SAP® PartnerEdge®

Partner Certification Academies for SAP BTP

[Developing with SAP Integration Suite (C_CPI_15)]

Eve Li SAP
Sep 26th, 28th, Oct 10th, 2023

THE BEST RUN SAP®

Agenda

Day 1

Intro

Unit 1 Introducing the Integration Suite

Unit 2 Introducing iPaaS

Unit 3 Managing APIs

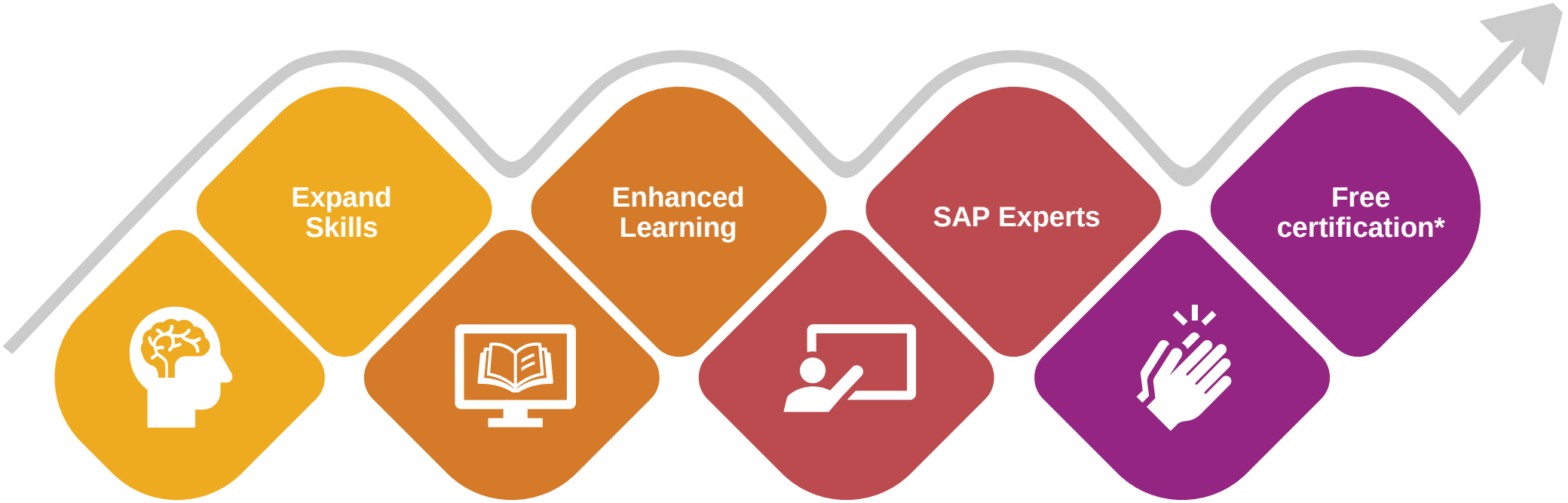
Day 2

Unit 4 Managing Cloud Integration

Unit 5 Modeling processes

Outro

Value of Partner Certification Academies



Expand Skills

Gain expertise with SAP BTP to build on a unified platform & help customers accelerate innovation

Enhanced Learning

Get a clear understanding of the courses and certification expectations at an accelerated pace

SAP Experts

Engage with SAP experts to help navigate the content & get your questions answered live

Free certification*

Eligible partners can get the cost of certification attempt(s) reimbursed*

* Eligibility criteria apply, check the landing page for more details.

Certification drives career growth and greater earning potential

28%
salary or wage increase

61%
promotion and job advancement

76%
greater job satisfaction

76%
increased respect from peers

74%
more work autonomy and independence

91%
increased confidence in abilities

Source: SAP Global Certification Infographic

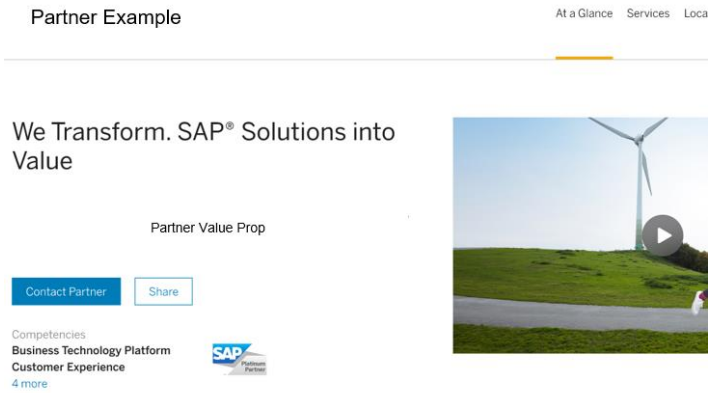
Certifications are key for the new Partner Competency Framework

Visualization of Branding & Logos on Partner Assets

- Earned competencies, no specialization details

- Single earned competency, with earned specializations

Partner Finder



- Identify best fit partners based on experience and capabilities
- Customer to get competency and specialization details of each partner

Specializations	Essential			Advanced			Expert			
	Solution Consultants	Delivered Projects	Specializations	Solution Consultants	Delivered Projects	Specializations	Solution Consultants	Delivered Projects	Specializations	Partner IP with BTP
Database and Data Management	3	1	1	5	3	2	10	5	3	1
Application Development and Integration	3	1								
Analytics and Planning	3	1								

Learn more about the Competency Framework

How does it work?

Here we are today

ACADEMY REGISTRATION

Completion of any Academy pre-requisites

LIVE SESSIONS

Join the live sessions with our subject matter experts

ACADEMY COMPLETION

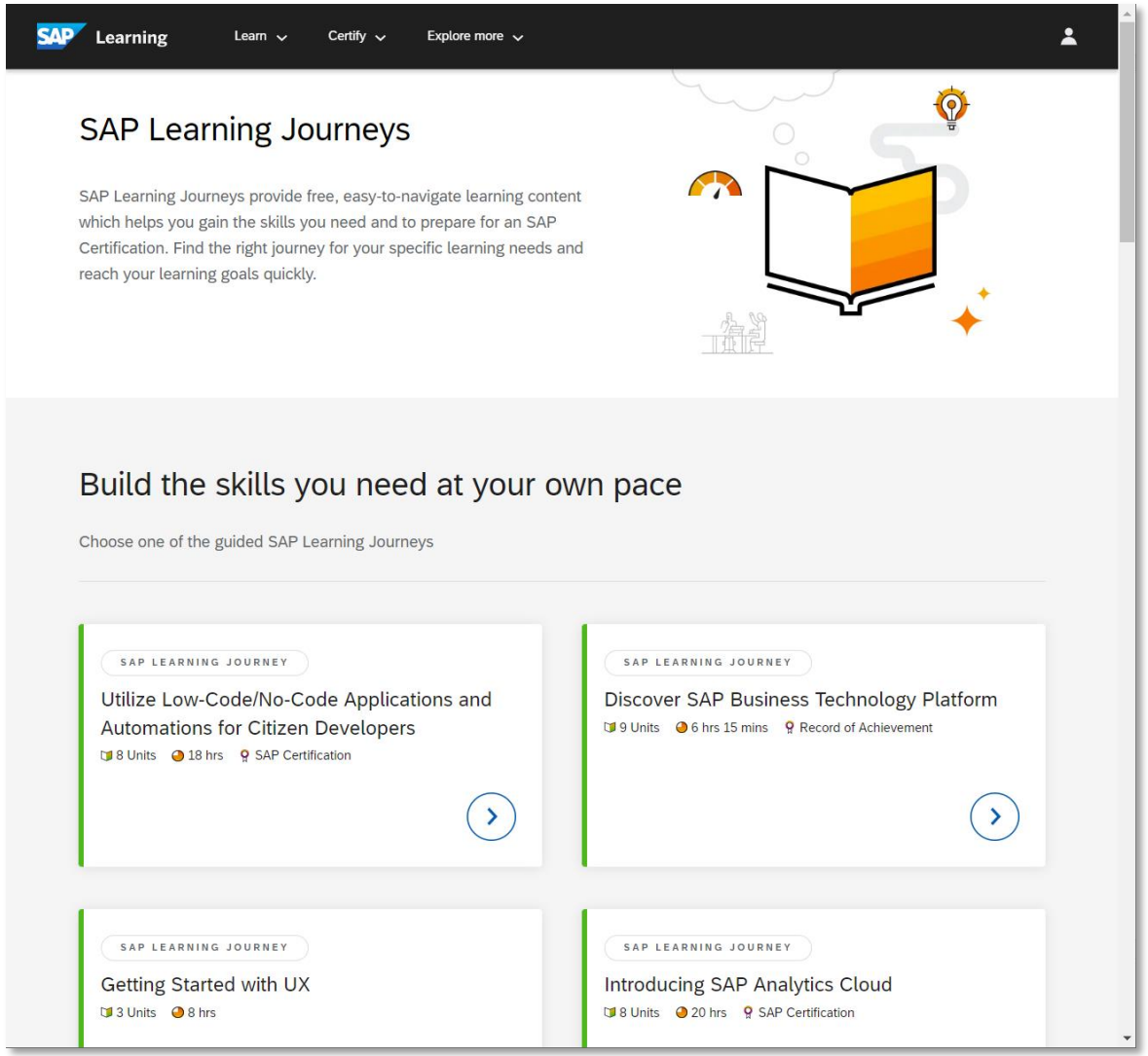
Familiarize yourself with any remaining content of the Learning Journey

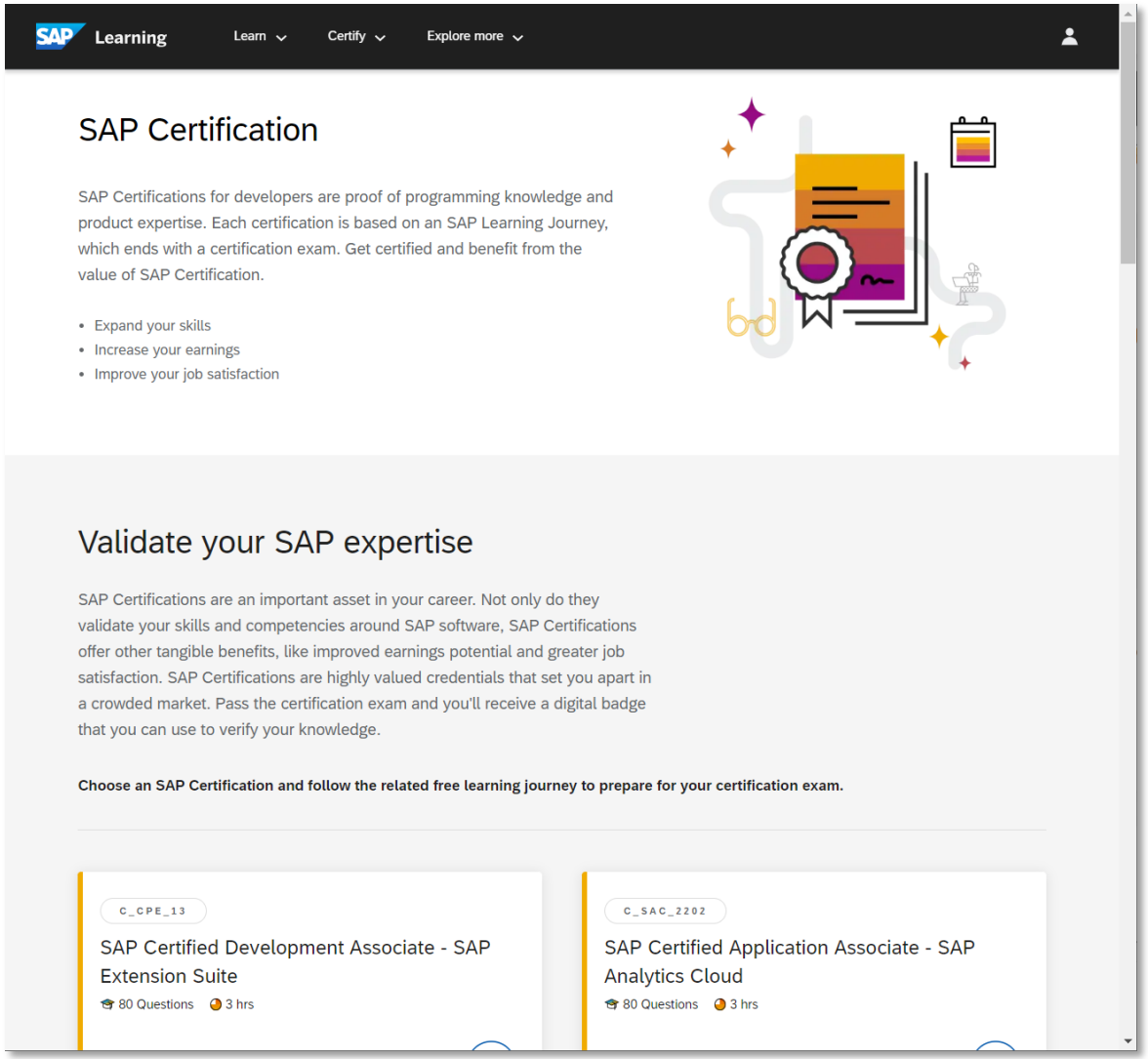
Optionally join the “Ask the Expert” session

GET CERTIFIED

Book and complete your certification exam

Background





Partner Certification Academies for SAP BTP

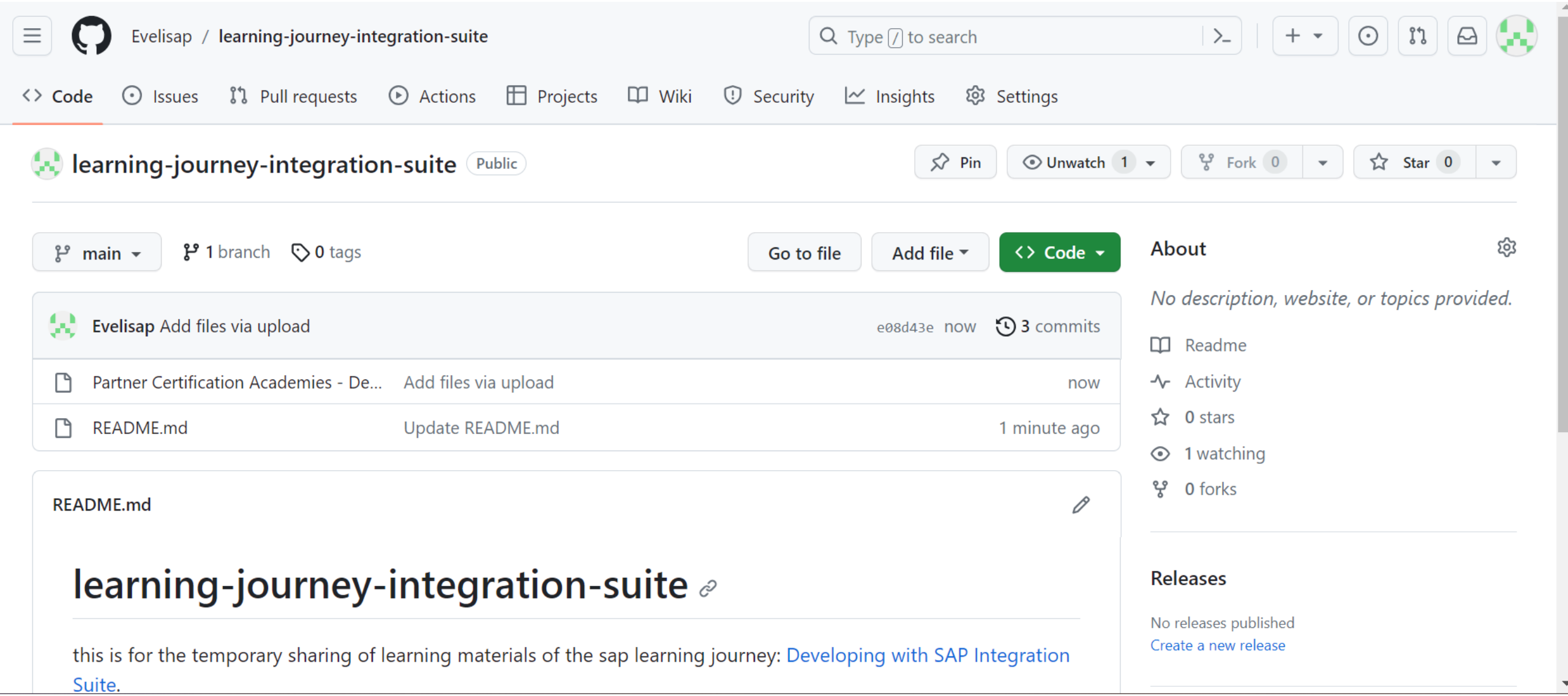
Developing with SAP Integration Suite

Pre-requisite	Sep 26	Sep 28	Oct 10
	Duration: 2 hours	Duration: 2 hours	Duration: 1 hour
• Basic knowledge of JavaScript or other programming languages used for web development • Basic knowledge of cloud development concepts	• Introducing the Integration Suite • Introducing iPaaS • Managing APIs	• Managing Cloud Integration • Modeling processes	• Ask the Expert

This Academy is based on the Developing with SAP Integration Suite learning journey content which is part of the preparation for the associated certification exam SAP Certified Development Associate - SAP Integration Suite (**C_CPI_15)**.

Please note that learning journey content and certification exam questions change occasionally and it is your own responsibility to ensure you are up to date with the latest learning content.

Slides and recordings availability



learning-journey-integration-suite

Unit 1 – Introducing the SAP Integration Suite

Developing with SAP Integration Suite

C_CPI_15

Unit 1 Contents

- Distributed architecture
- API first approach
- Exercise scenario
- Operating modes of API architecture
- REST, OData
- SAP Gateway Demo System
- SAP Graph
- Key Summary Points

Distributed Architecture

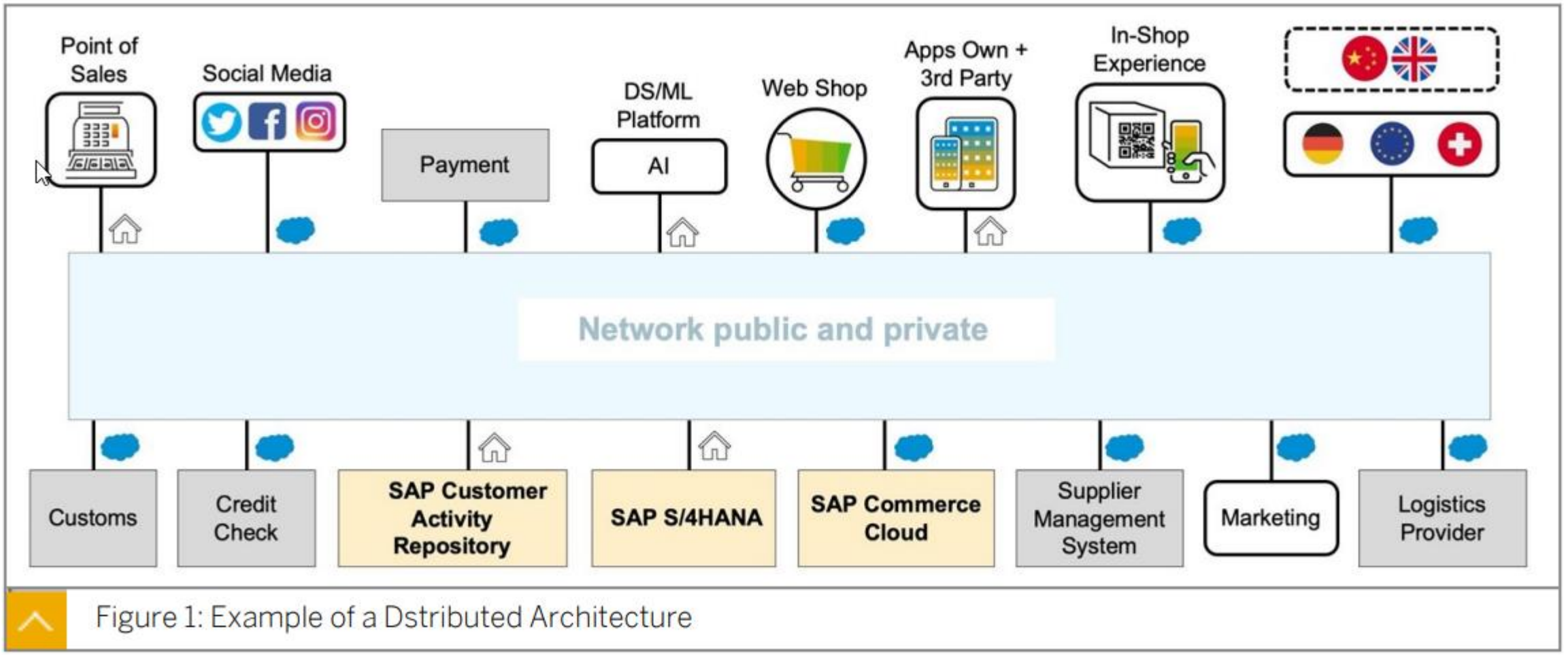


Figure 1: Example of a Dstributed Architecture

Challenges of Distributed Architecture

- Different transport and message protocols
- Release management
- Monitoring, Observability
- Security
- Latency, Quality of service
- Documentation

Heterogenous systems: Expensive, complex solutions are needed

Exercise 1 Set up an SAP BTP Subaccount With Integration Suite (Free Plan)

In this exercise, you will perform the following tasks:

Get predefined system access.
Check out the provisioned capabilities.
Log in and check out all capabilities.

Link: learninghub
Demo link: demo1

API first approach

- Focus on the API to create applications that can be easily connected to each other
- API Provider – Provides the interface
- API Consumer – Consumes the interface

Types of APIs

- Databased APIs
- Object Oriented APIs
- Remote APIs
- Messaging APIs

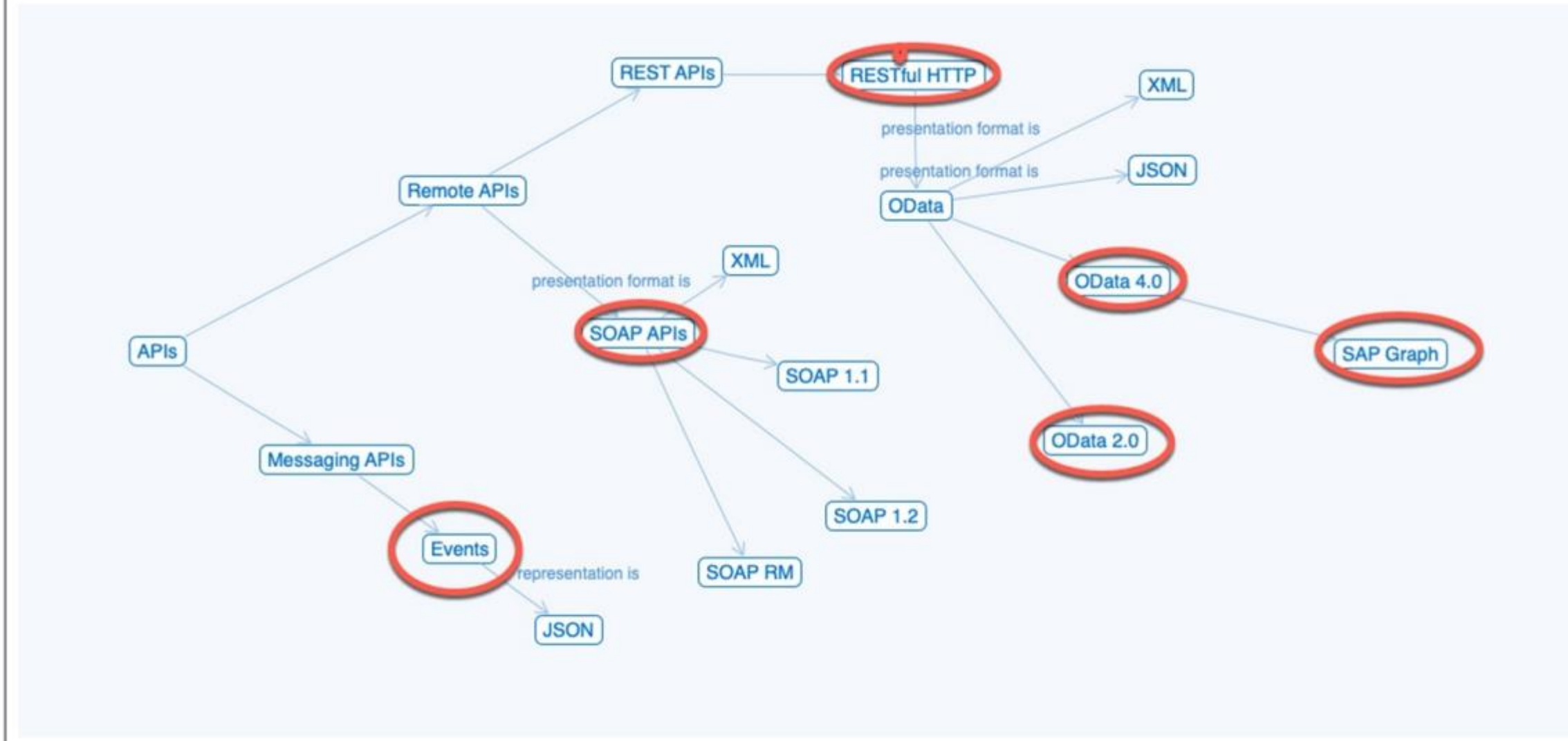


Figure 5: Relationship between APIs

SOAP, REST

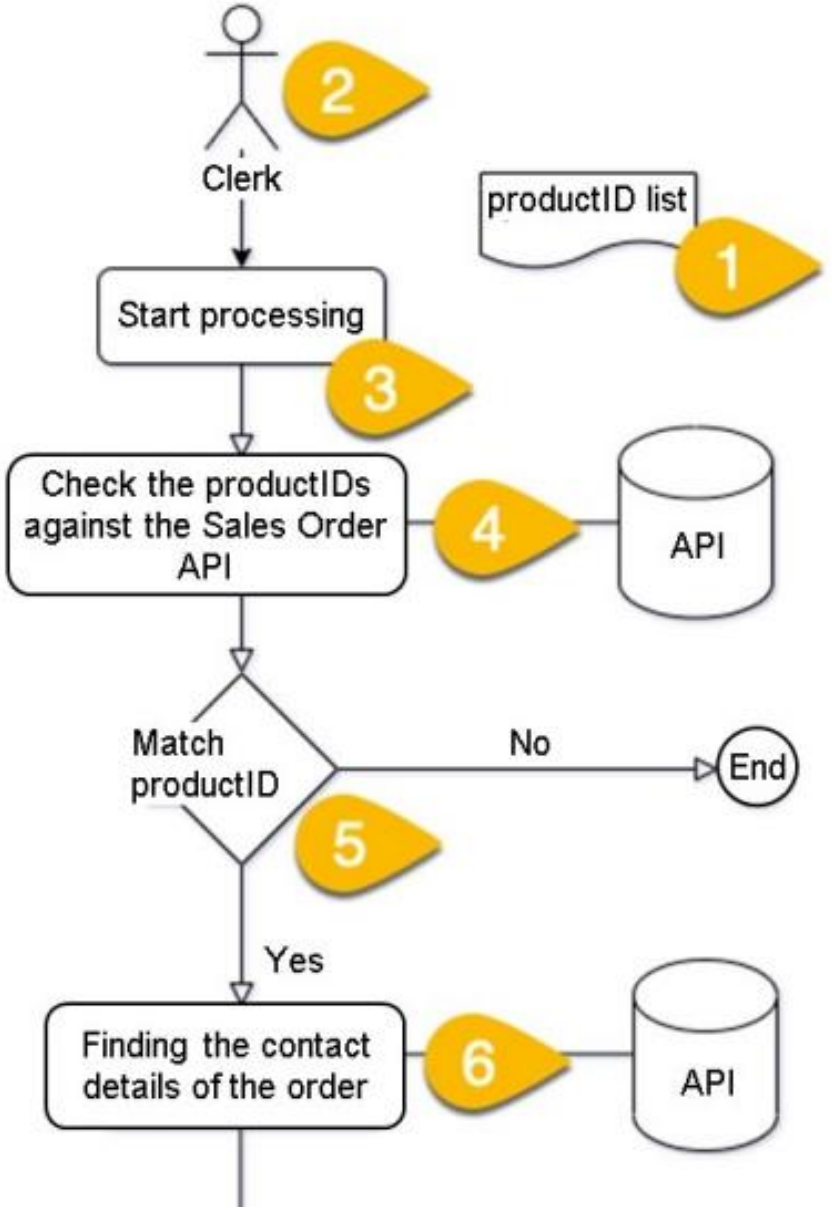
Type of API	Description language
SOAP	Web Services Description Language (WSDL)
REST	Open API • Used in API management • Interface definition language for describing, producing, consuming and visualizing RESTful web services RAML

Contract between API Provider and API consumer

- Implementation first approach
  - Implementation created first by API Provider
  - Contract generated automatically which is used by API Consumer
- Contract first approach
  - Contract created first
  - Both API Provider and API Consumer can simultaneously start working against the contract

Business Scenario

- Company A sells goods to customers
- Some products cannot be delivered on time
- Inform customers who ordered these products about delay



Task flow

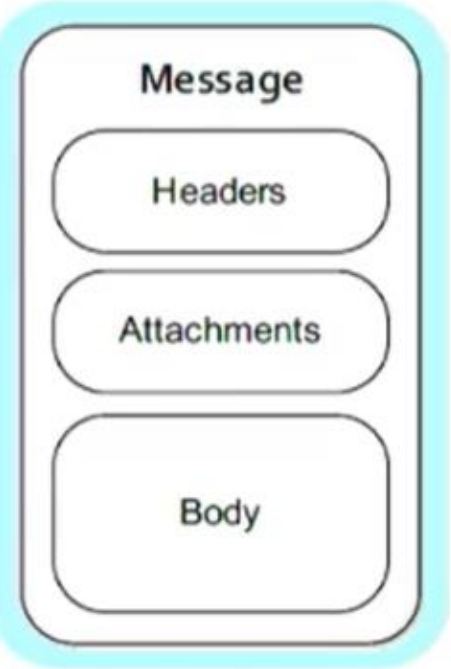

Send a list of Product IDs (SOAP)
Is Product ID in DB ?
Do this for all products
Get all Sales Orders for Product ID
Do this for all products in DB
Get Sales Header for Sales Order
Do this for all Sales Orders
Select Customer ID and write to Data Store
Do this for all Sales Headers
Laptop
iPhone
TV
Laptop
iPhone
TV
Laptop (Sales orders)
• 501
• 502
TV (Sales orders)
• 601
• 602
• 603
501 => Header 1
502 => Header 2
601 => Header 3
602 => Header 4
603 => Header 5
Header 1 => Customer 1
Header 2 => Customer 2
Header 3 => Customer 3
Header 4 => Customer 4
Header 5 => Customer 5
Write to Data Store

Basic concepts of Cloud Integration flow…

Message

Fundamental entity **containing the data** being carried and routed in Camel

- Messages have a body (a payload), headers, and optional attachments
- Messages are uniquely identified with an identifier of type `java.lang.String`
- *Headers*
  - Headers are values associated with the message
    - ⇨ Sender identifier, hints about content encoding, authentication information,…
  - Headers are name-value-pairs
    - ⇨ Name is a unique, case-insensitive string
    - ⇨ Value is of type `java.lang.Object`
- *Attachments*
  - Optional – typically used for Web service and e-mail components
- *Body*
  - Type: `java.lang.Object` → any kind of content is allowed

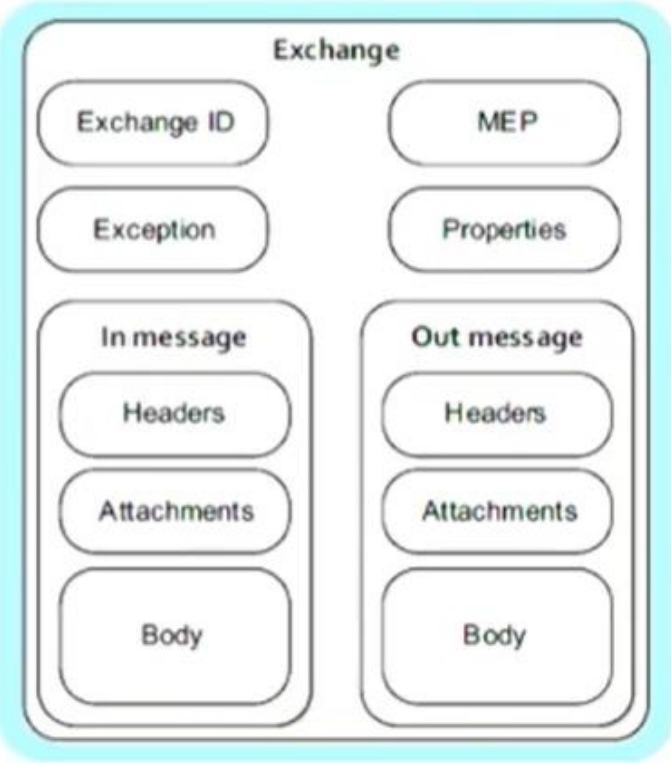


Basic concepts of Cloud Integration flow…

Exchange

The **message's container** during routing

- Provides support for various interaction types between systems, known as Message Exchange Patterns (MEP)
  - `InOnly`: a one-way message (e.g. JMS messaging)
  - `InOut`: a request-response message (e.g. HTTP-based transports)
- *Exchange ID*: a unique ID that identifies the exchange
- *MEP*
  - `InOnly`: exchange contains an "in message" **only**
  - `InOut`: exchange contains an "in message" **and** an "out message" containing the reply message for the caller
- *Exception*: If an error occurs during runtime, the Exception field will be filled
- *Properties*: Similar to message headers, but they last for the duration of the entire exchange; they contain global-level information; you can store and retrieve properties at any point during the lifetime of an exchange



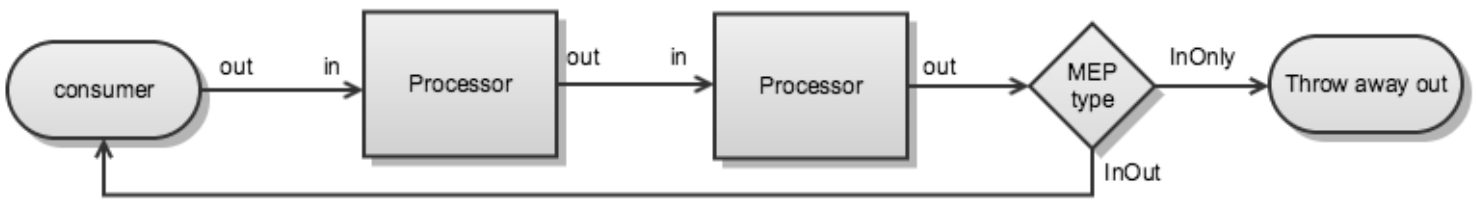
MESSAGE EXCHANGE PATTERNS AND THE EXCHANGE OBJECT

The Camel API is influenced by APIs such as JBI specification, CXF which defines a concept called Message Exchange Patterns (MEP for short).

The MEP defines the messaging style used such as one-way (InOnly) or request-reply (InOut), which means you have IN and optionally OUT messages. This closely maps to other APIs such as WS, WSDL, REST, JBI and the likes.

The Exchange API provides two methods to get a message, either `getIn` or `getOut`. Obviously the `getIn` gets the IN message, and the `getOut` gets the OUT message.

FLOW OF AN EXCHANGE THROUGH A ROUTE



- The out message from each step is used as the in message for the next step
- if there is no out message then the in message is used instead
- For the InOut MEP the out from the last step in the route is returned to the producer. In case of InOnly the last out is thrown away

TIP

Beware of `getOut` to check if there is an out message

`exchange.getOut` creates an out message if there is none. So if you want to check if there is an out message then you should use `exchange.hasOut` instead.

