Calculating Property Tax with BRF+

Applies to:

Tax and Revenue Management/ Property Tax. For more information, visit the Business Rules Management homepage.

Summary

With Enhancement Package 5 Tax and Revenue Management has integrated BRF+ into form based returns and registration processing. Property Tax (using RE-FX Land Use Management) is still only integrated with BRF. This cookbook describes all the necessary steps to use BRFplus for Property Tax Calculation instead of using BRF. The advantages of using BRF+ over BRF are mainly:

- BRF+ has more features than BRF and will be developed
- Consistent Rules Basis between Property and Form-based Taxes
- BRF+ is significantly faster than BRF.

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Author Bio

Frank Godeby has worked at SAP since August 1994. He joined the IBU Public Sector and worked in Development, Business development and Field Support and started his current position as Solution Manager for Tax and Revenue Management in 2008.

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Introduction

The solution described in this paper basically replaces the major call into BRF with a call into BRF+. It does not replace the BRF configuration content e.g. tax rates. Instead it assumes complete set up of the calculation in BRFplus. Once you have implemented the BRFplus integration, you will not use the property tax configuration for tax calculation e.g. tax rates anymore.
The coding provided in this paper is for exemplarity purposes only.

Differences between the BRF and BRF+ Integration

The major difference between the BRF and BRFplus property tax integration is the amount of calls. While the BRFplus application/function is called once per contract, BRF is called for each parcel, time slice and condition. This requires the setup of rules in BRFplus which loop across the tables IT_PARCEL, IT_COND and IT_YEAR if the same results are to be achieved. However, as this is modeled in BRFplus, the sequence of which loop is done first, second or third is flexible. In fact you might not even need to loop across the IT_COND table at all in order to improve performance, since the IT_YEAR table holds the condition type name as well.

The BRFplus integration does not consider 2 customizing views (V_PT_TAX_COND, V_PT_TAX_RATE) anymore. In case tax rate tables are required, decision tables created in BRFplus are to be used.

Potential conditions are to be linked to a condition group which again is linked to a contract type.

While BRF calculates all values of a contract from start date to the calculation end date, the new integration allows to define a recalculation start date. From that date onwards, time slices are to be calculated. Previous time slices before the recalculation start date are read from the contract and are not changed anymore.

BRF accumulated conditions results (IT_CALC_VALUE) into one line if possible. The BRFplus integration provides a condition calc value for each time slice. No aggregation takes place.

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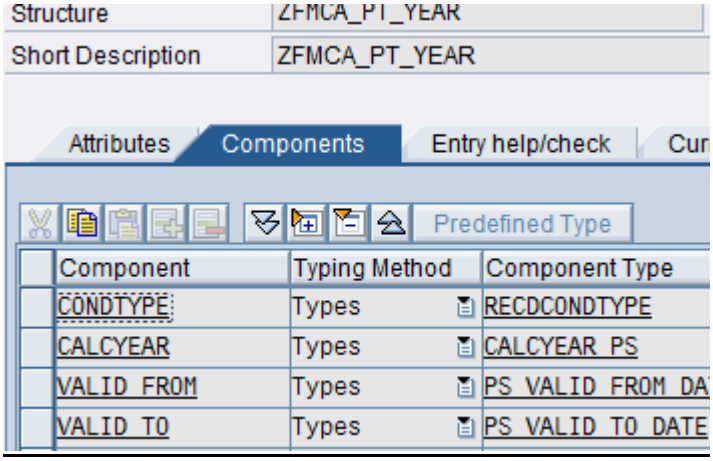
One-Time Implementation Steps

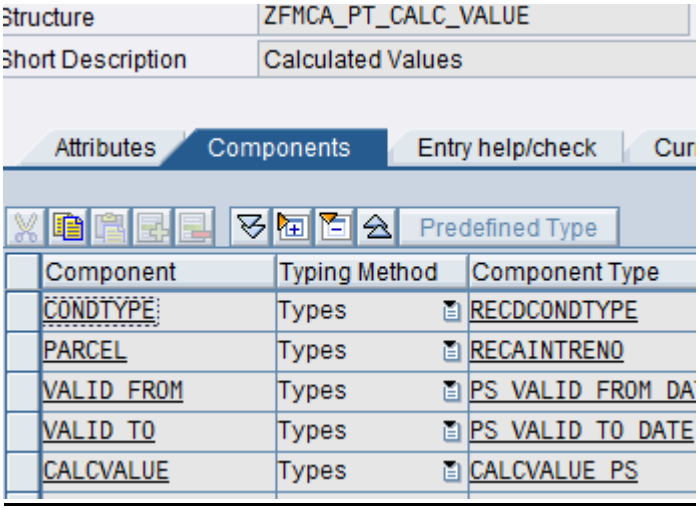
Create a package e.g. with the name ZTRM_PT. All objects can be included into this package. Create the following objects:

1) Structure Types

ZFMCA_PT_YEAR



ZFMCA_PT_CALC_VALUE



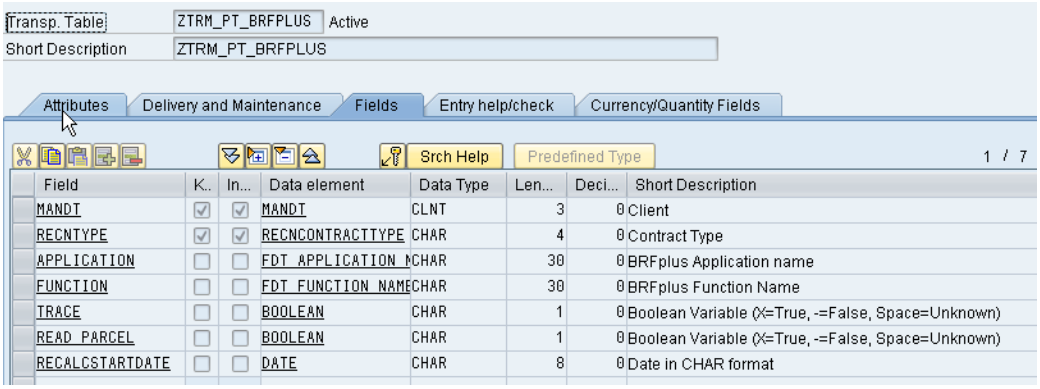
2) Table Types

ZFMCA_PT_T_YEAR with line type ZFMCA_PT_YEAR

ZFMCA_PT_T_CALC_VALUE with line type ZFMCA_PT_CALC_VALUE

3) Tables

ZTRM_PT_BRFPLUS



Field	K..	In...	Data element	Data Type	Len...	Deci...	Short Description
MANDT	☑	☑	MANDT	CLNT	3	0	Client
RECNTYPE	☑	☑	RECNCONTRACTTYPE	CHAR	4	0	Contract Type
APPLICATION	☐	☐	FDT_APPLICATION_N	CHAR	30	0	BRFplus Application name
FUNCTION	☐	☐	FDT_FUNCTION_NAME	CHAR	30	0	BRFplus Function Name
TRACE	☐	☐	BOOLEAN	CHAR	1	0	Boolean Variable (X=True, -=False, Space=Unknown)
READ_PARCEL	☐	☐	BOOLEAN	CHAR	1	0	Boolean Variable (X=True, -=False, Space=Unknown)
RECALCSTARTDATE	☐	☐	DATE	CHAR	8	0	Date in CHAR format

Delivery Class: C = Customizing
Display/Maintenance Allowed

Technical Settings:

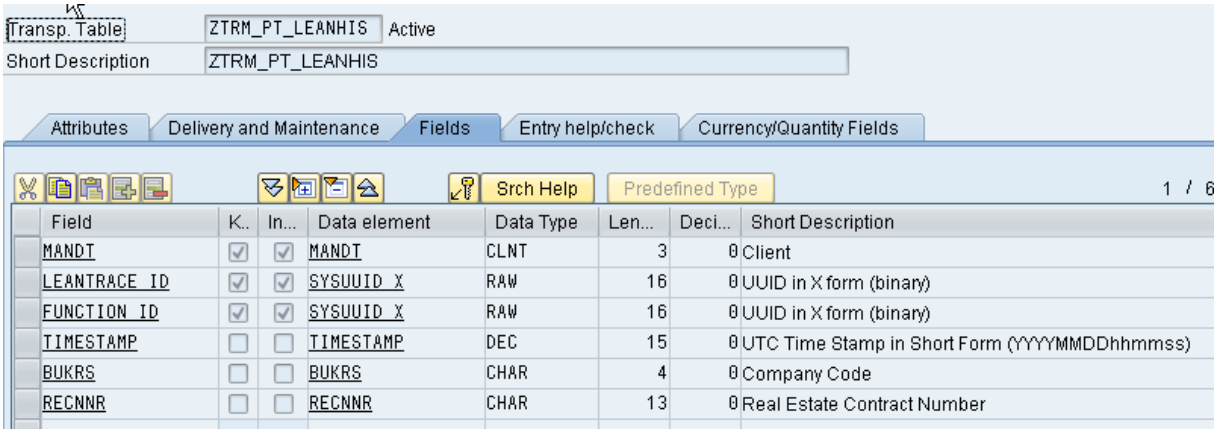
Data Class: APPL0
Size Category: 0
Fully Buffered

Enter the application name and function name you want to use for a given contract type.

