

SAP NetWeaver Application Server for ABAP 7.5

Overview and Product Highlights

SAP Technology Platform Product Management, SAP SE
February, 2016

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Agenda

Overview

Product Highlights

Summary

ABAP Platform Today

Customers and main assets

Business Suite, Business Warehouse, Partner, Custom Code, ...	41,200	Productive ERP 6.0 systems (NW 7x)
	8,020	Productive ERP systems on new EhP 7 (NW 74x)
	16,400	Productive BW systems
	370	Partner add-ons
SAP NW / ABAP Platform	10,000	Custom ABAP dev. objects per customer system
	5.1 million	Registered modifications in SAP code
Database	4.5 million	Registered ABAP developer

Rock solid and scalable server

- Built for mission critical business systems

Effective programming environment

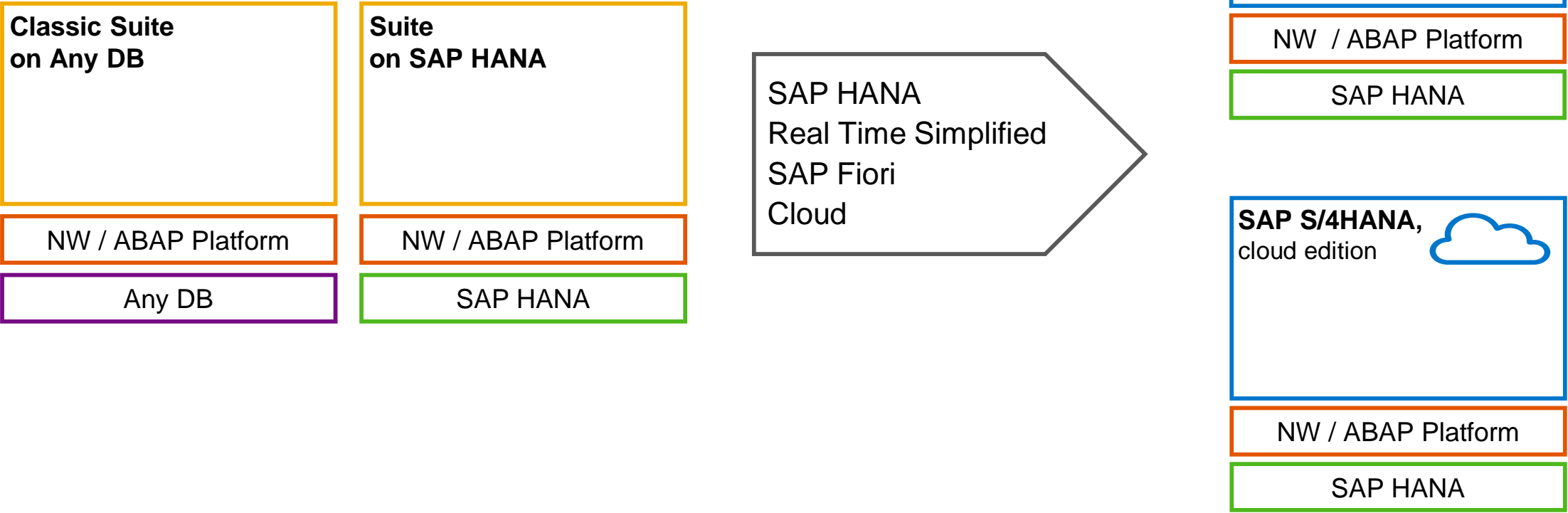
- Built for the complete life cycle of business apps

Continuously extended

- To serve new business scenarios

ABAP Platform for SAP S/4HANA

Transformation and role



SAP NetWeaver Application Server for ABAP 7.5

One common foundation for SAP Business Suite and S/4HANA, on-premise edition

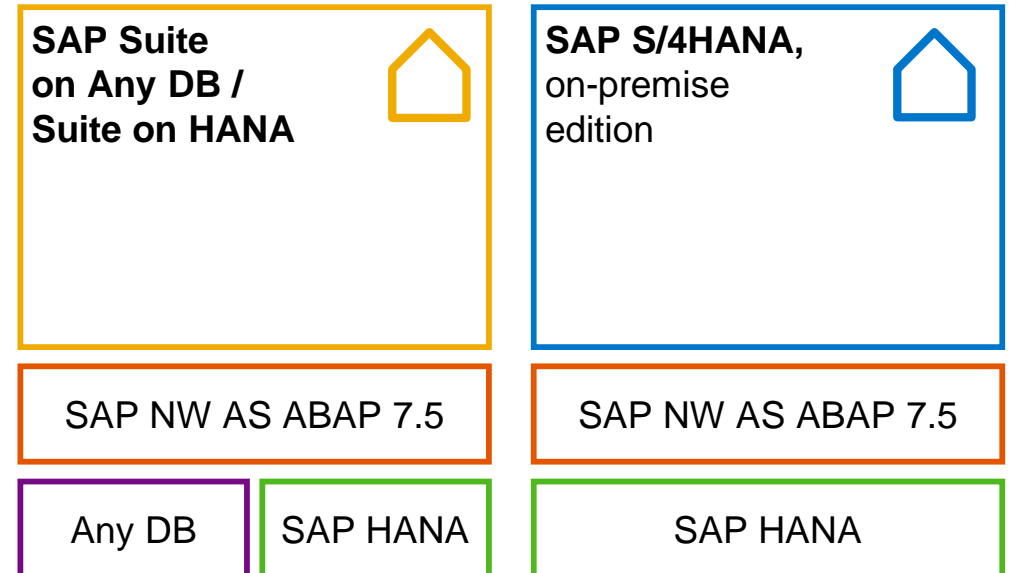
Some facts about the AS ABAP 7.5

- Generally available since October 20th, 2015
- Compatible successor of AS ABAP 7.4
- Runs on innovation kernel 7.45
- Unicode systems support only
- Supports SAP HANA and other classical databases

Continuous innovations without disruption

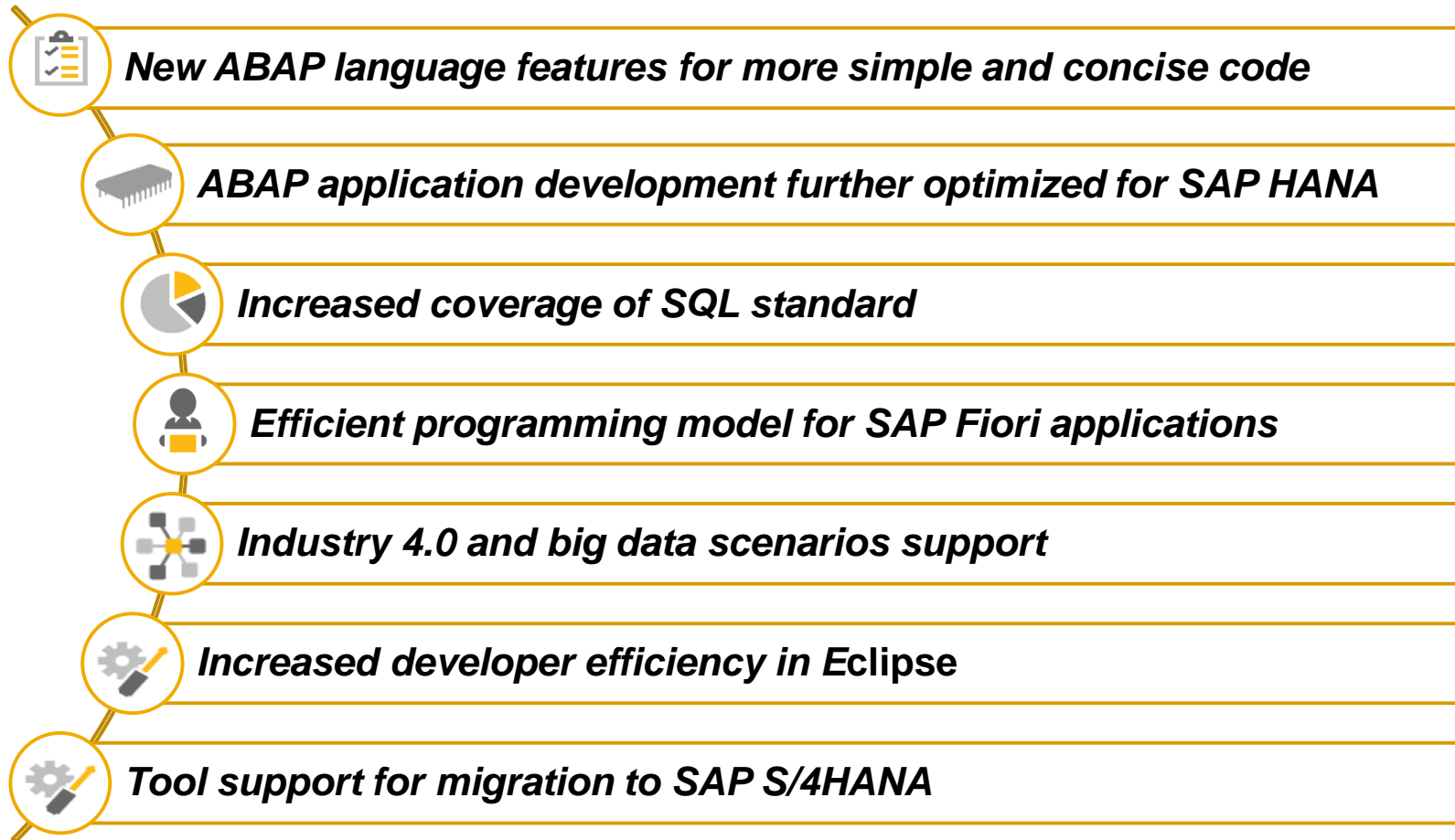
- Big Data, SAP HANA, SAP Fiori, cloud, and mobile

Makes it easy to exploit SAP HANA and build SAP Fiori business apps



SAP NetWeaver Application Server for ABAP 7.5

Highlights at a glance





ABAP Language

More simple and concise source code

ABAP Language

Declarative and functional modernization as of ABAP 7.4

Extensively expression-oriented ABAP syntax

- Inline declarations and type inference
- New constructor expressions (NEW, REF, CAST, ...)
- Table comprehensions and table line selections
- Powerful operations for internal tables such as CORRESPONDING () operator, grouping and filtering

Enhanced ABAP Objects

- Formal parameters allowed in functional methods
- Predicative call for functional methods
- Partial implementation of interfaces now supported

JSON support in sXML-Library and inline code documentation with ABAP Doc

Inline declaration

Old: data y type return_type_of_m,
x = oref->m().

New: data(x) = oref->m().

Constructor expressions

Old: create object oref type c01 exporting p1 = 17.

New: oref = new c01(17).