Operating Modes of API Architectures

- Request driven architecture
- Event driven architecture
- Combination

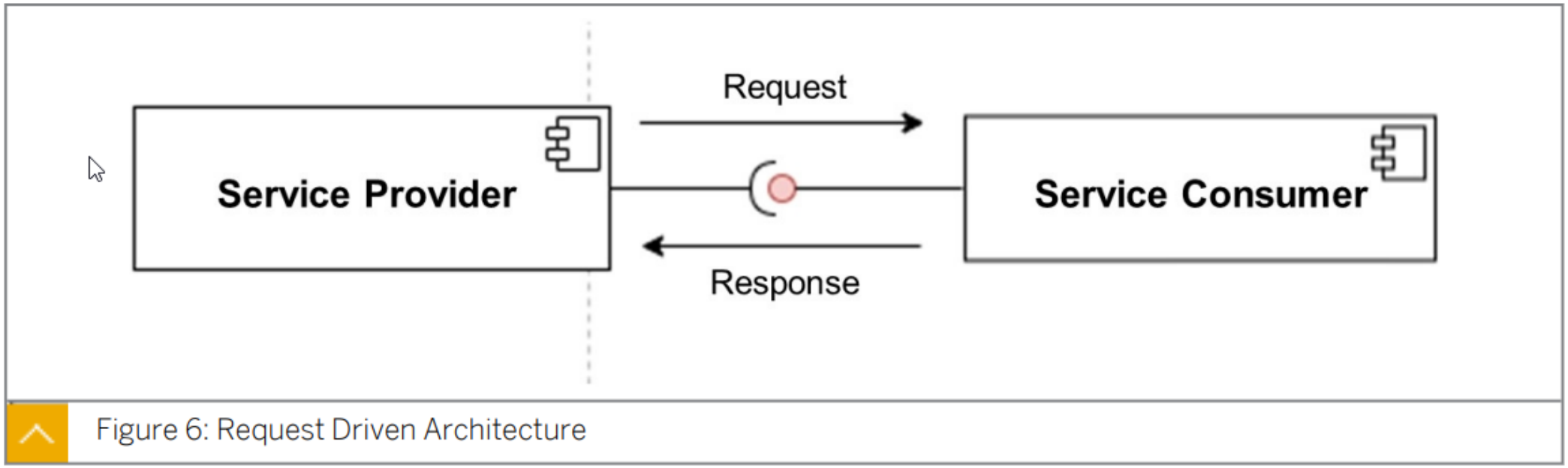


Figure 6: Request Driven Architecture

Request driven architecture

Pull Variant

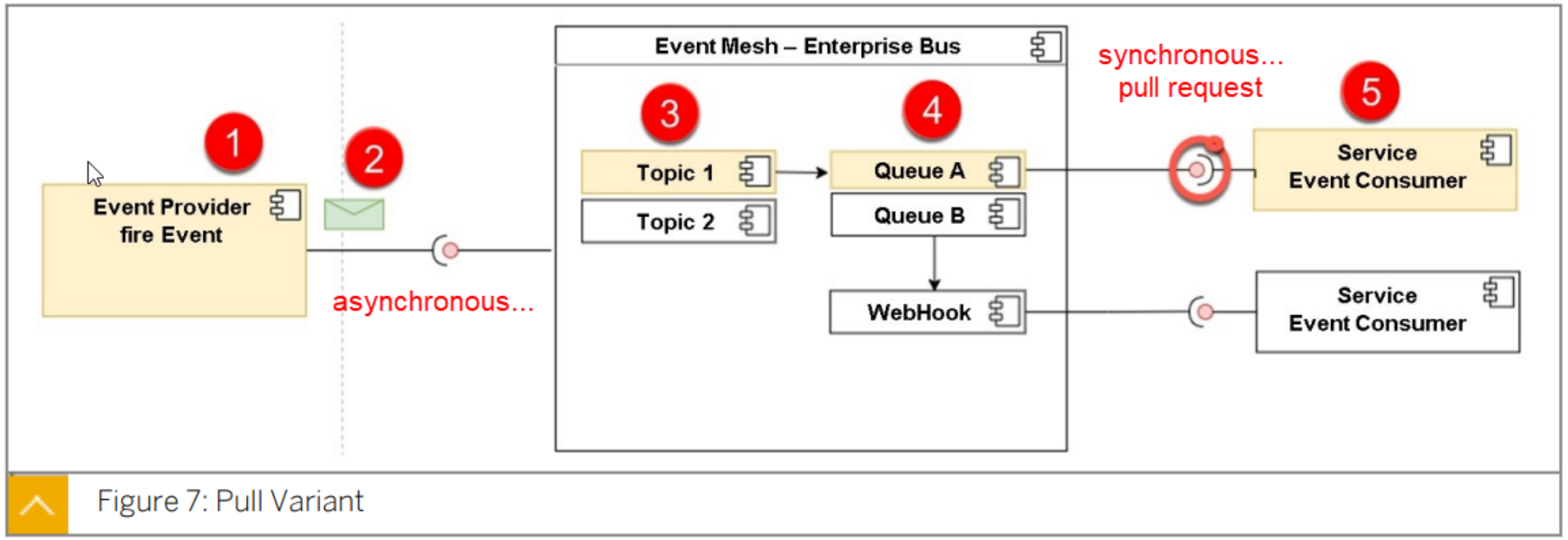


Figure 7: Pull Variant

Event driven architecture

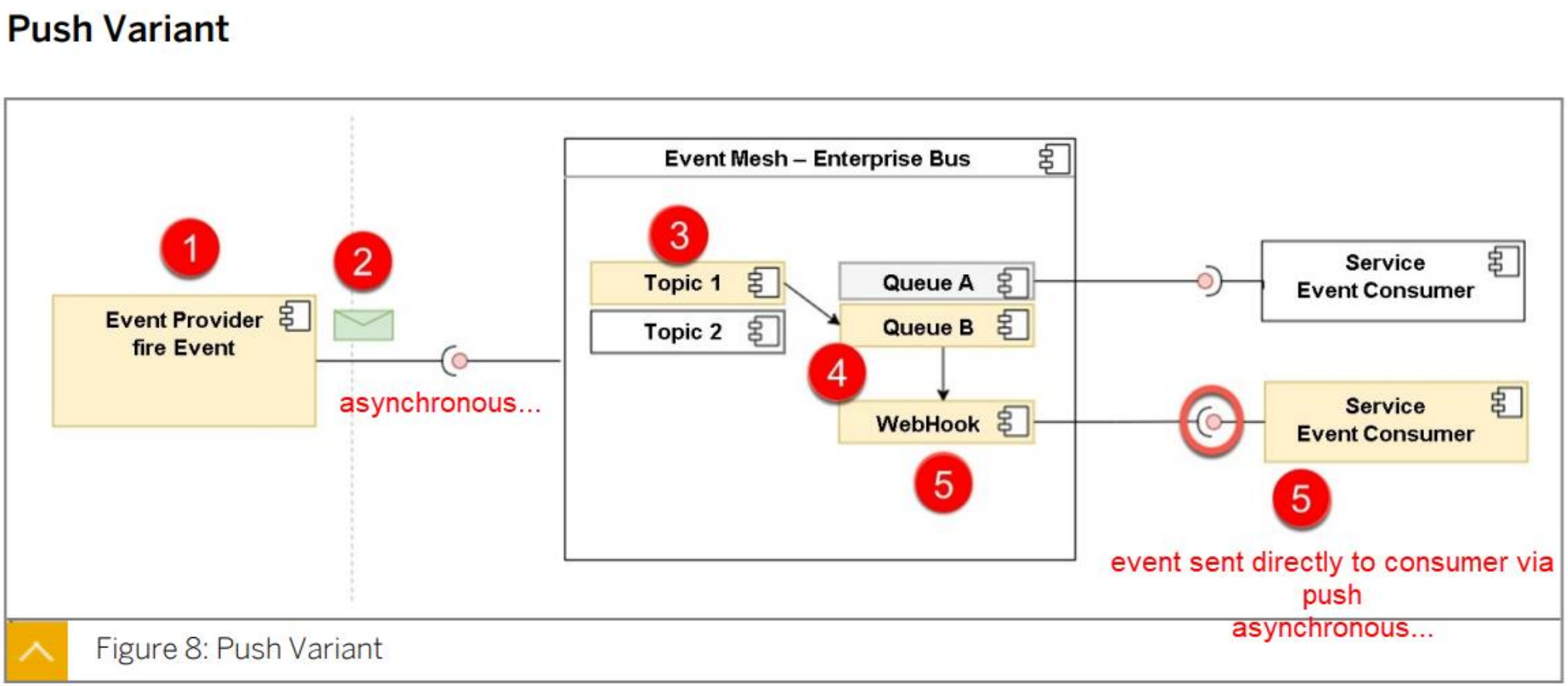


Figure 8: Push Variant

Combination: Request-Driven & Event-Based

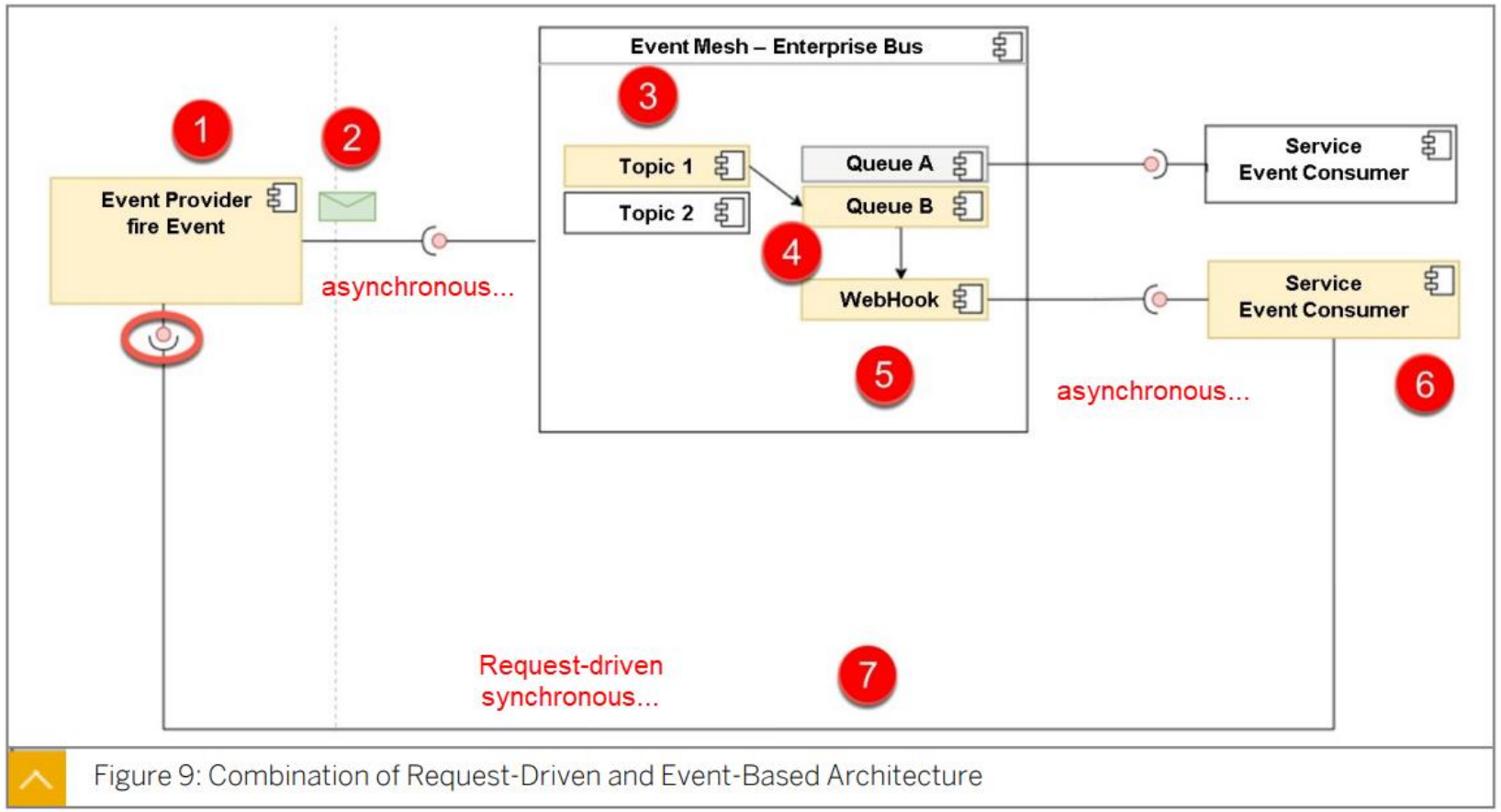


Figure 9: Combination of Request-Driven and Event-Based Architecture

REST

- Architectural properties
  - Simplicity of uniform interface
  - Scalability, modifiability, reliability etc.
- Architectural constraints (6)
  - Client server architecture
  - Stateless
  - Cache ability
  - Layered system
  - Code on demand (optional)
  - Uniform interface
- Uses standard HTTP methods and supports many media types

OData

- Architectural constraints
  - Resource identification
  - Fixed documents
    - Service document
    - Metadata document
  - Dynamic resources
  - Resource operation
  - Querying
  - Resource representation

SAP Gateway Demo System

- Check if product is available: HT-1000
- Get all sales order for product: HT-1000
- Get customer details for each sales order for product: HT-1000

Exercise 2 Create an Account on the SAP Gateway Demo System (ES5)

In this exercise, you will perform the following tasks:

Create a new SAP Gateway Demo System Access.

Go to SAP Gateway SAP GUI for HTML.

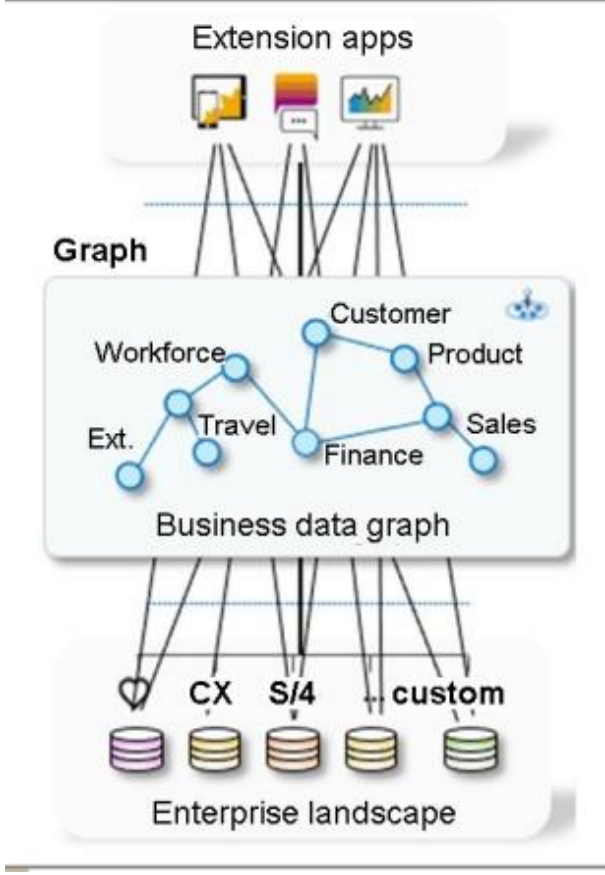
Change the password.

Open SAP Easy Access Menu for EPM: Classic Dynpro For Product Data.

Link: learning hub

Demo link: demo2

SAP Graph



- API based on OData v 4.0
- Connects entities from different sources in one API
  - For example, SAP S/4HANA Cloud, Sales Cloud and others
- Existing SAP Graph APIs for various entities
- Can be programmed with Node.js, SAP API Management (low code)

Key Summary Points – Unit 1

- Request driven architecture (Synchronous)
- Event driven architecture (Synchronous + Asynchronous)
- Pull variant, Push variant
- Combination

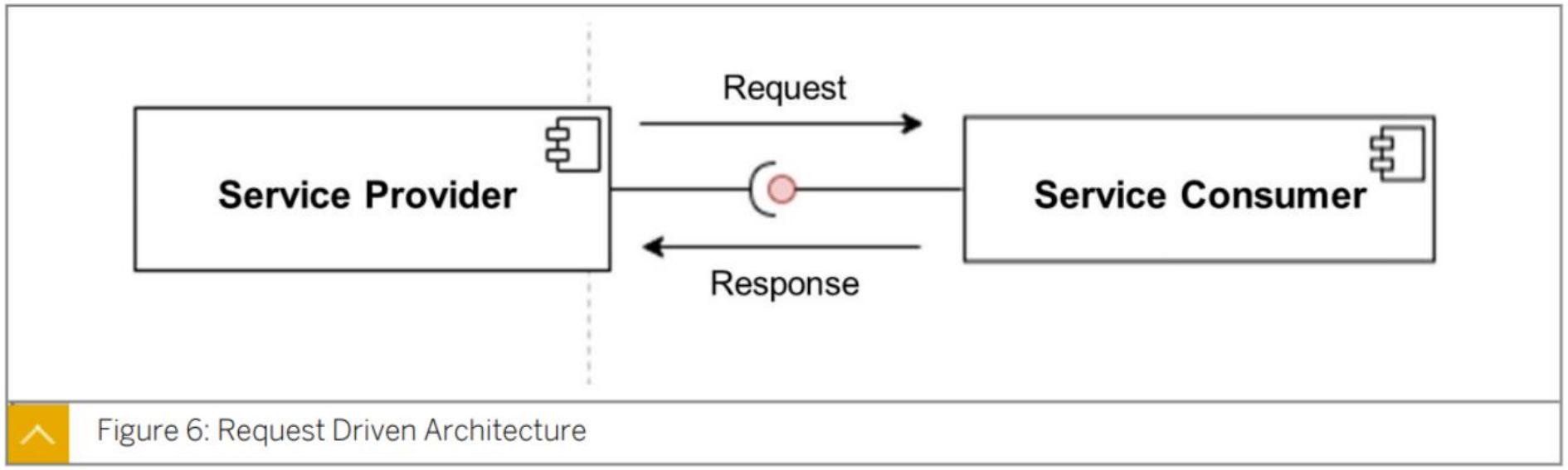


Figure 6: Request Driven Architecture

Key Summary Points – Unit 1

Pull Variant

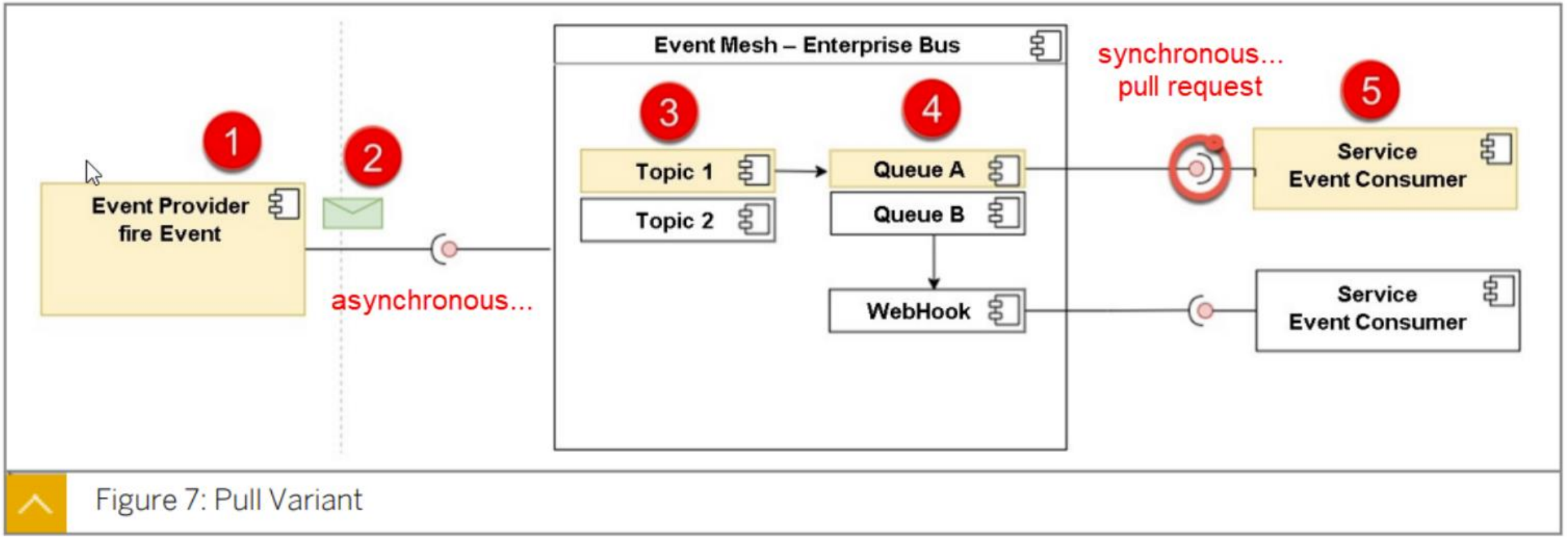


Figure 7: Pull Variant

Key Summary Points – Unit 1

Push Variant

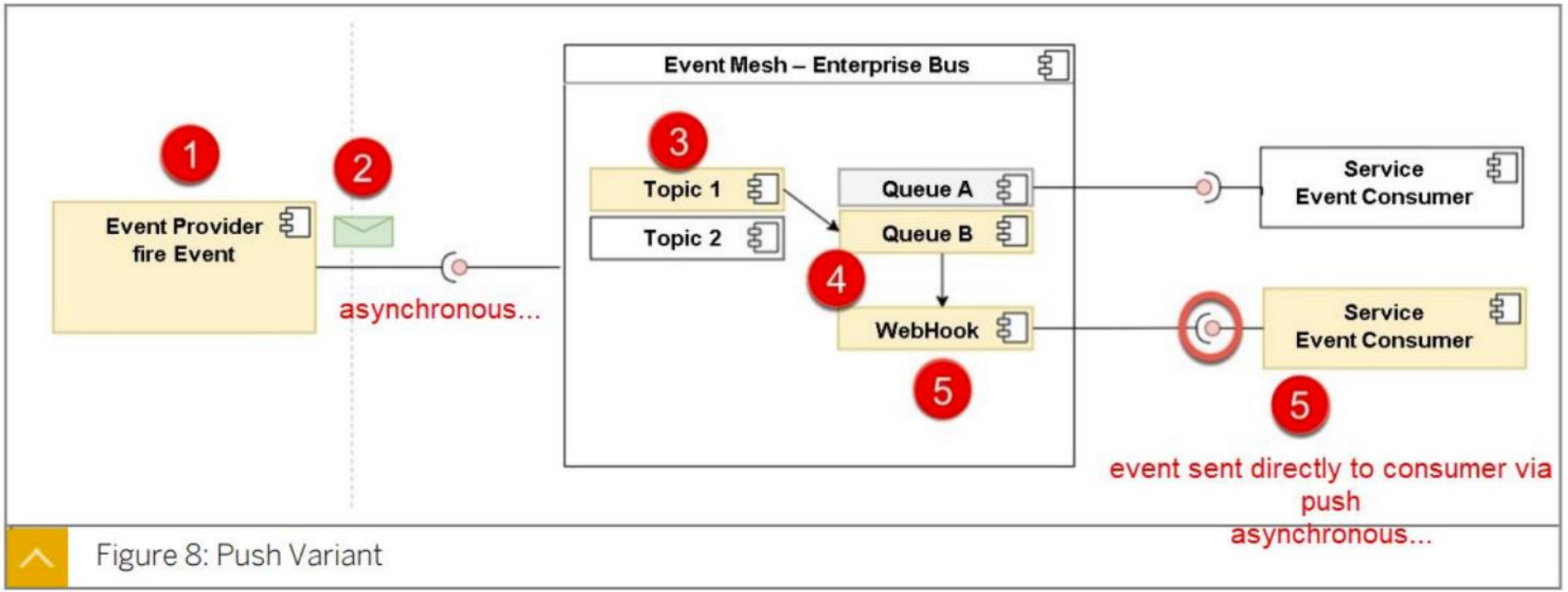


Figure 8: Push Variant

Key Summary Points – Unit 1

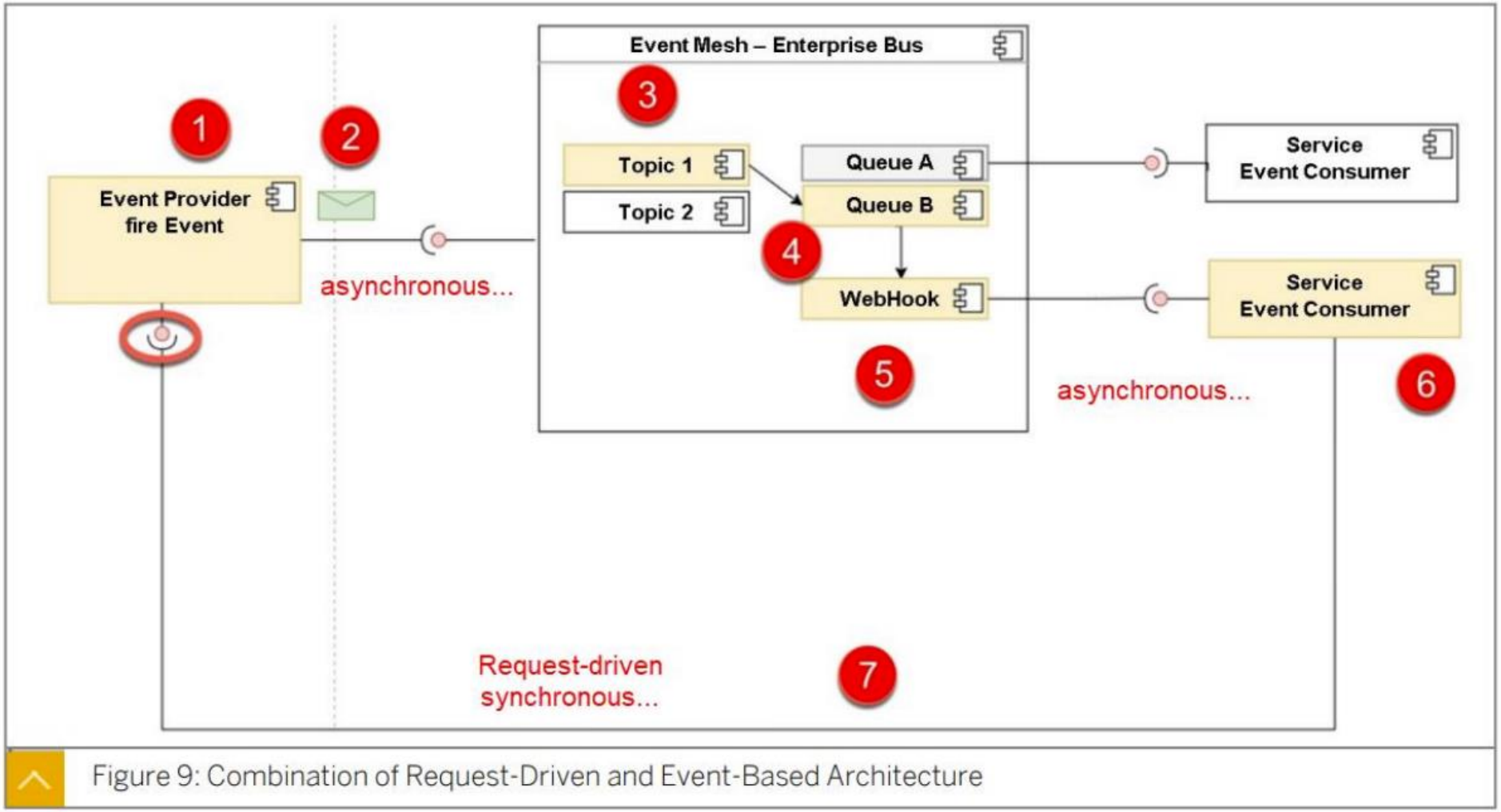


Figure 9: Combination of Request-Driven and Event-Based Architecture

Key Summary Points – Unit 1

Q2. Which are the guiding constraints that defines the REST architectural style?

A High-Availability

✓ Client-Server-Architecture

✓ Cache-Ability

✓ Stateless

✓ Correct

Correct. The guiding constraints that defines the REST architectural style are: Stateless, Client-Server-Architecture, and Cache-Ability.

REST

- Architectural properties
  - Simplicity of uniform interface
  - Scalability, modifiability, reliability etc.
- Architectural constraints (6)
  - Client server architecture
  - Stateless
  - Cache ability
  - Layered system
  - Code on demand (optional)
  - Uniform interface
- Uses standard HTTP methods and supports many media types

Key Summary Points – Unit 1

Q3. Where can you configure the virtual host alias?

A Discover

B Design

✓ Settings ->Integrations ->Configure

D Configure ->Settings ->Integrations

✓ Correct

Correct. You can configure the virtual host alias here: Settings ->Integrations ->Configure.

Key Summary Points – Unit 1

API Provider – Provides the interface
API Consumer – Consumes the interface

SOAP, REST

Type of API	Description language
SOAP	Web Services Description Language (WSDL)
REST	Open API • Used in API management • Interface definition language for describing, producing, consuming and visualizing RESTful web services RAML

Contract between API Provider and API consumer

- Implementation first approach
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  - Contract generated automatically which is used by API Consumer
- Contract first approach
  - Contract created first
  - Both API Provider and API Consumer can simultaneously start working against the contract

Unit 2 – Introducing iPaaS

Developing with SAP Integration Suite

C_CPI_15

Unit 2 Content

- Integration strategy of SAP
- SAP Integration Solution Advisory Methodology (ISA – M)
- Positioning Integration Suite
- Introduction to API Management
- Key summary points

Integration Strategy (4 principles)

- Predefined integration
  - Prebuilt integrations in SAP Business Accelerator Hub
- Open integration
  - Integration to SAP software, partner software and 3rd party software
  - Open Connectors
- Holistic integration
  - Covers most flavors of cloud and hybrid integration
- AI driven integration
  - AI techniques for integration scenarios
  - Integration Advisor

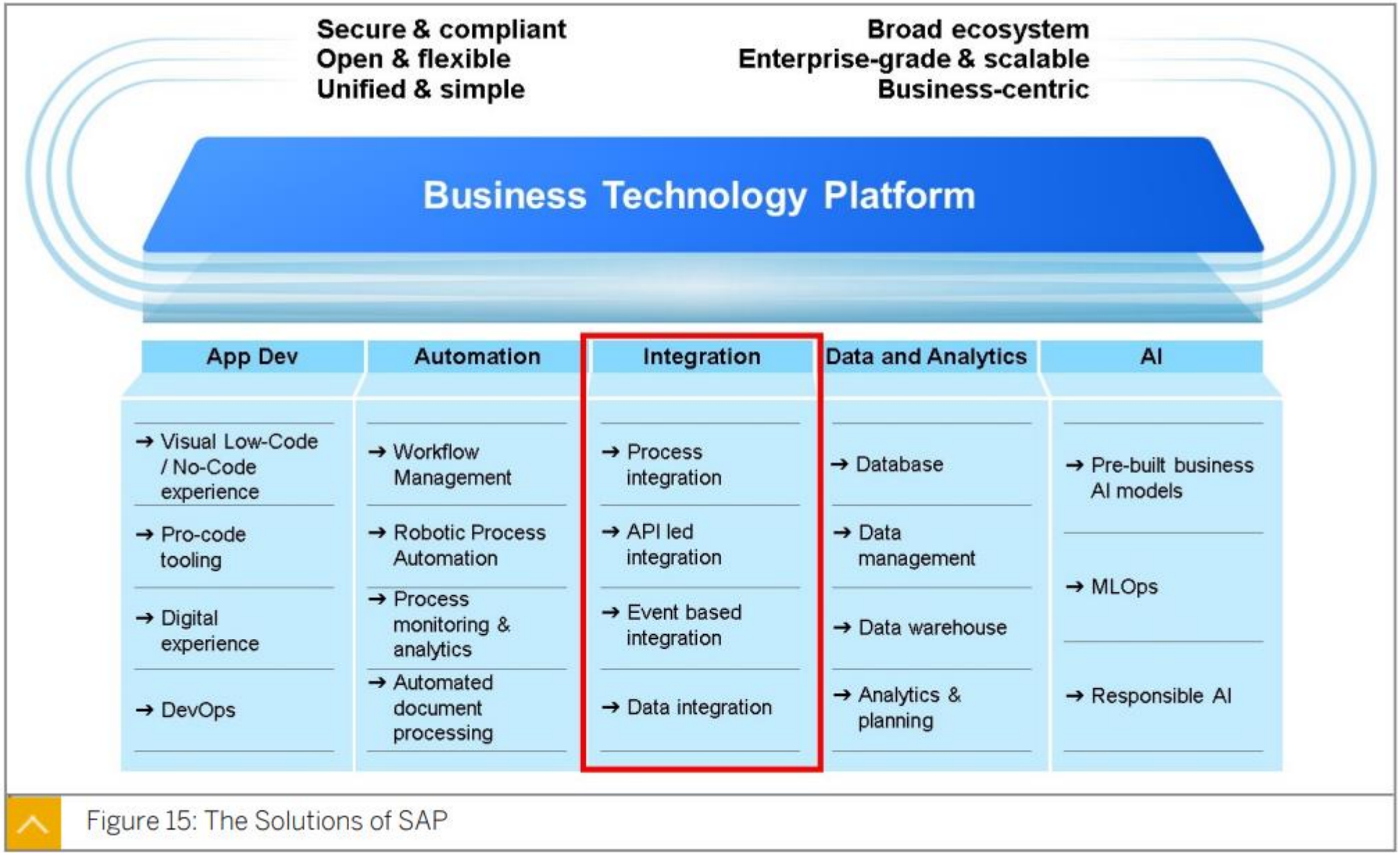
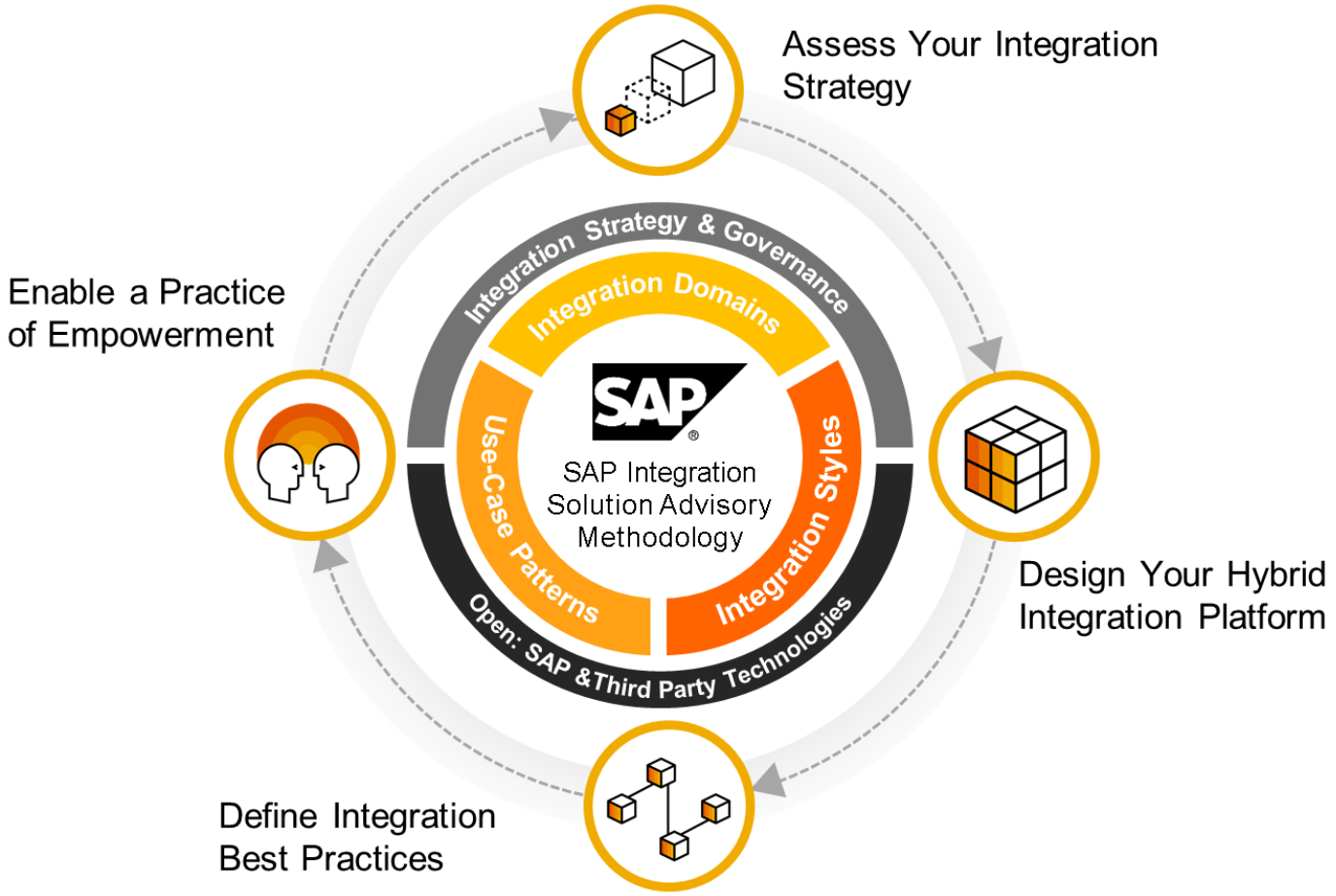


Figure 15: The Solutions of SAP

Integration Solution Advisory Methodology (ISA-M)

- Template in PowerPoint based on all the integration knowledge at SAP
- Aimed at Integration Architects
- Existing integration solutions can be documented
- New integration requirements can be determined and mapped to specific services

Integration Solution Advisory Methodology (ISA-M) circle



Simplify Integration by a Systematic Integration Approach

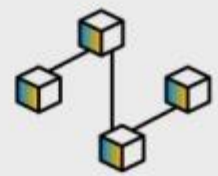
1	2	3	4
Assess your integration Strategy	**Design your Hybrid Integration Platform**	**Define Integration Best Practices**	**Enable a Practice of Empowerment**
			
Document/review your integration architecture	Map use case patterns to integration technologies	Define solution architecture blueprints	Democratize integration delivery
Scoping of focus area e.g. future building blocks	Derive integration guide-lines for your organization	Add decision criteria and key characteristics	Define areas for self service integration
Use-case driven approach (technology-agnostic)	Reflect customer context	Establish integration as recognized discipline	Establish a shared developer community

Figure 17: ISA-M: Four Use Cases for Enterprise Architects

https://youtu.be/ViH3eQXAjCo

Positioning Integration Suite

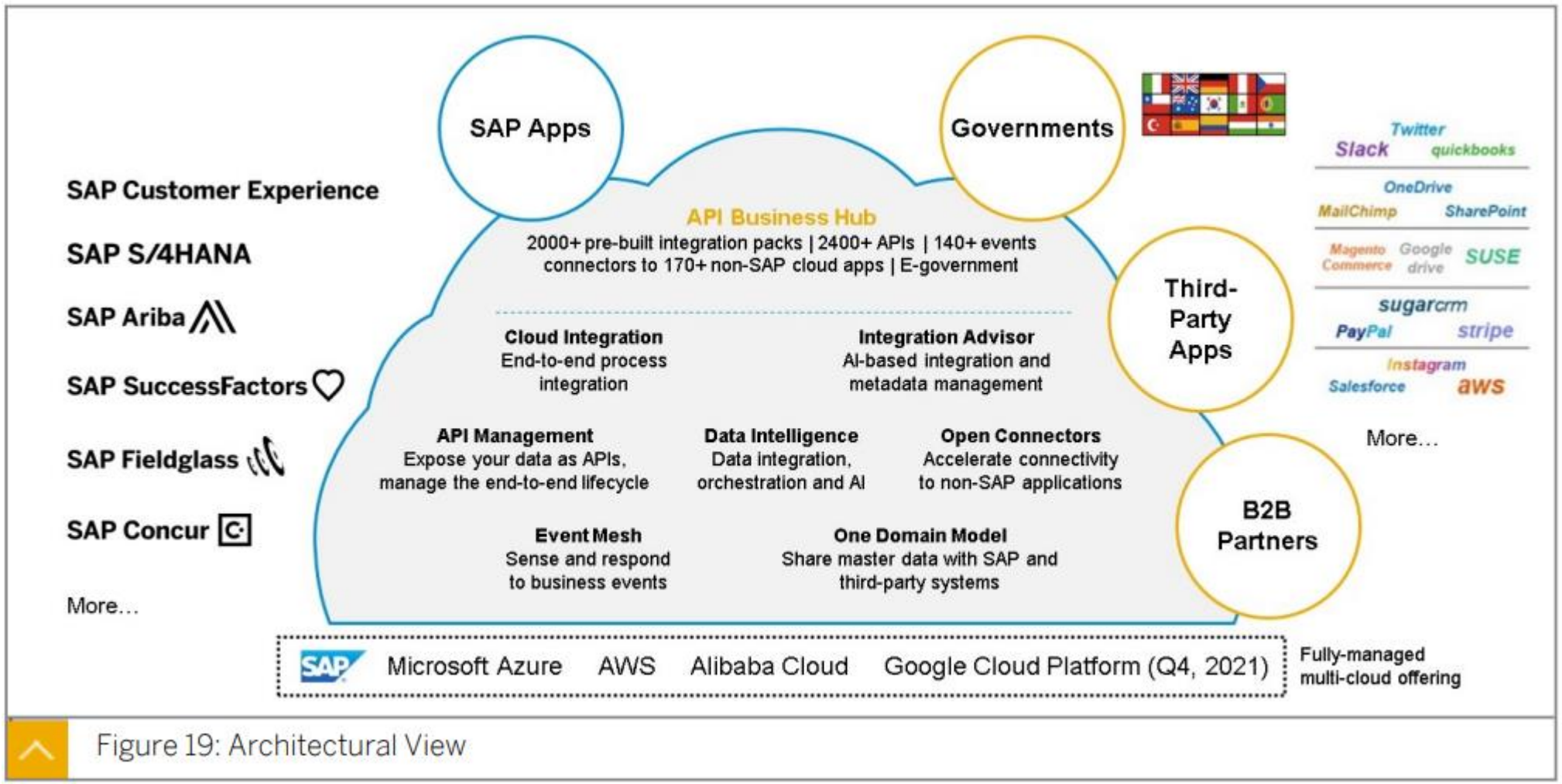


Figure 19: Architectural View

Core capacities of the Integration Suite

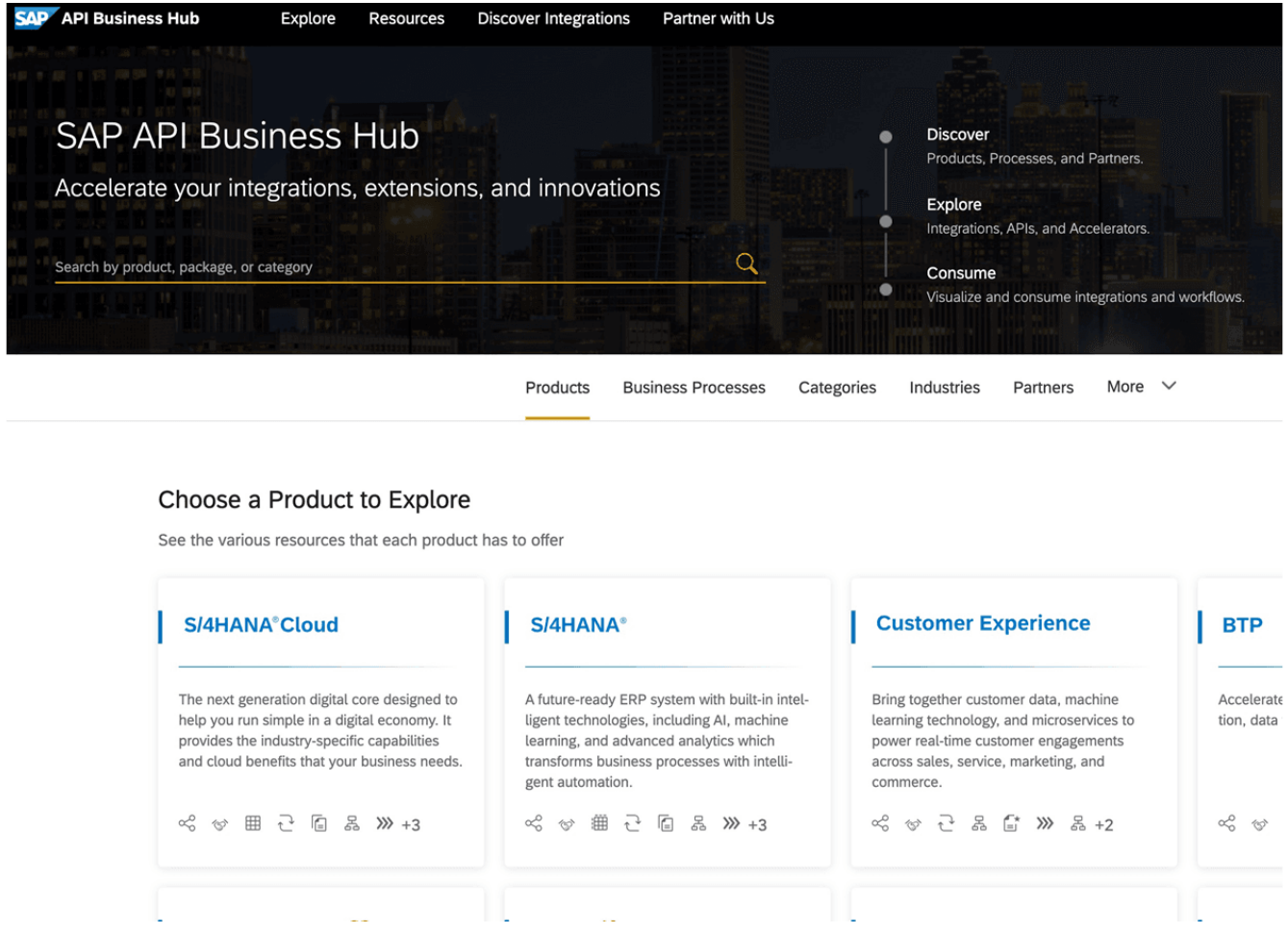
- Cloud-Integration
  - Seamless integration of everything and everyone (A2A/B2B) in real time.
- API-Management
  - Make your data and processes available as APIs. Manage the E2E lifecycle.
- Integration Assessment
  - Tool support for ISA-M to define and execute an integration strategy for companies.
- Integration Advisor
  - Accelerate the implementation and maintenance of B2B scenarios through machine learning.
- Trading Partner Management
  - Accelerate onboarding and maintenance of B2B integration scenarios with trading partners.
- Open Connectors
  - Accelerate connectivity to non-SAP applications.

