SAP Product Road Map
SAP Internet of Things

Road Map Revision: 2015.09.28

Customer

SAP

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Introduction to product road maps

Purpose

Product road maps are designed to support the product adoption planning activities of SAP customers. A product road map helps a customer match short term and long term goals with technology plans.

A product road map describes how the feature / function capabilities in an SAP product or technology are planned to progress over time, in general:

- Today = changes in the current release version
- Planned Innovations = changes planned in one or more upcoming development releases (up to 12-18 months).
- Future Direction = proposed themes for a product or technology beyond the planned releases

Complementary resources

For a more general description of the business problems / processes being solved and supported by SAP, refer to Solution Road maps.

For more detailed technical information please refer to the Product Availability Matrix, Ramp-up Knowledge Transfer materials and product documentation.

Table of contents

Product Overview

- Product description
- Solution Architecture
- Road map overview and major product updates

Product Road Map

- Today
- Planned
- Future

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Product Overview

- Product description
- Solution architecture
- Road map overview and major product updates

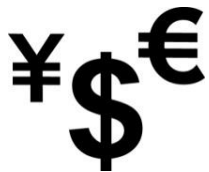# The world is getting more and more connected
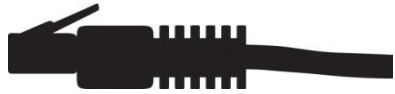
50 billion

devices connected by 2020*

40-50%

CAGR for M2M market until 2020*

-80%

price of sensors, microprocessors and wireless technologies today vs. 4 years ago**

* Source: Gartner – "Top 10 Tech Trends   ** Source: Economist Intelligence Unit – "The Rise of the Machines"

Market realities are forcing the need for **business transformation**

Evolving expectations

US$**6.2**T
Global worth of Internet of Things technology by 2025[1]

Hyper-connectivity

>**2.8**B
Internet users worldwide[2]

Business complexity

90%
Of the world's data generated in the last two years[3]

Accelerating Pace of Business

<**15** years
Average lifespan on the Fortune Global 500[4]

US$**41**T
World trade of goods and services by 2020, nearly two and half times more than 2010[5]

US$**14.4**T
Value created by the "Internet of Everything" from 2013 to 2022[6]

Sources:
[1] "15 Mind-Blowing Stats About The Internet Of Things" Giselle Abramovich, CMO.com, April 2015
[2] Kleiner Perkins Caufield Byers, Internet Trends 2015, May 2015
[3] "Big Data, For Better or Worse: 90% of the World's Data Generated in the Last Two Years," ScienceDaily, May 2013
[4] "Peggy Noonan on Steve Jobs and Why Big Companies Die," Steve Denning, Forbes, November 2011
[5] "Trading Places: The emergence of new patterns of international trade," Ernst & Young, 2011"
[6] "Embracing the Internet of Everything," Cisco, February 2013

SAP Internet of Things (IoT)
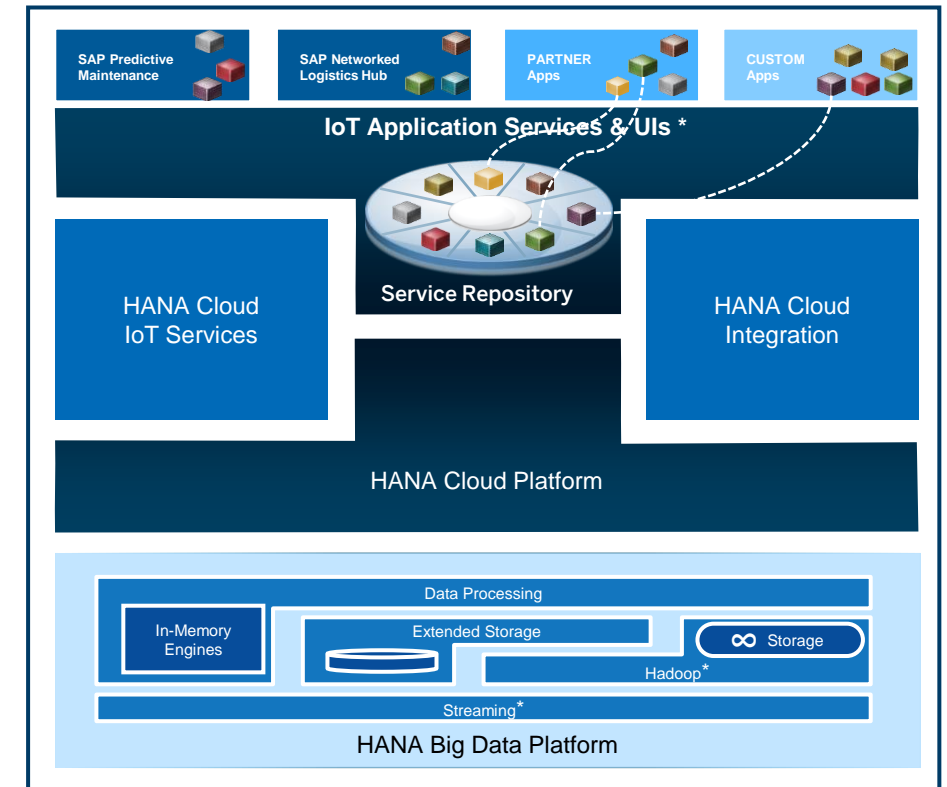## Product description

The world is becoming smarter with the digital economy and this is influencing companies in dramatic ways. The number of connected things is expected to grow to 50 billion by 2020.

While costs of sensors and wireless technologies are deteriorating, SAP Internet of Things enables customers to:

- Connect their machines and smart devices with a powerful IoT platform
- Analyze data in real time
- Leverage this information across the value chain to get new business insights

Based on the powerful integration with S/4HANA, SAP provides end to end solutions enabling new business models and smart services which have not been possible before.

This will help companies to leverage big data and new technologies to change everything from product design to how customers are served.
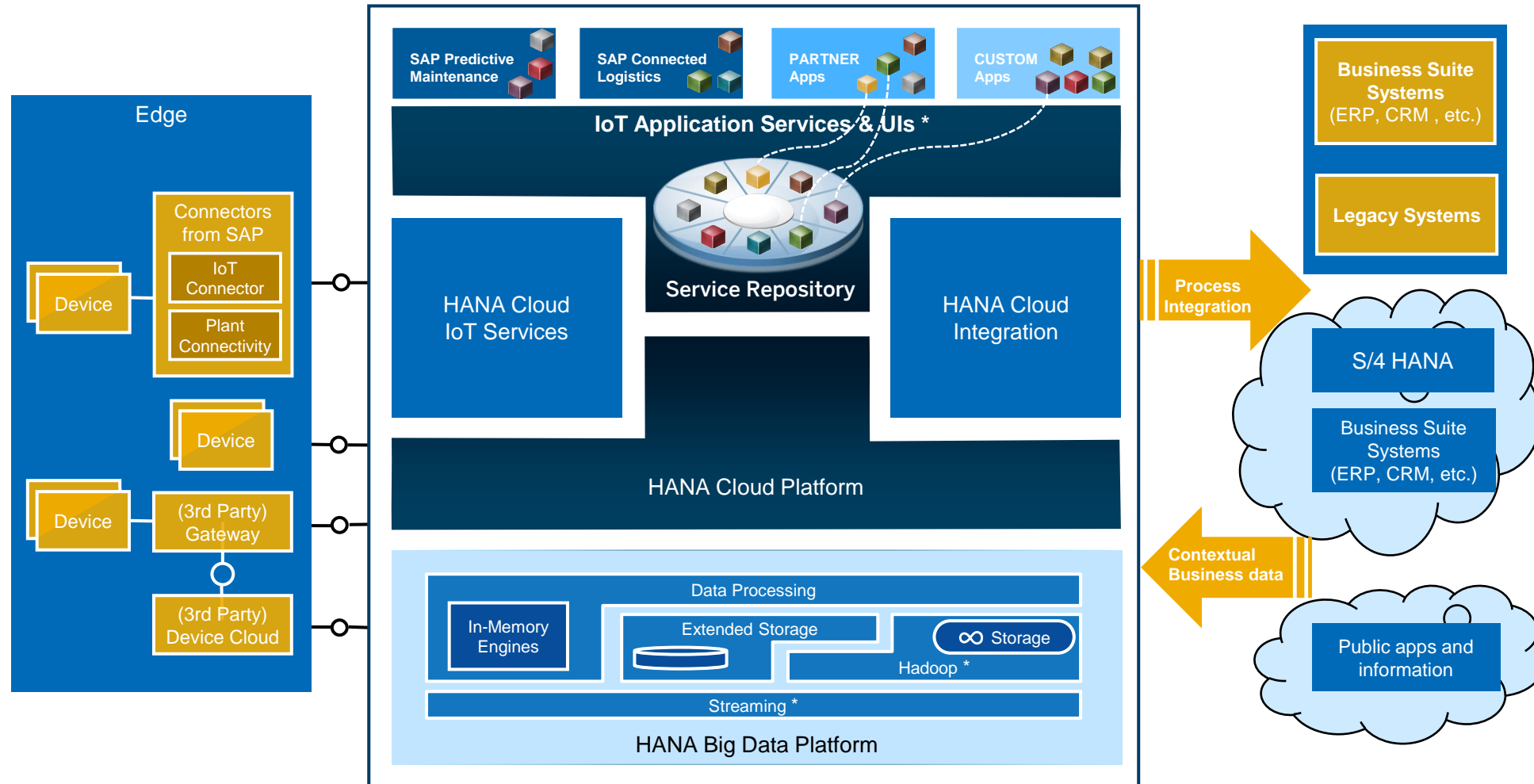

SAP Predictive Maintenance | SAP Networked Logistics Hub | PARTNER Apps | CUSTOM Apps

IoT Application Services & UIs *

Service Repository

HANA Cloud IoT Services

HANA Cloud Integration

HANA Cloud Platform

Data Processing

In-Memory Engines | Extended Storage | ∞ Storage

Hadoop*

Streaming*

HANA Big Data Platform

HANA Cloud Platform for the Internet of Things
Device and process integration capabilities

Edge

Device

Connectors from SAP
- IoT Connector
- Plant Connectivity

Device

Device

(3rd Party) Gateway

(3rd Party) Device Cloud

SAP Predictive Maintenance

SAP Connected Logistics

PARTNER Apps

CUSTOM Apps

IoT Application Services & UIs *

Service Repository

HANA Cloud IoT Services

HANA Cloud Integration

HANA Cloud Platform

Data Processing

In-Memory Engines

Extended Storage

∞ Storage

Hadoop *

Streaming *

HANA Big Data Platform

Process Integration

Contextual Business data

Business Suite Systems (ERP, CRM , etc.)

Legacy Systems

S/4 HANA

Business Suite Systems (ERP, CRM, etc.)

Public apps and information

* This is the current state of planning and may be changed by SAP at any time.

SAP Internet of Things
Product road map overview - key themes and capabilities

Today	Planned Innovations	Future Direction

Platform

- HANA Cloud Platform as a PaaS and Extension Platform for Internet of Things (IoT) scenarios
- Wide range of IoT-related database and application services (e.g. analytical capabilities) in order to support industry specific scenarios
- Capabilities for device connectivity, device management and message handling (e.g. SAP HANA Cloud Platform IoT Services)

Applications

- SAP Predictive Maintenance and Service for remote condition monitoring
- SAP Networked Logistics Hub for Increased Turnover of goods and real-time in-transit visibility
- SAP Connected Manufacturing for Real-time visibility and control of shop floor operations*
- SAP Vehicle Insights** for Vehicle Analytics
- SAP Smart Business services for integrated KPI visualization & insights

Integration & Process Innovation

- Business process integration with SAP Enterprise Asset Management, Cloud for Customer and S/4HANA
- Mobile integration with smart devices (Augmented Reality)

(Q3 2015)

Platform

- Leverage Cloud Foundry to take advantage of latest cloud and open source technologies (e.g. additional runtimes)
- Extended Big Data Platform, e.g. support of various databases, streaming capabilities
- Additional Data Centers in Japan and China
- Additional HCP platform services, e.g. gamification service
- Improved machine and device integration (IoT connector)
- High performance messaging service (MQTT support)

Applications

- Improved prediction and vibration analysis for rotating equipment
- SAP Asset Intelligence Network for shared equipment registry & improved collaboration between business partners
- Connected manufacturing for high speed automation
- Support of SAP Networked Logistics Hub in multiple industries with improved transparency & SCM integration
- Building and extending new applications based on powerful IoT application services
- New IoT scenarios, e.g. for utilities and other industries

Integration & Process Innovation

- Enhanced business process integration
- Leverage the power of the Business Network

Platform

- Extended Availability of SAP HANA Cloud Platform
- Support for deployments in data centers of customers / partners
- Infrastructure based on OpenStack
- Additional services, e.g. Hadoop

Applications

- SAP Predictive Maintenance and Service extended with Predictive Spare Parts Management scenario support
- Digital Object Memory to support Track & Trace and Track and Assembly across the value chain
- Additional IoT Application Services and powerful IoT Application Builder
- New IoT Scenarios and Enhanced IoT applications
- Advanced analytics and predictions

Integration & Process Innovation

- Enterprise Marketplace / App store for IoT services
- Enable New Business Models like Product-as-a-Service

* Shop floor integration / Industrie 4.0   ** Early Adoption

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Planned Innovations

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SAP Internet of Things - Platform
SAP HANA Cloud Platform - PaaS and extension platform for IoT scenarios

SAP HANA Cloud Platform supports different runtimes/programming models (Java, XSJS, HTML5) and offers standards-based development. The cockpit is the consolidated destination for all operational needs.