If you want that a trace is created set the trace to „X“.
If your calculation requires parcel information, set the READ_PARCEL to “X”.

If you want to avoid recalculations for periods which should no longer be calculated, set a recalculation start date (YYYYMMDD). From this start date onwards a recalculation will be done. E.g. if a contract starts in 2000 and you are in 2008, cash-flow range is set to two years, setting the date to 20080101 will only recalculate the values for the years 2008-2010.

ZTRM_PT_LEANHIS



Field	K..	In...	Data element	Data Type	Len...	Deci...	Short Description
MANDT	☑	☑	MANDT	CLNT	3	0	Client
LEANTRACE_ID	☑	☑	SYSUUID_X	RAW	16	0	UUID in X form (binary)
FUNCTION_ID	☑	☑	SYSUUID_X	RAW	16	0	UUID in X form (binary)
TIMESTAMP	☐	☐	TIMESTAMP	DEC	15	0	UTC Time Stamp in Short Form (YYYYMMDDhhmmss)
BUKRS	☐	☐	BUKRS	CHAR	4	0	Company Code
RECNNR	☐	☐	RECNNR	CHAR	13	0	Real Estate Contract Number

Delivery Class: A = Application
Display/Maintenance Allowed with Restrictions

Technical Settings:

Data Class: APPL0
Size Category: 1
No Buffering Allowed

This table stores all the created traces per contract number.

4) Classes (see below for method coding)

ZCL_FMCA_PT_CALC (superclass: CL_FMCA_PT_CALC)

Redefined Methods:

- CONDITION_VALUE
- CLEAR_ATTRIBUTES
- CALCULATES_VALUES

New Methods:

- CALCULATE_AMOUNT_BRFPLUS
- GET_RHYTHM_START_BRFPLUS
- SET_YEAR_VALUES_BRFPLUS

New Attributes:

- GV_BRFPLUS_EXECUTED
- GT_CALC_VALUE_BRFPLUS (not in FD3)
- GS_CONTRACT_BRFPLUS (not in FD3)

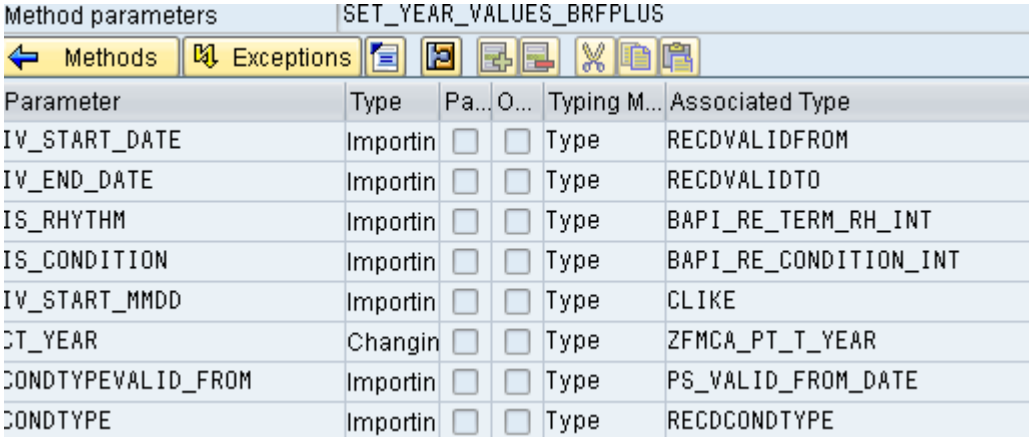
Parameter | Exception

Method	Level	Visibility	Method type	Description
CALCULATES_VALUES	Instance Met	Protected		Tax amount calculation
CLEAR_ATTRIBUTES	Instance Met	Public		Clear global attributes
CONDITION_VALUE	Instance Met	Public		tax amount of a condition
CALCULATE_AMOUNT_BRFPLUS	Instance Met	Public		CALCULATE_AMOUNT_BRFPLU
SET_YEAR_VALUES_BRFPLUS	Instance Met	Protected		SET_YEAR_VALUES_BRFPLUS
GET_RHYTHM_START_BRFPLUS	Instance Met	Protected		

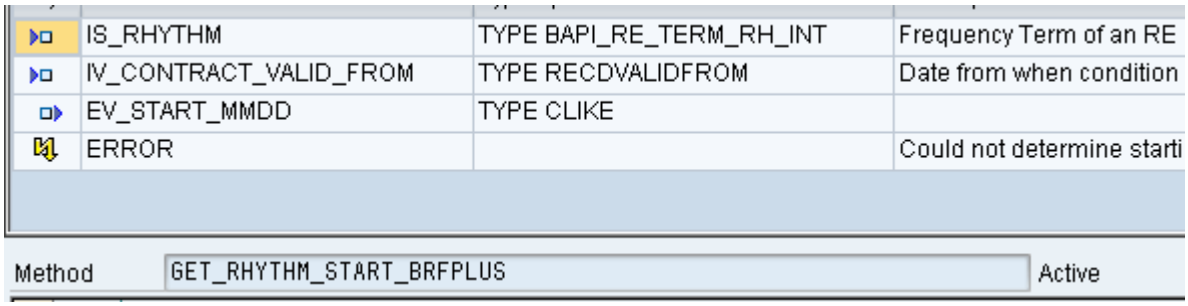
Method parameters CALCULATE_AMOUNT_BRFPLUS

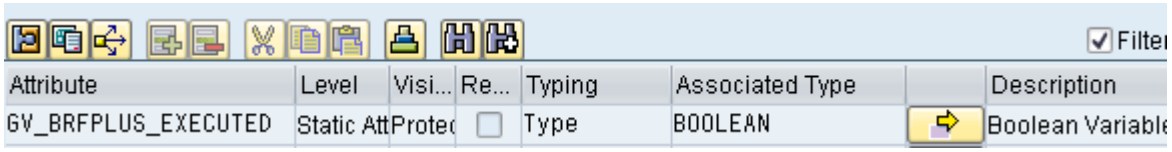
Methods | Exceptions

Parameter	Type	Pa...	O...	Typing M...	Associated Type
IT_YEAR	Importin	☐	☐	Type	ZFMCA_PT_T_YEAR
IT_COND	Importin	☐	☐	Type	RE_T_CONDITION_REL_GROUP
IV_OBJNR	Importin	☐	☐	Type	RECDOBJNRCALC
IO_OBJECT	Importin	☐	☐	Type Ref	OBJECT
IO_MSGLIST	Importin	☐	☐	Type Ref	IF_RECA_MESSAGE_LIST
IT_MAIN_PARTNER	Importin	☐	☐	Type	BAPI_RE_T_PARTNER_INT
IT_OBJECT_REL	Importin	☐	☐	Type	BAPI_RE_T_OBJECT_REL_INT
LS_CONTRACT	Importin	☐	☐	Type	BAPI_RE_CONTRACT_INT
IT_COND_CALC_OLD	Importin	☐	☐	Type	BAPI_RE_T_COND_CALC_INT
BRFPLUS_FUNCTION_ID	Importin	☐	☐	Type	IF_FDT_TYPES=>ID
IS_ZTRM_PT_BRFPLUS	Importin	☐	☐	Type	ZTRM_PT_BRFPLUS
CT_CALC_VALUE	Changin	☐	☐	Type	ZFMCA_PT_T_CALC_VALUE
CT_CALC_USED_OBJECTS	Changin	☐	☐	Type	RE_T_OBJNR



Get_Rhythm_start_brfplus needs an exception parameter as well.





