

ABAP-based Extensibility Options

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PUBLIC

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Overview

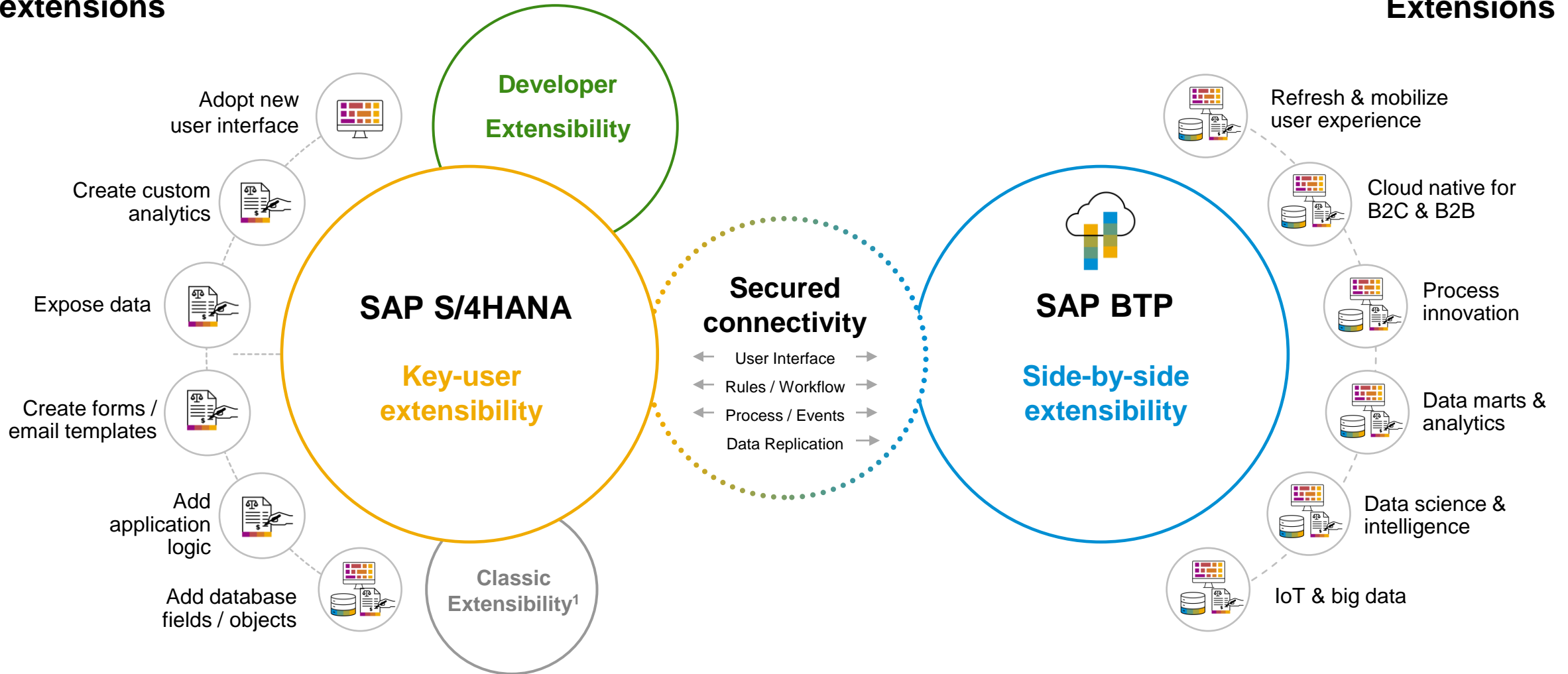


SAP S/4HANA extensibility today

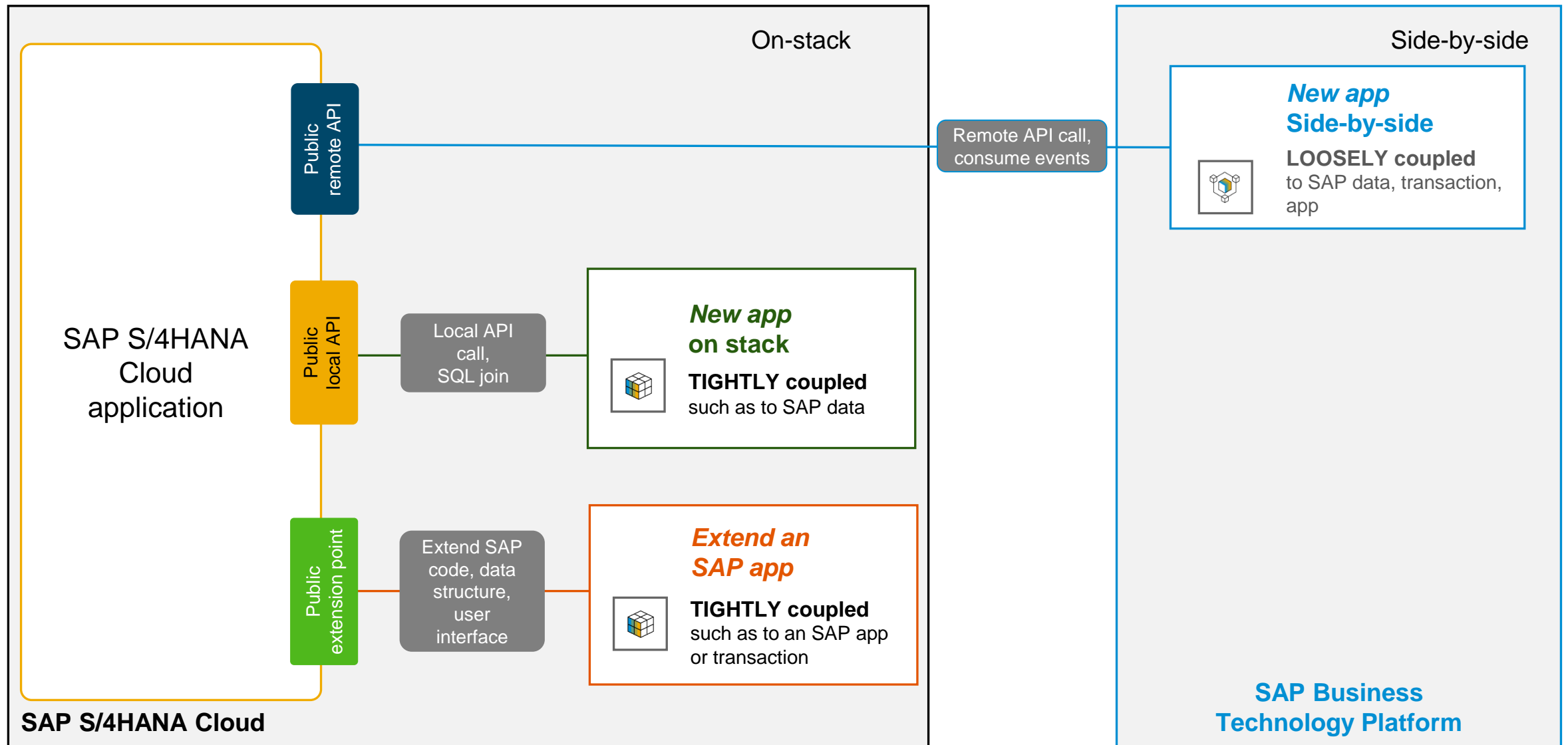
User Interface Layer  Application Layer  Database Layer 

