

# ABAP Cloud & ABAP RESTful Application Programming Model (RAP)

# **Overview**

ABAP Platform Product Management, SAP May 2023

**PUBLIC** 



# **Agenda**



**INTRODUCTION** 



**BIG PICTURE** 



**BUSINESS OBJECTS** 



**BUSINESS SERVICES** 



SUMMARY



# **INTRODUCTION**

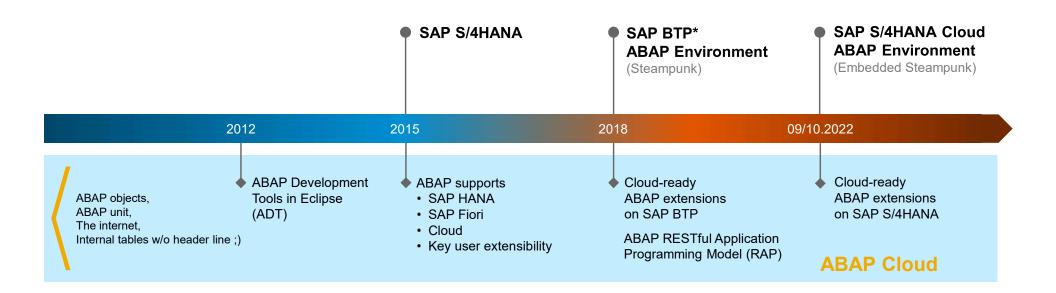


# Clean core with the ABAP cloud development model

# **ABAP Cloud**

- ... is the ABAP development model to build cloud-ready business apps, services and extensions
- ... comes with SAP Business Technology Platform (BTP) and SAP S/4HANA
- ... works with public or private cloud, and even on-premise

## The evolution to ABAP Cloud



Public \* SAP Business Technology Platform

5

# **ABAP Cloud at a glance**

**BUSINESS SERVICE EXPOSURE** 

#### **UI SERVICES**

OData and 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<sup>1</sup> entity, RAP<sup>2</sup> 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

Output Management, Jobs, SAP BTP Workflow, XCO, **SERVICES AND LIBRARIES** REUSE

Cloud-readiness, IAM3, BC4, extensibility,... **BUILT-IN QUALITIES** 

LIFECYCLE MANAGEMENT

and abapGit based code management with gCTS

ADT<sup>5</sup>, BAS<sup>6</sup>, Key User & Monitoring Tools

TOOLS

<sup>1</sup> Core Data Services

<sup>&</sup>lt;sup>2</sup> ABAP RESTful application programming model

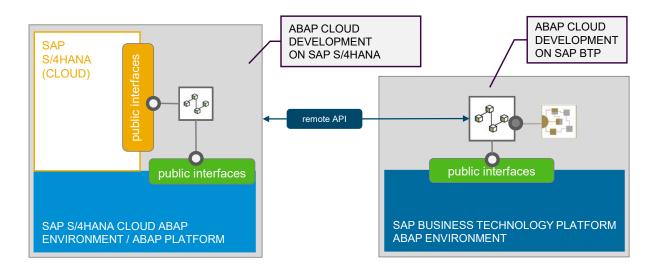
<sup>&</sup>lt;sup>3</sup> Identity & Access Management

<sup>&</sup>lt;sup>4</sup> Business Configuration

<sup>&</sup>lt;sup>5</sup> ABAP Development Tools

<sup>&</sup>lt;sup>6</sup> Business Application Studio

# **Availability of ABAP Cloud**



#### ABAP CLOUD IS AVAILABLE IN THE FOLLOWING PRODUCTS

PRODUCT	RELEASE	ABAP CLOUD USAGE
SAP BTP ABAP Environment	All	Mandatory
SAP S/4HANA Cloud, public edition	≥ 2208 (new customers)	Mandatory
SAP S/4HANA Cloud, private edition and SAP S/4HANA on-premise	≥ 2022	Recommended *

<sup>\*</sup> Classic ABAP can still be used

# **Evolution of the ABAP programming model**

ABAP PLATFORM ≤ 7.5

CLASSIC ABAP
PROGRAMMING

Best practice freestyle ABAP
programming, (Web) Dynpro,
CDS¹

<sup>1</sup> starting with release 7.4 SPS05

ABAP PROGRAMMING
MODEL FOR
SAP FIORI

CDS, CDS-based BOPF,
SEGW / @OData annotation

SAP BTP ABAP ENVIRONMENT SAP S/4HANA ≥ 1909

ABAP RESTful APPLICATION PROGRAMMING MODEL (RAP)

