



Efficient **DevOps** with **SAP Cloud Platform**

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Boris Zarske

Boris is product manager at SAP in the *cloud and lifecycle management* area. He is responsible for DevOps and lifecycle management topics around SAP Cloud Platform.

Together with colleagues from other areas, he is forging the overall DevOps story for SAP. In addition, he has a broad experience with system provisioning topics and enterprise architecture. He is a regular speaker at SAP events, such as SAP TechEd.

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Introduction to DevOps





“A **culture** where people, regardless of title or background, **work together** to imagine, develop, deploy, and operate a system.”

Definition by Ken Mugrage, ThoughtWorks

<http://kenmugrage.com/post/my-new-definition-of-devops/>

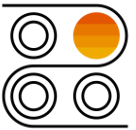
DevOps key principals



Culture



Automation



Lean



Measurement



Sharing

Recap



“As **trusted advisor**, we enable customers to apply **DevOps** principles to their **SAP technology stack** (and beyond).

Along the **CALMS** principles, we provide best practices, services, tools, trainings, and knowledge exchange.”

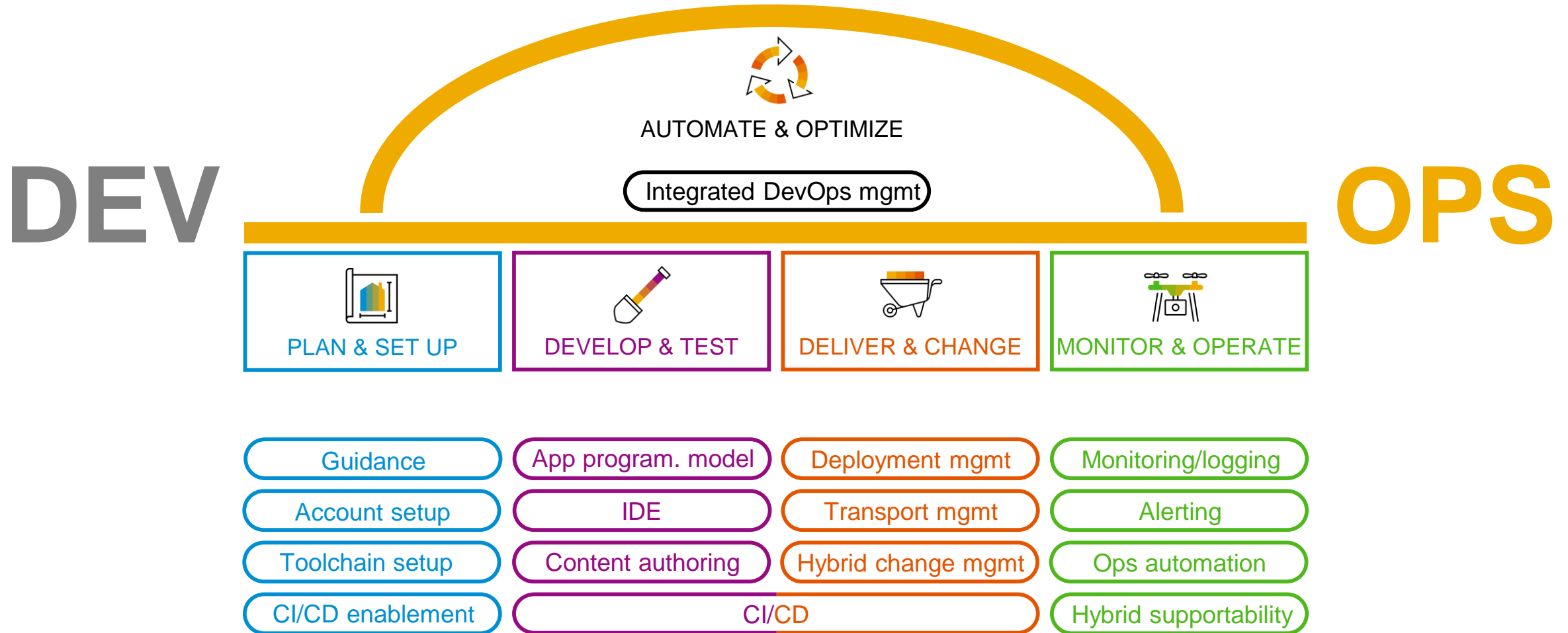
SAP DevOps vision statement

DevOps with SAP Cloud Platform



DevOps with SAP Cloud Platform

Categories and service portfolio



DevOps with SAP Cloud Platform

Plan & set up

DEV

OPS



PLAN & SET UP

Guidance

Account setup

Toolchain setup

CI/CD enablement

Best practices for SAP Cloud Platform guide

Guidance

Available in [SAP Help Portal](#)

- Contains detailed **planning section**:
 - Governance model
 - Account model (with examples!)
 - Security and compliance model
- Covers further aspects around **lifecycle management**

The screenshot shows the SAP Help Portal interface for the document 'When to Use Which Account Model'. The left sidebar contains a 'Table of Contents' with sections like 'Getting Started Checklist', 'Set Up and Plan', and 'Develop and Build'. The main content area includes a title, a brief introduction, and two tables: 'Project Setup' and 'Team Setup'. Each table compares five account models against various requirements.

When to Use Which Account Model

Determine which account model is the most appropriate for your needs.

The tables below provide requirements with regards to project and team setup as well as the services and resources involved. You can compare them against your own requirements and see which account model most closely matches. Please remember that the four account models are a result of a best-practice approach. They are not mutually exclusive and you may want to use a combination of approaches, if, for example, you have different projects with different requirements.

Project Setup

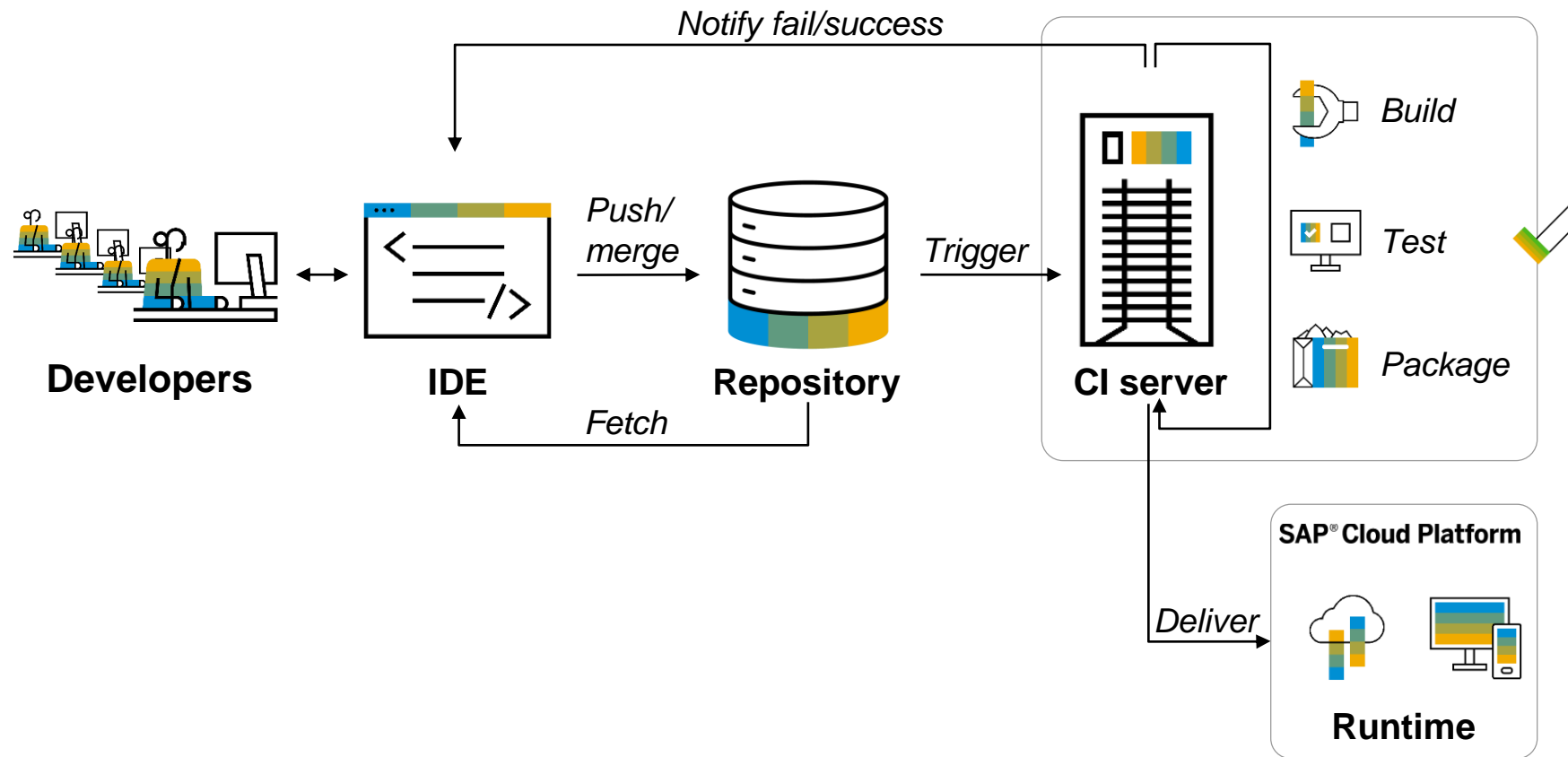
Your Requirements ...	Account Model 1	Account Model 2	Account Model 3	Account Model 4	Account Model 5
You follow the DevOps methodology and have many autonomous projects.		X		(X)	(X)
You need different stages for your project or scenario.	X	(X)	(X)	(X)	X
You have a highly centralized project landscape with many projects using the same technologies (for example, Fiori development for a Fiori launchpad).	X				X
You want to share more expensive resources (HANA databases, Integration service tenants) with multiple projects.	X		X	(X)	(X)

Team Setup

Your Requirements ...	Account Model 1	Account Model 2	Account Model 3	Account Model 4	Account Model 5
You have a large number of developers, with several different project admins responsible for them.		X		X	(X)
You have many different development teams, but only one single production environment for which the teams develop applications.				X	
You have different development teams, each of which works independently, meaning they should not be able to, for example, accidentally break the other team's developments.		X	X	X	X
Your development teams on SAP Cloud Platform are coming from different organizational units in different geographic locations and you want to track them separately.		X	X	X	X
You want to ensure that no developer or project admin can assign privileges to themselves for services or applications.		X	X	X	
You have stringent security requirements. For example, you don't want all developers to have access to all Git repositories.		X	X	(X)	(X)
You want to allow access to on-premise systems via Cloud Connector only for selected projects, while restricting it for the applications of other projects.		X	(X)		(X)

