	This is a package for the Solace Development Team. Anyone not in Solace Development should not be creating/modifying any of the objects in this Package.	
CUSTOMCODES	Editable	1.0	scott.dillon@solace.com	Thu, 04 May 2023 13:43:51 GMT	Reserved for content related to any end all customer POCs	
PlantMaintenance	Editable	1.0	scott.dillon@solace.com	Thu, 01 Jun 2023 06:22:00 GMT	Artifacts to show PM integration with AEM	
RabbitMQ Adapter for SAP Integration Suite	Configure only	1.0.4	jeffrey.cooling@solace.com	Thu, 08 Jun 2023 15:37:12 GMT	Use the RabbitMQ adapter to publish (receiver) and consume (sender) messages between RabbitMQ server and SAP Integration Suite.	
Slack Adapter for SAP Integration Suite	Configure only	1.0.1	benjamin.gottstein@solace.com	Tue, 11 Jul 2023 14:22:22 GMT	Slack Adapter to create and manage slack channel, retrieve file, folder or chats between slack storage and SAP Cloud Integration.	
SAP EMEA PRESALES	Editable	1.0.0	scott.dillon@solace.com	Fri, 18 Aug 2023 17:40:23 GMT	A dedicated area for pre-sales employees in the EMEA region to create content related to demos and POCs.	
SOLACE-PRESALES	Editable	1.0	scott.dillon@solace.com	Thu, 04 May 2023 14:39:23 GMT	A package dedicated to anyone in Solace Presales that would like to play around using Integration Suite to connect with AEM/PubSub+ brokers.	
SOLACE TIGER-TEAM	Editable	1.0	scott.dillon@solace.com	Thu, 01 May 2023 14:46:20 GMT	Package to be used by Tiger Team members.	
SolaceAdapterPoC	Editable	1.0.0	Scott.Dillon@solace.com	Fri, 19 May 2023 10:44:11 GMT	This is a PoC built to validate some basic scenarios and help in the architecture of the adapter.	

B) Importing the official SAP AdvancedEventMesh Adapter into your CI tenant

A new Advanced Event Mesh specific adapter was made available in January 2024. If you haven't used this adapter in your CI tenant before, you may need to import it once. Follow these steps to get the official adapter from SAP.

- Navigate to “Discover” -> “Integrations” in the left hand menu: -----→
- Search for “advanced” to find the “Advanced Event Mesh Adapter for SAP Integration Suite”:

The screenshot shows the SAP Integration Suite interface. In the top navigation bar, 'Discover (Integrations)' is selected under the 'Discover' section. Below the navigation, a search bar contains the term 'advanced'. The main content area displays a heading 'Discover (605)' followed by a search result summary: '22 package(s) found'. One result is highlighted: 'Advanced Event Mesh Adapter for SAP Integration Suite'. A brief description below the result states: 'The advanced event mesh adapters enable the exchange of events to and from advanced event mesh brokers.'



- Select the adapter package by clicking on it, then click on “Copy” on the top right.

The screenshot shows the details page for the 'Advanced Event Mesh Adapter for SAP Integration Suite'. At the top, the title is displayed. To the right, there is a 'Copy' button. Below the title, a description reads: 'The advanced event mesh adapters enable the exchange of events to and from advanced event mesh brokers.' To the right of the description, product metadata is shown: Vendor: SAP, Mode: Configure-only, Version: 1.3.0, and Published: 07 Jun 2024. At the bottom, a navigation bar includes tabs for 'Overview' (which is selected), 'Artifacts (1)', 'Documents (2)', and 'Tags'.

- Go to “Design” -> “Integrations and APIs” in the left hand menu and click on the newly created “Advanced Event Mesh Adapter for SAP Integration Suite” package

The screenshot shows the SAP Integration Suite interface. The left sidebar has a tree structure with "Discover", "Design" (selected), and "Integrations and APIs" expanded. The main area is titled "Design" and shows "Integrations and APIs /". Below it, there's a table titled "Packages (2)".

Name	Mode	Ver...	Created By	Created Date	Description	Action
Advanced Event Mesh Adapter f or SAP Integration Suite	Configu re-only	1.3.0	choltfurth@gmail.com	Mon, 17 Jun 2024 17:53:25 GMT	The advanced event mesh adapters enable the exchange of events to and from advanced event mesh brokers.	Delete View

- Navigate to “Artifacts” to see the Integration Adapter and click on and select “Deploy” from the “Actions” menu

The screenshot shows the SAP Integration Suite interface. The left sidebar has a more detailed tree structure with "Discover", "Design" (selected), and "Integrations and APIs" expanded. The main area is titled "Integrations and APIs / Advanced Event Mesh Adapter for SAP Integration Suite /". Below it, there's a large title "Advanced Event Mesh Adapter for SAP Integration Suite".

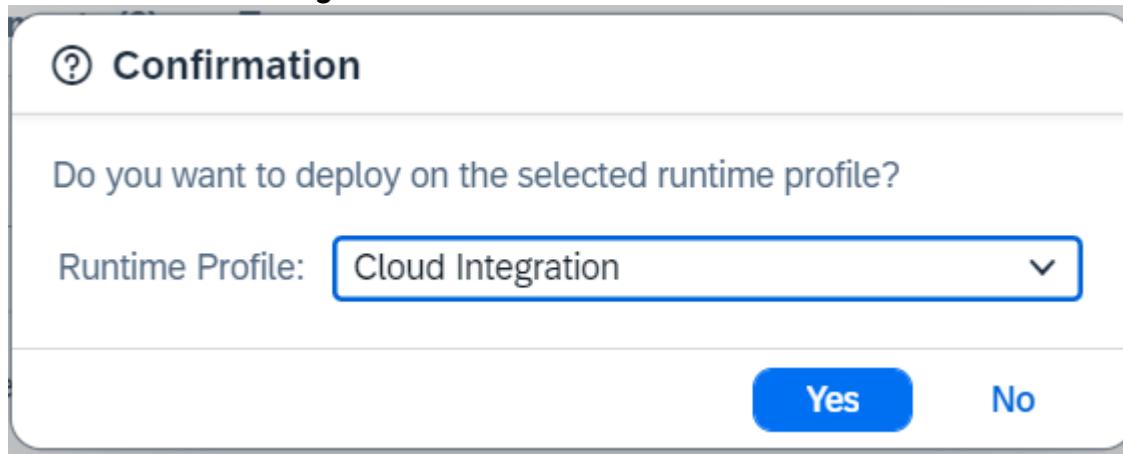
Below the title, it says "The advanced event mesh adapters enable the exchange of events to and from advanced event mesh brokers." and shows "Vendor: SAP Mode: Configure-only Version: 1.3.0".

The navigation bar below the title includes "Overview", "Artifacts (1)" (selected), "Documents (2)", and "Tags".

The "Artifacts" section has a table:

Name	Type	Version	Actions
AdvancedEventMesh	Integration Adapter	1.3.0	View metadata Deploy
Advanced Event Mesh Adapter for SAP Integration Suite initial release version. Unmodified			

- Select the “Cloud Integration” Runtime Profile



- You should now be able to see the AdvancedEventMesh Integration Adapter if you navigate to “Monitor” -> “Integrations and APIs” and click on the tile “All” under “Manage Integration Content” with a status of “Started” if everything went well:

The screenshot shows the SAP Integration Suite interface. The left sidebar has a navigation tree with sections like Home, Discover, Design, Monitor (selected), Inspect, and Settings. Under Monitor, the 'Integrations and APIs' section is selected. The main content area is titled 'Overview / Manage Integration Content' and shows 'Integration Content (1)'. A search bar contains the text 'advanced'. Below it is a table with one row:

Name	Status
AdvancedEventMesh	Started
Integration Adapter	

To the right of the table, there is a detailed view for the 'AdvancedEventMesh' entry. It includes:

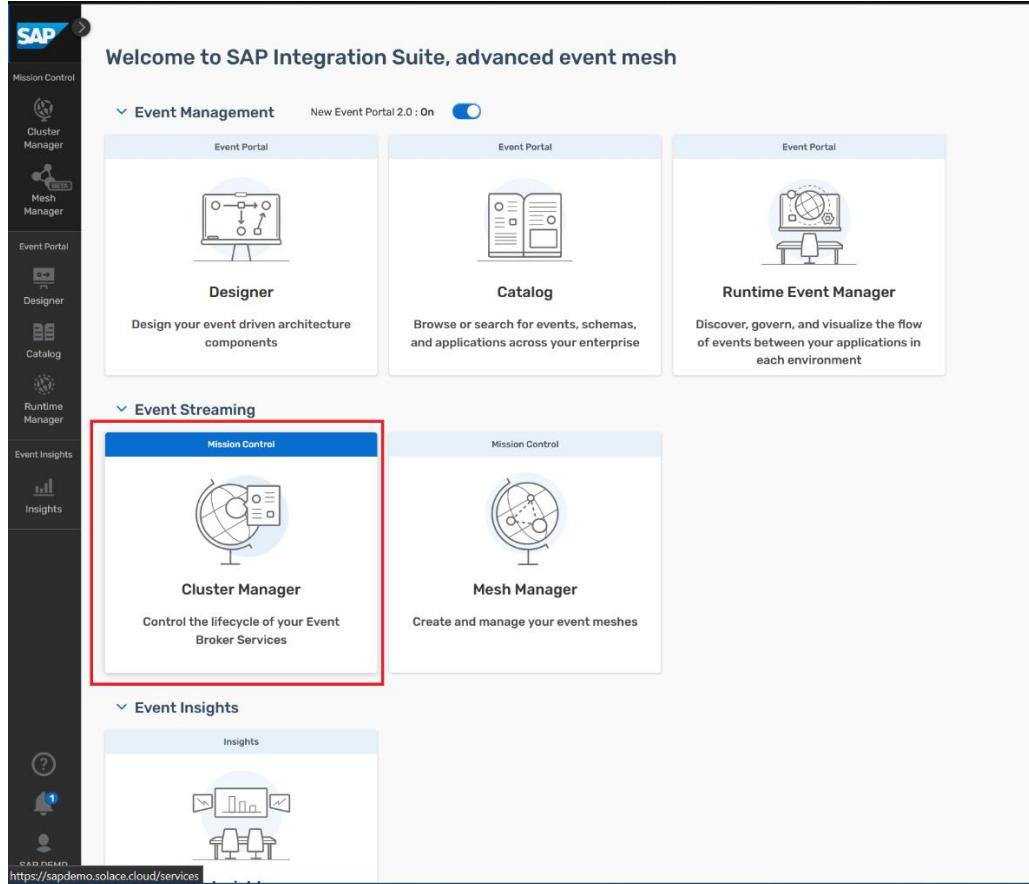
- AdvancedEventMesh** (name)
- Deployed On: Jun 17, 2024, 18:04:23 | ID: AdvancedEventMesh
- Deployed By: choltfurth@gmail.com | Version: 1.3.0
- Package: Advanced Event Mesh Adapter for SAP Integration Suite
- Mode: Configure-only
- Status Details**: The Integration Adapter is deployed successfully.
- Artifact Details**: Vendor: SAP

4. Scenario 1 - SalesOrder: AEMLegacyOutputAdapter (mandatory)

Setup/configure SAP AEM broker service

In this section we will create the required input queues for your integration flows.

- Go to **Cluster Manager** -> {your service} -> **Manage** -> **Queues** - to open the Broker UI



Services

[Create Service](#) Only show my services

All Services (14)

 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 
 MontrealBroker-10.1 EKS - Canada Central(Montreal) Developer Class Scott Dillon ● Running 	 US-Central AKS - Central US (Iowa) Developer Class Karl Ossoinig ● Running 	 sa1 EKS - Africa (Cape Town) Enterprise 250 Class Christian Holtfurth ● Running 
 cn1 AKS - East Asia (Hong Kong) Enterprise 250 Class Christian Holtfurth ● Running 	 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 
 MyMesh-Svc2 EKS - US West (Oregon) Developer Class Karl Ossoinig ● Running 	 My-First-Service EKS - Canada Central(Montreal) Enterprise 250 Class Andrea Kelso ● Running 	 test GKE - Asia South (Mumbai) Enterprise 1K Class Christian Holtfurth ● Running 
 testbrokersap1 GKE - EU(London) Enterprise 1K Class Christian Holtfurth ● Running 	 Karls-special-broker-just-for... AKS - Canada Central (Toronto) Enterprise 5K Class Karl Ossoinig ● Running 	

MontrealBroker-10.1

Status Connect **Manage** Monitoring Configuration Try Me!

Open Broker Manager ...

Event Broker Service Settings

Deletion Protection | **Delete Service** | **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

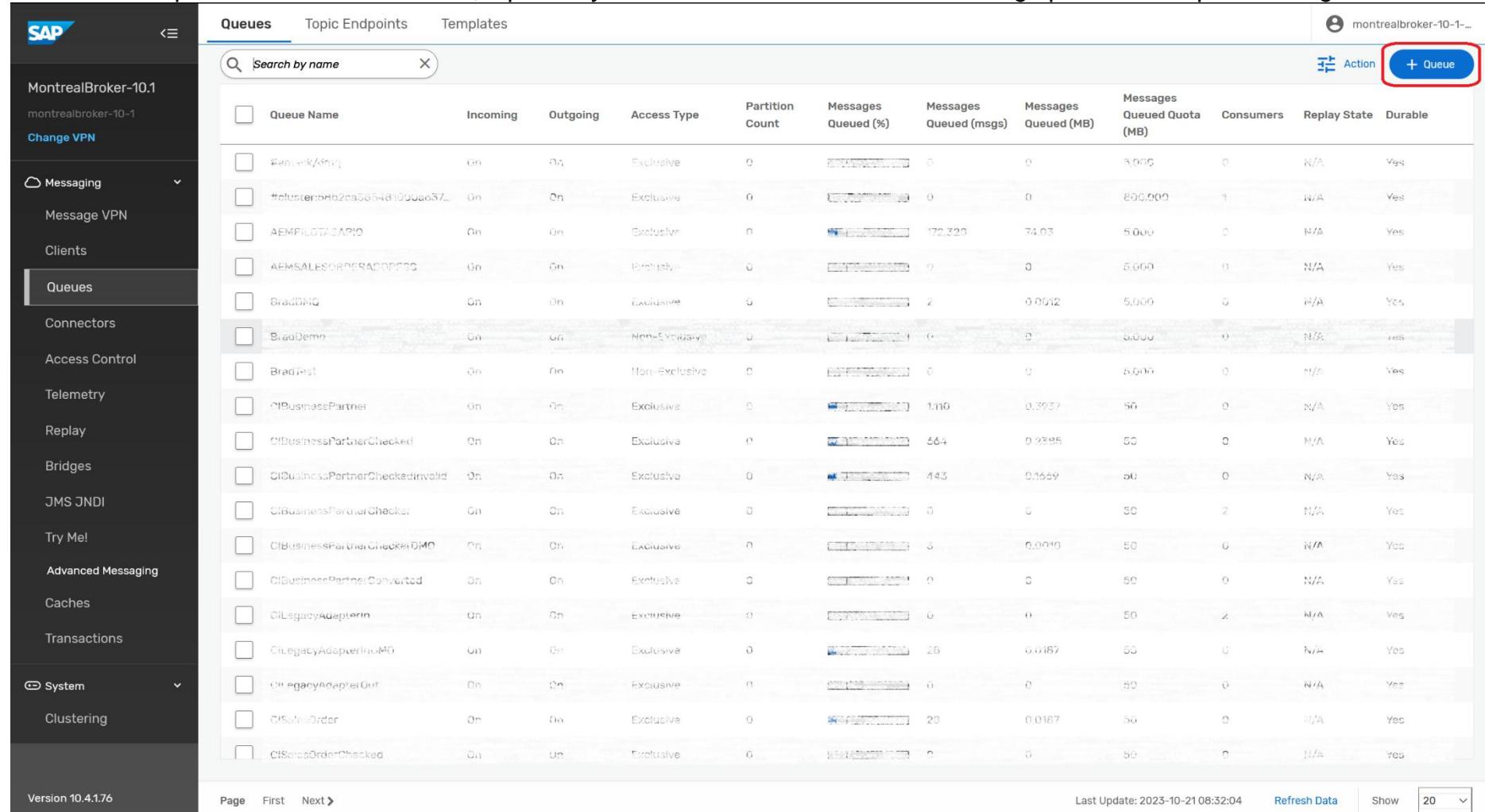


Bridges

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

To create the queues in the next sections, repeatedly click on the "+ Queue" button to bring up the create queue dialog.



The screenshot shows the SAP Message Broker configuration interface. On the left, there's a navigation sidebar with various options like MontrealBroker-10.1, Change VPN, Messaging, Clients, Queues (which is selected and highlighted in dark grey), Connectors, Access Control, Telemetry, Replay, Bridges, JMS JNDI, Try Me!, Advanced Messaging, Caches, Transactions, System, and Clustering. The main area is titled "Queues" and contains a table with the following columns: Queue Name, Incoming, Outgoing, Access Type, Partition Count, Messages Queued (%), Messages Queued (msgs), Messages Queued (MB), Messages Queued Quota (MB), Consumers, Replay State, and Durable. A search bar at the top says "Search by name". In the top right, there are "Action" and "+ Queue" buttons. The "+ Queue" button is specifically highlighted with a red box. The table lists several queues, including "BraadMQ", "BraadDemo", "BradTest", and "CIBusinessPartner" among others. At the bottom, there are buttons for Page, First, Next, Last Update (2023-10-21 08:32:04), Refresh Data, Show (with a dropdown set to 20), and a dropdown menu.

Queue Name	Incoming	Outgoing	Access Type	Partition Count	Messages Queued (%)	Messages Queued (msgs)	Messages Queued (MB)	Messages Queued Quota (MB)	Consumers	Replay State	Durable
#mq://localhost:8081	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	5,000	0	N/A	Yes
#mq://localhost:8081/00000000000000000000000000000000	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	800,000	1	N/A	Yes
AEMPILOTASAPI	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	172,320	74.03	5,000	0	N/A	Yes
ARMSALESORDERADAPTER	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	5,000	0	N/A	Yes
BraadMQ	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	2	0.0012	5,000	0	N/A	Yes
BraadDemo	On	On	Non-Exclusive	0	<div style="width: 100%;">100%</div>	0	0	5,000	0	N/A	Yes
BradTest	On	On	Non-Exclusive	0	<div style="width: 100%;">100%</div>	0	0	5,000	0	N/A	Yes
CIBusinessPartner	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	1,110	0.3937	50	0	N/A	Yes
CIBusinessPartnerChecked	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	664	0.2895	50	0	N/A	Yes
CIBusinessPartnerCheckedInvalid	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	443	0.1659	50	0	N/A	Yes
CIBusinessPartnerChecker	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	50	2	N/A	Yes
CIBusinessPartnerCheckerDMO	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	3	0.0010	50	0	N/A	Yes
CIBusinessPartnerConverted	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	50	0	N/A	Yes
CILegacyAdapterIn	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	50	2	N/A	Yes
CILegacyAdapterInDMO	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	28	0.0187	50	0	N/A	Yes
CILegacyAdapterOut	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	50	0	N/A	Yes
CISaleOrder	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	20	0.0187	50	0	N/A	Yes
CISaleOrderChecked	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	50	0	N/A	Yes

Provide the name as given (in the next sections).

Create Queue

Queue Name

Cancel Create

Open up the "Advanced Queue Settings" section, then follow along and provide the details as showing in the screenshots below.

Edit Queue Settings

TestQueue

Incoming

Outgoing

Access Type Exclusive Non-Exclusive

Messages Queued Quota (MB)

Owner

Non-Owner Permission

Maximum Consumer Count

Show Advanced Settings

Cancel Apply

Tips >>

Click on a label or an input field to see help message.

Create the following queues and provide the details as given (copy & paste where appropriate).

1. **CILegacyAdapterIn queue**

- Name: CILegacyAdapterIn
- Owner: solace-cloud-client
- Non-Owner Permission: No access
- DMQ Name: CILegacyAdapterInDMQ
- Redelivery: enabled
- Try Forever: disabled
- Maximum Redelivery Count: 3

SAP

MontrealBroker-10.1
montrealbroker-10-1
[Change VPN](#)

[Messaging](#) ▾
Message VPN
Clients
Queues
Connectors
Access Control
Telemetry
Replay
Bridges
JMS JNDI
Try Me!
Advanced Messaging
Caches
Transactions

[System](#) ▾
Clustering

Queues | CILegacyAdapterIn

Summary **Settings** Subscriptions Consumers Messages Queued Stats

Incoming

Outgoing

Access Type Exclusive Non-Exclusive

Messages Queued Quota (MB)

Alert Thresholds Clear Raise

Owner

Non-Owner Permission

Maximum Consumer Count

Alert Thresholds Clear Raise

Maximum Message Size (B)

Maximum Delivered Unacknowledged Messages per Flow

DMO Name

Enable Client Delivery Count

Delivery Delay (sec)

Message Priority

Respect Message Priority

SAP

MontrealBroker-10.1
montrealbroker-10-1
[Change VPN](#)

Messaging

Message VPN

Clients

Queues

Connectors

Access Control

Telemetry

Replay

Bridges

JMS JNDI

Try Me!

Advanced Messaging

Caches

Transactions

System

Clustering

Queues | CILegacyAdapterIn

Summary Settings Subscriptions Consumers Messages Queued Stats

Message Expiry

Respect TTL

Maximum TTL (sec)

Redelivery

Try Forever

Maximum Redelivery Count

Delayed Redelivery

Multiplier

Initial Delay

Maximum Delay

Congestion Control

Reject Messages to Sender on Discard ▼

Reject Low Priority Messages

Reject Low Priority Messages Limit

Alert Thresholds % #

Clear Raise ▼

The screenshot shows the SAP Cloud Platform Management UI for a queue named 'CILegacyAdapterIn'. The left sidebar lists various management categories like 'Clients', 'Queues', 'Connectors', etc. The 'Queues' category is selected. The main panel shows the 'Settings' tab for the specified queue. A red box highlights the 'Redelivery' section, which includes a toggle switch for 'Redelivery' (on), a toggle switch for 'Try Forever' (off), and a text input for 'Maximum Redelivery Count' set to '3'. Below this is the 'Delayed Redelivery' section with its toggle switch off. Further down are sections for 'Congestion Control' (with dropdown for 'Reject Messages to Sender on Discard' set to 'Notify-Sender') and 'Alert Thresholds' (with sliders for 'Clear' at 60 and 'Raise' at 80). Other settings like 'Multiplier', 'Initial Delay', and 'Maximum Delay' are also present.

- Once the queue is created, click on the queue name in the list, navigate to the Subscriptions tab and open the subscriptions dialog.

The screenshot shows the SAP Queue Management interface. On the left, there's a sidebar with a dark background containing the SAP logo, the text "MontrealBroker-10.1", "montrealbroker-10-1", "Change VPN", and a "Messaging" section with "Message VPN", "Clients", and "Queues". The "Queues" item is highlighted with a white border. The main area has a light gray background and displays "Queues | TestQueue". At the top, there are tabs: "Summary", "Settings", "Subscriptions" (which is circled in red), "Consumers", "Messages Queued", and "Stats". Below the tabs, it says "0 Subscriptions" and features a search bar with "Search by topic". To the right of the search bar is an "Action" button with a grid icon and a "+ Subscription" button (also circled in red). On the far right, there's a small user icon and the text "montrealbroker-10-1-...". The main content area is currently empty, showing a table header with a checkbox and the word "Topic".

- Add the following subscriptions to the queue
- sap.com/salesorder/create/v1/>
- sap.com/salesorder/change/v1/>
- sap.com/salesorder/retry/v1
- salesorder/retry/v1

SAP

MontrealBroker-10.1

montrealbroker-10-1

Change VPN

Messaging

Message VPN

Clients

Queues

Connectors

Queues | CILegacyAdapterIn

Summary Settings **Subscriptions** Consumers Messages Queued Stats

4 Subscriptions Search by topic

Topic
<input type="checkbox"/> sap.com/salesorder/create/V1/>
<input type="checkbox"/> sap.com/salesorder/change/V1/>
<input type="checkbox"/> sap.com/salesorder/retry/V1
<input type="checkbox"/> salesorder/retry/V1

2. CILegacyAdapterInDMQ queue

- **Name:** CILegacyAdapterInDMQ
- **Owner:** solace-cloud-client
- **Non-Owner Permission:** No access

SAP

Queues | CILegacyAdapterInDMQ

Summary **Settings** Subscriptions Consumers Messages Queued Stats

MontrealBroker-10.1
montrealbroker-10-1
[Change VPN](#)

Cloud Messaging

Message VPN
Clients
Queues
Connectors
Access Control
Telemetry
Replay

Incoming

Outgoing

Access Type Exclusive Non-Exclusive

Messages Queued Quota (MB)

Owner

Non-Owner Permission

Maximum Consumer Count

Now, before we jump back into Integration Suite:

Let's head to our Advanced Event Mesh Console and go to **Cluster Manager**, select the **service** that you want to connect your Integration Suite flows to and go to the "**Connect**" tab.

Take a note of the connectivity details underneath "**Solace Messaging**" (click on the section to open it up):

The screenshot shows the SAP Mission Control interface for the MontrealBroker-10.1 instance. The left sidebar includes links for Cluster Manager, Mesh Manager (Beta), Designer, Catalog, Runtime Manager, Insights, and SAP DEMO. The main content area has a header "MontrealBroker-10.1" with tabs for Status, Connect, Manage, Monitoring, Configuration, and Try Me! A sub-header "Connect Using a Supported Client Library" is followed by a dropdown "View by: Protocol". Below this, a section titled "Client Libraries" lists various Solace client libraries:

Client Library	Description	Action
Solace Java API (Java)	Start messaging with client libraries that use the Solace Message Format (SMF) protocol over TCP.	Get Started
Solace JCSMP API (JCSMP)		Get Started
Solace JavaRTO (Java)		Get Started
Solace JMS API (Java)		Get Started
Solace C (C)		Get Started
Solace Python (Python)		Get Started
Solace Go API (Go)		Get Started
Solace .NET (.NET)		Get Started
Spring Boot Java API (Spring)		Get Started
Spring Boot JMS API (Spring)		Get Started
Spring Cloud Stream		Get Started

Below the client library list, there are sections for "Solace Web Messaging" and "AMQP". A red box highlights the "Connection Details" section on the right, which contains fields for Username, Password, Message VPN, Secured SMF Host, Public Internet, TrustStore, and Download PEM.

