

Week 1 Unit 1: Onboarding

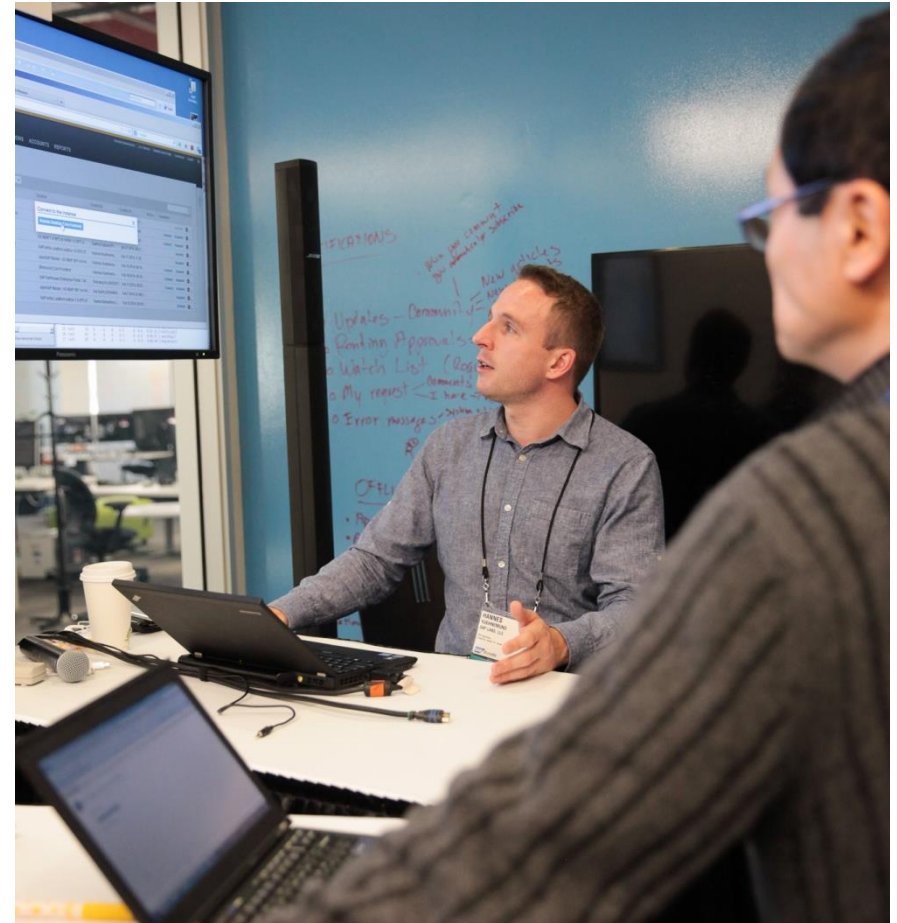


Onboarding

Welcome to ABAP Development for SAP HANA

Content

- Introduction
 - Speaker
 - Course Content
 - Testing Your Knowledge
- Demo Application
- Development Systems
- Trial Systems



Onboarding

End-to-End Application: Demo

End-to-end application demo

- On your trial system:
http://abapci:50000/sap/bc/ui5_ui5/sap/sepm_oia_fiori/index.html



Want to build a similar application on your own?

- <http://scn.sap.com/docs/DOC-54541>



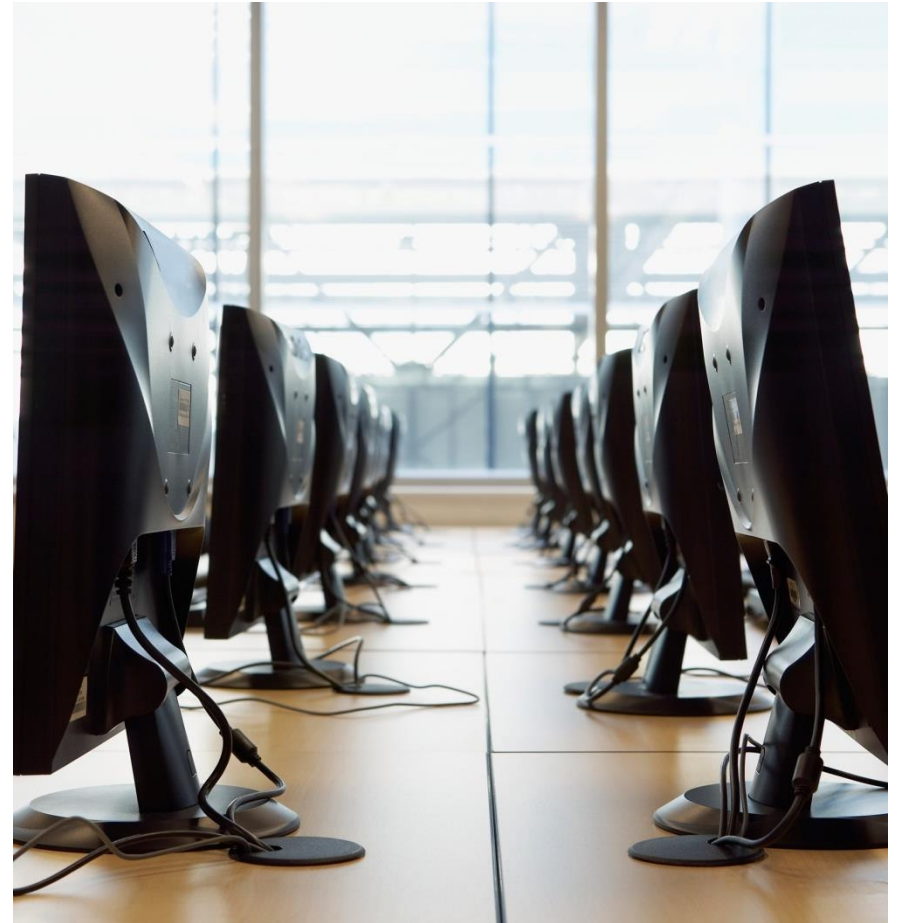
Onboarding

Development Systems

Learning by doing

- Getting a development system
- How to access the system
- Hands-on exercises

Detailed instructions on how to get a development system can be found in
<http://scn.sap.com/docs/DOC-56314>



Onboarding Trial Systems

SAP NetWeaver Application Server ABAP 7.4



AS ABAP incl. BW 7.4 SP5 on SAP HANA SP7 [Developer Edition]

Home > List > Solution Details

SAP NetWeaver Application Server ABAP 7.4 on SAP HANA - Trial Edition

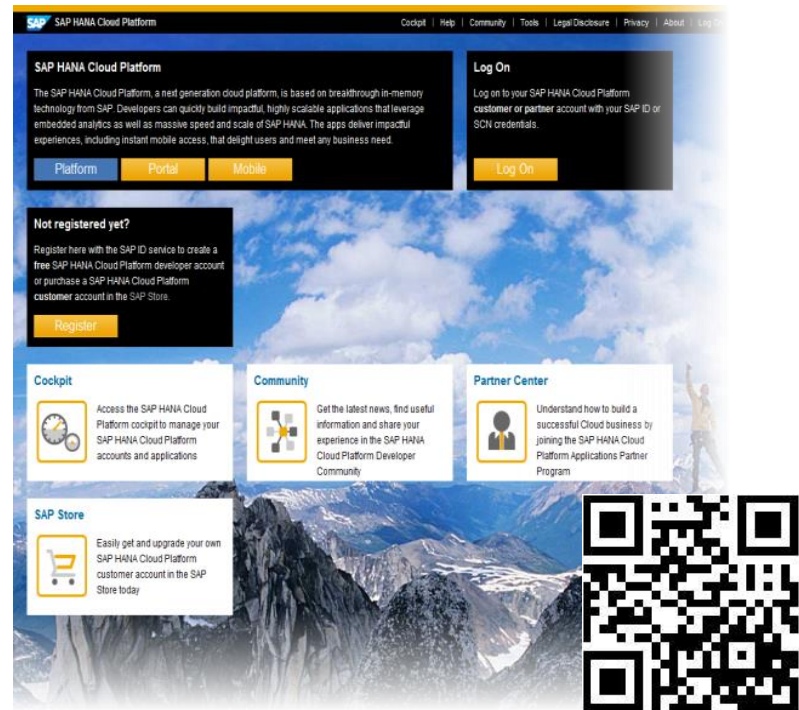
Version: 7.4 SP03
Supported Languages: English

SAP NetWeaver Application Server ABAP used by tens of thousands of SAP customers and partners worldwide is now powered by SAP HANA. This enables your business to evolve towards real-time processing and analysis of large data sets. As a result, you can make faster and smarter decisions, quickly react to market changes, and explore new business models that yield unprecedented value.