Internal table expressions

Old: read table itab into wa index 1.

read table itab into wa with key a= 1 b= 2.

New: wa = itab[1].

wa = itab[a = 1 b= 2].

Internal table functions

IF line_exists(itab[<expression>]).

...
ENDIF.

ABAP Language

Release 7.50 features overview

New built-in data type int8

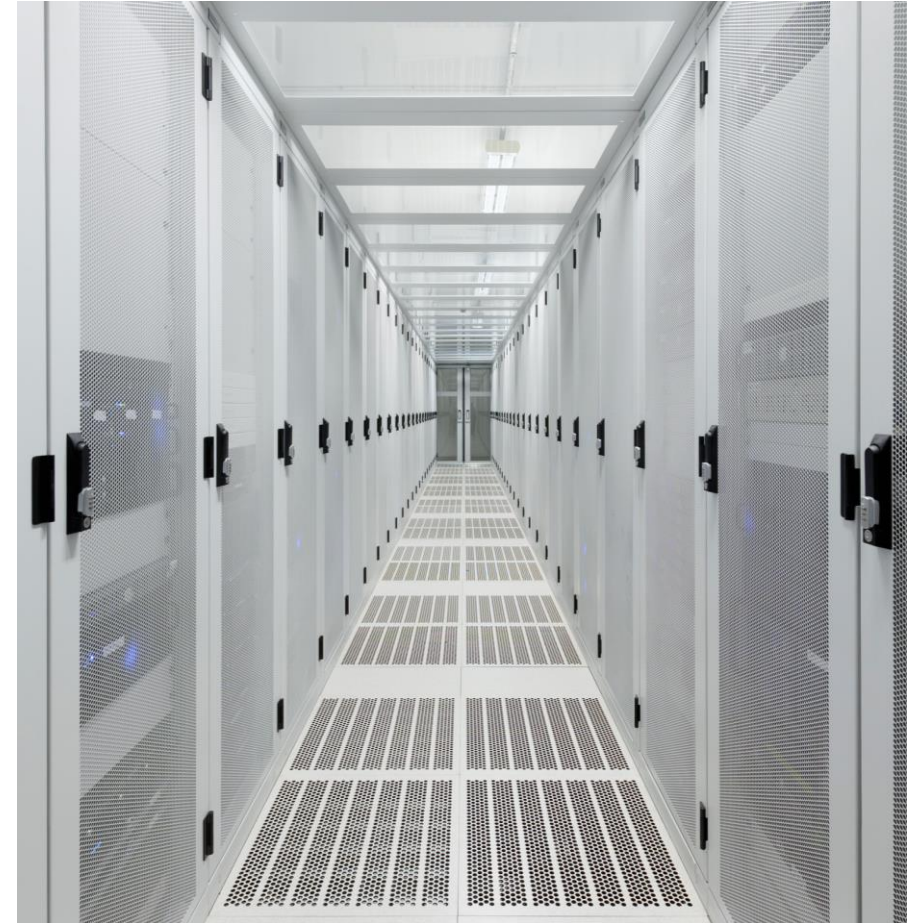
- 8-byte integers with signs
- Supported in ABAP dictionary and core platform frameworks
- Enables SAP BW to manage large data sets

Further expression enablement

- Enhanced type inference in constructor expressions
- Object component selector after table expressions

Dynamic component assignment

- Between structures or internal tables
- With dynamically specified mapping rules



ABAP Language

Release 7.50 features overview (2)

Type inspection for object reference variables

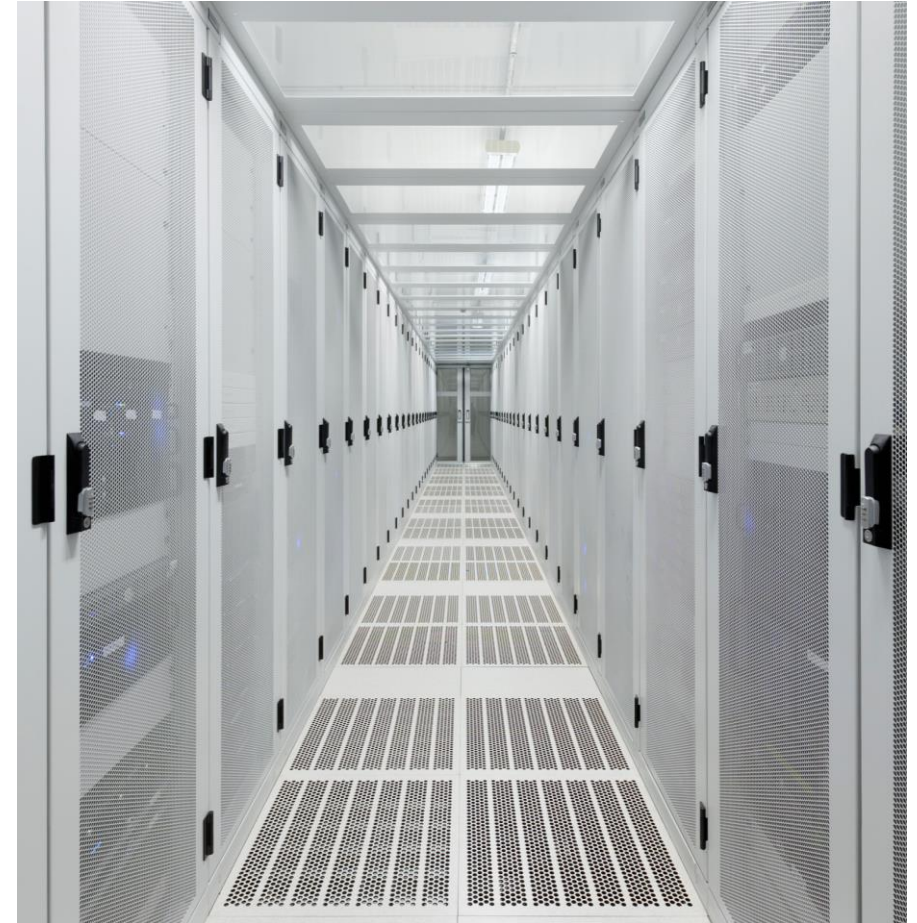
- Predicate expression `IS INSTANCE OF`
- Special statement `CASE TYPE OF` in case distinctions

Easy raising of T100 messages

- Using class-based exceptions
- Static and dynamic handling supported

Test seams and Injections

- For replacing a block of production code by a block of test code when unit tests are executed
- Supported for class pools and function pools

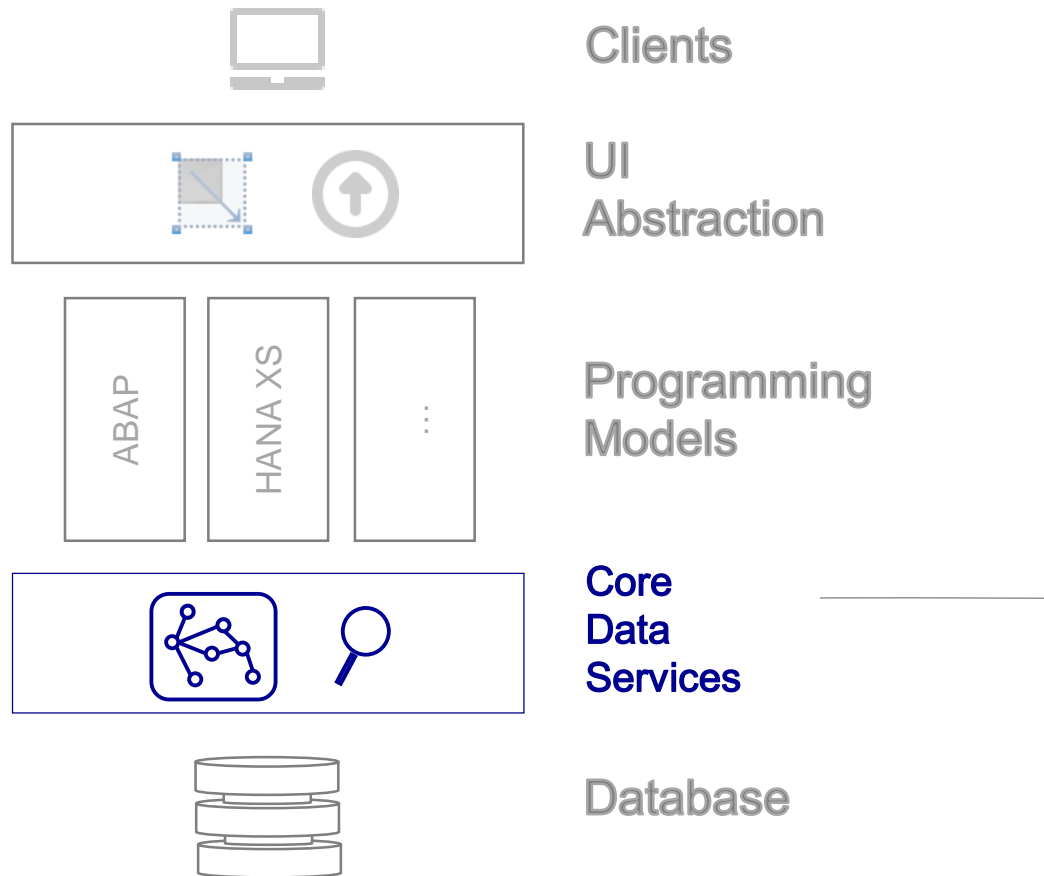




ABAP Core Data Services as standardized Data Model

Core Data Services (CDS)

Building block for timeless software



Next generation data definition and access for database centric applications

- Cross-platform unified abstraction layer – similar to OData for UI abstraction
- Extends native SQL means for higher productivity
- Maximum transparency for different programming models
- Integrates with platform lifecycle management

ABAP Core Data Services (CDS)

In a nutshell

Semantically rich data models

- Domain specific languages (DDL, QL, DCL)
- Declarative, close to conceptual thinking

Fully compatible with any DB

- Generated and managed SQL views
- Native integration in SAP HANA

Various built-in functions and expressions

- `sum (salesorder.gross_ammount)`
- `substring (bp.company_name, 0, 10) as name`

