SAP HANA
Product Roadmap

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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:

- Recent innovations = changes in the current and recent released version(s)
- Planned innovations = changes planned in one or more upcoming development release
- Product direction = proposed themes for major product releases beyond the current development plan
- Product vision = areas in which the product would be evolved based on technological and industry trends

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 and product documentation.

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Product Overview

- Product description
- Key trends and customer needs
- Road map overview and major product updates

Product Road Map

- Recent innovations
- Planned innovations
- Product direction
- Product vision

Appendix

Product Overview

- Product description
- Key trends and customer needs
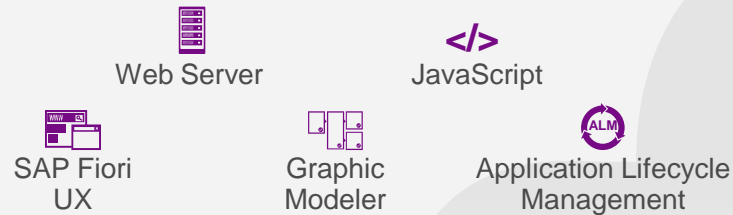- Road map overview and major product updates

SAP HANA platform
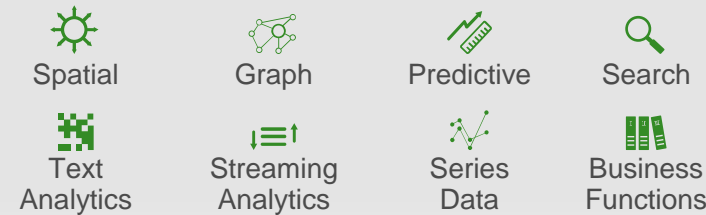## The data management and application platform for all applications

All Devices

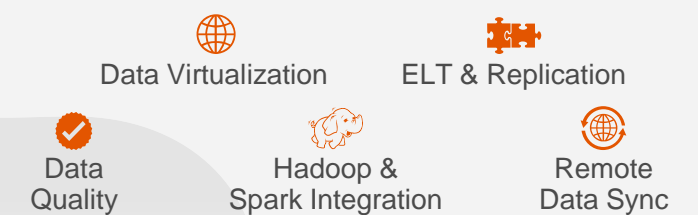SAP, ISV and Custom Applications

SAP HANA platform

APPLICATION DEVELOPMENT

Web Server

JavaScript

SAP Fiori UX

Graphic Modeler

Application Lifecycle Management

ADVANCED ANALYTICAL PROCESSING

Spatial

Graph

Predictive

Search

Text Analytics

Streaming Analytics

Series Data

Business Functions

DATA INTEGRATION & QUALITY

Data Virtualization

ELT & Replication

Data Quality

Hadoop & Spark Integration

Remote Data Sync

DATABASE MANAGEMENT

Columnar OLTP+OLAP

Multi-Core & Parallelization

Advanced Compression

Multi-tenancy

Multi-Tier Storage

Data Modeling

Openness

Admin & Security

High Availability & Disaster Recovery

ONE Open Platform　　　　**OLTP + OLAP**　　　　**ONE Copy of the Data**

SAP HANA platform is easy to adopt
Standard-based and open

S A P   H A N A   p l a t f o r m

APPLICATION DEVELOPMENT	ADVANCED ANALYTICAL PROCESSING	DATA INTEGRATION & QUALITY

DATABASE MANAGMENT

Database Management

- Standard RDBMS
- ACID, SQL 92 Compliant
- Accessible thru JDBC, ODBC, JSON, OData
- Standard security model
- Choice of third-party administration tools

Application Development

- Choice of application servers and webservers
- Eclipse-based and web development tool
- Include web application server with Java Script, Java, Node.JS, C++ runtime support
- Support git, github, maven tools
- Include HTML5 UI libraries

Advanced Analytical Processing

- Execute advanced data processing using SQL
- Spatial processing follows OGC standards, ISO SQL/MM, GeoJSON
- Built-in predictive libraries and supports R
- Apache Kafka integration for streaming

Data Integration & Quality

- Data movement and federation with existing DBs
- Framework to build custom adaptors
- Integration with Spark and Hadoop
- Apache Ambari support

SAP HANA platform: Database services
Breakthrough innovations

SAP HANA platform

APPLICATION DEVELOPMENT	ADVANCED ANALYTICAL PROCESSING	DATA INTEGRATION & QUALITY

DATABASE MANAGEMENT

Columnar OLTP+OLAP · Multi-Core & Parallelization · Advanced Compression · Multi-tenancy · Multi-Tier Storage · Data Modeling · Openness · Admin & Security · High Availability & Disaster Recovery
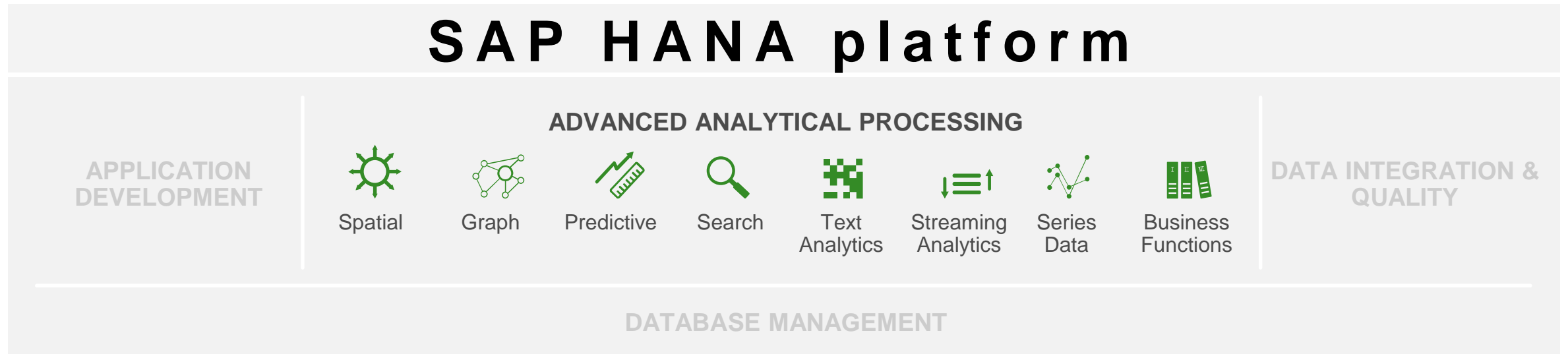
- Turns data into real-time information
- No database tuning required for complex and ad hoc queries
- Run Transactions and Analytics together on one system and one copy of data
- Ready for Cloud or On-premises deployment
- Not limited by the size of memory

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SAP HANA platform: Advanced Analytical Processing
Comprehensive advanced data processing and analytics

SAP HANA platform

APPLICATION DEVELOPMENT

ADVANCED ANALYTICAL PROCESSING

| Spatial | Graph | Predictive | Search | Text Analytics | Streaming Analytics | Series Data | Business Functions |

DATA INTEGRATION & QUALITY

DATABASE MANAGEMENT

- Run applications with dramatically different datatype characteristics in the same system
- Optimize graph, planning, and rules applications on the same data
- Empower your business via built-in predictive analytics, business functions, and data quality

SAP HANA platform: Application development
Web server and database in one system reducing data movements

S A P   H A N A   p l a t f o r m

APPLICATION DEVELOPMENT

Web Server   JavaScript   SAP Fiori UX   Graphic Modeler   Application Lifecycle Management
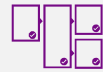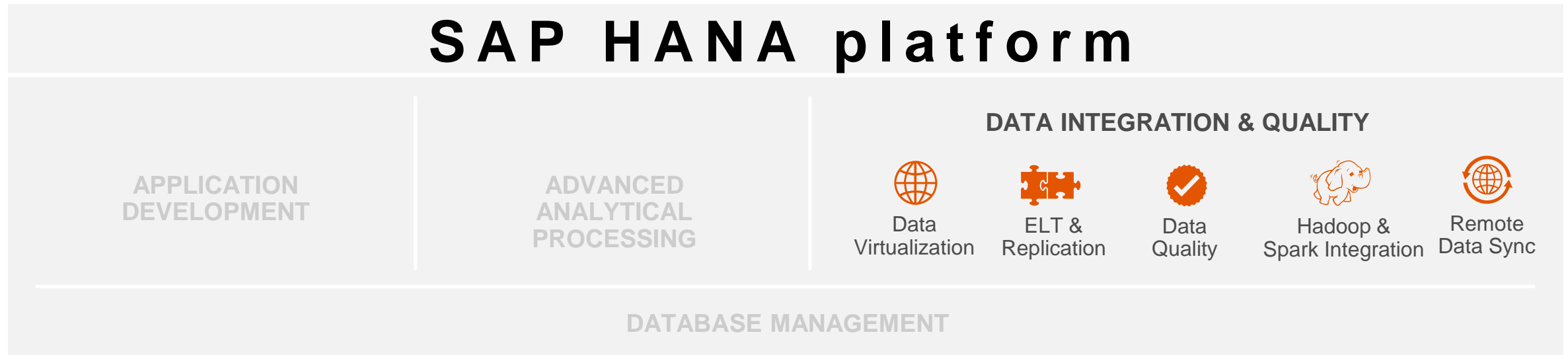
ADVANCED ANALYTICAL PROCESSING

INTEGRATION & QUALITY SERVICES

DATABASE MANAGEMENT

- Deliver consumer-grade User Experiences for any device, automatically
- Support standards and languages that developers already know how to use
  – Java, JavaScript, C++, Node.JS, SQL, JSON, ADO.NET, JDBC, ODBC, OData, HTML5, MDX, XML/A
- Built-in tools to develop, version-control, bundle, transport, and install applications

SAP HANA platform: Integration services
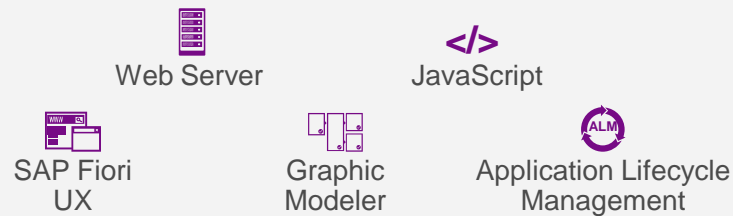Data from any source for a complete view of the business

SAP HANA platform

APPLICATION DEVELOPMENT	ADVANCED ANALYTICAL PROCESSING	DATA INTEGRATION & QUALITY

DATA INTEGRATION & QUALITY

Data Virtualization · ELT & Replication · Data Quality · Hadoop & Spark Integration · Remote Data Sync

