



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

FOR INTERNAL SAP AND PARTNER USE ONLY

Agenda

Day 1

Intro

Unit 1 Introducing the
Integration Suite

Unit 2 Introducing iPaaS

Unit 3 Managing APIs

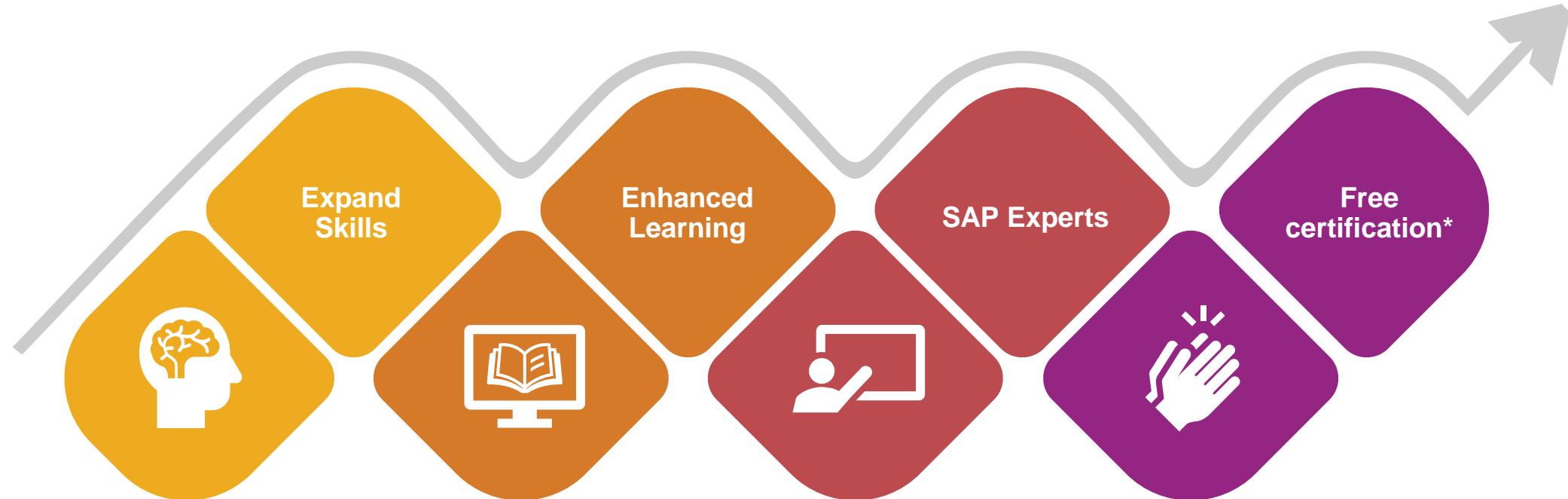
Day 2

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*

Certification drives career growth and greater earning potential



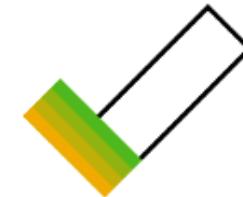
28%

salary or wage
increase



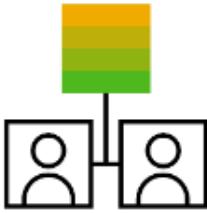
61%

promotion and
job advancement



76%

greater job
satisfaction



76%

increased respect
from peers



74%

more work autonomy
and independence



91%

increased
confidence in
abilities

Certifications are key for the new Partner Competency Framework

Visualization of Branding & Logos on Partner Assets



- Earned competencies, no specialization details



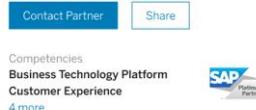
- Single earned competency, with earned specializations

Partner Finder

Partner Example

We Transform. SAP® Solutions into Value

Partner Value Prop



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

Specializations	ESSENTIAL		
	SOLUTION CONSULTANTS	DELIVERED PROJECTS	SPECIALIZATIONS
Database and Data Management	3	1	1
	3	1	
	3	1	

ADVANCED		
SOLUTION CONSULTANTS	DELIVERED PROJECTS	SPECIALIZATIONS
5	3	2

SOLUTION CONSULTANTS	DELIVERED PROJECTS	SPECIALIZATIONS	PARTNER IP WITH BTP
10	5	3	1

How does it work?



Background

SAP Learning Journeys

SAP Learning Journeys provide free, easy-to-navigate learning content which helps you gain the skills you need and to prepare for an SAP Certification. Find the right journey for your specific learning needs and reach your learning goals quickly.



Build the skills you need at your own pace

Choose one of the guided SAP Learning Journeys

SAP LEARNING JOURNEY
Utilize Low-Code/No-Code Applications and Automations for Citizen Developers
8 Units • 18 hrs • SAP Certification

SAP LEARNING JOURNEY
Discover SAP Business Technology Platform
9 Units • 6 hrs 15 mins • Record of Achievement

SAP LEARNING JOURNEY
Getting Started with UX
3 Units • 8 hrs

SAP LEARNING JOURNEY
Introducing SAP Analytics Cloud
8 Units • 20 hrs • SAP Certification

SAP Certification

SAP Certifications for developers are proof of programming knowledge and product expertise. Each certification is based on an SAP Learning Journey, which ends with a certification exam. Get certified and benefit from the value of SAP Certification.

- Expand your skills
- Increase your earnings
- Improve your job satisfaction



Validate your SAP expertise

SAP Certifications are an important asset in your career. Not only do they validate your skills and competencies around SAP software, SAP Certifications offer other tangible benefits, like improved earnings potential and greater job satisfaction. SAP Certifications are highly valued credentials that set you apart in a crowded market. Pass the certification exam and you'll receive a digital badge that you can use to verify your knowledge.

Choose an SAP Certification and follow the related free learning journey to prepare for your certification exam.

C_CPE_13
SAP Certified Development Associate - SAP Extension Suite
80 Questions • 3 hrs

C_SAC_2202
SAP Certified Application Associate - SAP Analytics Cloud
80 Questions • 3 hrs

Partner Certification Academies for SAP BTP

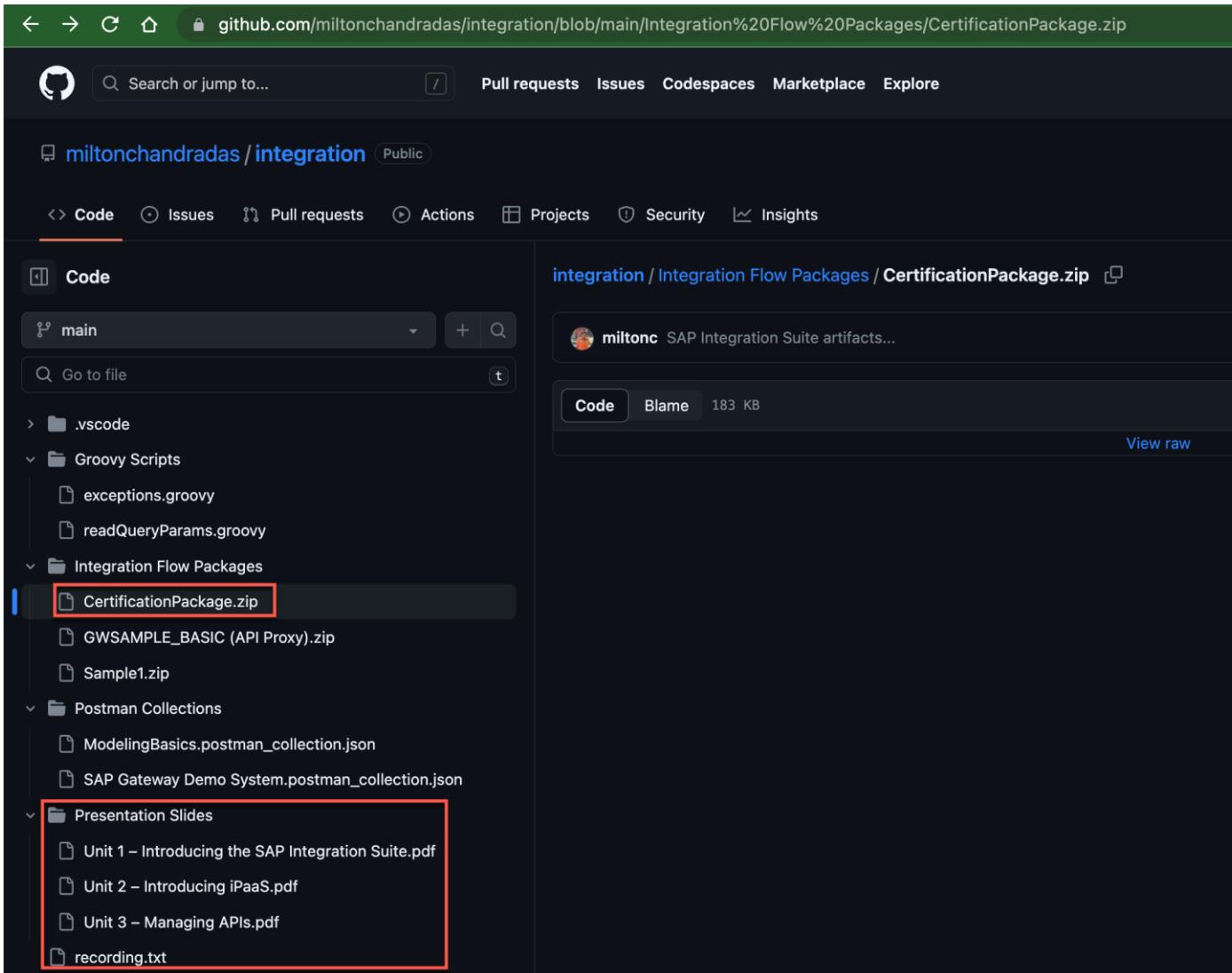
Developing with SAP Integration Suite

Pre-requisite	Sep 26	Sep 28	Oct 10
	Duration: 2 hours	Duration: 2 hours	Duration: 1 hour
<ul style="list-style-type: none">• Basic knowledge of JavaScript or other programming languages used for web development• Basic knowledge of cloud development concepts	<ul style="list-style-type: none">• Introducing the Integration Suite• Introducing iPaaS• Managing APIs	<ul style="list-style-type: none">• Managing Cloud Integration• Modeling processes	<ul style="list-style-type: none">• 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 \(C_CPI_15\)](#), coming soon).

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



<https://github.com/miltonchandradas/integration>

Unit 1 – Introducing the SAP Integration Suite

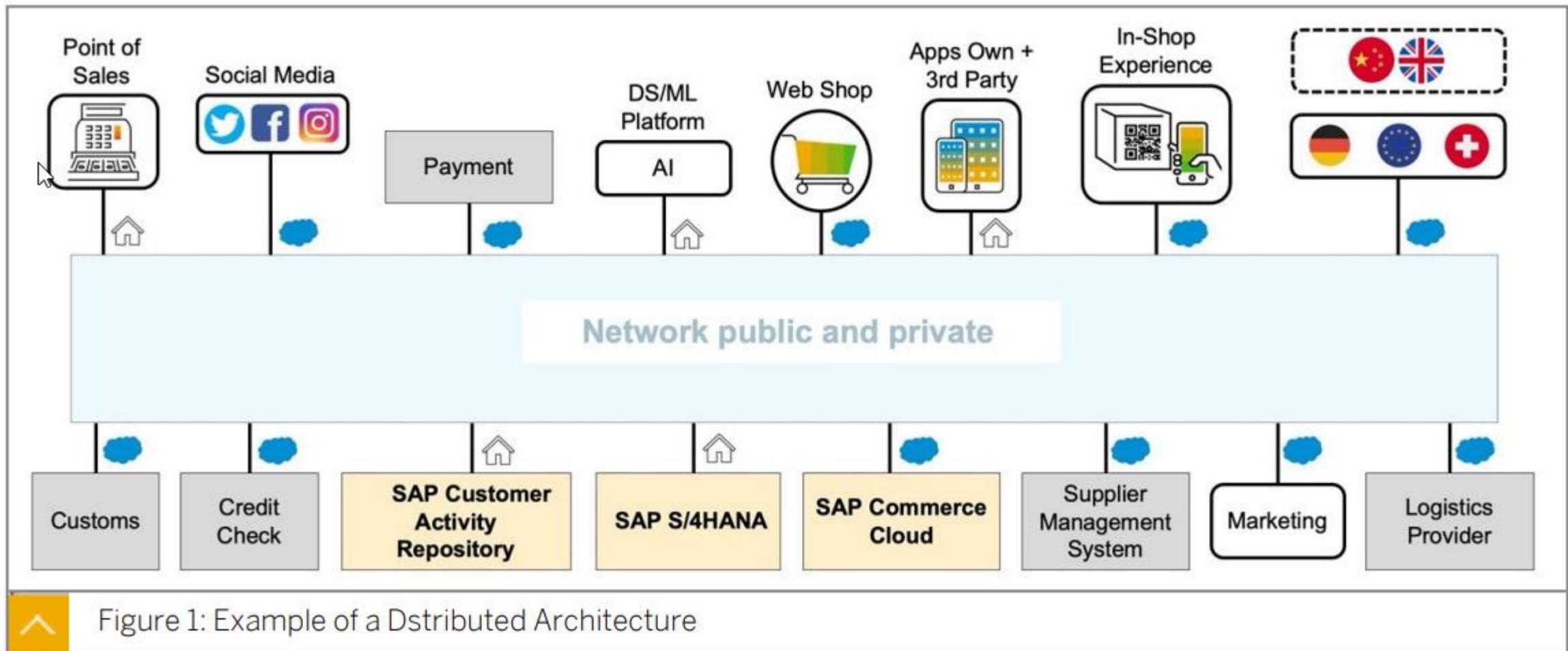
Developing with SAP Integration Suite

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



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**

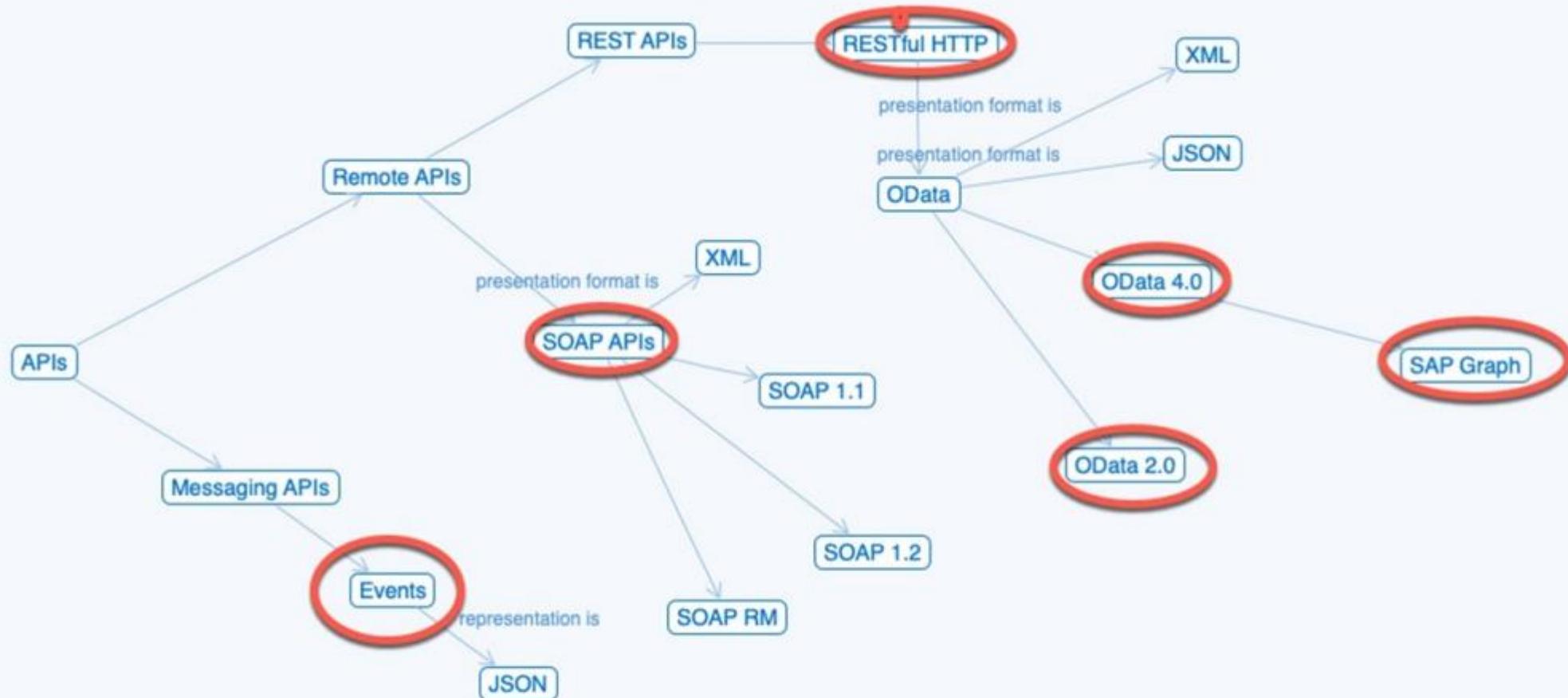


Figure 5: Relationship between APIs

SOAP, REST

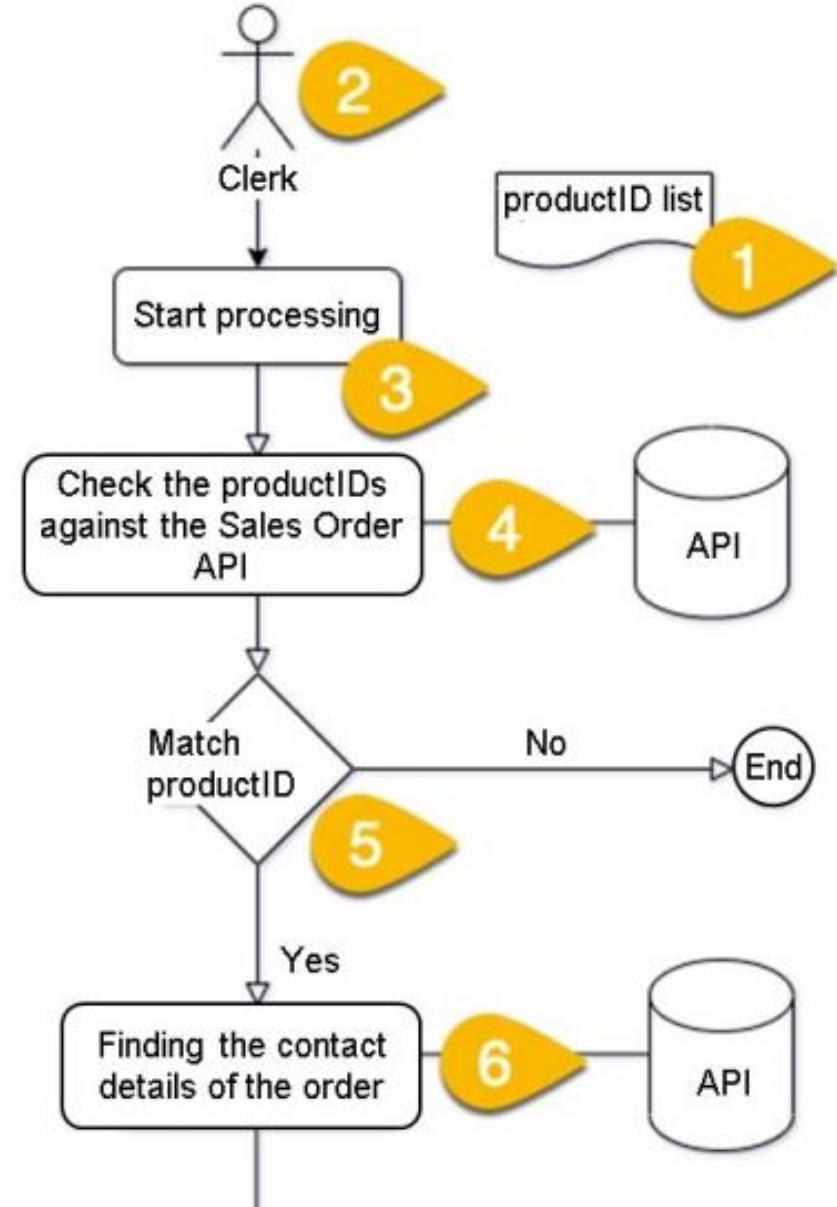
Type of API	Description language
SOAP	Web Services Description Language (WSDL)
REST	<p>Open API</p> <ul style="list-style-type: none">Used in API managementInterface definition language for describing, producing, consuming and visualizing RESTful web services <p>RAML</p>

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

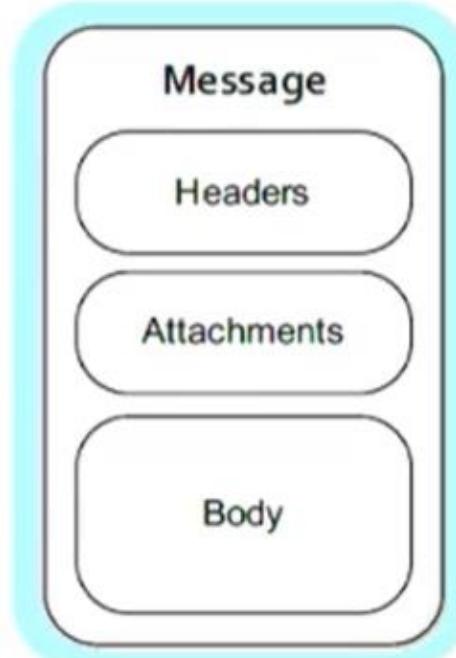


Basic concepts of Cloud Integration flow...