Domain-specific annotations

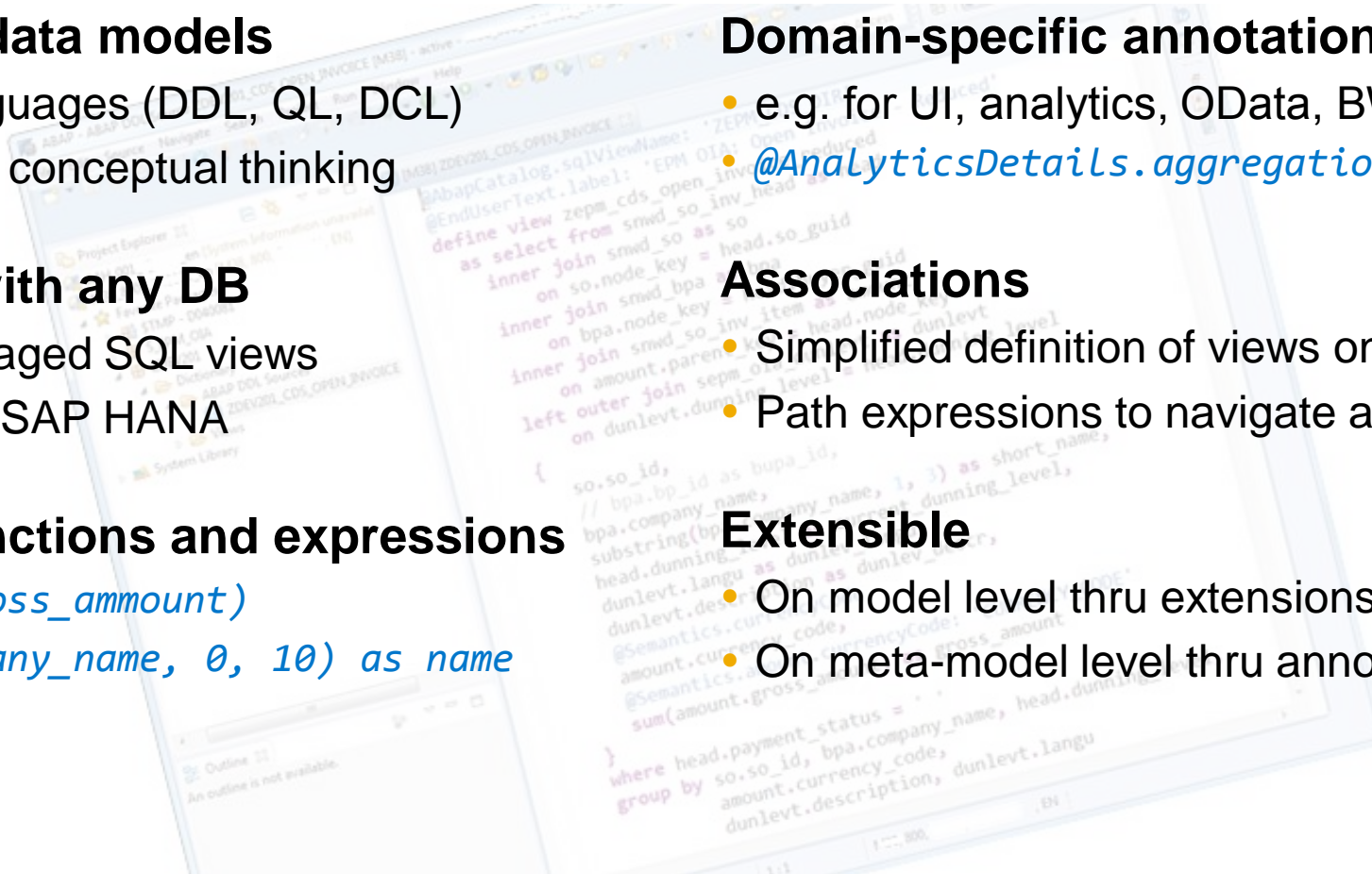
- e.g. for UI, analytics, OData, BW,...
- `@AnalyticsDetails.aggregationBehaviour: SUM`

Associations

- Simplified definition of views on top of views
- Path expressions to navigate along relations

Extensible

- On model level thru extensions
- On meta-model level thru annotations



CDS as standardized Data Model

Release 7.50 features overview

New language features,

- New SQL functions and expressions, CAST to data elements, ...

Enhanced annotations support

- Allowing support of domain-specific frameworks

Leverage the full power of associations in view extensions

Support of HANA breakout scenarios thru CDS table functions

Declarative authorizations with Data Control Language



CDS as standardized Data Model

Built-in functions and expressions overview

Generic SQL Expressions

Simple- / Searched-
Case
Coalesce

Conversion Functions

Unit Conversion
Currency
Conversion
Cast
Hex2Bin
Bin2Hex
Decimal Shift

String Functions

- Concat
Concat with Space
Instr
Left / Right
Length
Lpad / Rpad
Ltrim / Rtrim
Replace

Arithmetic Functions

Abs
Ceil
Div (Integer)
Division (Dec)
Floor
Mod
Round

Date and Time Functions

Days between
Add Days
Add Month
Current Tmstp
Date is Valid
Tmstp is Valid
Seconds btw.
Tmstps
Add seconds

PS: New and enhanced functions and expressions are bold

CDS as standardized Data Model

Enhanced annotation support

New domain-specific annotations provided for UI, OData, BW, search, ...

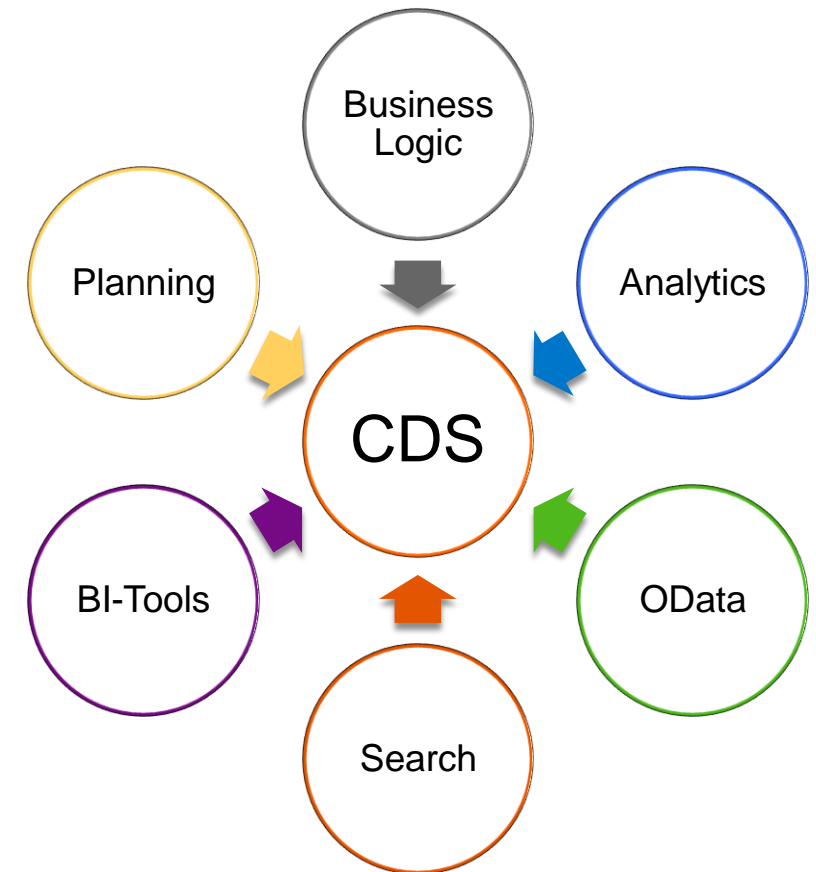
Custom annotations can be specified and queried by an annotation API

Reusable and unified view for all use cases

- Annotations enabling flexible usage in different contexts

Efficient development

- Code completion for SAP-predefined annotations
- Fast feedback about erroneous annotations



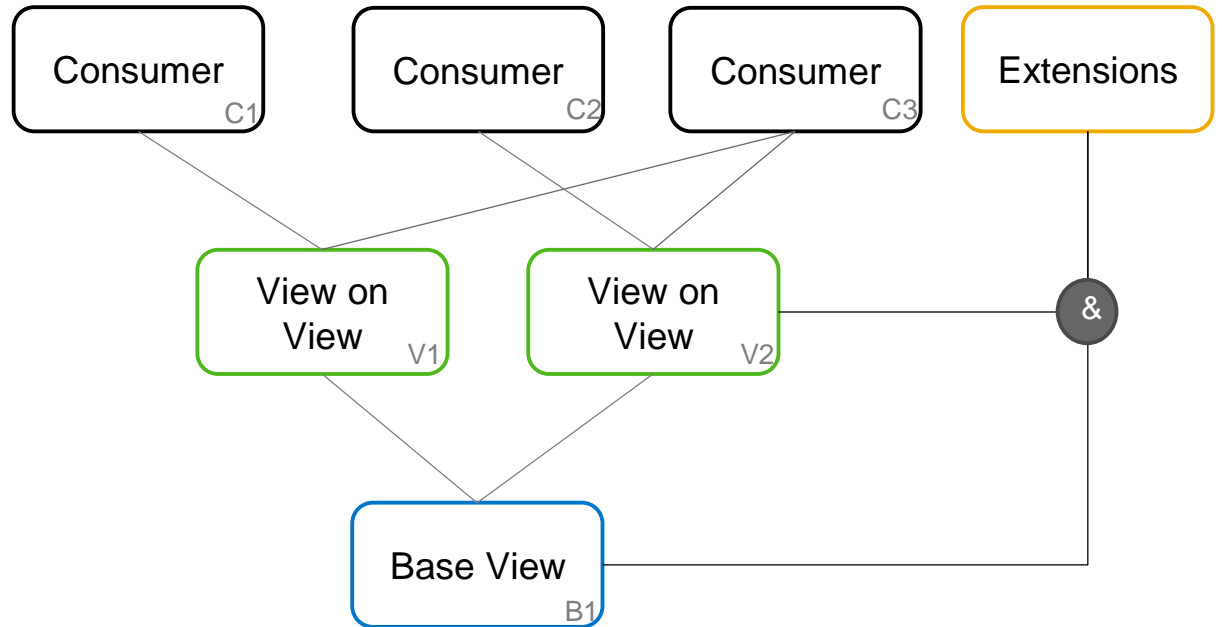
CDS as standardized Data Model

Leverage the full power of associations in view extensions

Extensions allow to append additional columns, arithmetic expressions or literals to result set

Usage of associations defined in the base view in extensions

Definition and usage of new associations in the extensions



CDS as standardized Data Model

HANA breakout scenarios with CDS table functions

CDS table functions

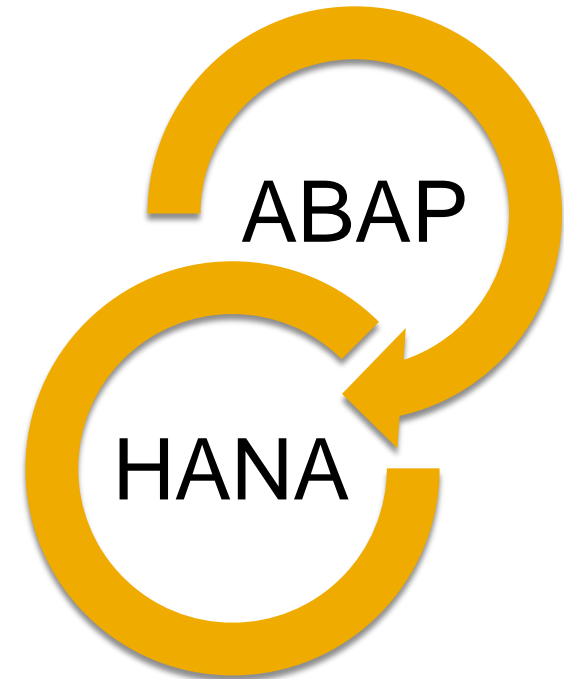
- Seamless interaction between ABAP CDS and ABAP managed Database Procedures (AMDP) framework
- Entities are consumable in CDS views and Open SQL

Needed for scenarios requiring selective measure

- Highest performance requirements e.g. with complex calculations
- Use of database / analytical engine specific functions required
- Open SQL and CDS views are not sufficient to solve problem

But!