DATABASE MANAGEMENT

- Access information stored in data silos while keeping the data in place
- Replicate and move any type of data in real-time to the cloud and on-premise when necessary
- Capture and analyze live data streams and route to appropriate storage or dashboard
- Synchronize data between SAP HANA and thousands of remote databases (SQL Anywhere, UltraLite)
- Multiple access points from SAP HANA to Hadoop data: thru Spark, Hive, HDFS and MapReduce
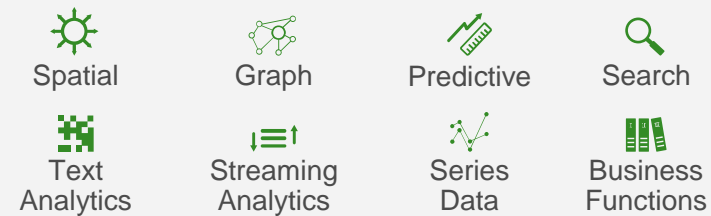
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SAP HANA: The platform for all applications
Comprehensive services to make information available to any application
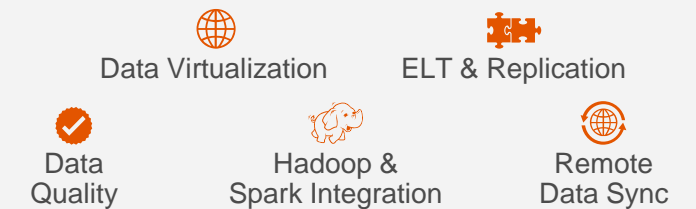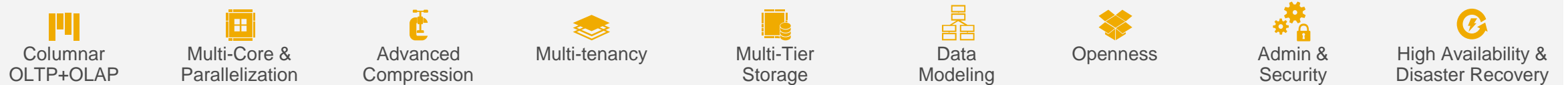
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Columnar OLTP+OLAP

Multi-Core & Parallelization

Advanced Compression

Multi-tenancy

Multi-Tier Storage

Data Modeling

Openness

Admin & Security

High Availability & Disaster Recovery

Choice of deployment: Cloud and On Premise

CONCUR

SAP Ariba

SAP SuccessFactors ♡

Cloud

Run all applications
in the cloud

| SAP Bus. Suite | SAP BW | SAP S/4 HANA | 3rd Party Apps |
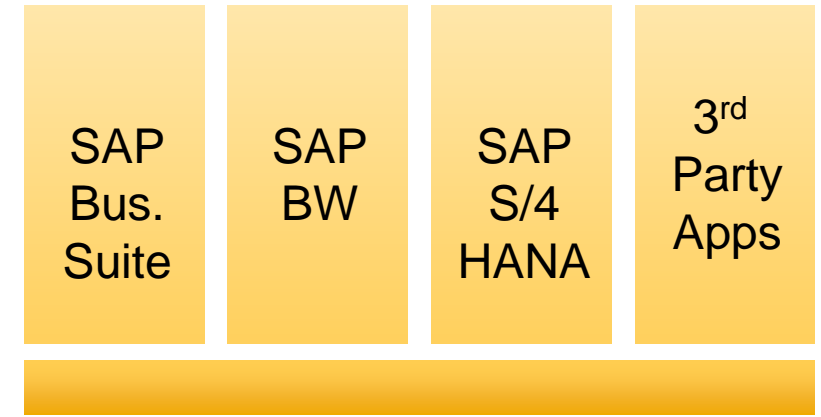
On Premise

Run all applications
on premise

Choose the right cloud deployment option

Public Cloud

SAP HANA One	SAP HANA on IaaS

- Pay per hour for SAP HANA license
- Build native SAP HANA applications

- Bring your own SAP HANA license
- Build native SAP HANA applications and run SAP applications

amazon web services   Microsoft Azure   SOFTLAYER an IBM Company

Managed Private Cloud

SAP HANA Enterprise Cloud

- Faster time to value with fully managed and secured cloud that offers elasticity and flexibility
- Run SAP Business Suite and SAP BW powered by SAP HANA and custom applications on SAP HANA
- Deliver maximum performance, security, high availability and disaster recovery

Platform-as-a-Service

SAP HANA Cloud Platform

- Open platform-as-a-service with in-memory DB and application services
- Build new applications or extend SAP cloud and on-premise applications
- Integrate cloud and on-premise applications seamlessly and securely
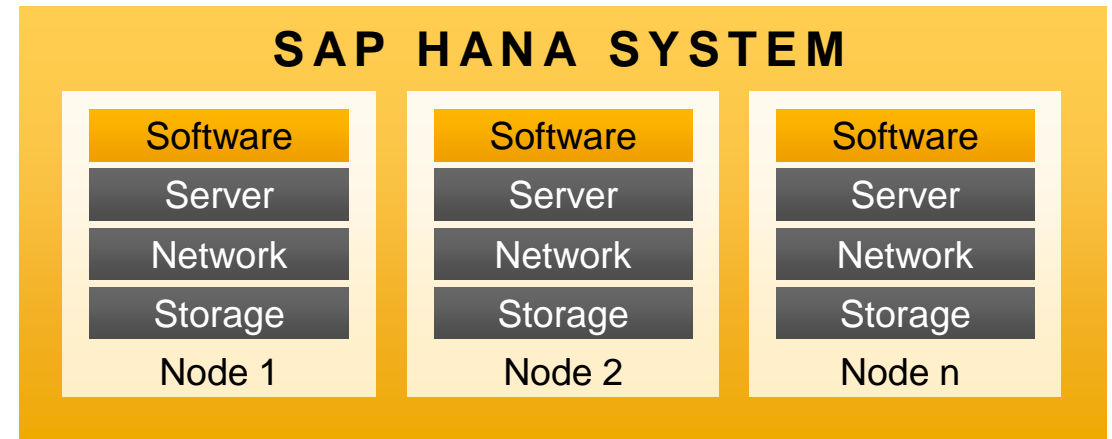- Create, deploy and manage enterprise-ready mobile applications

Choose the right on premise deployment option

Appliance

SAP HANA SYSTEM

Software Server Network Storage	Software Server Network Storage	Software Server Network Storage
Node 1	Node 2	Node n
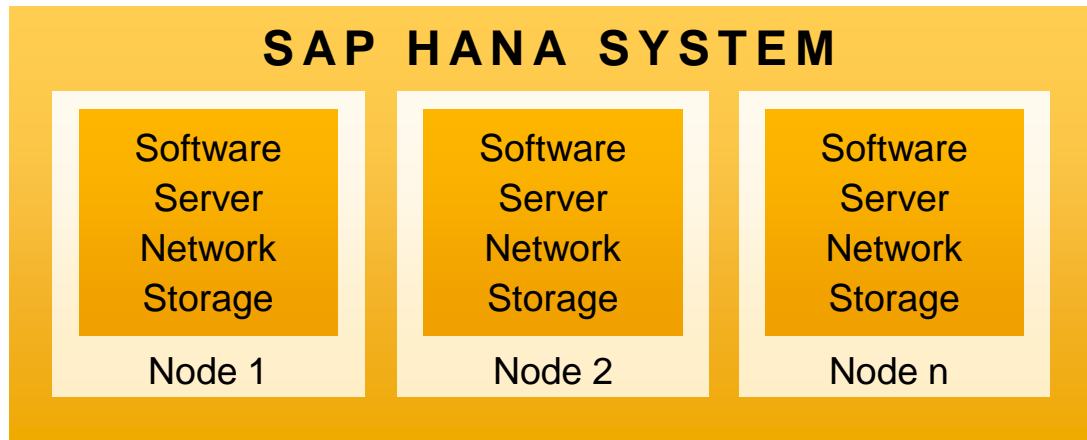
All in one box by certified partners
(1,000+ configurations – 48 GB to 20 TB)

Tailored Data Center Integration

SAP HANA SYSTEM

Software Server Network Storage	Software Server Network Storage	Software Server Network Storage
Node 1	Node 2	Node n

Choice of components that meet SAP
requirements from different vendors

SAP HANA platform
Product road map overview - key themes and capabilities

Recent innovations	2017 – Planned innovations	2018 – Product direction	2019 – Product vision

Recent innovations

Database Management
- Columnar OLTP + OLAP with multi-core, parallelization and advanced compression
- Multitenant database containers (MDC), workload management and NUMA optimizations
- Multi-temperature data management
- Cloud and data center delivery models with business continuity, security, administration and monitoring
- Data modeling via views
- Open standards (e.g. 3rd-party certifications, RDMA support, diverse Intel Xeon ecosystem, IBM Power for SAP BW, etc.)

Data Management
- Enterprise architecture designer
- Data streaming & remote data sync for IoT and offline apps
- Data virtualization and Hadoop integration
- EIM functionality (ELT, DQ, replication, rules)

Analytical Intelligence
- Predictive, text, series, search, planning, graph and spatial
- Application function libraries – native complex computations

Application Development
- Web server, JavaScript, BYOL, SAP Fiori UX, graphic modeler
- Application Lifecycle Management

2017 – Planned innovations

Database Management
- Security: data masking, backup encryption
- HA/DR: multi-target system replication, 3-tier active/active read-enabled, delayed secondary
- Admin/monitoring: workload based recommendations for improved operations
- Workload management: improved implicit workload balancing
- SQL Analyzer:pin hints/plans to SQL statements

Data Management
- Enterprise architecture: data movement modeling, NoSQL and DW DSO support
- Data modeling: complete feature parity for SAP Web IDE for SAP HANA
- DT: 3-tier system and 'async' replication
- SAP HANA smart data access: linked database
- SAP HANA smart data quality/smart data integration: additional adaptors, proximity matching, POI search

Analytical Intelligence
- ML: integration with external frameworks
- Spatial: linear reference system support
- Streaming: Support in SAP HANA, express edition
- Text: Native SAP Fiori search UI
- Graph: Expanded GraphScript
- Document Store: CSV import/export

Application Development
- SAP Fiori default programming model for XSA
- Ongoing SQL/SQLScript expansions and tooling enhancements

2018 – Product direction

Database Management
- Proactively tune and adjust DB operations with machine learning capabilities.
- Simplified and enhanced landscape database administration
- Improved backup lifecycle management
- Advanced data protection with extended encryption and key management capabilities
- IPv6 Support

Data Management
- Additional scalable and cost-effective data distribution and data storage options for structured and unstructured data
- Enterprise Architecture Designer: enhanced data modeling support, extensibility and data mappings
- DT support for storage snapshots

Analytical Intelligence
- Expand machine learning toolsets on persistent and streaming data for building real-time intelligent applications
- JSON as a native data type in SQL for more intuitive handling

Application Development
- Additional options for on-premises or cloud development tools and deployment
- Additional language support and continuous expansion of SQL/SQLScript

2019 – Product vision

The strategic goal and vision is to drive technology innovation and evolve SAP HANA into the one holistic real-time data management platform that addresses all data processing scenarios of our customers, regardless of size, on premises or cloud, analytical, or transactional. SAP HANA, as the real-time data management platform, becomes the common denominator of both the digital core and the converged business cloud enabling customers to innovate while leveraging all of their data management assets.

