DevOps with SAP BTP – Overview + latest news

Boris Zarske, SAP

Public

THE BEST RUN **SAP**

Rapid business innovation impacts business performance

Companies that innovate faster with software also score **higher on customer satisfaction, brand perception, and talent management**.
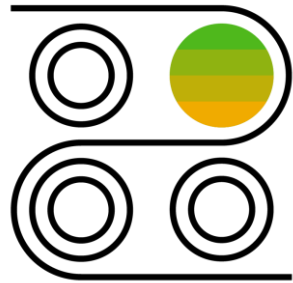
McKinsey

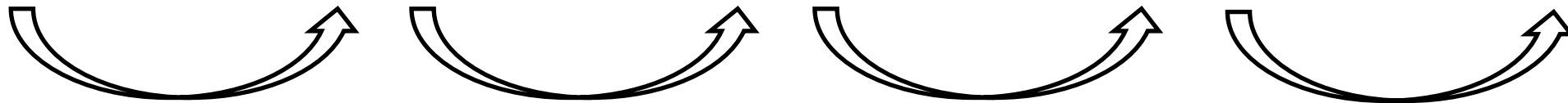# The goal of continuous delivery

Build quality in   Faster deployment   Faster feedback   Better software   Happier customer

The deployment pipeline

Plan → Code → Build → Integrate → Test → Release → Deploy → Operate → **Feedback loop**
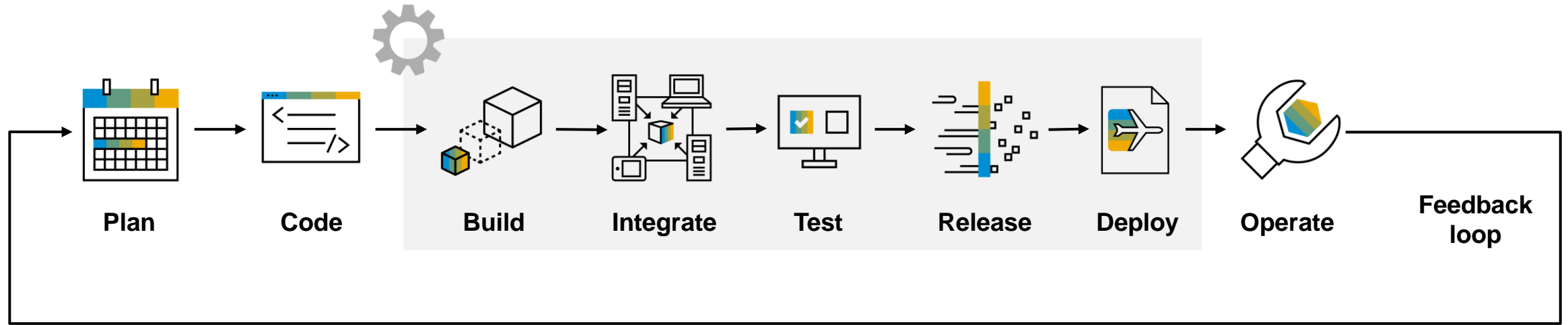
Example landscape to develop and run such an application with DevOps

SAP Business Technology Platform

Your data center / SAP HANA Enterprise Cloud

DEV subaccount

1. Set up CI

App

Continuous Integration and Delivery

GitHub, Jenkins, …

Alert Notification service

4. Operate

Automation Pilot

Cloud Transport Mgmt

Business App Studio

3. Deliver

2. Develop

SAP® S/4HANA

DEV   TEST   PROD

Secure tunnel

Cloud connector

QA subaccount   App

PROD subaccount   App

[Blog post with end-to-end example](#)

DevOps with SAP
Categories

AUTOMATE & OPTIMIZE

DEV   OPS

PLAN & SET UP | DEVELOP & TEST | DELIVER & CHANGE | MONITOR & OPERATE
1. Set up CI | 2. Develop | 3. Deliver | 4. Operate
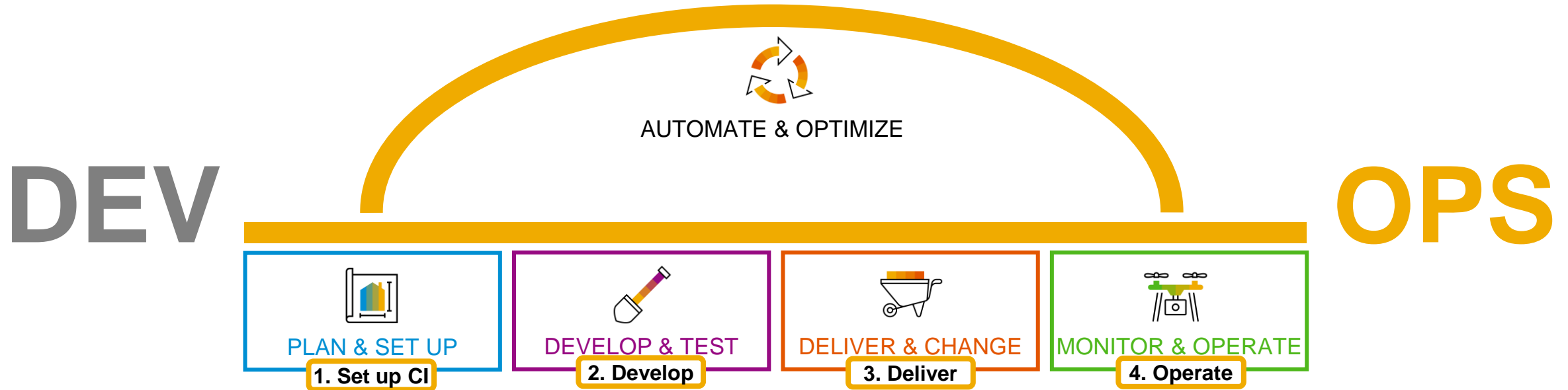
DevOps with SAP

1. Plan & set up

DEV OPS

PLAN & SET UP

Guidance

Account setup

Toolchain setup

CI/CD enablement

1. Set up CI/CD efficiently for SAP environments

CI/CD enablement

SAP Continuous Integration and Delivery

who For SAP customers and partners with ABAP background transitioning into the cloud

what The service provides a **golden path** for partner and customer development with SAP-specific scenarios

where Regional coverage (EU, US, APJ), Azure + AWS available, Trial + Free Tier

how Offered as SAP cloud BTP service – no own infrastructure required, running pipeline in minutes, support provided by SAP

Simplicity

for typical SAP business application developers

Project "Piper"

who For **experienced customers**, comes with full flexibility, requires know-how and CI/CD stack

what Enablement, learnings and **open source** CI/CD library for custom CI/CD pipelines, covering many SAP-specific scenarios

where Customers/partners must bring their own CI/CD stack, widely used also SAP-internally

how CI/CD expertise required, you build pipeline on separate infrastructure – running pipeline in hours/days, no direct support by SAP

Flexibility

to automate complex and customer-specific development scenarios

1. Set up CI/CD efficiently for SAP environments
SAP Continuous Integration and Delivery service

Q1 2022 1 Road Map Item

SAP Continuous Integration and Delivery 1.0

∧ Continuous Integration and Delivery

Publish Service API in SAP API Business Hub
- Seamless search, exploration, and consumption of APIs from SAP Continuous Integration and Delivery in SAP API Business Hub
- Testing APIs using a configured environment
- Adding APIs as data sources to your applications