We will need them in the next steps when configuring our flows.

The connect tab lists all the various connectivity details for the various supported protocols. Our Cloud Integration AEM adapter uses the Solace Messaging protocol, which is AEM's very own protocol with a broad feature set support. Each AEM service also comes with a default client user called `solace-cloud-client` that is configured for convenience reasons and is allowed to publish and subscribe to all topics. We will be using this user for all our iflows.

In a real production environment where security is important, you or your administrator will likely have this user disabled and will be creating separate users for each of the applications that connect to the AEM broker. Or this may even be deferred to an external authentication service over LDAP or OAuth with no client users stored on the broker itself and managed by your IAM service instead.

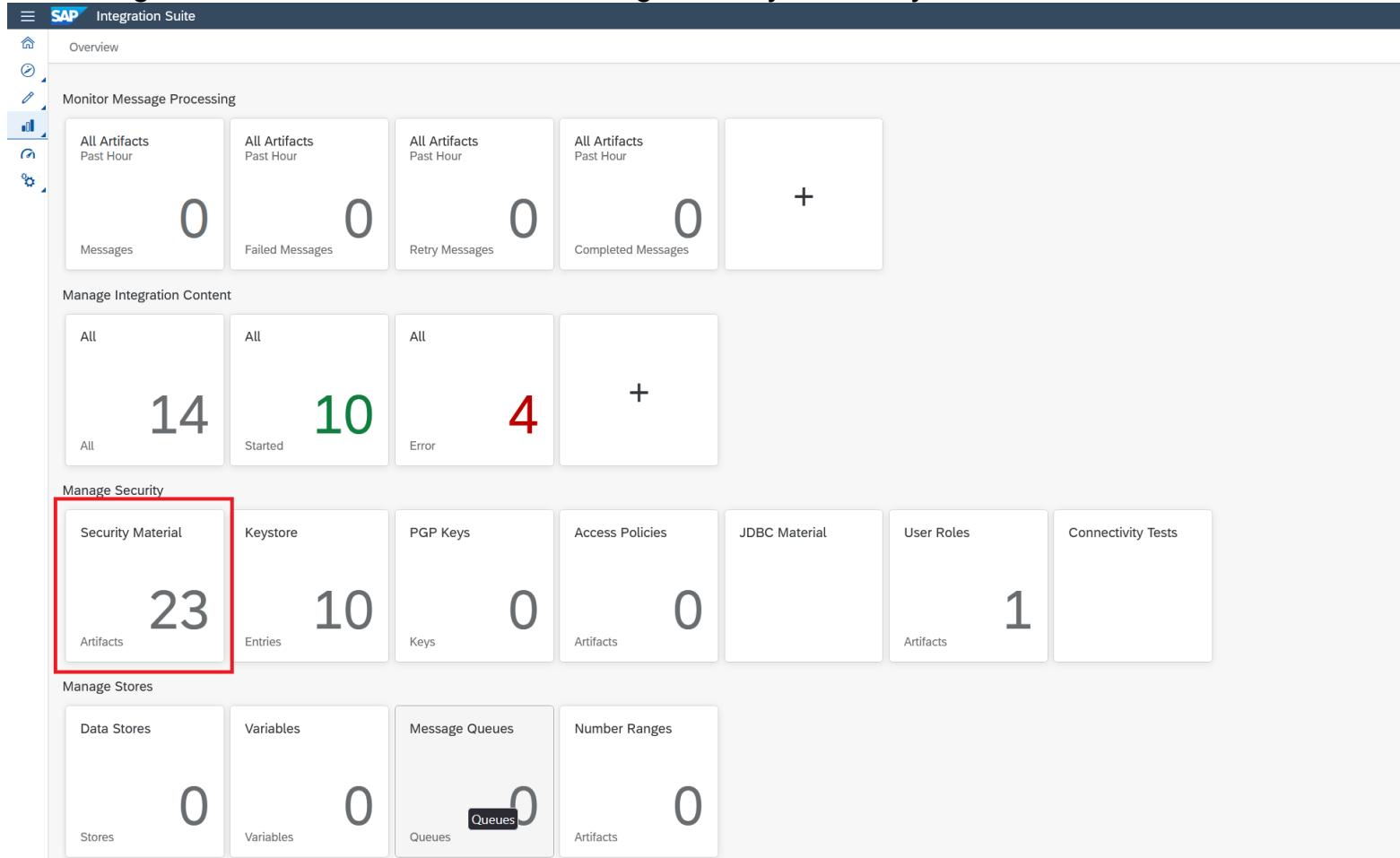
Now that we have set up all the prerequisites for our Integration Suite flows, we can take a look at the individual flows and prepare them for deployment.

Configure Your Integration Suite Flow

Security Configuration

Let's configure the security details we will need to connect to the various services like AEM & SFTP server.

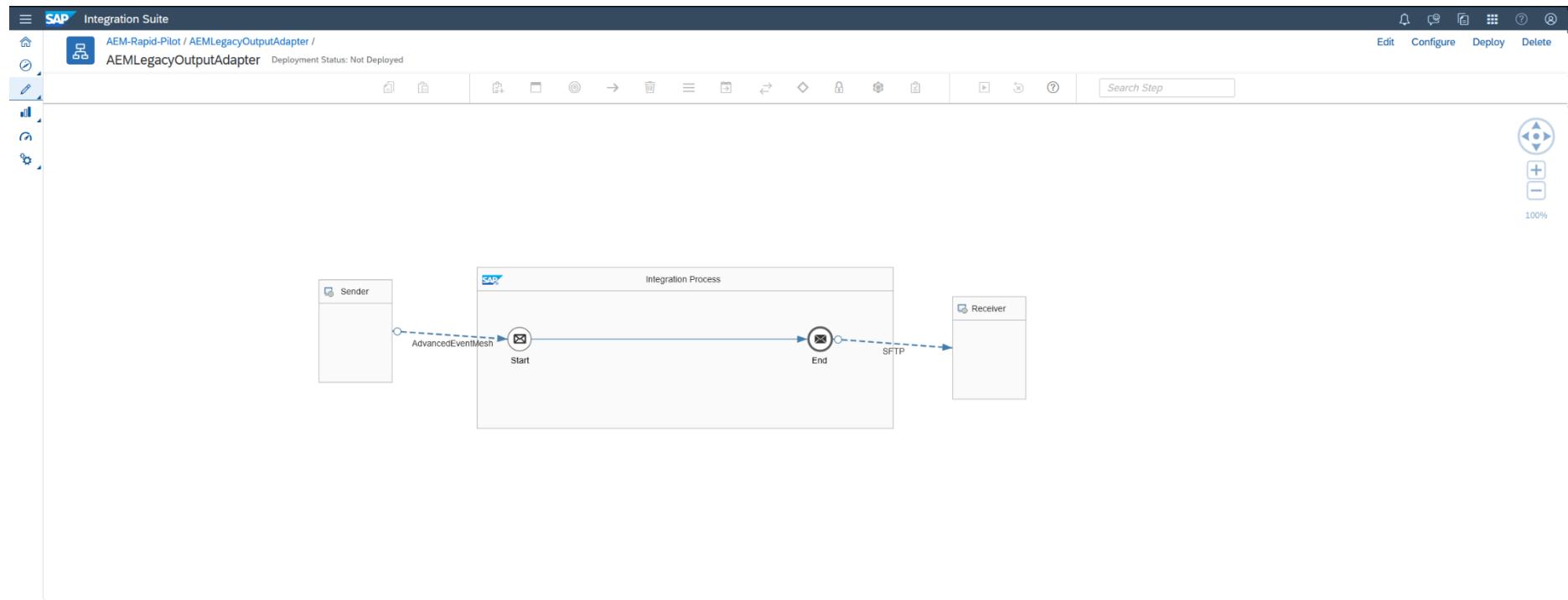
- Go to **Integration Suite Monitor Artifacts -> Manage Security -> Security Material**.



- In here, create security credentials for your AEM broker service, and SFTP server (sftp optional).
- Create **SecureParameter** `CABrokerUserPass` and store the password for your `solace-cloud-client` application user credentials.
- Create **UserCredentials** `sftpuser` and store SFTP servers user and password credentials (these can be prepopulated with dummy values for now).

Configure/Deploy AEMLegacyOutputAdapter

1. Let's take a look at the AEMLegacyOutputAdapter iflow:



This flow is really straightforward. It receives Sales Order events and appends them to a file over SFTP. This could be used for legacy system integration (as the name suggests) for systems that do not have capabilities to receive data/events in an event-driven fashion and instead are relying on batch-based file imports. AEM + CI could send all relevant events in real-time to the file and the downstream legacy system can then simply consume the file in batch intervals (or potentially triggered by a file detector if available), move/delete the import file and AEM + CI will simply create a new one as soon as the next event arrives.

Now we are going to use this simple flow to demonstrate the error handling capabilities of AEM. The flow will try to send events to

a file, but we have deliberately misconfigured the SFTP adapter to point to an invalid destination, so all messages delivery attempts will fail and trigger the AEM adapter's retry behaviour (that's intended).

Once the max configured retry attempts are exceeded, the AEM broker will move the message to a configured DMQ for exception processing.

Let's take a look at some of the relevant settings of the AEM adapter that control this behaviour.

SAP Integration Suite

Integrations / AEM-Rapid-Pilot / AEMLegacyOutputAdapter / AEMLegacyOutputAdapter Deployment Status: Not Deployed

Integration Process

```
graph LR; Sender[Sender] --> AdvancedEventMesh((AdvancedEventMesh)); AdvancedEventMesh --> End((End)); End -- SFTP --> Receiver[Receiver]
```

AdvancedEventMesh

General Connection Processing

SENDER PROCESSING DETAILS

Parallel Consumers:	1
Queue Name:	CILegacyAdapterIn
Selector:	
Acknowledgment Mode:	Automatic On Exchange Complete
Settlement Outcome After Maximum Attempts:	Failed
Maximum Message Processing Attempts:	2
Retry Interval (in ms):	500
Maximum Retry Interval (in ms):	500
Exponential Backoff Multiplier:	1.0

Let's look at these settings one by one:

1. **Acknowledgement Mode: "Automatic on Exchange Complete"**

The most important setting when it comes to not accidentally acknowledging and therefore removing a message from the broker's queue. This setting tells the flow/AEM adapter to only acknowledge (ack) the message after the flow has successfully completed processing the message. If any failure occurs, the AEM adapter will instead send a negative acknowledgment back (nack) to tell the broker to keep the message and retry it, because it couldn't be successfully processed by the flow. The alternative is to immediately ack the message when it's received, which will always result in the message being removed from the queue even if the flow fails to successfully process the message. (!!)

2. **Settlement Outcome After Maximum Attempts: "Failed"**

This setting controls the nack type and behaviour, we have two options here:

a) **Failed**, which will nack the message back to the broker and let the broker check the retry count of the message to trigger retries based on the queue settings and only sending messages to DMQ when the retry count on the message has exceeded the max retry settings on the queue.

b) **Rejected**, which will nack the message telling the broker to immediately move the message to DMQ when the AEM adapter settings (Maximum Message Processing Attempts) are exceeded irrespective of queue settings.

3. **Max. Message Processing Attempts: 2**

Controls how often we want to retry a message inside the iflow before we "give up" and pass it back to the broker.

4. **Retry interval, Max Retry Interval and Exponential Backoff Multiplier**

These are all settings that control how quickly we want to retry and whether we want to incrementally increase our retry delay with each failure. A good retry delay value prevents the iflow from repeatedly retrying a message within a few milli-seconds and gives some time for transient error situations to clear before we retry.

*Note that the error handling and retry settings go hand-in-hand with the DMQ and retry settings on the input queue for this flow (queue retry settings multiply with the internal retry settings in the iflow, e.g. if the iflow tries 2 times internally every time we pass it a message and the broker is configured to retry the same message 3 times to the broker, then we might get 8 executions before the message is actually stopped being processed and moved to the DMQ [(1 initial attempt + 3 times retry) * 2 times retry inside the iflow = 8 processing attempts]):*

SAP

< Queues | CILegacyAdapterIn

MontrealBroker-10.1
montrealbroker-10-1
[Change VPN](#)

Message VPN

Clients

Queues

Connectors

Access Control

Telemetry

Replay

Bridges

JMS JNDI

Try Me!

Advanced Messaging

Caches

Transactions

System

Clustering

Summary **Settings** Subscriptions Consumers Messages Queued Stats

Incoming

Outgoing

Access Type Exclusive Non-Exclusive

Messages Queued Quota (MB) 50

Alert Thresholds % # Clear 18 Raise 25

Owner solace-cloud-client

Non-Owner Permission No Access

Maximum Consumer Count 1000

Alert Thresholds % # Clear 60 Raise 80

Maximum Message Size (B) 10000000

Maximum Delivered Unacknowledged Messages per Flow 10000

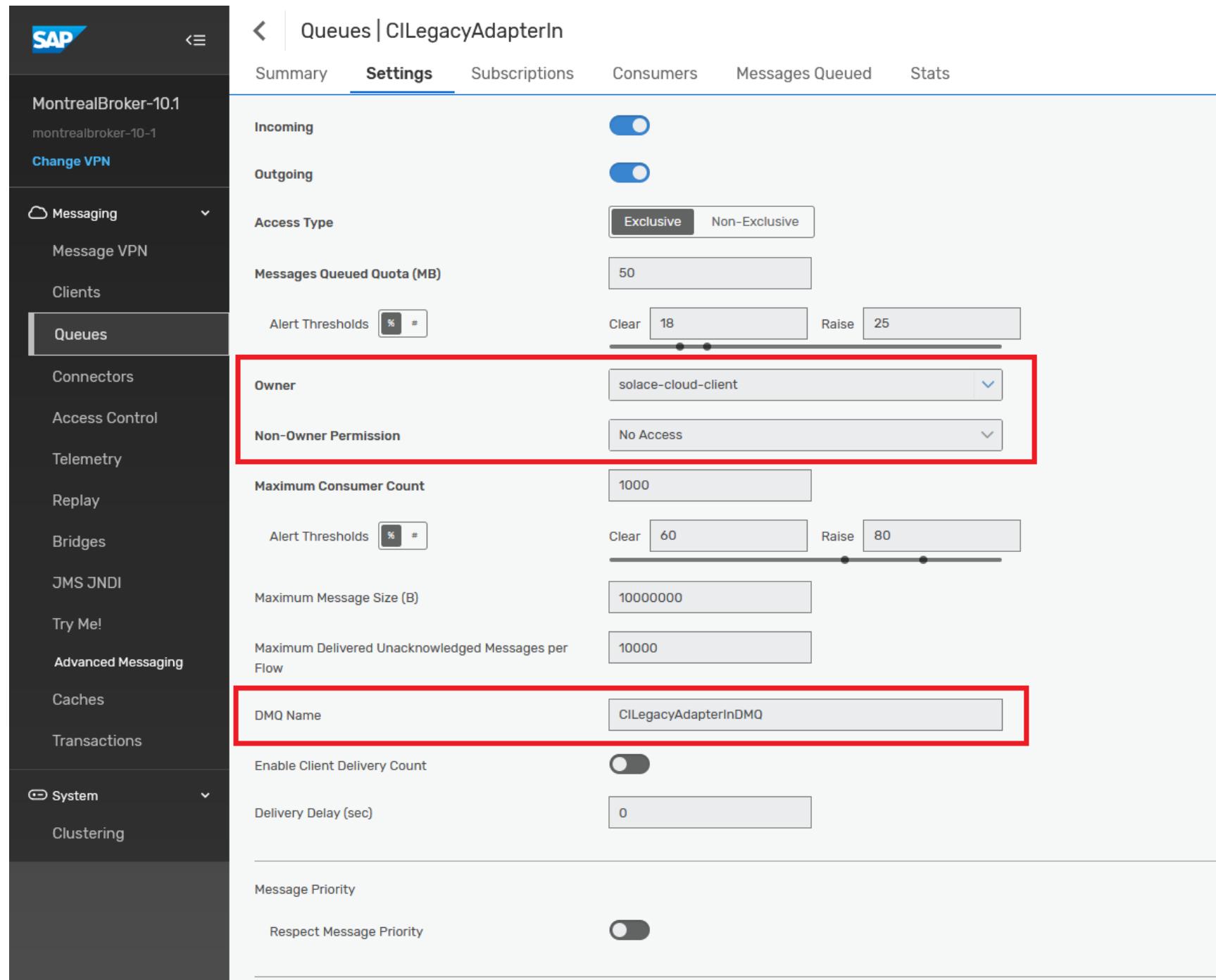
DMQ Name CILegacyAdapterInDMQ

Enable Client Delivery Count

Delivery Delay (sec) 0

Message Priority

Respect Message Priority



SAP

< Queues | CILegacyAdapterIn

Summary **Settings** Subscriptions Consumers Messages Queued Stats

MontrealBroker-10.1
montrealbroker-10-1
[Change VPN](#)

Messaging [Message VPN](#) [Clients](#) [Queues](#) [Connectors](#) [Access Control](#) [Telemetry](#) [Replay](#) [Bridges](#) [JMS JNDI](#) [Try Me!](#) [Advanced Messaging](#) [Caches](#) [Transactions](#)

System [Clustering](#)

Message Expiry

Respect TTL

Maximum TTL (sec)

Redelivery

Try Forever

Maximum Redelivery Count

Delayed Redelivery

Multiplier

Initial Delay

Maximum Delay

Congestion Control

Reject Messages to Sender on Discard

Reject Low Priority Messages

Reject Low Priority Messages Limit

Alert Thresholds % #

Clear Raise

Queues | CILegacyAdapterIn

Summary **Settings** Subscriptions Consumers Messages Queued Stats

MontrealBroker-10.1
montrealbroker-10-1
[Change VPN](#)

Messaging [Message VPN](#) [Clients](#) [Queues](#) [Connectors](#) [Access Control](#) [Telemetry](#) [Replay](#) [Bridges](#) [JMS JNDI](#) [Try Me!](#) [Advanced Messaging](#) [Caches](#) [Transactions](#)

System [Clustering](#)

Message Expiry

Respect TTL

Maximum TTL (sec)

Redelivery

Try Forever

Maximum Redelivery Count

Delayed Redelivery

Multiplier

Initial Delay

Maximum Delay

Congestion Control

Reject Messages to Sender on Discard

Reject Low Priority Messages

Reject Low Priority Messages Limit

Alert Thresholds % #

Clear Raise

Note: The delayed redelivery settings on the queue are not currently used by the AEM adapter. We can only set these settings in the adapter itself, but the queue needs to have a DMQ configured, a max redelivery count set (as opposed to retrying forever) and the events/messages have had to be published as DMQ eligible by the publisher.

2. Configuring and deploying the AEMLegacyOutputAdapter iflow: Remember the connectivity details for our AEM broker from the previous step? We will need those now.

The screenshot shows the SAP Cloud Platform Mission Control interface. The left sidebar includes links for SAP Cluster Manager, Mesh Manager, Designer, Catalog, Runtime Manager, Event Insights, and SAP DEMO. The main header shows 'MontrealBroker-10.1' and navigation tabs for Status, Connect, Manage, Monitoring, Configuration, and Try Me!. The 'Connect' tab is active.

The central area displays a 'Connect Using a Supported Client Library' section. It lists supported client libraries under 'Client Libraries' and provides a 'View by:' dropdown set to 'Protocol'. A 'Connection Details' section is highlighted with a red box, containing the following configuration:

- Username: solace-cloud-client
- Password: [REDACTED]
- Message VPN: montrealbroker-10-1
- Secured SMF Host: [REDACTED]
- Public Internet: [REDACTED]
- TrustStore: [REDACTED]
- Download PEM: [REDACTED]

Other sections visible include 'Solace Messaging' (using SMF protocol over TCP) and 'AMQP' (using open APIs).

- Hit **configure** at the top right and fill in the details to connect to your AEM broker service:

Configure "AEMLegacyOutputAdapter"

Sender	Receiver																		
Connection <table border="1" style="width: 100%;"> <tr> <td style="width: 15%;">Sender:</td> <td>Sender</td> <td style="width: 15%; text-align: right;">▼</td> </tr> <tr> <td>Adapter Type:</td> <td>AdvancedEventMesh</td> <td style="text-align: right;">▼</td> </tr> <tr> <td>Host:</td> <td>tcp://montrealbroker.messaging.solace.cloud:55443</td> <td style="text-align: right;">▼</td> </tr> <tr> <td>Message VPN:</td> <td>montrealbroker-10-1</td> <td style="text-align: right;">▼</td> </tr> <tr> <td>Username:</td> <td>solace-cloud-client</td> <td style="text-align: right;">▼</td> </tr> <tr> <td>Password Secure Alias:</td> <td>CABrokerUserPass</td> <td style="text-align: right;">▼</td> </tr> </table>		Sender:	Sender	▼	Adapter Type:	AdvancedEventMesh	▼	Host:	tcp://montrealbroker.messaging.solace.cloud:55443	▼	Message VPN:	montrealbroker-10-1	▼	Username:	solace-cloud-client	▼	Password Secure Alias:	CABrokerUserPass	▼
Sender:	Sender	▼																	
Adapter Type:	AdvancedEventMesh	▼																	
Host:	tcp://montrealbroker.messaging.solace.cloud:55443	▼																	
Message VPN:	montrealbroker-10-1	▼																	
Username:	solace-cloud-client	▼																	
Password Secure Alias:	CABrokerUserPass	▼																	

Configure "AEMLegacyOutputAdapter"

Sender	Receiver																		
Target <table border="1" style="width: 100%;"> <tr> <td style="width: 15%;">Receiver:</td> <td>Receiver</td> <td style="width: 15%; text-align: right;">▼</td> </tr> <tr> <td>Adapter Type:</td> <td>SFTP</td> <td style="text-align: right;">▼</td> </tr> <tr> <td>Address:</td> <td>londonlab.solace.com:22234</td> <td style="text-align: right;">▼</td> </tr> <tr> <td>Proxy Type:</td> <td>Internet</td> <td style="text-align: right;">▼</td> </tr> <tr> <td>Authentication:</td> <td>User Name/Password</td> <td style="text-align: right;">▼</td> </tr> <tr> <td>Credential Name:</td> <td>sftpuser</td> <td style="text-align: right;">▼</td> </tr> </table>		Receiver:	Receiver	▼	Adapter Type:	SFTP	▼	Address:	londonlab.solace.com:22234	▼	Proxy Type:	Internet	▼	Authentication:	User Name/Password	▼	Credential Name:	sftpuser	▼
Receiver:	Receiver	▼																	
Adapter Type:	SFTP	▼																	
Address:	londonlab.solace.com:22234	▼																	
Proxy Type:	Internet	▼																	
Authentication:	User Name/Password	▼																	
Credential Name:	sftpuser	▼																	

- Then hit **deploy** at the bottom right.

3. Check that your flow was deployed successfully and fix if necessary.

- Go to **Monitor Artifacts** -> **Manage Integration Content** -> **All**.

You should be seeing the AEMLegacyOutputAdapter flow as **Started**, similar to this view:

AEMSalesOrderNotification

Deployed On: Oct 05, 2023, 14:27:07 ID: AEMSalesOrderNotification Package: SOLACE-TIGER-TEAM
Deployed By: christian.holtfurth@solace.com Version: 1.0.0

Endpoints Status Details Artifact Details Log Configuration

There are no endpoints configured.

Status Details

The Integration Flow is deployed successfully.

Artifact Details

Monitor Message Processing
View deployed Artifact
Navigate to Artifact Editor

Log Configuration

Log Level: **Info**

Name	Status
AEMSalesOrderNotification	Started
AEMBusinessPartnerAddressCheck	Started
AEMLegacyOutputAdapter	Started
enack-idemo	Started
AdvancedEventMesh	Started
PubSubPlusEA	Started
Rainer test 01	Error
AEMLegacyInputAdapter	Error
BradTest	Error
SAP AEM Demo	Error
Slack	Started
SapBiposConnector	Started
AssignTechnician	Started
RabbitMQ	Started

- Go to your AEM Console and navigate to **Cluster Manager** -> **{your service}** -> **Manage** and click on the **Queues** tile:

The screenshot shows the AEM Cluster Manager interface for the service 'MontrealBroker-10.1'. The left sidebar includes links for Mission Control, Cluster Manager (selected), Mesh Manager (BETA), Designer, Catalog, Runtime Manager, and Insights. The main content area displays 'Event Broker Service Settings' with sections for Authentication (Enabled), Certificate Authorities (0 Client Certificate Authorities, 1 Domain Certificate Authority), and Client Profiles (1 Client Profile). Below this is the 'Broker Manager Quick Settings' section, which includes tiles for Message VPN, Clients, Queues (highlighted with a red box), Access Control, and Bridges. At the bottom is the 'Other Management Tools' section, listing SEMP - REST API, Broker Manager - Web Application, and SolAdmin - Desktop Application.