Core solution extensions

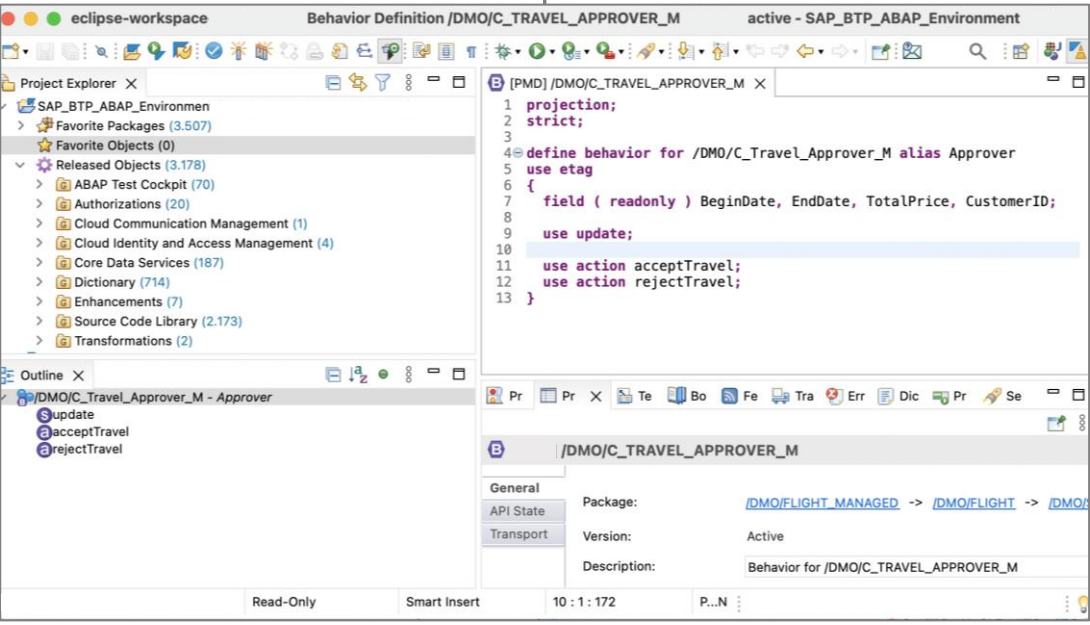
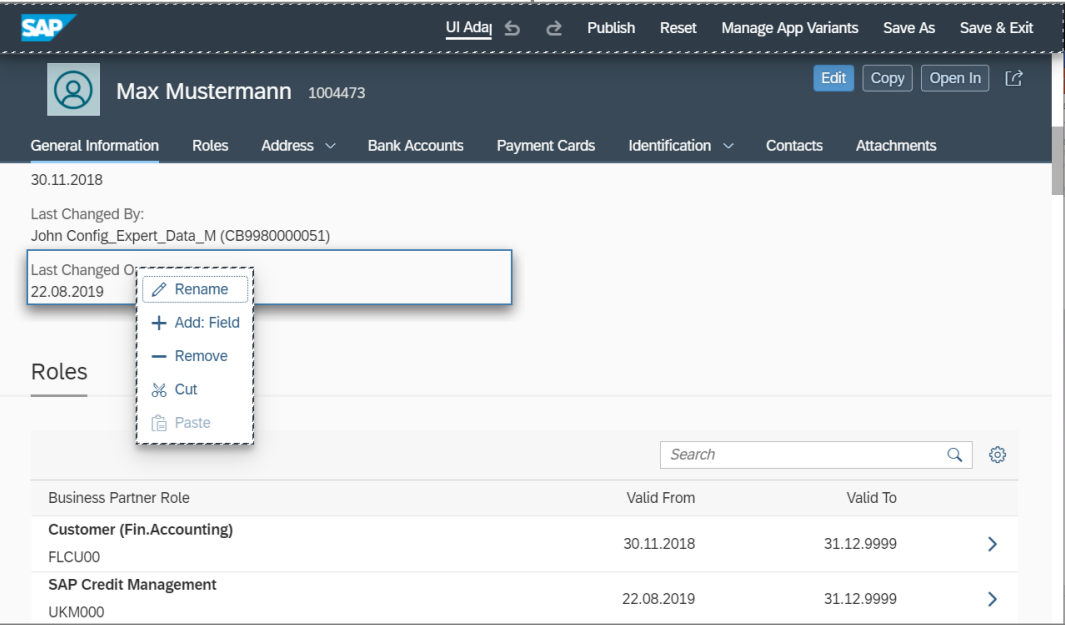
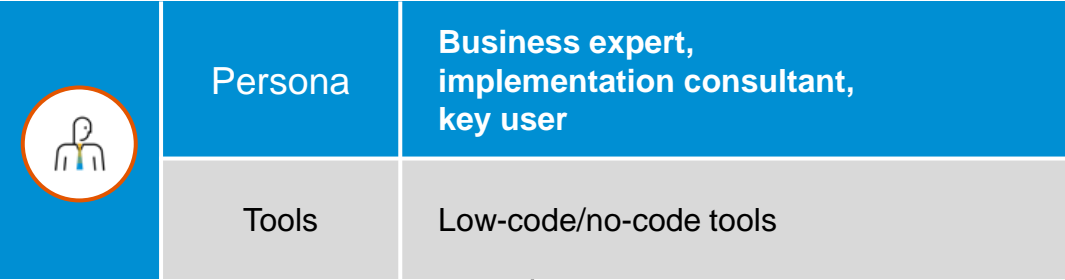
Side-by-side Extensions



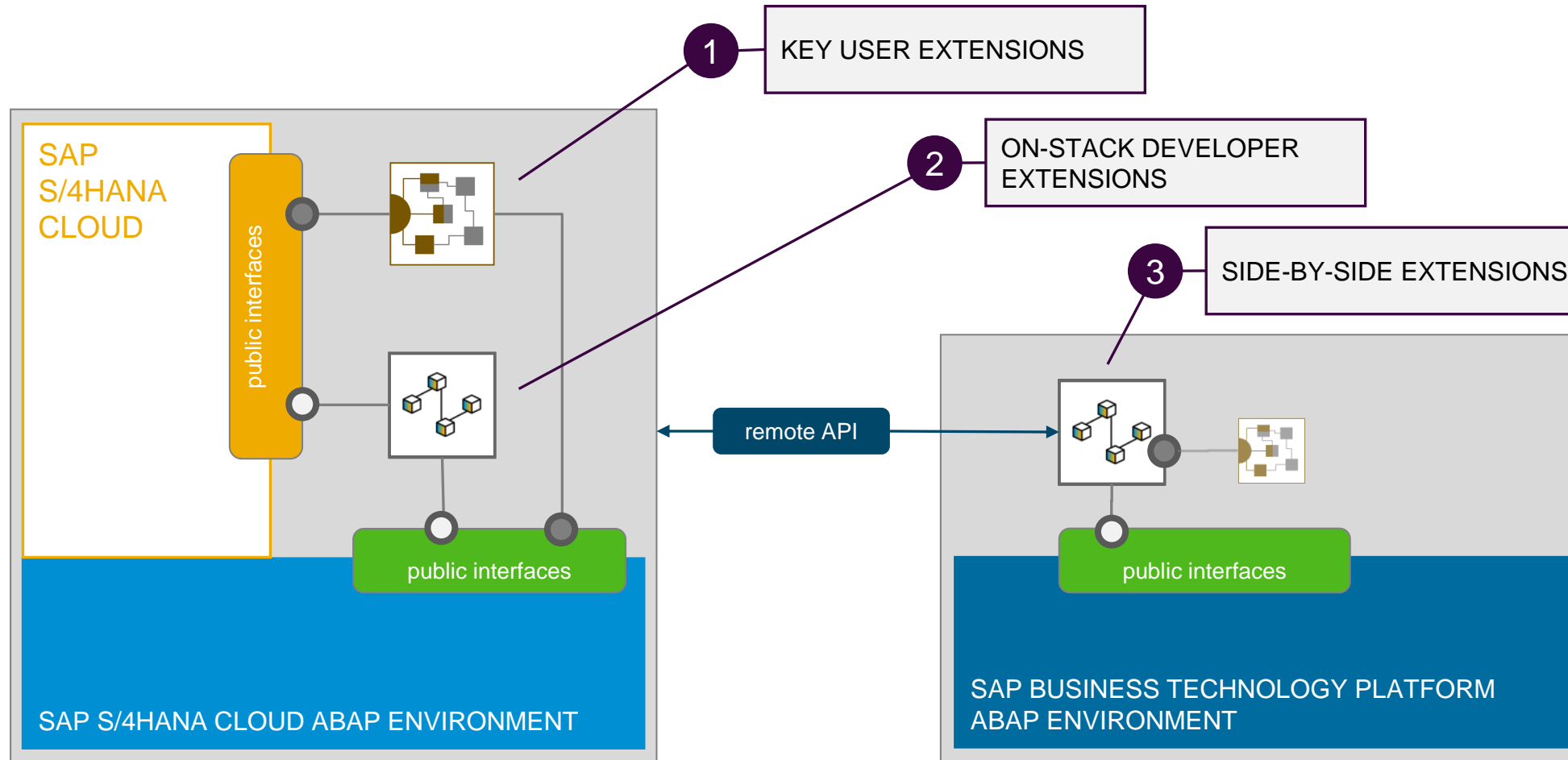
SAP S/4HANA Cloud extensibility patterns