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

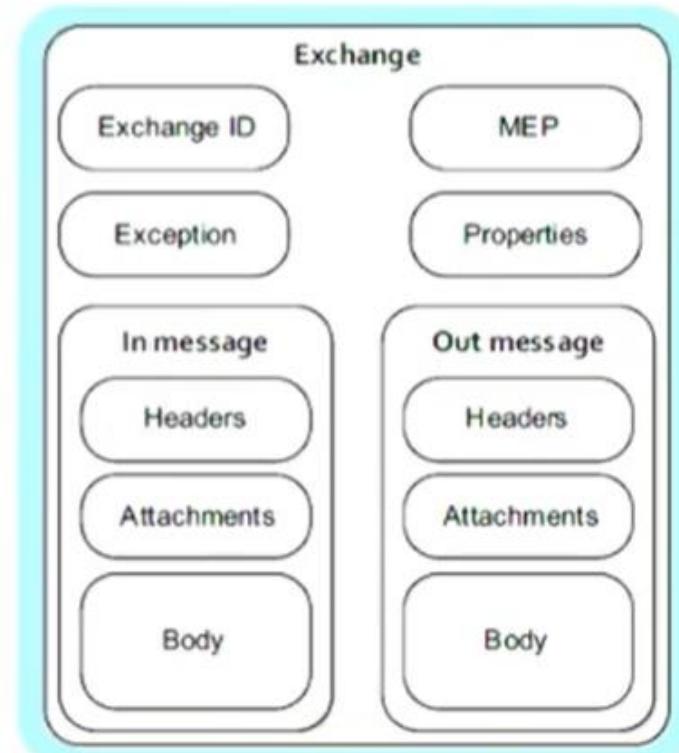


Basic concepts of Cloud Integration flow...

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



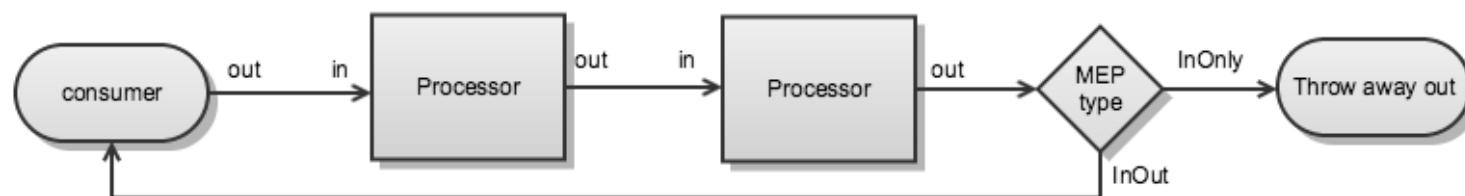
MESSAGE EXCHANGE PATTERNS AND THE EXCHANGE OBJECT

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

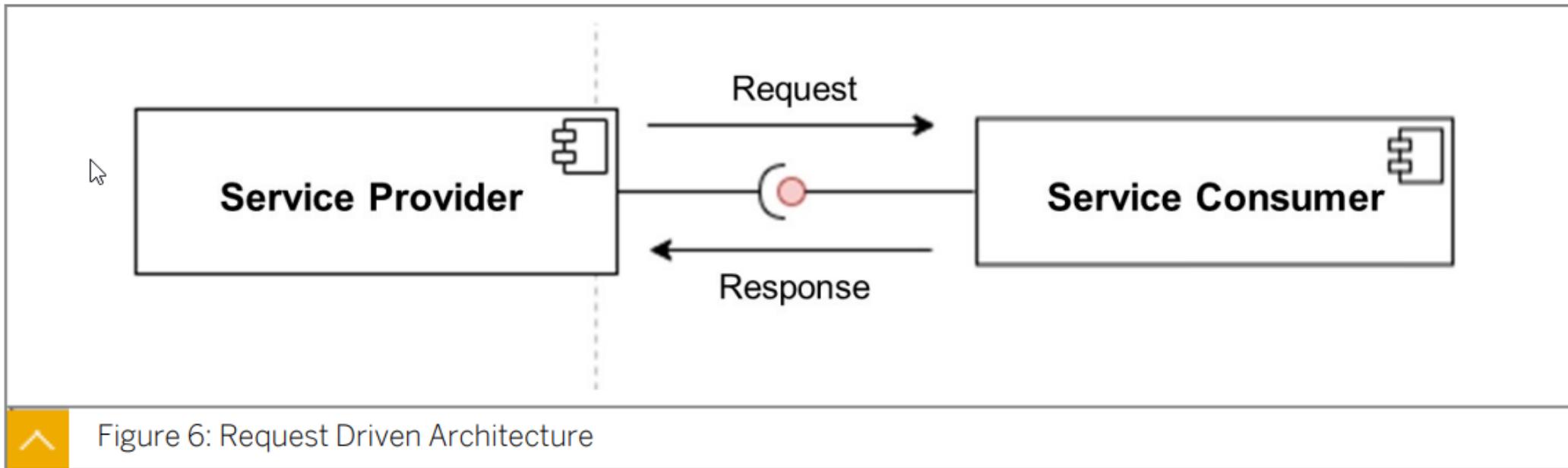
TIP

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.

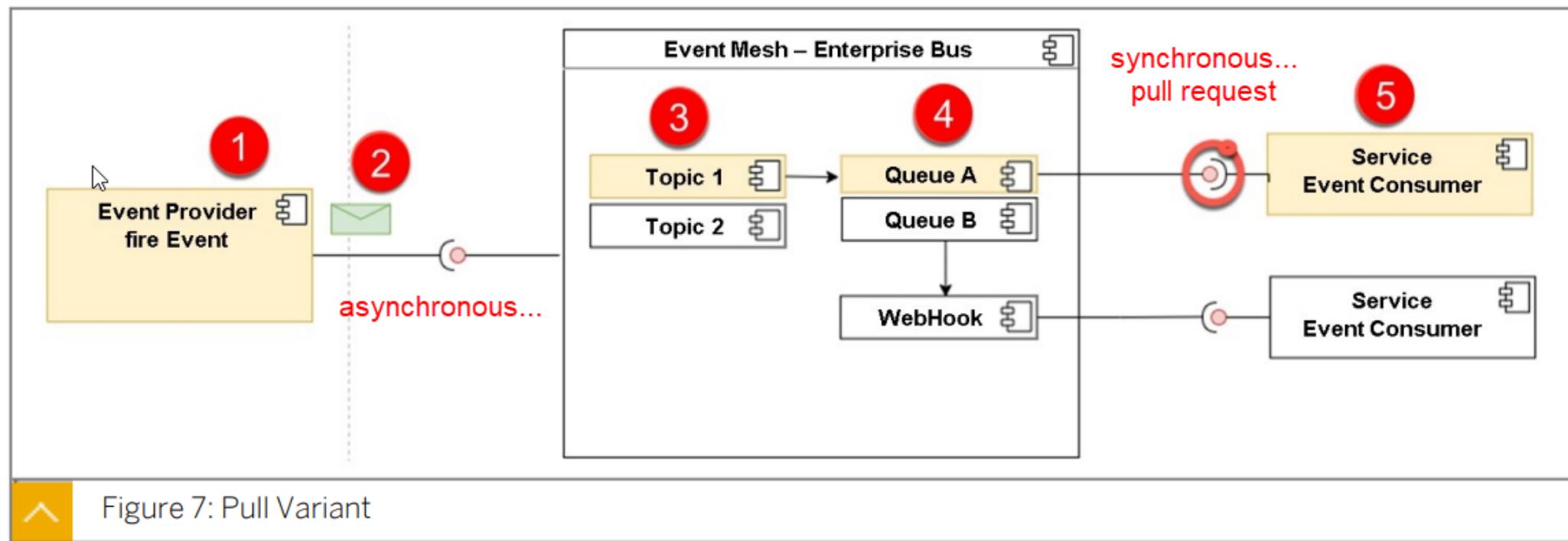
Operating Modes of API Architectures

- Request driven architecture
- Event driven architecture
- Combination



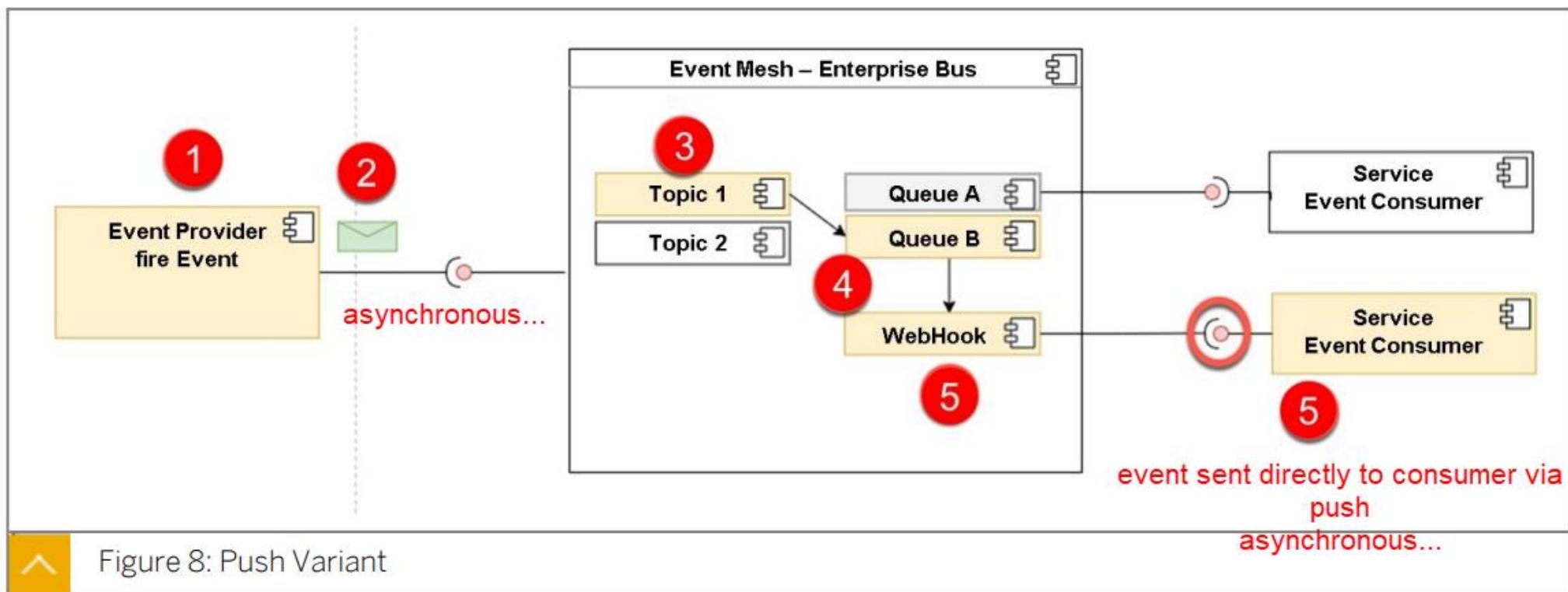
Request driven architecture

Pull Variant

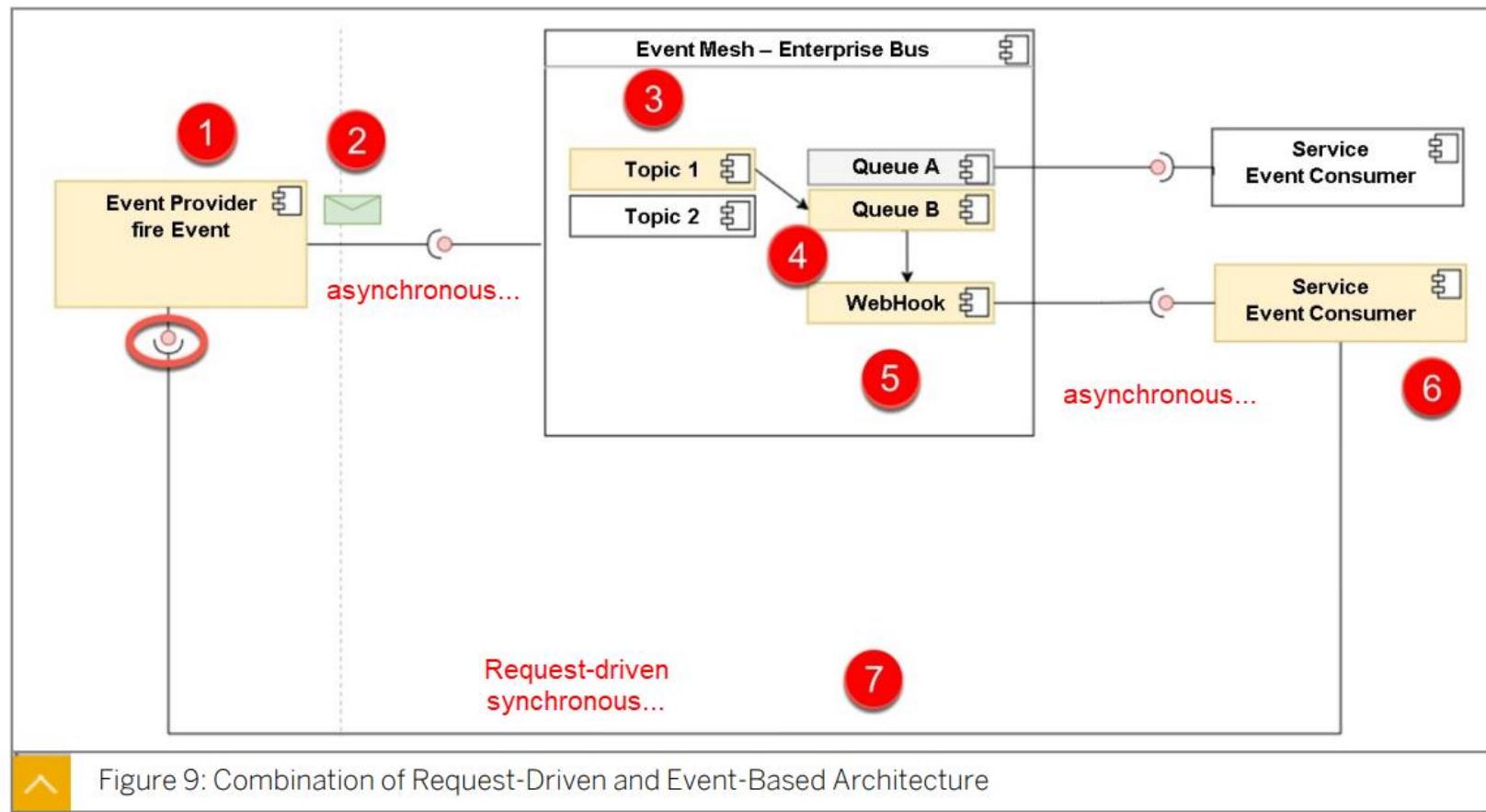


Event driven architecture

Push Variant



Combination: Request-Driven & Event-Based



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.

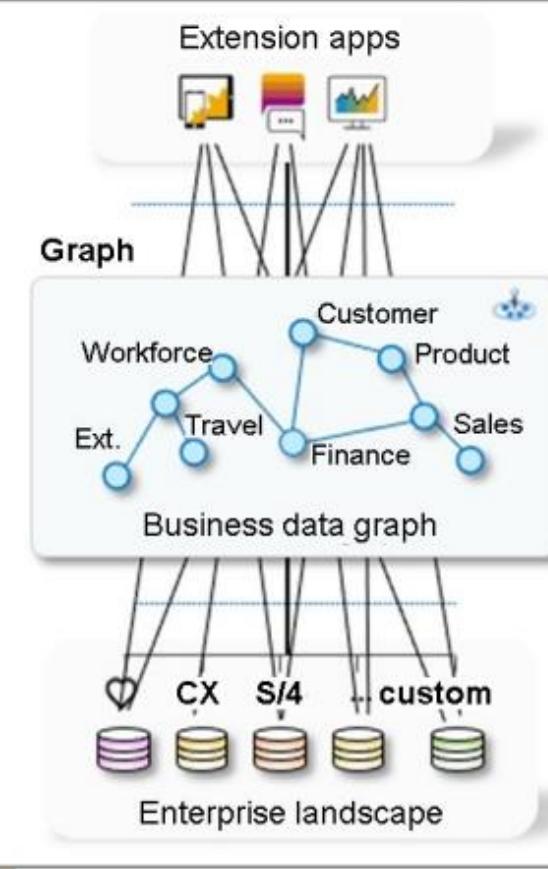
Open SAP Easy Access Menu for EPM: Classic Dynpro For Product Data.

Link: [learning hub](#)

Demo link: [demo2](#)

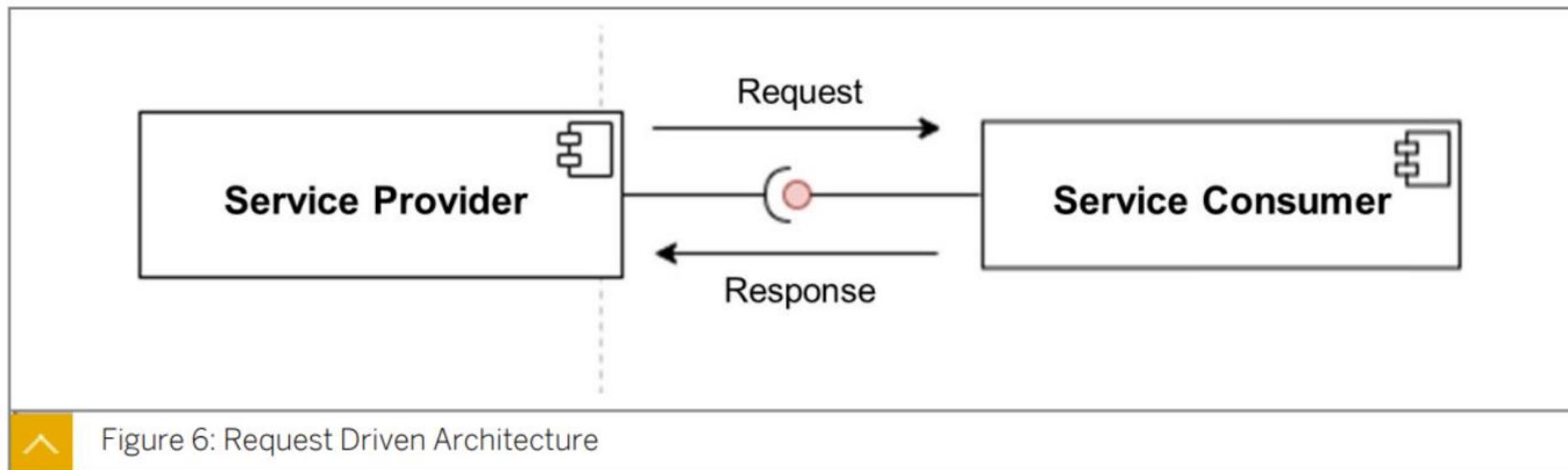
SAP Graph

- 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)