Java, XSJS and HTML5 programming models

- Application runtime containers for Java development
- Development of "native" SAP HANA applications by means of SAP HANA Extended Application Services (XSJS)
- HTML5 infrastructure to build and run HTML5 applications in the cloud

Standards-based development environment

- Use of the popular open-source Eclipse IDE on the local computer together with the SAP HANA Cloud Platform SDK
- SAP Web IDE to enable developers, business experts and designers to build new business applications in the cloud with zero footprint
- UI Theme Designer as the tool for theming and branding SAP's key user interfaces

HANA Cloud Platform cockpit for all operational needs

- Configuration
- Deployment
- Monitoring

API Management for simple, scalable and secure access to digital assets

SAP HANA App Center ecommerce showcase channel to evaluate, consume and market HANA Cloud Platform applications

A detailed product road map for SAP HANA Cloud Platform is available on SAP Service Marketplace

SAP Internet of Things - Platform
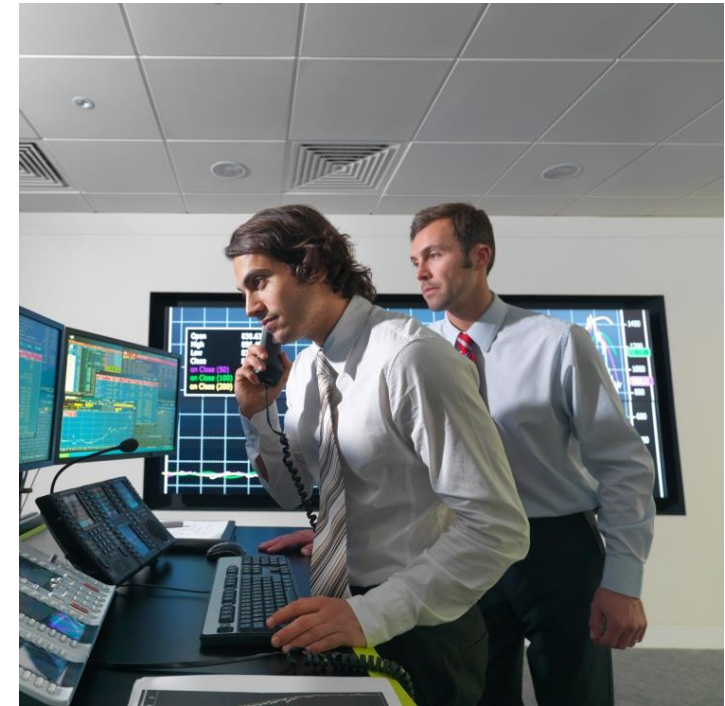## SAP HANA Cloud Platform - Infrastructure

SAP HANA Cloud Platform runs in SAP's data centers around the globe. It offers certified world-class tier-3 and 4 data centers with 24/7 global support and 99.9 % availability.

World-class tier-3 and 4 data centers

- Customers / partners choose the data center which they want to use
- Currently SAP HANA Cloud Platform is available in data centers in
  - St. Leon-Rot, Germany
  - Amsterdam, Netherlands (only for disaster recovery)
  - Ashburn (Virginia), United States
  - Phoenix (Arizona), United States
  - Sydney, Australia

Secure and compliant infrastructure with 99.9% availability

- Certifications, e.g. ISO 9001, ISO 27001
- SAP warrants 99.9% system availability over any calendar month

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SAP Internet of Things - Platform
SAP HANA Cloud Platform - Wide range of services

SAP HANA Cloud Platform gives developers access to many database, application and business services which can be used while building new applications and extensions.

Powerful database services

- SAP HANA
  - Supported editions: base, platform
  - Supported sizes (RAM): 32 GB, 64 GB, 128 GB, 256 GB, 512 GB, 1 TB (bigger sizes up to 3 TB on request)
  - Exemplary capabilities
    - Predictive Analysis Library
    - Series Data Storage & Services
    - Spatial Processing
    - Text Search and Analysis
- SAP ASE
  - High operational efficiency at very competitive cost
  - Can be used for scenarios where the power of SAP HANA is not needed (e.g. for small data volumes with low business value)

Wide range of application and business services

- Connectivity Service
- Content Services
- SAP Fiori Apps
- SAP Forms as a Service by Adobe
- Gamification Service
- HANA Cloud Integration
- IoT Services
- SAP Jam
- Mobile Services
- Remote Data Sync Service
- Portal Services
- Security Services
- SAP Translation Hub
- SAP Web Analytics
- SAP hybris as a Service

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SAP Internet of Things - Platform
Device integration capabilities

Device Integration capabilities

Connector based integration

- Integrate all kinds of machines or devices with a client software from SAP (either SAP IoT Connector* or SAP Plant Connectivity)

API-based integration

- Collect sensor data via different protocols (HTTP, Websockets, MQTT*) from enabled devices, e.g. based on ARM processors

Device Cloud

- Collect sensor data from a 3rd party device cloud or partner solutions
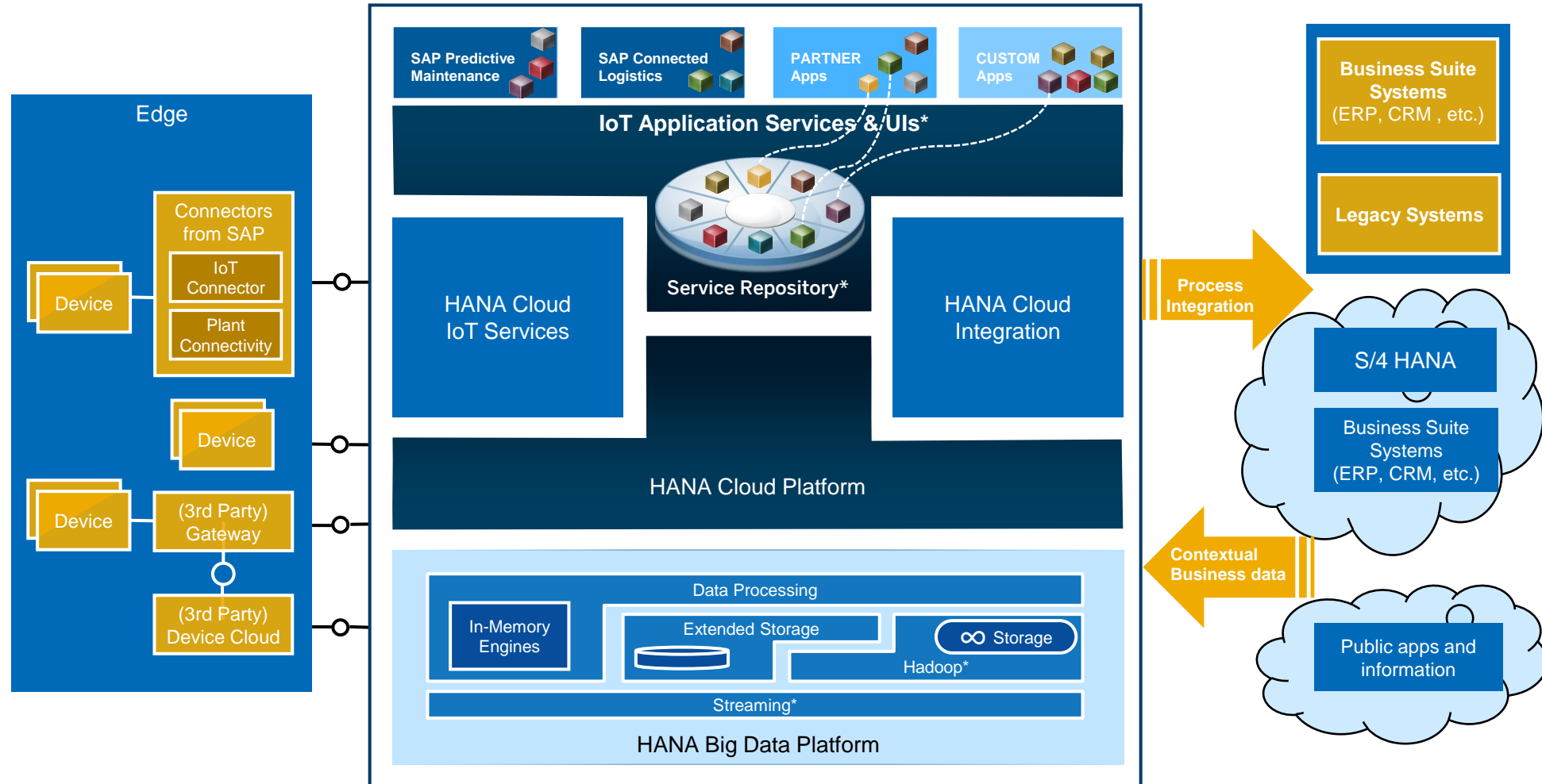
Edge

- Device
- Connectors from SAP
  - IoT Connector
  - Plant Connectivity
- Device
- Device
- (3rd Party) Gateway
- (3rd Party) Device Cloud

SAP Predictive Maintenance | SAP Connected Logistics | PARTNER Apps | CUSTOM Apps

IoT Application Services & UIs*

HANA Cloud IoT Services | Service Repository* | HANA Cloud Integration

HANA Cloud Platform

HANA Big Data Platform
- Data Processing
  - In-Memory Engines
  - Extended Storage
  - ∞ Storage
  - Hadoop*
- Streaming*

Business Suite Systems (ERP, CRM , etc.)

Legacy Systems

Process Integration

S/4 HANA

Business Suite Systems (ERP, CRM, etc.)

Contextual Business data

Public apps and information

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SAP Internet of Things - Platform
SAP HANA Cloud Platform IoT services

The SAP HANA Cloud Platform IoT Services can be used to connect devices to the HANA Cloud Platform in order to use data from these devices in applications.

