CUSTOMER HIERARCHY ROW BASED AUTHORIZATION for REPORT USERS

SAP BW hierarchy specifies a parent-child relationship which contains numerous nodes and leaves. A node can be assigned as top-level node. There can be only one top level node, which is also called as root. A hierarchy level consists of all nodes at the same level. Hierarchies in SAP BW have the following properties:

- They are created for characteristics that comprise master data. For instance, Material (0MATERIAL) and Division (0DIVISION) are characteristics that can have hierarchies.
- They are stored in master data tables.
- You can define many hierarchies on a single characteristic.
- A hierarchy can have up to 98 levels and not more than that.
- Hierarchies can be sourced from SAP ERP system or from flat files.

SAP BW Hierarchies are primarily used for 2 purposes:

- The first purpose is to have a tree display in a presentation hierarchy.
- The second purpose is in the variable selection, where users get an option to select the characteristic values as hierarchy nodes.

Make sure that you create hierarchies only for those characteristics that do not reference other characteristics.

About Scenario :

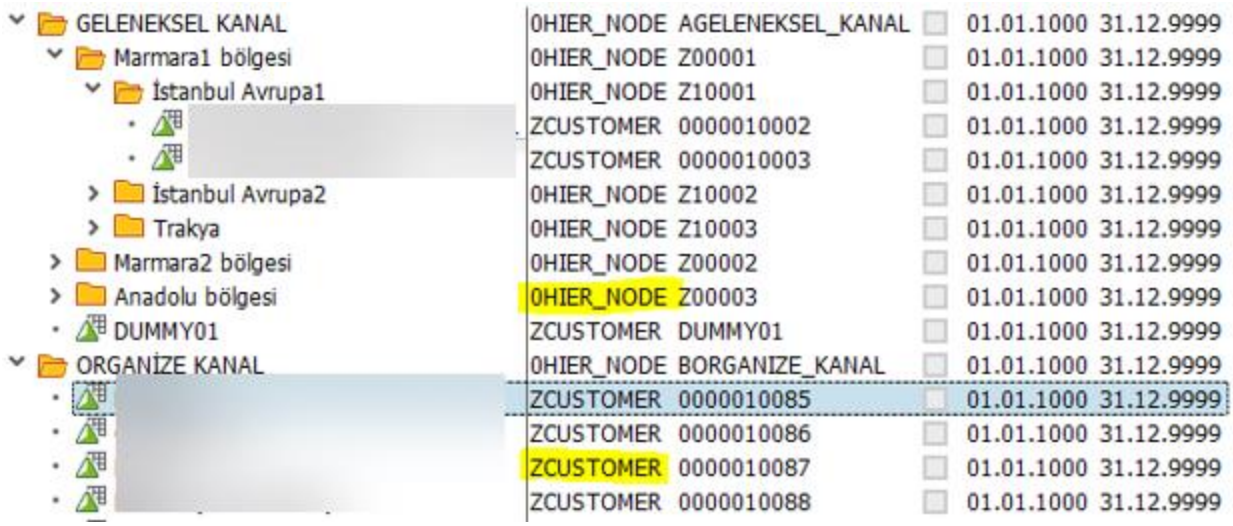
In this real scenario, i try to explain BW any version (BW 3.X to BW/4HANA) customer hierarchy row based authorization for report users.

For this scenario we have two users, Sales Area Manager A and Sales Area Manager B.

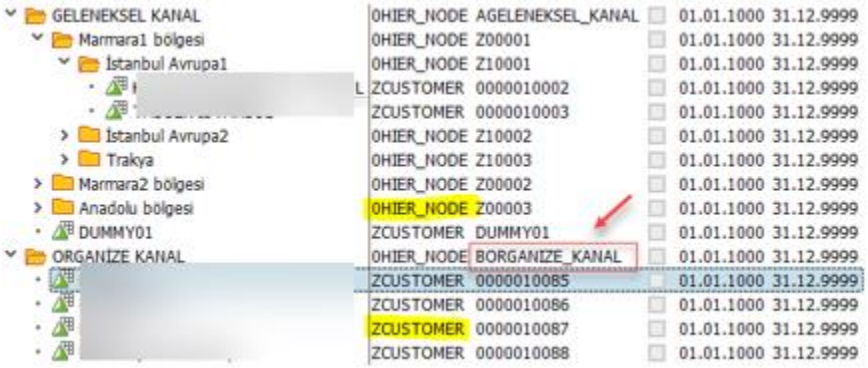
When sales area manager want to see the budget reports values, he can only be able to view the customer hierarchy row values within his authorization without seeing any hierarchy selection screen.