Add-on capacities of the Integration Suite

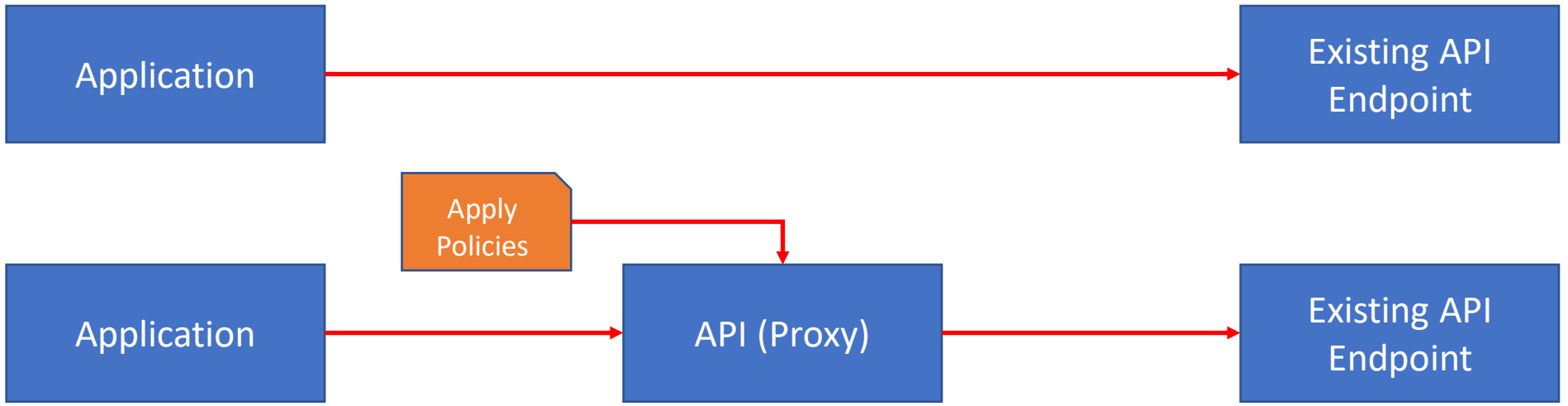
- Master Data Integration
  - Ensure a consistent view of master data within an integrated intelligent suite and its ecosystem.
- SAP Data Intelligence
  - Extract, transform, and load ETL scenarios for data lakes and data warehouses.
- Event Mesh
  - Event-based integrations with predefined events from SAP applications.
- Connectivity
  - Establish secure connectivity between cloud applications and On-Premise systems.
- SAP Graph
  - Unified API for accessing SAP-managed data that can be used to create new extensions and applications using SAP data.
- Alert Notification
  - Provides a common API for providers to publish alerts and for consumers to subscribe to these alerts.
- Cloud Transport Management
  - Management of software products between accounts in different environments by transporting them over different terms.
- Internet of Things
  - Bring raw sensor data into the context of business objects and use the data in analytical or transactional business applications.

On-top capacities are as follows:

- SAP Business Accelerator Hub
  - Jump start for integration projects with APIs, packaged integration content and adapters.



API Management (Key concept)



Why do I need this extra hop ??

Advantages:

- Consistent management rules and policies
- Token verification
- Rate limiting
- Caching
- Analytics and reporting etc.

API Management - Terminologies

- API Provider
  - Concept in API Management that defines connection details for existing services
- API (Proxy)
  - Managed facades for existing services (sits in front of the existing service)
  - Applications connect to API (proxy)
- Policies
  - Provides capabilities to define behavior of an API (proxy)
- Product
  - Bundle and publish API (proxies) as a Product for consumption
- Application
  - Consumes the Product (bundle of API proxies) using api key and secret

Exercise 3 Explore API Management

In this exercise, you will perform the following tasks:
Log On to Integration Suite.
Explore the API Management.

Link: learning hub
Demo link: demo3

Key Summary Points – Unit 2

Integration Strategy (4 principles)

- Predefined integration
  - Prebuilt integrations in SAP Business Accelerator Hub
- Open integration
  - Integration to SAP software, partner software and 3rd party software
  - Open Connectors
- Holistic integration
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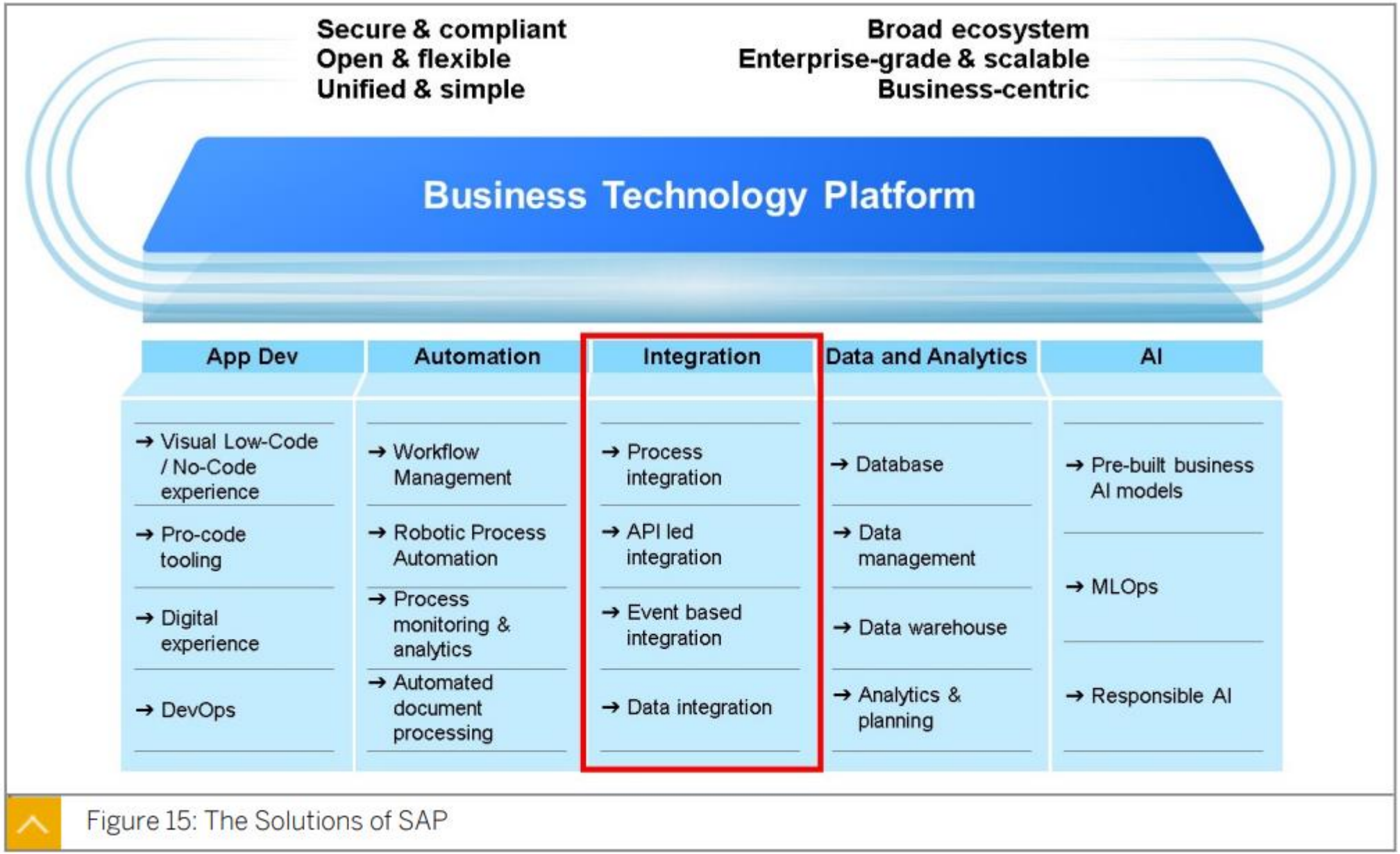

Figure 15: The Solutions of SAP

Key Summary Points – Unit 2
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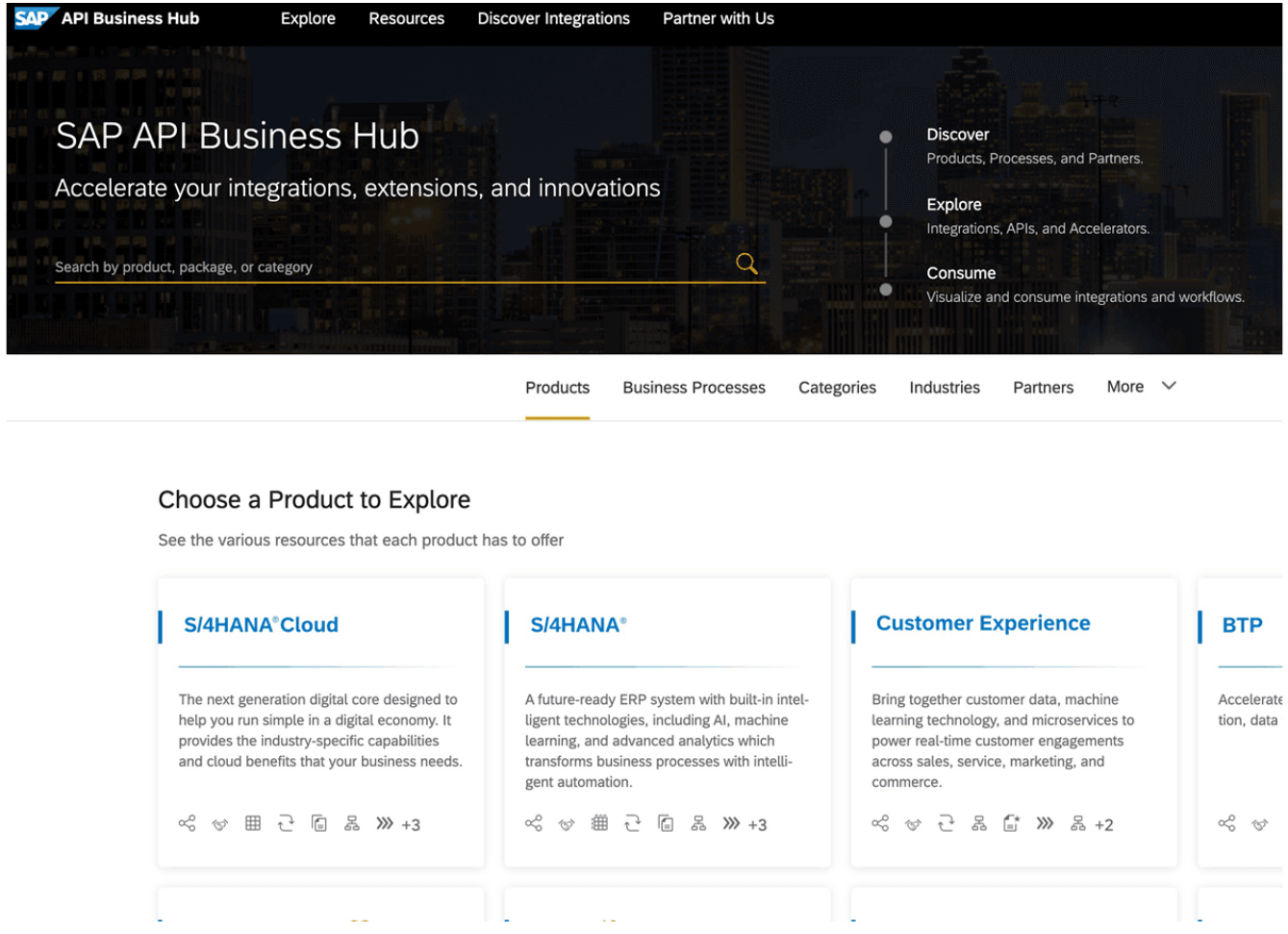
- Open Connectors
  - Accelerate connectivity to non-SAP applications.

Add-on capacities of the Integration Suite

- Master Data Integration
  - Ensure a consistent view of master data within an integrated intelligent suite and its ecosystem.
- SAP Data Intelligence
  - Extract, transform, and load ETL scenarios for data lakes and data warehouses.
- Event Mesh
  - Event-based integrations with predefined events from SAP applications.
- Connectivity
  - Establish secure connectivity between cloud applications and On-Premise systems.
- SAP Graph
  - Unified API for accessing SAP-managed data that can be used to create new extensions and applications using SAP data.
- Alert Notification
  - Provides a common API for providers to publish alerts and for consumers to subscribe to these alerts.
- Cloud Transport Management
  - Management of software products between accounts in different environments by transporting them over different terms.
- Internet of Things
  - Bring raw sensor data into the context of business objects and use the data in analytical or transactional business applications.

On-top capacities are as follows:

- SAP Business Accelerator Hub
  - Jump start for integration projects with APIs, packaged integration content and adapters.



Unit 3 – Managing APIs

Developing with SAP Integration Suite

C_CPI_15

Unit 3 Content

- SAP API Management
- Components of SAP API Management
- Creating an API Provider
- Creating an API (proxy)
- Using Policies
- Creating a Product
- Logging and Monitoring
- Key Summary Points

SAP API Management

- Building APIs (proxies)
- Publishing APIs (Bundle APIs as Product)
- Analyzing APIs
- Consuming APIs
- Monetizing APIs
- Discover API Packages
- API (proxy) Designer

Relevant Use Cases

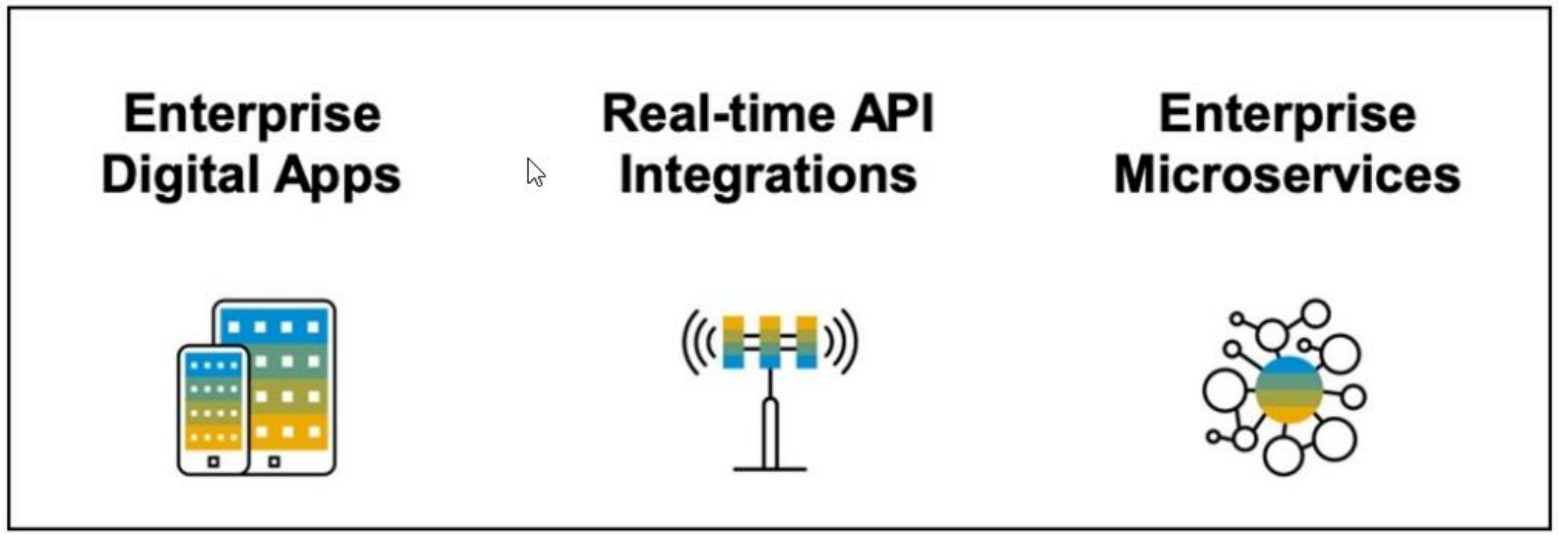
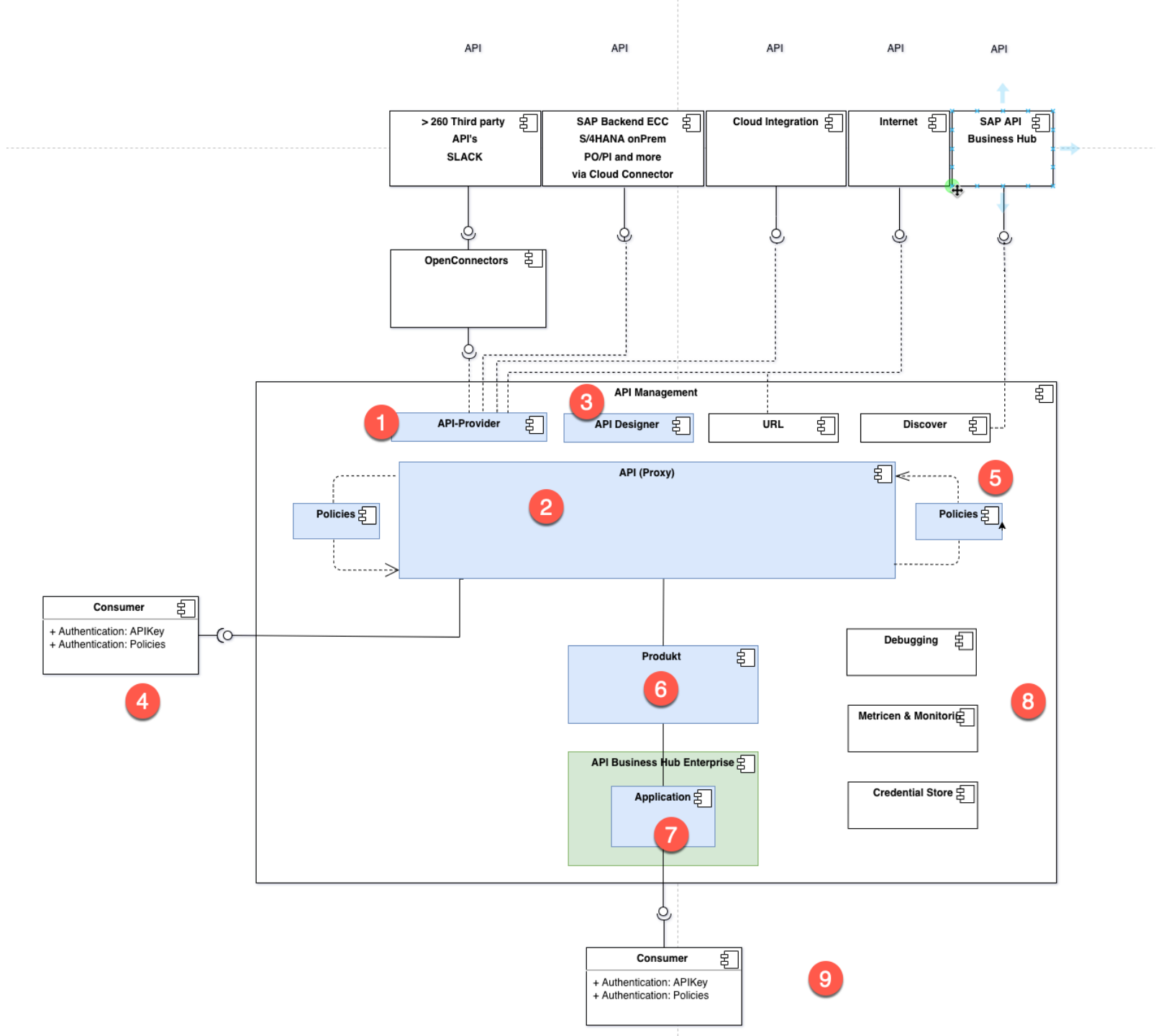


Figure 22: Relevant Use Cases

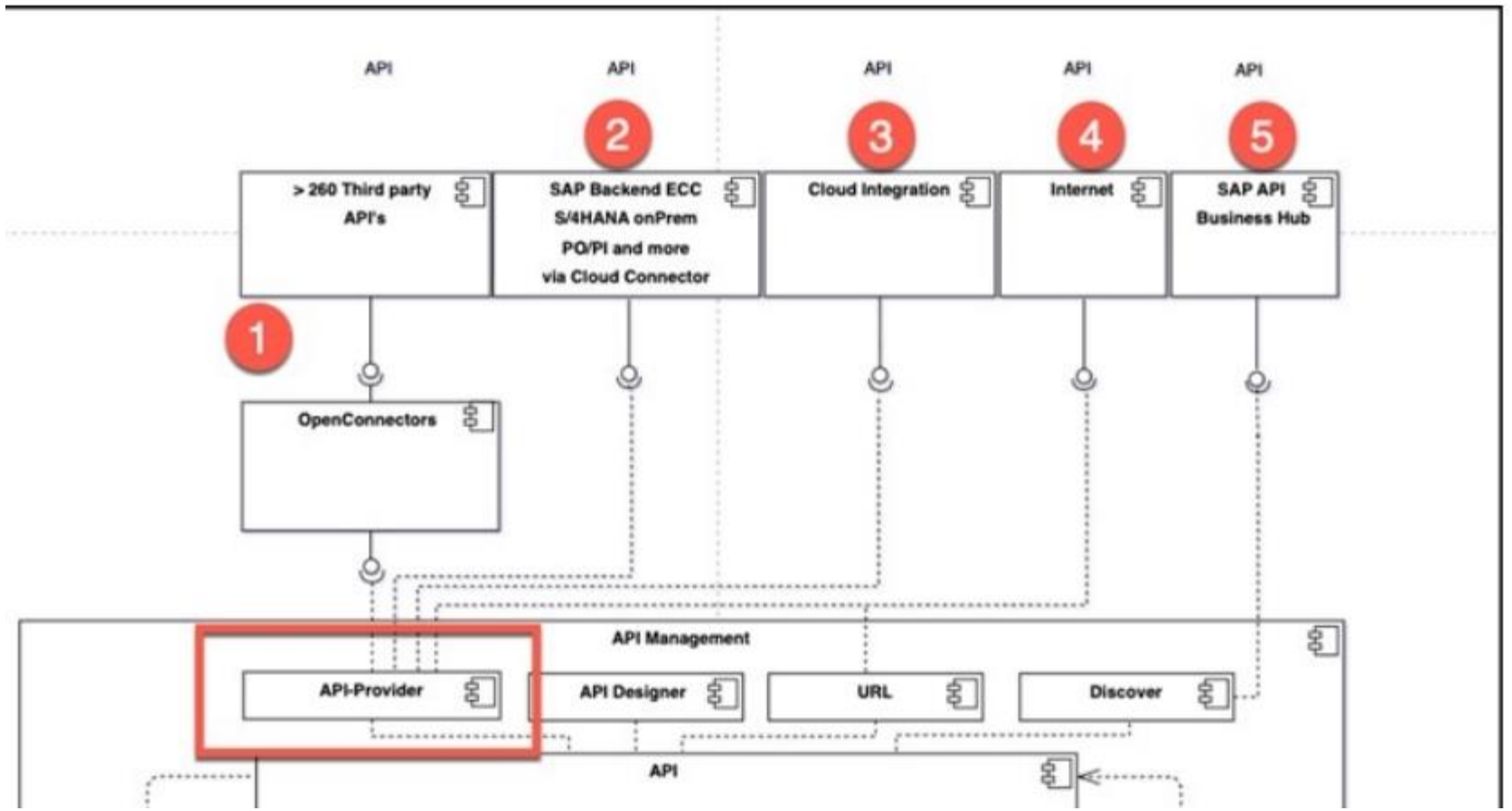
Components of SAP API Management

- API Provider
  - Concept in API Management that defines connection details for existing services
- API (Proxy)
  - Managed facades for existing services (sits in front of the existing service)
  - Applications connect to API (proxy)
- Policies
  - Provides capabilities to define behavior of an API (proxy)
- Product
  - Bundle and publish API (proxies) as a Product for consumption
- Application
  - Consumes the Product (bundle of API proxies) using api key and secret


API
API
API
API
API
> 260 Third party
API's
SLACK
SAP Backend ECC
S/4HANA onPrem
PO/PI and more
via Cloud Connector
Cloud Integration
Internet
SAP API
Business Hub
OpenConnectors
API Management
1
API-Provider
3
API Designer
URL
Discover
API (Proxy)
2
5
Policies
Policies
Consumer
+ Authentication: APIKey
+ Authentication: Policies
4
Produkt
6
Debugging
Metricen & Monitori
8
API Business Hub Enterprise
Application
7
Credential Store
Consumer
+ Authentication: APIKey
+ Authentication: Policies
9

Creating an API Provider

- Concept in SAP API Management
- Defines the connection details for services
  - Details of the host
  - Additional details to establish connection – for example, proxy settings


API
API
API
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2
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> 260 Third party
API's
SAP Backend ECC
S/4HANA onPrem
PO/PI and more
via Cloud Connector
Cloud Integration
Internet
SAP API
Business Hub
1
OpenConnectors
API Management
API-Provider
API Designer
URL
Discover
API

Exercise 4 Create an API Provider Based on Your ES5 Demo System

In this exercise, you will perform the following steps:

Log On to the API Management Configuration.
Check the virtual Host name.
Create API Provider.
Test the Connection.

Link: learning hub
Demo link: demo4

Creating an API (proxy)

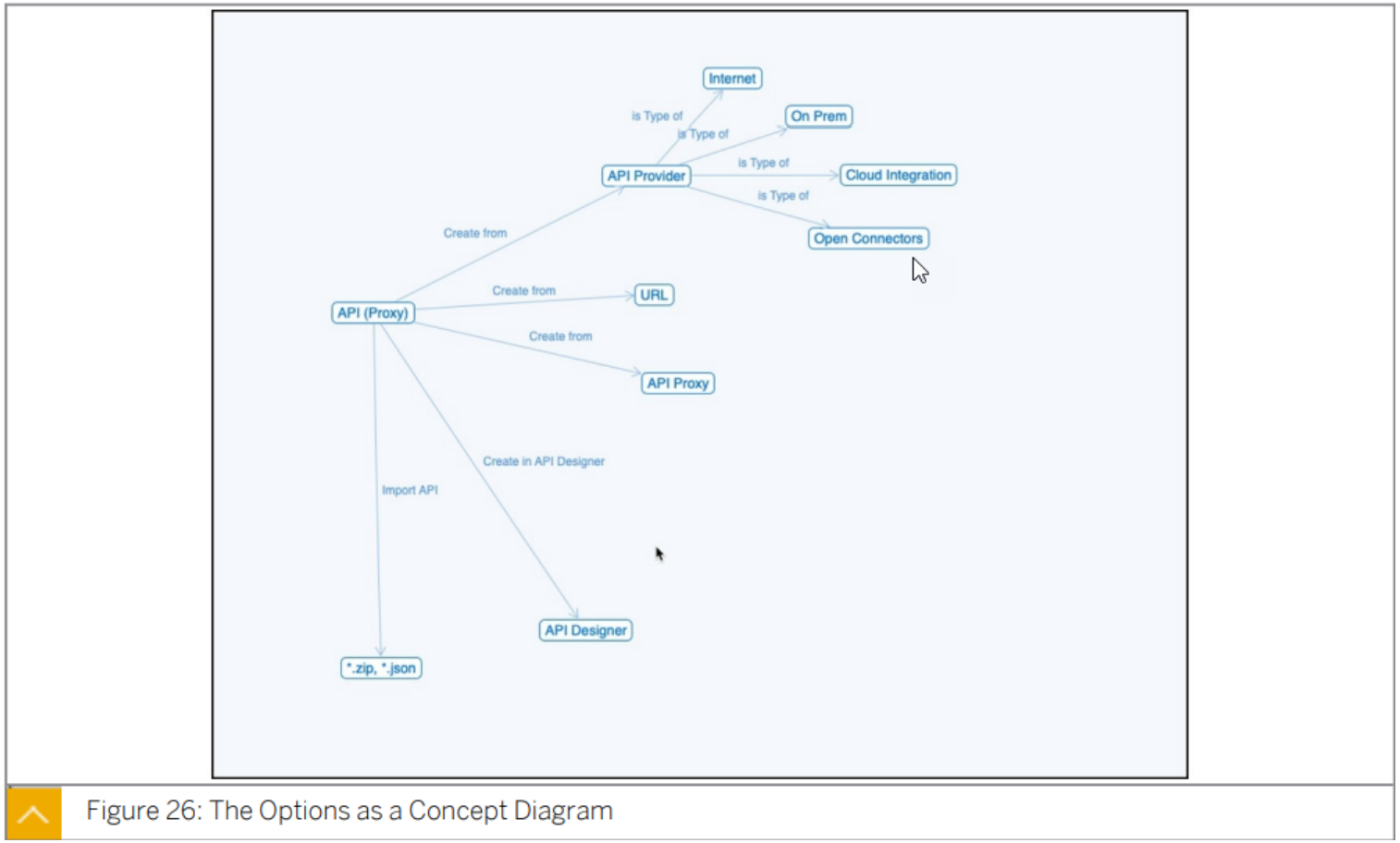
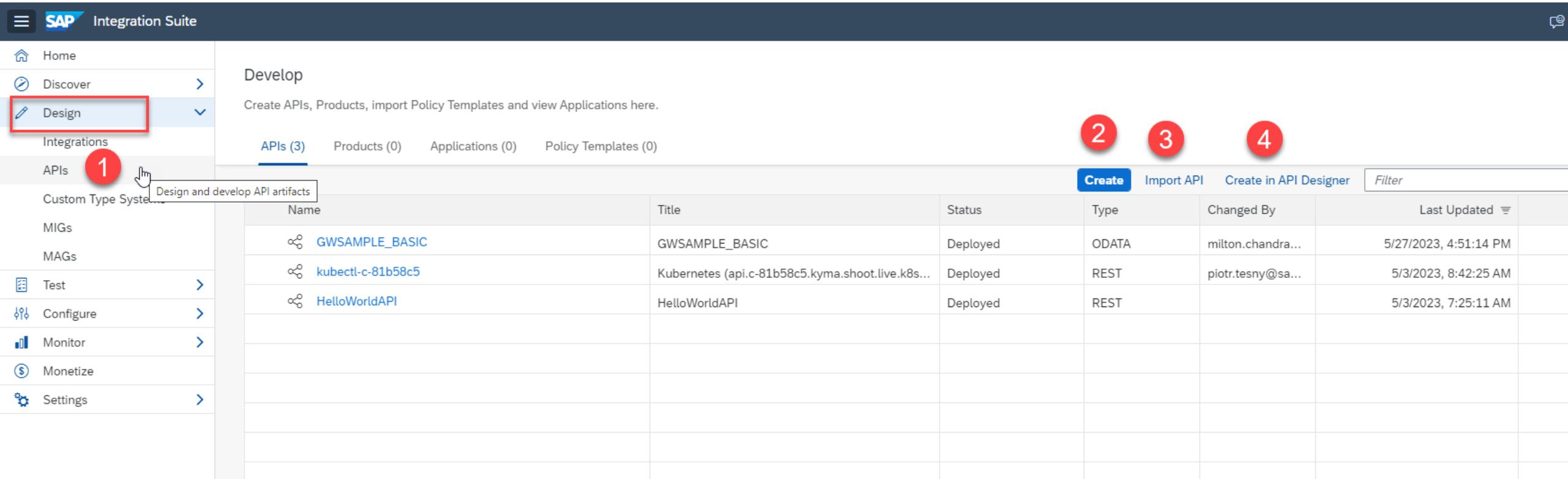
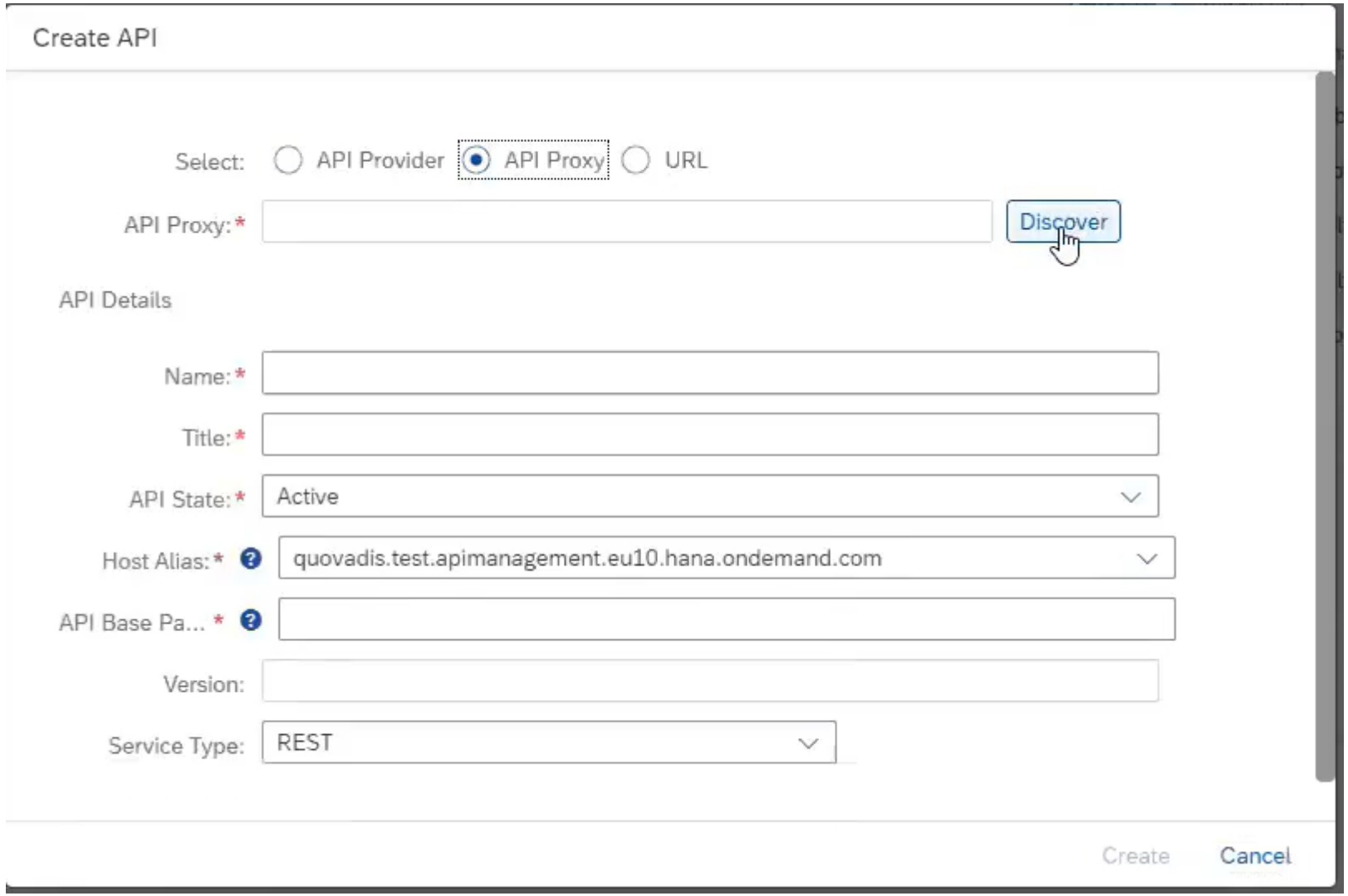


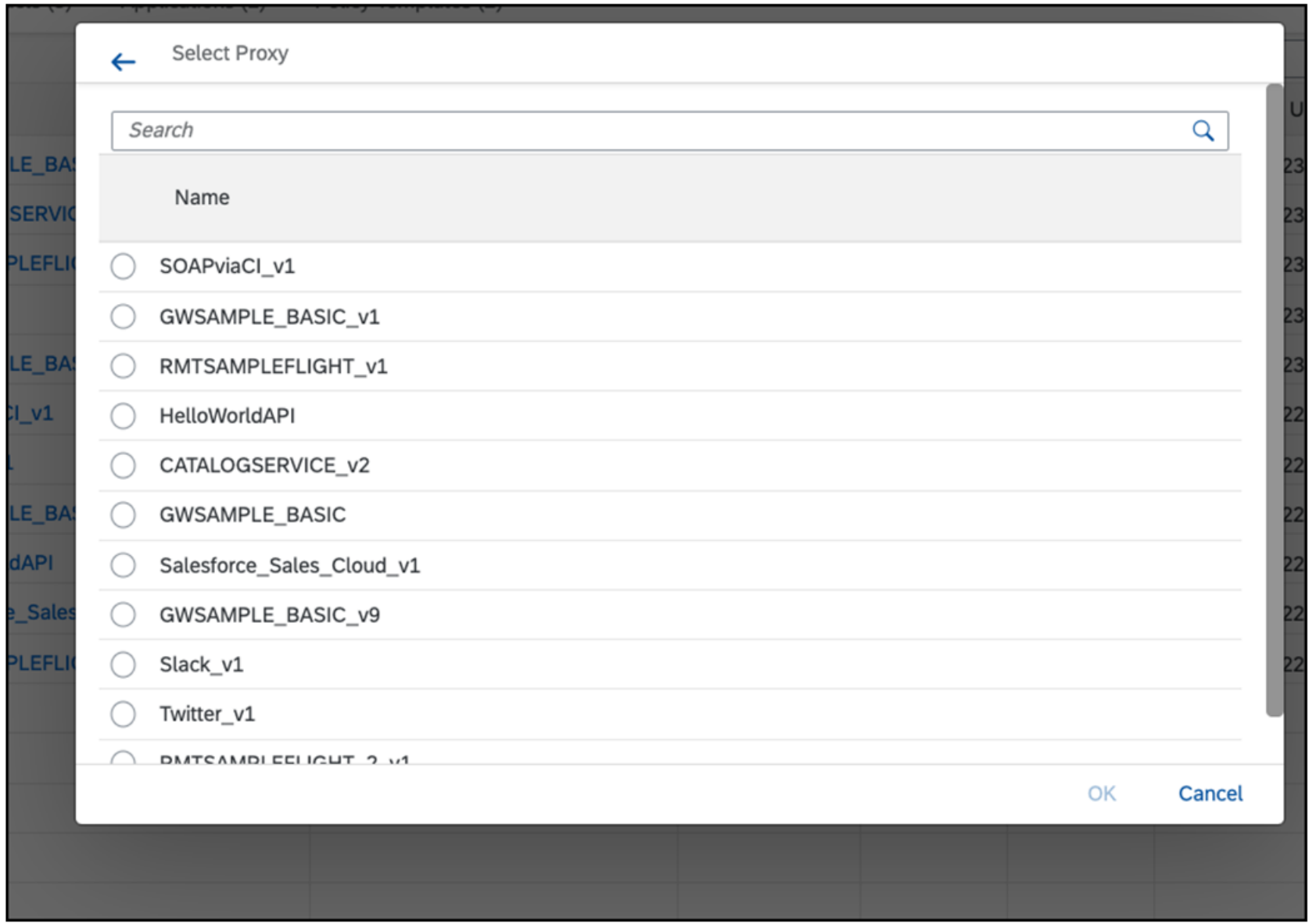
Figure 26: The Options as a Concept Diagram

Demo: API Proxy

- Create Button
  - API Provider
  - API Proxy (copy an existing proxy)
  - URL
- Import API
- Create in API Designer


SAP Integration Suite
Home
Discover
Design
Integrations
APIs
1
Design and develop API artifacts
Custom Type Systems
MIGs
MAGs
Test
Configure
Monitor
Monetize
Settings
Develop
Create APIs, Products, import Policy Templates and view Applications here.
APIs (3)
Products (0)
Applications (0)
Policy Templates (0)
2
3
4
Create
Import API
Create in API Designer
Filter
Name
Title
Status
Type
Changed By
Last Updated
GWSAMPLE_BASIC
GWSAMPLE_BASIC
Deployed
ODATA
milton.chandra...
5/27/2023, 4:51:14 PM
kubectl-c-81b58c5
Kubernetes (api.c-81b58c5.kyma.shoot.live.k8s...
Deployed
REST
piotr.tesny@sa...
5/3/2023, 8:42:25 AM
HelloWorldAPI
HelloWorldAPI
Deployed
REST
5/3/2023, 7:25:11 AM


Create API
Select:
API Provider
API Proxy
URL
API Proxy:*
Discover
API Details
Name:*
Title:*
API State:*
Active
Host Alias:*
quovadis.test.apimanagement.eu10.hana.ondemand.com
API Base Pa...*
Version:
Service Type:
REST
Create
Cancel


Select Proxy
Search
Name
SOAPviaCI_v1
GWSAMPLE_BASIC_v1
RMTSAMPLEFLIGHT_v1
HelloWorldAPI
CATALOGSERVICE_v2
GWSAMPLE_BASIC
Salesforce_Sales_Cloud_v1
GWSAMPLE_BASIC_v9
Slack_v1
Twitter_v1
OK
Cancel

Other ways to create API

- **Create an API using the Create button**
- **Use the URL option to create an API**
- **Create an API using menu links**
- **Use the Create in API Designer option**
- **Import an external API**

Exercise 5 Create an API Based on a pre-Defined API Provider

In this exercise, you will perform the following tasks:

Create an API.
Test the API.

