

# Building event-driven application with RAP Business Events in ABAP Cloud



**SAP Mentor**  
since 2014



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Strategic Enterprise  
Architect for SAP

SAP Consultant  
since 1996



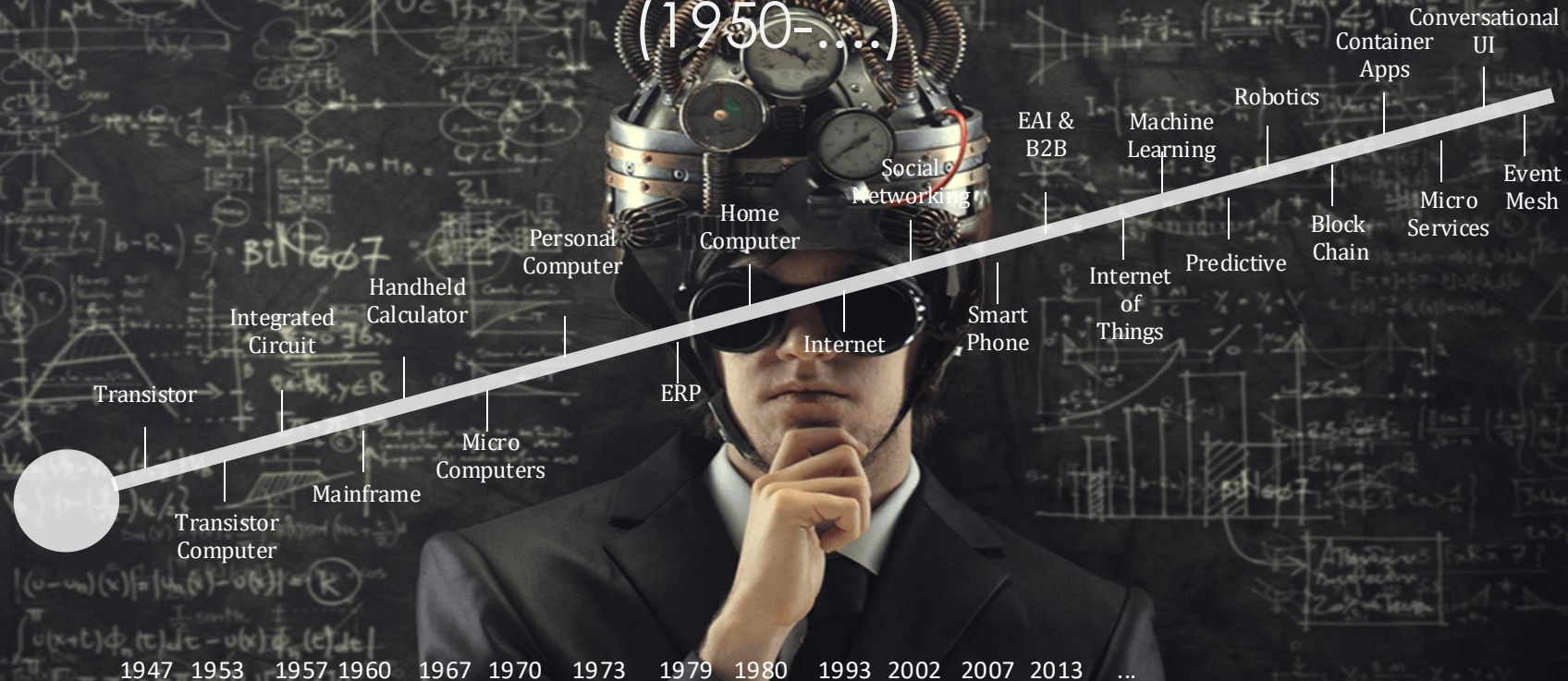
**NL for Business**

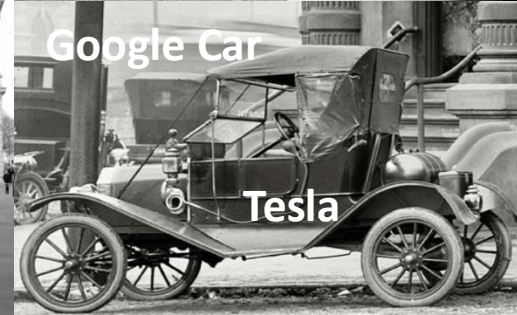
Founded in 2001  
SAP Service Partner

# Digital Revolution

from Human Brain to Intelligence & Robotics

(1950-...)





Digital Revolution changes the way we work



We solve the same challenges.



Sales document Edit Goto Extras Environment System Help

Create Standard Order: Overview

Standard Order  Net value 3.500,00 EUR

Sold-To Party 1032 Institut fuer Umweltforschung / Bernauer Strasse 12 / 81669 ...

Ship-To Party 1032 Institut fuer Umweltforschung / Bernauer Strasse 12 / 81669 ...

PO Number  PO date

Sales Item overview Item detail Ordering party Procurement Shipping Reason for rejection

Req. deliv.date D 05.03.2012 Deliver.Plant

☐ Complete dlv. Total Weight 290 KG

Delivery block  Volume 0,780 M3

Billing block  Pricing date 03.03.2012

Payment card  Exp.date

Card Verif.Code

Payment terms ZB01 14 Days 3%, 30/2... Incoterms CFR München

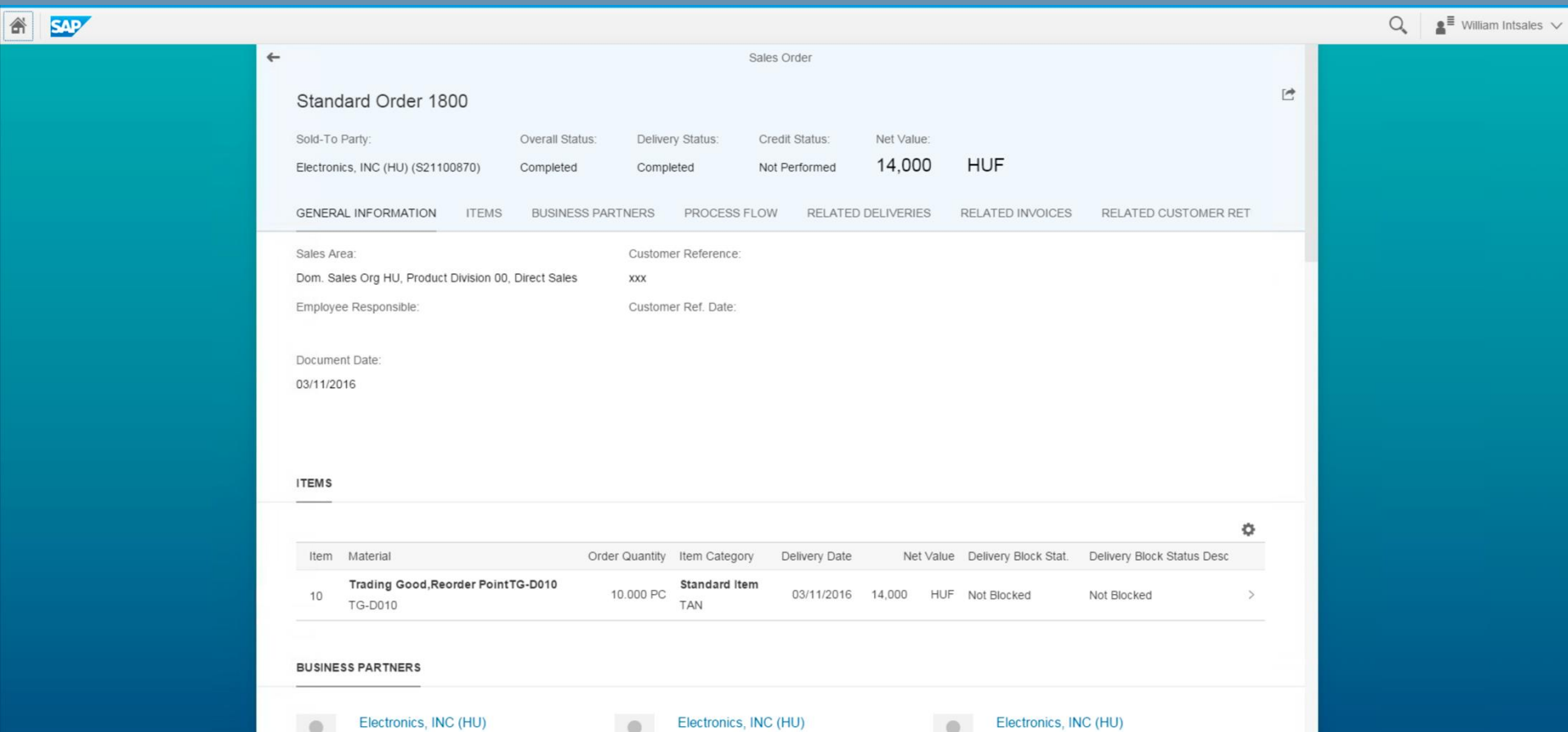
Order reason

All items

Item	Material	Order Quantity	Un	Description	S	Customer Material Numb
10	P-109	1	PC	Pumpe Stahlguss IDES...	<input checked="" type="checkbox"/>	
					<input type="checkbox"/>	

'Classic' ERP  
User  
Interactions  
at today's  
customers  
are complex

# Modern Business systems will still be Complex and need more Data.



The screenshot displays the SAP Sales Order interface for 'Standard Order 1800'. The top navigation bar includes the SAP logo, a search icon, and the user 'William Intsales'. The main header shows the order title and a back arrow. Below this, a summary section provides key details: Sold-To Party (Electronics, INC (HU) (S21100870)), Overall Status (Completed), Delivery Status (Completed), Credit Status (Not Performed), Net Value (14,000), and Currency (HUF). A tabbed interface below the summary allows switching between various views: GENERAL INFORMATION, ITEMS, BUSINESS PARTNERS, PROCESS FLOW, RELATED DELIVERIES, RELATED INVOICES, and RELATED CUSTOMER RET. The 'GENERAL INFORMATION' tab is active, showing Sales Area (Dom. Sales Org HU, Product Division 00, Direct Sales), Customer Reference (xxx), Employee Responsible, Customer Ref. Date, and Document Date (03/11/2016). The 'ITEMS' section is expanded, revealing a table with one item: Item 10, Material Trading Good, Reorder Point TG-D010, Order Quantity 10.000 PC, Item Category Standard Item TAN, Delivery Date 03/11/2016, Net Value 14,000 HUF, and Delivery Block Status Not Blocked. The 'BUSINESS PARTNERS' section at the bottom shows three entries for Electronics, INC (HU).

SAP

William Intsales

Sales Order

Standard Order 1800

Sold-To Party: Electronics, INC (HU) (S21100870)

Overall Status: Completed

Delivery Status: Completed

Credit Status: Not Performed

Net Value: 14,000

HUF

GENERAL INFORMATION ITEMS BUSINESS PARTNERS PROCESS FLOW RELATED DELIVERIES RELATED INVOICES RELATED CUSTOMER RET

Sales Area: Dom. Sales Org HU, Product Division 00, Direct Sales

Customer Reference: xxx

Employee Responsible:

Customer Ref. Date:

Document Date: 03/11/2016

ITEMS

Item	Material	Order Quantity	Item Category	Delivery Date	Net Value	Delivery Block Stat.	Delivery Block Status Desc
10	Trading Good, Reorder Point TG-D010	10.000 PC	Standard Item TAN	03/11/2016	14,000 HUF	Not Blocked	Not Blocked

BUSINESS PARTNERS

Electronics, INC (HU)

Electronics, INC (HU)

Electronics, INC (HU)

User Interaction should be simplified and smart.