Key capabilities

- Connect to remote devices to manage life-cycle from onboarding till decommissioning
- Receive device data and send commands to remote devices
- Use IoT message management capabilities to collect sensor data and store it in the HANA Cloud Platform persistence layer (HANA or ASE)

Benefits

- Use data from real-world processes in applications by using device management and message management functionalities

Applications on
SAP HANA Cloud Platform

Application
Enablement API

IoT Services
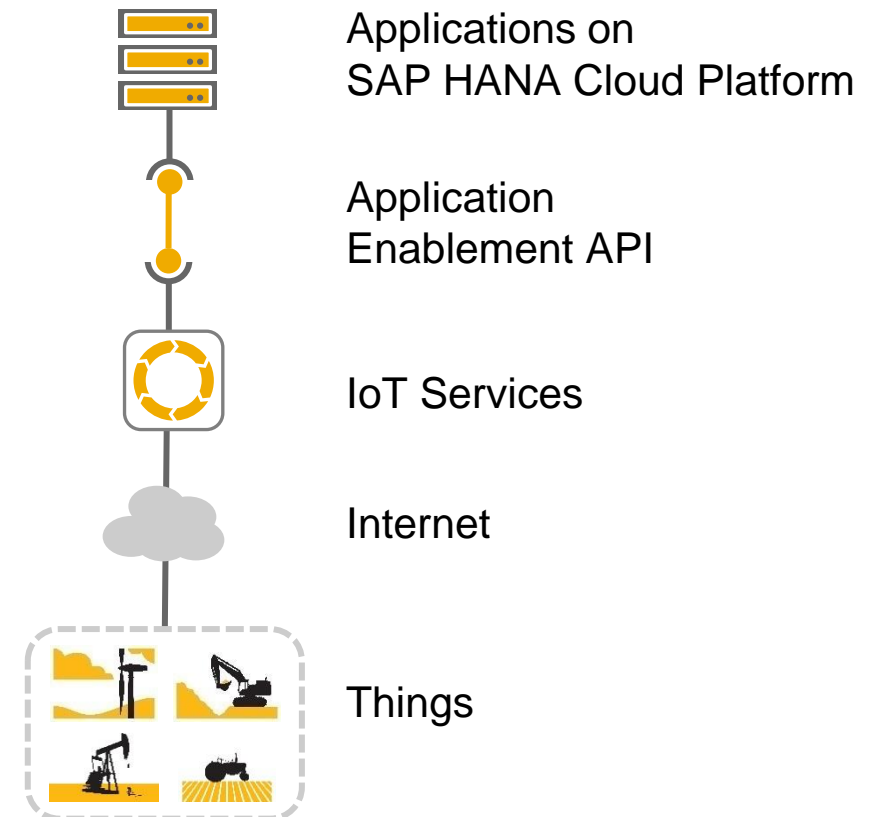
Internet

Things

SAP Internet of Things - Platform
SAP HANA Cloud Platform Remote Data Sync service

SAP HANA Cloud Platform Remote Data Sync Service provides a service for synchronizing huge numbers of remote databases into a consolidated SAP HANA database in the cloud.

Key capabilities

- Remote Data Sync service is a synchronization technology for exchanging data between relational databases
- Source database needs to be SAP SQL Anywhere or UltraLite
- Data synchronization with remote databases
- Example: store sensor data in remote databases, consolidate in SAP HANA Cloud Platform, e.g. for analytics and monitoring

Benefits

- Ensures transactional integrity over unstable networks
- Sophisticated strategies for resolution of data change conflicts

Customer

Database SAP SQL Anywhere, UltraLite

Client

🔒 HTTPS Internet

Server on SAP HANA Cloud Platform

SAP

SAP HANA

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SAP Internet of Things - Applications
SAP Predictive Maintenance and Service, cloud edition

Situational Overview
- Alarm and machine list with quick filtering

Detailed Machine Master data
- Replication of relevant masterdata from multiple systems

Powerful Device Health Analytic
- Special target graph for health diagnostics
- Near real-time
- Drill into data
- Display of warning and alarm threshold violation

Notifications
- Notify personnel about alerts from devices via email, etc.

Business Process Integration
- Create notifications or work orders in business process systems in SAP like ERP/Customer Service (CS), CRM Service, ERP/Plant Maintenance (PM), Cloud for Service

Analytics
- Leverage SAP Lumira to build your analytics dashboards with Drag & Drop
- Pre-configured machine KPIs
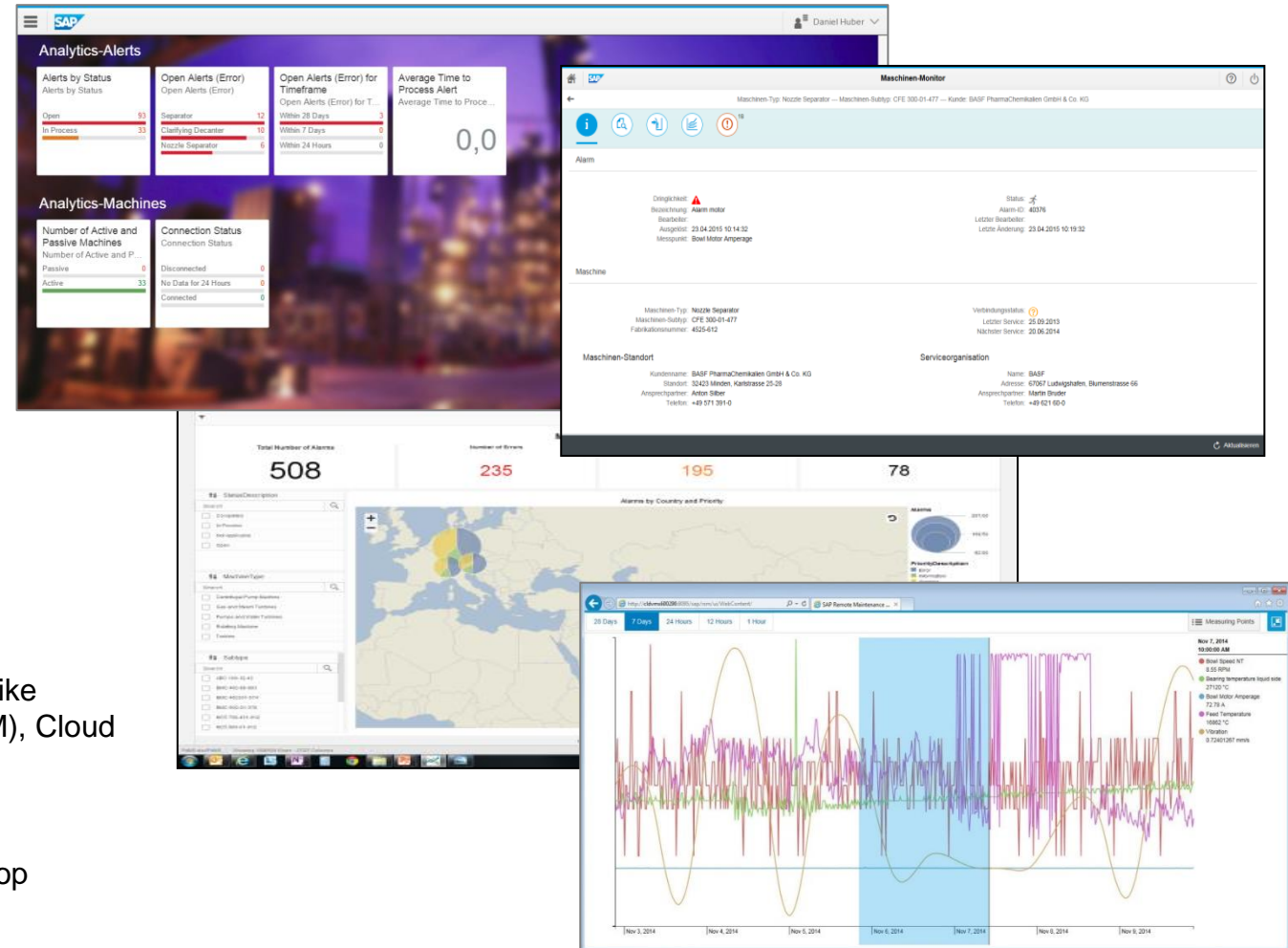
A detailed product road map for SAP Predictive Maintenance and Service, cloud edition is available on SAP Service Marketplace

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SAP Internet of Things - Applications
SAP Networked Logistics Hub

A business network for collaboration in logistics

Hub operator	Logistics service provider	Carrier and truck driver

- Gain real-time transparency of infrastructure usage
- Inform drivers of incidents
- Invite business network

- Communicate with drivers
- Gain real-time transparency of transportation progress
- Invite subcontractors

- Get up-to-date information on traffic and recommendations
- Receive order information from dispatcher

Turn *insights* into *benefits*

- ✓ Improved infrastructure utilization
- ✓ Increased turnover
- ✓ Improved competitiveness

- ✓ Higher throughput with less transportation assets employed
- ✓ Improved on-time delivery

- ✓ Higher customer satisfaction
- ✓ Reduced idle times toward and at hub
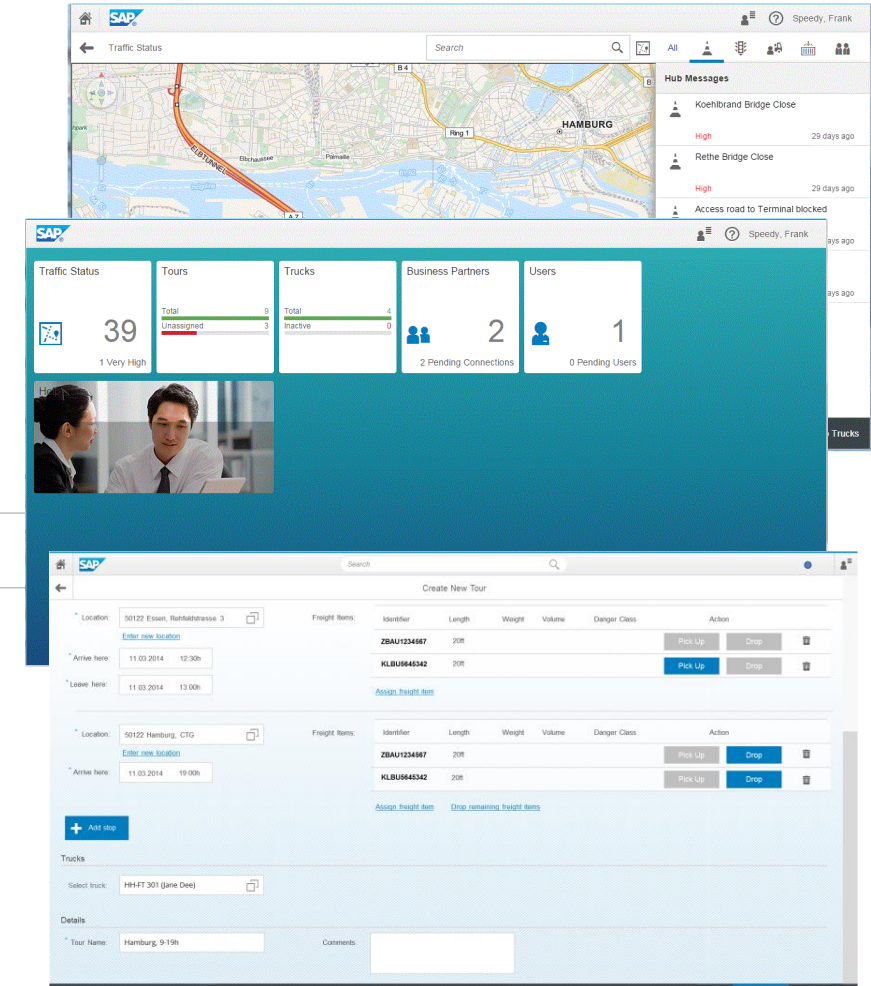
SAP Internet of Things - Applications
SAP Connected Manufacturing

SAP Connected Manufacturing for Real-time visibility and control of shop floor operations

Manufacturing Execution (ME) and Manufacturing Integration & Intelligence (MII):

Manufacturing Execution

Tracking & Tracing on level Serial Number (so called Shop Floor Control SFC)

Non Conformance Handling

Process Interlocking

Production Data Acquisition

KPIs, Reporting & Statistical Process Control

Automation related Master Data (Setpoints)

Highly Extensible

Application Enablement

Preferred Data Service for Manufacturing Integration & Intelligence (MII) incl. Configuration of Plant Connectivity (PCo) set-up from MII