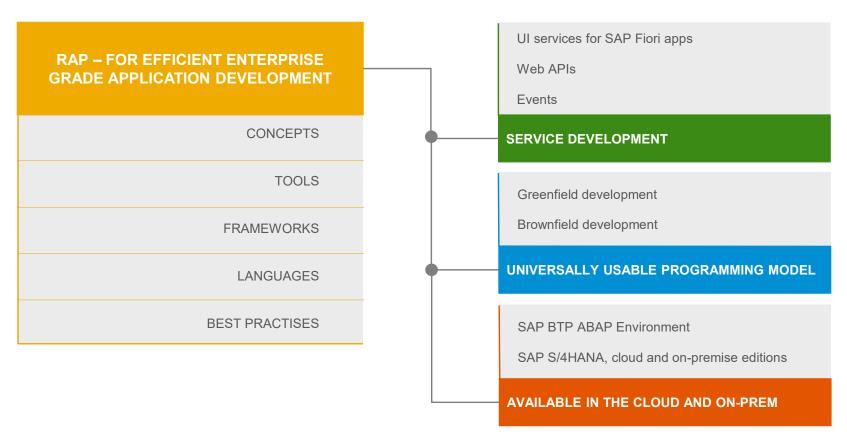
CDS, Behavior Definition & Implementation, Business Services

Public

with Referenced Data Source

# ABAP RESTful Application Programming Model (RAP) at a glance

The centerpiece of ABAP Cloud for building transactional apps



rublic (

# The key players

ABAP Development Tools in Eclipse for all development tasks

Easy developer onboarding End-to-end development flow

Languages: ABAP and Core Data Services (CDS)

Standard implementation tasks via typed APIs supporting static code checks, auto-completion, element info

## Powerful frameworks

Take over technical implementation tasks
Business logic added in code exits on protocol-agnostic layers



# Efficient ABAP development in Eclipse®

# ABAP DEVELOPMENT TOOLS (ADT) ON-PREMISE AND IN THE CLOUD

#### MODERN DEVELOPMENT TOOLSET

Fully eclipse-based
Syntax check, Code completion
Navigation, Search, Quick Fixes
Full support for the ABAP RESTful
Application Programming Model and CDS

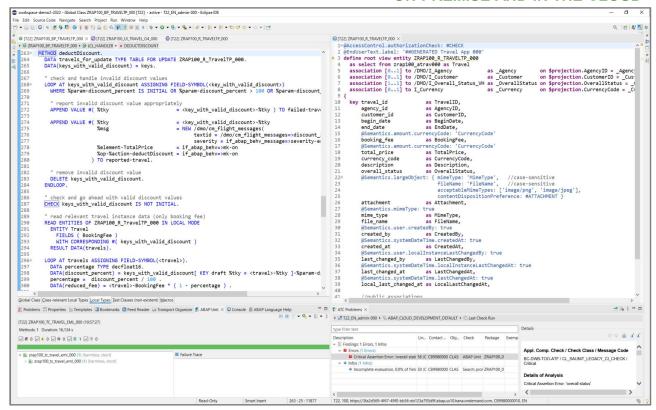
#### **QUALITY ASSURANCE**

Static code checks (ATC, CVA) with remote and local scenarios Unit testing incl. isolation frameworks

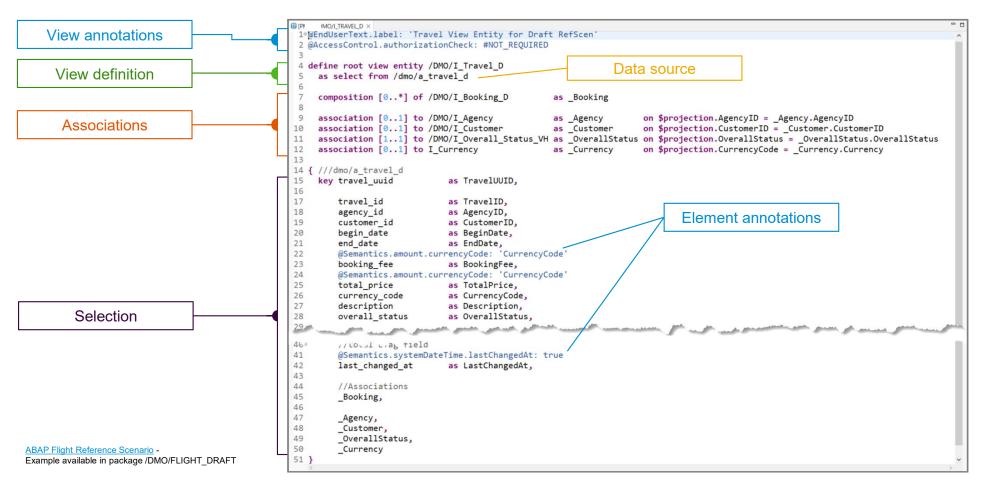
Test seams and injections

#### **SUPPORTABILITY**

Debugging, profiling, tracing Static and dynamic logging Runtime monitoring and analysis