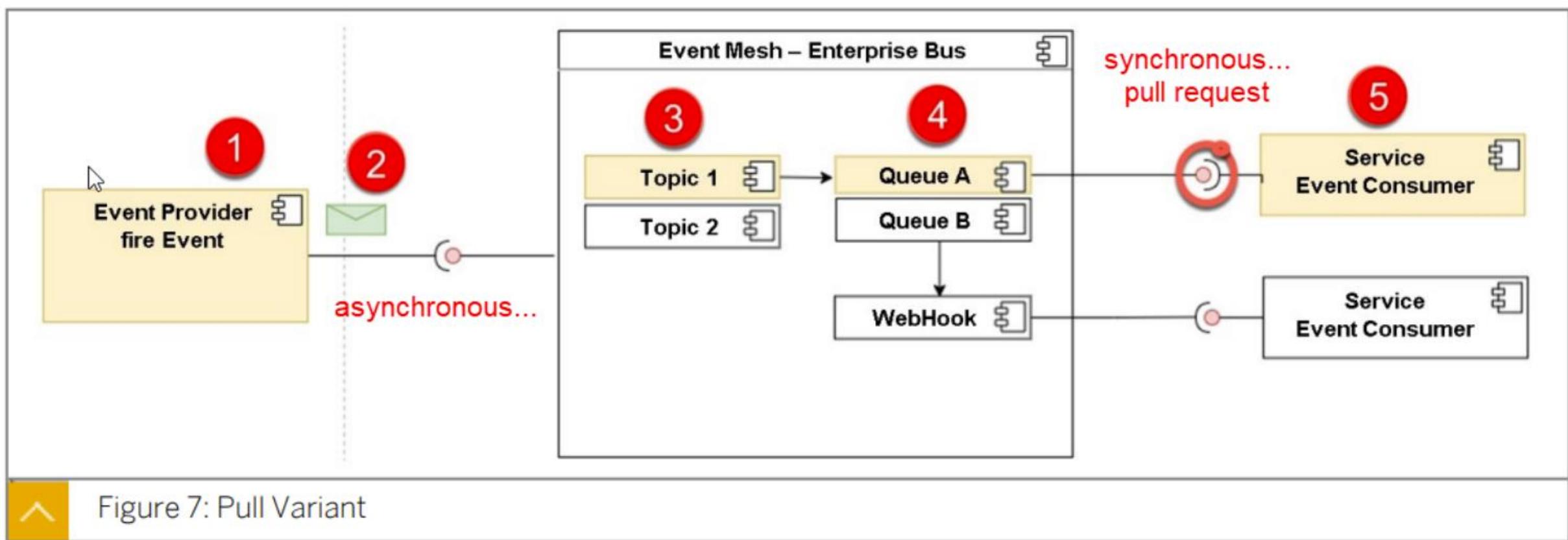
Key Summary Points – Unit 1

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



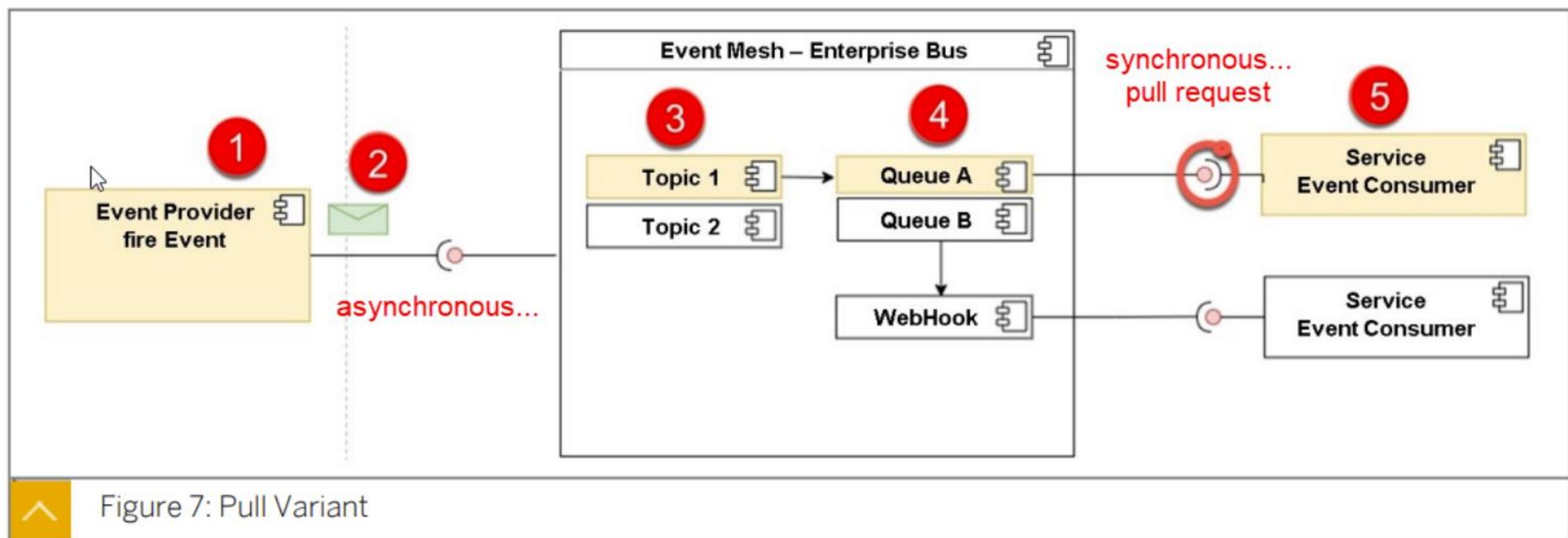
Key Summary Points – Unit 1

Pull Variant



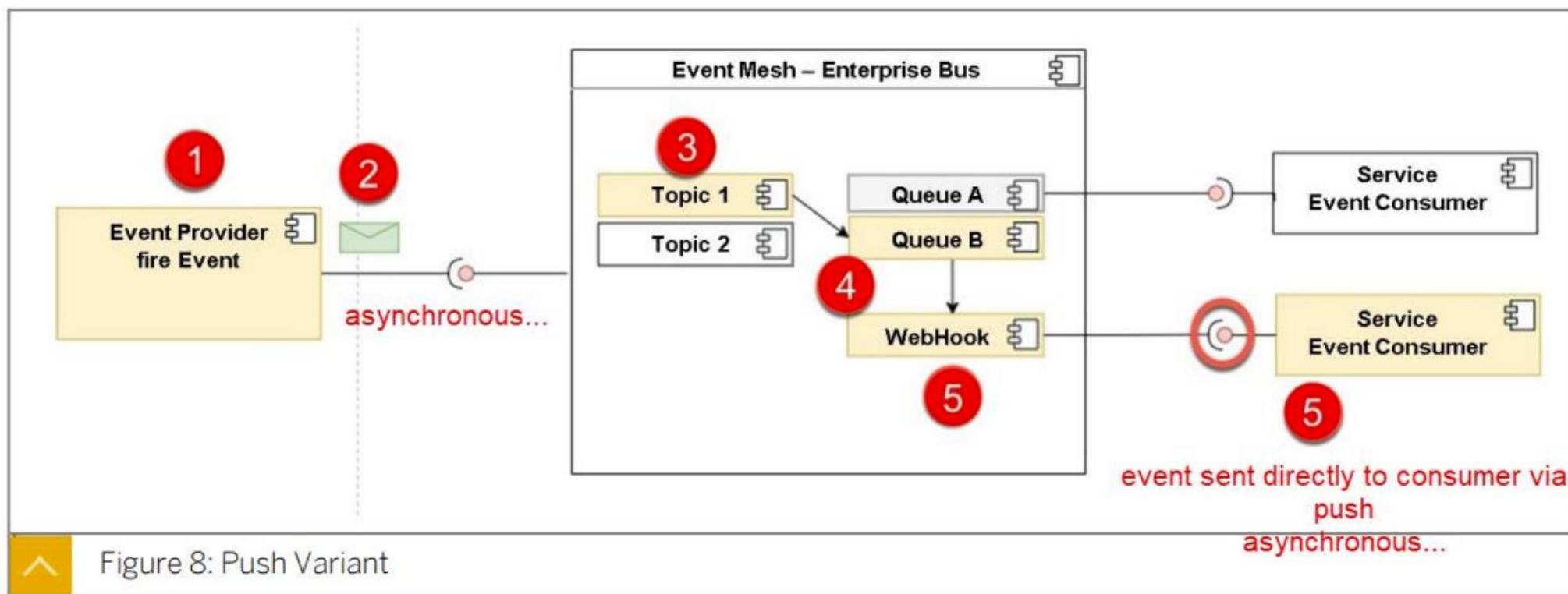
Key Summary Points – Unit 1

Pull Variant

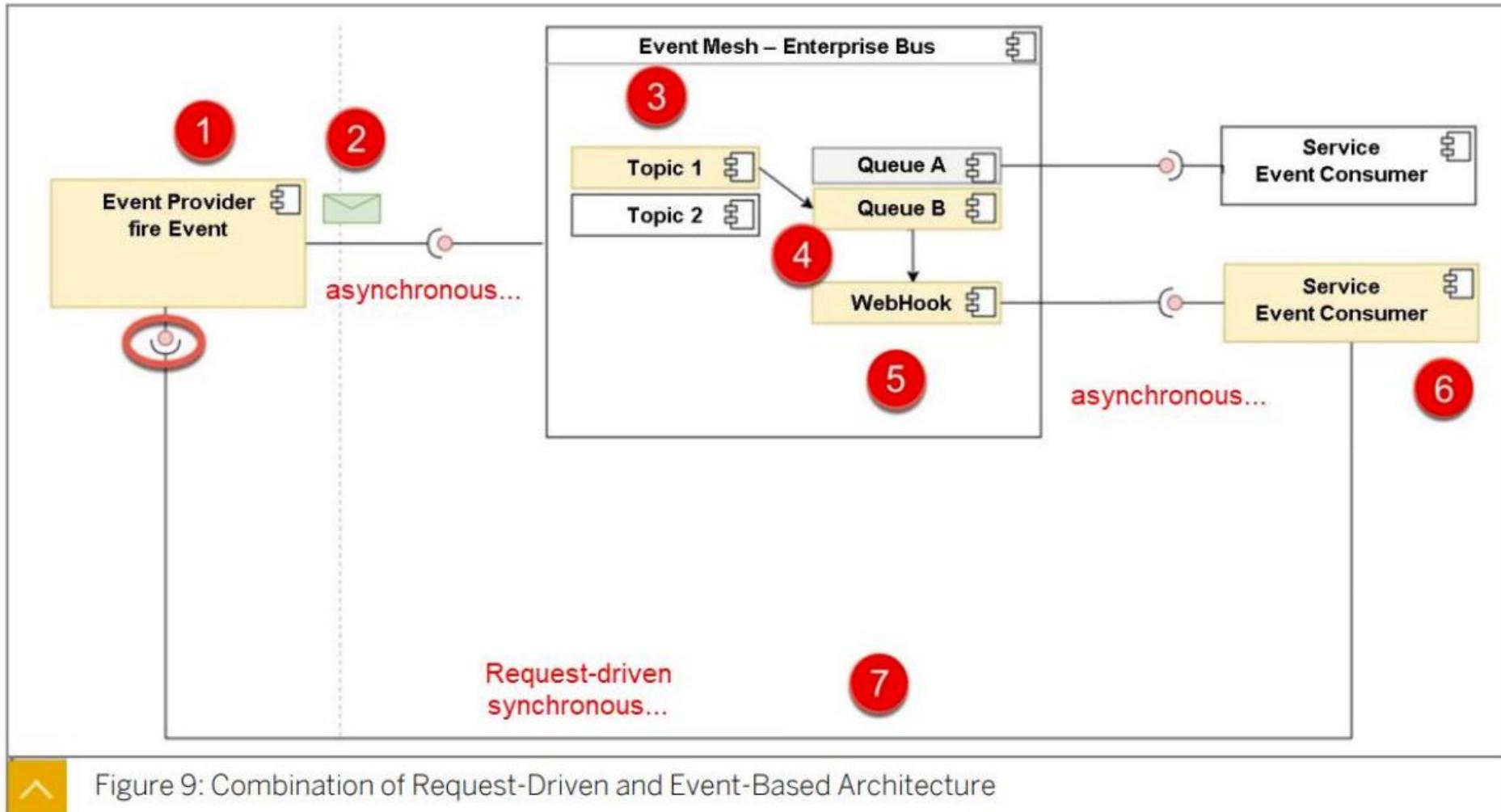


Key Summary Points – Unit 1

Push Variant



Key Summary Points – Unit 1



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	<p>Open API</p> <ul style="list-style-type: none">Used in API managementInterface definition language for describing, producing, consuming and visualizing RESTful web services <p>RAML</p>

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

Unit 2 – Introducing iPaaS

Developing with SAP Integration Suite

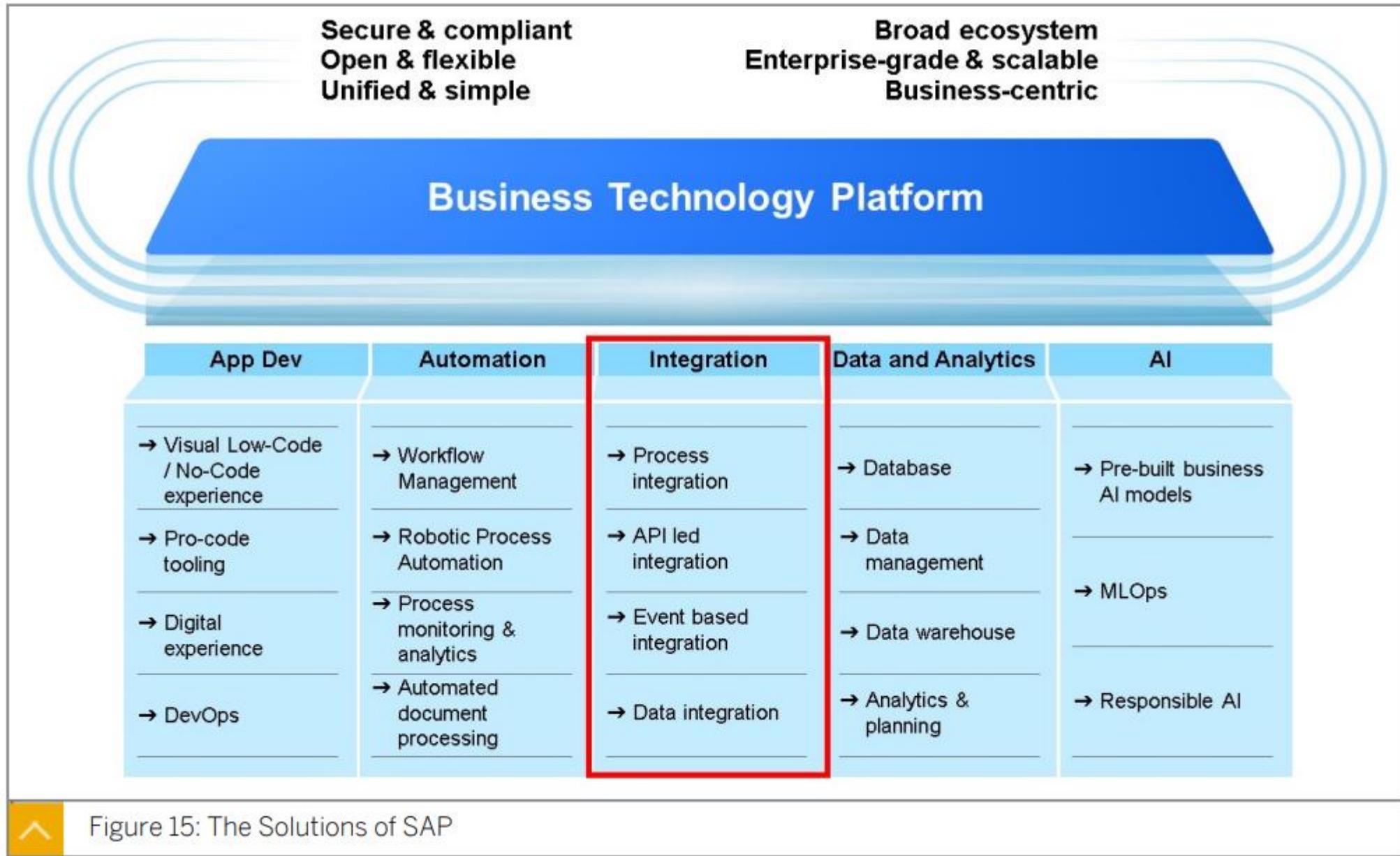
C_CPI_15

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



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



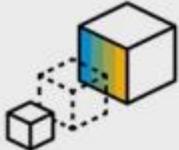
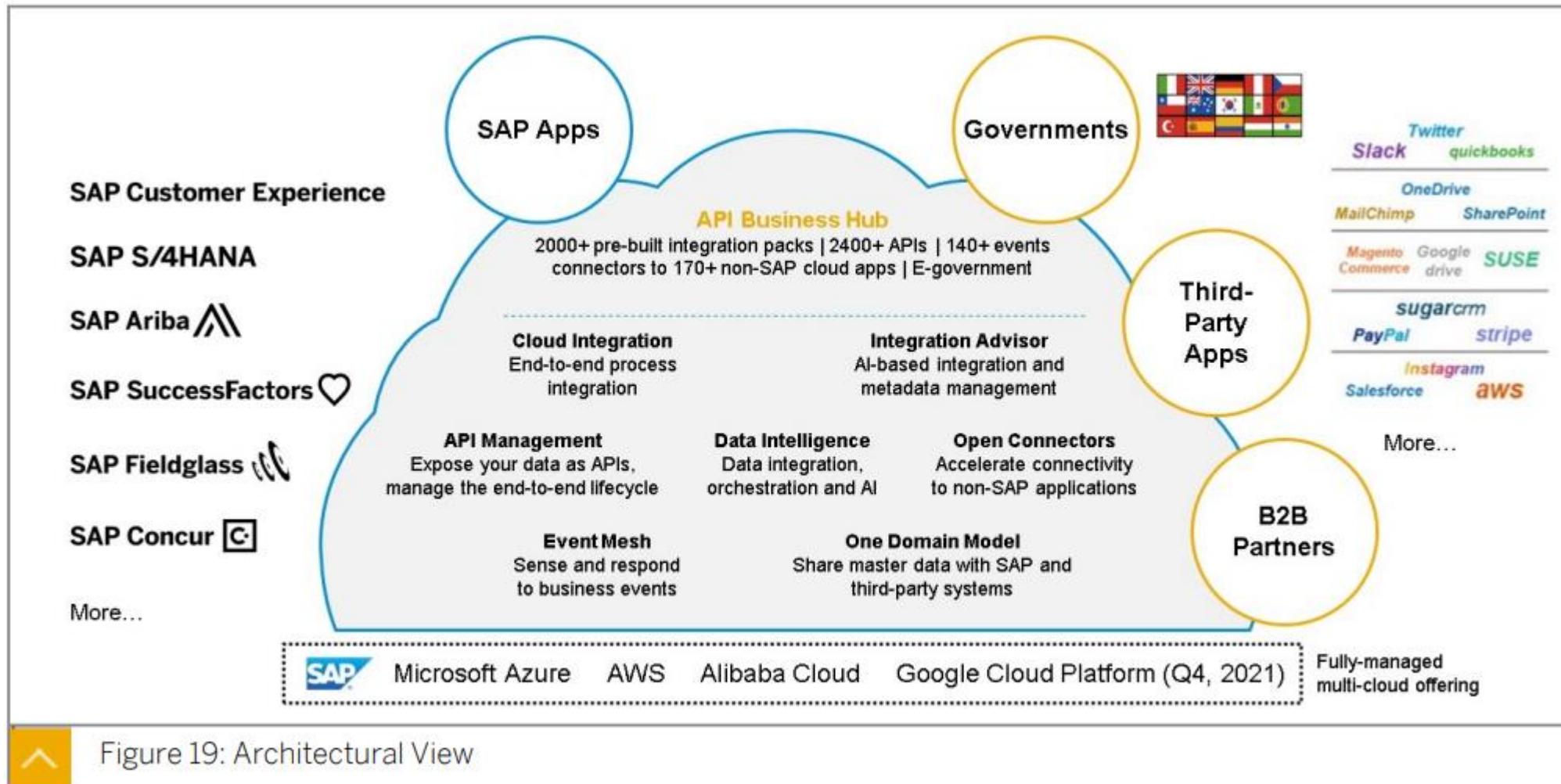
Simplify Integration by a Systematic Integration Approach			
1 Assess your integration Strategy	2 Design your Hybrid Integration Platform	3 Define Integration Best Practices	4 Enable a Practice of Empowerment
			
Document/review your integration architecture	Map use case patterns to integration technologies	Define solution architecture blueprints	Democratize integration delivery
Scoping of focus area e.g. future building blocks	Derive integration guidelines 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

Positioning Integration Suite



Core capacities of the Integration Suite

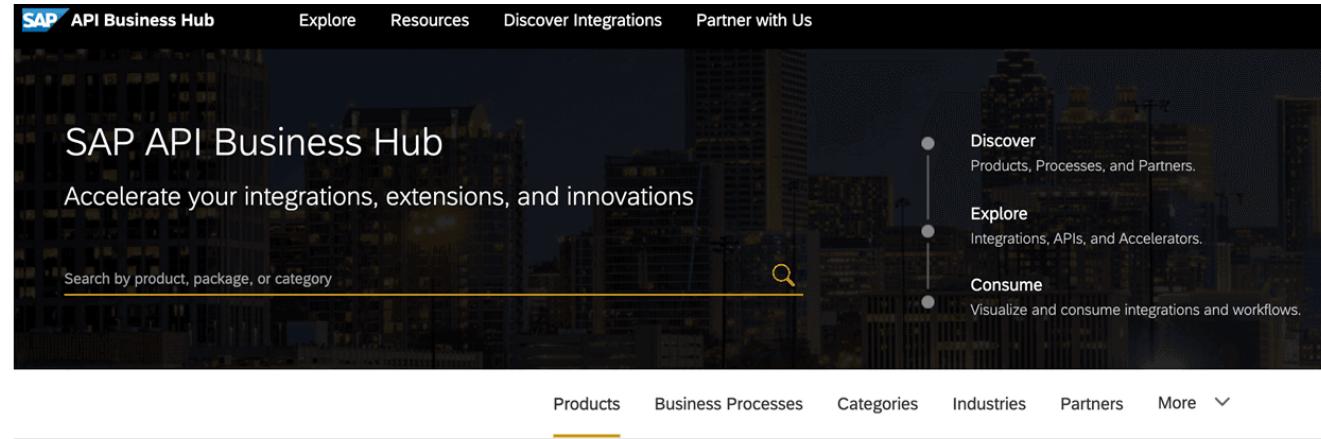
- Cloud-Integration
 - Seamless integration of everything and everyone (A2A/B2B) in real time.
- API-Management
 - Make your data and processes available as APIs. Manage the E2E lifecycle.
- Integration Assessment
 - Tool support for ISA-M to define and execute an integration strategy for companies.
- 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.