Event Broker Service Settings

- Authentication: Enabled
- Certificate Authorities: 0 Client Certificate Authorities, 1 Domain Certificate Authority
- Client Profiles: 1 Client Profile

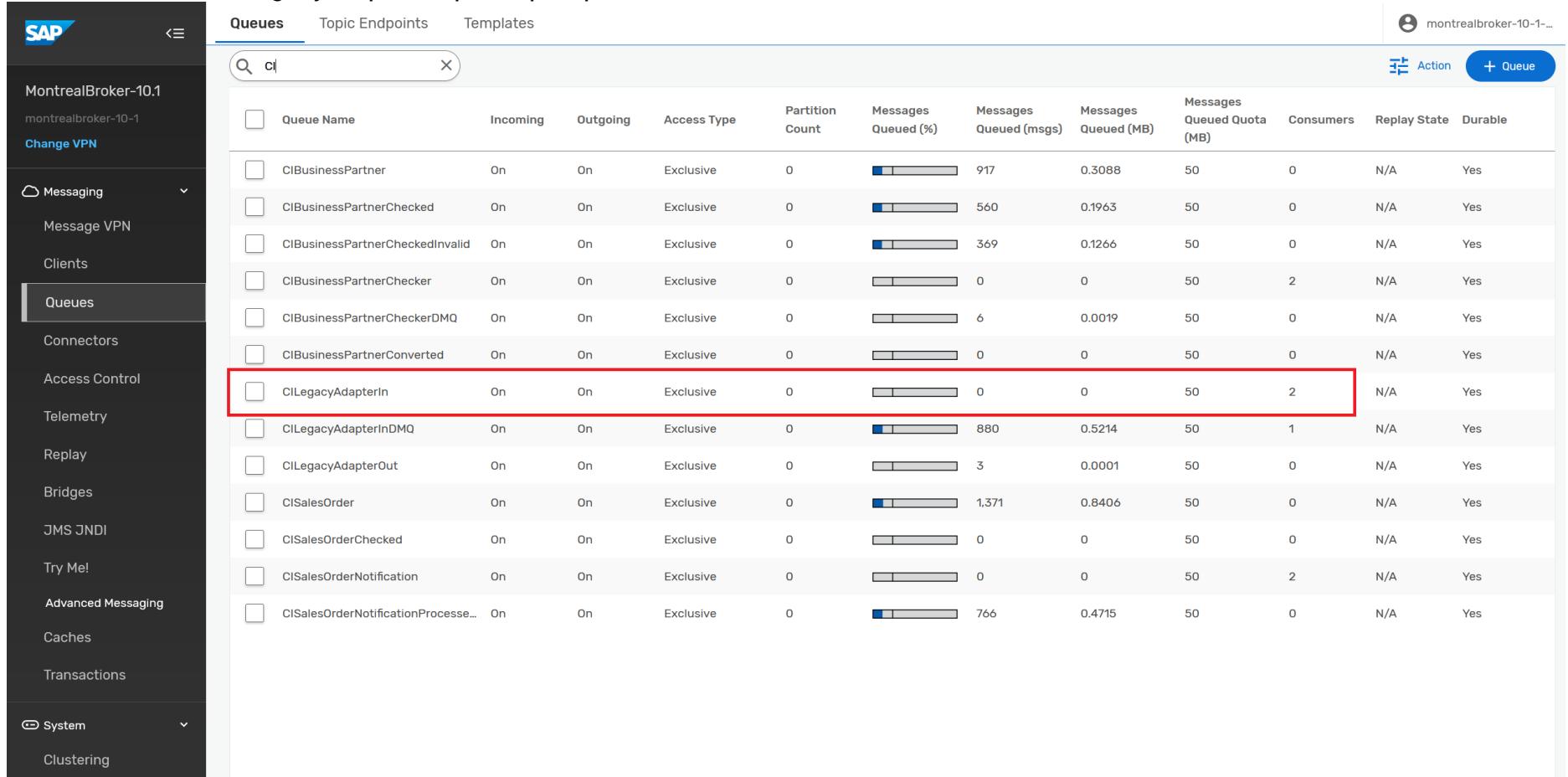
Broker Manager Quick Settings

- Message VPN
- Clients
- Queues** (highlighted)
- 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.
- SolAdmin - Desktop Application: SolAdmin is a legacy desktop application that you can use to manage the Event Broker Service.

- Check that the AEMLegacyOutputAdapter input queue has at least one consumer connected to it.



The screenshot shows the SAP Message Broker interface with the 'Queues' tab selected. The left sidebar includes sections like 'MontrealBroker-10.1', 'Change VPN', 'Messaging', 'Message VPN', 'Clients', 'Queues' (which is highlighted), 'Connectors', 'Access Control', 'Telemetry', 'Replay', 'Bridges', 'JMS JNDI', 'Try Me!', 'Advanced Messaging', 'Caches', 'Transactions', 'System', and 'Clustering'. The main area displays a table of queues with the following columns: Queue Name, Incoming, Outgoing, Access Type, Partition Count, Messages Queued (%), Messages Queued (msgs), Messages Queued (MB), Messages Queued Quota (MB), Consumers, Replay State, and Durable. A search bar at the top filters results for 'ci'. One specific row, 'CILegacyAdapterIn', is highlighted with a red border. The table data is as follows:

Queue Name	Incoming	Outgoing	Access Type	Partition Count	Messages Queued (%)	Messages Queued (msgs)	Messages Queued (MB)	Messages Queued Quota (MB)	Consumers	Replay State	Durable
CIBusinessPartner	On	On	Exclusive	0	<div style="width: 100px; height: 10px; background-color: #ccc; border: 1px solid black;"></div>	917	0.3088	50	0	N/A	Yes
CIBusinessPartnerChecked	On	On	Exclusive	0	<div style="width: 100px; height: 10px; background-color: #ccc; border: 1px solid black;"></div>	560	0.1963	50	0	N/A	Yes
CIBusinessPartnerCheckedInvalid	On	On	Exclusive	0	<div style="width: 100px; height: 10px; background-color: #ccc; border: 1px solid black;"></div>	369	0.1266	50	0	N/A	Yes
CIBusinessPartnerChecker	On	On	Exclusive	0	<div style="width: 100px; height: 10px; background-color: #ccc; border: 1px solid black;"></div>	0	0	50	2	N/A	Yes
CIBusinessPartnerCheckerDMQ	On	On	Exclusive	0	<div style="width: 100px; height: 10px; background-color: #ccc; border: 1px solid black;"></div>	6	0.0019	50	0	N/A	Yes
CIBusinessPartnerConverted	On	On	Exclusive	0	<div style="width: 100px; height: 10px; background-color: #ccc; border: 1px solid black;"></div>	0	0	50	0	N/A	Yes
CILegacyAdapterIn	On	On	Exclusive	0	<div style="width: 100px; height: 10px; background-color: #ccc; border: 1px solid black;"></div>	0	0	50	2	N/A	Yes
CILegacyAdapterInDMQ	On	On	Exclusive	0	<div style="width: 100px; height: 10px; background-color: #ccc; border: 1px solid black;"></div>	880	0.5214	50	1	N/A	Yes
CILegacyAdapterOut	On	On	Exclusive	0	<div style="width: 100px; height: 10px; background-color: #ccc; border: 1px solid black;"></div>	3	0.0001	50	0	N/A	Yes
CISalesOrder	On	On	Exclusive	0	<div style="width: 100px; height: 10px; background-color: #ccc; border: 1px solid black;"></div>	1,371	0.8406	50	0	N/A	Yes
CISalesOrderChecked	On	On	Exclusive	0	<div style="width: 100px; height: 10px; background-color: #ccc; border: 1px solid black;"></div>	0	0	50	0	N/A	Yes
CISalesOrderNotification	On	On	Exclusive	0	<div style="width: 100px; height: 10px; background-color: #ccc; border: 1px solid black;"></div>	0	0	50	2	N/A	Yes
CISalesOrderNotificationProcesse...	On	On	Exclusive	0	<div style="width: 100px; height: 10px; background-color: #ccc; border: 1px solid black;"></div>	766	0.4715	50	0	N/A	Yes

Congrats!

If you can see your consumers connected to your queue, then your iflow is successfully up and running waiting for event messages to arrive. 😊

Complete the success path for this scenario (OPTIONAL step for later)

Only complete this step **after** you have seen the flow interact end to end with the UI5 components and the BPA process in this Dead Message Queue (DMQ) error handling scenario.

Please **do not** complete this **until** you have a couple of messages on our Dead Message Queue, "CILegacyAdapterInDMQ" as we will need them for the rest of this scenario.

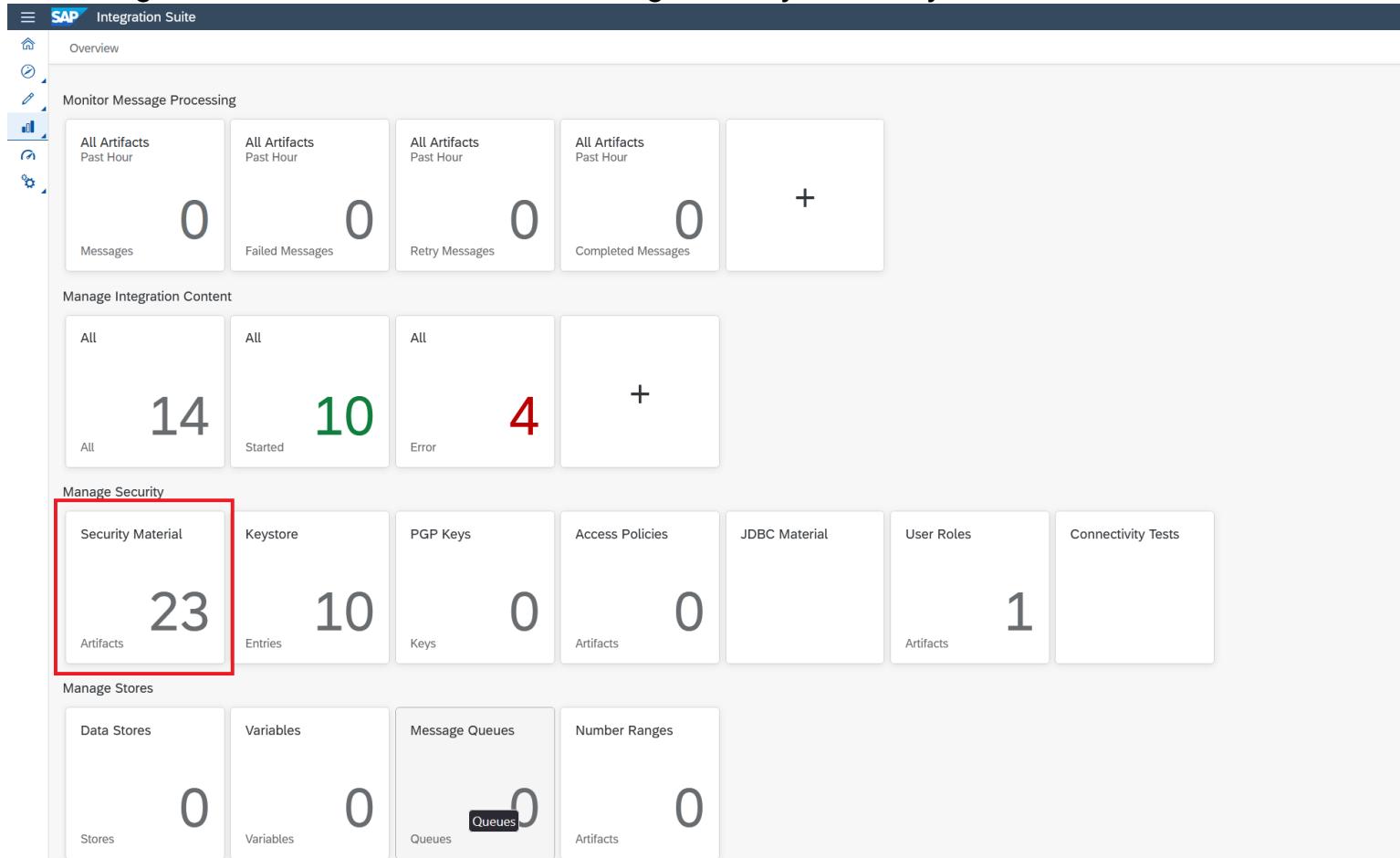
The legacy output adapter is simulating appending events to a file via an SFTP adapter, which could be imported to a legacy system. The workshop scenario doesn't require a working sftp destination, as we are using this iflow to simulate a failure to demonstrate the retry and error handling capabilities of AEM. The iflow will try a few times to deliver each event to the SFTP destination. After 3 failed attempts messages will be moved to a Dead Message Queue for manual processing by a UI5 and Business Process Automation workflow.

If, **AFTER** successful demonstration of the error handling, you would still like to see a successful delivery of events to a file via sftp, you will need an sftp server and sftp credentials to configure the flow with a valid endpoint (sftp server address and username password) and import the ssh identity into .

Security Configuration

Let's go back and configure the security details we will need to connect to the SFTP server.

- Go to **Integration Suite Monitor Artifacts -> Manage Security -> Security Material**.



- Update `UserCredentials sftpuser` and store your SFTP servers user and password credentials.

- You may also need to create a known.hosts file, populate it with your SFTP server's ssh id if you want to complete this optional step of successfully sending events to a file via SFTP (success path of the AEMLegacyOutputAdapter flow). See [this post](#) by Pravesh Shukla if you need help with this step.

Configure and Deploy your iflows

Go back to your iflow, reconfigure the SFTP adapter with your SFTP servers address and redeploy.

5. Automation of AEM setup via APIs and CI/CD (OPTIONAL)

Advanced Event Mesh APIs & CI

All configuration within AEM can be automated using a combination of two APIs:

- AEM Cloud API (for any configuration on the AEM Cloud Console)
- The broker's SEMP API (for any configuration on the broker service directly)

The documentation of these APIs can be found in the AEM docs [here](#)

Both these APIs are RESTful and can be used in numerous ways to pull/push configuration like queues and client configuration through CI/CD pipelines or configure/promote Event Portal content in step with code promotion from environment to environment.

And we are soon releasing additional features to push configuration from the Event Portal to individual brokers to implement a design-driven approach.

Sample CI/CD Configuration Tool

There are many options/tools that can be used to automate these tasks, like Jenkins, Ansible, scripts, Terraform etc. For the purpose of this exercise we are going to use a sample application written in CAP that has the nice advantage of running in our

browser that we can point at our broker's API and feed some configuration files.

The screenshot shows a web-based configuration tool. At the top, there are four input fields: 'Semp Base Path', 'VPN Name', 'Username', and 'Password'. Below these is a large text area labeled 'Config Json Payload' where configuration JSON can be pasted. To the right of this area is a blue 'Create Configuration' button. A red callout at the bottom of the form area reads: 'Key in all the information above to create configuration'.

Pushing AEM Configuration for Scenario 2 & 3

Here we will look at one example for automating our broker configuration for scenario 2 & 3 respectively, which will save us some time not having to repeat similar configuration steps like in scenario 1 again and again.

The AEM Rapid Pilot - Automatic Configuration can be accessed [here](#)

We will need some details from your AEM service again to connect the configuration tool with your AEM service. Let's head to our Advanced Event Mesh Console and go to **Cluster Manager**, select the **service** that you want to connect your Integration Suite flows to and go to the "**Manage**" tab. Take a note of the connectivity details underneath "**SEMP - REST API**" (click on the section to open it up):

The screenshot shows the SAP Advanced Event Mesh Cluster Manager interface for the cluster **MontrealBroker-10.1**. The left sidebar contains links for Mission Control, Cluster Manager (selected), Mesh Manager (Beta), Event Portal, Designer, Catalog, Runtime Manager, KPI, Event Insights, and SAP DEMO.

The main content area has tabs for Status, Connect, Manage (selected), Monitoring, Configuration, and Try Mel. It includes sections for Authentication (Enabled), Certificate Authorities (0 Client Certificate Authorities, 1 Domain Certificate Authority), and Client Profiles (1 Client Profile). Below these are Broker Manager Quick Settings for Message VPN, Clients, Queues, Access Control, and Bridges.

A red box highlights the "Other Management Tools" section, which contains:

- SEMP - REST API**: Describes the Solace Element Management Protocol (SEMP) as a REST API for managing the Event Broker Service. It shows the base path `https://mr-connection-qhgik3f2ezp.messaging.solace.cloud:943/SEMP/v2/config` and `https://montrealbroker.messaging.solace.cloud:943/SEMP/v2/config`.
- Manage with SEMP**: Includes a "Base path to the config API" field with the value `https://mr-connection-qhgik3f2ezp.messaging.solace.cloud:943/SEMP/v2/config`, and help links for Spec, Help, and Tutorials.
- SEMP Credentials**: Fields for Message VPN Name (`montrealbroker-10-1`), Username (`montrealbroker-10-1-admin`), and Password (redacted).
- Broker Manager - Web Application**: Describes the Broker Manager as a browser-based administration console for managing the Event Broker Service.
- SolAdmin - Desktop Application**: Describes SolAdmin as a desktop application for managing the Event Broker Service.

And copy & paste the URL, vpn name, admin username and password into the config tool:

The screenshot shows a web-based configuration tool with the following interface elements:

- Header:** The Solace logo on the left, the title "AEM Rapid Pilot - Automatic Configuration" in the center, and the SAP logo on the right.
- Input Fields (top row):**
 - 1g.solace.cloud:943/SEMP/v
 - montrealbroker-10-1
 - montrealbroker-10-1-admin
 - (redacted password)
- Configuration JSON Preview:** A large text area containing the following JSON configuration:

```
    "subscriptions": [
        "sap.com/salesorder/create/V1/>"
    ],
},
{
    "name": "CISalesOrderNotificationProcessed",
    "type": "exclusive",
    "owner": "solace-cloud-client",
    "subscriptions": [
        "sap.com/salesorder/notified/V1/>"
    ]
}
```

- Action Buttons:**
- A blue "Create Configuration" button located next to the configuration preview.

Please download the configuration file from [AEM configuration file](#) and copy & paste the content into the "**Config JSON Payload**" input field.

Hit "**Create Configuration**" to apply this config to your broker.

6. Scenario 2 - SalesOrder: AEMSONotificationV2 (mandatory)

Setup/Configure Dependency Services

We will give you connectivity details to one of our brokers where we have an iflow deployed that is configured to send emails via an external email service to enable us to automatically send welcome/confirmation emails.

Setup/configure SAP AEM broker service

You can skip over this step for configuring the AEM queues if you have used the CI/CD tool in section 5 to automate the configuration in the previous step. Resume with the Integration Suite flow configuration next.

In this section we will create the required input queues for your integration flows.

- Go to **Cluster Manager** -> **{your service}** -> **Manage** -> **Queues** - to open the Broker UI

Welcome to SAP Integration Suite, advanced event mesh

New Event Portal 2.0 : On

Event Management

Event Portal

Event Portal

Event Portal

Designer

Design your event driven architecture components

Catalog

Browse or search for events, schemas, and applications across your enterprise

Runtime Event Manager

Discover, govern, and visualize the flow of events between your applications in each environment

Event Streaming

Mission Control

Cluster Manager

Control the lifecycle of your Event Broker Services

Mission Control

Mesh Manager

Create and manage your event meshes

Event Insights

Insights

https://sapdemo.solace.cloud/services

Services

[Create Service](#)

Filter by service name Only show my services

All Services (14)

eu1 SAP DEMO (eu-central-1) Enterprise 250 Class Christian Holtfurther ● Running	us1 GKE - US Central (Iowa) Enterprise 250 Class Christian Holtfurther ● Running	ap1 EKS - Asia Pacific (Singapore) Enterprise 250 Class Christian Holtfurther ● 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 Holtfurther ● Running
cn1 AKS - East Asia (Hong Kong) Enterprise 250 Class Christian Holtfurther ● 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 Holtfurther ● Running
testbrokersap1 GKE - EU(London) Enterprise 1K Class Christian Holtfurther ● Running	Karls-special-broker-just-for-... AKS - Canada Central (Toronto) Enterprise 5K Class Karl Ossoinig ● Running	

MontrealBroker-10.1

Status Connect **Manage** Monitoring Configuration Try Me!

Open Broker Manager ⋮

Event Broker Service Settings

Deletion Protection Delete Service 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 

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.

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

To create the queues in the next sections, repeatedly click on the "+ Queue" button to bring up the create queue dialog.

The screenshot shows the SAP Message Broker interface for managing queues. The left sidebar contains navigation links for various components like Messaging, Clients, Queues, Connectors, Access Control, Telemetry, Replay, Bridges, JMS JNDI, Try Me!, Advanced Messaging, Caches, Transactions, System, and Clustering. The 'Queues' link is currently selected. The main area displays a table of existing queues with columns for Queue Name, Incoming, Outgoing, Access Type, Partition Count, Messages Queued (%), Messages Queued (msgs), Messages Queued (MB), Messages Queued Quota (MB), Consumers, Replay State, and Durable. A search bar at the top allows filtering by queue name. On the right side of the table, there is an 'Action' button and a prominent blue '+ Queue' button, which is highlighted with a red box. The top right corner shows the user's session information: montrealbroker-10-1... and a small profile icon.

Queue Name	Incoming	Outgoing	Access Type	Partition Count	Messages Queued (%)	Messages Queued (msgs)	Messages Queued (MB)	Messages Queued Quota (MB)	Consumers	Replay State	Durable
#mq://localhost:8080/	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	5,000	0	N/A	Yes
#mq://localhost:8080/00000000000000000000000000000000	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	800,000	1	N/A	Yes
ADMPILOTASAPIO	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	172,320	74.03	5,000	0	N/A	Yes
ARMSALESORDERADAPTER	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	5,000	0	N/A	Yes
BraadMQ	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	2	0.0012	5,000	0	N/A	Yes
BraadDemo	On	On	Non-Exclusive	0	<div style="width: 100%;">100%</div>	0	0	5,000	0	N/A	Yes
BradTest	On	On	Non-Exclusive	0	<div style="width: 100%;">100%</div>	0	0	5,000	0	N/A	Yes
CIBusinessPartner	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	1,110	0.3937	50	0	N/A	Yes
CIBusinessPartnerChecked	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	664	0.2895	50	0	N/A	Yes
CIBusinessPartnerCheckedInvalid	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	443	0.3659	50	0	N/A	Yes
CIBusinessPartnerChecker	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	50	2	N/A	Yes
CIBusinessPartnerCheckerDMO	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	3	0.0010	50	0	N/A	Yes
CIBusinessPartnerConverted	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	50	0	N/A	Yes
CILegacyAdapterIn	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	50	2	N/A	Yes
CILegacyAdapterInDMO	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	20	0.0187	50	0	N/A	Yes
CILegacyAdapterOut	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	50	0	N/A	Yes
CISaleOrder	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	20	0.0187	50	0	N/A	Yes
CISaleOrderChecked	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	50	0	N/A	Yes

Page: First Next > Last Update: 2023-10-21 08:32:04 Refresh Data Show 20

Provide the name as given (in the next sections).

Create Queue

Queue Name

Cancel

Create

Open up the "Advanced Queue Settings" section, then follow along and provide the details as showing in the screenshots below.

The screenshot shows the 'Edit Queue Settings' interface for a queue named 'TestQueue'. The interface has a blue header bar with 'Edit Queue Settings' on the left and 'Cancel' and 'Apply' buttons on the right. Below the header, there are several configuration options:

- Incoming:** An toggle switch is turned on.
- Outgoing:** An toggle switch is turned on.
- Access Type:** A radio button group with 'Exclusive' selected and 'Non-Exclusive' as an option.
- Messages Queued Quota (MB):** A text input field containing '5000'.
- Owner:** A dropdown menu currently empty.
- Non-Owner Permission:** A dropdown menu currently set to 'Consume'.
- Maximum Consumer Count:** A text input field containing '1000'.

On the right side of the interface, there is a vertical sidebar with the following sections:

- Show Advanced Settings** (button, highlighted with a red box)
- Tips >>**
- Click on a label or an input field to see help message.

Create the following queues and provide the details as given.

1. CISalesOrderNotification queue

- Name:** CISalesOrderNotification
- Owner:** solace-cloud-client
- Non-Owner Permission:** No access
- Redelivery:** enabled
- Try Forever:** disabled

- Maximum Redelivery Count: 3

SAP

MontrealBroker-10.1
montrealbroker-10-1
[Change VPN](#)

[Messaging](#) ▾
Message VPN
Clients
Queues

Connectors
Access Control
Telemetry
Replay
Bridges
JMS JNDI
Try Me!
Advanced Messaging
Caches
Transactions

[System](#) ▾
Clustering

Queues | CISalesOrderNotification

Summary **Settings** Subscriptions Consumers Messages Queued Stats

Incoming

Outgoing

Access Type Exclusive Non-Exclusive

Messages Queued Quota (MB)

Alert Thresholds

Owner

Non-Owner Permission

Maximum Consumer Count

Alert Thresholds

Maximum Message Size (B)

Maximum Delivered Unacknowledged Messages per Flow

DMQ Name

Enable Client Delivery Count

Delivery Delay (sec)

Message Priority
Respect Message Priority

SAP

MontrealBroker-10.1
montrealbroker-10-1
[Change VPN](#)

[Messaging](#) ▾
Message VPN
Clients
Queues
Connectors
Access Control
Telemetry
Replay
Bridges
JMS JNDI
[Try Me!](#)
Advanced Messaging
Caches
Transactions

[System](#) ▾
Clustering

Queues | CISalesOrderNotification

Summary **Settings** Subscriptions Consumers Messages Queued Stats

Message Expiry

Respect TTL

Maximum TTL (sec)

Redelivery
Try Forever
Maximum Redelivery Count

Delayed Redelivery

Multiplier
Initial Delay
Maximum Delay

Congestion Control

Reject Messages to Sender on Discard

Reject Low Priority Messages

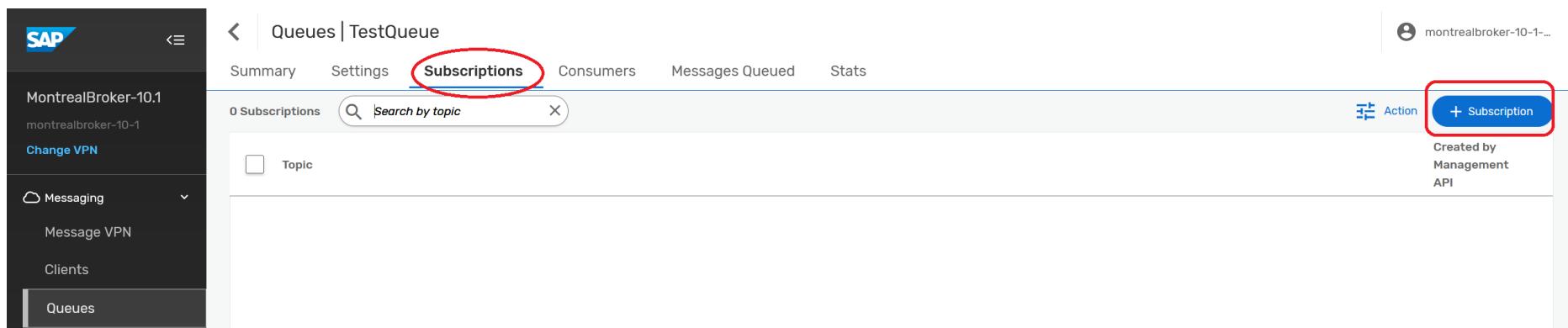
Reject Low Priority Messages Limit

Alert Thresholds
Clear Raise

Disaster Recovery

Consumer Acknowledgment Propagation

- Once the queue is created, click on the queue name in the list, navigate to the Subscriptions tab and open the subscriptions dialog.