- Implement new data-driven applications and accelerate key business processes by fully exploiting the power of SAP HANA
- Boost the productivity of your developers with E2E application development on Eclipse
- Enable lightweight access to business data and services with the embedded SAP NetWeaver Gateway technology
- Enhance the user experience of your business applications with the embedded UI development toolkit for HTML5 aka SAPUI5

<http://sap.com/abaptrial>

SAP HANA Cloud Platform



SAP HANA Cloud Platform

The SAP HANA Cloud Platform, a next generation cloud platform, is based on breakthrough in-memory technology from SAP. Developers can quickly build impactful, highly scalable applications that leverage embedded analytics as well as massive speed and scale of SAP HANA. The apps deliver impactful experiences, including instant mobile access, that delight users and meet any business need.

Log On
Log on to your SAP HANA Cloud Platform customer or partner account with your SAP ID or SCN credentials.

Not registered yet?
Register here with the SAP ID service to create a free SAP HANA Cloud Platform developer account or purchase a SAP HANA Cloud Platform customer account in the SAP Store.

Cockpit
Access the SAP HANA Cloud Platform cockpit to manage your SAP HANA Cloud Platform accounts and applications

Community
Get the latest news, find useful information and share your experience in the SAP HANA Cloud Platform Developer Community

Partner Center
Understand how to build a successful Cloud business by joining the SAP HANA Cloud Platform Applications Partner Program

SAP Store
Easily get and upgrade your own SAP HANA Cloud Platform customer account in the SAP Store today

<http://hanatrial.ondemand.com>

Onboarding

What's Next?

Week 1 Unit 2

ABAP Meets SAP HANA: Evolution and Architecture





Thank you

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Week 1 Unit 2: ABAP Meets SAP HANA: Evolution and Architecture



ABAP Meets SAP HANA: Evolution and Architecture - Outline



Additional
Material

Content

- SAP HANA Ambitions
- Hardware & Software Innovations
- Evolution of ABAP and SAP HANA
- ABAP for SAP HANA Architecture
- Highlights of SAP NetWeaver Application Server ABAP 7.4



ABAP Meets SAP HANA: Evolution and Architecture

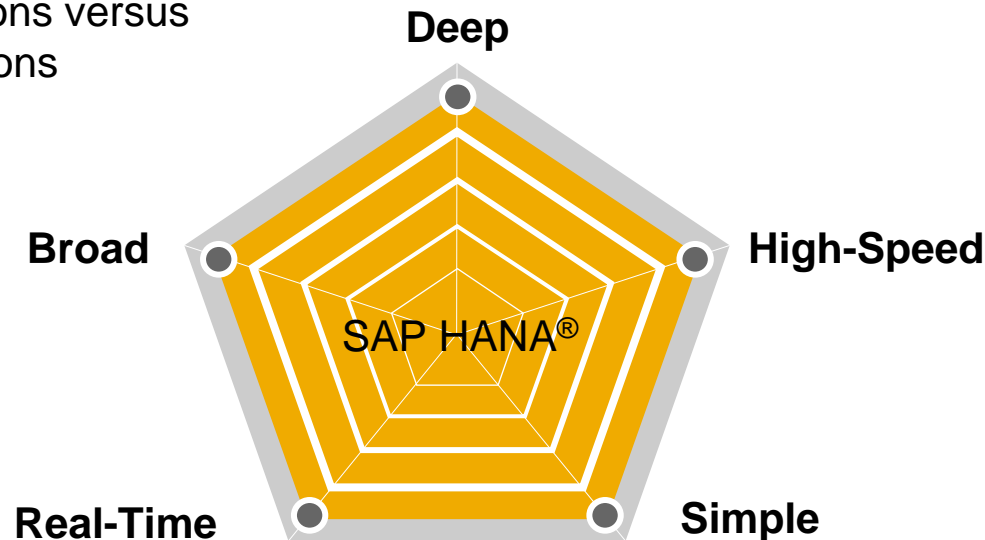
SAP HANA Ambitions

Pre-SAP HANA technology requires trade-off decisions, for example:

- High-speed versus simple
- Real-time versus deep
- OLTP-like applications versus OLAP-like applications

SAP HANA ambition: Deliver across all five dimensions:

- Allow combining OLTP and OLAP patterns within one application

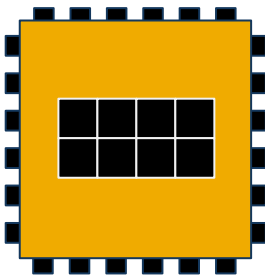


ABAP Meets SAP HANA: Evolution and Architecture

Hardware Technology Innovations

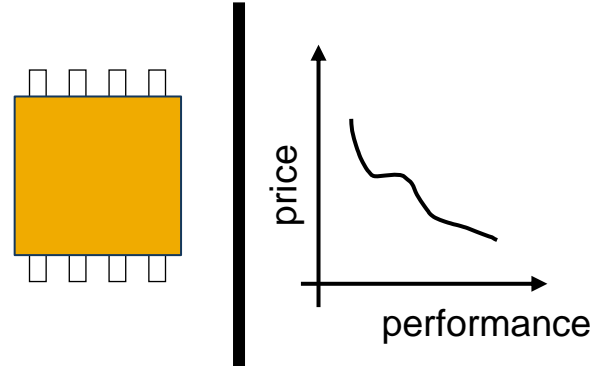
Multicore Architecture

- 8 CPUs x (8-16) cores per blade
- Parallel scaling with many blades



Address Space

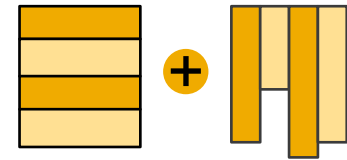
- 64-bit address space (4TB in current server boards)
- Dramatic decline in price



ABAP Meets SAP HANA: Evolution and Architecture

SAP Software Technology Innovations

Row and Column Store



Data Compression

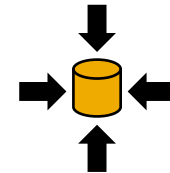
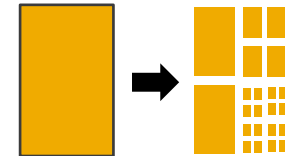
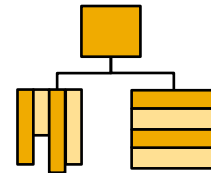


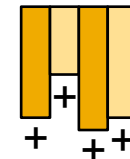
Table Partitioning



Avoidance of Aggregate Tables



Insert Only on Delta



ABAP Meets SAP HANA: Evolution and Architecture

SAP HANA Goals

Compatibility and standard DBMS features

Hybrid data management system

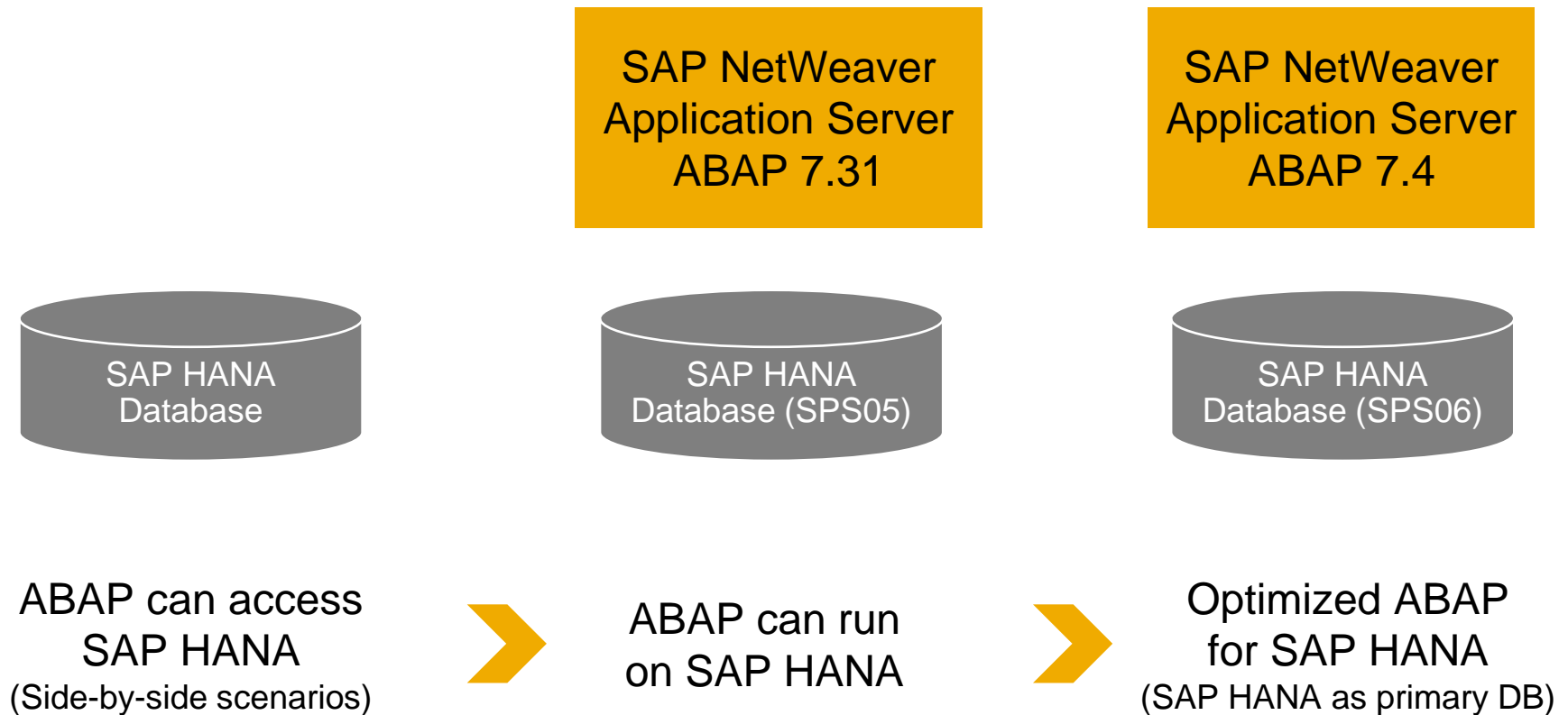
Enable new applications and optimize existing applications