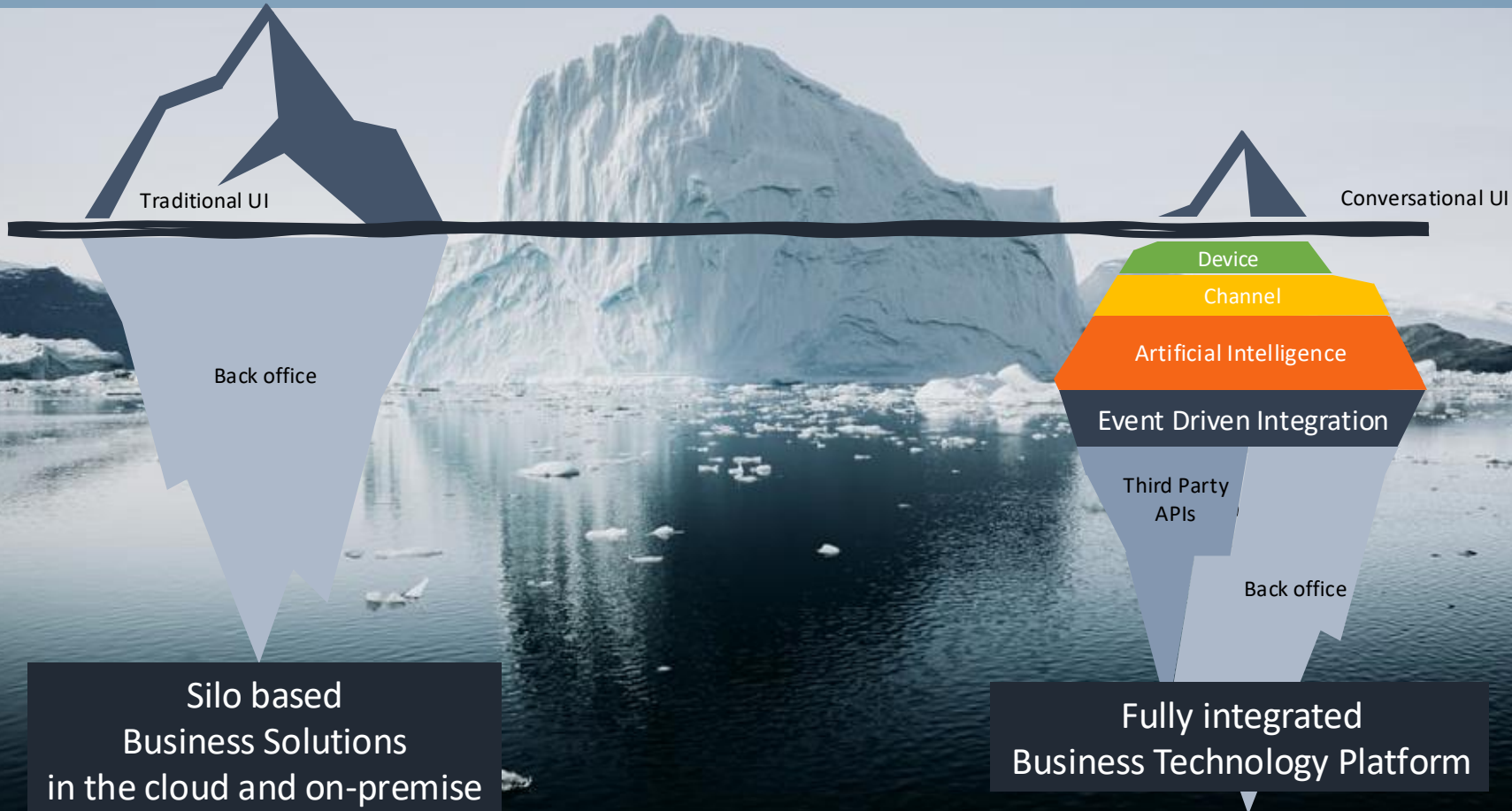


... or even fully automated



**Bring your own process,  
Bring your own device &  
Bring your own application**

# Hide complexity from end-user



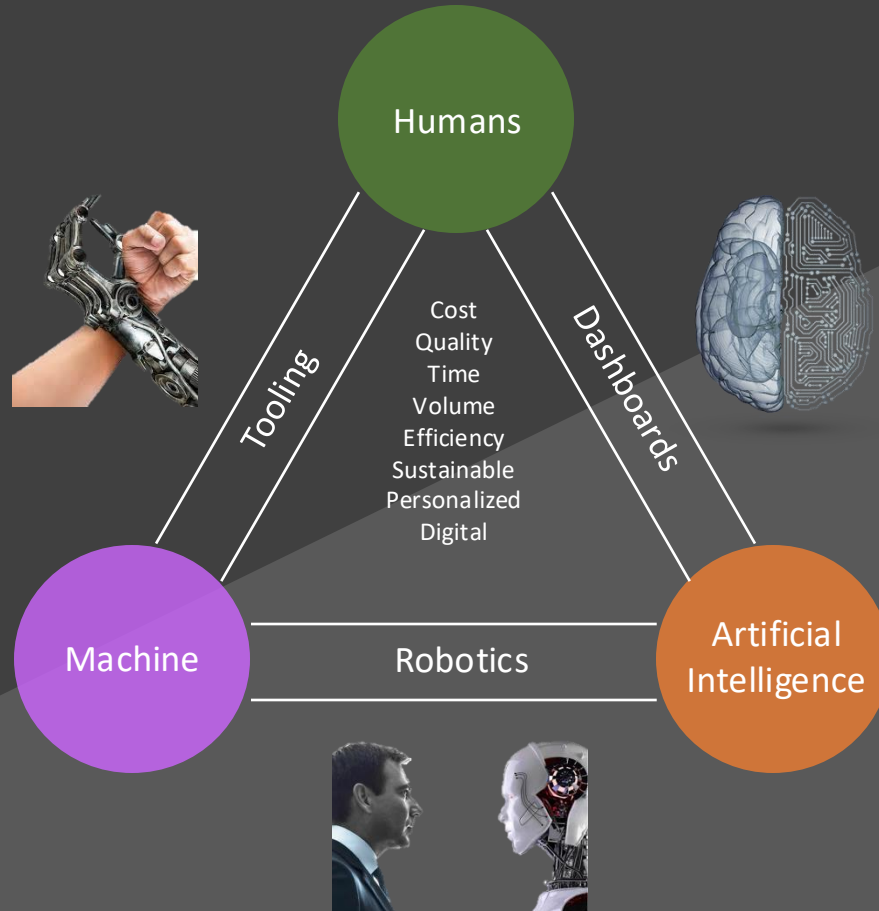


Find a balance between data entry, automated data collection, and automated decisions.

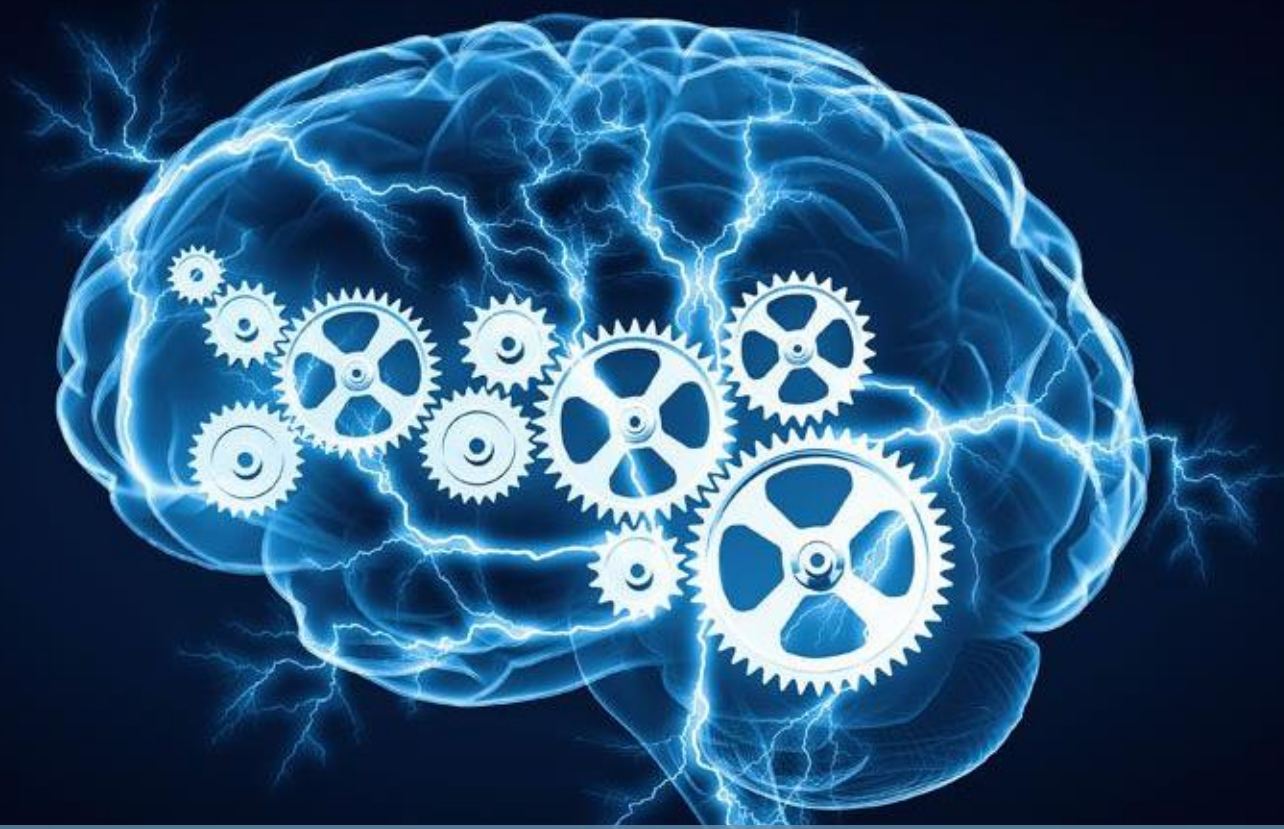
Human vs Automated

# automate human tasks

Industrial Revolution



Digital Revolution



Applications should work like our brains.



Data streams should be connected.