SAP Continuous Integration and Delivery 1.0

Continuous Integration and Delivery

Q2 2022 CURRENT 4 Road Map Items

SAP Continuous Integration and Delivery 1.0

∧ Continuous Integration and Delivery

Ability to send notifications from pipelines
- Ability to be alerted by pipeline events via SAP Alert Notification service
- Configuration of alert notifications and delivery channels

SAP Continuous Integration and Delivery

Continuous Integration and Delivery

Compliance stage using SonarQube
- Add compliance checks to pipeline projects for SAP Cloud Application Programming Model and SAP Fiori apps
- "Bring your own Sonar" to gain the ability to connect to Internet-facing instances of SonarQube and SonarCloud

SAP Continuous Integration and Delivery 1.0

Continuous Integration and Delivery

Predefined pipeline for SAP BTP, ABAP environment add-on creation
Configure and run predefined continuous integration and delivery (CI/CD) pipelines for ABAP applications and extensions in the cloud

SAP Continuous Integration and Delivery

Continuous Integration and Delivery

Webhooks for Azure Repos
- Configure a Webhook between your Azure Repos repository and SAP Continuous Integration and Delivery
- Automate jobs of the SAP Continuous Integration and Delivery service using Azure Repos Webhooks

SAP Continuous Integration and Delivery 1.0

Continuous Integration and Delivery

Q3 2022 1 Road Map Item

Future Release

∧ Continuous Integration and Delivery

Package and deploy your SAPUI5/SAP Fiori apps to an ABAP front-end server
- Configuration of continuous integration and delivery (CI/CD) pipeline for the development of SAPUI5 and SAP Fiori apps for a front-end server running ABAP

SAP Continuous Integration and Delivery

Continuous Integration and Delivery

Q4 2022 1 Road Map Item

Future Release

∧ Continuous Integration and Delivery

Acceptance stage using the WebdriverIO open-source testing automation framework
Execute automated, comprehensive acceptance tests using WebdriverIO (WDIO) with the extension WDI5 especially for your SAP Cloud Application Programming Model and SAP Fiori apps

SAP Continuous Integration and Delivery

Continuous Integration and Delivery

More use cases

Compliance

SAP Road Map Explorer

DevOps with SAP

2. Develop & test

DEV OPS

PLAN & SET UP   DEVELOP & TEST

App program. model

IDE

Content authoring
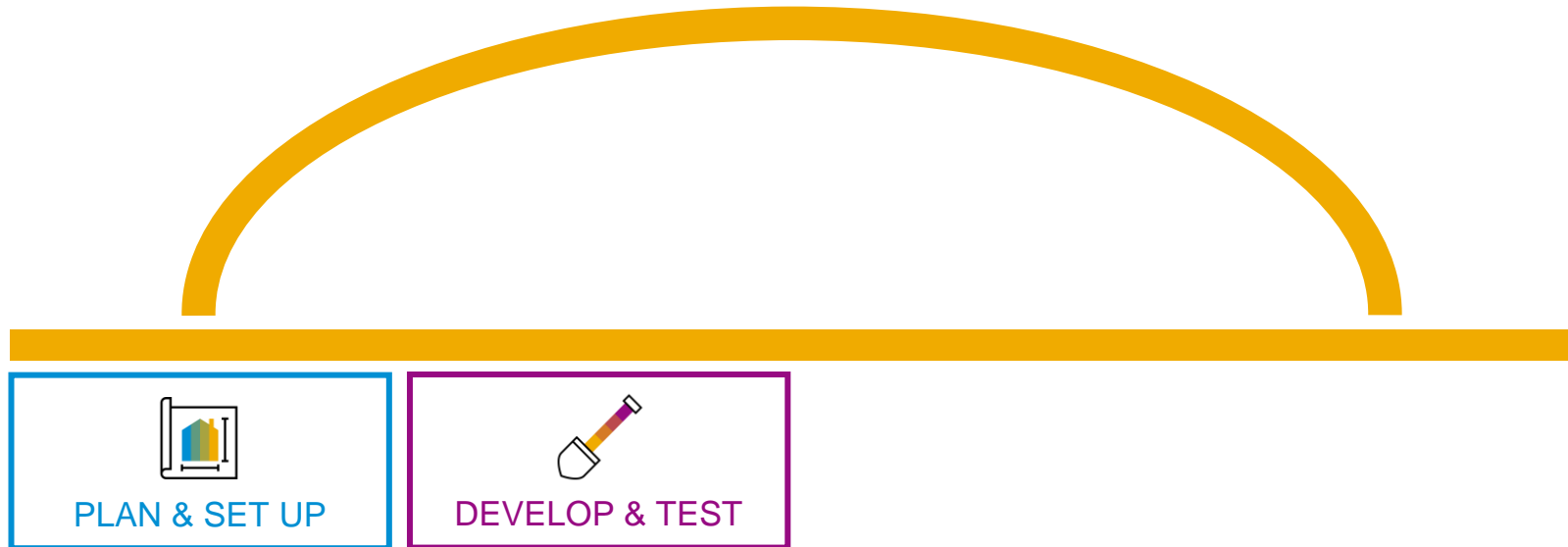
CI/CD

2. Agile development
Using automated Continuous Integration and Continuous Delivery pipelines

Notify fail/success

Push/merge

Trigger

Fetch

Deliver

Developers

IDE

Repository

CI server

Build

Test

Package

Runtime
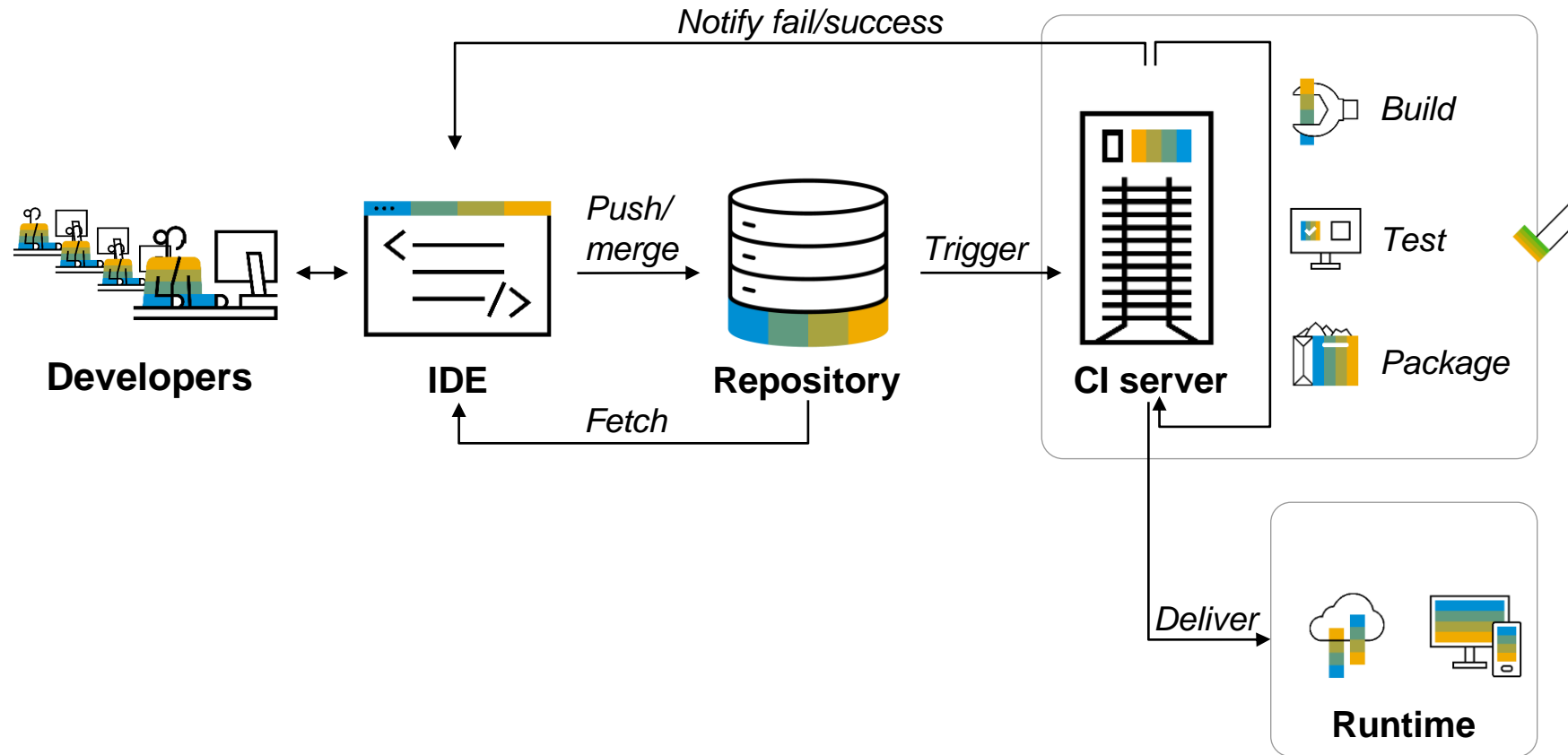
Continuous Integration and Delivery (CI/CD)

