

## How to work around problems when extending complex SAP Fiori apps in SAP S/4HANA

Andre Fischer, SAP December 09, 2021

**Public** 



#### **Agenda**

What is reference data source approach and what is redefinition?

The basic problem - Redefinition of Reference Data Source based OData services

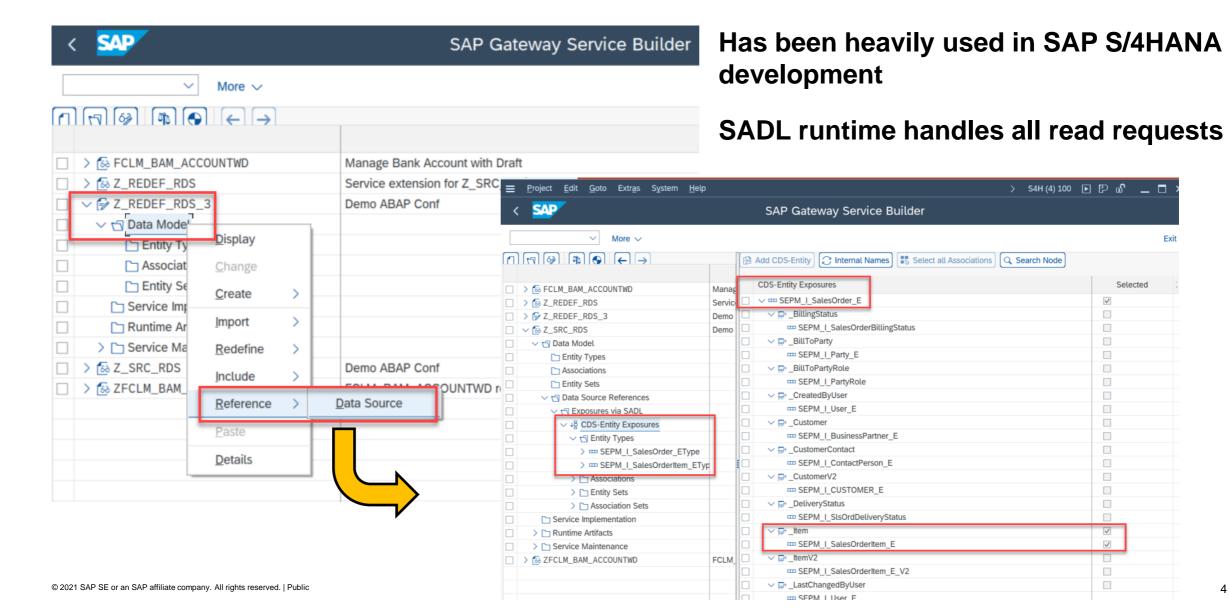
The workaround – Custom code in MPC\_EXT and DPC\_EXT

Tool support

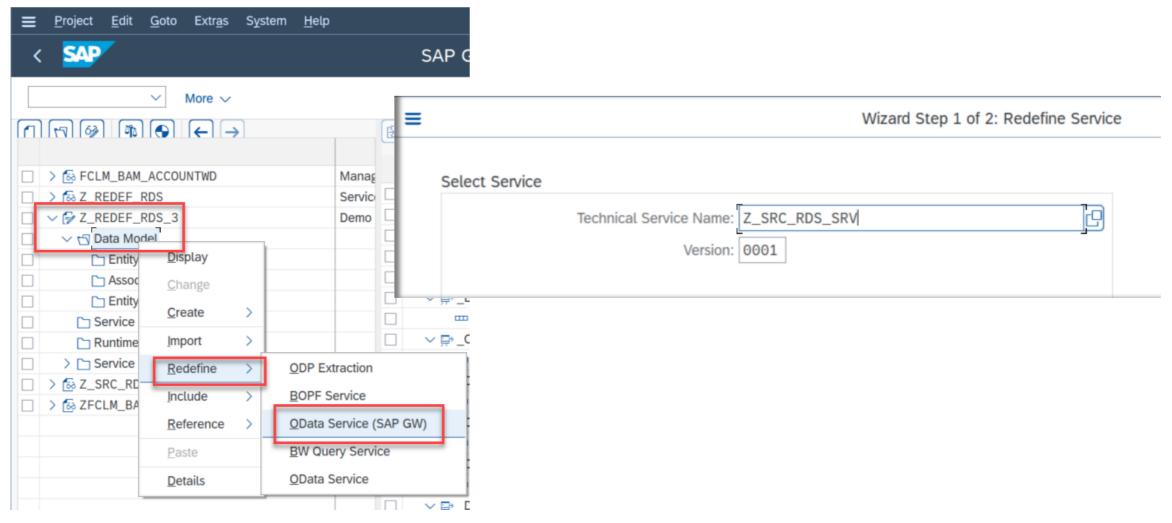
Known issues when redefining large OData services