The screenshot shows the SAP Fiori interface for managing queues. On the left, there's a sidebar with navigation links: MontrealBroker-10.1, Change VPN, Messaging (Message VPN, Clients, Queues), and Queues. The main area is titled 'Queues | TestQueue' and has tabs for Summary, Settings, Subscriptions (which is active and highlighted with a red circle), Consumers, Messages Queued, and Stats. Below the tabs, it says '0 Subscriptions' and features a search bar with 'Search by topic'. In the bottom right corner of the main content area, there's a blue button with a plus sign and the text '+ Subscription' (also highlighted with a red circle). The status bar at the top right indicates the session is 'montrealbroker-10-1...'.

- Add the following subscriptions to the queue
- `sap.com/salesorder/create/v1/>`

SAP

MontrealBroker-10.1

montrealbroker-10-1

Change VPN

Messaging

Message VPN

Clients

Queues

Queues | CISalesOrderNotification

Summary Settings **Subscriptions** Consumers Messages Queued Stats

1 Subscriptions Search by topic

Topic
<input type="checkbox"/> sap.com/salesorder/create/V1/>

2. CISalesOrderNotificationProcessed queue (optional - if you want to see/check the output of the flow)

- Name: CISalesOrderNotificationProcessed
- Owner: solace-cloud-client
- Non-Owner Permission: No access

The screenshot shows the SAP Solace Cloud interface. On the left, there's a sidebar with a dark background containing the SAP logo at the top, followed by the broker name "MontrealBroker-10.1" and a "Change VPN" button. Below that is a "Messaging" section with a dropdown menu showing "Message VPN" as the selected option. The sidebar also lists "Clients", "Queues" (which is highlighted with a white background), "Connectors", "Access Control", "Telemetry", "Replay", and "Bridges". The main content area has a header "Queues | CISalesOrderNotificationProcessed" with a back arrow. Below the header is a navigation bar with tabs: "Summary", "Settings" (which is underlined in blue, indicating it's active), "Subscriptions", "Consumers", "Messages Queued", and "Stats". The "Settings" tab contains several configuration options:

- "Incoming": A toggle switch that is turned on (blue).
- "Outgoing": A toggle switch that is turned on (blue).
- "Access Type": A button group with two options: "Exclusive" (which is selected and highlighted in dark grey) and "Non-Exclusive".
- "Messages Queued Quota (MB)": An input field containing the value "50".
- "Owner": A dropdown menu currently set to "solace-cloud-client".
- "Non-Owner Permission": A dropdown menu currently set to "No Access".
- "Maximum Consumer Count": An input field containing the value "1000".

- Once the queue is created, click on the queue name in the list, navigate to the Subscriptions tab and open the subscriptions dialog.

The screenshot shows the SAP Fiori interface for managing queues. The left sidebar shows the navigation path: MontrealBroker-10.1 > messaging > Queues. The main page title is "Queues | TestQueue". The top navigation bar includes tabs for Summary, Settings, **Subscriptions**, Consumers, Messages Queued, and Stats. The "Subscriptions" tab is highlighted with a red circle. Below the tabs, it says "0 Subscriptions" and features a search bar with "Search by topic". On the right side, there is an "Action" button with a plus sign and the text "+ Subscription", which is also highlighted with a red box. A small note below it says "Created by Management API".

- Add the following subscriptions to the queue
- sap.com/salesorder/notified/V1/>

The screenshot shows the SAP Fiori interface for managing queues. The left sidebar shows the navigation path: MontrealBroker-10.1 > messaging > Queues. The main page title is "Queues | CISSalesOrderNotificationProcessed". The top navigation bar includes tabs for Summary, Settings, **Subscriptions**, Consumers, Messages Queued, and Stats. The "Subscriptions" tab is highlighted. Below the tabs, it says "1 Subscriptions" and features a search bar with "Search by topic". A single subscription entry is listed: "sap.com/salesorder/notified/V1/>". This entire entry is highlighted with a large red box.

Configure Your Integration Suite Flow

Continue here, if you have completed the CI/CD section or configured your queues manually in the step above.

One thing, before we jump back into Integration Suite: Let's head to our Advanced Event Mesh Console and go to **Cluster Manager**, select the **service** that you want to connect your Integration Suite flows to and go to the "**Connect**" tab. Take a note of the connectivity details underneath "**Solace Messaging**" (click on the section to open it up):

The screenshot shows the SAP Advanced Event Mesh Cluster Manager interface. On the left, there is a sidebar with various icons and sections: Mission Control, Cluster Manager (selected), Mesh Manager, Event Portal (Designer, Catalog, Runtime Manager), Event Insights (Insights), and a bottom row with Help, Notifications, and SAP DEMO. The main content area has a header "MontrealBroker-10.1" with tabs for Status, Connect, Manage, Monitoring, Configuration, and Try Me! The "Connect" tab is active. Below the header, there is a section titled "Connect Using a Supported Client Library" with a dropdown "View by: Protocol". A "Select a connection point and supported client library below to start messaging." message is displayed. Under "Client Libraries", there is a list of Solace client libraries: Java API, JCSMP API, JavaRTO, JMS API, C, Python, Go, .NET, Spring Boot Java API, Spring Boot JMS API, and Spring Cloud Stream. Each item has a "Get Started" button. A red box highlights the "Connection Details" section for the Solace Messaging entry. This section contains fields for Username ("solace-cloud-client"), Password ("solacecloudclient"), Message VPN ("montrealbroker-10-1"), Secured SMF Host (Public Internet: "https://connection-solace.cloud.messaging.solace.cloud:85443" and "https://connection-solace.messaging.solace.cloud:443"), and TrustStore ("Download PEM"). The Solace logo is visible at the bottom right of the page.

We will need them in the next steps when configuring our flows.

The connect tab lists all the various connectivity details for the various supported protocols. Our Cloud Integration AEM adapter uses the Solace Messaging protocol, which is AEM's very own protocol with a broad feature support. Each AEM service also comes with a default client user called `solace-cloud-client` that is configured for convenience reasons and is allowed to publish and subscribe to all topics. We will be using this user for all our iflows. In a real production environment where security is important, you or your administrator will likely have this user disabled and will be creating separate users for each of the applications that connect to the AEM broker. Or this may even be deferred to an external authentication service over LDAP or OAuth.

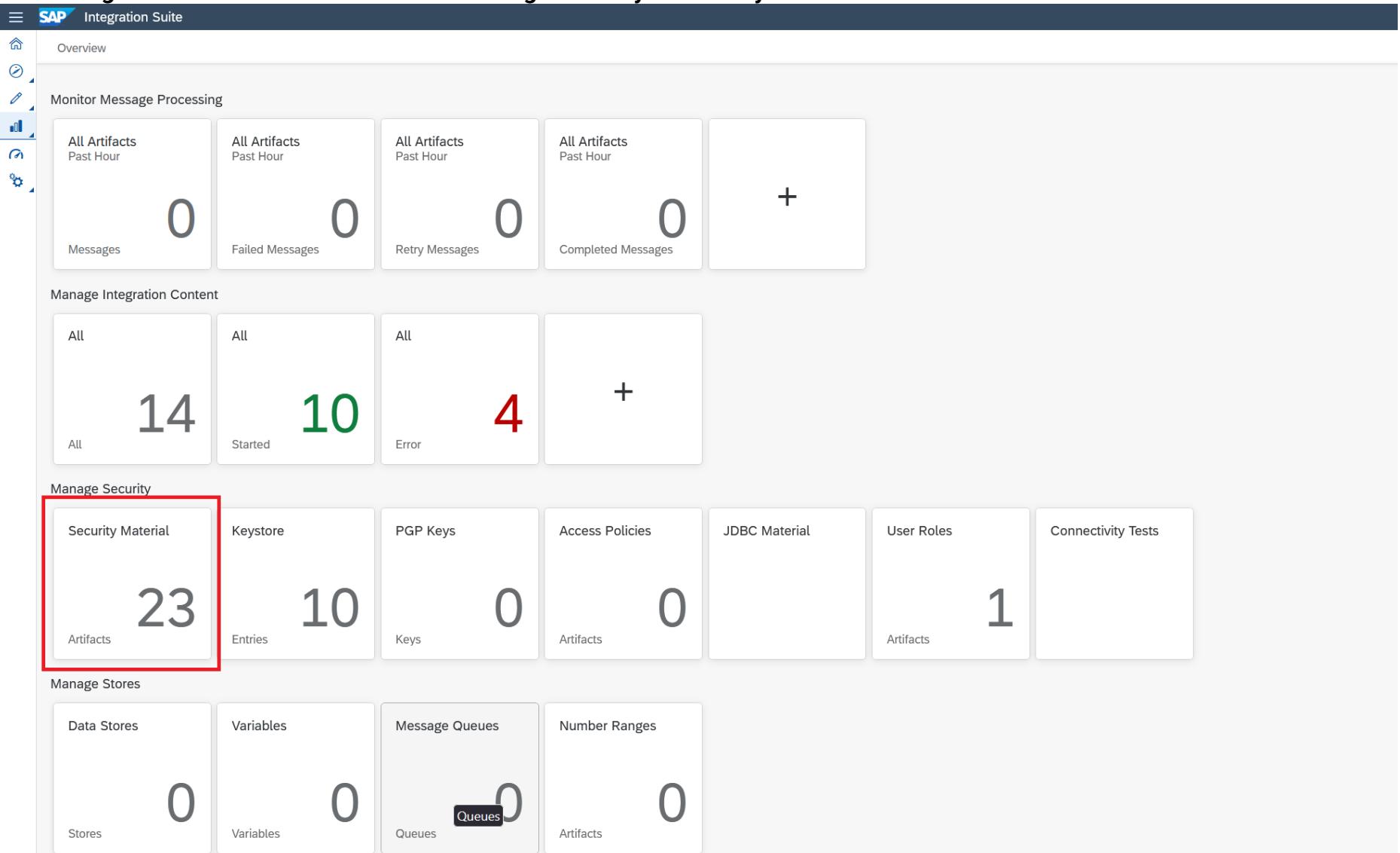
Now that we have set up all the prerequisites for our Integration Suite flows, we can take a look at the individual flows and prepare them for deployment.

0) - Security Configuration

Let's configure the security details we will need to connect to the various services like AEM & email service iflow's AEM broker.

Go to your Integration Suite cockpit.

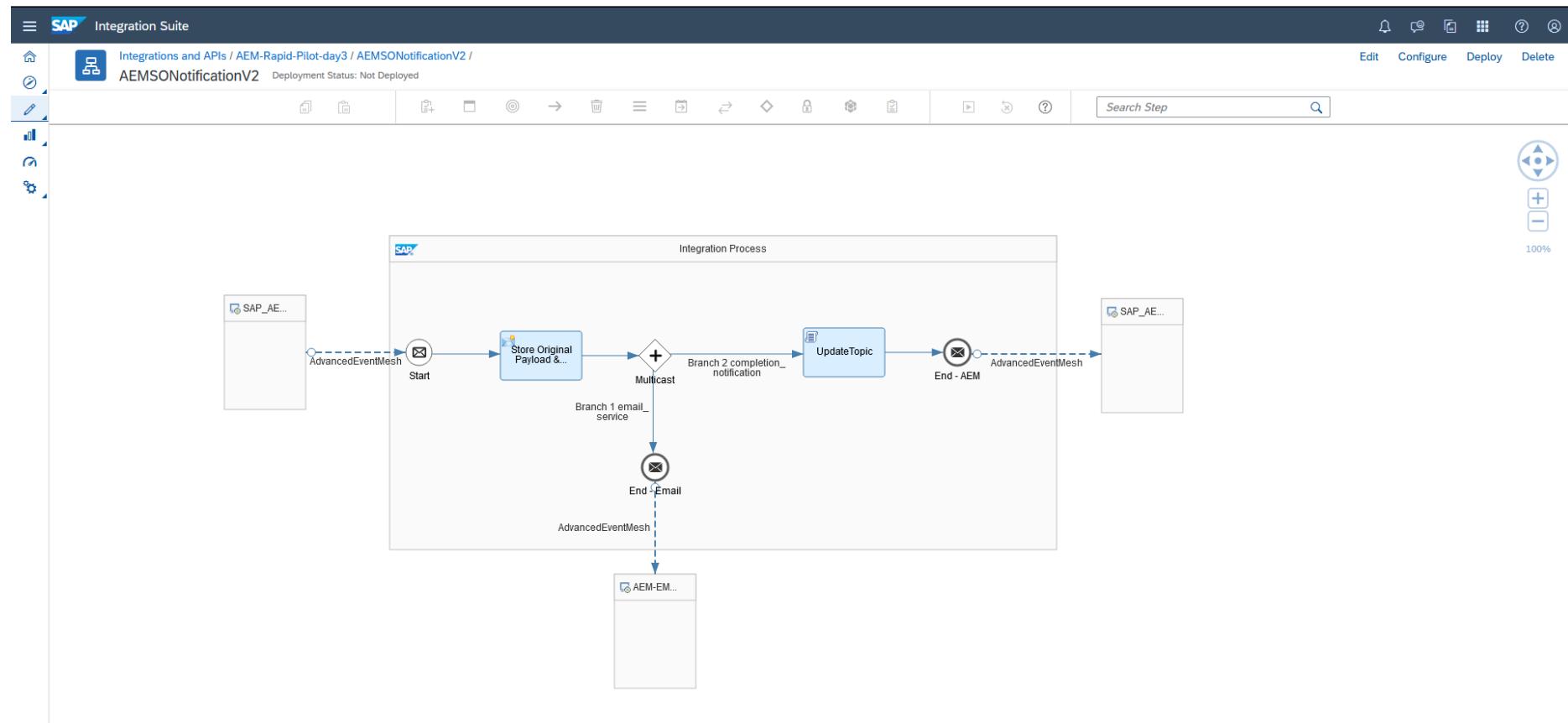
- Go to **Integration Suite Monitor Artifacts -> Manage Security -> Security Material**.



- In here, create security credentials for your AEM broker service (**if not already done**) & email server.
- Create **SecureParameter** `CABrokerUserPass` and store the password for your `solace-cloud-client` application user credentials.
- Create another **SecureParamter** `email-profile-pwd` and store the password we have handed out in the workshop.

Configure/Deploy AEMSONNotificationV2

1. Let's take a look at the AEMSONNotificationV2 iflow:

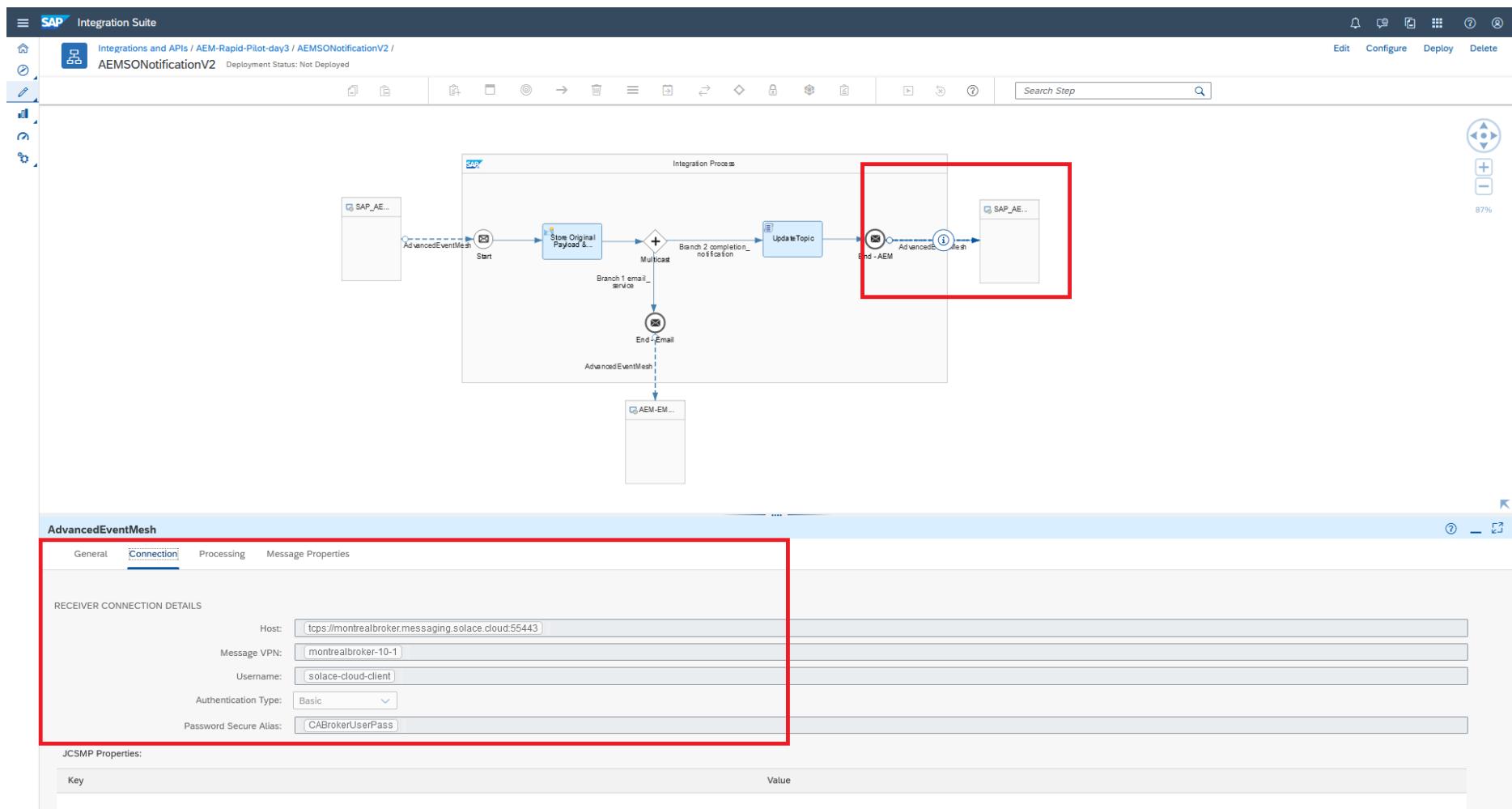


This flow gets triggered by Sales Order events and does two things:

- It creates an email request and by forwarding this event to an email service iflow on another broker (hosted by us) on topic `sap.com/emailnotification/created/V1`.

b) It sends a new event to `sap.com/salesorder/notified/V1/{salesOrg}/{distributionChannel}/{division}/{customerId}` to indicate that the email request was successfully forwarded.

2. Configuring and deploying the AEMSONNotificationV2 iflow:



- Populate the connection details for the AEM broker service to send an event to the AEM broker provided by us whenever the flow successfully sends a notification email.
- Hit **configure** at the top right and fill in the details to connect to your AEM broker service:

If you get confused about which parts of your iflow to connect to your broker and which ones to connect to our broker, remember this simple rule:

The sender and receiver (left and right of your iflow) connect to your broker. The connector down at the bottom connects to our, from your point of view external, broker.

Configure "AEMSONNotificationV2"

Sender Receiver

Connection

Sender:	SAP_AEM_Sender
Adapter Type:	AdvancedEventMesh
Host:	tcp://montrealbroker.messaging.solace.cloud:55443
Message VPN:	montrealbroker-10-1
Username:	solace-cloud-client
Password Secure Alias:	CABrokerUserPass

Configure "AEMSONNotificationV2"

Sender **Receiver**

Connection

Receiver:	SAP_AEM_Receiver
Adapter Type:	AdvancedEventMesh
Host:	tcp://montrealbroker.messaging.solace.cloud:55443
Message VPN:	montrealbroker-10-1
Username:	solace-cloud-client
Password Secure Alias:	CABrokerUserPass

- No need to configure the adapter connecting to our email service, we've prepopulated this one and we have already deployed the necessary security configuration in the step above.

- Then hit **deploy** at the bottom right.

3. Check that your flow was deployed successfully and fix if necessary.

- Go to **Monitor Artifacts** -> **Manage Integration Content** -> **All**.

You should be seeing the AEMSONNotificationV2 flow as **Started**, similar to this view (instead of AEMSalesOrderNotification, you should see AEMSONNotificationV2):

The screenshot shows the SAP Integration Suite interface. On the left, there is a sidebar with various icons and a search/filter bar. The main area is titled "Integration Content (14)". A table lists several artifacts, each with a name, status, and type. One artifact, "AEMSalesOrderNotification", is highlighted and shown in more detail on the right side of the screen. This detailed view includes information about deployment (Deployed On: Oct 05, 2023, 14:27:07, Deployed By: christian.holtfurth@solace.com, Version: 1.0.0, Package: SOLACE-TIGER-TEAM), endpoints (none configured), status details (the integration flow is deployed successfully), artifact details (links to monitor message processing, view deployed artifact, and navigate to artifact editor), and log configuration (log level set to Info).

Name	Status	Type
AEMSalesOrderNotification	Started	Integration Flow
AEMBusinessPartnerAddressCheck	Started	Integration Flow
AEMLegacyOutputAdapter	Started	Integration Flow
slack-idemo	Started	Integration Flow
AdvancedEventMesh	Started	Integration Adapter
PubSubPlusEA	Started	Integration Adapter
Rainforest 01	Error	Integration Flow
AEMLegacyInputAdapter	Error	Integration Flow
BradTest	Error	Integration Flow
SAP AEM Demo	Error	Integration Flow
Slack	Started	Integration Adapter
SapBipSolConnector	Started	Integration Adapter
AssignTechnician	Started	Integration Flow
RabbitMQ	Started	Integration Adapter

- Go to your **AEM Console** and navigate to **Cluster Manager** -> **{your service}** -> **Manage** and click on the **Queues** tile:

The screenshot shows the AEM Cluster Manager interface for the service "MontrealBroker-10.1". The left sidebar includes links for Mission Control, Cluster Manager (selected), Mesh Manager (BETA), Event Portal, Designer, Catalog, Runtime Manager, Event Insights, and Insights.

The main content area displays "Event Broker Service Settings" with sections for Authentication (Enabled), Certificate Authorities (0 Client Certificate Authorities, 1 Domain Certificate Authority), and Client Profiles (1 Client Profile). Below this is the "Broker Manager Quick Settings" section, which includes tiles for Message VPN, Clients, Queues (highlighted with a red box), Access Control, and Bridges.

At the bottom is the "Other Management Tools" section, listing SEMP - REST API, Broker Manager - Web Application, and SolAdmin - Desktop Application, each with a corresponding icon.

- Check that the **AEMSalesOrderNotification** input queue has at least one consumer connected to it.

SAP

MontrealBroker-10.1

montrealbroker-10-1

[Change VPN](#)

[Messaging](#) ▾

- Message VPN
- Clients
- Queues**
- Connectors
- Access Control
- Telemetry
- Replay
- Bridges
- JMS JNDI
- Try Me!
- Advanced Messaging
- Caches
- Transactions

[System](#) ▾

- Clustering

Queues Topic Endpoints Templates

Action + Queue

<input type="checkbox"/>	Queue Name	Incoming	Outgoing	Access Type	Partition Count	Messages Queued (%)	Messages Queued (msgs)	Messages Queued (MB)	Messages Queued Quota (MB)	Consumers	Replay State	Durable
<input type="checkbox"/>	CIBusinessPartner	On	On	Exclusive	0	<div style="width: 10px;"></div>	917	0.3088	50	0	N/A	Yes
<input type="checkbox"/>	CIBusinessPartnerChecked	On	On	Exclusive	0	<div style="width: 10px;"></div>	560	0.1963	50	0	N/A	Yes
<input type="checkbox"/>	CIBusinessPartnerCheckedInvalid	On	On	Exclusive	0	<div style="width: 10px;"></div>	369	0.1266	50	0	N/A	Yes
<input type="checkbox"/>	CIBusinessPartnerChecker	On	On	Exclusive	0	<div style="width: 10px;"></div>	0	0	50	2	N/A	Yes
<input type="checkbox"/>	CIBusinessPartnerCheckerDMQ	On	On	Exclusive	0	<div style="width: 10px;"></div>	6	0.0019	50	0	N/A	Yes
<input type="checkbox"/>	CIBusinessPartnerConverted	On	On	Exclusive	0	<div style="width: 10px;"></div>	0	0	50	0	N/A	Yes
<input type="checkbox"/>	CLegacyAdapterIn	On	On	Exclusive	0	<div style="width: 10px;"></div>	0	0	50	2	N/A	Yes
<input type="checkbox"/>	CLegacyAdapterInDMQ	On	On	Exclusive	0	<div style="width: 10px;"></div>	880	0.5214	50	1	N/A	Yes
<input type="checkbox"/>	CLegacyAdapterOut	On	On	Exclusive	0	<div style="width: 10px;"></div>	3	0.0001	50	0	N/A	Yes
<input type="checkbox"/>	CISSalesOrder	On	On	Exclusive	0	<div style="width: 10px;"></div>	1,371	0.8406	50	0	N/A	Yes
<input type="checkbox"/>	CISSalesOrderChecked	On	On	Exclusive	0	<div style="width: 10px;"></div>	0	0	50	0	N/A	Yes
<input type="checkbox"/>	CISSalesOrderNotification	On	On	Exclusive	0	<div style="width: 10px;"></div>	0	0	50	2	N/A	Yes
<input type="checkbox"/>	CISSalesOrderNotificationProcesse...	On	On	Exclusive	0	<div style="width: 10px;"></div>	766	0.4715	50	0	N/A	Yes

7. Scenario 3 - BusinessPartner: AEMBusinessPartner AddressCheck (OPTIONAL)

Setup/Configure Dependency Services

One of our iflows that we are going to deploy is invoking the SAP Data Quality Management service (DQM) to check and cleanse address data in the BusinessPartner events. For the flow to work properly, you will need a working DQM service subscription so you can configure your iflow with this. For completing this section, you have two options:

A) Use DQM service credentials provided by us during the workshop

SAP is providing us with a credentials for a SAP owned DQM service instance. We will hand out the token and connectivity details to our DQM service, which you can use instead.

