SAP TechEd

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Delve into ABAP Cloud on SAP BTP ABAP environment – AD181v

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November 3, 2023

Agenda

INTRODUCTION

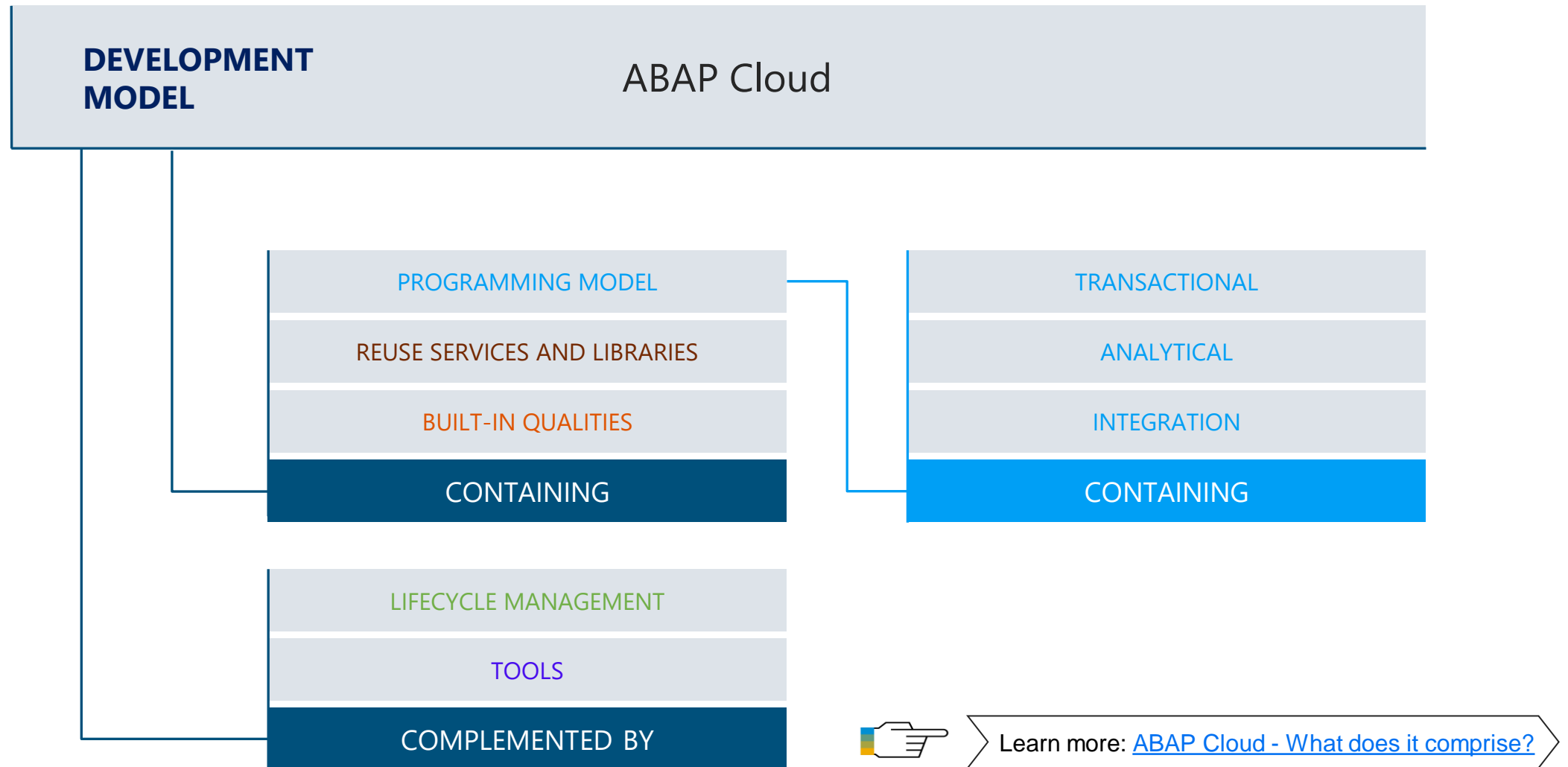TODAY'S SCENARIO – OVERVIEW

TODAY'S SCENARIO – EXERCISES

WRAP UP

INTRODUCTION

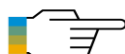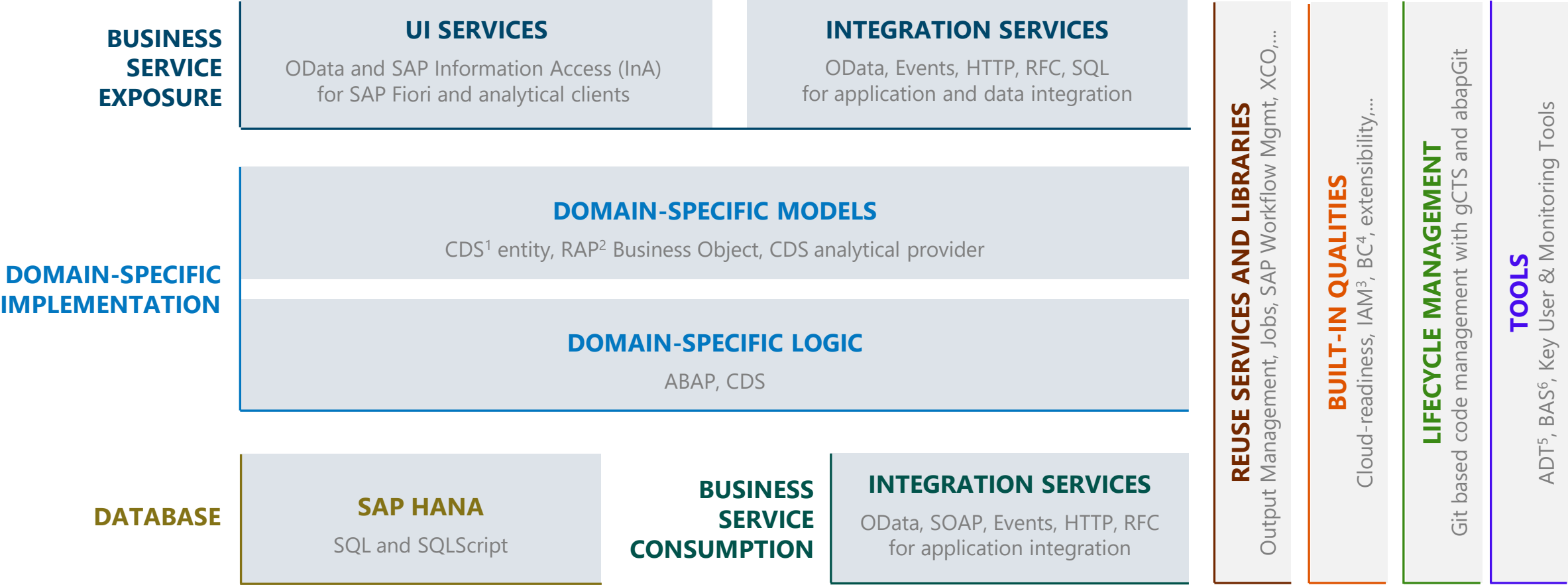# ABAP Cloud

… is the ABAP development model to build cloud-ready business apps, services, and extensions

… comes with SAP Business Technology Platform (SAP BTP) and SAP S/4HANA

… works with public or private cloud, and even on-premise

ABAP Cloud – What's in it?

DEVELOPMENT MODEL	ABAP Cloud

PROGRAMMING MODEL	TRANSACTIONAL
REUSE SERVICES AND LIBRARIES	ANALYTICAL
BUILT-IN QUALITIES	INTEGRATION
CONTAINING	**CONTAINING**

LIFECYCLE MANAGEMENT
TOOLS
COMPLEMENTED BY

Learn more: ABAP Cloud - What does it comprise?

ABAP Cloud map

BUSINESS SERVICE EXPOSURE	**UI SERVICES** OData and SAP Information Access (InA) for SAP Fiori and analytical clients	**INTEGRATION SERVICES** OData, Events, HTTP, RFC, SQL for application and data integration	

DOMAIN-SPECIFIC IMPLEMENTATION

DOMAIN-SPECIFIC MODELS

CDS[1] entity, RAP[2] Business Object, CDS analytical provider

DOMAIN-SPECIFIC LOGIC

ABAP, CDS

DATABASE

SAP HANA

SQL and SQLScript

BUSINESS SERVICE CONSUMPTION