DevOps with SAP

3. Delivery & change

DEV

OPS

| PLAN & SET UP | DEVELOP & TEST | DELIVER & CHANGE |

Deployment mgmt

Transport mgmt

Hybrid change mgmt

CI/CD
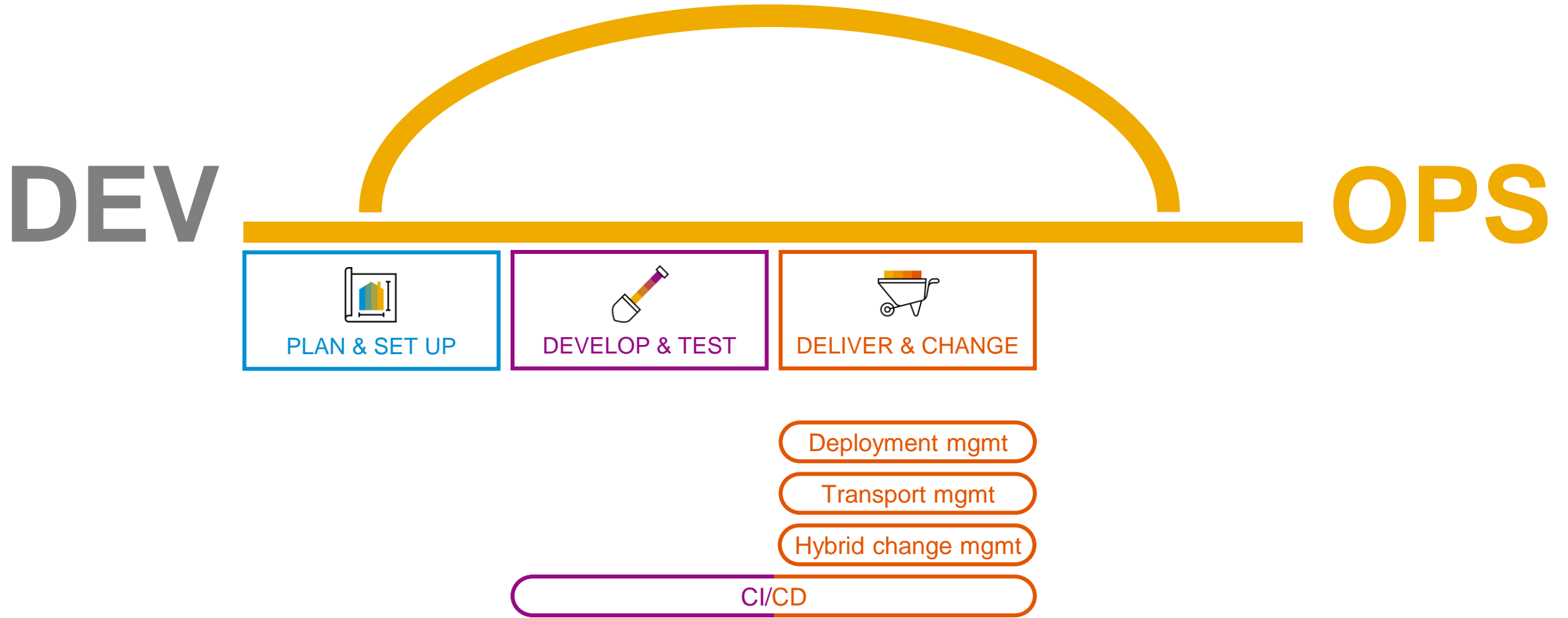
3. **Deliver** your **cloud** changes toward production

Continuous Delivery

- Mainly **source-code-based** and for isolated development
- Ideally fully automated

SAP Continuous Integration and Delivery service

Open source/ 3rd party + **Project "Piper"**

+

Transport & Change Management

- Apply standardized, enterprise-ready change management process
- Add transparency on **audit trail of changes**
- Establish **separation of concerns** + regain control
- Option for **synchronizing transports** with on-premise artifacts

(🏠 **CTS+**)

SAP Cloud Transport Management service

SAP Cloud ALM

SAP Solution Manager 7.2

SAP Focused Run 3.0
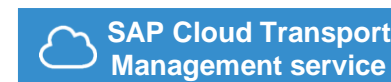
3. **Deliver** your **cloud** changes toward production