...and timing is crucial





# Event Driven Applications



High volume of events



Not every event is relevant



Events can be overruled



Applications can react different on same event



Events should speak the same language



Lowcode/Nocode  
Platforms

Container based  
Computing

Intelligent  
ERP

Analytics

Cloud  
Applications

Office  
Applications

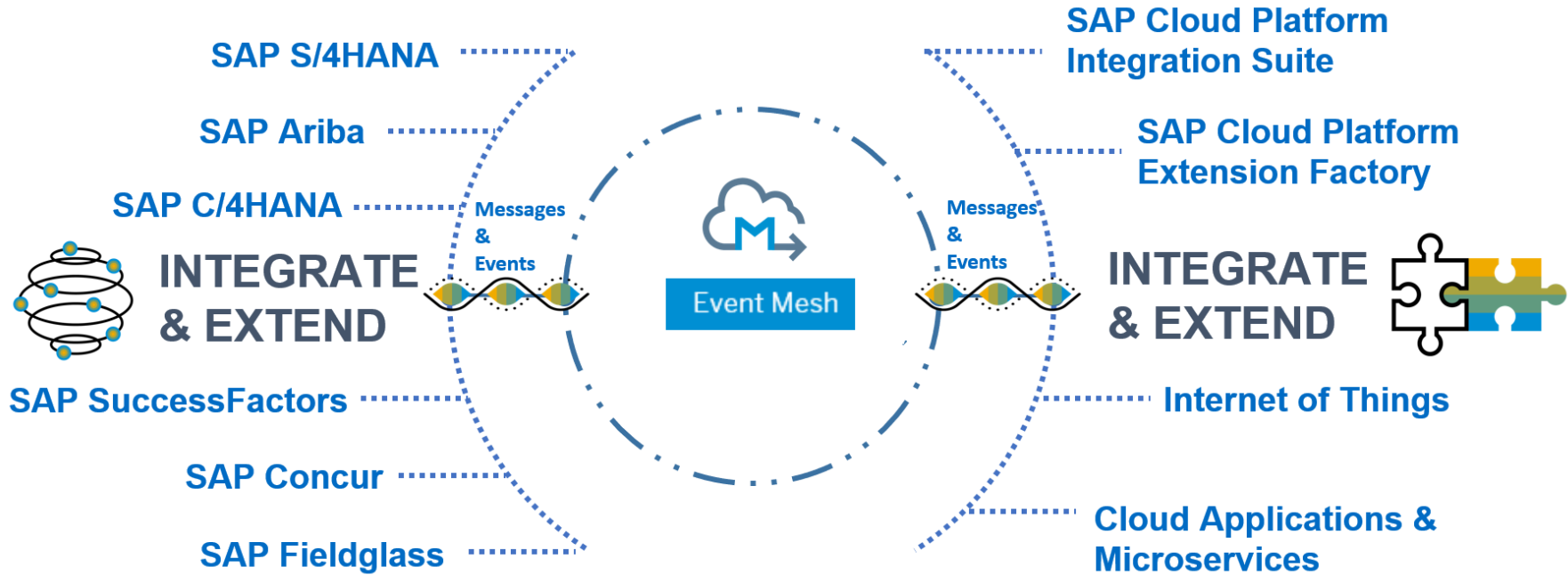
Social  
Media

Chat  
bots

RPA

IoT

Events should not be silo based



SAP recognize the importance of events



**ABAP Cloud Local Events (XBE)**



**SAP Cloud Application Event Hub**



**SAP Event Mesh**

- Default Plan
- Connectivity Plan to connect with Microsoft Azure Event Grid



**SAP Advanced Event Mesh (AEM)**

SAP Event Brokers



**SAP NetWeaver** Add-On for Event Enablement (based on ASAPIO)

**S/4HANA**

**S/4HANA** Business Events



**ABAP Cloud** Custom events



**SAP Customer Experience** Business Events



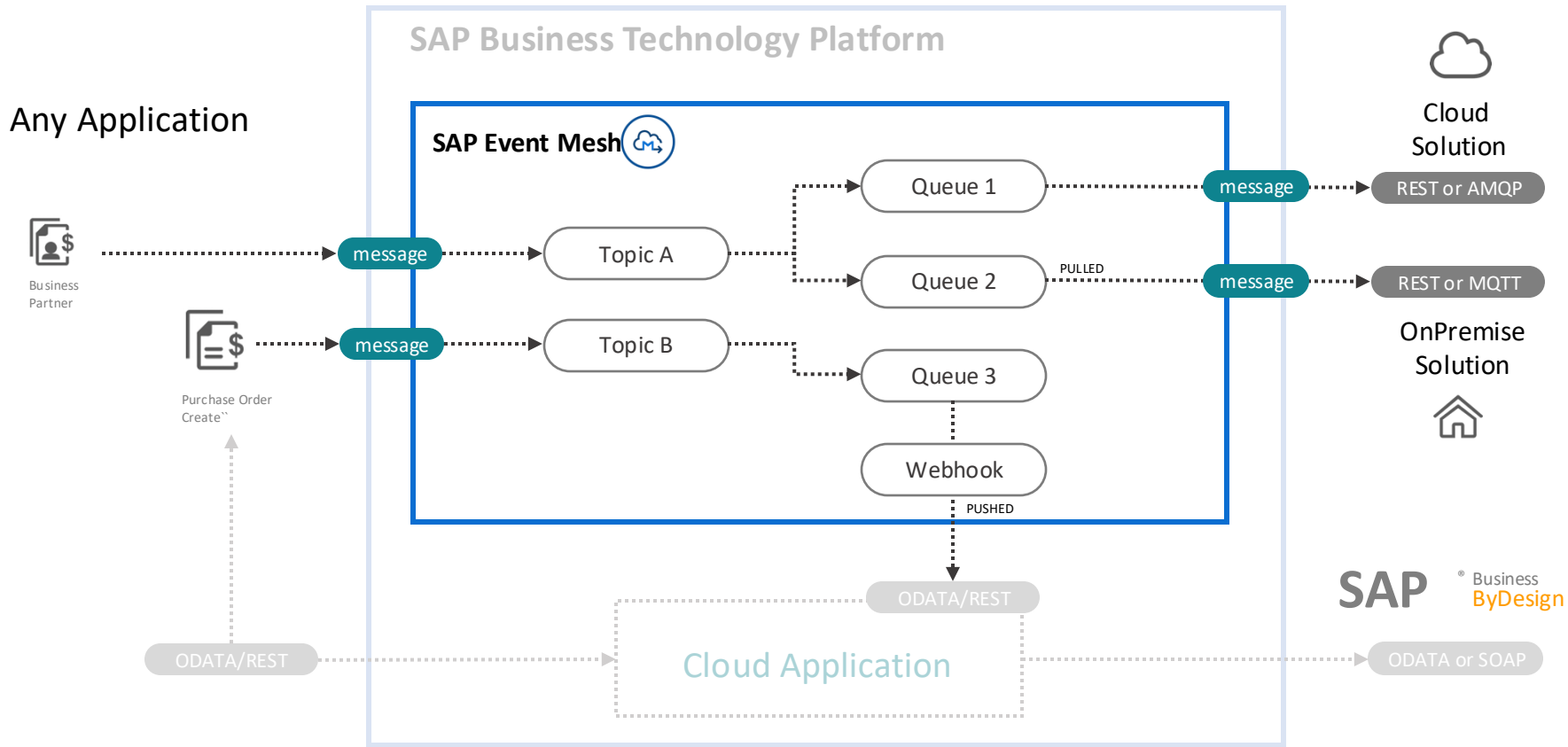
**SAP Cloud Integration** AMQP Channel



**SAP Cloud Application Programs** on SAP BTP

and others.

SAP Event Providers/Consumers

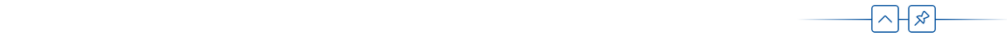


SAP Event Mesh is system agnostic

SAP\_CP\_XF\_NQ40

Copy Bindings From Previous Version

🔗



Outbound Topic Bindings

Inbound Topic Bindings

Subscriptions

Outbound Topics (4)

Create

Delete

⚙️

📄

▾

Topic	Channel	
<input type="radio"/> sap/s4/beh/businesspartner/v1/BusinessPartner/*	SAP_CP_XF_NQ40	>
<input type="radio"/> sap/s4/beh/product/v1/Product/*	SAP_CP_XF_NQ40	>
<input type="radio"/> sap/s4/beh/purchaseorder/v1/PurchaseOrder/*	SAP_CP_XF_NQ40	>
<input type="radio"/> sap/s4/beh/salesorder/v1/SalesOrder/*	SAP_CP_XF_NQ40	>

```
{
  "type": "sap.s4.beh.salesorder.v1.SalesOrder.Changed.v1",
  "specversion": "1.0",
  "source": "/default/sap.s4.beh/0000000007",
  "id": "fa163e62-59b2-1edc-89ed-9ac5c80fa163",
  "time": "2021-10-07T12:48:15Z",
  "datacontenttype": "application/json",
  "data": {
    "SalesOrder": "47"
  }
}
```

Inbound Topic Bindings

Inbound Topics (0)

Topic
No data found.

Create

Delete

⚙️

📄

▾

Subscriptions

Subscriptions (0)

Create

Delete

⚙️

📄

▾

Status	Subscription Address	Topic Name
No data found.		

S/4HANA Notification Events



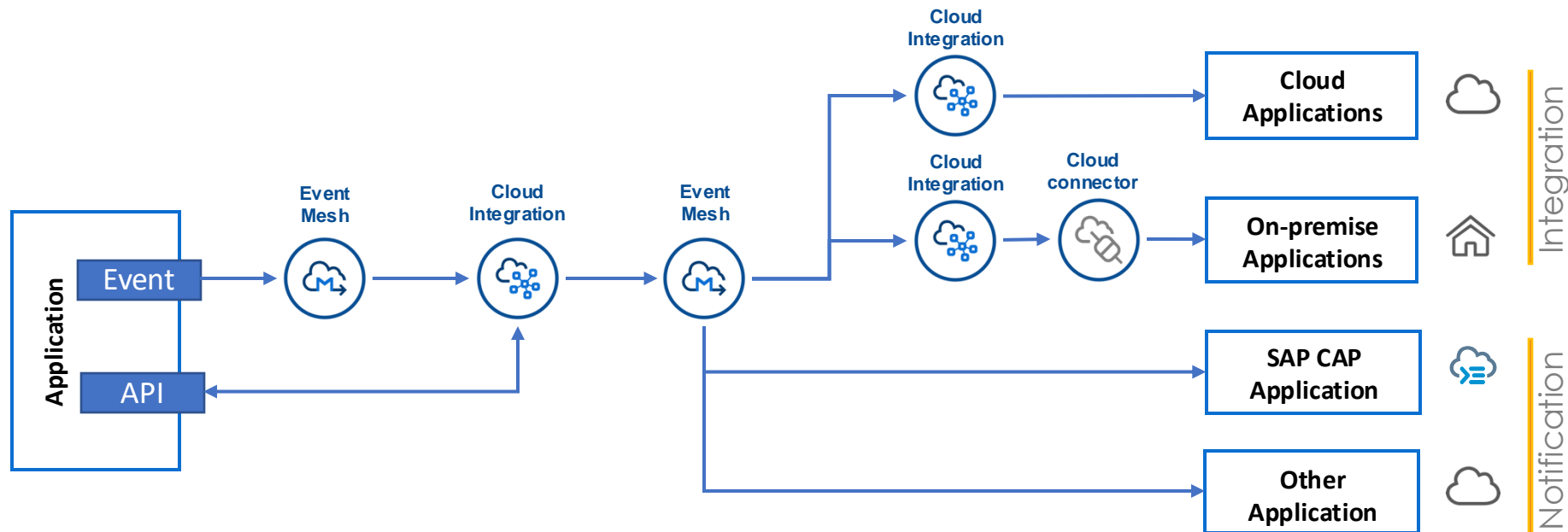
Event Mesh + Integration platform

# Trigger

# Enrich

# Dispatch

# Process



## Notification versus Integration

Notification Events

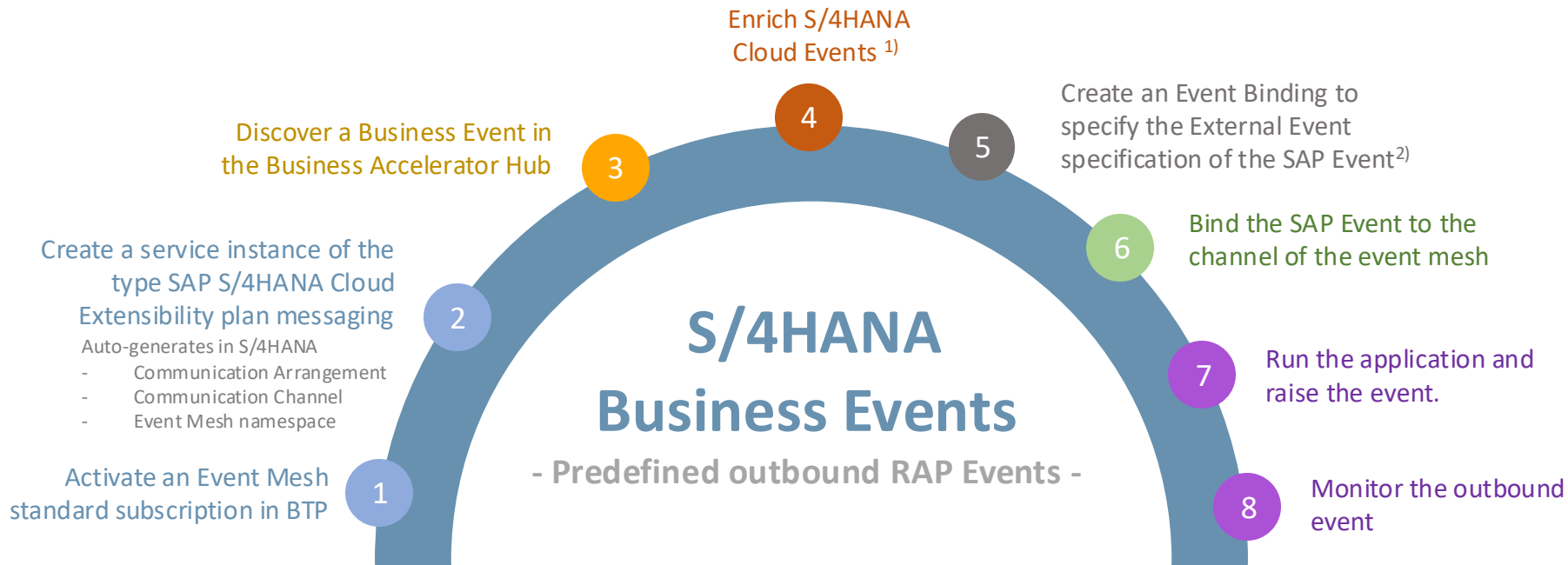
Data Events



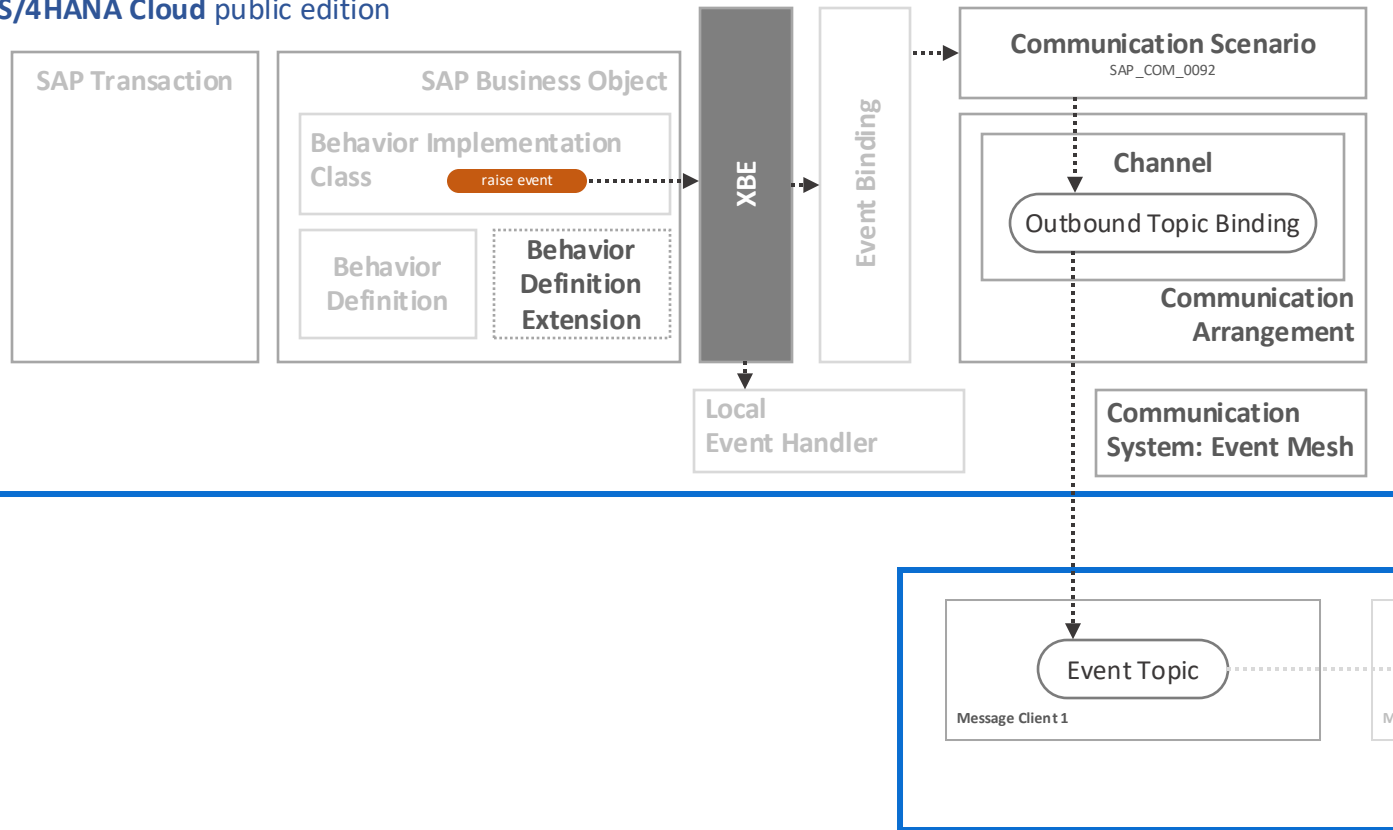
Only basic info

Detailed Info

Event Types



# Steps to publish S/4HANA Business Events



**New Instance or Subscription**

1 Basic Info 2 Parameters 3 Review

Enter basic info for your instance or subscription.