ZCL_FMCA_PT_CALC_RULE (superclass: CL_FMCA_PT_CALC_RULE)

Redefined Methods:

- IF_EX_RECD_CALC_RULE~GET_ATTRIBUTES
- IF_EX_RECD_CALC_RULE~GET_VALUES

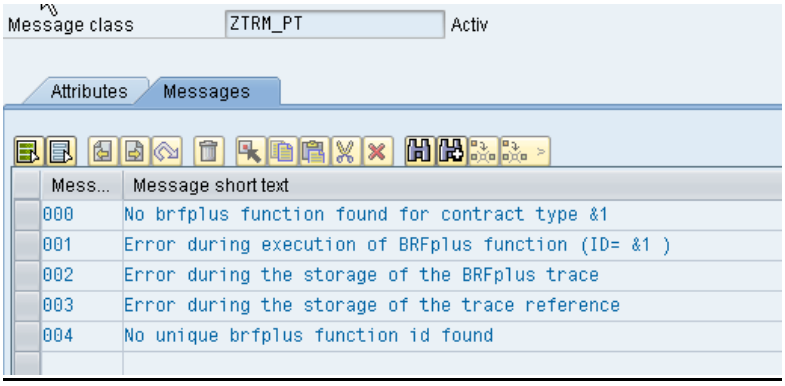
ZCL_FMCA_PT_RECN_CONTRACT (superclass: CL_FMCA_PT_RECN_CONTRACT)

Redefined Methods:

- IF_EX_RECN_CONTRACT~SUBSTITUTE

- UPDATE_CONDITIONS

5) Message class



Mess...	Message short text
000	No brfplus function found for contract type &1
001	Error during execution of BRFplus function (ID= &1)
002	Error during the storage of the BRFplus trace
003	Error during the storage of the trace reference
004	No unique brfplus function id found

6) Program (see below for coding)

ZTRM_PT_DISPLAY_TRACE

This program allows displaying any created traces for a real estate contract. The Entry Parameter to start this program are Company Code and RE-FX Contract. The next screen shows a list of every persisted trace:

Contract ID	Company Code	Date/Time
2000000000001	0001	20,100,817,085,149
2000000000001	0001	20,100,817,085,209
2000000000001	0001	20,100,818,033,249
2000000000001	0001	20,100,818,033,636
2000000000001	0001	20,100,818,033,701
2000000000001	0001	20,100,818,034,241
2000000000001	0001	20,100,818,034,622
2000000000001	0001	20,100,818,034,944
2000000000001	0001	20,100,818,041,243
2000000000001	0001	20,100,818,051,627
2000000000001	0001	20,100,818,075,957
2000000000001	0001	20,100,818,080,149
2000000000001	0001	20,100,818,081,155
2000000000001	0001	20,100,818,125,212
2000000000001	0001	20,100,907,021,945
2000000000001	0001	20,100,907,022,024
2000000000001	0001	20,100,907,022,413
2000000000001	0001	20,100,907,030,211
2000000000001	0001	20,100,907,030,217
2000000000001	0001	20,100,907,030,314
2000000000001	0001	20,100,907,030,410
2000000000001	0001	20,100,907,030,410
2000000000001	0001	20,100,907,030,410

Double-click to show the result of the trace:

7) BadI

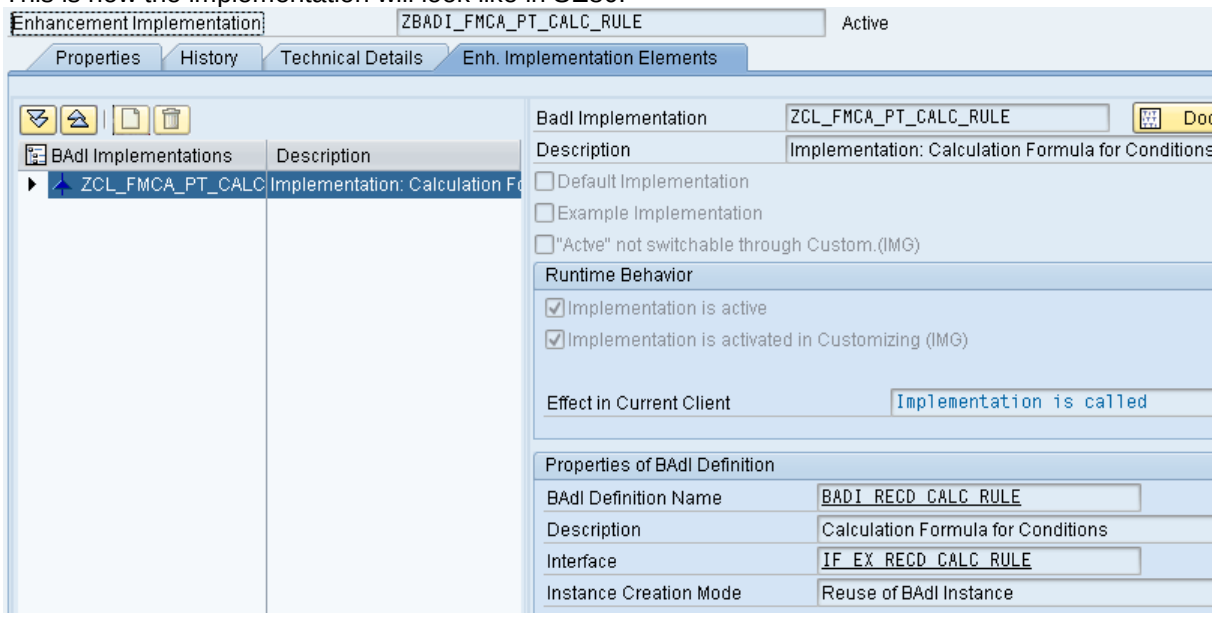
Create a new BADI implementation based on ZCL_FMCA_PT_CALC_RULE . Deactivate CL_FMCA_PT_CALC_RULE. The creation of the BADI should be done via IMG. It is a 2 step process. First use the create button to create a new BADI pointing to the class created before; and secondly the deactivaton of the existing implementation.

(IMG -> Flexible Real Estate Management (RE-FX) -> Conditions and Flows -> Calculation and Distribution Formulas -> Implement Enhancements (BAdI) -> Calculation Formula for Conditions)

Implementations for BAdI Definition BADI_RECD_CALC_RULE

Actve(IMG)	Actve(Impl.)	Enhancement Implementation	BAdI Implementation
☐	☑	BADI_FMCA_PT_CALC_RULE	BADI_FMCA_PT_CALC_RULE
☑	☑	BADI_RE_XC_CD_NL_CALC_SUBS	REXC_CD_NL_CALC_SUBS
☑	☑	BADI_RE_XC_MM_OT	REXC_MM_OT
☑	☑	BADI_RE_XC_MM_OTOP	REXC_MM_OTOP
☑	☑	ZBADI_FMCA_PT_CALC_RULE	ZCL_FMCA_PT_CALC_RULE

This is how the implementation will look like in SE80:



Create a new BADI implementation based on ZCL_FMCA_PT_RECN_CONTRACT. Deactivate CL_FMCA_PT_RECN_CONTRACT. The creation of the BADI should be done via IMG. It is a 2 step process. First use the create button to create a new BADI pointing to the class created before; and secondly the deactivaton of the existing implementation.

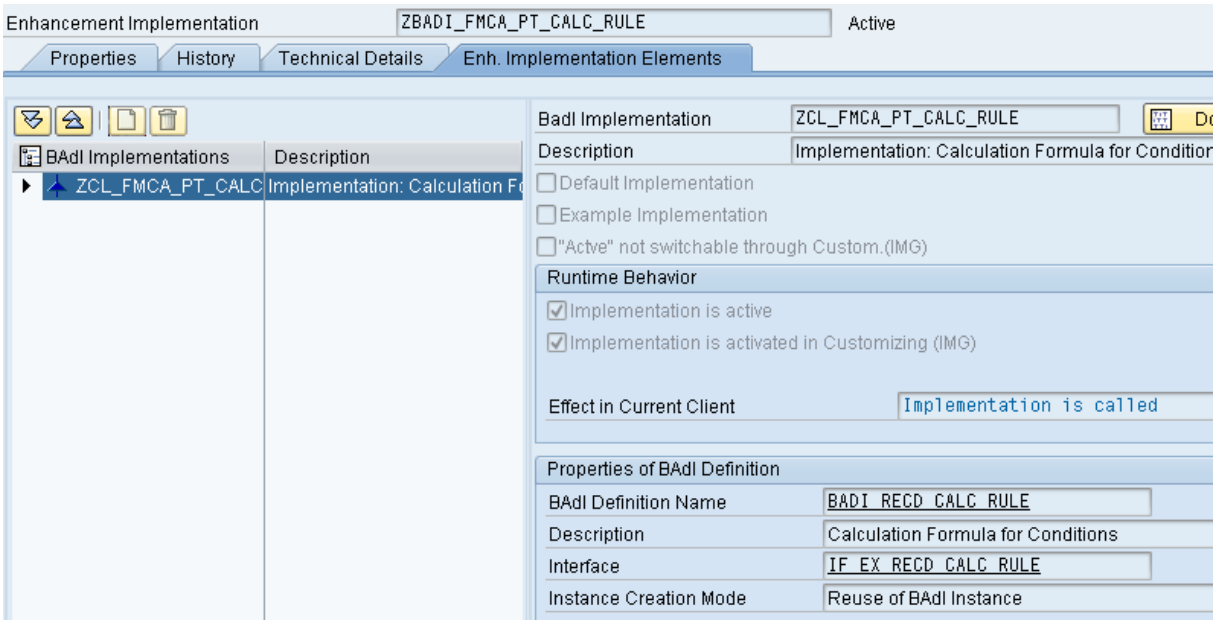
(IMG -> Flexible Real Estate Management (RE-FX) -> Contract -> Implement Enhancements (BAdI) -> Number Assignment, Validation, Substitution)