Extensibility personas



Overview of extensibility options



Key-user extensions
low-code/no-code extensions



ABAP custom code or partner extensions
following the cloud extensions model

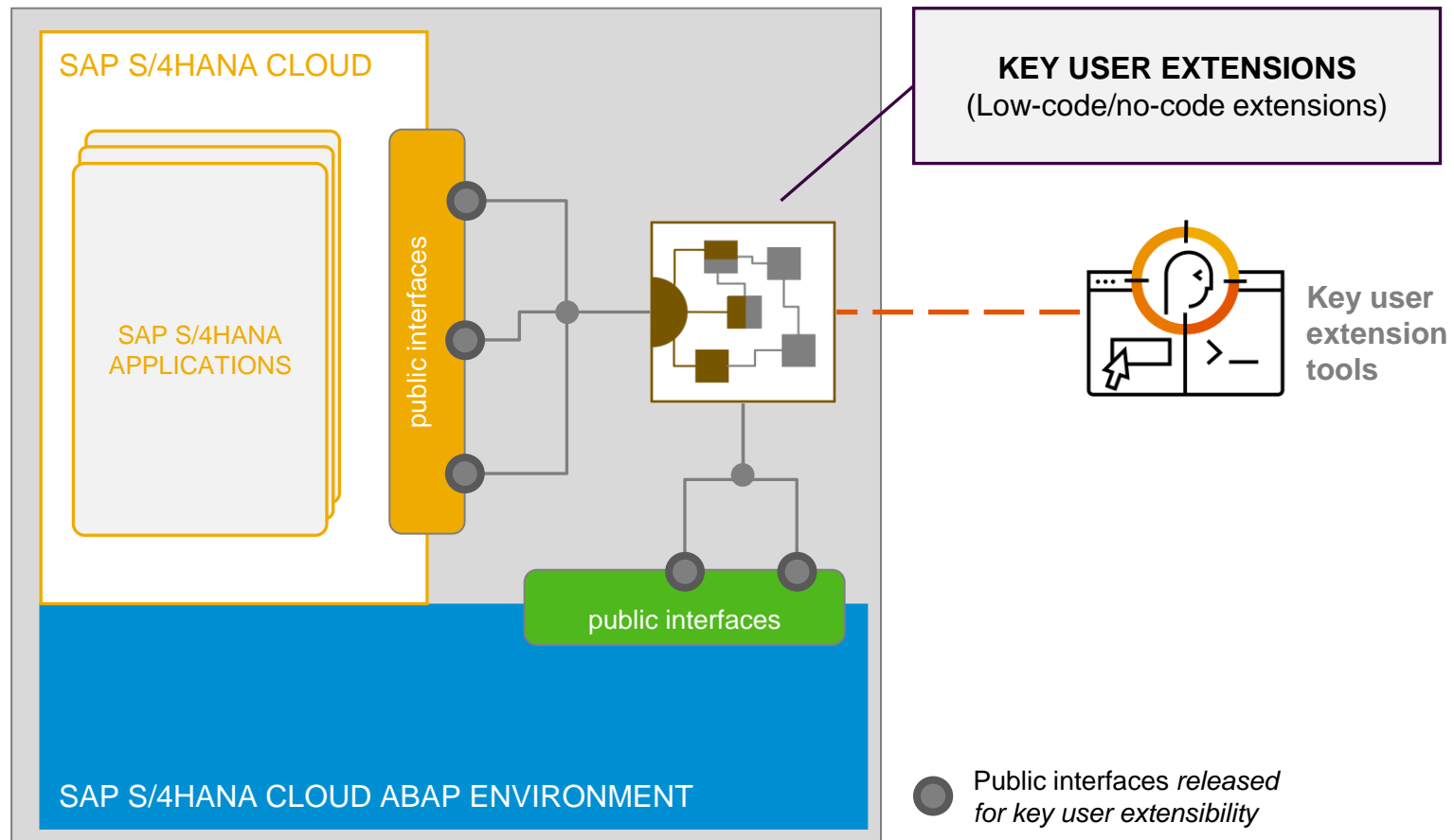


Public interfaces *released for developer extensibility*

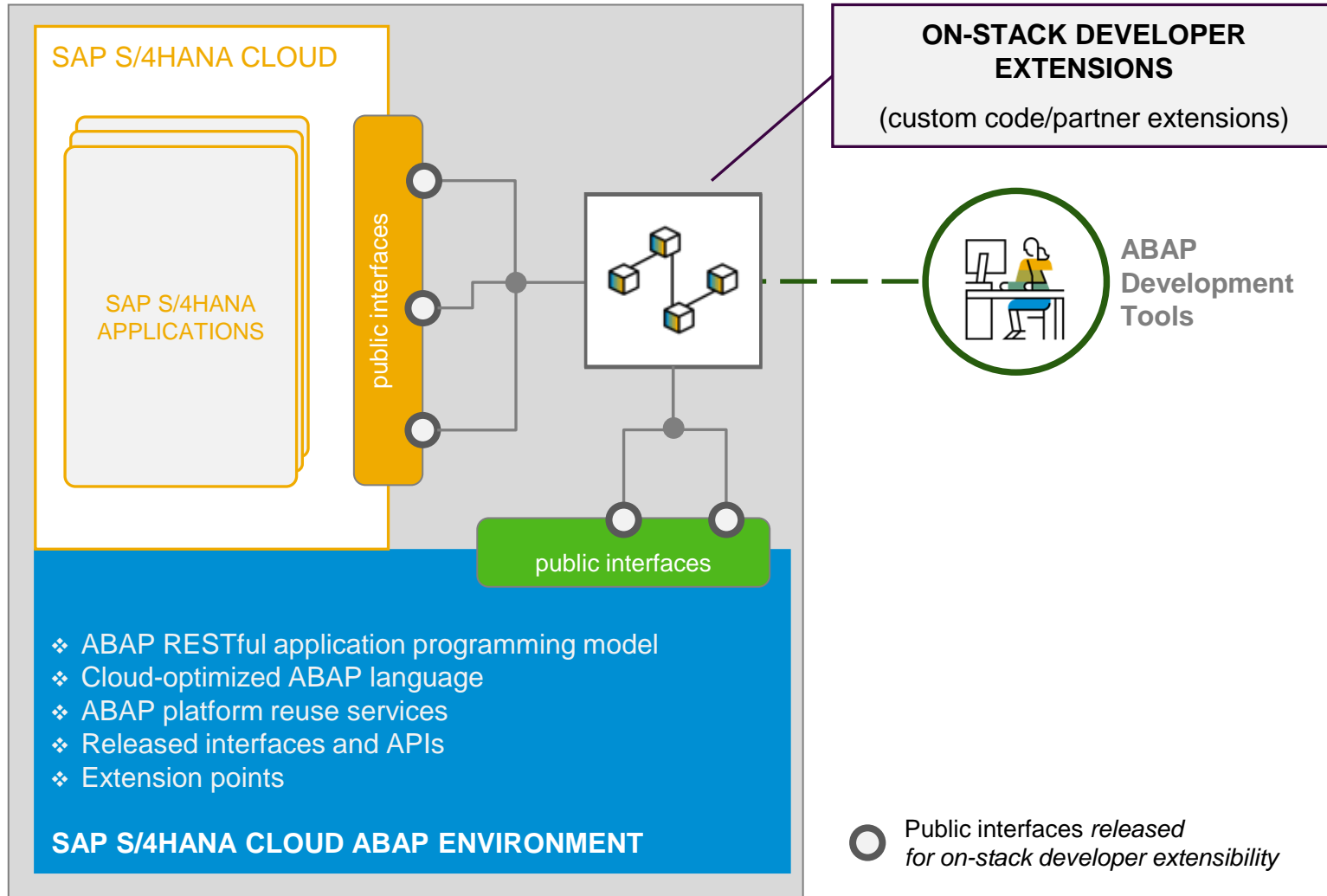


Public interfaces *released for key-user extensibility*

Key user extensibility 1



On-stack developer extensibility 2



**ENABLE CUSTOM ABAP DEVELOPMENT
DIRECTLY ON SAP S/4HANA CLOUD STACK**

MODERN ABAP DEVELOPMENT

SAP, customers and partners use the same development model

High developer productivity

ABAP RESTful application programming model

- Development of SAP HANA-optimized apps and services
- Eclipse-based ABAP development tools