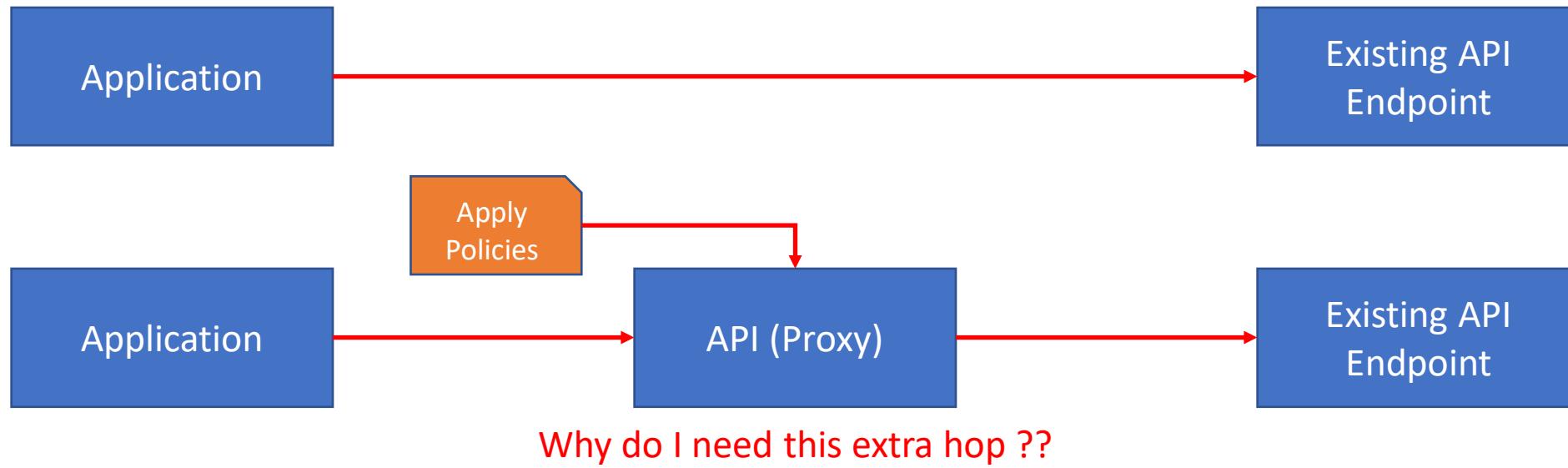
Choose a Product to Explore

See the various resources that each product has to offer

The grid displays four product cards:

- 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.
- 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.
- Customer Experience**: Bring together customer data, machine learning technology, and microservices to power real-time customer engagements across sales, service, marketing, and commerce.
- BTP**: Acceleration, data

API Management (Key concept)



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.

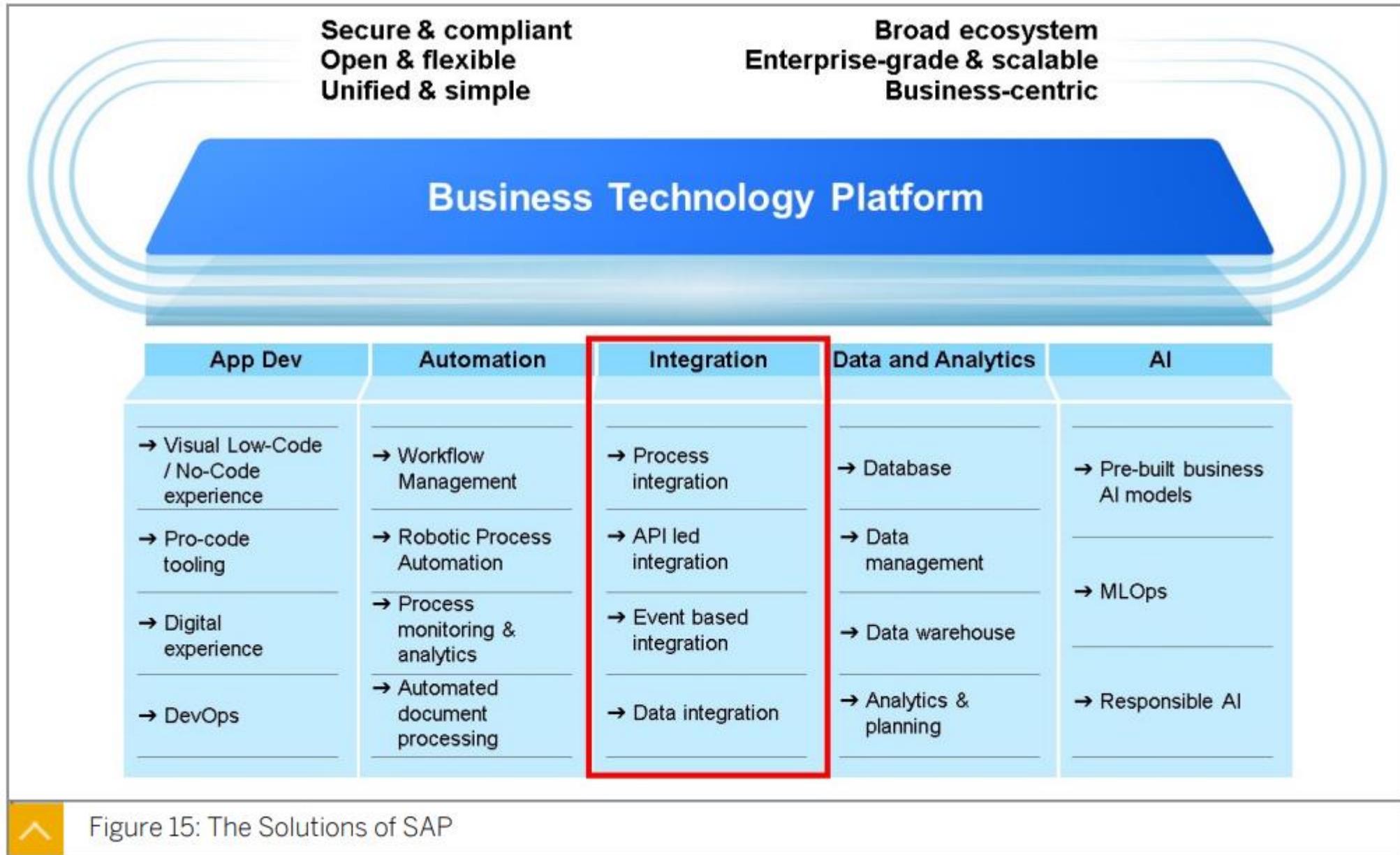
Link: [learning hub](#)

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
 - Covers most flavors of cloud and hybrid integration
- AI driven integration
 - AI techniques for integration scenarios
 - Integration Advisor



Key Summary Points – Unit 2

Core capacities of the Integration Suite

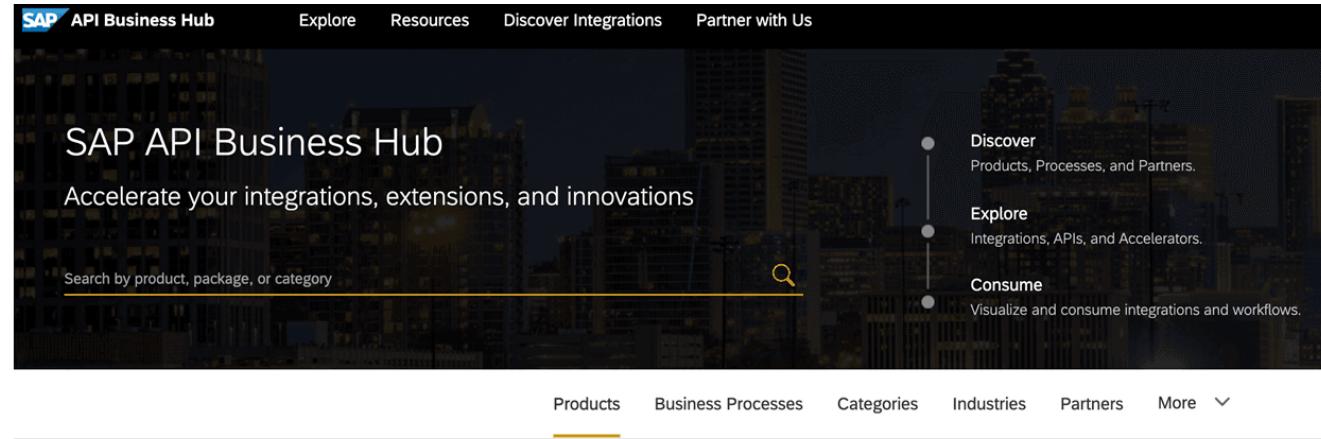
- Cloud-Integration
 - Seamless integration of everything and everyone (A2A/B2B) in real time.
- API-Management
 - Make your data and processes available as APIs. Manage the E2E lifecycle.
- Integration Assessment
 - Tool support for ISA-M to define and execute an integration strategy for companies.
- 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.



Choose a Product to Explore

See the various resources that each product has to offer

The grid displays four product cards:

- 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.
- 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.
- Customer Experience**: Bring together customer data, machine learning technology, and microservices to power real-time customer engagements across sales, service, marketing, and commerce.
- BTP**: Acceleration, data

Unit 3 – Managing APIs

Developing with SAP Integration Suite

C_CPI_15

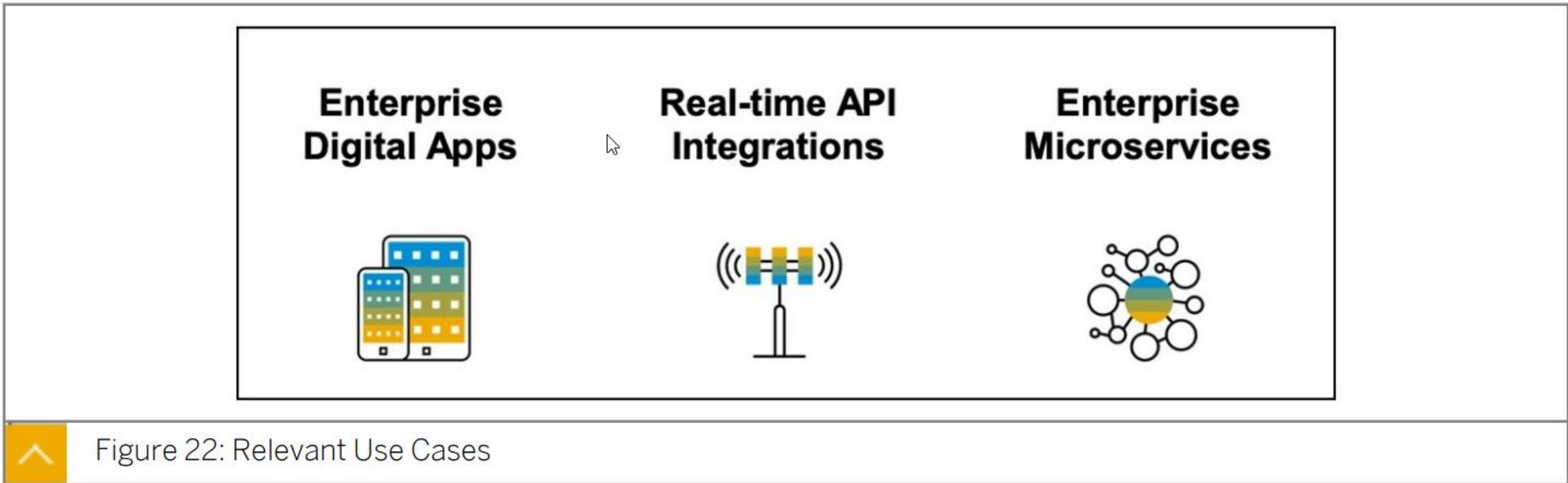
Unit 3 Content

- 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

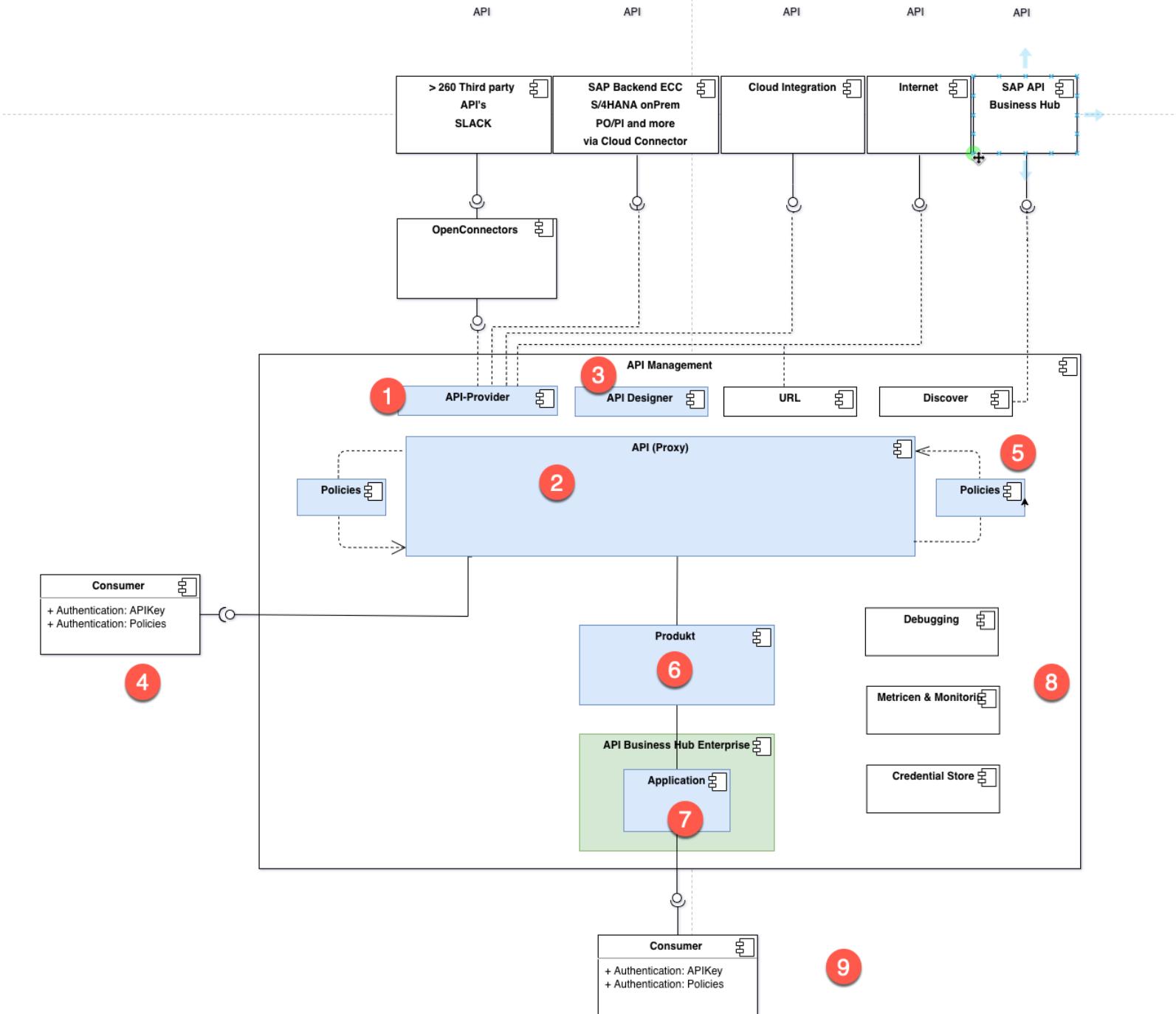
- Building APIs (proxies)
- Publishing APIs (Bundle APIs as Product)
- Analyzing APIs
- Consuming APIs
- Monetizing APIs
- Discover API Packages
- API (proxy) Designer

Relevant Use Cases



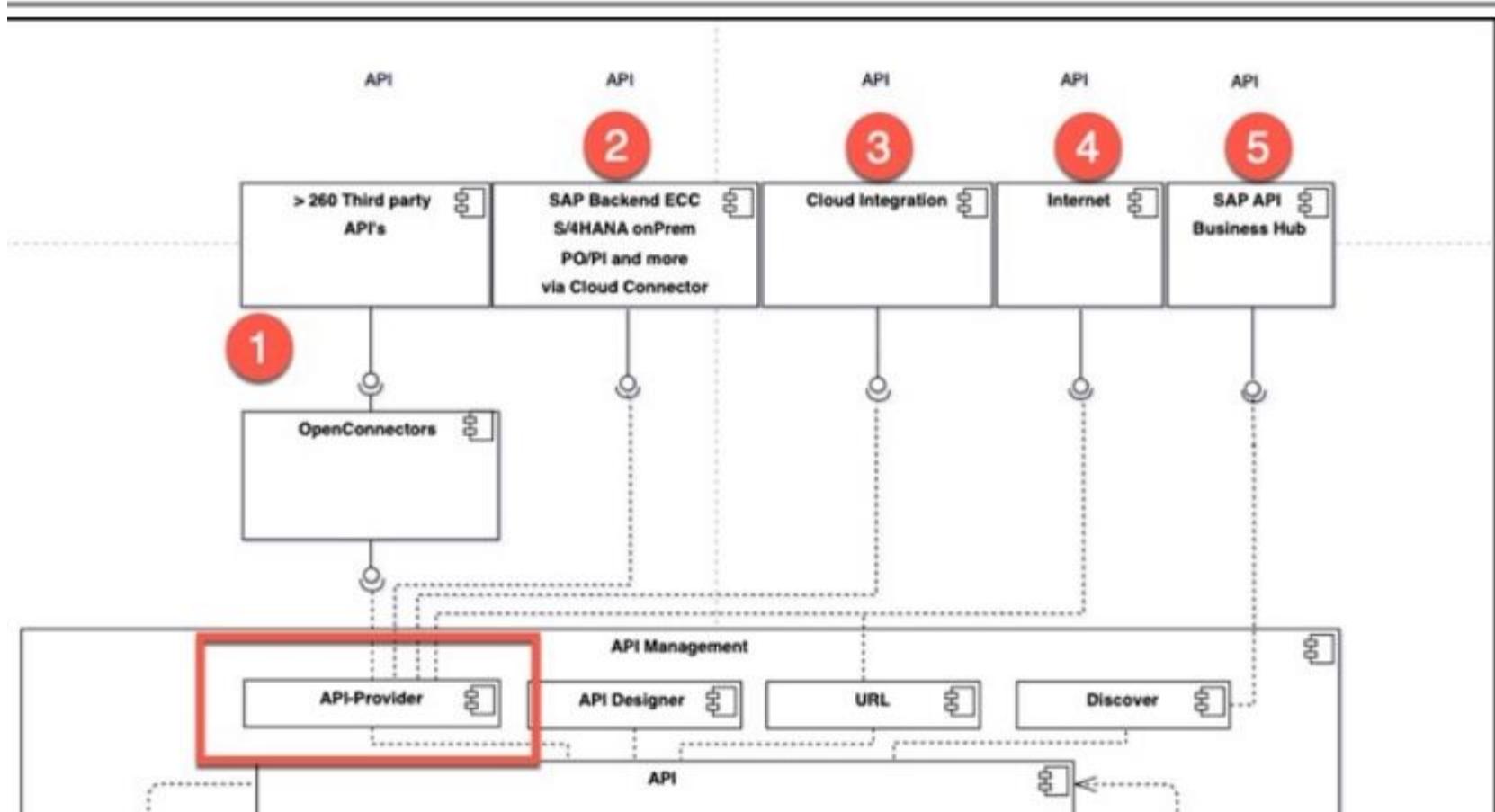
Components of SAP API Management

- 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



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



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.

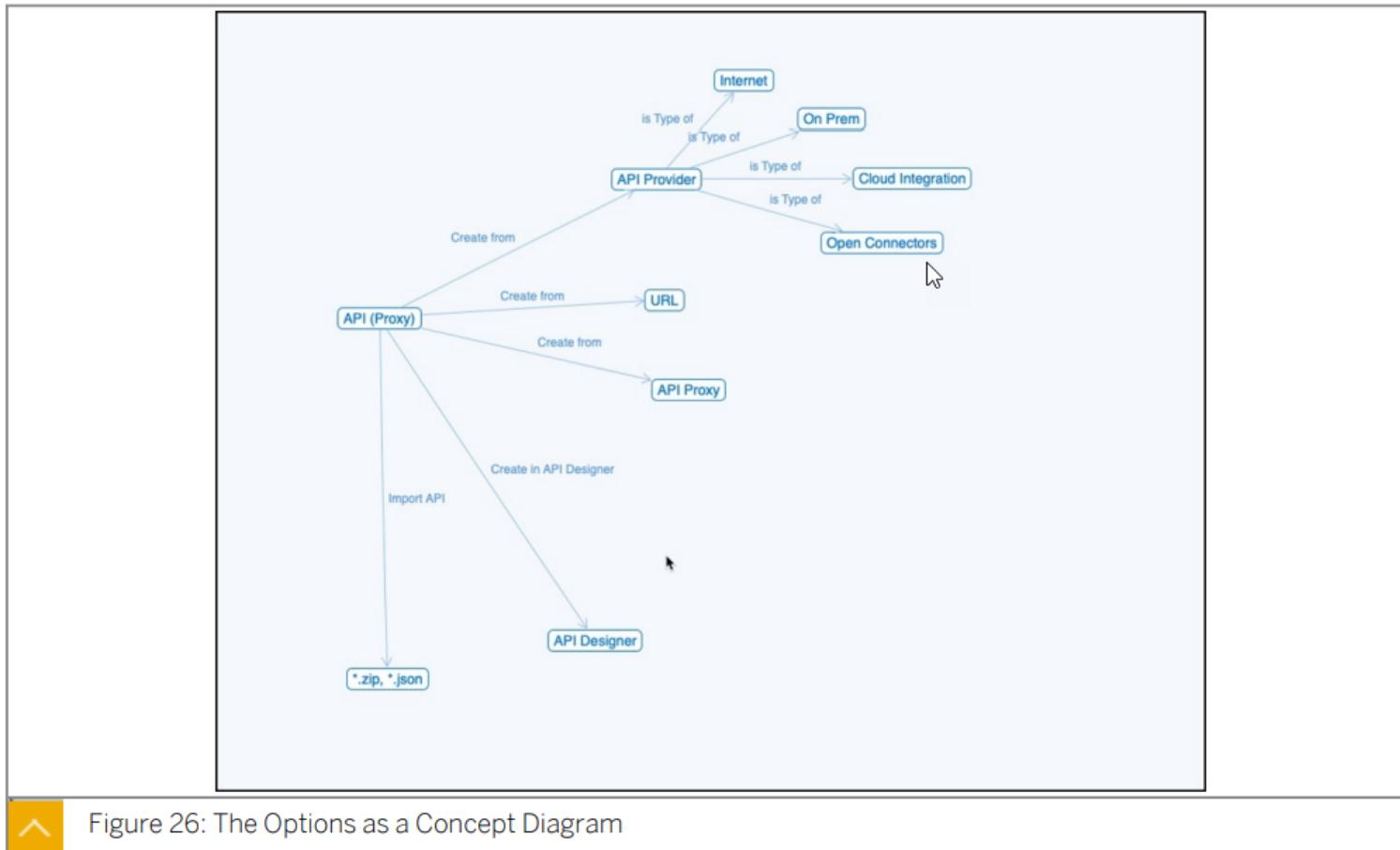
Create API Provider.

