

SAP How-to Guide
Business Analytics

How to SELECT in SAP BW transformations

Applicable Releases:

SAP BW 7.0* and later releases

Version 1.0

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The Best-Run Businesses Run SAP™

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Document History

Document Version	Description
1.10	Second Review
1.00	First draft of this guide
2.00	Official Release



Typographic Conventions

Type Style	Description
<i>Example Text</i>	Words or characters quoted from the screen. These include field names, screen titles, pushbuttons labels, menu names, menu paths, and menu options. Cross-references to other documentation
Example text	Emphasized words or phrases in body text, graphic titles, and table titles
Example text	File and directory names and their paths, messages, names of variables and parameters, source text, and names of installation, upgrade and database tools.
Example text	User entry texts. These are words or characters that you enter in the system exactly as they appear in the documentation.
<Example text>	Variable user entry. Angle brackets indicate that you replace these words and characters with appropriate entries to make entries in the system.
EXAMPLE TEXT	Keys on the keyboard, for example, F2 or ENTER.

Icons





Icon	Description
	Caution
	Note or Important
	Example
	Recommendation or Tip



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1. Business Scenario

For complex data staging scenarios within SAP BW it is usually necessary to manipulate data, this can be done at several points during loading:

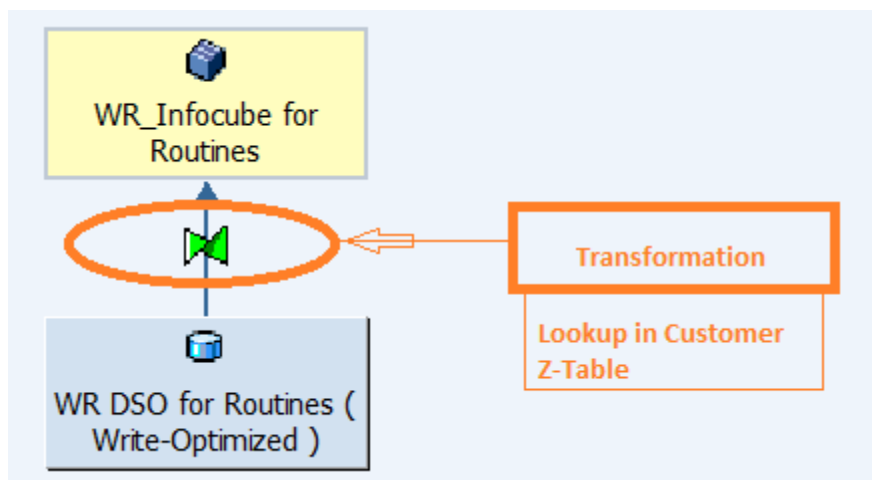
- Start routine
- Expert routine
- End routine

The following scenario is about manipulation and transformation of data during staging through the data warehouse. Scenario:

- (1) You need to do a lookup on custom Z-table and populate a field in this case ZCOUNTRY in the data target (InfoCube) within transformation from DataStore Object to InfoCube.

In order to accomplish the above task it has been determined to use End Routine for the Enhancement. As best practice it is well known and recommendable to use internal tables rather than SELECT SINGLE statement in performance point of view. As mentioned on SAP NetWeaver BW powered by SAP HANA this best practices remains valid, therefore the data selection via the internal table will be showed.

For demonstration purposes data will be loaded from a DataStore Object to an InfoCube. In the transformation for field OSOLD_TO a lookup for country in the customer Z-Table will be done.



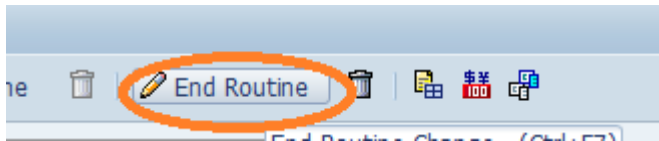
This transformation will be enhanced via end routines by performing the following actions:

- (1) Get the country from Z-Table for each OSOLD_TO and populate field ZCOUNTRY in the Data Target (InfoCube)

A SAP BW system powered by HANA at current state doesn't change much on the ABAP Application Layer, a lot of well-known performance optimizations in this area are remaining valid. Therefore the present How to guide shows an efficient way to use SELECT statements in transformation in SAP NetWeaver BW powered by SAP HANA as well as with SAP BW on other databases.

