TEC106
SAP NetWeaver AS ABAP for SAP HANA
The Future of the ABAP Platform
Andreas Wesselmann, Chief Product Owner ABAP Platform
October, 2012
Disclaimer

This presentation outlines our general product direction and should not be relied on in making a purchase decision. This presentation is not subject to your license agreement or any other agreement with SAP. SAP has no obligation to pursue any course of business outlined in this presentation or to develop or release any functionality mentioned in this presentation. This presentation and SAP's strategy and possible future developments are subject to change and may be changed by SAP at any time for any reason without notice. This document is provided without a warranty of any kind, either express or implied, including but not limited to, the implied warranties of merchantability, fitness for a particular purpose, or non-infringement. SAP assumes no responsibility for errors or omissions in this document, except if such damages were caused by SAP intentionally or grossly negligent.
Agenda

ABAP Platform and SAP HANA
- Business value (“viability”) and target groups (“desirability”)
- The bigger context: SAP NetWeaver planned innovations (“feasibility”)

- Detect, optimize and exploit
- Guidelines and best practices

ABAP Development Tools for SAP NetWeaver

ABAP Platform capabilities
“Behind the scenes”: How do we develop?

ABAP Platform roadmap

How can you engage?
ABAP Platform and SAP HANA
Business values and target groups

Reduce Total Cost of Ownership and Total Cost of Development

How can you leverage the power of SAP HANA with AS ABAP?

Ease the daily life: Accelerate reports and selections, intuitive value helps, ...

New types of applications (SAP standard and custom development)

Re-use ABAP skills

Integrated Lifecycle Management and operations
The bigger context - SAP NetWeaver planned innovations

SAP NetWeaver – Main constituents
- Coherent technology platform for on-premise and on-demand solutions
- Contains SAP NetWeaver 7.4

Scenarios
- Support and leverage HANA
- Bridge between on premise and on demand offerings
- End to end product and user experience

Platform capabilities
- Business Continuity
- Cloud provisioning
- One login
Value Proposition
Why bring your SAP system to SAP HANA?

Accelerate – Innovate – Simplify

SAP NetWeaver BW

• Boosted Performance
• Lower TCO: replace BWA and traditional DB by SAP HANA
• Simplified modeling

ABAP Custom Development

• Speed up existing customer programs
• Develop new applications that leverage SAP HANA optimally

SAP NetWeaver 7.4 Hubs

• Extended Product Availability Matrix
• Support system-wide SAP HANA deployments
ABAP based applications using SAP HANA

Guidelines and best practices

- Improved tools for performance analysis
- Re-use components optimized for SAP HANA
- Using SAP HANA artifacts in ABAP

Transparent optimizations

SAP NetWeaver Application Server ABAP 7.4
Based on a concrete example scenario (simplified “Open Items Analysis”)

Consider the following questions

- How can I detect optimization potential on SAP HANA?
- How can I optimize my existing code with minimal investments?
- How can I fully exploit the power of SAP HANA?
- What are guidelines and best practices, and how do they differ from existing recommendations?
Step 1: Detect the optimizing potential of SAP HANA
Performance tools in AS ABAP

Tools for runtime analysis

- New ABAP profiler in Eclipse based on SAT* (enriched with graphical representations)
- Proven SQL Trace, STAD, DBA Cockpit

Static code checks and guidelines

- Detect certain anti-patterns in DB access (reported with priority based on table size, etc.)
- Integrated improvement proposals and guidelines

* SAT = Single Activity Trace (Runtime Analysis tool)
Step 2: Optimize existing ABAP code for SAP HANA

Two concrete examples

Use the power of Open SQL
- Use sorting, aggregations, joins, sub-selects, etc.
- Reduce database roundtrips and transferring too much data to the application server
- Allows implicitly to benefit from parallelization on SAP HANA

Leverage „ALV“ optimized for SAP HANA
- Option to describe data declaratively instead of passing large internal tables
- Optimized HANA database access based on user interface needs
- Usable in SAP GUI and Web Dynpro / Floorplan Manager
Step 3: Exploit the power of SAP HANA