INTEGRATION SERVICES

OData, SOAP, Events, HTTP, RFC
for application integration

REUSE SERVICES AND LIBRARIES
Output Management, Jobs, SAP Workflow Mgmt, XCO,…

BUILT-IN QUALITIES
Cloud-readiness, IAM[3], BC[4], extensibility,…

LIFECYCLE MANAGEMENT
Git based code management with gCTS and abapGit

TOOLS
ADT[5], BAS[6], Key User & Monitoring Tools

Related sessions: AD103v, AD107v, DT187v, DT182v, DT103v, DT200v

[1] Core Data Services
[2] ABAP RESTful application programming model

[3] Identity & Access Management
[4] Business Configuration

[5] ABAP Development Tools
[6] SAP Business Application Studio

7

ABAP Cloud – Transactional scenarios
## The ABAP RESTful application programming model (RAP)

BUSINESS SERVICE EXPOSURE

UI SERVICES

UI services for SAP Fiori based on OData

INTEGRATION SERVICES

OData Web APIs, Business Events

SERVICE BINDING

Service Definition, Service Projection, Event Binding

DOMAIN MODEL & IMPLEMENTATION

DOMAIN-SPECIFIC DATA MODELING

CDS[1] Entity, RAP[2] Business Object

DOMAIN-SPECIFIC PROGRAMMING

ABAP, CDS

DATA ACCESS

SAP HANA

SQL and SQLScript

BUSINESS SERVICE CONSUMPTION

APPLICATION INTEGRATION

HTTP / REST, WebSocket RFC, Business Events, OData, SOAP

[1] Core Data Services
[2] ABAP RESTful application programming model

TODAY'S SCENARIO – OVERVIEW

Building transactional SAP Fiori apps with RAP
Underlying simplified Flight data model

