SAP HANA Cloud
Migration

Dominique Noth, SAP
December 2021

THE BEST RUN **SAP**

Agenda

Motivation

Process

Outlook and customer reference

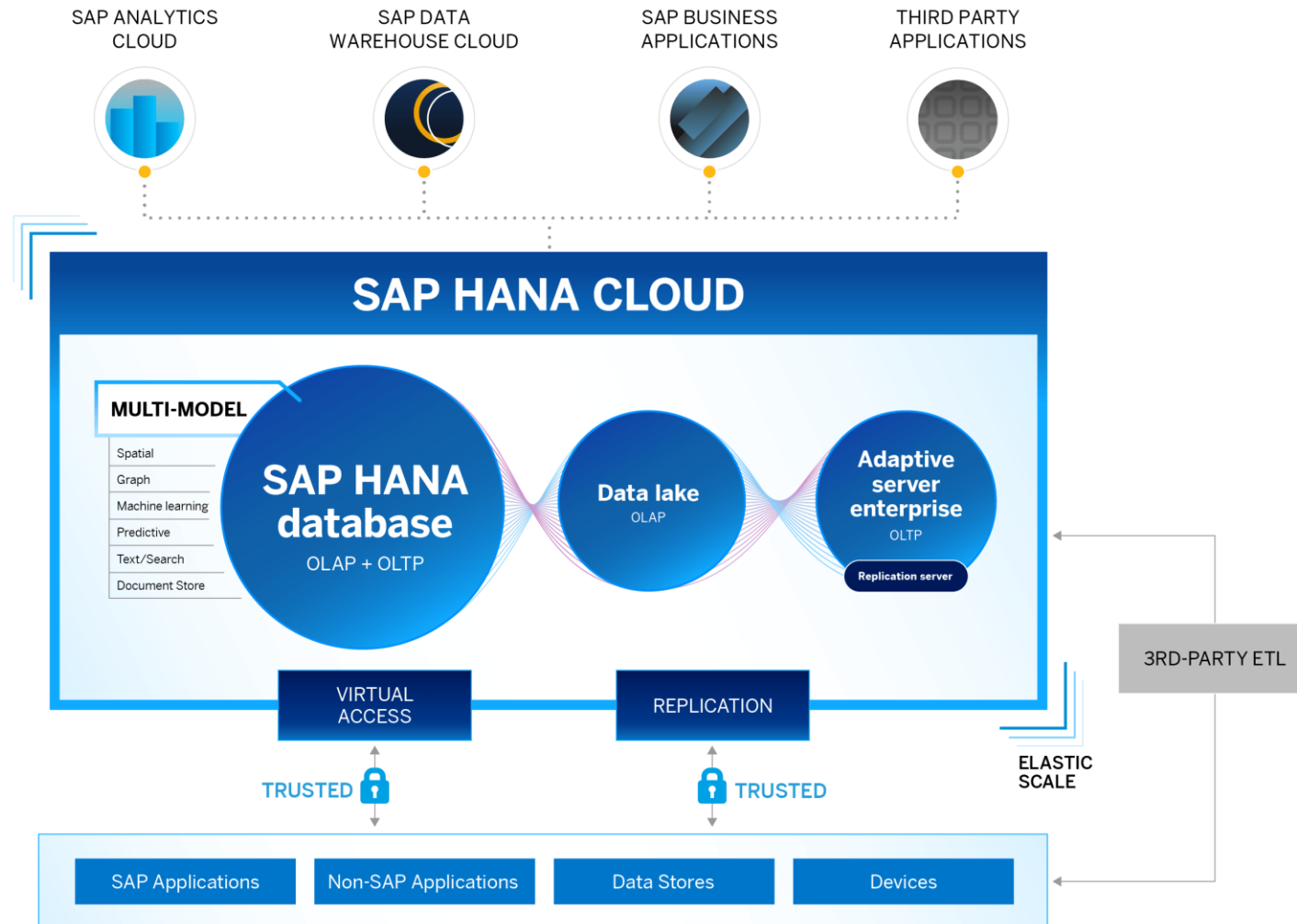Migration Factory Program

Migration Success Story – SAP Cloud ALM

Further information

Migration motivation

SAP HANA Cloud | Architecture

SAP ANALYTICS CLOUD

SAP DATA WAREHOUSE CLOUD

SAP BUSINESS APPLICATIONS

THIRD PARTY APPLICATIONS

SAP HANA CLOUD

MULTI-MODEL
- Spatial
- Graph
- Machine learning
- Predictive
- Text/Search
- Document Store

SAP HANA database
OLAP + OLTP

Data lake
OLAP

Adaptive server enterprise
OLTP

Replication server

VIRTUAL ACCESS

REPLICATION

3RD-PARTY ETL

TRUSTED

TRUSTED

ELASTIC SCALE

SAP Applications

Non-SAP Applications

Data Stores

Devices

SAP HANA Cloud | Motivation
Benefits of moving to SAP HANA Cloud

Scalability
Flexible Upsizing and Downsizing

BTP
Fully integrated within our Business Technology Platform

HA/DR
High Availability features with Disaster Recovery capabilities

Flexible
Fully flexible managed cloud service

Multi-Model
Use ML/AI, Graph, Doc Store, Geospatial with HANA Cloud

TCO/ROI
Faster ROI and continuous reduced TCO with HANA Cloud

SAC
Support of Live Connection with SAP Analytics Cloud

SCC
Support of SAP Cloud Connector with HANA Cloud

Data Lake
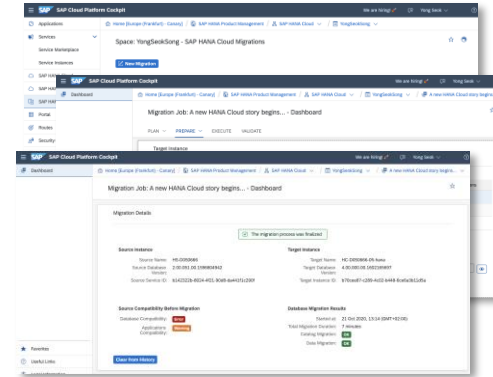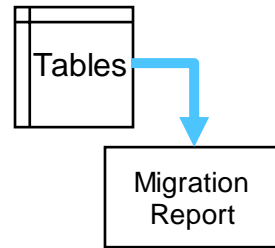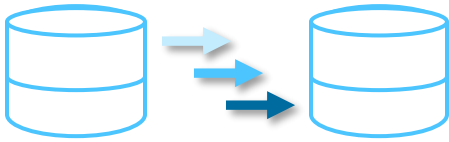Rapid provisioning of Petabyte scale storage