Test the Connection.

Link: [learning hub](#)

Demo link: [demo4](#)

Creating an API (proxy)



Demo: API Proxy

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

SAP Integration Suite

Develop

Create APIs, Products, import Policy Templates and view Applications here.

APIs (3) Products (0) Applications (0) Policy Templates (0)

Custom Type System Design and develop API artifacts

1

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

Home Discover Design Integrations APIs 1 Custom Type System Design and develop API artifacts MIGs MAGs Test Configure Monitor Monetize Settings

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... * ?

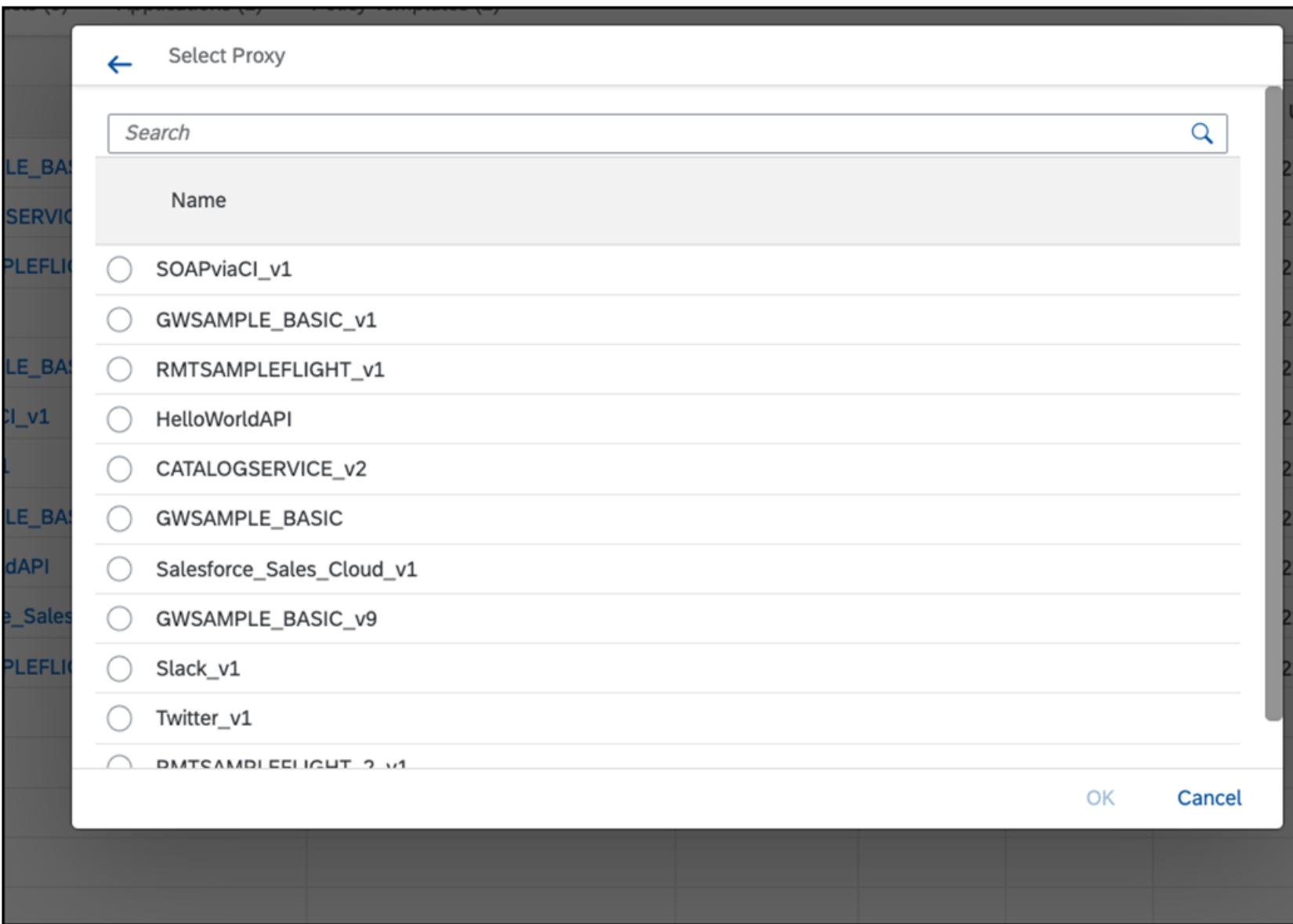
Version:

Service Type: REST



Create

Cancel



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...

Products

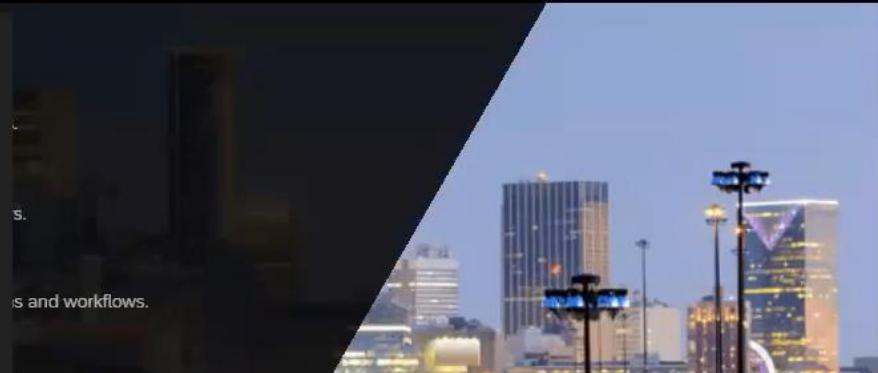
- SAP S/4HANA Cloud
- SAP S/4HANA
- SAP Customer Experience
- SAP Business Technology Platform
- SAP SuccessFactors
- SAP Ariba
- SAP Concur
- SAP Fieldglass
- SAP Business ByDesign
- SAP Integrated Business Planning for Supply Chain

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 (BAdls)
- Business Object Interfaces
- CDS Views
- Business Processes
- One Domain Model
- Data Intelligence

**Discover Integrations**[View All Products](#)[FEEDBACK](#)**S/4HANA® Cloud**

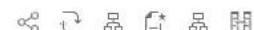
The next generation digital core designed to help you run simple in a digital economy. It provides the industry-specific capabilities and cloud benefits that your business needs.

**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.

**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.



/ SAP API Management Debugging and Traceability

Performance_Traceability 1

This policy template assists in API Proxy Execution Performance assessment

Download4

Overview

This policy template assists in API Proxy Execution Performance assessment

Version: 1

Last Modified: 07 Apr 2022

Type: Policy Template

Policies	
proxy_request_receiving_latency.js	ProxyEndPoint
proxy_processing_time.js	PostFlow
targetreceivinglatency.js	TargetEndPoint
target_processing_time.js	PreFlow

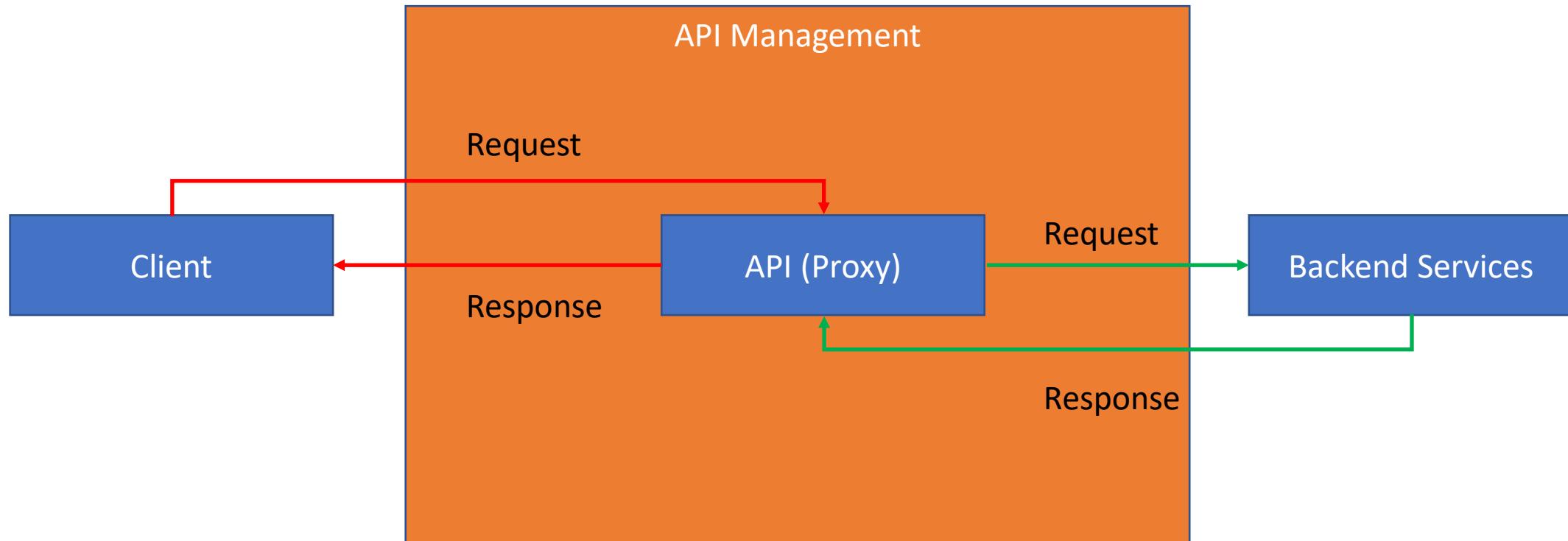
Flow Type:



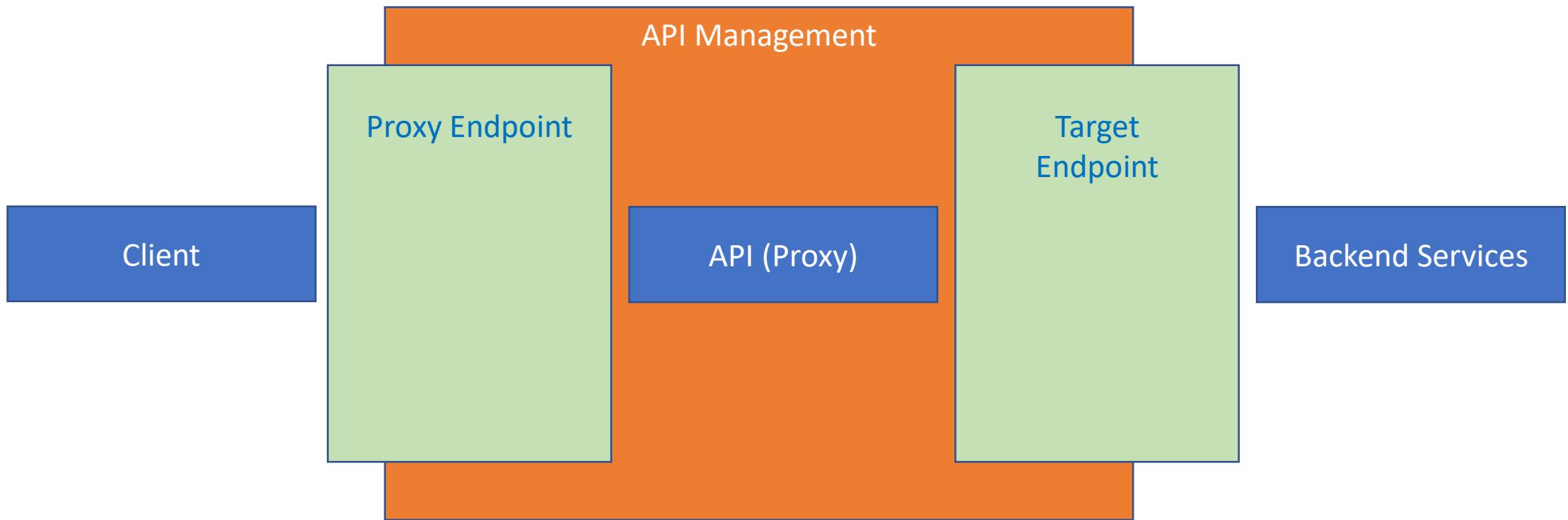
Scripts	
proxy_processing_time.js	
proxy_request_receiving_latency.js	
target_processing_time.js	
targetreceivinglatency.js	

FEEDBACK

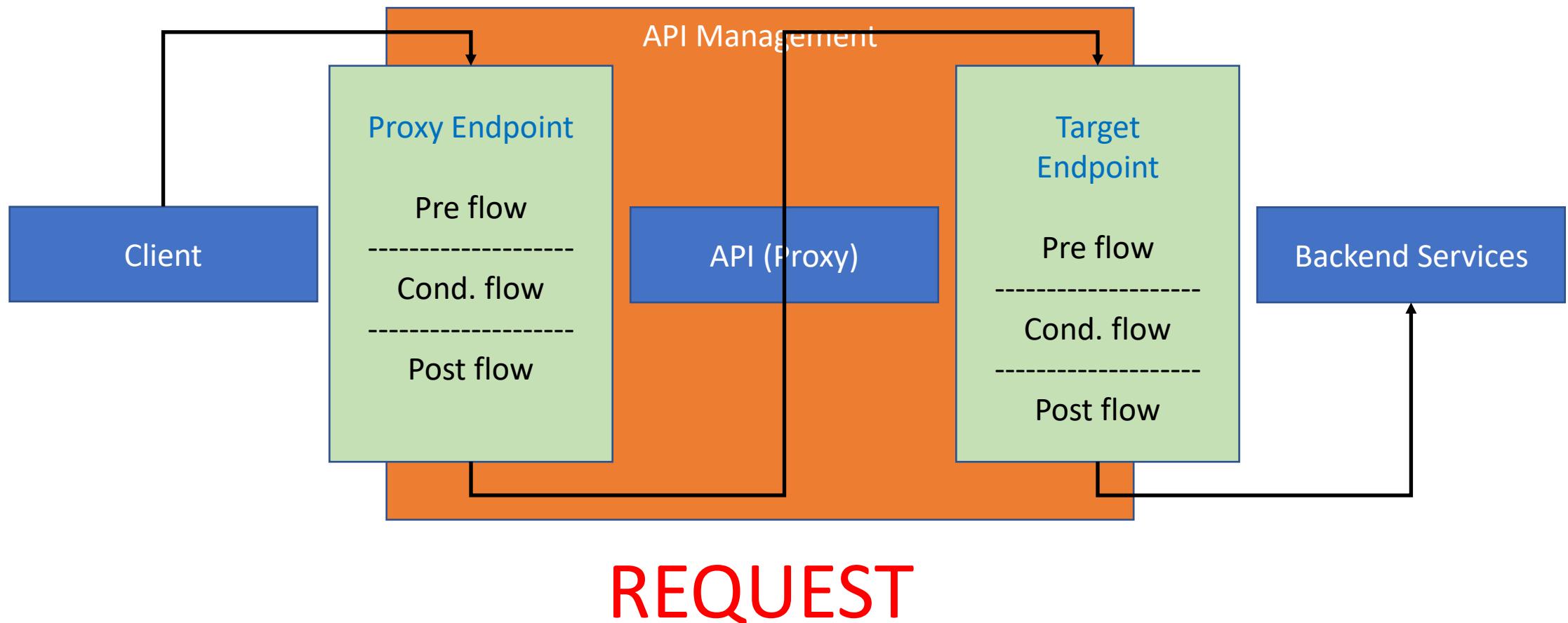
Flows – Where should I apply my policies ?



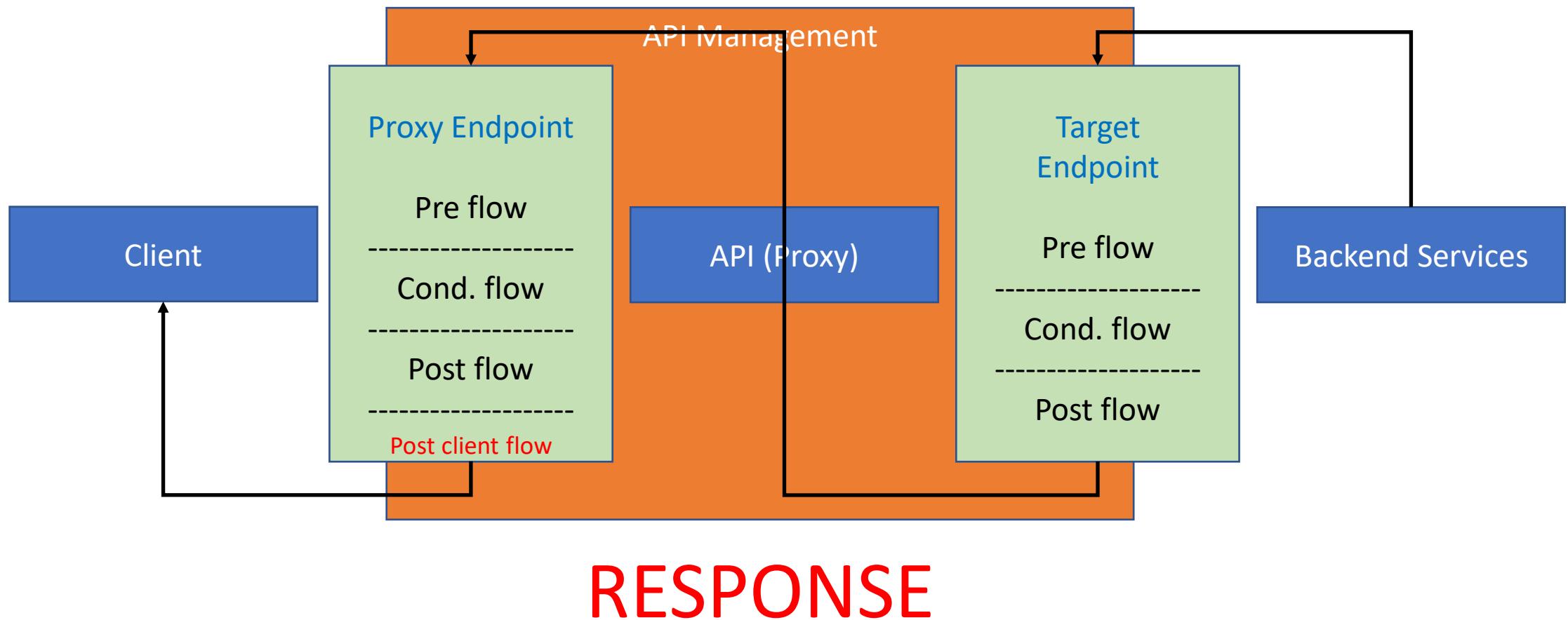
Flows – Where should I apply my policies ?



Flows – Where should I apply my policies ?



Flows – Where should I apply my policies ?