2. Step by Step Solution

- (1) Create Transformation from DataStore Object to InfoCube.
- (2) Create End Routine as follows.



Add Global Declaration. Refer to appendix for the ABAP Code.

```

DATA: BEGIN OF I_S_CUSTOMER,
  /BIC/S_CUSTOMER TYPE ZCUSTLOC-/BIC/S_CUSTOMER,
  /BIC/S_COUNTRY TYPE ZCUSTLOC-/BIC/S_COUNTRY,
END OF I_S_CUSTOMER.
DATA: i_t_customer like HASHED table of I_S_CUSTOMER with unique key
  /BIC/S_CUSTOMER.

DATA: S_COUNTRY TYPE ZCUSTLOC-/BIC/S_COUNTRY.
***$ end of 2nd part global - insert your code only before this line *

==== Segments ====
FIELD-SYMBOLS:
  <RESULT_FIELDS> TYPE ty_s_TG_1.

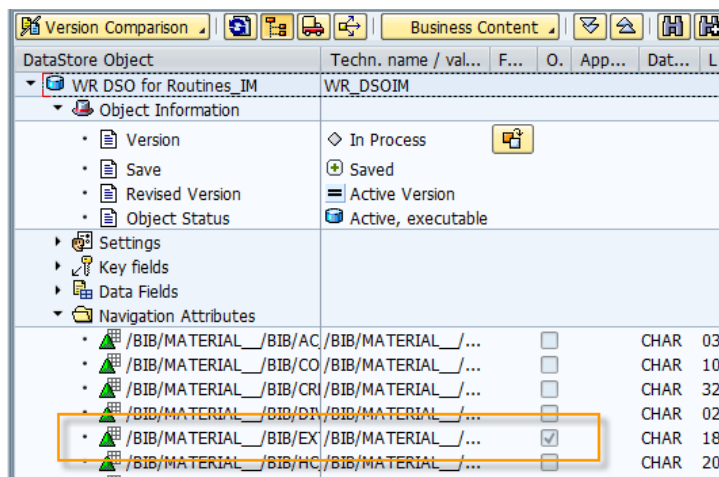
DATA:
  MONITOR_REC TYPE rstmonitor.

| *****
| ** read master data in local table once from custom z table
| *****
|   select /BIC/S_CUSTOMER /BIC/S_COUNTRY from zcustloc
|     into corresponding fields of table i_t_customer.
|   if sy-subrc = 4.
|     RAISE EXCEPTION TYPE CX_RSROUT_ABORT.
|   endif.
|   sort i_t_customer by /BIC/S_CUSTOMER.
|
|   loop at RESULT_PACKAGE ASSIGNING <RESULT_FIELDS>.
|
| *Uncomment / Comment lines 318 - 322 to test with select * and read from
| *internal table
|   read table i_t_customer into I_S_CUSTOMER with key
|     /BIC/S_CUSTOMER = <RESULT_FIELDS>-/BIC/S_SOLD_TO.
|   if sy-subrc eq 0.
|     <RESULT_FIELDS>-/BIC/S_COUNTRY = I_S_CUSTOMER-/BIC/S_COUNTRY.
|   endif.
| *
| * Uncomment / Comment lines 326 - 330 to test with select single table
| *   select single /B49/S_COUNTRY into S_COUNTRY from zcustloc
| *     where /B49/S_CUSTOMER = <RESULT_FIELDS>-/B49/S_SOLD_TO.
| *   if sy-subrc eq 0.
| *     <RESULT_FIELDS>-/B49/S_COUNTRY = S_COUNTRY.
| *   endif.
|   endloop.
  