Customer hierarchy (ZCUSTOMER) BW transaction: RSH1 hierarchy screenshot,

As seen sample screenshot, hierarchy values consist of sales area main nodes. Other folders area sub sales area folders. And in deepest levels are customer numbers.



For example, Sales Area Manager A is only authorized for red rectangle node folder (BORGANIZE_KANAL).



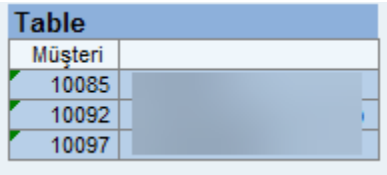
Sales Area Manager A can only see the report hierarchy rows as seen below screenshot.

Table	
Müşteri	
BORGANIZE_KANAL	
10085	
10086	
10087	
10088	

For this example we have another reporting user, Sales Area Manager B.

Sales Area Manager B is only authorized for Customer numbers 0000010085, 0000010092, 0000010097 hierarchy rows.

Sales Area Manager B can only see the report hierarchy rows as seen below screenshot.

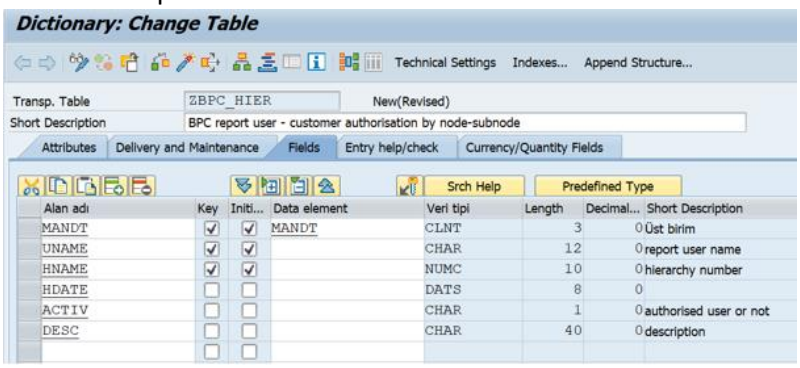


Table

Müşteri
10085
10092
10097

Solution steps :

1) In BW on HANA system, I first create a Z custom table in SE11 transaction to enter values of report user name and hierarchy node and leaf values.
UNAME: Sales area manager user name
HNAME: Hierarchy
ACTIV: User Sales Area Manager still have authorization to see the report values or not, Any report user can be blocked from seeing any or all of the hierarchy rows
DESC: BEX report name


Dictionary: Change Table

Technical Settings | Indexes... | Append Structure...

Transp. Table: ZBPC_HIER — New(Revised)
Short Description: BPC report user - customer authorisation by node-subnode

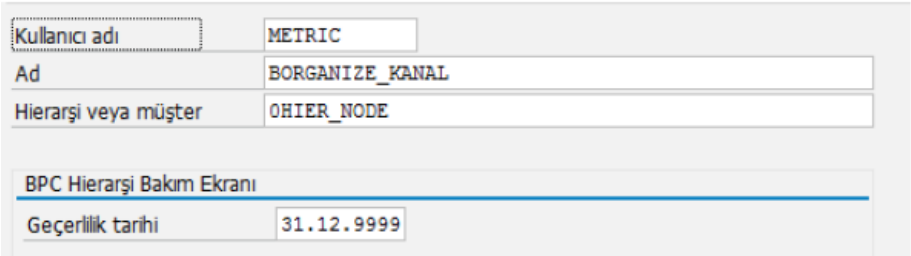
Attributes | Delivery and Maintenance | Fields | Entry help/check | Currency/Quantity Fields