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

Product Road Map

- Recent innovations
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Database Management Transformed

SAP HANA platform – Recent innovations

Database Management Transformed
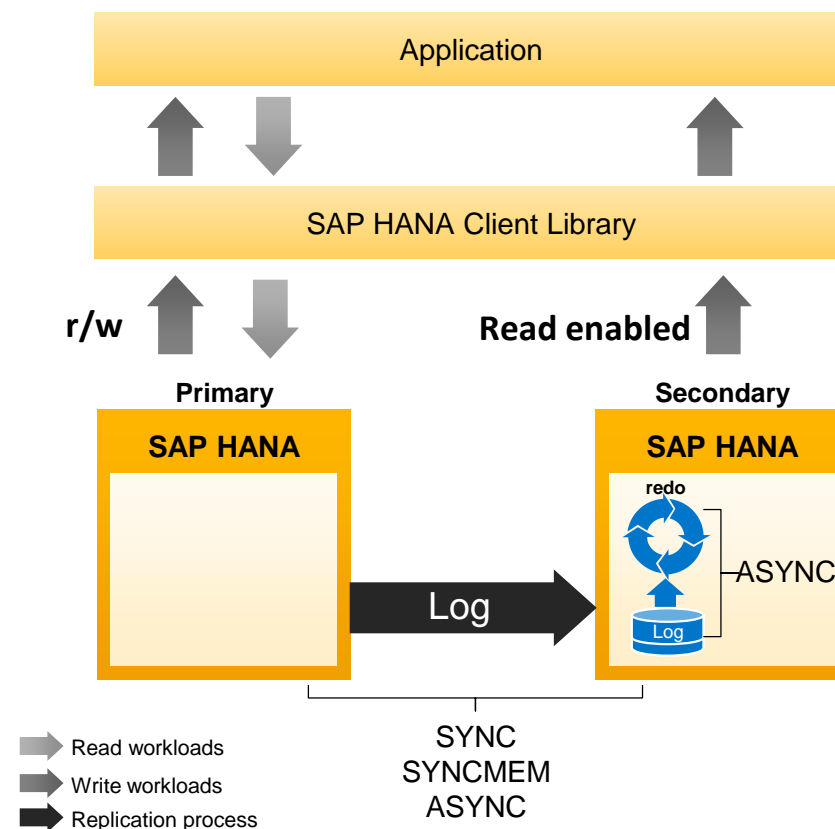## High availability and disaster recovery

System Replication

- "Active / Active read-enabled" to utilize the secondary systems to offload read intense workloads

SAP Landscape Management*

- Expand support with automated orchestration for HA/DR processes (like takeover, zero-downtime updates, …)

* License Separately

Application

SAP HANA Client Library

r/w   Read enabled

Primary   Secondary

SAP HANA   SAP HANA

redo

Log   ASYNC

Log

Read workloads
Write workloads
Replication process

SYNC
SYNCMEM
ASYNC

Ensure business continuity and availability to meet the most demanding SLAs

Database Management Transformed
Backup and recovery

Backup and Recovery

- Consolidate log backup files from SAP HANA to simplify workload for certified 3rd party backup tools
- Option to define location of backup catalog (independent of redo logs) to allow choice of backup catalogs for recovery and improve performance
- Recover a backup from a singleDB (non-MDC) system to a tenant database from an MDC system to support testing scenarios in a transition from single to MDC
- Restore SAP HANA 1.0 (needs to be SPS10+) backup to SAP HANA 2.0 system
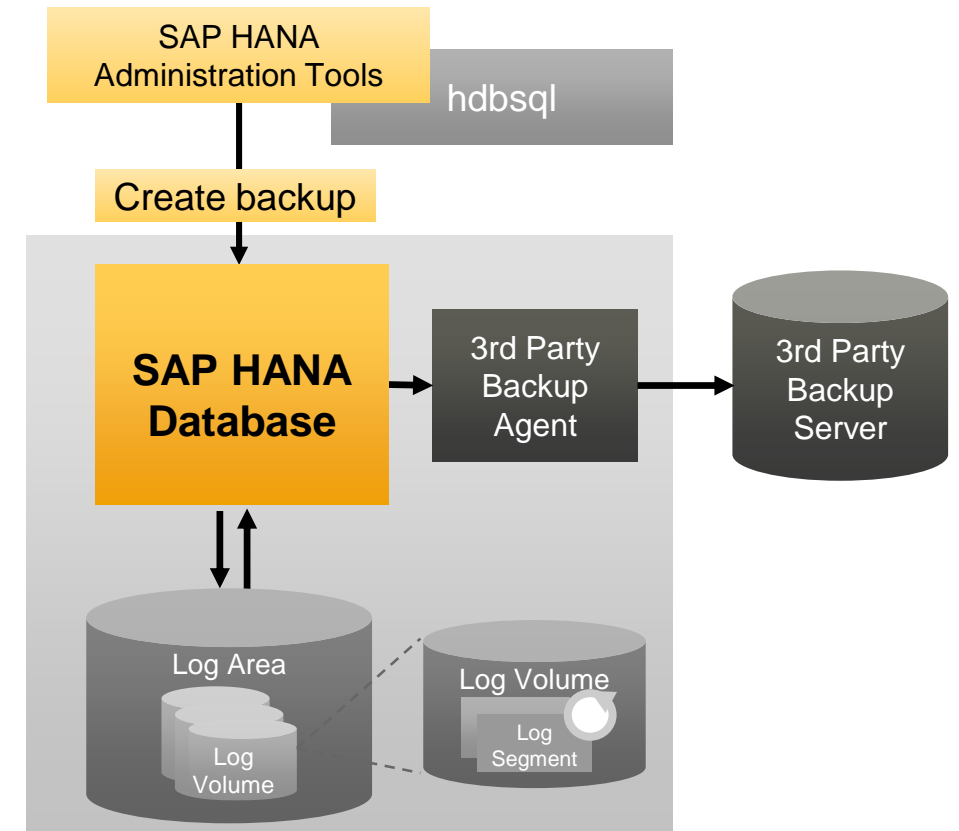
Simplify backup and recovery operations to provide more flexibility

Database Management Transformed
Enhanced data security and compliance enablement

Data Encryption

- Full native data at rest encryption (including redo logs, DT data volume, etc.)
- Enhanced encryption key management (i.e. changing the root key of the application encryption service that is used)

User and Role Management

- Authorization management in SAP HANA based on LDAP groups to lower operation cost
- Additional authentication and user management capabilities for XS Advanced scenarios, e.g. app-to-app SSO

User	SAP HANA	LDAP Server

Log on	→	Authenticate User		
		↓		
		Search for user's LDAP group memberships	→	Identify user
				↓
Access resources based on granted roles	→	Grant roles mapped to LDAP group(s)	←	Send user's group information
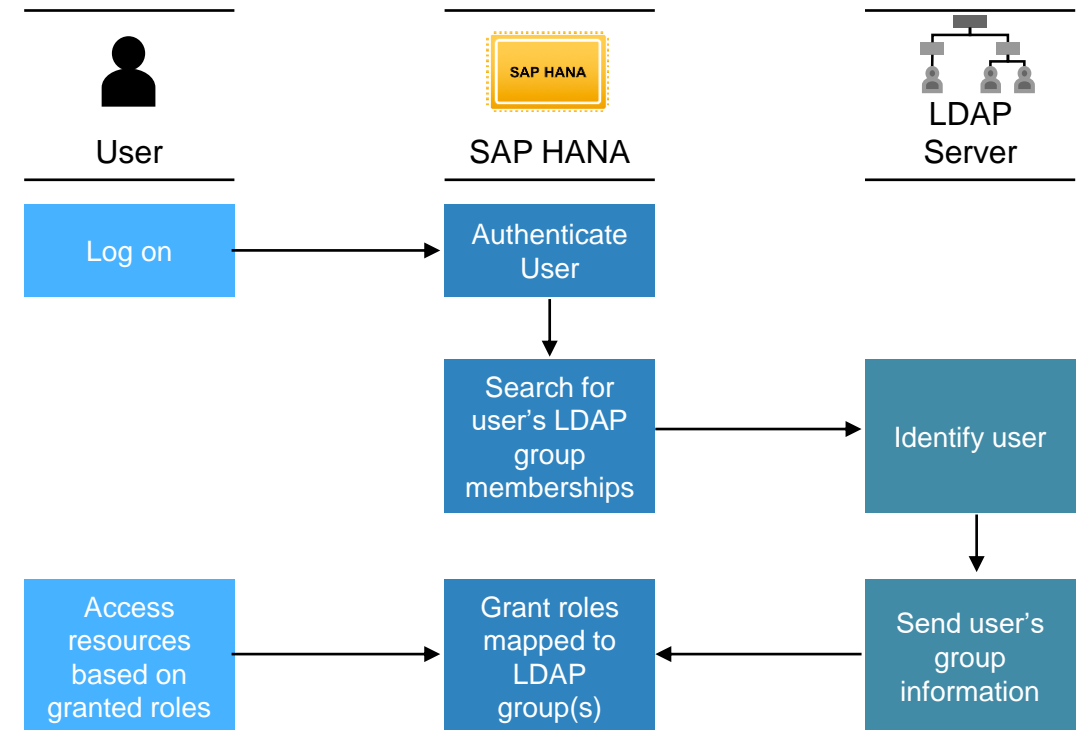
Integrated security framework with authentication, SSO, user/role management, data and communication encryption, audit logging, secure configuration and secure application development for comprehensive protection

Database Management Transformed
Capture and replay / workload analyzer

Workload Capture and Replay

- Compare several replays coming from the same capture with each other for baseline analysis
- Resource consumption reporting allows comparison of workload on system level after replay
- Comparison of results of view-based queries based on row counts offers new insights into replay performance