BAdI Implementations

Implementations for BAdI Definition BADI_RECN_CONTRACT

Actve(IMG)	Actve(Impl.)	Enhancement Implementation	BAdI Implementation	Description
☐	☑	BADI_FMCA_PT_RECN_CONTRACT	BADI_FMCA_PT_RECN_CONTRACT	Real Estate Contract : Property Ta
☑	☑	BADI_RE_XC_PT_CN_ST	BADI_RE_XC_PT_CN_ST	Implementation: Real Estate Contrac
☑	☑	BADI_RE_XC_PT_CONTRACT	BADI_RE_XC_PT_CONTRACT	Check if parcel is assigned to othe
☑	☑	EHP604_FM_RECN_CTRACT_AA_SPLIT	FM_ACCOUNT_ASSIGNMENT_SPLIT	
☑	☑	REXC_IN_BADI_RE_CN_CN	BADI_RECN_CONTRACT_IN	Implementation: Contract Screen for
☑	☑	ZBADI_FMCA_PT_RECN_CONTRACT	ZCL_FMCA_PT_RECN_CONTRACT	Implementation: Real Estate Contrac

This is how the implementation will look like in SE80:



8) BRFplus

Upload BRFplus template application "TRM_PT_TEMPLATE" via xml-import in the BRFplus workbench. The template file should have been delivered with this cook book. As a result of the upload, you will find all the elements, structures and tables necessary for the interface between the calling programs and BRF+ in the BRF+ workbench. In order to upload the file, you need to switch to expert mode in the BRF+ workbench (Workbench->User Mode->Expert Mode). Then chose Tools->XML Import.

The BRFplus function is fed with the following data:

IS_CONTRACT (type: BAPI_RE_CONTRACT_INT) – contains attributes of the real estate contract

IT_DFACTS (type: DFACTS_T_TYPE) – contains attributes of facts which a linked to a parcel

IT_PARCEL (type: BAPI_RE_T_PARCEL_LAND_INT)– contains attributes on parcels which are linked to the contract

IT_COND (type: RE_T_CONDITION_REL_GROUP) – contains all conditions which are linked to a real estate contract type

IT_CONTRACT_PARTNER (type: BAPI_RE_T_PARTNER_INT) – contains contract partners of a real estate contract

IT_YEAR (type: ZFMCA_PT_T_YEAR) – contains timeslices for which a calculation should take place

The result is to be provided to the result table:

"IT_CALC_VALUE" (type: ZFMCA_PT_T_CALC_VALUE)

Recurring Customizing steps

- Copy Property Tax BRFplus application template
- Build rules in the copied BRFplus application which computes records which feed the result table “IT_CALC_VALUE”.
- Insert an entry in table “ZTRM_PT_BRFPLUS” E.g.

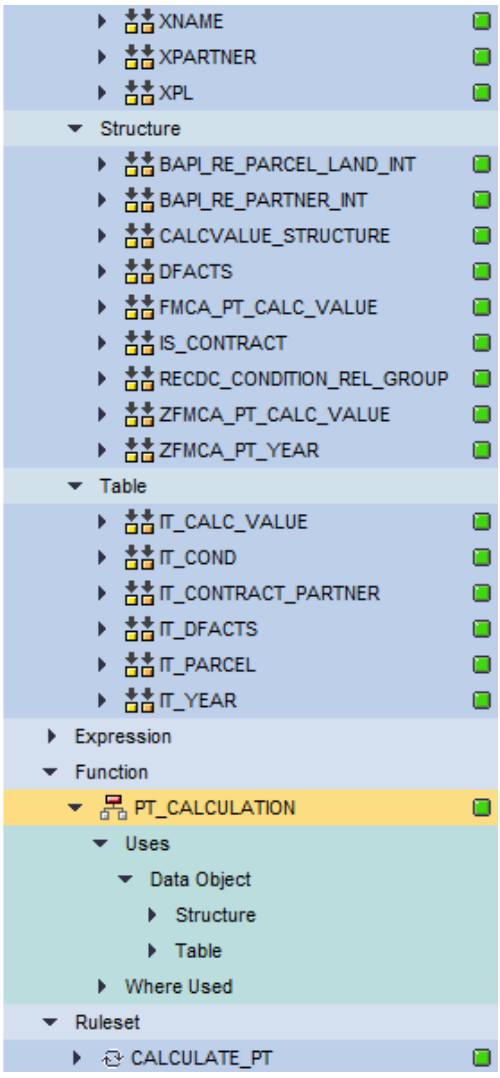
Table: ZTRM_PT_BRFPLUS
Displayed Fields: 7 of 7 Fixed Columns: 2 List Width 0250

MANDT	RECNTYPE	APPLICATION	FUNCTION	TRACE	READ_PARCEL	RECALCSTARTDATE
850	PS01	ZTRM_PT_TEST2	PT_CALCULATION	X	X	

- Execute code_generation program in case it is not executed automatically after the first call (sa38 -> “FDT_GENERATION_TOOL”)

Notes regarding the creation of BRFplus content

After you have copied the application template into your application, you should have additional BRF+ content (elements, structures, tables) available in your application:



It is important to understand that all the conditions, time-slices and parcels are transferred into BRF+. So this usually results in a nested loop. For performance reasons it might be important to immediately check, which conditions apply, before moving into additional loops. The following screen shoot should only describe a possibility (closed to standard logic using BRF instead of BRF+).