B) Alternative: Activate your own SAP Data Quality Management service in BTP

Please note that if you want to proceed down this route, it may take some time to complete, so you may want to complete this in your own time after the workshop.

The good news, if you don't have a DQM subscription already or are not using our instance, then you can use a free tier subscription for this purpose. Please follow along the steps in this [blog post](#) by Hozumi Nakano to active the service.

Additionally, you will have to create a service instance and a service key to be configured with your integration flow later. Follow [these steps](#) to create a service instance and key.

Take a note of the URL and user credentials once you've activated the service.

Setup/configure SAP AEM broker service

You can skip over this step for configuring the AEM queues if you have used the CI/CD tool in section 5 to automate the configuration in the previous step. Resume with the Integration Suite flow configuration next.

In this section we will create the required input queues for your integration flows.

- Go to **Cluster Manager** -> **{your service}** -> **Manage** -> **Queues** - to open the Broker UI

The screenshot shows the SAP Integration Suite advanced event mesh welcome page. The left sidebar contains navigation links for Mission Control, Cluster Manager, Mesh Manager (BETA), Event Portal, Designer, Catalog, Runtime Manager, Event Insights, and Insights. The main content area features a header "Welcome to SAP Integration Suite, advanced event mesh". Below it, there are sections for "Event Management" and "Event Streaming". The "Event Streaming" section is highlighted with a red box around the "Cluster Manager" card. The "Cluster Manager" card includes icons for "Mission Control" and "Cluster Manager", and text describing it as a tool for controlling the lifecycle of Event Broker Services. Other cards in the "Event Streaming" section include "Mesh Manager" (for managing event meshes) and "Event Insights" (for providing insights). The "Event Management" section includes cards for "Event Portal Designer" (for designing event-driven architecture components), "Event Portal Catalog" (for browsing or searching for events, schemas, and applications), and "Event Portal Runtime Event Manager" (for discovering, governing, and visualizing the flow of events between applications). A toggle switch at the top indicates "New Event Portal 2.0 : On". The bottom of the page shows a URL bar with the address <https://sapdemo.solace.cloud/services>.

Services

[Create Service](#) Filter by service name Only show my services

All Services (14)

 eu1 SAP DEMO (eu-central-1) Enterprise 250 Class Christian Holtfurth ● Running 	 us1 GKE - US Central (Iowa) Enterprise 250 Class Christian Holtfurth ● Running 	 ap1 EKS - Asia Pacific (Singapore) Enterprise 250 Class Christian Holtfurth ● Running 
 MontrealBroker-10.1 EKS - Canada Central(Montreal) Developer Class Scott Dillon ● Running 	 US-Central AKS - Central US (Iowa) Developer Class Karl Ossoinig ● Running 	 sa1 EKS - Africa (Cape Town) Enterprise 250 Class Christian Holtfurth ● Running 
 cn1 AKS - East Asia (Hong Kong) Enterprise 250 Class Christian Holtfurth ● Running 	 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 
 MyMesh-Svc2 EKS - US West (Oregon) Developer Class Karl Ossoinig ● Running 	 My-First-Service EKS - Canada Central(Montreal) Enterprise 250 Class Andrea Kelso ● Running 	 test GKE - Asia South (Mumbai) Enterprise 1K Class Christian Holtfurth ● Running 
 testbrokersap1 GKE - EU(London) Enterprise 1K Class Christian Holtfurth ● Running 	 Karls-special-broker-just-for-... AKS - Canada Central (Toronto) Enterprise 5K Class Karl Ossoinig ● Running 	

MontrealBroker-10.1

Status Connect **Manage** Monitoring Configuration Try Me!

Open Broker Manager ...

Event Broker Service Settings

Authentication Enabled

Certificate Authorities 0 Client Certificate Authorities 1 Domain Certificate Authority

Client Profiles 1 Client Profile

Deletion Protection Delete Service Advanced Options

Broker Manager Quick Settings

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.

SolAdmin - Desktop Application

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

To create the queues in the next sections, repeatedly click on the "+ Queue" button to bring up the create queue dialog.

The screenshot shows the SAP Message Broker interface for managing queues. The left sidebar contains navigation links for various components like Messaging, Clients, Queues, Connectors, Access Control, Telemetry, Replay, Bridges, JMS JNDI, Try Me!, Advanced Messaging, Caches, Transactions, System, and Clustering. The 'Queues' link is currently selected. The main area displays a table of existing queues with columns for Queue Name, Incoming, Outgoing, Access Type, Partition Count, Messages Queued (%), Messages Queued (msgs), Messages Queued (MB), Messages Queued Quota (MB), Consumers, Replay State, and Durable. A search bar at the top allows filtering by queue name. On the right side of the table, there is an 'Action' button and a prominent blue '+ Queue' button, which is highlighted with a red box. The top right corner shows the user's session information: montrealbroker-10-1... and a small profile icon.

Queue Name	Incoming	Outgoing	Access Type	Partition Count	Messages Queued (%)	Messages Queued (msgs)	Messages Queued (MB)	Messages Queued Quota (MB)	Consumers	Replay State	Durable
#mq://localhost:8080/	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	5,000	0	N/A	Yes
#mq://localhost:8080/00000000000000000000000000000000	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	800,000	1	N/A	Yes
ADMPILOTASAPIO	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	172,320	74.03	5,000	0	N/A	Yes
ARMSALESORDERADAPTER	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	5,000	0	N/A	Yes
BraadMQ	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	2	0.0012	5,000	0	N/A	Yes
BraadDemo	On	On	Non-Exclusive	0	<div style="width: 100%;">100%</div>	0	0	5,000	0	N/A	Yes
BradTest	On	On	Non-Exclusive	0	<div style="width: 100%;">100%</div>	0	0	5,000	0	N/A	Yes
CIBusinessPartner	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	1,110	0.3937	50	0	N/A	Yes
CIBusinessPartnerChecked	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	664	0.2895	50	0	N/A	Yes
CIBusinessPartnerCheckedInvalid	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	443	0.3659	50	0	N/A	Yes
CIBusinessPartnerChecker	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	50	2	N/A	Yes
CIBusinessPartnerCheckerDMO	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	3	0.0010	50	0	N/A	Yes
CIBusinessPartnerConverted	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	50	0	N/A	Yes
CILegacyAdapterIn	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	50	2	N/A	Yes
CILegacyAdapterInDMO	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	20	0.0187	50	0	N/A	Yes
CILegacyAdapterOut	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	50	0	N/A	Yes
CISaleOrder	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	20	0.0187	50	0	N/A	Yes
CISaleOrderChecked	On	On	Exclusive	0	<div style="width: 100%;">100%</div>	0	0	50	0	N/A	Yes

Page: First Next > Last Update: 2023-10-21 08:32:04 Refresh Data Show 20

Provide the name as given (in the next sections).

Create Queue

Queue Name

[Cancel](#)

[Create](#)

Open up the "Advanced Queue Settings" section, then follow along and provide the details as showing in the screenshots below.

The screenshot shows the 'Edit Queue Settings' interface for a queue named 'TestQueue'. The interface has a blue header bar with 'Edit Queue Settings' on the left and 'Cancel' and 'Apply' buttons on the right. Below the header, there are several configuration options:

- Incoming:** A toggle switch that is turned on (blue).
- Outgoing:** A toggle switch that is turned on (blue).
- Access Type:** A radio button group where 'Exclusive' is selected (highlighted in grey), and 'Non-Exclusive' is unselected.
- Messages Queued Quota (MB):** An input field containing the value '5000'.
- Owner:** A dropdown menu currently showing a single option.
- Non-Owner Permission:** A dropdown menu currently showing the option 'Consume'.
- Maximum Consumer Count:** An input field containing the value '1000'.

On the right side of the interface, there is a vertical panel with the following content:

- Show Advanced Settings**: A button with a red border around it.
- Tips >>**: A link to additional information.
- A note: 'Click on a label or an input field to see help message.'

Create the following queues and provide the details as given.

1. CIBusinessPartnerChecker queue

- Name:** CIBusinessPartnerChecker
- Owner:** solace-cloud-client
- Non-Owner Permission:** No access
- DMQ Name:** CIBusinessPartnerCheckerDMQ
- Redelivery:** enabled
- Try Forever:** disabled
- Maximum Redelivery Count:** 3

SAP

MontrealBroker-10.1
montrealbroker-10-1
[Change VPN](#)

Messaging

Message VPN

Clients

Queues

Connectors

Access Control

Telemetry

Replay

Bridges

JMS JNDI

Try Me!

Advanced Messaging

Caches

Transactions

System

Clustering

Queues | CIBusinessPartnerChecker

Summary **Settings** Subscriptions Consumers Messages Queued Stats

Incoming

Outgoing

Access Type Exclusive Non-Exclusive

Messages Queued Quota (MB)

Alert Thresholds % # 18 25

Owner

Non-Owner Permission

Maximum Consumer Count

Alert Thresholds % # 60 80

Maximum Message Size (B)

Maximum Delivered Unacknowledged Messages per Flow

DMQ Name

Enable Client Delivery Count

Delivery Delay (sec)

SAP

< Queues | CIBusinessPartnerChecker

Summary **Settings** Subscriptions Consumers Messages Queued Stats

MontrealBroker-10.1
montrealbroker-10-1
[Change VPN](#)

Cloud Messaging ▾

- Message VPN
- Clients
- Queues**
- Connectors
- Access Control
- Telemetry
- Replay
- Bridges
- JMS JNDI
- Try Me!
- Advanced Messaging
- Caches
- Transactions

System ▾

- Clustering

Message Expiry

Respect TTL

Maximum TTL (sec)

Redelivery

Try Forever

Maximum Redelivery Count

Delayed Redelivery

Multiplier

Initial Delay

Maximum Delay

Congestion Control

Reject Messages to Sender on Discard

Reject Low Priority Messages

Reject Low Priority Messages Limit

Alert Thresholds Clear 60 Raise 80

- Once the queue is created, click on the queue name in the list, navigate to the Subscriptions tab and open the subscriptions dialog.

SAP Fiori interface showing the 'Queues | TestQueue' screen. The left sidebar shows 'MontrealBroker-10.1' and 'Queues' is selected. The top navigation bar has tabs: Summary, Settings, **Subscriptions**, Consumers, Messages Queued, and Stats. The 'Subscriptions' tab is highlighted with a red circle. Below it, there is a search bar 'Search by topic' and a blue button labeled '+ Subscription' which is also circled in red.

- Add the following subscriptions to the queue
- <sap.com/businesspartner/create/V1/>
- <sap.com/businesspartner/change/V1/>

SAP Fiori interface showing the 'Queues | CIBusinessPartnerChecker' screen. The left sidebar shows 'MontrealBroker-10.1' and 'Queues' is selected. The top navigation bar has tabs: Summary, Settings, **Subscriptions**, Consumers, Messages Queued, and Stats. The 'Subscriptions' tab is highlighted. Below it, there is a search bar 'Search by topic' and a list of two subscriptions: 'sap.com/businesspartner/create/V1/' and 'sap.com/businesspartner/change/V1/'. This list is highlighted with a red rectangle.

2. CIBusinessPartnerCheckerDMQ queue

- Name: CIBusinessPartnerCheckerDMQ
- Owner: solace-cloud-client
- Non-Owner Permission: No access

SAP

MontrealBroker-10.1

montrealbroker-10-1

Change VPN

Cloud Messaging

Message VPN

Clients

Queues

Connectors

Access Control

Telemetry

Replay

Bridges

JMS JNDI

Try Me!

Advanced Messaging

Caches

Transactions

System

Clustering

Edit Queue Settings

CIBusinessPartnerCheckerDMQ

Incoming

Outgoing

Access Type Exclusive Non-Exclusive

Messages Queued Quota (MB)

Owner

Non-Owner Permission

Maximum Consumer Count

Maximum Message Size (B)

Maximum Delivered Unacknowledged Messages per Flow

DMQ Name

Enable Client Delivery Count

Delivery Delay (sec)

Message Priority

Message Expiry

3. CIBusinessPartnerChecked queue

(optional – only if you want to see/check the output of the flow e.g. for troubleshooting purposes)

- Name: CIBusinessPartnerChecked
- Owner: solace-cloud-client
- Non-Owner Permission: No access

The screenshot shows the SAP Solace Cloud interface for managing queues. On the left, a sidebar menu lists various broker components: MontrealBroker-10.1, Change VPN, Messaging (Message VPN, Clients, Queues), Connectors, Access Control, Telemetry, Replay, Bridges, and JMS JNDI. The 'Queues' item is currently selected. The main content area is titled 'Queues | CIBusinessPartnerChecked' and displays the 'Settings' tab. The configuration includes:

- Incoming: Enabled (blue toggle switch)
- Outgoing: Enabled (blue toggle switch)
- Access Type: Exclusive (selected button)
- Messages Queued Quota (MB): 50
- Owner: solace-cloud-client
- Non-Owner Permission: No Access
- Maximum Consumer Count: 1000

- Once the queue is created, click on the queue name in the list, navigate to the Subscriptions tab and open the subscriptions dialog.

The screenshot shows the SAP Fiori interface for managing queues. On the left, there's a sidebar with navigation links: MontrealBroker-10.1, Change VPN, Messaging (Message VPN, Clients, Queues), and a back arrow. The main area is titled "Queues | TestQueue". It has tabs for Summary, Settings, Subscriptions (which is highlighted with a red oval), Consumers, Messages Queued, and Stats. Below the tabs, it says "0 Subscriptions" and has a search bar "Search by topic". To the right, there's an "Action" button with a plus sign and the text "+ Subscription" (also highlighted with a red rectangle). A small note says "Created by Management API".

- Add the following subscriptions to the queue
- sap.com/businesspartner/addressChecked/v1/>
- !sap.com/businesspartner/addressChecked/*/*/Invalid

The screenshot shows the SAP Solace Cloud interface for managing queues. The left sidebar has a dark theme with the SAP logo and navigation options: MontrealBroker-10.1, Change VPN, Messaging (selected), Message VPN, Clients, Queues (selected), and Connectors. The main content area is titled 'Queues | CIBusinessPartnerChecked' and shows the 'Subscriptions' tab is active. It displays '2 Subscriptions' with a search bar. Two topics are listed: 'sap.com/businesspartner/addressChecked/V1/>' and '!sap.com/businesspartner/addressChecked/V1/*/*/Invalid'. The second topic is highlighted with a red box.

Notice the second subscription that starts with ! ?

This is called a topic exception and removes any events matching topic subscription

`sap.com/businesspartner/addressChecked/V1/*/*/Invalid` from the previously matched list of events matched by `sap.com/businesspartner/addressChecked/V1/>`. This is a really handy feature to exclude subsets of events matched by a larger topic subscription. See [link](#) for more details on Solace's topic syntax.

4. CIBusinessPartnerCheckedInvalid queue

(optional – only if you want to see/check the output of the flow e.g. for troubleshooting purposes)

- Name: CIBusinessPartnerCheckedInvalid
- Owner: solace-cloud-client

- Non-Owner Permission: No access

SAP

Queues | CIBusinessPartnerCheckedInvalid

MontrealBroker-10.1

montréalbroker-10-1

Change VPN

Messaging

- Message VPN
- Clients
- Queues**
- Connectors
- Access Control
- Telemetry
- Replay

Settings

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)	50
Owner	solace-cloud-client
Non-Owner Permission	No Access
Maximum Consumer Count	1000

- Once the queue is created, click on the queue name in the list, navigate to the Subscriptions tab and open the subscriptions dialog.

The screenshot shows the SAP Cloud Platform Management Cockpit interface. On the left, there's a sidebar with the SAP logo and navigation links: MontrealBroker-10.1, Change VPN, Messaging (Message VPN, Clients), and Queues (which is selected). The main area has a header "Queues | TestQueue" with tabs: Summary, Settings, **Subscriptions**, Consumers, Messages Queued, and Stats. The Subscriptions tab is highlighted with a red circle. Below it, there's a search bar "Search by topic" and a button "+ Subscription". A tooltip "Created by Management API" is visible near the "+ Subscription" button. The main content area shows 0 Subscriptions and a table with a single column "Topic".

- Add the following subscriptions to the queue
- sap.com/businesspartner/addressChecked/v1/*/*/invalid

The screenshot shows the SAP Cloud Platform Management Cockpit interface. The sidebar is identical to the previous one, with the Queues link selected. The main area has a header "Queues | CIBusinessPartnerCheckedInvalid" with tabs: Summary, Settings, **Subscriptions**, Consumers, Messages Queued, and Stats. The Subscriptions tab is highlighted. Below it, there's a search bar "Search by topic" and a table showing 1 Subscriptions. The table has a single row with a checkbox and the topic "sap.com/businesspartner/addressChecked/V1/*/*/Invalid", which is also highlighted with a red box.

Configure Your Integration Suite Flow

Continue here, if you have completed the CI/CD section or configured your queues manually in the step above.

One thing, before we jump back into Integration Suite: Let's head to our **Advanced Event Mesh Console** and go to **Cluster Manager**, select the **service** that you want to connect your Integration Suite flows to and go to the "**Connect**" tab. Take a note of the connectivity details underneath "**Solace Messaging**" (click on the section to open it up):

The screenshot shows the SAP Mission Control interface for the MontrealBroker-10.1 instance. The left sidebar includes links for Cluster Manager, Mesh Manager (Beta), Designer, Catalog, Runtime Manager, Insights, and SAP DEMO. The main content area has a header "MontrealBroker-10.1" with tabs for Status, Connect, Manage, Monitoring, Configuration, and Try Me! A sub-header "Connect Using a Supported Client Library" is followed by a dropdown "View by: Protocol". Below this, a section titled "Client Libraries" lists various Solace client libraries:

Client Library	Description	Action
Solace Java API (Java)	Start messaging with client libraries that use the Solace Message Format (SMF) protocol over TCP.	Get Started
Solace JCSMP API (JCSMP)		Get Started
Solace JavaRTO (Java)		Get Started
Solace JMS API (Java)		Get Started
Solace C (C)		Get Started
Solace Python (Python)		Get Started
Solace Go API (Go)		Get Started
Solace .NET (.NET)		Get Started
Spring Boot Java API (Spring)		Get Started
Spring Boot JMS API (Spring)		Get Started
Spring Cloud Stream		Get Started

Below the client library list, there are sections for "Solace Web Messaging" and "AMQP". A red box highlights the "Connection Details" section on the right, which contains fields for Username, Password, Message VPN, Secured SMF Host, Public Internet, TrustStore, and Download PEM.

We will need them in the next steps when configuring our flows.

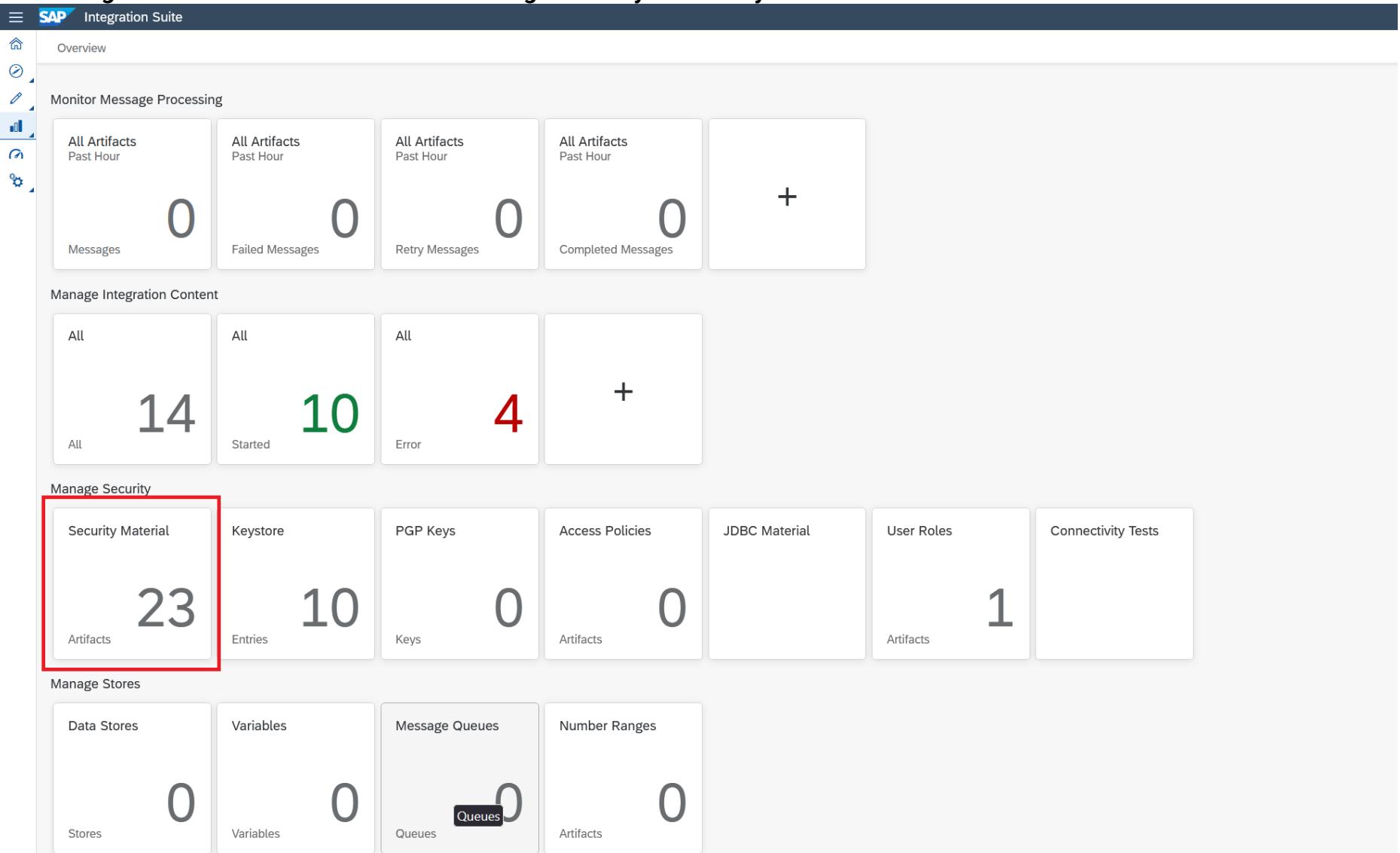
The connect tab lists all the various connectivity details for the various supported protocols. Our Cloud Integration AEM adapter uses the Solace Messaging protocol, which is AEM's very own protocol with a broad feature support. Each AEM service also comes with a default client user called `solace-cloud-client` that is configured for convenience reasons and is allowed to publish and subscribe to all topics. We will be using this user for all our iflows. In a real production environment where security is important, you or your administrator will likely have this user disabled and will be creating separate users for each of the applications that connect to the AEM broker. Or this may even be deferred to an external authentication service over LDAP or OAuth.

Now that we have set up all the prerequisites for our Integration Suite flows, we can take a look at the individual flows and prepare them for deployment.

0) - Security Configuration

Let's configure the security details we will need to connect to the various services like AEM.

- Go to **Integration Suite Monitor Artifacts -> Manage Security -> Security Material**.



- In here, create security credentials for your AEM broker service (**if not already done**).
- Create **SecureParameter** `CABrokerUserPass` and store the password for your `solace-cloud-client` application user credentials.
- Create **OAuth2 Client Credentials** and store your credentials from your DQM service key.
- Token Service URL (should end in /oauth/token)
- Client ID

- Client Secret (either use your own or the one we will have handed out during the workshop.)