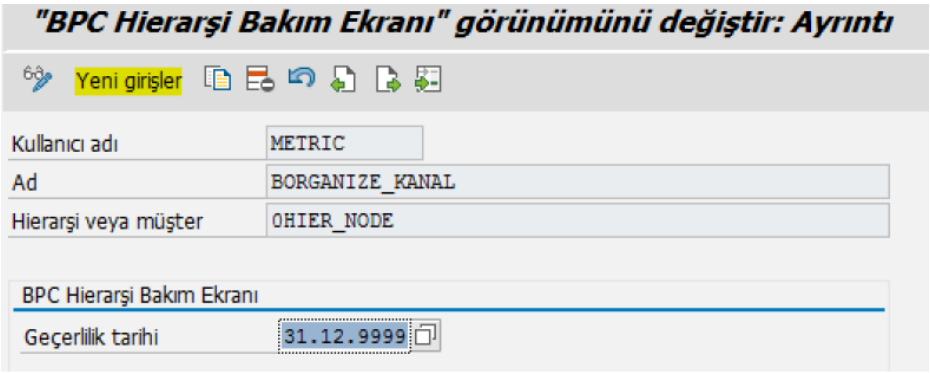
Srch Help | Predefined Type

Alan adı	Key	Initi...	Data element	Veri tipi	Length	Decimal...	Short Description
MANDT	☑	☑	MANDT	CLNT	3	0	Üst birim
UNAME	☑	☑		CHAR	12	0	report user name
HNAME	☑	☑		NUMC	10	0	hierarchy number
HDATE	☐	☐		DATS	8	0	
ACTIV	☐	☐		CHAR	1	0	authorised user or not
DESC	☐	☐		CHAR	40	0	description
	☐	☐					

2) After creating Z table, I bind it to custom transaction ZBPC_H_AUTH01 . Reporting System Admin can enter, edit, or deactivate the Sales Area Managers authorization and areas via ZBPC_H_AUTH01.
The authorization to utilize this transaction can be given by the SAP Basis team.

ZBPC_H_AUTH01 manual maintenance screenshot,





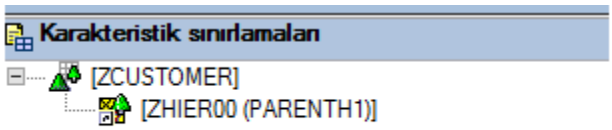
ZBPC_HIER table screenshot,

MANDT	UNAME	HNAME	HDATE
900	METRIC	BORGANIZE_KANAL	

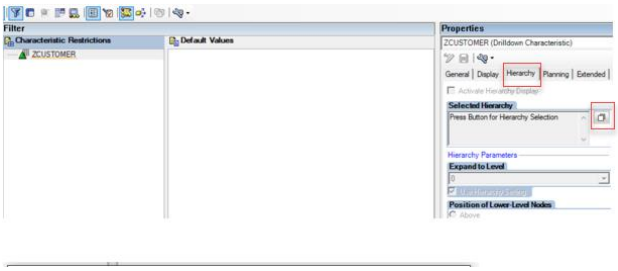
- If there is high amount of reporting users and authorizations rows, all data can be uploaded via Abap Excel upload program to Z custom table.

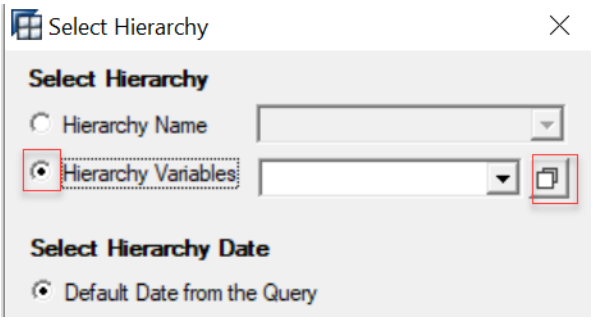
3) I create BEX report (technical name: ZBPC_BUDGET_Q001) with hierarchy variable.