How tools enable DevOps

Example for automation as driver for DevOps

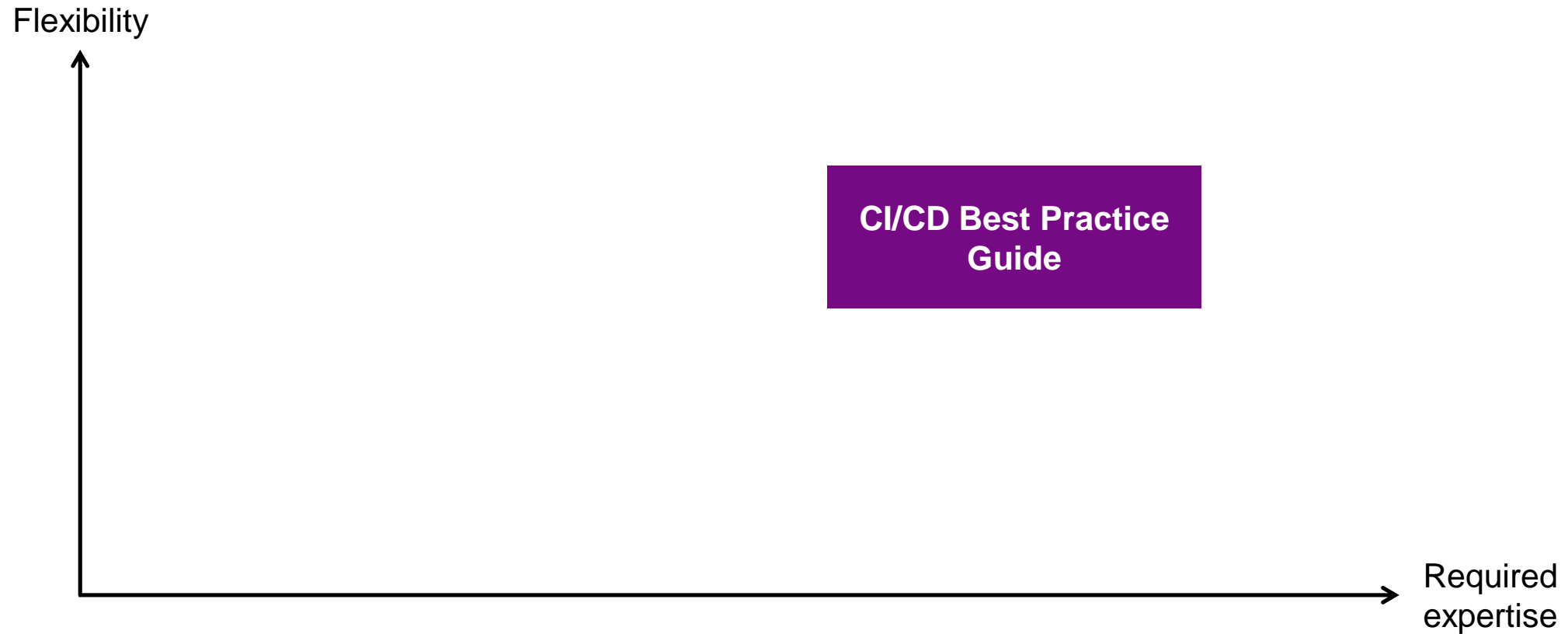


Continuous Integration and Delivery (CI/CD)

Continuous Integration and Delivery

SAP offerings that ease applying CI/CD for your projects

CI/CD enablement



Continuous Integration and Delivery

Continuous Integration and Delivery Best Practices Guide

CI/CD enablement

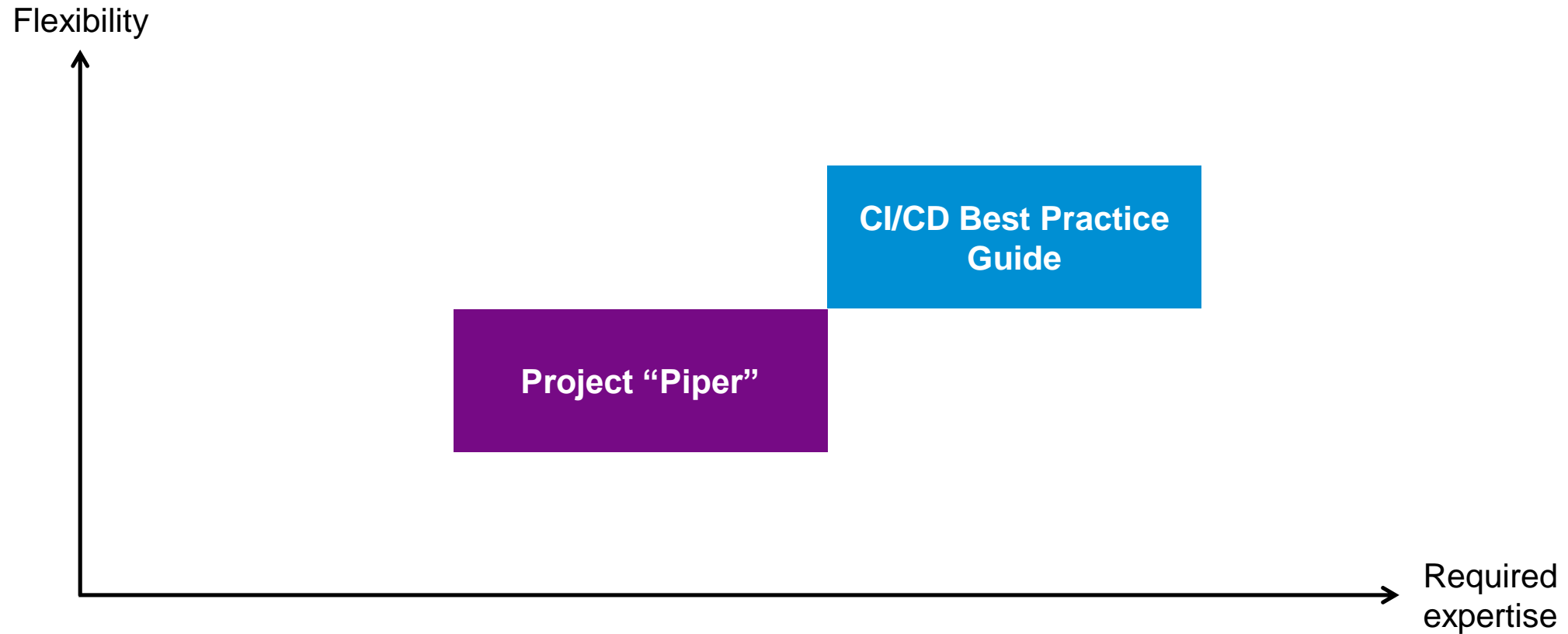
The screenshot shows the SAP Help Portal interface. The browser address bar displays the URL: `help.sap.com/viewer/3324745951b44b578bd65221d2ff8f9a/Cloud/en-US`. The page title is "Continuous Integration and Delivery Best Practices Guide". A search bar is located below the title. On the left, a "Table of Contents" sidebar lists sections like "Continuous Integration and Delivery Best Practices Guide" and "Procedures for CI/CD Pipelines". The main content area features a "Note" box stating that the guide is under construction. Below this, the section "What Is This Guide About?" explains the guide's purpose. At the bottom, a diagram shows a four-stage pipeline: Build, Test, Deploy, and Extend, with a legend indicating that the first three stages are for "Set Up Your Pipeline" and the last stage is for "Extend Your Pipeline".

- Provides simple procedures to implement continuous delivery pipelines **on any CI/CD stack**
- Demonstrates how to apply principles of CI/CD to **SAP-specific technology**

Continuous Integration and Delivery

SAP offerings that ease applying CI/CD for your projects

CI/CD enablement



Continuous Integration and Delivery

Project "Piper"

CI/CD enablement

Containerized tools

Docker Images

The following images are published on hub.docker.com:

Name	Description	Docker Image
Jenkins	Use a preconfigured Jenkins to run project "Piper" pipelines.	<code>pipen/jenkins-master</code>
MTA Archive Builder	Build multitarget applications with the MTA Archive Builder.	<code>pipen/mta-archive-builder</code>
CD Client	Interact with SAP Solution Manager or CTS using the command line.	<code>pipen/cd-client</code>
CloudFoundry CLI	Use command line tools for Cloud Foundry with plugins for blue-green deployment and MTA.	<code>pipen/cf-cli</code>
Neo CLI	Use SAP Cloud Platform tools for Neo.	<code>pipen/cf-cli</code>
Jenkinsfile Runner	Run a Jenkinsfile without a long-running, stateful Jenkins master. The Jenkinsfile Runner is based on <code>pipen/jenkins-master</code> .	<code>pipen/jenkinsfile-runner</code>
Life Cycle Container	Improve life-cycle management of the CI-server by using a lifecycle image.	<code>pipen/lifecycle-container</code>
Container Structure Test	Run container structure tests with a shell for <code>pipen/jenkins-master</code> .	<code>pipen/container-structure-test</code>
Node Browsers	Use web browsers for end-to-end tests of web applications in Jenkins pipelines.	<code>node/browsers</code>
SAP HANA XS Advanced CLI	Use command line tools to deploy to SAP HANA XS Advanced.	<code>pipen/hana-cli</code>

Description

The CI Server is a collection of Docker images for images that can be used in Continuous Delivery (CD) pipelines for SAP development projects. The images are optimized for use with project "Piper" on Jenkins. Docker containers simplify your CD tool stack, encapsulating tools and environments that are required to execute pipeline steps.

If you want to learn how to use project "Piper" please have a look at the documentation, introductory material and a list of SAP systems not covered by project "Piper" are described in our Continuous Integration Best Practices.

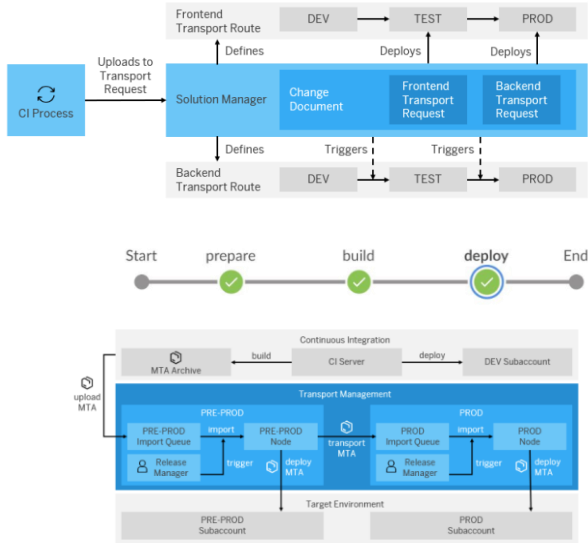
The repository contains Dockerfiles that are designed to run project "Piper" pipelines. Nevertheless, they can also be used flexibly in your container environment and automation scripts.

For detailed usage information please check the README and in the corresponding folders.

Docker Images

The following images are published on hub.docker.com:

Name	Description	Docker Image
Jenkins	Preconfigured Jenkins to run project "Piper" pipelines.	<code>pipen/jenkins-master</code>
Jenkinsfile Runner	Jenkinsfile Runner based on <code>pipen/jenkins-master</code> , allows running a Jenkinsfile without a long-running, stateful Jenkins master.	<code>pipen/jenkinsfile-runner</code>
Jenkinsfile Runner (SSH)	GitHub Action for using the Jenkinsfile Runner.	<code>pipen/jenkinsfile-runner-ssh</code>
Life Cycle Container	Subset image for life cycle management of the CI-server.	<code>pipen/lifecycle-container</code>



Typical scenarios

Project "Piper"

sap.github.io/jenkins-library/

The screenshot shows the GitHub repository for 'sap/jenkins-library'. It displays the repository name, description, and a list of recent commits. The repository is a shared library for Continuous Delivery pipelines, used by many projects in the SAP ecosystem.