Service: **Event Mesh** [Can't find what you're looking for?](#)

Plan: **standard**

Instances: default

Subscriptions: standard

[Next](#) [Create](#)

Create subscription

**SAP BTP Cockpit**

HL For Business B.V. / DoCloudNow-D

**Event Mesh**

Application Technical Name: enterprise-messaging-hub  
Plan Display Name: standard  
Plan: standard  
Status: **Subscribed**

Created On: 2 Mar 2022  
Changed On: 2 Mar 2022  
Created By: robert.eijpe@nt4b.com  
Changed By: robert.eijpe@nt4b.com

[Go to Application](#)

**Overview** Roles

The SAP Event Mesh service decouples communication and allows for event-driven business processes.

Labels (0)

No labels assigned to this subscription. Click 'Add' to assign labels.

**Additional Links**

[Documentation](#)

Event Mesh subscription in BTP

**SAP Event Mesh**

Subdomain: docloudnow-d-2beutdmr

**Message Clients**

[Refresh](#)

Queues

Resource Allocation

Resource Usage

Test

Event Mesh application

# Activate Event Mesh in BTP

**New Instance or Subscription**

1 Basic Info 2 Parameters 3 Review

Enter basic info for your instance or subscription.

Service: ⓘ [Can't find what you're looking for?](#)

SAP S/4HANA Cloud Extensibility

Plan: messaging

☒ This service plan is not bindable.

☒ I understand that enabling a service might result in costs, depending on the plan selected. [See Service Catalog](#)

Runtime Environment: Cloud Foundry

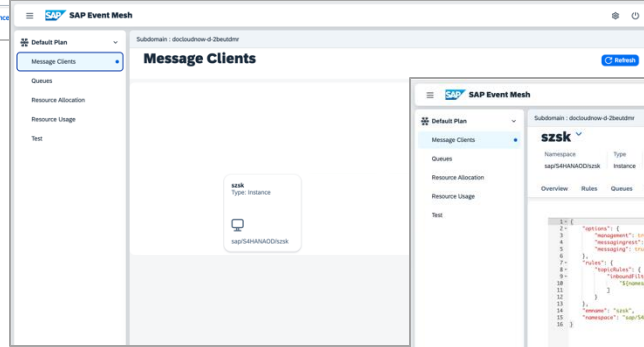
Space: dev

System Name: SAHPC\_NLAB\_PARTNER\_SYSTEM\_100

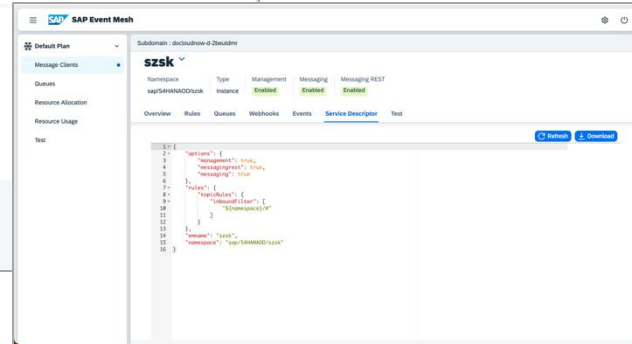
Instance Name: EM\_S4HANA\_SZSK

[Next](#) [Create](#) [Cancel](#)

Create a service instance of the type SAP S/4HANA Cloud Extensibility plan messaging



Message Client in Event Mesh Application



S/4HANA Message Client Details

**SAP Communication Arrangements**

SAP\_CLOUD\_PLATFORM\_XF\_szk

Scenario ID: SAP\_COM\_0002 Changed By: Robert Elje Editing Status: Active

Scenario: Enterprise Eventing Integration Changed On: 05/14/2024, 09:29:42

**Common Data**

Arrangement Name: SAP\_CLOUD\_PLATFORM\_XF\_szk Own SAP Cloud System: 0M54759

Communication System: 43603DCC38A49D1BACDE9C1D0A8D9 API URL: https://my43603d-sap.s4hana.cloud.sap

**Additional Properties**

Property Name	Property Value
Channel	SAP_CP_XF_SZSK
Description	Integration with Enterprise Messaging for EM Client [szsk]
Topic Space	sapS4HANAExtensibility
QoS	1
Reconnect Attempts	0
Reconnect wait time(sec)	5

Inbound Communication [Supported Authentication Methods](#)

Channel  
Namespace

Communication Arrangement in S/4HANA

# Create a Message Client for SAP S/4HANA Cloud

## SAP S/4HANA Cloud Public Edition

Ready-to-run cloud ERP that delivers the latest industry best practices and continuous innovations. You can also accelerate and grow your business with continuous innovations.

Overview APIs **Events** On Stack Extensibility Integrations Business Processes Build VPUC Analytics

Event Objects Packages

Showing 1-12 of 19 results

< Previous Page 1 of 2

Next > Sort by: Updated ▾

Sales Order



Event Object

### Sales Order Events

Inform a remote system about created, changed, and deleted sales orders in an SAP S/4HANA Cloud tenant

Version 1.0.0

ACTIVE



Event Object

### Sales Order Without Charge Events

Inform a remote system about created, changed, and deleted sales order without charge in the SAP S/4HANA Cloud tenant

Version 1.0.0

ACTIVE



Event Object

### Warehouse Order Events

Inform a remote system about created, canceled, and confirmed warehouse task of a warehouse order in the SAP S/4HANA Cloud tenant

Version 1.0.0

ACTIVE



Event Object

### Freight Order Events

Inform a remote system about created, changed, and deleted freight orders in the SAP S/4HANA Cloud tenant

Version 1.0.0



Event Object

### Production Order Events

Inform a remote system about created and changed Production orders in an SAP S/4HANA Cloud tenant

Version 1.0.0

ACTIVE



Event Object

### Maintenance Order Events

Inform a remote system about closed, approved, and rejected events for maintenance orders in an SAP S/4HANA Cloud tenant

Version 1.0.0

ACTIVE



Event Object

### Service Order Events

Inform a remote system about created, changed, completed, released, and deleted service orders in an SAP S/4HANA Cloud tenant

Version 1.0.0

ACTIVE



Event Object

### Process Order Events

Inform a remote system about created, changed, and deleted process orders in the SAP S/4HANA Cloud tenant

Version 1.0.0

/ SAP S/4HANA Cloud Public Edition for Business Events

## Sales Order Events

Inform a remote system about created, changed, and deleted sales orders in an SAP S/4HANA Cloud tenant

Overview **Event References** Event Consumption Documents

OPERATIONS

ce/sap/s4/beh/salesord

en/s4/salesorder/appro

valschanged/v1

ce/sap/s4/beh/salesord

en/s4/salesorder/chan

ged/v1

ce/sap/s4/beh/salesord

en/s4/salesorder/creat

d/v1

ce/sap/s4/beh/salesord

en/s4/salesorder/delete

d/v1

ce/sap/s4/beh/salesord

en/s4/salesorder/itemc

hanged/v1

ce/sap/s4/beh/salesord

en/s4/salesorder/itemcr

eated/v1

ce/sap/s4/beh/salesord

en/s4/salesorder/itembl

lled/v1

ce/sap/s4/beh/salesord

en/s4/salesorder/itemdel

ted/v1

### Operations

SUB ce/sap/s4/beh/salesorder/v1/SalesOrder/ApprovalsChanged/v1

Operation ID select

Accepts the following message:

SalesOrder Approval Status Changed

This event is raised when the approval status of a sales order is changed.

Payload > Expand all

Object

Headers > Expand all

Object

### Examples

Payload >

Headers >

Chat (Beta)

FEEDBACK

# SAP Business Accelerator Hub

[illegible]

S/4HANA  
Data  
Event

## Data Extension

```
{
  "type": "fexs.s4.beh.fexs.SalesOrder.Created.v1",
  "specversion": "1.0",
  "source": "/default/sap.abap.custom/743798665",
  "id": "77e43f3a-3619-1eef-a6ef-818acd5aed72",
  "time": "2024-11-05T13:44:17Z",
  "xsapsalesordersoldto": "37100001",
  "xsapsalesordertype": "OR",
  "datacontenttype": "application/json",
  "data": {
    "SalesOrder": "10",
    "EventRaisedDateTime": "2024-11-05T13:44:15Z",
    "SalesOrderType": "OR",
    "SalesOrganization": "3710",
    "DistributionChannel": "10",
    "OrganizationDivision": "00",
    "SoldToParty": "37100001",
    "TotalNetAmount": 1350,
    "TransactionCurrency": "EUR",
    "PricingDate": "2024-11-05",
    "PurchaseOrderByCustomer": "Kadootje",
    "BillingCompanyCode": "3710",
    "ControllingArea": "A000"
  }
}
```

# Enrich S/4HANA Business Events

```

1  @Open Documentation
2  interface;
3  extensible;
4  with privileged mode;
5
6  define behavior for I_SalesOrderTP alias SalesOrder
7  use etag
8  {
9      use create;
10     use update;
11     use action CreateWithReference;
12
13     use event Created;
14     use event Changed;
15     use event Deleted;
16
17     field ( readonly ) SalesOrder;
18     use association_Item { create; }
19     use association_Partner { create; }
20     use association_Text { create; }
21     use association_PricingElement { create; }
22 }
23
24 define behavior for I_SalesOrderPartnerTP alias SalesOrderPartner
25 use etag
26 {
27     use update;
28     use delete;
29
30     field ( suppress ) SalesOrganization, DistributionChannel, OrganizationDivision, SalesOrderType;
31
32     use association_SalesOrder;
33 }
34
35 define behavior for I_SalesOrderTextTP alias SalesOrderText
36 use etag
37 {

```

Original interface I\_SalesOrderTP

```

1  @Open Documentation
2  @EndUserText.label: 'Sales Order Created'
3  @ObjectModel.sapObjectType.name: 'SalesOrder'
4  @ObjectModel.supportedCapabilities: [#DATA_STRUCTURE]
5  @VDM.usage.type: [#EVENT_SIGNATURE]
6  @Metadata.allowExtensions: true
7  define abstract entity D_SalesOrderCreated {
8
9      @Event.raisedAt.dateTime: true
10     EventRaisedDateTime : vdm_lastchangedon;
11
12     SalesOrderType : auart_unv;
13
14     SalesOrganization : vkorg;
15
16     DistributionChannel : vtweg;
17
18     OrganizationDivision : spart;
19
20     SoldToParty : kunnr;
21 }
22

```

Original notification event data D\_SalesOrderCreated

extension using interface i\_salesorderTP;

extend behavior for SalesOrder{  
 managed event /fexs/created on Created parameter /fexs/D\_SalesOrderCreated;  
 managed event /fexs/changed on Changed parameter /fexs/D\_SalesOrderChanged;  
}

## RAP Behavior Definition Extension

```

@AccessControl.authorizationCheck: #NOT_REQUIRED
@EndUserText.label: 'Event data Sales Order Changed'
@Metadata.ignorePropagatedAnnotations: false
@Searchable: false

```

define view entity /FEXS/D\_SALESORDERCREATED  
as select from I\_SalesOrder  
{

key SalesOrder,

@Event.raisedAt.dateTime: true  
cast( timestamp\_current\_timestamp() as timestamp )  
as EventRaisedDateTime,

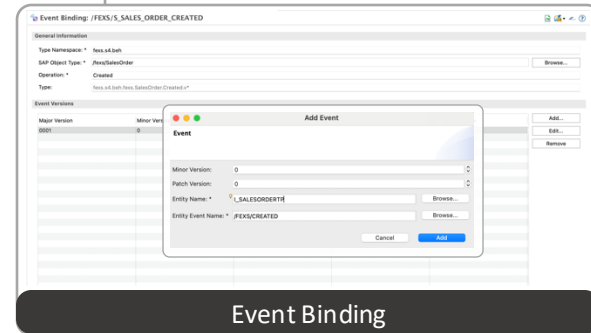
@Event.context.attribute: 'xsapsalesordertype'  
SalesOrderType,  
SalesOrganization,  
DistributionChannel,  
OrganizationDivision,  
@Event.context.attribute: 'xsapsalesordersoldto'  
SoldToParty,

```

// Additional Data Fields
TotalNetAmount,
TransactionCurrency,
PricingDate,
PurchaseOrderByCustomer,
BillingCompanyCode,
ControllingArea
}

```

## RAP CDS View Entity for Event Data



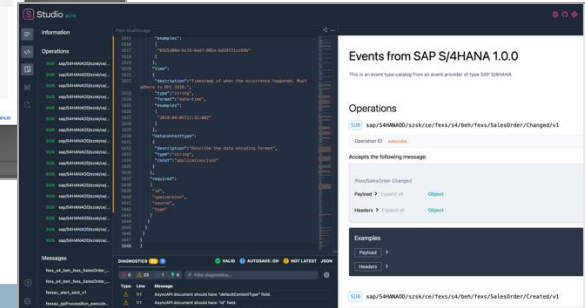
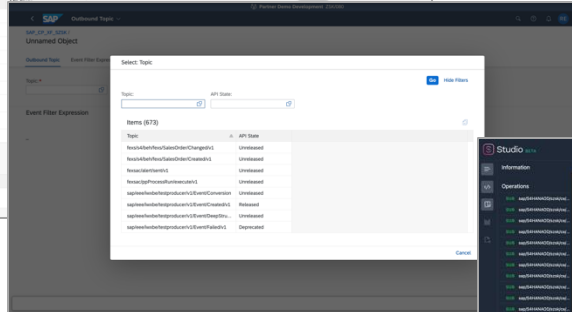
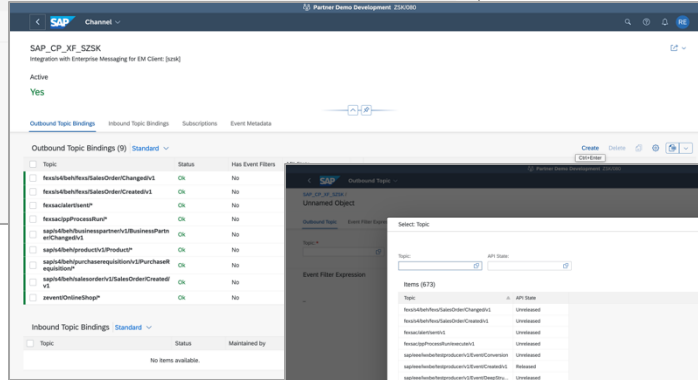
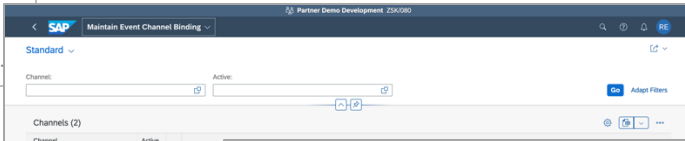
## Event Binding

# Extend the behavior definition

## Enterprise Event Enablement Configure Channel B...



Configure Channel B...