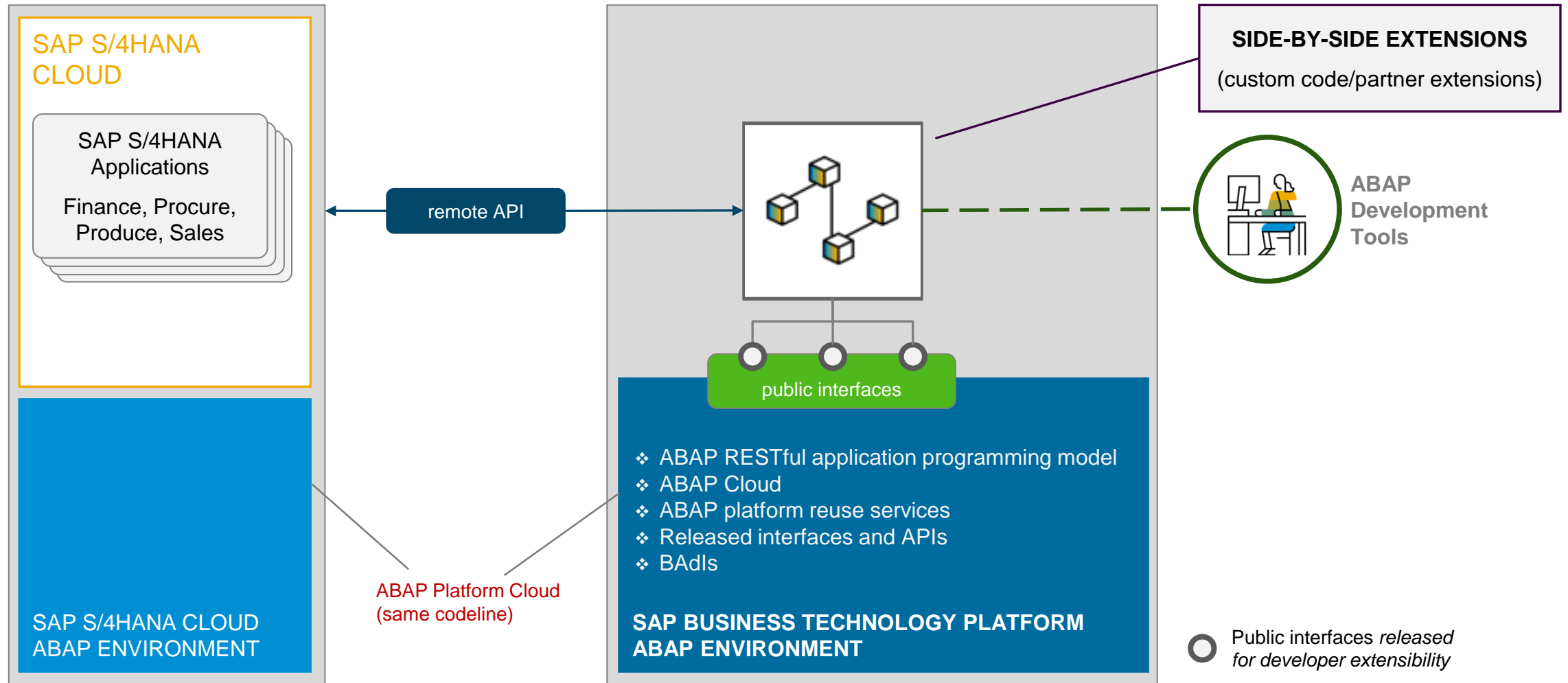
SAP Fiori tools for UI Development

Proven Lifecycle Management




RULES OF THE GAME

- Clear separation between SAP solutions and extensions
- Only stable and reliable public interfaces and released objects from both ABAP platform and SAP S/4HANA Cloud applications can be used
- No modifications

Side-by-side extensibility 3



Summary of ABAP-related extensibility options in SAP S/4HANA Cloud

	KEY USER EXTENSIBILITY  Business expert, implementation consultant, citizen developer, key user	ON-STACK DEVELOPER EXTENSIBILITY  ABAP developer	SIDE-BY-SIDE EXTENSIBILITY  ABAP developer
SCENARIO	Low-code/no-code adaptations and extensions of SAP S/4HANA applications	Custom ABAP development projects that need proximity or coupling to SAP S/4HANA data, transactions, or apps	Loosely-coupled applications and partner SaaS solutions
USE CASES	Adapting UIs, adding custom fields, adding custom business objects etc.	Custom applications with frequent or complex SQL access to SAP S/4HANA data Custom extensions running in the same logical unit of work (LUW) as SAP applications Tailored custom remote APIs or services which serve side-by-side SAP BTP apps	Custom applications for a separate target group (no ERP users) Custom application workload that shall run separated from ERP Custom applications needing proximity to intelligent SAP BTP services like machine learning, AI etc. Solutions integrating with several ERP systems and cloud services SaaS applications provided by partners
BENEFIT	Fully managed and integrated in SAP S/4HANA Cloud No or only very basic development skills required	Development of extensions inside the SAP S/4HANA Cloud system No remote access or data replication Use and extend released SAP S/4HANA Cloud objects	Decoupled extensions independent of SAP S/4HANA Cloud operation and lifecycle management
	On-stack extension domain		Side-by-side extension domain