Edit OAuth2 Client Credentials

Name:*	DQMCred
Description:	Client credential for calling DQM service
Token Service URL:*	https://scpsubaccount.authentication.eu10.hana.ondemand.com/oauth2/token
Client ID:	
Client Secret:*	
Client Authentication:*	Send as Request Header 
Scope:	
Content Type:	application/json 
Resource:	
Audience:	

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

SAP Integration Suite

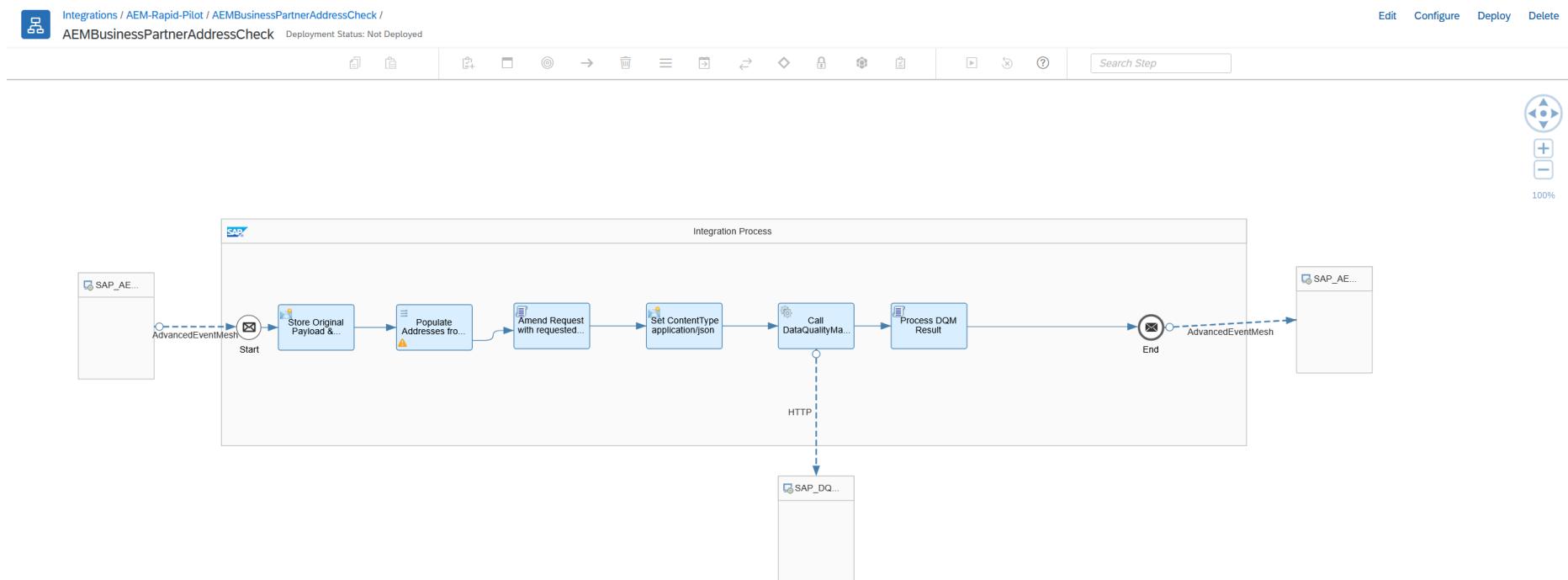
Overview / Manage Security Material

Security Material (23)

Name	Type	Status	Deployed By	Deployed On	Actions
emaildaemon	User Credentials	Deployed	christian.holtfurther@solace.com	Sep 15, 2023, 15:45:15	
rainier-test-cred	User Credentials	Deployed	christian.holtfurther@solace.com	Sep 11, 2023, 10:15:25	
zeni_am_secure_west-europe-aas	Secure Parameter	Deployed	markus.rehbech@solace.com	Sep 07, 2023, 16:08:26	
amcloud-amn.pwd	Secure Parameter	Deployed	andrew.mackenzie@solace.com	Sep 06, 2023, 16:09:19	
ManusPadAuth	Secure Parameter	Deployed	manus.padach@solace.com	Aug 24, 2023, 15:11:29	
amcloud-us1.amn.pwd	Secure Parameter	Deployed	andrew.mackenzie@solace.com	Aug 18, 2023, 16:00:19	
known.hosts	SSH Known Hosts	Deployed	christian.holtfurther@solace.com	Aug 10, 2023, 17:02:34	
sftpuser	User Credentials	Deployed	christian.holtfurther@solace.com	Aug 08, 2023, 17:24:49	
DraftCred	User Credentials	Deployed	brian.caufield@solace.com	Jul 18, 2023, 17:45:44	
oh-production-amn-creds	Secure Parameter	Deployed	benjamin.euristem@solace.com	Jul 19, 2023, 07:37:42	
DQMCred	OAuth2 Client Credentials	Deployed	scott.dillon@solace.com	Jul 12, 2023, 12:55:30	
CABrokerUserPass	Secure Parameter	Deployed	christian.holtfurther@solace.com	Jul 11, 2023, 14:45:27	
CABrokerUser	Secure Parameter	Deployed	christian.holtfurther@solace.com	Jul 11, 2023, 14:44:59	
subBroker	Secure Parameter	Deployed	benjamin.euristem@solace.com	Jul 10, 2023, 16:22:39	
sts-10-04-pass	Secure Parameter	Deployed	Sunit.Singh@solace.com	Jul 04, 2023, 16:38:37	
test-service-1234-pass	Secure Parameter	Deployed	Sunit.Singh@solace.com	Jul 04, 2023, 16:39:47	
sunilSingh	User Credentials	Deployed	Sunit.Singh@solace.com	Jun 02, 2023, 16:56:50	
ID_SC_PWD	Secure Parameter	Deployed	Jeffrey.Dunnington@solace.com	Jun 01, 2023, 15:52:52	
MarkusPadAuth	User Credentials	Deployed	markus.padach@solace.com	Jun 01, 2023, 04:27:11	
DevPass	Secure Parameter	Deployed	Sunit.Singh@solace.com	May 26, 2023, 16:48:06	
TEST	Secure Parameter	Deployed	scott.dillon@solace.com	May 26, 2023, 16:49:52	
HQ_CRED	User Credentials	Deployed	scott.dillon@solace.com	May 10, 2023, 17:09:23	
AEW_CRED	User Credentials	Deployed	scott.dillon@solace.com	May 09, 2023, 20:40:19	

Configure/Deploy AEMBusinessPartnerAddressCheck (OPTIONAL)

1. Let's take a look at the AEMBusinessPartnerAddressCheck iflow:



This flow receives Business Partner Create and Change events and invokes the Data Quality Management Service in BTP to check and correct the addresses inside the Business Partner event payload. It does this by

- Storing the original event payload in an environment variable.
- Populating the DQM request payload with the addresses in the input event.
- Invoking the DQM service over REST and

d) Parsing the response, checking whether the DQM service evaluated the input addresses to be Valid, Invalid, Blank or has Corrected them.

e) Merging any corrected addresses back into the original payload.

f) And finally publishing the result back as a new event to the AEM broker with an updated topic in the format:

`sap.com/businesspartner/addressChecked/V1/{businessPartnerType}/{partnerId}/{addressCheckStatus}`

Let's also look at what happens in order to publish a new event back to the Advanced Event Mesh broker. First of all, on the integration flow overall configuration settings, we are preserving the destination header field to have access to the original topic that this event was published on. This matters, because the event may contain valuable meta-data that helps us and downstream consumers filter for events relevant to them and it saves us from reparsing the payload, which can be CPU and I/O intensive.

Integration Flow

The screenshot shows the 'Integration Flow' configuration interface. The 'Runtime Configuration' tab is selected. Key settings visible include:

- Runtime Profile: Cloud Integration
- Namespace Mapping: (empty)
- Allowed Header(s): Destination (highlighted with a red box)
- HTTP Session Reuse: None

Secondly we are using a couple of lines in the script that is evaluating the DQM service result and merging the corrected addresses back into the original payload to retrieve and parse the original topic, replace one level (the verb) to create a new event and amend another extra meta-data level that contains the result of the address check (either Valid, Corrected, Invalid or Blank), which can be used by downstream systems to filter for specific outcomes. We are storing the newly created topic in the Destination field of the message header. Here's how this is done in a script:

SAP Integration Suite

AEM-Rapid-Pilot / AEMBusinessPartnerAddressCheck / script2.js / script2.js

```
1  /* Refer the link below to learn more about the use cases of script.
2  https://help.sap.com/viewer/368c481cd6954bdfa5d0435479fd4eaf/Cloud/en-US/148851bf8192412cba1f9d2c17f4bd25.html
3
4  If you want to know more about the SCRIPT APIs, refer the link below
5  https://help.sap.com/doc/a56f52e1a58e4e2bac7f7adb45b2e26/Cloud/en-US/index.html */
6  importClass(com.sap.gateway.ip.core.customdev.util.Message);
7  importClass(java.util.HashMap);
8
9  function processData(message) {
10    //Body
11    var DQMresponse = String(message.getBody( new java.lang.String().getClass()));
12    DQMresponse = JSON.parse(DQMresponse);
13
14    var origBody = message.getProperty("ORIGPAYLOAD");
15    var origTopic = message.getProperty("ORIGTOPIC");
16    origBody = JSON.parse(origBody);
17
18    var i=0;
19    var addressStatus = "Unknown";
20    origBody.businessPartner.forEach(function(bp){
21      bp.addressLink.forEach(function(link) {
22        link.address.forEach(function(address) {
23          const currAddress=DQMresponse.addressOutput[i];
24          if (currAddress.addr_asmt_info == "C") {
25            //corrected address, copy changes over from each addressoutput into customer addressoutput
26            address.street = currAddress.std_addr_prim_address + currAddress.std_addr_sec_address;
27            address.city = currAddress.std_addr_locality_full;
28            address.zipCode = currAddress.std_addr_postcode_full;
29            address.country = currAddress.std_addr_country_2char;
30            //additional fields available, not used:
31            //currAddress.std_addr_region_full
32            addressStatus = "Corrected";
33            i++;
34          } else if (currAddress.addr_asmt_info == "V") {
35            //valid address, nothing to do
36            addressStatus = "Valid";
37          } else if (currAddress.addr_asmt_info == "I") {
38            //invalid address, can't autofix, just flag on the topic
39            addressStatus = "Invalid";
40          } else if (currAddress.addr_asmt_info == "B") {
41            //invalid address, can't autofix, just flag on the topic
42            addressStatus = "Blank";
43          }
44        })
45      })
46    })
47
48    var topicLevels = origTopic.split("/");
49    topicLevels[2] = "addressChecked";
50    var outputTopic = topicLevels.join("/") + "/" + addressStatus;
51
52    message.setHeader("Destination", outputTopic);
53    message.setBody(JSON.stringify(origBody));
54    return message;
55 }
```

Lastly, the AEM Receiver adapter is configured to persistently (to avoid message loss) publish to a topic, taking the value from the header field that we set in the previous step/script.

AdvancedEventMesh

General Connection **Processing** Message Properties

PUBLISHER PROCESSING DETAILS

Delivery Mode: Persistent ▾

Endpoint Type: Topic ▾

Destination Name: \${header.Destination}

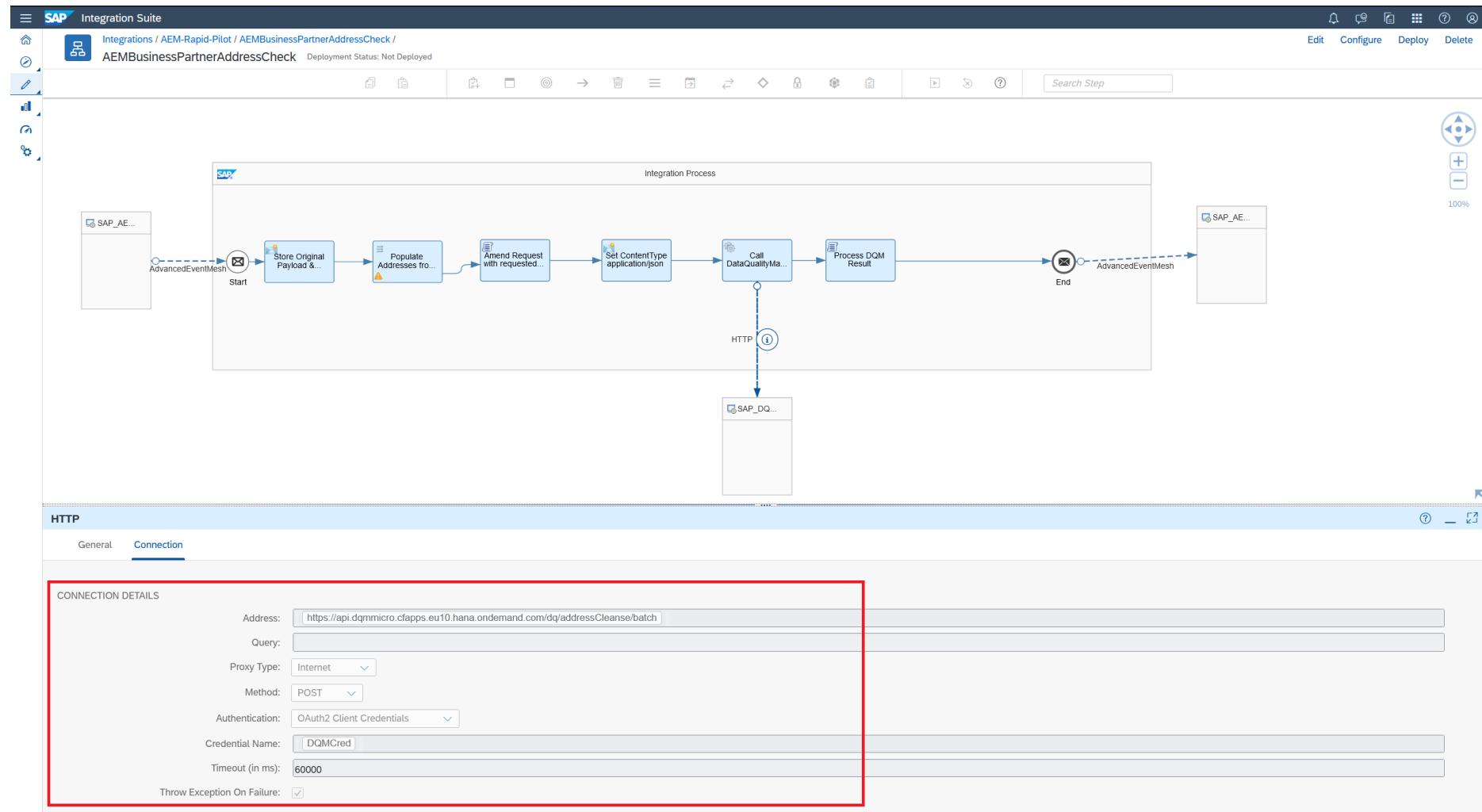
Message Type: Automatic ▾

SYNCHRONOUS REQUEST PROCESSING DETAILS

Convert Publish Into Synchronous Requestor?:

The screenshot shows the configuration interface for the AdvancedEventMesh component. The 'Processing' tab is active. In the 'PUBLISHER PROCESSING DETAILS' section, four fields are displayed: 'Delivery Mode' set to 'Persistent', 'Endpoint Type' set to 'Topic', 'Destination Name' set to '\${header.Destination}', and 'Message Type' set to 'Automatic'. The 'Delivery Mode', 'Endpoint Type', and 'Destination Name' fields are grouped together and highlighted with a red rectangular border. Below this section is the 'SYNCHRONOUS REQUEST PROCESSING DETAILS' section, which contains a single checkbox labeled 'Convert Publish Into Synchronous Requestor?'. The overall interface has a light blue header bar and a white main content area.

2. Configuring and deploying the AEMBusinessPartnerAddressCheck iflow:



You will need to:

- Populate the connection details for the DQM service call out with the ones for your own DQM service instance. (You don't need to change the address, if you are using our DQM service. If you are using your own DQM service, you'll need to take the API URL from your token and append `/dq/addressCleanse/batch` to the end of it. It should look something like <https://api.dqmmicro.cfapps.eu10.hana.ondemand.com/dq/addressCleanse/batch>).
- Hit **configure** at the top right and fill in the details to connect to your AEM broker service:

Configure "AEMBusinessPartnerAddressCheck"

Sender Receiver

Connection	Sender:	SAP_AEM_Sender
	Adapter Type:	AdvancedEventMesh
	Host:	tcps://mr-connection-qhgik3f2ezp.messaging.solace.cloud:55443
	Message VPN:	montrealbroker-10-1
	Username:	solace-cloud-client
Password Secure Alias:	CABrokerUserPass	

Configure "AEMBusinessPartnerAddressCheck"

Sender **Receiver**

Receiver:	SAP_AEM_Receiver
Adapter Type:	AdvancedEventMesh
Connection	
Host:	tcps://mr-connection-qhgik3f2ezp.messaging.solace.cloud:55443{{<aem_server_url_smf_endpoint>}}
<aem_server_url_smf_endpoint>:	tcps://mr-connection-qhgik3f2ezp.messaging.solace.cloud:55443
Message VPN:	montrealbroker-10-1{{<aem_message_vpn>}}
<aem_message_vpn>:	montrealbroker-10-1
Username:	solace-cloud-client{{<aem_client_user_name>}}
<aem_client_user_name>:	solace-cloud-client
Password Secure Alias:	CABrokerUserPass{{<aem_client_user_password_alias>}}
<aem_client_user_password_alias>:	CABrokerUserPass

- Then hit **deploy** at the bottom right.

3. Check that your flow was deployed successfully and fix if necessary.

- Go to **Monitor Artifacts** -> **Manage Integration Content** -> **All**.

You should be seeing the AEMBusinessPartnerAddressCheck flow as **Started**, similar to this view:

The screenshot shows the SAP Integration Suite interface. On the left, there is a sidebar with various icons and a list of integration flows. The main area displays the details for the 'AEMSalesOrderNotification' integration flow. The flow is listed under 'Integration Content (14)' with a status of 'Started'. The right side of the screen shows the configuration details for this specific flow, including deployment information, endpoints, status details, artifact details, and log configuration.

AEMSalesOrderNotification

Deployed On: Oct 05, 2023, 14:27:07
Deployed By: christian.holtfurther@solace.com
ID: AEMSalesOrderNotification
Version: 1.0.0
Package: SOLACE-TIGER-TEAM

Endpoints Status Details Artifact Details Log Configuration

There are no endpoints configured.

Status Details

The Integration Flow is deployed successfully.

Artifact Details

Monitor Message Processing
View deployed Artifact
Navigate to Artifact Editor

Log Configuration

Log Level: Info

Name	Status
AEMSalesOrderNotification	Started
AEMBusinessPartnerAddressCheck	Started
AEMLegacyOutputAdapter	Started
anack-demo	Started
AdvancedEventMesh	Started
Integration Adapter	Started
PubSubPlusEA	Started
Integration Adapter	Error
Rainer-test-Q1	Error
Integration Flow	Error
AEMLegacyInputAdapter	Error
Integration Flow	Error
BradTest	Error
Integration Flow	Error
SAP AEM Demo	Error
Integration Flow	Error
Slack	Started
Integration Adapter	Started
SapBiposConnector	Started
Integration Adapter	Started
AssignTechnician	Started
Integration Flow	Started
RabbitMQ	Started
Integration Adapter	Started

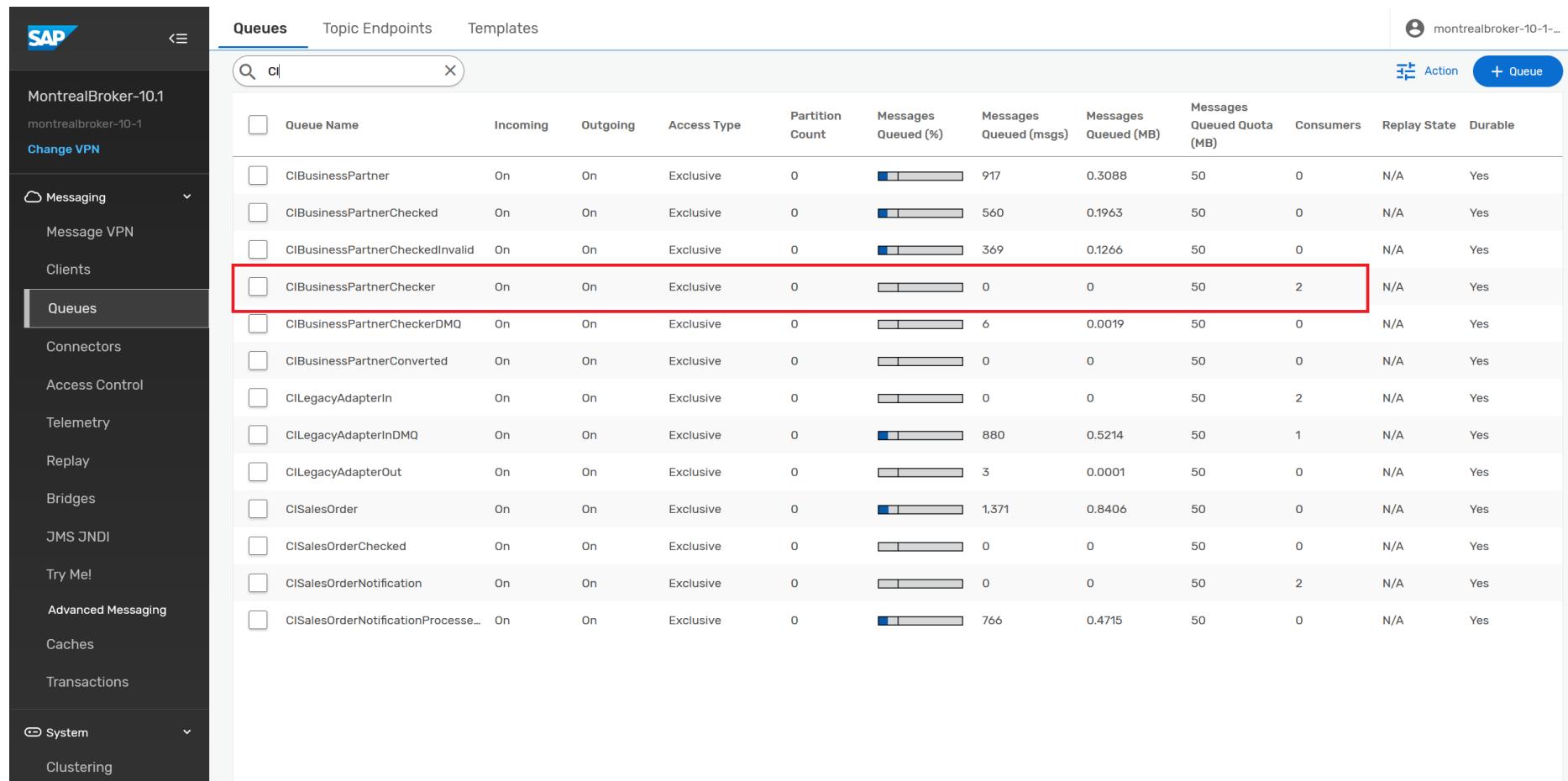
- Go to your **AEM Console** and navigate to **Cluster Manager** -> **{your service}** -> **Manage** and click on the **Queues** tile:

The screenshot shows the SAP AEM Cluster Manager interface for the service "MontrealBroker-10.1". The left sidebar includes links for Mission Control, Cluster Manager (selected), Mesh Manager (BETA), Event Portal, Designer, Catalog, Runtime Manager, Event Insights, and Insights.

The main content area displays "Event Broker Service Settings" with sections for Authentication (Enabled), Certificate Authorities (0 Client Certificate Authorities, 1 Domain Certificate Authority), and Client Profiles (1 Client Profile). Below this is the "Broker Manager Quick Settings" section, which includes tiles for Message VPN, Clients, Queues (highlighted with a red box), Access Control, and Bridges.

At the bottom is the "Other Management Tools" section, listing SEMP - REST API, Broker Manager - Web Application, and SolAdmin - Desktop Application, each with a corresponding icon.

- Check that the **CIBusinessPartnerChecker** input queue has at least one consumer connected to it.



The screenshot shows the SAP Message Broker Queue Management interface. The left sidebar contains navigation links for various components like Messaging, Clients, Queues, Connectors, etc. The main area is titled 'Queues' and displays a table of queue details. A search bar at the top allows filtering by queue name. The table columns include: Queue Name, Incoming, Outgoing, Access Type, Partition Count, Messages Queued (%), Messages Queued (msgs), Messages Queued (MB), Messages Queued Quota (MB), Consumers, Replay State, and Durable. One specific row, 'CIBusinessPartnerChecker', is highlighted with a red border.

<input type="checkbox"/> Queue Name	Incoming	Outgoing	Access Type	Partition Count	Messages Queued (%)	Messages Queued (msgs)	Messages Queued (MB)	Messages Queued Quota (MB)	Consumers	Replay State	Durable
<input type="checkbox"/> CIBusinessPartner	On	On	Exclusive	0	<div style="width: 10%;"><div style="width: 10%;"></div></div>	917	0.3088	50	0	N/A	Yes
<input type="checkbox"/> CIBusinessPartnerChecked	On	On	Exclusive	0	<div style="width: 10%;"><div style="width: 10%;"></div></div>	560	0.1963	50	0	N/A	Yes
<input type="checkbox"/> CIBusinessPartnerCheckedInvalid	On	On	Exclusive	0	<div style="width: 10%;"><div style="width: 10%;"></div></div>	369	0.1266	50	0	N/A	Yes
<input type="checkbox"/> CIBusinessPartnerChecker	On	On	Exclusive	0	<div style="width: 0%;"><div style="width: 0%;"></div></div>	0	0	50	2	N/A	Yes
<input type="checkbox"/> CIBusinessPartnerCheckerDMQ	On	On	Exclusive	0	<div style="width: 10%;"><div style="width: 10%;"></div></div>	6	0.0019	50	0	N/A	Yes
<input type="checkbox"/> CIBusinessPartnerConverted	On	On	Exclusive	0	<div style="width: 0%;"><div style="width: 0%;"></div></div>	0	0	50	0	N/A	Yes
<input type="checkbox"/> CLegacyAdapterIn	On	On	Exclusive	0	<div style="width: 0%;"><div style="width: 0%;"></div></div>	0	0	50	2	N/A	Yes
<input type="checkbox"/> CLegacyAdapterInDMQ	On	On	Exclusive	0	<div style="width: 10%;"><div style="width: 10%;"></div></div>	880	0.5214	50	1	N/A	Yes
<input type="checkbox"/> CLegacyAdapterOut	On	On	Exclusive	0	<div style="width: 0%;"><div style="width: 0%;"></div></div>	3	0.0001	50	0	N/A	Yes
<input type="checkbox"/> CISalesOrder	On	On	Exclusive	0	<div style="width: 10%;"><div style="width: 10%;"></div></div>	1,371	0.8406	50	0	N/A	Yes
<input type="checkbox"/> CISalesOrderChecked	On	On	Exclusive	0	<div style="width: 0%;"><div style="width: 0%;"></div></div>	0	0	50	0	N/A	Yes
<input type="checkbox"/> CISalesOrderNotification	On	On	Exclusive	0	<div style="width: 0%;"><div style="width: 0%;"></div></div>	0	0	50	2	N/A	Yes
<input type="checkbox"/> CISalesOrderNotificationProcesse...	On	On	Exclusive	0	<div style="width: 10%;"><div style="width: 10%;"></div></div>	766	0.4715	50	0	N/A	Yes

Congratulations, if you are seeing both the Started iflow as well as the consumers on the queue, then that confirms that your iflow is running and has successfully opened and bound to the queue waiting for event to flow!

8. Scenario 4 - SalesOrder: AEMSalesOrderToDatastore & DatastoreToLegacyOutputAdapter (OPTIONAL)

With the introduction of the Advanced Event Mesh, not all customers will be ready to adopt an Event Driven approach for all of their applications. They will be able to innovate in some areas but also have to sustain existing applications that use Flat Files. In this scenario, we will use a couple of the common Cloud Integration artifacts to facilitate this scenario. We will use 2 iFlows to accomplish this.

This iFlow “AEMSalesOrderToDatastore” will subscribe to events on the Advanced Event Mesh, convert them to XML (E.g. The DataStore object only works with XML) and then write them into the DataStore.