*Code-2-Data (aka „code pushdown“)*

**Classical ABAP implementation**

- Select data from database into application server
- Calculations and conversions done in ABAP (usually via CALL FUNCTION within a loop)

```sql
SELECT * FROM smw_so INTO TABLE orders.

LOOP AT orders ASSIGNING <order>,
  CALL FUNCTION 'CONVERT_TO_LOCAL_CURRENCY'
    EXPORTING
      date = sy-datum
      foreign_amount = <order>-gross_amount
      foreign_currency = <order>-currency_code
      local_currency = 'EUR'
    IMPORTING
      local_amount = amount.

READ TABLE result WITH KEY buyer_id = <order>-buyer_guid ASSIGNING <line>.
  IF ( sy-subrc <> 0 ).
    APPEND INITIAL LINE TO result ASSIGNING <line>.
    <line>-buyer_id = <order>-buyer_guid. <line>-gross_amount = amount.
  ENDIF.

  ADD AMOUNT TO <line>-gross_amount.
ENDLOOP.

SORT result BY gross_amount.
```

**Optimized for SAP HANA**

- Create views/procedures in HANA using built-in capabilities for calculations and conversions
- Only minimal result set transferred to ABAP

```sql
SELECT company_name SUM( converted_gross_amount ) AS gross_amount INTO TABLE result
FROM au_sales_view GROUP BY company_name.
```
Optimizing ABAP for SAP HANA
Guidelines and best practices

1. Most general guidelines remain valid …
   E.g.: reduce transferred data (rows/columns), usage of array selects, table buffer, etc.

2. … but some get a different priority
   E.g.: access to non-indexed columns (not as bad), nested SELECT statements within loops (worse)

3. There are new optimization patterns and entirely new possibilities …
   E.g.: Embedded authority checks in SELECT statements, avoidance of manifested aggregates, using HANA views/procedures/text search

4. … which require ABAP developers to rethink some design patterns of the past
   New paradigm: „Code to Data“ (instead of „Data to Code“)
Some concrete best practices for optimization

**Field list optimization**
SELECT ... FROM ... WHERE ...
UP TO n ROWS

The more rows are selected, the more important becomes the optimization for field lists. Large factors (>20) are possible for 1000+ rows.

**Usage of joins** instead of nested SELECT statements (or FOR ALL ENTRIES)

Proper usage of JOINs becomes more important on HANA due to column storage. General rule: runtime for JOIN << FOR ALL ENTRIES << Nested SELECT

**Usage of ABAP table buffer** according to existing guidelines

Basic rules still apply in general
Access times in ABAP coding:
Internal table << table buffer << DB cache / HANA << standard DB disk

More best practices and guidelines can be found at: [http://scn.sap.com/community/abap](http://scn.sap.com/community/abap)
How can I detect optimization potential?

1. Ask the right questions first (identify business need)
2. Use the performance and code analysis tools to localize performance critical steps
3. Decide scope of optimization project (e.g. pure acceleration vs. extension)

Summary (2)

How can I optimize my existing code?

- Leverage built-in database support (e.g. Open SQL) in optimal way (good SQL knowledge is key)
- Fetch only data needed for user interface or process step (e.g. apply paging where possible)
- Follow guidelines and best practices for ABAP development on SAP HANA

Summary (3)

How can I fully exploit the power of SAP HANA from ABAP?

- **Pushdown data crunching** to SAP HANA using views and procedures
- Leverage **advanced features of SAP HANA** (e.g. text search) for new user experiences
Demo

“ALV on HANA”
ABAP Development Tools for SAP NetWeaver
SAP’s new ABAP IDE built on Eclipse™

The ABAP Development Tools integrate tightly with all Eclipse-based development tools of SAP’s strategic product areas cloud, mobility and in-memory providing a highly productive E2E development environment.

Highlights
- Evolution of the ABAP workbench built on Eclipse offering excellent user experience and assistance
- One IDE for all development tasks: SAP HANA modeling, ABAP development, HTML5 UI, ...
- Powerful search and navigation, advanced source code editing and refactoring capabilities
- Built-in extensibility: ADT SDK (lab preview)

More Information
- SCN: http://scn.sap.com/community/abap/eclipse
- Trial: http://scn.sap.com/docs/DOC-29607
- YouTube: http://youtu.be/BXg7xXrEAUw

Related Sessions
- CD201: ADT Overview (1h)
- CD164: ADT Hands-on (4h)
- CD206: ADT SDK Preview (1h)
## ABAP Platform Capabilities: The complete picture