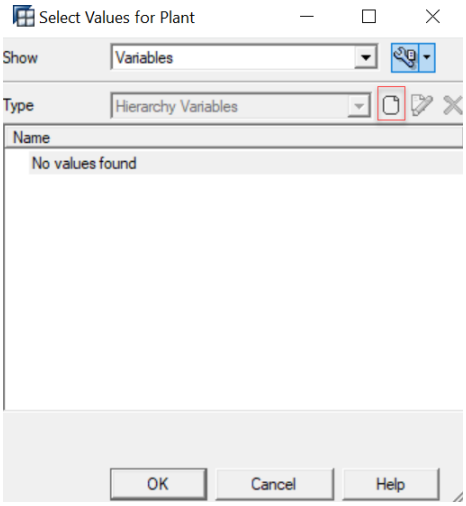
ZHIER00 hierarchy variable on ZCUSTOMER hierarchy,



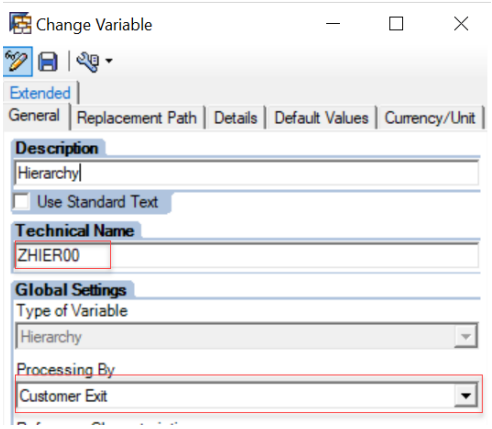
BEX: ZBPC_BUDGET_Q001



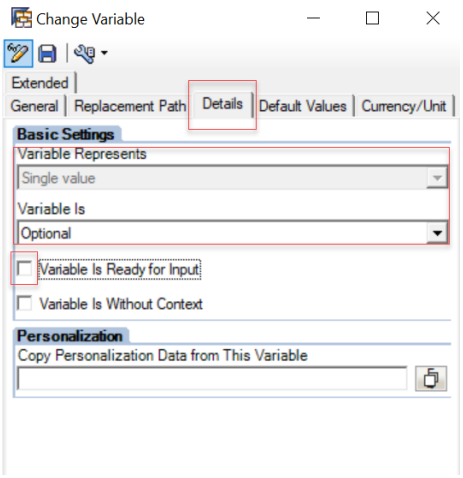




Hierarchy variable technical name: ZHIER00
Hierarchy processing by: Customer Exit

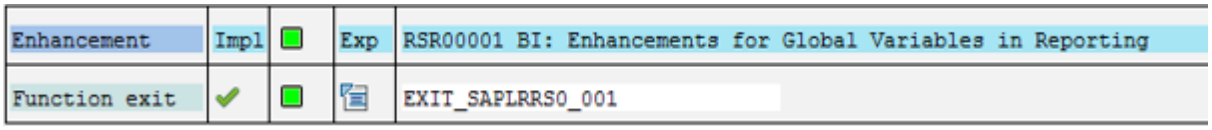


Uncheck 'variable is ready for input' in 'Details' tab.



4) I created Z tables and hierarchy customer exit variable in previous steps.

Now, I create abap coding to fetch the Z table values to hierarchy customer exit variable ZHIER00.