...



ABAP Meets SAP HANA: Evolution and Architecture

Evolution of ABAP for SAP HANA



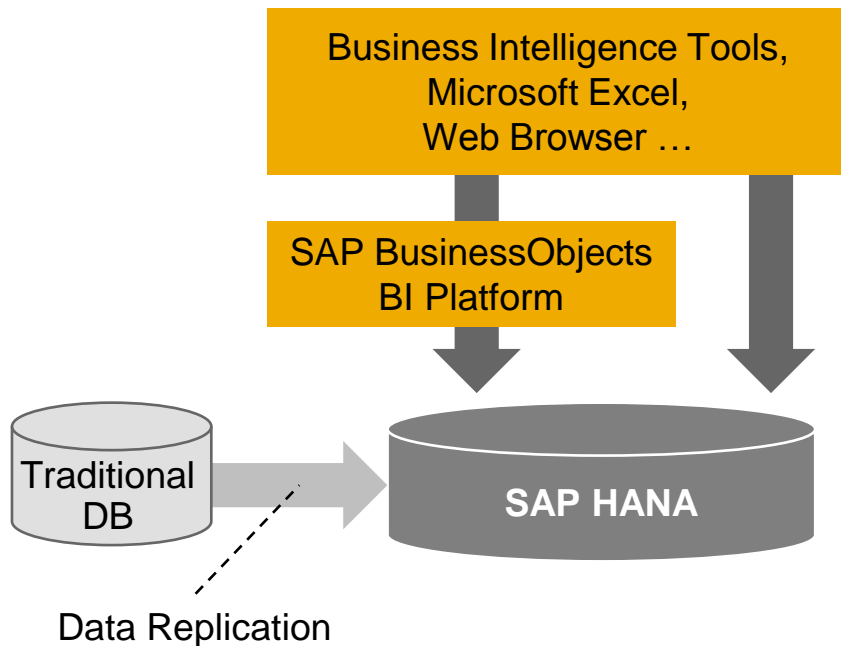
ABAP Meets SAP HANA: Evolution and Architecture

Possible Types of SAP HANA-Based Applications

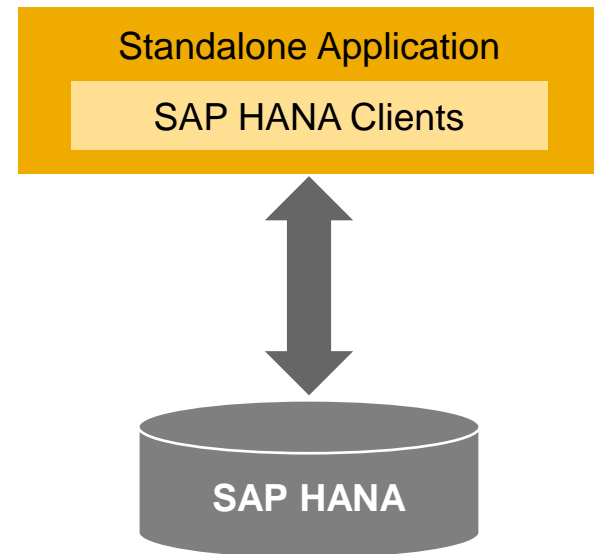


Additional
Material

Data marts based on SAP HANA



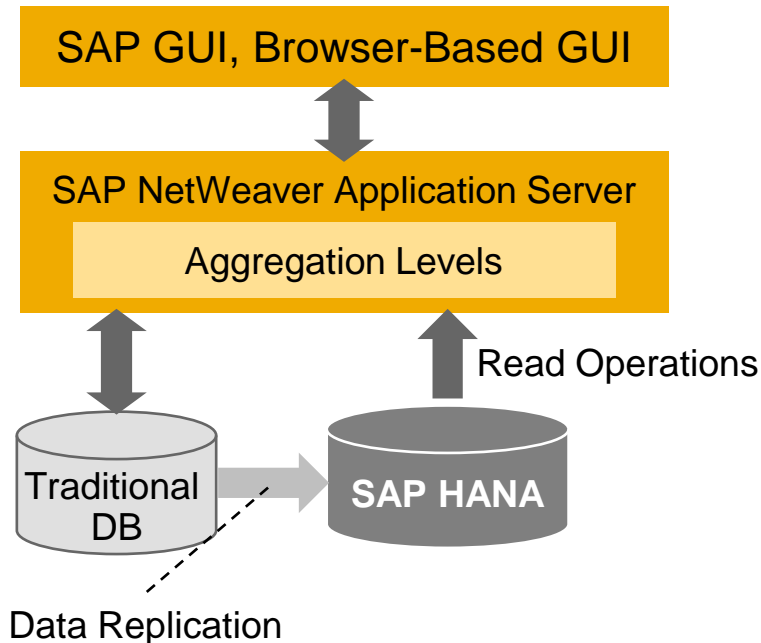
Native SAP HANA applications



ABAP Meets SAP HANA: Evolution and Architecture

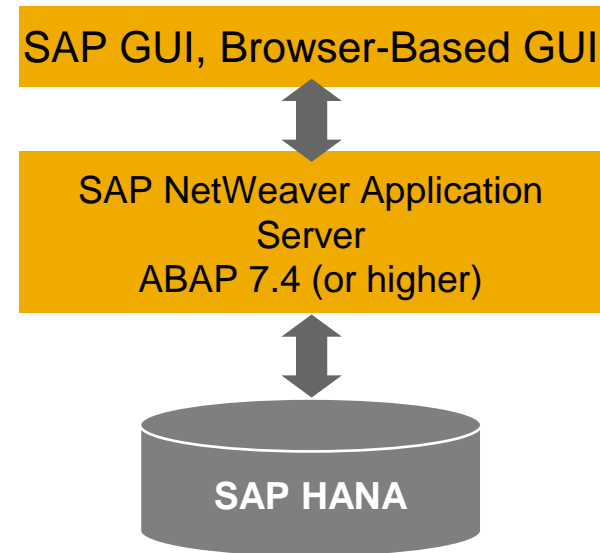
Possible Types of SAP HANA-Based Applications

Application Accelerators



Redirect data-intensive
calculations to SAP HANA

Optimized ABAP Applications



Focus of this course

ABAP Meets SAP HANA: Evolution and Architecture

SAP NetWeaver Application Server ABAP 7.4

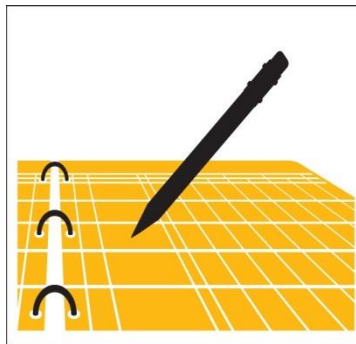
Go-to release for ABAP development for SAP HANA

