Event Brokering Using SAP Cloud Platform
Enterprise Messaging

Karsten Strothmann, SAP SE
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Agenda

SAP Cloud Platform Enterprise Messaging
Event-Driven architectures with SAP
How to event enable SAP Backends
Selected Event-Driven Use Cases
Short Demo
Key takeaways
SAP Cloud Platform Enterprise Messaging
Hybrid Integration Platform
Enterprise Integration Suite for hybrid and heterogenous environments

**Cloud Integration**
- Integration flow deployment to PI/PO
- Hybrid integration via Cloud Connectivity, PI/PO, DS

**Integration Advisor**
- Interface Management and Mapping
- Runtime artifact generations for CPI, PI/PO

**Data Intelligence**
- Data ingestion, preparation & Governance
- Complex data orchestration & pipelining

**Open Connectors**
- Pre-built connectors to non-SAP SaaS apps
- Integration with LOBs, e.g. Marketing Cloud, Analytics Cloud, Data Hub and I/O

**API Management**
- Apply API security best practices and govern access to APIs.
- Developer engagement and API Monetization.

**API Business Hub**
Out-of-the-box Integration for Intelligent Enterprise Suite as packaged integrations | Open APIs for extensions and integrations | Support for Partner Integration packages

**Enterprise Messaging**
- Build extensible integration for event-based use cases
- Send, consume and react to business changes
- Events across hybrid landscapes

**Process Integration and Orchestration**
- A2A Integration
- B2B & B2G Integration

**Data Integration and Orchestration**
- Data Lakes, Databases, SAP Data services
- Information Management and Governance

**SAP Cloud Platform Integration Suite**
- Data Integration and Orchestration

**APIs**
- SAP S/4HANA Cloud
- SAP C/4HANA
- SAP Ariba
- SAP Concur
- SAP Fieldglass
- SAP SuccessFactors

**Non-SAP Cloud Applications**
- and more ...

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SAP Cloud Platform Enterprise Messaging

Fully-managed cloud service for enabling applications to communicate asynchronously through messages and events.

**Seamless connectivity**
- Connect your applications and services seamlessly using standard protocols (MQTT, AMQP 1.0, REST)
- APIs (Java JMS, Node.js)
- Exchange patterns (e.g. pub/sub, point-to-point, request/reply)

**Reliable communication**
- Messaging middleware decouples communication between senders and receivers for greater scalability.
- Choose from different Quality of Service levels to ensure messages are delivered reliably.

**Non-blocking communication**
- Asynchronous message patterns provide elasticity meaning unexpected peaks in data traffic can be handled efficiently.

**Event enablement**
- Transports events (type of message) from event source to the Cloud for seamless integration of hybrid landscapes.
- Build responsive applications and extensions that can react to events without disrupting core business systems.
Benefits

✓ **Heterogeneous integration**: connect and integrate all kinds of different clients.

✓ **Fire and forget**: message broker delivers messages to consumers so applications can concentrate on their core competencies.

✓ **Scalability**: decouples communication between consumers and producers to handle peak loads (e.g. rush hour).

✓ **Buffering**: message broker buffers data during times of high load and when consumers are offline, which means no loss of data.

✓ **Flexibility/agility**: loose coupling enables you to switch seamlessly between architectures if environment changes.
Event bus - decoupled communication between digital core and cloud

Digital core publishers:
- SAP e.g.
  - SAP S/4HANA
  - SAP SuccessFactors
  - SAP C/4HANA
- Non SAP

Subscribers:
- Cloud-native extension applications

SAP Cloud Platform Enterprise Messaging

- Asynchronous, non-blocking, communication
- Standard protocols (AMQP 1.0, Webhook, REST, MQTT)
- Libraries (Java JMS, Node.js)
- Exchange patterns (pub/sub, point-to-point, request/reply)
Event-driven architectures with SAP
Event-Driven Architectures – Your food is ready
What is an event?

- An event is a significant change in state (of an object in an enterprise system)

- Event notifications can be sent from the system in which the event occurred to inform other systems, microservices, and applications of the change.

- **cloudevents** is a specification for describing event data in a common way

- SAP, Google, Microsoft … support cloudevents

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**Enterprise Messaging:**

```
{"eventType":"BO.BusinessPartner.Changed","cloudEventsVersion":"0.1","source":"https://S4HANAOD.sap.com","eventId":"ABY+SjviHumz99TYDcdQrw==","eventTime":"2019-09-05T09:22:16Z","schemaURL":"https://S4HANAOD.sap.com/sap/opu/odata/IWXBEBROWSER_SRV","contentType":"application/json","data":{""BUSINESSPARTNER":"0000000211"}}
```

Event-Driven Architectures in Nature

Event
A significant change of status in a spider's web

Event Consumer
Listening for and reacting to events

Event

Messaging Broker
Spider's web passes on events via vibrations
Event-driven extensions / integrations with SAP

Highly **decoupled**, single-purpose event processing components that asynchronously receive and process events.

