SAP NetWeaver AS ABAP for SAP HANA

How does ABAP help to leverage the benefits of in-memory database technology?

Applies to:

SAP NetWeaver Application Server ABAP, SAP HANA

Summary

This document describes SAP's vision, strategy, development, and commitment to enable ABAP for SAP HANA.

Company: SAP AG

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1. Disclaimer

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2. Preface

ABAP is an important pillar of SAP's core business. The SAP NetWeaver Application Server ABAP (AS ABAP) is the underlying application server for solutions such as SAP Business Suite, SAP NetWeaver Business Warehouse, and on-demand offerings from SAP. At the same time, key technology trends – like Cloud, Mobile, and In-Memory – provide customers and partners with the ability to react to new business needs and therefore offer them a greater chance to differentiate themselves from their competitors with superior technology. Customers and partners do, however, ask how these technology trends affect the AS ABAP:

- What ABAP support do customers and partners get with regard to the technology trends?
- How does the AS ABAP help to leverage the benefits of the technology trends?
- What is the impact on customer-specific developments (existing ones, new ones)?

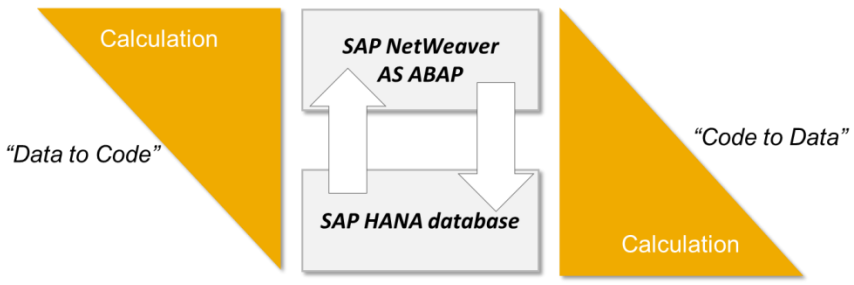
To answer these questions, SAP engages closely with user groups (for example, DSAG), customers, and partners. A major focus of customer engagement activities during the last months has been on the combination of ABAP technology and SAP HANA (project "Trailblazer").

The following pages describe the steps SAP intends to take in order to optimize SAP NetWeaver AS ABAP for the SAP HANA database. These steps will take into consideration not only SAP's vision and strategy, but also the feedback received from customer engagements. It has been formulated through cooperation between SAP and DSAG. The optimizations are intended to be made use of in standard applications developed by SAP, as well as in customer-specific developments.

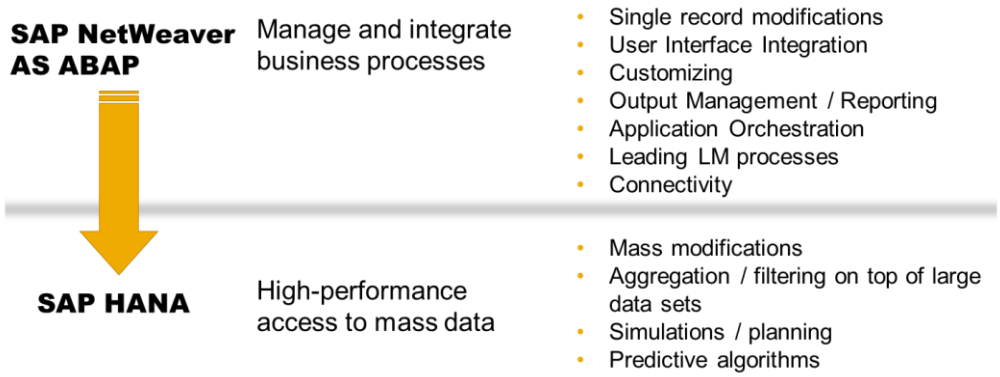
3. SAP NetWeaver AS ABAP and In-Memory Database Technology

The SAP HANA platform combines in-memory software with hardware from leading SAP partners. It not only enables significant acceleration of existing applications, but also the development of completely new applications that were not previously possible.