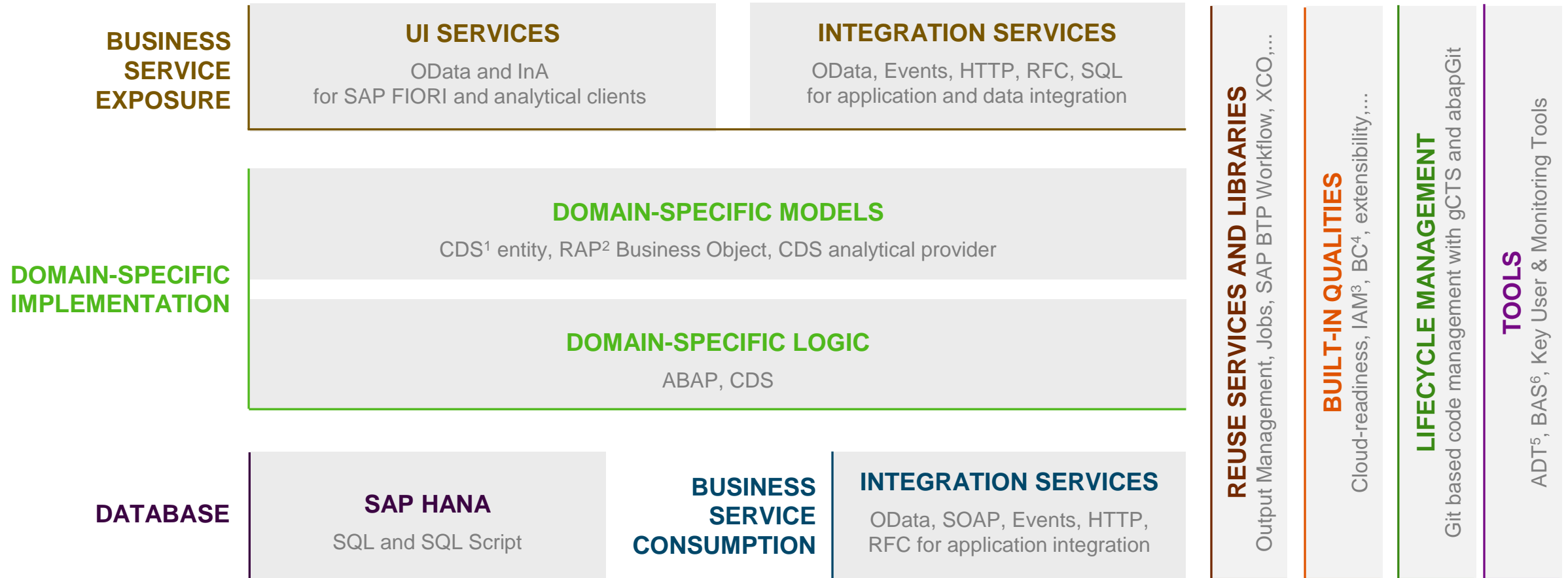
ABAP Cloud



ABAP Cloud

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

ABAP Cloud map



¹ Core Data Services

² ABAP RESTful application programming model

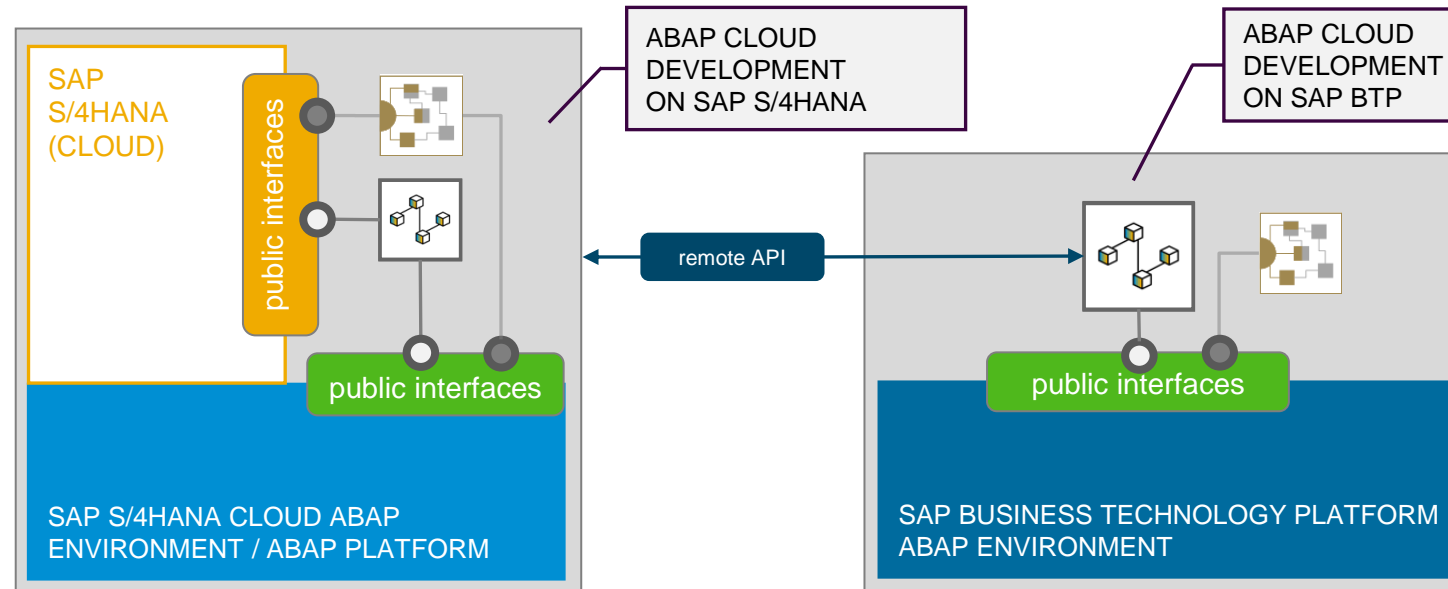
³ Identity & Access Management

⁴ Business Configuration

⁵ ABAP Development Tools

⁶ 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 *

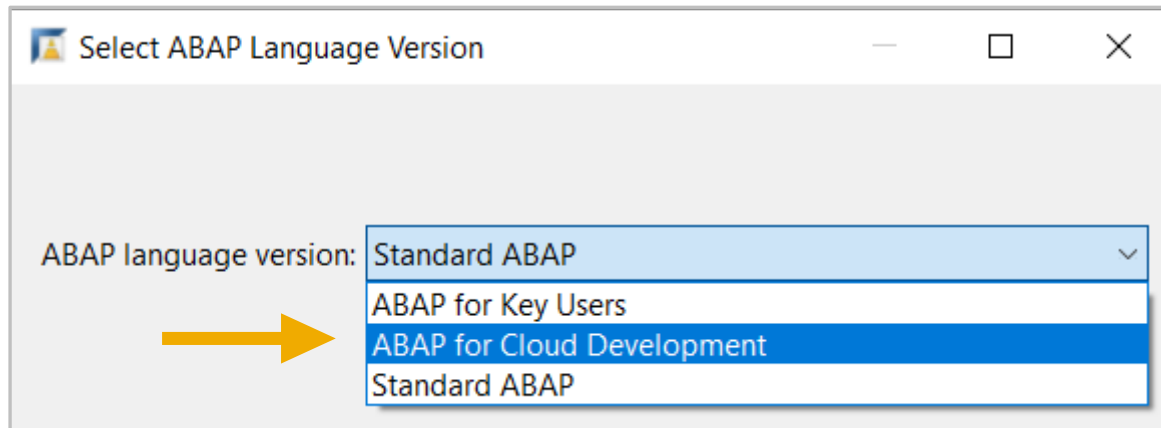
* Classic ABAP can still be used

SAP S/4HANA, private cloud and on-premise editions

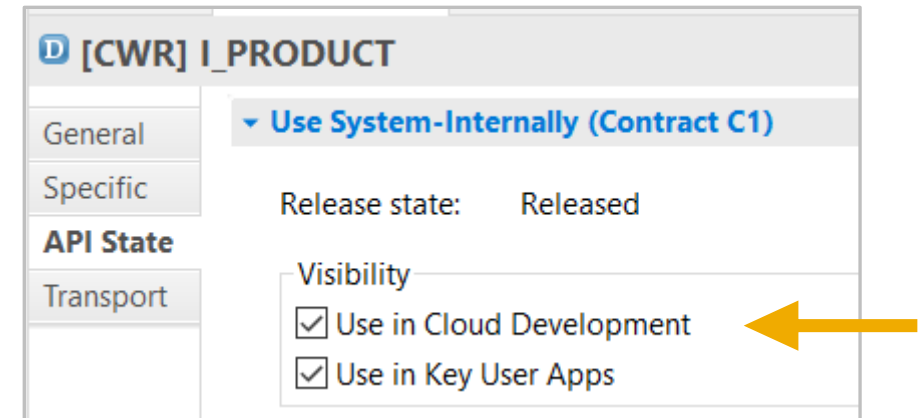
ABAP cloud development – ABAP language version and public SAP APIs

How will I use **ABAP Cloud** in the private cloud and on-premise editions of SAP S/4HANA?

- ❖ Switch on the strict ABAP Cloud syntax check for the selected custom ABAP objects (such as a new Z-class)
- ❖ Use the public APIs that SAP released for ABAP cloud development (such as the CDS view I_PRODUCT)