- Database specific
- Currently SAP HANA DB only
- No automatic fallback for Any DB



CDS as standardized Data Model

HANA breakout scenarios with CDS table functions - What do you need?

DDL Source

1

Contains definition of CDS table function

Specifies parameter list, return parameters and a reference to the implementing method

AMDP Method

2

Implementation of an AMDP function

Fully managed and called by the ABAP Managed Database Procedures framework

SAP HANA Database

3

Database and runtime for CDS Table Functions

Runs stored SQL-script database function generated from AMDP on database tables

CDS as standardized Data Model

Declarative authorizations with Data Control Language (DCL)

Declarative instead of coded approach

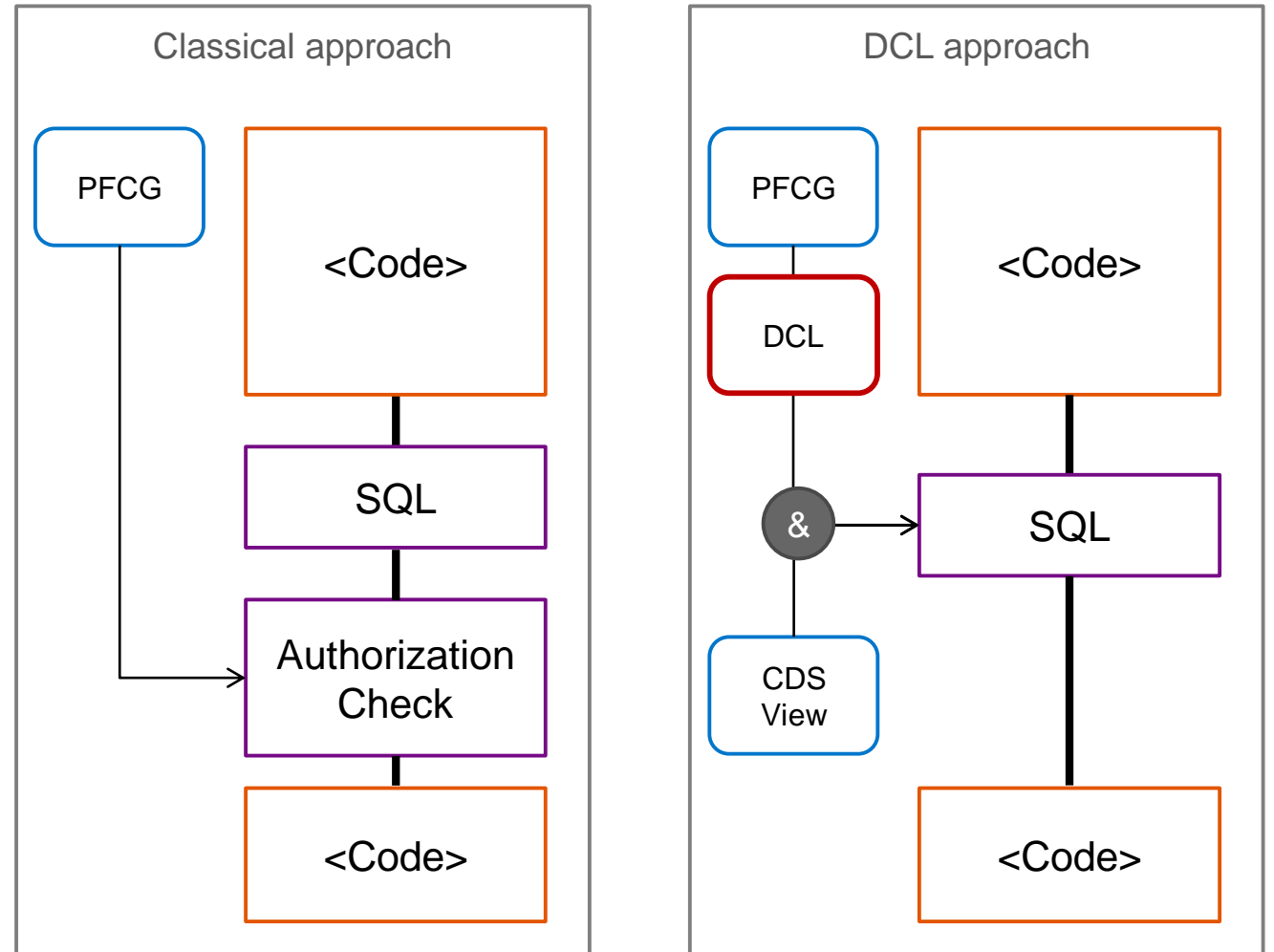
- Based on CDS modeling objects and PFCG role data; Part of the data model

Authorizations are also pushed down to DB by extending the Open SQL SELECT statement

Increased flexibility and consistency

- Defined once and automatically (re-) used everywhere

Supported in Open SQL, Analytical Engine, SADL and Enterprise Search





Open SQL

Increased coverage of the SQL standard

Open SQL

More freedom and less restrictions

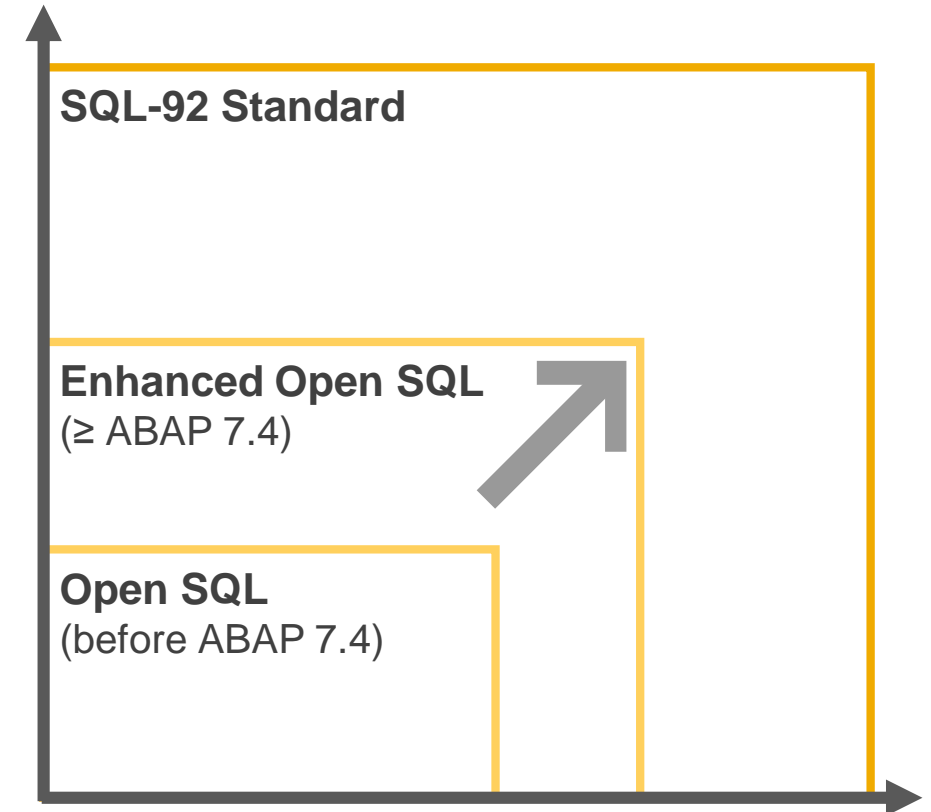
Broader coverage of SQL standard as of ABAP 7.4

Code pushdown support thru new language features and reduction of existing limitations

- Enhanced JOIN support, aggregate functions, SQL functions, expressions as column information after SELECT, ...
- Increased number of sub-queries

New Open SQL syntax introduced

- Comma separated SELECT list
- Escaping of host variables with “@”
- Old syntax still supported



Open SQL

Release 7.5 feature overview

Higher expressiveness in Open SQL statements thru enhanced syntax

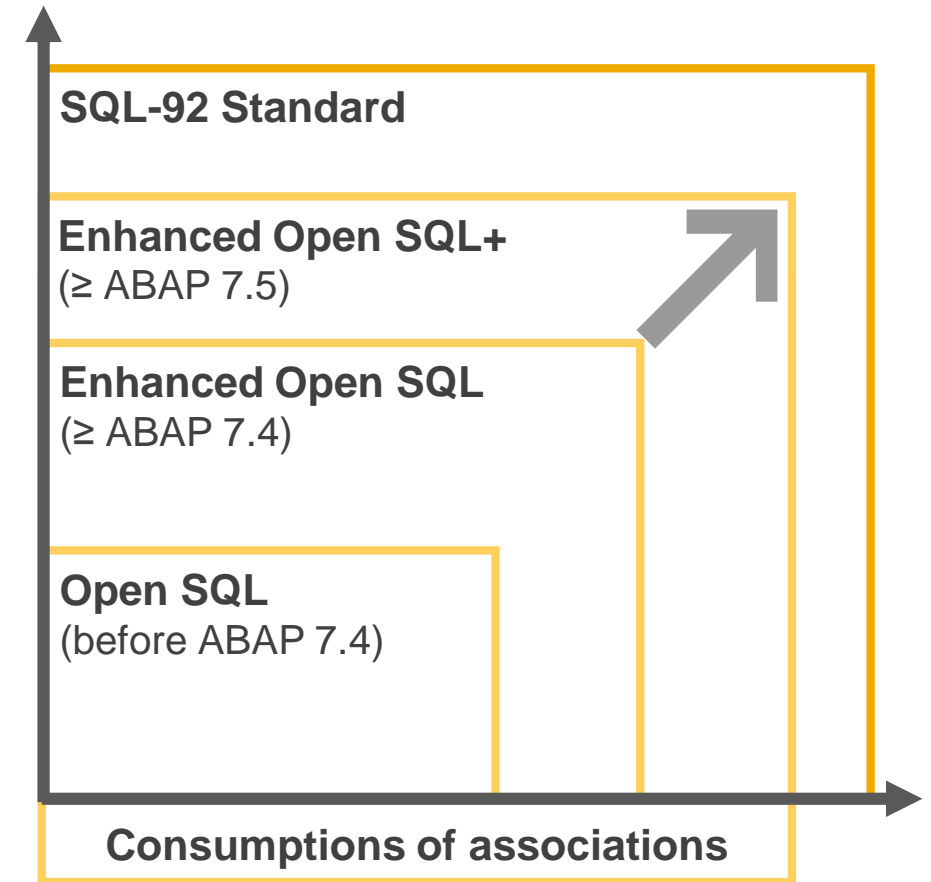
New and enhanced SQL functions and expressions like CONCAT, LPAD, REPLACE, enhanced COALESCE