# What is the reference data source approach and what is redefinition?

#### Redefinition



#### Redefinition



#### Redefinition – DPC

DPC inherits from DPC\_EXT of the source service

```
▶ G ZCL_Z_REDEF_RDS_DPC ▶
  1⊕ class ZCL_Z_REDEF_RDS_DPC definition
      _public
     inheriting from ZCL_Z_SRC_RDS_DPC_EXT
      abstract
      create public .
    public section.
    protected section.
    private section.
 10 ENDCLASS.
 11
13
14⊕ CLASS ZCL_Z_REDEF_RDS_DPC IMPLEMENTATION.
 15 ENDCLASS.
```

#### **Redefinition – MPC**

```
model->extend_model( iv_model_name = 'Z_SRC_RDS_MDL'
iv_model_version = '0001' ).
model->set_schema_namespace( 'Z_SRC_RDS_SRV' ).
```

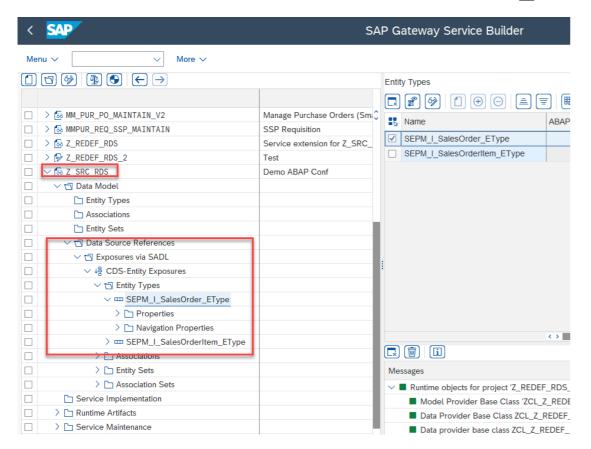
- MPC loads the model from the source service.
- No inheritance based on class inheritance

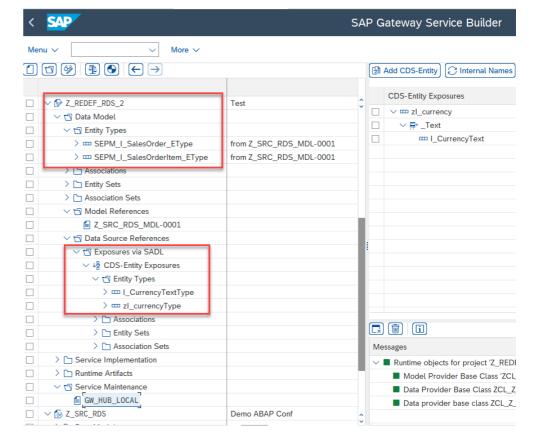
```
1200 CLASS ZCL Z REDEF RDS 2 MPC IMPLEMENTATION.
122
125 *&
126 *&
127 *& !!!NEVER MODIFY THIS CLASS. IN CASE YOU WANT TO CHANGE THE MODEL
131
132
133 data:
      lo entity type
                        type ref to /iwbep/if mgw odata entity typ, "#EC NEEDED
      lo complex type ref to /iwbep/if mgw odata cmplx type, "#EC NEEDED
                        type ref to /iwbep/if mgw odata property, "#EC NEEDED
      lo association type ref to /iwbep/if mgw odata assoc, "#EC NEEDED
      lo assoc set
                        type ref to /iwbep/if mgw odata assoc set, "#EC NEEDED
      lo_ref_constraint type ref to /iwbep/if_mgw_odata_ref_constr, "#EC NEEDED
      lo_nav_property type ref to /iwbep/if_mgw_odata_nav_prop, "#EC NEEDED
                        type ref to /iwbep/if mgw odata action, "#EC NEEDED
      lo parameter
                        type ref to /iwbep/if_mgw_odata_property, "#EC NEEDED
      lo_entity_set type ref to /iwbep/if_mgw_odata_entity_set, "#EC NEEDED
      lo_complex_prop type ref to /iwbep/if_mgw_odata_cmplx_prop. "#EC NEEDED
147 model->extend model( iv model name = 'Z SRC RDS MDL' iv model version = '0001' ). "#EC NOTEXT
149 model->set schema namespace( 'Z SRC RDS SRV' ).
```

