Unit 5 – Modeling Processes

Developing with SAP Integration Suite

C_CPI_14

Agenda

- Modeling Integration Flows
- Learning the Basics
- Using Adapters
- Using Mappings
- Using Adapter Outbound Security
- Performing Exception Handling
- Using Scripting
- Using Adapter Inbound Security
- Using Integration Patterns

Business Scenario - Task flow

Business Scenario – Steps involved

1. Create Integration Package and Integration Flow with Timer
2. Add Content Modifier (mock data – Product list)
3. Add General Splitter (split Products for iteration)
4. Add Content Modifier (add Product ID to Exchange Property)
5. Add Request Reply (is Product ID in database)
6. Add Router (If Product ID exists - CONTINUE, else END)

Using Adapters

- Wide variety of pre-built adapters available
- Support various application, transport protocols, message protocols
- Differentiation made between input and output adapters
- Broadly categorized into 2 groups
  - TCP based
  - Non TCP based

Features of OData Adapter

- Query wizard
  - Navigate the interface to be accessed with metadata document
- Page Processing mode
  - Read entries in multiple pages which are processed sequentially
- Automatically removing namespaces
  - Remove namespaces and prefixes automatically

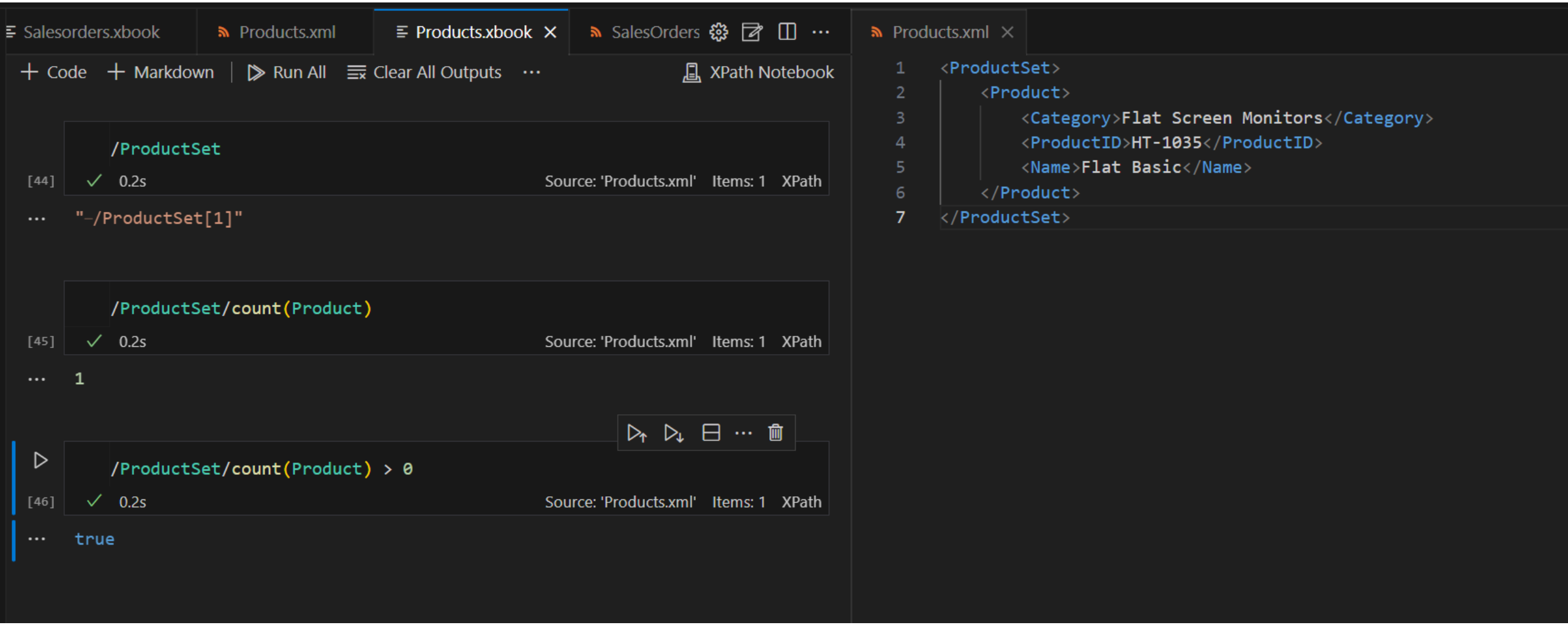
Details of OData Adapter

Example: OData Adapter

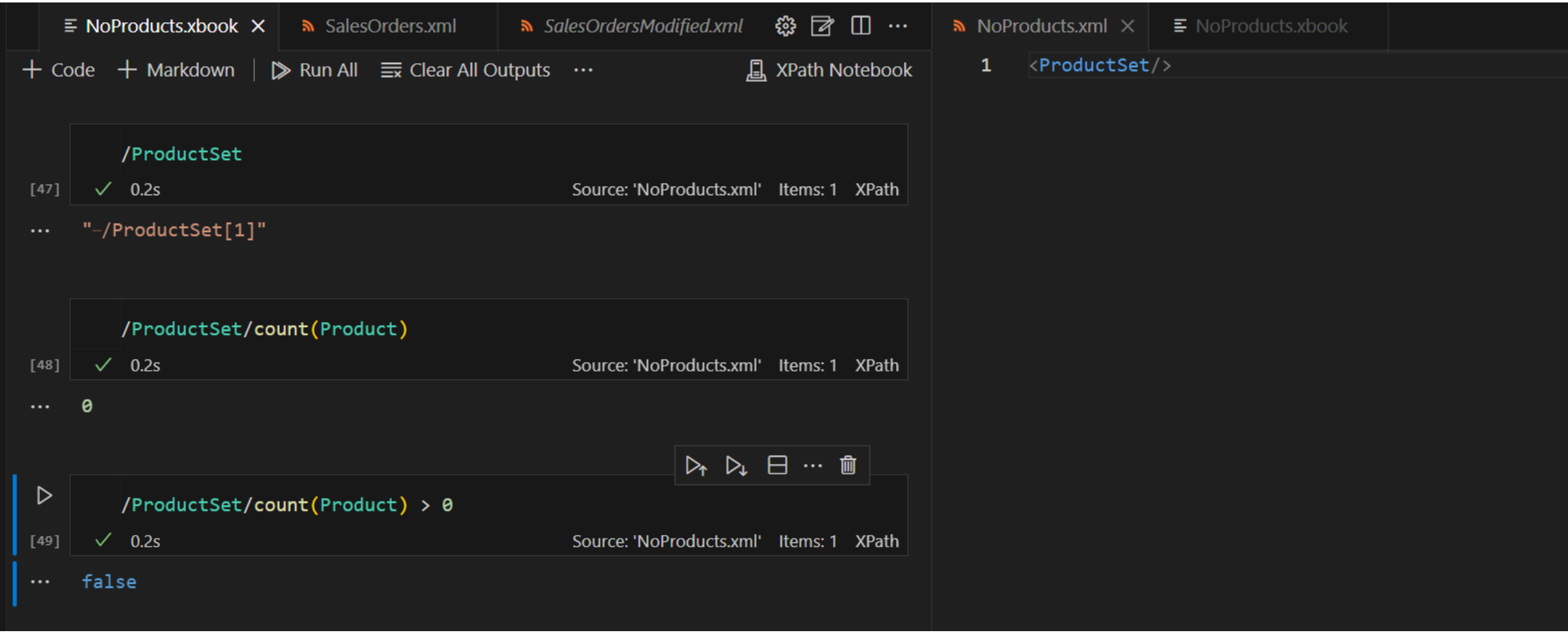
Table 1: Example: Details of an OData Adapter

Detail	Outcome
Category	HTTP based
Transport protocol	TCP/IP
Application protocol	HTTP/HTTPS
Message protocol	Atom Pub as XML or JSON representation

XPath Expressions



XPath Expressions



Business Scenario - Task flow

Business Scenario – Steps involved

7. Add Request Reply (get all Sales Orders for each Product)
8. Add XSLT Mapping (remove namespaces)
9. Add General Splitter (split Sales Order for iteration)