<table>
<thead>
<tr>
<th>SAP NetWeaver AS ABAP</th>
<th>What’s NEW</th>
<th>What’s NEXT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SAP HANA</strong></td>
<td>• SAP Kernel 7.20 allows usage of SAP HANA as secondary persistence</td>
<td>• Next enhancement package for AS ABAP is optimized for SAP HANA</td>
</tr>
<tr>
<td></td>
<td>• SAP NetWeaver Business Warehouse 7.3 supports SAP HANA as primary persistence</td>
<td>• SAP Business Suite and other standard applications adapt the new enhancement package</td>
</tr>
<tr>
<td><strong>Development Environment</strong></td>
<td>• ABAP Development Tools for SAP NetWeaver (aka ABAP in Eclipse) 1.0 released June 2012</td>
<td>• Improved and additional tools for Eclipse-based ABAP development (Web Dynpro ABAP, native debugger, transport management, Web Services)</td>
</tr>
<tr>
<td><strong>Connectivity</strong></td>
<td>• Central Web Service Configuration</td>
<td>• Enhanced connectivity programming model</td>
</tr>
<tr>
<td></td>
<td>• SAP NetWeaver Gateway released October 2011</td>
<td>• Basic OData support as part of AS ABAP</td>
</tr>
<tr>
<td><strong>Business Continuity</strong></td>
<td>• SAP Certified HA-Solutions of partners</td>
<td>• Further HA-awareness in MMC, LVM…</td>
</tr>
<tr>
<td></td>
<td>• Near zero Downtime Management</td>
<td>• Further reductions of downtime</td>
</tr>
<tr>
<td><strong>Security</strong></td>
<td>• SMIME support</td>
<td>• Support for OAuth2, SPNego</td>
</tr>
<tr>
<td></td>
<td>• Security Policy</td>
<td>• Read Access Logging</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unified user management for ABAP on SAP HANA</td>
</tr>
<tr>
<td><strong>Trial Systems</strong></td>
<td>• SAP NetWeaver AS ABAP 7.03 Trial version released June 2012</td>
<td>• SAP NetWeaver AS ABAP 7.4 Trial version running on SAP HANA (delivered in the Cloud)</td>
</tr>
</tbody>
</table>
“Behind the scenes”: How do we develop?

CO-INNOVATION

- Customer Engagement Initiatives
- Collaboration with SAP Mentors
- SCN ABAP Community

AGILITY

- Scrum as development methodology
- Increased flexibility due to lean principles

OPENNESS

- Support of open standards, e.g. OData protocol
- New Eclipse-based IDE
- SDK for ABAP Development Tools*

* currently under development

Examples
ABAP Platform Roadmap

Q4 / 2012

- SAP NetWeaver 7.4 (BETA shipment)
- AS ABAP
  
  comprises
  - ABAP Development Tools in Eclipse 2.0 (BETA shipment)

Begin of ABAP 7.4 Customer Engagements

Q1 / 2013

- SAP NetWeaver 7.4 TRIAL version (delivered in the Cloud)
- AS ABAP
  
  comprises
  - ABAP Development Tools in Eclipse 2.0 (TRIAL version)

Q2 / 2013

- SAP NetWeaver 7.4 (standard shipment)
- AS ABAP
- AS JAVA
- BW
- ...
  
  comprises
  - ABAP Development Tools in Eclipse 2.0 (STANDARD shipment)

Q3 / 2013

Begin of Ramp-Up

© 2012 SAP AG. All rights reserved.
Demo

“A glimpse into the future”
How can you engage?

Are you interested in a **TRIAL version** of SAP NetWeaver AS ABAP 7.4 (delivered in the Cloud)?

Check our **ABAP for SAP HANA Community** in SCN for news:

http://scn.sap.com/community/abap-for-hana

Do you want to take part in a **BETA shipment** of SAP NetWeaver AS ABAP 7.4 and be able to validate ABAP for SAP HANA use cases early?

Write an eMail to us: **ABAP.On.HANA@sap.com**

Are you interested to participate in the **Ramp-Up** of SAP NetWeaver AS ABAP 7.4 and to go live with the new technology as soon as possible?