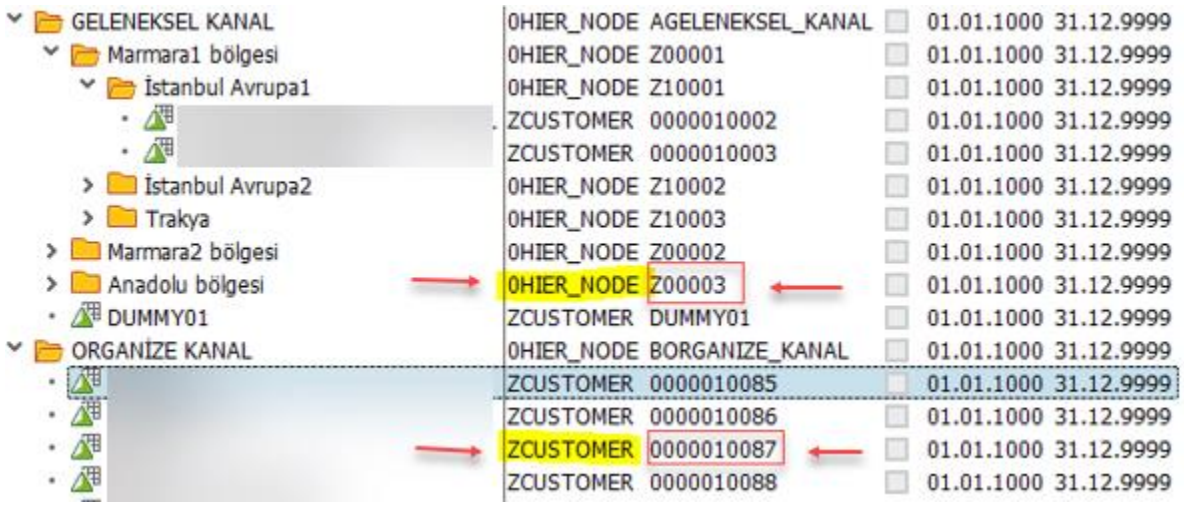


```
case i_vnam.

  when 'ZHIER00'.

    if i_step = 2.

      select *
        from zbpc hier
        into table t_hier
       where uname = sy-uname
         and activ = 'X'
         and desc = 'ZBPC_BUDGET_Q001'." BEX report technical name


      loop at t_hier into s_hier.

        l_string_in = s_hier-hname.

        call function 'NUMERIC_CHECK'
          exporting
            string in  = l_string_in
          importing
            string out = l string_out
            htype      = htype.

        if htype = 'CHAR'.
          l_s_range-low = s_hier-hname.
          l s range-
high = '0HIER NODE'. " if hier  value CHAR type, then assign 0HIER_NODE
          l s range-sign = 'I'.
          l_s_range-option = 'EQ'.
        elseif htype  = 'NUMC'.
          l s range-low = s_hier-hname.
          l s range-
high = 'ZCUSTOMER'. " if hier value NUMC type, then assign ZCUSTOMER
          l s range-sign = 'I'.
          l s range-option = 'EQ'.
        endif.


        clear:l_string_in,l_string_out, htype.

      endloop.

    endif.
```

In code given above, to fill the range-high value, there is an algorithm.

If hierarchy row value is NUMC then assign ZCUSTOMER to high value.

Else if hierarchy row value is CHAR then assign 0HIER_NODE to high value.



To summarize, each Sales Manager can only see their area data via hidden backend filtering.

No prompt selection screen for ZHIER00 hierarchy variable.

Additional note:
This table can be utilized for different BEX reports.
For above example, budget report (technical name: ZBPC_BUDGET_Q001).
This table also can be utilized for different reports, such as revenue reports. (for example ZBPC_REV_Q001).

Same coding can be added to CMOD for different BEX reports (newly created revenue report: ZBPC_REV_Q001) with different variable name (ZHIER01)

To utilize ZBPC_HIER table for different BEX hierarchy authorizations, DEST field in table ZBPC_HIER must be changed to KEY field.

Abap coding for newly created revenue report ZBPC_REV_Q001 in transaction CMOD,

```
when 'ZHIER01'.

    if i_step = 2.

      select *
        from zbpc_hier
        into table t_hier
       where uname = sy-uname
         and activ = 'X'
         and desc = 'ZBPC_REV_Q001'." BEX report technical name
```

```
      loop at t_hier into s_hier.

        l_string_in = s_hier-hname.

        call function 'NUMERIC_CHECK'
          exporting
            string_in  = l_string_in
          importing
            string out = l string_out
            htype      = htype.

        if htype = 'CHAR'.
          l s range-low = s_hier-hname.
          l s range-
high = '0HIER_NODE'. " if hier  value CHAR type, then assign 0HIER_NODE
          l s range-sign = 'I'.
          l s range-option = 'EQ'.
        elseif htype  = 'NUMC'.
          l s range-low = s_hier-hname.
          l s range-
high = 'ZCUSTOMER'. " if hier value NUMC type, then assign ZCUSTOMER
          l_s_range-sign = 'I'.
          l s range-option = 'EQ'.
        endif.


        clear:l_string_in,l_string_out, htype.

      endloop.

    endif.
```