Mature Product with broad usage

Windows as Operating System required
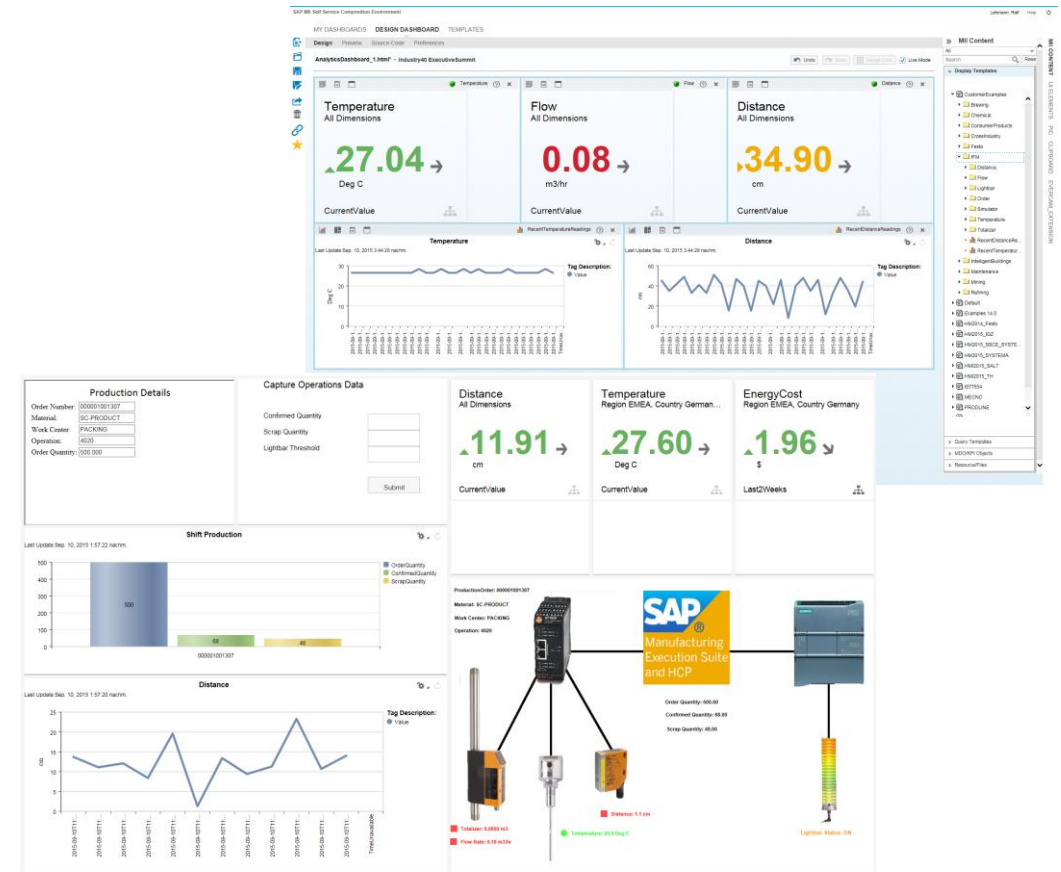
SAP Internet of Things - Applications
SAP Vehicle Insights *

Vehicle Insights, a cloud-based analytic service platform, enables a variety of new business models by integrating vehicle telematics data and analytic insights.

- Support for vehicle monitoring, efficient process planning and control

- Integration of real-time sensor data from vehicles in operation and analytic insights into business processes

- Advanced analytic and predictive capabilities based on complex structured and unstructured data

- Enables innovative business processes through flexibility and extensibility

- Development efficiency by platform concept supported by standardized data models

- Easy to consume cloud solution, requires minimal IT involvement and no disruption to existing systems

- Standardized web enabled services with open integration

- Reduced costs through improved operating, process planning, and control efficiency
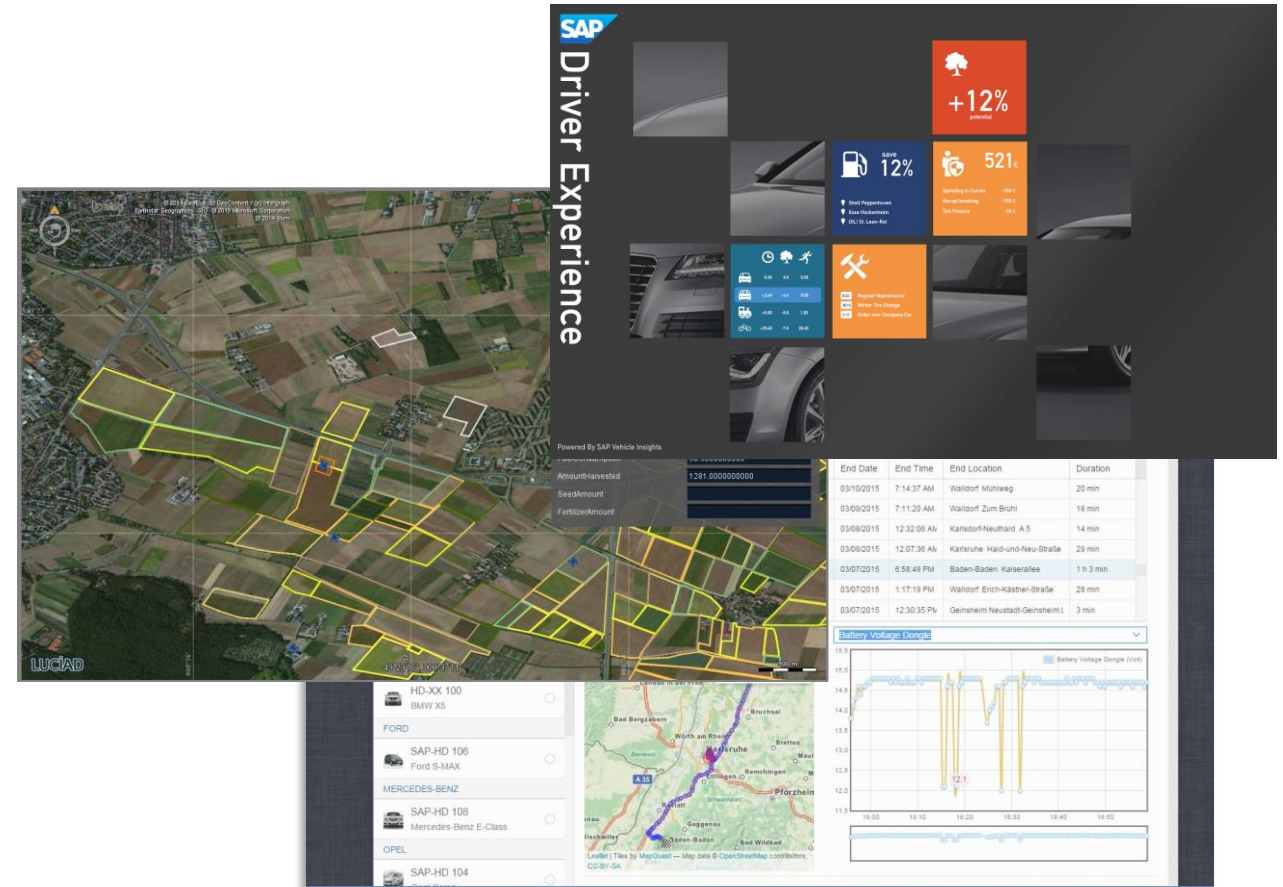
* Early Adoption

SAP Internet of Things - Applications
SAP Smart Business, cloud edition

Provide a quick, comprehensive overview of machine KPIs, e.g. in command and control centers

Visualize machine KPIs and drill-downs

- Visualize your individual machine alerts and KPIs by using SAP Smart Business
- Powerful drill-down scenarios for near real-time insights

Map device locations

- Add positioning data to devices for placement on maps
- Graphical drill down to devices with particular alert situations

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SAP Internet of Things – Business Process Integration
Business process integration with HANA Cloud Integration
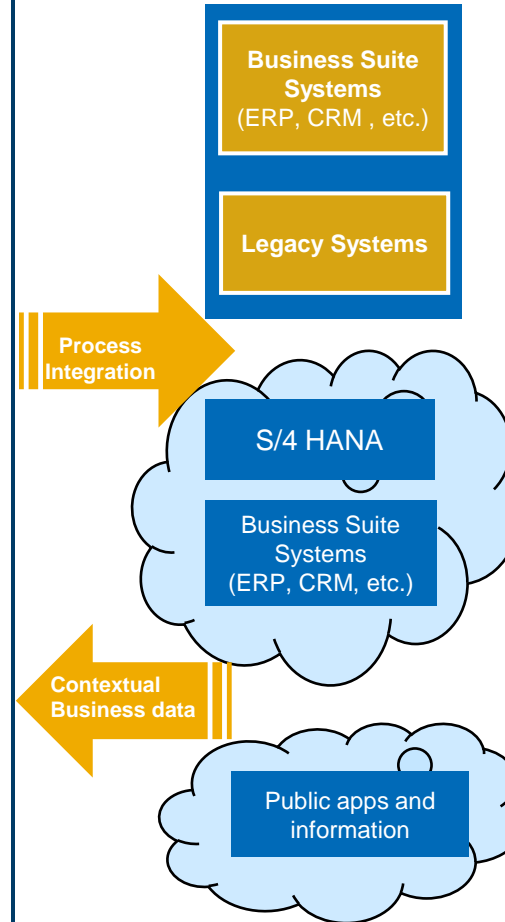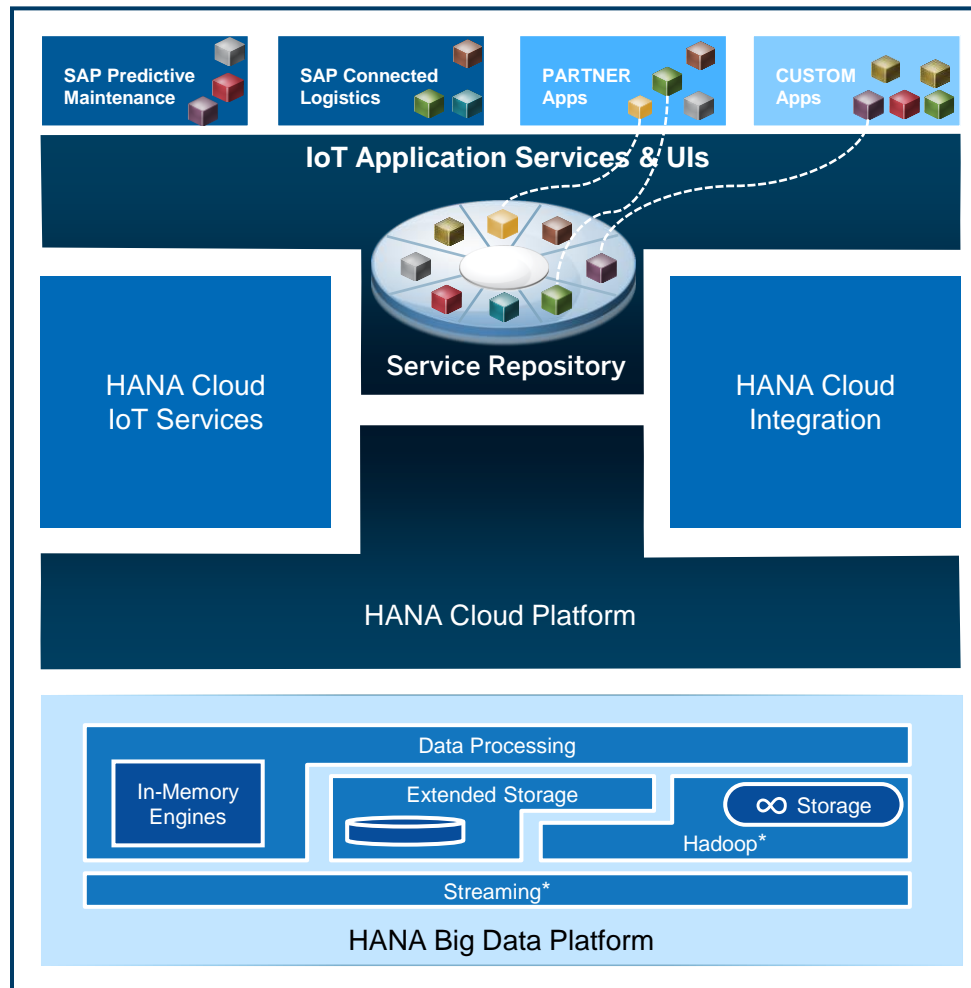
Strategic service for OD-OD & OP-OD integration on SAP HANA Cloud Platform

- Pre-packaged integration content hub in cloud – "Discover, Configure, Manage"
- Engineered for Cloud: Multi-tenancy, rolling software updates, horizontal scalability. Subscription-based usage
- Strong focus on security including data isolation
- Used by SuccessFactors, SAP Cloud For Customer, Financial Services Network etc.
- Complementary offering to SAP Process Integration
- Open for partners – projects, content, connectivity etc.
- Available as:
  - SAP HCI Standard Edition, SAP HCI Professional Edition
  - SAP HCI Developer Edition
  - SAP HCI Application Edition (bundled with SAP cloud apps.)
  - SAP HANA AppServices, Premium Edition

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SAP Internet of Things - Integration
SAP HANA Cloud Integration

SAP HANA Cloud Integration is the strategic service for on-premise to cloud & cloud to cloud integration and runs on top of the SAP HANA Cloud Platform.