10. Add Content Modifier (add Sales Order ID, Item to Exchange Property)

Business Scenario - Task flow

Business Scenario – Steps involved

11. Add Request Reply (get Sales Header for each Sales Order)
12. Add XSLT Mapping (remove namespaces)
13. Add Content Modifier (add Customer ID to Exchange Property)

HTTP Adapter

SalesOrdersNamespaces.xml | SalesOrders.xml | SalesOrdersModified.xml

```
<feed xmlns="http://www.w3.org/2005/Atom"
    xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metada
    xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices" xml:b
    <id>https://sapes5.sapdevcenter.com/sap/opu/odata/iwbep/GWSAMPLE_BASI
    <title type="text">SalesOrderLineItemSet</title>
    <updated>2023-06-04T07:44:49Z</updated>
    <author>
        <name/>
    </author>
    <link href="ProductSet('HT-1035')/ToSalesOrderLineItems" rel="self" t
    <entry>
        <id>https://sapes5.sapdevcenter.com/sap/opu/odata/iwbep/GWSAMPLE_
        <title type="text">SalesOrderLineItemSet(SalesOrderID='0500000001
        <updated>2023-06-04T07:44:49Z</updated>
        <category term="GWSAMPLE_BASIC.SalesOrderLineItem" scheme="http:/
        <link href="SalesOrderLineItemSet(SalesOrderID='0500000001',ItemP
        <content type="application/xml">
            <m:properties xmlns:m="http://schemas.microsoft.com/ado/2007/
                xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataser
                <d:SalesOrderID>0500000001</d:SalesOrderID>
                <d:ItemPosition>0000000040</d:ItemPosition>
                <d:DeliveryDate>2018-01-07T23:00:00.0000000</d:DeliveryDa
            </m:properties>
        </content>
    </entry>
    <entry>
        <id>https://sapes5.sapdevcenter.com/sap/opu/odata/iwbep/GWSAMPLE_
        <title type="text">SalesOrderLineItemSet(SalesOrderID='0500000007
        <updated>2023-06-04T07:44:49Z</updated>
```