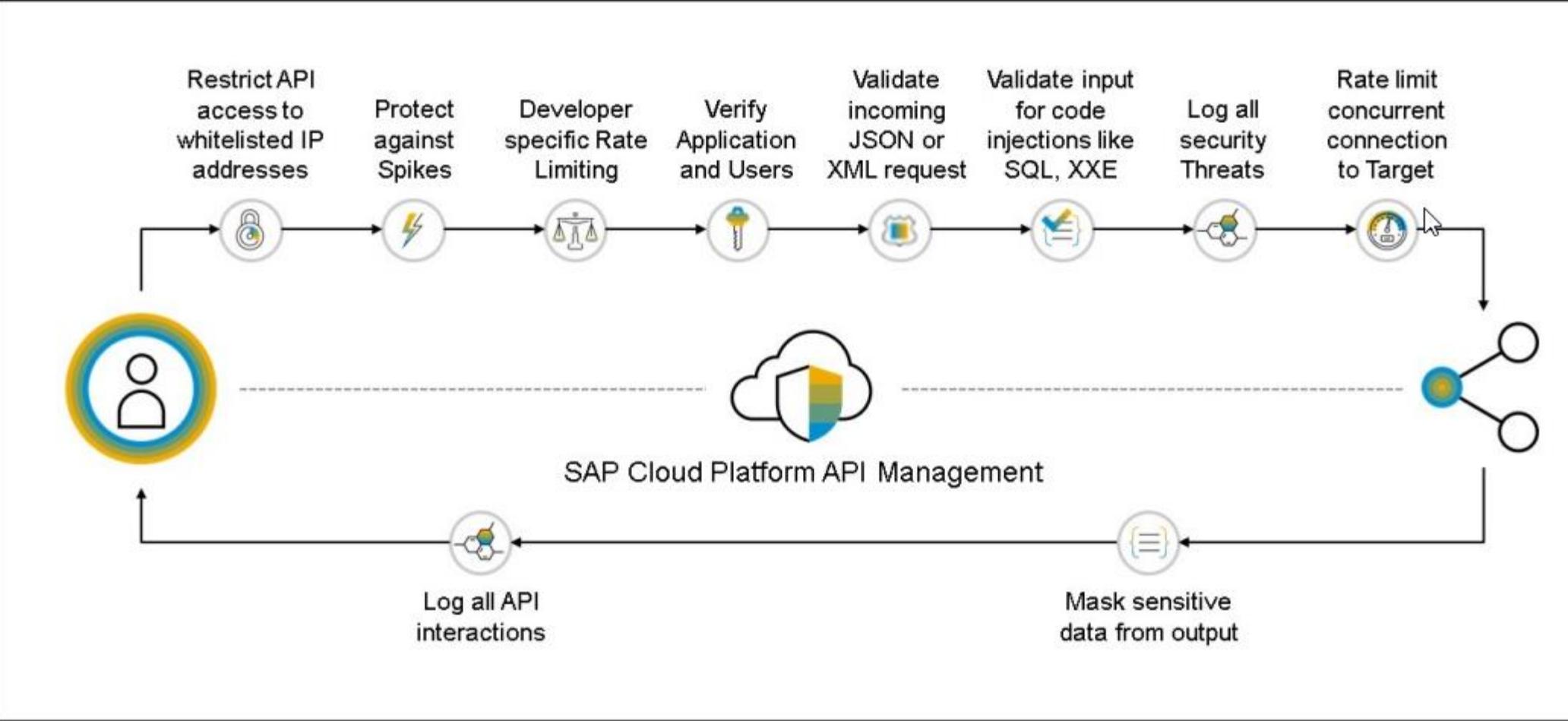


Figure 44: SAP Cloud Platform API Management

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

The screenshot shows the SAP API Management interface for the API **GWSAMPLE_BASIC**. The API is currently **Deployed** and can be reached via the **API Proxy URL**: https://quovadis.test.apimanagement.eu10.hana.ondemand.com:443/GWSAMPLE_BASIC.

The main navigation bar includes links for **Transport**, **Policies**, **Copy**, **Edit**, and more. Below the navigation, there are four tabs numbered 1 through 4:

- 1** Overview (highlighted)
- 2** Proxy EndPoint
- 3** Target EndPoint
- 4** Resources

The **Overview** section displays the following details:

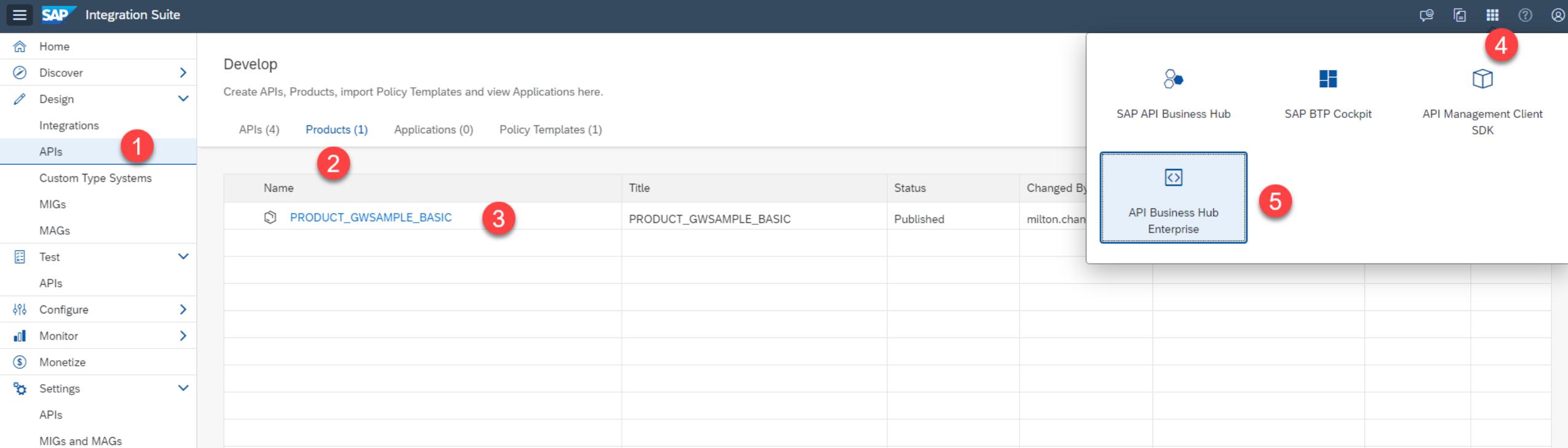
- Title:** GWSAMPLE_BASIC
- Host Alias:** quovadis.test.apimanagement.eu10.hana.ondemand.com
- API Base Path:** /GWSAMPLE_BASIC
- API State:** Active
- Description:** (empty)

On the right side, there are two summary boxes:

- Calls(05/01/2023 - 05/29/2023):** 3.5k
- API Health:** A green progress bar indicating 3487 calls out of 0 total.

Creating a Product

- Products are artifacts that appear in the SAP API Business Hub Enterprise Portal
- Role Collections
 - AuthGroup.API.Admin
 - AuthGroup.API.ApplicationDeveloper



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

Get entities from BusinessPartnerSet

[Try out](#) [Code Snippet](#)**Parameters**[Try out](#)

Name	Description
------	-------------

Stop Show only the first n items, see Paging - Top

50

\$skip Skip the first n items, see Paging - Skip*\$skip - Skip the first n items, see [Paging - Skip][http://www.oxygenxml.com/doc/api/guide/Paging-Skip.html]***\$filter** Filter items by property values, see Filtering*\$filter - Filter items by property values, see [Filtering][http://www.oxygenxml.com/doc/api/guide/Filtering.html]***\$inlinecount** Include count of items, see Inlinecount*Available values : allpages, none***\$orderby** 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*

Logging and Monitoring

SAP Integration Suite

Home Discover Design Integrations APIs Custom Type Systems MIGs MAGs Test APIs Configure Monitor Integrations APIs Monetize Settings APIs MIGs and MAGs

Analyze Here you can view the KPIs for the highlights and information related to various APIs

Overview Health Usage + Add (UTC+0:0) UTC May 23, 2023 - May 29, 2023

Total API Calls 3496 △ Difference from last week API Response Time 93.2 ms △ Difference from last week Request Processing Latency 4445 ms △ Difference from last week Total API Errors 0 Difference from last week Target System Errors 0 Difference from last week Target Response Time 91.5 ms △ Difference from last week

API Calls Number of calls per day All APIs Select APIs from the list Cumulative Failure Success

Day	Cumulative API Calls
Monday	~2.2K
Tuesday	~2.5K
Wednesday	~2.8K
Thursday	~3.1K
Friday	3.44K
Saturday	~2.1K

Key Summary Points – Unit 3

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



Access Control



Identity Management



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

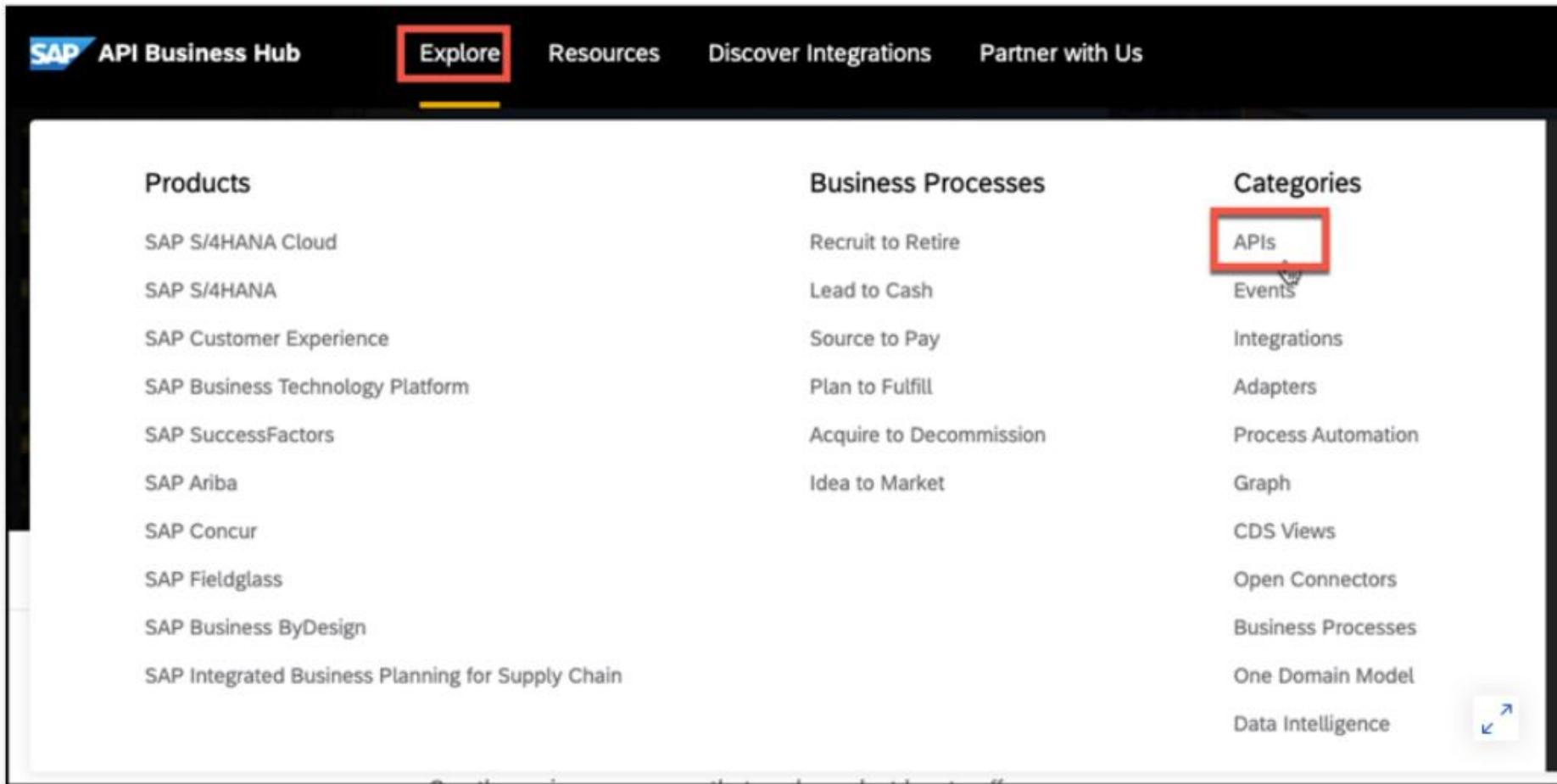
Incorrect. You can download standardized, reusable policy templates from the SAP Business Accelerator Hub.

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.

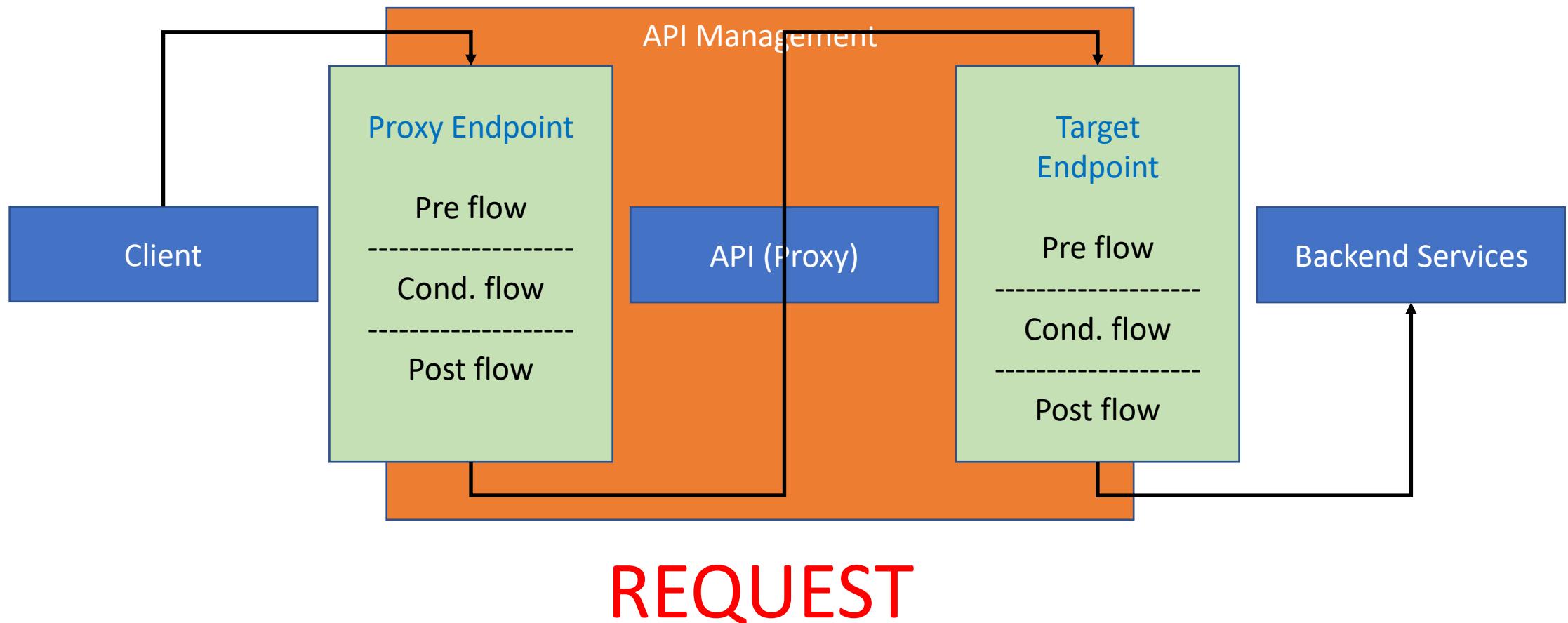
Navigate to <https://api.sap.com/>  to Explore → APIs.



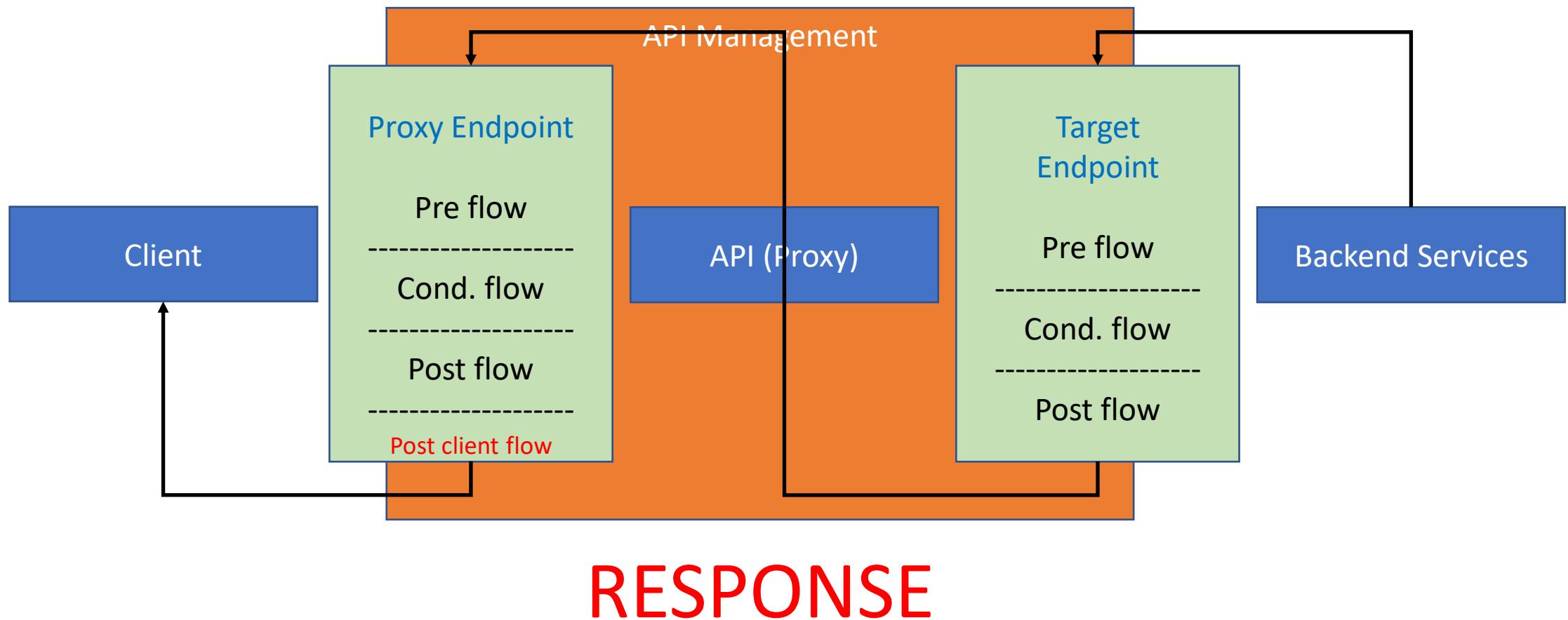
The screenshot shows the SAP API Business Hub interface. The top navigation bar includes links for SAP API Business Hub, Explore (which is highlighted with a red box), Resources, Discover Integrations, and Partner with Us. Below the navigation is a main content area divided into three columns: Products, Business Processes, and Categories. The Products column lists various SAP offerings. The Business Processes column lists several business processes. The Categories column lists various categories, with 'APIs' highlighted by a red box. A dropdown menu for 'APIs' shows options like Events, Integrations, Adapters, Process Automation, Graph, CDS Views, Open Connectors, Business Processes, One Domain Model, and Data Intelligence. A small navigation icon is visible in the bottom right corner of the content area.

Products	Business Processes	Categories
SAP S/4HANA Cloud	Recruit to Retire	APIs
SAP S/4HANA	Lead to Cash	Events
SAP Customer Experience	Source to Pay	Integrations
SAP Business Technology Platform	Plan to Fulfill	Adapters
SAP SuccessFactors	Acquire to Decommission	Process Automation
SAP Ariba	Idea to Market	Graph
SAP Concur		CDS Views
SAP Fieldglass		Open Connectors
SAP Business ByDesign		Business Processes
SAP Integrated Business Planning for Supply Chain		One Domain Model
		Data Intelligence

Flows – Where should I apply my policies ?



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

The screenshot shows the SAP API Management interface for the API **GWSAMPLE_BASIC**. The API is currently **Deployed** and can be reached via the **API Proxy URL**: https://quovadis.test.apimanagement.eu10.hana.ondemand.com:443/GWSAMPLE_BASIC.

The main navigation bar includes links for **Transport**, **Policies**, **Copy**, **Edit**, and more. Below the navigation, there are four tabs numbered 1 through 4:

- 1** Overview (highlighted)
- 2** Proxy EndPoint
- 3** Target EndPoint
- 4** Resources

The **Overview** section displays the following details:

- Title:** GWSAMPLE_BASIC
- Host Alias:** quovadis.test.apimanagement.eu10.hana.ondemand.com
- API Base Path:** /GWSAMPLE_BASIC
- API State:** Active
- Description:** (empty)

On the right side, there are two summary boxes:

- Calls(05/01/2023 - 05/29/2023):** 3.5k
- API Health:** A green progress bar indicating 3487 calls out of 0 total.