Key capabilities

- Pre-packaged integration content: "Discover, Configure, Manage"
- Certification process for integration content built by partners
- Cloud enabled integration platform
- Security: Data isolation, message & payload (PGP, WS sec., ...) level
- Light weight orchestration
- Diverse connectivity
- ISO27001 certification
- Integration with SAP Solution Manager
- Data consolidation from OP sources

SAP Cloud Applications

SAP HANA Cloud Integration

Real-Time Process Integration	Data Integration	Prepackaged Integration flows	Community and Marketplace

SAP On-Premise

3rd Party On-Premise

3rd Party Cloud Solutions
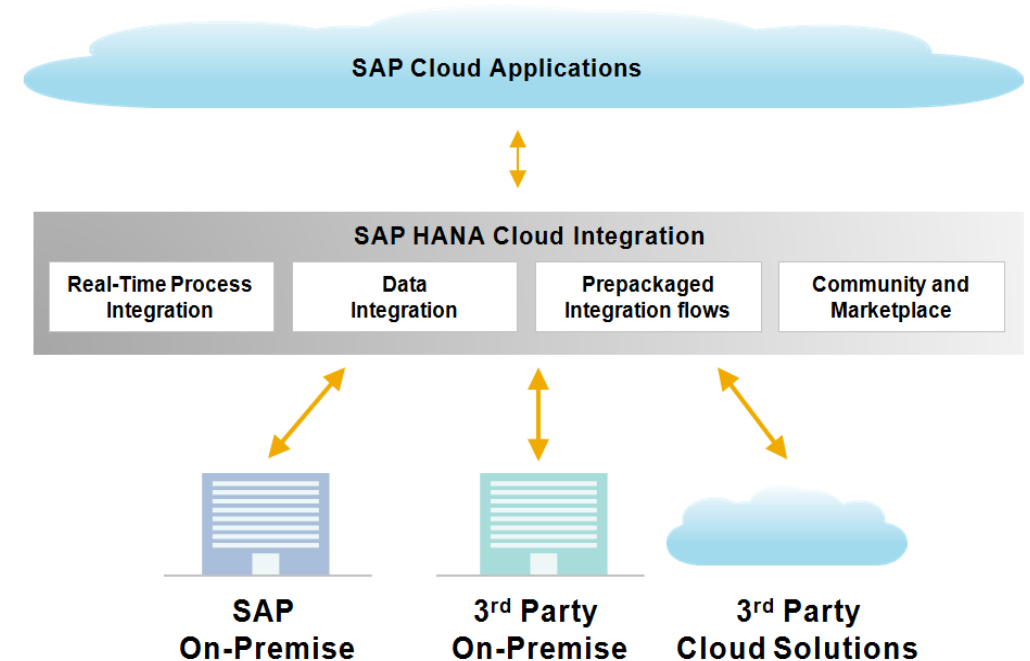
A detailed product road map for SAP HANA Cloud Integration is available on SAP Service Marketplace

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SAP Internet of Things – Integration with mobile devices
Mobile integration with smart devices (Augmented Reality)

SAP Work Manager

- Maintain, inspect and repair mission critical assets
- View asset schematics, history, and dependencies
- Generate notifications and work orders on the spot
- Report worker's status, progress, and location
- Install and tag equipment – barcode, RFID, geotag
- Upload Attachments
- Inspection Rounds
- Integration with GIS
- Integration with SAP 3D Visual Enterprise

Android

iOS

Windows

SAP Mobile Platform

SAP Gateway

SAP Business Suite

CRM   SRM   SCM   PLM   ERP

SAP AR Service Technician

- Show 3D Work Instructions
- Record Voice notes
- Video Call with Experts

➡ Companion App to the SAP Work Manager

➡ Smart Glass App for SAP EWM

SAP AR Warehouse Picker

- Replace Handscanners in outbound picking scenario
- QR-Code & barcode scanning using a head-mounted display

SAP Internet of Things
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(Q3 2015)

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- SAP Predictive Maintenance and Service extended with Predictive Spare Parts Management scenario support
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- Additional IoT Application Services and powerful IoT Application Builder
- New IoT Scenarios and Enhanced IoT applications
- Advanced analytics and predictions

Integration & Process Innovation
- Enterprise Marketplace / App store for IoT services
- Enable New Business Models like Product-as-a-Service

* Shop floor integration / Industrie 4.0   ** Early Adoption

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SAP Internet of Things - Platform
Cloud Foundry – Additional Runtimes

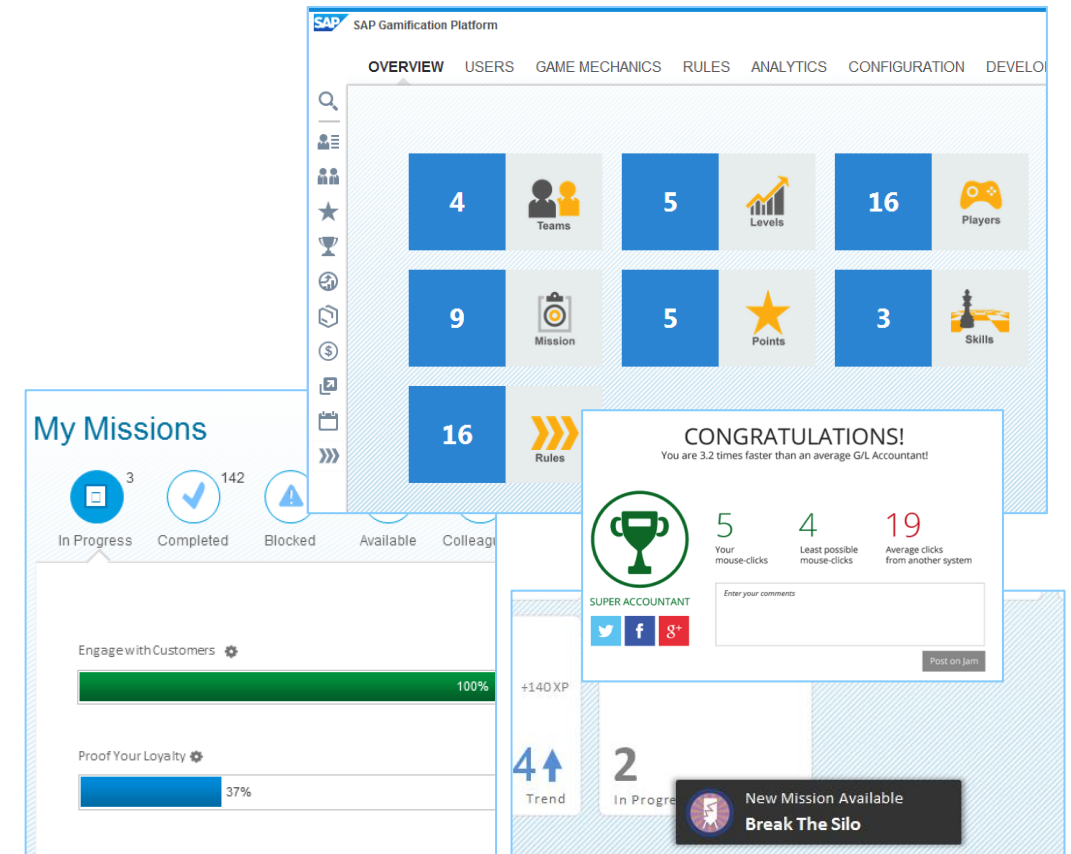By leveraging Cloud Foundry, SAP HANA Cloud Platform will support additional runtimes (i.e. programming languages and frameworks) in SAP HANA Cloud Platform.

Key capabilities

- Leveraging Cloud Foundry enables developers to choose from various programming languages and frameworks
- SAP supported buildpacks based on Cloud Foundry system buildpacks (Java, Node.js)
- Bring your own language (BYOL) with the support for custom buildpacks (e.g. PHP, Python, Ruby, Go)

Benefits

- Full SAP support for the SAP supported languages and community support for all others
- Achieve more with your language of choice through BYOL

CLOUD FOUNDRY™

Develop with other runtimes

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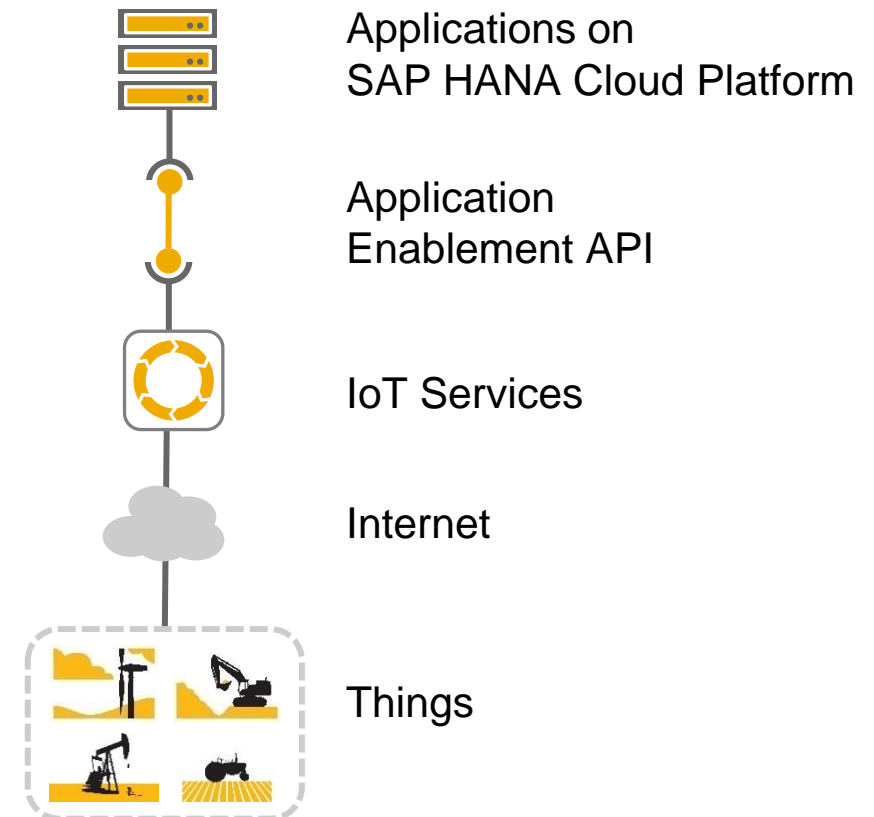# SAP Internet of Things - Platform
Extended Big Data platform - Smart Data Streaming

The SAP HANA smart data streaming option processes high-velocity, high-volume event streams in real time, allowing to filter, aggregate, enrich and analyze raw data before committing it to a database.