Hybrid
Hybrid Cloud architecture with on-premise and cloud data sources

Future proof
Long-term support for HANA Cloud and regular delivery of innovative features
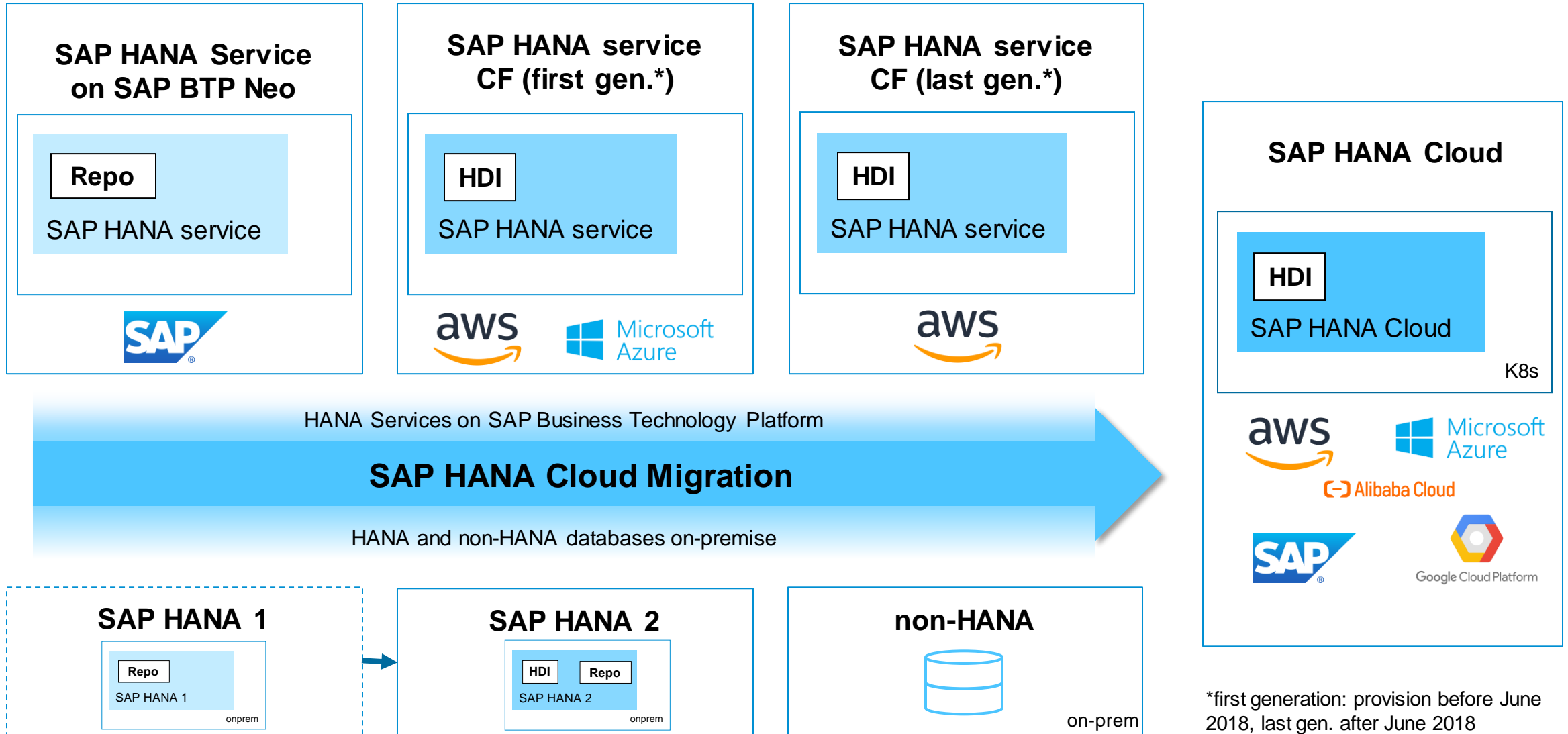
SAP HANA Cloud | Motivation
Enablers for SAP HANA Cloud Migration

- Automates key migration tasks to reduce the cost and effort of migration

- Reduces uncertainty and helps to plan/prepare for migration by identifying potential issues upfront

- Self-service tool provided as a service (free of charge) through SAP Business Technology Platform