Foundation of

- SAP Business Suite 7 i2013
- SAP Business Warehouse powered by SAP HANA



SAP BW



SAP Business Suite



New applications

ABAP Meets SAP HANA: Evolution and Architecture

Highlights of SAP NetWeaver Application Server ABAP 7.4 – Overview

ABAP development guidelines

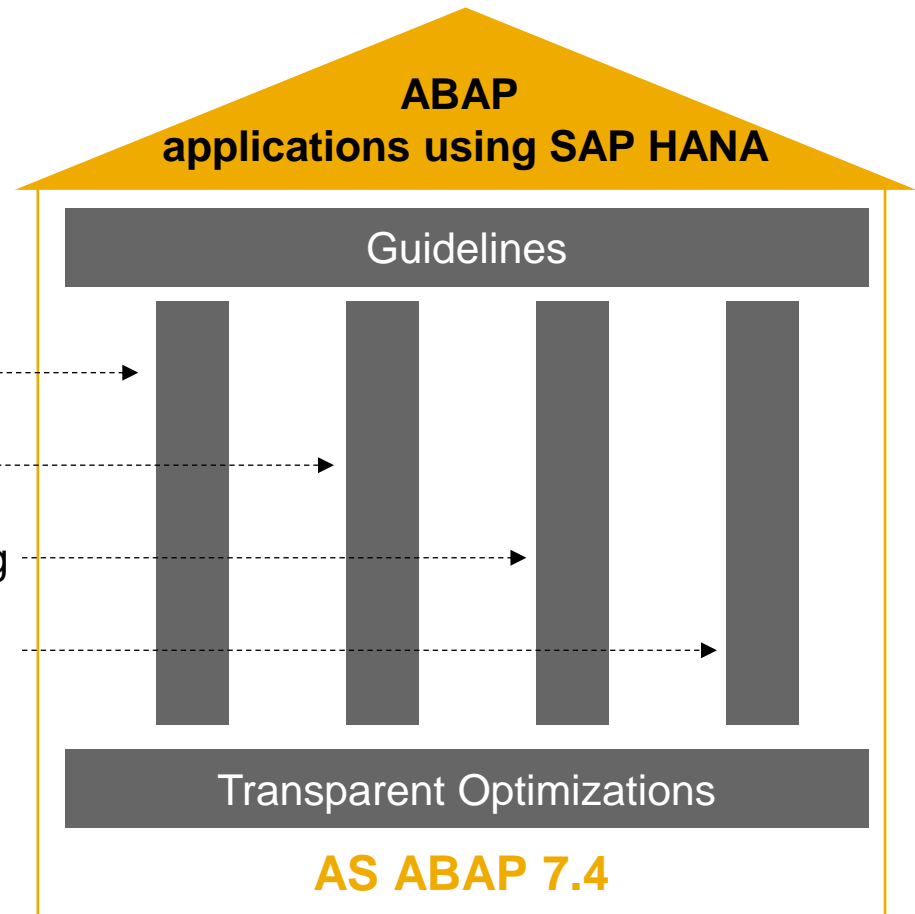
Improved tools for performance analysis

Extensions to ABAP and OpenSQL

Features for SAP HANA-oriented programming

Re-use components optimized for SAP HANA

Transparent optimizations

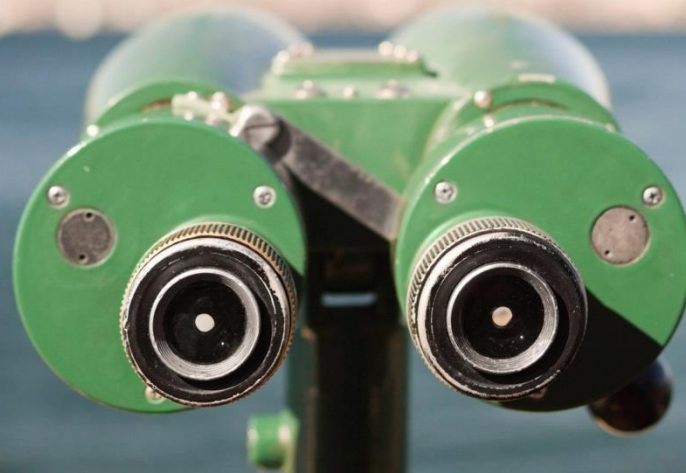


ABAP Meets SAP HANA: Evolution and Architecture

What's Next?

Week 1 Unit 3

ABAP Meets SAP HANA: What You Need to Know





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Week 1 Unit 3: ABAP Meets SAP HANA: What You Need to Know



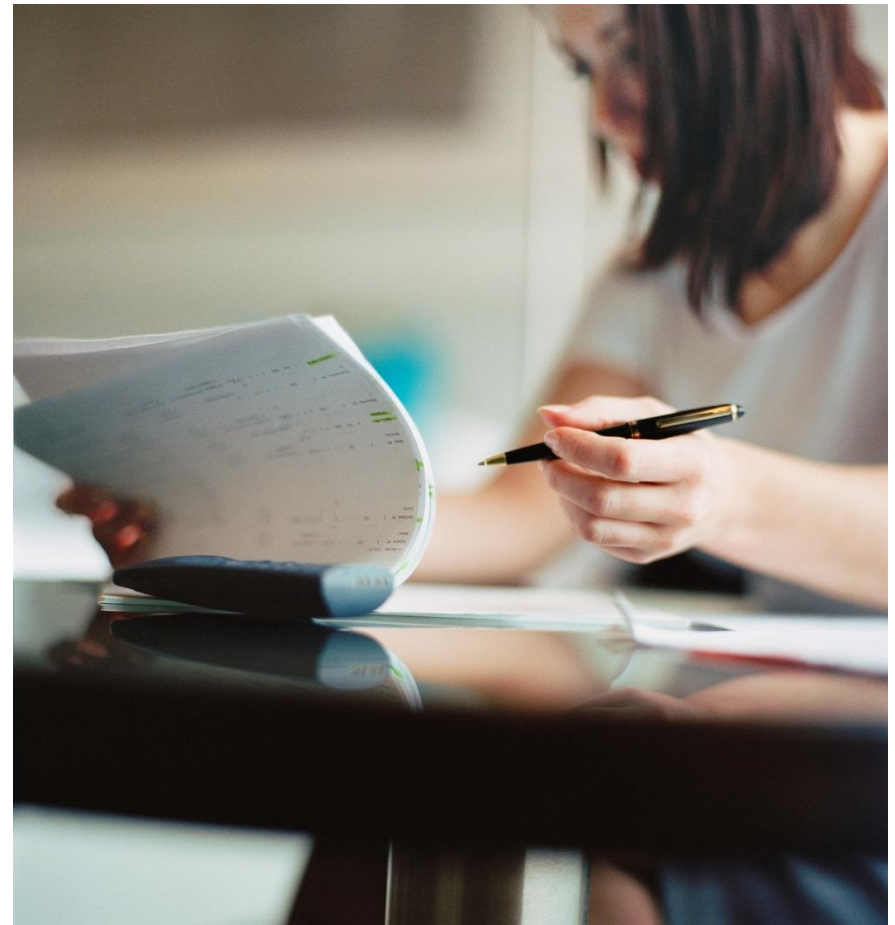
ABAP Meets SAP HANA: What You Need to Know - Outline



Additional
Material

Content

- Row Store vs. Column Store
- ABAP Dictionary Enhancements
- Data Type Systems: ABAP & SAP HANA
- Database Schemas



ABAP Meets SAP HANA: What You Need to Know

Row Store

Order	Customer	Currency	Amount
456	JaTeCo	EUR	1300
457	SAP	EUR	750
458	Sorali	EUR	115
459	SAP	EUR	30.000

```
SELECT * ...  
WHERE ORDER = 457
```

Good performance

```
SELECT SUM(Amount)...
```

Low performance

ABAP Meets SAP HANA: What You Need to Know

Column Store

Order	Customer	Currency	Amount
456	JaTeCo	EUR	1300
457	SAP	EUR	750
458	Sorali	EUR	115
459	SAP	EUR	30.000

```
SELECT * ...  
WHERE ORDER = 457
```