Step library



General purpose pipeline



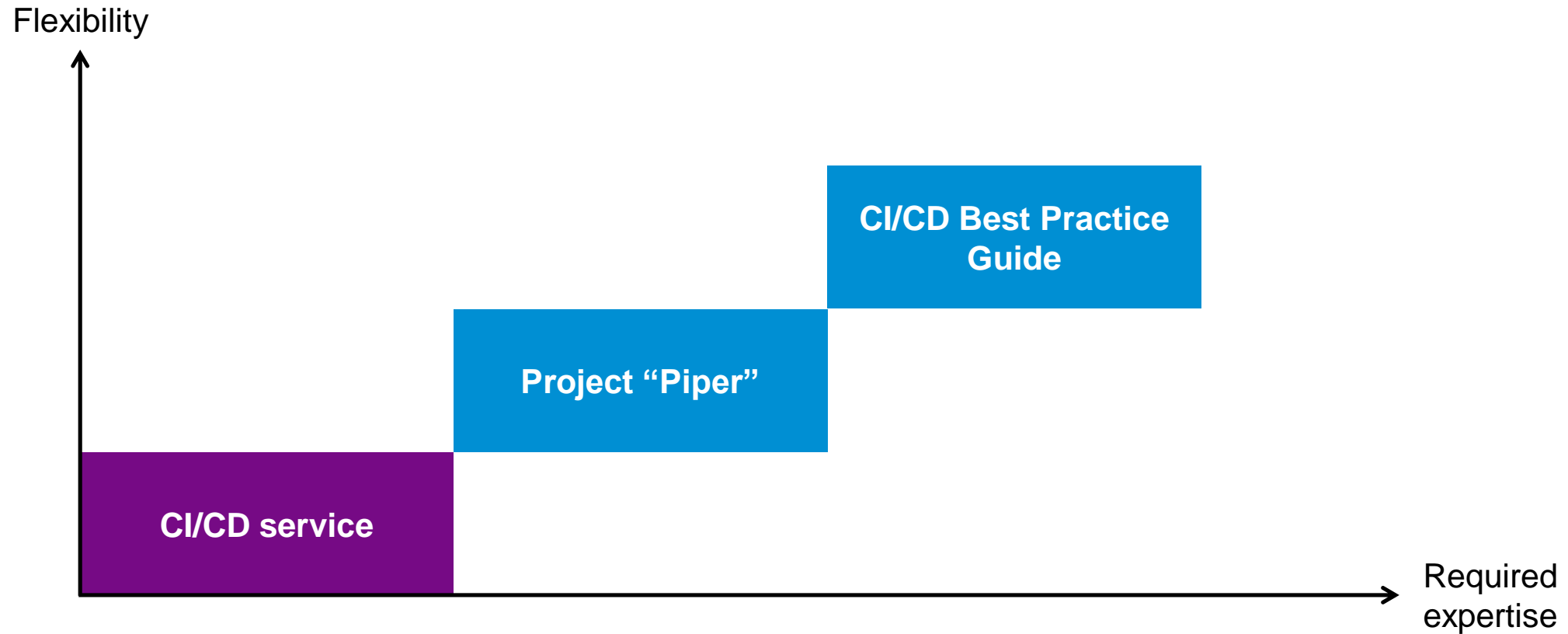
SAP Cloud SDK pipeline

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Continuous Integration and Delivery

SAP offerings that ease applying CI/CD for your projects

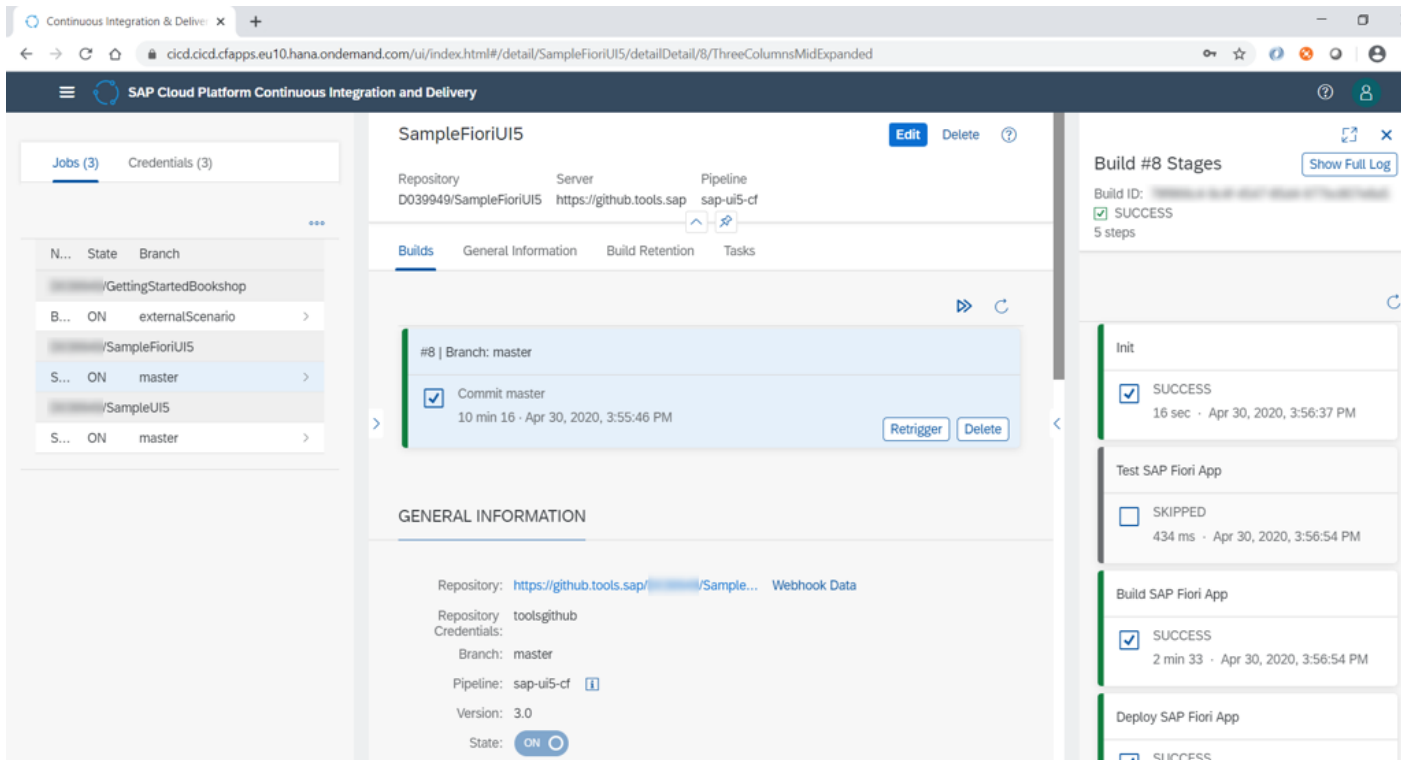
CI/CD enablement



SAP Cloud Platform Continuous Integration and Delivery

CI/CD enablement

Configure and run predefined pipelines to automatically test, build, and deploy your code changes.



- **Simple onboarding** for SAPUI5 and cloud application programming model (CAP) development projects
- **No customer CI infrastructure** required
- **No in-depth CI/CD knowledge** required
- Well-integrated in tooling ecosystem for SAP Cloud Platform

[Documentation](#)

Deep dive on CI/CD



Irina Kirilova
Development expert at SAP

THE BEST RUN



DevOps in a nutshell:

SAP Solutions for Continuous Integration (CI) and Continuous Delivery (CD)

Speaker:

Irina Kirilova, SAP SE

Follow this [link](#) to register!

Date & Time:

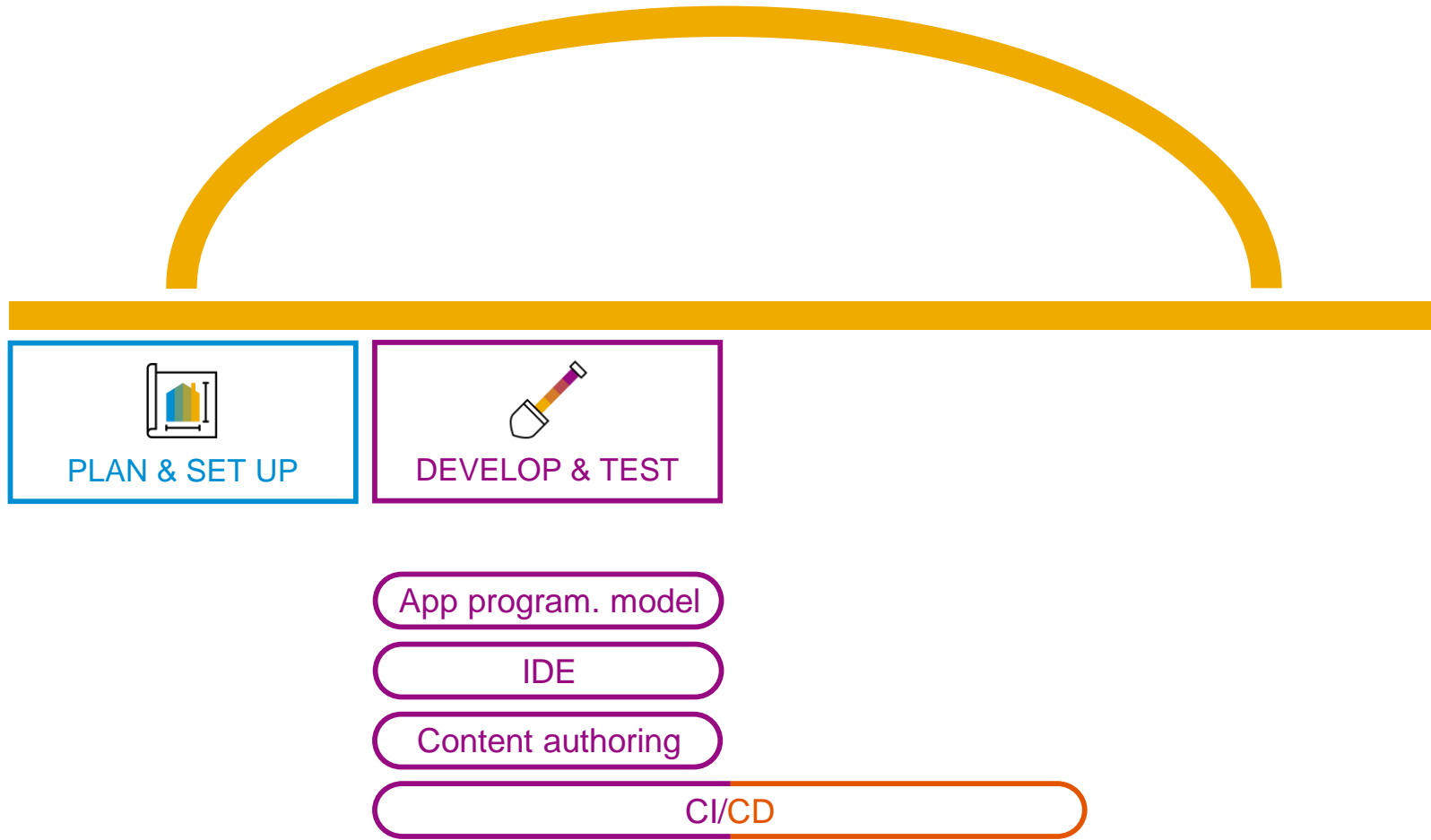
November 11, 2020,
4PM - 5PM
CET (Germany)