**Senders** of events are **not aware** of event **receivers**.
Event-Driven Architectures

Defining elements

- Distributed asynchronous architecture pattern used to produce highly scalable applications.
- Made up of highly decoupled, single-purpose event processing components that asynchronously receive and process events.
- A key element of event notification is that the source system doesn't really care much about the response.

Benefits

- Decouples communication
- Removes idle downtimes
- Enables responsive applications that react to events in other systems/applications
- Permits events to trigger functions (as a service) in response to execute defined business logic
- Facilitates pay-per-use consumption costs by removing “always on”
## Event-Driven Architectures – scenarios and use cases

<table>
<thead>
<tr>
<th>Use Case</th>
<th>Real-Time Event Information</th>
<th>Event-Driven Architectures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Inform all interested apps/services of changes, updates, and additions to data in underlying processes</td>
<td>Distributed and Flexible Architectures</td>
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<td></td>
<td>An event, a change of state, is communicated to all interested parties.</td>
<td>Isolation</td>
</tr>
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<td></td>
<td>Event processing engines and downstream event-driven activities can flexibly change over time allowing for extremely loose coupling and a highly distributed landscape.</td>
<td>Resilience</td>
</tr>
<tr>
<td><strong>Advantages</strong></td>
<td>Events are communicated as they happen (real-time)</td>
<td>Supports highly distributed architectures</td>
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<td></td>
<td>Components still remain autonomous</td>
<td>Event publisher does not need to know about architecture or who is listening to events</td>
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<td>Interested parties can listen to events in different networks</td>
<td>Provides great flexibility</td>
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<td>Is non-blocking for event publisher (fire and forget)</td>
<td>Allows for a completely new development paradigm</td>
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<td>Event publisher and event processing engine can work at their own speed</td>
<td>API calls only when needed (after relevant event received)</td>
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<td></td>
<td>Enables greater responsiveness</td>
<td>Clearly separates / isolates components</td>
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<td></td>
<td>Is highly scalable</td>
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<td><strong>Example Project</strong></td>
<td>Car Production Updates – TechEd 2018 Keynote</td>
<td>Cache data in the Cloud – Chemical Company</td>
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<td></td>
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<td>Restrict backend access – CP Mission</td>
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<td></td>
<td>Protect backend – Airline</td>
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How to Event Enable SAP Backends
A number of business objects have been event-enabled with more to come. Can be used out-of-the-box.

SuccessFactors Intelligent Service events can be enabled for Enterprise Messaging following this blog [How to use SAP Enterprise Messaging as an event bus for SuccessFactors](#).
Setup and Configuration for a S/4HANA Event Driven Architecture

1. Make EM Instance ready for Eventing - Service Key with clientID, clientsecret and URI

2. Create S/4 Communication System, User and Arrangement

3. Maintain Event Topics for a Channel

4. Queue Subscription to the Event Topic Pattern

SAP S/4HANA

1. Communication System & User

2. Event Channel

3. Communication Arrangement

SAP Cloud Platform

1. SAP Cloud Platform EnterpriseMessaging

2. Topic

3. Queue

Consumer A

Consumer B
SAP SuccessFactors / SAP Cloud Platform Enterprise Messaging EDA

Make EM Instance ready for Eventing - Service Key with clientID, clientsecret and URI

Enable Intelligent Services

Expose Intelligent Services Events in Admin Center

Queue Subscription to the Event Topic Pattern

SAP SuccessFactors

Intelligent Services

SAP Cloud Platform

REST Gateway

Topic

Queue

SAP Cloud Platform Enterprise Messaging

Consumer A

Consumer B
Selected Use Cases
TechEd 2019 Hands-On Exercise: Integration using Event Pattern

Business Partner Replication from S/4Hana Cloud to Slack and HubSpot
1. Business partner created in SAP S/4HANA.
2. Generates event BusinessPartner.Created
3. Event sent using Enterprise Messaging to extension application where it triggers short-lasting function.
4. Function extracts BusinessPartnerID and EmployeeID from event.
5. Uses API call to retrieve employee's name from SAP S/4HANA.
6. Calls Consent Repository using OData service to ascertain permission to share data.
7. Calls Skills Management to retrieve skills.
8. Data retrieved is published to Slack Channel using Open Connectors.
SAP S/4HANA Cloud & Cloud Platform Mission Example App

Extension application on SAP Cloud Platform to react to changes in S/4 BusinessPartner BO
Key takeaways
Event Brokering Using SAP Cloud Platform Enterprise Messaging

Key takeaways

SAP Enterprise Messaging

- Is SAP’s **Messaging as a Service** and highly scalable
- Supports **extensible event-driven integrations**
- Is available as Message broker standalone or as part of SAP offerings for the Intelligent Enterprise like the **Integration Suite**.
More information

Event Bus:

- SAP Community: https://community.sap.com/topics/enterprise-messaging

Extensibility:

- SAP Help Portal:
  - Extending SAP Solutions
  - Extending SAP SuccessFactors
Questions and Answers
Thank you.

Karsten Strothmann
Product Management
SAP Cloud Platform Core