Support of UNION / UNION ALL

Subqueries as data source of INSERT

Global temporary tables access

- For storing intermediate results for subsequent database calls



Open SQL

Release 7.5 feature overview (2)

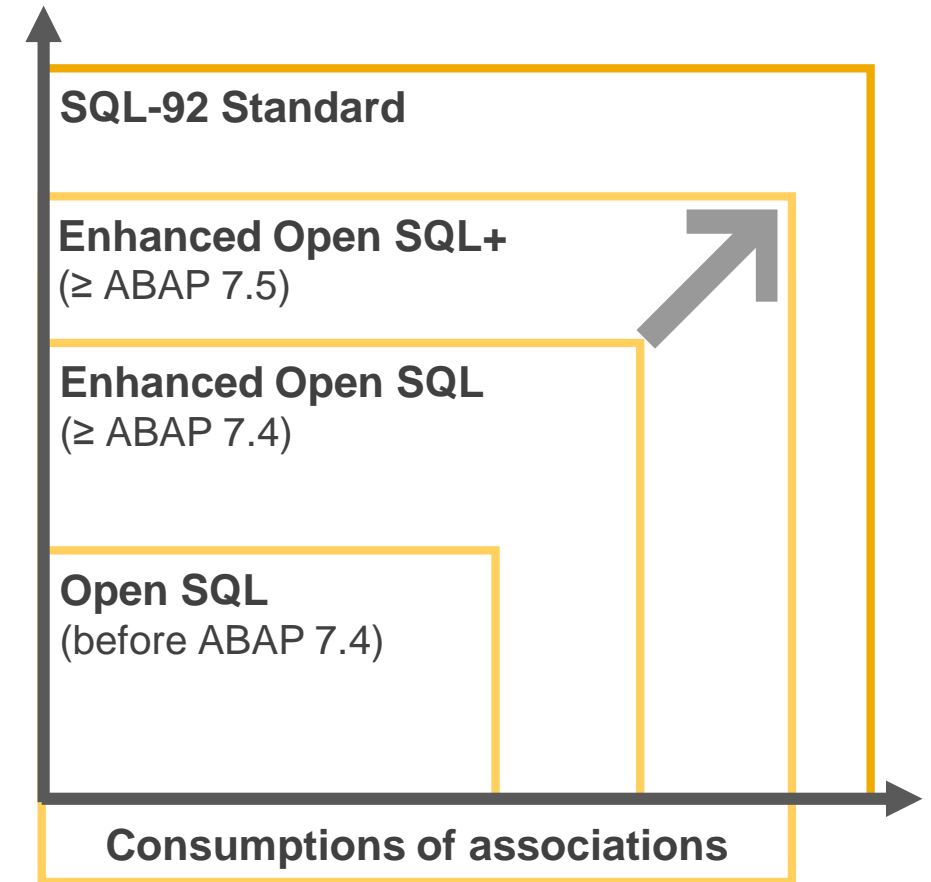
Flexible consumption of CDS data models and roles

- Usage of associations via simple path expressions at different positions of SELECT statement (e.g. data source and column)
- Consumption of declarative authorizations (CDS DCL)
- Consumption of CDS table functions
- CDS views with parameters now supported on Any DB

Enhanced syntax such as FROM in front of field list and new addition FIELDS to enable code completion

Support of sub-queries as data source of INSERT

Dynamic ON condition of JOINS now supported





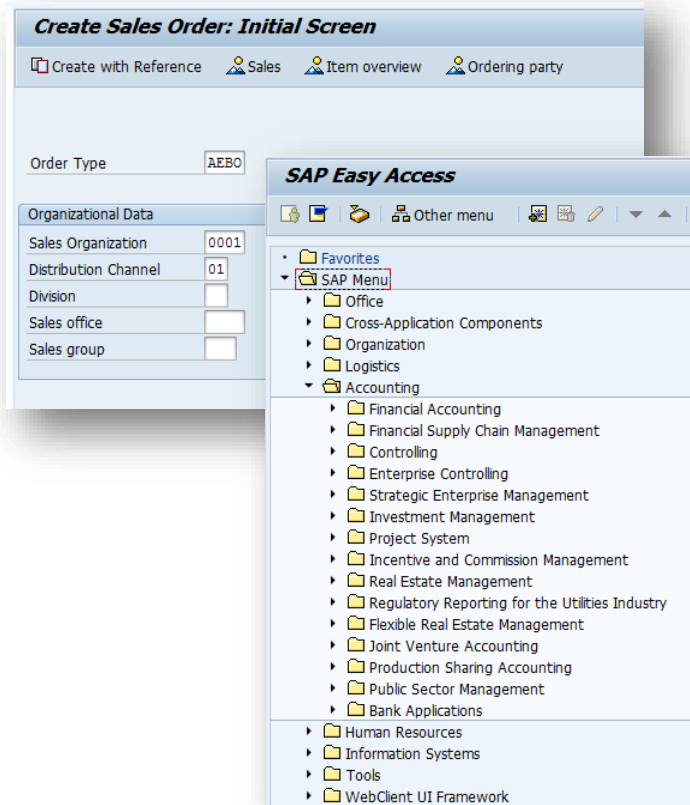
Efficient Programming Model

Common programming model for transactional and analytical Fiori apps

Efficient ABAP Programming Model

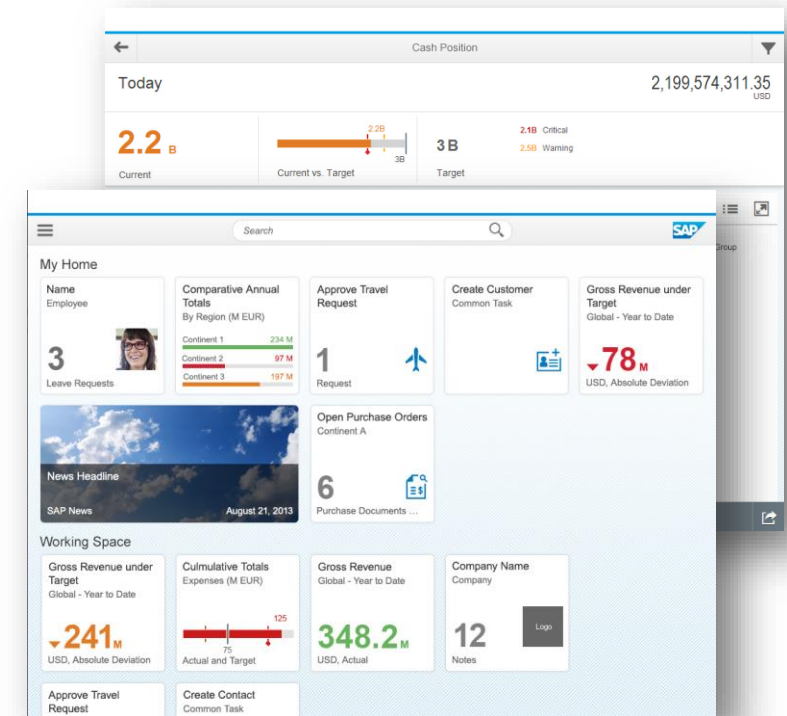
New Scenarios – Fiori Apps

Classic GUI based transactions



New
Programming
Model

Role-based Fiori apps



Efficient ABAP Programming Model for SAP Fiori Apps

At a glance

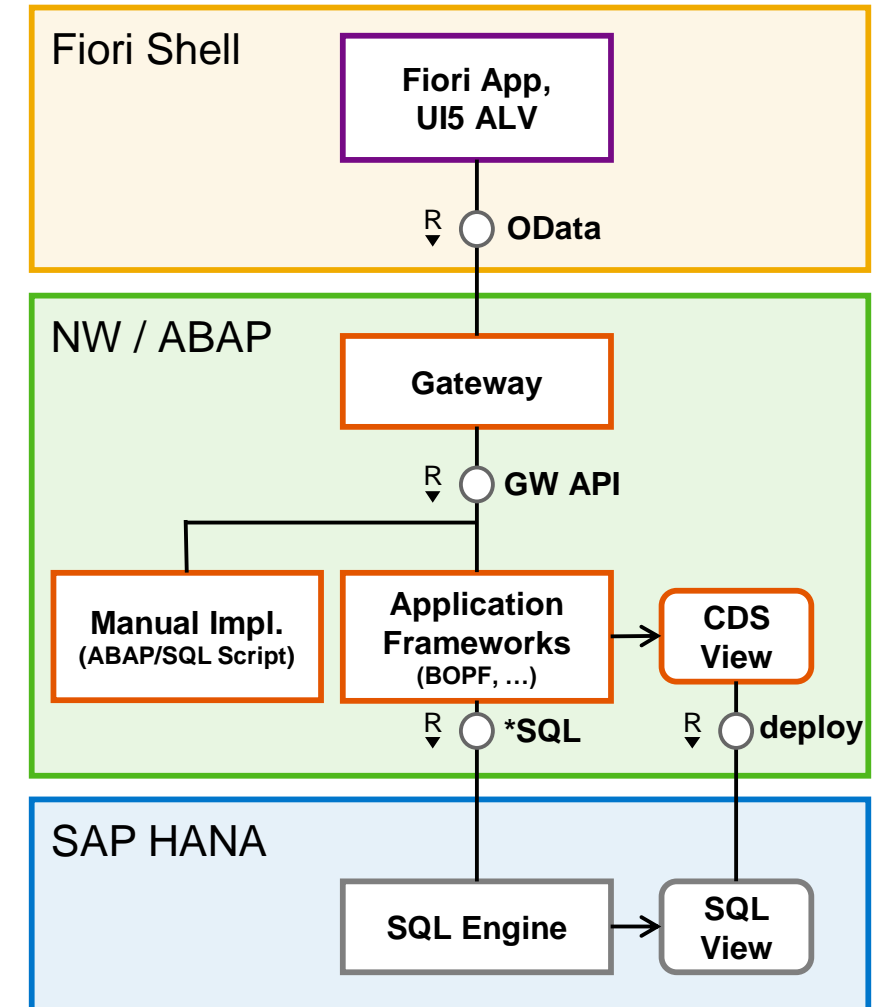
SAP Fiori user experience on any devices