SalesOrdersNamespaces.xbook | NoProducts.xml | NoProducts.xbook

+ Code + Markdown | Run All | Clear All Outputs ... XPath Notebook

```
//content/m:properties/d:SalesOrderID
```

[53] ✓ 0.2s Source: 'SalesOrdersNamespaces.xml' Items: 2 XPath

```
[
    "-/feed[1]/entry[1]/content[1]/m:properties[1]/d:SalesOrderID[1]",
    "-/feed[1]/entry[2]/content[1]/m:properties[1]/d:SalesOrderID[1]"
]
```

```
//content/m:properties/d:ItemPosition
```

[54] ✓ 0.2s Source: 'SalesOrdersNamespaces.xml' Items: 2 XPath

```
[
    "-/feed[1]/entry[1]/content[1]/m:properties[1]/d:ItemPosition[1]",
    "-/feed[1]/entry[2]/content[1]/m:properties[1]/d:ItemPosition[1]"
]
```

Namespaces are not automatically removed in HTTP adapter...
So your XPath needs to take that into account

Mappings

- Message Mapping
  - Mapping editor provides tools to map XML or JSON messages
- XSLT Mapping
  - Language designed for transforming XML docs to other formats
  - Stylesheet is processed by an XSLT processor (Xalon or Saxon)
- Mapping with scripting
- Operation Mapping from Enterprise Service Repository (On-Premise)

Mappings

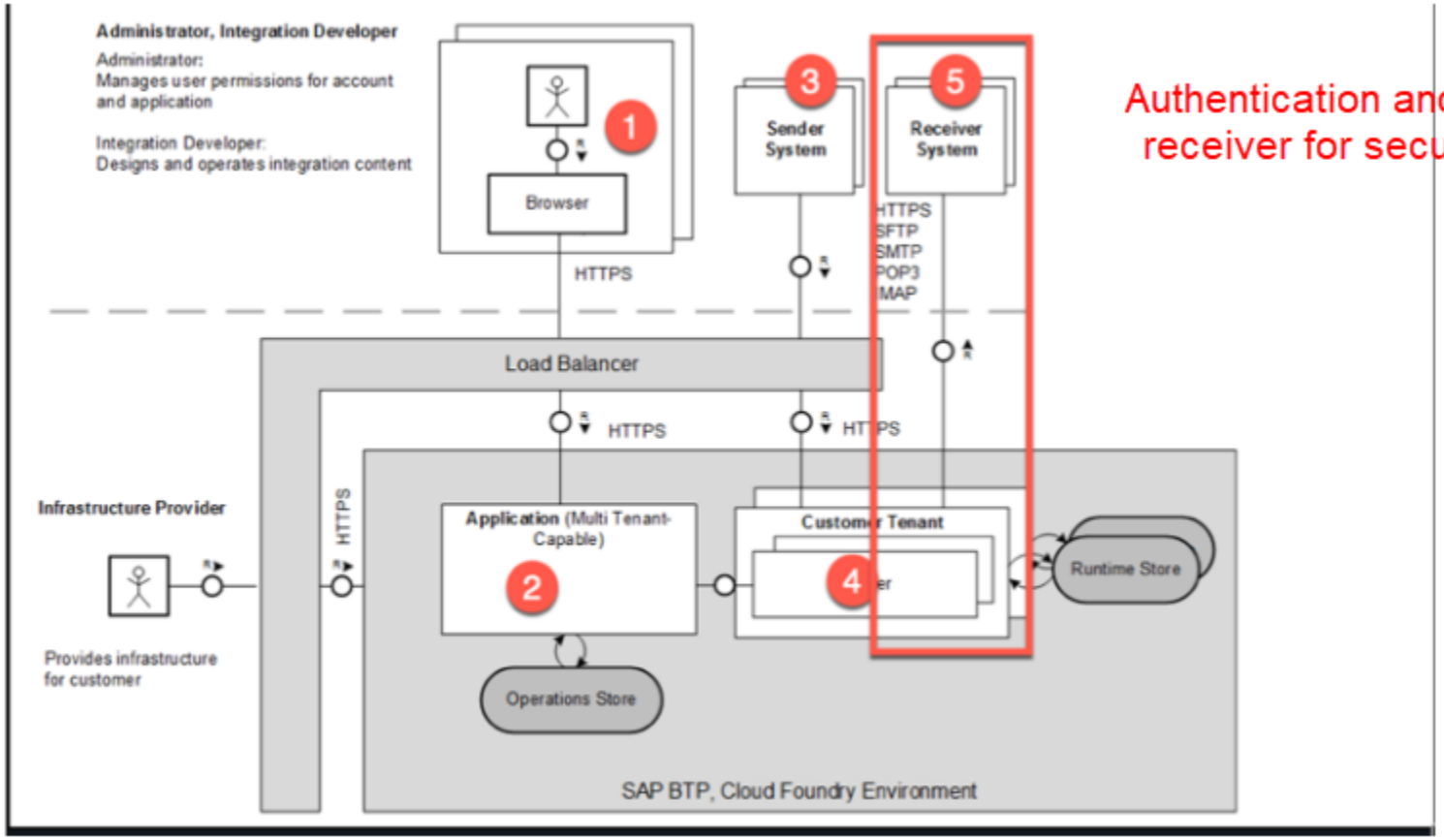
- Process of converting source format into different target formats
- Message Mapping offers context handling, UDF, testing functions
- XSLT Mapping requires XML as input
  - Can create more target formats
  - Useful for creating attachments
- Mapping via scripting offers most flexibility

