ESPRESSO TUTORIALS

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Practical Guide to SAP® HANA and Big Data Analytics

- SAP HANA and SAP BW/4HANA architecture concepts
- Predictive Analytics and Big Data component integration
- Recommendations for a sustainable, future-proof analytics solutions
- Organizational impact and change management

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2 Building blocks of an SAP HANA architecture

This chapter introduces you to the specific building blocks of the architecture scenarios that we explore and use for our architectural discussions throughout this book. We present you with SAP-specific technology and tools, as well as non-SAP tools that we believe fit well into a modern overall BI architecture. Each section provides an explanation of the tools, recommendations for their usage and further information.

Table 2.1 provides an overview of the tools we discuss in this chapter, and gives links to information on technologies that are relevant for architectural (SAP HANA) designs.

Component	Description	Reference
SAP HANA core features		
SAP HANA server-side components	The components of an SAP HANA server such as index, name, statistic server, etc.	See *SAP HANA Advanced Modeling*
SAP HANA engines	Similar functionalities are bundled into engines	See Section 2.1.2
SAP HANA rules framework	Business rules can be defined by the end user	*https://blogs.sap.com/2016/12/19/hana-rules-framework-hrf-blog-of-blogs*
Extended applications services advanced (XSA)	The XSA engine sustains several SAP HANA internal applications and also builds the basis for web apps	See Section 2.1.3
SAP HANA deployment infrastructure	HDI uses containers to package functionality into one single application	See Section 2.1.4

Component	Description	Reference
SAP HANA Views	SAP HANA views are used to combine data for reporting	See Section 2.1.5
Libraries (PAL, BFL, AFL, etc.)	Libraries represent standard functionality that can be reused within SAP HANA	See Section 2.1.6
Building your SAP HANA BI architecture		
Big Data technologies	Tools for managing and running a Big Data platform	See Section 2.7
Predictive analytics tools	Tools used for finding patterns in, and making predictions on, the data	See Section 2.4
SAP BO/HANA in the cloud	Using cloud computing for running SAP HANA and SAP BusinessObjects	See Section 2.8
Front-end tools	Tools for the visualization and reporting of data (e.g. SAP Lumira)	See Section 2.6
Data provisioning tools	Tools for the provisioning of data (e.g. SAP Data Services, Kafka, etc.)	See Section 2.4
SAP BW/4HANA	SAP data warehousing component running only on SAP HANA	See Section 2.3
Around SAP HANA BI architectures		
SAP S/4HANA	New operational system for different Lines of Business optimized for SAP HANA	See Section 2.2
SAPS/4HANA Embedded Analytics	Operational reporting component for S/4HANA modules only	See Section 2.2
SAP HANA dynamic tiering	Support of the data temperature concept including storage via Big Data	*https://blogs.sap.com/2018/04/18/whats-new-sap-hana-dynamic-tiering-2.0-sp-03*

Component	Description	Reference
SAP Edge Services	Internet of Things (IoT) data collection at the point of creation instead of at a central SAP HANA server	*https://www.sap.com/products/edge-services.html*
SAP HANA Data Warehousing Foundation	Manage data and memory efficiently across the application landscape	*https://blogs.sap.com/2015/03/04/sap-hana-data-warehousing-foundation/*
SAP HANA real-time replication	Real-time replication based on the SAP Landscape Transformation Replication Server (SLT)	*https://blogs.sap.com/2017/02/01/sap-hana-2.0-editions-and-options-by-the-sap-hana-academy/*
SAP Business Suite on HANA	SAP modules running on SAP HANA, not yet on S/4HANA	*https://blogs.saphana.com/2014/08/29/the-benefits-of-the-business-suite-on-hana/*
Change and Transport System (CTS+) and SAP HANA Transport for ABAP (HTA)	Transport of SAP HANA and ABAP managed objects	A useful guide for these tools can be found here: *https://blogs.sap.com/2015/06/11/cts-or-hta/*
Intelligent Enterprise	SAP HANA Analytics plays an essential role, achieving an effective use of data throughout the enterprise	*https://www.sap.com/products/intelligent-enterprise.html*

Table 2.1: Overview of SAP HANA related tools

Before looking into each component, we will first introduce a high-level view of our reference architecture that is further detailed in Chapter 3.