Low performance

```
SELECT SUM(Amount)...
```

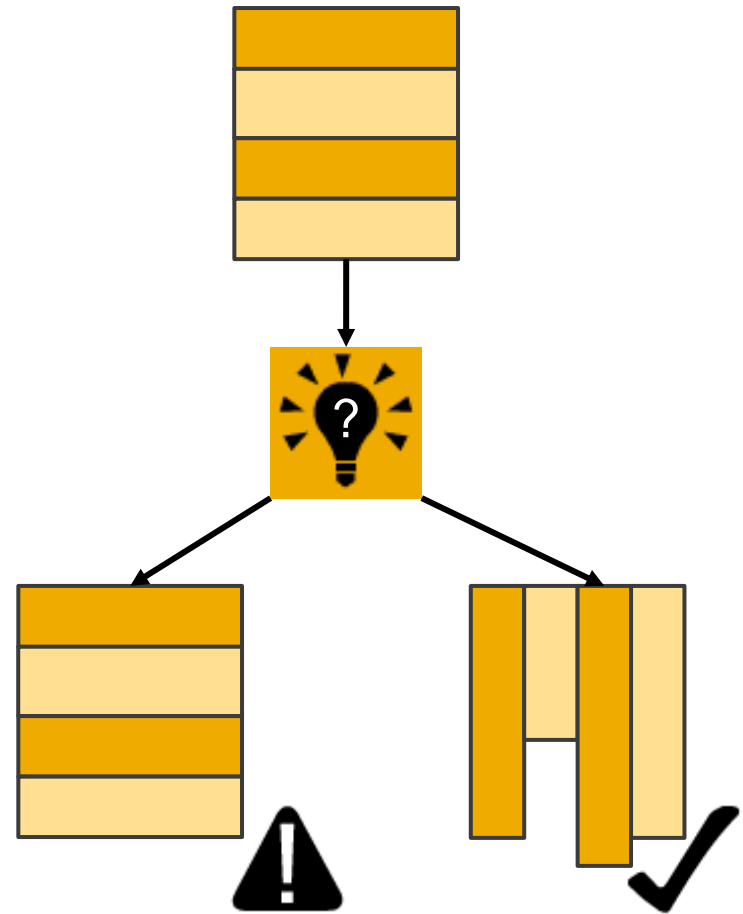
Good performance

ABAP Meets SAP HANA: What You Need to Know

When to Use Columnar Storage?

Columnar storage is best for tables

- that are subject to column operations on a large number of rows
- that have a large number of columns, more unused
- that are subject to aggregations and intensive search operations

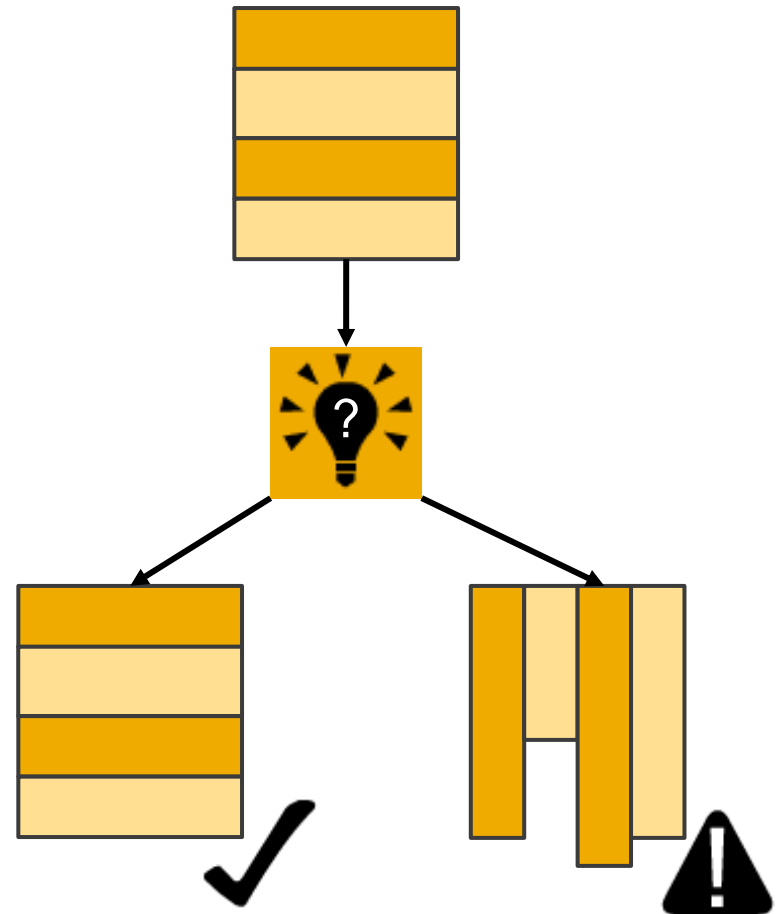


ABAP Meets SAP HANA: What You Need to Know

When to Use Row Storage?

Row storage is more suitable for tables

- that contain mainly distinct values
→ low compression rate
- in which most/all columns are relevant
- that are not subject to aggregation or search operations on non-indexed columns
- that are fully buffered
- that have a small number of records



ABAP Meets SAP HANA: What You Need to Know

Demo

ABAP Dictionary

- Database-Specific Properties
- Database-Specific Indices

Data Types

- ABAP Type System
- SAP HANA Type System



ABAP Meets SAP HANA: What You Need to Know

Column Store Dictionary Compression

Logical Table

Order	Customer	Currency	Amount
456	JaTeCo	EUR	1300
457	SAP	EUR	750
458	Sorali	EUR	115
459	SAP	EUR	30.000
460	PicoBit	EUR	300
461	Siwusha	EUR	600
462	PicoBit	EUR	600
463	SAP	EUR	1.200
...



Dictionary

1	JaTeCo
2	PicoBit
3	SAP
4	Siwusa
5	Sorali

5 entries →
3 bits to encode

Compressed column

1	1
2	3
3	5
4	3
5	2
6	4
7	2
8	3
...	...

Where is
order 460?

Inverted index

1	1
2	5,7
3	2,4,8
4	6
5	3

Which orders
of SAP?

ABAP Meets SAP HANA: What You Need to Know

What's Next?

Week 1 Unit 4

Code-To-Data Paradigm





Thank you

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Week 1 Unit 4: Code-to-Data Paradigm



Code-to-Data Paradigm

Outline

Content

- Code-to-data: What's in it for you?
- Code-to-data by means of
 - OpenSQL & ABAP Dictionary views
 - Advanced view definition
 - ABAP Managed Database Procedures
 - Native SQL



Code-to-Data Paradigm

Performance Boost Example: Demo

Code-to-Data Paradigm in Action

- Performance improvements
- Comparison of two ABAP reports



Code-to-Data Paradigm

Implications of an In-Memory Database

In-memory computing imperative:

- Avoid (unnecessary) movement of large data volume
- Perform data-intensive calculations in the database

Today:

Data-intensive computations in application layer

calculate

Application Layer



Data Layer

calculate

SAP HANA:

Delegate data-intensive operations to data layer

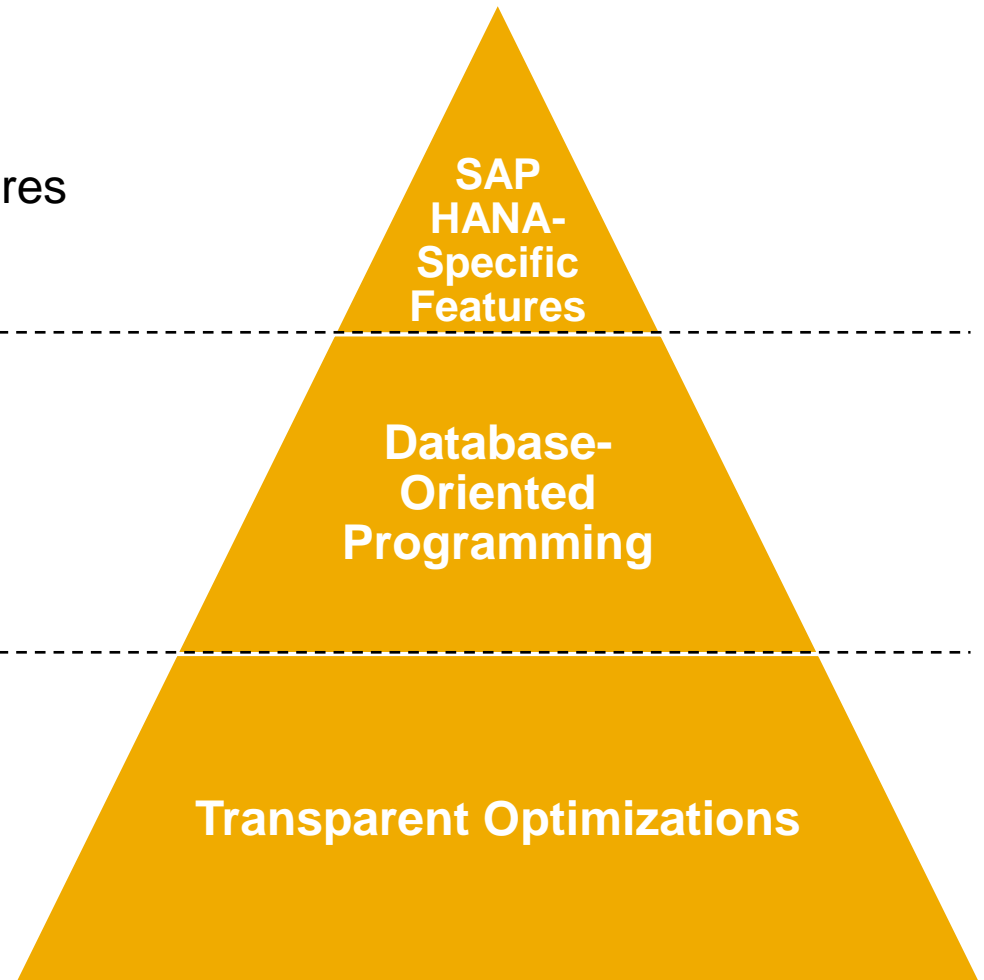
Code-to-Data Paradigm

Overview Code-to-Data Capabilities

- ABAP managed database procedures
- Native SQL

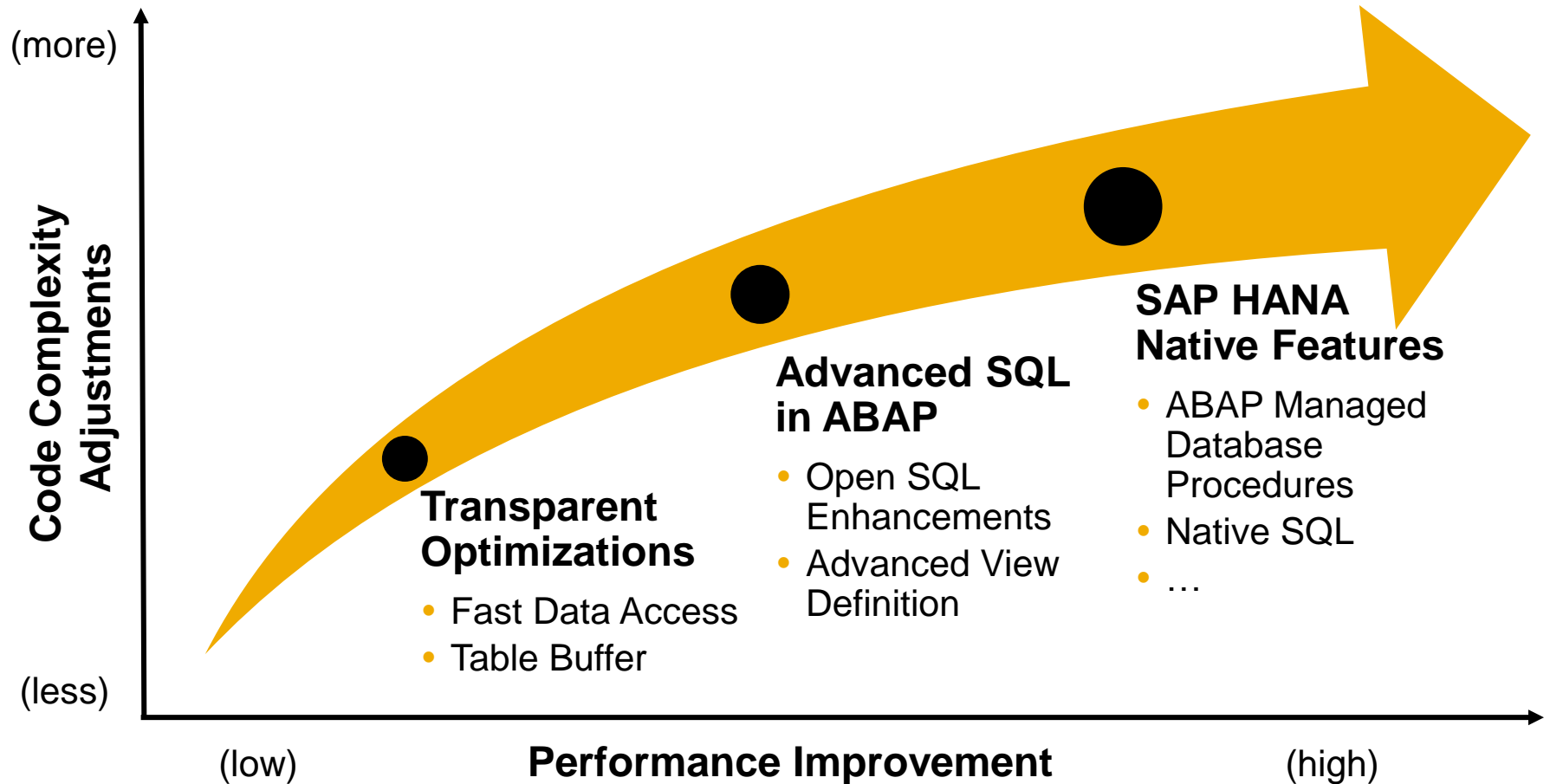
- Open SQL enhancements
- Advanced view definition

- Optimized protocols, such as Fast Data Access
- Table buffer enhancements
- ...



Code-to-Data Paradigm

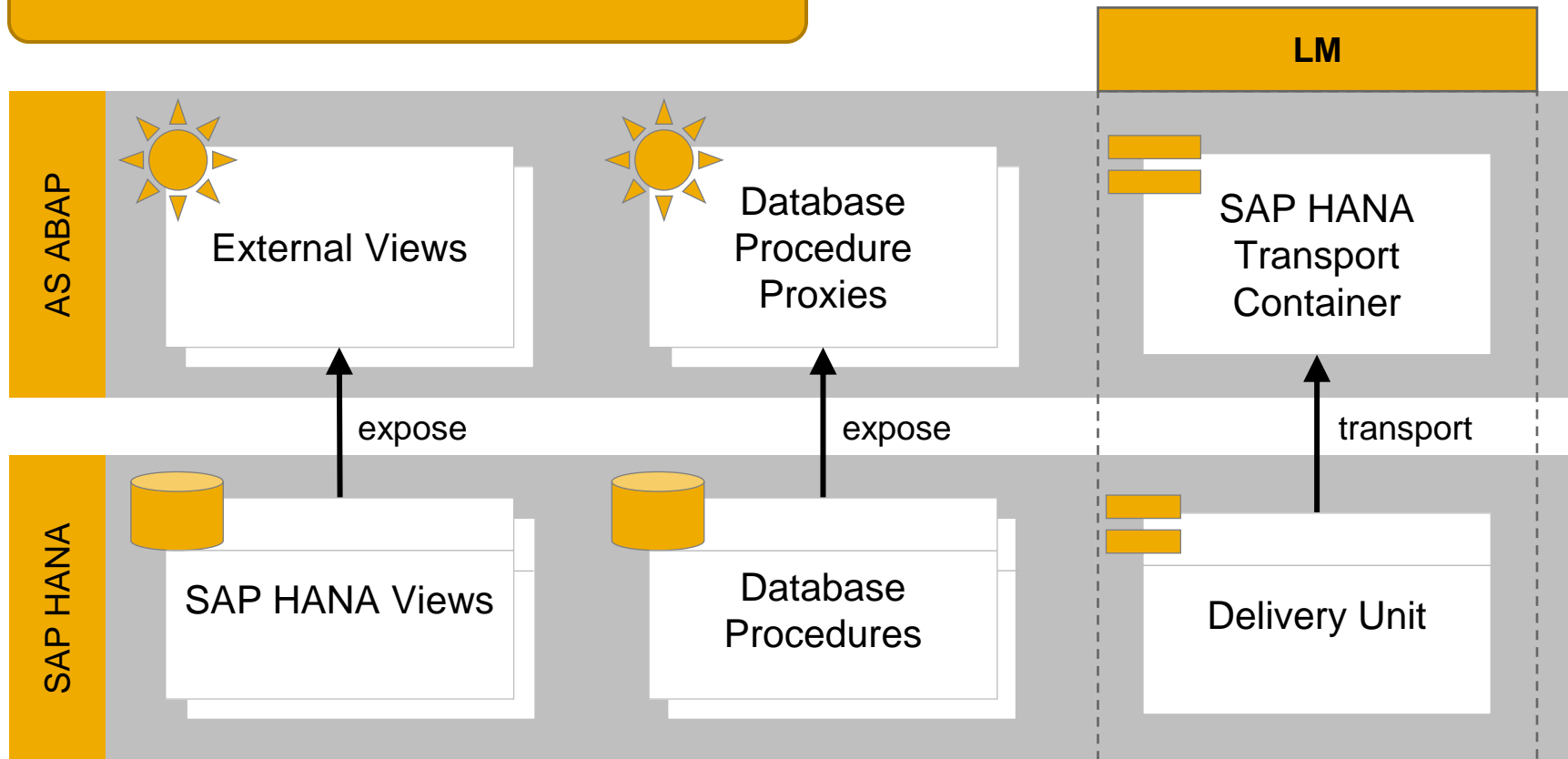
Performance Improvement vs. Code Adjustments