DevOps with SAP Cloud Platform

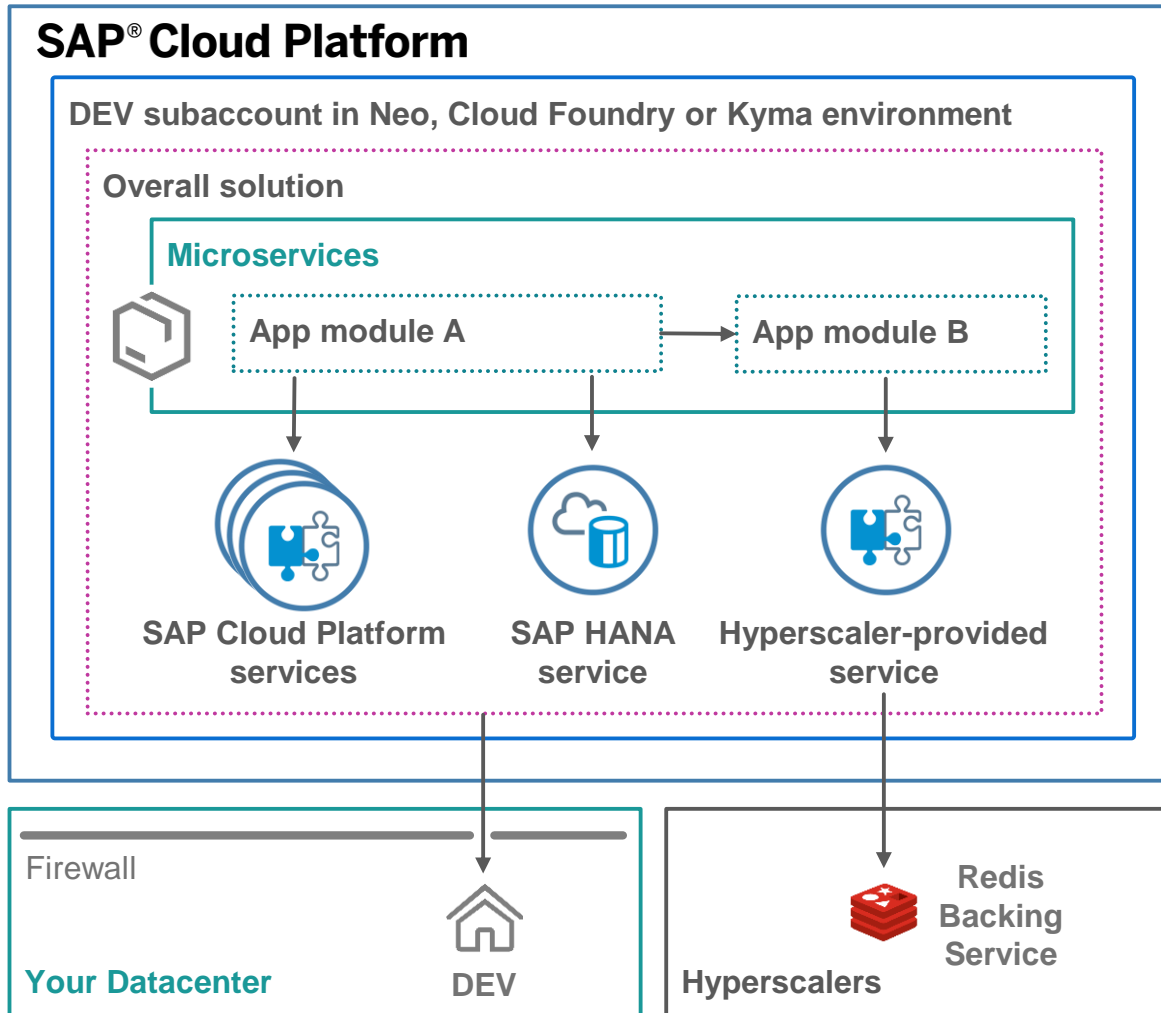
Develop & test

DEV

OPS



Example app



Develop your application

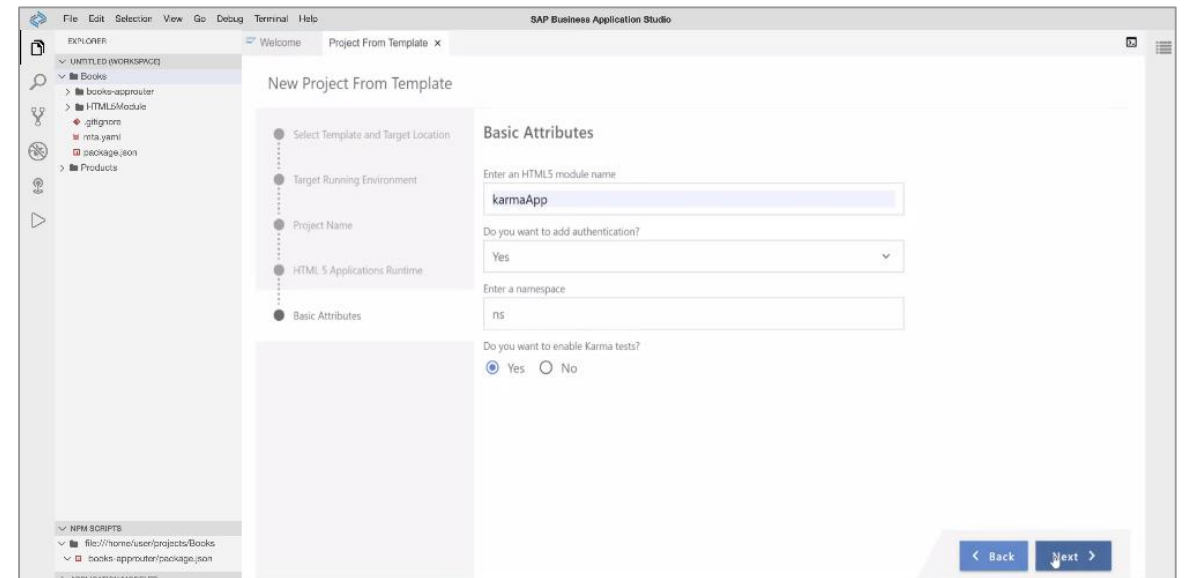
Development environment

IDE

Use an **Integrated Development Environment** to create and test your applications:

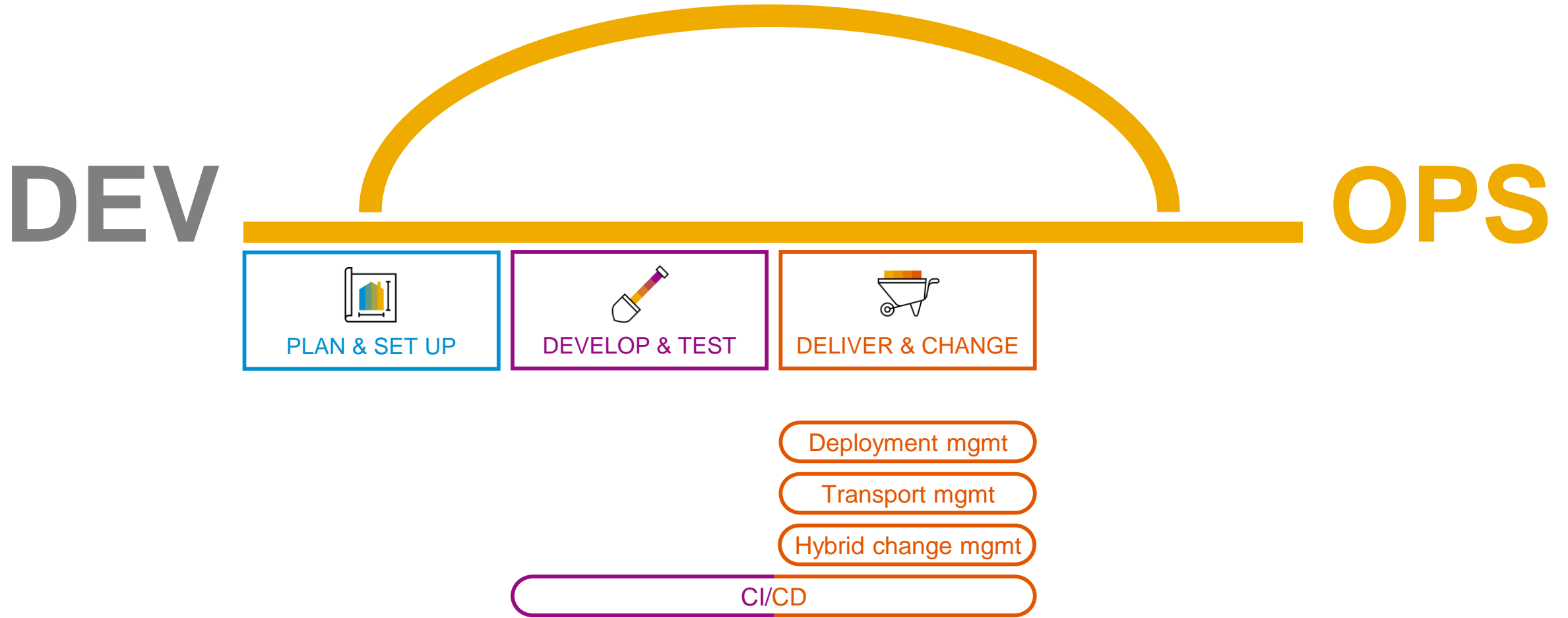
SAP Business Application Studio:

- Available as cloud service on SAP Cloud Platform, multi-cloud foundation
- Tailored for efficient development of business applications for the **Intelligent Enterprise** ([more information](#))
- **Integrated testing capabilities**
- End-to-end CI/CD using
SAP CP **Continuous Integration and Delivery** service

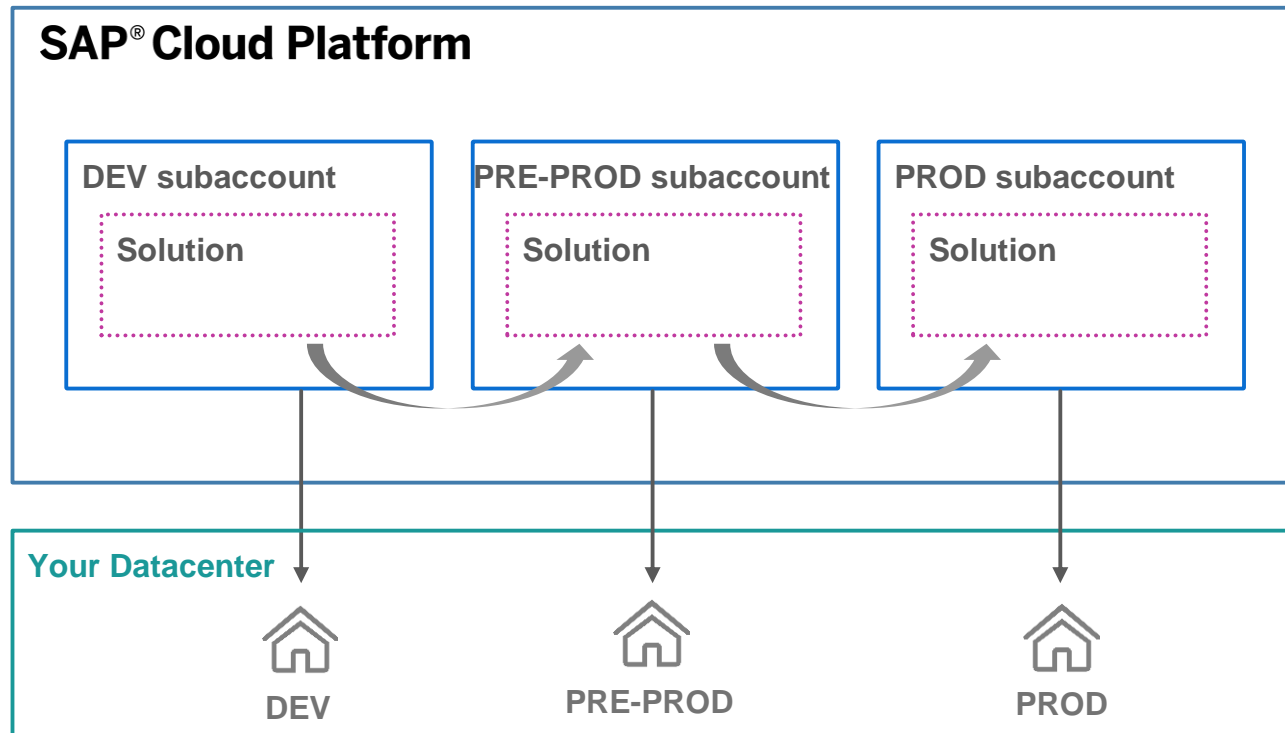


DevOps with SAP Cloud Platform

Delivery & change



Example app



Deliver your changes toward production



Continuous Delivery

- Mainly **source-code-based** development
- Typically fully automated



Transport Management

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



SAP Cloud Platform Transport Management

- **Cloud-centric** solution desired
- Transport of cloud **development** and **application content** (also beyond MTA)