Integration into CI/CD: Combining agility + control

Development landscape

- Based on *Continuous Integration* principles, managed by DevOps team

- Verification of single developer change
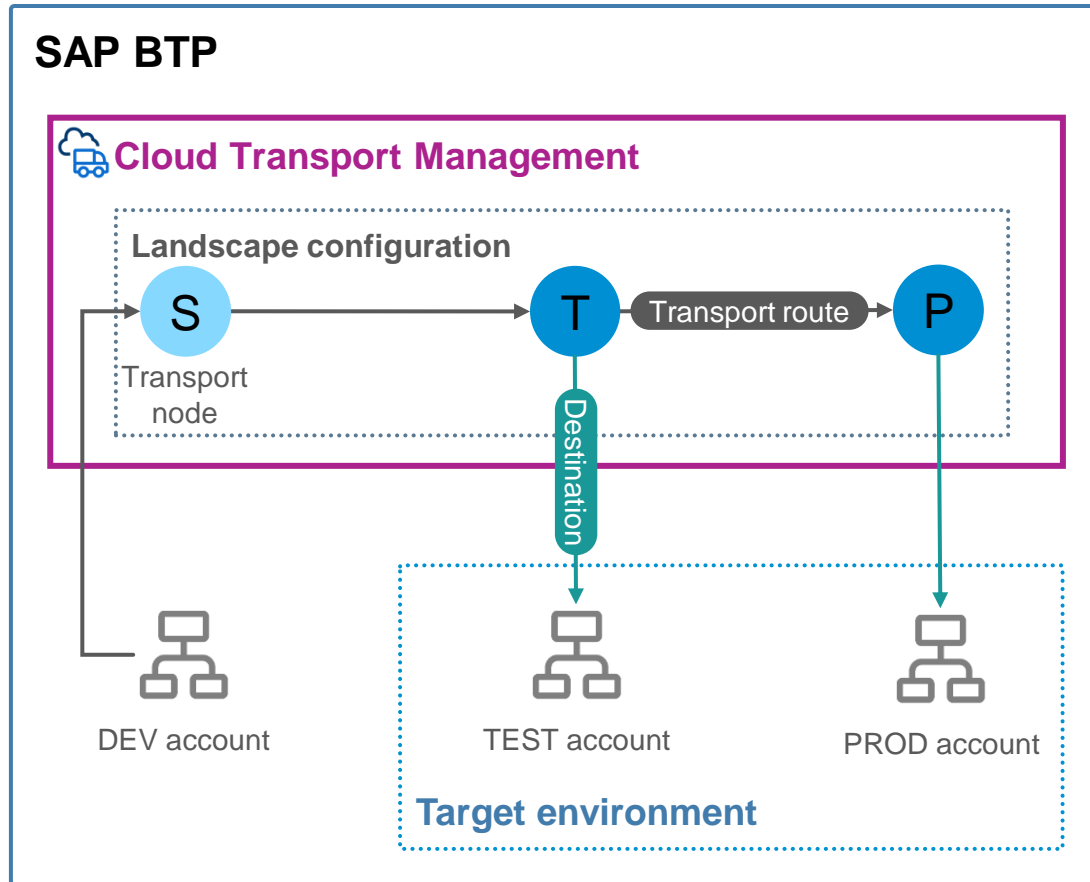
- Typically fully automated

Delivery landscape

- Based on strict *Transport Management* rules (policies, schedules), managed by ops/approvers

- Verification of release candidate version

- Typically done with manual confirmation

Dev subaccount

Pre-Prod subaccount

Prod subaccount

CI/CD

Repository ↔ CI server

Transport Management

Change Management

Fully qualified archive

Optional control

SAP Continuous Integration and Delivery service

Open source/ 3rd party + Project "Piper"

SAP Cloud Transport Management service

(⌂ **CTS+**)

SAP Solution Manager 7.2

SAP Cloud ALM

3. **Deliver** your **cloud** changes toward production
SAP Cloud Transport Management service

SAP BTP

Cloud Transport Management

Landscape configuration

S

Transport node

T → Transport route → P

Destination

DEV account   TEST account   PROD account

Target environment

Cloud-based transport management solution for your changes in the cloud – no ABAP system required

Transport in Neo + Cloud Foundry environments of:

- **Dev artifacts** (MTA archives – like CTS+)
- In addition: application content

API Mgmt   Workflow Mgmt   SAP Cloud Integration   **SAP Cloud solutions** ...

Manifold integration options:

- With CI/CD
- Basis for cloud integration into Change Management in SAP Solution Manager and SAP Cloud ALM
- Open APIs

Available via SAP BTP free tier model, PAYG, CPEA

3. **Deliver** your **cloud** changes toward production
SAP Cloud Transport Management service

Q4 2021 1 Road Map Item

∧ Transport of Development and App Content

Detailed content information

- Delivery features for the content of cloud solutions from SAP:
  - Extended information tree for content for SAP Cloud Integration for data services
  - Enhanced content information for MTA module types
  - Export of landscape configuration
- Availability of SAP Cloud Transport Management service: Google Cloud Platform, Iowa (US30)

SAP Cloud Transport Management ∧

Q1 2022 1 Road Map Item

∧ Transport of Development and App Content

Transport requests – access to additional information

- Usability improvements:
  - Additional information on import queues (transport request ID)
  - New GUID-based deployment service end point
- Availability of SAP Cloud Transport Management on EU30 Google Cloud Platform Frankfurt

SAP Cloud Transport Management ∧

Q2 2022 CURRENT 1 Road Map Item

∧ Transport of Development and App Content

Integration with SAP Cloud ALM for improved cloud management and content delivery

- Change management for cloud solutions from SAP: ability to integrate with SAP Cloud ALM for cloud-based application lifecycle management (ALM)
- Additional events for SAP Alert Notification service for SAP BTP

SAP Cloud Transport Management ∧

Q3 2022 1 Road Map Item

Future Release

∧ Transport of Development and App Content

Enabling transport of content for SAP BTP, ABAP environment

- Delivery features for the content of cloud solutions from SAP:
  - Import of landscape configuration
- Additional customization options for SAP Cloud Transport Management
- Extended content coverage:
- Content transport of SAP Business Technology Platform (SAP BTP), ABAP environment
- Availability of SAP Cloud Transport Management:
  - SAP NS2 Secure Data Cloud

SAP Cloud Transport Management ∧

Improved transparency

Integration

Additional content

SAP Road Map Explorer

3. Deliver your cloud changes toward production
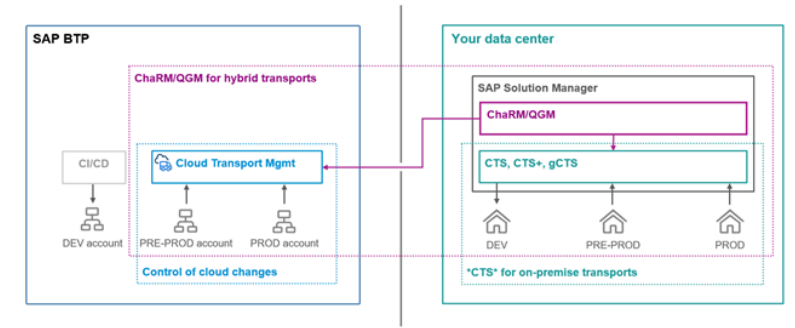## What level(s) of control do you require?

Allows to evolve by time – start simple, grow big

LEVEL OF CONTROL

3 — Centralized control with **change management**

- Integrate transports into holistic change mgmt.
- To synchronize all changes of hybrid scenario, on-premise + cloud
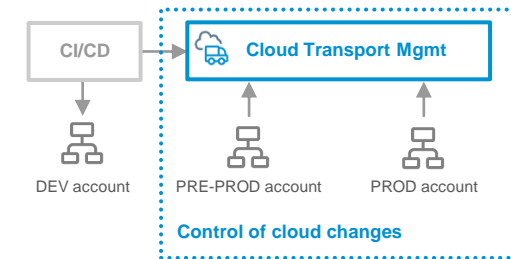- Enabled by SAP's strategic operations platforms

