

Week 3 Unit 5: Core Data Services: Associations



Core Data Services: Associations

Outline

Content

- CDS Views: UNION and JOIN Support
- CDS Associations:
 - Definition
 - Consumption
- Association Types
 - Ad-Hoc Association
 - Exposed Association
- Filtered Associations
- Advantages of Associations

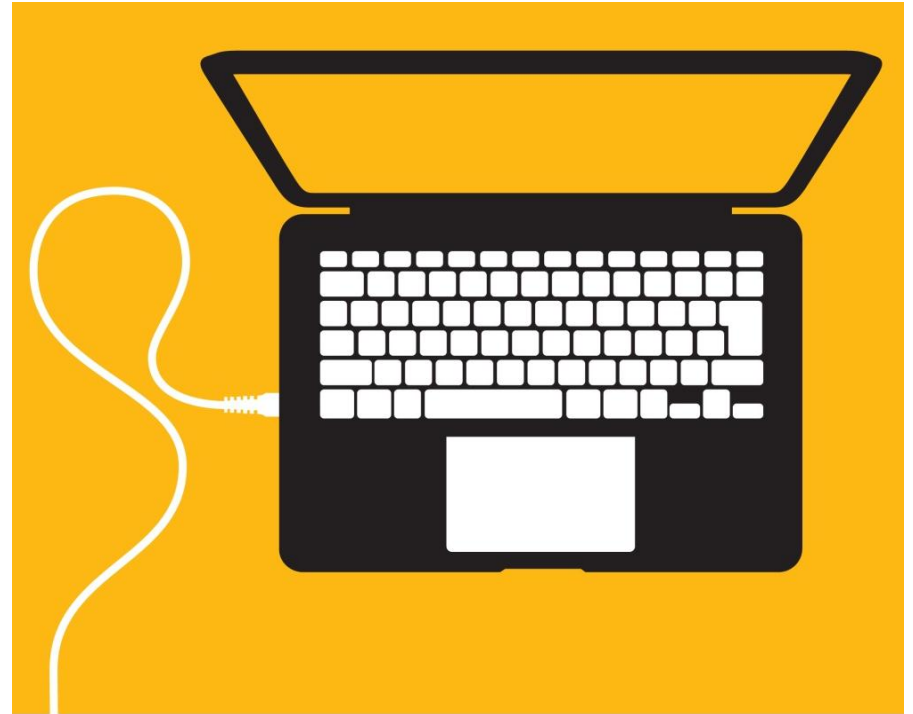


Core Data Services: Associations

CDS View Definition: Demo

CDS View Definition Features

- UNION (ALL)
- JOIN



Core Data Services: Associations

UNION & UNION ALL Statements



Additional
Material

- Concatenation of different queries using **UNION (ALL)** construct
- Select lists of the different queries must
 - have the same number of columns
 - contain compatible types
- **UNION** implies a distinct semantic
- **UNION ALL** does not remove duplicates, so it does not imply the distinct semantic
- Do not mix **UNION & UNION ALL** in a CDS View

```
@AbapCatalog.sqlViewName: 'ZDDL5_CDS_20'  
define view zcdsv_union as  
select from snwd_so as so  
    inner join snwd_bpa as bpa  
        on so.buyer_guid = bpa.node_key  
{  
    key bpa.bp_id,  
    bpa.company_name,  
    sum( gross_amount ) as total_gross_amount,  
    'small' as category  
}  
group by bpa.bp_id, bpa.company_name  
having sum( gross_amount ) < 10000000  
  
union all  
  
select from snwd_so as so  
    inner join snwd_bpa as bpa  
        on so.buyer_guid = bpa.node_key  
{  
    key bpa.bp_id,  
    bpa.company_name,  
    sum( gross_amount ) as total_gross_amount,  
    'large' as category  
}  
group by bpa.bp_id, bpa.company_name  
having sum( gross_amount ) >= 10000000
```

Core Data Services: Associations

JOIN Statements



Additional
Material

- Supported join types:
 - **INNER** join
 - **LEFT OUTER** join
 - **RIGHT OUTER** join
- Complex join operations using (...) are supported
- Arbitrary on-conditions (including >, >=, <, <=, like between, and, or, not)

```
@AbapCatalog.sqlViewName: 'ZDDL_S_CDS_21'  
define view zcdsv_join as  
  select from snwd_so as so  
  inner join snwd_bpa as bpa  
    on so.buyer_guid = bpa.node_key  
  left outer join snwd_so_inv_head as  
inv_head on so.node_key = inv_head.so_guid  
{  
  key so.so_id,  
    bpa.company_name,  
    so.delivery_status,  
    inv_head.payment_status  
}
```