Workload Analyzer

- Analyze historical sampling-based workload data in a visual form, making it easier to evaluate and draw conclusions
  - Timeline-based view, with statements structured in an execution hierarchy based on application and statement level, for better analysis and navigation
  - Analyze captured workloads, visualizing system load based on engine Instrumentation

SQL Analyzer

- Analyze individual query runtimes by providing execution overview as well as several performance details.
  - Shows multiple KPI, e.g. used tables for query or SQLScript statement execution statistics

Simulate and analyze workloads to reduce time and cost when implementing change

Database Management Transformed
Workload management

Workload Management

- Initial admission control offering to automatically reject requests from the database (applications, analytics, ...) if thresholds are exceeded to avoid system-overload situations
- New option for clients to define a query timeout parameter in order to avoid run-away queries
- Support BI clients enabling workload classes at the session level for improved workload management by non-SAP clients
- Simplified enabling / disabling workload classes via the SAP HANA Cockpit to manage business processes

SAP HANA Session Layer

Desktop Datamart

db-connect → Session Context

Mobile Dashboard

db-connect → Session Context

Mapping Rules

Workload Class "DATAMART"

Workload Class "BW"

Workload Class "CRM"

Workload Class "MOBILE"
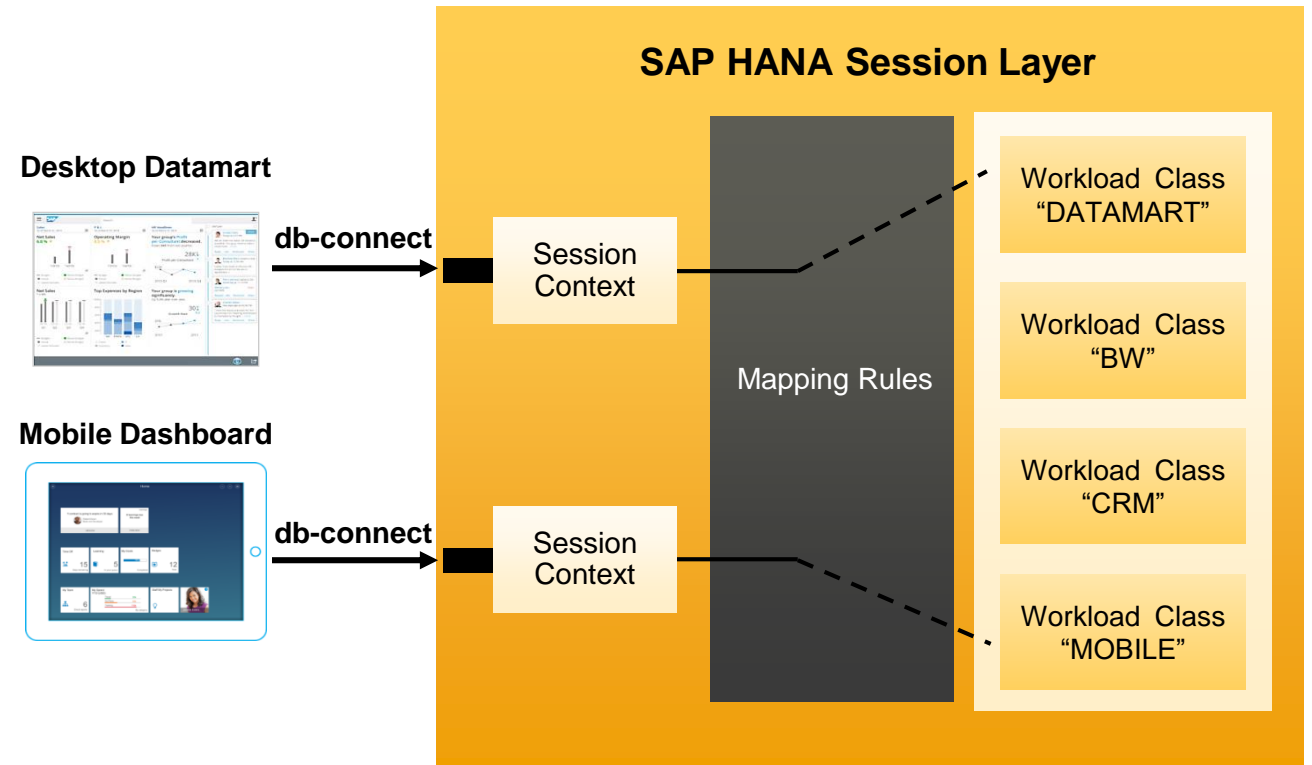
Influence dynamic resource consumption according to workload classifications to improve performance for users and applications

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Customer   25

Database Management Transformed
Administration and monitoring

SAP HANA Cockpit

- Re-architected for optimized administration in order to
  - Unify individual, multiple database, and tenant management
  - Run without dedicated SAP HANA instance and separate administration environment from production system
  - Support on-premise or cloud implementations
- Integrated database explorer for catalog browsing, SQL console, and trace file management capabilities to increase DBA productivity
- Enhanced performance analysis of SQL plan that has been executed with related statistics to analyze the execution plan of a SQL statement in a graphical view

Simplify administration and monitoring for the digital core to improve IT efficiency

Data Management Transformed

SAP HANA platform – Recent innovations

Data Management Transformed
SAP Enterprise Architecture Designer, Edition for SAP HANA

SAP Enterprise Architecture Designer, Edition for SAP HANA*

- Web-based enterprise architecture modeling tool for comprehensive end to end modeling experience
- Support business process modeling
- Provide landscape, application and business capability modeling
- Provide analysis of linked items across perspectives to drive decisions for digital transformation
- Architect and plan physical data models targeting new and/or migrations to SAP HANA
- Support requirements modeling/documentation
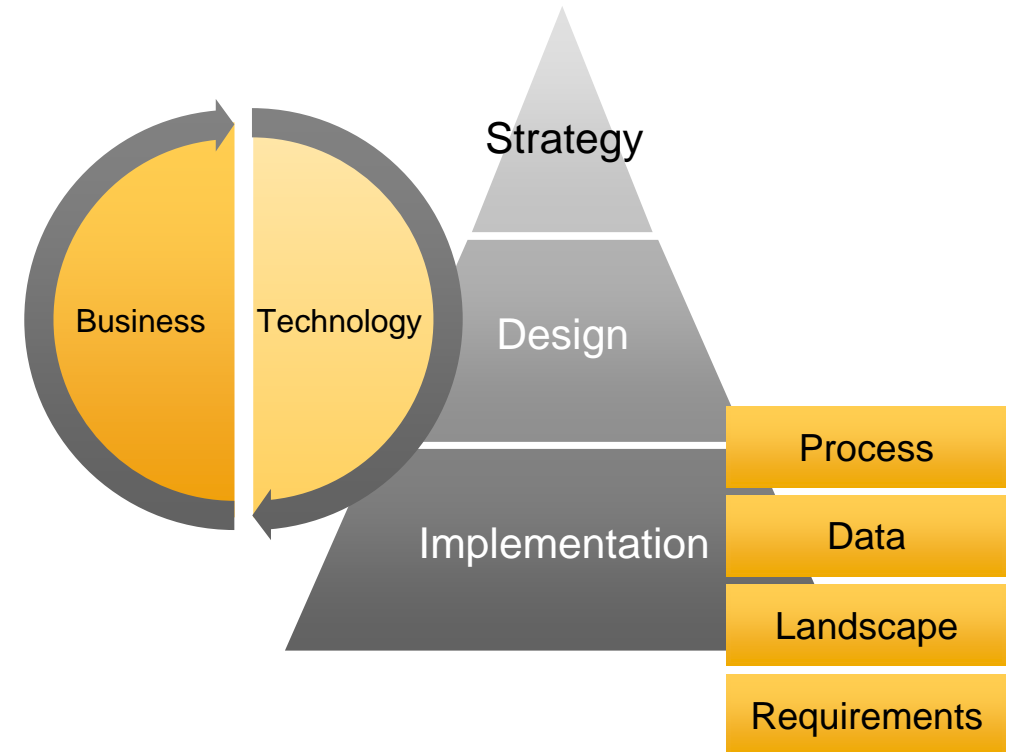
* 5 user license with SAP HANA.

Business Technology

Strategy

Design

Implementation

Process

Data

Landscape

Requirements

Strategy – Design – Implementation

Create and integrate enterprise, landscape, process, and data models to manage information and systems effectively

Data Management Transformed
Smart data integration, smart data quality, and smart data access

SAP HANA Smart Data Integration (SDI)

- Virtual procedure support (via BAPIs) to enable read/write scenarios with ABAP-based systems
- Support parallel data load to optimize memory consumption and improve data load performance
- Automatic recovery of real-time replication, if source system becomes unavailable, to simplify operations
- Additional data sources: Microsoft Access and Microsoft Sharepoint for data virtualization and integration scenarios

SAP HANA Smart Data Quality (SDQ)

- SDQ cleanse transform support for address suggestions to improve accuracy of address data

SAP HANA Smart Data Access (SDA)

- SDA Remote metadata sync via refresh command to easily maintain changing schemas

SQL	MDX	HTTP	OData	XMLA

SAP HANA platform

Index Server

Virtual Tables	Tables

Data Provisioning Server — OData

Data Provisioning Agent

Adapters	ECC, ASE, SAP HANA	Hive	Facebook	Excel
	3rd Party RDBMS	Files	Twitter	SOAP