Link: learning hub
Demo link: demo5

Using Policies

- Policy is a program that executes a specific function at runtime
- Adds common functionality to API (proxy)
- Provides features to secure APIs, control API traffic etc.
- Also customize the behavior of API by adding scripts

Prebuilt policies

- Access Control
- Basic Authentication
- Extract Variables
- JavaScript
- Oauth v2.0
- Quota
- Verify API Key
- And so on…

api.sap.com

DRPA | Wakefern | Learning Journey | SAP | Utils | Pending | Innovator Challenge | Healthcare | Cloud Providers | SAPUI5 - PWA | Past Projects | SWGas | Lockheed | Blogs | YouTube | Other bookmarks

SAP Business Accelerator Hub

Explore | Resources | Discover Integrations | Partner with Us

Login

Products

- SAP S/4HANA Cloud
- SAP S/4HANA
- SAP Customer Experience
- SAP Business Technology Platform
- SAP SuccessFactors
- SAP Ariba
- SAP Concur
- SAP Fieldglass
- SAP Business ByDesign
- SAP Integrated Business Planning for Supply Chain

Business Processes

- Recruit to Retire
- Lead to Cash
- Source to Pay
- Plan to Fulfill
- Acquire to Decommission
- Idea to Market

Categories

- APIs
- Events
- Integrations
- Graph
- Adapters
- Process Automation
- Business Add-Ins (BAdIs)
- Business Object Interfaces
- CDS Views
- Business Processes
- One Domain Model
- Data Intelligence

Discover Integrations

s and workflows.

View All Products

FEEDBACK

S/4HANA® Cloud

The next generation digital core designed to help you run simple in a digital economy. It provides the industry-specific capabilities and cloud benefits that your business needs.

+6

S/4HANA®

A future-ready ERP system with built-in intelligent technologies, including AI, machine learning, and advanced analytics which transforms business processes with intelligent automation.

+4

Customer Experience

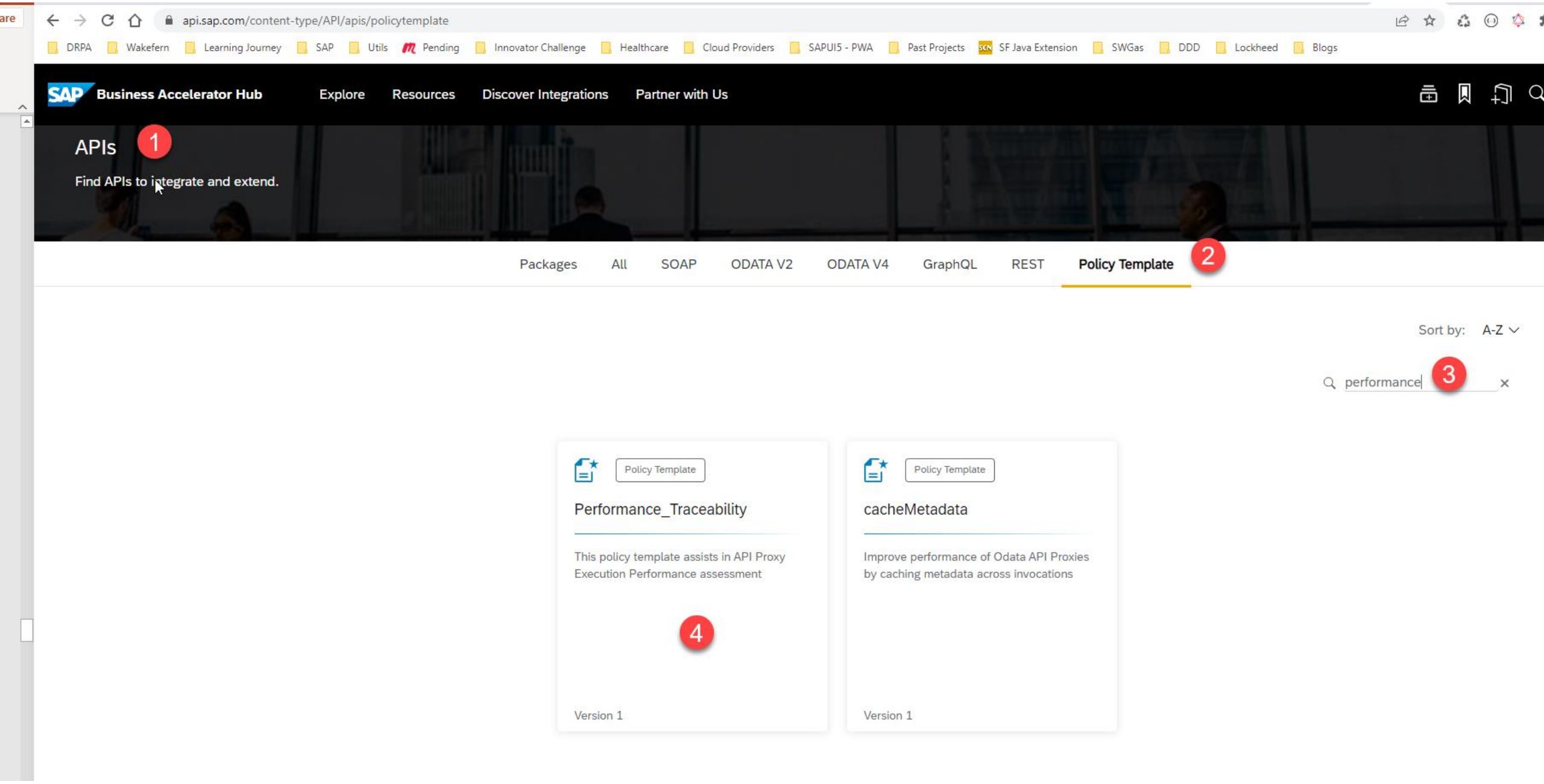
Bring together customer data, machine learning technology, and microservices to power real-time customer engagements across sales, service, marketing, and commerce.

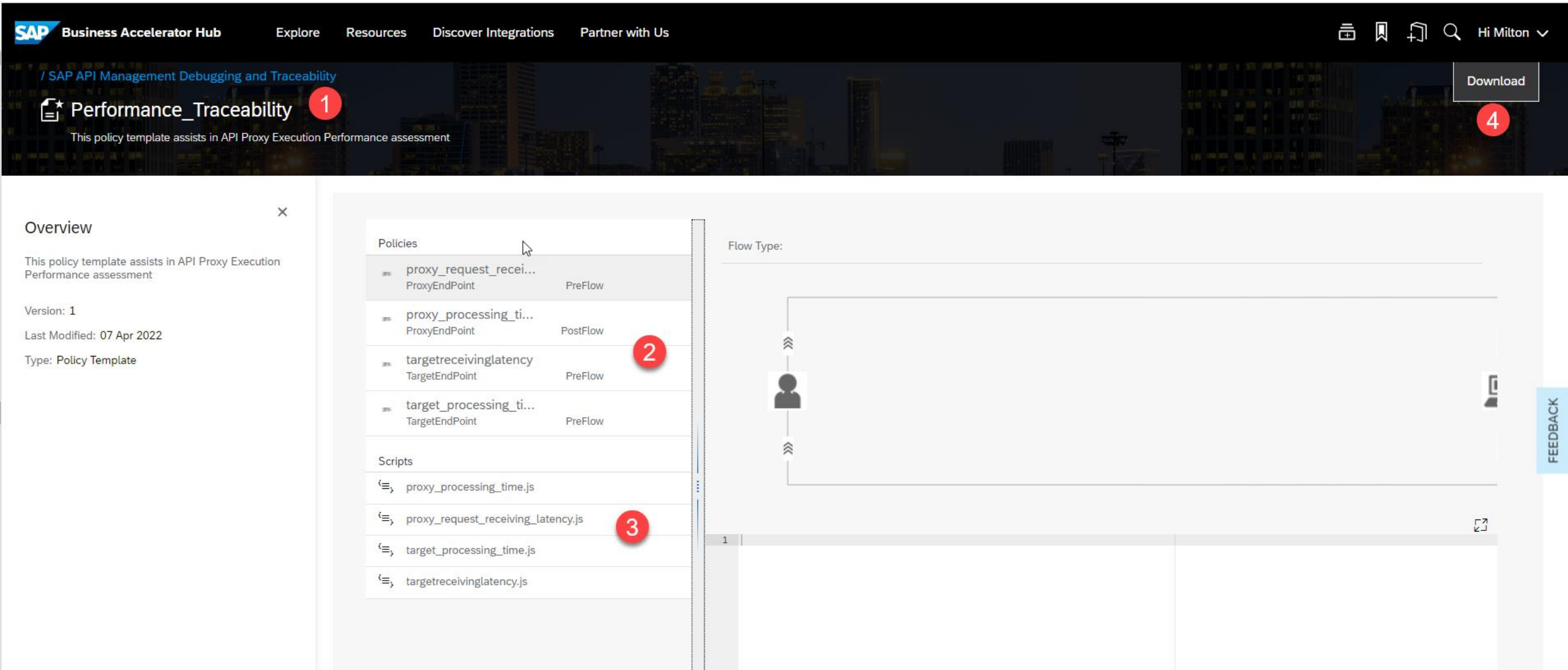
BTP

Accelerate business outcomes with integration, data to value, and extensibility.

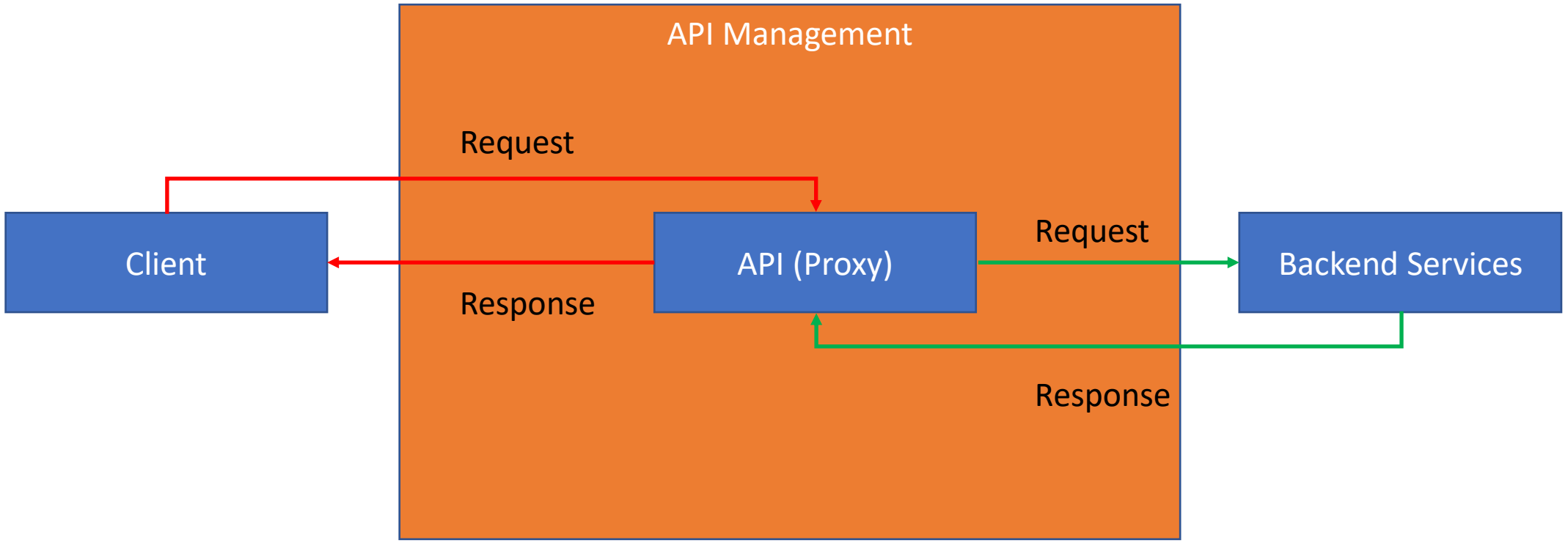
+6

SuccessFactors | Ariba | Concur | Fieldglass

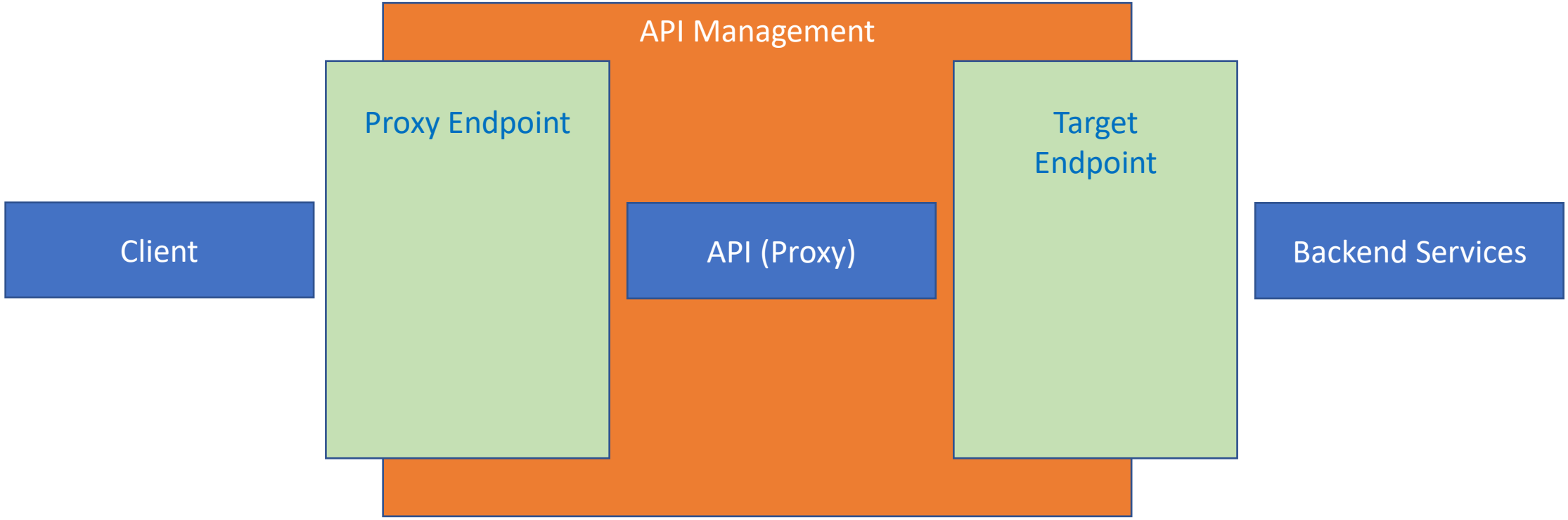

api.sap.com/content-type/API/apis/policytemplate
DRPA
Wakefern
Learning Journey
SAP
Utils
Pending
Innovator Challenge
Healthcare
Cloud Providers
SAPUI5 - PWA
Past Projects
SF Java Extension
SWGas
DDD
Lockheed
Blogs
Business Accelerator Hub
Explore
Resources
Discover Integrations
Partner with Us
APIs
1
Find APIs to integrate and extend.
Packages
All
SOAP
ODATA V2
ODATA V4
GraphQL
REST
Policy Template
2
Sort by:
A-Z
performance
3
Policy Template
Performance_Traceability
This policy template assists in API Proxy Execution Performance assessment
4
Version 1
Policy Template
cacheMetadata
Improve performance of Odata API Proxies by caching metadata across invocations
Version 1


Business Accelerator Hub
Explore
Resources
Discover Integrations
Partner with Us
Hi Milton
/ SAP API Management Debugging and Traceability
Performance_Traceability
1
This policy template assists in API Proxy Execution Performance assessment
Download
4
Overview
This policy template assists in API Proxy Execution Performance assessment
Version: 1
Last Modified: 07 Apr 2022
Type: Policy Template
Policies
proxy_request_recei...
ProxyEndPoint
PreFlow
proxy_processing_ti...
ProxyEndPoint
PostFlow
targetreceivinglatency
TargetEndPoint
PreFlow
2
target_processing_ti...
TargetEndPoint
PreFlow
Scripts
proxy_processing_time.js
proxy_request_receiving_latency.js
3
target_processing_time.js
targetreceivinglatency.js
Flow Type:
1
FEEDBACK

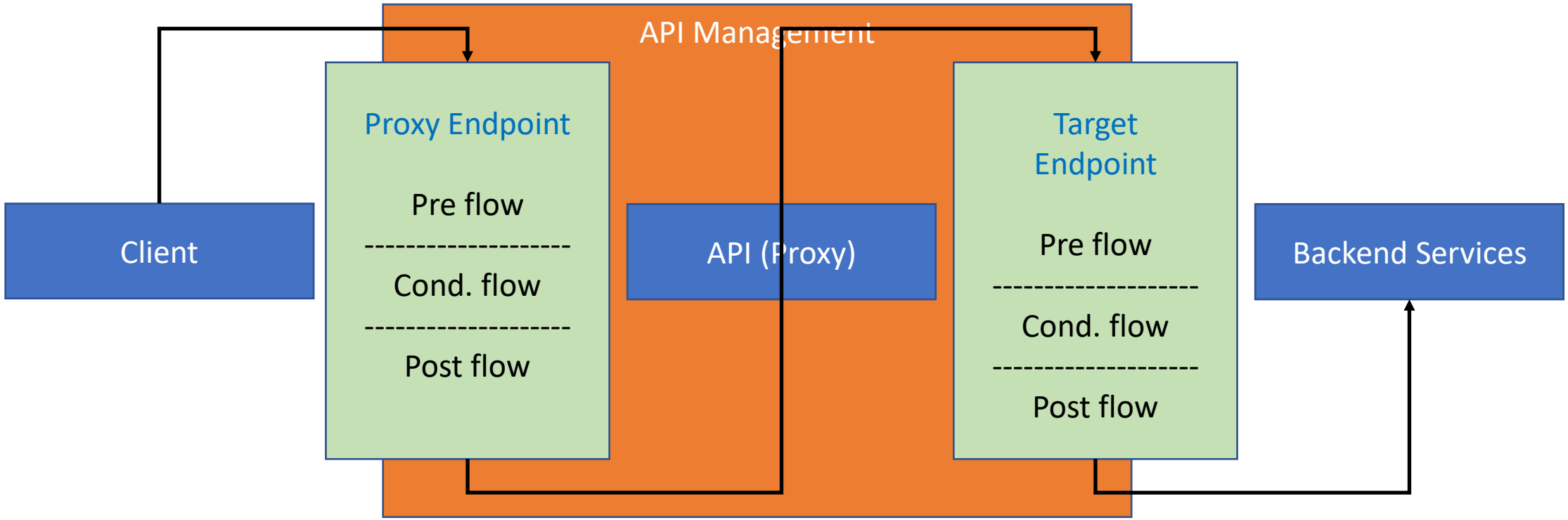
Flows – Where should I apply my policies ?



Flows – Where should I apply my policies ?

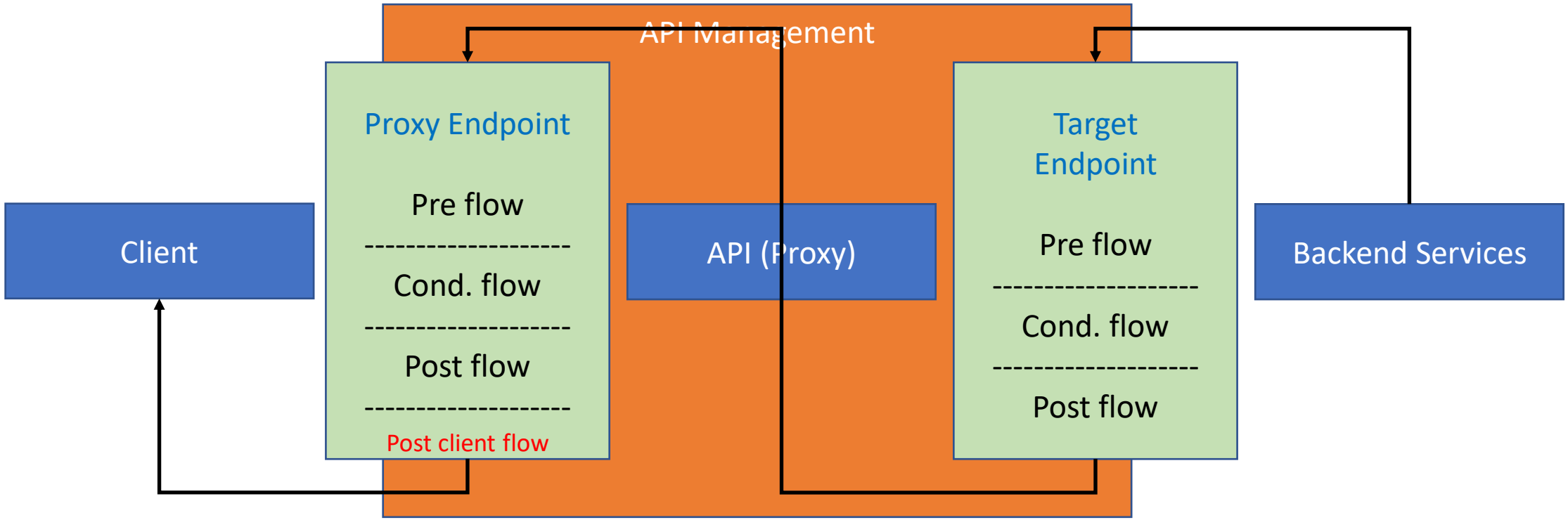


Flows – Where should I apply my policies ?



REQUEST

Flows – Where should I apply my policies ?



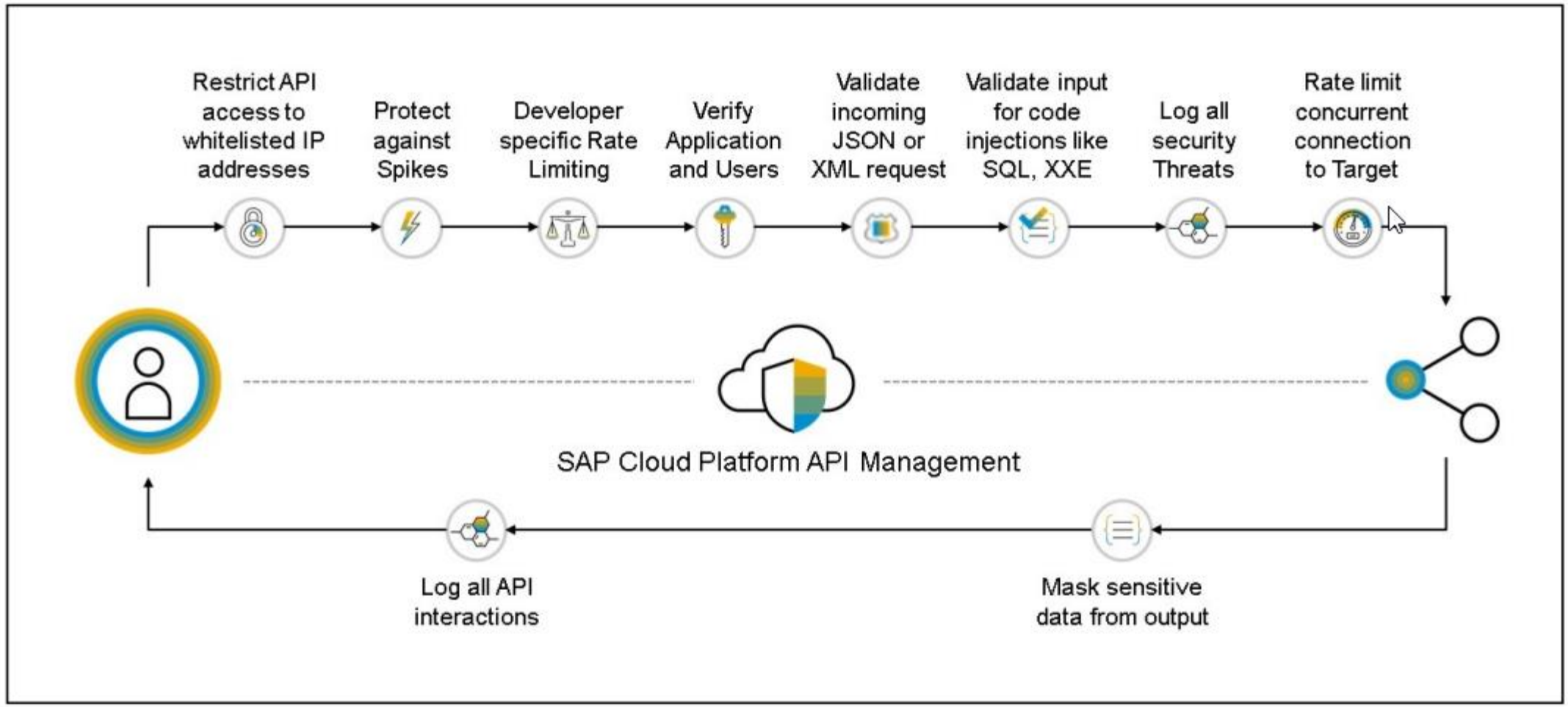


Figure 44: SAP Cloud Platform API Management

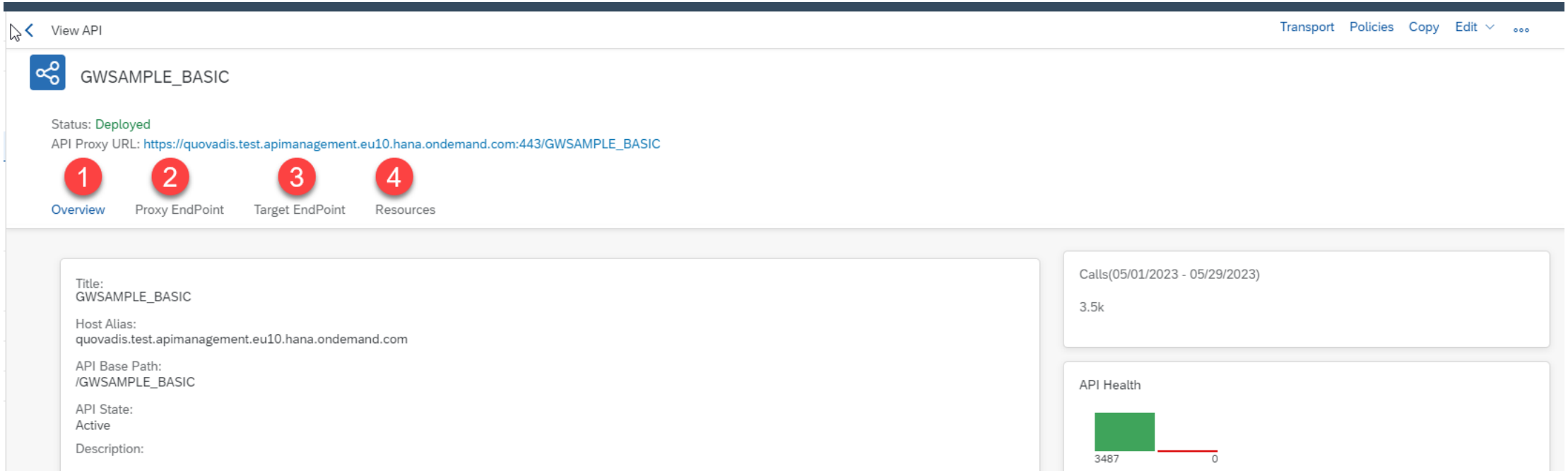
Exercise 6 Explore the API, Policies and More at SAP Business Accelerator Hub

In this exercise, you will perform the following tasks:

Log On to SAP Business Accelerator Hub.
Explore the policies.
Import the downloaded Policies to your HelloWorldAPI.
Explore the APIs at SAP Business Accelerator Hub.

Link: learning hub
Demo link: demo6

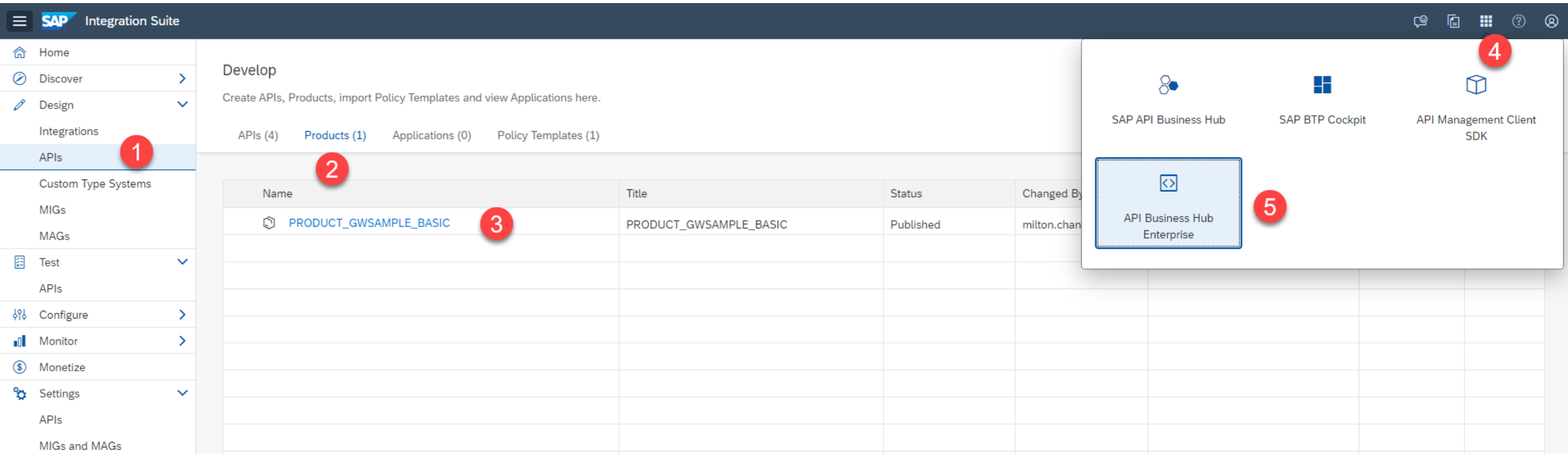
Editing APIs



Creating a Product

- Products are artifacts that appear in the SAP API Business Hub Enterprise Portal

- Role Collections
  - AuthGroup.API.Admin
  - AuthGroup.API.ApplicationDeveloper


Integration Suite
Home
Discover
Design
Integrations
APIs
Custom Type Systems
MIGs
MAGs
Test
APIs
Configure
Monitor
Monetize
Settings
APIs
MIGs and MAGs
Develop
Create APIs, Products, import Policy Templates and view Applications here.
APIs (4)
Products (1)
Applications (0)
Policy Templates (1)
Name
Title
Status
Changed By
PRODUCT_GWSAMPLE_BASIC
PRODUCT_GWSAMPLE_BASIC
Published
milton.chan
SAP API Business Hub
SAP BTP Cockpit
API Management Client SDK
API Business Hub Enterprise
1
2
3
4
5

Home Manage My Workspace Test Console

New Design Hi Milton Logout

API Business Hub Enterprise

Centralized API catalog to discover, consume and monitor APIs

Type here to search

PRODUCT_GWSAMPLE_BASIC

API Based on the SAP Gateway Demo System (ES5). The authorization against the source interface is realized via policies. No...

Published on May 29 2023

1 API

GWSAMPLE_BASIC

Download SDK Download JSON

API References Details

- BusinessPartnerSet
- SalesOrderSet
- ContactSet
- ProductSet
- SalesOrderLineItemSet
- VH_SexSet
- VH_CountrySet
- VH_AddressTypeSet
- VH_CategorySet
- VH_CurrencySet
- VH_UnitQuantitySet
- VH_UnitWeightSet
- VH_UnitLengthSet
- VH_ProductTypeCodeSet
- VH_BPRoleSet
- VH_LanguageSet
- Service Operations

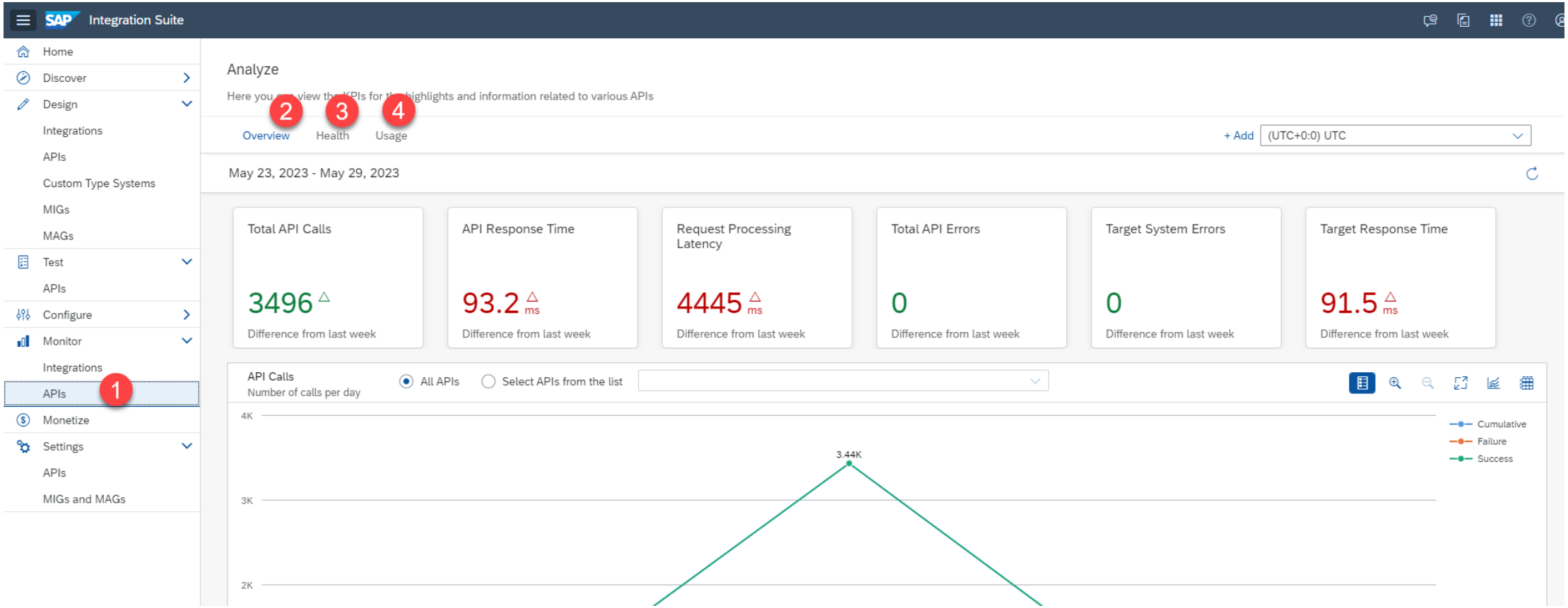
GET **/BusinessPartnerSet** Try out Code Snippet

Get entities from BusinessPartnerSet

Parameters Try out

Name	Description
Stop integer *(query)*	Show only the first n items, see Paging - Top 50
Sskip integer *(query)*	Skip the first n items, see Paging - Skip *$skip - Skip the first n items, see [Paging - Skip](htt*
Sfilter string *(query)*	Filter items by property values, see Filtering *$filter - Filter items by property values, see [Filtering*
Sinlinecount string *(query)*	Include count of items, see Inlinecount *Available values* : allpages, none --
Sorderby array[string] *(query)*	Order items by property values, see Sorting *Available values* : Address, Address desc, BusinessPartnerID, BusinessPartnerID desc, CompanyName, CompanyName desc, EmailAddress, EmailAddress desc, PhoneNumber, PhoneNumber desc, FaxNumber, FaxNumber desc, LegalF ... More -- Address Address desc BusinessPartnerID

Logging and Monitoring



Key Summary Points – Unit 3

Q10. What are the reasons for using policies in API management?