2 — Additional control with **transport management**

- Automated hand-over of release candidates from pipeline
- Improved auditability, separation of concerns, regain control
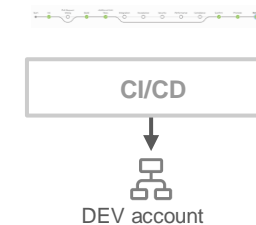- Enabled by *SAP Cloud Transport Management*
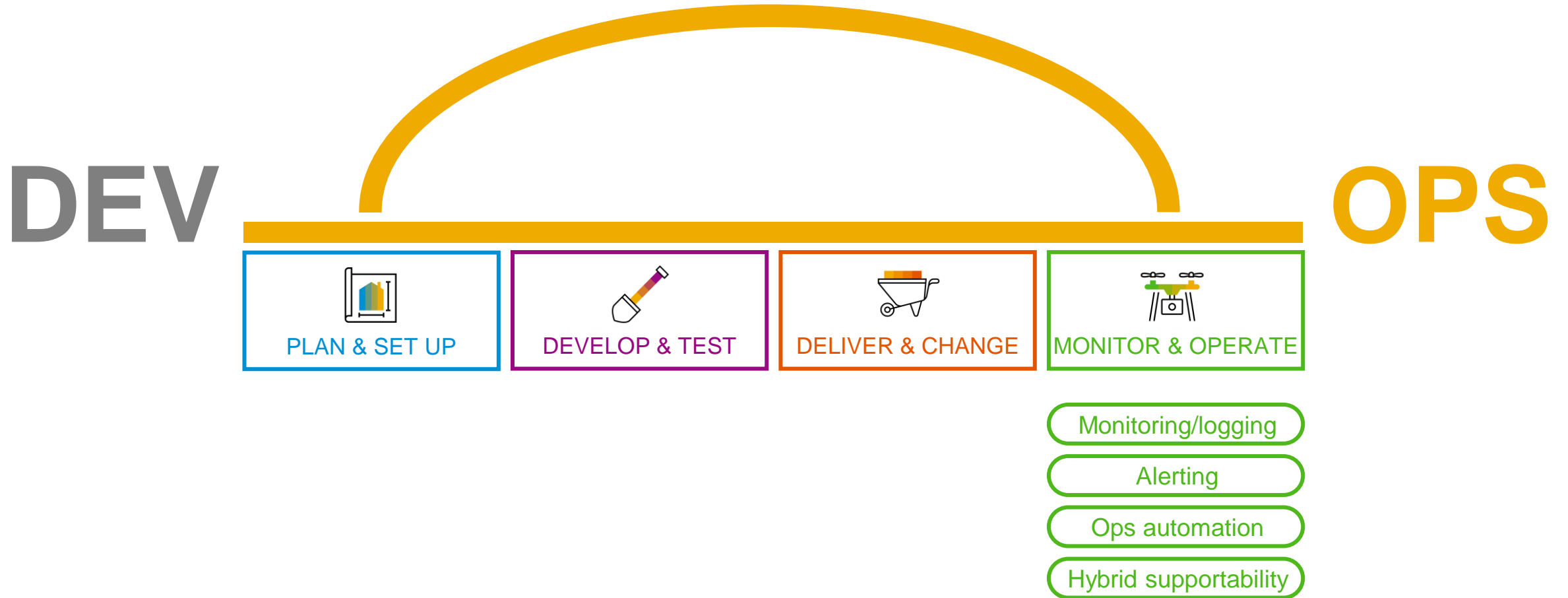

1 — Simple start with **CI/CD**

- Automated build/test/deploy pipelines
- Quick results with low entry barrier
- Enabled by *SAP Continuous Integration and Delivery* and *project 'Piper'*

DevOps with SAP BTP
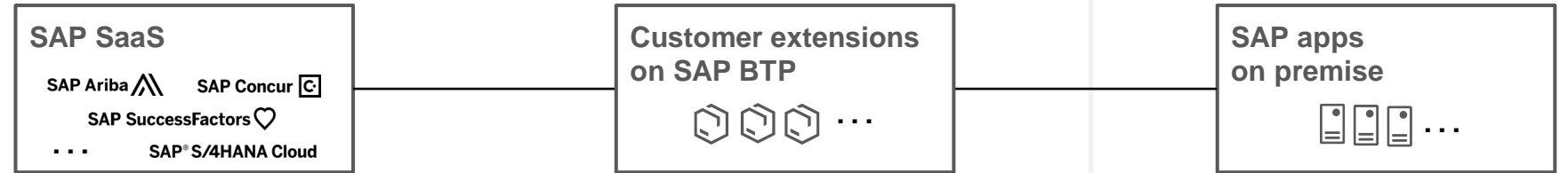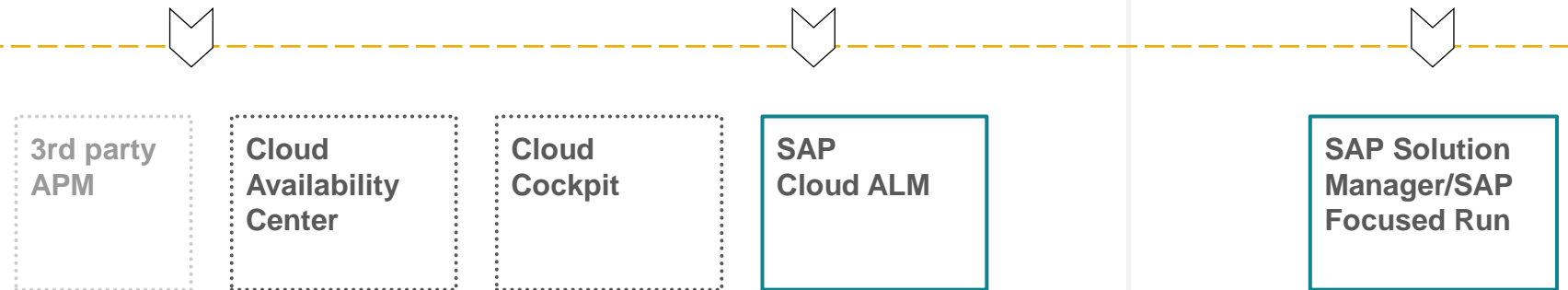## 4. Monitor & operate

DEV OPS

| PLAN & SET UP | DEVELOP & TEST | DELIVER & CHANGE | MONITOR & OPERATE |

- Monitoring/logging
- Alerting
- Ops automation
- Hybrid supportability

Observability and Supportability in the SAP Integration and Extension Suite

Application Layer

SAP SaaS

SAP Ariba
SAP Concur
SAP SuccessFactors
...
SAP® S/4HANA Cloud

Customer extensions on SAP BTP

...

SAP apps on premise

...