RDBMS / Hadoop   Text Data   Structured Data   Social Network
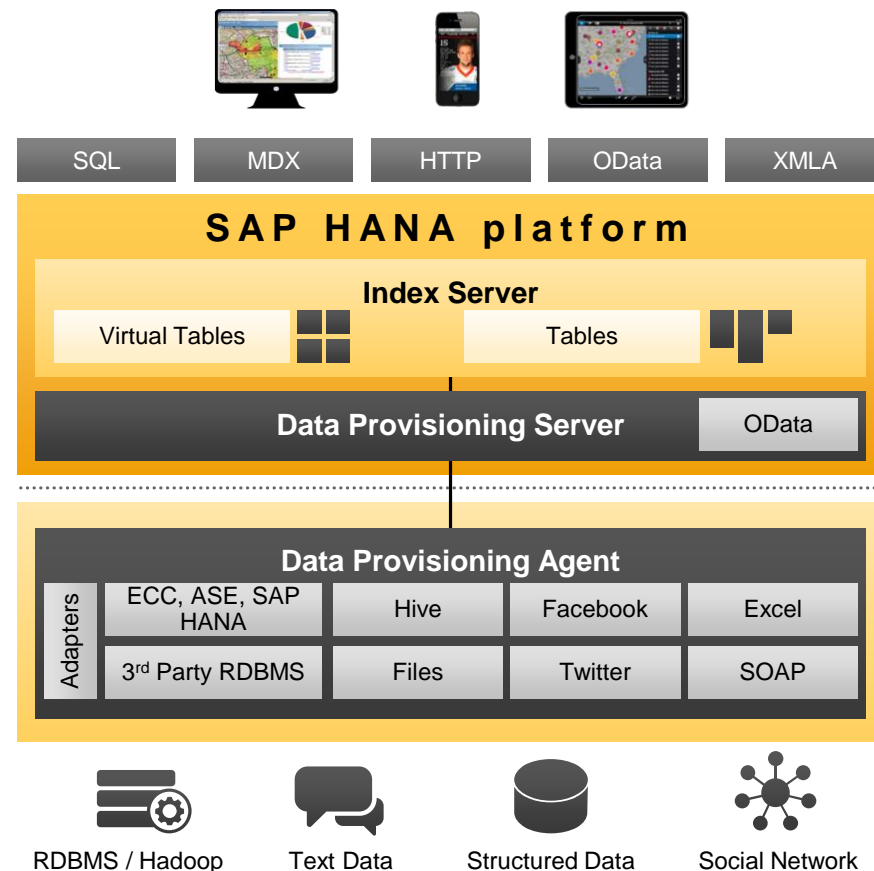
Data integration and transformation for advanced and rich processing of business data

Customer   29

Data Management Transformed
Tiered storage

Dynamic Tiering

- Multi-store table is a partitioned SAP HANA column table with partitions distributed between memory and extended store to simplify management of large volumes of data
  - With the ability to bi-directionally move partitions between memory and extended store as the business value of data changes (like aging)
  - With runtime partition pruning, ensure query optimizer accesses only the pertinent partitions
- Support system replication for two-tier synchronous SAP HANA and extended stores for high availability
- Delta backups now support systems with both in-memory and extended store to reduce backup times and storage requirements
- Encrypt extended store for better security

SAP HANA Database

Multistore Table T_M

Partition 1   Partition 2

Partition 3

In-memory-store

Column Table T_C

Extended Store (Dynamic Tiering)

Extended Table T_E
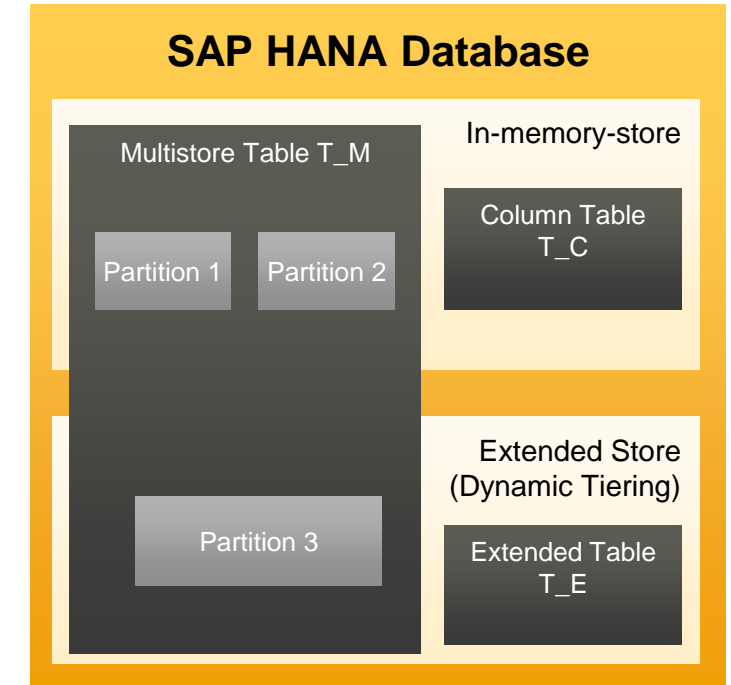
**Combine enhanced dynamic tiering and data lifecycle management
to optimize the data management for multi temperature management**

Analytical Intelligence Transformed

SAP HANA platform – Recent innovations

Analytical Intelligence Transformed
Predictive / machine learning

Predictive Analytics Library

- Expand existing library to include **8 new** algorithms to enable new analytical use cases
- Infrastructure enhancements (like metadata sharing) to enable SAP Predictive Analytics to easily consume new PAL functions
- Support parallel execution of PAL scoring functions to improve processing performance for large scale partitioned data

Streaming Analytics

- Guarantee message delivery via REST interface for real-time analysis use cases where data assurance is required
- New adaptors (ODATA, JSON, XML support) for greater flexibility
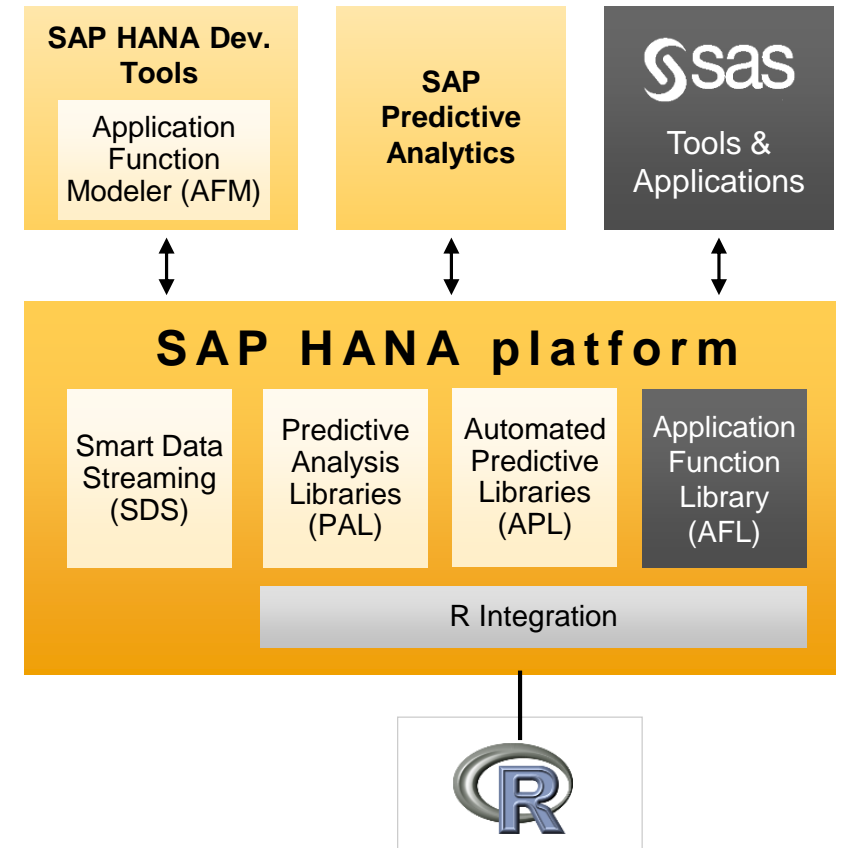
Rich set of native algorithms for in-database and in-memory processing exploiting analytic capabilities resulting in quicker insights and faster implementation

SAP HANA In-Memory Predictive Analytics
Predictive Analysis Library (PAL)–algorithms supported in SAP HANA 2.0 SPS00

Classification Analysis

- CART
- C4.5 Decision Tree Analysis
- CHAID Decision Tree Analysis
- K Nearest Neighbour
- Logistic Regression Elastic Net
- Back-Propagation (Neural Network)
- Naïve Bayes
- Support Vector Machine
- Random Forests
- **Gradient Boosting Decision Tree***
- **Linear Discriminant Analysis (LDA)***
- Confusion Matrix
- Area Under Curve (AUC)
- Parameter Selection / Model Evaluation

Regression

- Multiple Linear Regression Elastic Net
- Polynomial, Exponential, Bi-Variate Geometric, Bi-Variate Logarithmic Regression
- **Generalized Linear Model***
- **Cox Proportional Hazards Model***

Cluster Analysis

- ABC Classification
- DBSCAN
- K-Means
- K-Medoid Clustering
- K-Medians
- Kohonen Self Organized Maps
- Agglomerate Hierarchical
- Affinity Propagation
- Latent Dirichlet Allocation (LDA)
- Gaussian Mixture Model (GMM)
- Cluster Assignment

Time Series Analysis

- Single/Double/ Brown /Triple Exp.Smoothing
- Forecast Smoothing
- Auto - ARIMA/ Seasonal ARIMA
- Croston Method
- Forecast Accuracy Measure
- Linear Regression with Damped Trend and Seasonal Adjust
- Test for White Noise, Trend, Seasonality
- **Fast Fourier Transform (FFT)***
- **Correlation Function***

Association Analysis

- Apriori
- Apriori Lite
- FP-Growth
- KORD – Top K Rule Discovery
- **Sequential Pattern Mining***

Probability Distribution

- Distribution Fit/ Weibull analysis
- Cumulative Distribution Function
- Quantile Function
- Kaplan-Meier Survival Analysis

Outlier Detection

- Inter-Quartile Range Test (Tukey's Test)
- Variance Test
- Anomaly Detection
- Grubbs Outlier Test

Link Prediction

- Common Neighbors
- Jaccard's Coefficient
- Adamic/Adar
- Katzβ

Statistic Functions

- Mean, Median, Variance, Standard Deviation, Kurtosis, Skewness
- Covariance Matrix
- Pearson Correlations Matrix
- Chi-squared Tests:
  - Test of Quality of Fit
  - Test of Independence
- F-test (variance equal test)
- **Data Summary**

Data Preparation

- Sampling
- Binning
- Scaling
- Partitioning
- Principal Component Analysis (PCA) / PCA Projection