# Bind the event to the Channel

Create

Create

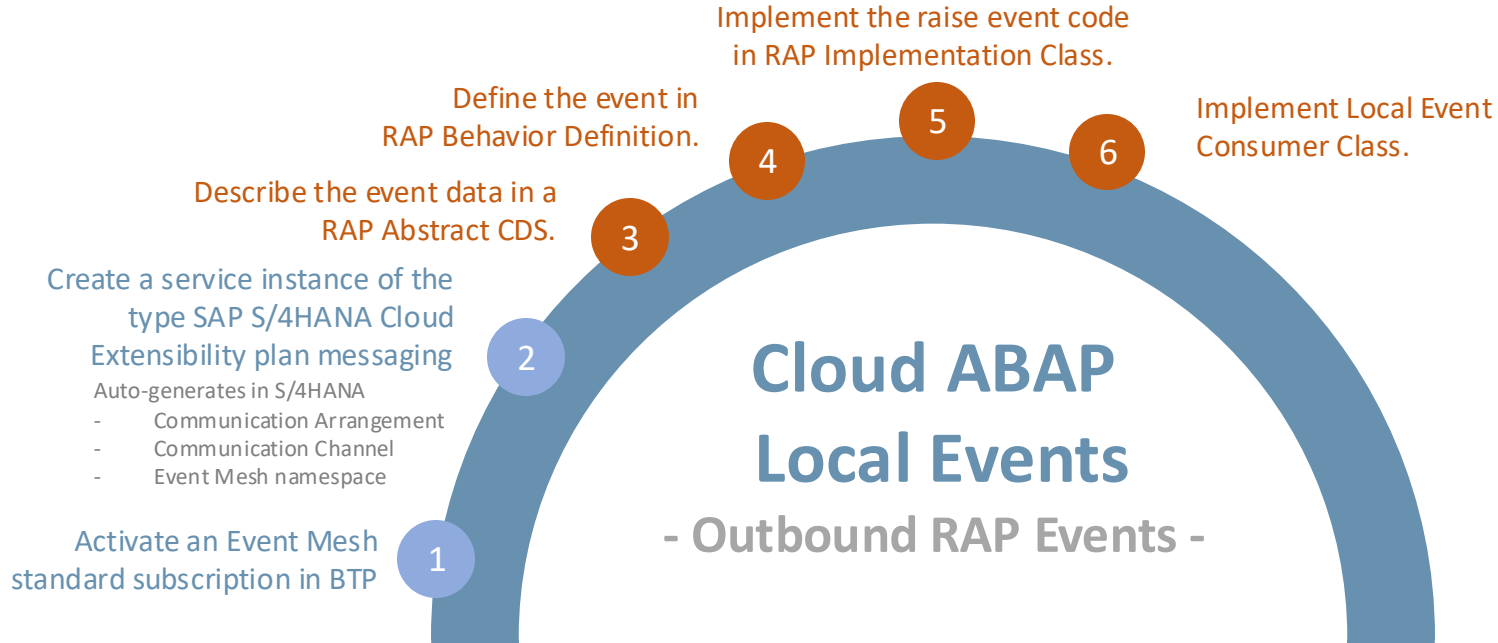
Create

Create

Create

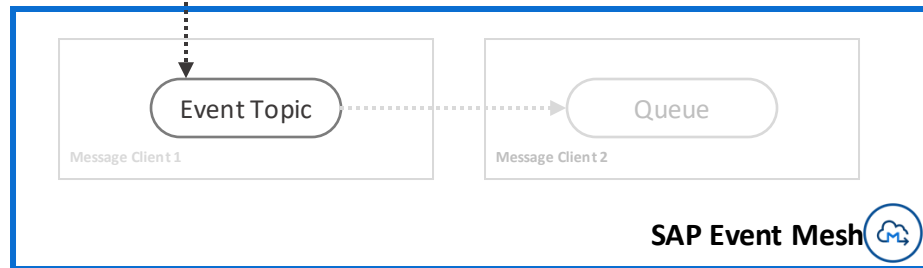
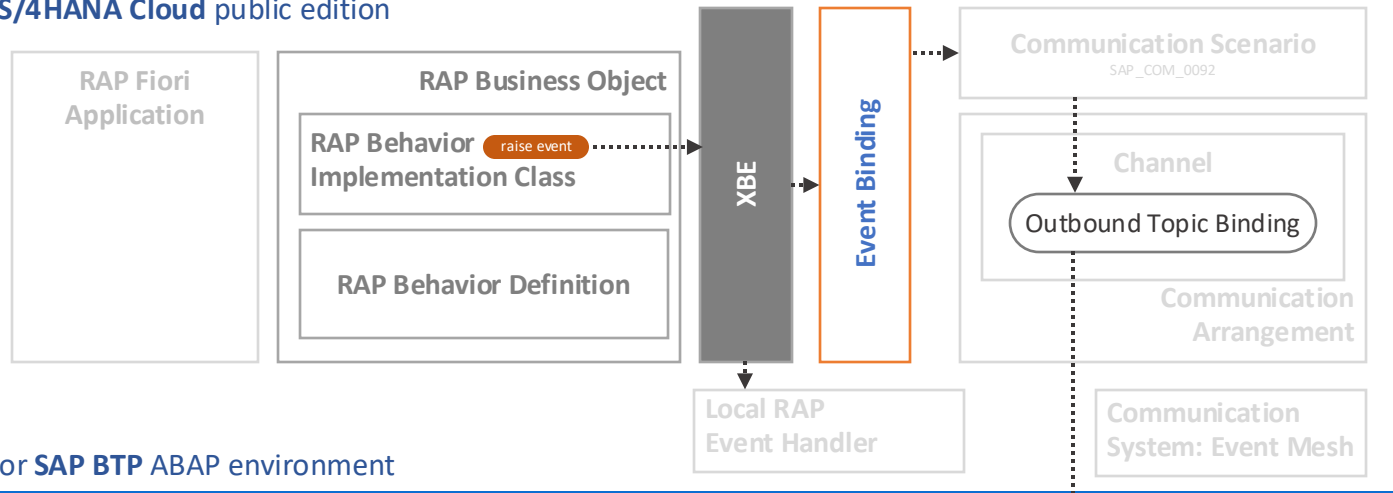
Create

# Trigger an event and monitor



# Steps to publish an RAP Events

## S/4HANA Cloud public edition



message

# Process Flow Inbound Events

```
@EndUserText.label: 'event parameter for Order Item'
define abstract entity ZA_ORDER_ITEM_000
{
   orderid : abap.numc(8);
    ordereditem : abap.char(40);
    orderitemtext : abap.char(40);
    @Semantics.amount.currencyCode: 'currency'
    price : abap.curr(11,2);
    @Semantics.amount.currencyCode: 'currency'
    totalprice : abap.curr(11,2);
    currency : abap.cuky;
    orderquantity : abap.numc(4);
    deliverydate : abap.dats;
    overallstatus : abap.char(30);
    notes : abap.string(256);
    name1 : abap.char(40);
    name2 : abap.char(40);
    street : abap.char(60);
    housenumber : abap.char(10);
    postalcode : ad_pstcd1;
    city : abap.char(40);
    countrycode : land1;
    country : abap.char(50);
}
```

RAP Abstract CDS Entity

# Describe your event data

```

managed implementation in class ZBP_ONLINESHOPTP_000 unique;
strict ( 2 );
with draft;
define behavior for ZR_ONLINESHOPTP_000 alias OnlineShop
draft table ZDONLINESHOP_000
etag master LocalLastChangedAt
lock master total etag LastChangedAt
authorization master( global )
with unmanaged save
{
  create;
  update (features:instance);
  delete;

  event ItemIsOrdered parameter ZA_ORDER_ITEM_000;
  ...

```

## RAP Behavior Definition

**METHOD** save\_modified.

```

DATA : lt_online_shop_as TYPE STANDARD TABLE OF zaonlineshop_000,
        ls_online_shop_as TYPE zaonlineshop_000.
IF create-onlineshop IS NOT INITIAL.
  lt_online_shop_as = CORRESPONDING #(
    create-onlineshop MAPPING FROM ENTITY ).
INSERT zaonlineshop_000 FROM TABLE @lt_online_shop_as.

RAISE ENTITY EVENT zr_onlineshoptp_000~ItemIsOrdered
FROM VALUE #(
  FOR online_shop IN create-onlineshop (
    %key = online_shop-%key
    %param-ordered_item = online_shop-OrderedItem )
  ).
...

ENDIF.

```

## RAP Implementation Class

### RAP Local Event Consumer Class

```
CLASS zcl_lod_evt_shop DEFINITION  
  PUBLIC  
  ABSTRACT  
  FINAL  
  FOR EVENTS OF zr_onlineshoptp_000.
```

```
  PUBLIC SECTION.  
  PROTECTED SECTION.  
  PRIVATE SECTION.  
ENDCLASS.
```

Global Class

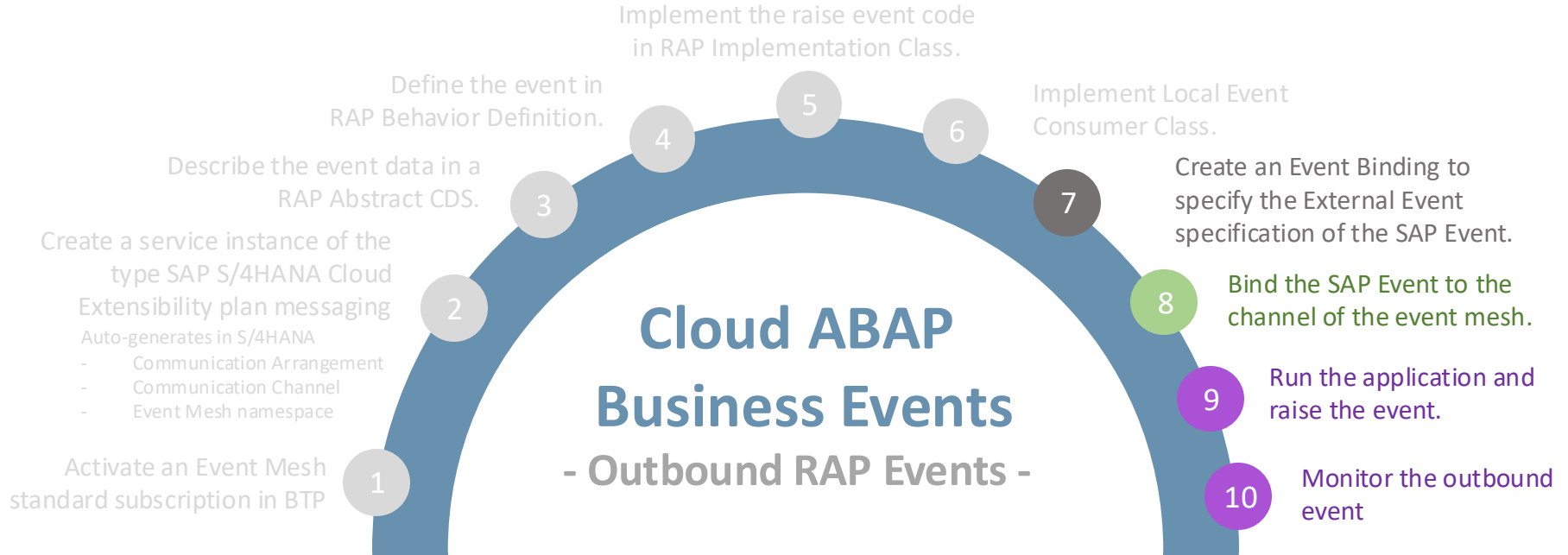
```
CLASS lcl_lod_evt_shop_handler DEFINITION INHERITING FROM  
  cl_abap_behavior_event_handler.
```

```
  PRIVATE SECTION.  
    METHODS item_is_ordered  
      FOR ENTITY EVENT ordered_items  
      FOR OnlineShop~ItemsOrdered.  
  ENDCLASS.
```

```
CLASS lcl_lod_evt_shop_handler IMPLEMENTATION.  
  METHOD item_is_ordered.  
    LOOP AT ordered_items INTO DATA(ordered_item).  
    ...  
  ENDLOOP.  
  ENDMETHOD.  
ENDCLASS.
```

Local Types

# RAP Local Event Consumer



# Steps to publish an RAP Events

ABAP RAP  
Event

Event Binding: ZEVTB\_ONLINESHOP\_000 2 warnings detected

General Information

Type Namespace: \*

SAP Object Type: \*

Operation: \*

Type:

Event Versions

Major Version	Minor Version	Patch Version	Entity Name	Entity Event Name
0001	0	0	ZR_ONLINESHOP_TP_000	ITEMISORDERED

Add...  
Edit...  
Remove

Event Binding

RAP  
Business  
Event

RAP External Business Event



Channel	Active
EM_NL4B_S4H_IN	Yes
SAP_CP_XF_SZSK	Yes

The screenshot shows the 'Outbound Topic Bindings' configuration page in SAP S/4HANA Cloud Integration. The page is divided into two main sections: 'Outbound Topic Bindings (5)' and 'Inbound Topic Bindings'.