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

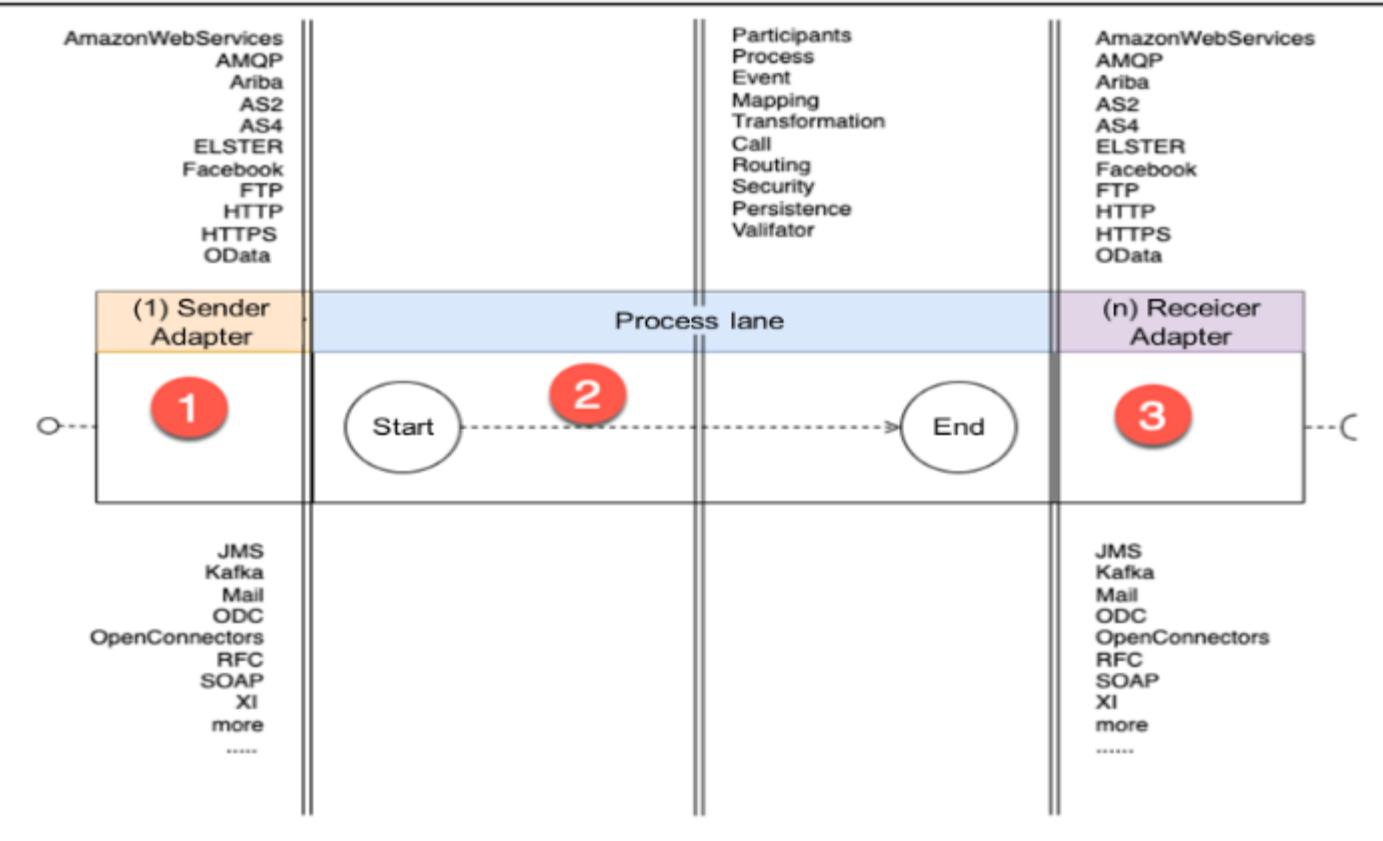
C_CPI_15

Unit 4 Content

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

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



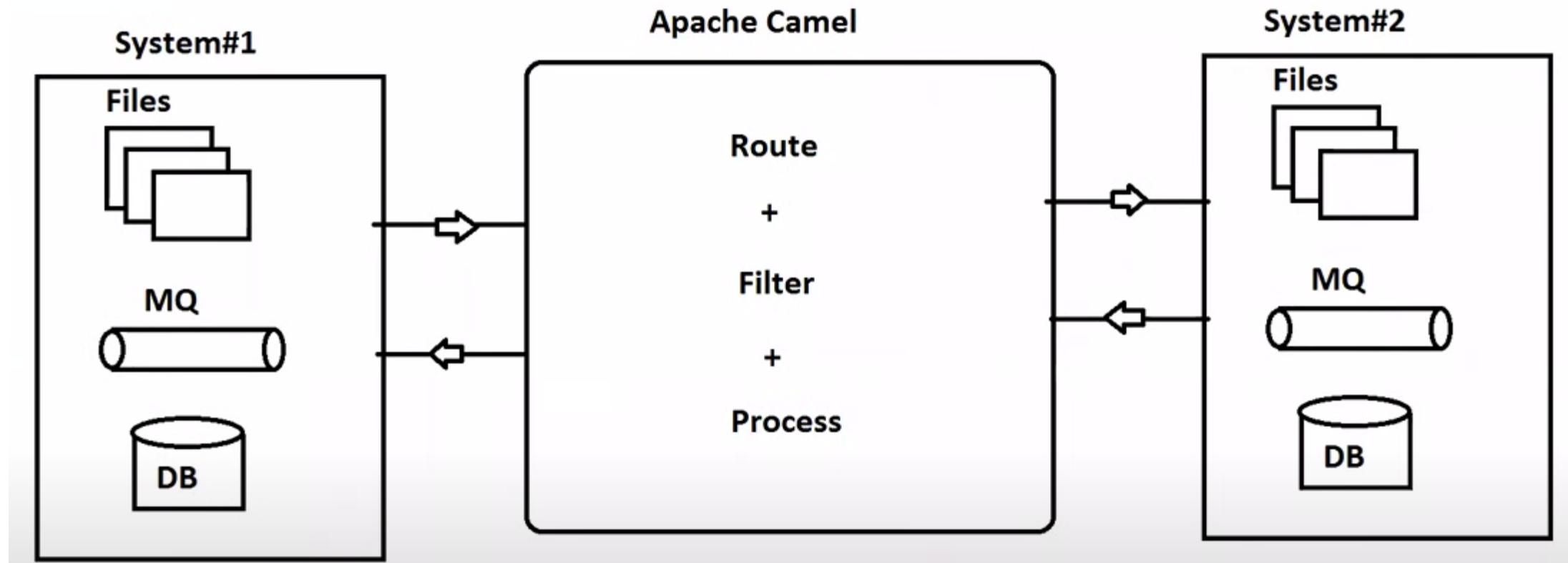
- Integration flow has 0-1 sender adapter
- Message is delivered via an endpoint
 - If an adapter is configured
- Process is started via **Start** event
- Different ways messages can be processed
- Receiver adapters can be configured
- Message processing can be synchronous or asynchronous

Key Features of Cloud Integration

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

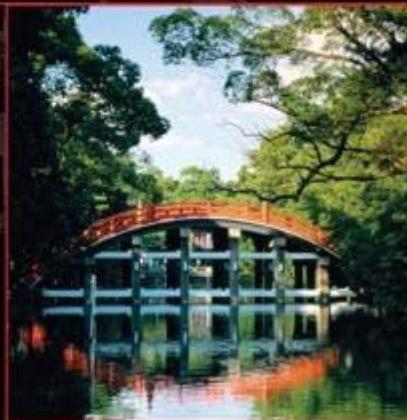
ENTERPRISE INTEGRATION PATTERNS

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



A MARTIN FOWLER SIGNATURE BOOK

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...

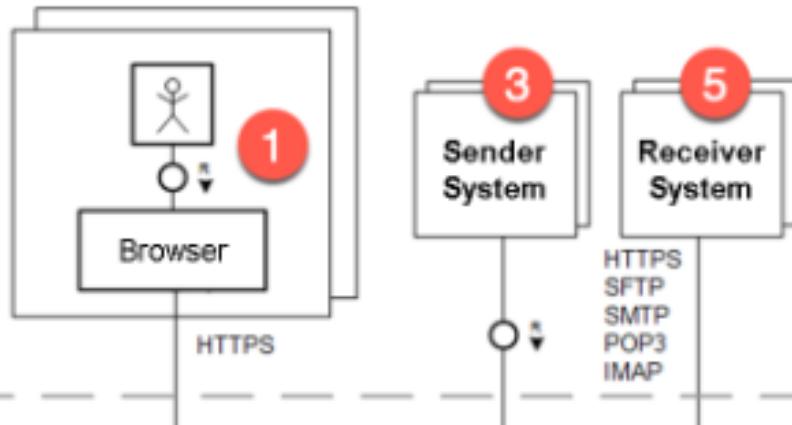
Administrator, Integration Developer

Administrator:

Manages user permissions for account and application

Integration Developer:

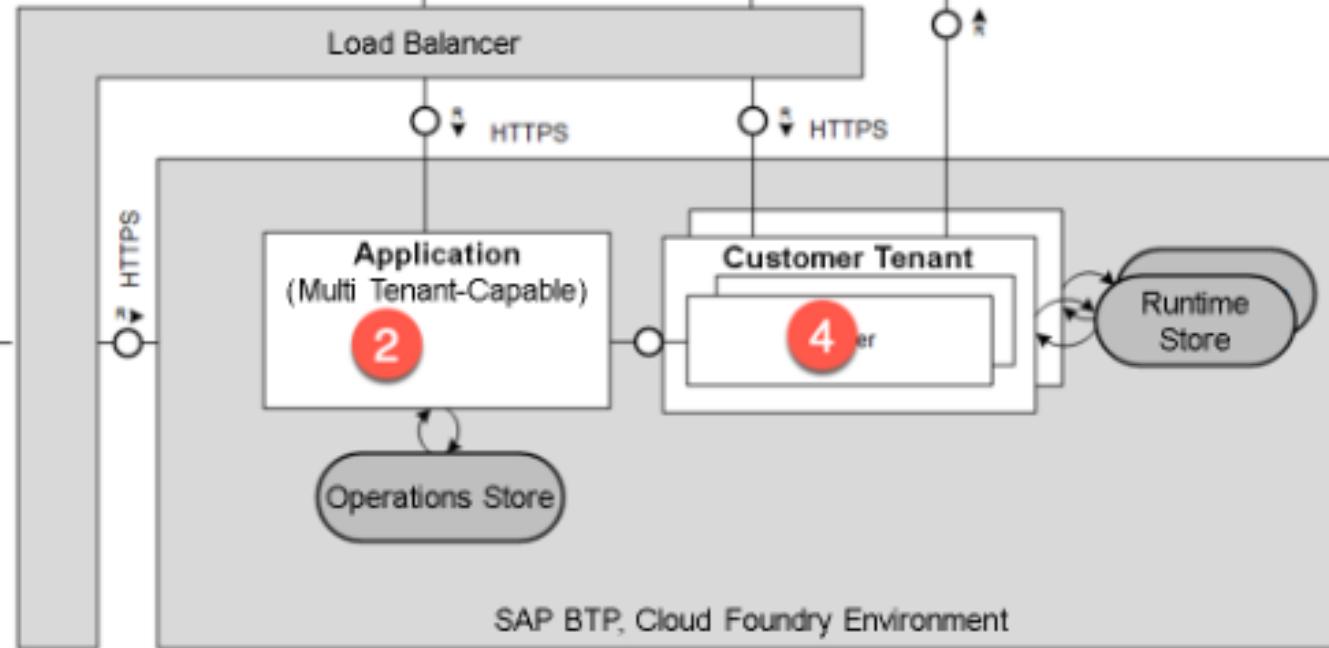
Design and operates integration content



Infrastructure Provider



Provides infrastructure for customer



The Entire Implementation

Demo: Building sample integration

- Building integration from scratch
- Predefined integration content

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



Demo of working solution...

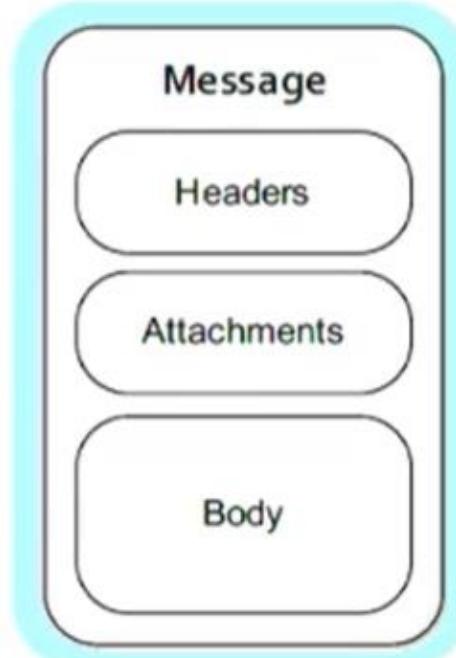
- Demo of the working solution
- Explore Cloud Integration
 - Discover area
 - Design area
 - Monitor area
 - Settings area

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

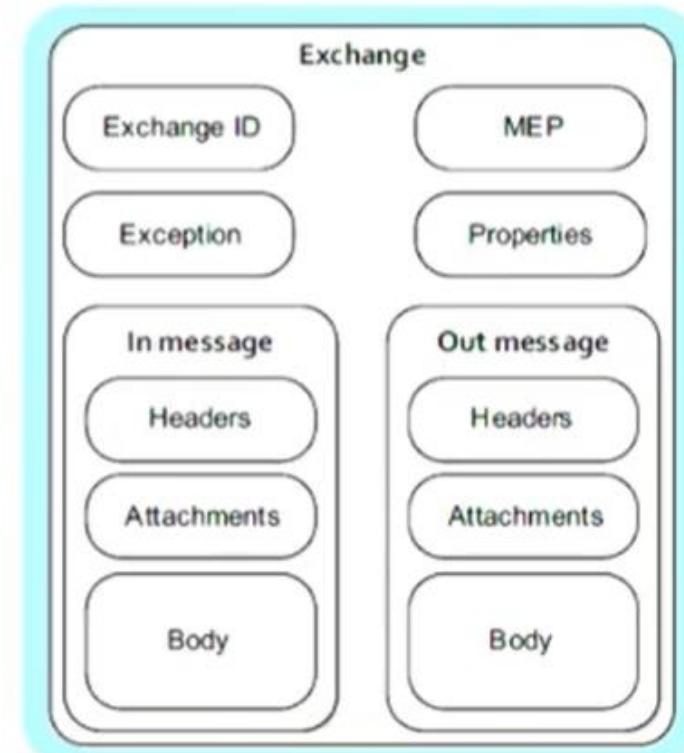


Basic concepts of Cloud Integration flow...

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



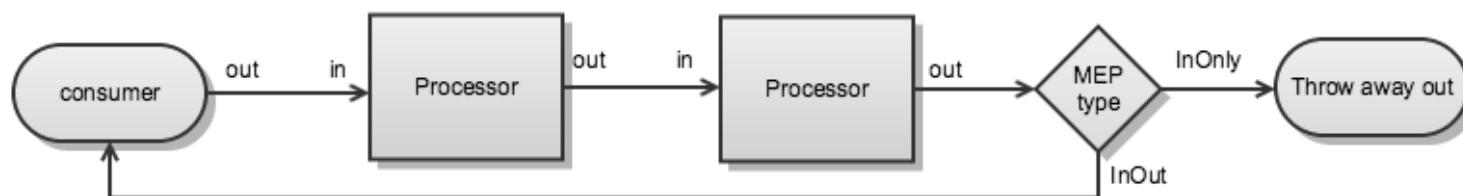
MESSAGE EXCHANGE PATTERNS AND THE EXCHANGE OBJECT

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.

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}`

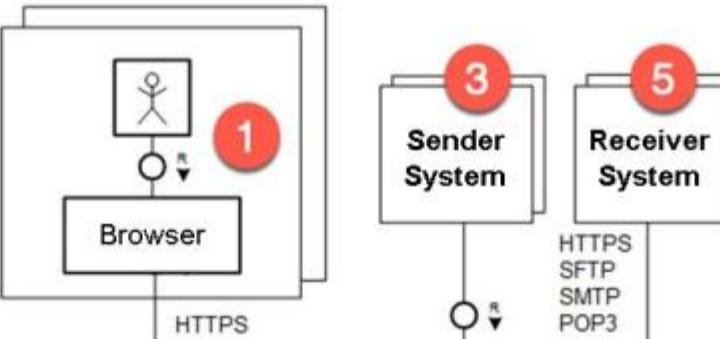
Administrator, Integration Developer

Administrator:

Manages user permissions for account and application

Integration Developer:

Design and operates integration content



Infrastructure Provider

Provides infrastructure for customer

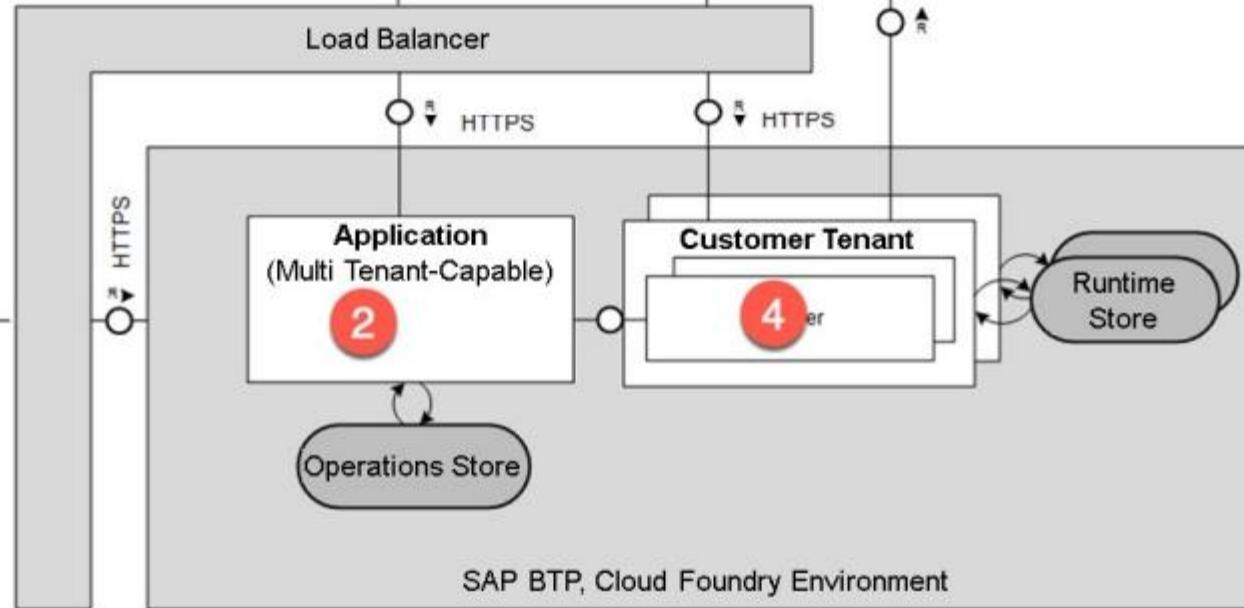


Figure 78: The Entire Implementation

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)

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

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

XPath Expressions

The screenshot shows the VS Code interface with the 'XPath Notebook' extension installed. There are three code cells in the left pane and an XML preview in the right pane.

Code Cells:

- [44] `/ProductSet` ✓ 0.2s Source: 'Products.xml' Items: 1 XPath
... `"-/ProductSet[1]"`
- [45] `/ProductSet/count(Product)` ✓ 0.2s Source: 'Products.xml' Items: 1 XPath
... `1`
- [46] `/ProductSet/count(Product) > 0` ✓ 0.2s Source: 'Products.xml' Items: 1 XPath
... `true`

XML Preview:

```
1 <ProductSet>
2   <Product>
3     <Category>Flat Screen Monitors</Category>
4     <ProductID>HT-1035</ProductID>
5     <Name>Flat Basic</Name>
6   </Product>
7 </ProductSet>
```

XPath Expressions

The screenshot shows an IDE interface with two tabs at the top: "NoProducts.xbook" and "SalesOrders.xml". The "SalesOrders.xml" tab is active, displaying the file's content.

The main area is an "XPath Notebook" containing three entries:

- [47] `/ProductSet` ✓ 0.2s Source: 'NoProducts.xml' Items: 1 XPath
... `"-/ProductSet[1]"`
- [48] `/ProductSet/count(Product)` ✓ 0.2s Source: 'NoProducts.xml' Items: 1 XPath
... `0`
- [49] `/ProductSet/count(Product) > 0` ✓ 0.2s Source: 'NoProducts.xml' Items: 1 XPath
... `false`

A toolbar with icons for Run All, Clear All Outputs, and other options is visible above the notebook. A status bar at the bottom shows the current file path: "NoProducts.xml" and "NoProducts.xbook".