- No additional storage needed. SAP manages the temporary storage for export and import.
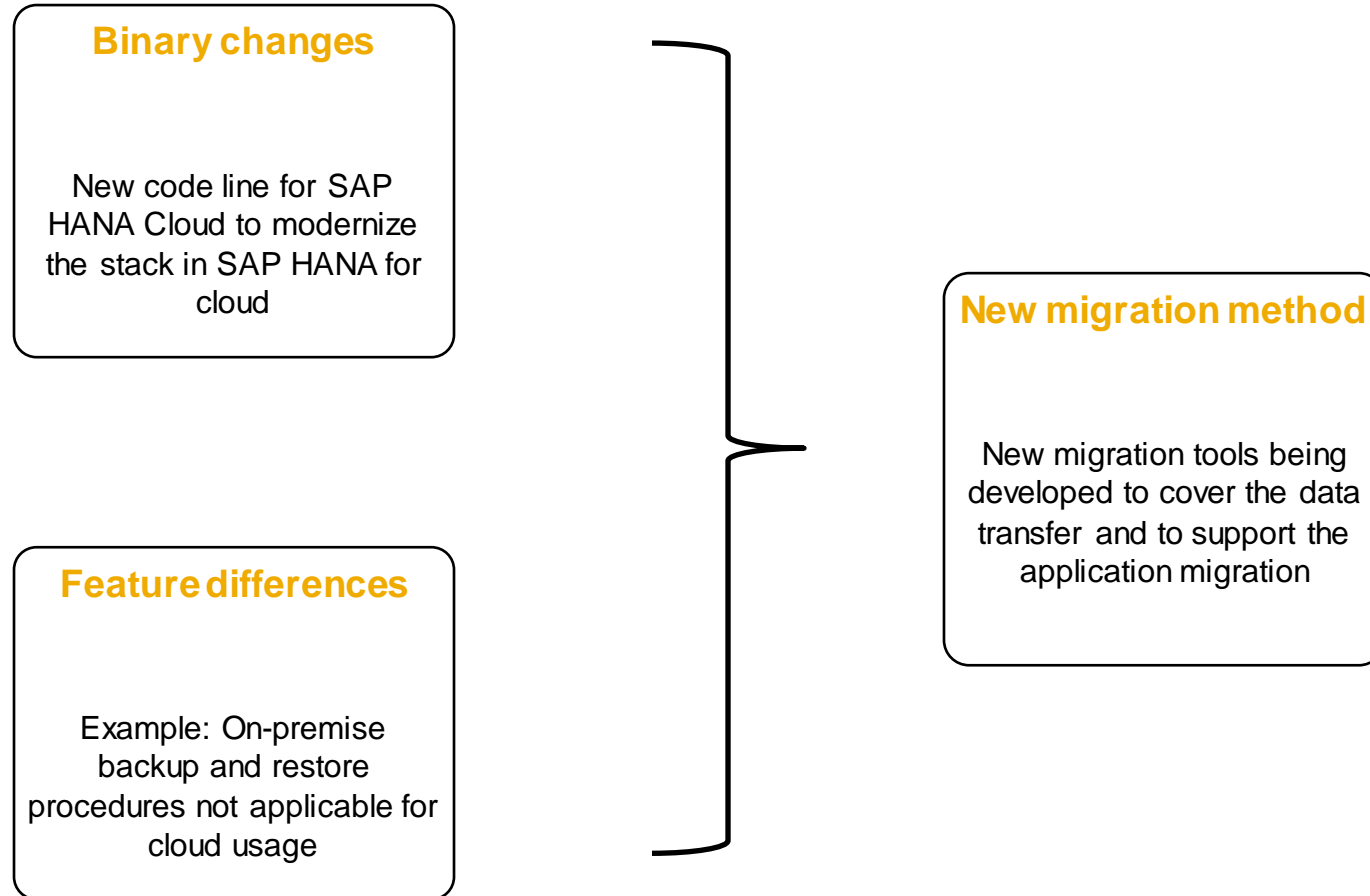
SAP HANA Cloud | Migration scenarios to SAP HANA Cloud
Overview

SAP HANA Service on SAP BTP Neo

> Repo
>
> SAP HANA service

SAP

SAP HANA service CF (first gen.*)

> HDI
>
> SAP HANA service

aws   Microsoft Azure

SAP HANA service CF (last gen.*)

> HDI
>
> SAP HANA service

aws

SAP HANA Cloud

> HDI
>
> SAP HANA Cloud

K8s

aws   Microsoft Azure

Alibaba Cloud

SAP   Google Cloud Platform

HANA Services on SAP Business Technology Platform

SAP HANA Cloud Migration

HANA and non-HANA databases on-premise

SAP HANA 1

> Repo
>
> SAP HANA 1
>
> onprem

SAP HANA 2

> HDI   Repo
>
> SAP HANA 2
>
> onprem

non-HANA

on-prem

*first generation: provision before June 2018, last gen. after June 2018

SAP HANA Cloud | Why is a migration tool even necessary?
Reasons

Binary changes

New code line for SAP HANA Cloud to modernize the stack in SAP HANA for cloud

Feature differences

Example: On-premise backup and restore procedures not applicable for cloud usage

New migration method

New migration tools being developed to cover the data transfer and to support the application migration

SAP HANA Cloud | Which features are changed, removed, or will be replaced?
Overview

TREXViaDBSL

Legacy interface to communicate Non-Relational Query plans from ABAP to SAP HANA coming from the TREX times, to be replaced by SQL and/or specialized stored procedures

UPDATE FROM

Replace MERGE INTO statement with UPDATE FROM statement

Fulltextindex (FTI)

FULLTEXT index and TEXT/BINTEXT/SHORTTEXT data types is removed

virus-scanner (embedded into Repo)

Virus-scanner integration for repository in SAP HANA, no longer needed after Repository deprecation

SQLScript V1 & V2

Old versions of stored procedure language, replaced by successor version V3

Webdispatcher

HTTP request load balancer

Data type ALPHANUM

Specialized datatype used by the NGAP and stack for SAP Business ByDesign

SLD integration

Provides support for SAP on premise tools, not required in the cloud

History tables

Legacy functionality allowing simple timetravel functionality. Alternative: system versioning tables

XSC

Old JavaScript application server embedded in SAP HANA, deprecated several years ago to be replaced by advanced functionality in Cloud Foundry

. . . and more!

Migration process

SAP HANA Cloud | SAP HANA Service CF to SAP HANA Cloud
Scenario

SAP Business Technology Platform - Cloud Foundry

Internal Orchestration Cluster (K8s)

HANA Cluster (K8s)

HDI

SAP HANA Service

first & last gen.