Appendix: Coding for the Class Methods

Program: ZTRM_PT_DISPLAY_TRACE

```
*&---------------------------------------------------------------------*
*& Report  ZTRM_PT_DISPLAY_TRACE
*&
*&---------------------------------------------------------------------*
REPORT  ZTRM_PT_DISPLAY_TRACE.

TABLES: ztrm_pt_leanhis.

data: it_ztrm_pt_leanhis type table of ztrm_pt_leanhis.

TYPE-POOLS: SLIS.

SELECTION-SCREEN BEGIN OF BLOCK f01 WITH FRAME TITLE text-f01.
SELECT-OPTIONS:
               BUKRS for ztrm_pt_leanhis-BUKRS   no intervals NO-EXTENSION
OBLIGATORY,
               RECNNR for ztrm_pt_leanhis-RECNNR no intervals NO-EXTENSION
OBLIGATORY.

SELECTION-SCREEN END   OF BLOCK f01.

DATA: V_REPID LIKE SY-REPID .
DATA: I_FIELDCAT TYPE SLIS_T_FIELDCAT_ALV,
      WA_FIELDCAT TYPE SLIS_FIELDCAT_ALV.

DATA: V_EVENTS TYPE SLIS_T_EVENT,
      WA_EVENT TYPE SLIS_ALV_EVENT.


INITIALIZATION.

  V_REPID = SY-REPID.
  PERFORM BUILD_FIELDCATLOG.

  CALL FUNCTION 'REUSE_ALV_EVENTS_GET'
    EXPORTING
      I_LIST_TYPE = 0
    IMPORTING
      ET_EVENTS   = V_EVENTS.

  READ TABLE V_EVENTS INTO WA_EVENT WITH KEY NAME = 'USER_COMMAND'.
  IF SY-SUBRC EQ 0.
    WA_EVENT-FORM = 'USER_COMMAND'.
    MODIFY V_EVENTS FROM WA_EVENT TRANSPORTING FORM WHERE NAME =
WA_EVENT-NAME.
  ENDIF.

START-OF-SELECTION.

  select * from ztrm_pt_leanhis into table IT_ztrm_pt_leanhis
```

```
    where BUKRS in BUKRS
    and RECNNR in RECNNR.

  sort IT_ztrm_pt_leanhis by timestamp.

  PERFORM DISPLAY_ALV_REPORT.

*&---------------------------------------------------------------------*
*&      Form  BUILD_FIELDCATLOG
*&---------------------------------------------------------------------*
FORM BUILD_FIELDCATLOG.
  WA_FIELDCAT-TABNAME = 'IT_ZTRM_PT_LEANHIS'.
  WA_FIELDCAT-FIELDNAME = 'RECNNR'.
  WA_FIELDCAT-SELTEXT_M = 'Contract ID'.
  WA_FIELDCAT-outputlen = 20.
  APPEND WA_FIELDCAT TO I_FIELDCAT.
  CLEAR WA_FIELDCAT.

  WA_FIELDCAT-TABNAME = 'IT_ZTRM_PT_LEANHIS'.
  WA_FIELDCAT-FIELDNAME = 'BUKRS'.
  WA_FIELDCAT-SELTEXT_M = 'Company Code'.
  WA_FIELDCAT-outputlen = 20.
  APPEND WA_FIELDCAT TO I_FIELDCAT.
  CLEAR WA_FIELDCAT.

    WA_FIELDCAT-TABNAME = 'IT_ZTRM_PT_LEANHIS'.
  WA_FIELDCAT-FIELDNAME = 'TIMESTAMP'.
  WA_FIELDCAT-SELTEXT_M = 'Date/Time'.
  WA_FIELDCAT-outputlen = 20.
  APPEND WA_FIELDCAT TO I_FIELDCAT.
  CLEAR WA_FIELDCAT.

ENDFORM.                    "BUILD_FIELDCATLOG


*&---------------------------------------------------------------------*
*&      Form  display_alv_report
*&---------------------------------------------------------------------*
FORM DISPLAY_ALV_REPORT.

  CALL FUNCTION 'REUSE_ALV_GRID_DISPLAY'
    EXPORTING
      I_CALLBACK_PROGRAM      = V_REPID
      I_CALLBACK_USER_COMMAND = 'USER_COMMAND'
      IT_FIELDCAT             = I_FIELDCAT[]
      IT_EVENTS               = V_EVENTS
    TABLES
      T_OUTTAB                = it_ztrm_pt_leanhis.

ENDFORM.                    "display_alv_report


*&---------------------------------------------------------------------*
*&      Form  USER_COMMAND
*&---------------------------------------------------------------------*
FORM USER_COMMAND USING R_UCOMM LIKE SY-UCOMM
```

```
RS_SELFIELD TYPE SLIS_SELFIELD.

  DATA:  lt_parameters TYPE tihttpnvp,
         ls_parameter  TYPE ihttpnvp,
         wa_ztrm_pt_leanhis type ztrm_pt_leanhis.

  CASE R_UCOMM.
    WHEN '&IC1'.
      READ TABLE it_ztrm_pt_leanhis INTO wa_ztrm_pt_leanhis INDEX RS_SELFIELD-
TABINDEX.

      ls_parameter-name = 'IV_TRACE_ID'.
      move wa_ztrm_pt_leanhis-leantrace_id to ls_parameter-value.
      APPEND ls_parameter TO lt_parameters.

      ls_parameter-name = 'IV_FUNCTION_ID'.
      move wa_ztrm_pt_leanhis-function_id to  ls_parameter-value.
      APPEND ls_parameter TO lt_parameters.

      ls_parameter-name = 'IV_TRACE_TABLE'.
      ls_parameter-value = 'FDT_TRACE_0100'.
      APPEND ls_parameter TO lt_parameters.
      CALL FUNCTION 'WDY_EXECUTE_IN_PLACE'
        EXPORTING
          internalmode = 'X'
          application  = 'FMCA_WD_LEAN_TRACE'
          parameters   = lt_parameters.

  ENDCASE.
ENDFORM.                    "user_command
```

Class: ZCL_FMCA_PT_RECN_CONTRACT

Method: IF_EX_RECN_CONTRACT~SUBSTITUTE

```
method IF_EX_RECN_CONTRACT~SUBSTITUTE.

  DATA: lt_tax_cond TYPE fmca_pt_t_tax_cond.

* No property tax caluclation, if condition update is disabled
  IF ch_recn_contract=>is_condition_update_disabled( ) = 'X'.
    RETURN.
  ENDIF.

* No property tax caluclation for the following transaction during saving a contract
  IF id_event_type    = 'S'
      AND (    sy-tcode = 'RECARG'     " update contracts by worklist
            OR sy-tcode = 'RECNCHECK'  " check in change mode/save maybe
            OR sy-tcode = 'RECDCGOL'   " cashflow update
            OR sy-tcode = 'RERAPP'     " periodic postings contracts
            OR sy-batch = abap_true ).
    RETURN.
  ENDIF.
```

```
  IF     id_activity NE '01'
     OR  id_activity EQ '01'
     AND id_event_type = 'S'.

    CALL METHOD update_conditions
      EXPORTING
        io_object = io_object.
  ENDIF.
endmethod.
```

Method: UPDATE_CONDITIONS

```
method UPDATE_CONDITIONS.


  DATA:
    lr_fmca_pt_calc TYPE REF TO zcl_fmca_pt_calc.

  CREATE OBJECT lr_fmca_pt_calc.

*clear global attributes
  CALL METHOD lr_fmca_pt_calc->clear_attributes.

*build condition list and update condition list of contract
  CALL METHOD lr_fmca_pt_calc->add_condition_list
    EXPORTING
      io_object = io_object.

* Store any messages issued during calculations into an itab that
* will be checked during the CHECK_ALL method:
  lr_fmca_pt_calc->go_msglist->get_list( IMPORTING et_list = gt_msg ).

  lr_fmca_pt_calc->go_msglist->free( ).

endmethod.
```

Class: ZCL_FMCA_PT_CALC_RULE

Method: IF_EX_RECD_CALC_RULE~GET_VALUES

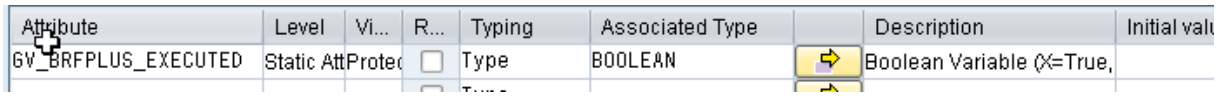
```
method IF_EX_RECD_CALC_RULE~GET_VALUES.

* Only for calculation rule type 'PPTX':
  CHECK id_calcruleext = 'PPTX'.

  DATA:
  lr_fmca_pt_calc TYPE REF TO zcl_fmca_pt_calc.

  CREATE OBJECT lr_fmca_pt_calc.

*calculate tax amounts for one condition
  CALL METHOD lr_fmca_pt_calc->condition_value
    EXPORTING
      id_abs_from          = id_abs_from
      id_abs_to            = id_abs_to
```

```
      io_object            = io_object
      is_condition         = is_condition
    CHANGING
      ct_calc_values       = ct_calc_values
      ct_calc_used_objects = ct_calc_used_objects.

  lr_fmca_pt_calc->go_msglist->free( ).

endmethod.
```

Method: IF_EX_RECD_CALC_RULE~GET_ATTRIBUTES

```
method IF_EX_RECD_CALC_RULE~GET_ATTRIBUTES.


* Only for calculation rule type 'PPTX':
  CHECK id_calcruleext = 'PPTX'.

  cf_distribute = 'X'.            " Can the calculation also distribute?
  cf_adjustable = ' '.            " Can the condition be adjusted by the adjustment?
  cf_unitprice_hide = 'X'.        " Should the unit price be hidden?
  cf_depend_condition = ' '.      " Is the calculation dependent on conditions?
  cf_depend_object = 'X'.         " Is the calculation dependent on object data?
  CLEAR cf_unique_values.         " Does the calculation result in one-time amounts?
  CLEAR cf_unique_values_multi.   " Does the calculation result in multiple one-time
amounts?

* cd_gui_fm_para_pbo = 'FMCA_PT_GUI_CALC_RULE_PBO'.   " PBO function module for
maintenance of formula parameters
* cd_gui_fm_para_pai = 'FMCA_PT_GUI_CALC_RULE_PAI'.   " PAI function module for
maintenance of formula parameters

endmethod.
```