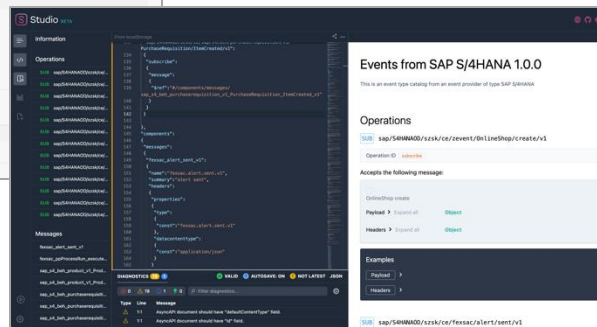
**Outbound Topic Bindings (5)**

Topic	Status	Has Event Filters	API State
<input checked="" type="checkbox"/> /rescaler/alerItem*	OK	No	>
<input checked="" type="checkbox"/> /rescaler/processRun*	OK	No	>
<input checked="" type="checkbox"/> sap/s4h/brandExtV3/Product*	OK	No	>
<input checked="" type="checkbox"/> sap/s4h/purchaseRequisitionV2/PurchaseRequisition*	OK	No	>
<input checked="" type="checkbox"/> zeventOnlineShop*	OK	No	>

**Inbound Topic Bindings** Standard ▾

Topic	Status	Maintained by
No items available.		

The right sidebar shows the 'SAP Studio' interface with a tree view of the project structure, including 'Information', 'Operations', and 'Tools'.



## Bind the event to the Channel

## Enterprise Event Enablement Event Monitor



Event Monitor for En

SAP Enterprise Event Enablement - Event Monitor

Standard

Channel: Active:

Go Adapt Filters

Channels (2)

Channel	Active	In Process Events	Processed Events	Failed Events	Status Text
EM_NL4B_S4H_IN	Yes	5	0	0	
SAP_CP_XF_SZSK	Yes	0	1	0	

SAP Channel

Partner Demo Development ZSK/080

SAP\_CP\_XF\_SZSK  
Integration with Enterprise Messaging for EM Client: [szsk]

Refresh Produce Test Event

Active	In Process Events	Processed Events	Failed Events
Yes	0	1	0

Inbound Events Outbound Events

Inbound Events

Topic

Outbound Events (1)

Topic
sap/54HANAO/szsk/ce/zeventOnlineShop/create/v1

SAP Outbound Event

Partner Demo Development ZSK/080

SAP\_CP\_XF\_SZSK / sap/54HANAO/szsk/ce/zeventOnlineShop/create/v1 / sap/54HANAO/szsk/ce/zeventOnlineShop/create/v1

Status  
Acknowledged

Times Event Data Produced by Payload

Arrival Time: 11/01/2024, 17:47:09	Acknowledged Time: 11/01/2024, 17:47:09
Publish Time: 11/01/2024, 17:47:09	Full Time: --

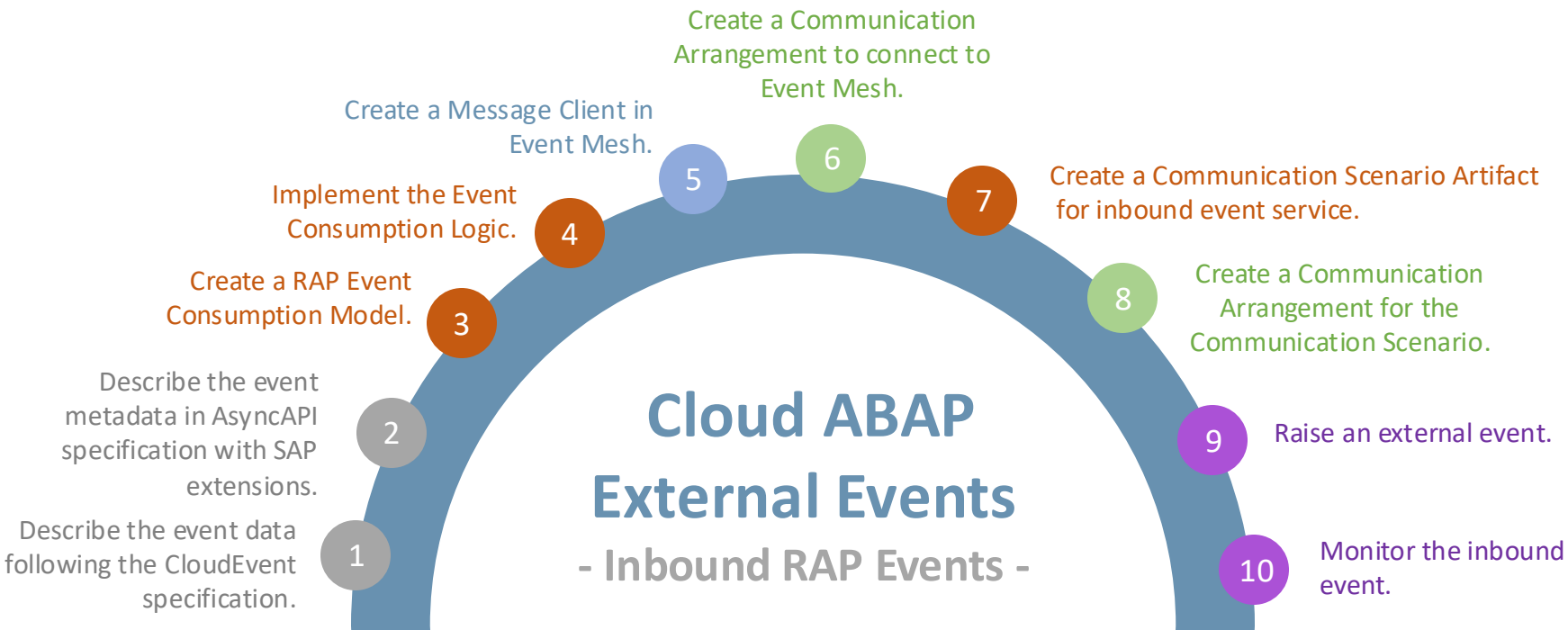
Event Data

Cloud Event ID: 45133905-6b5d-1ee6-a6ff-2a25ee7af686	Delivery Counter: 1	Reason for failure: --
Cloud Event Source: default/sap.alp.com/743798665	Quality of Service: At least once	

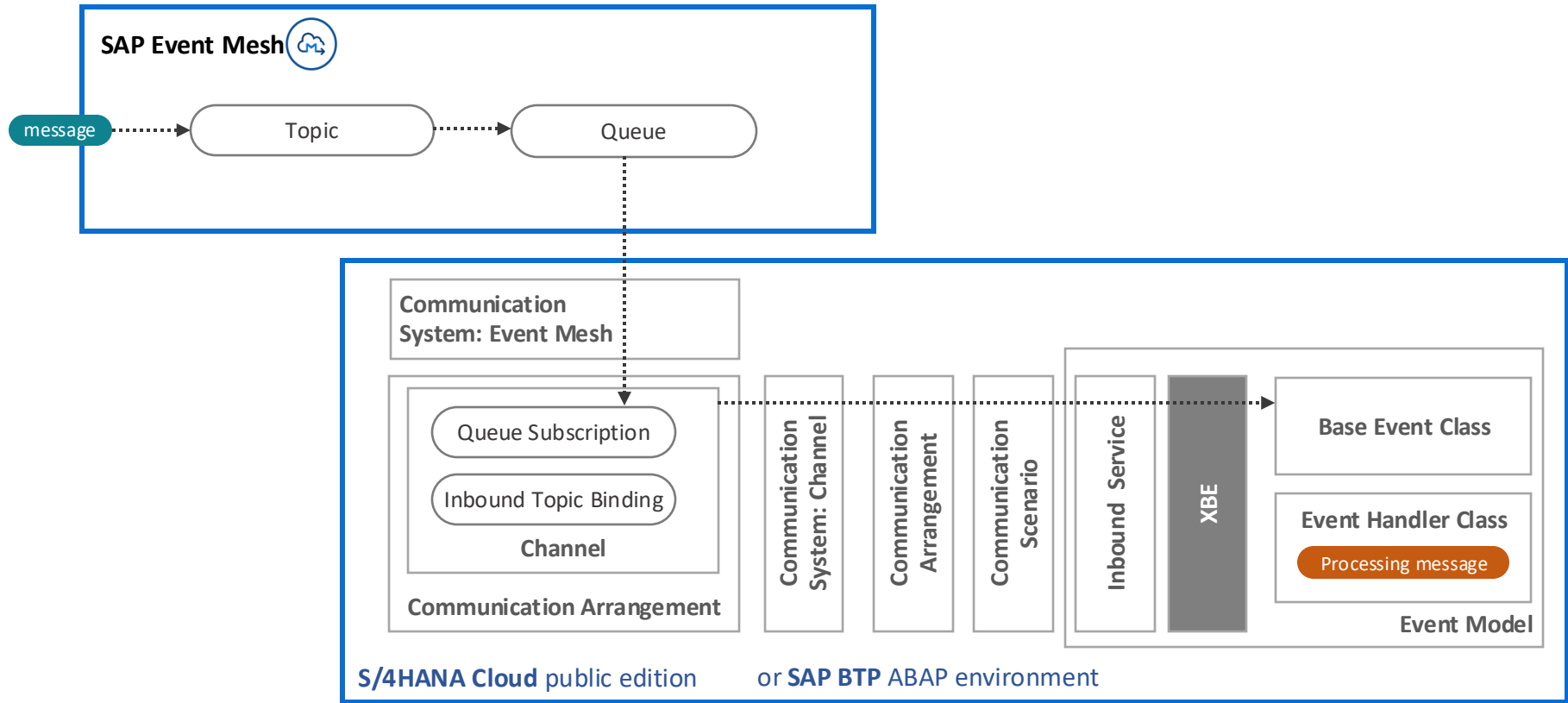
Produced by

Triggers the event

# Trigger an event and monitor



# Steps to Consume External Events in SAP RAP



# Process Flow Inbound Events



# cloudevents

```
{
  "id": "81327fe9-9776-11ef-b73c-eeee0a876e7e",
  "data": {
    "decision": "Approved",
    "OrderUUID": "451c3806-dc5d-1eef-a5ee-cf0a79a90d64",
    "ordered_item": "GIFTCARDBOL",
    "note": "No problem"
  },
  "time": "2023-11-11T16:00:00+00:00",
  "type": "zcap.event.MyShop.confirm.v1",
  "source": "/default/sap-build",
  "specversion": "1.0",
  "datacontenttype": "application/cloudevents+json"
}
```

Event Data

CloudEvent  
Wrapper

More info: <https://cloudevents.io/>

## SAP follows the Cloud Event specifications

Studio

Information

Operations

Messages

Schemas

sapS4HANAO0/szsk/ce/zcap/event/MyShop/confirm/v1

zcap\_event\_MyShop\_confirm\_v1

zcap\_event\_MyShop\_confirm\_v1

```
1 {
2   "asyncapi": "2.8.0",
3   "x-sap-catalog-spec-version": "1.0",
4   "info": {
5     "title": "Events from SAP S/4HANA",
6     "version": "1.0",
7     "description": "This is an event type catalog from an event provider of type SAP S/4HANA"
8   },
9   "x-sap-api-type": "EVENT",
10  "x-sap-stateful": {
11    "state": "active"
12  },
13  "channels": {
14    "sapS4HANAO0/szsk/ce/zcap/event/MyShop/confirm/v1": {
15      "subscribe": {
16        "message": {
17          "$ref": "#/components/messages/zcap_event_MyShop_confirm_v1"
18        }
19      }
20    },
21  },
22  "components": {
23    "message": {
24      "zcap_event_MyShop_confirm_v1": {
25        "name": "zcap_event_MyShop_confirm_v1",
26        "summary": "MyShop confirm",
27        "headers": {
28          "properties": {
29            "type": {
30              "const": "zcap_event_MyShop_confirm_v1"
31            }
32          },
33          "datacontenttype": {
34            "const": "application/json"
35          }
36        },
37        "payload": {
38          "$ref": "#/components/schemas/zcap_event_MyShop_confirm_v1"
39        },
40        "traits": {
41          "$ref": "#/components/messageTraits/CloudEventContext"
42        }
43      }
44    },
45  },
46  "schemas": {
47    "zcap_event_MyShop_confirm_v1": {
48      "type": "object",
49      "properties": {
50        "ordered_item": {
51          "type": "string",
52          "maxLength": 18
53        },
54        "orderId": {
55          "type": "string"
56        }
57      }
58    }
59  }
60 }
```

VALID

AUTOSAVE ON

NOT LATEST

JSON

7

1

Filter diagnostics...