1. PLAN: Check

Self-Service Migration for SAP HANA Cloud

2. PREPARE: Select target

HDI

SAP HANA Cloud

K8s

4. VALIDATE: Check

3.1. EXECUTE:
Export Data
Export HDI

Cloud data store

3.2. EXECUTE:
Import Data
Import HDI

Service broker

HDI binding

Application binding

HDI re-binding

Application

Application

Application

SAP HANA Cloud | Severity of compatibility checks
Color Code

RED – Error:

- Breaking changes, unsupported objects won't get migrated, because they can't be created in the target system, e.g. Fulltextindex, History Tables, XSC ...
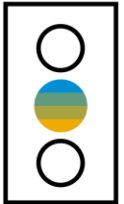
YELLOW – Warning:

- The schema objects reported may continue to work, but they may need extensive validation testing after migration.

- Issues, where replacements are available, i.e. "UPDATE FROM"
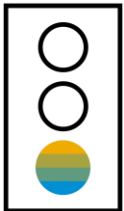
GREEN – Info:

- Informational issues: These objects won't impact the migration but there are changes, which might have no or low impact on the database or application.

Like in every migration project, validation tests after migration are highly recommended.

Migration outlook and customer reference

SAP HANA Cloud | HANA Cloud Migration Self-Service
Planned as of Q4 2021

SAP Business Technology Platform, SAP HANA Service on Cloud Foundry
(provisioned **after** 4th June 2018)

SAP Business Technology Platform, SAP HANA Service on Cloud Foundry
(provisioned **before** 4th June 2018)

SAP Business Technology Platform, SAP HANA Service on Neo

SAP Business Technology Platform, SAP HANA Service on Alibaba Cloud

SAP HANA 2.0 (onprem)

HANA Cloud Migration Service

Released

Released

Planned Q1 2022*

Planned 2022

Planned 2022

SAP HANA Cloud
(available since 27th March 2020)

*aspired
First version only supports data migration.

SAP HANA Cloud | Customer references
Migration from SAP HANA service (on Cloud Foundry) to SAP HANA Cloud
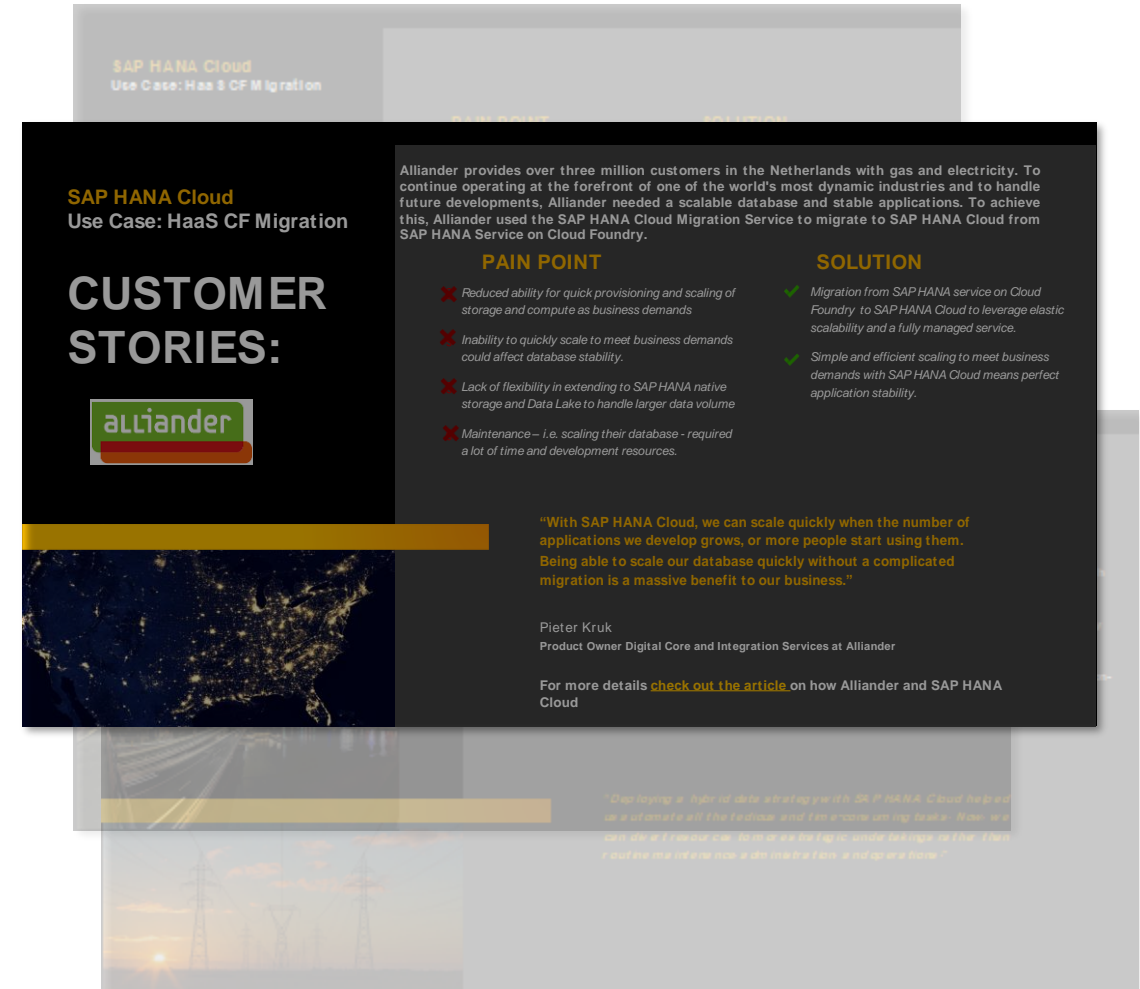
Source: SAP Business Technology Platform, SAP HANA service, on Cloud Foundry

Target: SAP HANA Cloud

Tool: Cloud migration service with partial support of SAP Database Migration Factory tools

Benefits:

- Migration from the SAP HANA service on Cloud Foundry to SAP HANA Cloud to leverage elastic scalability and a fully managed service

- Simple and efficient scaling to meet business demands with SAP HANA Cloud for perfect application stability

- Data lake providing hot and cold data capabilities that keep costs down and offers high performance

- Separated and independent compute and storage, support for scale up or down, consumption-based pricing where charges are calculated based on actual usage of resources and services

SAP HANA Cloud | SAP Cloud Solutions migrate to SAP HANA Cloud

- SAP Commerce Cloud

- SAP Sales Cloud, SAP Service Cloud

- SAP Data Warehouse Cloud

- SAP Integrated Business Planning

- SAP Analytics Cloud

- UI5 flexibility

- SAP Cloud ALM

- SAP BTP Workflow Management

- SAP Internet of Things

- SAP BTP API Management, partner-managed edition

- SAP BTP, ABAP environment

- SAP BTP Mobile Services

- SAP Web Analytics

- And many more . . .