Core Data Services: Associations

Concept

CDS Associations

- Definition of relationships between entities
- Association definition contains
 - Target entity
 - Cardinality [...] (optional)
 - Alias name (optional)
 - ON condition representing the JOIN

Associations replace JOINS with simple path expressions

- Usage of aliases improves readability / model understanding
- Path expressions support
 - simplified consumption
 - easy refactoring of ON conditions

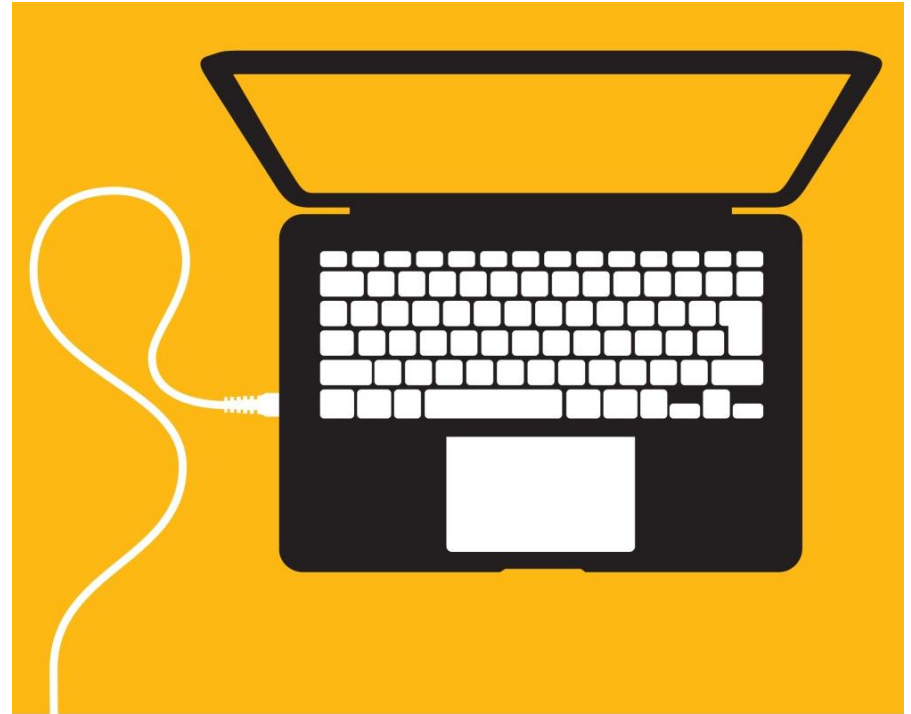


Core Data Services: Associations

Demo

CDS View with Associations

- CDS Association
 - Ad-Hoc Association
 - Exposed Association
- Consumption of an Association
 - Projection List
 - FROM Clause
 - Arithmetic Expressions
 - WHERE and HAVING Clauses
 - ...
- Path Expression
 - Filter Conditions



Core Data Services: Associations

Simple Association



Additional
Material

- Definition of associations within a CDS view
- Consumption of the association, for example in the projection list or in the WHERE clause
- Consumption of the association in an aggregation, the GROUP BY, and the HAVING clause

```
@AbapCatalog.sqlViewName: 'ZDDL_S_CDS_30'  
define view zcdsv_simple_assoc_examples as  
  select from snwd_so as so  
  association [1] to snwd_bpa as business_partners  
    on so.buyer_guid =  
    business_partners.node_key  
  association [0..1] to snwd_so_inv_head as  
    invoice_headers  
    on so.node_key = invoice_headers.so_guid  
  {  
    key so.so_id as order_id,  
    so.delivery_status,  
    invoice_headers.payment_status,  
    invoice_headers.currency_code,  
    sum( invoice_headers.gross_amount )  
    as total_gross_amount  
  }  
  where business_partners.company_name = 'SAP'  
  group by so.so_id,  
    so.delivery_status,  
    invoice_headers.payment_status,  
    invoice_headers.currency_code  
  having sum( invoice_headers.gross_amount ) > 3000
```




Ad Hoc Associations

- Association definition and usage in the same CDS view
- Association consumption constitutes a JOIN

Exposed Association

- Association definition, exposure of association, and exposure of fields used in the ON condition
- Consumption of association, for example in a view on the view
- Exposure does not automatically lead to a JOIN: “JOINS on demand”

```
@AbapCatalog.sqlViewName: 'ZDDL_S_CDS_31A'
define view zcdsv_assoc_types as
  select from snwd_so as so
  association [1] to snwd_bpa as business_partners
    on so.buyer_guid = $projection.buyer_guid
  association [0..1] to snwd_so_inv_head as
  invoice_headers
    on so.buyer_guid = invoice_headers.so_guid
  {
    key so.so_id as order_id,
    so.delivery_status,
    -- ad hoc association
    invoice_headers.payment_status,

    --exposed association
    -- field used in the ON condition
    so.buyer_guid,
    -- exposing association business_partners
    business_partners
  }
```