Key capabilities

- Capture only the data you want, in the form you need it
- Combine raw events into actionable information
- Monitor incoming data
- Watch for trends, correlation, patterns, missing data
- Stream live updates to operational dashboards
- Generate alerts or notify applications to respond

Benefits

- Process the data as fast as it arrives from devices and application
- Enrich, transform, filter before loading into the SAP HANA database
- Real-time situation detection for immediate response
- Administration via SAP HANA Studio and Cockpit
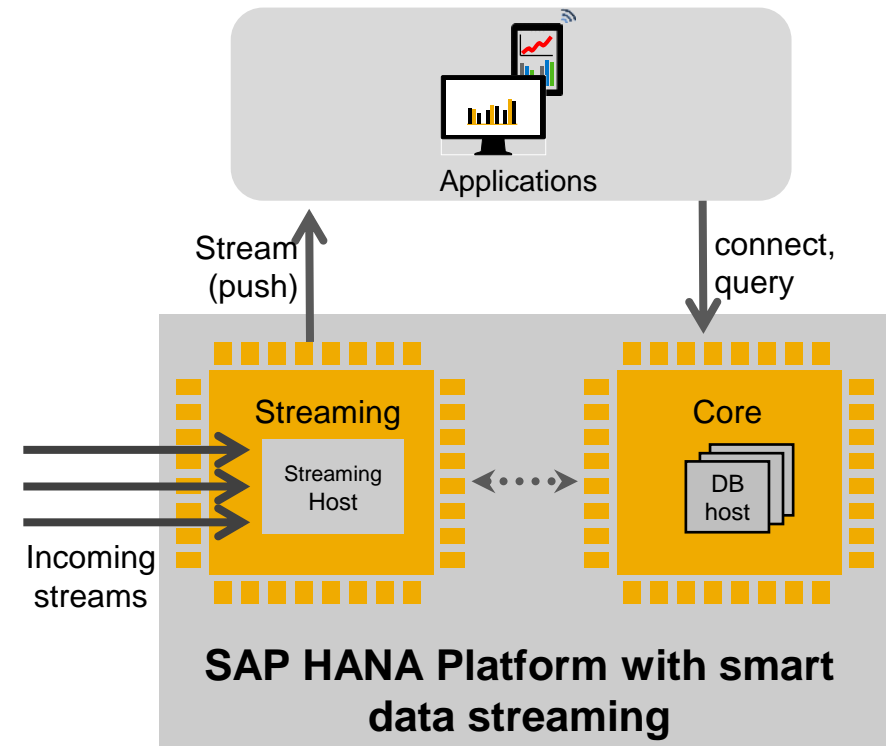
Applications

Stream (push)

connect, query

Streaming

Streaming Host

Core

DB host

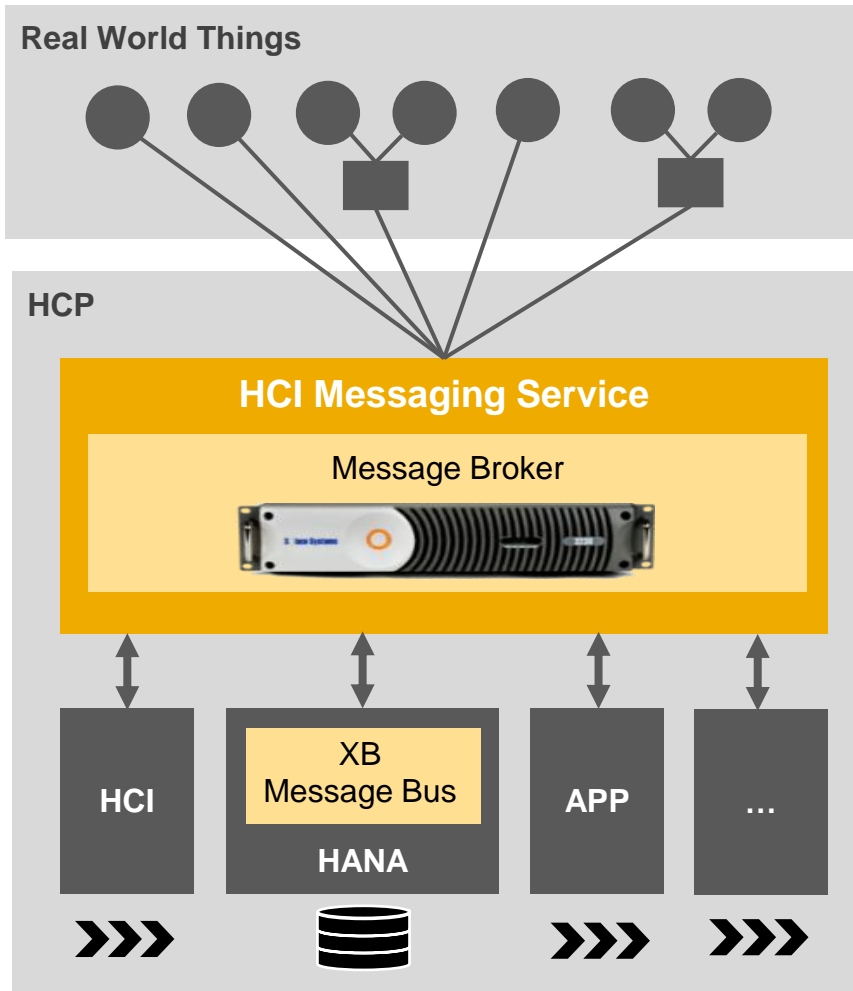Incoming streams

SAP HANA Platform with smart data streaming

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SAP Internet of Things - Platform
Additional data centers

SAP HANA Cloud Platform will expand to additional data centers. We plan to invest into business continuity features and disaster recovery between the data centers within regions.

Additional data centers in Japan and China
- Tokyo and Osaka, Japan
- Shanghai, China

Improvements for business continuity
- Use zero downtime maintenance feature to avoid bi-weekly maintenance windows (Remark: today, during these maintenance windows applications cannot be deployed and re-started, running applications are not affected)

Disaster recovery data centers within regions
- St. Leon-Rot ⇔ Amsterdam
- Ashburn ⇔ Phoenix
- Tokyo ⇔ Osaka
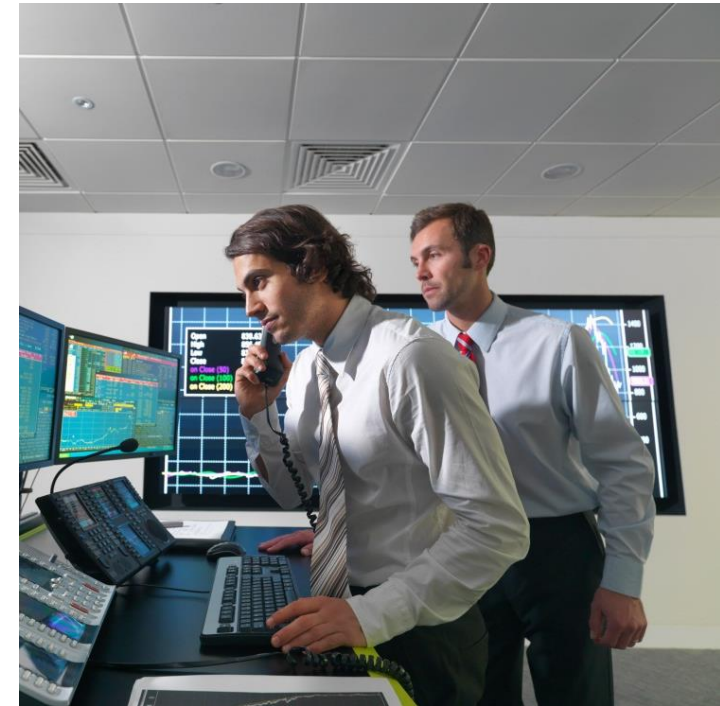
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SAP Internet of Things - Platform
Additional services - Gamification Service

The SAP HANA Cloud Platform Gamification Service can be used to engage and motivate people with rewarding experiences.

Key capabilities

- Easy integration of game events with Web API
- Implement complex game mechanics with web-based gamification workbench
- Outlook: full support of loyalty management & default content

Benefits

- Engage users with real-time feedback on achievements
- Continuously improve the engagement during run-time via gamification analytics

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SAP Internet of Things - Platform
SAP HANA Cloud Platform IoT Services

The SAP HANA Cloud Platform IoT Services can be used to connect devices to the HANA Cloud Platform in order to use data from these devices in applications.

Key capabilities

- Improved remote device management, e.g. certificate based authentication
- Support of additional transport protocols, e.g. MQTT via integration with HCI messaging service
- Enhanced model authoring
- Integration with Smart Data Streaming
- SAP IoT connector for device connectivity and management with SDK

Benefits

- Remote device management with heightened security
- Easier message management

Applications on
SAP HANA Cloud Platform

Application
Enablement API

IoT Services

Internet

Things

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SAP Internet of Things - Platform
Integration with HCI Messaging Service

Real World Things

HCP

HCI Messaging Service

Message Broker

HCI	XB Message Bus	APP	...
	HANA		

Cloud-Based Messaging Service

- Highly, scalable and reliable messaging as a service
- Co-Innovation with Solace Systems
- Hardware-based message broker
- http://www.solacesystems.com/press-releases/sap-selects-solace-for-high-performance-messaging-in-cloud

Key Characteristics

- Built-in virtualization concept
- Non-persistent and persistent messaging
- High Availability and Disaster Recovery

XB Message Bus

- Message Inserter: fast-path message transport to HANA

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SAP Internet of Things - Applications
SAP Vibration Analysis

Automatic vibration analysis for rotating equipment
Vibration analysis is a condition monitoring technique that reveal valuable information about machine health – or impending failures

Record vibrations
- Take high frequency snapshots of vibrations
- Calculate the vibration spectrum
- Determine threshold spectrum for automatic detection auf deviations

Process automation
- Identify the relevant harmonics per component
- Automatically detect deviations per component
- Notify about detected defects

Vibration analysis helps a service engineer to pinpoint specifically the failure mode and identify which machine component is degrading.

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SAP Internet of Things - Applications
SAP Asset Intelligence Network

Key Capabilities

Manufacturers can

- Centrally manage and publish information about models & equipment to selected audiences
- Establish Channel to Operators
- Build Installed Base Knowledge
- Gain Operation Insights / Access
- Push Communication & Alerts
- Sell Add-Value Services
- Connect SAP Predictive Maintenance and Service to multiple operators

Operators can

- Centrally register & subscribe for selected models & equipment
- Establish Channel to Manufacturers
- Use latest / reliable info in Operation & Maintenance
- Securely feed operation data
- Collaborate with Peers / Partner
- Enable New Business Models – consume equipment as a service
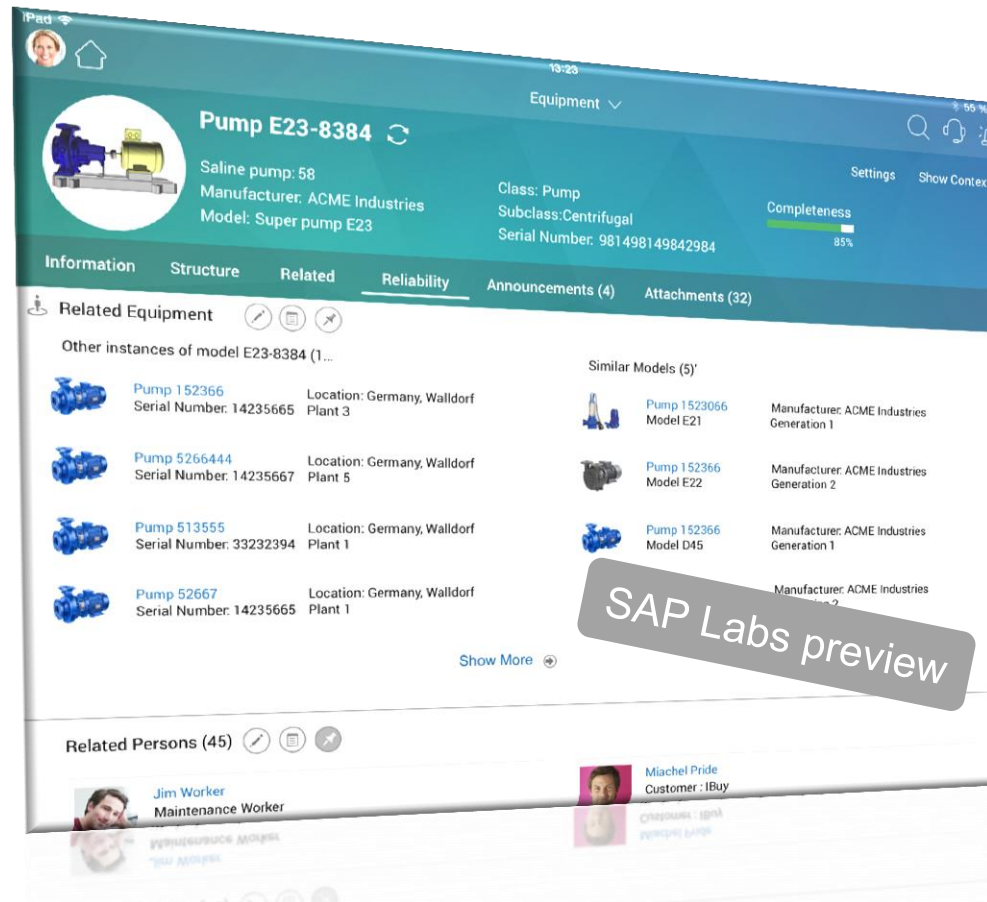
A cross industry network that brings together the manufacturers, services providers and operators of the worlds industrial assets to maximize value, improve efficiency and deliver new business models

Target Customers

AIN is a cloud based Business Network bringing together the following types of customers:

Operators: Companies of various industries that buy, own and operate industrial and other assets

Manufacturers: Industrial Asset Manufacturers that design, produce, sell, commission and operate / service industrial assets

Dealers & Service Providers: Units that are operating close by the Operators and serving them with Sales & Services around

Engineering & Construction: Companies that are delivering engineering services from the design, construction and outsourced operations of the worlds assets.