Code-to-Data Paradigm

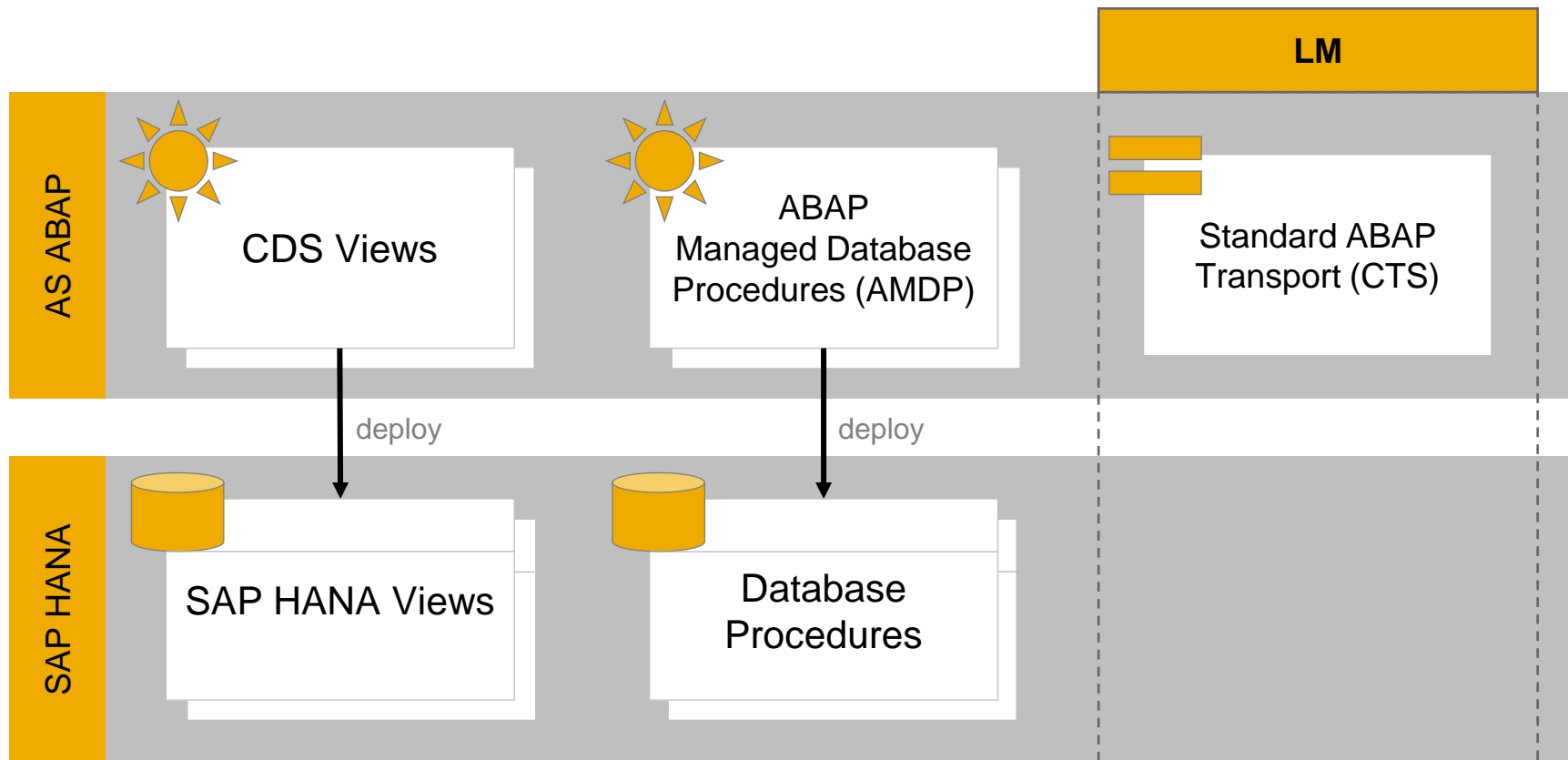
Bottom-Up Approach (≥ NW AS ABAP 7.40 SP02)

Not the focus of this course!



Code-to-Data Paradigm

Top-Down Approach (\geq NW AS ABAP 7.40 SP05)



Code-to-Data Paradigm

What's Next?

Week 1 Unit 5 Your Development Tools





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Week 1 Unit 5: Your Development Tools



Your Development Tools

Outline

Content

- SAP Development Tools for Eclipse
- ABAP Development Tools
- Brief Introduction / Survival Guide

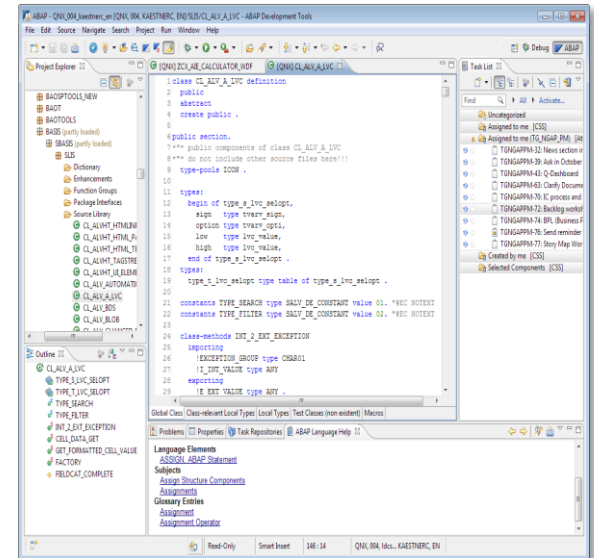
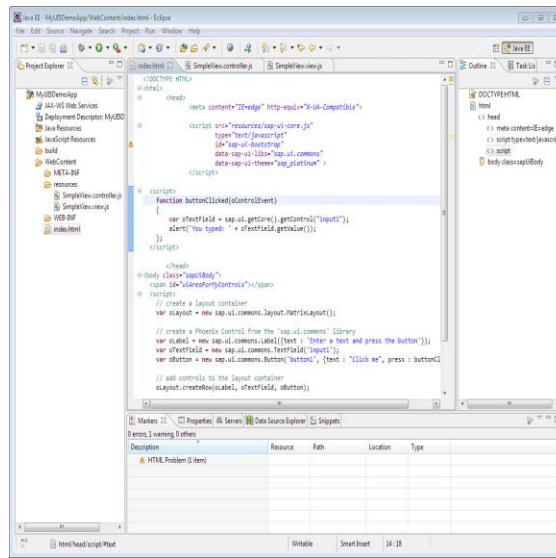
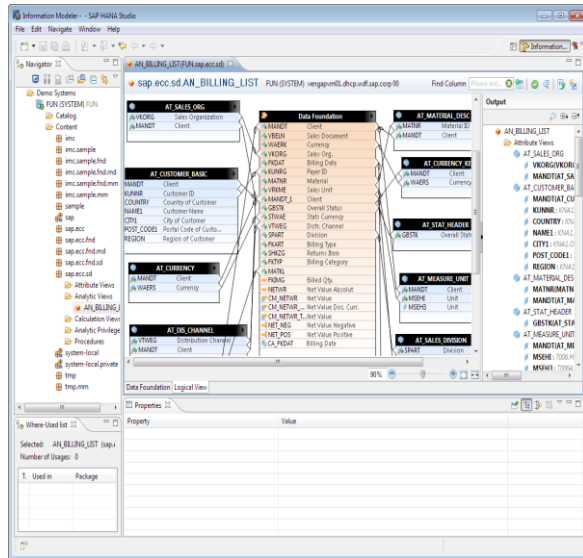


Your Development Tools

SAP Development Tools for Eclipse



Eclipse is SAP's strategic platform for highly integrated design-time and development tools

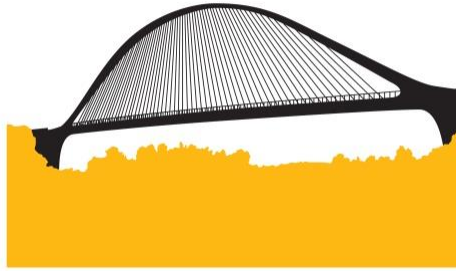


Your Development Tools

SAP Development Tools for Eclipse



Increased Developer
Productivity



One Integration
Platform



Extensible Development
Tools

ABAP Development Tools for SAP NetWeaver can significantly improve development productivity