Class: ZCL_FMCA_PT_CALC
Attribute: GV_BRFPLUS_EXECUTED / GT_CALC_VALUE_BRFPLUS / GS_CONTRACT_BRFPLUS



Method: SET_YEAR_VALUES_BRFPLUS

```
method SET_YEAR_VALUES_BRFPLUS.

  DATA:
    lv_origduedate TYPE sy-datum,
    ls_posting_rh TYPE retm_posting_rh,
    ls_condition_x TYPE recd_condition_x,
    lv_next_from TYPE ps_valid_to_date,
    lv_period_faktor TYPE int4,
    lv_period TYPE fkk_fkdate_period,
    ls_year TYPE zfmca_pt_year,
    lv_date TYPE key_date_ps,
    lv_year TYPE calcyear_ps,
  key_date type key_date_ps.

  CLEAR ct_year.

  lv_period_faktor = is_rhythm-frequency.

  CASE is_rhythm-frequencyunit.
    WHEN 0.
*Months
      lv_period = 'M'.
    WHEN 1.
*Years
      lv_period = 'Y'.
    WHEN 2.
*Days
      lv_period = 'D'.
  ENDCASE.

  ls_year-valid_from = iv_start_date.
  DO.

    CALL FUNCTION 'FKK_DTE_ADD'
      EXPORTING
        i_base_date     = ls_year-valid_from
        i_periode       = lv_period
        i_period_factor = lv_period_faktor
      IMPORTING
        e_datum         = lv_next_from.
    ls_year-valid_to = lv_next_from - 1.
*    IF ls_year-valid_to > iv_end_date.
*      ls_year-valid_to = iv_end_date.
*    ENDIF.

* Determine taxation year based on: tax year starts based on frequency start
    IF ls_year-valid_from+4(4) >= iv_start_mmdd.
```

```
          ls_year-calcyear = ls_year-valid_from(4).
        ELSE.
          ls_year-calcyear = ls_year-valid_from(4) - 1.
        ENDIF.

    * Determine key date - same date used all through the tax year:
        CONCATENATE ls_year-calcyear iv_start_mmdd INTO key_date.

        IF key_date > iv_end_date.
          EXIT.
        ENDIF.

    *Set due date
    *    ls_year-due_date = ls_year-key_date.


    * set condtype //condvalid_from
    move condtype to ls_year-condtype .

        APPEND ls_year TO ct_year.
        ls_year-valid_from = lv_next_from.
        CLEAR ls_year-valid_to .
      ENDDO.
    endmethod.
```

Method: GET_RHYTHM_START_BRFPLUS

```
method GET_RHYTHM_START_BRFPLUS.



* Based on the frequency settings, determine the starting month/day
* for conditions
*
  CLEAR ev_start_mmdd.
  CASE is_rhythm-monthfrom.
    WHEN '14'.
*  Start of Calendar Year
      ev_start_mmdd = '0101'.
    WHEN '13'.
*  start of contract
*  if start of condition is initial)

        ev_start_mmdd = iv_contract_valid_from+4(4).

    WHEN '01' OR '02' OR '03' OR
         '04' OR '05' OR '06' OR
         '07' OR '08' OR '09' OR
         '10' OR '11' OR '12'.
```

```
      CONCATENATE is_rhythm-monthfrom '01' INTO ev_start_mmdd.
    WHEN '40'.
*      Custom
      ev_start_mmdd = is_rhythm-rhythmbegin+4(4).
    WHEN OTHERS.
  ENDCASE.

  IF ev_start_mmdd IS INITIAL.
    MESSAGE e015(fmca_pt) WITH is_rhythm-monthfrom
         RAISING error.
  ENDIF.

endmethod.
```