Other

- Weighted Scores Table
- Substitute Missing Values

* New in SAP HANA 2.0 SPS00
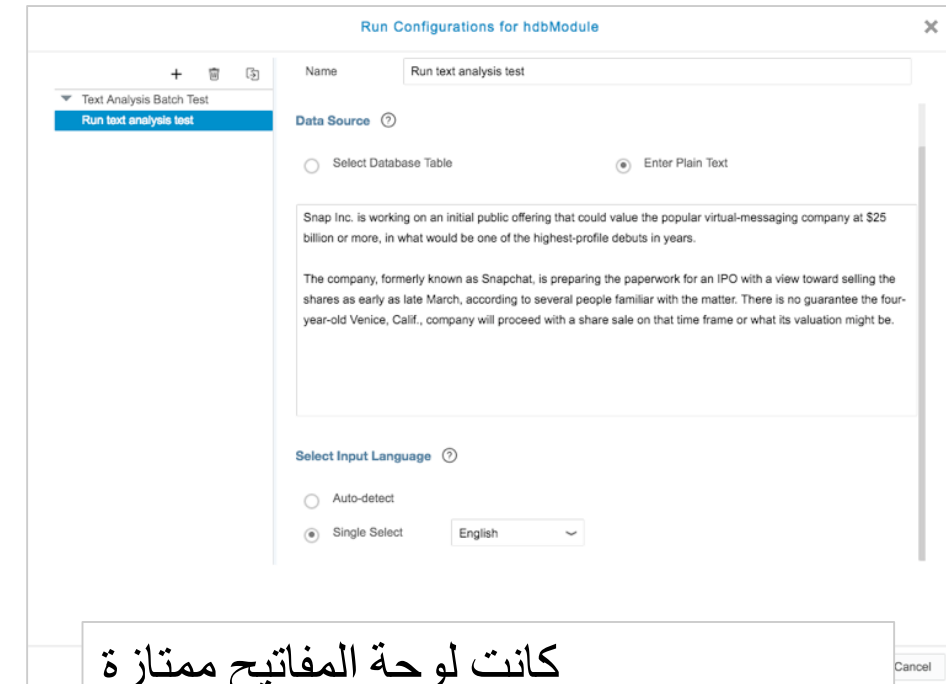
Analytical Intelligence Transformed
Text data processing

Text Search

- Filter on a date data type be it partial (e.g. 2016/09), decimal or string in faceted navigation applications for additional flexibility when browsing unstructured data
- Dynamically configure rule sets that require system specific parameters when used for either development, testing or production environments
- Run in "batch mode" for rule sets to detect duplicates on a set of records; goes beyond limited single row inputs

Text Analysis

- Create, test iteratively and maintain their custom dictionaries and rules in SAP Web IDE for SAP HANA
- Offer a native SQL interface to support simple integration of text scenarios into applications
- Expand sentence-/clause-level sentiment analysis to Arabic
- Extend tokenization and custom dictionary support to all whitespace-delimited languages in the world

كانت لوحة المفاتيح ممتازة
StrongPositiveSentiment: ممتازة
Topic: لوحة المفاتيح

Search and analyze text hidden in unstructured sources to uncover new insights

Analytical Intelligence Transformed
Spatial data processing

Spatial Data Processing

- Support spatial data type in Web IDE for SAP HANA
  - Calculated columns like calculate distance from home and office addresses
  - Output attributes to visualize spatial data in output like average revenue by region where the country boundary is in the output not the text of the region for visualization needs

esri ArcGIS

SAP BusinessObjects Cloud

Delivered

SAP HANA platform

SAP HANA DW Foundation	SAP HANA Spatial	SAP HANA Dev. Tools

SAP HANA Database

Option

Data Integration	**SAP Data Services**	Data Cleansing

Comprehensive Spatial Bundle
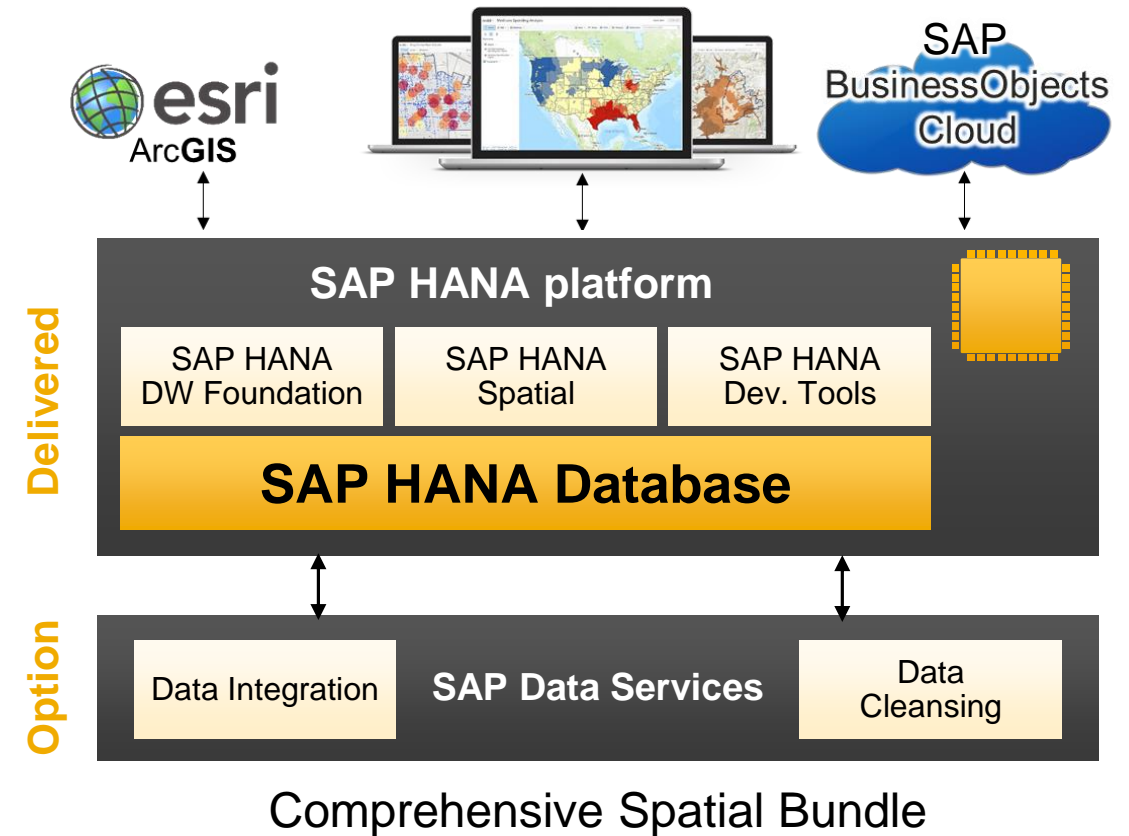
Process spatial data and develop spatially-enabled applications to improve user insight and action

Analytical Intelligence Transformed
Graph data processing

Graph Data Processing

- Enhanced visualization in Graph Viewer for improved exploration
- Support Cypher for pattern matching to leverage existing skillsets

Graph Modeler	Graph Viewer

SAP HANA platform

Graph Engine

Graph Algorithms	Pattern Matching
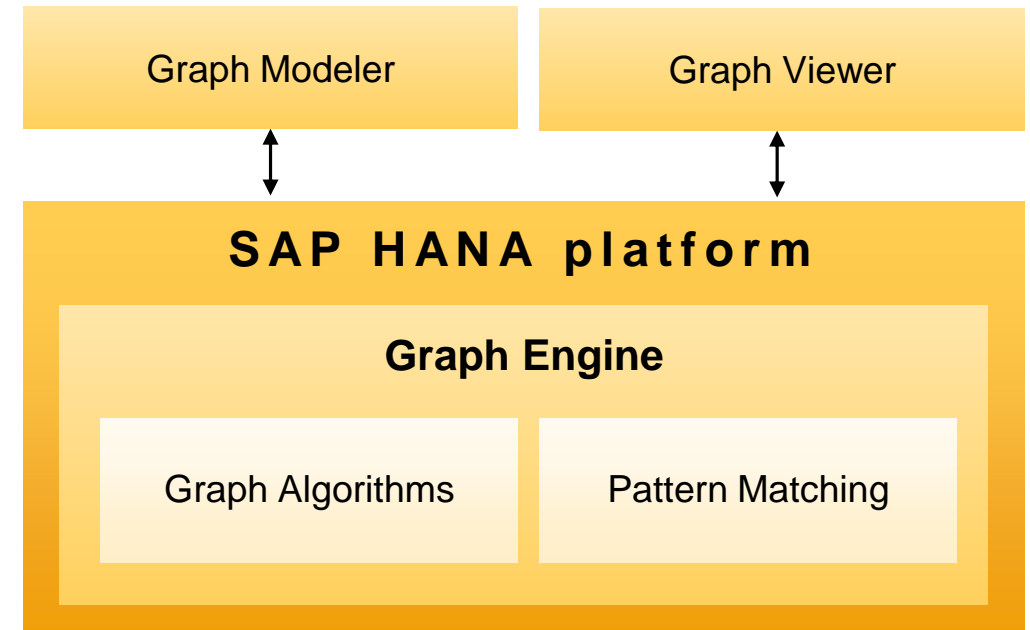
Traverse vast amounts of connected data, without duplication, and combine transparently with enterprise data to discover and act upon meaningful relationships

Customer

Application Development Transformed

SAP HANA platform – Recent innovations

Application Development Transformed
Extended Application Server

Extended Application Server (XS)

- Bring Your Own language / runtimes to reduce TCO by running these applications within the XSA framework
- Token based authentication for job scheduling to support business users
- Improved enterprise supportability and TCO
  – Enhanced JAVA / JavaScript runtime supportability and trace features to reduce effort of supporting JAVA based applications
  – Extended web based application monitoring instead of command line for improved usability
  – Migration assistant to reduce effort of migrating existing Extended Application Services Classic (XSC) applications to XSA
  – Build native applications in MDC landscapes without restrictions
- SDI REST API to programmatically invoke a flow-graph and return the results at runtime from within an application.
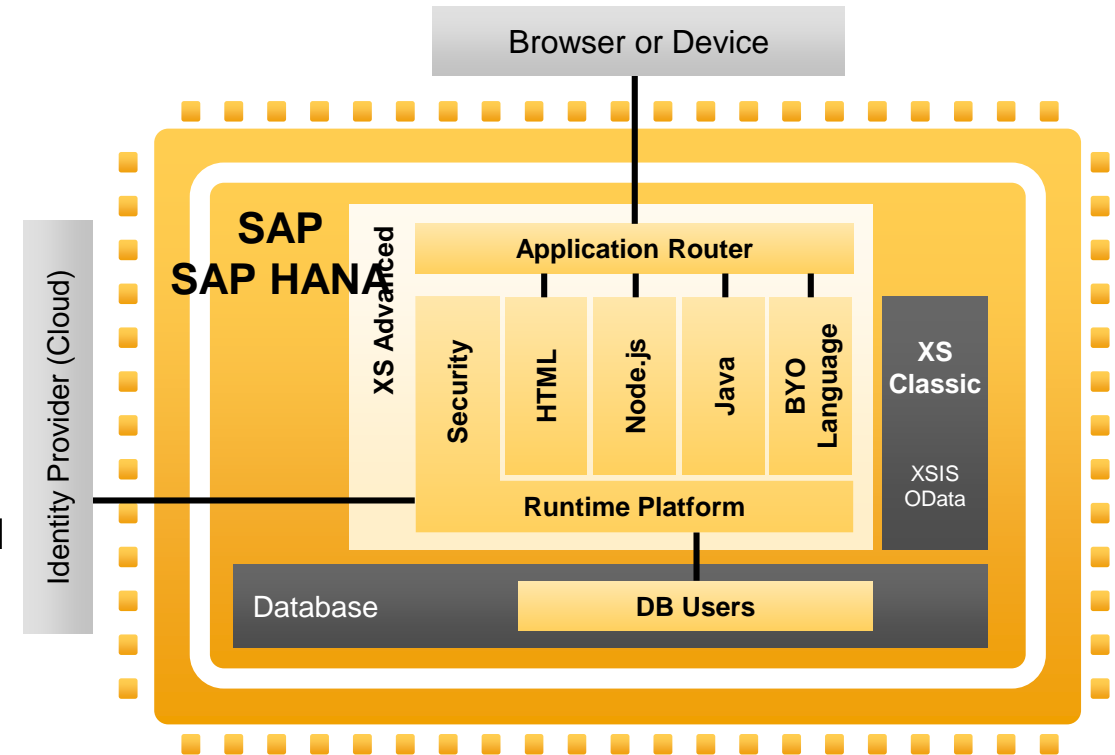
Browser or Device