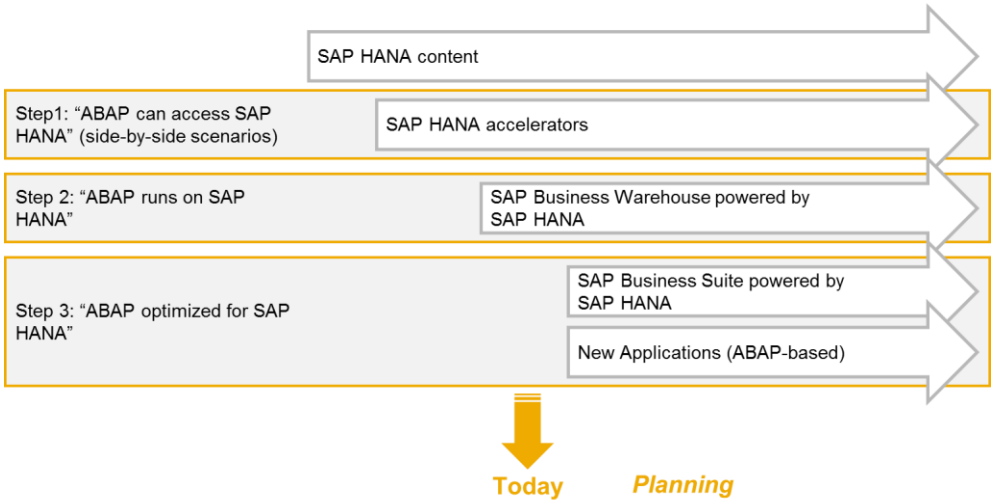
In order to leverage the strengths of SAP HANA, applications follow the "code to data" paradigm, that is, pushing calculation logic down from the application server to the database server (as depicted in the following diagram).



As a general pattern, operations on top of large data sets are benefiting from the in-memory database technology and can therefore be delegated from AS ABAP to SAP HANA. A few specific examples of typical candidates for remaining in the SAP NetWeaver Application Server ABAP or for being pushed-down to SAP HANA are shown in this illustration:



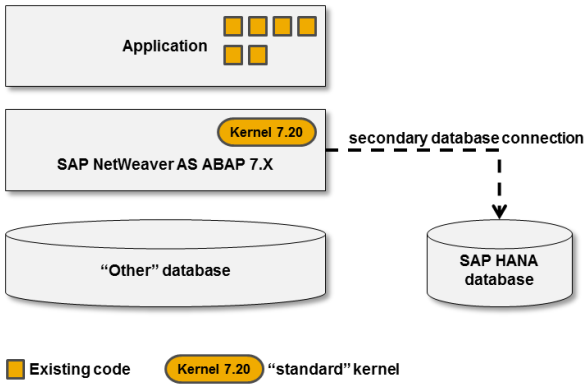
Today, SAP HANA can already be used for SAP HANA content, SAP HANA accelerators, and SAP NetWeaver Business Warehouse powered by SAP HANA. Innovations that are currently planned for SAP HANA incorporate SAP Business Suite powered by SAP HANA, as well as completely new ABAP-based applications for SAP HANA. To support the different use cases, SAP has started improving the AS ABAP in a step-by-step approach:



- Step1 – "ABAP can access SAP HANA": ABAP-based applications can use the SAP HANA database as secondary persistence (side-by-side scenarios)
- Step 2 – "ABAP runs on SAP HANA": ABAP-based applications can use the SAP HANA database as primary persistence (analytical use-cases)
- Step 3 – "ABAP optimized for SAP HANA": the optimization of ABAP-based applications for the SAP HANA database is actively facilitated by the AS ABAP (transactional/hybrid use cases)

3.1 Step 1: "ABAP can access SAP HANA"

It is already possible today to access a SAP HANA database from an AS ABAP running on a traditional database (for example, IBM DB2, SAP MaxDB, Oracle) by means of a secondary database connection. The following diagram represents the architecture schematically:

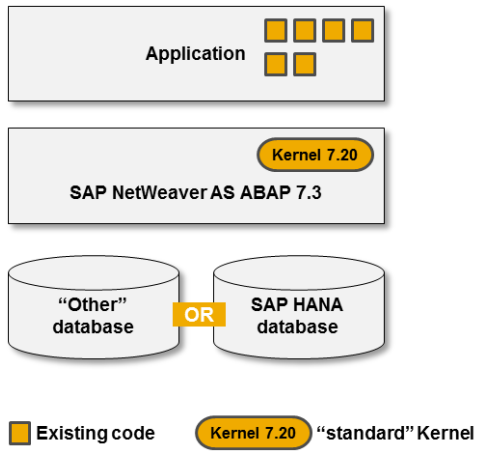


Accelerators leverage the power of SAP HANA to significantly improve the performance of specific processes managed in SAP applications with high volumes of data involved.

The secondary database connection helps customers benefit from SAP HANA without making changes to the primary database. In particular, this enables use cases for SAP HANA accelerators where selected data is replicated from the primary to the secondary database. Afterwards, the secondary database connection can be used by the AS ABAP and the respective application to read data from and delegate calculations to the SAP HANA database. Examples for this are SAP CO-PA Accelerator software or SAP Customer Segmentation Accelerator software.

3.2 Step 2: "ABAP runs on SAP HANA"

With SAP NetWeaver AS ABAP 7.3, the SAP HANA database can be used as primary persistence. This is already released for SAP NetWeaver Business Warehouse 7.3 powered by SAP HANA, which is a pure analytical use case.



By porting their SAP NetWeaver Business Warehouse to SAP HANA, customers and partners can reduce the TCO of their data warehousing solution since optimized query performance can now be achieved without SAP NetWeaver BW Accelerator. Moreover, ETL processes (= extract, transform, load) can be accelerated and data modeling can be simplified due to fewer materialized layers.

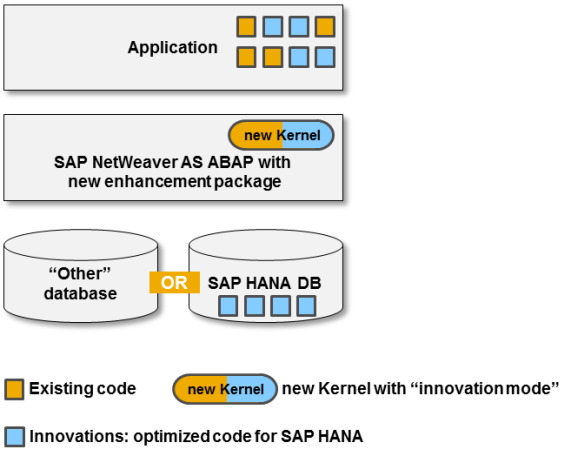
3.3 Step 3: "ABAP optimized for SAP HANA"

In a next step, SAP plans to enable other solutions to use SAP HANA as primary persistence, in particular SAP Business Suite. SAP therefore foresees making those adjustments to the AS ABAP that are necessary in order to support SAP HANA as the underlying database also for (mainly) transactional use cases. At the same time, SAP plans to facilitate a deeper integration of ABAP developments with SAP HANA and thus ease leveraging the strengths of SAP HANA within the application logic.

By porting their AS ABAP-based solutions to SAP HANA and using it as primary persistence, customers and partners can reduce the TCO of the overall landscape: First of all, replication efforts to secondary databases are no longer required. In addition to this, SAP HANA accelerators can run locally with SAP HANA as primary persistence. Following a one-vendor strategy, customers will get database server, application server, and applications all from SAP

With operational data residing in SAP HANA, customers can perform ad-hoc reporting on top of their applications, such as SAP ERP. This can provide enormous performance benefits in the area of operational reporting.