- ✓ Access Control
- B Identity Management
- C Data Management

✓ Correct

Correct. The reason for using policies in API management is Access Control.

Key Summary Points – Unit 3

Q8. Where can you download standardized, reusable policy templates?

A SAP API Business Hub Enterprise

B Enterprise Hub for APIs

✓ SAP Business Accelerator Hub

✓ Correct

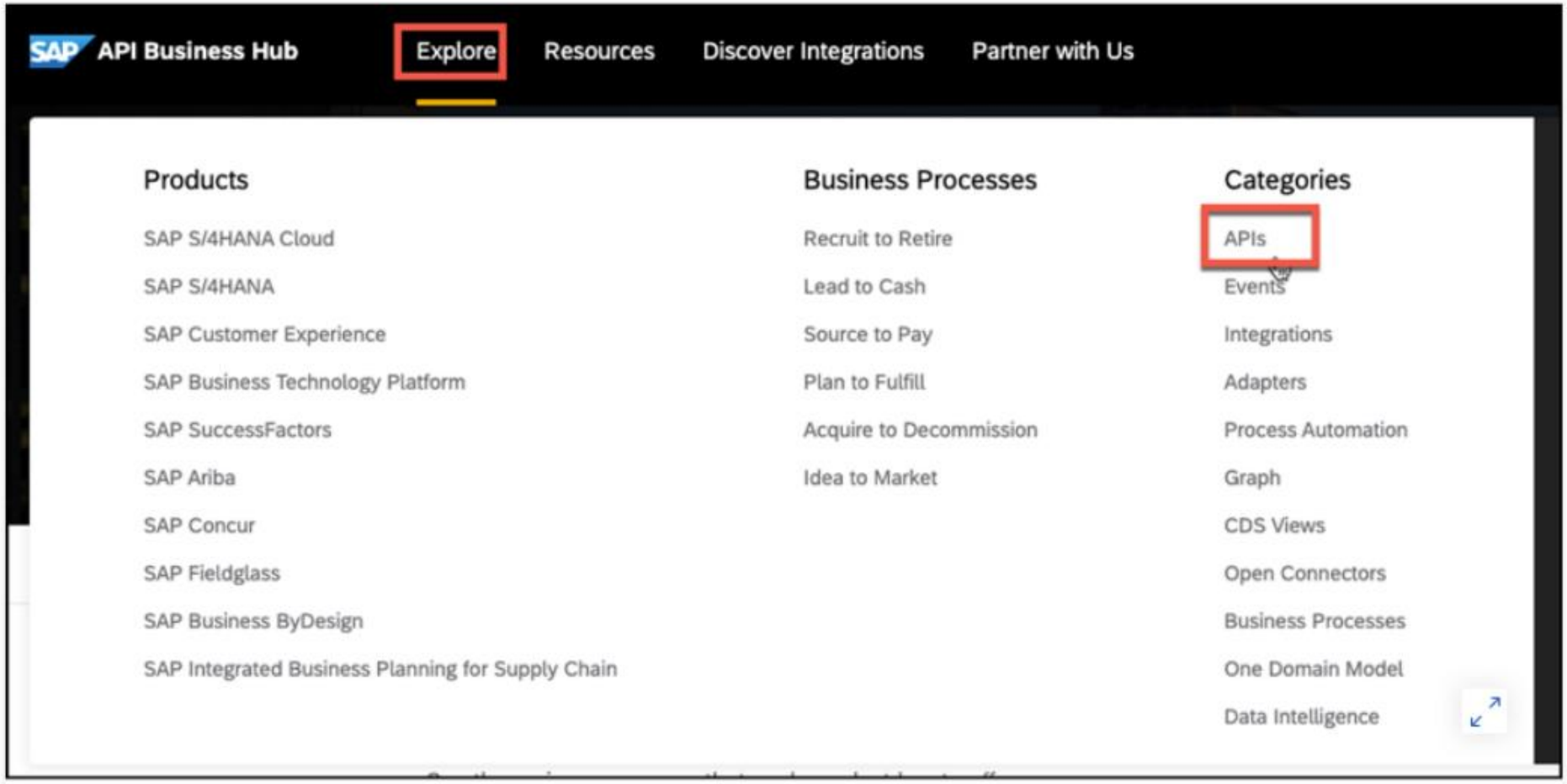
Incorrect. You can you download standardized, reusable policy templates from the SAP Business Accelerator Hub.

Key Summary Points – Unit 3

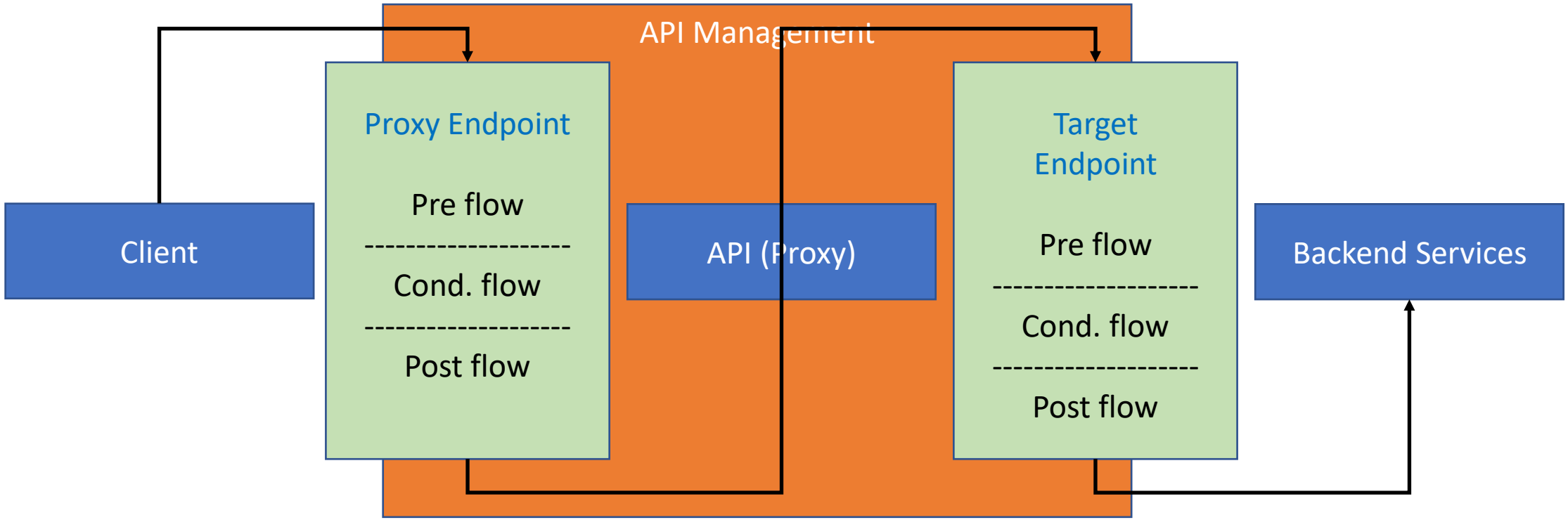
Use predefined policies

There are predefined sets of policies for specific applications. These can be found in the SAP Business Accelerator Hub.

Navigate to https://api.sap.com/ to *Explore* → *APIs*.

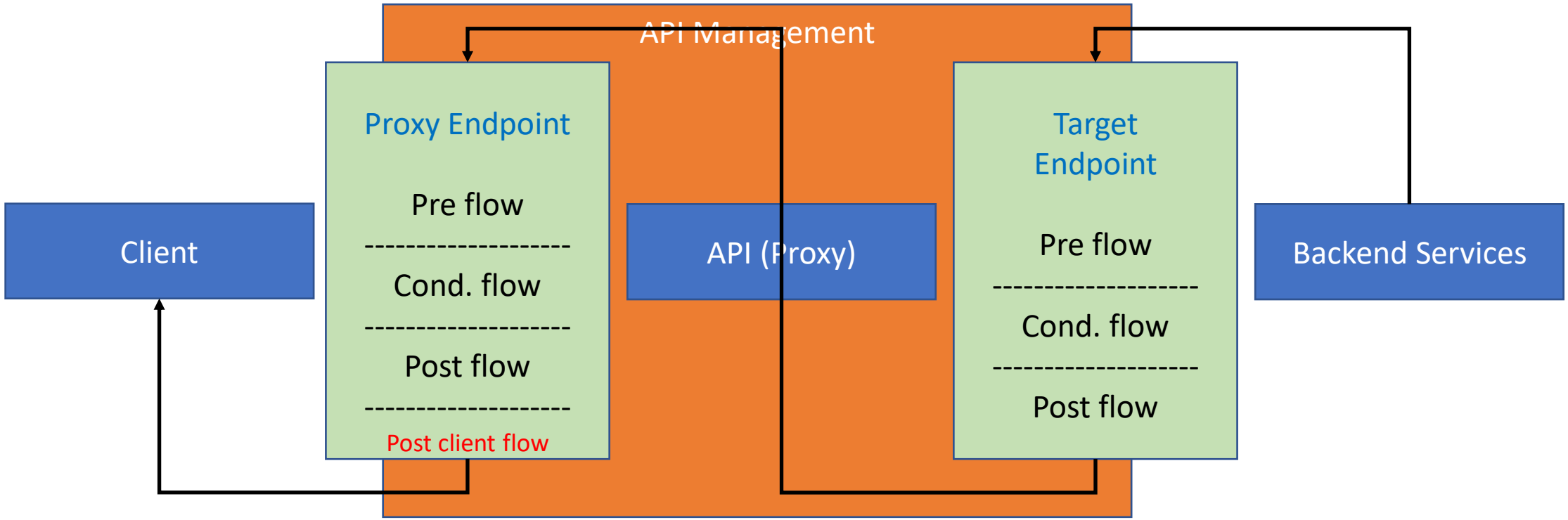


Flows – Where should I apply my policies ?



REQUEST

Flows – Where should I apply my policies ?



Key Summary Points – Unit 3

Q9. Which Role Collections do you need to use the API Business Hub Enterprise?

A AuthGroupAPIADMINDesigner,AuthGroupAdministrator

✓ AuthGroup.API.Admin, AuthGroup.API.ApplicationDeveloper

C AuthgroupHeadofManager,AuthgroupChildhoodCaseManager

✓ Correct

Correct. To use the API Business Hub Enterprise you need the Role Collections AuthGroup.API.Admin, and AuthGroup.API.ApplicationDeveloper.

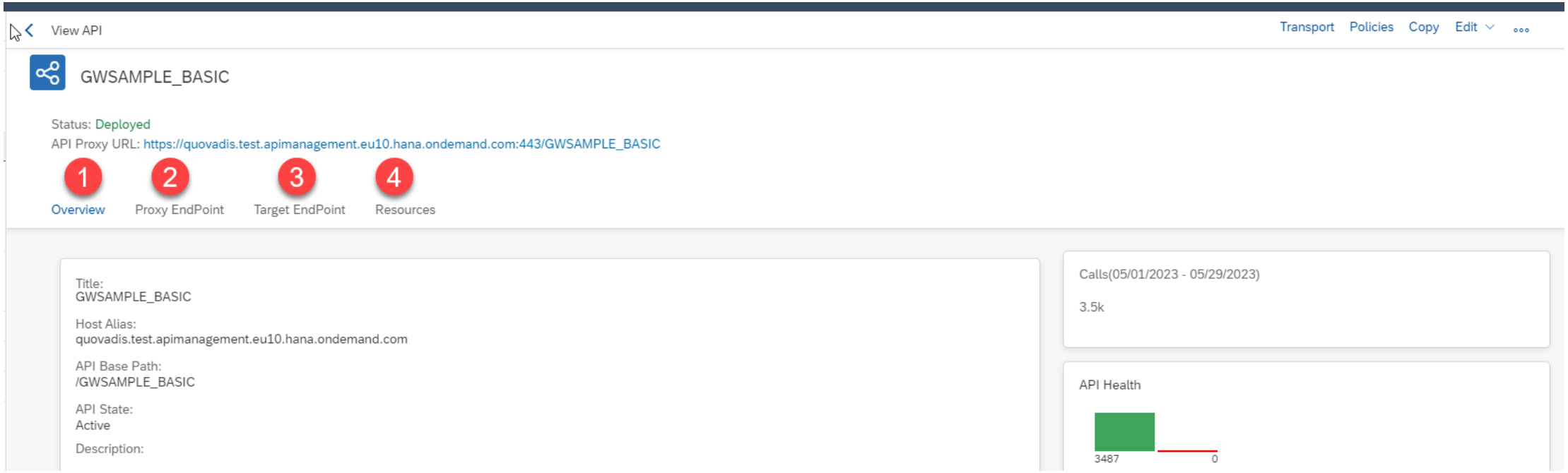
Components of SAP API Management

- API Provider
  - Concept in API Management that defines connection details for existing services
- API (Proxy)
  - Managed facades for existing services (sits in front of the existing service)
  - Applications connect to API (proxy)
- Policies
  - Provides capabilities to define behavior of an API (proxy)
- Product
  - Bundle and publish API (proxies) as a Product for consumption
- Application
  - Consumes the Product (bundle of API proxies) using api key and secret

Other ways to create API

- **Create an API using the Create button**
- **Use the URL option to create an API**
- **Create an API using menu links**
- **Use the Create in API Designer option**
- **Import an external API**

Editing APIs



Creating a Product

- Products are artifacts that appear in the SAP API Business Hub Enterprise Portal

- Role Collections
  - AuthGroup.API.Admin
  - AuthGroup.API.ApplicationDeveloper

Unit 4 – Managing Cloud Integration

Developing with SAP Integration Suite

C_CPI_15

Unit 4 Content

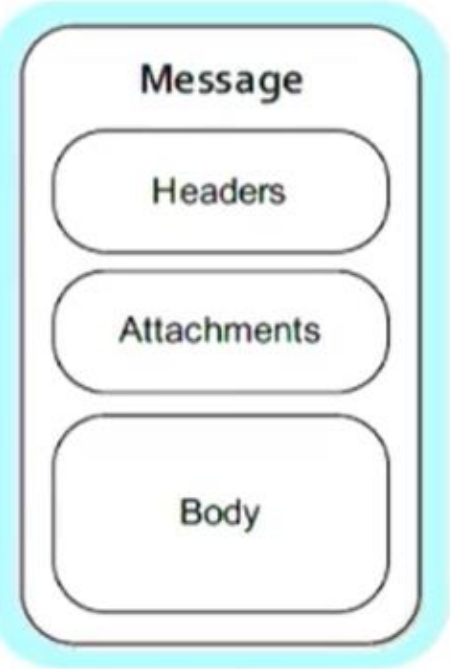
- Introducing Cloud Integration
- Business Scenario
- Explaining Development Cycle
- Message Monitoring and Logging
- Camel Data Model and Simple Expression Language

Basic concepts of Cloud Integration flow…

Message

Fundamental entity **containing the data** being carried and routed in Camel

- Messages have a body (a payload), headers, and optional attachments
- Messages are uniquely identified with an identifier of type `java.lang.String`
- *Headers*
  - Headers are values associated with the message
    - ⇨ Sender identifier, hints about content encoding, authentication information,…
  - Headers are name-value-pairs
    - ⇨ Name is a unique, case-insensitive string
    - ⇨ Value is of type `java.lang.Object`
- *Attachments*
  - Optional – typically used for Web service and e-mail components
- *Body*
  - Type: `java.lang.Object` → any kind of content is allowed

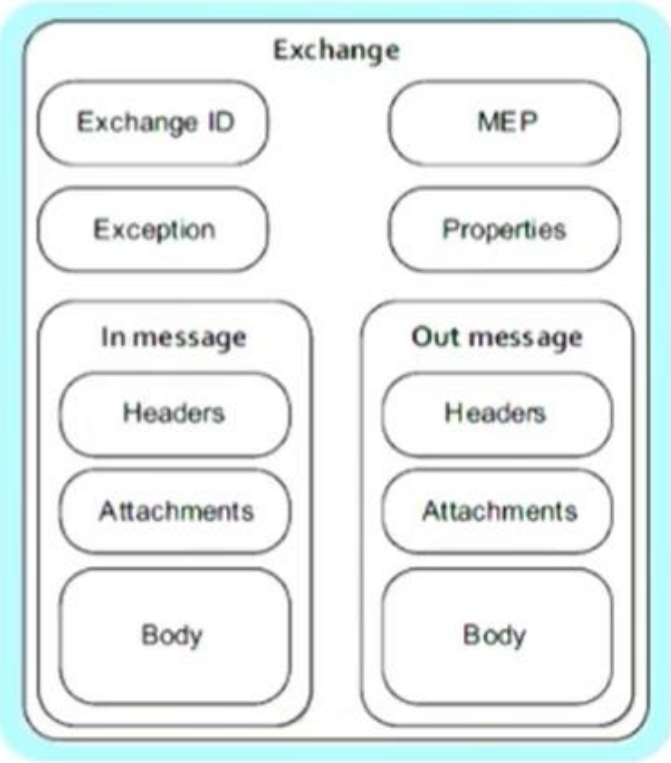


Basic concepts of Cloud Integration flow…

Exchange

The **message's container** during routing

- Provides support for various interaction types between systems, known as Message Exchange Patterns (MEP)
  - `InOnly`: a one-way message (e.g. JMS messaging)
  - `InOut`: a request-response message (e.g. HTTP-based transports)
- *Exchange ID*: a unique ID that identifies the exchange
- *MEP*
  - `InOnly`: exchange contains an "in message" **only**
  - `InOut`: exchange contains an "in message" **and** an "out message" containing the reply message for the caller
- *Exception*: If an error occurs during runtime, the Exception field will be filled
- *Properties*: Similar to message headers, but they last for the duration of the entire exchange; they contain global-level information; you can store and retrieve properties at any point during the lifetime of an exchange



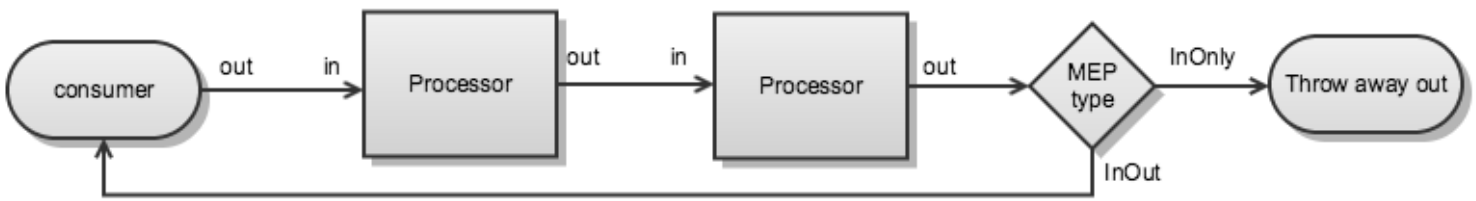
MESSAGE EXCHANGE PATTERNS AND THE EXCHANGE OBJECT

The Camel API is influenced by APIs such as JBI specification, CXF which defines a concept called Message Exchange Patterns (MEP for short).

The MEP defines the messaging style used such as one-way (InOnly) or request-reply (InOut), which means you have IN and optionally OUT messages. This closely maps to other APIs such as WS, WSDL, REST, JBI and the likes.

The Exchange API provides two methods to get a message, either `getIn` or `getOut`. Obviously the `getIn` gets the IN message, and the `getOut` gets the OUT message.

FLOW OF AN EXCHANGE THROUGH A ROUTE



- The out message from each step is used as the in message for the next step
- if there is no out message then the in message is used instead
- For the InOut MEP the out from the last step in the route is returned to the producer. In case of InOnly the last out is thrown away

TIP

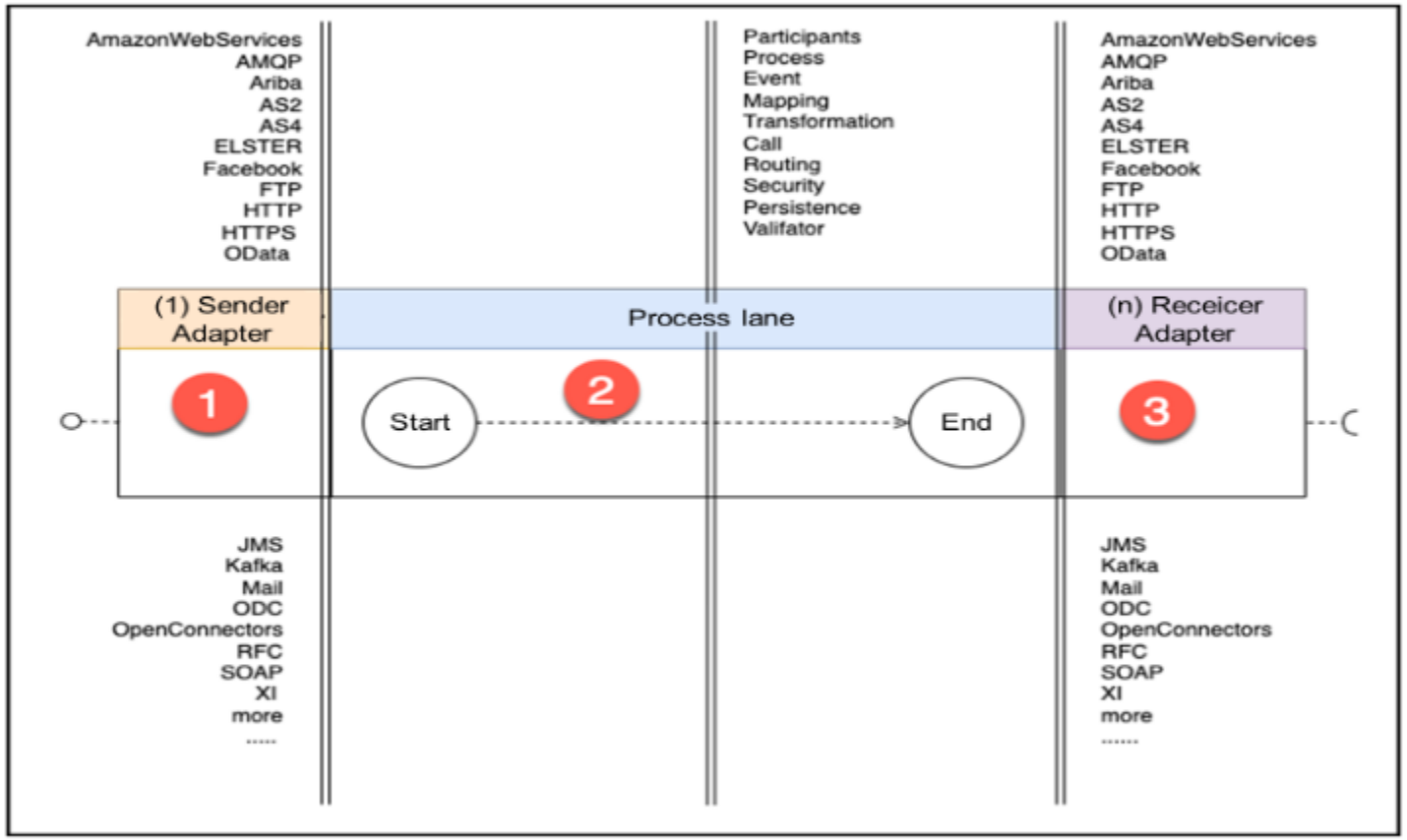
Beware of `getOut` to check if there is an out message

`exchange.getOut` creates an out message if there is none. So if you want to check if there is an out message then you should use `exchange.hasOut` instead.

Introducing Cloud Integration

- Supports end-to-end process integration through exchange of messages
- Based on open source framework Camel from Apache Software Foundation
- Core capabilities of SAP BTP Integration Suite
- Low Code / No Code approach

Introducing Cloud Integration- Key Features



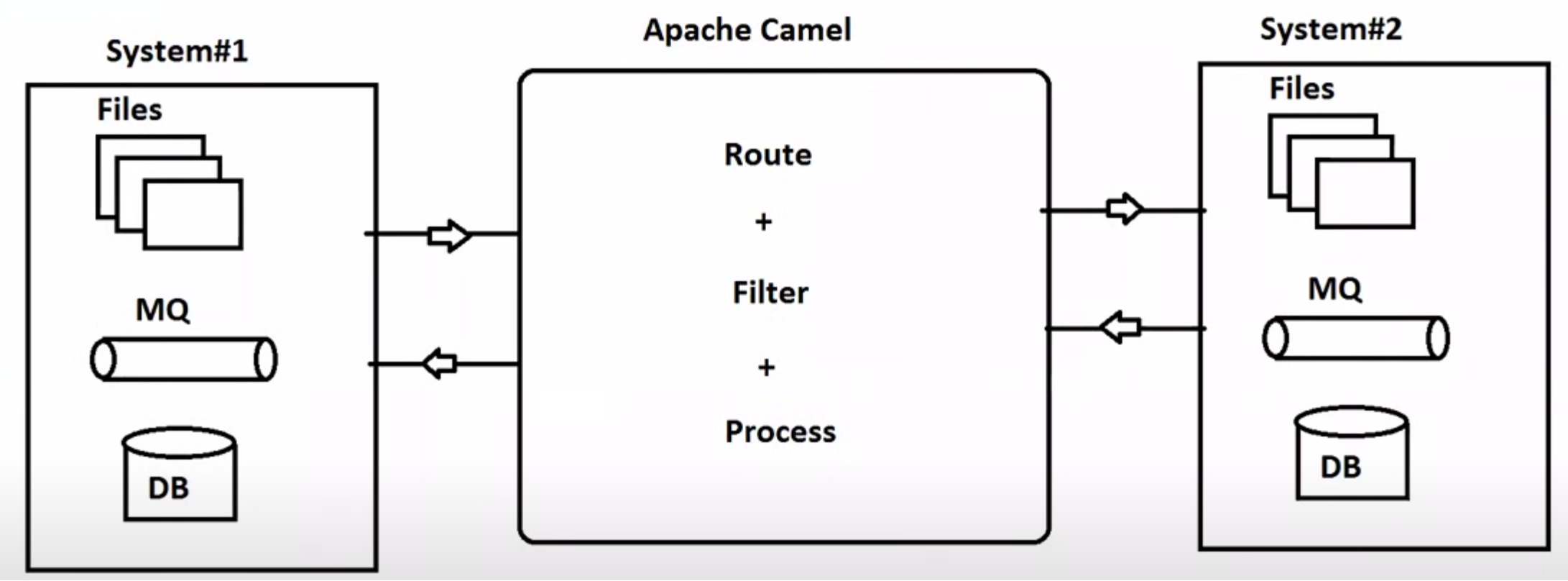
Key Features of Cloud Integration

- Integration flow has 0-1 sender adapter
- Message is delivered via an endpoint
  - If an adapter is configured
- Process is started via Start event
- Different ways messages can be processed
- Receiver adapters can be configured
- Message processing can be synchronous or asynchronous

Apache Camel - Challenge

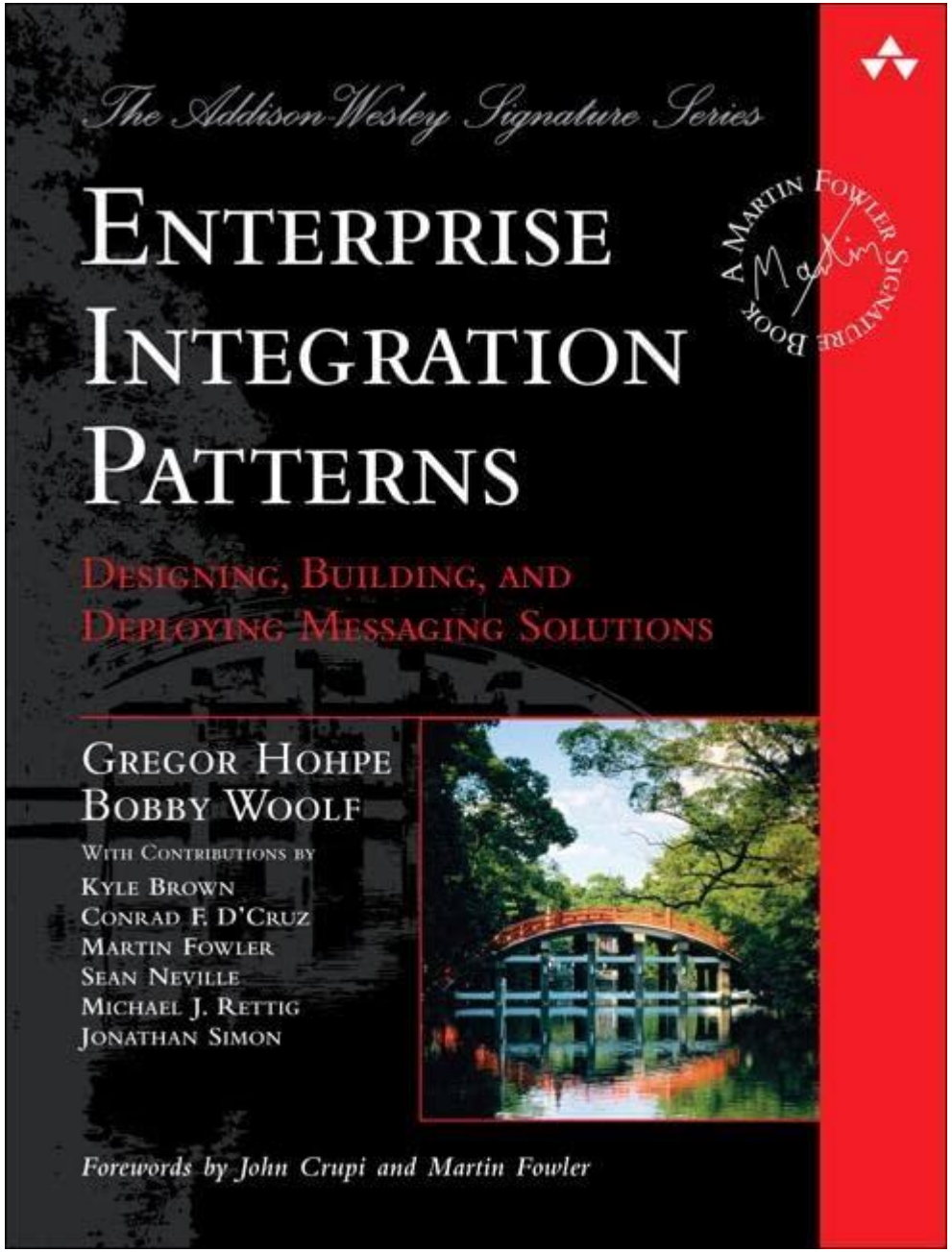
- Companies have data in various systems
- Need to move data between various systems
- Writing a program entails understanding…
  - Protocols of the various systems
  - Data formats of the various systems
  - And so much more

Apache Camel



Apache Camel

- Java library that helps you write integrations and run them
- Define your integration flows
  - Where you want to pull data from
  - What you can or cannot do with the data
  - Where the data needs to go
  - And a lot more…
- Comes with built-in set of patterns you can use in integration flows
  - Splitter pattern – split the message based on how you want
  - Content based routing pattern – route messages based on content
  - And a lot more…

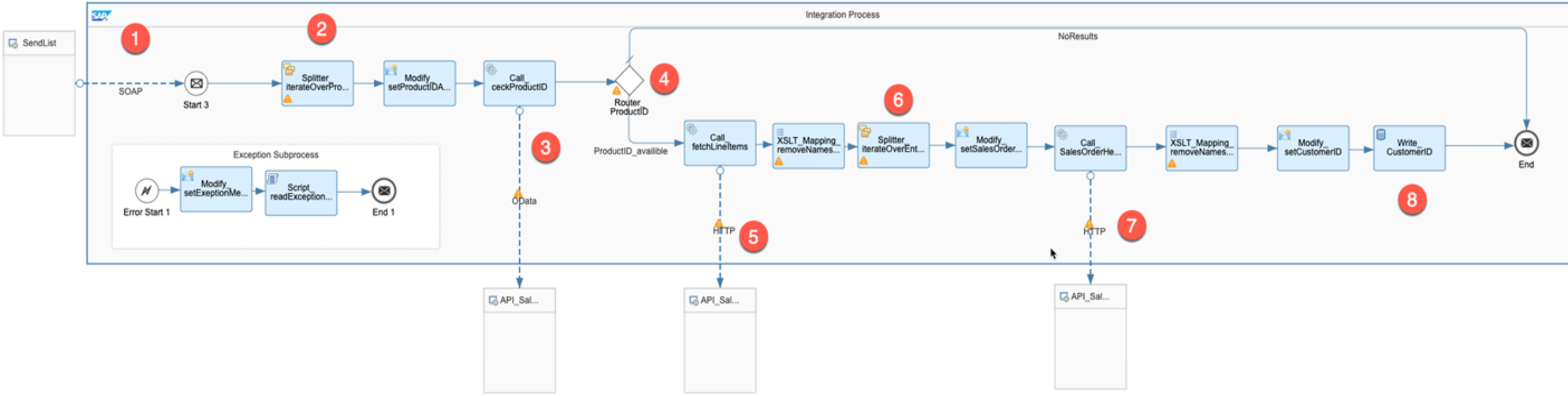

The Addison Wesley Signature Series
A Martin Fowler Signature Book
Enterprise Integration Patterns
Designing, Building, and Deploying Messaging Solutions
Gregor Hohpe
Bobby Woolf
With Contributions by
Kyle Brown
Conrad F. D'Cruz
Martin Fowler
Sean Neville
Michael J. Rettig
Jonathan Simon
Forewords by John Crupi and Martin Fowler

SAP Cloud Integration

- Adds enterprise features to Apache Camel
- Engineered for cloud
  - Multitenancy
  - Rolling software updates
  - Horizontal scalability
- Strong focus on security including data isolation
- Used by SAP SaaS solutions
  - SAP S/4HANA
  - SAP SuccessFactors and so on…

Describe the iFlow Process Created in the Next Exercises- Business Scenario

The fully implemented exercise scenario is presented in the following picture, to help you understand the process as a whole.

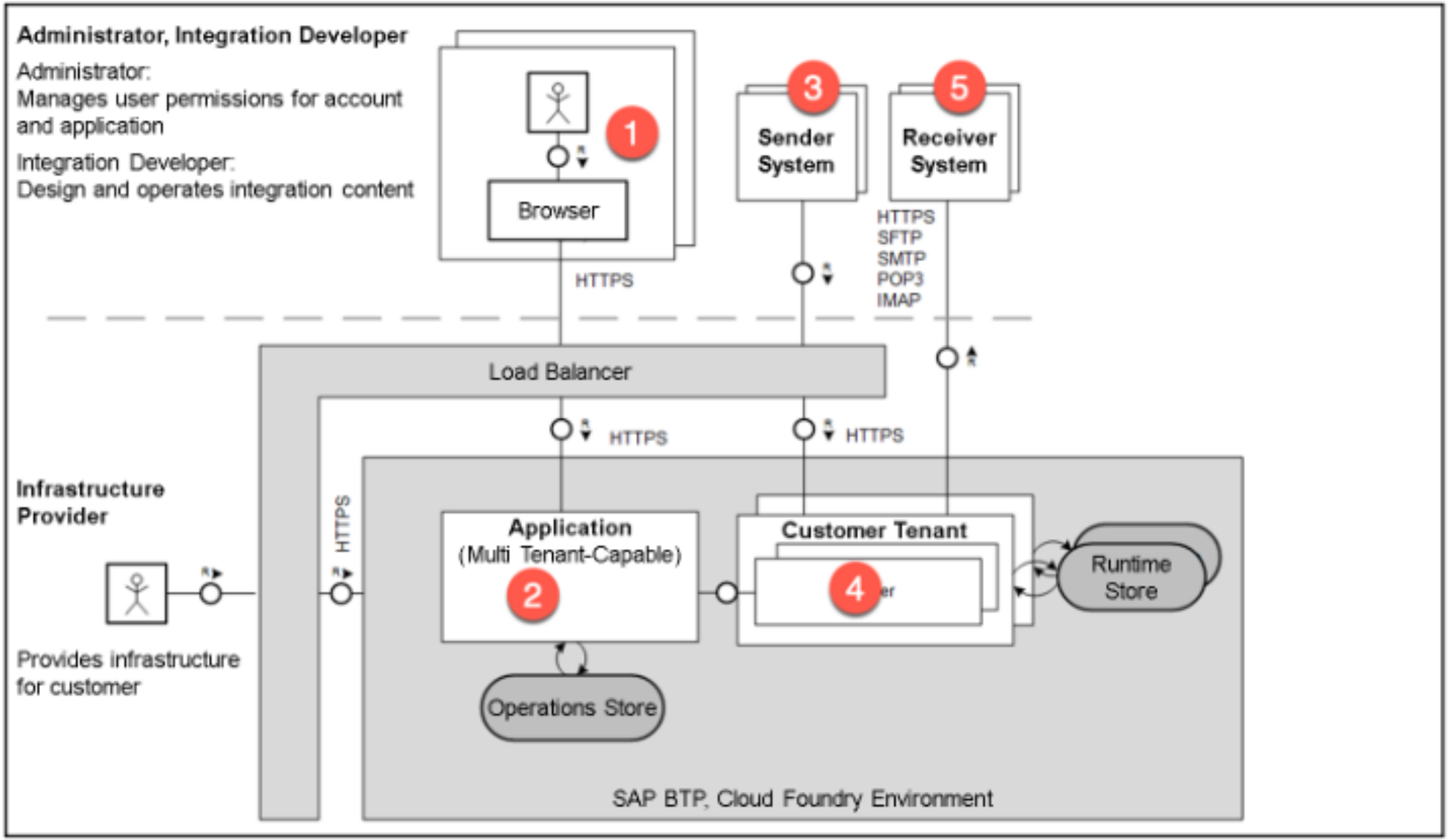


Exercise 7 Explore the Cloud Integration

In this exercise, you will perform the following tasks:

Log on to the Cloud Integration.
Explore the Cloud Integration.