CUSTOMER

TRAVEL

BOOKING

AGENCY

FLIGHT
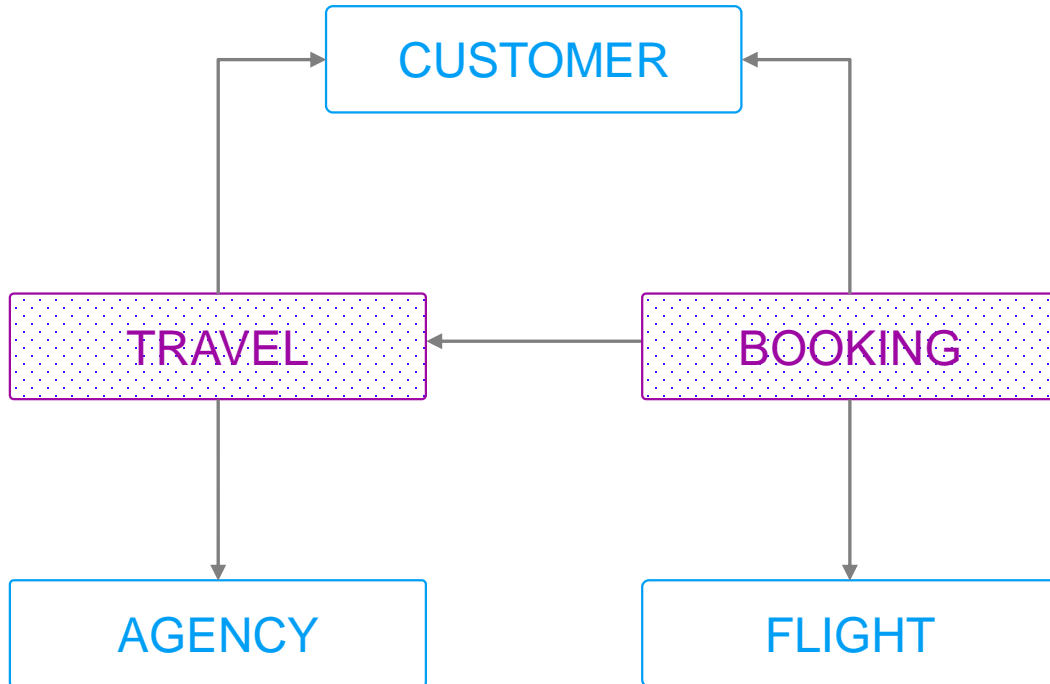
Main business entities in current scenario

Secondary business entities in current scenario

A **Travel entity** defines general travel data, such as the agency ID or customer ID, the overall status of the travel booking, and the total price of the travel.

A **Booking entity** comprises general flight and booking data, the customer ID for whom the flight is booked as well as the travel ID to which the booking belongs.

A **Customer entity** provides a detailed description of a flight customer, or passenger, such as the name, the address, and contact data.

An **Agency entity** defines travel agency data, such as the address and contact data.

A **Flight entity** defines the general flight data for each connection.

Building transactional SAP Fiori apps with RAP
with search, filter, and draft capabilities

Some of the used RAP features:
- ❖ Large objects / OData streams
- ❖ Virtual elements
- ❖ Late numbering
- ❖ Internal and determine instance actions
- ❖ Static (default) factory action
- ❖ Side effects
- ❖ Functions
- ❖ Business events
- ❖ etc.

Navigation to object page

Building transactional SAP Fiori apps with RAP
Travel list report app >> Object page

TODAY'S SCENARIO – EXERCISES

The AD181v hands-on exercises

Exercises 🔗

^Top of page

Follow these steps to enhance an existing OData UI service developed with RAP for a transactional SAP Fiori elements-based Travel Processing app.

Exercises	Boosters
Getting Started	--
Exercise 1: Inspect your Exercise Package - Generated RAP BO & UI Service	--
Exercise 2: Enhance the Data Model of the Base and Projected BO	--
Exercise 3: Enhance the BO Behavior Definition and Projection	💡
Exercise 4: Implement the Base BO Behavior - Late Numbering	--
Exercise 5: Adjust the UI Semantics in the Metadata Extensions	💡
Exercise 6: Implement the Base BO Behavior - Validations	💡
Exercise 7: Implement the Base BO Behavior - Actions	💡
Exercise 8: Implement the Base BO Behavior - Determinations	--
Exercise 9: Enhance the BO Behavior with Side Effects	--
Exercise 10: Implement the Base BO Behavior - Functions	--
Exercise 11: Enhance the BO Behavior with Business Events	--
Exercise 12: Implement the Base BO Behavior - Dynamic Feature Control	--

BO: Business Object
EML: Entity Manipulation Language
💡 Exercises with *Boosters* offer an accelerated way of doing them.

01 Access to the exercises:
https://github.com/SAP-samples/teched2023-AD181v

02 Set up your development environment.
1. Install and set up your ABAP Development Tools for Eclipse
2. Onboarding to the SAP BTP ABAP environment Trial

03 Move at your own speed!
▶ Use the provided 💡boosters if you are already familiar with a particular topic

04 Feel free to ask questions via GitHub issues!
▶ Provide screenshots to facilitate the support

The **AD181v hands-on exercises** – Working on GitHub (1)

Follow the step-by-step instructions
provided on [GitHub](#).

The **AD181v** hands-on exercises – Working on GitHub (2)