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

The screenshot shows the SAP Cloud Platform Integration Explorer interface. On the left, there is a code editor window displaying an XML feed definition. The feed has a title 'SalesOrderLineItemSet' and an updated timestamp '2023-06-04T07:44:49Z'. It contains two entries, each with an id pointing to a SalesOrderLineItemSet resource. The first entry's content includes properties for SalesOrderID (0500000001), ItemPosition (000000040), and DeliveryDate (2018-01-07T23:00:00.000000). The second entry is similar. On the right, there are two XPath Notebook results. Result [53] shows the path //content/m:properties/d:SalesOrderID for both entries, returning values 0500000001 and 0500000001 respectively. Result [54] shows the path //content/m:properties/d:ItemPosition for both entries, returning values 000000040 and 000000040 respectively. A note at the bottom states: "Namespaces are not automatically removed in HTTP adapter... So your XPath needs to take that into account".

```
<feed xmlns="http://www.w3.org/2005/Atom"
      xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
      xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices" xml:lang="en-US">
  <id>https://sapes5.sapdevcenter.com/sap/opu/odata/iwbep/GWSAMPLE_BASIC</id>
  <title type="text">SalesOrderLineItemSet</title>
  <updated>2023-06-04T07:44:49Z</updated>
  <author>
    <name/>
  </author>
  <link href="ProductSet('HT-1035')/ToSalesOrderLineItems" rel="self" type="application/atom+xml">
  <entry>
    <id>https://sapes5.sapdevcenter.com/sap/opu/odata/iwbep/GWSAMPLE_BASIC(SalesOrderID='0500000001')</id>
    <title type="text">SalesOrderLineItemSet(SalesOrderID='0500000001')</title>
    <updated>2023-06-04T07:44:49Z</updated>
    <category term="GWSAMPLE_BASIC.SalesOrderLineItem" scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme">
    <link href="SalesOrderLineItemSet(SalesOrderID='0500000001',ItemPosition=40)" rel="self" type="application/atom+xml">
      <content type="application/xml">
        <m:properties xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
                      xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices" xml:lang="en-US">
          <d:SalesOrderID>0500000001</d:SalesOrderID>
          <d:ItemPosition>000000040</d:ItemPosition>
          <d:DeliveryDate>2018-01-07T23:00:00.000000</d:DeliveryDate>
        </m:properties>
      </content>
    </entry>
    <entry>
      <id>https://sapes5.sapdevcenter.com/sap/opu/odata/iwbep/GWSAMPLE_BASIC(SalesOrderID='0500000002')</id>
      <title type="text">SalesOrderLineItemSet(SalesOrderID='0500000002')</title>
      <updated>2023-06-04T07:44:49Z</updated>
```

SalesOrdersNamespaces.xml SalesOrders.xml SalesOrdersModified.xml ... SalesOrdersNamespaces.xbook NoProducts.xml NoProducts.xbook ... XPath Notebook

[53] ✓ 0.2s Source: 'SalesOrdersNamespaces.xml' Items: 2 XPath
[]
 //content/m:properties/d:SalesOrderID
 []
 "-/feed[1]/entry[1]/content[1]/m:properties[1]/d:SalesOrderID[1]",
 "-/feed[1]/entry[2]/content[1]/m:properties[1]/d:SalesOrderID[1]"
[54] ✓ 0.2s Source: 'SalesOrdersNamespaces.xml' Items: 2 XPath
[]
 //content/m:properties/d:ItemPosition
 []
 "-/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

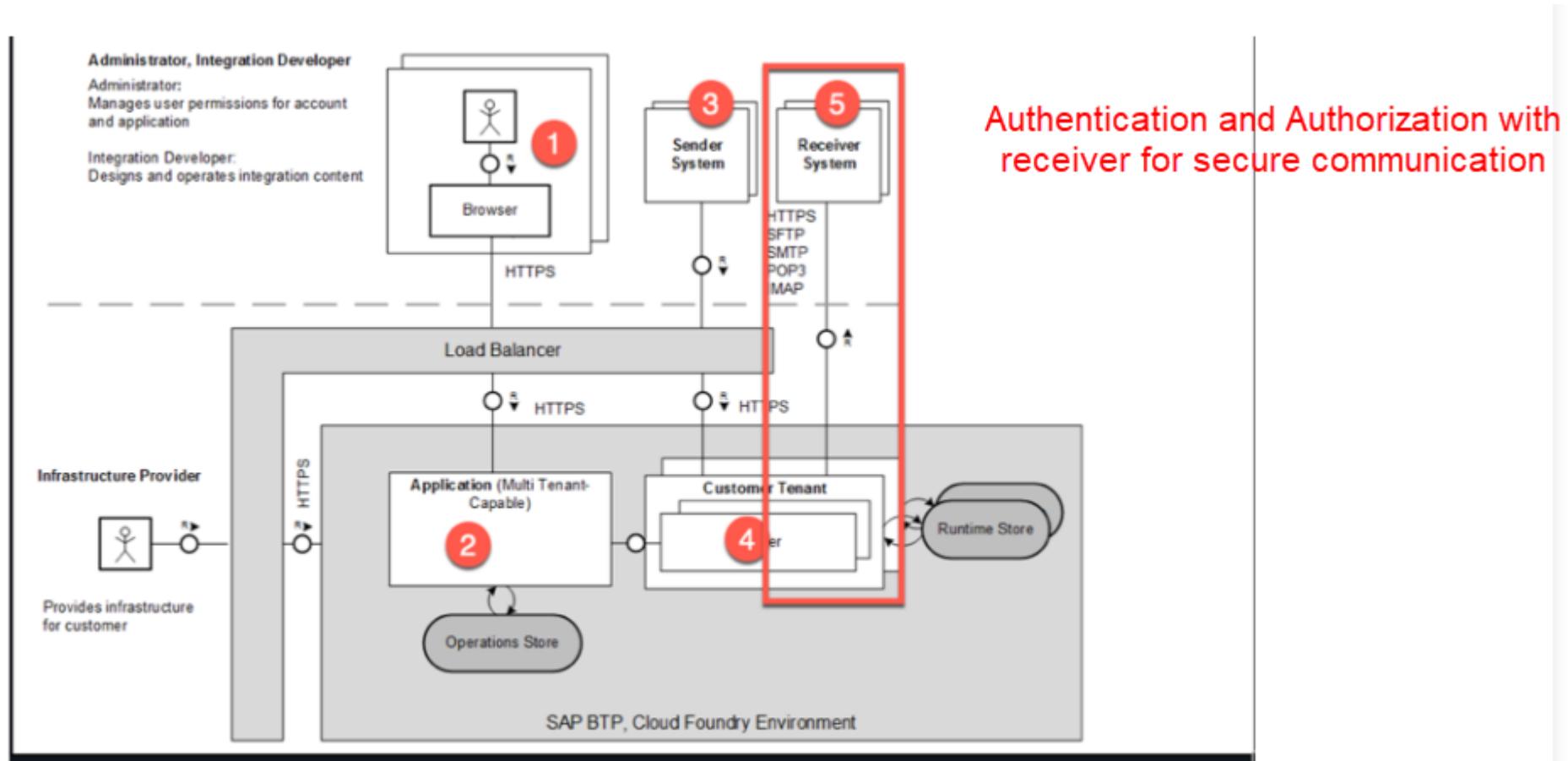
Business Scenario - Task flow



Business Scenario – Steps involved

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

Using Adapter Outbound Security



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

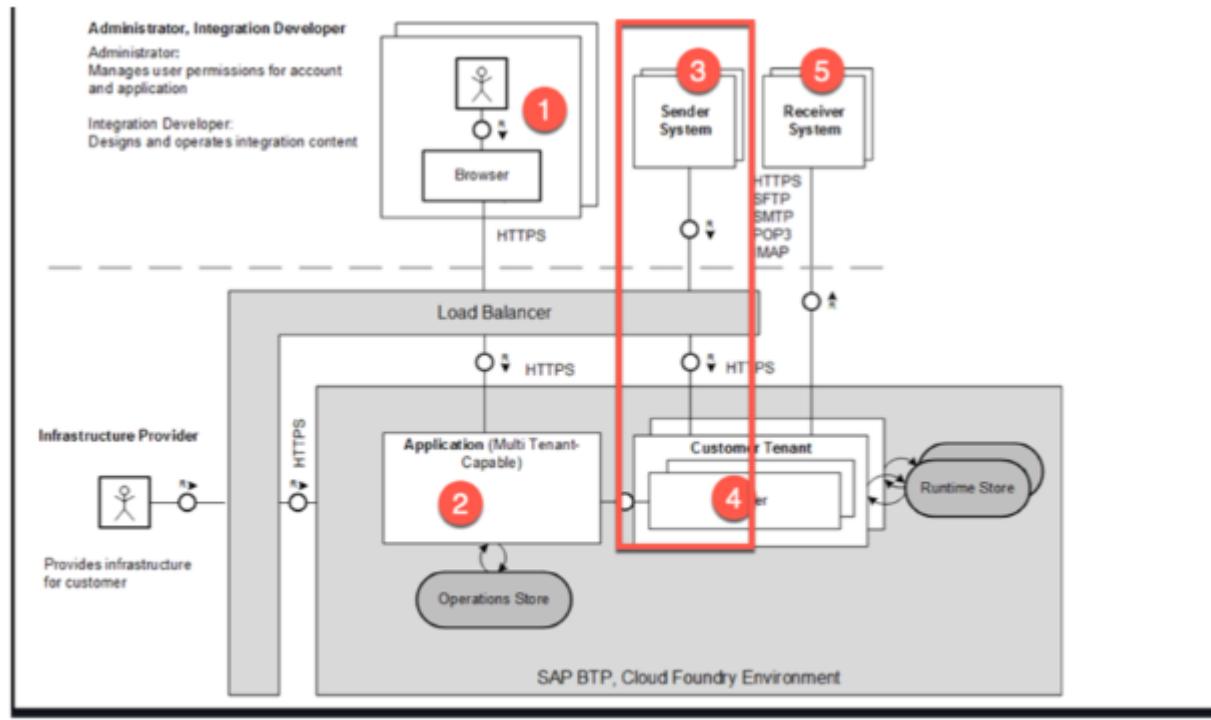


Business Scenario – Steps involved

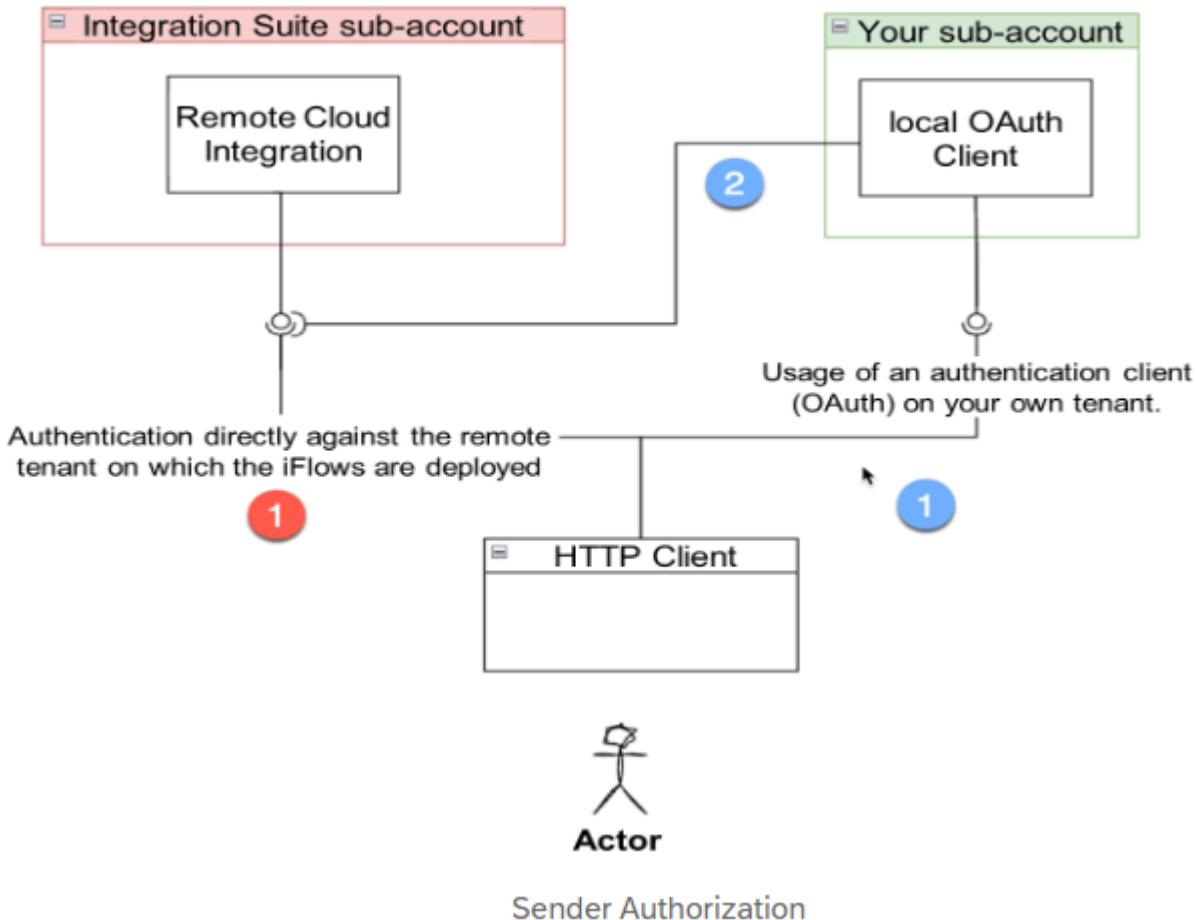
17. Add **Message Start** (remove Timer)
18. Add **SOAP adapter** (asynchronous call)
19. Remove \$top clause (power of asynchronous call)

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

The screenshot shows the SAP Integration Suite interface. The left sidebar has a red circle labeled '1' over the 'Discover' button. The main area shows a breadcrumb 'Discover (Integrations) / Discover (542)' and a dropdown menu with 'Examples' selected, indicated by a red circle labeled '2'. Below it, a message says '9 package(s) found'. A red circle labeled '3' is over the third item in the list of packages.

- Integration Flow Design Guidelines - Scripting Guidelines
This integration package contains integration flows to illustrate the design guidelines for ...
- Integration Flow Design Guidelines - Learn the Basics
This integration package contains integration flows to illustrate the design guidelines for ...
- Integration Flow Design Guidelines - Enterprise Integration Patterns
This integration package contains integration flows to illustrate the design of the ...
- Integration Flow Design Guidelines - Handle Errors Gracefully
This integration package contains integration flows to illustrate the design guidelines for ...

SAP Integration Suite

Integrations / Integration Flow Design Guidelines - Learn the Basics / Integration Flow Design Guidelines - Learn the Basics

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

Actions generic

Copy View metadata Actions

Download Configure Deploy

Deploy

Name	Type	Version
Generic Receiver	Integration Flow	1.0.0
Integration flow mocking a receiver system for test purposes Unmodified		

1 2 3 4 5 6 7

The screenshot shows the SAP Integration Suite interface. The left sidebar is collapsed (1). The main title bar has a red circle with '2' (2). The breadcrumb path 'Integrations / Integration Flow Design Guidelines - Learn the Basics / Integration Flow Design Guidelines - Learn the Basics' is displayed. Below it is a brief description of the integration package. On the right, there are buttons for 'Edit', 'Export', and 'Delete'. The left sidebar has several sections: Home, Discover (with sub-options Integrations, APIs, Type Systems), Design (with sub-options Integrations (1), APIs, Custom Type Systems, MIGs, MAGs), Test, Configure, Monitor, Monetize, Settings (with sub-options APIs, MIGs and MAGs), and a 'Discover' section. The 'Artifacts (35)' tab is selected (3). A table lists artifacts: 'Generic Receiver' (Integration Flow, 1.0.0, Unmodified). A context menu (4) is open over the first row, showing options: Copy, View metadata, Actions (6), Download, Configure, Deploy (7). The 'Deploy' button is highlighted with a mouse cursor.

The screenshot illustrates the SAP Integration Suite interface for deploying an integration flow. The process is numbered 1 through 7:

- 1** The user is in the **Design** section of the left sidebar.
- 2** The user has selected the **Integrations** package.
- 3** The **Artifacts (35)** tab is selected in the top navigation bar.
- 4** A context menu is open over an artifact named **Modeling Basics - Decouple Flows Using JMS**.
- 5** The artifact details are shown, indicating it is an **Integration Flow** version **1.0.0**.
- 6** The **Deploy** button in the context menu is highlighted.
- 7** The **Deploy** button is being clicked.

Integration Package Details:

- Integrations / Integration Flow Design Guidelines - Learn the Basics / Integration Flow Design Guidelines - Learn the Basics**
- This integration package contains integration flows to illustrate the design guidelines for modeling integration flows.
- Vendor:** SAP **Mode:** Editable **Version:** 1.10.0

Artifact List:

Name	Type	Version
Modeling Basics - Decouple Flows Using JMS	Integration Flow	1.0.0
Basic integration flow to show how to decouple two integration flows using JMS queues as persistency		
Modified		

The screenshot shows the Postman application interface with several numbered callouts highlighting specific features:

- 1**: A red circle highlights the collection tree on the left side of the interface.
- 2**: A red circle highlights the "DecoupleProcessing" folder under the "ModelingBasics" collection.
- 3**: A red circle highlights the "POST DecoupleFlowsUsingJMS" request under the "DecoupleProcessing" folder.
- 4**: A red circle highlights the "Send" button in the top right corner of the request configuration panel.
- 5**: A red circle highlights the XML response body, which contains the following XML code:

```
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>
```

Outro

Certification preparation

Topic distribution

80 Questions 3 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.

The screenshot shows a SAP Consultant Certification exam interface. At the top, it says "SAP Consultant Certification" and "May 18 2021 Logged in as: SAPdemo@questionmark.com". The main content area displays a question about SAP BPC options. On the right side, there is a "Translation" panel with a red border around its header and content. The panel has a "Language" dropdown set to "English". Below it is a list of eight languages: Chinese (简体中文), English, French (Français), German (Deutsch), Japanese (日本語), and Korean (한국어). The "French (Français)" option is highlighted with a cursor. At the bottom of the screen, there are buttons for "Next Question > Assessment Navigator" and "Submit".

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

The screenshot shows the SAP TRAINING website with a dark header. The main title is "SAP TRAINING". Below it are navigation links: "Explore catalog", "SAP Learning Hub", "SAP Certification", and "More". A search bar with placeholder text "Enter keyword to search for courses, certifications or training paths" is positioned above the content area. The breadcrumb navigation shows "Courses & Curricula | SAP Certification Exam, One Attempt". The product title "CER001 SAP Certification Exam, One Attempt" is displayed prominently. Below the title, the delivery method is listed as "SAP Certification", level as "Certification", and language as "English". A "Solution Release" status of "010" is shown. On the right side, there is a "Chat Now" button. The "Course announcements" section contains two bullet points: "SAP Certification validates the expertise of anyone in the SAP ecosystem with innovative certifications delivered directly by SAP." and "All exams are proctored and delivered online, for maximum flexibility and convenience." The "Course information" section lists "Content" and "A subscription to SAP Certification exam, one attempt provides you a 12-months access to Certification Hub, where you can schedule one exam attempt over your subscription period.". The "Price" is listed as "200.00 € (EUR)" with a note "Price excludes tax." and an "Add to basket" button.

The screenshot shows the SAP TRAINING website with a dark header. The main title is "SAP TRAINING". Below it are navigation links: "Explore catalog", "SAP Learning Hub", "SAP Certification", and "More". A search bar with placeholder text "Enter keyword to search for courses, certifications or training paths" is positioned above the content area. The breadcrumb navigation shows "Courses & Curricula | SAP Certification Exam, Six Attempts". The product title "CER006 SAP Certification Exam, Six Attempts" is displayed prominently. Below the title, the delivery method is listed as "SAP Certification", level as "Certification", and language as "English". A "Solution Release" status of "010" is shown. On the right side, there is a "Chat Now" button. The "Course announcements" section contains two bullet points: "SAP Certification validates the expertise of anyone in the SAP ecosystem with innovative certifications delivered directly by SAP." and "All exams are proctored and delivered online, for maximum flexibility and convenience." The "Course information" section lists "Content" and "A subscription to SAP Certification exam, six attempts provides you a 12-months access to Certification Hub, where you can schedule up to a maximum of six exam bookings over your subscription period.". The "Price" is listed as "500.00 € (EUR)" with a note "Price excludes tax." and an "Add to basket" button.

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

The screenshot shows the SAP BTP Learning community homepage. At the top, there's a navigation bar with links for Groups, Partner Groups, SAP Events, Help, and user icons. Below the header is a search bar and a main title "SAP BTP Learning". The breadcrumb navigation shows: SAP Community Groups > Groups > SAP Learning > SAP BTP Learning.

Welcome learners! Join in this new and exciting collaboration experience.

How to get certified as an SAP BTP expert - in 3 simple steps

SAP Learning Tips & Tricks: How to Bookmark a Lesson

Below these posts is a section titled "Group Activity" with a red circle around the "Join Group" button. A post from a member named AB is visible, followed by a "Group Information" box.

The screenshot shows the SAP BTP Learning community homepage after joining the group. A green success message box appears at the top: "Success! You are now a member and will receive notifications of group activity." The rest of the page content is identical to the first screenshot, including the posts and the "Group Activity" section with its red circled "Join Group" button.

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 comments 10 likes 5,830 views

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
2		SAP Integration Suite Certification Entitlements	SAP HANA Academy
3		SAP Integration Suite Certification Provisioning	SAP HANA Academy
4		SAP Integration Suite Certification Open Connectors	SAP HANA Academy
5		SAP Integration Suite Certification Open Connectors	SAP HANA Academy
6		SAP Integration Suite Certification API Management	SAP HANA Academy
7		SAP Integration Suite Certification API Management	SAP HANA Academy

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

SAP Learning

On this page: Learning Content **Live sessions** SAP Learning Group SAP Learning Class SAP Certification Practice Systems

Live Sessions

Expand your learning experience and deepen your knowledge in SAP solutions by registering for one or more scheduled expert-led live sessions from our limited free series.



Live Sessions

Q&A live sessions - Side-by-Side Extensions on SAP BTP
Join a Q&A live session with an SAP Learning expert to get answers to your questions about the self-study content, and successfully complete the SAP Learning...

Expert deep dive live sessions - Deploy a CAP application to SAP BTP, Kyma Runtime
Register for any of the deep dive live sessions delivered by SAP Learning experts, who will guide you through specific topics with detailed explanations and demos.

SAP Learning Group for SAP BTP

Join our SAP expert-moderated learning group. Get answers to questions about your learning journey and certification preparation.

[Join here](#)



SAP

Q&A Live Session - Developing Side-by-Side Extensions with SAP BTP

Q&A Live Session - Developing Side-by-Side Extensions with SAP BTP

Description:
This expert-guided live session provides an opportunity to have questions about the learning journey "Build side-by-side extensions on SAP BTP" answered by an expert. Bring your open questions about difficult topics, and get answers live from your speaker, as well as hearing explanations to questions raised by your fellow learners.

Speakers:
SAP Instructors

Date:
May 16, 2023

Time Berlin CEST 10:00 - 11:00 (UTC+01:00)
Time New Delhi IST 13:30 - 14:30 (UTC+05:30)
Time Singapore SGT 16:00 - 17:00 (UTC+08:00)

Q&A Live Session - Developing Side-by-Side Extensions with SAP BTP

Description:
See details above

Speakers:
SAP Instructors

Date:
May 16, 2023

Time Berlin CEST 15:00 - 16:00 (UTC+01:00)
Time San Francisco PDT 06:00 - 07:00 (UTC-08:00)
Time New York EDT 09:00 - 10:00 (UTC-05:00)

Q&A Live Session - Developing Side-by-Side Extensions with SAP BTP

Description:
See details above

Speakers:
SAP Instructors

Date:
June 30, 2023

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](#).

Thank you.

Contact information:

Eve Li

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