Method: CALCULATE_AMOUNT_BRFPLUS

```
method CALCULATE_AMOUNT_BRFPLUS.

  CONSTANTS iv_tracetable type TABNAME value 'FDT_TRACE_0100'.

  types:
    BEGIN OF ty_parcel_ci_buf,
            objid TYPE dfacts-objid,
            parcel_ci TYPE recn_contract_ci,
          END OF ty_parcel_ci_buf .
  types:
    ty_t_parcel_ci_buf TYPE STANDARD TABLE OF ty_parcel_ci_buf .

  data:l_bapiret2  TYPE bapiret2,
       ls_parcel   TYPE bapi_re_parcel_land_int,
       lt_parcel   TYPE table of bapi_re_parcel_land_int,
       ls_parcel_object TYPE bapi_re_object_rel_int,
       ls_parcel_ci     TYPE relm_parcel_of_land_ci,
       ls_parcel_ci_buf TYPE ty_parcel_ci_buf,
       lt_parcel_ci_buf TYPE table of ty_parcel_ci_buf,

       lt_facts_buffer TYPE dfacts_t_type.

  data:
        r_parcel_object TYPE RANGE OF dfacts-OBJID,
        r_parcel_line LIKE LINE OF r_parcel_object.

  data:
  is_CALC_VALUE Type  ZFMCA_PT_CALC_VALUE,
  it_CALC_VALUE Type  table of ZFMCA_PT_CALC_VALUE,

  is_CALC_USED_OBJECTS  type  RECAOBJNR.

  DATA lv_result_string TYPE fmca_pt_t_calc_value.
  DATA lv_timestamp TYPE timestamp.

  DATA: lo_factory     TYPE REF TO if_fdt_factory,
        lo_function    TYPE REF TO if_fdt_function,
```

```
        lo_context     TYPE REF TO if_fdt_context,
        lo_trace        TYPE REF TO if_fdt_trace,
        lo_leantrace    TYPE REF TO if_fdt_lean_trace,
        lcx_fdt        TYPE REF TO cx_fdt.


  data: lt_name_value  TYPE          abap_parmbind_tab,
        ls_name_value  TYPE          abap_parmbind.

    data: ER_DATA type ref to data.

* Make message handler available to all methods:
  go_msglist = io_msglist.


  if    is_ztrm_pt_brfplus-READ_PARCEL = 'X'.

*read parcels

*fill buffer
    LOOP AT it_object_rel INTO ls_parcel_object
          WHERE objtypecn = 'I8'.
* Get parcel data needed for calculation:
      CALL FUNCTION 'API_RE_PL_GET_DETAIL'
        EXPORTING
          id_objnr          = ls_parcel_object-objnrcn
        IMPORTING
          es_parcel_of_land = ls_parcel
          es_ci_data        = ls_parcel_ci
        EXCEPTIONS
          error             = 1
          OTHERS            = 2.
      IF sy-subrc <> 0.
        go_msglist->add_symsg( ).
        RETURN.
      ENDIF.
      APPEND ls_parcel TO lt_parcel.
      MOVE-CORRESPONDING ls_parcel_ci TO ls_parcel_ci_buf.
      ls_parcel_ci_buf-objid = ls_parcel_object-objnrcn.
      APPEND ls_parcel_ci_buf TO lt_parcel_ci_buf.
      clear  r_parcel_line.
      r_parcel_line-sign   = 'I'.
      r_parcel_line-option = 'EQ'.
      move ls_parcel-intreno to r_parcel_line-low .
      r_parcel_line-high   = ''.
      append   r_parcel_line to r_parcel_object.
    ENDLOOP.

*Select facts of parcel
    CLEAR lt_facts_buffer.
    SELECT * FROM dfacts INTO TABLE lt_facts_buffer
          WHERE  obart  = 'I8'
          AND    objid  in r_parcel_object.
*      APPEND LINES OF lt_facts_buffer TO gt_facts_buffer.
  ENDIF.
```

```
GET TIME STAMP FIELD lv_timestamp.

MOVE: 'IS_CONTRACT'        TO ls_name_value-name,
      'S'  TO ls_name_value-kind.
GET REFERENCE OF ls_contract INTO er_data.
CALL METHOD CL_FDT_FUNCTION_PROCESS=>MOVE_DATA_TO_DATA_OBJECT
    EXPORTING
      IR_DATA             = er_data
      IV_FUNCTION_ID      = brfplus_function_id
      IV_DATA_OBJECT      = 'IS_CONTRACT'
      IV_TIMESTAMP        = lv_timestamp
      IV_TRACE_GENERATION = is_ztrm_pt_brfplus-trace
      IV_HAS_DDIC_BINDING = 'X'
    IMPORTING
      ER_DATA             = ls_name_value-value.
INSERT ls_name_value INTO TABLE lt_name_value.

MOVE: 'IT_CONTRACT_PARTNER'        TO ls_name_value-name,
      'T'  TO ls_name_value-kind.
GET REFERENCE OF it_main_partner[] INTO er_data.
  CALL METHOD CL_FDT_FUNCTION_PROCESS=>MOVE_DATA_TO_DATA_OBJECT
    EXPORTING
      IR_DATA             = er_data
      IV_FUNCTION_ID      = brfplus_function_id
      IV_DATA_OBJECT      = 'IT_CONTRACT_PARTNER'
      IV_TIMESTAMP        = lv_timestamp
      IV_TRACE_GENERATION = is_ztrm_pt_brfplus-trace
      IV_HAS_DDIC_BINDING = 'X'
    IMPORTING
      ER_DATA             = ls_name_value-value.
INSERT ls_name_value INTO TABLE lt_name_value.

MOVE: 'IT_YEAR'        TO ls_name_value-name,
      'T'  TO ls_name_value-kind.
GET REFERENCE OF it_year[] INTO er_data.
    CALL METHOD CL_FDT_FUNCTION_PROCESS=>MOVE_DATA_TO_DATA_OBJECT
    EXPORTING
      IR_DATA             = er_data
      IV_FUNCTION_ID      = brfplus_function_id
      IV_DATA_OBJECT      = 'IT_YEAR'
      IV_TIMESTAMP        = lv_timestamp
      IV_TRACE_GENERATION = is_ztrm_pt_brfplus-trace
      IV_HAS_DDIC_BINDING = 'X'
    IMPORTING
      ER_DATA             = ls_name_value-value.
INSERT ls_name_value INTO TABLE lt_name_value.

MOVE: 'IT_DFACTS'   TO ls_name_value-name,
      'T'           TO ls_name_value-kind.


GET REFERENCE OF lt_facts_buffer[] INTO er_data.
    CALL METHOD CL_FDT_FUNCTION_PROCESS=>MOVE_DATA_TO_DATA_OBJECT
    EXPORTING
      IR_DATA             = er_data
      IV_FUNCTION_ID      = brfplus_function_id
      IV_DATA_OBJECT      = 'IT_DFACTS'
      IV_TIMESTAMP        = lv_timestamp
      IV_TRACE_GENERATION = is_ztrm_pt_brfplus-trace
      IV_HAS_DDIC_BINDING = 'X'
    IMPORTING
      ER_DATA             = ls_name_value-value.
INSERT ls_name_value INTO TABLE lt_name_value.
```

```
  MOVE: 'IT_COND'        TO ls_name_value-name,
        'T'  TO ls_name_value-kind.
  GET REFERENCE OF IT_COND[] INTO er_data.
      CALL METHOD CL_FDT_FUNCTION_PROCESS=>MOVE_DATA_TO_DATA_OBJECT
      EXPORTING
        IR_DATA             = er_data
        IV_FUNCTION_ID      = brfplus_function_id
        IV_DATA_OBJECT      = 'IT_COND'
        IV_TIMESTAMP        = lv_timestamp
        IV_TRACE_GENERATION = is_ztrm_pt_brfplus-trace
        IV_HAS_DDIC_BINDING = 'X'
      IMPORTING
        ER_DATA             = ls_name_value-value.
  INSERT ls_name_value INTO TABLE lt_name_value.

  MOVE: 'IT_PARCEL'        TO ls_name_value-name,
        'T'  TO ls_name_value-kind.
  GET REFERENCE OF lT_PARCEL[] INTO er_data.
      CALL METHOD CL_FDT_FUNCTION_PROCESS=>MOVE_DATA_TO_DATA_OBJECT
      EXPORTING
        IR_DATA             = er_data
        IV_FUNCTION_ID      = brfplus_function_id
        IV_DATA_OBJECT      = 'IT_PARCEL'
        IV_TIMESTAMP        = lv_timestamp
        IV_TRACE_GENERATION = is_ztrm_pt_brfplus-trace
        IV_HAS_DDIC_BINDING = 'X'
      IMPORTING
        ER_DATA             = ls_name_value-value.
  INSERT ls_name_value INTO TABLE lt_name_value.

  TRY.


      IF is_ztrm_pt_brfplus-trace EQ 'X'.

*   process the function
        cl_fdt_function_process=>process(
          EXPORTING
            iv_function_id = brfplus_function_id
            iv_timestamp   = lv_timestamp
            iv_trace_mode = if_fdt_constants=>gc_trace_mode_lean
        IMPORTING
            eo_trace      = lo_trace
          ea_result      = it_calc_value
         CHANGING
   ct_name_value  = lt_name_value ).

      else.

*   process the function
        cl_fdt_function_process=>process(
          EXPORTING
            iv_function_id = brfplus_function_id
            iv_timestamp   = lv_timestamp
                    IMPORTING
          ea_result      =  it_CALC_VALUE
          CHANGING  ct_name_value  = lt_name_value ).

      endif.

    CATCH cx_fdt INTO lcx_fdt.

      CALL METHOD go_msglist->add
        EXPORTING
          id_msgty = 'E'
```

```
          id_msgid = 'ZTRM_PT'
          id_msgno = '001'
          id_msgv1 = brfplus_function_id.
      return.
  ENDTRY.

  IF is_ztrm_pt_brfplus-trace EQ 'X'.
*** save lean trace ***

    TRY .
        lo_leantrace ?= lo_trace.
        IF lo_leantrace IS BOUND.
          lo_leantrace->if_fdt_trace~set_trace_db_table( iv_tracetable ).
          lo_leantrace->save( ).

        ENDIF.
      CATCH cx_sy_move_cast_error.
        CALL METHOD go_msglist->add
          EXPORTING
            id_msgty = 'E'
            id_msgid = 'ZTRM_PT'
            id_msgno = '002'.

        return.
      CATCH cx_fdt_input.
        CALL METHOD go_msglist->add
          EXPORTING
            id_msgty = 'E'
            id_msgid = 'ZTRM_PT'
            id_msgno = '002'.

        return.
      CATCH cx_fdt_lean_trace.
        CALL METHOD go_msglist->add
          EXPORTING
            id_msgty = 'E'
            id_msgid = 'ZTRM_PT'
            id_msgno = '002'.
        return.
    ENDTRY.


**** start store lean trace ref data *****
    data: wa_ZTRM_PT_LEANHIS type ZTRM_PT_LEANHIS.
    move lo_leantrace->mv_uuid to wa_ZTRM_PT_LEANHIS-leantrace_id.
    move brfplus_function_id to wa_ZTRM_PT_LEANHIS-function_id.
    move lv_timestamp to wa_ZTRM_PT_LEANHIS-timestamp.
    move ls_contract-BUKRS to wa_ZTRM_PT_LEANHIS-BUKRS.
    move ls_contract-RECNNR to wa_ZTRM_PT_LEANHIS-RECNNR.
    insert ZTRM_PT_LEANHIS from wa_ZTRM_PT_LEANHIS .
    if sy-subrc <> 0.
      CALL METHOD go_msglist->add
        EXPORTING
          id_msgty = 'E'
          id_msgid = 'ZTRM_PT'
          id_msgno = '003'.

      return.
    endif.
  endif.


****  calculate used objects plus prepare aggregation in case of many parcels ****
  clear ct_CALC_USED_OBJECTS.
  Loop at it_calc_value into is_calc_value.
```

```
    if is_CALC_VALUE-parcel is not initial.
      move is_calc_value-parcel to is_CALC_USED_OBJECTS.
      append is_CALC_USED_OBJECTS to ct_CALC_USED_OBJECTS.
    endif.

    is_CALC_VALUE-parcel = ''.
    collect is_CALC_VALUE into ct_calc_value.
    clear is_CALC_VALUE.
  endloop.
  sort ct_CALC_USED_OBJECTS.



  delete adjacent duplicates from ct_CALC_USED_OBJECTS.
  GV_BRFPLUS_EXECUTED = 'X'.

endmethod.
```

Method: CLEAR_ATTRIBUTES

```
method CLEAR_ATTRIBUTES.

CALL METHOD SUPER->CLEAR_ATTRIBUTES.

  CLEAR GV_BRFPLUS_EXECUTED.

endmethod.
```