SAP
SAP HANA

Identity Provider (Cloud)

XS Advanced

Application Router

Security | HTML | Node.js | Java | BYO Language

Runtime Platform

XS Classic

XSIS OData

Database | DB Users

Reduce application development cycles and deploy scalable applications on premise and cloud to support rapid innovation

Application Development Transformed
File processor API

File Processor API

- Unlock, extract, and load tool for documents
- Embedded file filters to pull text out of binary documents (like PDF, Microsoft Office, ...)
- Extracts document metadata properties (like creation date, file type, author) for use in downstream processes
- Monitoring and error handling
- Fully scalable for extreme batch processing

3 Harvest Structured File Meta Data

File Processor

Client App

4 Use File Metadata in App

2
- Receive or load file
- Distribute processing for high throughput
- Extract metadata and provide metadata for harvesting
- Clean up

1 Send Files or URLs
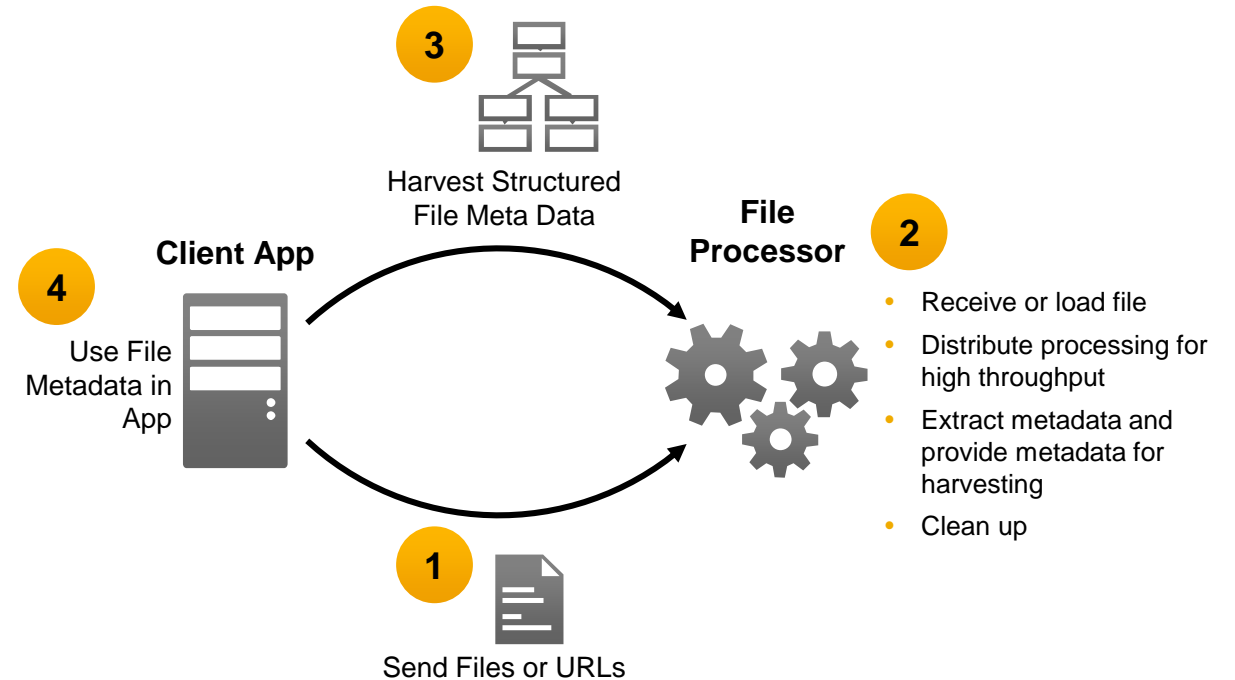
API to enable developers to easily process, load and move documents from within applications

Application Development Transformed
Development and modeling tools

SAP Web IDE for SAP HANA

- Full support for graphical data models
  - Unified model – calculation views supported in web based modeling tools for simplified modeling
  - Expanded support for spatial, graph, native data store objects, CDS, ...
- Advanced Git capabilities: version management, branch viewing, and more, for better source code management
- Improved syntax error troubleshooting
  - Expanded Impact and Lineage analysis
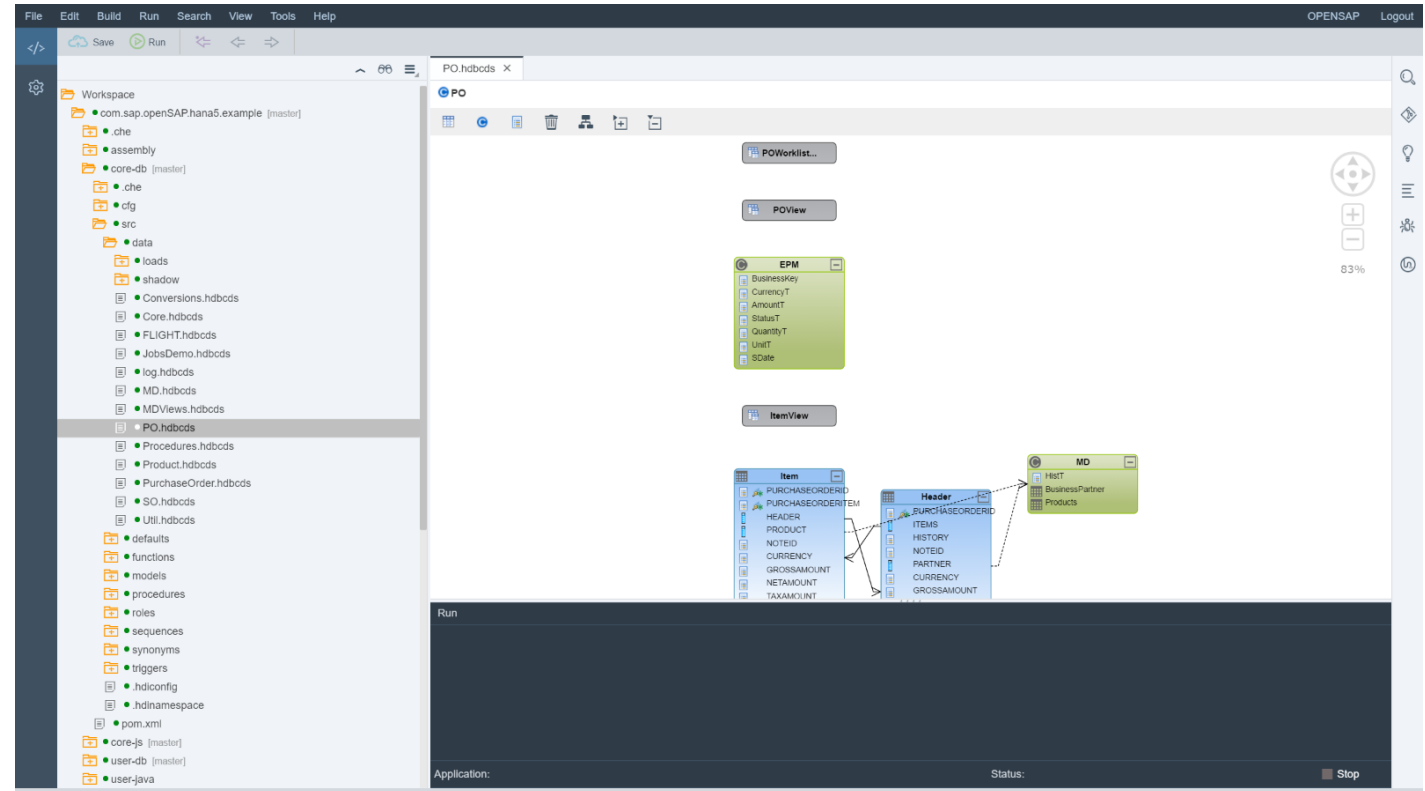
Comprehensive graphical modeling tools for streamlined development

Application Development Transformed
Languages

SQL

- SQL syntax to directly create and query hierarchies without dependency on the graphical modeler
- Xpath support for SQL based access to XML data structure

MDX

- MDX console: test and develop MDX based queries and statements against SAP HANA Views
- Leverage MDX via XML/A as a query language when building XSA applications
- Additional MDX capabilities
  - Develop custom/advanced calculated measures and sets
  - Flattened result sets, dynamic currencies, ...
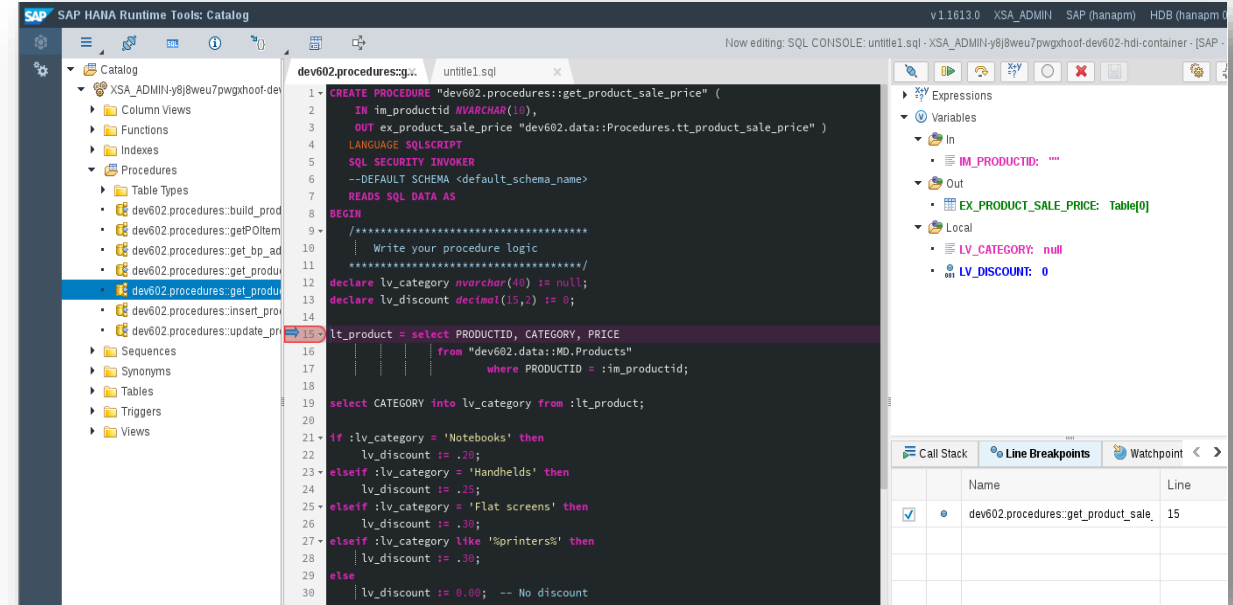
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- Predictive, text, series, search, planning, graph and spatial
- Application function libraries – native complex computations