One data model for all consumers

Easy exposure of CDS data models to the UI

ALV-like HANA optimized services for analytic apps

Transaction, error and event handling services



CDS Core Data Services
GW Gateway
BOPF Business Object Process Framework



Innovation for Industry 4.0

Enhanced ABAP Channels

Innovation for Industry 4.0

Native TCP/IP support in ABAP 7.5

ABAP Channels enable Industry 4.0 scenarios by supporting native TCP/IP protocols

Simplified setup and lower TCO thru direct connection between ABAP server and shop-floor devices

Simplified applications thru new event handling with ABAP Channels



Innovation for Industry 4.0

New event handling with ABAP Channels

Direct communication with sensors /machines

Support native TCP/IP protocols

ABAP Messaging Channel – Collaborate

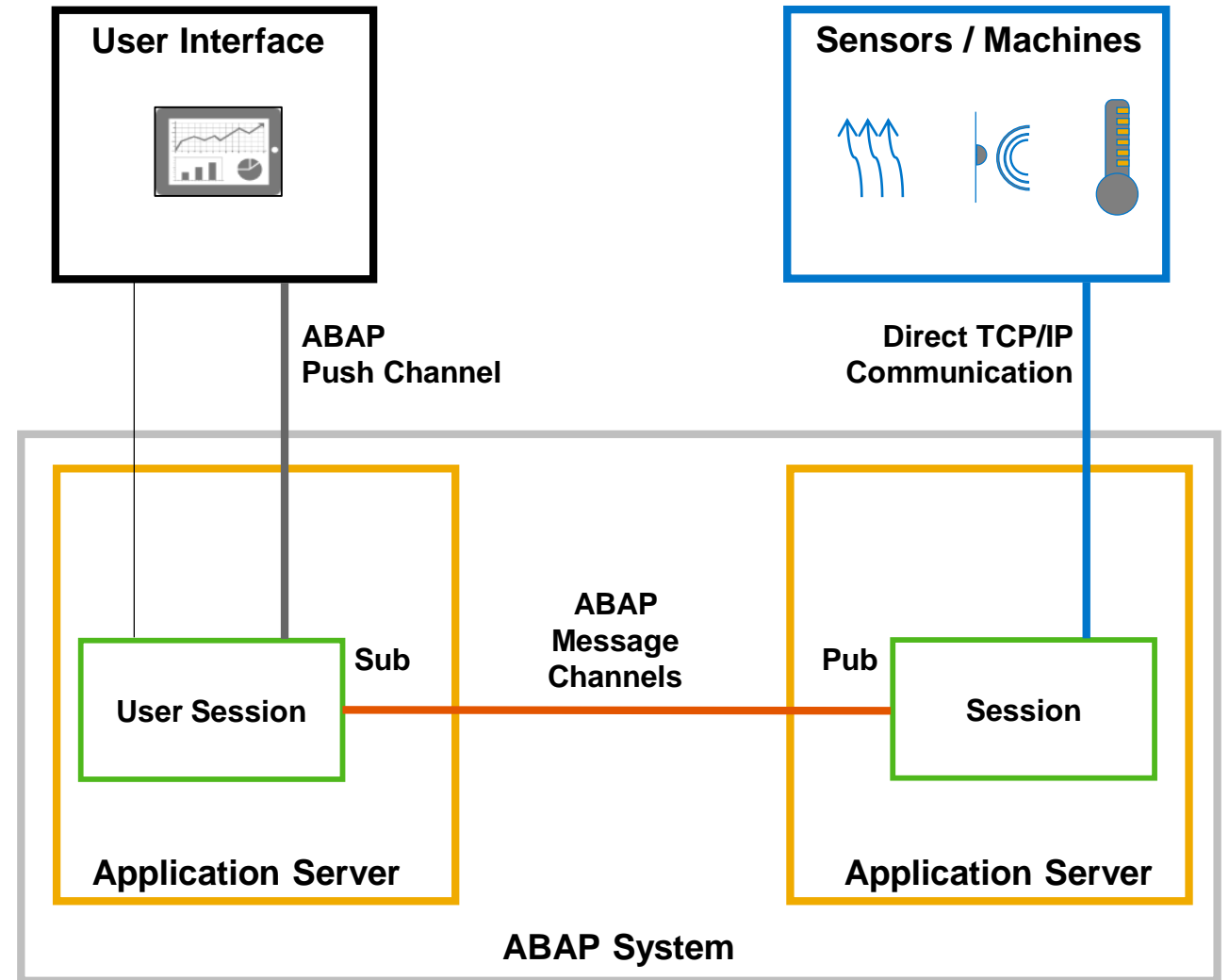
Publish / subscribe infrastructure to exchange messages between sessions

Data changes are published to subscribed clients immediately

ABAP Push Channel – No more polling

Bi-directional communication via Web Sockets in ABAP

User interface is automatically updated when data changes





ABAP Development Tools

Increased developer efficiency

ABAP Development Tools in eclipse™

Overview

Superior toolset for high developer productivity

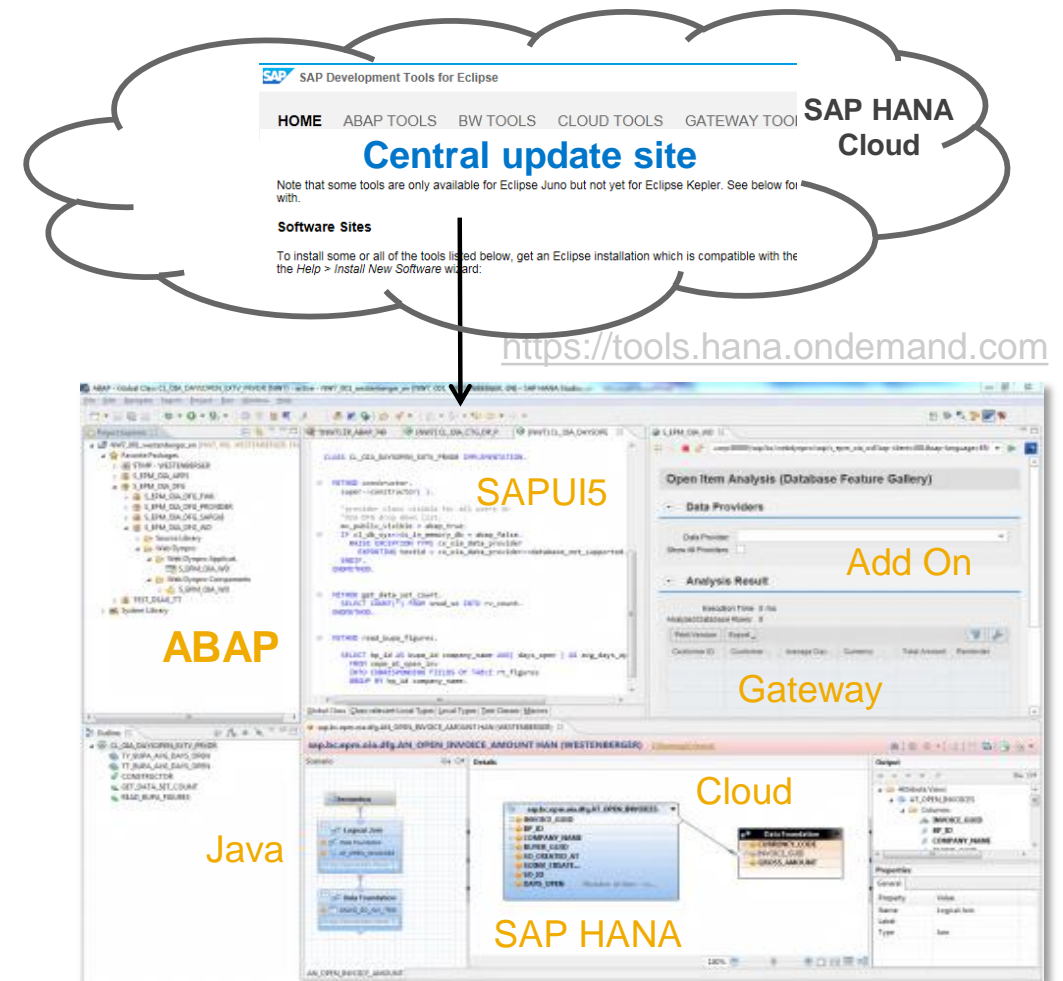
- Flexible UI with powerful code editor incl. refactoring support
- New SQL development tools for CDS and AMDP, incl. ABAP SQL console
- Troubleshooting tools like debugger, tracing, dump analysis
- Quality tools for static code checks and unit testing
- New code documentation capabilities with ABAP Doc

Integration of all development aspects in one IDE

- ABAP, SAPUI5, SAP HANA, Java, Cloud, BW, ...

Open & Extensible

- SDK for partner and customer extensions
- Eclipse Marketplace & Community



ABAP Development Tools in Eclipse

Release 7.5 feature overview

Source-based editor for dictionary structure

New AMDP debugger

Native BOPF business objects editor in Eclipse

Form-based editor for data elements

Source-based editor for Simple Transformations

Further developer productivity enhancements

- Like new Web Dynpro ABAP tools, offline ABAP Doc, Quick Fixes and enhanced CDS editing support



Find more information here:
<http://scn.sap.com/community/abap/eclipse/blog/2015/10/22/out-now-adt-version-251-for-the-brand-new-as-abap-750>