```

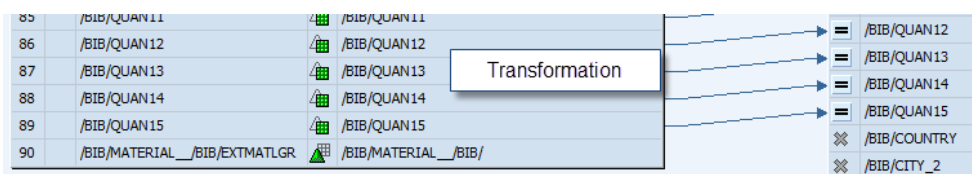
How to SELECT in SAP BW transformations

Remarks on the shown example:

- If it is useful to read a table according to our example ZCUSTLOC in the end routine is depending on the amount of records. Considering tables, in our example ZCUSTLOC, with a lot of entries it is recommendable to read only the relevant Data Packages and to buffer this table (usage of FOR ALL ENTRIES IN <result_package>). See also “Note 1662726 - Optimizing select with FOR ALL ENTRIES in SAP HANA database”
- In scenarios where a lookup of data of BW InfoObjects is executed it is recommendable to use the standard rule type “reading master data” because this is already optimized for data selects without the need to use ABAP coding. This is also possible for Navigation Attributes and DataStore objects since BW 7.30 (see below).
- The mentioned best practices are also valid for scenarios where 3.x data flow logic is used as well as for new HANA optimized objects like shown.
- New standard look-up features with SAP BW 7.30:
Beside the possibility to do master data look up via a routine or rule (reading master data) it is also possible to switch on the navigation attribute in the source object to make this attribute visible as a source field in the transformation. Hence it is available as field for staging, which makes it not necessary to read to master data separately:



Afterwards the navigation attribute become available in the transformation and can be used:



- There is also a new “look-up” feature available for look ups in DataStore Object.
- These standard functionalities are fully optimized, easy to use and therefore highly recommended to use.

3. Conclusions / Recommendations

There is significant improvement in End Routine Processing times when using “Read Table” rather than “Select Single” with-in Loop Statement. Select Single should be avoided with in a loop where-ever possible.

Valid for SAP NetWeaver BW powered by SAP HANA:

- (1) Due to the architecture of SAP HANA database recommendation and best practices of good ABAP coding are valid and still important.
- (2) During different loading cycles it has been observed that larger DTP - Data Package size of 100,000 - 150,000 records showed a significant performance gain than smaller DataPackages.
- (3) Secondary indexes on customer Z-Tables might not be required, as data is already stored in column store with in HANA. DataStore Object Secondary indexes aren't required on SAP HANA anymore. However for some use cases secondary indexes can still be beneficial. This is especially true for highly selective queries on non-primary key fields. These queries can be significantly improved by indexes on single fields which are most selective. (Note 1740373 - DSO: Maintenance of database indexes in SAP HANA.)

All best practices of the following SAP Notes should be considered for SAP HANA as well:

- Note 1227667 - Guidelines for expert routine: Design rules
- Note 1258089 - Design rule: Adding records to the start routine
- Note 1223532 - Design rules: Adding records to end routine

4. Appendix

```
DATA: BEGIN OF I_S_CUSTOMER,  
/BIC/S_CUSTOMER TYPE ZCUSTLOC-/BIC/S_CUSTOMER,  
/BIC/S_COUNTRY TYPE ZCUSTLOC-/BIC/S_COUNTRY,  
END OF I_S_CUSTOMER.  
DATA: i_t_customer like HASHED table of I_S_CUSTOMER with unique key  
/BIC/S_CUSTOMER.  
  
select /BIC/S_CUSTOMER /BIC/S_COUNTRY from zcustloc  
into corresponding fields of table i_t_customer.  
if sy-subrc = 4.  
    RAISE EXCEPTION TYPE CX_RSROUT_ABORT.  
endif.  
sort i_t_customer by /BIC/S_CUSTOMER.  
  
loop at RESULT_PACKAGE ASSIGNING <RESULT_FIELDS>.  
    read table i_t_customer into I_S_CUSTOMER with key  
        /BIC/S_CUSTOMER = <RESULT_FIELDS>-/BIC/S_SOLD_TO.  
        if sy-subrc eq 0.  
            <RESULT_FIELDS>-/BIC/S_COUNTRY = I_S_CUSTOMER-  
/BIC/S_COUNTRY.  
        endif.  
endloop.
```



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