### Basic Problem – Redefiniton of Reference Data Source (RDS) based Odata Services

#### Redefinition of RDS based Services ...

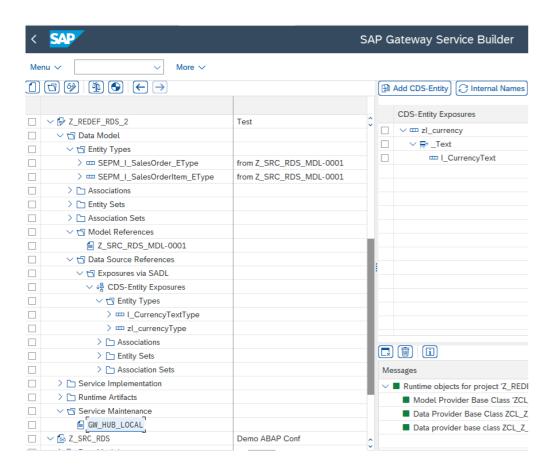
Redefine an RDS based project Z\_SRC\_RDS ... and add additional entities via RDS in Z\_REDEF\_RDS

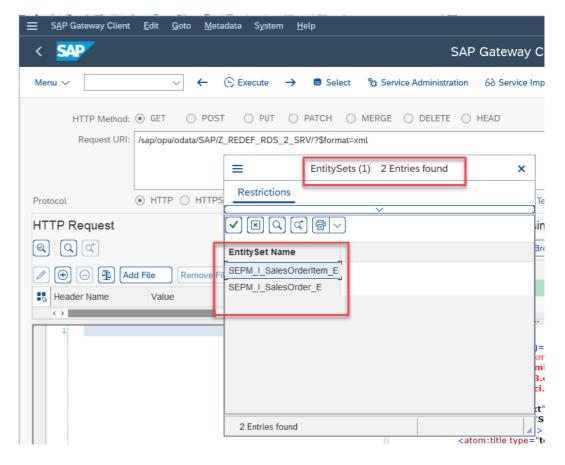




#### ... does not work out of the box

We still see only 2 entities from our source project

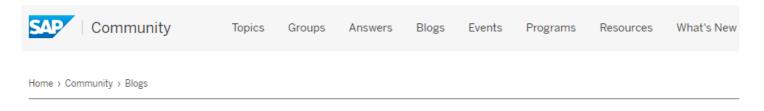




## The workaround – Custom code in MPC\_EXT and DPC\_EXT

#### How to overcome these technical restrictions ...

#### How to redefine RDS based OData services? | SAP Blogs

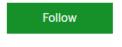


Technical Articles



#### How to redefine RDS based OData services?

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#### Introduction

Extenstions of OData Services that have been created using the Reference Data Source (RDS) approach do not work out of the box. When you try to add additional entities to the SEGW project that redefines an RDS based OData service these entities are not part of the \$metadata document.

This is quite unfortunate since most of the OData services hat have been delivered with SAP S/4HANA are based on RDS.