Business Scenario - Task flow

Business Scenario – Steps involved

14. Add Data Store (write Customer ID to Data Store)

Using Adapter Outbound Security



Authentication and Authorization with receiver for secure communication

Example of a Direct Receiver and Sender Adapter

Options for Authentication / Authorization

- Basic
- Client Certificate
- None
- OAuth2 Client Credentials
- OAuth2 SAML Bearer Assertion

Business Scenario - Task flow

Business Scenario – Steps involved

15. Add Exception Subprocess (barebone)
16. Add Groovy Script (read exception messages to payload)

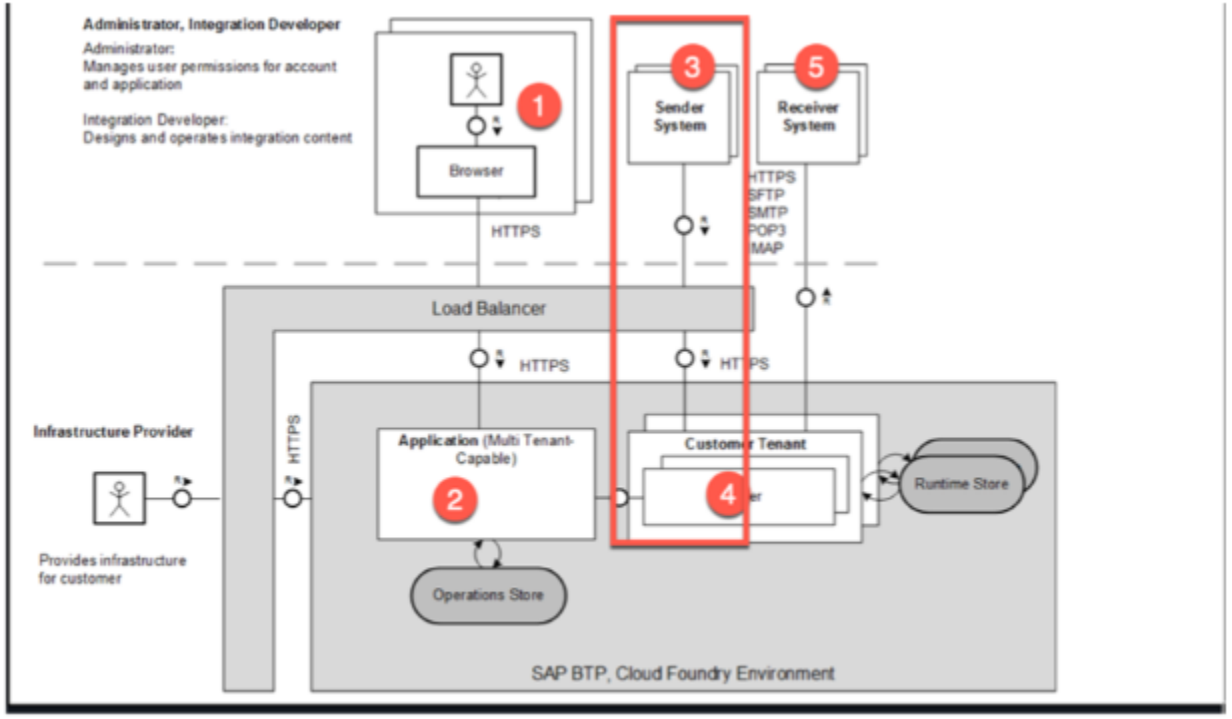
Business Scenario - Task flow

Business Scenario – Steps involved

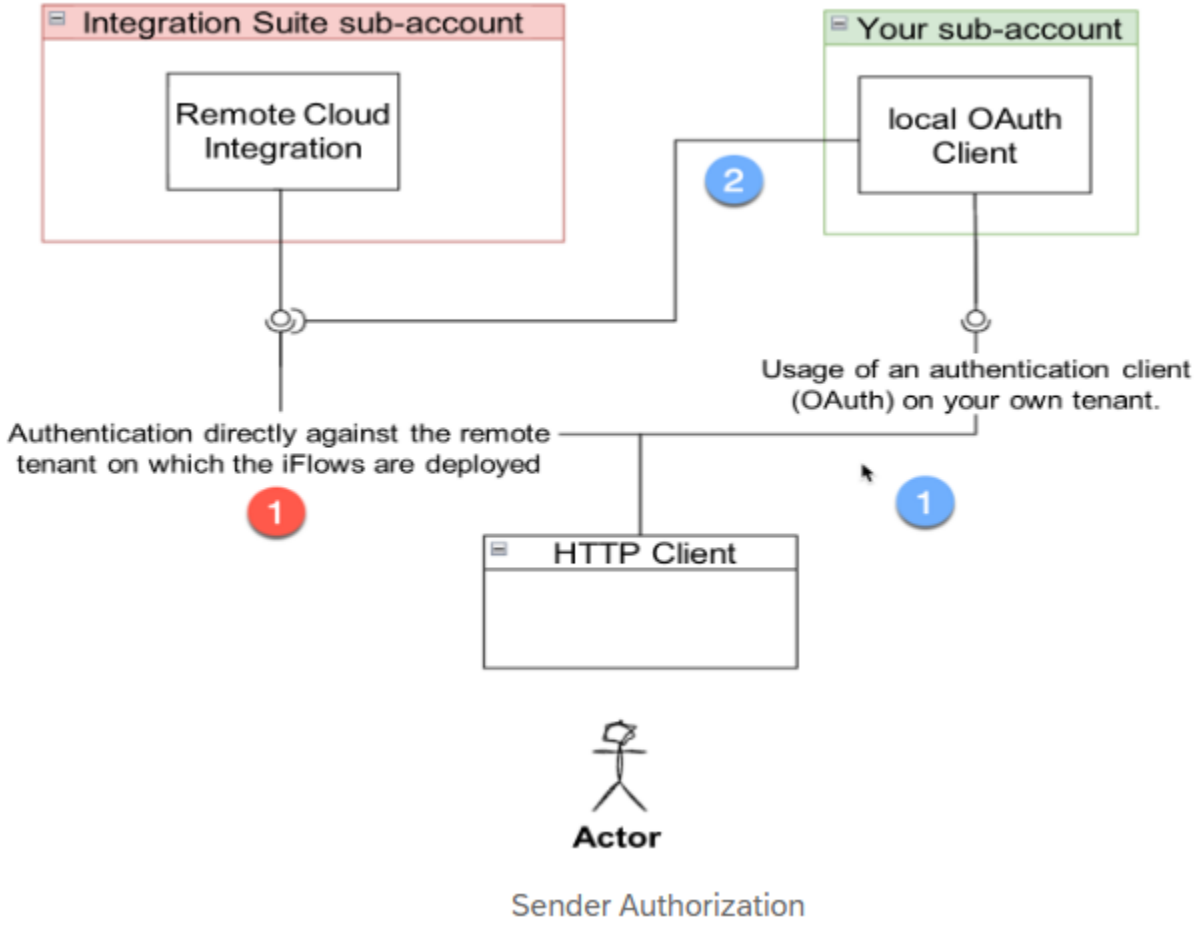
17. Add Message Start (remove Timer)
18. Add SOAP adapter (asynchronous call)
19. Remove $top clause (power of asynchronous call)

Using Adapter Inbound Security

- Certificates between sender and load balancer for HTTPS connection
- Sender's authorization validated against Integration flow endpoint