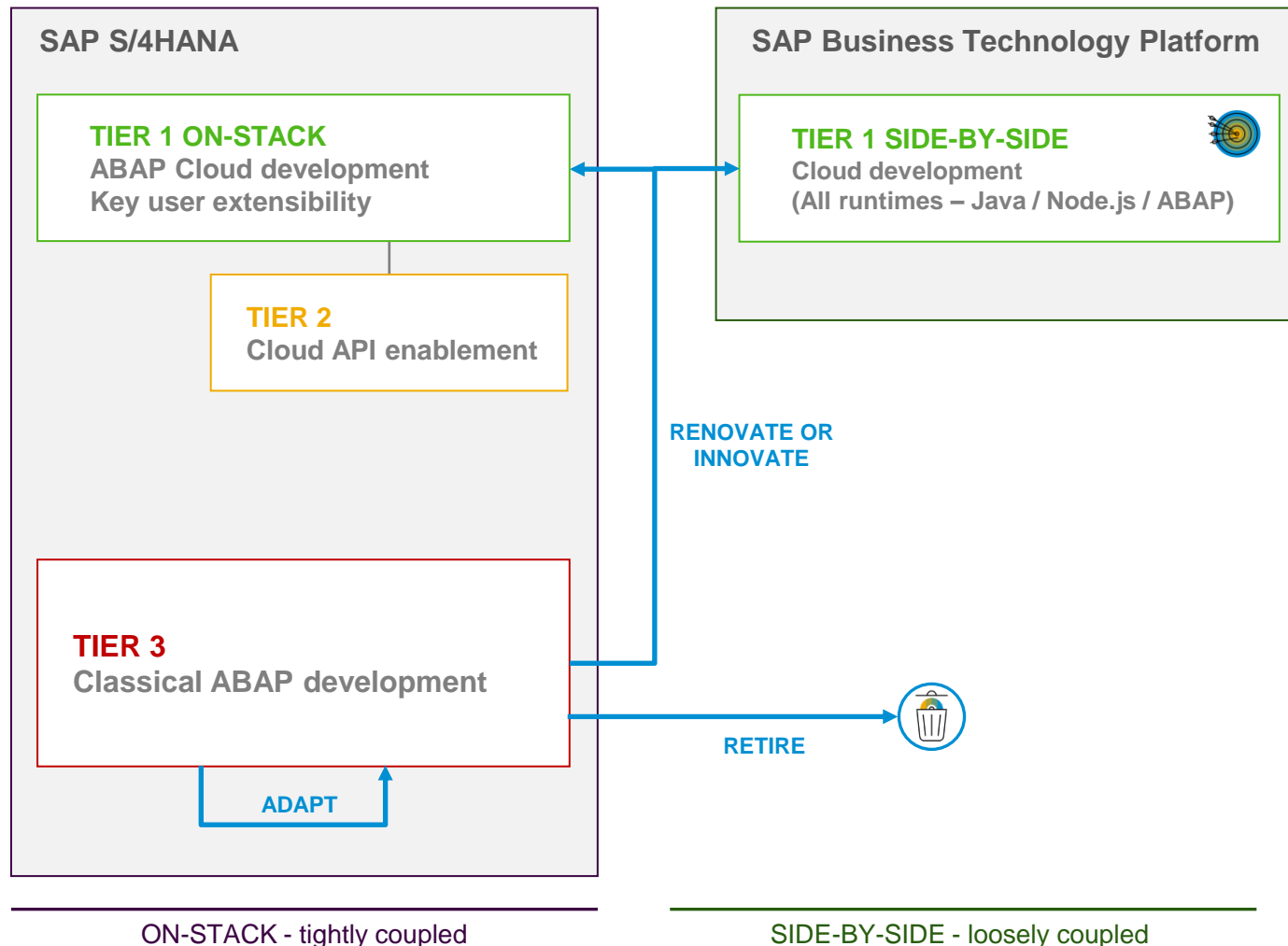


Switch from classic ABAP extensibility (Standard ABAP) to ABAP Cloud (ABAP for cloud development)



SAP released the CDS view for *ABAP Cloud development*

3-tier extensibility model for SAP S/4HANA private cloud and on-premise



TIER 1 – Cloud extensibility model

Development of cloud-ready and upgrade-stable applications and extensions

Same development model as used in SAP S/4HANA Cloud, public edition

Default for new extensions and custom apps

TIER 2 – Cloud API enablement

Extends and enables tier 1 for private cloud and on-premise
Mitigates missing public SAP APIs or extension points:

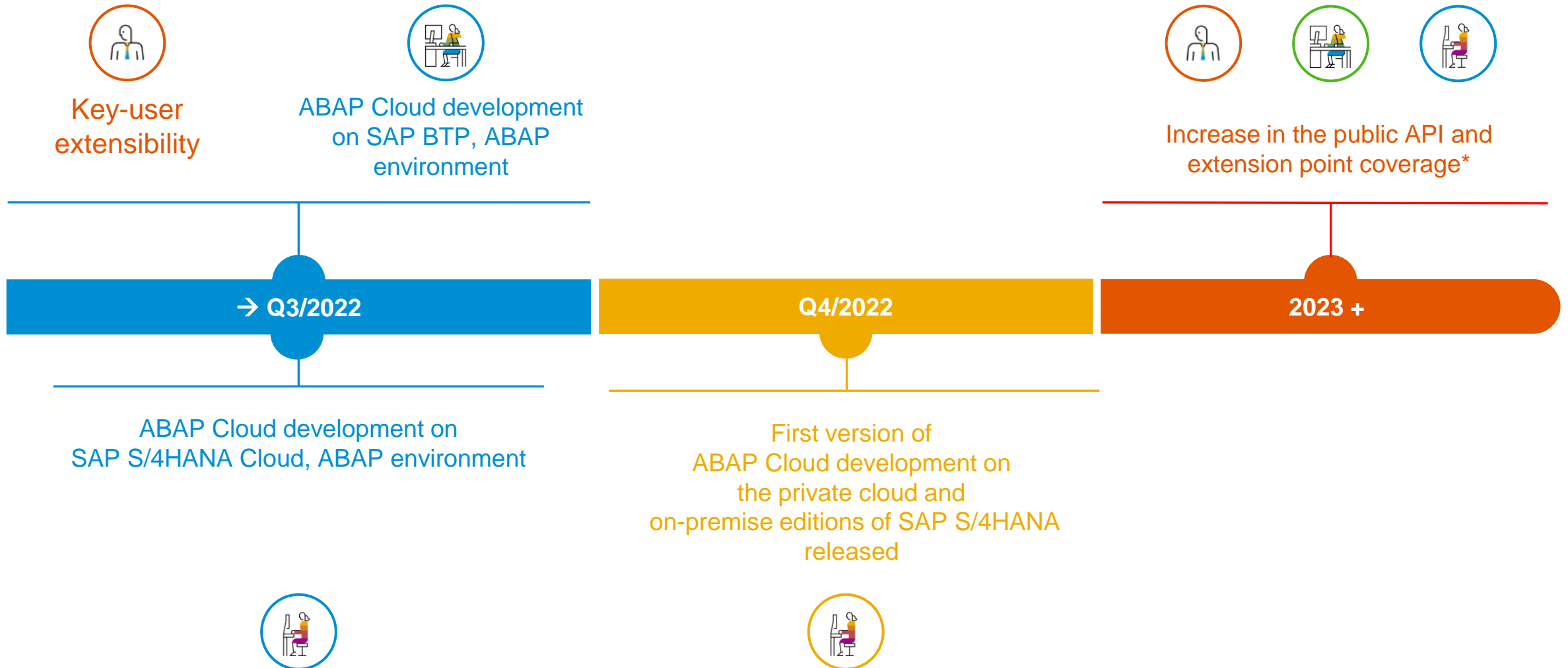
- Develop custom wrapper objects for not released SAP objects to be used in tier 1
- Retire wrapper once a released SAP API is available

TIER 3 – Classic ABAP extensions

Legacy/existing custom ABAP code or new on-stack extensions code that cannot follow the rules of tier 1 and 2