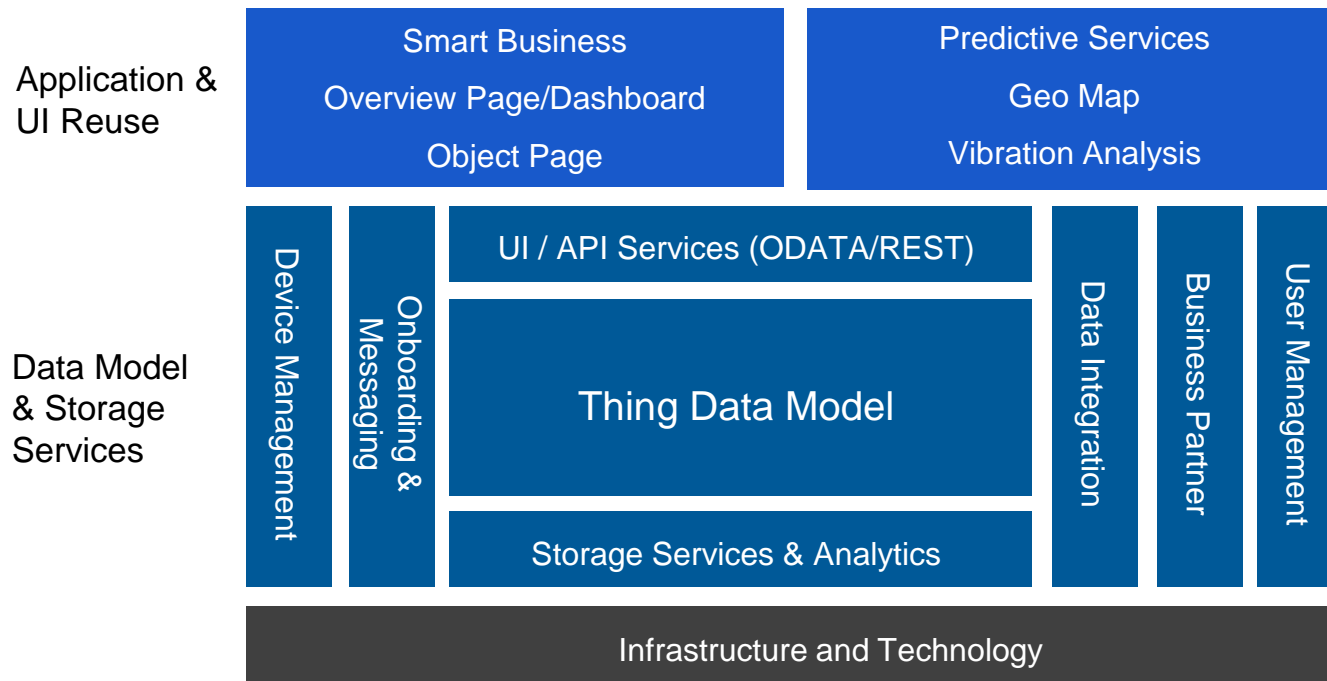**This is the current state of planning and may be changed by SAP at any time.**

SAP Internet of Things - Applications
SAP Connected Manufacturing

We plan to extend SAP Connected Manufacturing for High Speed Automation
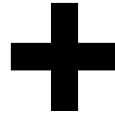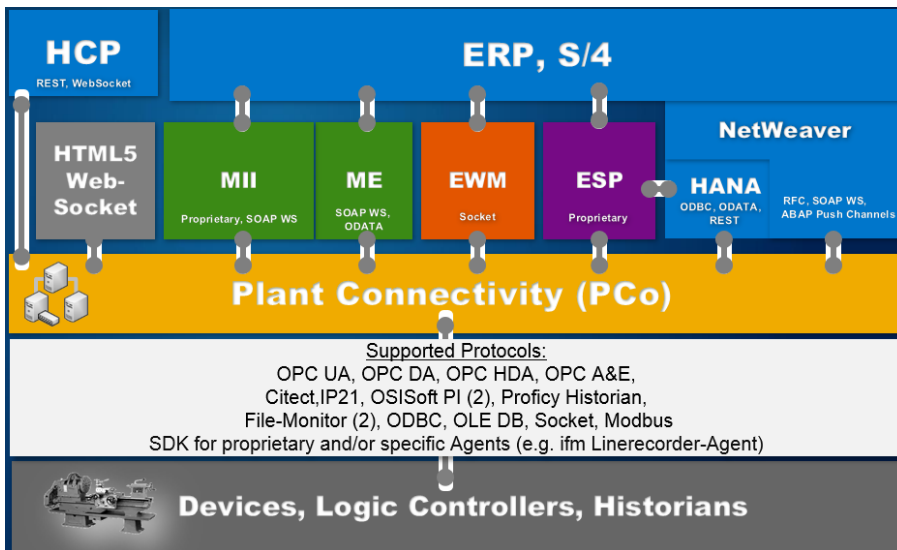
Plant Connectivity (PCo) runs on Linux via Mono-Framework

PCo will strengthen the OPC UA footprint via providing an OPC UA Server (today, PCo is OPC UA Client)

MQTT enablement

New MTConnect Agent

Configure PCo via HTML5 UI

Enhanced Support of Pick&Place Machines

Extend buffer-mechanism beyond SAP Manufacturing Execution (ME) (e.g. application specific buffering of S/4 or HCP data in order to enable fast actions on machines)

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SAP Internet of Things - Applications
SAP Networked Logistics Hub

SAP Networked Logistics Hub

- SCL "Radar fences"
- Enhanced tour analytics
- UI enhancements

Advanced Vehicle Tracking for Logistic Service Provider

- Monitoring & alerting on tour execution based on customer requirements
- Integration with vehicle analytics / telematic data provider for monitoring & advanced analytics on truck performance

Integration with SAP Event Management

- Interface for events based on truck geo locations (and geo fences)

Integration with SAP Yard Logistics

- Interface for tour details, position data, Estimated time of arrival (ETA)
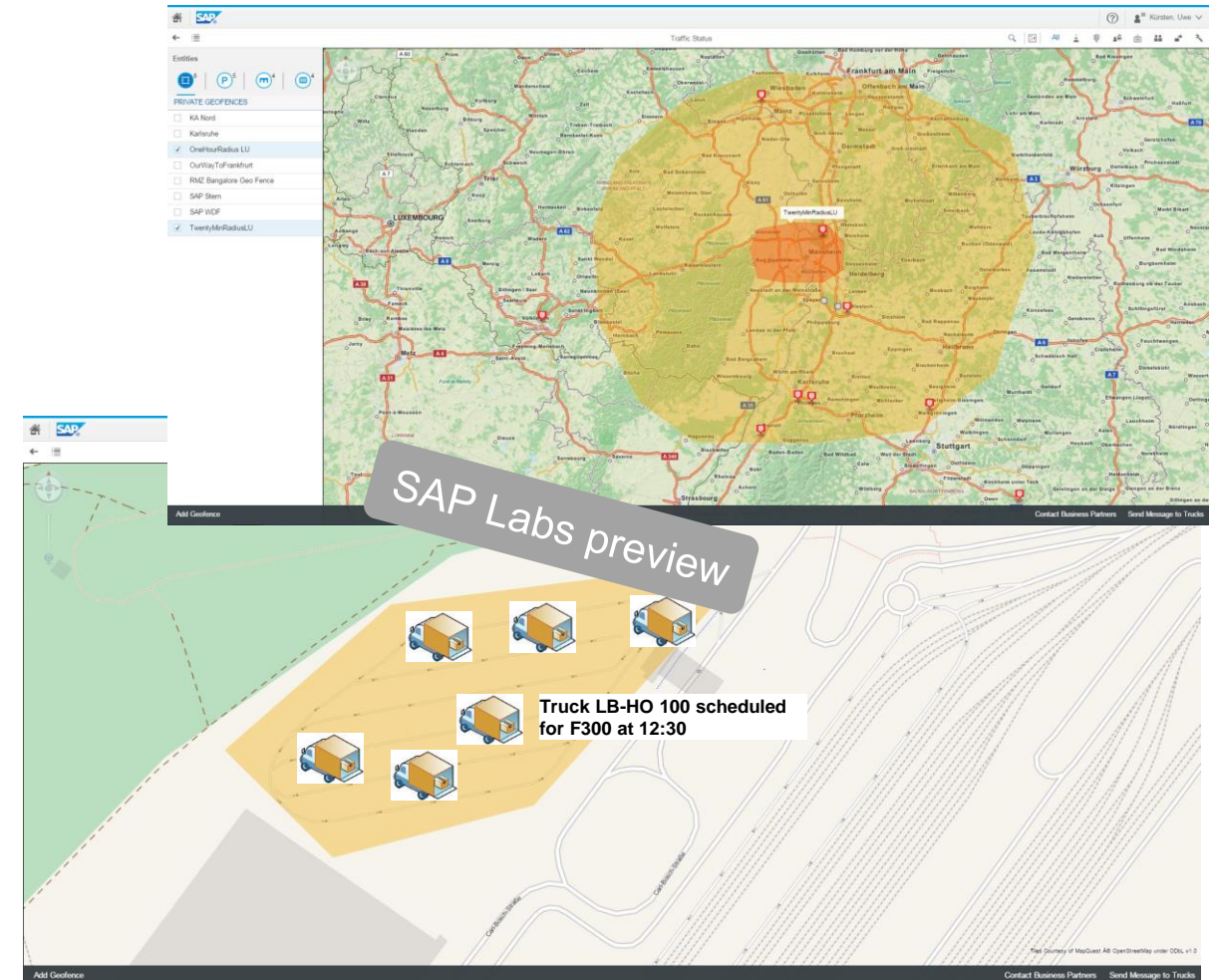
SAP Labs preview

Truck LB-HO 100 scheduled for F300 at 12:30

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SAP Internet of Things - Applications
IoT Application Services

We plan to continuously make available new Application Services for IoT which allow increased efficiency for SAP, partners and customers in configuring and building new and differentiating IoT scenarios.

Application & UI Reuse

Smart Business	Predictive Services
Overview Page/Dashboard	Geo Map
Object Page	Vibration Analysis

Data Model & Storage Services

Device Management

Onboarding & Messaging

UI / API Services (ODATA/REST)

Thing Data Model

Storage Services & Analytics

Data Integration

Business Partner

User Management

Infrastructure and Technology

Common Application Services:

- **Configuration:** Service to install configuration (metadata, customizing, ...)
- **Business Partner:** As known from the business suite (persons, groups, organizations)
- **Authorizations:** Authorization management
- **Common Services:** Share services and reuse entities such as countries, languages
- **Reuse UIs:** A set of reuse UIs such as Thing Properties, Thing Maps, Thing measurement chart, KPIs,…

IoT-specific Services:

- **Metadata Services:** Services for the definition of a data model (e.g. things)
- **Data Services:** Services for access to data (e.g. things)
- **Persistence Services:** Storage services (e.g. HANA, Hadoop)

Administrative Services:

- **User Management:** Management and onboarding of users

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SAP Internet of Things - Integration
Integration and process innovation

In the future we will improve existing and support additional integration use-cases. Particular focus will be on SAP S/4 HANA, Ariba, Fieldglass.

Enhanced business process integration
- Improve capabilities for end-to-end business processes between IoT and backend systems, like Cloud for Customer, ERP, S/4HANA

Leverage the power of the Business Network, such as FieldGlass, Ariba
- Integrate IoT scenarios with the business network for increased and efficient collaboration between business partners.