Observability and Supportability Technologies

3rd party APM

Cloud Availability Center

Cloud Cockpit

SAP Cloud ALM

SAP Solution Manager/SAP Focused Run

Platform & Data Layer

SAP BTP

Observability + expert services

Other SAP BTP services

Customer landscape on premise

4. **Operations** for SAP BTP

SAP BTP

Microservices

App module A → App module B

SAP BTP services

SAP HANA service

Hyperscaler provided service

Alert Notification service

Automation Pilot

Send alerts from SAP BTP to different recipients/channels

4. Operations: SAP Alert Notification service for SAP BTP

Alerting

SAP BTP runtimes & services

CLOUD FOUNDRY

Neo

SAP Integration Suite

Cloud Transport Mgmt

SAP HANA

Mobile services

Kyma

3rd-party, external event sources

Dynatrace | Kibana

Grafana | Catchpoint

IaaS

Google Cloud

aws

Cloud events

Microsoft Azure | Alibaba Cloud

Rest API

ingest & filter

deliver

Message

#Slack

Strategic ops platforms from SAP

SAP Solution Manager 7.2 | Focused Run 2.0 | SAP Cloud ALM

Automated reaction

Automation Pilot | Workflow service

3rd-party (e.g. incident creation)

PagerDuty | VictorOps

Jira | servicenow

HTTP webhooks

4. **Operations** for SAP BTP

Alerting

Ops automation

SAP BTP

Microservices

App module A → App module B

SAP BTP services

SAP HANA service

Hyperscaler provided service

Alert Notification service

Automation Pilot

Send alerts from SAP BTP to different recipients/channels

React to alerts; automate DevOps
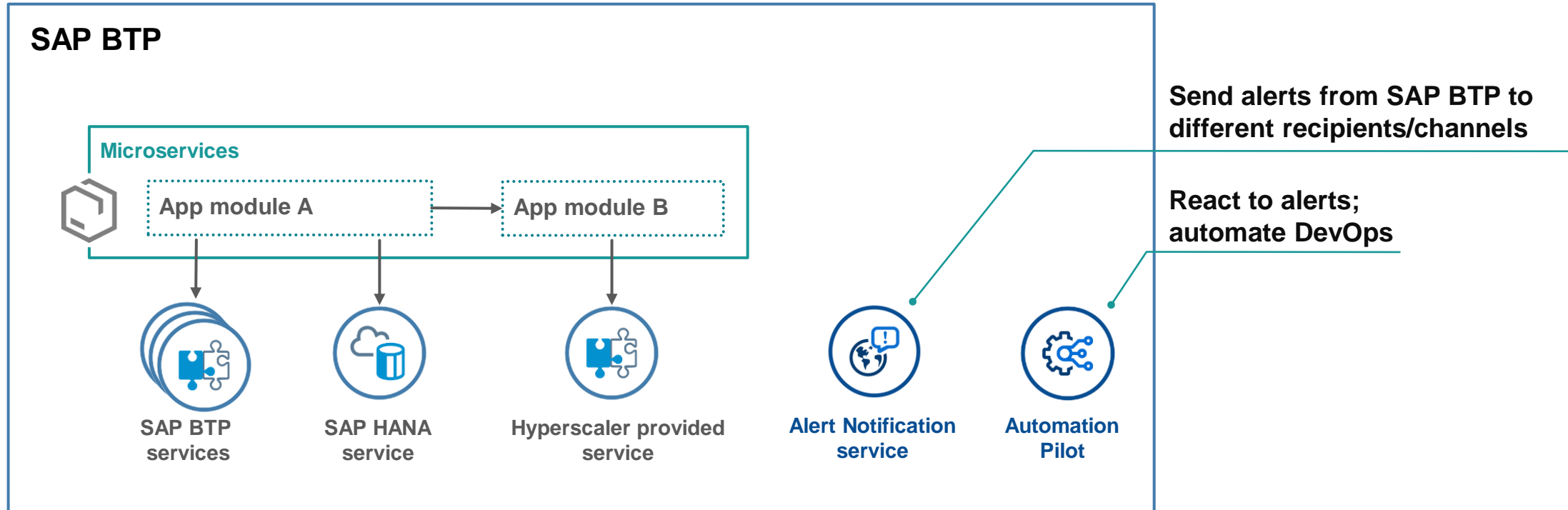
4. Operations: SAP Automation Pilot service

Automation Pilot

- Low-code/no-code automation engine
- Model + execute automated sequences
- Execute scripts in serverless manner
- Brings catalogs of automated sequences that can be used or built upon
- Example used cases:
  - Daily ops tasks
  - Alert remediation
  - Lifecycle management, hooks
  - Scheduled maintenance
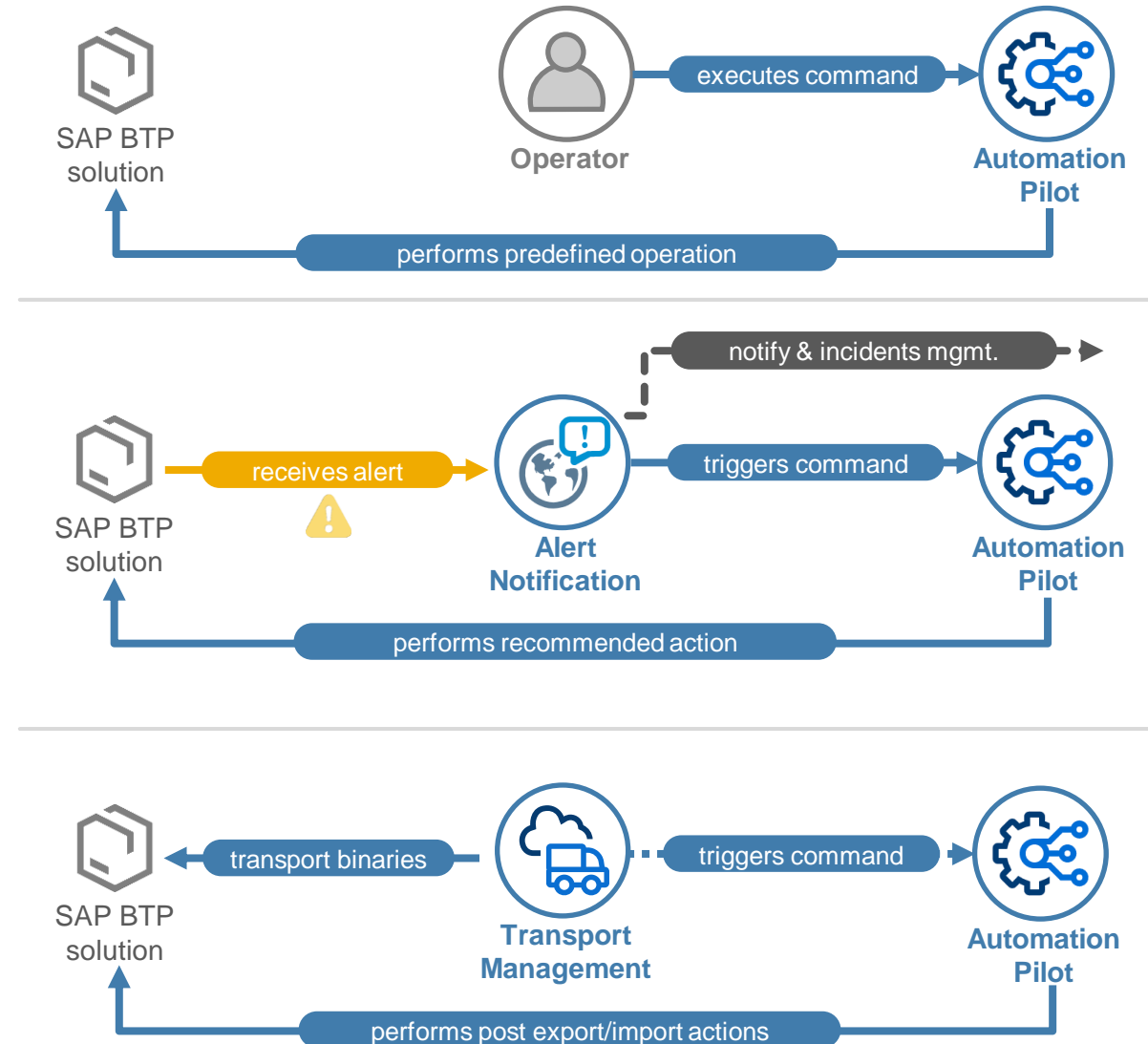
4. Operations: SAP Automation Pilot service