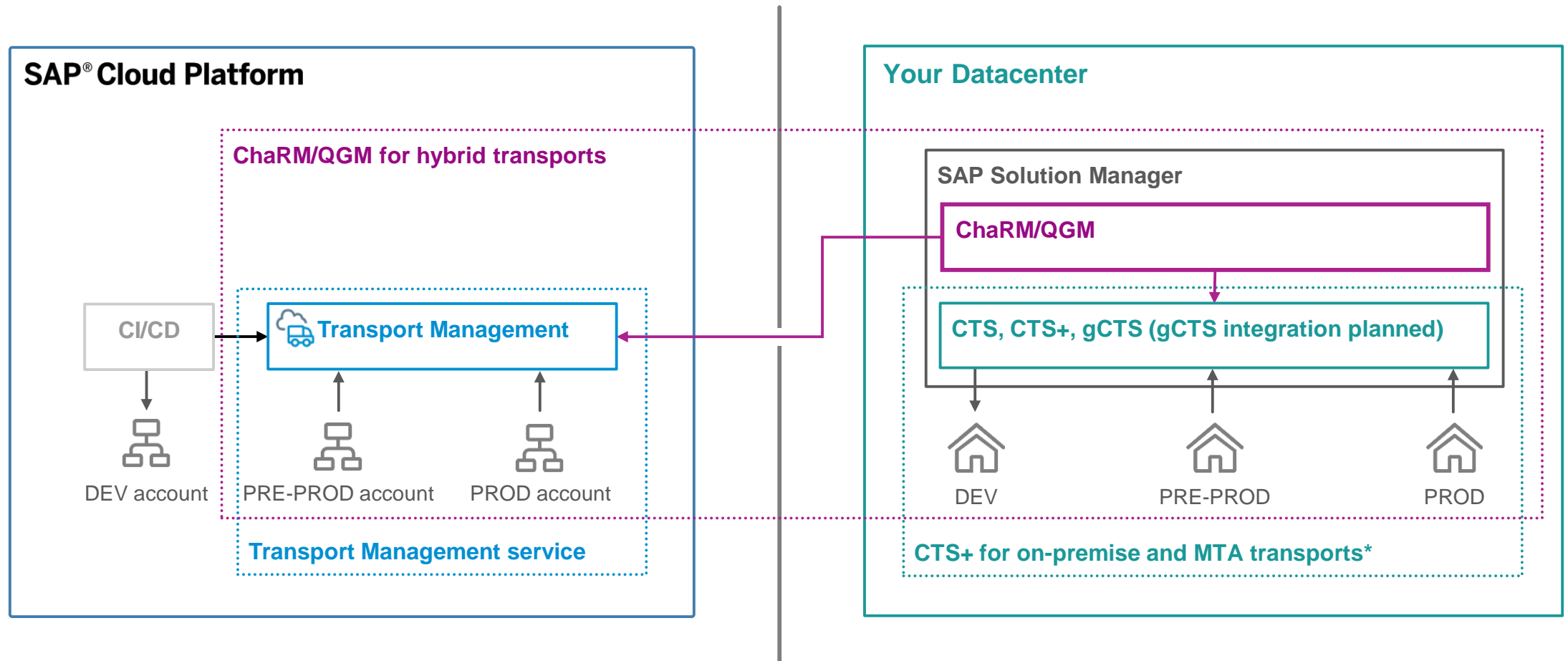
CTS+

- **ABAP-centric** landscape
- Transport of “Multitarget Application Archive (**MTA**)”-**based cloud content only** (in addition to on-premise content)

Deliver applications with **transport management**

Best practice and way forward for hybrid scenarios

Hybrid change mgmt



*) CTS+ can also handle MTA-based transports on SAP Cloud Platform (such as for SAP Cloud Platform Integration)

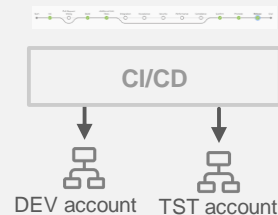
Deliver your changes toward production

Example for evolution of delivery approaches for a project

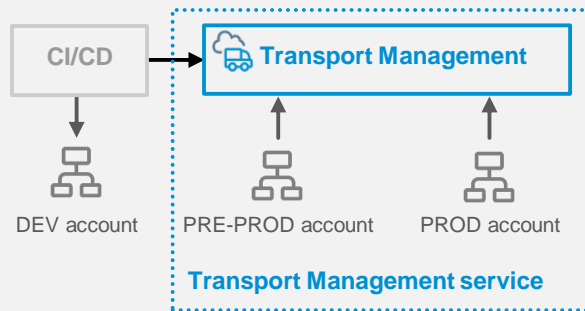
3 Hybrid interdependencies come up or get more important, so that you want to control them by synchronizing on-premise changes with SAP CP development

2 You release your project and want to have more control of your prod environment

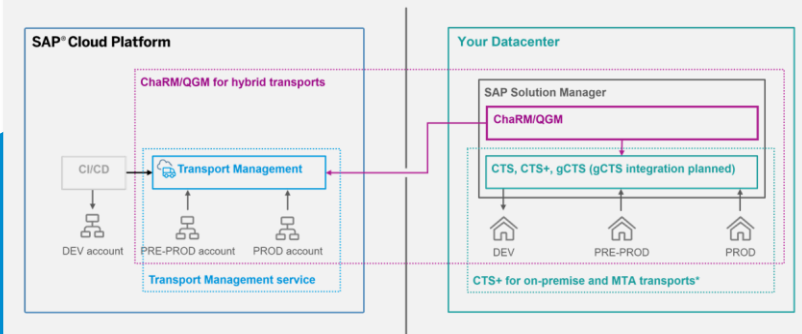
1 You start your project with a pipeline



Consider **project “Piper”** and **Continuous Integration and Delivery service** to set up your environment quickly



Configure **automated hand-over** of release candidates from pipeline to transport mgmt



Integrate transport management into **change management**

Deep dive on integration into transport and change management

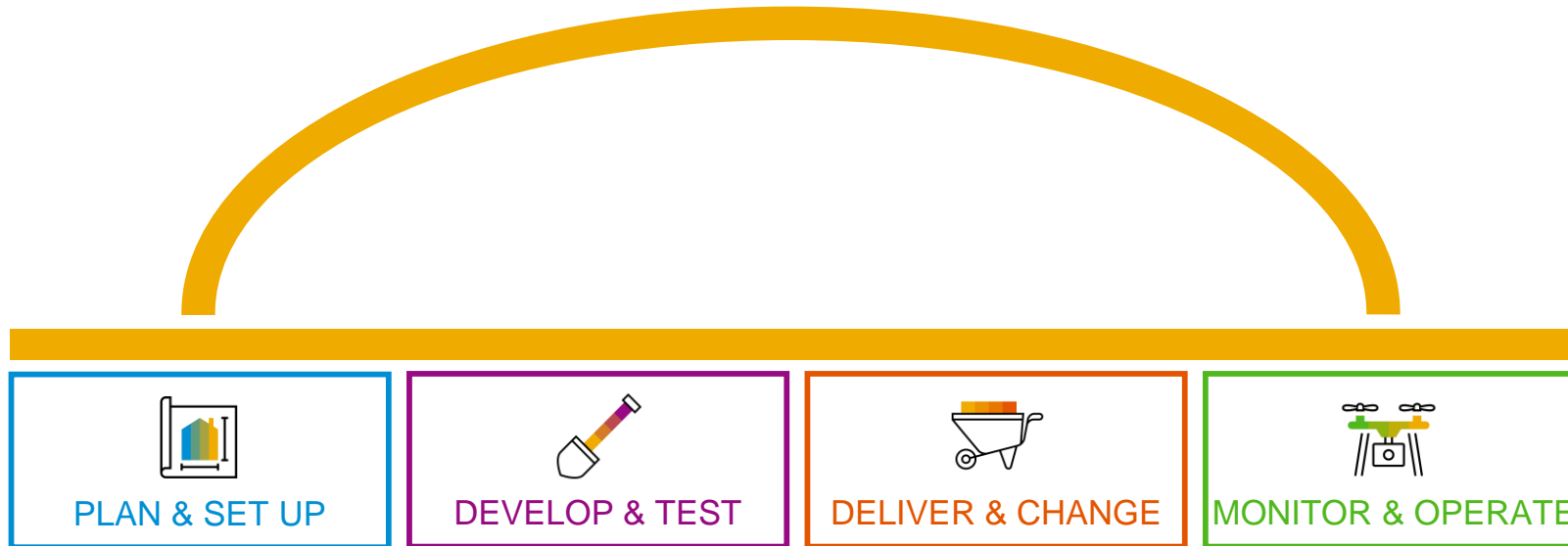


Harald Stevens, product expert for
transport management solutions in
SAP Cloud Platform