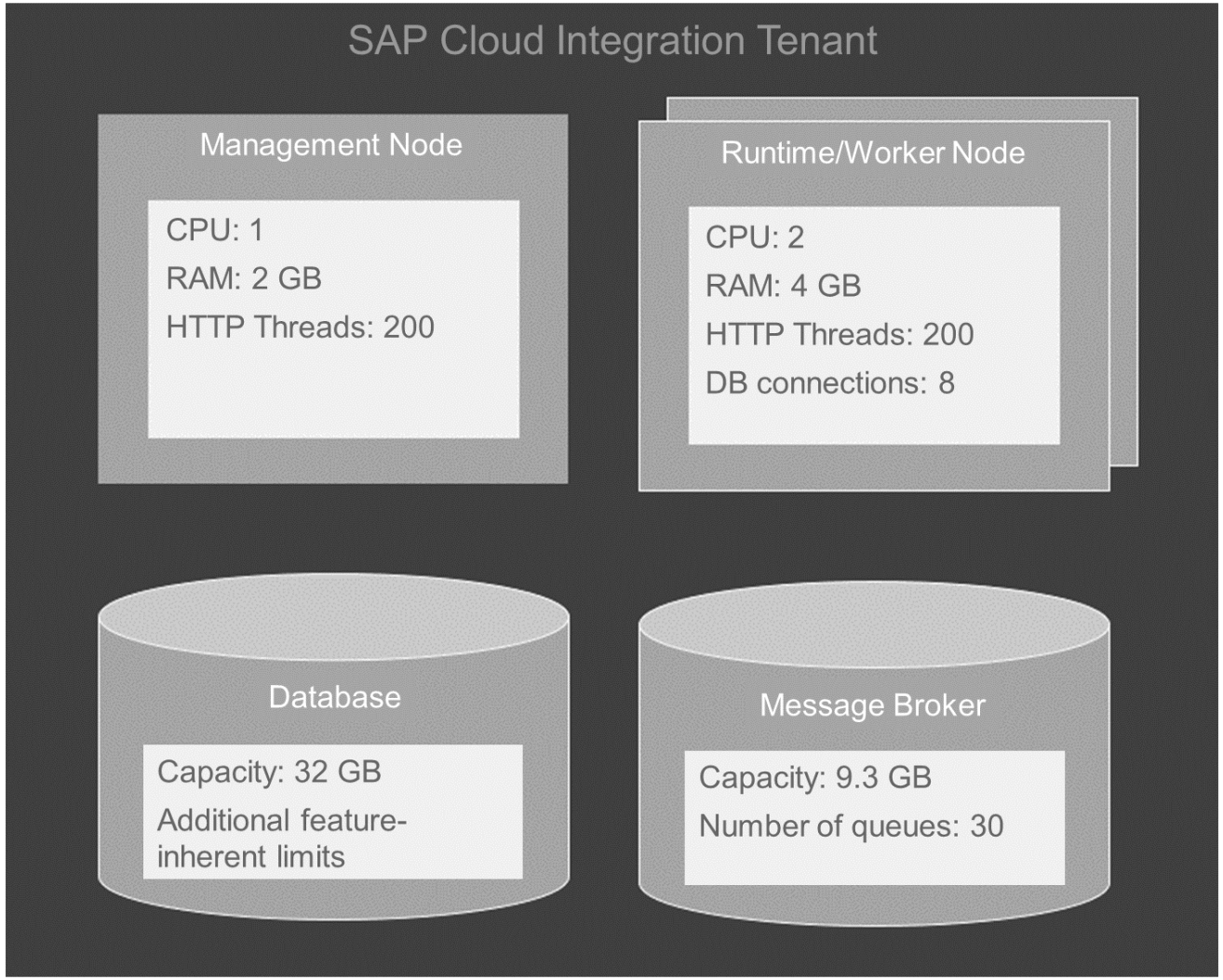
Link: learning hub
Demo link: demo7



The Entire Implementation

Resources on a Tenant

The resources for a Cloud Integration implementation are limited.



Development Cycle for Creating Integration Flow

- Understand your use case.
- Configure the SAP BTP subaccount and the Integration Suite.
- Find the list of required API with all its metadata, such as credentials, headers, and more.
- Start in the Cloud Integration with an empty template.
- Modeling your processes.
- Build the integration flow bit by piece.
- Repeat the steps.
- What comes next?

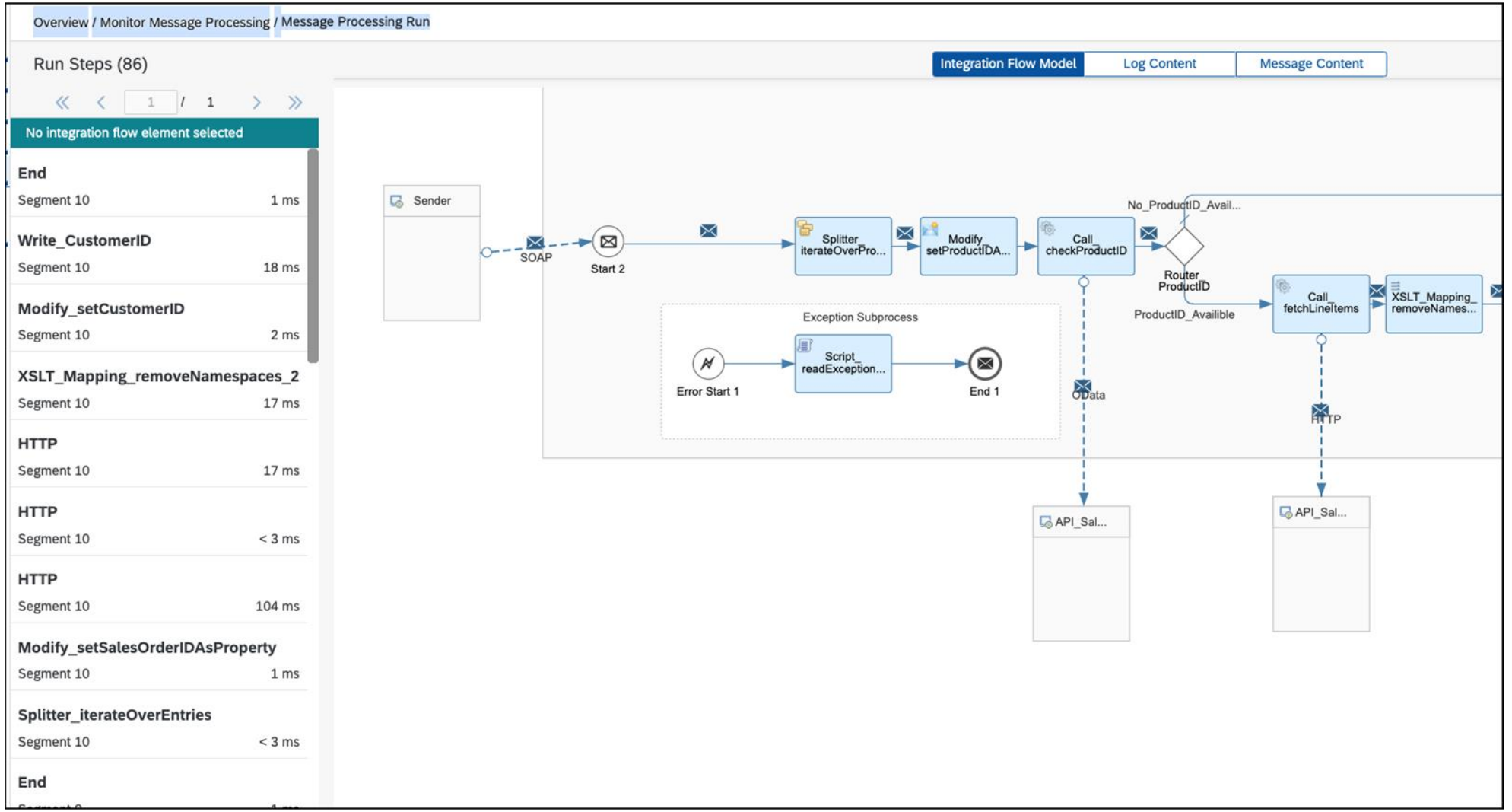
Developer Test with Real Deployment and Debugging of your Integration Flow

- Start at your integration flow.
- Choose the Deploy button.
- Choose a spot in the white space outside the integration flow swim lane.
- Choose the Deployment Status in the Integration Flow configuration area.
- If your integration flow is successful deployed, you will see a Navigate to Manage Integration Content link.
- Choose this link to jump to Monitor Artifacts → Overview → Manage Integration Content.
- Change the log level to trace.

Developer Test with Real Deployment and Debugging of your Integration Flow

- Deploy again if you use a timer starting event. Otherwise, send a message to the endpoint.
- If you deploy again, come back to Monitor Artifacts → Overview → Manage Integration Content.
- Here, choose the Monitor Message Processing link.
- In the new window, choose Monitor Artifacts → Overview → Monitor Message Processing. Choose the last message on the message list and choose it.
- Choose the Trace link to jump directly to Monitor Artifacts → Overview → Monitor Message Processing → Message Processing Run.
- Explore the trace of your flow.

Developer Test with Real Deployment and Debugging of your Integration Flow



Developer Test with Simulations of your Integration Flow and Components

- Choose a place on the line in front of the Splitter_iterateOverProducts component.
- Set the starting point via the context menu.
- Add the input message as a payload (content).
- Choose the line after the Modify_setProductIDAsProperty component.
- Set the end point of the simulation.
- The simulation navigation bar is now active.
- Start the simulation with the Start button of the navigation bar.
- Choose all envelopes between the start point and the endpoint to explore the results.
- After the testing, choose the Clear button of the navigation bar.

Exercise 8 Create an Integration Package and Integration Flow

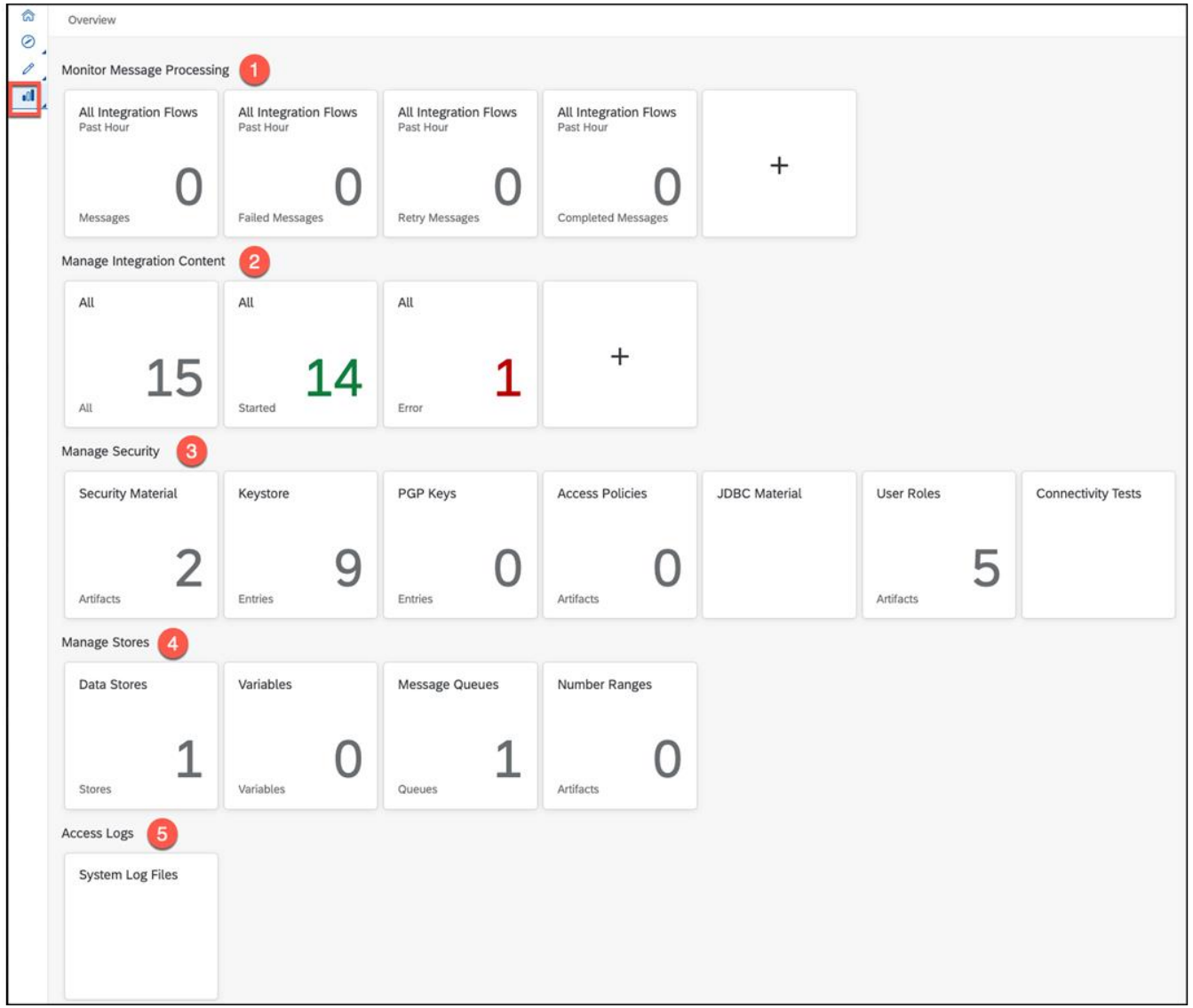
In this exercise, you will perform the following tasks:

Log on to the Design view of Cloud Integration.
Create an Integration Package.
Create an integration flow within the Integration Package.
Link: learning hub
Demo link: demo8

Using Message Monitoring and Logging- Types of Monitoring

- SAP Cloud ALM
- SAP Solution Manager
- SAP Focused Run SAP Analytics Cloud
- SAP Application Interface Framework
- Cloud Integration OData APIs

Build-In Monitor for Message Monitoring



Exercise 9 Create a Timer Event in Place of the Message Start Event

In this exercise, you will perform the following tasks:

Log on to the Integration Flow DelayedDelivery_Process.
Explore the design view.
Replace the message start event by a timer event.
Version and deploy the integration flow.
Use the monitor to check out the result.

Link: learning hub
Demo link: demo9

Manipulating Exchange Parameters

- Exchange params (including payload): set by incoming messages
- But these params can also be manually manipulated
  - Content Modifier component
  - Groovy SDK
  - JavaScript SDK
  - PDF in Message Mapping
  - XSLT Mapping
  - And more…

Simple Expression Language

- Used to parameterize Exchange Parameters
- General scheme is ${} placeholder containing built-in variable or Exchange parameter
- For example
  - ${in.body}
  - ${property.someproperty}
  - ${header.someheader}

Exercise 10 Create a Content Modifier with Sample Data as Payload (XML)

In this exercise, you will perform the following tasks:

Log on to the integration flow DelayedDelivery_Process.
Place and configure a Content Modifier component.
Save as version, deploy, and debug your integration process.

Link: learning hub
Demo link: demo10

Key Summary Points – Unit 4

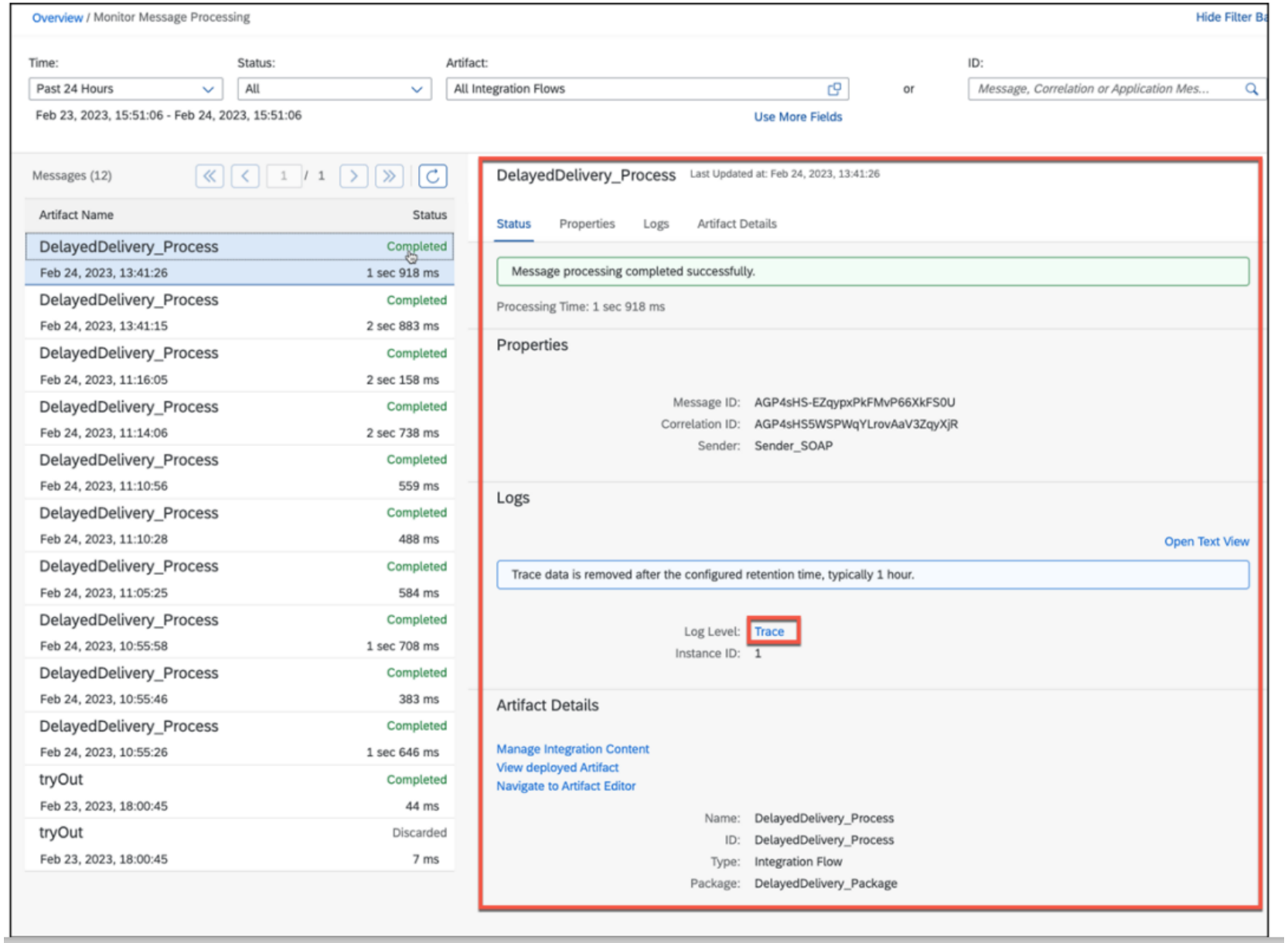
Q2. What needs to be enabled to work in debugging mode within the monitor?

- ✓ The log level must be set on trace.
- B The log level must be set on info.
- C The log level must be set on hold.

✓ Correct

Correct. The log level must be set on trace.

Key Summary Points – Unit 4



Key Summary Points – Unit 4

Q3. Where can you discover pre-defined integration content?

A My preferred SAP Consultant dealerstore.

SAP Business Accelerator Hub - New name

✓ API Business Hub or Discovery tab in the Integration Suite.

C API Business Hub Enterprise or Design Tab into the Integration Suite.

✓ Correct

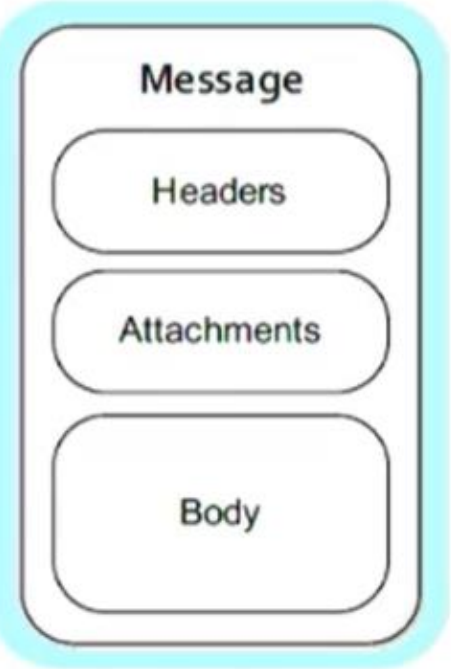
Correct. You can discover pre-defined integration content on the API Business Hub or Discovery tab in the Integration Suite.

Basic concepts of Cloud Integration flow…

Message

Fundamental entity **containing the data** being carried and routed in Camel

- Messages have a body (a payload), headers, and optional attachments
- Messages are uniquely identified with an identifier of type `java.lang.String`
- *Headers*
  - Headers are values associated with the message
    - ⇨ Sender identifier, hints about content encoding, authentication information,…
  - Headers are name-value-pairs
    - ⇨ Name is a unique, case-insensitive string
    - ⇨ Value is of type `java.lang.Object`
- *Attachments*
  - Optional – typically used for Web service and e-mail components
- *Body*
  - Type: `java.lang.Object` → any kind of content is allowed

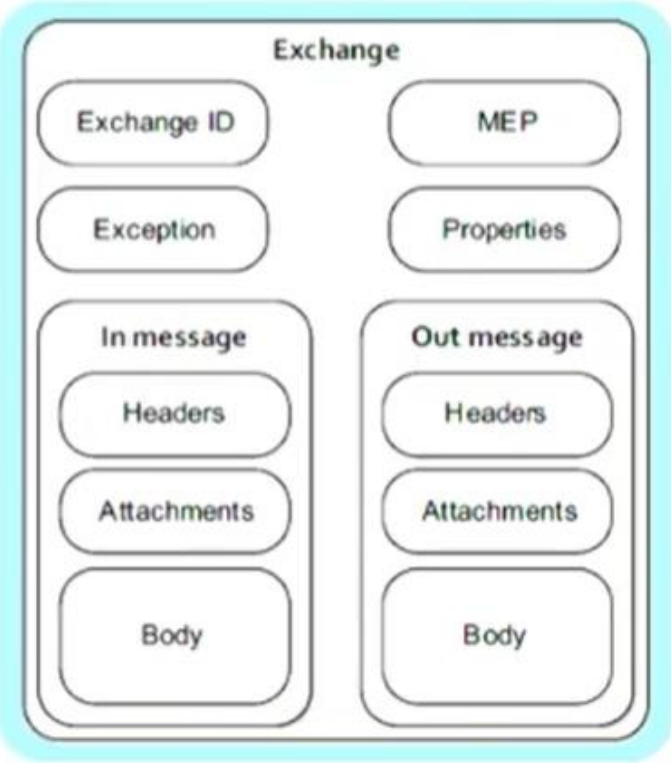


Basic concepts of Cloud Integration flow…

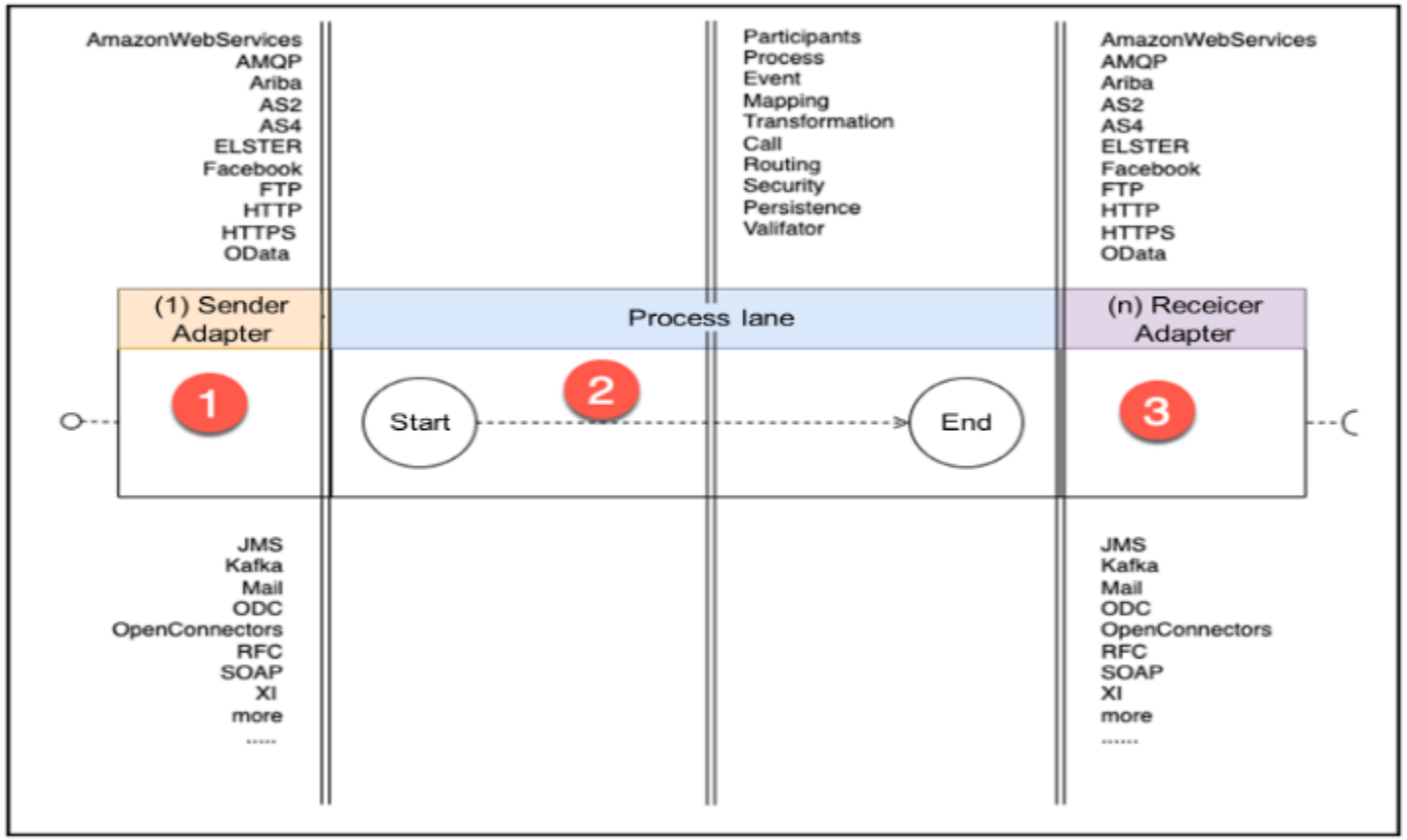
Exchange

The **message's container** during routing

- Provides support for various interaction types between systems, known as Message Exchange Patterns (MEP)
  - `InOnly`: a one-way message (e.g. JMS messaging)
  - `InOut`: a request-response message (e.g. HTTP-based transports)
- *Exchange ID*: a unique ID that identifies the exchange
- *MEP*
  - `InOnly`: exchange contains an "in message" **only**
  - `InOut`: exchange contains an "in message" **and** an "out message" containing the reply message for the caller
- *Exception*: If an error occurs during runtime, the Exception field will be filled
- *Properties*: Similar to message headers, but they last for the duration of the entire exchange; they contain global-level information; you can store and retrieve properties at any point during the lifetime of an exchange



Introducing Cloud Integration- Key Features



Key Features of Cloud Integration

- Integration flow has 0-1 sender adapter
- Message is delivered via an endpoint
  - If an adapter is configured
- Process is started via Start event
- Different ways messages can be processed
- Receiver adapters can be configured
- Message processing can be synchronous or asynchronous

Key Summary Points – Unit 4

Summary

The process of creating an integration flow involves using a graphical editor in the remote cloud integration application. Simulations can be conducted on individual parts or the entire integration flow to verify that values are correctly set in content modifiers, scripts or mappings. Once the integration flow is complete, it is versioned and deployed, resulting in the creation and deployment of a Java application in a runtime. The integration flow can then be executed. The development process can be approached as cycles, where the placement and configuration of components, debugging using trace log levels, and testing are repeated until the desired result is achieved.

Manipulating Exchange Parameters

- Exchange params (including payload): set by incoming messages
- But these params can also be manually manipulated
  - Content Modifier component
  - Groovy SDK
  - JavaScript SDK
  - PDF in Message Mapping
  - XSLT Mapping
  - And more…

Simple Expression Language

- Used to parameterize Exchange Parameters
- General scheme is ${} placeholder containing built-in variable or Exchange parameter
- For example
  - ${in.body}
  - ${property.someproperty}
  - ${header.someheader}

Unit 5 – Modeling Processes

Developing with SAP Integration Suite

C_CPI_15

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

Guideline to Design Enterprise-Grade Integration Flows

- Learn to design with high availability.
- Learn to design with resilience.
- Learn to deal with limited resources.
- Learn to design loose coupling.
- Learn to handle failures gracefully.
- Learn to design flows readability.
- Learn to use prepackaged integration content.

The Basics of Process Modeling

- Handle Attachments
- File Transfer
- Decouple integration flows
- Decouple with SOAP Adapter
- Use Converters

Exercise 11 Create and Configure a General Splitter

In this exercise, you will perform the following tasks:

Log on to the integration flow DelayedDelivery_Process.
Create and configure a General Splitter.
Save as version, deploy, and debug your integration process.
Learn more about the splitter component.

Link: learning hub
Demo link: demo11

Adapter in an overview

Adapters can be broadly categorized into two groups

- TCP based.
- Non TCP based.

Difference to the adapters in process integration （PI）

- In PI, messages are converted to the internal protocol, emphasizing the role of converters, especially with XML Message formats for better support.

Features of OData Adapter

Query wizard

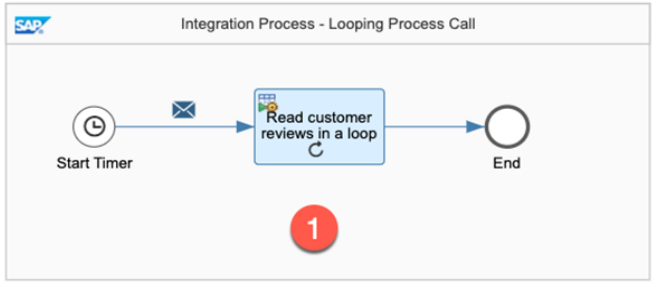
- Navigate the interface to be accessed with metadata document
- Page Processing mode
- Read entries in multiple pages which are processed sequentially
- Overcome challenges with large number of entries
- Automatically removing namespaces
- Remove namespaces and prefixes automatically

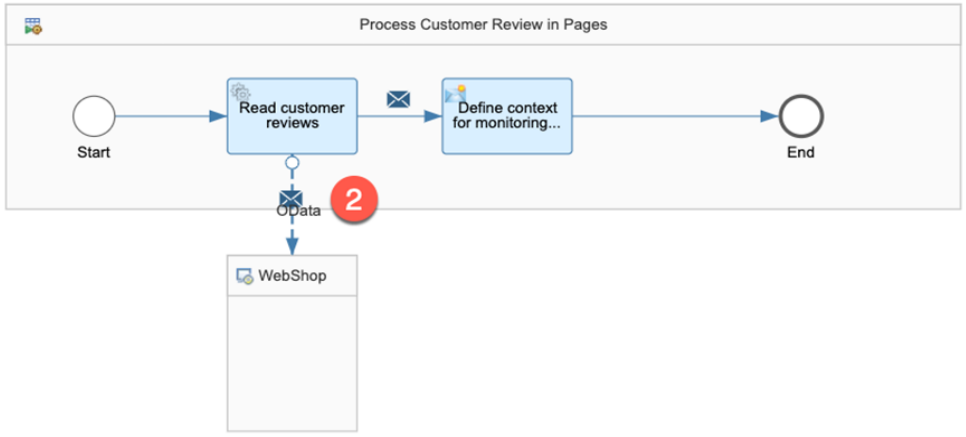
Example: OData Adapter

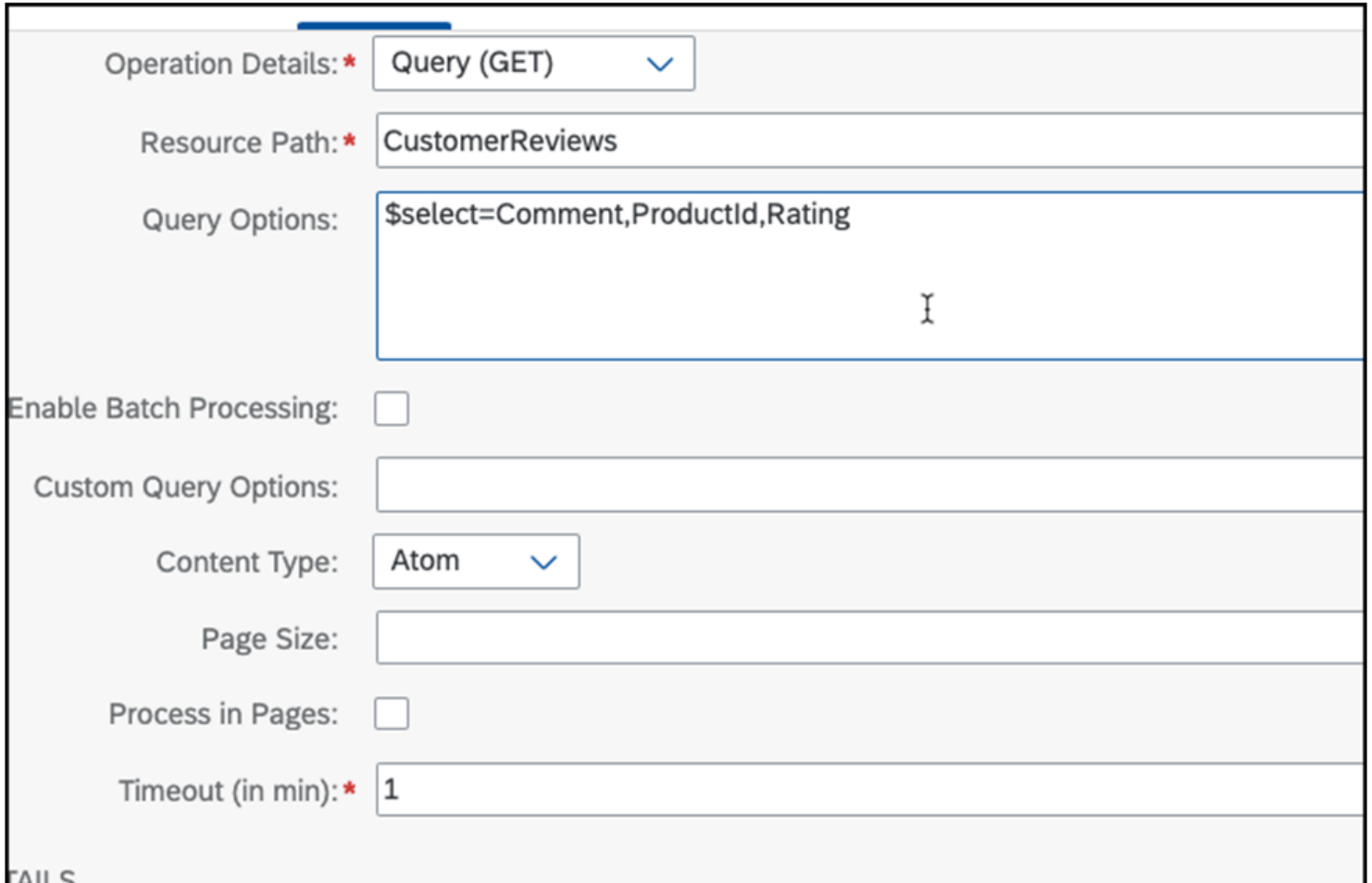
Detail	Outcome
Category	HTTP based
Transport protocol	TCP/IP
Application protocol	HTTP/HTTPS
Message protocol	Atom Pub as XML or JSON representation

Sample with Page Processing Mode

No Page Processing







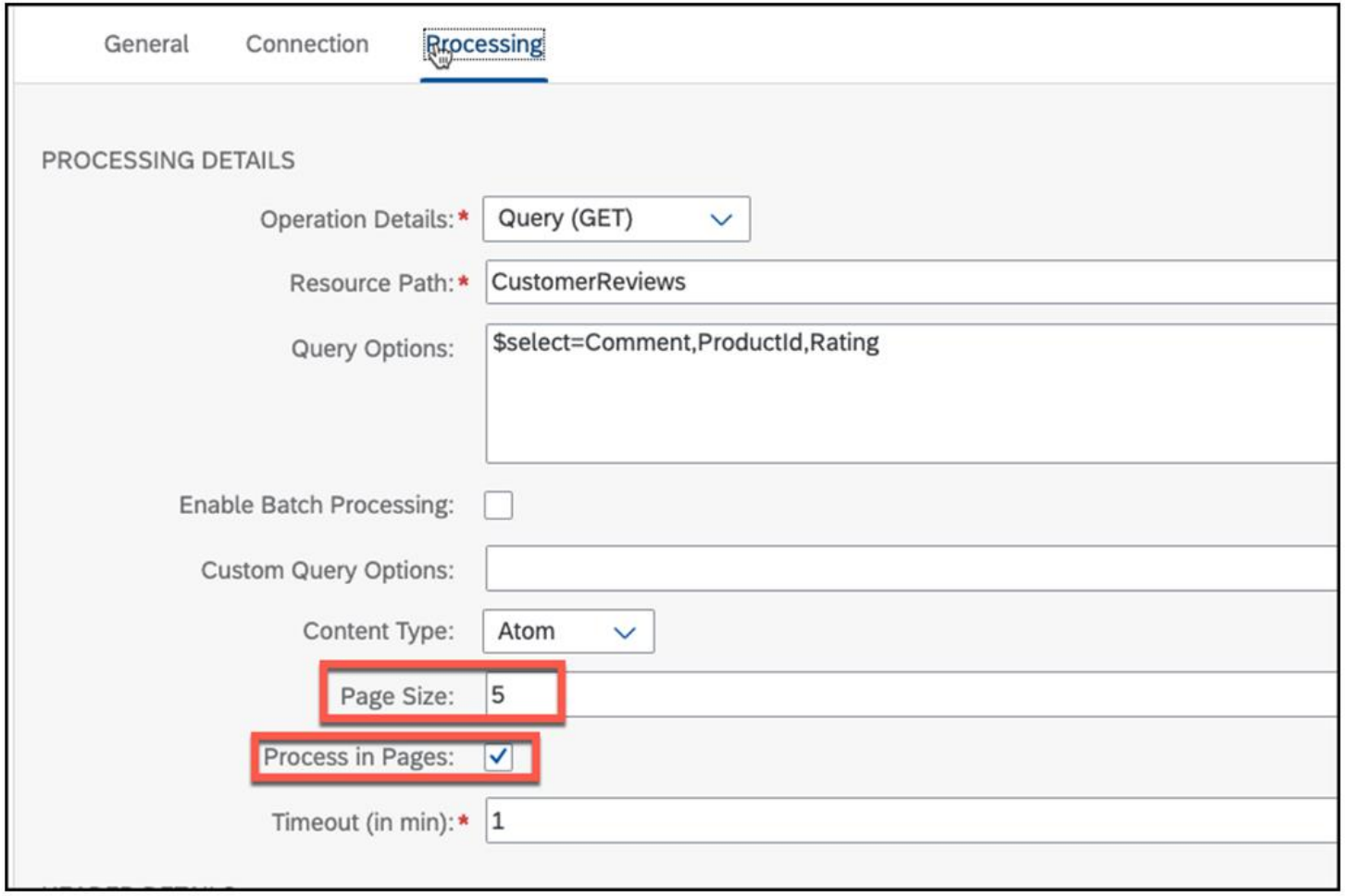
Sample with Page Processing Mode

The Result is:

```
<CustomerReviews>
<CustomerReview>
<Comment>A must buy. Great Performance</Comment>
<Rating>5</Rating>
<ProductId>HT-1000</ProductId>
</CustomerReview>
<CustomerReview>
<Comment>An average notebook, not for power users</Comment>
<Rating>2</Rating>
<ProductId>HT-1000</ProductId>
</CustomerReview>
<CustomerReview>
<Comment>bought this laptop for gifting. its a good buy</Comment>
<Rating>3</Rating>
<ProductId>HT-1000</ProductId>
</CustomerReview>
<CustomerReview>
<Comment>An Average mouse</Comment>
<Rating>3</Rating>
<ProductId>HT-1061</ProductId>
</CustomerReview>
<CustomerReview>
<Comment>A great PDA!!!</Comment>
<Rating>3</Rating>
<ProductId>HT-1007</ProductId>
</CustomerReview>
<CustomerReview>
<Comment>A great PDA!!! Must buy this one if you need a PDA</Comm
<Rating>3</Rating>
<ProductId>HT-1020</ProductId>
</CustomerReview>
<CustomerReview>
<Comment>Good product for the price</Comment>
```

Sample with Page Processing Mode

With Page Processing



Sample with Page Processing Mode

The Result is:

```
<CustomerReviews>
<CustomerReview>
<Comment>good</Comment>
<Rating>2</Rating>
<ProductId>HT-2001</ProductId>
</CustomerReview>
<CustomerReview>
<Comment>bad</Comment>
<Rating>1</Rating>
<ProductId>HT-2001</ProductId>
</CustomerReview>
<CustomerReview>
<Comment>Good1</Comment>
<Rating>5</Rating>
<ProductId>HT-2001</ProductId>
</CustomerReview>
<CustomerReview>
<Comment>very good</Comment>
<Rating>5</Rating>
<ProductId>HT-2001</ProductId>
</CustomerReview>
<CustomerReview>
<Comment>test</Comment>
<Rating>3</Rating>
<ProductId>HT-2001</ProductId>
</CustomerReview>
</CustomerReviews>
```

Exercise 12 Create a Request and Reply to an external Call (OData Adapter)

In this exercise, you will perform the following tasks:

Log on to the integration flow DelayedDelivery_Process.
Create and configure an OData Adapter.
Save as version, deploy, and debug your integration process.