Migration Migration Factory Program

SAP HANA Cloud | SAP Database Migration Factory Program
Program Overview

Program Objectives — Simplify adoption of SAP HANA Cloud for customers running SAP HANA Service (CF/Neo) (or) on-premise SAP HANA (or) any non-SAP app's database.

- Predictable end to end migration implementation with SAP Consulting / SAP approved SI Partners

- Demonstrate product capabilities, migration feasibility and superior performance

- Reduce manual efforts with HANA Cloud Database Migration tools from SAP

06 Fixed Price Proposal from Partners

05 DB Migration POC or Prototype

360°

Global Database Migration Factory Team

04 DB Migration Automation

03 End to end To-be Architecture

02 Migration Scoping, Sizing & Estimations

01 Business Case
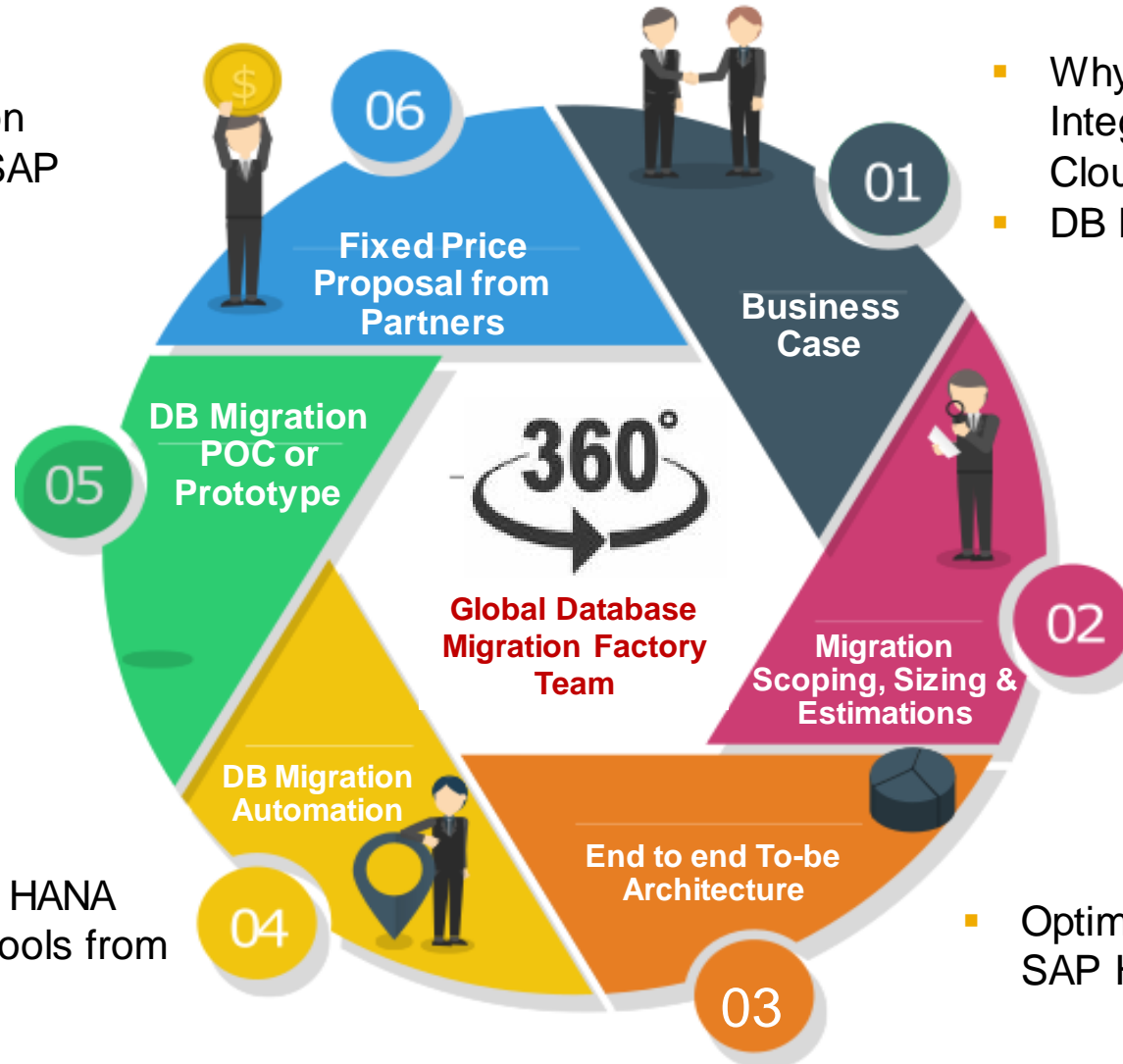
- Why migrate to next generation Integrated solution on SAP HANA Cloud
- DB Migration TCO/ROI

- Database, Application and Infrastructure Assessment
- SAP HANA Cloud Sizing

- Optimize and simplify architecture with SAP HANA Cloud

SAP HANA Cloud | White-Glove HANA Cloud Migration Services
Offering Assessment

White-Glove migration service is a no-cost **service** offering from SAP to **selected customers** to **simplify and accelerate** migration of SAP HANA Service (CF/Neo) and/or SAP HANA on-premise to SAP HANA Cloud.