Authorization of sender



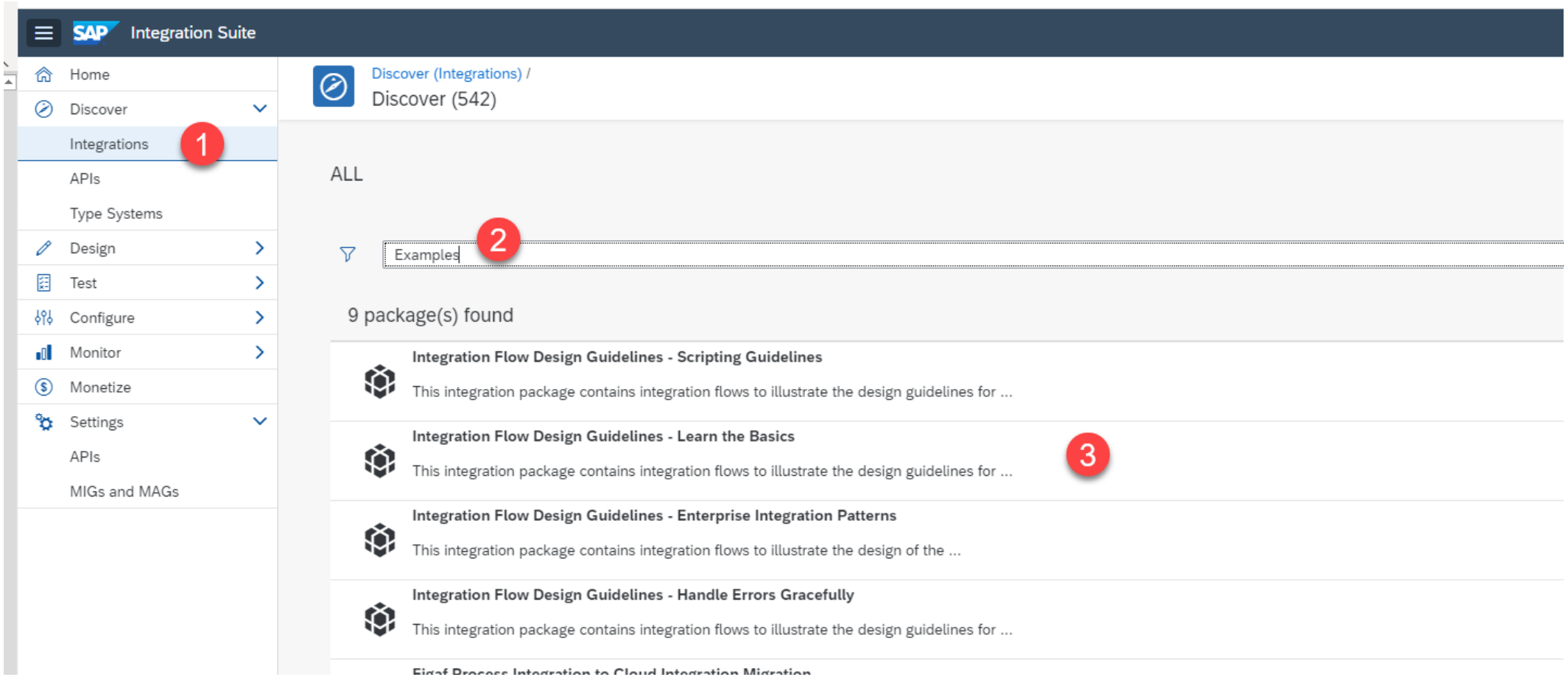
Authentication against remote endpoint

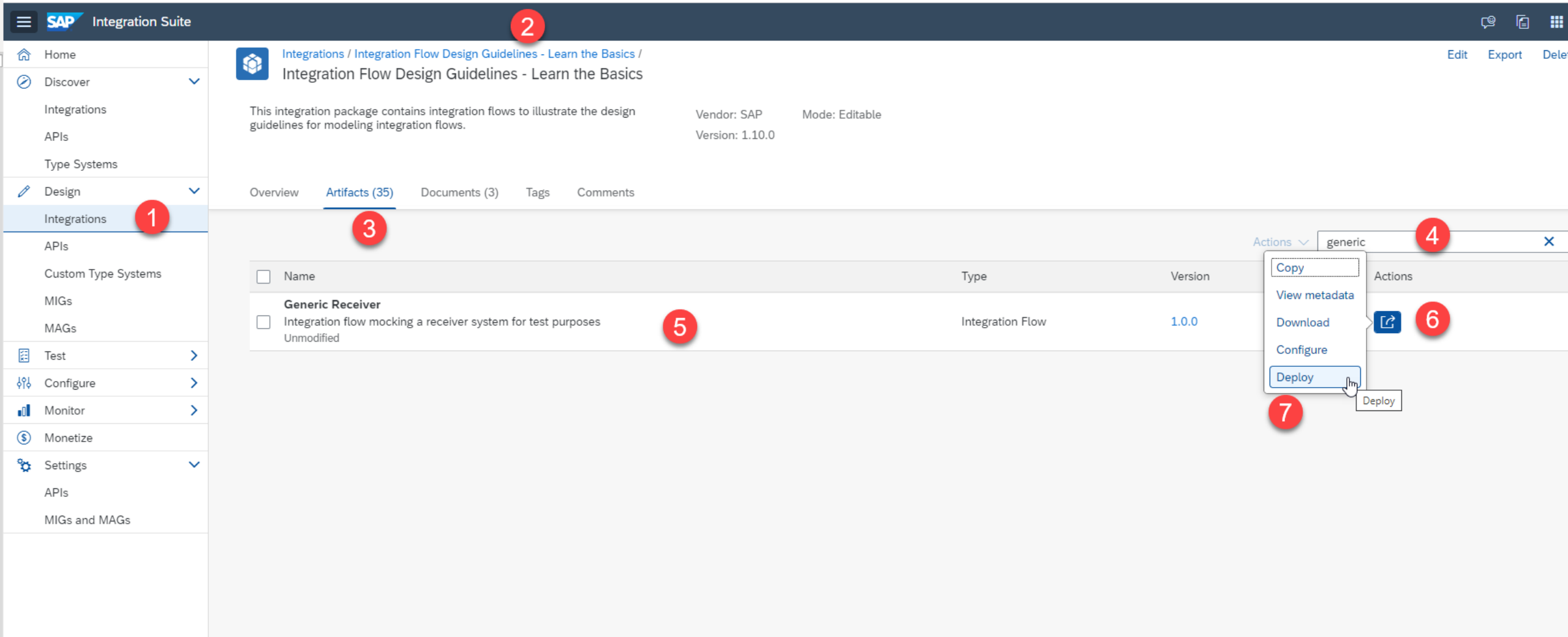
- Assign user role ESBMessaging.send
- Not recommended for production use