Type Line Message

111 AsyncAPI document should have "defaultContentType" field.

111 AsyncAPI document should have "id" field.

Events from SAP S/4HANA 1.0

This is an event type catalog from an event provider of type SAP S/4HANA

Operations

PUB

sapS4HANAO0/szsk/ce/zcap/event/MyShop/confirm/v1

Operation ID [subscribe](#)

Accepts the following message:

MyShop confirm

Payload [Expand all](#) [Object](#)

Headers [Expand all](#) [Object](#)

Messages

#1 zcap\_event\_MyShop\_confirm\_v1

MyShop confirm

Message ID [zcap\\_event\\_MyShop\\_confirm\\_v1](#)

Payload [Expand all](#) [Object](#)

Headers [Expand all](#) [Object](#)

Schemas

zcap\_event\_MyShop\_confirm\_v1 [Expand all](#) [Object](#)

Examples

Payload

```
{
  "ordered_item": "testing",
  "orderId": "2701af49-d681-4629-8700-a3af6788053"
}
```

This example has been generated automatically.

Headers

More info: <https://studio.asyncapi.com/>

# Specify the Event Metadata with AsyncApi

New Event Consumption Model

Event Consumption Model

Create Event Consumption Model

Project: \*ZSK\_EN

Package: \*Z\_PURCHASE\_REQ\_000

☐ Add to favorite packages

Name: ZEVTSHP0000001

Description: \*Event Consumption for CAP shop

Original Language: EN

Namespace / Prefix / Identifier: \*<No namespace in package> / Z / EVTSHOP000

Event Specification File: \*/Users/robertelpe/Documents/AIE2209/workspace/Documentation/asynccapi.cap\_online\_shop.json

Namespace and Prefix for objects to be generated:  
Z

?

< Back

New Event Consumption Model

Select Event Types

Specify event types for event consumption

Type filter text

Event Type	Entity Name	Behavior Definition	Event Interface	Issue
<input checked="" type="checkbox"/> zcap.event.MyShop.confirm.v1	Z_MyShop_confirm_v1	Z_MyShop_confirm_v1	ZIF_MYSHOP_CONFIRM_V1	

Select All

Deselect All

New Event Consumption Model

Define Consumer Artifacts

Specify consumer artifacts

Consumer Class: \*ZCL\_EVTSHOP000\_BASE

Consumer Extension Class: \*ZCL\_EVTSHOP000

Consumer Interface: \*ZIF\_EVTSHOP000\_HANDLER

< Back

Next >

Cancel

Finish

New Event Consumption Model

ABAP Artifact Generation List

List of ABAP artifacts that are going to be generated

ABAP Artifact Name	Type
ZEVTSHP0000001	Event Consumption Model
ZEVTSHP000_EEEC	Inbound Service
ID will be generated after creation	Authorization Default Values
ZCL_EVTSHOP000_BASE	Global Class
ZCL_EVTSHOP000	Global Class
ZIF_EVTSHOP000_HANDLER	Interface
ZIF_MYSHOP_CONFIRM_V1	Interface
Z_MYSHOP_CONFIRM_V1	Data Definition
Z_MyShop_confirm_v1	Behavior Definition

< Back

Next >

Cancel

Finish

Event Consumption Model: ZEVTSHP0000001

Event Consumption Model

Consumer Class: \*ZCL\_EVTSHOP000

Event Types

Type	Entity Name
zcap.event.MyShop.confirm.v1	Z_MyShop_confirm_v1

?

< Back

Next >

















Cancel

Finish

Edit...

Simulate Consumption

# Create an Event Consumption Model

- ▼  Event Consumption Models (1)
  - ▼  ZEVTSHOP000 0001 *Event Consumption for CAP shop*
    - ▼  Abstract Entities
      - >  Z\_MYSHOP\_CONFIRM\_V1 *Z\_MyShop\_confirm\_v1 generated*
    - ▼  Inbound Services
      -  ZEVTSHOP000\_EEEC
    - ▼  Behavior Definitions
      - >  Z\_MYSHOP\_CONFIRM\_V1
    - ▼  Classes
      - >  ZCL\_EVTSHOP000 *Generated extension class for ZCL\_EVTSHOP000\_BASE*
      - >  ZCL\_EVTSHOP000\_BASE *Generated base class for ZEVTSHOP000*
    - ▼  Interfaces
      - >  ZIF\_EVTSHOP000\_HANDLER *Generated handler interface for ZCL\_EVTSHOP000\_BASE*
      - >  ZIF\_MYSHOP\_CONFIRM\_V1 *Generated event interface for ZCL\_EVTSHOP000\_BASE*
    - ▼  Authorization Default Values
      - >  F915D88932141EEDE261BD59DA0BBCHT *R3TR EEEC ZEVTSHOP000* 0001

# Generate RAP Artifacts

```

@EndUserText.label: 'Z_MyShop_confirm_v1_F773 generated'
define root abstract entity Z_MyShop_confirm_v1_F773
{
    @Event.element.externalName: 'ordered_item'
    ordered_item : abap.strg;
    @Event.element.externalName: 'OrderUUID'
    OrderUUID : abap.raw( 16 );
    @Event.element.externalName: 'note'
    note : abap.strg;
    @Event.element.externalName: 'decision'
    decision : abap.strg;
}

```

Type in AsyncAPI File	Format in AsyncAPI File	Generated ABAP Type (abstract BDEF)
boolean		abap_boolean
integer	int8	abap.int1( 3 )
	int16	abap.int2( 5 )
	int32	abap.int4( 10 )
	int64	abap.int8( 19 )
number	uint8	abap.int2( 5 )
	decimal	abap.d34n( 34 )
	double	abap.fltp( 16, 16 )
	float	abap.fltp( 16, 16 )
string		abap.strg
	base64url	abap.rstr
	date	abap.dats( 8 )
	date-time	timestamp
	duration	abap.dec( 27, 12 )
	time	abap.tims( 6 )
	uri-reference	abap.strg
	uuid	abap.raw( 16 )

# Generate abstract entity of event data

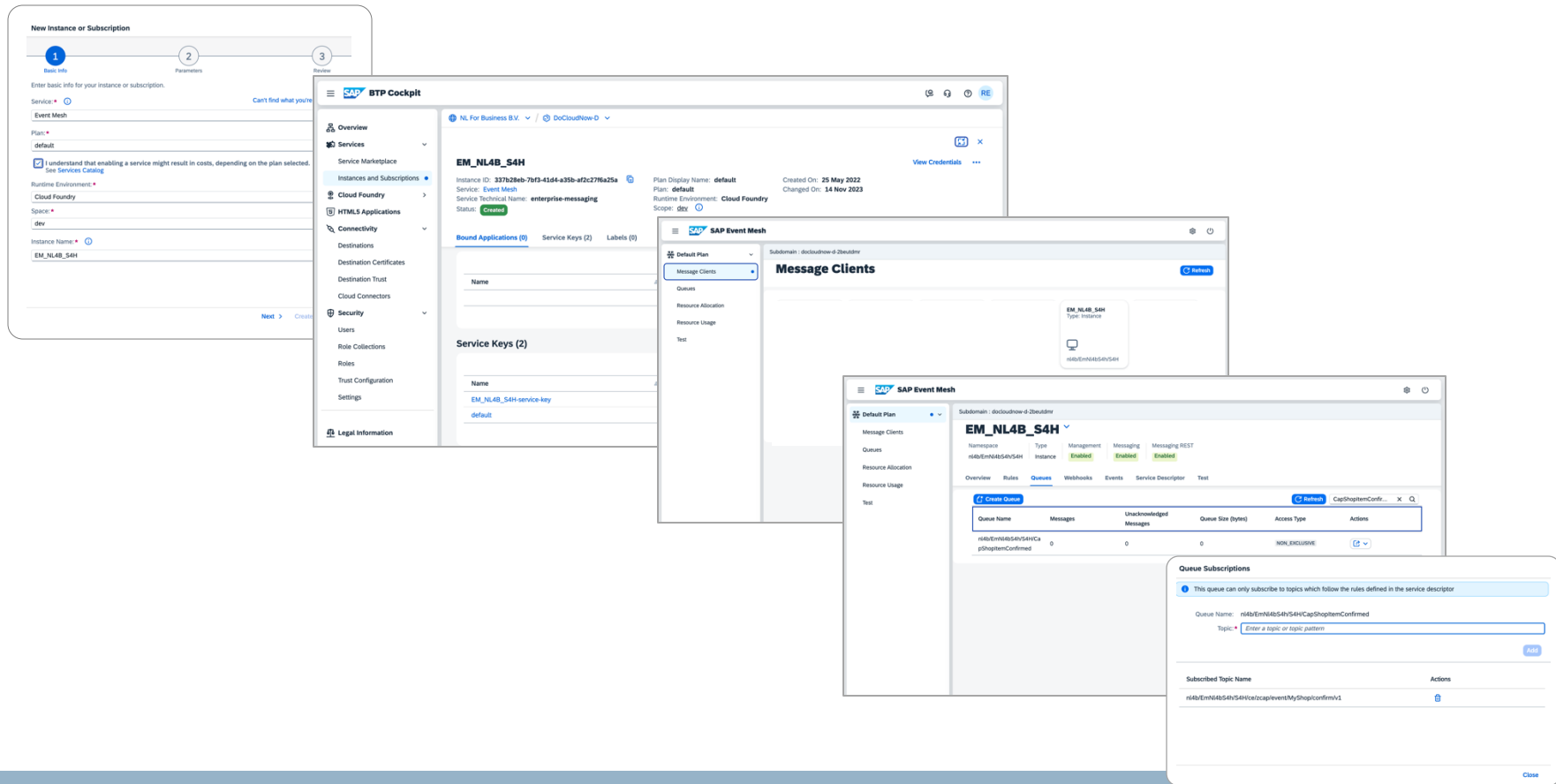
```

1 ① CLASS zcl_evtshop000 DEFINITION
2    PUBLIC
3    INHERITING FROM zcl_evtshop000_base
4    FINAL
5    CREATE PUBLIC .
6
7    PUBLIC SECTION.
8
9    METHODS zif_evtshop000_handler~handle_myshop_confirm_v1
10     REDEFINITION .
11    PROTECTED SECTION.
12    PRIVATE SECTION.
13  ENDClass.
14
15 ② CLASS zcl_evtshop000 IMPLEMENTATION.
16 ③ METHOD zif_evtshop000_handler~handle_myshop_confirm_v1.
17    " Event Type: zcap.event.MyShop.confirm.v1
18    DATA business_evtdata    TYPE STRUCTURE FOR HIERARCHY Z_MyShop_confirm_v1.
19    DATA business_event_data TYPE Z_MyShop_confirm_v1.
20    DATA update_line         TYPE STRUCTURE FOR UPDATE zr_onlineshoptp_000\OnlineShop.
21    DATA update_lines        TYPE TABLE FOR UPDATE zr_onlineshoptp_000\OnlineShop.
22
23    business_evtdata = io_event->get_business_data( ).
24    business_event_data = CORRESPONDING #( business_evtdata ).
25
26    update_line~tky-OrderUUID = business_event_data-OrderUUID.
27    update_line~OverallStatus = 'Confirmed'.
28    APPEND update_line TO update_lines.
29
30    MODIFY ENTITIES OF zr_onlineshoptp_000
31      ENTITY OnlineShop
32        UPDATE
33          FIELDS ( OverallStatus )
34          WITH update_lines
35          REPORTED DATA(reported)
36          FAILED DATA(failed)
37          MAPPED DATA(mapped).
38
39 ④ IF lines( failed-onlineshop ) > 0 .
40    ROLLBACK ENTITIES.
41    RETURN.
42  ENDIF.
43 ⑤ COMMIT ENTITIES
44    RESPONSES FAILED FINAL(failed_late)
45    REPORTED FINAL(reported_late).
46 ⑥ IF lines( failed_late ) > 0.
47 ⑦ LOOP AT failed_late ASSIGNING FIELD-SYMBOL(<failed_late>).
48
49    * raise message based on error in reported_late.
50    ENDOLOOP.
51    ROLLBACK ENTITIES.
52    RETURN.
53  ENDIF.
54  ENDMETHOD.
55  ENDClass.