Latest improvements:

- New commands:
  - Executing **SAP HANA Cloud SQL** statements – designed for use with SAP HANA Cloud instances
  - Managing **SAP BTP resources** via Cloud Management – commands for managing subaccounts and assignments of entitlements + quotas to subaccounts ([blog post](#))
  - Triggering & monitoring **Jenkins jobs**

- UX improvement:
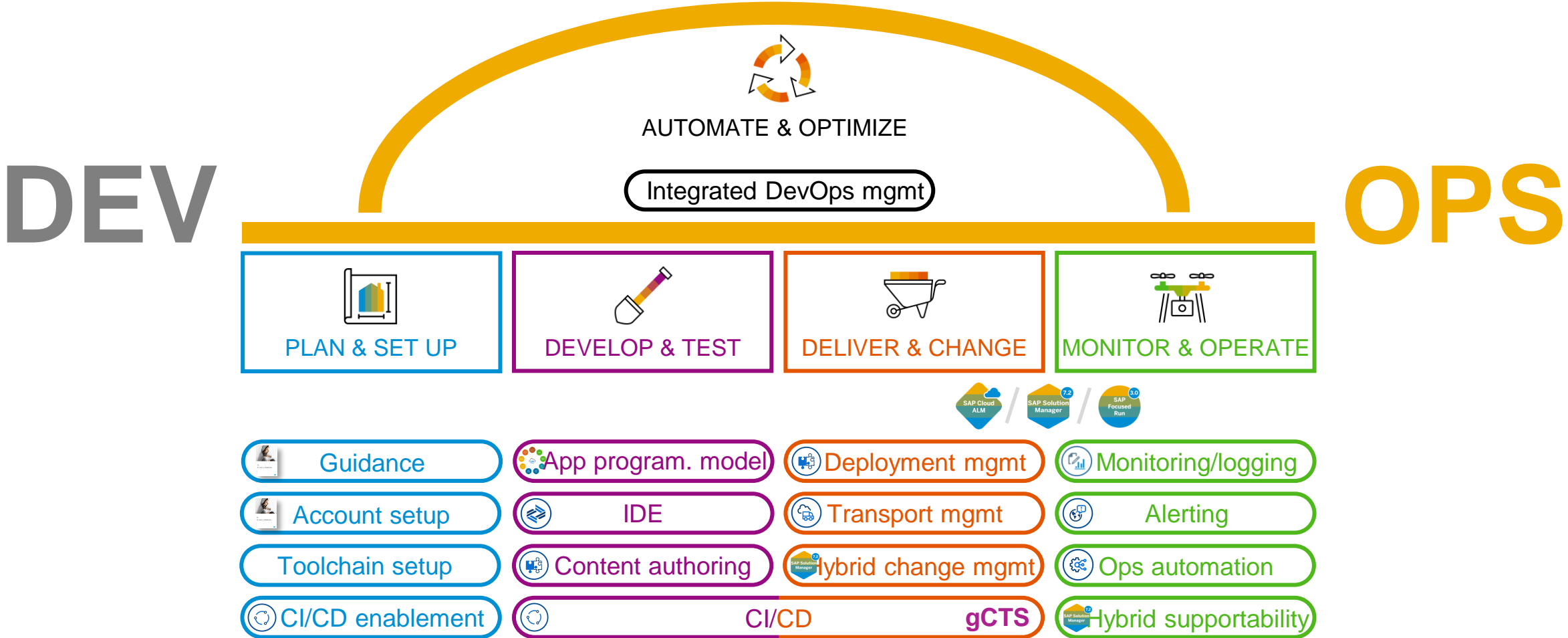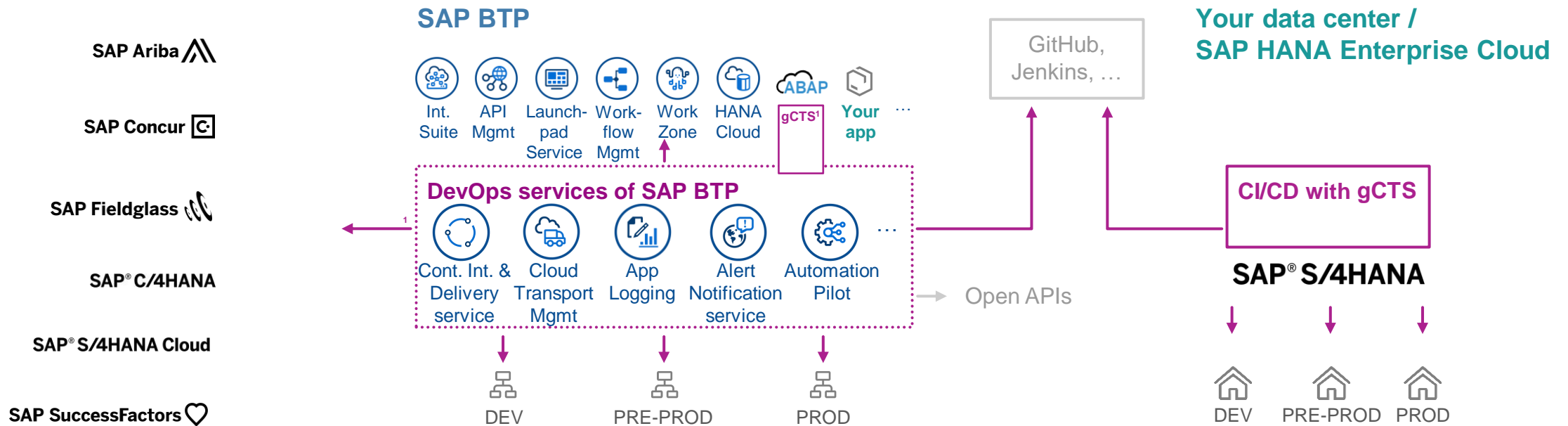 - Visual separation of service tenants – such as to distinguish between different environments

SAP	SAP Automation Pilot	DEV 👤

SAP	SAP Automation Pilot	PROD 👤

Automation Pilot

4. **Operations** for SAP BTP
Example: complement alerts with automation

SAP BTP

SAP Availability Service

Microservices

App module A **1** → App module B

3

SAP BTP services

SAP HANA service

Hyperscaler provided service

Alert Notification service

Automation Pilot

2 3

SAP Solution Manager 7.2

Focused Run 2.0

SAP Cloud ALM

Colla-boration tools

E-Mail client

Tracking system

...