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SAP Internet of Things
Product road map overview - key themes and capabilities

Today

Platform
- HANA Cloud Platform as a PaaS and Extension Platform for Internet of Things (IoT) scenarios
- Wide range of IoT-related database and application services (e.g. analytical capabilities) in order to support industry specific scenarios
- Capabilities for device connectivity, device management and message handling (e.g. SAP HANA Cloud Platform IoT Services)

Applications
- SAP Predictive Maintenance and Service for remote condition monitoring
- SAP Networked Logistics Hub for Increased Turnover of goods and real-time in-transit visibility
- SAP Connected Manufacturing for Real-time visibility and control of shop floor operations*
- SAP Vehicle Insights** for Vehicle Analytics
- SAP Smart Business services for integrated KPI visualization & insights

Integration & Process Innovation
- Business process integration with SAP Enterprise Asset Management, Cloud for Customer and S/4HANA
- Mobile integration with smart devices (Augmented Reality)

(Q3 2015)

Planned Innovations

Platform
- Leverage Cloud Foundry to take advantage of latest cloud and open source technologies (e.g. additional runtimes)
- Extended Big Data Platform, e.g. support of various databases, streaming capabilities
- Additional Data Centers in Japan and China
- Additional HCP platform services, e.g. gamification service
- Improved machine and device integration (IoT connector)
- High performance messaging service (MQTT support)

Applications
- Improved prediction and vibration analysis for rotating equipment
- SAP Asset Intelligence Network for shared equipment registry & improved collaboration between business partners
- Connected manufacturing for high speed automation
- Support of SAP Networked Logistics Hub in multiple industries with improved transparency & SCM integration
- Building and extending new applications based on powerful IoT application services
- New IoT scenarios, e.g. for utilities and other industries

Integration & Process Innovation
- Enhanced business process integration
- Leverage the power of the Business Network

Future Direction

Platform
- Extended Availability of SAP HANA Cloud Platform
- Support for deployments in data centers of customers / partners
- Infrastructure based on OpenStack
- Additional services, e.g. Hadoop

Applications
- SAP Predictive Maintenance and Service extended with Predictive Spare Parts Management scenario support
- Additional IoT Application Services and powerful IoT Application Builder
- New IoT Scenarios and Enhanced IoT applications
- Advanced analytics and predictions

Integration & Process Innovation
- Enterprise Marketplace / App store for IoT services
- Enable New Business Models like Product-as-a-Service

* Shop floor integration / Industrie 4.0   ** Early Adoption

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SAP HANA Cloud Platform
Future direction

Additional Use Cases
- Support for additional use-cases based on requirements from customers and partners
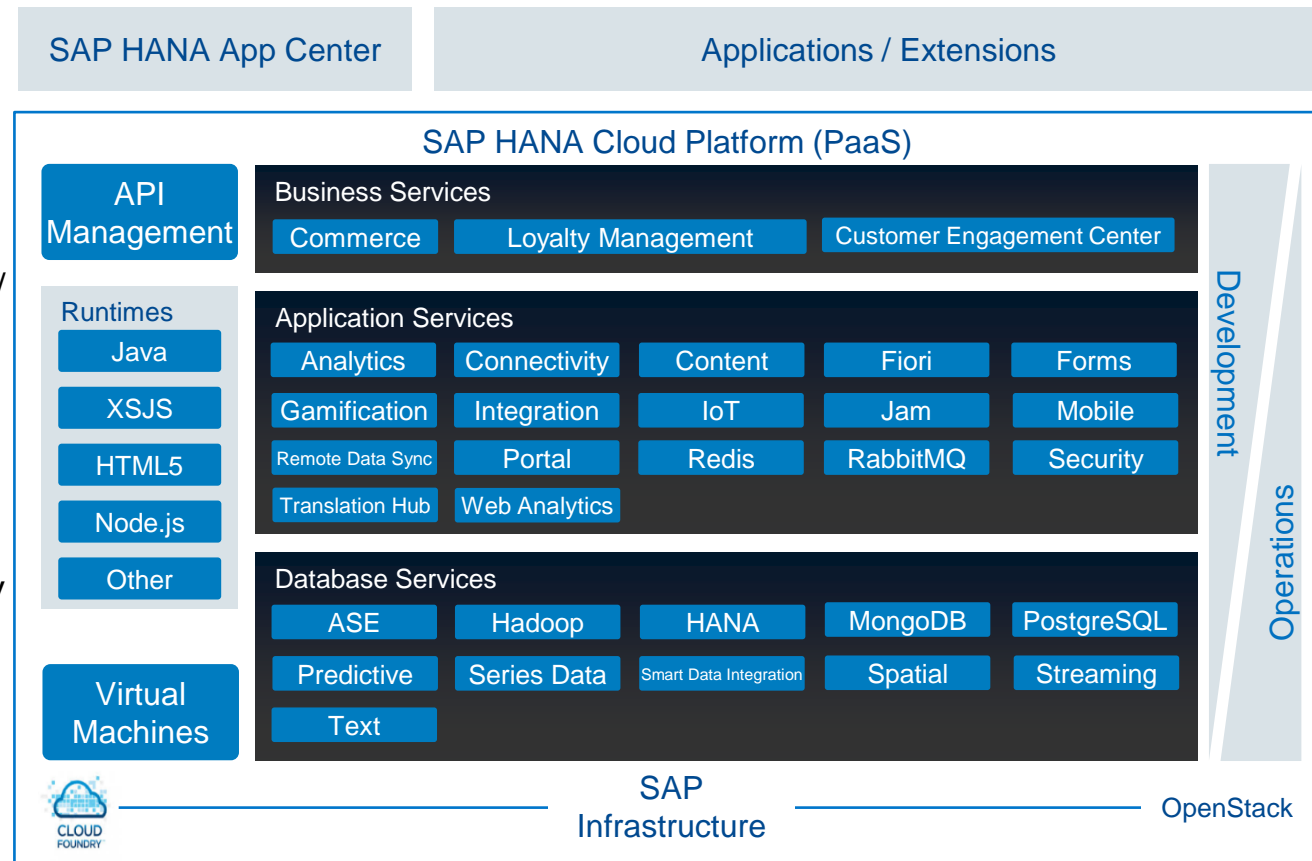
Infrastructure
- Availability of SAP HANA Cloud Platform in all regions
- Support for deployments in data centers of customers / partners
- Infrastructure based on OpenStack

Services
- Continuous improvements of existing services
- New services based on requirements from customers and partners (including Hadoop, Mail, Content Delivery Network)

Development & Operations
- Runtime environment completely based on Cloud Foundry
- Support for additional use-cases based on requirements from customers and partners

SAP HANA App Center	Applications / Extensions

SAP HANA Cloud Platform (PaaS)

API Management

Runtimes
- Java
- XSJS
- HTML5
- Node.js
- Other

Virtual Machines

Business Services
- Commerce
- Loyalty Management
- Customer Engagement Center

Application Services
- Analytics
- Connectivity
- Content
- Fiori
- Forms
- Gamification
- Integration
- IoT
- Jam
- Mobile
- Remote Data Sync
- Portal
- Redis
- RabbitMQ
- Security
- Translation Hub
- Web Analytics

Database Services
- ASE
- Hadoop
- HANA
- MongoDB
- PostgreSQL
- Predictive
- Series Data
- Smart Data Integration
- Spatial
- Streaming
- Text

Development

Operations

CLOUD FOUNDRY

SAP Infrastructure

OpenStack

Powered by SAP HANA

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Customer   42

SAP Internet of Things – Applications & Integration
Future direction

New IoT Scenarios and Enhanced IoT applications, with Scenarios like

- Predictive Consumables Planning for devices that require consumables like active filter minerals
- Predictive Spare Parts Planning: Reduce stock and improve your supply processes
- Emerging Issue Detection: Get alerts based on statistical insights
- Predictive Technician and Workforce Planning: Plan the right skill portfolio for you technicians and schedule them optimally
- Digital Object Memory to support Track & Trace and Track and Assembly across the value chain

New IoT application services for Internet of Things and a powerful IoT Application Builder

Advanced Analytics and Predictions

Enable New Business Models like Product-as-a-Service

- Sell your devices based on their utilization, e.g. by cubic meters of earth moved
- Improve your customer's satisfaction and loyalty
- Calculate the utilization within IoT applications
- Integration into SAP CRM et. al. for charging and billing

Enterprise Marketplace / App store for SAP, customer and partner IoT services

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Summary

SAP Internet of Things enables customers to connect their machines and smart devices with a powerful IoT platform, analyze data in real time and leverage this information across the value chain to get new business insights. It enables customers and partners to build and run <u>business</u> applications in the cloud allowing end-to-end insight to action.

Already today, SAP Internet of Things:
- provides powerful applications, integration scenarios and a wide range of platform services
- offers a standards-based development environment and embraces open source
- runs in SAP's certified tier-3 and 4 data centers in Germany, United States and Australia

In the future, SAP Internet of Things:
- will offer additional applications, industry scenarios and support additional use-cases
- will support additional runtimes as well as platform services (including open source services)
- will give customers and partners access to rich business services / APIs
- will be rolled out to more data centers and will support deployments in data centers of customers / partners
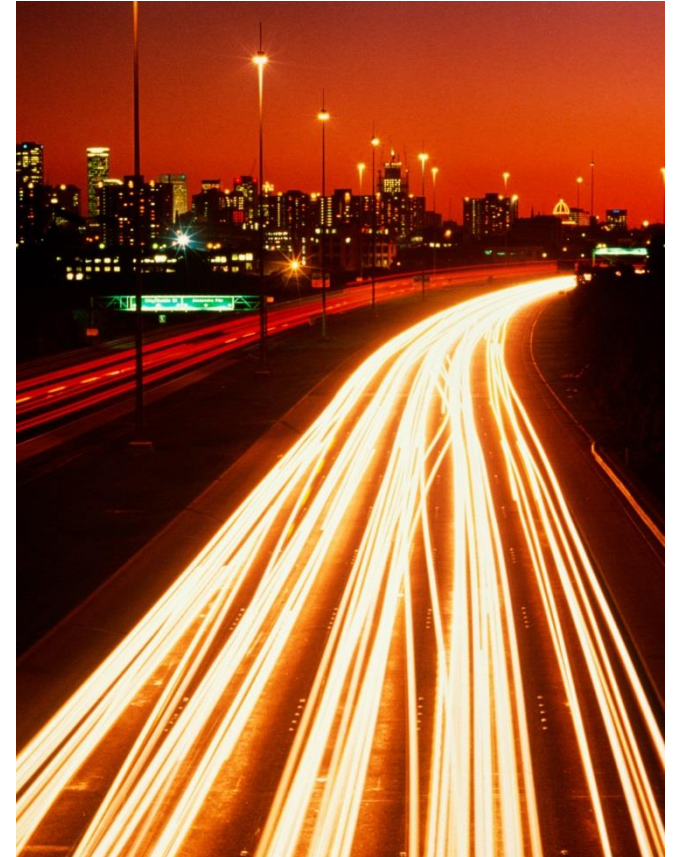
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Why SAP?

SAP Internet of Things for Business

- **Seamless integration** with IT systems to make business sense of your sensor and machine data, from insight to action

- Big data analytics and **monitoring with SAP HANA** in-memory computing

- Fast time to value and low TCO by utilizing a big data IT architecture **in the cloud**

- **Ensure strong security standards** by relying your data to SAP's decades of expertise with IT security

Workforce engagement

Supplier collaboration business Networks

Digital Core
SAP S/4 HANA

Assets & Internet of Things

Multi-channel **Customer** experience

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Related road maps

Related product road maps available on Service Marketplace:

- SAP HANA Cloud Platform
- SAP HANA Cloud Integration
- SAP Enterprise Portal and SAP HANA Cloud Portal
- SAP HANA
- SAP Predictive Maintenance and Service, cloud edition

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Customer

Thank you

Road map contacts for customers and partners

- Ulf Guttmann   Ulf.Guttmann@sap.com   Solution Manager IoT
- Alexander Braun   alexander.braun@sap.com   Product Manager HCP
- Martin Bachmann   Martin.Bachmann@sap.com   Product Manager HCI
- Daniel Huber   Daniel.huber@sap.com   Product Manager IoT Applications

Key links for more information
For customers and partners

Key links

- Road maps on SAP Service Marketplace   http://service.sap.com/saproadmaps

- SAP Community Network   http://sdn.sap.com

- IT Planning Resources   https://service.sap.com/~sapidb/011000358700001160122012E

- SAP HANA Cloud Platform   http://hcp.sap.com

Where to go to provide product feedback and ideas

- SAP Idea Place   http://ideas.sap.com

- Influence programs   http://service.sap.com/influence

- SAP User Groups   http://sapusergroups.com

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