DevOps with SAP Cloud Platform

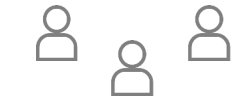
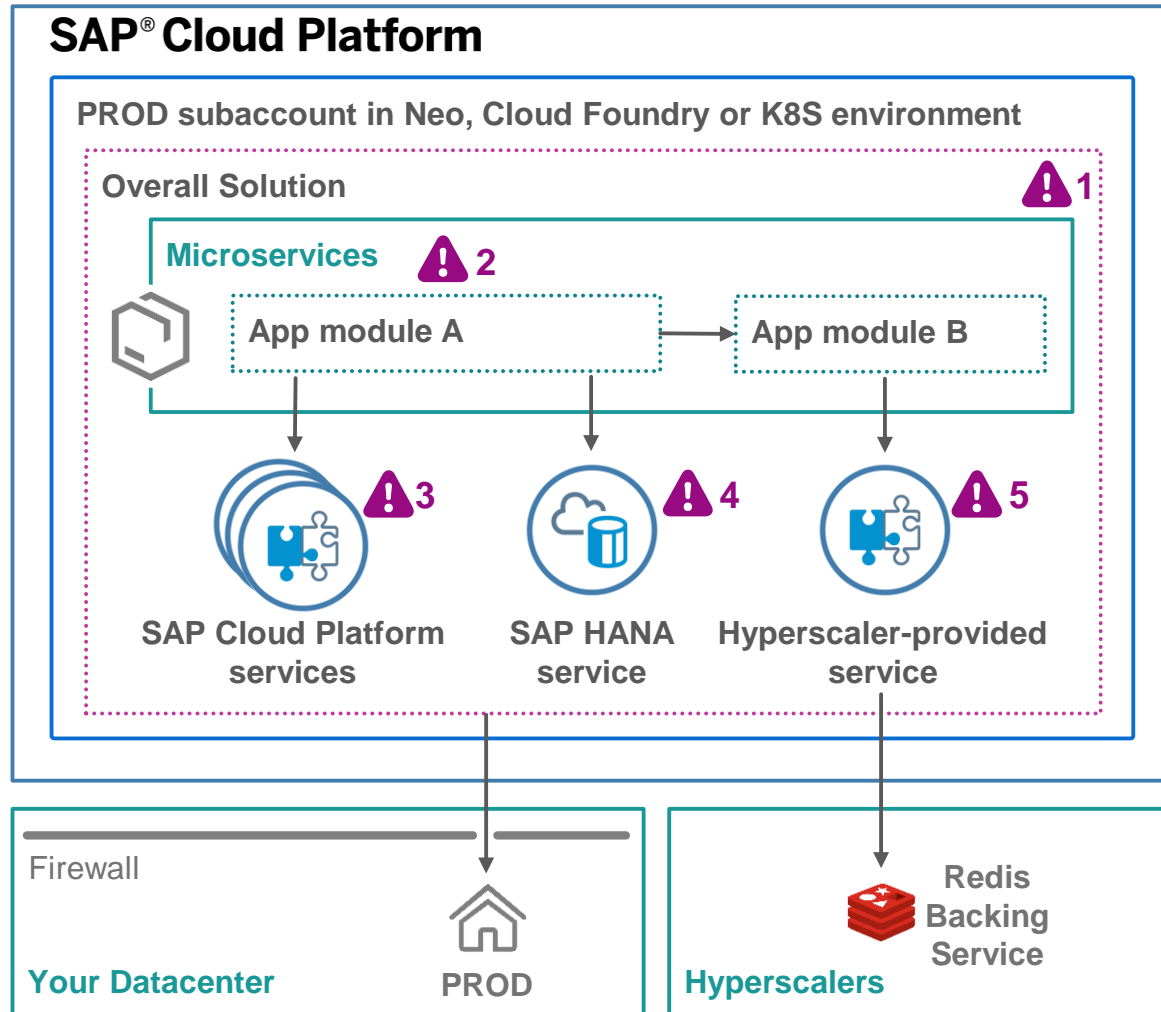
Monitor & operate

DEV








OPS

Cloud-native problem space for **Site Reliability Engineering (SRE)**

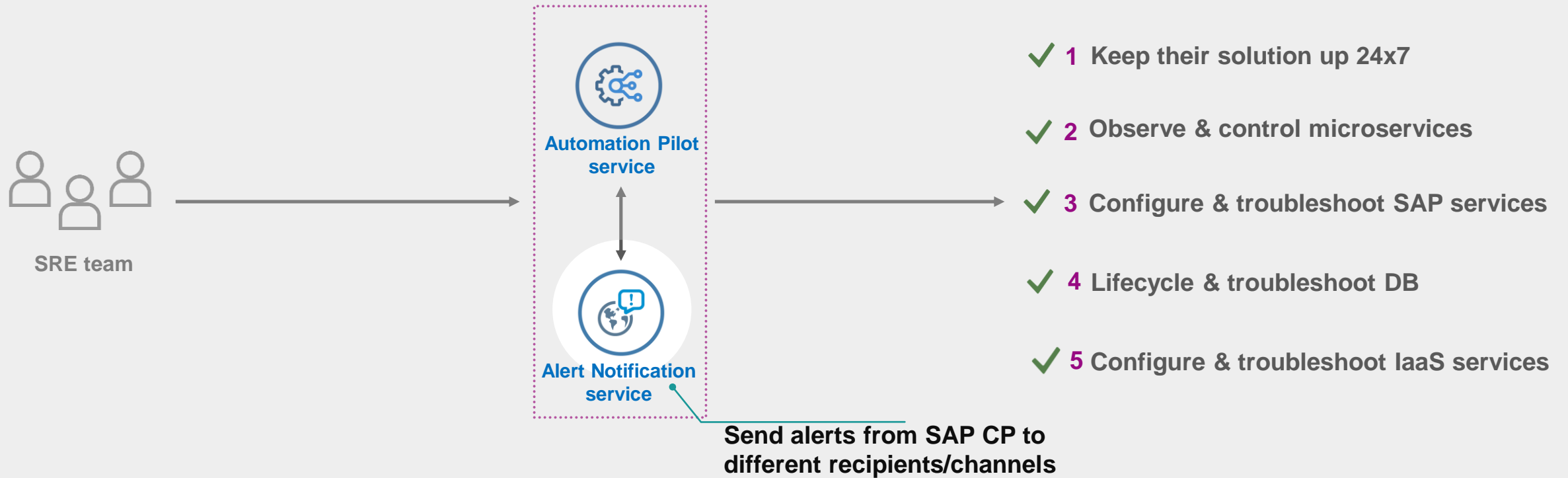


SRE team
responsible for:

-  1 Keep their solution up 24x7
-  2 Observe & control microservices
-  3 Configure & troubleshoot SAP services
-  4 Lifecycle & troubleshoot DB
-  5 Configure & troubleshoot IaaS services

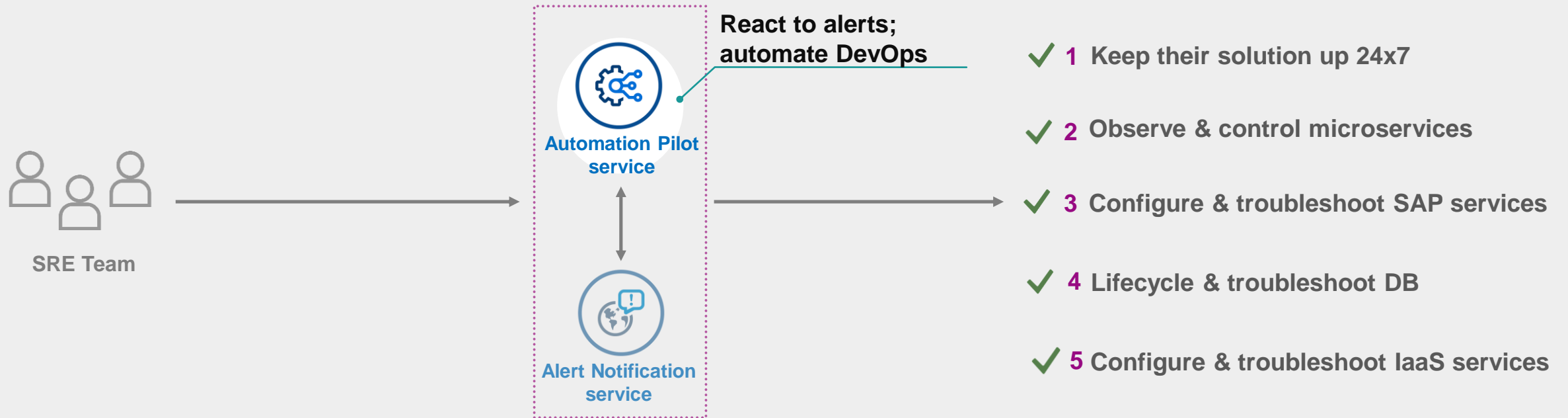
SAP Cloud Platform **Alert Notification**