Your Development Tools

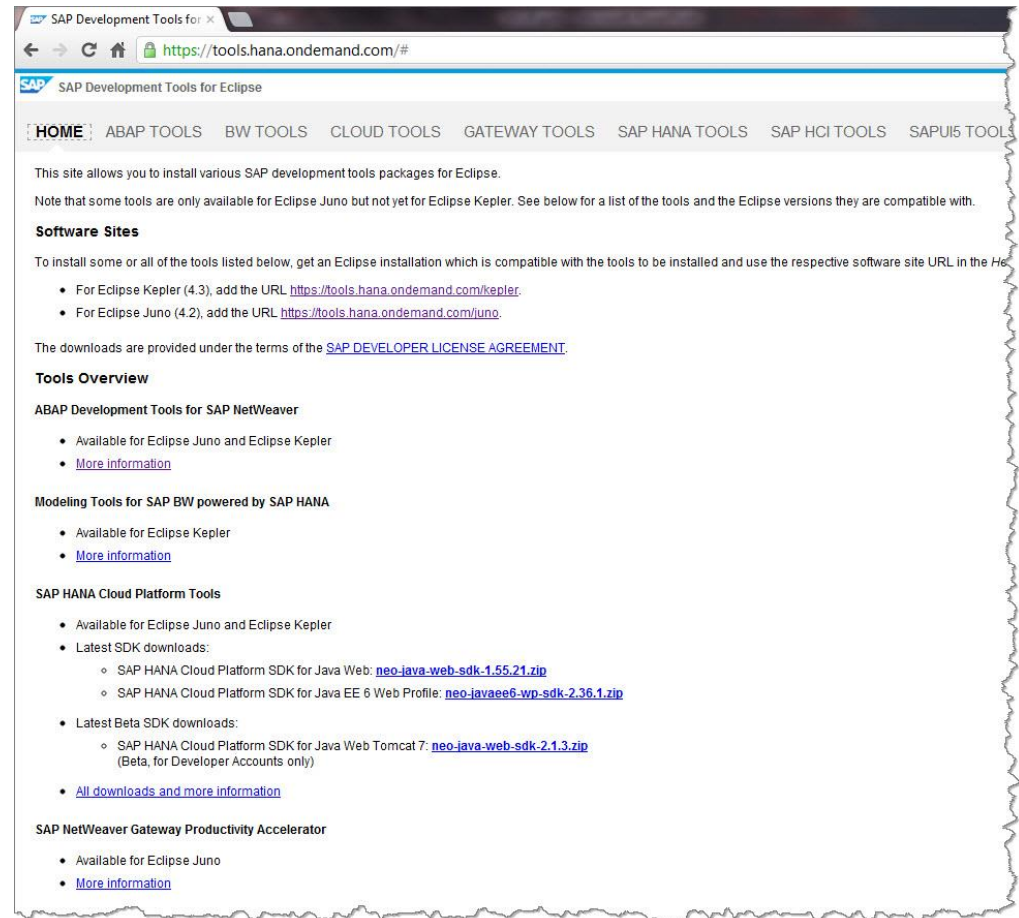
Getting the SAP Development Tools

SAP Development Tools for Eclipse

- <http://tools.hana.ondemand.com/>

Also see SAP Community Network

- <http://scn.sap.com/community/abap/eclipse>
- <http://scn.sap.com/community/abap/hana>



Your Development Tools

Brief Introduction to ABAP Development Tools: Demo

ABAP Development Tools for SAP NetWeaver

- Create an ABAP Project
- Create a Hello World Program
- Debugging



Your Development Tools

Shortcuts



Speed up your ABAP development using shortcuts

Edit

Ctrl+Shift+A	Open development object
Ctrl+F2	Check development object
Ctrl+F3	Activate development object
Ctrl+Shift+F3	Activate all inactive objects
Ctrl+Space	Code completion
Ctrl+1	Quick fix proposal
Ctrl+<	Add comment
Ctrl+Shift+<	Remove comment
Shift+F1	Format source aka pretty printer

Help

F1	ABAP keyword documentation
F2	Show code element information
Ctrl+3	Search for commands & views
Ctrl+Shift+L	List all keyboard shortcuts

Navigate

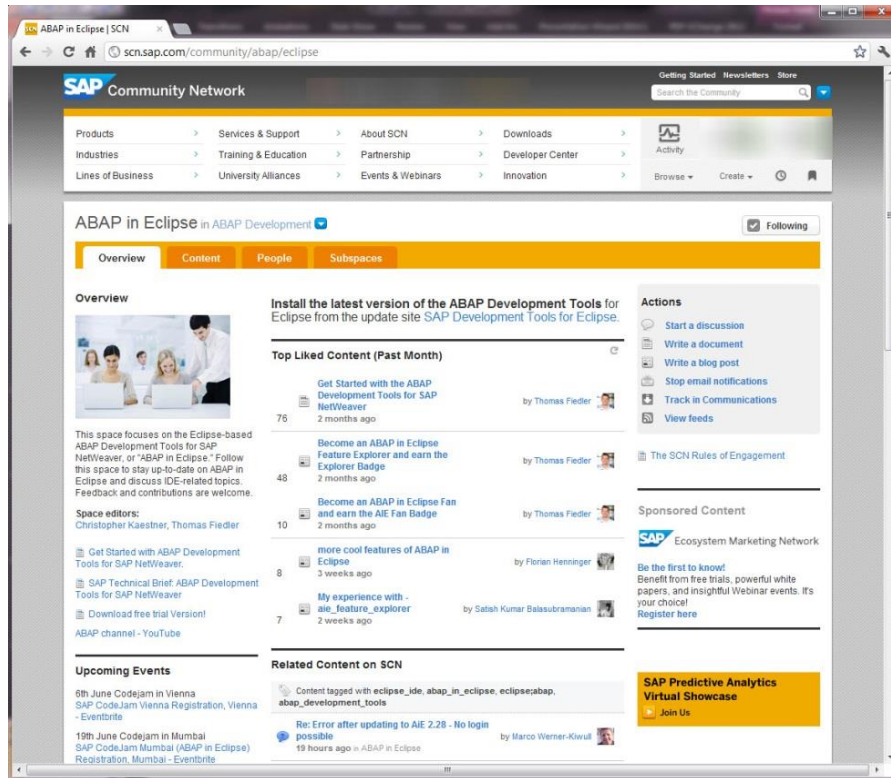
F3	Open definition
Alt+Left	Backward history
Alt+Right	Forward history
Ctrl+T	Quick hierarchy
F4	Open Type Hierarchy
Ctrl+O	Quick outline
Ctrl+Shift+G	Where-used list

Run, Debug

F8	Run current ABAP object
Alt+F8	Select & run ABAP application
Ctrl+Shift+B	Toggle breakpoint
F5, F6, F7, F8	Step into, over, return, resume
Ctrl+Shift+F10	Execute ABAP unit tests
Alt+F9	Profile development object

Your Development Tools

More Information



SCN Community

<http://scn.sap.com/community/abap/eclipse>

SAP CodeJam: 2012 – 2013 stats



52 cities



9,500 hours of coding



Over 3,200 developer connections made

SAP HANA

1,898
developers

SAP MOBILE

644
developers

SAP HANA CLOUD

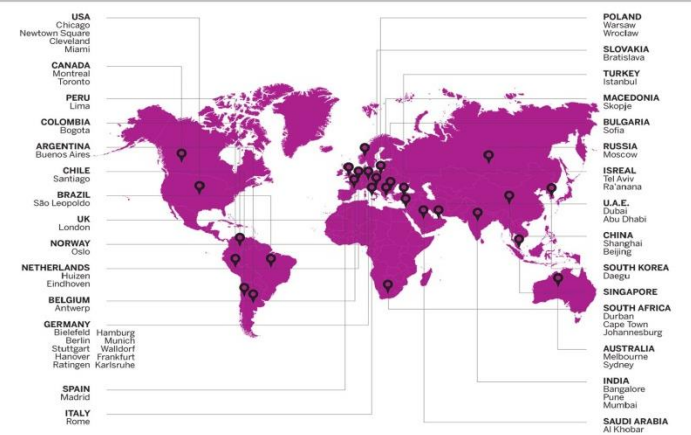
342
developers

SAP NetWeaver Gateway

151
developers

SAP UI5

30
developers



SAP CodeJam

<http://scn.sap.com/community/events/codejam>

Your Development Tools

What's Next?

Week 2 Unit 1
Existing Code: Is It Still Valid?





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