Link: learning hub
Demo link: demo12-1 demo12-2

Exercise 13 Create and Configure a Router

In this exercise, you will perform the following tasks:

Log on to the integration flow DelayedDelivery_Process.
Create and configure a Router.
Save as version, deploy, and debug your integration process.
Link: learning hub
Demo link: demo13

Exercise 14 Create a Request and Reply to an external Call (HTTP Call)

In this exercise, you will perform the following tasks:

Log on to the integration flow DelayedDelivery_Process.
Create a request and reply to external HTTP call.
Save as version, deploy, and debug your integration process.
Link: learning hub
Demo link: demo14-1 demo14-2

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

Exercise 15 Create an XSLT Mapping

In this exercise, you will perform the following tasks:

Log on to the integration flow DelayedDelivery_Process.
Create an XSLT Template as Mapping component.
Customize the HTTP call Call_fetch_LineItems.
Save as version, deploy, and debug your integration process.

Link: learninghub
Demo link: demo15-1

Exercise 16 Create and Configure a Second General Splitter

In this exercise, you will perform the following tasks:

Step 1: Log on to the integration flow DelayedDelivery_Process.

Step 2: Create and configure a second General Splitter.

Step 3: Save as version, deploy, and debug your integration process

Link: learninghub
Demo link: demo16

Exercise 17 Create and Configure a Content Modifier for the SalesOrderID

In this exercise, you will perform the following tasks:

Step 1: Log on to the integration flow DelayedDelivery_Process.

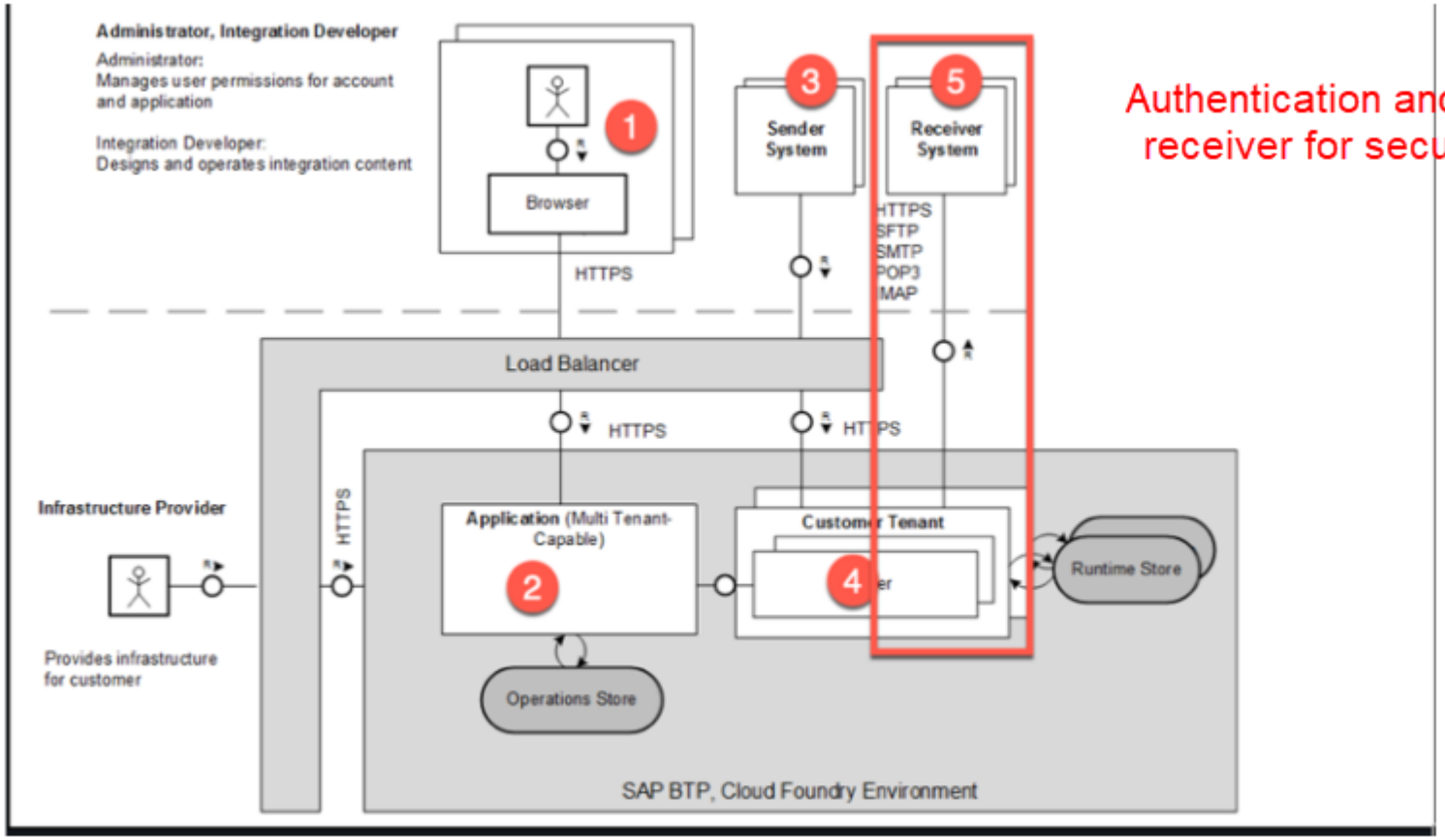
Step 2: Create and configure an Content Modifier.

Step 3: Save as version, deploy, and debug your integration process.

Link: learninghub

Demo link: demo17

Using Adapter Outbound Security



Authentication and Authorization with receiver for secure communication

Example of a Direct Receiver and Sender Adapter

Exercise 18 Create a Request and Reply an external Call

In this exercise, you will perform the following tasks:

Log on to the integration flow DelayedDelivery_Process.
Create a request and reply external call.
Save as version, deploy, debug, and check the result.

Link: learning hub
Demo link: demo18

Exercise 19 Create an XSLT Template as Mapping Component

In this exercise, you will perform the following tasks:

Log on to the integration flow DelayedDelivery_Process.
Create an XSLT template as Mapping component.
Save as version, deploy, and debug your integration process.

Link: learninghub
Demo link: demo19

Exercise 20 Create and Configure an Content Modifier for the CustomerID

In this exercise, you will perform the following tasks:

Log on to the integration flow DelayedDelivery_Process.
Create and configure an Content Modifier.
Save as version, deploy, and debug your integration process.

Link: learninghub
Demo link: demo20

Exercise 21 Create a Data Store Operation

In this exercise, you will perform the following tasks:

Log on to the integration flow DelayedDelivery_Process.
Create a Data Store Operation.
Configure a Data Store Operation.
Save as version, deploy, and debug your integration process.
Check the Data Store.
Delete the data store entries.
Learn more about Data Store operations.

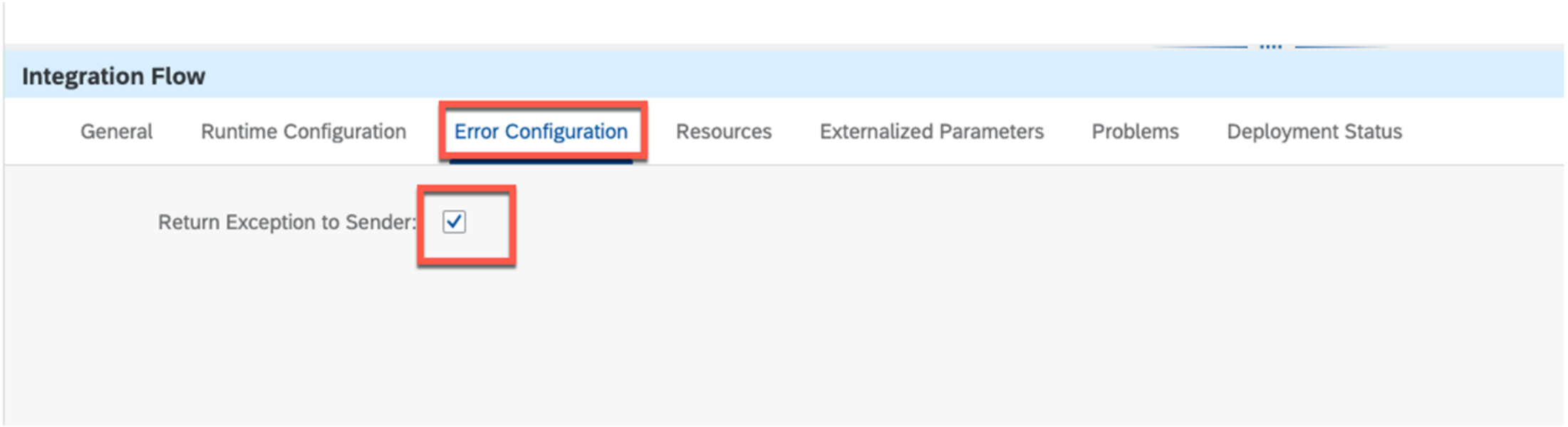
Link: learninghub
Demo link: demo21

Performing Exception Handling

Two Kinds of Exception

- Expected and unexpected.

Define Error Configuration for one Integration Flow



Exercise 22 Create an Exception Process

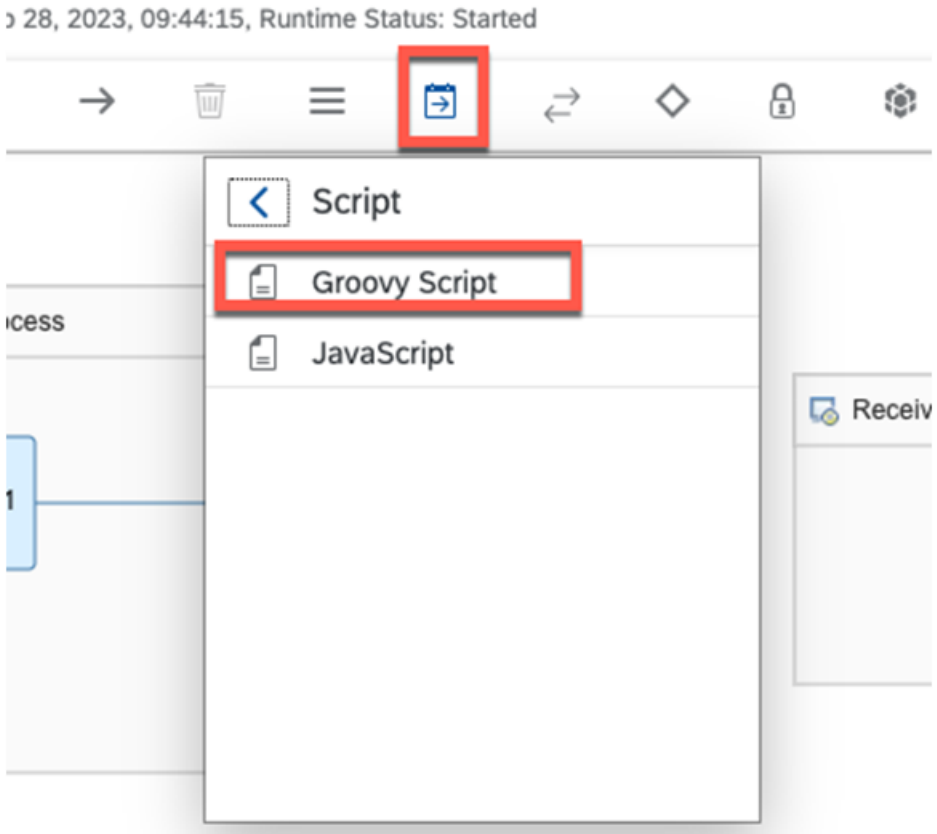
In this exercise, you will perform the following tasks:

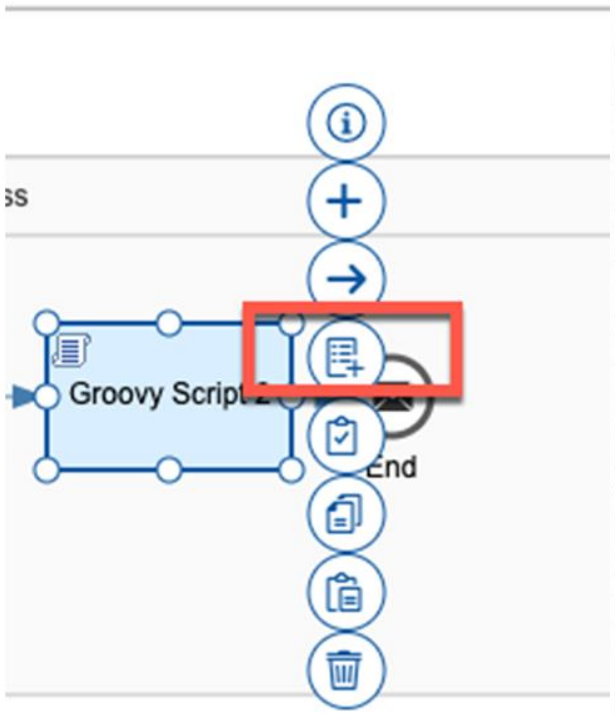
Log on to the integration flow DelayedDelivery_Process.
Create and configure an Exception Subprocess.
Learn more about the Exception Subprocess.

Link: learninghub
Demo link: demo22

Using Scripting

- **Developing Groovy Scripts with the inline editor**



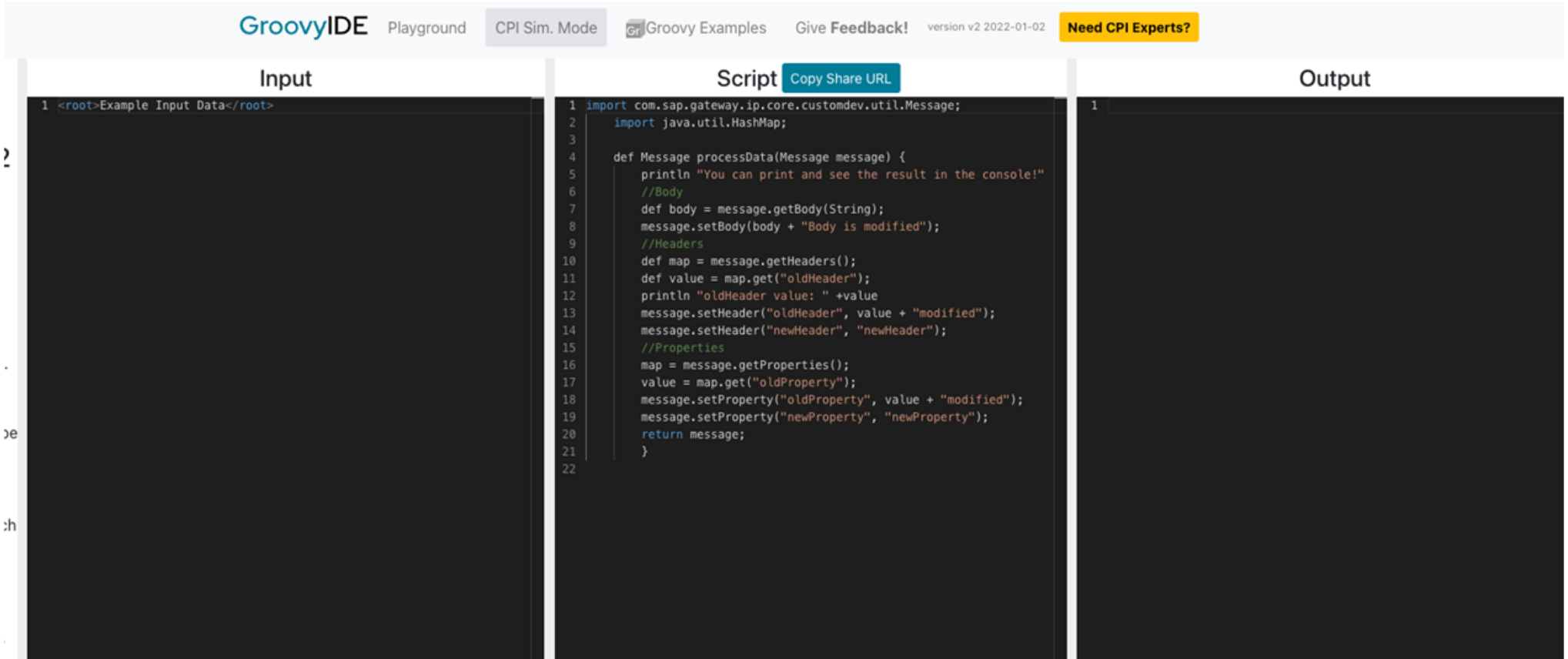



```
/* Refer the link below to learn more about the use cases of script.
https://help.sap.com/viewer/368c481cd6954bdfa5d0435479fd4eaf/Cloud/en-

If you want to know more about the SCRIPT APIs, refer the link below
https://help.sap.com/doc/a56f52e1a58e4e2bac7f7adbf45b2e26/Cloud/en-US/
import com.sap.gateway.ip.core.customdev.util.Message;
import java.util.HashMap;
def Message processData(Message message) {

    //Body
    def body = message.getBody();
    message.setBody(body + " Body is modified");
    //Headers
    m
    return message;
}
```

```
modified local
message local
Message local
more local
Math keyword
HashMap local
import local
customdev local
```

Using Scripting

- Create Groovy Scripts with an External Editor
  - You can build a local development environment with Eclipse, IntelliJ, or Visual Code. You can get the corresponding SDK here: SAP Development Tools at Using Script API → Script API.
  - There is also an online editor with which you can write and test directly. Use Groovy IDE for easy development and testing of your scripts. All necessary SDKs are already implemented.



Exercise 23-1 Create a Groovy Script for Error Handling

In this exercise, you will perform the following tasks:

Log on to the integration flow DelayedDelivery_Process.
Create a Groovy Script.
Save as version, deploy, and debug your integration process.

Link: learninghub
Demo link: demo23-1

Exercise 23-2 Replace the Timer Event by a Message Start Event

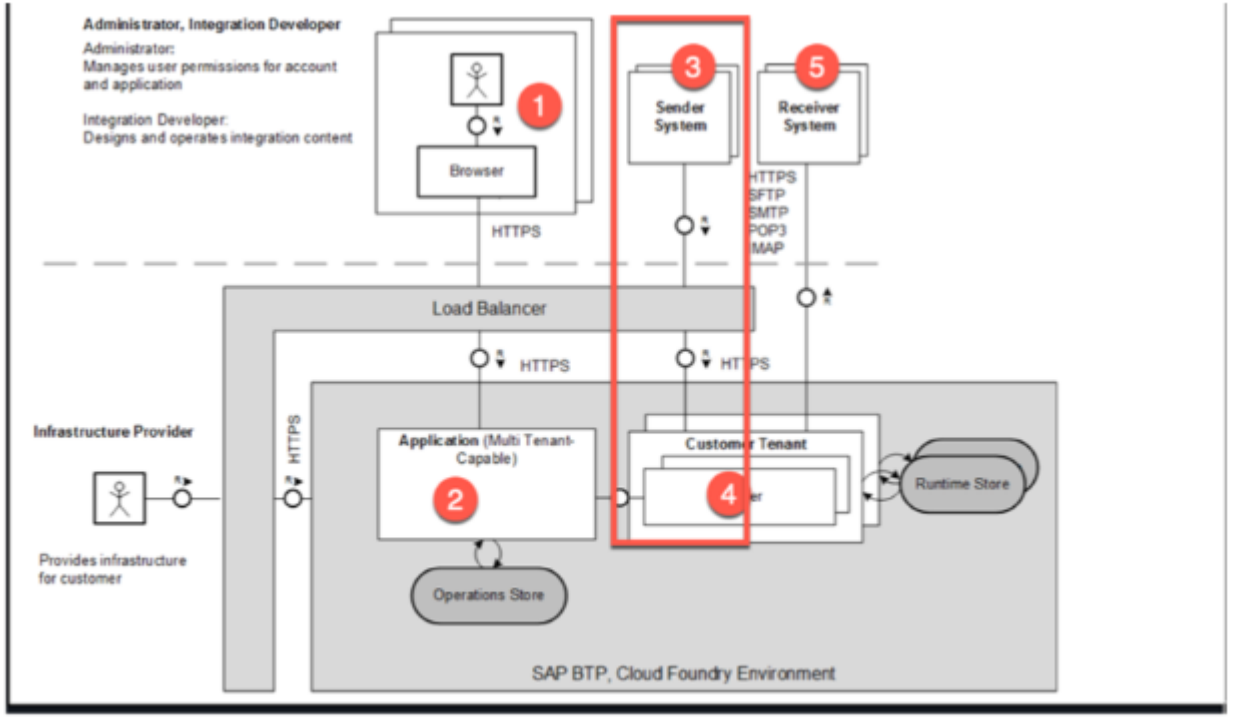
In this exercise, you will perform the following tasks:

Log on to the integration flow DelayedDelivery_Process.
Substitute the timer event with a message start event.
Save as version, deploy, and debug your integration process.

Link: learninghub
Demo link: demo23-2

Using Adapter Inbound Security

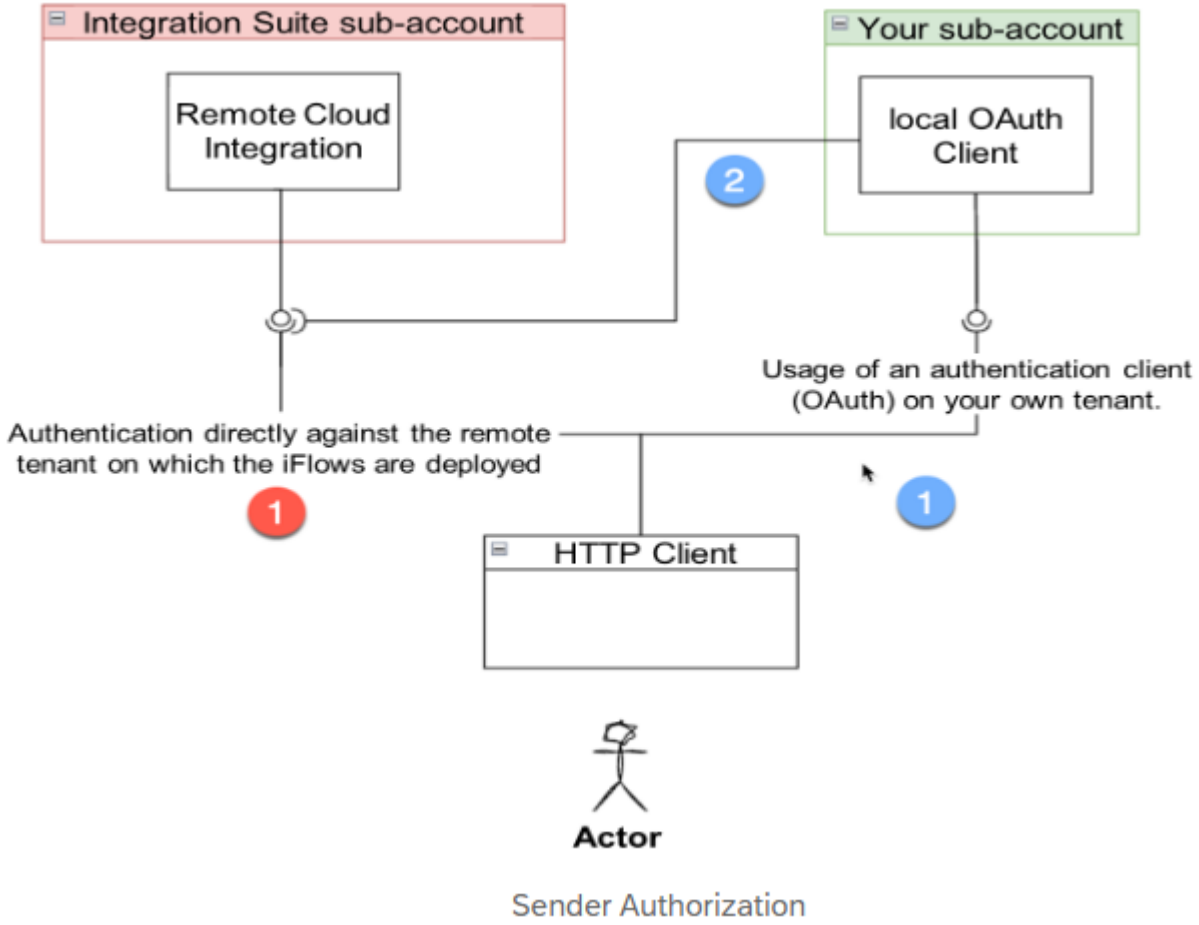
- Certificates between sender and load balancer for HTTPS connection
- Sender's authorization validated against Integration flow endpoint



Options for Authentication / Authorization

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

Authorization of sender



Sender Authorization

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

Exercise 24 Create an Inbound SOAP Adapter

In this exercise, you will perform the following tasks:

Log on to the integration flow DelayedDelivery_Process.
Create an Inbound SOAP Adapter.
Save as version and deploy your integration process.

Link: learninghub
Demo link: demo24

Exercise 25 Allow the Sender to Send Messages to the Endpoint of the iFlow

In this exercise, you will perform the following tasks:

Check the role ESBMessaging.send at Cloud Integration.
Create a Role Collection at your SAP BTP subaccount.

Link: learninghub
Demo link: demo25

Exercise 26 Create an HTTP Client to Send SOAP Messages to an iFlow

In this exercise, you will perform the following tasks:

Use Postman HTTP Client to send a message to the integration flow.

Use curl to send a message to the integration flow.

Create an HTTP Client with Business Application Studio.

Link: learninghub

Demo link: demo26

Exercise 27 Remove the ?$top Parameter at Call_fetchLineItem

In this exercise, you will perform the following tasks:

Remove the ?&top=2 parameter at Call_fetchLineItem.
Version, deploy, and run the process.
Handle large entries in the Monitor.
Check out the configuration of the SOAP adapter.

Link: learninghub
Demo link: demo27

Using Integration Patterns

- Aggregator
- Composed Message Processor
- Content-Based Routing
- Content Enricher
- Content Filter
- Message Filter
- Recipient List
- Resequencer
- Scatter-Gather
- Splitter
- Quality of Service Exactly Once

Exercise 28 Install Example Integration Flows

In this exercise, you will perform the following tasks:

Log on to the Discover → Integration view.
Search, find, and copy the example integration flows to your Design area.
Check out the documentation.
Check out the help pages.
Link: learninghub
Demo link: demo28

Exercise 29 Install the Postman Collection

In this exercise, you will perform the following tasks:

Download the Postmann Collection JSON file.
Open Postman HTTP Client.
Install the Postman Collection.
Link: learninghub
Demo link: demo29

Exercise 30 Check out Decoupled iFlows Using JMS

In this exercise, you will perform the following tasks:

Deploy the Generic Receiver if it has not been deployed yet, following the instructions mentioned earlier.
Explore the Decouple Flows Using JMS integration flow.
Explore the Documentation to Decouple Flows Using JMS.
Deploy, Run, and Trace your process to understand how it works.
Examine other Integration Flow Design Guidelines.

Link: learninghub
Demo link: demo30

Key Summary Points – Unit 5

Q2. Which object do you use to transform message structure into a specific target structure?

- ✓ XSLT Mapping
- B Message Mapping
- C Value Mapping
- D Content Modifier

✓ Correct

Correct. You use the XSLT Mapping to transform message structure into a specific target structure.

Key Summary Points – Unit 5

Q3. Where can user credentials be configured for secure authentication?

A Monitor → API → Manage Security → Manage Security Material

✓ Monitor → Integrations → Manage Security → Manage Security Material

C Monitor → Integrations → Manage Security → User Role

✓ Correct

Correct. You configure user credentials here: Monitor → Integrations → Manage Security → Manage Security Material.

Key Summary Points – Unit 5

Q6. What role do you need to assign to yourself in order to send a message to your configured endpoint?

- ✓ ESBMessaging.send
- B Send.To.Endpoint
- C ESB.Messaging.Send
- D HTTP.ESBMessaging.Send

✓ Correct

Correct. In order to send a message to your configured endpoint you need to assign the role: ESBMessaging.send.

Features of OData Adapter

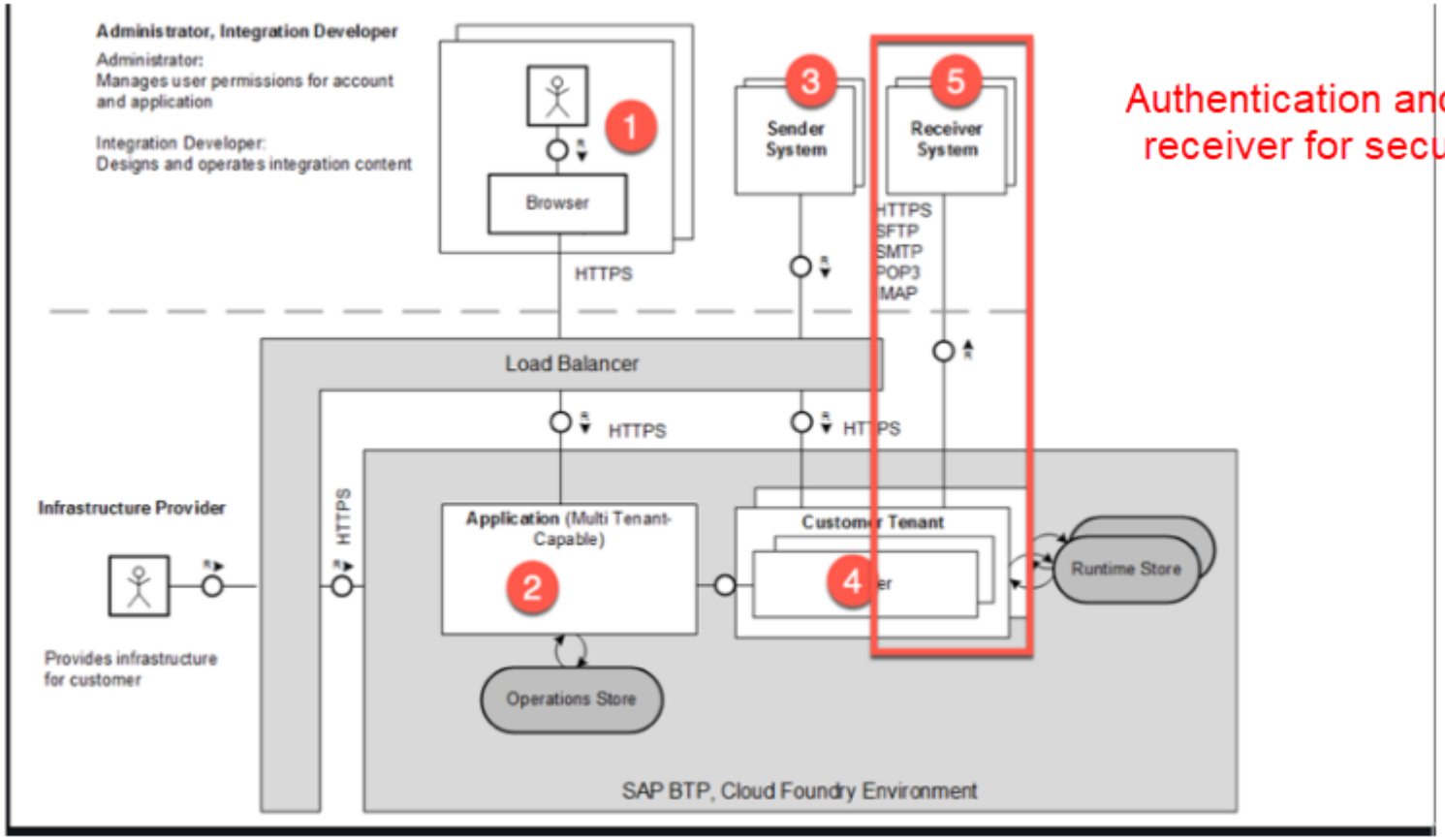
Query wizard

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

Example: OData Adapter

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

Using Adapter Outbound Security

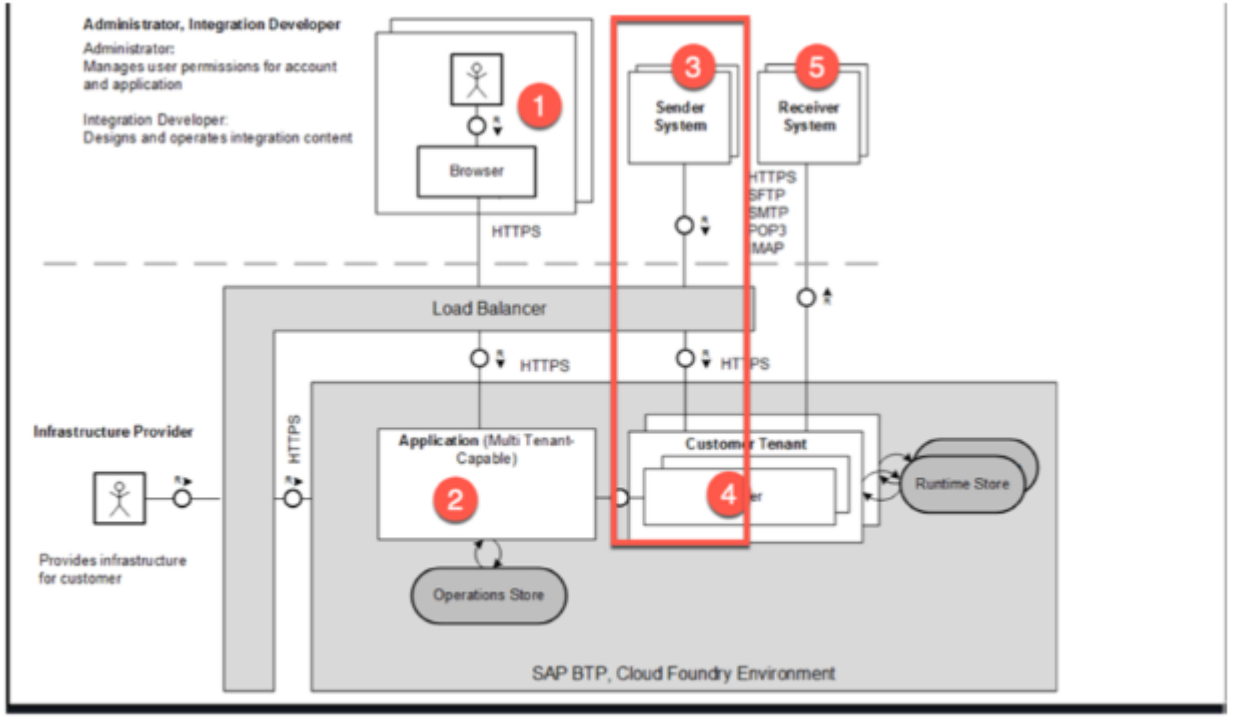


Authentication and Authorization with receiver for secure communication

Example of a Direct Receiver and Sender Adapter

Using Adapter Inbound Security

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



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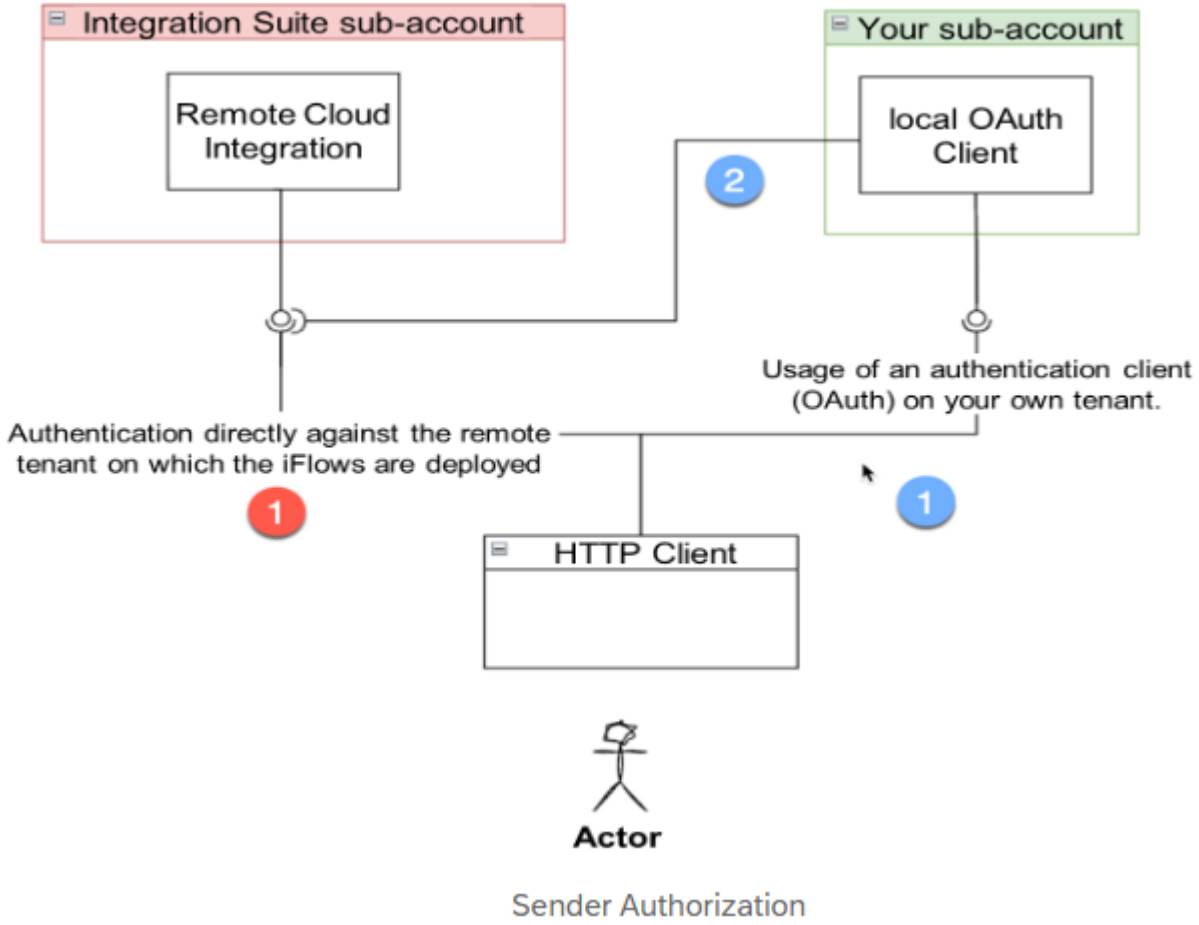