Alerting



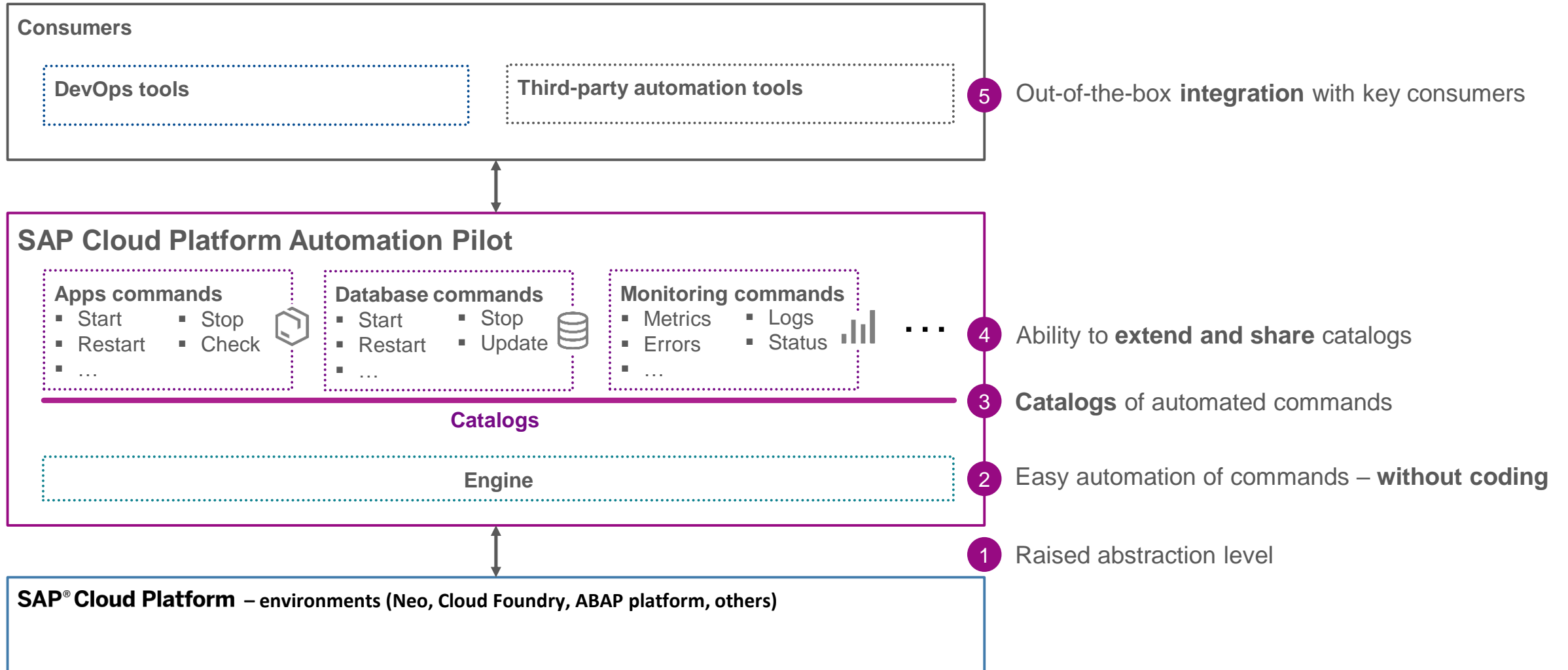
SAP Cloud Platform Automation Pilot

Ops automation



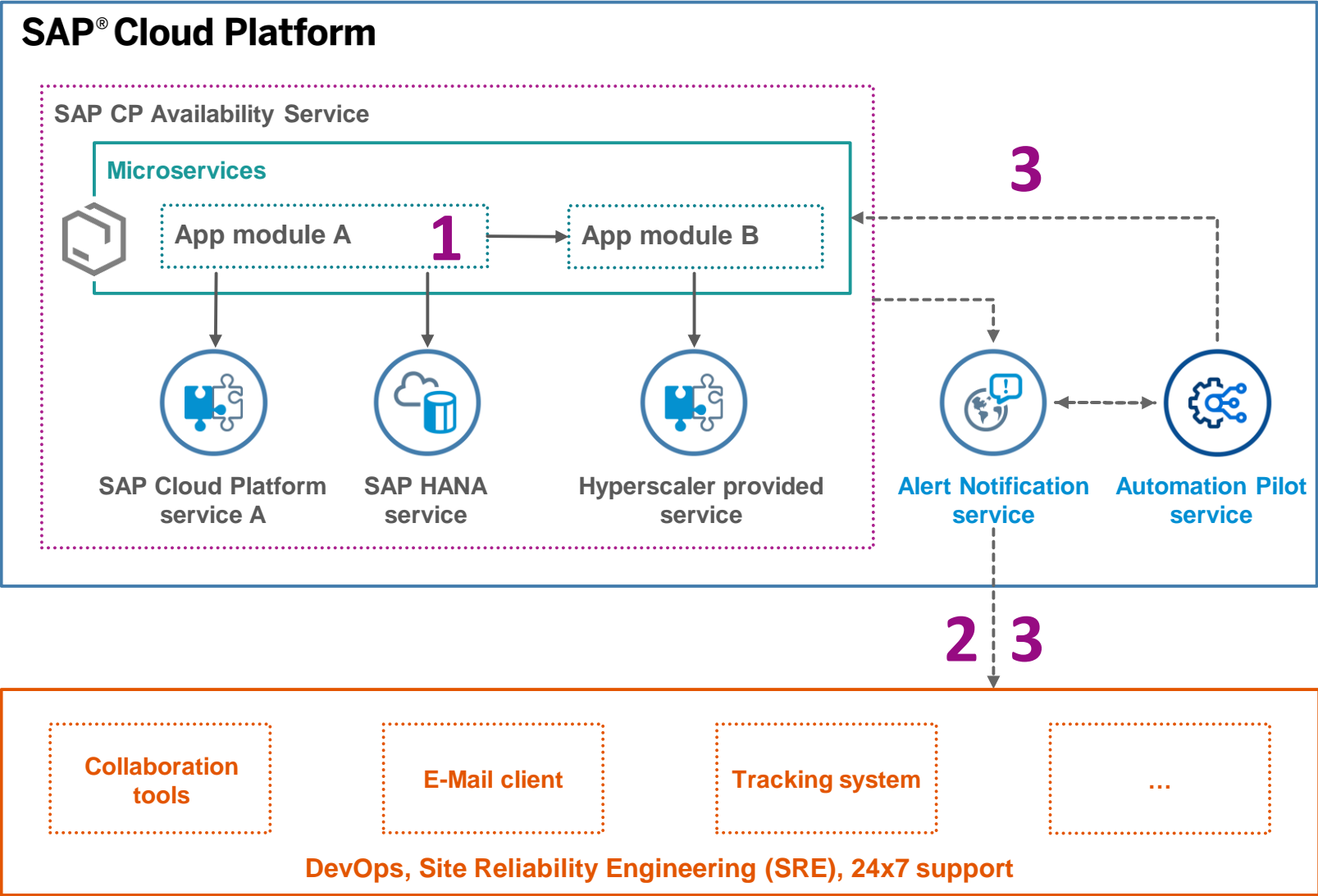
SAP Cloud Platform Automation Pilot

Ops automation



Example: complement alerts with automation

Ops automation

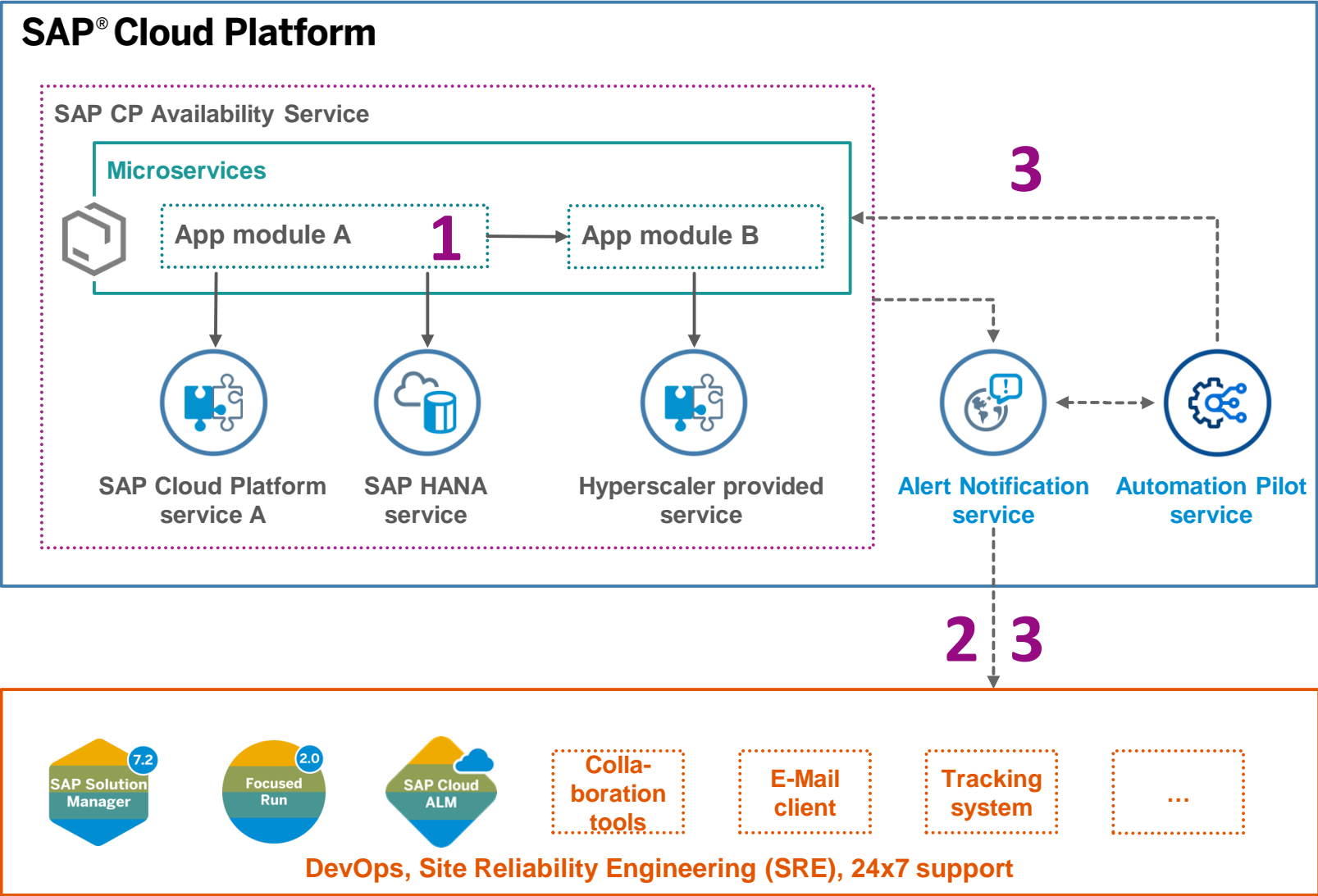


- 1 Event (e.g. service stops working)
- 2 Notify + trigger
- 3 Recover service + notify



Example: complement alerts with automation

Ops automation



- 1** Event (e.g. service stops working)
- 2** Notify + trigger
- 3** Recover service + notify



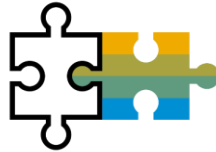
Monitor and operate your **hybrid** application

Hybrid supportability offerings

Hybrid supportability

Integration Monitoring

Ensure reliable data exchange between SAP on-premise and cloud



Trace Analysis

Trace performance of SAP Cloud Platform apps, based on exposed statistics



User Monitoring

Ensure availability and performance of SAP Cloud scenarios from customer on-premise locations



Exception Management

Forward business-critical exceptions from SAP Cloud to on-premise operations



SAP operations

Approach to extend towards **hybrid operations** from **on-premise center of gravity**

Hybrid supportability



Existing
on-premise ops



Upcoming
cloud scenarios

SAP® Cloud Platform



SAP operations

Hybrid supportability

Approach to extend towards **hybrid operations** from **on-premise center of gravity**



Existing
on-premise ops



Proposed approach:

Smooth the transition by extending existing on-premise ops processes with cloud aspects

- Retaining center of gravity around on-premise
- Optionally with defined hand-over from cloud-native processes



Upcoming
cloud scenarios

SAP® Cloud Platform

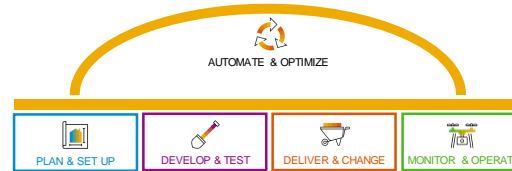


“Offers **hybrid** lifecycle management support”

SAP operations

Exemplary options to extend towards **hybrid operations**

Hybrid supportability



SAP® Cloud Platform

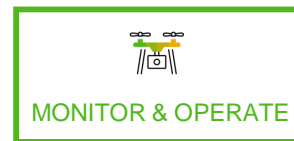
Proposed approach:

Smooth the transition by extending existing on-premise ops processes with cloud aspects

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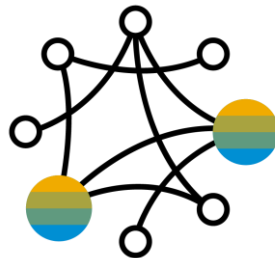
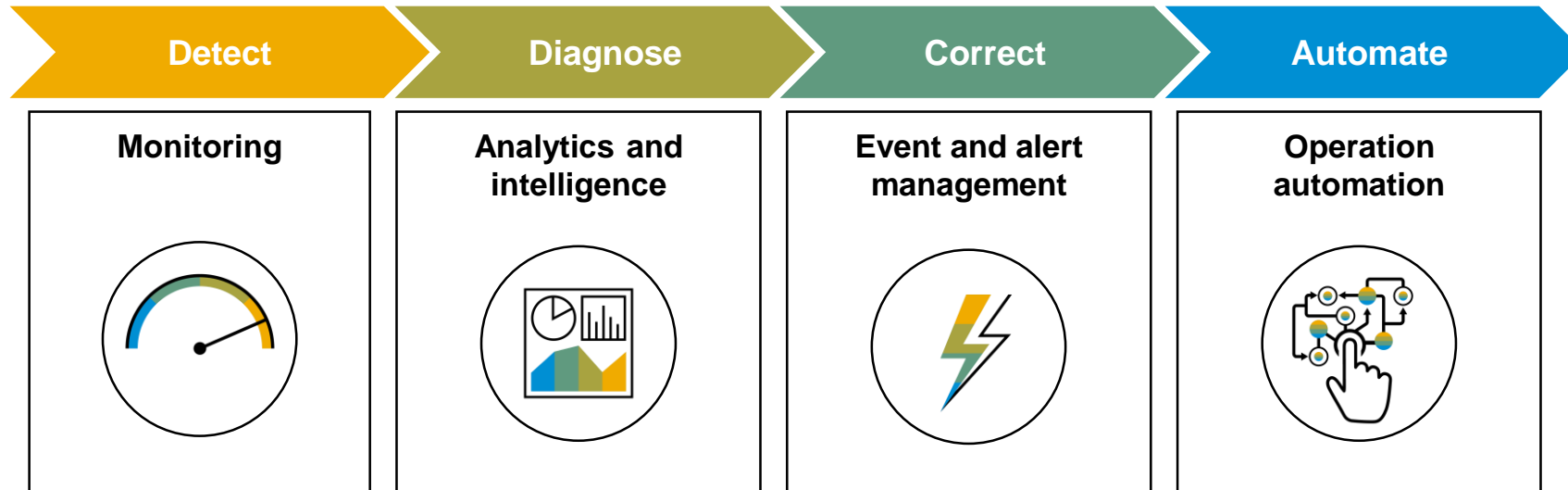
- Use **transport mgmt** – to integrate SAP CP into **change mgmt**, optionally with **defined hand-over from CI/CD** pipelines



- Forward SAP CP **alerts** towards SAP Solution Manager
- No-coding approach for technical **ops automation**
- **Hybrid supportability**