#### Step 1 – Add merged SADL xml file (MPC\_EXT)

```
▶ G ZCL Z REDEF RDS MPC EXT ▶
                                                                                   if_sadl_gw_model_exposure_data~get_model_exposure
 1⊖ CLASS ZCL_Z_REDEF_RDS_MPC_EXT DEFINITION
 2 PUBLIC
 3 INHERITING FROM ZCL_Z_REDEF_RDS_MPC
 4 CREATE PUBLIC .
                                                                                   contains merged SADL xml file
      PUBLIC SECTION.
       METHODS define REDEFINITION.
       METHODS if sadl gw model exposure data~get model exposure REDEFINITION.
     PROTECTED SECTION.
     PRIVATE SECTION.
10 ENDCLASS.
11@ CLASS ZCL Z REDEF RDS MPC EXT IMPLEMENTATION.
     METHOD define.
        super->define().
      ENDMETHOD.
14
      METHOD if sadl gw model exposure data~get model exposure.
        CONSTANTS: co gen timestamp TYPE timestamp VALUE '20211208180352'.
16
       DATA(lv sadl xml) =
17
18
                   <?xml version="1.0" encoding="utf-16"?>  &
19
                   <sadl:definition xmlns:sadl="http://sap.com/sap.nw.f.sadl" syntaxVersion="V2" > | &
                    <sadl:dataSource type="CDS" name="SEPM I SALESORDERITEM E" binding="SEPM I SALESORDERITEM E" />| &
20
                    <sadl:dataSource type="CDS" name="SEPM I SALESORDER E" binding="SEPM I SALESORDER E" />| &
21
                   <sadl:dataSource type="CDS" name="I CURRENCYTEXT" binding="I CURRENCYTEXT" /> &
22
23
                    <sadl:dataSource type="CDS" name="ZI CURRENCY" binding="ZI CURRENCY" />   &
24
                   <sadl:resultSet>| &
25
                   <sadl:structure name="SEPM I SalesOrderItem E" dataSource="SEPM I SALESORDERITEM E" maxEditMode="RO" exposure="TRUE" > | &
                    <sadl:query name="SADL_QUERY">| &
26
                    </sadl:guery>| . &
27
43
                  </sadl:resultSet>| &
44
                  </sadl:definition> .
45
        ro model exposure = cl sadl gw model exposure=>get exposure xml( iv uuid
                                                                                 = CONV #( 'Z SRC RDS' )
46
                                                                     iv timestamp = co gen timestamp
47
                                                                     iv sadl xml = lv sadl xml ).
48
      ENDMETHOD.
    ENDCLASS
```

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**METHOD** 

#### Step 2 – Add merged SADL xml file (DPC\_EXT)

```
METHOD if sadl gw dpc util~get dpc.
 CONSTANTS: co gen timestamp TYPE timestamp VALUE '20211208223150'
 DATA(lv sadl xml) =
          <?xml version="1 0" encoding="utf-16"?>  &
           <sadl:dataSource type="CDS" name="I CURRENC+</pre>
                                                      ling="I CURRENCYTEXT" /> &
            <sadl:dataSource type="CDS" name="ZI CURRENCY"</pre>
                                                               PENCY" /> &
           |<sadl:resultSet>| &
           <sadl:structure name="SEPM I SalesOrderItem E" dataSource="SEPM I</pre>
            <sad1:query name="SADL QUERY">  &
                                                                                         METHOD
            </sadl:querv> | &
           </sadl:structure> | &
           <sadl:structure name="SEPM I SalesOrder E" dataSource="SEPM I SALESORDER E" maxEditMode="RO'</p>
                                                                                         if sadl gw dpc util~get dpc
            <sad1:query name="SADL QUERY"> &
            </sadl:query> &
            <sadl:association name="TO ITEM" binding=" ITEM" target="SEPM I SalesOrderItem E" cardinalit</pre>
                                                                                         also contains merged SADL xml file
           </sadl:structure>| &
           <sadl:structure name="I CurrencyText" dataSource="I CURRENCYTEXT" maxEditMode="R0" exposure=</p>
            <sad1:query name="SADL QUERY">| &
            </sadl:querv>| &
           </sadl:structure>| &
           <sadl:structure name="zI currency" dataSource="ZI CURRENCY" maxEditMode="RO" exposure="TRUE" >  &
            <sadl:query name="SADL QUERY"> &
            </sadl:query> &
            <sadl:association name="TO TEXT" binding=" TEXT" target="I CurrencyText" cardinality="zeroToMany" />| &
           </sadl:structure>   &
           </sadl:resultSet>| &
          </sadl:definition> .
 ro dpc = cl sadl gw dpc factory=>create for sadl( iv sadl xml = lv sadl xml
                        = co gen timestamp
       iv timestamp
                        = 'MM PUR CNTRL CTR MAINTAIN'
       iv uuid
                        = me->mo context ).
       io context
ENDMETHOD.
```