Use the ᴏᴜᴛʟɪɴᴇ view to get a quick overview of the exercises.
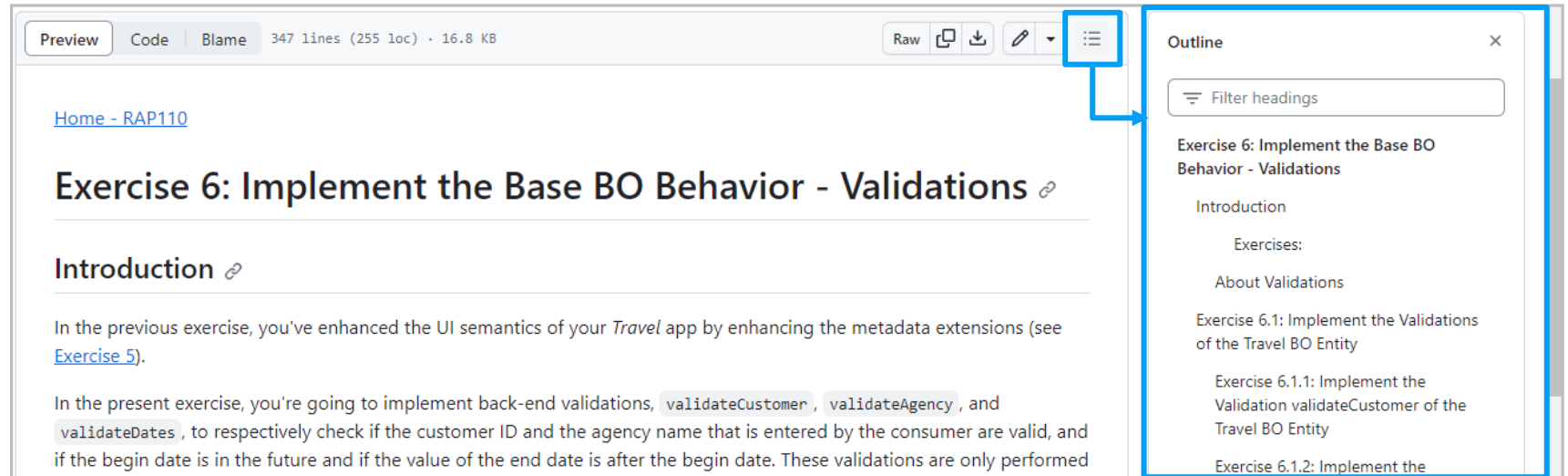
Use provided booster exercises to speed up the steps of familiar exercises
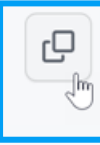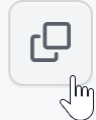
The AD181v hands-on exercises – Working on GitHub (3)

Make use of Copy raw contents button to easily copy code snippets


```
***********************************************************************
* Instance-bound action acceptTravel
***********************************************************************
  METHOD acceptTravel.
    MODIFY ENTITIES OF ZRAP110_R_TravelTP ### IN LOCAL MODE
           ENTITY travel
               UPDATE FIELDS ( OverallStatus )
                   WITH VALUE #( FOR key IN keys ( %tky        = key-%tky
                                                   OverallStatus = travel_status-accepted ) ). " 'A' Accepted
```

Always replace all occurrences of ### **with your assigned suffix in code snippets**

ABAP Console

```
RAP110 exercise generator
-----------------------------------------
Use transport D23K901012
Info: Suffix "810" will be used.
The following package got created for you and includes everything you need:
In the "Project Explorer" right click on "Favorite Packages" and click on "
Enter "ZRAP110_810" and click OK.
```

The **AD181v** hands-on exercises – Working on GitHub (3)