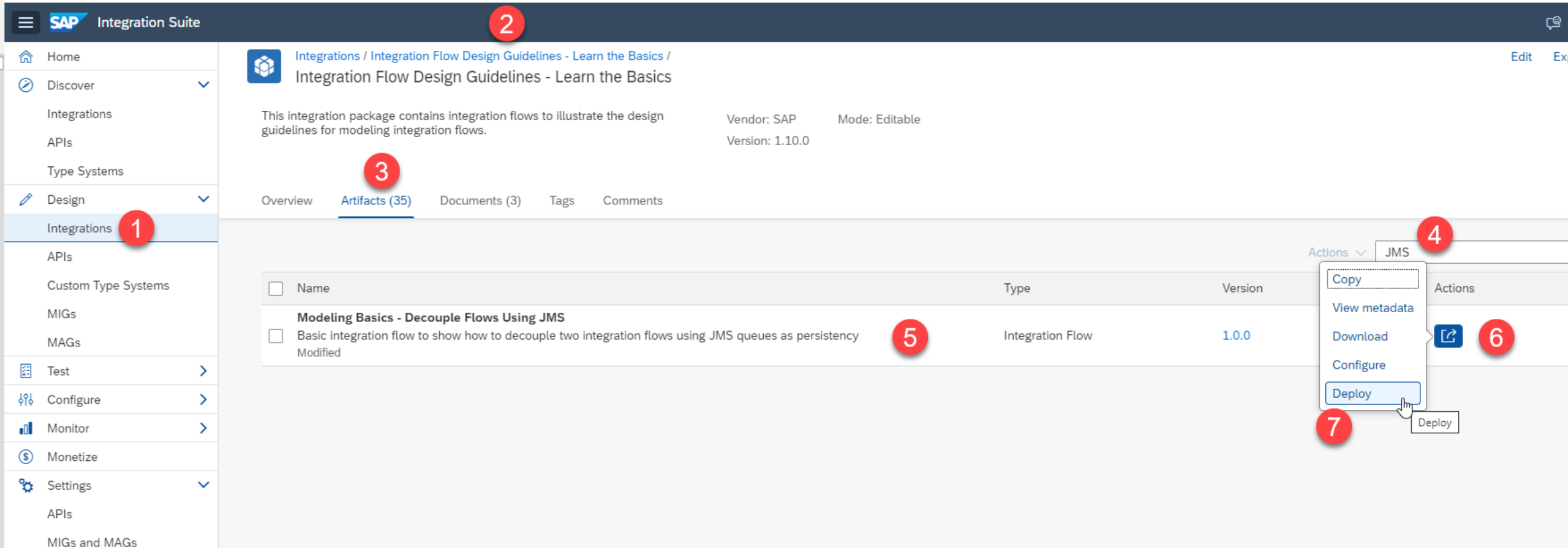
Authentication (Oauth) client on your own Tenant

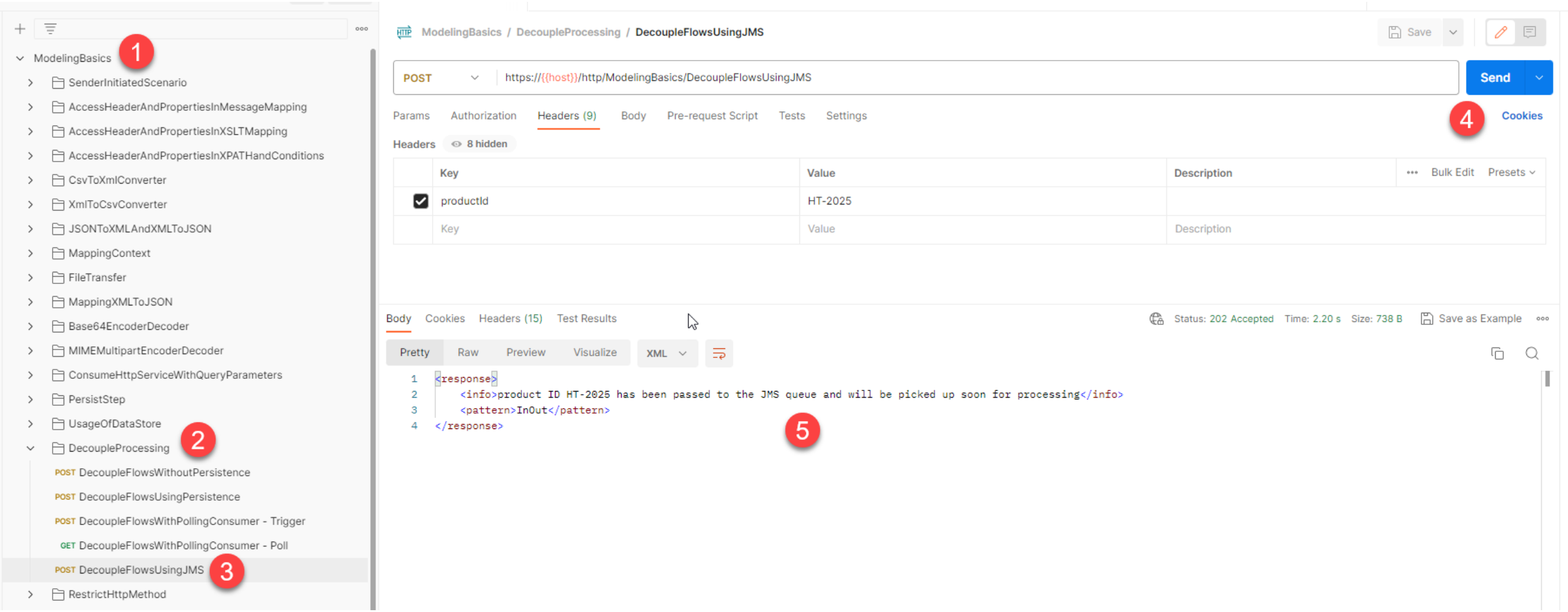
- Set up Process Integration Runtime instance
- Supports
  - Authorization code
  - Client credentials
  - Password
  - Refresh Token
  - SAML2 Bearer
  - JWT Bearer