Avoid and reduce the content in tier 3

Road map – ABAP extensibility options



Demo



Extensibility concept - *Embedded Steampunk*: The developer perspective

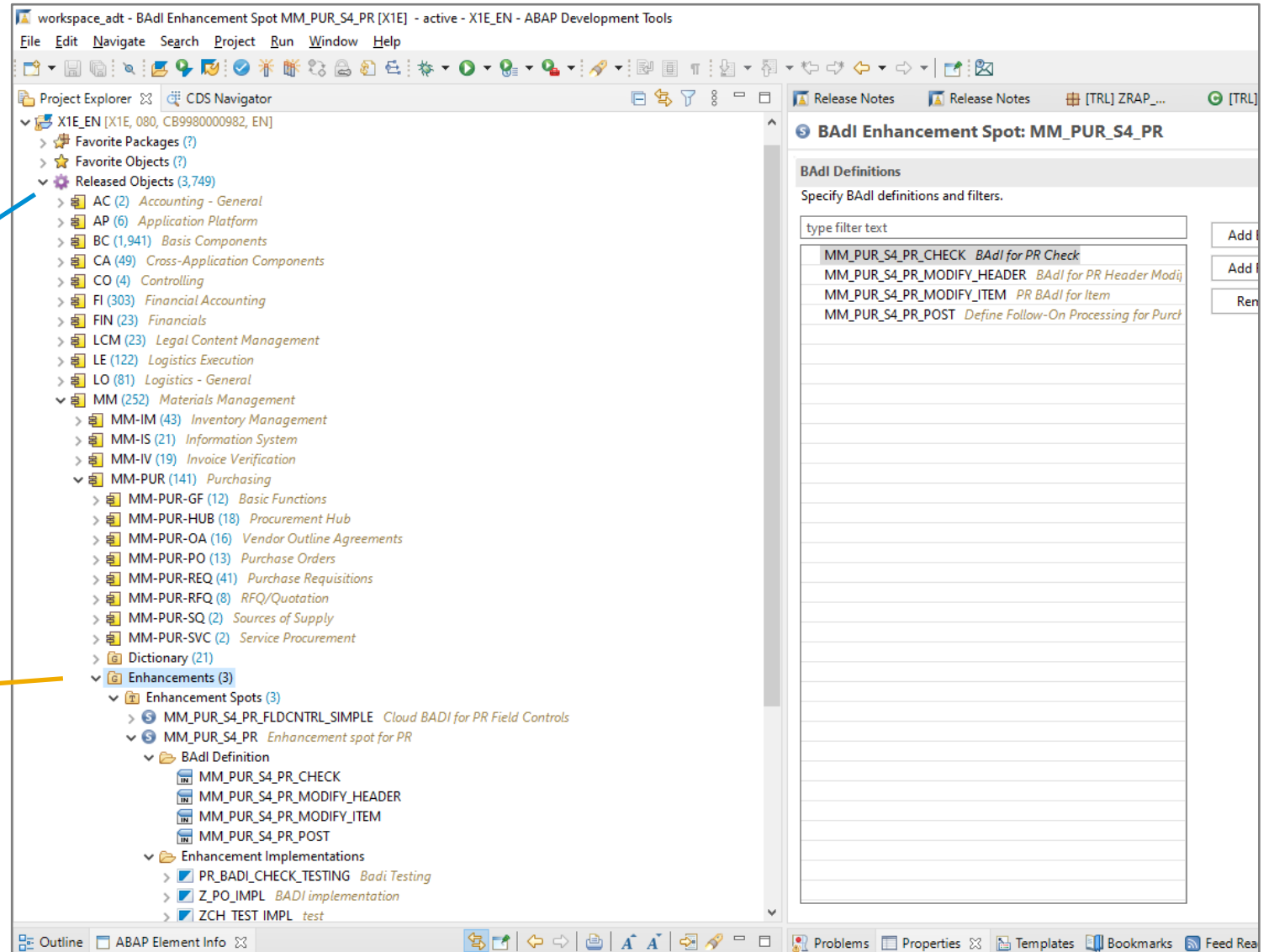
PUBLIC APIS / RELEASED OBJECTS

Clean core

Modification-free extension development


FEATURE RICH TOOL SUPPORT


Search and identification of public API by browsing the application component tree