Following this layer architecture, we will look at the essential building blocks of an SAP-centric BI landscape in today's world (Figure 2.1).

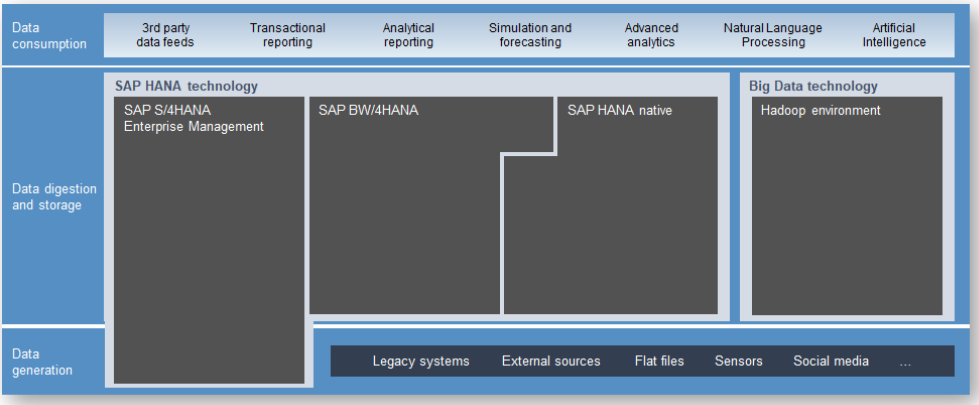

Figure 2.1: Reference layers of a BI landscape

Data generation is the sourcing layer of all data we plan to process in our BI landscape. Looking at the SAP world, SAP S/4HANA is a good example of this. In the *data digestion and storage layer*, data is processed, pre-calculated and stored for further use. SAP BW/4HANA, SAP HANA native or Big Data technologies provide significant features to implement this layer. Last, but not least, *data consumption* gives access to the data processed in the previous layers.

2.1 SAP HANA functionalities

This section introduces the SAP HANA related add-ons and features that are the most relevant for designing an SAP HANA-based BI architecture. This specifically excludes data provisioning tools, analytical tools and frontends, which are discussed separately in the following sections.

2.1.1 SAP HANA 2.0

In December 2016, SAP released SAP HANA 2.0—the digital foundation to build the next-generation of analytics applications. In the following

section, we highlight selected innovations and new features of this version.

First, let's start with the migration path. With SAP HANA 1.0 SPS 10 or higher, an upgrade to SAP HANA 2.0 SPS 00 can be performed directly. When migrating from SPS 12, you can test SAP HANA 2.0 SPS 00 with the capture and replay function before migrating. If you run SAP HANA 1.0 SPS 9 or older, you need to upgrade to SAP HANA 1.0 SPS 12 first.

One of the new features in SAP HANA 2.0 is the *Active/Active (read-enabled)* option, where a secondary SAP HANA system (which is synchronized with the primary through logs) is utilized to take over read-intensive processes. Whereas read and write operations are executed only on the primary SAP HANA system, the second one acts autonomously in answering queries (read operations).

Active/Active (read-enabled) option—SAP S/4HANA case

A good example of an SAP S/4HANA system (see Section 2.2.1) which uses the Active / Active read-enabled option can be found at:

https://blogs.sap.com/2017/06/22/making-use-of-an-activeactive-read-only-hana-database-in-s4-hana/

Furthermore, and especially against the background of General Data Protection Regulation (GDPR) in Europe, *data security and authorization management* (e.g. on LDAP groups) has improved. New encryption features have been released (e.g. full native data at rest encryption, enhanced encryption key management).

Workload management helps SAP HANA 2.0 to better avoid system-overload situations. Requests can be automatically rejected from the database when a threshold is exceeded.

With regard to *data integration* features, the Smart data integration (SDI), Smart data quality, and Smart data access components have been enhanced. For instance, SDI now allows virtual procedures (e.g. via BAPI) to perform read/write operations with ABAP-based systems.

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