# Next generation data modeling and access with ABAP CDS – Example



# **Entity Manipulation Language (EML)** – At a glance

Extension of the ABAP Language with SQL-like syntax

Used to control the transactional behavior of RAP business objects (BOs)

Provides API-based access to RAP BOs, even outside of the RAP context

API reference available in the ABAP keyword documentation (link)

```
EXAMPLES
"Modify travel instance
MODIFY ENTITIES OF /DMO/I_Travel_D IN LOCAL MODE
  ENTITY Travel
    UPDATE FIELDS ( OverallStatus )
    WITH VALUE #( FOR key IN keys ( %tky
                                                 = kev-%tkv
                                   OverallStatus = travel_status-accepted ) ).
"Read changed data for action result
READ ENTITIES OF /DMO/I Travel D IN LOCAL MODE
  ENTITY Travel
    ALL FIELDS WITH
    CORRESPONDING #( keys )
  RESULT DATA(travels).
result = VALUE #( FOR travel IN travels ( %tky = travel-%tky
                                         %param = travel ) ).
```

# **BIG PICTURE**



# **RAP** – The big picture

CONSUMPTION

#### **WEB APIs**

Consume OData based services

#### **EVENTS**

Consume business events

#### **SAP FIORI UIS**

Consume OData based UI services

**SERVICE BINDING** – Bind to protocol version and scenario

**SERVICE DEFINITION** – Define scope to be exposed

### **BUSINESS OBJECT PROJECTIONS AND INTERFACES**

CDS: BO projection views BDEF: Behavior projection

ABAP: Behavior implementation <sup>1</sup>

## BUSINESS SERVICE EXPOSURE

## **CDS ENTITIES**

CDS: Data modeling

## **BUSINESS OBJECTS**

CDS: Data modeling

BDEF: Behavior definition

ABAP: Behavior implementation

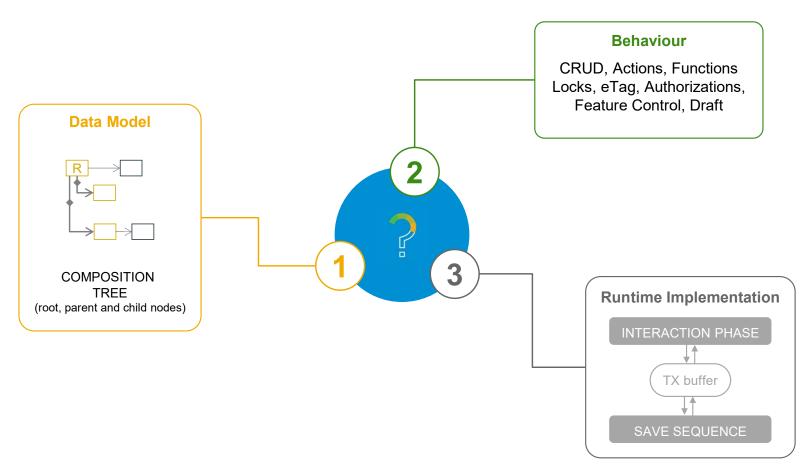
DATA MODELING & BEHAVIOR

**EXTENSIBILITY** 

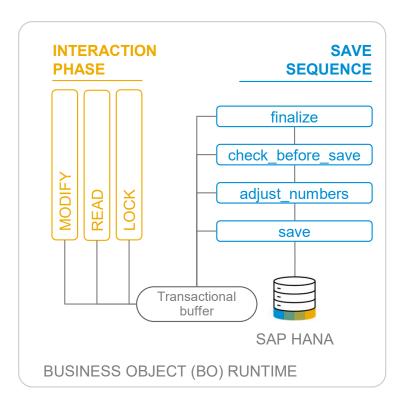
# **BUSINESS OBJECTS**



# What is a business object (BO)?



# **BO** runtime implementation types



#### **UNMANAGED**

For brownfield developments with available application code for interaction phase, transactional buffer, and save sequence

- → Developers in charge of BO runtime: CRUD operations
- → Adapters needed to integrate the existing code