Demo

Trigger Purchase Requisition creation in SAP S/4HANA using RAP facades and EML

<  Online Shop ▼

Standard* ▼ 



 Adapt Filters


Online Store (5) | Standard* ▼


Update IR

Update Purchase reqn

Create

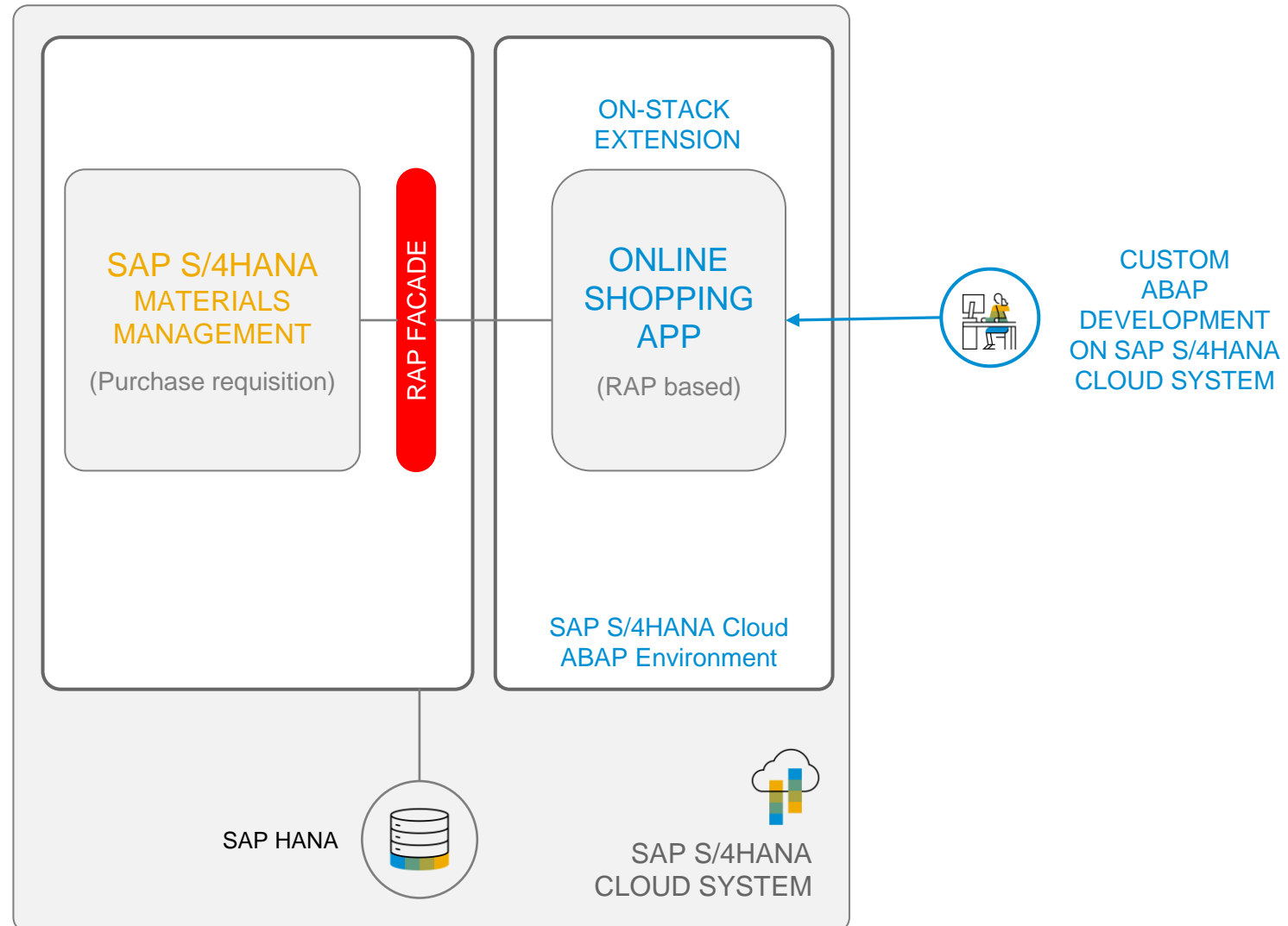
Delete



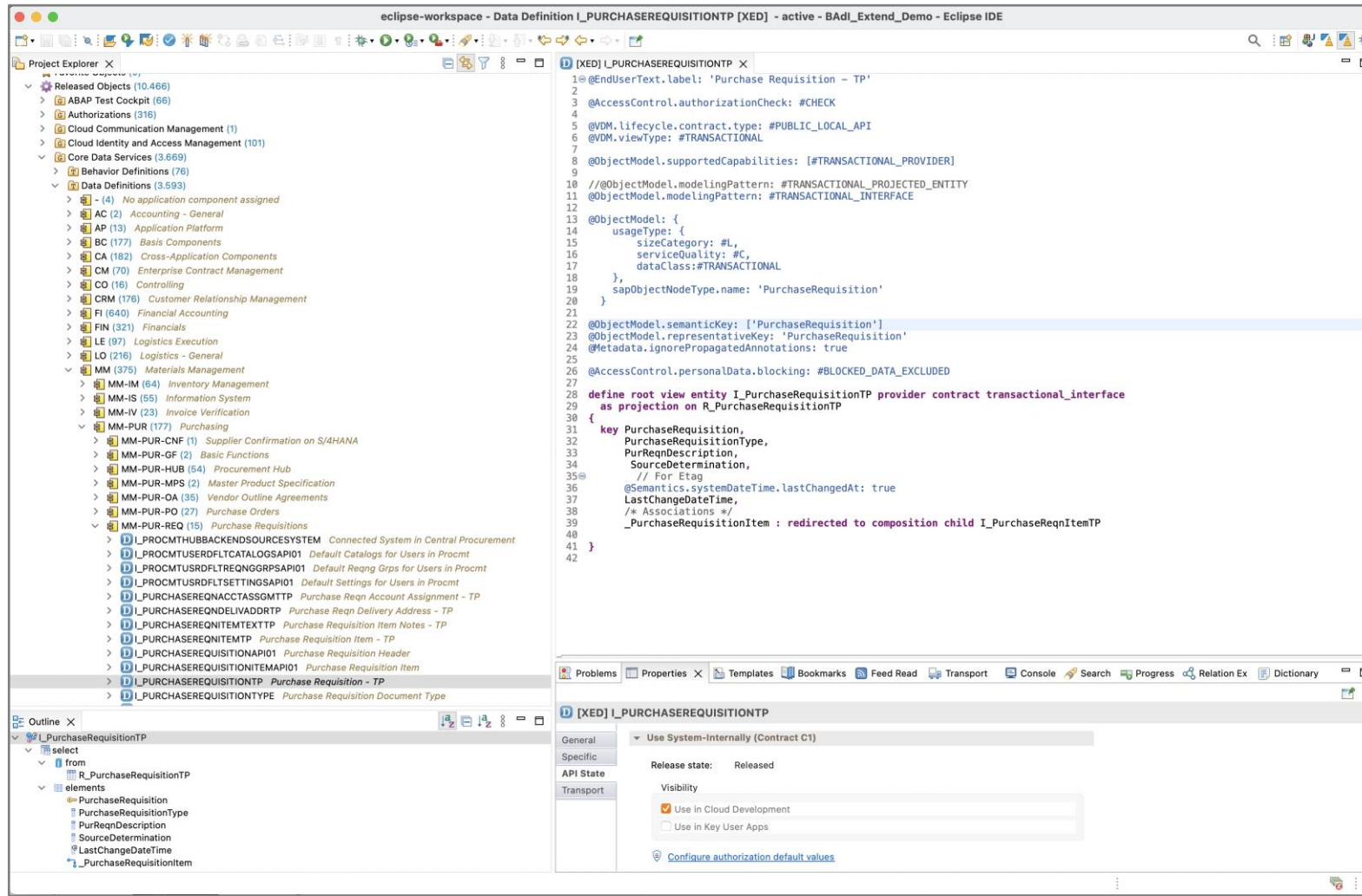
 ▼

order id	Ordered item	Product group	Purchase Reqn	Maximum D...	Purchase requisition status	Remaining d...	
<input type="radio"/> 1	Desktop	A002	0010000192	180	✓ On the way	<div>100 o...</div>	>
<input type="radio"/> 2	Chair	A004	0010000194	180	✓ On the way	<div>100 o...</div>	>
<input type="radio"/> 3	Printer	A005	0010000200	180	✓ On the way	<div>100 o...</div>	>
<input type="radio"/> 4	Table	A003		180	✗	<div>100 o...</div>	>
<input checked="" type="radio"/> 5	Laptop	A001	0010000203	180	✓ On the way	<div>100 o...</div>	>

Demo scenario



RAP facades



RAP FACADES

Modification free access to
functionality of stable core

Released and stable API

Local (non-remote) access

Based on ABAP Core Data
Services

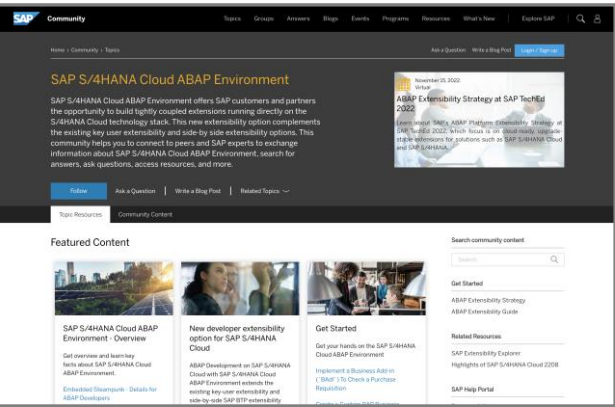
Invoking RAP facades via EML

Entity
Manipulation
Language
(EML)

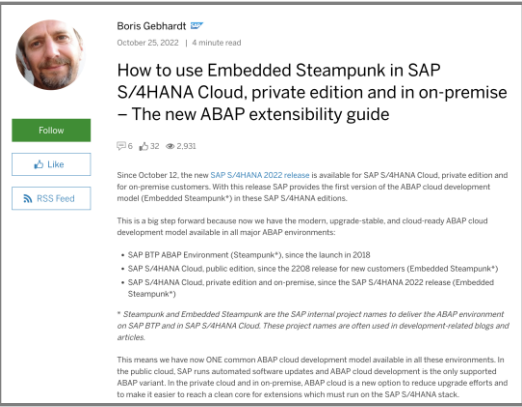
```
73  
74 METHOD create_pr.  
75  
76 keys IS NOT INITIAL.  
77  
78 READ ENTITIES OF Orders IN LOCAL MODE  
79 ENTITY Orders  
80 ALL FIELDS  
81 WITH CORRESPONDING #( keys )  
82 RESULT DATA(lt_order_result)  
83 FAILED DATA(lt_failed)  
84 REPORTED DATA(lt_reported).  
85  
86  
87 MODIFY ENTITIES OF i_purchaserequisitiontp  
88 ENTITY purchaserequisition  
89  
90 CREATE FIELDS ( purchaserequisitiontype )  
91 WITH VALUE #( ( %cid = 'My%CID_1'  
92 purchaserequisitiontype = 'NB' ) )  
93  
94 CREATE BY \_purchaserequisitionitem  
95 FIELDS ( plant  
96 purchaserequisitionitemtext  
97 accountassignmentcategory  
98 requestedquantity  
99 baseunit  
100 purchaserequisitionprice  
101 purreqnitemcurrency  
102 materialgroup  
103 purchasinggroup  
104 purchasingorganization  
105 )  
106  
107 WITH VALUE #(   
108 ( %cid_ref = 'My%CID_1'  
109 %target = VALUE #(   
110 ( %cid = 'My%ItemCID_1'  
111 plant = '1010'  
112 purchaserequisitionitemtext = lt_order_result[ 1 ]-Ordereditem  
113 accountassignmentcategory = 'U'  
114 requestedquantity = '8.00'  
115 baseunit = 'EA'  
116 purchaserequisitionprice = '10.00'  
117 purreqnitemcurrency = 'EUR'  
118 materialgroup = lt_order_result[ 1 ]-Materialgroup  
119 purchasinggroup = '001'  
120 purchasingorganization = '1010'  
121 )  
122 )  
123 )  
124 )  
125
```

Released
RAP
Facade

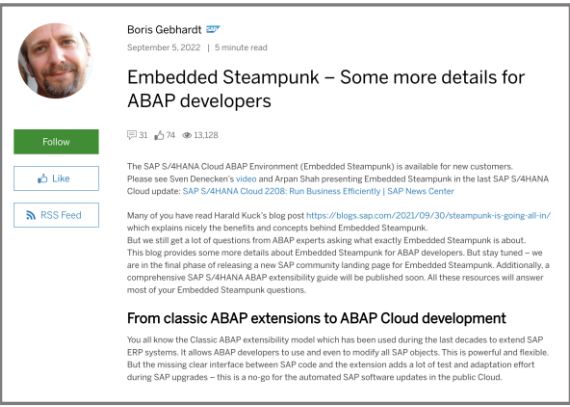
More information



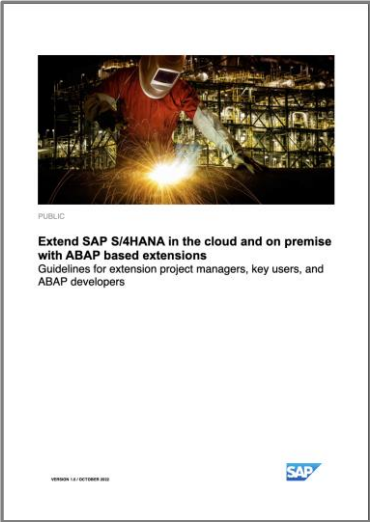
[SAP Community](#)



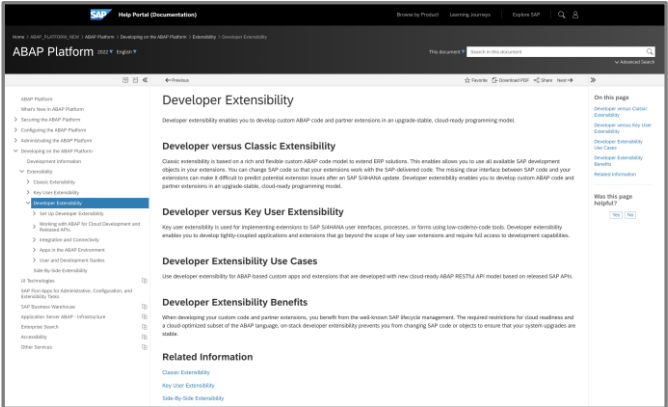
[How to use Embedded Steampunk in SAP S/4HANA Cloud, private edition and in on-premise – The new ABAP extensibility guide | SAP Blogs](#)



[Embedded Steampunk – Some more details for ABAP developers | SAP Blogs](#)



[The new ABAP extensibility guide](#)



[SAP documentation](#)



[Developer Discussion: ABAP Cloud](#)

Thank you.

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