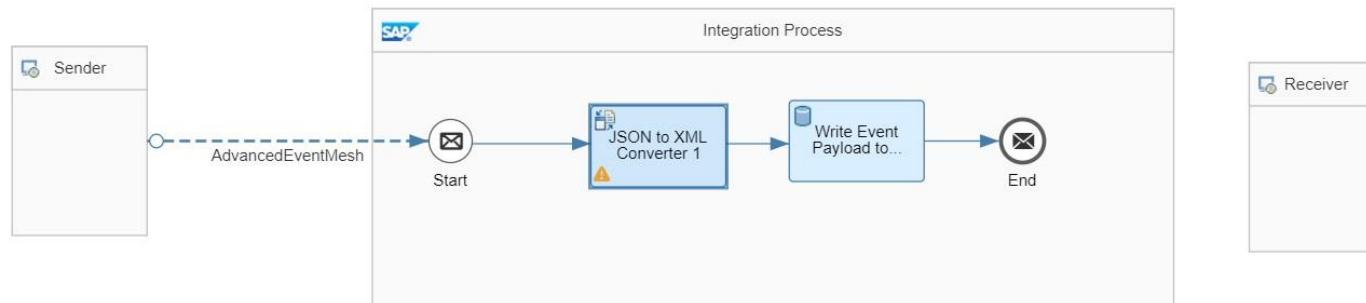


Integrations and APIs / AEM-Rapid-Pilot-development / AEMSalesOrderToDatastore /

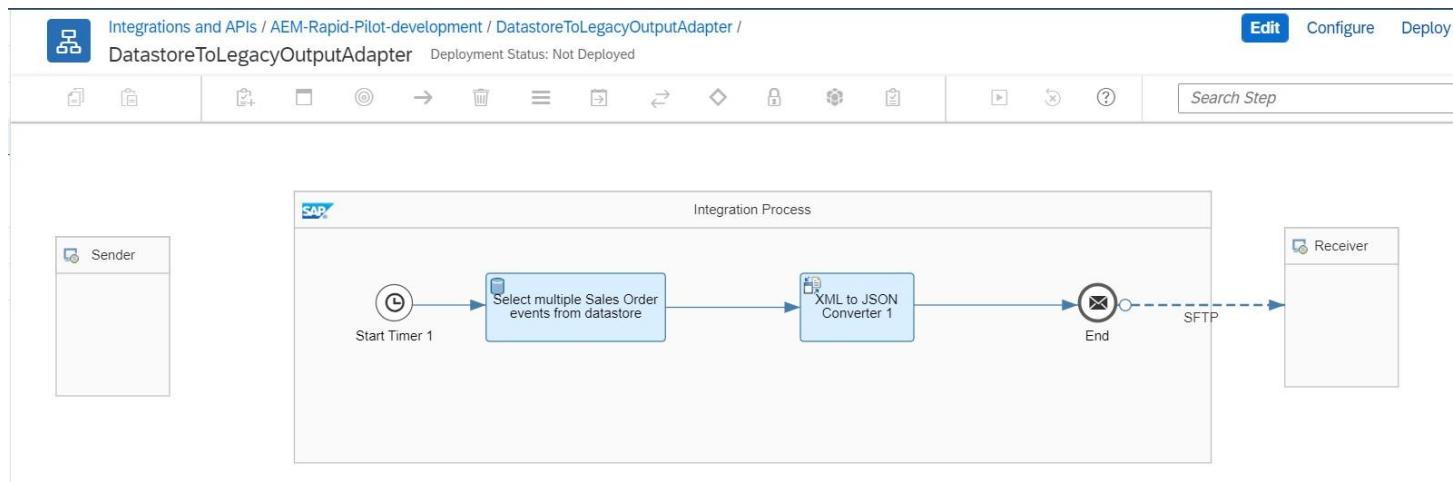
AEMSalesOrderToDatastore Deployment Status: Deployed on Mar 12, 2024, 21:33:47, Runtime Status: Started



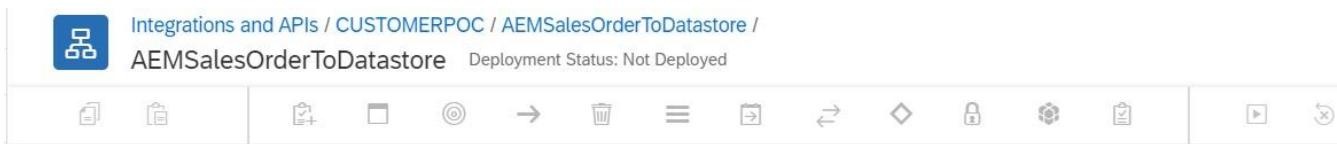
Search



We will then use a second iFlow to pull the events from the DataStore, convert them back to JSON and then use the SFTP adapter to create a flat file full of these events.



The first iFlow “AEMSalesOrderToDatastore” can be downloaded [HERE](#)
 (only follow this step if you don’t see this flow already in your AEM-Rapid-Pilot-day3 package).
 You will follow the same process as earlier to import the iFlow – except this time we are just importing 1 iFlow into our package instead of a whole package (head to your iFlow package to import a single flow into that package).
 Under the Connection tab, you will need to specify your host and of course, as per the first iFlow, we will be using the same secure credential that you created in the first section.



AdvancedEventMesh

General Connection Processing

SENDER CONNECTION DETAILS

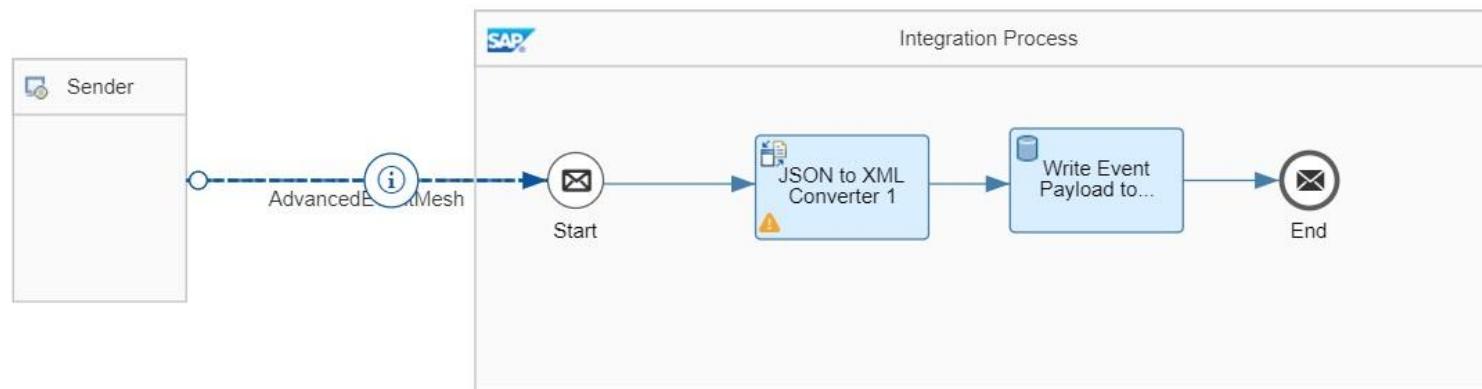
Host:	YOURAEMBROKER
Message VPN:	montrealbroker-10-1
Username:	solace-cloud-client
Authentication Type:	Basic
Password Secure Alias:	CABrokerUserPass

Just notice that the name of the queue is FFSalesOrders. This artifact was included in the list of objects earlier in the CI/CD step so you shouldn't have to do anything to create that object. However, it would be prudent to check the AEM console to make sure that artifact is there. Also, notice on the adapter settings there is a retry capability with a few properties.



Integrations and APIs / CUSTOMERPOC / AEMSalesOrderToDatastore /

AEMSalesOrderToDatastore Deployment Status: Not Deployed



AdvancedEventMesh

General

Connection

Processing

SENDER PROCESSING DETAILS

Consumer Mode:

Parallel Consumers:

Queue Name:

Selector:

Acknowledgment Mode:

Maximum Message Processing Attempts:

Data Integration Version: 1.000

Deploy the iFlow and do a quick test by creating another order with the [UI5 Order Entry Application](#). From the monitor, you should now see a Data Store as shown in the screenshot.
(** Of course, if you are using the Data Store object, you should see the number incremented ***)

The screenshot shows the SAP Integration Suite interface. The left sidebar has a navigation menu with Home, Discover, Design (with Integrations and APIs), Monitor (selected), and Inspect. The Monitor section is expanded, showing sub-options like Integrations and APIs. The main area is titled 'Overview' and contains four cards: Artifacts (25), Entries (10), Keys (0), and Artifacts (0). Below this is a 'Connectivity Tests' section. Under 'Manage Stores', there are four tiles: Data Stores (1 Stores), Variables (0 Variables), Message Queues (0 Queues), and Number Ranges (0 Artifacts).

Clicking on the Data Stores Tile, you should see the name of the Data Store specified in the iFlow.

The screenshot shows the SAP Integration Suite interface. On the left is a navigation sidebar with the following items:

- Home
- Discover >
- Design < (with a dropdown arrow)
- Integrations and APIs
- Monitor < (with a dropdown arrow)
- Integrations and APIs (highlighted with a light blue background)
- Inspect
- Settings >

The main content area is titled "Overview / Manage Data Stores". It displays a table with one row:

Data Stores (1)	Filter by Name	Actions
AggregateSalesOrders	17	

Below the table, it says "Global". There are also three icons: a magnifying glass, a circular arrow, and a gear.

If after you submit the new order with the UI5 application, you see at least 1 Object appear in this window, you are on the right track and should proceed to the next section iFlow which will be pulling these orders out of the Data Store.

The second iFlow “DatastoreToLegacyOutputAdapter” can be downloaded [HERE](#).

(Only follow this step if you don’t see this flow already in your AEM-Rapid-Pilot-day3 package).

Same as above, import the iFlow.

Once imported, the only thing that needs to be configured are the SFTP properties. You will need to change the properties to reflect your SFTP server. There are 2 security materials that need to be created so that the SFTP credentials can be properly used in the iFlow.

First go back to the Manage Security section within Cloud Integration.

SAP Integration Suite

Home

Discover >

Design >

Monitor > **Integrations and APIs**

Inspect

Settings >

Overview

Monitor Message Processing

All Artifacts Past Hour 0 Messages	All Artifacts Past Hour 0 Failed Messages	All Artifacts Past Hour 0 Retry Messages
---	--	---

Manage Integration Content

All 25 All	All 25 Started	All 0 Error
----------------------	--------------------------	-----------------------

Manage Security

Security Material 29 Artifacts	Keystore 10 Entries	PGP Keys 0 Keys
---	-------------------------------	---------------------------

Here you will create these 2 artifacts.

The screenshot shows the SAP Integration Suite interface with the title "Overview / Manage Security Material". Under "Security Material (29)", there are two entries: "known.hosts" (Type: SSH Known Hosts, Status: Deployed, Deployed By: brad.caldwell@solace.com, Deployed On: Mar 12, 2024, 13:42:43) and "sftpuser" (Type: User Credentials, Status: Deployed, Deployed By: brad.caldwell@solace.com, Deployed On: Mar 12, 2024, 09:40:17). A toolbar at the top includes icons for Filter by Name or Deployed By, Create, Upload, and other actions.

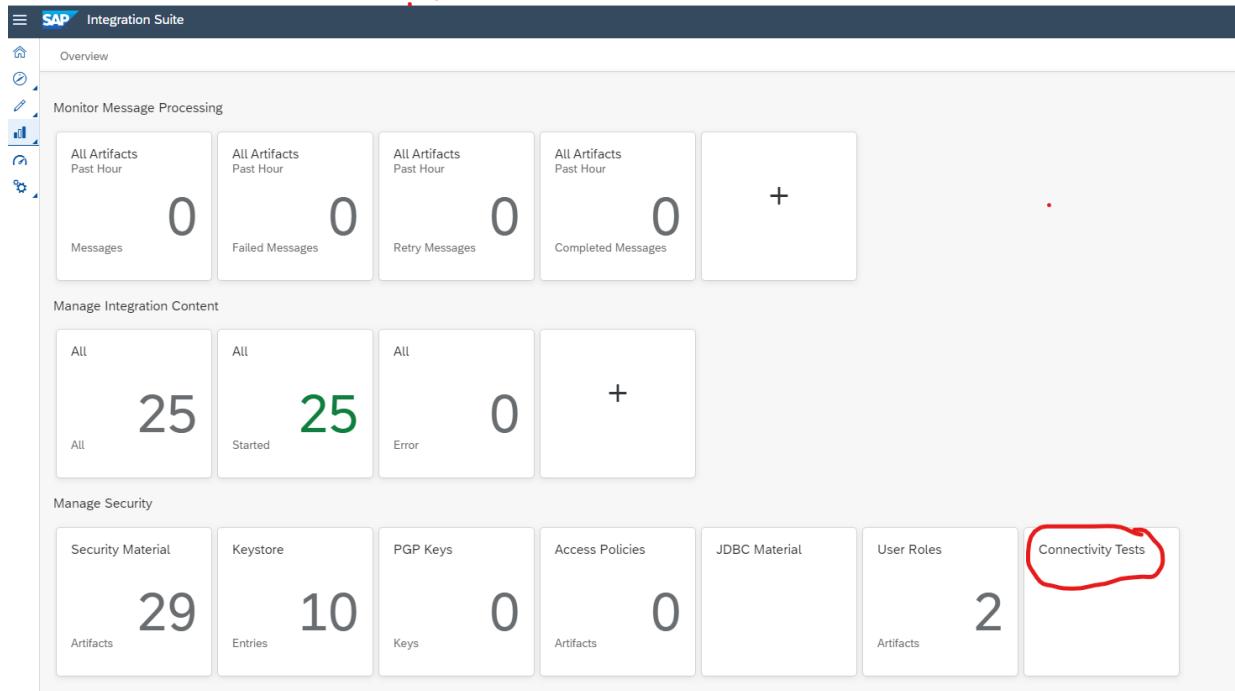
First let's create the User Credentials for the sftpuser. Click "**Create**" then "**User Credentials**". Use the name- sftpuser. Then input the Username and password to your sftp server and click "**Deploy**"

The dialog box is titled "Edit User Credentials". It contains the following fields:

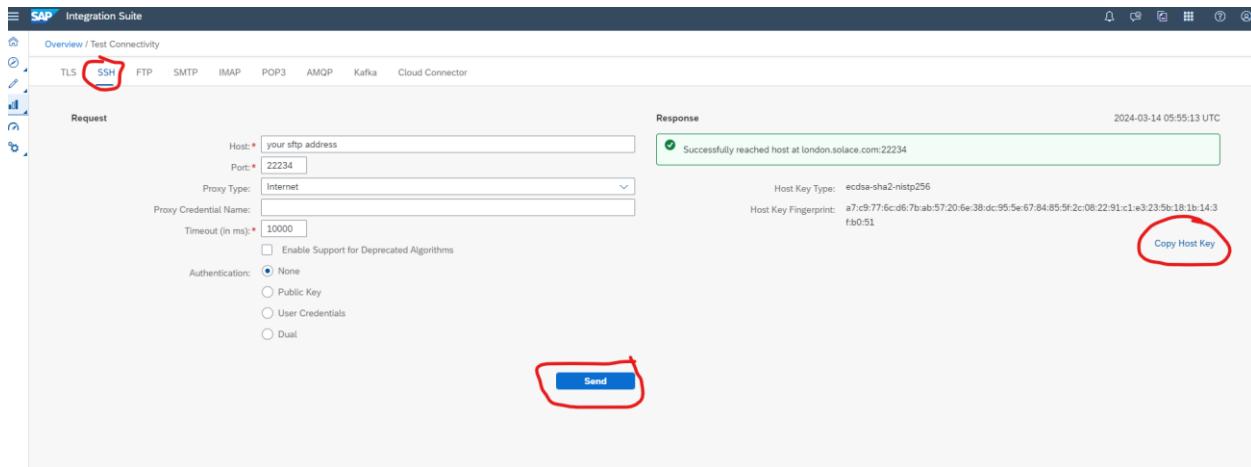
- Name: * sftpuser
- Description: (empty)
- Type: * User Credentials (dropdown menu)
- User: * sftpuser
- Password: (empty)
- Repeat Password: (empty)

At the bottom are "Deploy" and "Cancel" buttons.

Now let's add the SSH Known Hosts. This one requires a few extra steps. First, we need to run a connectivity test to the SFTP server which will give us the "Host Key"



Choose the SSH option at the top. Enter your SFTP server address in the Host field. Add Port. Click “Send” to test the connection. If the connection is successful, you can now click “**Copy Host Key**” to obtain your Host Key.

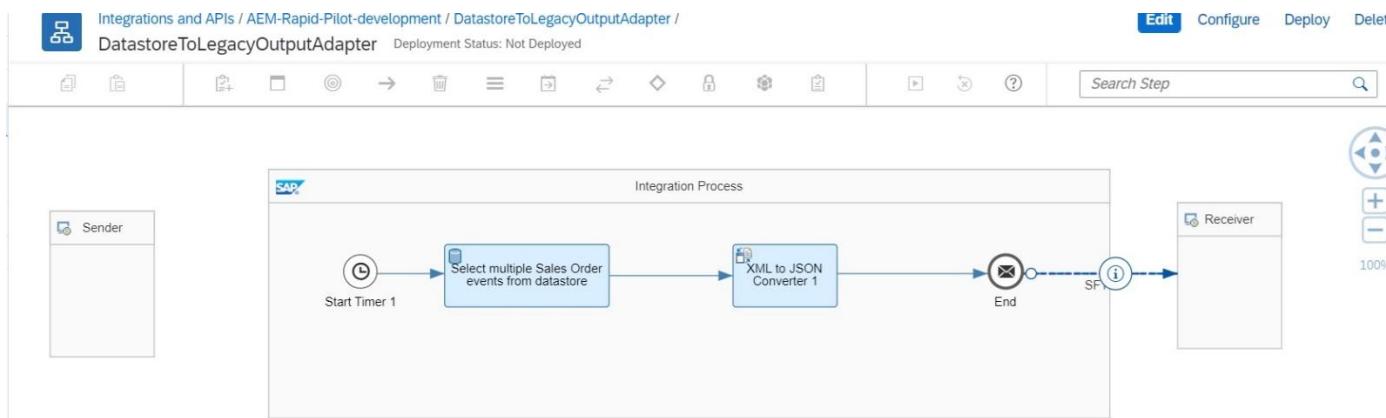


Now that you have the Host Key. You can open a text file like notepad, paste the host Key you copied and name the file known.hosts.txt. the name does not actually matter because IS will automatically change the name for you when you upload the .txt. Once you have saved the .txt file with your host key in it, go back to the **Security Material** tile where we created the user credentials and at the top select “**Upload**” > **Know Hosts (SSH)**. Select the .txt file that you just saved and click “**Deploy**.” (Note: if you have an existing Known.host from a prior project you can skip this step if you are using the same sftp server or you can download the existing host and update the new Host Key and re-upload)

The screenshot shows the SAP Integration Suite interface for managing security material. A modal dialog titled "Upload SSH Known Hosts" is open in the foreground. It contains a file input field labeled "File:" with the placeholder "Choose a file for upload" and a "Browse..." button. At the bottom of the dialog are two buttons: "Deploy" (which is circled in red) and "Cancel". In the background, there is a table listing various security material items, each with columns for Name, Type, Status, Deployed By, and Deployed On. One item in the list is currently being edited, as indicated by a small edit icon next to its row.

Name	Type	Status	Deployed By	Deployed On
known.hosts	SSH Known Hosts	Deployed	brad.caldwell@solace.com	Mar 12, 2024, 13:42:43
sftpuser	User Credentials	Deployed	brad.caldwell@solace.com	Mar 12, 2024, 09:40:17
amack_amqp	User Credentials	Deployed	andrew.mackenzie@solace.com	Feb 20, 2024, 11:02:43
eks-10-04-uc	User Credentials	Deployed	Sunil.Singh@solace.com	Feb 20, 2024, 10:56:37
email-profile-pwd	Secure Parameter	Deployed	scott.dillon@solace.com	Feb 15, 2024, 20:55:09
Mocred	User Credentials	Deployed	brad.caldwell@solace.com	Feb 13, 2024, 15:04:17
sewtestcredentials	User Credentials	Deployed	rainer.froehnhofer@solace.com	Dec 09, 2023, 06:23:34
RAL-SE-DEMO-User	User Credentials	Deployed	andrew.lawrence@solace.com	Oct 30, 2023, 12:09:19
emaildaemon	User Credentials	Deployed	alan.hoellfurth@solace.com	Sep 15, 2023, 10:45:15
rainer-taxi-creds	User Credentials	Deployed	rainer.froehnhofer@solace.com	Sep 11, 2023, 05:15:25
aem_am_azure_west-europe-alias	Secure Parameter	Deployed	markus.hebach@solace.com	Sep 07, 2023, 09:08:25
amack.mtlaem.pwd	Secure Parameter	Deployed	andrew.mackenzie@solace.com	Sep 06, 2023, 11:09:18
MarkusPassAlias	Secure Parameter	Deployed	markus.hebach@solace.com	Aug 24, 2023, 10:37:25

Now that your Credentials and SSH key are available you will be able to properly connect to your SFTP server using the SFTP adaptor in Cloud Integration. Now you can go back to the "DatastoreToLegacyOutputAdapter" iFlow that you imported and update the SFTP Adaptor Target settings with your credentials. Make sure to add the Port at the end of your address like the screenshot below and use the sftpuser credential in the Credential Name field. For the File Access Parameters we use Filezilla which is a free FTP solution that can be downloaded [HERE](#). Within Filezilla you can connect to your SFTP server and create a Directory that we will send and read our flat files from. We called ours RPP, but feel free to choose your own name for both the directory and the file. We named the file salesorders because we are simulating sales order objects. Lastly uncheck the "Append Timestamp" box. We won't need it for testing. Make sure to save your changes.



The screenshot shows the 'SFTP' configuration dialog. It has tabs for 'General', 'Target', and 'Processing', with 'Target' selected. The 'Target' tab contains the following sections:

- FILE ACCESS PARAMETERS**
 - Directory: RPP
 - File Name: Salesorders
 - Append Timestamp:
- CONNECTION PARAMETERS**
 - Address: london.solace.com:22234
 - Proxy Type: Internet
 - Authentication: User Name/Password
 - Credential Name: sftpuser
 - Timeout (in ms): 10000

As you can see in the next screenshot, nothing here to change but it references the same DataStore object and we specify '10' as the number of "Events" that should be grabbed from the DataStore during each poll.

Integrations and APIs / AEM-Rapid-Pilot-development / DatastoreToLegacyOutputAdapter / DatastoreToLegacyOutputAdapter Deployment Status: Not Deployed

Edit Configure Deploy

Sender Receiver

Integration Process

Select

General Processing

Data Store Name: AggregateSalesOrders

Visibility: Global

Number of Polled Messages: 10

Delete On Completion:

Once your SFTP properties are configured, just one last thing to check/modify. During our testing, we set the timer to be “execute once”. As configured, it will run just one time after it’s deployed. So, now you can deploy your iFlow via top right button “Deploy”, you should see a flat file appear with all of your Sales Orders in the directory you specified in the SFTP properties. We are using FileZilla as the SFTP Client, it seems to work well.

9. Security and fine grained access control to topics

For this section and in general, we would like to take this opportunity to answer a common question:

Is it possible to prevent clients from publishing to certain Topics and/or subscribing to certain topics?

The answer is absolutely!

We would like everyone to experience an Access Control List and how it can be used to control what is published or subscribed.

Experimenting publishing and subscribing to protected topics

From the **console**, we need to navigate to the **broker manager**. You can get there by either clicking on the "**Open Broker Manager**" button or clicking any of the Tiles labelled "**Clients**", "**Queues**", "**Access Control**".

The screenshot shows the Solace Broker Manager interface for the broker named "MontrealBroker-10.1". At the top, there's a navigation bar with links for Status, Connect, Manage, Monitoring, Configuration, and Try Me. The "Manage" link is currently selected. On the right side of the header, there's a button labeled "Open Broker Manager" which is highlighted with a red box. Below the header, there's a section titled "Event Broker Service Settings" with three cards: "Authentication" (Enabled), "Certificate Authorities" (0 Client Certificate Authorities, 1 Domain Certificate Authority), and "Client Profiles" (1 Client Profile). There's also a "Deletion Protection" section with options for "Delete Protection" and "Delete Service". Under "Broker Manager Quick Settings", there are five icons: "Message VPN", "Clients", "Queues", "Access Control", and "Bridges". At the bottom, there's a section titled "Other Management Tools".

You will then see the **Broker Manager** Screen and on the left you will see a more advanced "try-me" test client. Click on it, to reveal the information you must provide to connect: For this screen, you will be trying to connect to our Broker (Note: We are doing this because your iFlow on Day 3 will send an Event to our broker to send an email) where we have created an ACL to limit what you can do and on what topics you can publish. The information you will use is as follows:

```
Broker URL: wss://montrealbroker.messaging.solace.cloud:443
Message VPN: montrealbroker-10-1
Client UserName: email-profile
Client Password: ***** <- provided during the course
```

The screenshot shows the SAP Solace Broker interface. On the left is a sidebar with a dark background and white text, listing various broker configurations and system components. The main area is titled "Send and Receive" and is divided into sections for "Publisher" and "Subscriber".

Publisher Section:

- Establish Connection:** Shows a status of "% Connected" and a "Broker URL" input field containing "wss://mr-connection-qhgik3f2ezp.messaging.solace.cloud:443".
- Message VPN:** Set to "montrealbroker-10-1".
- Clients:** Set to "montrealbroker-10-1".
- Queues:** Set to "email-profile".
- Connectors:** Set to ".....".
- Access Control:** Set to "Topic".
- Telemetry:** Set to "Replay".
- Replay:** Set to "Bridges".
- Bridges:** Set to "JMS JNDI".
- JMS JNDI:** Set to "try-me".
- Advanced Messaging:** Set to "Delivery Mode: Direct".
- Caches:** Set to "Message Content: Hello world!".
- Transactions:** Set to "try-me".

Subscriber Section:

- Establish Connection:** Shows a status of "% Connected" and a "Broker URL" input field containing "wss://mr-connection-qhgik3f2ezp.messaging.solace.cloud:443".
- Message VPN:** Set to "montrealbroker-10-1".
- Clients:** Set to "email-profile".
- Queues:** Set to ".....".
- Connectors:** Set to ".....".
- Access Control:** Set to "Topic".
- Telemetry:** Set to "Replay".
- Replay:** Set to "Bridges".
- Bridges:** Set to "JMS JNDI".
- JMS JNDI:** Set to "try-me".
- Advanced Messaging:** Set to "Delivery Mode: Direct".
- Caches:** Set to "Message Content: Hello world!".
- Transactions:** Set to "try-me".