Your **generated exercise package** will look like this →
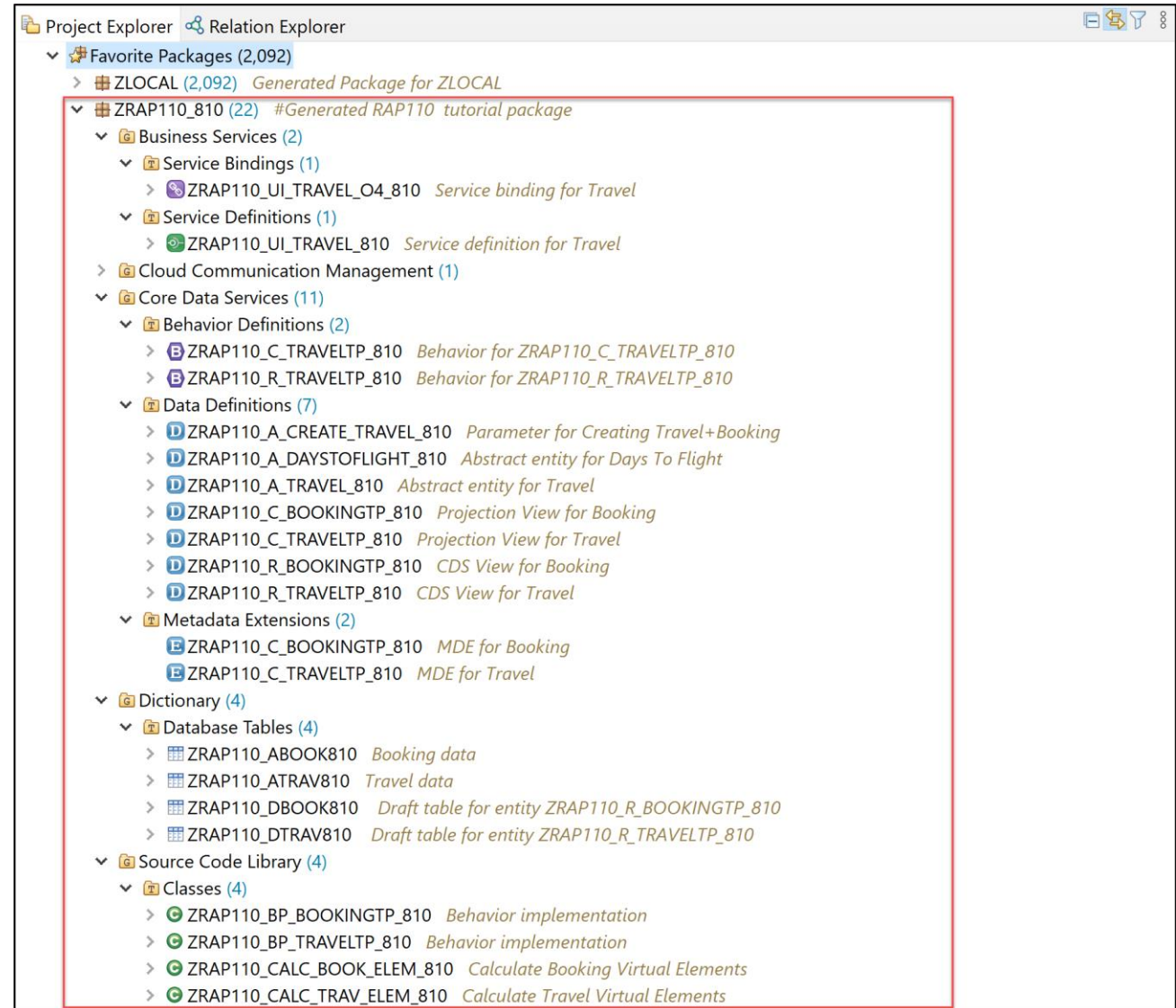
The AD181v hands-on exercises – Working on GitHub (4)
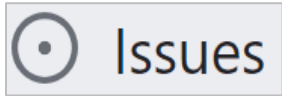
Open GitHub Issues to get help from the SAP experts.
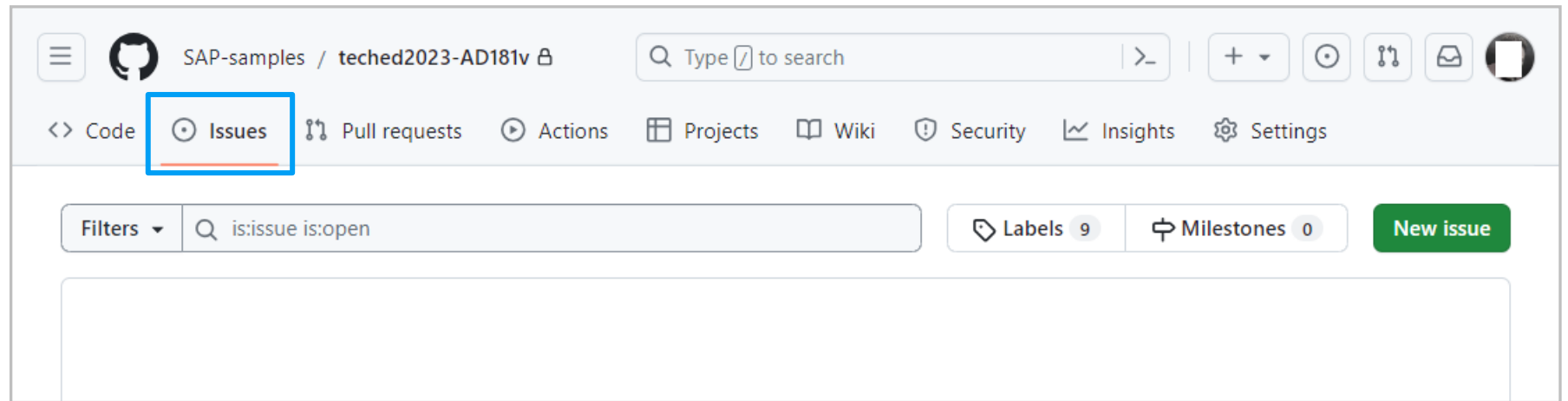
→ **COMPACT GLOSSARY**

SUMMARY

ABAP Cloud – One development model for SAP S/4HANA and SAP BTP

SAP S/4HANA any premise[1]	SAP S/4HANA Cloud, private edition[1]	SAP S/4HANA Cloud, public edition[2]	SAP BTP, ABAP Environment

ABAP Cloud development model
to build cloud-ready business apps, services, and extensions

Classic ABAP development model
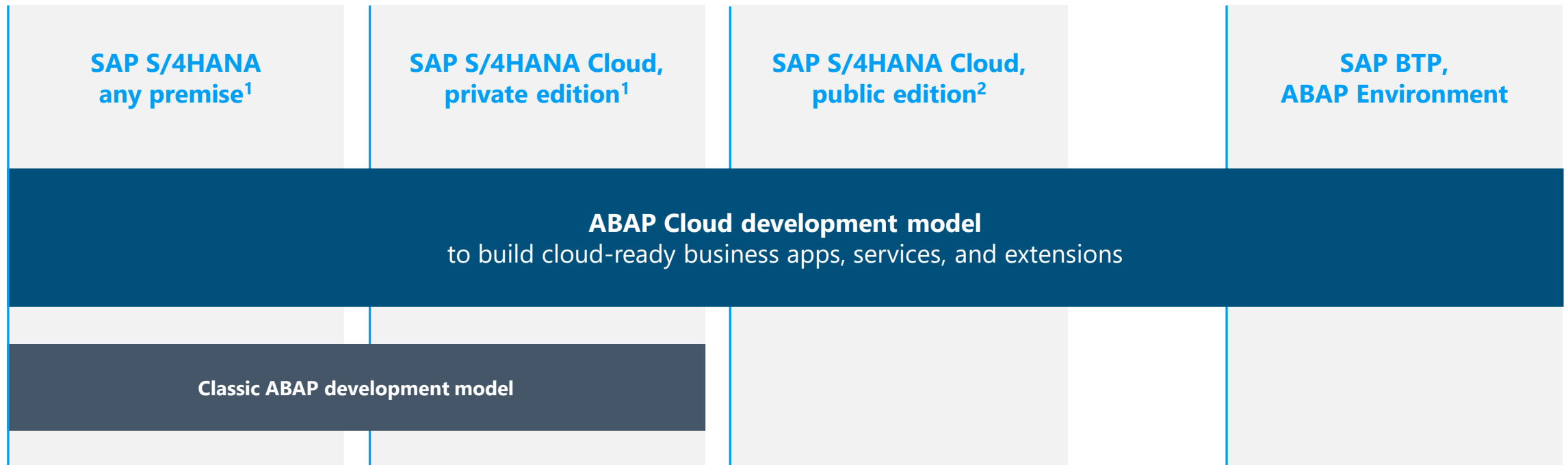
[1] SAP S/4HANA any premise or SAP S/4HANA Cloud, private edition release ≥ 2022
[2] SAP S/4HANA Cloud, public edition release ≥ 2208, 3-system landscape required

Key takeaways

ABAP Cloud is the development model provided to build cloud-ready enterprise services, apps, and extensions on SAP BTP ABAP environment and all editions[1] of SAP S/4HANA, in the cloud and on-premises.