Custom Code Management

Ensure quality and robustness

Custom Code Management

Release 7.5 features overview

Powerful quality assurance tools

**SPAU 2.0 to improve adjustment of
SAP code modifications**

**ATC remote check for SAP NetWeaver AS,
add-on for Code Vulnerability Analysis (CVA)**

Tools supporting migration to SAP S/4HANA



Custom Code Management

ABAP Test Cockpit

Static code checks on ABAP development objects

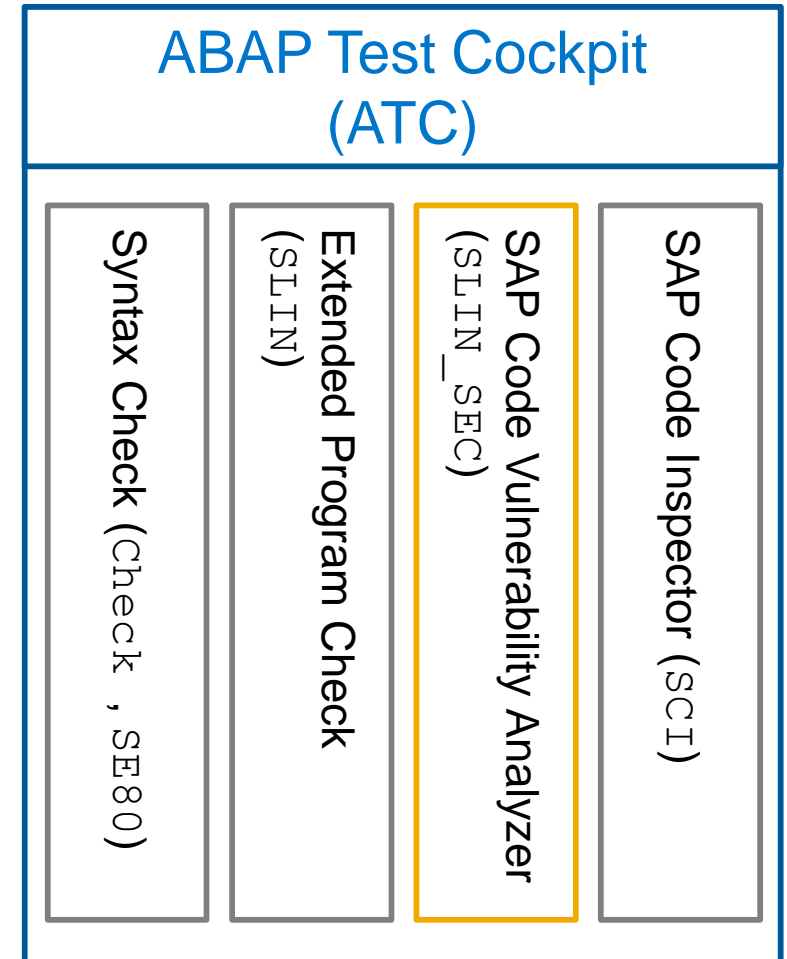
- Functional, performance, ..., security aspects covered
- Findings reported in a prioritized worklist
- New quality gates and processes supported (like exemption process and regression tests)
- Fully integrated into ABAP lifecycle management

Smooth migration of ABAP code to SAP HANA

- Check variant `FUNCTIONAL_DB` for SAP HANA readiness
- Check variant `PERFORMANCE_DB` for DB performance analysis

Remote static checks available for older releases

- Refer to SAP Note 2011106 for older releases



Custom Code Management

SQL Monitor

Runtime code analysis in ABAP productive systems

- Collection of runtime information of constructs (Entry points, elapsed time, records read, ...)
- Transparent SQL profile of systems provided

Monitored SQL data linked to the related processes

- Various aggregation and drill-down options available

SQL Trace integrated for detailed investigation

The screenshot displays the SAP SQL Monitor interface. The top section, titled "SQL Monitor", includes navigation links for Application Help, Log, Data, and Job Overview. Below this, the "State" section provides summary statistics: Number of Records (665,006), Record Limit (2,000,000), Last State Change (19.08.2014 / 11:46:58 (CET) by user USR01), Last Data Action (01.07.2014 / 09:57:04 (CET) by user USR01 (refresh data)), Scheduled Data Refresh Job (Scheduled for Job Event SAP_RTM_COLLECT_ALL_FINISHED by User USR01), Scheduled Deactivation (26.08.2014 / 11:46:56 (CET) by user USR01), Time Series (Active / Period: 1 Hours), and Activation State (Globally Active (8 servers available)).

The "Server Name" table lists two servers: vm:012_1_33 and vm:012_2_33, both with an Expected State of "Active" and an Actual State of "SQL Monitor is active".

The "Activation / Deactivation" section includes buttons for "All Servers", "Select Servers", and "Deactivate".

The "Data Management" section includes buttons for "Display Data" and "Export Data".

The bottom section, titled "SQL Monitor: Top 200 records, not aggregated", displays a table of SQL operations. The table has columns for DB Exctns, Total DB Time, Total Records, DB Mn T, Mean, Table Names, SQL Operation, Obj., Object Name, and Include Name. The table lists various SQL operations, including SELECT, UPDATE, and COMMIT, with associated object names and include names.

An orange arrow points from the "wait x weeks" text to the "SQL Monitor" title bar.

Custom Code Management

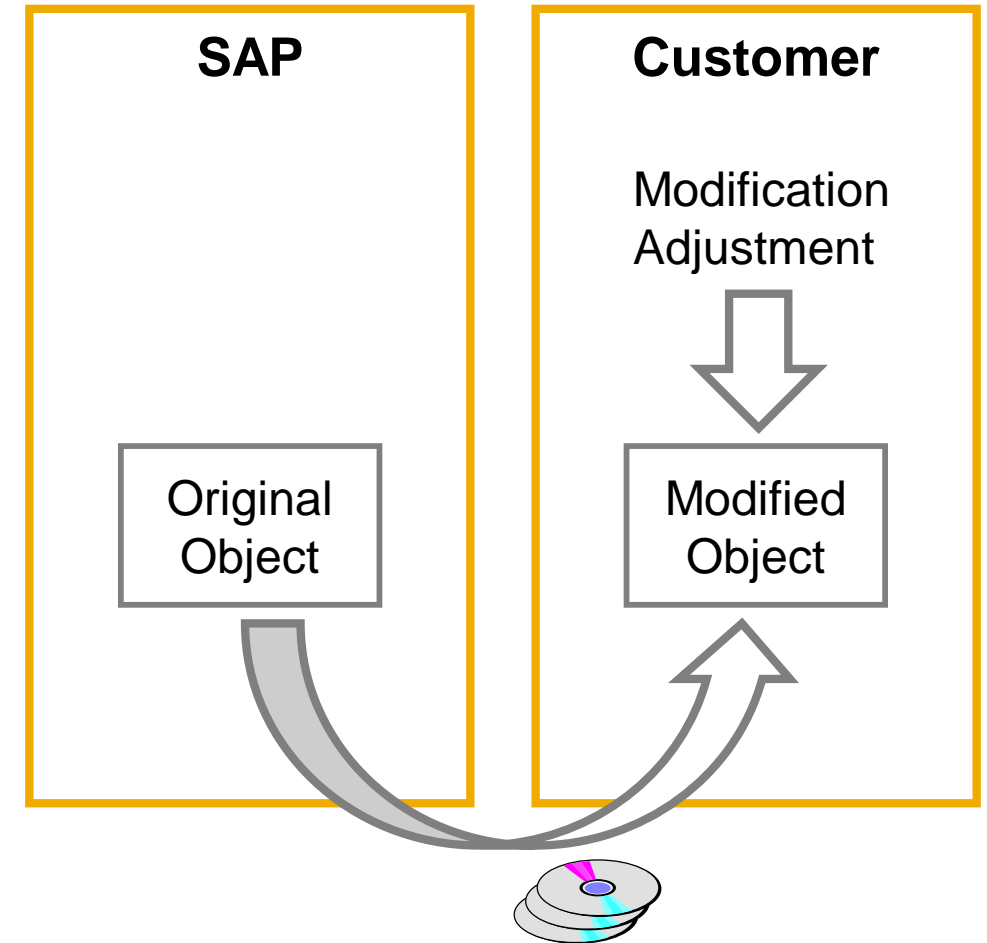
Purpose of transactions SPAU and SPDD

Upgrades overwrite

- Modifications
- SAP Note corrections

Modification adjustment

- SPDD: Prevent DDIC changes from getting lost
- SPAU: Retrieve modifications, re-implement SAP Notes



Custom Code Management

SPAU 2.0 to improve adjustment of modifications of SAP code

Housekeeping

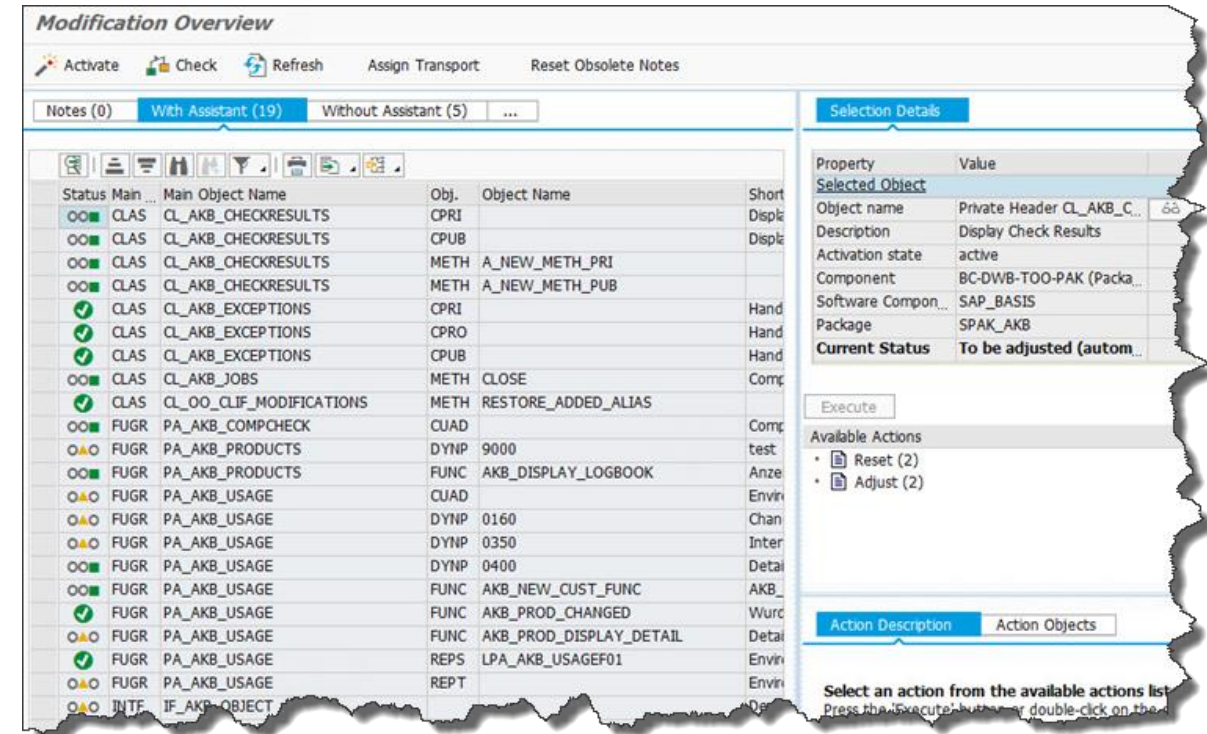
- Unadjusted objects are **collected** before the upgrade
- They can be **reset** to standard before the upgrade
- They are **marked** in SPAU

New user interface

- ALV Grid with standard features, customizable columns
- All relevant object details available
- Easy navigation to to-be-adjusted objects or SAP Notes

Mass operations

- Reset to original, automatic adjustment, etc.