Once you have entered in the connectivity information, you should see the "Connected" message in blue.

Once connected, change nothing and hit "**Publish**", you should immediately see the "**Publish ACL Denied**" on this action because the ACL will not permit you to complete this action.

SAP Integration Suite

Integration Cards Plus Advanced | Integration Suite | Integration Suite | Service details | SAP Integration Suite | Send and Receive | Try Me | All Bookmarks

mr-connection-[sgigk3f2exp.messaging.solace.cloud:943/#/msg-vpm/5W9udHJIVWecm9eZXhMTAeMQ==/try-me/send-receive?count=20&cursor=did...](#)

MontrealBroker-10.1

Change VPN

Messaging

Message VPN

Clients

Queues

Connectors

Access Control

Telemetry

Replay

Bridges

DMS JNDI

Try Me

Advanced Messaging

Caches

Transactions

System

Clustering

Version 10.4.1.76

Send and Receive

Publisher

Establish Connection Connected Disconnect

Publish
Select a topic or queue to publish to:
 Topic Queue
try-me Show Advanced

Delivery Mode:
 Direct Persistent

Message Content:
Hello world!

Publish

Message is rejected with error X
Publish ACL Denied

Messages Published Clear Stats
1 Direct 0 Persistent

Subscriber

Establish Connection Not Connected Connect

Subscribe
How do you want to receive messages:
Subscribe to a topic to receive direct messages try-me

Bind to an endpoint to receive guaranteed messages >

Messages (Most Recent 20) Clear Stats Clear Messages
0 Direct 0 Persistent 0 Non-Persistent

Now, let's try the exact same thing with the subscription. Hit the "**Connect**" button, and you should see the connection properties already populated so accept this and hit connect.

Subscriber

Establish Connection

Not Connected

Broker URL Same as Publisher
wss://mr-connection-qhgik3f2ezp.messaging.solace.cloud:44

Message VPN Same as Publisher
montrealbroker-10-1

Client Username Same as Publisher
email-profile

Client Password
.....

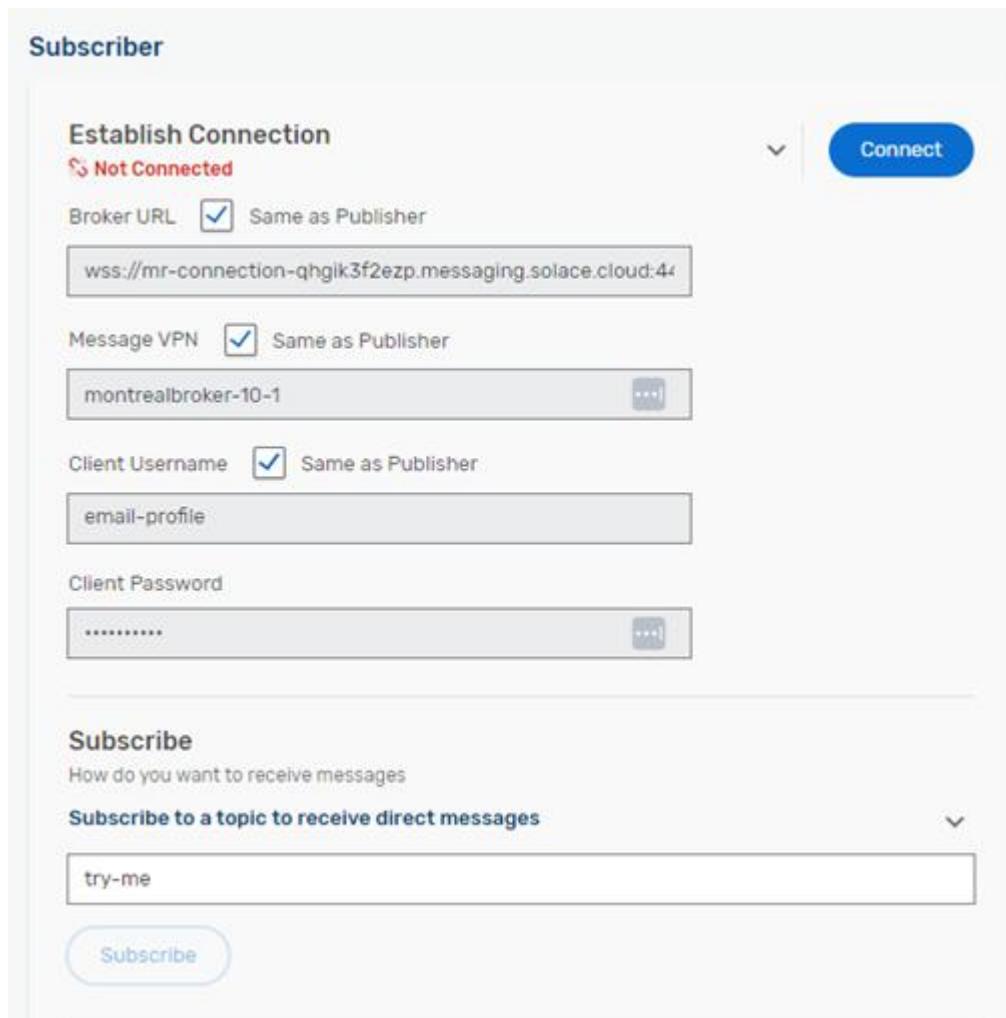
Subscribe

How do you want to receive messages

Subscribe to a topic to receive direct messages

try-me

Subscribe

The screenshot shows the 'Subscriber' configuration page. At the top, it says 'Establish Connection' with a status of 'Not Connected'. It includes fields for 'Broker URL' (set to 'Same as Publisher' with value 'wss://mr-connection-qhgik3f2ezp.messaging.solace.cloud:44'), 'Message VPN' (set to 'Same as Publisher' with value 'montrealbroker-10-1'), 'Client Username' (set to 'Same as Publisher' with value 'email-profile'), and 'Client Password' (redacted). Below this is a 'Subscribe' section with a dropdown menu set to 'Subscribe to a topic to receive direct messages' and a text input field containing 'try-me'. A 'Subscribe' button is at the bottom of this section.

Once connected, you will see this:

The screenshot shows the MQTT.js Subscriber interface. At the top, it says "Subscriber". Below that, "Establish Connection" has a green progress bar labeled "% Connected" at 100%. To the right is a "Disconnect" button. Under "Subscribe", there's a dropdown menu set to "Subscribe to a topic to receive direct messages" with a value "try-me" in the input field. A "Subscribe" button is below this. Another dropdown menu is set to "Bind to an endpoint to receive guaranteed messages". At the bottom, it shows "Messages (Most Recent 20)" with counts: 0 Direct, 0 Persistent, 0 Non-Persistent. There are "Clear Stats" and "Clear Messages" buttons.

From here, just hit the **Subscribe** button and you should see the following screen:

Subscriber

Establish Connection

% Connected



Disconnect

Subscribe

How do you want to receive messages

Subscribe to a topic to receive direct messages



Subscribe

Subscribed Topics

try-me

Subscription request failed with error



Subscription ACL Denied

Bind to an endpoint to receive guaranteed messages



Messages (Most Recent 20)

Clear Stats Clear Messages

0 Direct 0 Persistent 0 Non-Persistent

Again, you have been "**Denied**" - That was expected. 😊

Now, let's head back to the "Publisher" and change the "Topic" to <sap.com/emailnotification/created/V1> Use the following structure for your Message Content....be sure to copy the entire structure below including all of the curly braces. This is the structure that is passed to the Solace Event Mesh for processing. If successful, you should receive an email shortly after publishing with the information contained in the message. In the structure below, please replace "**YOUREMAILADDRESS**" with your actual email address prior to hitting the publish button.

```
{"orderHeader": [{"salesOrderNumber": "SO2958", "creator": "John Doe", "date": "2023-08-11", "salesType": "Online", "ordertype": "Expedited", "salesOrg": "SA03", "distributionChannel": "DC01", "division": "DV02", "netvalue": 423.76, "currency": "CAD", "customer": [{"customerId": "CUST008", "customerName": "scott", "zipCode": "13579", "street": "Seventh Avenue", "phone": "555-888-9999"}, {"country": "USA", "city": "Houston", "emailAddress": [{"email": "YOUREMAILADDRESS"}]}], "orderItem": [{"item": "ITEM013", "material": "MAT013", "materialType": "Product", "itemType": "Standard", "itemDescription": "Volt Electric bike", "orderSchedule": [{"scheduleNumber": "SCH013", "quantity": 40, "uom": "EA"}]}]}]
```

Send and Receive

Publisher

Establish Connection > Connected Disconnect

Publish Select a topic or queue to publish to Show Advanced

Topic Queue

sap.com/emailnotification/created/V1

Delivery Mode

Direct Persistent

Message Content

```
{"orderHeader": [{"salesOrderNumber": "SO2958", "creator": "John Doe", "date": "2023-08-11", "salesType": "Online", "orderType": "Expedited", "salesOrg": "SA03", "distributionChannel": "D001", "division": "DV02", "netValue": 423.76, "currency": "CAD"}, {"customer": [{"customerId": "CUST008", "customerName": "scott", "zipCode": "13579", "street": "Seventh Avenue", "phone": "555-888-9999", "country": "USA", "city": "Houston", "emailAddress": [{"email": "scott.dillon@solace.com"}]}]}, {"orderItem": [{"item": 1}]}]
```

Publish

Messages Published: 1 Direct 0 Persistent

Clear Stats

If you have entered the topic and message body correctly, you should see that 1 message has been published.

So how did we do that? The magic happens in the ACL Profile as shown next.

Broker Topic ACLs

We have changed the Default Publish Action to be Disallow. In other words, unless we specify an exception, the user profile associated with this ACL cannot publish anything by default. In this case, as you can see, we have listed one exception.

The screenshot shows the 'ACL Profiles' interface for an 'email-profile'. The 'Publish Topic' tab is selected. Under 'Publish Default Action', a dropdown menu is set to 'Disallow'. Below this, there is a search bar labeled 'Exceptions' with a placeholder 'Search by topic' and a clear button. Two checkboxes are present: 'Publish Exception Topic' and 'sap.com/emailnotification/created/V1', with the second one being checked. The entire 'sap.com/emailnotification/created/V1' row is highlighted with a yellow background.

For the subscription settings, it's very simple: We specify the Default Action is "Disallow" and do not provide any exceptions. AKA, this ACL does not permit any subscriptions.



ACL Profiles | email-profile

[Client Connect](#)[Publish Topic](#)[**Subscribe Topic**](#)[Subscribe Share Name](#)[Profile Users](#)

Subscribe Default Action

Disallow



Exceptions



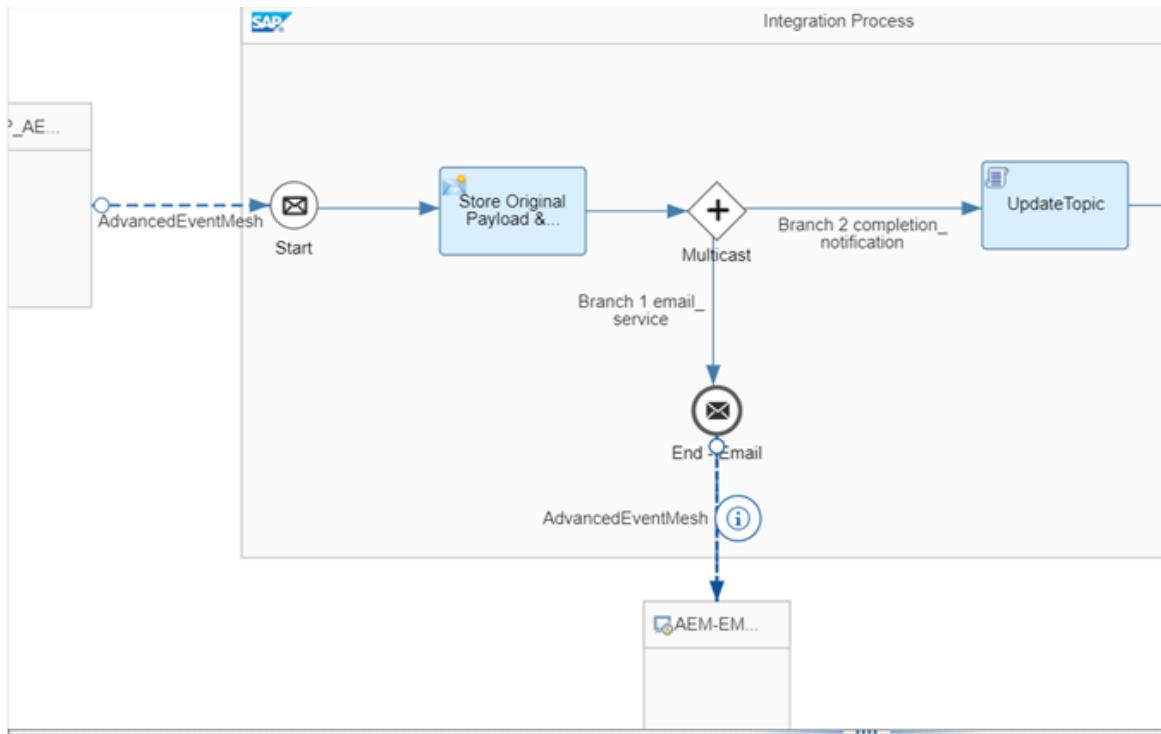
Search by topic



Subscribe Exception Topic

Now that you have this understanding, you will see when you configure/deploy this iFlow why we have a Username "email-profile". It has been assigned the ACL email-profile so the iFlow can publish to our broker but only on that topic. Everything else is prohibited by the email-profile user ACL, so it can only be used for this single purpose.

See below screenshot for where you would have used these credentials in your iflow.



AdvancedEventMesh

- General
- Connection**
- Processing
- Message Properties

RECEIVER CONNECTION DETAILS

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

As you can see, broker ACLs are a quite powerful tool to tightly control access to the broker and its topics. You can separately control publish topics and subscribe topics and even IP address ranges that clients are allowed to connect from. In addition to topic ACLs, remember that queue access is controlled by the queue ownership model and the "other permission".

10. Troubleshooting

Checking that your flow was deployed successfully.

- Go to **Monitor Artifacts** -> **Manage Integration Content** -> **All**.
 You should be seeing your flow as **Started**, similar to this view:

AEMSalesOrderNotification

Deployed On: Oct 05, 2023, 14:27:07 ID: AEMSalesOrderNotification Package: SOLACE-TIGER-TEAM
 Deployed By: christian.holtfurth@solace.com Version: 1.0.0

Endpoints **Status Details** **Artifact Details** **Log Configuration**

There are no endpoints configured.

Status Details

The Integration Flow is deployed successfully.

Artifact Details

Monitor Message Processing
[View deployed Artifact](#)
[Navigate to Artifact Editor](#)

Log Configuration

Log Level: **Info**

Name	Status
AEMSalesOrderNotification	Started
AEMBusinessPartnerAddressCheck	Started
AEMLegacyOutputAdapter	Started
anackidemo	Started
AdvancedEventMesh	Started
PubSubPlusEA	Started
Rainer-test-01	Error
AEMLegacyInputAdapter	Error
BradTest	Error
SAP aEM Demo	Error
Slack	Started
SapRtpSotConnector	Started
AssignTechnician	Started
RabbitMQ	Started

- Go to your **AEM Console** and navigate to **Cluster Manager** -> **{your service}** -> **Manage** and click on the **Queues** tile:

The screenshot shows the SAP AEM Cluster Manager interface for the service 'MontrealBroker-10.1'. The left sidebar contains links for Mission Control, Cluster Manager (selected), Mesh Manager (BETA), Designer, Catalog, Runtime Manager, and Insights. The main content area displays 'Event Broker Service Settings' with sections for Authentication (Enabled), Certificate Authorities (0 Client Certificate Authorities, 1 Domain Certificate Authority), and Client Profiles (1 Client Profile). Below this is the 'Broker Manager Quick Settings' section, which includes tiles for Message VPN, Clients, Queues (highlighted with a red box), Access Control, and Bridges. At the bottom is the 'Other Management Tools' section, listing SEMP - REST API, Broker Manager - Web Application, and SolAdmin - Desktop Application.

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

- Check that the input queue for your flow has at least one consumer connected to it.

The screenshot shows the SAP Cloud Platform SAP Message Broker Queues overview page. The left sidebar contains navigation links for MontrealBroker-10.1, messaging components like Message VPN, Clients, Queues (which is selected), Connectors, Access Control, Telemetry, Replay, Bridges, JMS JNDI, Try Me!, Advanced Messaging, Caches, Transactions, System, and Clustering. The main area has tabs for Queues, Topic Endpoints, and Templates. A search bar at the top right shows 'ci'. The Queues table lists the following data:

Queue Name	Incoming	Outgoing	Access Type	Partition Count	Messages Queued (%)	Messages Queued (msgs)	Messages Queued (MB)	Messages Queued Quota (MB)	Consumers	Replay State	Durable
CIBusinessPartner	On	On	Exclusive	0	<div style="width: 100%;"> </div>	917	0.3088	50	0	N/A	Yes
CIBusinessPartnerChecked	On	On	Exclusive	0	<div style="width: 100%;"> </div>	560	0.1963	50	0	N/A	Yes
CIBusinessPartnerCheckedInvalid	On	On	Exclusive	0	<div style="width: 100%;"> </div>	369	0.1266	50	0	N/A	Yes
CIBusinessPartnerChecker	On	On	Exclusive	0	<div style="width: 100%;"> </div>	0	0	50	2	N/A	Yes
CIBusinessPartnerCheckerDMQ	On	On	Exclusive	0	<div style="width: 100%;"> </div>	6	0.0019	50	0	N/A	Yes
CIBusinessPartnerConverted	On	On	Exclusive	0	<div style="width: 100%;"> </div>	0	0	50	0	N/A	Yes
CILegacyAdapterIn	On	On	Exclusive	0	<div style="width: 100%;"> </div>	0	0	50	2	N/A	Yes
CILegacyAdapterInDMQ	On	On	Exclusive	0	<div style="width: 100%;"> </div>	880	0.5214	50	1	N/A	Yes
CILegacyAdapterOut	On	On	Exclusive	0	<div style="width: 100%;"> </div>	3	0.0001	50	0	N/A	Yes
CISalesOrder	On	On	Exclusive	0	<div style="width: 100%;"> </div>	1,371	0.8406	50	0	N/A	Yes
CISalesOrderChecked	On	On	Exclusive	0	<div style="width: 100%;"> </div>	0	0	50	0	N/A	Yes
CISalesOrderNotification	On	On	Exclusive	0	<div style="width: 100%;"> </div>	0	0	50	2	N/A	Yes
CISalesOrderNotificationProcesse...	On	On	Exclusive	0	<div style="width: 100%;"> </div>	766	0.4715	50	0	N/A	Yes

Checking your flow is running successfully.

- Go to **Monitor Artifacts** -> **Monitor Message Processing** -> **All Artifacts (Past Hour)**.
In this view you can see whether your flows are being triggered and completing successfully or running into any errors.

SAP Integration Suite

Overview / Monitor Message Processing

Time: Past Week Status: All Artifact: All Artifacts

ID: Message, Correlation or Application Message

Messages (23199) 1 / 464 AEMLegacyOutputAdapter Last Updated at: Feb 24, 2024, 03:33:51

Artifact Name	Status
AEMSONNotificationV2	Completed
Feb 24, 2024, 03:33:52	1 sec 9 ms
AEMLegacyOutputAdapter	Failed
Feb 24, 2024, 03:33:51	308 ms
AEMLegacyOutputAdapter	Failed
Feb 24, 2024, 03:33:51	310 ms
SalesOrderToBPaiFlow	Completed
Feb 24, 2024, 03:30:17	8 ms
AEMSONNotificationV2	Completed
Feb 24, 2024, 03:26:53	1 sec 8 ms
AEMLegacyOutputAdapter	Failed
Feb 24, 2024, 03:26:53	308 ms
AEMLegacyOutputAdapter	Failed
Feb 24, 2024, 03:26:52	309 ms
AEMSONNotificationV2	Completed
Feb 24, 2024, 03:25:53	1 sec 8 ms
AEMLegacyOutputAdapter	Failed
Feb 24, 2024, 03:25:53	308 ms
AEMLegacyOutputAdapter	Failed
Feb 24, 2024, 03:25:52	309 ms
AEMSONNotificationV2	Completed
Feb 24, 2024, 03:24:53	1 sec 9 ms
AEMLegacyOutputAdapter	Failed
Feb 24, 2024, 03:24:53	307 ms

Status Properties Logs Artifact Details

Message processing failed.

Processing Time: 308 ms

Error Details
org.apache.camel.component.file.GenericFileOperationException: Cannot connect to sap-sftp://sftpuser@london.solace.com:22234, cause: com.jcraft.jsch.JSchException: timeout: socket is not established

Properties

Message ID: AGXZY588bFC7WonFwORs0u7NYXBw
Correlation ID: AGXZY59G67AxbTMk0sfgyYypoABQ

Logs

Log Level: Info
Instance ID: 1

Artifact Details

Manage Integration Content
View deployed Artifact
Navigate to Artifact Editor

Name: AEMLegacyOutputAdapter
ID: AEMLegacyOutputAdapter

Open Text View

(Please note that the AEMLegacyOutputAdapter flow is meant to fail in the initial scenario.) You can use this view to see various details about the flow execution and click on the trace/log to see exactly where the flow has failed. (If the log is set to info and isn't giving you enough information to troubleshoot, then you may want to go over to the flow monitor as seen in the previous step to change it to a more detailed level.)

SAP Integration Suite

Overview / Monitor Message Processing

Time: Past Week Status: All Artifact: All Artifacts ID: Message, Correlation or Application Message

Messages (23199) 1 / 464 AEMLegacyOutputAdapter Last Updated at: Feb 24, 2024, 03:33:51

Artifact Name	Status
AEMSONNotificationV2	Completed
Feb 24, 2024, 03:33:52	1 sec 9 ms
AEMLegacyOutputAdapter	Failed
Feb 24, 2024, 03:33:51	308 ms
AEMLegacyOutputAdapter	Failed
Feb 24, 2024, 03:33:51	310 ms
SalesOrderToBPaiFlow	Completed
Feb 24, 2024, 03:30:17	8 ms
AEMSONNotificationV2	Completed
Feb 24, 2024, 03:26:53	1 sec 8 ms
AEMLegacyOutputAdapter	Failed
Feb 24, 2024, 03:26:53	308 ms
AEMLegacyOutputAdapter	Failed
Feb 24, 2024, 03:26:52	309 ms
AEMSONNotificationV2	Completed
Feb 24, 2024, 03:25:53	1 sec 8 ms
AEMLegacyOutputAdapter	Failed
Feb 24, 2024, 03:25:53	308 ms
AEMLegacyOutputAdapter	Failed
Feb 24, 2024, 03:25:52	309 ms
AEMSONNotificationV2	Completed
Feb 24, 2024, 03:24:53	1 sec 9 ms
AEMLegacyOutputAdapter	Failed
Feb 24, 2024, 03:24:53	307 ms

Status Properties Logs Artifact Details

Message processing failed.

Processing Time: 308 ms

Error Details
org.apache.camel.component.file.GenericFileOperationException: Cannot connect to sap-sftp://sftpuser@london.solace.com:22234, cause: com.jcraft.jsch.JSchException: timeout: socket is not established

Properties

Message ID: AGXZY588bFC7WonFwORs0u7NYXBw
Correlation ID: AGXZY59G67AxbTMk0sfgyYypoABQ

Logs

Log Level: Info
Instance ID: 1

Artifact Details

Manage Integration Content
View deployed Artifact
Navigate to Artifact Editor

Name: AEMLegacyOutputAdapter
ID: AEMLegacyOutputAdapter

Open Text View

SAP Integration Suite

Overview / Monitor Message Processing / Message Processing Run

Run Steps (3)

	SFTP	1/1
	SFTP	
	Segment 1	302 ms
	End	
	Segment 1	1 ms
	PubSubPlusEA	
	Segment 1	< 3 ms

Integration Flow Model Log Content

Integration Process

```
graph LR; subgraph IP [Integration Process]; direction LR; Start((Start)) -->|PubSubPlusEA| S1(( )); S1 -->|SFTP| End((End)); end; Sender[Sender] -->|PubSubPlusEA| S1; S1 -->|SFTP| End; End -->|SFTP| Receiver[Receiver]
```

The screenshot shows the SAP Integration Suite interface for monitoring message processing. On the left, a sidebar displays 'Run Steps (3)' with three entries: SFTP (1/1), End, and PubSubPlusEA. The SFTP entry shows a duration of 302 ms. The End entry shows a duration of 1 ms. The PubSubPlusEA entry shows a duration of < 3 ms. The main area is titled 'Integration Process' and contains a flow diagram. The flow starts at a 'Sender' node, which has a dashed line leading to a 'PubSubPlusEA' connector. This connector is followed by a 'Start' event node. From the 'Start' node, a solid line leads to another 'PubSubPlusEA' connector, which then leads to an 'End' event node. Finally, a dashed line leads from the 'End' node to a 'Receiver' node. The SAP logo is visible above the 'Integration Process' title.

11. Takeaways

- Configuring AEM broker queues, subscriptions and queue related settings
- Import additional adapters into Integration Suite (if not already present)
- Import Integration Suite packages
- Configure security related settings in Integration Suite
- Understand event-driven iflows and configure them for your AEM environment
- Receive events in Integration Suite and publish new events
- Access topic information and parse and modify topic levels to publish to new dynamic Topics
- Understand retry and error processing capabilities in the AEM adapter and the AEM broker
- How to use the broker's config APIs to automate configuration and enable CI/CD pipelines.
- How fine-grained security access in AEM works.

Thanks for participating in this codelab! Let us know what you thought in the [Solace Community Forum](#)! If you found any issues along the way we'd appreciate it if you'd raise them by clicking the Report a mistake button at the bottom left of this codelab.