#### Step 3 – Add entity specific methods (DPC\_EXT)

Create entity specific methods:

i\_currencytex\_get\_entity
i\_currencytex\_get\_entityset
zi\_currency\_get\_entity
zi\_currency\_get\_entityset

```
METHOD i currencytex get entity.
  if_sadl_gw_dpc_util~get_dpc( )->get_entity( EXPORTING io_tech_request_context = io_tech_request_context
                                              IMPORTING es data
                                                                                = er entity ).
ENDMETHOD.
METHOD i currencytex get entityset.
  if sadl gw dpc util~get dpc( )->get entityset( EXPORTING io tech request context = io tech request context
                                                 IMPORTING et data
                                                                                   = et entityset
                                                                                   = es response context ).
                                                           es response context
ENDMETHOD.
METHOD zi currency get entity.
  if sadl gw dpc util~get dpc( )->get entity( EXPORTING io tech request context = io tech request context
                                              IMPORTING es data
                                                                                = er entity ).
ENDMETHOD.
METHOD zi currency get entityset.
  if_sadl_gw_dpc_util~get_dpc( )->get_entityset( EXPORTING io_tech_request_context = io_tech_request_context
                                                 IMPORTING et data
                                                                                   = et entityset
                                                                                   = es response context ).
                                                           es response context
ENDMETHOD.
```

#### Step 4 – Add Generic \_GET\_ENTITY and \_GET\_ENTITYSET methods (DPC\_EXT)

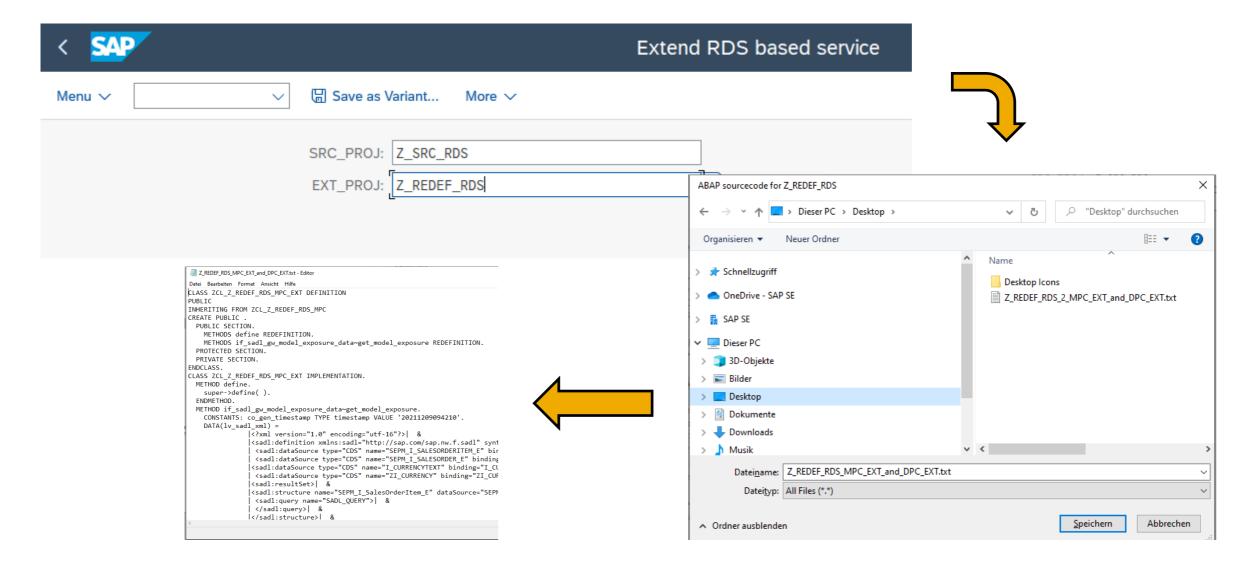
```
CASE statements:
NETHOD /iwbep/if mgw appl srv runtime~get entityset.
DATA(my entity name) = io tech request context->get entity set name(
CASE io tech request context->get entity set name( ).
  WHEN 'I CurrencyText'.
     i currencytex get entityset( EXPORTING io tech request context = io tech request context
                                                                        = DATA(i currencytex_entit
                                   IMPORTING et entityset
                                     es response context
                                                             = es response context ).
    IF i currencytex entityset IS NOT INITIAL.
      copy data to ref( EXPORTING is data = i currencytex entityset
                       CHANGING cr data = er entityset ).
   WHEN 'zI currency'.
    zi currency get entityset( EXPORTING io tech request context = io tech request context
                                   IMPORTING et entityset
                                                                        = DATA(zi currency entityset
                                      es response context
                                                             = es response context ).
    IF zi currency entityset IS NOT INITIAL.
      copy data to ref( EXPORTING is data = zi currency entityset
                       CHANGING cr data = er entityset ).
   WHEN OTHERS.
    super->/iwbep/if mgw appl runtime~get entityset (EXPORTING iv entity name
                                                                                            = iv entity name
                                                                                       = iv entity set name
                                                              iv entity set name
                                                              iv source name
                                                                                       = iv source name
                                                              it filter select options = it filter select options
                                                              it order
                                                                                       = it order
                                                              is paging
                                                                                       = is paging
                                                              it key tab
                                                                                       = it key tab
                                                              it navigation path
                                                                                       = it navigation path
                                                              iv filter string
                                                                                       = iv filter string
                                                              iv search string
                                                                                       = iv search string
                                                              io tech request context = io tech request context
                                                    IMPORTING er_entityset
                                                                                       = er entityset
                                                              es response context
                                                                                       = es response context ).
ENDCASE
```