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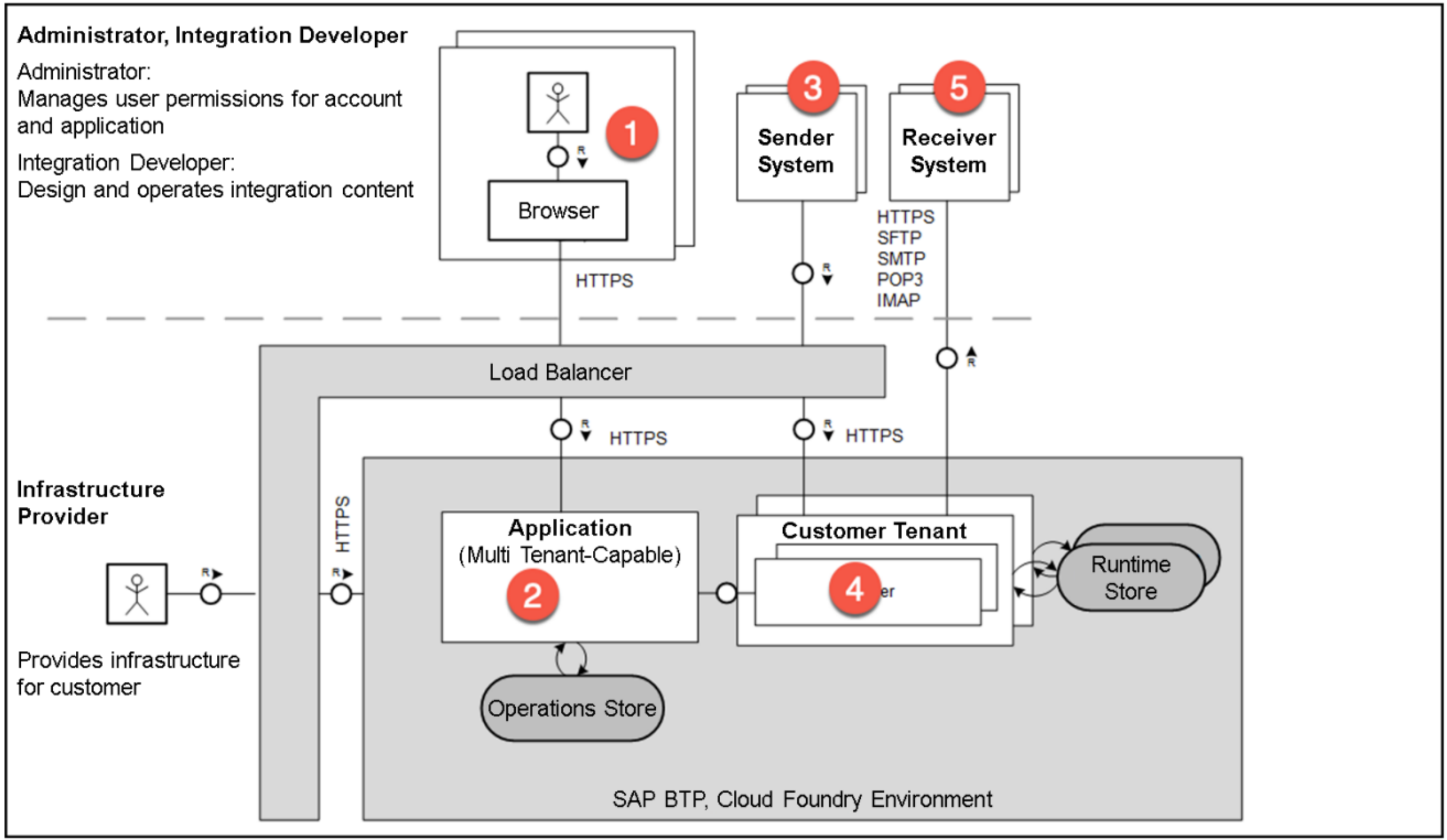

Administrator, Integration Developer
Administrator:
Manages user permissions for account and application
Integration Developer:
Design and operates integration content
Browser
1
3
Sender System
5
Receiver System
HTTPS
SFTP
SMTP
POP3
IMAP
HTTPS
Load Balancer
HTTPS
HTTPS
HTTPS
Infrastructure Provider
Application
(Multi Tenant-Capable)
2
Customer Tenant
4
Runtime Store
Operations Store
Provides infrastructure for customer
SAP BTP, Cloud Foundry Environment

Outro

Certification preparation

Topic distribution

60 Questions 2 hrs 75% cut score

- **SAP Integration Suite Overview** 11% - 20%
- **Introducing iPaaS** 11% - 20%
- **Managing APIs** 11% - 20%
- **Managing Cloud Integration** 11% - 20%

Certification preparation

General rules about questions

- Questions
  - are simple and objective.
  - can be single choice or multiple choice, which will be clearly indicated.

- Multiple-choice questions
  - number of correct answers is given as part of the question.
  - question is considered correct only if all correct alternatives are selected.
    - i.e. multiple-choice questions **cannot** be partially correct. They are either correct or wrong.

Certification preparation

Important Exam Process and Security Guidelines

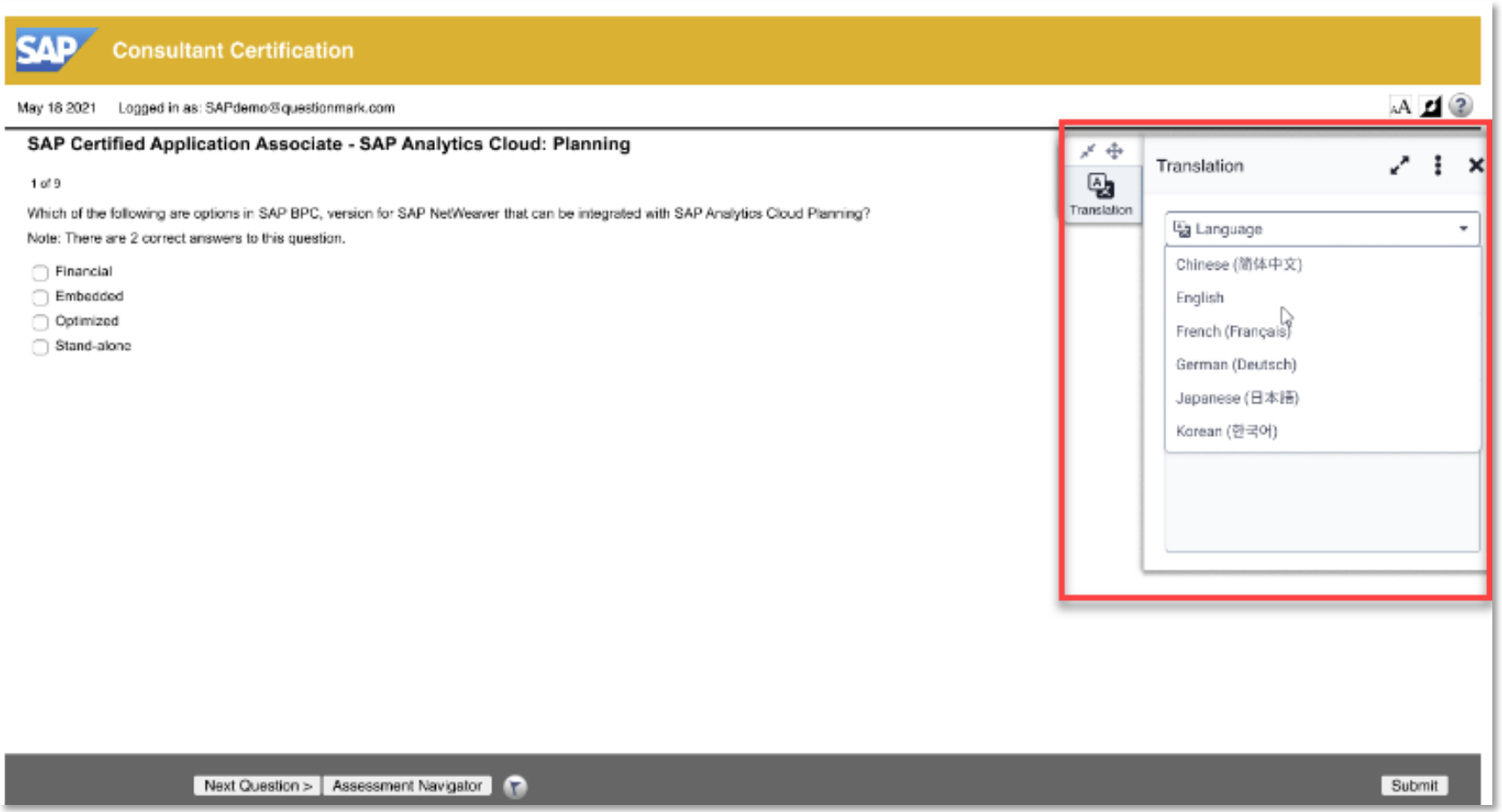
- An on-site exam:
  - is proctored in person by an exam supervisor
  - requires 2 forms of valid identification (not expired)
    - at least one government-issued photo ID
  - personal items (cell phones, bags, notepads, organizers, etc.) not allowed
- An online exam:
  - requires stable internet
  - is proctored remotely via Zoom (both webcam and entire desktop)
  - requires government-issued photo ID (not expired) via webcam
  - is only released by the exam supervisor after checking the exam environment
    - requires you to be in a quiet and secure room alone throughout the exam
    - you will be asked to rotate your webcam around the room
    - only one screen may be active.
    - cellphones/tablets and recording devices are forbidden
  - requires you use the Questionmark Secure browser to access the exam

More details here

Take SAP Certification Exams in your own language

With a new translation tool, SAP can now provide real-time machine translation from English to eight other languages: Chinese, French, German, Japanese, Korean, Portuguese, Russian, and Spanish

Please read this blog for additional details.



What are the next steps?

Here we are today

ACADEMY REGISTRATION

Completion of any Academy pre-requisites

LIVE SESSIONS

Join the live sessions with our subject matter experts

ACADEMY COMPLETION

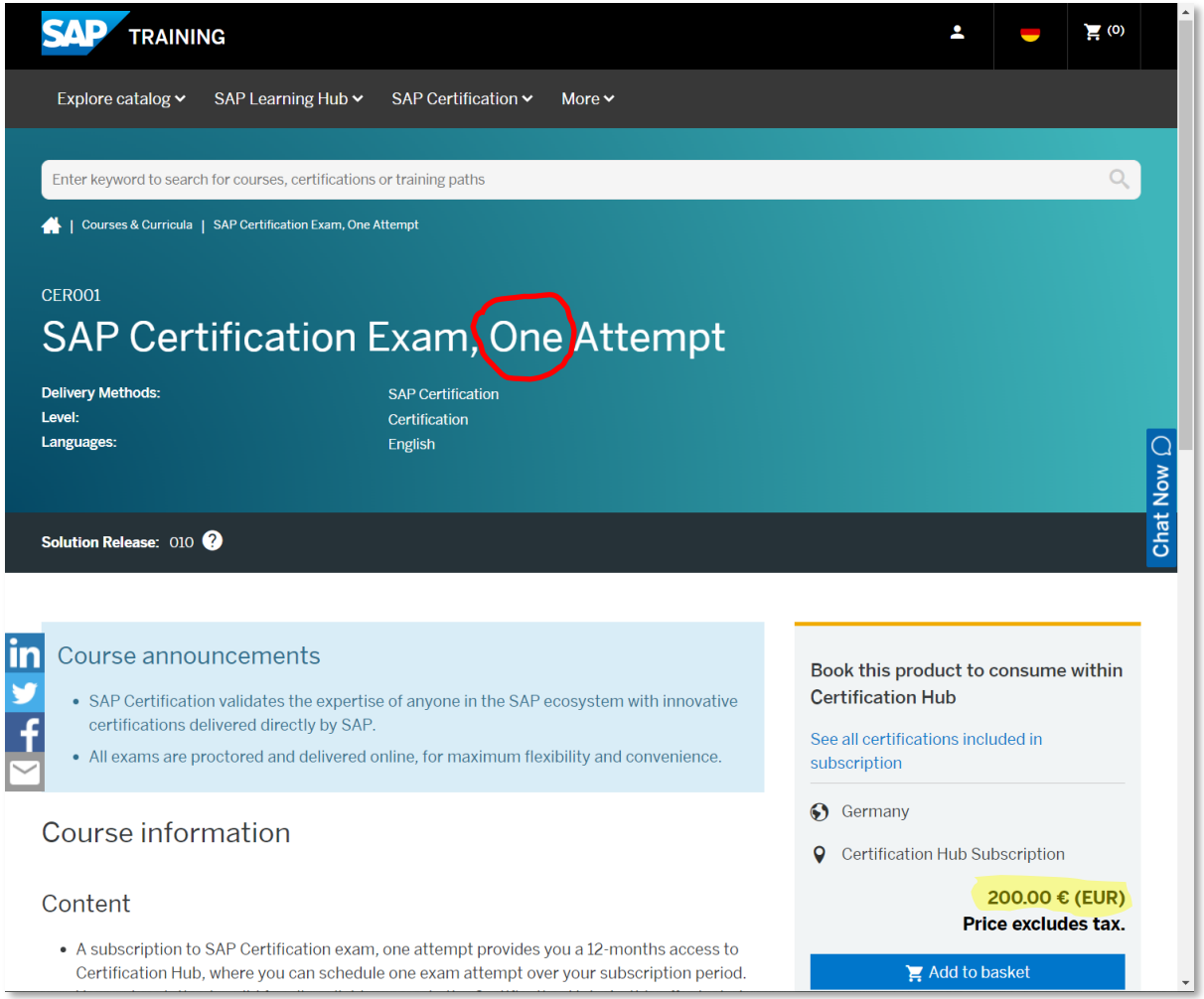
Familiarize yourself with any remaining content of the Learning Journey

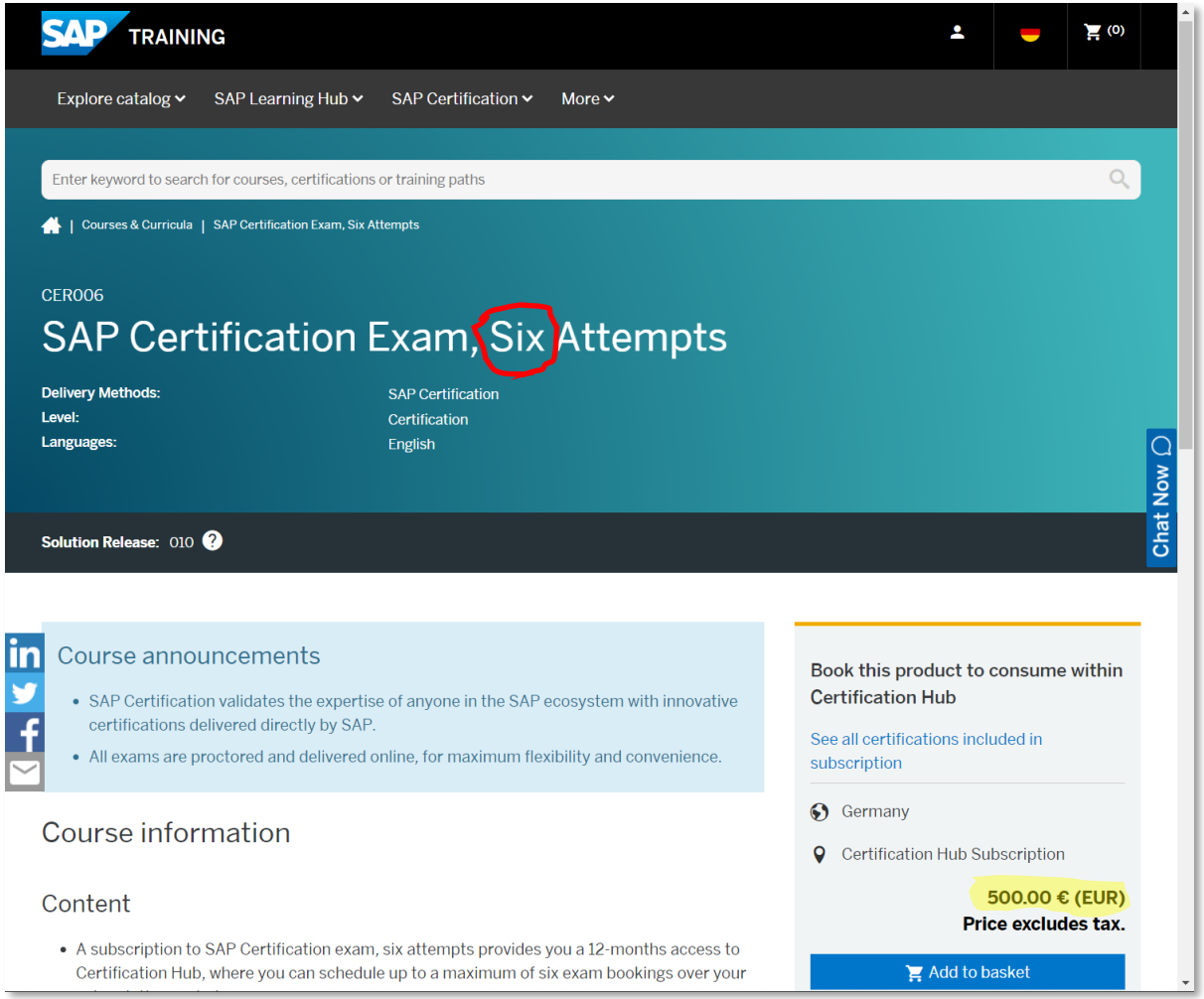
Optionally join the “Ask the Expert” sessions

GET CERTIFIED

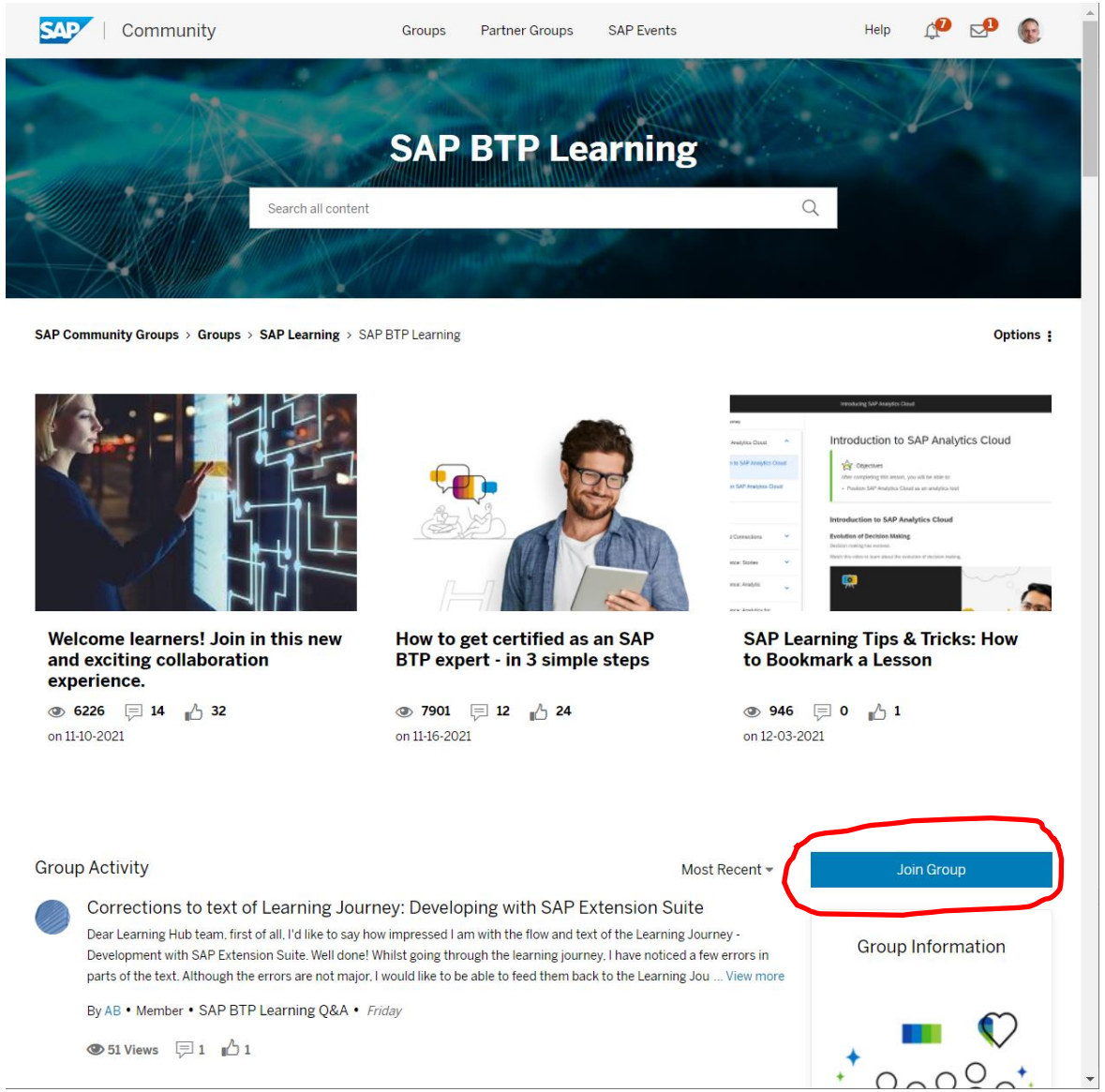
Book and complete your certification exam

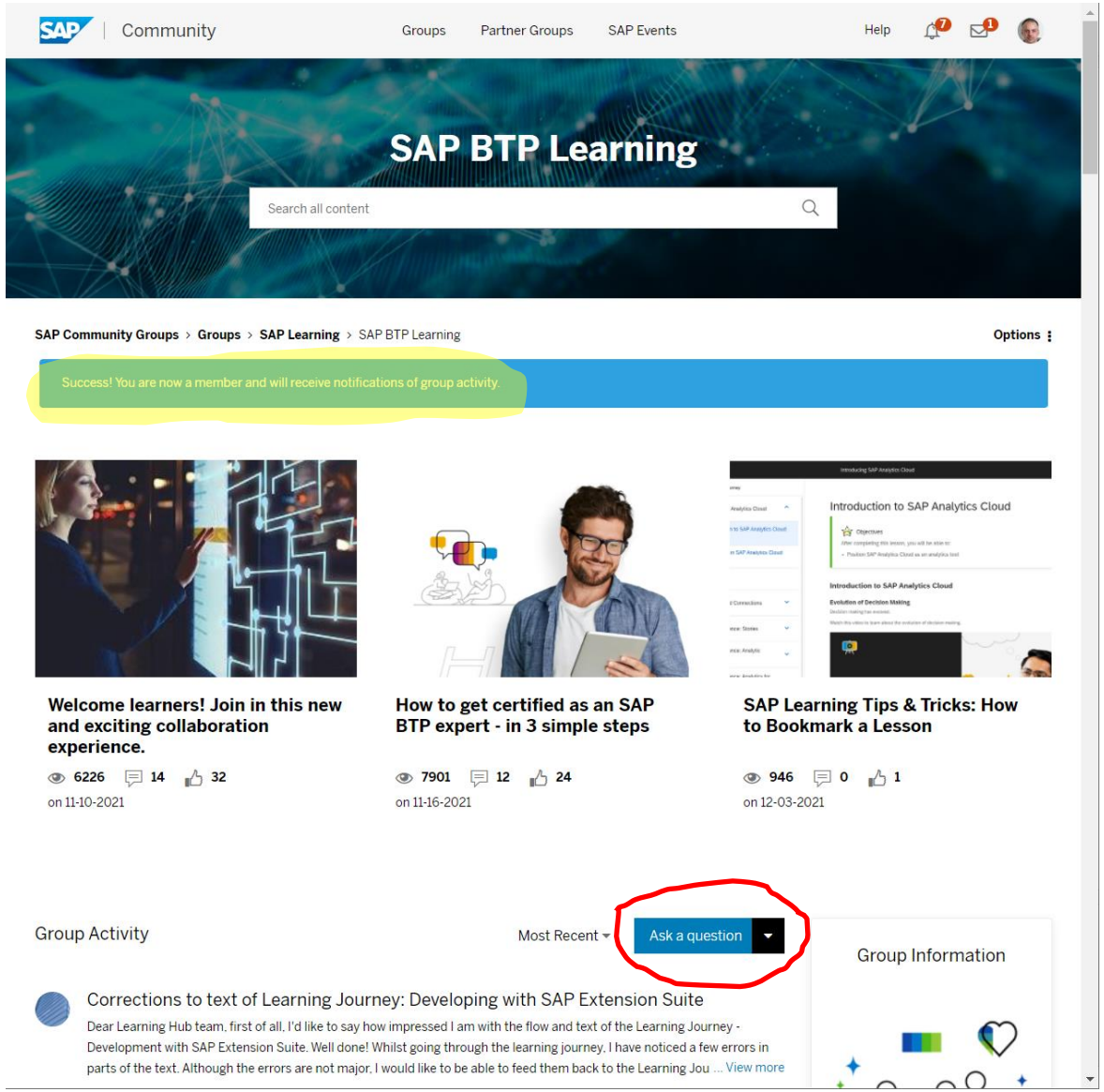
Purchasing certification exam attempts





Ask your “off-line” questions in the SAP BTP Learning community





Complement your certification related learning with SAP HANA Academy

Check out the blog post for current and coming topics

Denys van Kempen

May 10, 2022 | 8 minute read

Get Certified – SAP Integration Suite | SAP BTP Certification Video Tutorials

5 10 5,830

Interested to get SAP BTP certified? Here is a video tutorial series from the SAP HANA Academy to help you reach your goal.

- Get Certified – SAP Integration Suite << this article
- Get Certified – SAP Extension Suite
- Get Certified – SAP HANA Cloud

For earlier articles about SAP BTP certifications, see

- Get Certified: C_CPI_14 | SAP Certified Development Associate – SAP Integration Suite
- Get Certified: C_CPE_13 | SAP Certified Development Associate – SAP Extension Suite
- Get Certified: C_SAC | SAP Certified Application Associate – SAP Analytics Cloud
- Get Certified: C_HCADM | SAP Certified Technology Associate – SAP HANA Cloud
- Get Certified: C_HCMOD_01 | SAP Certified Technology Associate – SAP HANA Cloud
- Get Certified: C_HCDEV_01 | SAP Certified Development Associate – SAP HANA Cloud

Questions? Please post as comment.

Useful? Give us a like and share on social media.

Thanks!

Dive directly into the video playlist of the first topic covered – SAP Integration Suite

SAP BTP Certifications: SAP Integration Suite

16 videos • 644 views • Updated yesterday

Video tutorials to prepare for the SAP Certification SAP Certified Development Associate - SAP Integration Suite (C_CPI_14):
https://learning.sap.com/learning-jou...

For the article (blog post), see
https://blogs.sap.com/2022/05/10/get-...

Exclusive for SAP Partners, make sure also to check out the schedule for the live sessions
https://bit.ly/partneredge-certificat...

SAP HANA Academy SUBSCRIBE

1 SAP Integration Suite Certification | SAP Discovery Center — SAP HANA Academy — 5:39

2 SAP Integration Suite Certification | Entitlements — SAP HANA Academy — 4:24

3 SAP Integration Suite Certification | Provisioning — SAP HANA Academy — 5:05

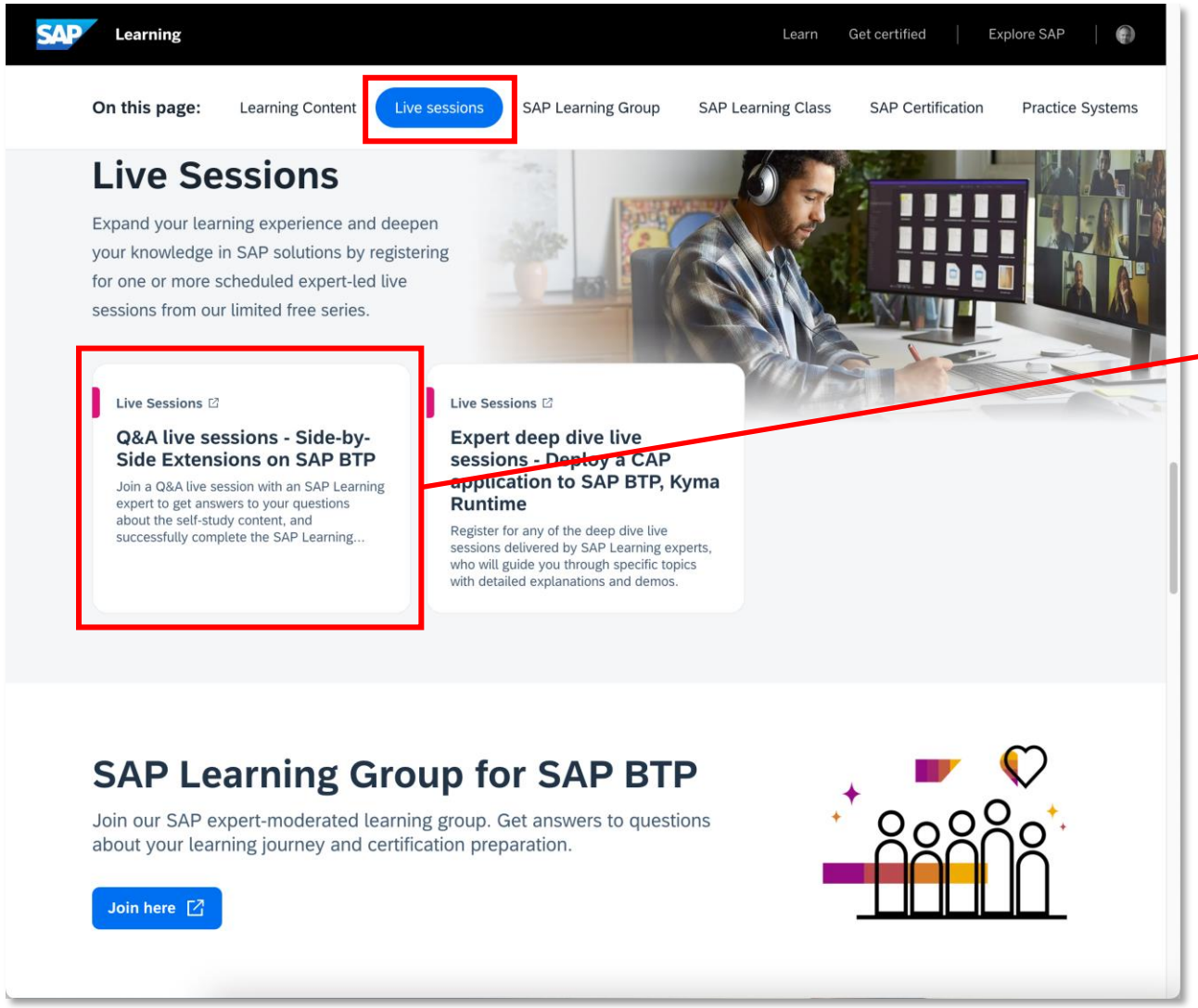
4 SAP Integration Suite Certification | Open Connectors — SAP HANA Academy — 4:12

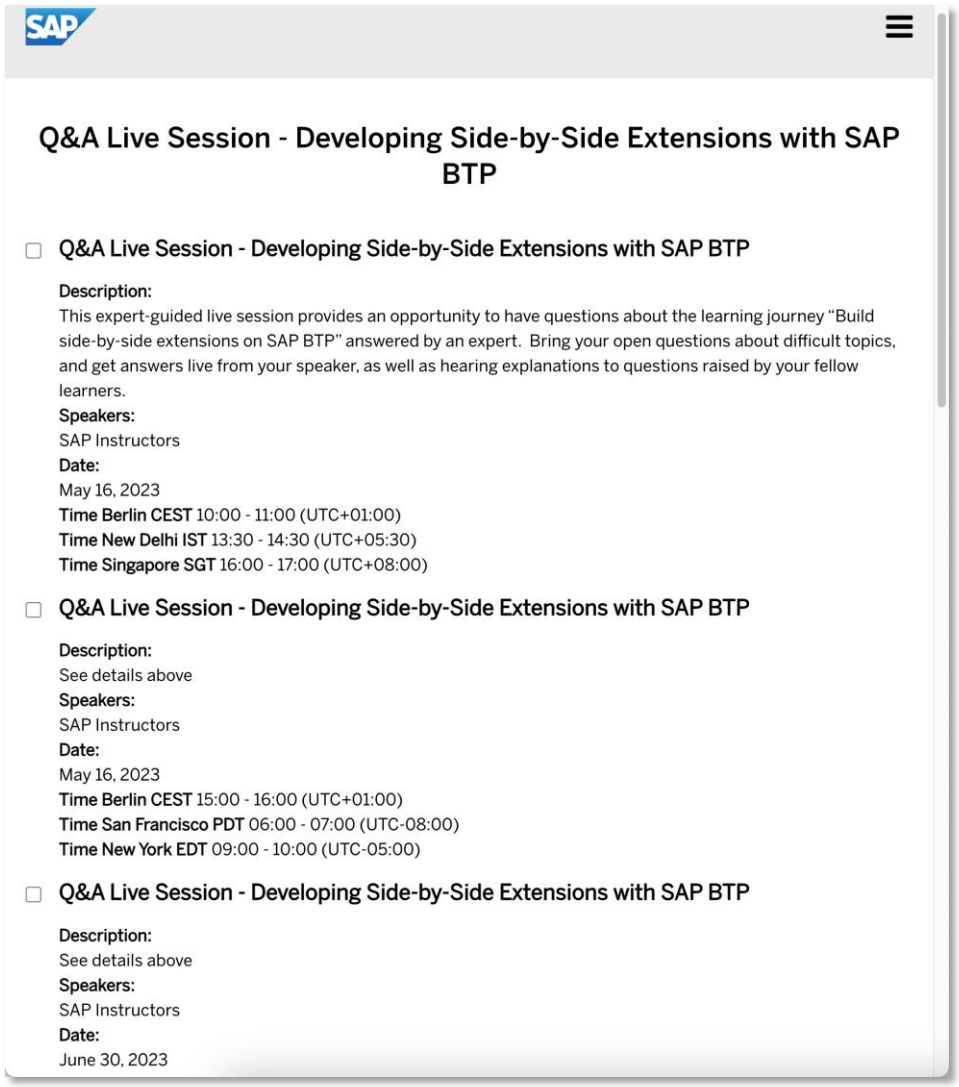
5 SAP Integration Suite Certification | Open Connectors — SAP HANA Academy — 3:49

6 SAP Integration Suite Certification | API Management — SAP HANA Academy — 6:48

7 SAP Integration Suite Certification | API Management — SAP HANA Academy — 6:40

Live Q&A sessions with SAP Learning for select Learning Journeys





Current schedule for all Partner Certification Academies for SAP BTP

Past dates leads to recorded replays

Learning Journey	Associated Certification	Schedule & Registration links		
		NA/LAC	EMEA	APJ/ANZ
Designing Stories in SAP Analytics Cloud	SAP Certified Application Associate - SAP Analytics Cloud Story Design	Q3 2023 replay	Q3 2023 replay	Q3 2023 replay
Leveraging SAP Analytics Cloud Functionality for Enterprise Planning	SAP Certified Application Associate - SAP Analytics Cloud: Planning	Q3 2023 replay	Q3 2023 replay	Q3 2023 replay
Build side-by-side extensions on SAP BTP	SAP Certified Development Associate - SAP BTP Extension Developer	Oct 17,19,31	Sep 26,28 / Oct 10	Sep 26,28 / Oct 10
Develop Full-Stack Applications Using Productivity Tools in SAP Business Application Studio	SAP Certified Development Associate - Build applications with SAP Business Application Studio	Oct 24,26 / Nov 2	Oct 3,5,12	Oct 10,12,24
Deliver Side-by-Side Extensibility based on SAP BTP, Kyma Runtime	SAP Certified Development Associate - Side-by-Side Extensibility based on SAP BTP, Kyma runtime	Oct 24,26 / Nov 2	Oct 31 / Nov 2,9	←
Developing with SAP Integration Suite	SAP Certified Development Associate - SAP Integration Suite	Sep 26,28 / Oct 10	Oct 10,12,24	Sep 26,28 / Oct 10
Develop Data Models with SAP HANA Cloud	SAP Certified Technology Associate - SAP HANA Cloud Modeling	Q2 2023 replay	Q2 2023 replay	Q2 2023 replay
Develop Applications Running on SAP BTP Using SAP HANA Cloud	SAP Certified Development Associate - SAP HANA Cloud 1.0	Q2 2023 replay	Q2 2023 replay	Q2 2023 replay
Explore Provisioning and Administration with SAP HANA Cloud	SAP Certified Technology Associate - SAP HANA Cloud Provisioning and Administration	Q4 2022 replay	Q4 2022 replay	Q4 2022 replay
Utilize SAP Build for Low-Code/No-Code Applications and Automations for Citizen Developers	SAP Certified Citizen Developer Associate - SAP Build Low-code/No-code Applications and Automations	→	Oct 3, 5, 11	←
Implement and Administer SAP Build Work Zone	SAP Certified Application Associate - SAP Build Work Zone - Implementation and Administration	Q2 2023 replay	Q1 2023 replay	Q1 2023 replay

Last date is the optional Ask-the-Expert session

Latest schedule and information can always be found here.

SAP® PartnerEdge®

Thank you.

Contact information:

Eve Li

Shanghai, SAP, PVG12
eve.li@sap.com

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