Review and Optimize Architecture

Migrate Database and Data

Migrate / Remediate native CF/Neo apps.

SAP ERP, Interfaces & *3rd party apps

*3rd Party Apps, subject to Vendor supporting SAP HANA Cloud

SAP Database Migration Factory
Virtual Team (SAP Managed
Contractor Resources)

SAP Product Team,
COE
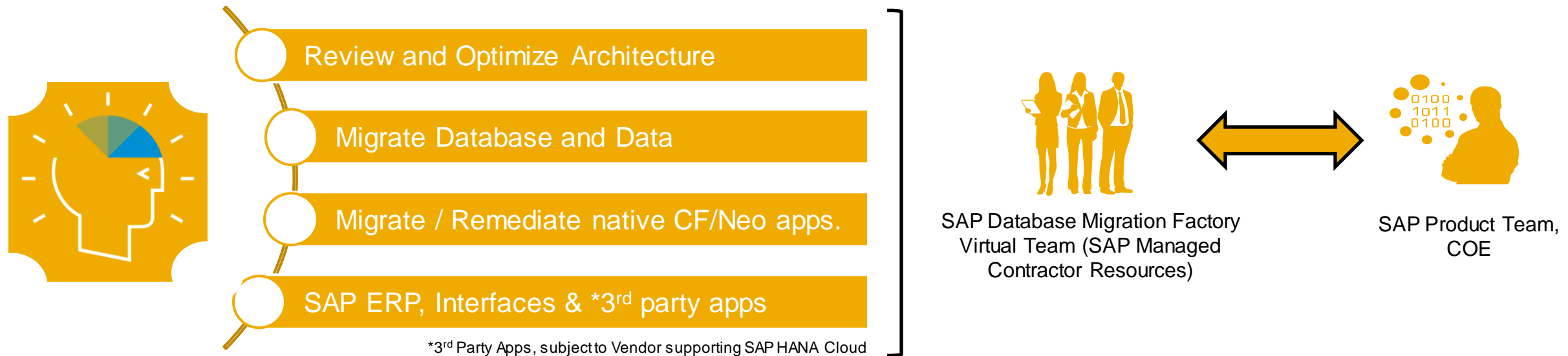
Migration Success Story
SAP Cloud ALM

What is SAP Cloud ALM
Positioning

Positioning

- SAP Cloud ALM is THE Application Lifecycle Management solution for the Intelligent Suite

- Customers with Enterprise Support Cloud Edition are entitled to consume SAP Cloud ALM

- SAP Cloud ALM is free of charge for the customer as long the application is being used by fair means (8 GB for free, if more memory is consumed, it is charged via CPEA)
  - For Details please see Support Portal pages at https://support.sap.com/en/alm/sap-cloud-alm.html

- SAP Cloud ALM is in General Availability since August 30, 2020, currently 600 customers

What is SAP Cloud ALM
Positioning – SAP Cloud ALM is Cloud Native and Open to Extend and Integrate with Partners

SAP Cloud ALM – Capabilities

Operations

| Performance Management & User Monitoring | Integration Monitoring & Application Monitoring | Alert Management & Operation Automation | Business Process Monitoring & Improvement |

Cloud Service Delivery

Built-In Support with CoPilot

Implementation

| Process Management | Task Management | Test Management | Deploy Management |

SAP Cloud ALM integrates with

API Hub
- Monitoring
- IT Service Management
- People Enablement
- Collaboration
- Task Management
- Deployment tools
- Test automation
- Document Management

SAP Business Technology Platform   Platform services and Data management

CLOUD FOUNDRY

Migration to HANA Cloud for SAP Cloud ALM
Motivation

Data Center Strategy

- SAP Cloud ALM development started in 2019 and we decided to go for an open stack

- At that time there was no HANA Cloud available but HANA as a Service exclusively

- We decided to offer SAP Cloud ALM to our customers on several hyperscaler (AWS, Azure, Alibaba Cloud, …)
  - Since on Azure there is no SAP HANA Service, and we don't run SAP Cloud ALM on different hyperscaler with different database codelines, migration on AWS from HaaS to HANA Cloud was required

Further reasons to move to HANA Cloud

- HANA Cloud will offer better horizontal scaling options

- Future enhancements like Tenant Move, HANA Serverless, …

- HANA Cloud is expected to have lower TCO than SAP HANA Service

Migration to HANA Cloud for SAP Cloud ALM

Technical Migration

Technical Setup of SAP Cloud ALM in EU10

- SAP Cloud ALM consists of 50 micro services

- Data separation of customer data is implemented with schema separation

- For resilience reasons, SAP Cloud ALM runs one HDI container per customer per micro service, distributed on 8 HANA instances (depending on the load and the expected data size);

Migration to HANA Cloud for SAP Cloud ALM
Technical Migration

Technical migration for SAP Cloud ALM

- The technical migration in SAP Cloud ALM in production environment in Data Center

  AWS Frankfurt / EU10 happened on September 06

Migration further information

SAP HANA Cloud | Links and further information

- SAP Help – SAP HANA Cloud Compatibility and Migration Information: https://help.sap.com/viewer/3c53bc7b58934a9795b6dd8c7e28cf05/latest/en-US/7b9c7b1b7fbe42358d4d75cc17e29e26.html

- SAP Note 2937069 - SAP HANA Cloud Migration FAQ: https://launchpad.support.sap.com/#/notes/2937069

- SAP HANA Cloud – Getting Started: https://help.sap.com/viewer/db19c7071e5f4101837e23f06e576495/2020_03_QRC/en-US/d0aa0ec935c1401e8deb3be35d49730b.html

- Overview: https://www.sap.com/products/hana/cloud.html

- Onboarding: https://www.sap.com/documents/2021/09/7476f8c4-f77d-0010-bca6-c68f7e60039b.html

- Trial: https://www.sap.com/products/hana/cloud-trial.html

Thank you.