Operations, 24x7 support, DevOps, Site Reliability Engineering (SRE)

1 Event (e.g. service stops working)

2 Notify + trigger

3 Recover service + notify

Summary

DevOps with SAP

DEV **OPS**

AUTOMATE & OPTIMIZE

Integrated DevOps mgmt

PLAN & SET UP	DEVELOP & TEST	DELIVER & CHANGE	MONITOR & OPERATE

SAP Cloud ALM / SAP Solution Manager 7.2 / SAP Focused Run 3.0

Guidance	App program. model	Deployment mgmt	Monitoring/logging
Account setup	IDE	Transport mgmt	Alerting
Toolchain setup	Content authoring	Hybrid change mgmt	Ops automation
CI/CD enablement	CI/CD	gCTS	Hybrid supportability

Vision of DevOps in hybrid enterprise environments

SAP Cloud ALM / SAP Solution Manager / Focused Run

Strategic operations platforms

SAP Ariba

SAP Concur

SAP Fieldglass

SAP® C/4HANA

SAP® S/4HANA Cloud

SAP SuccessFactors

SAP BTP

Int. Suite | API Mgmt | Launch-pad Service | Work-flow Mgmt | Work Zone | HANA Cloud | ABAP gCTS[1] | Your app | …

DevOps services of SAP BTP

Cont. Int. & Delivery service | Cloud Transport Mgmt | App Logging | Alert Notification service | Automation Pilot | …

→ Open APIs

DEV | PRE-PROD | PROD

GitHub, Jenkins, …

Your data center / SAP HANA Enterprise Cloud

CI/CD with gCTS

SAP® S/4HANA

DEV | PRE-PROD | PROD

[1]) In progress

Call to **action**

Learn more about DevOps with SAP:

- DevOps SAP Community page
- openSAP course "Efficient DevOps with SAP"
- Sway about potential first steps

- SAP Help Portal page about DevOps with SAP BTP
- Best Practices for SAP BTP guide
- SAP BTP, Getting Started for Administrators –
  by SAP HANA Academy | SAP Blogs
- App Development & Integration in SAP Road Map Explorer

- ADMCLD - Introduction to SAP BTP Administration | SAP Training
  (classroom training)
- Introduction to tools for CI/CD aligned development processes |
  Services and Support Catalog (ondemand.com) (service offering)

- SAP Cloud ALM for operations

Try out our services on SAP BTP:

- Set up our services in the free tier environment of SAP BTP
- Run missions and tutorials for CI/CD

Contribute to our SAP Continuous Influence session
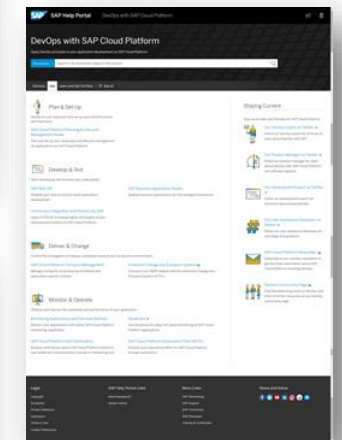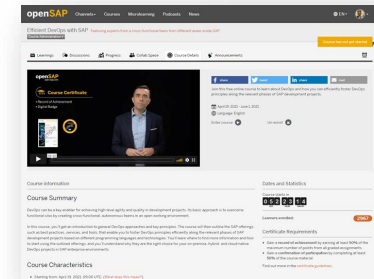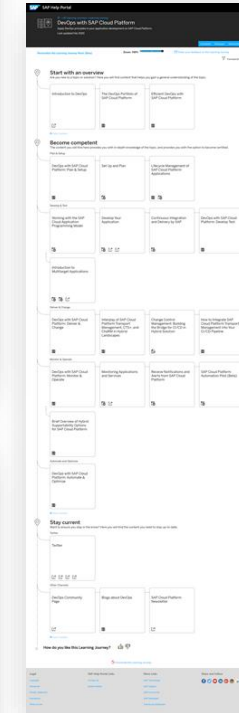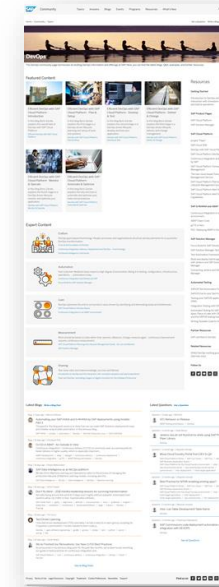
openSAP course Efficient DevOps with SAP

From 2021, available as self-paced course

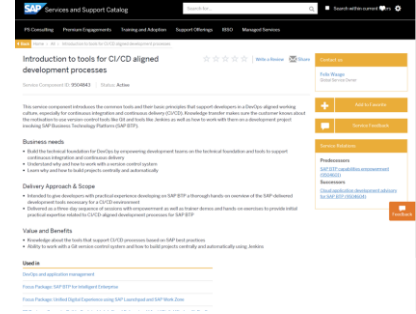Course language: English

Course content:

- Week 1: Introduction to DevOps
- Week 2: CI/CD with ABAP (On-Premise)
- Week 3: Delivery of Cloud Applications
- Week 4: Hybrid Change and Test Management
- Week 5: Operation of Your Solution and Summary

https://open.sap.com/courses/devops1

Service offering from SAP Services and Support

Introduction to tools for CI/CD aligned development processes | Services and Support Catalog

- Service Component ID: 9504843, link
- Contacts: Felix Waage (felix.waage@sap.com), Dominic Steinhauser (dominic.steinhauser@sap.com)

Business needs:

- Build technical foundation for DevOps by empowering dev teams on technical foundation + CI/CD tools
- Understand why and how to work with a version control system
- Learn why and how to build projects centrally and automatically

Scope and delivery approach:

- Overview and hands-on of SAP-delivered development tools necessary for a CI/CD environment
- 3 day workshop with empowerment, demos and hands-on exercises to provide initial practical experience with SAP-delivered CI/CD tools
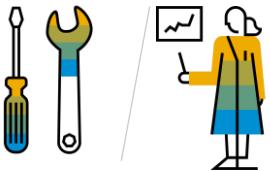
Value and benefit:

- Knowledge about the tools that support CI/CD processes based on SAP best practices
- Ability to work with Git version control system and how to build projects centrally and automatically using CI infrastructure

Service offering from SAP Services and Support

Content

Focus Topics

SAP Continuous Integration and Delivery

Build your first pipeline using the continuous integration service on the SAP BTP for SAPUI5 and CAP projects.
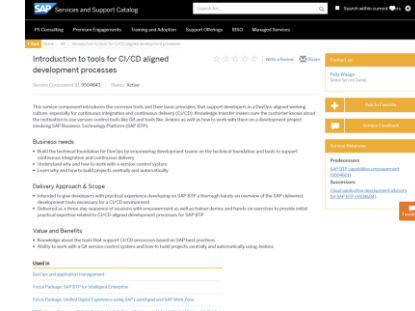
Project "Piper"

Usage of Project "Piper" in your own CI infrastructure (e.g.: Azure DevOps or Jenkins).

Cloud Transport Management

Learn how to setup a best practice cloud transport environment and the integration with your CI infrastructure.

General Overview (optional)

Hybrid scenarios

Get an overview of possible hybrid CI scenarios with SAP Solution Manager, ChaRM and CTS+.

ABAP on-premise: gCTS

Learn more about gCTS and the ABAP environment pipeline.

SAP Continuous Influence

Are you missing any SAP BTP features in the area of platform foundation?

Contribute to our SAP Continuous Influence session: https://influence.sap.com/sap/ino/#campaign/2277
- Browse through existing improvement requests submitted by other customers and partners & vote for them
- Submit own requests
- Requests that reach the vote threshold will be assessed in the next review cycle

Available categories in the *SAP BTP – Platform Foundation* session:
- Multi-cloud
- Security services
- CI/CD
- Lifecycle management

Thank you.

Contact information:

Boris Zarske
Product Manager – SAP SE
Boris.Zarske@sap.com | LinkedIn | Twitter

THE BEST RUN **SAP**