Filtered Association

- Base view: Definition of an association with a “to-n” cardinality
- Filter expression given in squared brackets
- Explicit cardinality of applied filter condition

```
@AbapCatalog.sqlViewName: 'ZDDL_S_CDS_32A'
define view zcdsv_filter_example_base as
  select from snwd_so_inv_head as invoice_header
  association[1..*] to snwd_so_inv_item as invoice_items
  on $projection.header_guid = invoice_items.parent_key
  {
    invoice_header.so_guid as order_guid,
    invoice_header.node_key as header_guid,
    invoice_items
  }
```

```
@AbapCatalog.sqlViewName: 'ZDDL_S_CDS_32B'
define view zcdsv_filter_example_vov as
  select from snwd_so as so
  association [1] to snwd_bpa as business_partners
  on so.buyer_guid = business_partners.node_key
  association [0..1] to zcdsv_filter_example_base as invoice_headers
  on so.node_key = invoice_headers.order_guid
  {
    key so.so_id as order_id,

    -- value 01 means customer
    business_partners[ bp_role = '01' ].company_name as customer_name,

    -- filter 1..n association on first position
    invoice_headers.invoice_items[1: inv_item_pos =
    '0000000010'].currency_code,
    invoice_headers.invoice_items[1: inv_item_pos =
    '0000000010'].gross_amount
  }
  where invoice_headers.header_guid is not null
```

Core Data Services: Associations

Advanced Example for Filtered Associations



Additional
Material

Filtered Association

- First view defines a normalized view on the EPM text table
- Second view defines an association between the product table and the text information encoded in the first view
- Third view consumes the association, filtering the language to the given input parameter value or a default value

```
@AbapCatalog.sqlViewName: 'ZDDL5_CDS_33A'  
define view zcdsv_adv_filter_example_base  
as select from snwd_texts  
{  
  parent_key as product_text_guid,  
  language,  
  text  
}
```

```
@AbapCatalog.sqlViewName: 'ZDDL5_CDS_33B'  
define view zcdsv_adv_filter_example_l1  
as select from snwd_pd as pd  
association [1..*] to zcdsv_adv_filter_example_base as texts  
on texts.product_text_guid = $projection.text_guid  
{  
  key pd.product_id,  
  pd.desc_guid as text_guid,  
  texts  
}
```

```
@AbapCatalog.sqlViewName: 'ZDDL5_CDS_33C'  
define view zcdsv_adv_filter_example_l2  
with parameters lang : abap.Lang  
as select from zcdsv_adv_filter_example_l1 as product  
{  
  $parameters.lang as langu_filter_param,  
  coalesce (  
    product.texts[1: language = $parameters.lang ].text,  
    product.texts[1: language = 'E' ].text  
  ) as product_description  
}
```

Core Data Services: Associations

Advantages of Associations

Why would you use associations?

- Easy model consumption
 - Path expressions
 - Filter expressions
- Small(er) re-use views
- “JOINS on demand”:
JOINS are only generated if the corresponding association is consumed



Core Data Services: Associations

What's Next?

Week 4 Unit 1

Native SAP HANA Usage in ABAP





Thank you

Contact information:

open@sap.com

open**SAP**

© 2014 SAP AG or an SAP affiliate company. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP AG or an SAP affiliate company.

SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP AG (or an SAP affiliate company) in Germany and other countries. Please see <http://global12.sap.com/corporate-en/legal/copyright/index.epx> for additional trademark information and notices.

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

National product specifications may vary.

These materials are provided by SAP AG or an SAP affiliate company for informational purposes only, without representation or warranty of any kind, and SAP AG or its affiliated companies shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP AG or SAP affiliate company products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

In particular, SAP AG or its affiliated companies have no obligation to pursue any course of business outlined in this document or any related presentation, or to develop or release any functionality mentioned therein. This document, or any related presentation, and SAP AG's or its affiliated companies' strategy and possible future developments, products, and/or platform directions and functionality are all subject to change and may be changed by SAP AG or its affiliated companies at any time for any reason without notice. The information in this document is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. All forward-looking statements are subject to various risks and uncertainties that could cause actual results to differ materially from expectations. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of their dates, and they should not be relied upon in making purchasing decisions.