**ENDMETHOD** 

CASE io\_tech\_request\_context->get\_entity\_set\_name( ).
 WHEN 'I\_CurrencyText'.
 ...
 WHEN 'zI\_currency'.
 ...
 WHEN OTHERS.

### **Tool support**

#### Report - zaf\_r\_extend\_rds\_based\_service



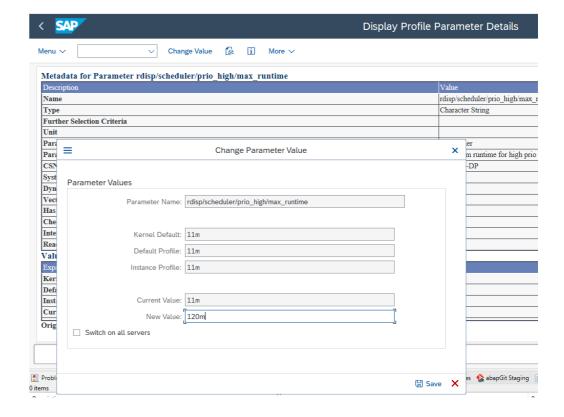
#### **Generated source code**

```
Z_REDEF_RDS_MPC_EXT_and_DPC_EXT.txt - Editor
Datei Bearbeiten Format Ansicht Hilfe
CLASS ZCL_Z_REDEF_RDS_MPC_EXT DEFINITION
INHERITING FROM ZCL_Z_REDEF_RDS_MPC
CREATE PUBLIC .
 PUBLIC SECTION.
   METHODS define REDEFINITION.
   METHODS if_sadl_gw_model_exposure_data~get_model_exposure REDEFINITION.
 PROTECTED SECTION.
 PRIVATE SECTION.
ENDCLASS.
CLASS ZCL_Z_REDEF_RDS_MPC_EXT IMPLEMENTATION.
 METHOD define.
   super->define( ).
 ENDMETHOD.
 METHOD if_sadl_gw_model_exposure_data~get_model_exposure.
   CONSTANTS: co_gen_timestamp TYPE timestamp VALUE '20211209094210'.
   DATA(lv_sadl_xml) =
              <?xml version="1.0" encoding="utf-16"?>| &
              <sadl:definition xmlns:sadl="http://sap.com/sap.nw.f.sadl" syntaxVersion="V2" >| &
               <sadl:dataSource type="CDS" name="SEPM_I_SALESORDERITEM_E" binding="SEPM_I_SALESORDERITEM_E" />| &
               <sadl:dataSource type="CDS" name="SEPM I SALESORDER E" binding="SEPM I SALESORDER E" /> &
              <sadl:dataSource type="CDS" name="I CURRENCYTEXT" binding="I CURRENCYTEXT" /> &
            . </sau_._uery>, &
               <sadl:association name="TO_TEXT" binding="_TEXT" target="I_CurrencyText" cardinality="zeroToMany" /> | &
              </sadl:structure>| &
              </sadl:resultSet>| &
              </sadl:definition>| .
   ro_model_exposure = cl_sadl_gw_model_exposure=>get_exposure_xml( iv_uuid = CONV #( 'Z_SRC_RDS' )
                                                              iv timestamp = co gen timestamp
                                                              iv sadl xml = lv sadl xml ).
 ENDMETHOD.
ENDCLASS.
* DPC EXT Code goes here *
CLASS ZCL_Z_REDEF_RDS_DPC_EXT DEFINITION
 INHERITING FROM ZCL Z REDEF RDS DPC
CREATE PUBLIC .
PUBLIC SECTION.
   METHODS if_sadl_gw_dpc_util~get_dpc REDEFINITION .
 METHODS /iwbep/if_mgw_appl_srv_runtime~get_entityset REDEFINITION .
 METHODS /iwbep/if_mgw_appl_srv_runtime~get_entity REDEFINITION .
 PROTECTED SECTION.
 METHODS I CurrencyTex get entity
     IMPORTING
       !io_tech_request_context TYPE REF TO /iwbep/if_mgw_req_entity OPTIONAL
                              TYPE ZCL Z REDEF RDS MPC=>TS    "use code completion to select correct type from MPC .
       !er entity
       !es_response_context TYPE /iwbep/if_mgw_appl_srv_runtime=>ty_s_mgw_response_entity_cntxt
     RAISING
```