Sample Integration Flows




SAP Integration Suite
2
Home
Discover
Integrations
APIs
Type Systems
Design
Integrations
1
APIs
Custom Type Systems
MIGs
MAGs
Test
Configure
Monitor
Monetize
Settings
APIs
MIGs and MAGs
Integrations / Integration Flow Design Guidelines - Learn the Basics /
Integration Flow Design Guidelines - Learn the Basics
Edit
Export
This integration package contains integration flows to illustrate the design guidelines for modeling integration flows.
Vendor: SAP
Mode: Editable
Version: 1.10.0
Overview
Artifacts (35)
Documents (3)
Tags
Comments
3
Actions
generic
4
Name
Type
Version
Actions
Generic Receiver
Integration flow mocking a receiver system for test purposes
Unmodified
5
Integration Flow
1.0.0
6
Copy
View metadata
Download
Configure
Deploy
Deploy
7


SAP Integration Suite
2
Home
Discover
Integrations
APIs
Type Systems
Design
Integrations
1
APIs
Custom Type Systems
MIGs
MAGs
Test
Configure
Monitor
Monetize
Settings
APIs
MIGs and MAGs
Integrations / Integration Flow Design Guidelines - Learn the Basics /
Integration Flow Design Guidelines - Learn the Basics
Edit
This integration package contains integration flows to illustrate the design guidelines for modeling integration flows.
Vendor: SAP
Mode: Editable
Version: 1.10.0
3
Overview
Artifacts (35)
Documents (3)
Tags
Comments
4
Actions
JMS
Name
Type
Version
Actions
Modeling Basics - Decouple Flows Using JMS
Basic integration flow to show how to decouple two integration flows using JMS queues as persistency
Modified
5
Integration Flow
1.0.0
6
Copy
View metadata
Download
Configure
Deploy
7
Deploy


ModelingBasics
1
SenderInitiatedScenario
AccessHeaderAndPropertiesInMessageMapping
AccessHeaderAndPropertiesInXSLTMapping
AccessHeaderAndPropertiesInXPATHandConditions
CsvToXmlConverter
XmlToCsvConverter
JSONToXMLAndXMLToJSON
MappingContext
FileTransfer
MappingXMLToJSON
Base64EncoderDecoder
MIMEMultipartEncoderDecoder
ConsumeHttpServiceWithQueryParameters
PersistStep
UsageOfDataStore
DecoupleProcessing
2
POST DecoupleFlowsWithoutPersistence
POST DecoupleFlowsUsingPersistence
POST DecoupleFlowsWithPollingConsumer - Trigger
GET DecoupleFlowsWithPollingConsumer - Poll
POST DecoupleFlowsUsingJMS
3
RestrictHttpMethod
ModelingBasics / DecoupleProcessing / DecoupleFlowsUsingJMS
Save
POST
https://{{host}}/http/ModelingBasics/DecoupleFlowsUsingJMS
Send
Params
Authorization
Headers (9)
Body
Pre-request Script
Tests
Settings
4
Cookies
Headers
8 hidden
Key
Value
Description
Bulk Edit
Presets
productId
HT-2025
Key
Value
Description
Body
Cookies
Headers (15)
Test Results
Status: 202 Accepted
Time: 2.20 s
Size: 738 B
Save as Example
Pretty
Raw
Preview
Visualize
XML
1 <response>
2 <info>product ID HT-2025 has been passed to the JMS queue and will be picked up soon for processing</info>
3 <pattern>InOut</pattern>
4 </response>
5