Write an eMail to us: **ABAP.On.HANA@sap.com**

* terms and conditions apply
Further Information

SAP Public Web
http://scn.sap.com/community/abap
http://scn.sap.com/community/abap-for-hana
http://scn.sap.com/community/abap/eclipse

SAP Education and Certification Opportunities
www.sap.com/education

Related Workshops/Lectures at SAP TechEd 2012
CD101 The Brand-New ABAP Test Cockpit – A New Level of ABAP Quality Assurance
CD162 Accelerating ABAP Applications Using the Best Features in SAP HANA
CD164 Modern ABAP with ABAP Development Tools for Eclipse
CD201 ABAP Development Tools for Eclipse – Develop Like Never Before
CD202 ABAP for SAP HANA: Building Business Applications Optimized for In-Memory
CD206 Enhancing ABAP Development Tools in Eclipse
Feedback

Please complete your session evaluation for TEC106.

Thanks for attending this SAP TechEd session.
No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP AG. The information contained herein may be changed without prior notice.

Some software products marketed by SAP AG and its distributors contain proprietary software components of other software vendors.

Microsoft, Windows, Excel, Outlook, PowerPoint, Silverlight, and Visual Studio are registered trademarks of Microsoft Corporation.

IBM, DB2, DB2 Universal Database, System i, System i5, System p, System p5, System x, System z, System z10, z10, zVM, z/OS, z/Enterprise, PowerVM, Power Architecture, Power Systems, POWER7, POWER6+, POWER6, POWER, PowerHA, pureScale, PowerPC, BladeCenter, System Storage, Storwize, XIV, GPFS, HACMP, RETAIN, DB2 Connect, RACF, Redbooks, OS/2, AIX, Intelligent Miner, WebSphere, Tivoli, Informix, and Smarter Planet are trademarks or registered trademarks of IBM Corporation.

Linux is the registered trademark of Linus Torvalds in the United States and other countries.

Adobe, the Adobe logo, Acrobat, PostScript, and Reader are trademarks or registered trademarks of Adobe Systems Incorporated in the United States and other countries.

Oracle and Java are registered trademarks of Oracle and its affiliates.

UNIX, X/Open, OSF/1, and Motif are registered trademarks of the Open Group.

Citrix, ICA, Program Neighborhood, MetaFrame, WinFrame, VideoFrame, and MultiWin are trademarks or registered trademarks of Citrix Systems Inc.

HTML, XML, XHTML, and W3C are trademarks or registered trademarks of W3C®, World Wide Web Consortium, Massachusetts Institute of Technology.

Apple, App Store, iPad, iPhone, iPod, iTunes, Multi-Touch, Objective-C, Retina, Safari, Siri, and Xcode are trademarks or registered trademarks of Apple Inc.

IOS is a registered trademark of Cisco Systems Inc.

RIM, BlackBerry, BBM, BlackBerry Curve, BlackBerry Bold, BlackBerry Pearl, BlackBerry Torch, BlackBerry Storm, BlackBerry Storm2, BlackBerry PlayBook, and BlackBerry App World are trademarks or registered trademarks of Research in Motion Limited.

Google App Engine, Google Apps, Google Checkout, Google Data API, Google Maps, Google Mobile Ads, Google Mobile Update, Google Mobile, Google Store, Google Sync, Google Updater, Google Voice, Google Mail, Gmail, YouTube, Dalvik and Android are trademarks or registered trademarks of Google Inc.

INTERMEC is a registered trademark of Intermec Technologies Corporation.

Wi-Fi is a registered trademark of Wi-Fi Alliance.

Bluetooth is a registered trademark of Bluetooth SIG Inc.

Motorola is a registered trademark of Motorola Trademark Holdings LLC.

Computop is a registered trademark of Computop Wirtschaftsinformatik GmbH.

SAP, R/3, SAP NetWeaver, Duet, PartnerEdge, ByDesign, SAP BusinessObjects Explorer, StreamWork, SAP HANA, and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP AG in Germany and other countries.

Business Objects and the Business Objects logo, BusinessObjects, Crystal Reports, Crystal Decisions, Web Intelligence, Xcelsius, and other Business Objects products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of Business Objects Software Ltd. Business Objects is an SAP company.

Sybase and Adaptive Server, iAnywhere, Sybase 365, SQL Anywhere, and other Sybase products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of Sybase Inc. Sybase is an SAP company.

Crossgate, m@gic EDDY, B2B 360°, and B2B 360° Services are registered trademarks of Crossgate AG in Germany and other countries. Crossgate is an SAP company.

All other product and service names mentioned are the trademarks of their respective companies. Data contained in this document serves informational purposes only. National product specifications may vary.

The information in this document is proprietary to SAP. No part of this document may be reproduced, copied, or transmitted in any form or for any purpose without the express prior written permission of SAP AG.