The **ABAP RESTful application programming model** (RAP) is the **centerpiece of ABAP Cloud** for building efficiently **transactional** OData-based services and SAP Fiori apps with built-in cloud qualities.

RAP best support **SAP HANA** and **SAP Fiori elements**.

RAP is available on **SAP BTP ABAP Environment**, **SAP S/4HANA Cloud**, and **SAP S/4HANA** as of edition 1909.

The **RAP feature set** is enhanced **quarterly** in SAP BTP ABAP environment, **twice a year** in SAP S/4HANA Cloud ABAP environment, and **every two years** in SAP S/4HANA.

What's New: SAP BTP ABAP environment | SAP S/4HANA | SAP S/4HANA Cloud

What's Next: ABAP Platform Roadmap Information for all products

[1] - SAP S/4HANA any premise or SAP S/4HANA Cloud, private edition release ≥ 2022
- SAP S/4HANA Cloud, public edition release ≥ 2208, 3-system landscape required
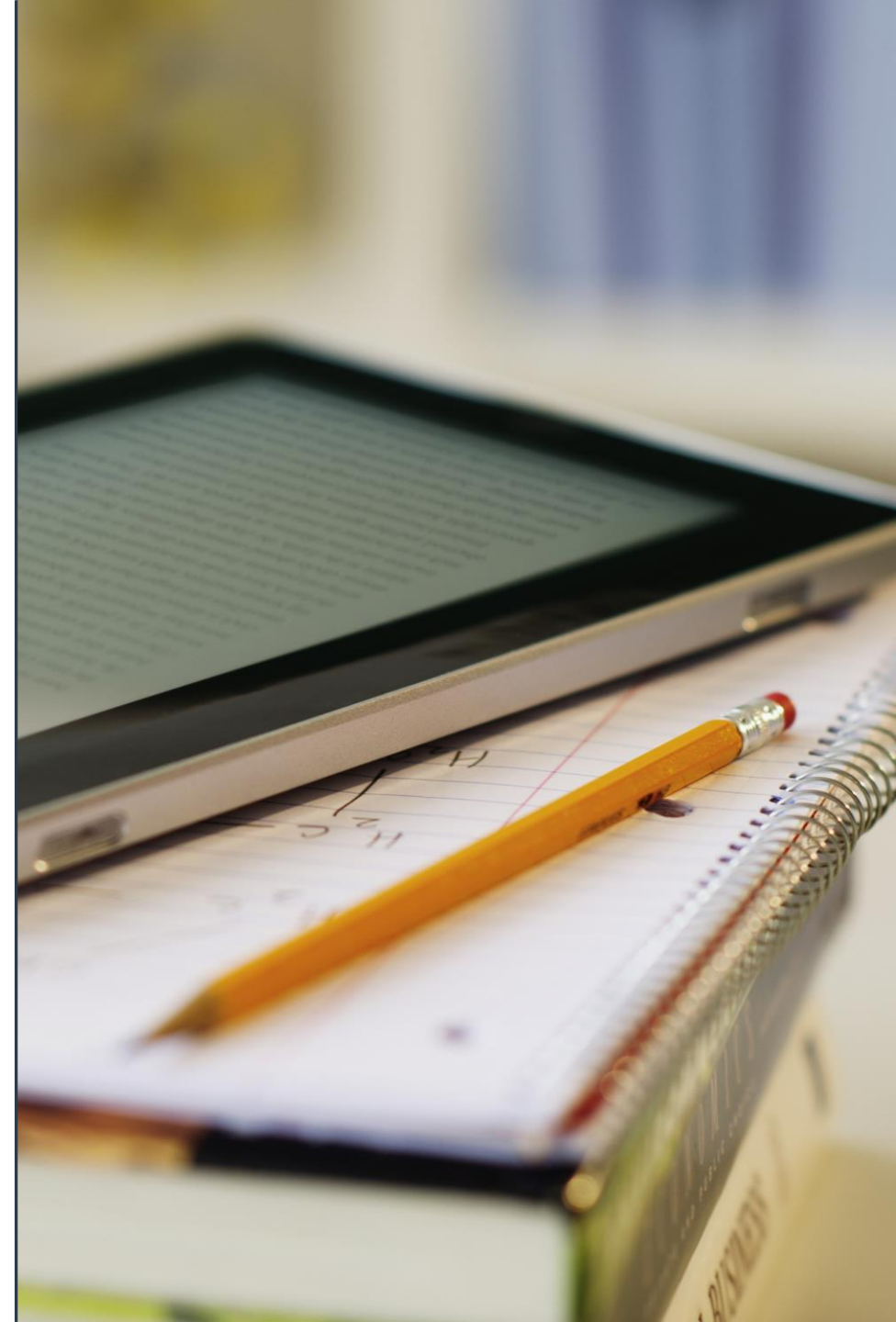
Learn more about ABAP Cloud at SAP TechEd 2023