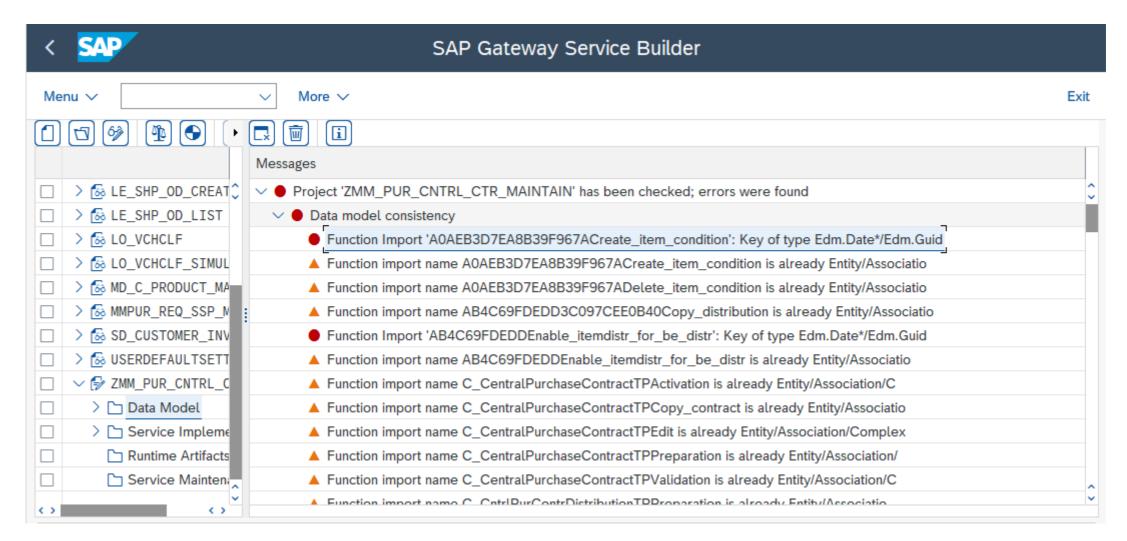
## Known issues when redefining large OData services in SAP S/4HANA

#### **Time-out problems**

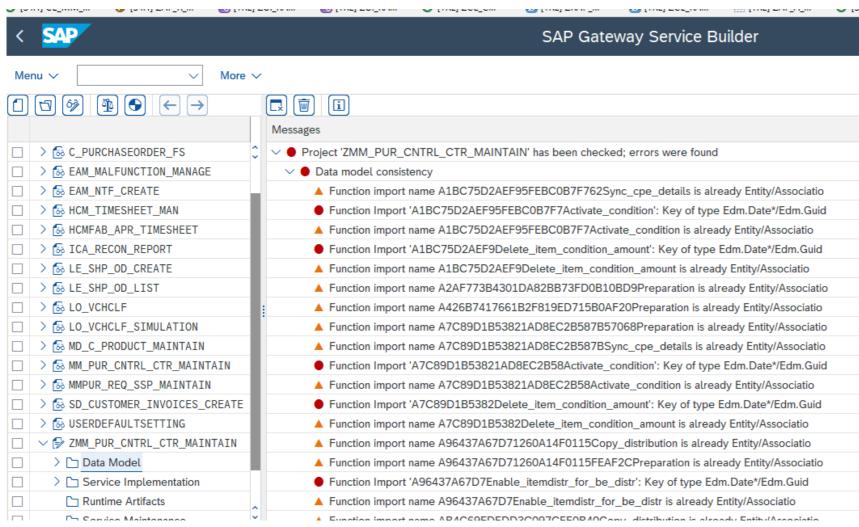
- Actions in SEGW can take very long when redefining large SAP owned SEGW projects
- Workaround:
   Adapt profile parameter
   rdisp/scheduler/prio\_high/max\_runtime
- Profile parameter can be changed online using transaction RZ11
- 2918906 Deprecation of Profile Parameter
   "rdisp/max\_wprun\_time" SAP ONE Support
   Launchpad