Contact information:

Dominique Noth
SAP HANA Product Management

Follow us

www.sap.com/contactsap

THE BEST RUN SAP

Migration service-instances

Service Instance Migration | Options

Before migration
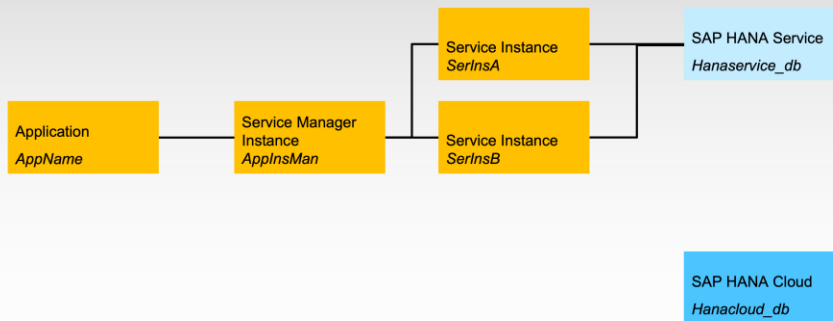
Nonmanaged schema plan migration
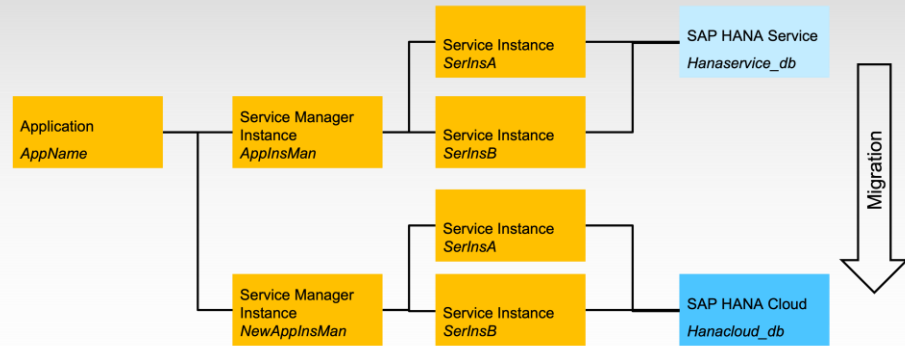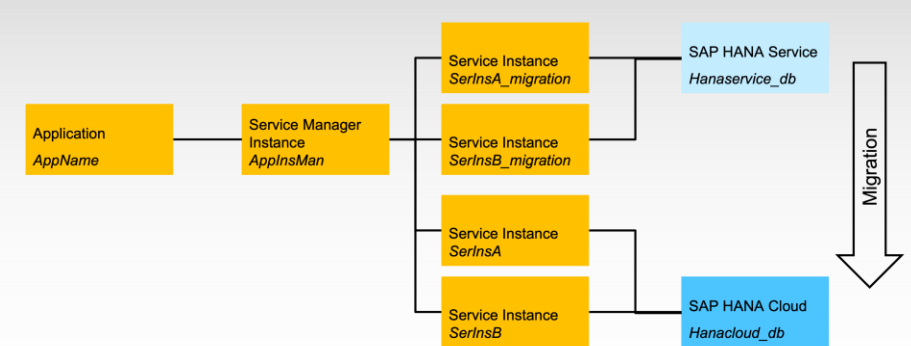
Creating a new service-manager instance

Using the existing service-manager instance

What is SAP Cloud ALM
Positioning – SAP Cloud ALM is Cloud Native and Open to Extend and Integrate with Partners

SAP Cloud ALM – Capabilities

- Performance Management & User Monitoring
- Integration Monitoring & Application Monitoring
- Alert Management & Operation Automation
- Business Process Monitoring & Improvement

Cloud Service Delivery

Built-In Support with CoPilot

- Process Management
- Task Management
- Test Management
- Deploy Management
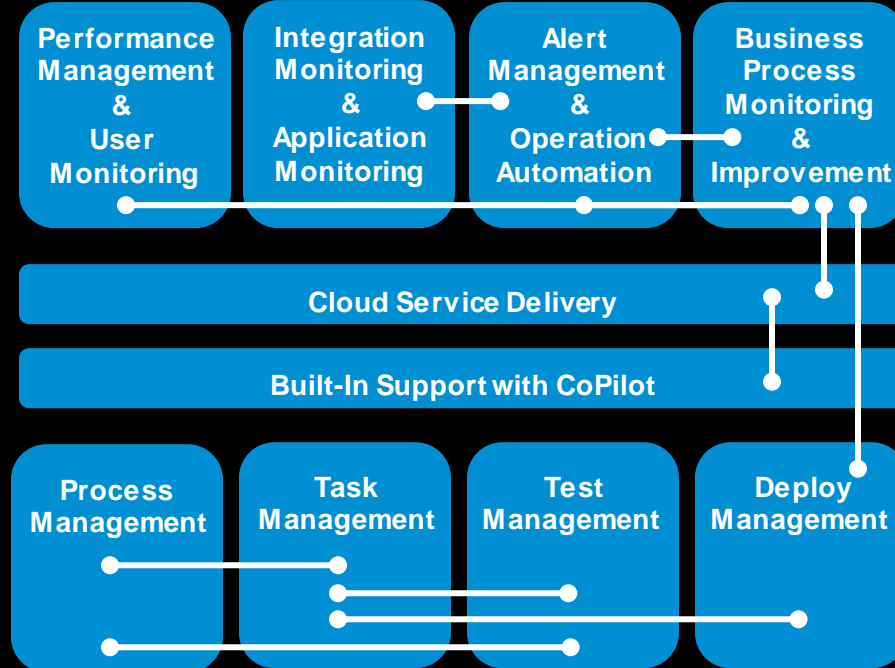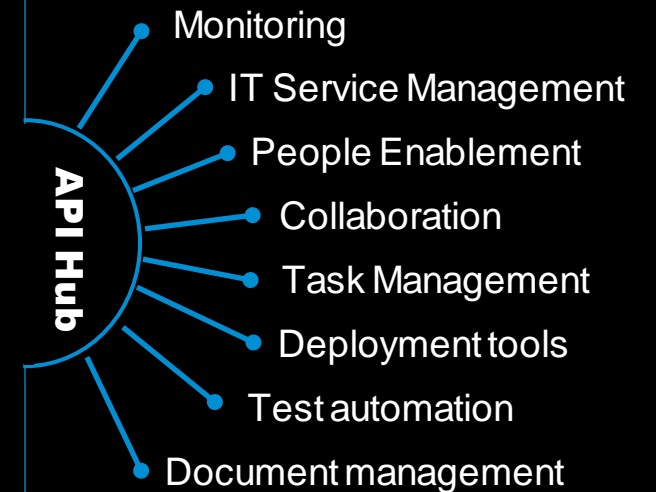
SAP® Cloud Platform
Platform services and Data management
CLOUD FOUNDRY