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2017 Planned innovations
Database Management: Data Center Architect

Simplify operations with a modern, in-memory database platform in the cloud or on premises

Extend and round of features of SAP HANA active/active read-enable
- Active/active support for multi-tier system replication to allow active read-enabled accesses to tier 3 hosts in a multi-tier environment

Multitenant Database Containers
- Storage snapshot backup & recovery for Multi-Tenant Database Containers
- Tenant copy with the help of SAP HANA Backint API
- Copy/move tenant not conflicting with SAP HANA system replication
- Keep backup history on add/remove service

Dynamic tiering:
- 3-tier system replication and 2-tier asynchronous replication
- Initialize secondary system with delta changes instead of full data transfer
- Virtualized HW support
- Simplified landscape for MDC set ups

IPv6 Support

Expanded SAP Landscape Management 3.0 integration (MDC, backup, etc.)

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2017 Planned innovations
Database Management: Data Center Architect

Multi-target replication in SAP HANA System Replication

- Beneficial for a lot of use cases, like update scenarios, Multi-Tenant Database Containers copy and move operations while the backbone system replication can continue etc.
- Together with the following option "delayed secondary" customer can establish a first option to handle logical errors by keeping multiple replicas with different delays for recovering individual missing objects faster

Delayed secondary in SAP HANA System Replication

- Often requested by customers who want to operated a delayed secondary of system replication to offer an option to handle logical errors.

Enhanced System Replication options – Log store replication for SDS

- SAP HANA system replication will replicate CCL log stores, allowing smart data streaming SDS project state to be restored on failover

3-tier and 2-tier asynchronous system replication

- For HA/DR, synchronous replication between primary and secondary tiers, and asynchronous replication between secondary and tertiary tiers
- Asynchronous as well as synchronous replication in two-tier set ups

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2017 Planned innovations
Database Management: Administrator

Simplify operations with a modern, in-memory database platform in the cloud or on premise.
Effective monitoring of database resource utilization and identification of existing or potential issues.
Improve database performance and capacity, and properly plan for future expansion.

Administration and Monitoring
- Advisors that present DBAs with recommendations to improve performance and availability, based on current and historical workloads
- Prepared and custom-generated reports to show performance trends and determine areas that may require investigation

Backup and Recovery
- Backup and recovery of tenant databases from the system database using the SAP HANA cockpit
- Database copy functionality using the SAP HANA cockpit

Workload Management
- Improve current admission control implementation with tighter integration with workload classes
- Improve implicit workload balancing on database level between instances/tenants on the same hardware

Multitenancy
- Extend administration UI to support copy/move of tenant databases, resource management, landscape management, and blacklist configuration

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2017 Planned innovations
Database Management: Administrator

Capture and Replay
- Improve reporting on replay results for end users, including export options for reports
- Improve usability by adding more replay controls and new UIs for replay report

Workload Analyzer
- Increase usability for end user by adding more flexibility to the UI as well as new filters and export options for reports
- Improve flexibility of current UI elements such as timeline view to broaden reporting and analysis options for end user

SQL Analyzer
- Add visualization and configuration of new plan stability features to web-based tooling
- Provide end user options to pin hints and actual execution plans to different SQL statements

Database Explorer
- Supportability: flexible tracing configuration
- SQL development: custom editors for working with sequences, procedures, and other database objects

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2017 Planned innovations
Database Management: Security Architect

Manage secure data access and keep your systems protected

Advanced data protection
- Native data masking
- Native backup encryption

Simple and secure operations
- Simplified encryption configuration and key management in SAP HANA Cockpit
- Additional security management capabilities in SAP HANA Cockpit, e.g. catalog role management and authentication provider setup
- Extended LDAP integration, e.g. nested LDAP groups

Securing application scenarios
- SQLScript scanner
- XS Advanced: X.509 authentication, user propagation to services

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2017 Planned innovations
Data Management: Data Architect

Designing, implementing and managing the corporate data architecture.

Enterprise Architecture (enterprise data model)
- Support of Native Data Store Objects (NDSO) in native DWH models
- Data movement modeling (modeling of data flows between data sources)
- NoSQL support

Data Modeling (logical data model)
- Complete feature parity SAP Web IDE for SAP HANA calculation view modeling (cross-system integration)
- Multi-join node, column masking, table functions as inner nodes, graph algorithm enhancements
- Graphical CDS editor enhancements for entity modeling (annotation & extension support) and view modeling (associations & subquery support)
- Column-based SAP HANA cross-object impact and lineage analysis

Data Management (physical data model)
- Dynamic Tiering: support extended tables and multistore tables in CDS views
- Dynamic Tiering: trigger support; performance enhancements
- Partitioning: pruning for non partition-key columns (synopsis); enhanced range-range scheme (scale-out + data aging)
- Scale Out: optimized table placement analysis (workload statistics; join path analysis); improved supportability (network monitoring; partition info); optimized table re-distribution

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2017 Planned innovations
Data Management: Data Integrator

Access data from anywhere on the digital highway. SAP HANA's portfolio of data integration products give you access to your data across systems and across time zones, making data available where it is needed, when it is needed.

SAP HANA smart data access
- Continued optimizations and performance enhancements to improve data transfer within SAP HANA and across data sources
- Linked database: Support for ad-hoc queries against remote sources

SAP HANA smart data integration
- Enhanced connectivity – SAP HANA Vora, SAP BW as a target, ABAP code generation, SFTP support, SQL Server cluster, Oracle & SQL Server stored procedures
- Improved cloud readiness, new transforms, SAP HANA XSA cockpit content, REST API enhancements, data assurance integration

SAP HANA smart data quality
- Match – proximity matching
- Geocode – points of interest search

SAP HANA remote data sync
- A mature technology providing the data management and movement technology that developers need to build IoT solutions, remote operations, and mobile applications.
- Optimizing for SAP HANA multitenant database container operations.

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2017 Planned innovations
Analytical Intelligence: Advanced Analyst

This persona will see ever increasing depth and breadth for multi-model processing, storing and analyzing a wide range of data types. Enhancements will make it easy-to-use and extend the existing information discovery capabilities of efficiently working with a single copy of data resulting in greater number of use cases.

Predictive and machine learning
- Enhanced prediction speed for machine learning algorithms
- Expand algorithm support by enabling integration with external machine learning frameworks

Spatial
- Support for linear reference systems
- Enhanced validity checks and geometry simplification

Streaming
- Smart data streaming available in SAP HANA, express edition
- Support for IBM Power Systems

Text
- Native SAP Fiori search UI and support for spatial data types in search
- Automatic word form handling for custom dictionaries in text analysis
- Summarization of a document in text mining

Graph
- Enhancements to GraphScript
- Additional built-in algorithms and pattern matching concepts

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2017 Planned innovations
Application Development: Developer

Combine the powerful SAP HANA in-memory processing with a micro-service application server / web server / basis for an application development platform inside SAP HANA while minimizing architectural "layers" to produce a low cost of ownership and ease of getting started

SAP Fiori Default Programming Model for XSA
- OData V4 with Odata4SAP extensions
- CDS OData Publish
- SAP Fiori elements templates UI support

Continued SQL/SQLScript enhancements

Tooling and Usability
- Java tooling integration
- Streamlined on-premise/cloud-based interoperability
- Approaching feature parity with SAP HANA Studio

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- EIM functionality (ELT, DQ, replication, rules)

Analytical Intelligence
- Predictive, text, series, search, planning, graph and spatial
- Application function libraries – native complex computations

Application Development
- Web server, JavaScript, BYOL, SAP Fiori UX, graphic modeler
- Application Lifecycle Management

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2018 Product direction

Database Management

- Predictive analytics capability to proactively adjust database operations before issues occur
- Intelligent tuning and machine learning to analyze patterns in customer workload/scenarios
- Simplification and TCO reduction of security operations, e.g. extended LDAP integration for centralized authorization management and advanced data protection leveraging extended encryption and key management capabilities, e.g. column encryption
- Advanced tenant replication options

Application Development

- Work toward product capabilities that enable the choice of on-premise or cloud development tools and deployment
- Further support SAP HANA as a general-purpose database by enabling new aspects of both languages and tools

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2018 Product direction

Data Management

- Enhanced big data capabilities, improved cloud readiness and usability
- Describe, model and plan enterprise landscape architecture by strengthening graphical and data dataflow modeling
- Scalable and cost-effective data distribution and data storage options by integrating with SAP HANA Vora and Hadoop
- Centralized interface for SAP HANA smart data access and cross-database federation.

Analytical Intelligence

- Expand machine learning toolsets on persistent and streaming data for building real-time intelligent applications
- Support tiered storage for processing structured and unstructured data types with varied size and complexity

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Thank you

Key links for more information
For customers and partners

Key links

- SAP.com/roadmaps — http://www.sap.com/roadmaps
- SAP Community Network — http://www.sap.com/community
- IT Planning Resources — https://wiki.scn.sap.com/wiki/x/ggvRGg
- SAP Innovation Discovery — http://www.sap.com/innovationdiscovery
- Experience SAP HANA — http://www.saphana.com

Where to go to provide product feedback and ideas

- SAP Idea Place — https://ideas.sap.com
- Influence programs — http://service.sap.com/influence
- SAP User Groups — http://www.sapusergroups.com/

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