Check the virtual Session Catalog: SAP TechEd Virtual in 2023

Join us for these insightful virtual sessions to learn more about accelerating development with pro-code tools:
AD103v, AD107v, DT187v, DT182v, DT103v, DT200v

☞ See blog post ABAP Cloud at SAP TechEd 2023

More information on ABAP Cloud
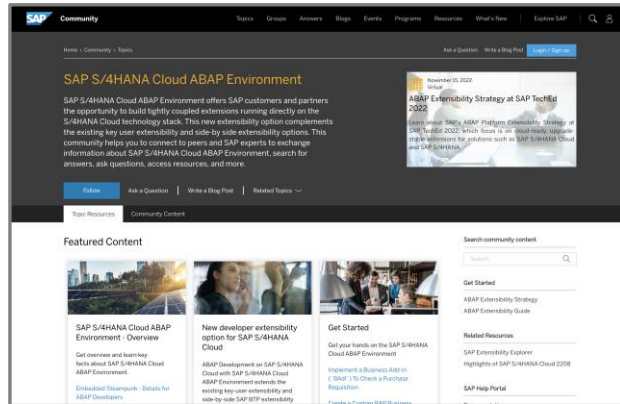
SAP Community
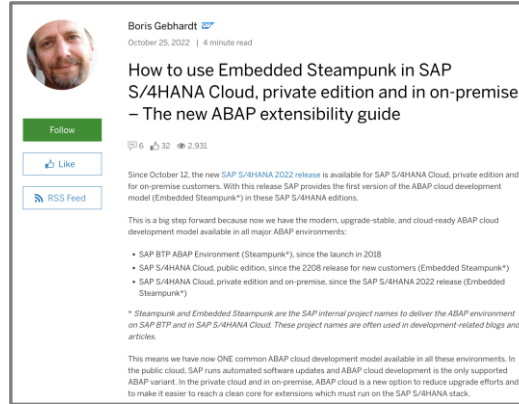
How to use Embedded Steampunk in SAP S/4HANA Cloud, private edition and in on-premise – The new ABAP extensibility guide | SAP Blogs
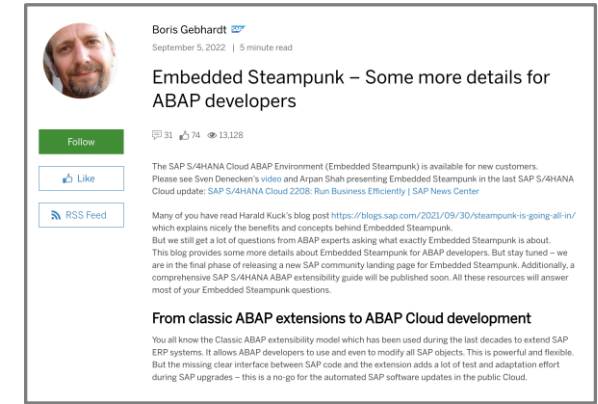
Embedded Steampunk – Some more details for ABAP developers | SAP Blogs

The new ABAP extensibility guide
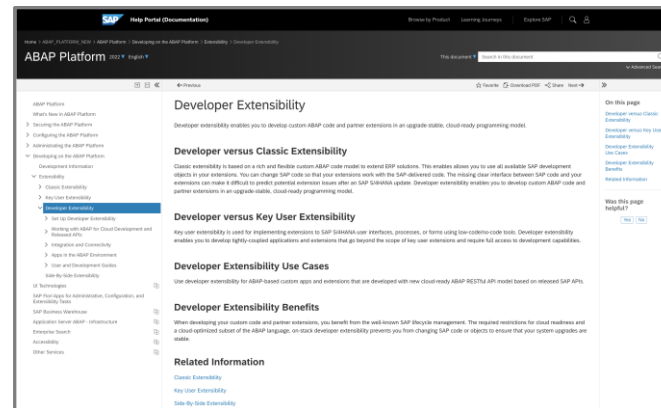
SAP documentation
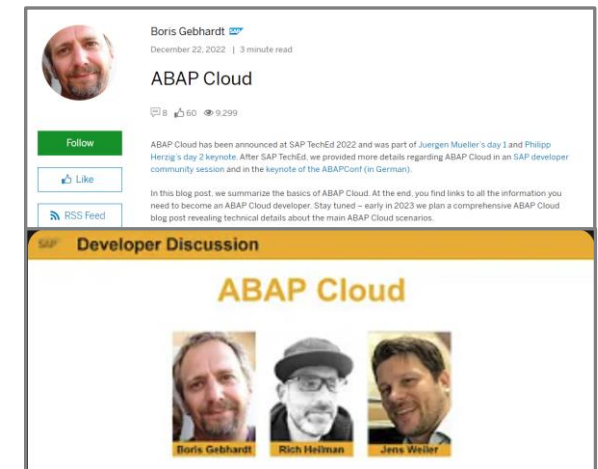
ABAP Cloud | SAP Blogs

Developer Discussion: ABAP Cloud

More information on RAP

State-of-the-Art ABAP Development with the ABAP RESTful Application Programming Model (RAP) | SAP Community

Modernization with RAP | SAP Blogs

Acquire Core ABAP Skills | Practicing Clean Core Extensibility for SAP S/4HANA Cloud | SAP Learning Journey

📺 ABAP Cloud at SAP's Devtoberfest in 2023 | 📺 ABAP Cloud sessions at SAP TechEd 2023