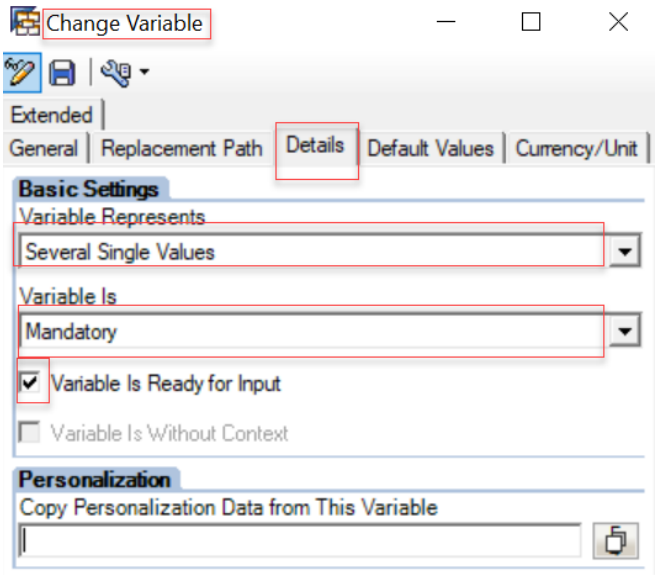
This solution is flexible in many ways.

On any BW or BPC hierarchy infoobject, different row level privileges can be easily granted in different reports for any reporting user.

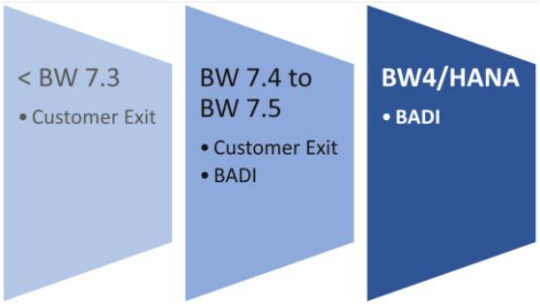
This solution can be implemented for any BW version (starting from 3.X to BW4/HANA) in a reports infoobjects authorization such as (0COMP_CODE, 0PLANT, 0MATERIAL, 0COSTCENTER, 0SALESORG, 0SALES_DIST, 0SALES_GRP, 0SALES_OFF, 0DISTR_CHAN etc) and BPC reports infoobjects.

By adding a selection screen to this solution method, it is possible for the report user to receive reports by selecting only the regions where he is authorized to receive reports. This can be done via changing BEX variable 'details' tab parameters. To do this,

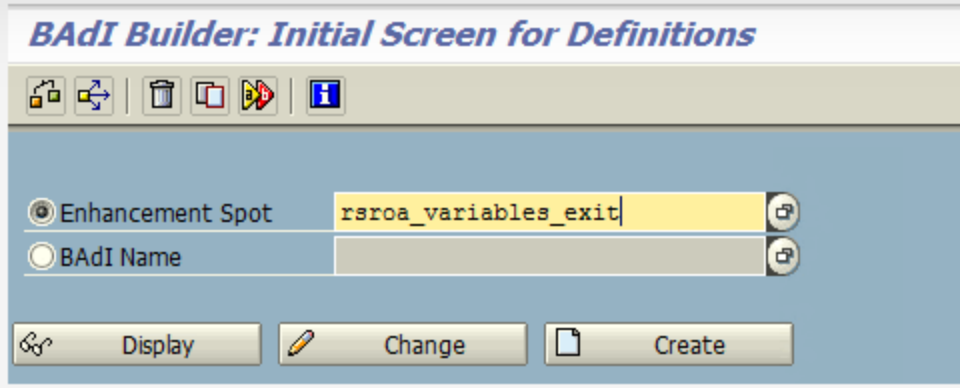
'Details' tab → 'Several single values' → variable is 'mandatory' → checkbox 'variable is ready for input'



Above abap codings can be applied for BW4/HANA via transaction SE18 and select enhancement spot RSROA_VARIABLES_EXIT.



BW4/HANA t.code: SE18 and select enhancement spot RSROA_VARIABLES_EXIT screenshot,



That’s all steps.

Thank you.

Cihan Ekin