```

Global Class | Class-relevant Local Types | Local Types | Test Classes | Macros

# Implement the logic of the event handler



# Create a Message Client in Event Mesh

Partner Demo Development ZSK/080

<

SAP

Communication Arrangements

>

RE

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EM\_NL4B\_S4H\_IN

Edit

Update by Service Key

Display Changes

Delete

Scenario ID: [SAP\\_COM\\_0092](#)

Changed By: Robert Eljpe

Editing Status: Active

Scenario: Enterprise Eventing Integration

Changed On: 05/17/2024, 19:10:36

Common Data

Arrangement Name:

Own SAP Cloud System:

Communication System:  [Display](#)

API-URL:

Additional Properties

Property Name	Property Value
Channel	<input type="text" value="EM_NL4B_S4H_IN"/>
Description	<input type="text" value="Channel EM_NL4B_S4H_IN for Enterprise Event Enablement"/>
Topic Space	<input type="text" value="nl4b/EmNI4bS4h/S4H"/>
QoS	<input type="text" value="1"/>
Reconnect Attempts	<input type="text" value="0"/>
Reconnect wait time(sec)	<input type="text" value="100"/>

Inbound Communication

[Supported Authentication Methods](#)

User Name:

Authentication Method:

Inbound Services

Service	Application Protocol	Service URL/Service Interface	WSDL/Service Metadata	Additional Properties
<a href="#">Discovery of Events</a>	ODATA V2	https://my408401-api.s4hana.cloud.sap/sap/opu/odata/IWXB/E/BROWSER_SRV	<a href="#">↓</a>	

Create a Communication Arrangement (SAP\_COM\_0092)  
to connect to Event Mesh

Communication Scenario: Z\_EVTSHOP\_COM\_000 Publish Locally

**General**

Communication Scenario Type: \* Customer Managed ⓘ ☐

Allowed Instances: \* One instance per scenario & communication system ⓘ Scope Dependent

Status: Unpublished

**Additional Properties**

📄 🔍 🔗 🏠 ⬇️ Value Help

type filter text

Property Name	Default Value	Data Element	Is Multiple	Is Secure	Is Hidden	Value Help
<Enter new value>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Communication Scenario: Z\_EVTSHOP\_COM\_000 Publish Locally

**Inbound Settings**

Supported Authentication Methods

☒ Basic ☒ X.509 ☐ OAuth 2.0

**Inbound Services**

Add... Remove

type filter text

Number	Inbound Service ID	Name
0001	ZEVTSHP000_EEEC	Generated Inbound Service for ZEVTSHOP000

**Inbound Service**

Inbound ID: 0001

Service Type: Event Consumer

**New Inbound Service**

General Attributes

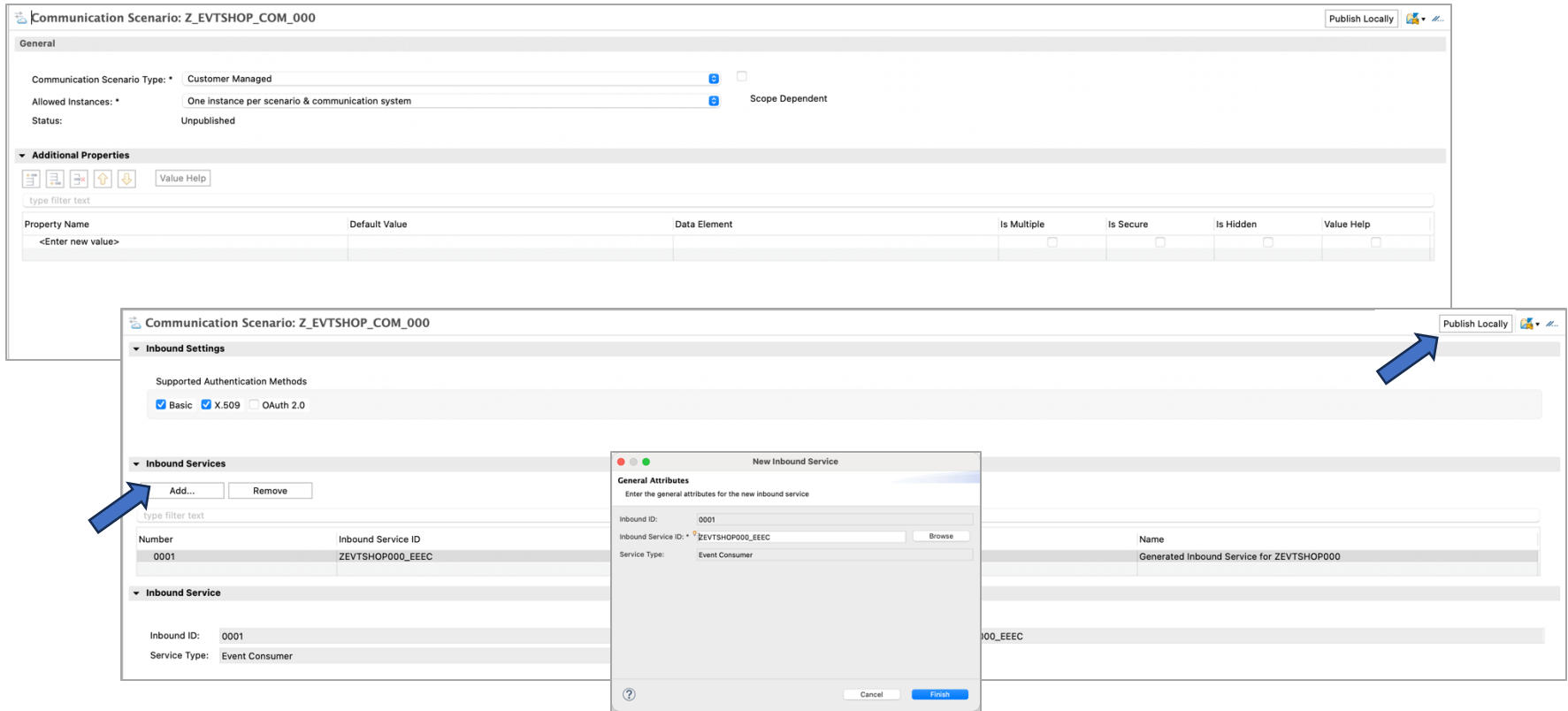
Enter the general attributes for the new inbound service

Inbound ID: 0001

Inbound Service ID: \* ZEVTSHOP000\_EEEC Browse

Service Type: Event Consumer

? Cancel Finish



Create a Communication Scenario Artifact  
for inbound event service

Partner Demo Development ZSK080

<

SAP

Communication Arrangements

>

Search

Help

Notifications

RE

Z\_EVTSHOP\_COM\_000

Edit

Display Changes

Delete

Scenario ID: Z\_EVTSHOP\_COM\_000

Scenario: event consumption scenario 001

Changed By: Robert Eljpe

Changed On: 01/22/2024, 20:30:49

Editing Status: Active

Common Data

Arrangement Name: Z\_EVTSHOP\_COM\_000

Own SAP Cloud System: OMSATS9

Communication System: S4H\_INBOUND\_EVENT

Display

API-URL: https://my408401-api.s4hana.cloud.sap

Inbound Communication

User Name: EM\_NL4B\_S4H\_USER

Authentication Method

Inbound Services

Service	Application Protocol	Active	Service URL/Service Interface
Generated Inbound Service for ZEVTSHOP001	Event Consumer	✓	

New Communication Arrangement

Scenario:\*

Z\_EVTSHOP\_COM\_000

Arrangement Name:

Z\_EVTSHOP\_COM\_000

Create

Cancel

Partner Demo Development ZSK080

<

SAP

Communication System

>

Search

Help

Notifications

RE

S4H\_INBOUND\_EVENT

S4H\_INBOUND\_EVENT

Edit

Display Changes

Delete

Changed By: Robert Eljpe

Changed On: 01/22/2024, 20:19

Editing Status: Active

General

Users for Inbound Communication

Communication Arrangements

General Data

System ID: S4H\_INBOUND\_EVENT

System Name: S4H\_INBOUND\_EVENT

Notes

Contact Person Name

E-Mail

Phone Number

Technical Data

General

Logical System

Inbound Only: ✓

Business System

OAuth 2.0 Settings

Inbound OAuth 2.0 Client Settings

Client Redirect URI Type: Standard Loopback

Client Redirect URI

Event Exchange Infrastructure

Event Channel

Communication Scenario ID

Communication Scenario Description

EM\_NL4B\_S4H\_IN

SAP\_COM\_D092

Enterprise Eventing Integration

Event Monitor

Configure Channel Binding

Create a Communication Arrangement of created Communication Scenario

## Enterprise Event Enablement Event Monitor



Event Monitor for En...

**SAP My Inbox**

All Tasks (1)

Search

Please review and approve Giftcard request: ab-come-0b986d...

Medium

**Gift Card Bel.com**

**10.00 EUR**

**Request Details**

Request Number: 11

Delivery date: 2024-11-15

**Receiver**

Name: Robert

Street: Bergweg

☒ I acknowledge that we have received your order and will process it based on the availability

Comments

It is ok

950 characters remaining

**Approve** **Reject** **Show Log** **Claim**



Triggers the event

**SAP Enterprise Event Enablement - Event Monitor**

Standard

Channel: [dropdown] Action: [dropdown] [Refresh] [Filter]

Channels (2)

Channel	Active	In Process Events	Processed Events	Failed Events	Status
EM_NL4B_S4H_IN	Yes	5	3	0	1
SAP_SF_SF_S204	Yes	0	0	0	1

Produce Test Event Create Failed Events Reset Failed Events [5] [Filter]

**SAP Channel**

EM\_NL4B\_S4H\_IN

Channel EM\_NL4B\_S4H\_IN for Enterprise Event Enablement

Active In Process Events Processed Events Failed Events

Yes 5 3 0

**Inbound Events** **Outbound Events**

Inbound Events (2)

Topic	Status	Events
zscapiEventMyShopconfirmv1	In Process	5
zscapiEventMyShopconfirmv1		

Outbound Events (1)

Topic	Status
zscapiEventMyShopconfirmv1	Consumed

**SAP Inbound Event**

EM\_NL4B\_S4H\_IN\_zscapiEventMyShopconfirmv1

zscapiEventMyShopconfirmv1

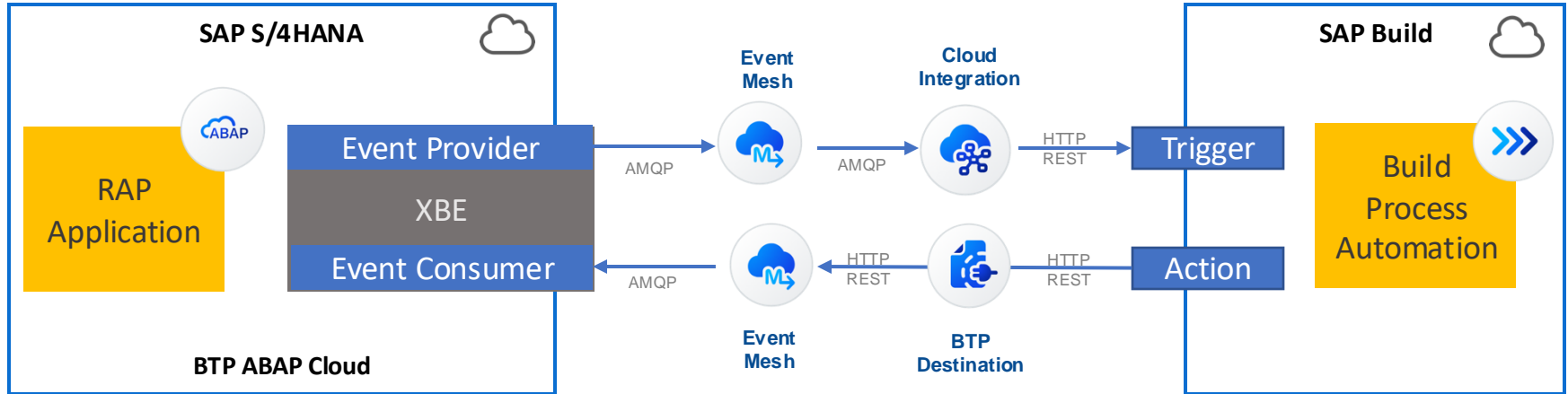
Status: Consumed

Times Event Data Consumed by Payload

Event Data	Consumed by
Event Data	Consumed by
Cloud Event Source: defaultshop build	Cloud Event ID: S204765-9876-12af-8b3b-ewordBusiness
Quality of Service: At least once	Reason for failure: -
Consumed by	Consumer ID: ZEV75H09021
Consumer Version: 1	
Payload	Size (KB): 0.14
Payload: {"shop": "S4H-9876-12af-8b3b-ewordBusiness", "request": "Approve", "orderId": "11000000000000000000", "timestamp": "2024-11-15T10:00:00.000Z", "type": "zscapiEventMyShopconfirmv1", "source": "ShopConfirmv1", "version": "1.0", "application": "ApplicationCloudEvents.js"} [Show Log]	

# Trigger an event and monitor

# SEE IT IN ACTION



Demo

## Lessons learned...

- Developing and adopting SAP Events is still in progress
  - Many SAP Business Objects do not support local event handlers and are unavailable for event extensibility.
  - Due to understanding the AsyncApi specification and data type mapping, inbound RAP events are complex in the beginning. Only AsyncApi version 1 is currently supported.
- Building your own RAP outbound events and local event handlers is very easy.
- Commits in Local RAP Event handlers can only be supported by uncontrolled bgPF
- Eventing is an easy way to exchange data between CAP and RAP applications.
- Interaction with SAP Build Process Information for Custom events needs some additional work.

## More info...

- Blog **CloudEvents at SAP** from Antonio Maradiaga
- A lot of sessions at **SAP Devtoberfest 2024**
- **Tutorial** at SAP Community
- Youtube: **Extending** SAP S/4HANA **Cloud events with RAP** and **event filtering** plus dynamic topics in S4HC
- YouTube: What's New in the **ABAP RESTful Application Programming Model (RAP)**?
- SAP **Help**

Extend your knowledge



abap  
conf2024

30 onside spots available

**Watch Party  
The Netherlands**

5 December  
8.00 - 18.30

Vitusgebouw  
Kerklaan 10  
Blaricum  
near by Amsterdam

Extend your knowledge

# Take away points

- Event-Driven Architecture (EDA) is the future
- Implementing an EDA needs a good design.
  - Notification versus Data events
- Handling and monitoring of events is different from traditional integration.
- Events and API belong together.
- SAP only supports AsyncAPI version 1.0 to describe the event metadata



NL for Business

Intelligent Enterprises runs better and faster

## Thank you



**Robert Eijpe MSc.**

Strategic Enterprise  
Architect for SAP

you can find me on Linked-In