SAP Cloud ALM for operations

Hybrid supportability



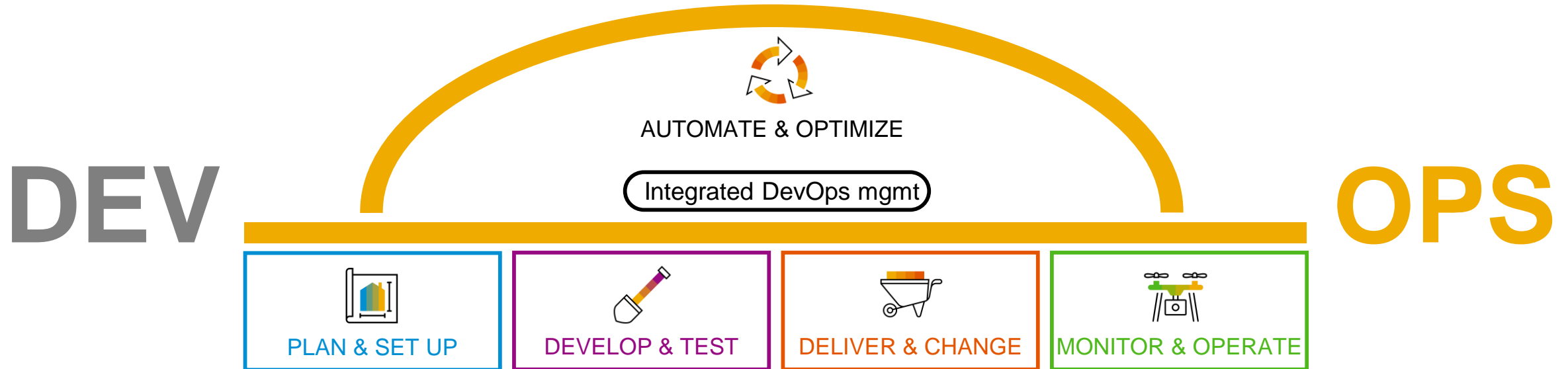
Deep dive on alerting and ops automation



Kiril Gavrailov
Product and development manager
SAP Labs Sofia

DevOps with SAP Cloud Platform

Automate & optimize



Automate & operate

Preview at planned service for integrated DevOps management

Outlook
Integrated DevOps mgmt

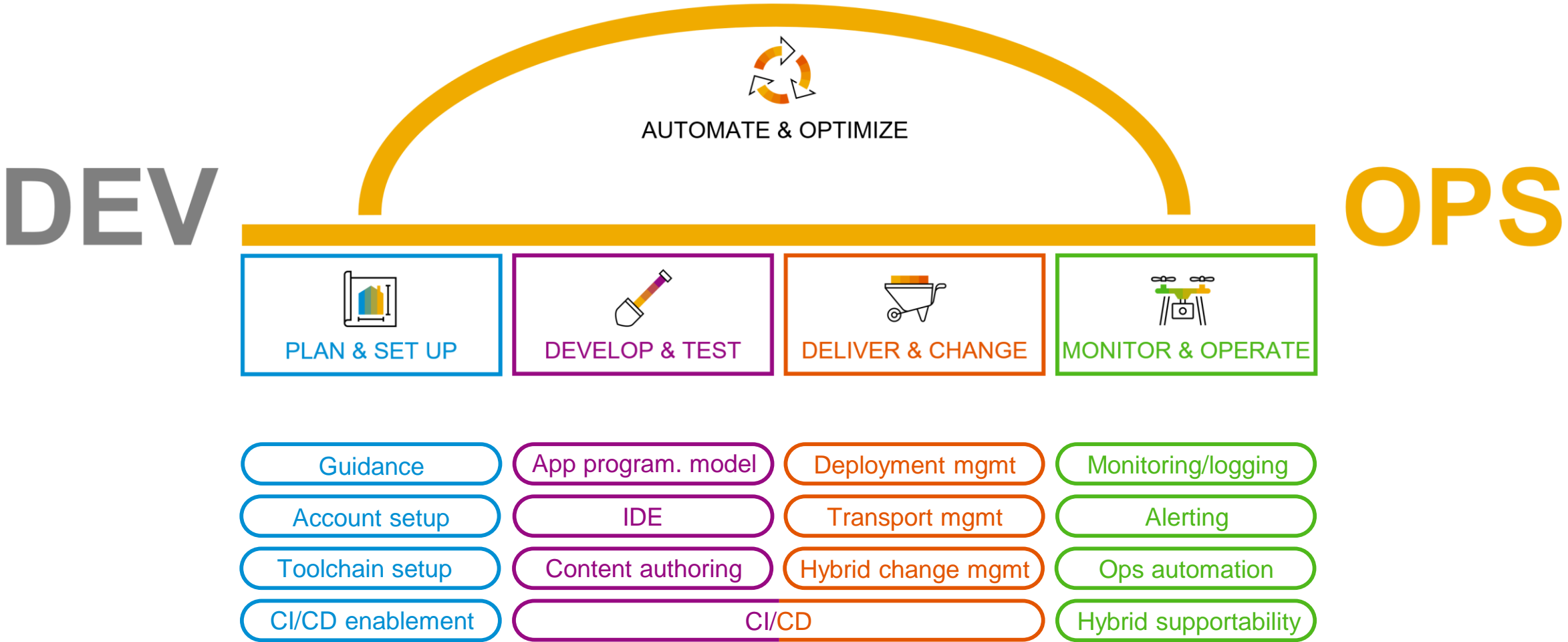
Mockup



Summary

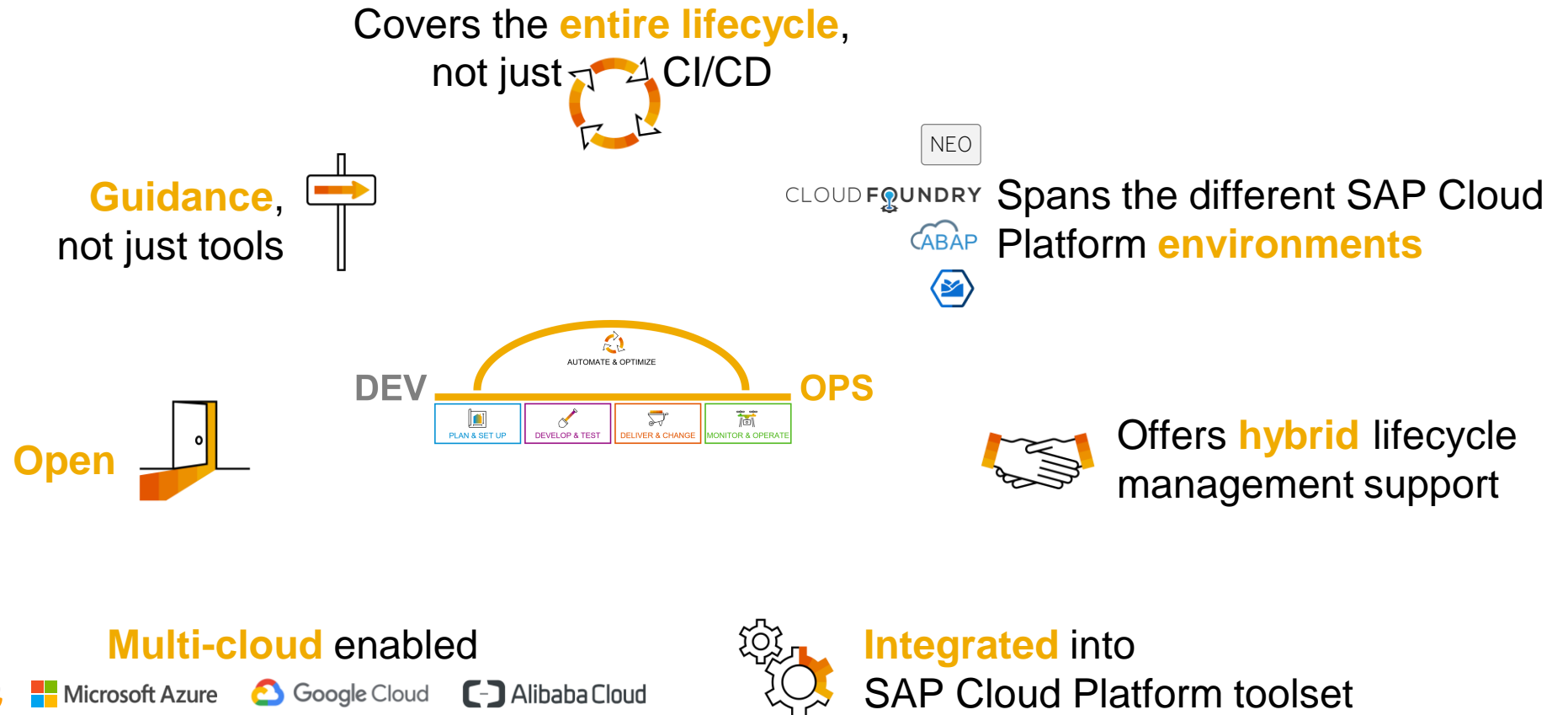


DevOps with SAP



DevOps with SAP Cloud Platform

Corner stones of our offering



Call to action



Learn more about DevOps with SAP:

- [DevOps SAP Community page](#)
- [gCTS documentation page](#) and central [SAP Note 2821718](#)
- [SAP Help Portal page about DevOps with SAP Cloud Platform](#)
- [Blog post series around efficient DevOps with SAP Cloud Platform](#)
- [Learning Journey – DevOps with SAP Cloud Platform](#)
- [Best Practices for SAP Cloud Platform guide](#)

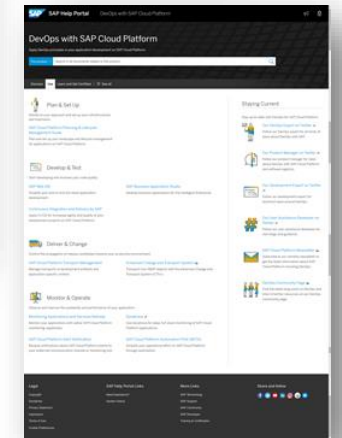
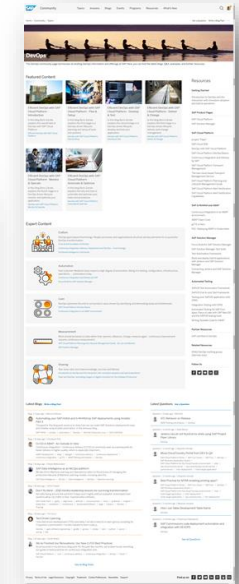
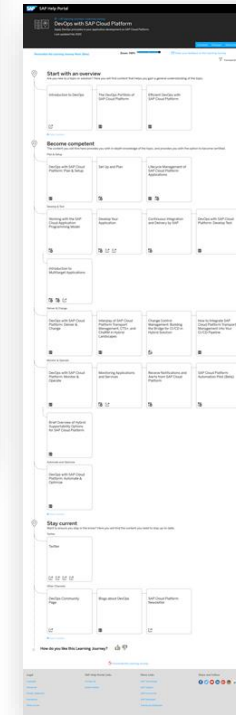


Try out our services on SAP Cloud Platform:

- Set up our services in the trial environment for [SAP Cloud Platform](#)
- Run our missions in SAP Cloud Platform Discovery Center (such as for [transport management](#))



Contribute to our [SAP Continuous Influence session](#)



SAP Continuous Influence

Are you missing any SAP Cloud Platform 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 Cloud Platform – Platform Foundation* session:

- Multi-cloud
- Security services
- CI/CD
- Lifecycle management

Thank you.

Contact information:

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