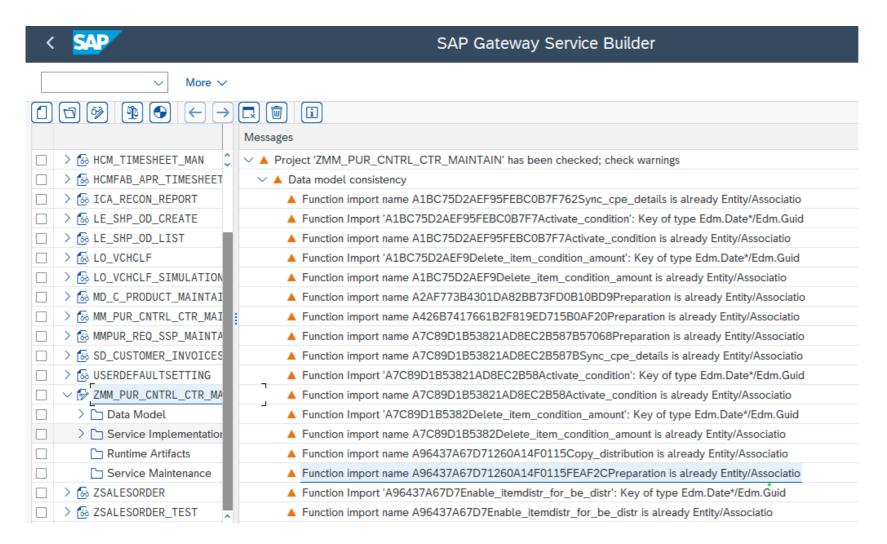
## 2853065 - SEGW Tool update - Association & Referential Constraints (Example - MM\_PUR\_CNTRL\_CTR\_MAINTAIN)



## 3115221 - SEGW Tool - Covert Error Messages to Warnings during check (Example - MM\_PUR\_CNTRL\_CTR\_MAINTAIN)



#### Result - MM\_PUR\_CNTRL\_CTR\_MAINTAIN can be redefined



#### Known issues when redefinining complex OData services

<u>2853065 - SEGW Tool update - Association & Referential Constraints - SAP ONE Support Launchpad</u>

3115221 - SEGW Tool - Covert Error Messages to Warnings during check - SAP ONE Support Launchpad

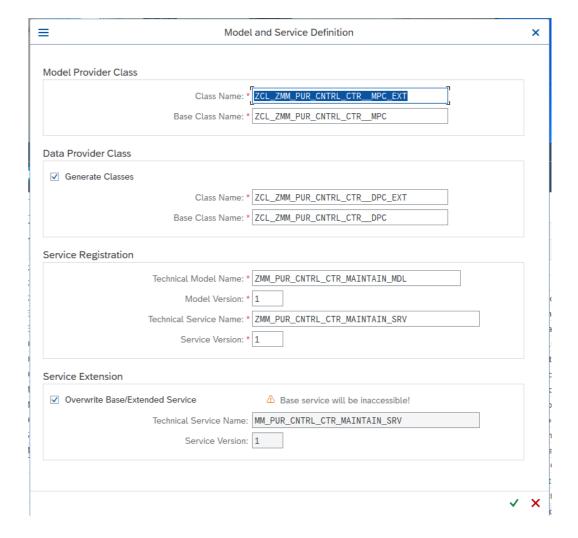
3099856 - ValueList annotation for value helps from view extensions not loaded in segw

#### **Overwrite Base / Existing Service**

 When using the apps locally deployed in SAP S/4HANA:

Check "Overwrite Base / Existing Service"

 Result - App in S/4 will call the redefined service instead of the original one



## Thank you.

Contact information:

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