SAP Cloud ALM integrates with

API Hub

- Monitoring
- IT Service Management
- People Enablement
- Collaboration
- Task Management
- Deployment tools
- Test automation
- Document management

Migration to HANA Cloud for SAP Cloud ALM

Microsoft Azure

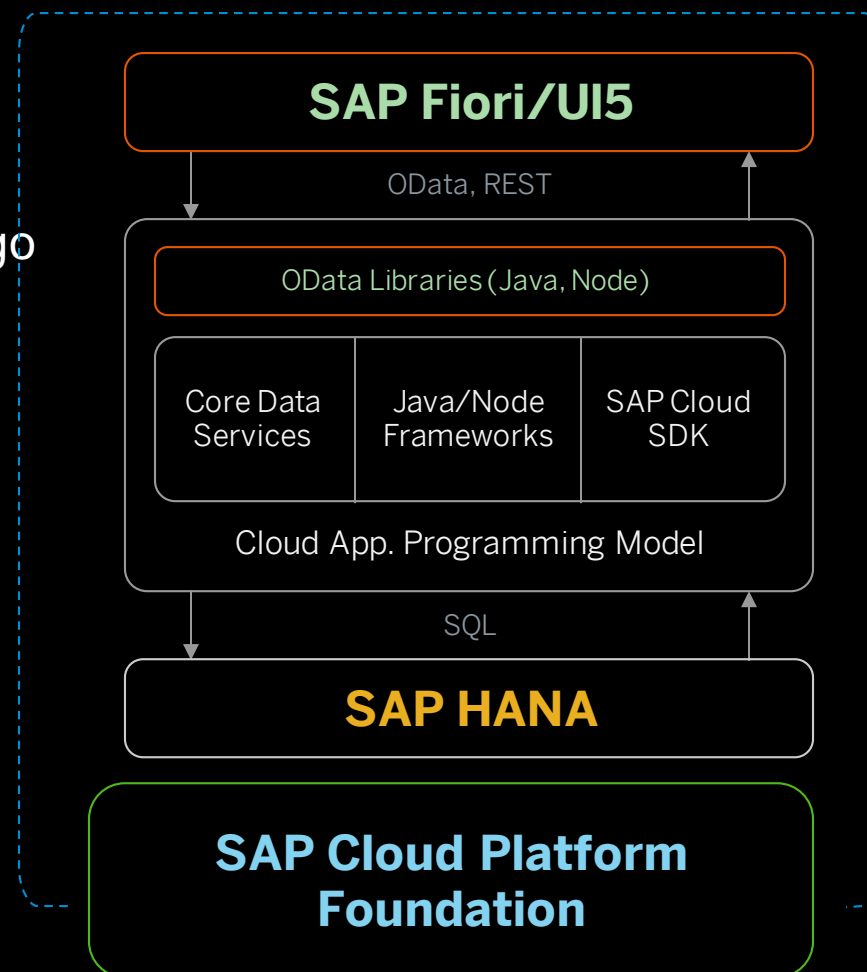## Motivation

Data Center Strategy

- SAP Cloud ALM development started in 2019 and we decided to go for the Open & Opinionated Stack

- At that time there was no HANA Cloud available but HANA as a Service exclusively

- We decided to offer SAP Cloud ALM to our customers on several hyperscaler (AWS, Azure, Alibaba Cloud, …)
  - Since on Azure there is no HaaS, and we don't run SAP Cloud ALM on different hyperscaler with different database codelines, migration on AWS from HaaS to HANA Cloud was required

Further reasons to move to HANA Cloud

- HANA Cloud will offer better horizontal scaling options
- Future enhancements like Tenant Move, HANA Serverless, …
- HANA Cloud is expected to have lower TCO than HaaS

CXS Cloud Stack
Open & Opinionated

SAP Fiori/UI5

OData, REST

OData Libraries (Java, Node)

| Core Data Services | Java/Node Frameworks | SAP Cloud SDK |

Cloud App. Programming Model

SQL

SAP HANA

SAP Cloud Platform Foundation

aws   Alibaba Cloud

Migration to HANA Cloud for SAP Cloud ALM
Technical Migration

Technical Setup of SAP Cloud ALM in EU10

- SAP Cloud ALM consists of 50 micro services

- Data separation of customer data is implemented with schema separation

- For resilience reasons, we run one HDI container per customer per micro service, distributed on 8 HANA instances (depending on the load and the expected data size)

HANA Instance	DB Size in GB	HDI Container
prod-hdb-ops-im-01	159	474
prod-hdb-x-cross-01	67	4740
prod-hdb-imp-cross-01	34	4740
prod-hdb-ops-bm-01	20	474
prod-hdb-ops-perfmon-01	9	474
prod-hdb-x-infrastructure-01	9	2370
prod-hdb-ops-jm-01	4	474
prod-hdb-ops-hm-01	3	474