SAP Fiori elements Feature Showcase App with RAP

What's New in RAP: SAP BTP ABAP Environment | SAP S/4HANA | SAP S/4HANA Cloud

Outlook: ABAP Platform Roadmap Information | SAP BTP ABAP Environment@interactive SAP Road Map Explorer

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Public SAP Web sites

ABAP Development Community: www.sap.com/community/topic/abap.html

SAP BTP ABAP Environment Community: https://community.sap.com/topics/btp-abap-environment

SAP S/4HANA Cloud ABAP Environment Community: https://community.sap.com/topics/s4hana-cloud-abap-environment

ABAP Testing and Analysis Community: https://community.sap.com/topics/abap-testing-analysis

SAP products: www.sap.com/products

SAP training and certification opportunities

www.sap.com/education – e.g. trainings S4D437, S4D430, HA400, and S4D400

learning.sap.com/learning-journey – e.g., search for ABAP or ABAP Cloud

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37% Of IT certification candidates received salary increases after earning a certification*

92% Are more confident in their abilities*

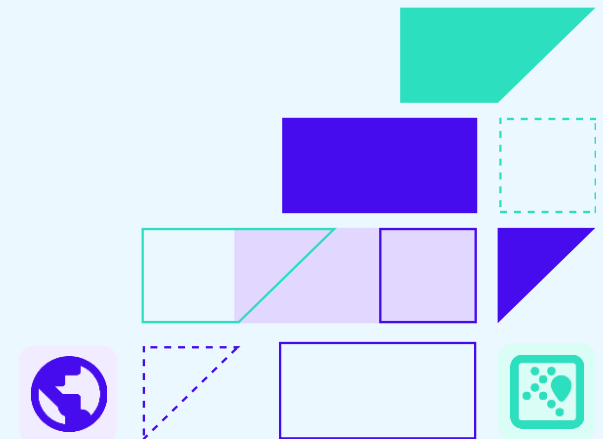*"[2023 Value of IT Certification Candidate Report](#)," Pearson VUE, 2023.

Thank you

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APPENDIX

COMPACT GLOSSARY

About some of the used RAP features – Compact Glossary

UI Semantics with CDS Annotations

Various UI-specific CDS annotations can be used to solve the most common UI layout tasks in SAP Fiori elements apps built with RAP. UI annotations represent semantic views on business data through the use of specific patterns that are independent of UI technologies. For more information, see Develop UI Specifics | CDS Annotations | SAP Fiori elements Showcase App for RAP And ABAP CDS.

Support for Large Objects (aka OData Streams)

You can enable your RAP application for maintaining large objects (LOBs). By doing so, you provide end users the option to incorporate external binary files or text files when editing entity instances. For more information, see Working with Large Objects

Virtual Elements in CDS Projection Views

Virtual elements represent transient fields in business applications. They are used to define additional CDS elements that are not persisted on the database, but calculated during runtime using ABAP classes that implement the virtual element interface. They are defined at the level of CDS projection views as additional elements within the SELECT list. For more information, see Virtual Elements.

About some of the used RAP features – Compact Glossary (2)

Late Numbering

Numbering is the process of setting values for primary key fields of entity instances during runtime. Early and late numbering are supported in RAP. In a **late numbering** scenario, the key values are always assigned internally without consumer interaction after the point of no return in the interaction phase has passed, and the SAVE sequence is triggered. For more information, see Numbering.

Validations

Validations are used to ensure the data consistency. Back-end are defined in the BO behavior definitions and implemented in the respective behavior implementation classes. Front-end validations are used to improve the user experience by providing faster feedback and avoiding unnecessary roundtrips. They can be defined in the BO data model using value helps. For more information, see Validations.

Determinations

A determination is an optional part of the business object behavior that modifies instances of business objects based on trigger conditions. A determination is implicitly invoked by the RAP framework if the trigger condition of the determination is fulfilled. Trigger conditions can be modify operations and modified fields. A determination can be triggered on modify or on save. For more information, see Determinations.

About some of the used RAP features – Compact Glossary (3)

Actions

Actions are specified in behavior definitions and implemented in ABAP behavior pools. By default, actions are related to instances of a BO entity. The addition static allows you to define a static actions that are not bound to any instance but relates to the complete entity. The addition internal define a private action that can only be called within the given BO. For more information, see [Actions](#).

Functions

A function in RAP is a custom read-operation that is part of the business logic.
Functions perform calculations or reads on business objects without causing any side effects. Functions don't issue any locks on database tables and you can't modify or persist any data computed in a function implementation. For more information, see [Functions](#).

RAP Business Events

Business events provide the opportunity of light-weight, decoupled process integration based on standardized and stable APIs and they are now a native part of RAP. With the RAP Business Event Bindings Editor, you can create RAP Event Bindings which are needed to provide a mapping between the definition of RAP Events via behavior definition (BDEF) and the external representation of Business Events. For more information, see [RAP Business Events](#).

Business events can be consumed locally using an event handler class or remotely using the SAP Event Mesh.

About some of the used RAP features – Compact Glossary (4)

Static and Dynamic Feature Control

Feature control offers developers the possibility to determine, which entities of your business object should be create-, delete- and update-enabled, so that they can be modified during consumption using EML or OData services. It also allows developers to control which (UI) fields of an entity are read-only or which actions in which usage scenarios are enabled or disabled for execution by the end users.

The availability of feature control values is modeled in a behavior definition. Unlike static feature control, instance feature control requires not only a definition but also an implementation in a handler class of the behavior pool. Therefore, we also talk about dynamic feature control in case of instance feature control.

Feature control can be related to an entire entity or to individual elements of an entity, such as individual fields or operations. For more information, see Feature Control.