In addition, completely new applications are emerging. These applications combine transactional and analytical behavior – this means that in the future the borders between OLTP and OLAP will diminish. Also, customers and partners can develop this kind of hybrid solution on top of AS ABAP optimized for SAP HANA.



SAP plans to provide a new enhancement package for SAP NetWeaver AS ABAP. It is intended to be completely compatible with SAP NetWeaver AS ABAP 7.3, will focus on optimizations for the SAP HANA database, and it will allow customers and partners to adopt innovations in a step-by-step way. A dedicated kernel will provide the innovations.

3.3.1 Key Benefit: Compatibility and Innovation without Disruption

The starting point for developing the new enhancement package for AS ABAP will be the current SAP NetWeaver AS ABAP 7.3. All corrections and continuous innovations for the 7.3 codeline will also be made available for the new enhancement package. The enhancement package is therefore intended to be fully compatible with SAP NetWeaver AS ABAP 7.3. This means applications on top continue to run when upgrading the AS ABAP to the new enhancement package.

This emphasizes one of the key paradigms behind SAP's decision to provide a new enhancement package for SAP NetWeaver AS ABAP: Innovation without disruption.

3.3.2 Key Benefit: Optimizations to the SAP HANA database

With the new enhancement package for SAP NetWeaver AS ABAP, customers and partners can use SAP HANA artifacts and capabilities directly in ABAP with an integrated development and lifecycle management experience.

As a first big step, activities that naturally belong to the database are transferred to SAP HANA. For example, queries with joins across tables will be performed in the SAP HANA database instead of using internal tables in the application server.

The exact scope of the additional SAP HANA optimizations is currently under discussion. This is an excerpt from planned innovations:

- Access to SAP HANA views through ABAP Data Dictionary
- Integration of SQL Script and HANA business functions into ABAP
- SAP HANA-specific source code sections
- Transport of SAP HANA artifacts by means of ABAP transport request

3.3.3 Key Benefit: Stepwise Adoption of Innovations

The new kernel version supports switching on innovations. Customers and partners who have developments that are intended to run as before should not switch on innovations: These programs remain unchanged. Customers should switch on the innovations for customer code that is to be optimized for SAP HANA. Afterwards, customers can refactor existing programs or design new ones using the new functionality.

This mechanism enables the SAP ecosystem to transition the existing custom code assets to SAP HANA at the speed of their choice. This is a powerful mechanism to protect the investment of long-standing customers and partners who have built extensive custom applications in the past.

4. Developer Productivity and Experience

Complementary to the optimizations to SAP NetWeaver AS ABAP for the SAP HANA database, SAP also plans to enhance developer productivity and experience. These improvements are planned to become available independent of the SAP HANA enabling.

With SAP NetWeaver Developer Tools for ABAP, SAP plans to offer a state-of-the-art Eclipse-based development environment for ABAP. For customers and partners using SAP HANA, this integrates smoothly with the SAP HANA Studio and allows developers to implement in-memory applications end-to-end within one environment.

In addition to this, SAP aims to support customers and partners in adopting these innovations as well as the overall new paradigm towards intermeshed SAP HANA and ABAP development by providing various knowledge transfer activities. These include publications, documentation, best practices, reference applications, sandbox systems/trial versions, and a lively online community.

5. Timeline

The new enhancement package to optimize ABAP for SAP HANA is planned to be available to first customers and partners by the end of 2012. SAP will engage closely with the ecosystem to validate custom development use-cases (similar to the current “Trailblazer” activities). Standard availability is planned for 2013.

SAP intends to invest in ABAP technology beyond 2013. This means that SAP plans to continuously update the AS ABAP which might involve the deprecation of some selected functions. SAP wishes to establish a joint initiative with the user groups to allow an evolution with reasonable lead time which ensures that the customers and partners can adapt existing custom code in time. In return, the ecosystem will benefit long-term from a state-of-the-art application server hosting their custom code assets and adopting key technology trends quickly in the future.

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