Custom Code Management

SAP NetWeaver AS, add-on for Code Vulnerability Analysis (CVA)*

Find security issues at design time

- Reduced false-positive rate by dataflow analysis
- Efficient scan directly from within the development environment

Developer guidance

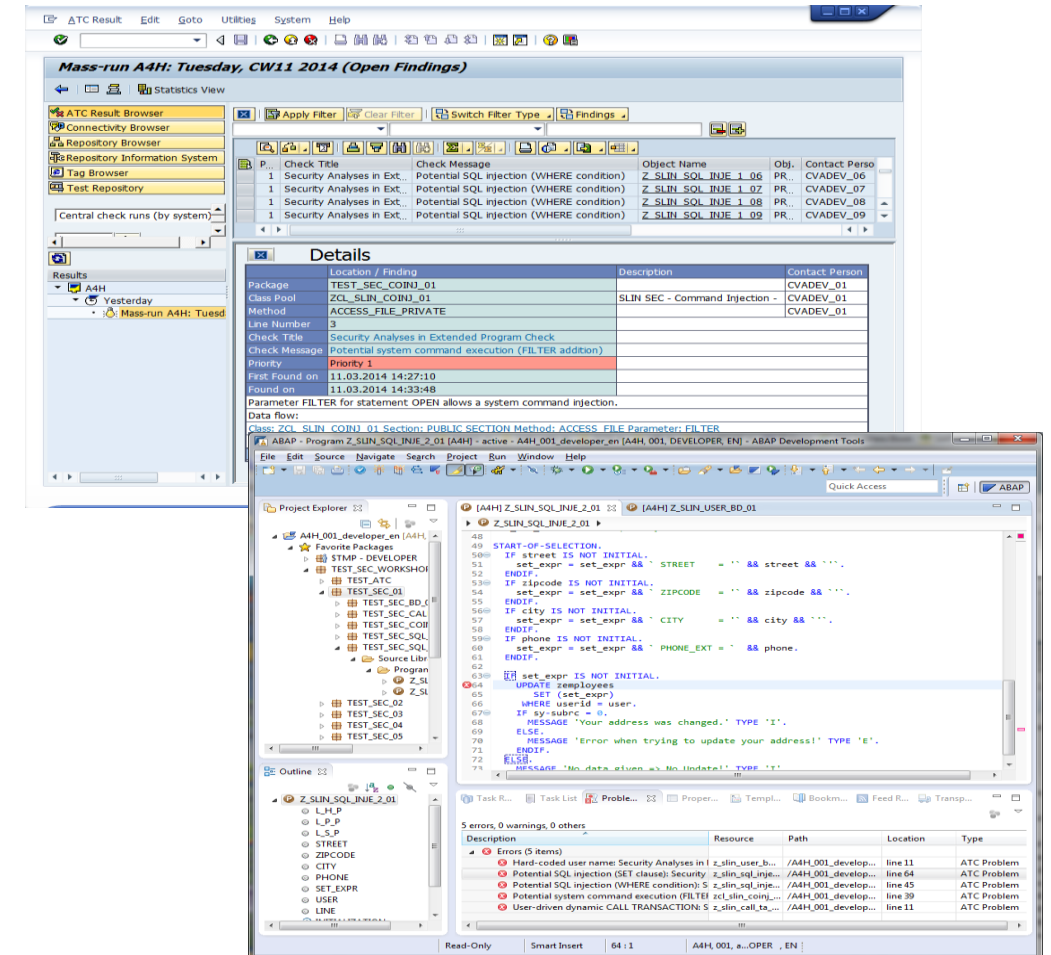
- Detailed help and explanations to all errors
- Assistance to find the right location for the fix
- Approval workflows for false positives included

Integration

- Integrated into ABAP development environment, standard ABAP check frameworks, SAP transport system and ABAP Test Cockpit

Available for various SAP NetWeaver releases

- AS ABAP 7.02 SP14 | 7.0 SP09 | 7.31 SP09 | 7.4 SP05 | 7.5



(*) Separate price list item

Custom Code Management

Code Vulnerability Analysis (CVA)* – Release 7.5 features overview

Detection of Cross Site Scripting (XSS) in BSP pages

- As BSP is still in use, XSS issues are still a risk to applications. The new checks support BSP model analysis and will directly point you to the issues in the models itself.

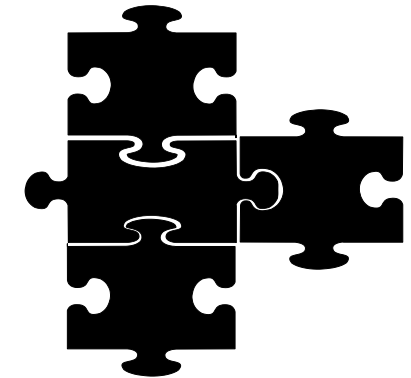


Missing or incomplete authorization check when calling transactions

- Using the 'CALL TRANSACTION' statement, programmers can execute transactions bypassing the standard authorization check for the called transaction.

Ability to analyze code within enhancement spots

- Within enhancement spots developers can add custom code snippets to SAP program. With the new feature customers can check their code in the context of the SAP programs.



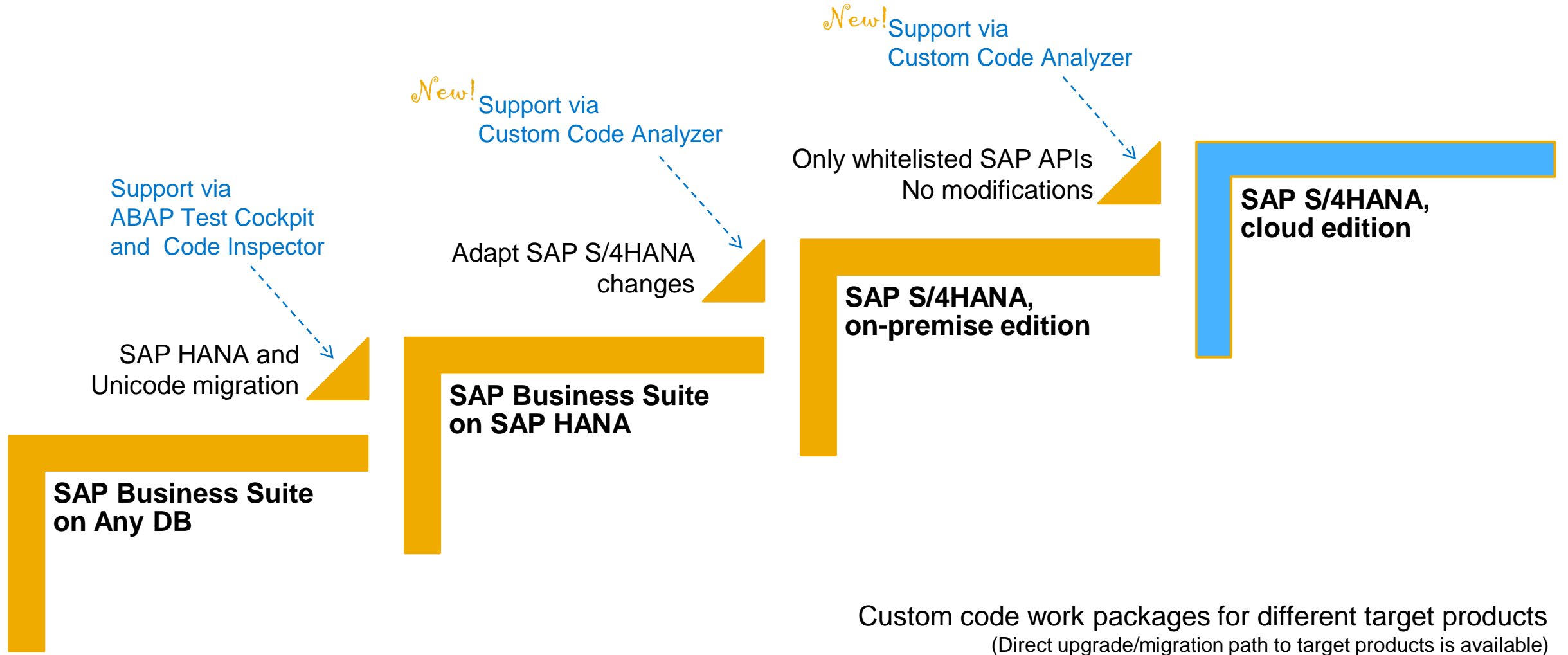
Central Security Scan Support (Remote Scan)

- Security Code Scans are not an area just for the latest release of your software. To enable customers to also scan developments on older releases down to 7.00 a new remote scan solution was implemented which will first ship with the SAP NetWeaver 7.50 release.

(*) Separate price list item

Custom Code Management

Migration of custom ABAP code to SAP S/4HANA



Custom Code Management

Migration of custom ABAP code to SAP S/4HANA – Tool support

1

Download Simplification Database from SMP and upload to analysis system

2

Run Custom Code Extractor and transfer metadata to analysis system

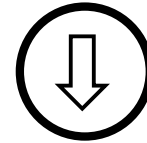
3

Optional: Get usage data to restrict effort for productively used custom code

4

Work on customer specific hits

Task



Customer ERP DEV or Q System

Custom Code Extractor

Customer ERP Productive System

Collect Usage Data



Analysis System

Simplification DB

Changed/deprecated functionality
Changed/deprecated business processes



Custom code metadata

Used SAP objects
Extended SAP objects
Modified SAP objects



Customer specific metadata

Usage data from productive System



Result of Analysis

Affected custom code
Affected extensions
Affected modifications



Summary

SAP NetWeaver Application Server for ABAP 7.5 at a Glance

AS ABAP 7.5 enables on premise custom development for SAP Business Suite and SAP S/4HANA

- Generally available since October 20th, 2015

AS ABAP 7.5

- makes it easy to exploit HANA with new sophisticated database-centric optimizations
- Delivers a common ABAP programming model for transactional and analytical applications
- establishes SAP Fiori as cross-application user experience
- supports Industry 4.0 and big data scenarios
- further modernizes and simplifies the ABAP language
- offers first class developer experience in Eclipse
- keeps up advanced quality assurance
- provides custom code management tools for simple upgrade and migration to SAP S/4HANA

Further Information

SCN

<http://scn.sap.com/docs/DOC-67771>

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

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

- Links collections about AS ABAP 7.5
- ABAP Development SCN Community
- ABAP for SAP HANA SCN Community

SAP Help Portal

<http://help.sap.com/nw75>

http://help.sap.com/abapdocu_750/en/index.htm?file=abennews.htm



Thank you



Olga Dolinskaja
Product Management
SAP Technology Platform

SAP SE

 olga.dolinskaja@sap.com



Carine Tchoutouo Djomo
Product Management
SAP Technology Platform

SAP SE

 carine.tchoutouo.djomo@sap.com

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