#### **MANAGED**

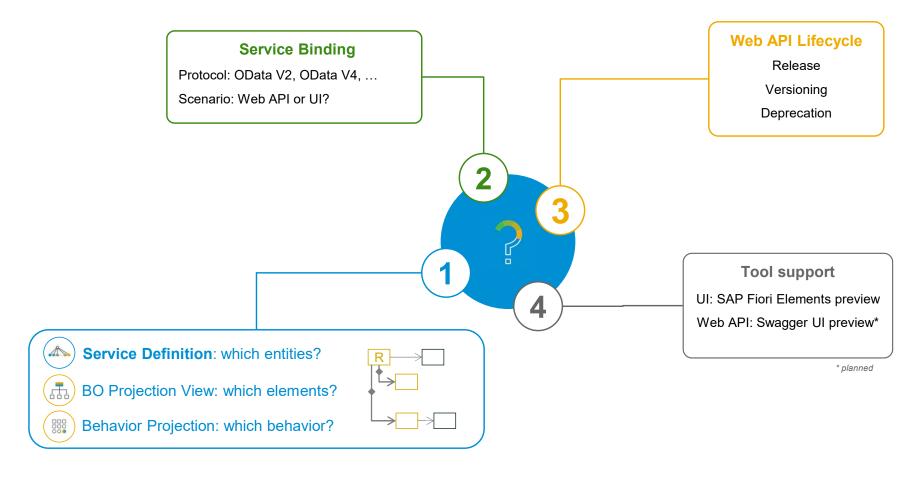
For greenfield developments with standard implementation (opt. unmanaged appl. components: DB tables, lock/PFCG object, update task FM)

- → Standard CRUD operations work out of the box
- → Developers add BO-specific business logic

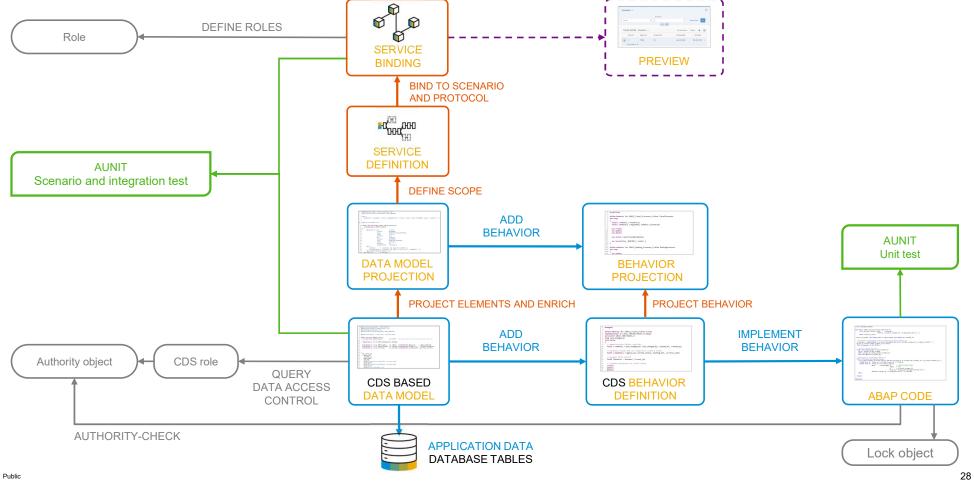
# **BUSINESS SERVICES**



## **Business service**



# The development flow



# **SUMMARY**



# **Key takeaways**

The **ABAP RESTful Application Programming Model** (RAP) helps you efficiently and rapidly build enterprise-grade services 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 scope** is enhanced **quarterly** in SAP BTP ABAP Environment, **twice a year** in SAP S/4HANA Cloud ABAP Environment, and **annually** 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



## More information on RAP

#### **Further information**

Modern ABAP Development with the ABAP RESTful Application Programming Model (RAP) | SAP Community

Modernization with RAP | SAP Blogs

Building Apps with RAP | openSAP Course

Acquire Core ABAP Skills | SAP Learning Journey

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

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

#### **Public SAP Web sites**

ABAP Development Community: <a href="https://www.sap.com/community/topic/abap.html">www.sap.com/community/topic/abap.html</a>

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

SAP S/4HANA Cloud ABAP Environment Community: <a href="https://community.sap.com/topics/s4hana-cloud-abap-environment">https://community.sap.com/topics/s4hana-cloud-abap-environment</a>

ABAP Testing and Analysis Community: <a href="https://community.sap.com/topics/abap-testing-analysis">https://community.sap.com/topics/abap-testing-analysis</a>

SAP products: <a href="https://www.sap.com/products">www.sap.com/products</a>

## SAP training and certification opportunities

<u>www.sap.com/education</u> – e.g. trainings S4D437, S4D430, HA400, and S4D400 <u>learning.sap.com/learning-journey</u> – e.g., search for ABAP

**Exercises** 

# https://github.com/SAP-samples/abap-exercises-codejam

# Thank you.

Contact information:

Rich Heilman
Developer Advocacy
SAP
rich.Heilman@sap.com