Method: CONDITION_VALUE

```
method CONDITION_VALUE.


* The following global attributes store the calculation results:
* GT_CALC_VALUE  (list of calculation result)
* GT_CALC_USED_OBJECTS (list of parcel which are used)
* GT_CONDITION ( condition list)
*
  DATA:
    ls_msg TYPE recamsg,
    lv_parcel_intreno TYPE recaintreno,
    ls_parcel TYPE bapi_re_parcel_land_int,
    ls_calc_value_int TYPE fmca_pt_calc_value,
    lt_calc_value_int TYPE TABLE OF fmca_pt_calc_value,
    lv_calcrulepara1 TYPE recdcalcrulepara,
    lv_calcrulepara2 TYPE recdcalcrulepara,
    lv_valid_to TYPE ps_valid_to_date,
    ls_calc_value TYPE recd_calc_values_tab.


*If linked objects changed clear global attributes
  CALL METHOD me->check_linked_objects
    EXPORTING
      io_object = io_object.
```

```
*  If calculation results exist do not recalculate:
  if  GV_BRFPLUS_EXECUTED = ''.

    go_msglist->clear( ).
    CALL METHOD calculates_values
      EXPORTING
        id_abs_from          = id_abs_from
        id_abs_to            = id_abs_to
        io_object            = io_object
        io_msglist           = go_msglist
      CHANGING
        ct_calc_used_objects = gt_calc_used_objects.
  endif.

  LOOP AT gt_calc_value INTO ls_calc_value_int
          WHERE condtype = is_condition-condtype
            AND valid_from >= id_abs_from
            AND valid_to   <= id_abs_to.

    ls_calc_value-CALCVALUE = ls_calc_value_int-calcvalue.
    ls_calc_value-valuevalidfrom = ls_calc_value_int-valid_from.
    ls_calc_value-valuevalidto = ls_calc_value_int-valid_to.
    ls_calc_value-calcnumber = sy-index.
    ls_calc_value-partnerobjnr = ls_calc_value_int-contract.
    APPEND ls_calc_value TO ct_calc_values.
    CLEAR ls_calc_value.
  endloop.

  ct_calc_used_objects = gt_calc_used_objects.

endmethod.
```

Method: CALCULATES_VALUES.

```
method CALCULATES_VALUES.



*
* The following global attributes store the calculation results:
* GT_CALC_VALUE  (list of calculation result)
* GT_CALC_USED_OBJECTS (list of parcel which are used)
* GT_CONDITION ( condition list)

  types:
    BEGIN OF s_function,
        id TYPE if_fdt_types=>id,
        name TYPE if_fdt_types=>name,
        context TYPE if_fdt_types=>ts_id_name, "temporary, shall use ts_id_name
      END OF s_function .

  DATA:
  lv_start_mmdd TYPE char4,
  lv_last_calc_date TYPE sydatum,
  lt_year TYPE zfmca_pt_t_year,
  lt_year_temp TYPE zfmca_pt_t_year,
  ls_year TYPE zfmca_pt_year,
  lv_end_date TYPE sydatum,
  lv_start_date TYPE sydatum,
  lv_cond_start_date TYPE sydatum,
  lv_end_year TYPE numc4,
  ls_contract       TYPE bapi_re_contract_int,
  ls_contract_ci    TYPE recn_contract_ci,
  ls_contract_type  TYPE bapi_re_contract_type_int,
  lr_badi_fmca_pt_calc TYPE REF TO badi_fmca_pt_calc,
  lt_tax_rate       TYPE fmca_pt_t_tax_rate,
  ls_condition      TYPE bapi_re_condition_int,
  it_condition      TYPE table of bapi_re_condition_int,
  lt_rhythm         TYPE bapi_re_t_term_rh_int,
  ls_rhythm         TYPE bapi_re_term_rh_int,
  ls_calc_value_ext TYPE recd_calc_values_tab,
  ls_calc_value     TYPE zfmca_pt_calc_value,
  gs_calc_value     TYPE fmca_pt_calc_value,
  ls_parcel         TYPE bapi_re_parcel_land_int,
```

```
  lv_parcel_intreno TYPE recaintreno,
  lv_condamount     TYPE boolean,
  lT_MAIN_PARTNER   TYPE BAPI_RE_T_PARTNER_INT,
  lT_COND_CALC_OLD  TYPE  BAPI_RE_T_COND_CALC_INT,
  wa_COND_CALC_OLD  TYPE  BAPI_RE_COND_CALC_INT,
  lt_object_rel     TYPE  BAPI_RE_T_OBJECT_REL_INT,
  is_ztrm_pt_brfplus TYPE ztrm_pt_brfplus.

  DATA:
        lv_appl_name    TYPE fdt_application_name,
        lv_appl_id      TYPE if_fdt_types=>id,
        lo_brfp_manager TYPE REF TO cl_fmca_brfp_manager,
        lt_func         TYPE cl_fmca_brfp_manager=>t_function,
        ls_func         type s_function,
        func_name TYPE if_fdt_types=>name,
        lv_func_id      TYPE if_fdt_types=>id,
        brfplus_function_id      TYPE if_fdt_types=>id.


*** NEW BRFplus variables ***
data: lt_calc_value TYPE table of zfmca_pt_calc_value.


data: lt_cond type RE_T_CONDITION_REL_GROUP,
      ls_cond type RECDC_CONDITION_REL_GROUP.


*read contract data
  CALL FUNCTION 'API_RE_CN_GET_DETAIL'
    EXPORTING
      io_object        = io_object
    IMPORTING
      es_contract      = ls_contract
      es_contract_type = ls_contract_type
      es_ci_data       = ls_contract_ci
      et_object_rel    = lt_object_rel
      ET_MAIN_PARTNER  = lt_MAIN_PARTNER
      ET_COND_CALC     = lt_COND_CALC_old
      et_term_rhythm   = lt_rhythm.



  select single * from ZTRM_PT_BRFPLUS
    into is_ztrm_pt_brfplus where RECNTYPE  = ls_contract-RECNTYPE.
if sy-subrc <> 0.
      CALL METHOD go_msglist->add
```

```
        EXPORTING
          id_msgty = 'E'
          id_msgid = 'ZTRM_PT'
          id_msgno = '000'
          id_msgv1 = ls_contract-RECNTYPE.
      EXIT.
endif.

**** Delete ET_COND_CALC conditions which should be reused
  if is_ztrm_pt_brfplus-RECALCSTARTDATE is not initial.
    delete lt_COND_CALC_old where VALUEVALIDfrom >=  is_ztrm_pt_brfplus-RECALCSTARTDATE.
  endif.

*  read TAX_COND customizing  TIVCDCONDREC / TIVCDCONDTYPE
  CALL METHOD cl_recdc_condition_rel_group=>get_list_by_contracttype
    EXPORTING
      id_contracttype = ls_contract-RECNTYPE
    IMPORTING
      et_list         = lt_cond.


* calculate amount for each TAX_COND customizing record
  LOOP AT lt_cond INTO ls_cond.
    CLEAR ls_condition.

    IF NOT is_condition IS INITIAL.
      MOVE-CORRESPONDING is_condition TO ls_condition.
      ls_condition-objnrcalc = is_condition-objnr.
    ELSE.
      ls_condition-objnrcalc = ls_contract-objnr.
      ls_condition-condtype = ls_cond-condtype.
      ls_condition-condpurposeext = ls_cond-condpurposeext.
      ls_condition-condcurr = ls_contract-recncncurr.
    ENDIF.

    CALL BADI lr_badi_fmca_pt_calc->set_terms
      EXPORTING
        io_object         = io_object
        is_condition      = ls_condition
      CHANGING
        cv_condpurposeext = ls_condition-condpurposeext
```

```
        cv_termnopy       = ls_condition-termnopy
        cv_termnorh       = ls_condition-termnorh
        cv_termnoaj       = ls_condition-termnoaj
        cv_termnooa       = ls_condition-termnoaj
        cv_termnosr       = ls_condition-termnosr
        cv_termnomr       = ls_condition-termnomr.

    READ TABLE lt_rhythm INTO ls_rhythm
           WITH KEY termno = ls_condition-termnorh.
    IF sy-subrc <> 0.
      CALL METHOD go_msglist->add
        EXPORTING
          id_msgty = 'E'
          id_msgid = 'FMCA_PT'
          id_msgno = '016'
          id_msgv1 = ls_condition-termnorh.
      EXIT.
    ENDIF.

* Determine the month/day on which this condition starts:
    CALL METHOD get_rhythm_start_brfplus
      EXPORTING
        is_rhythm              = ls_rhythm
        iv_contract_valid_from = ls_contract-recnbeg
      IMPORTING
        ev_start_mmdd          = lv_start_mmdd
      EXCEPTIONS
        error                  = 1
        OTHERS                 = 2.
    IF sy-subrc <> 0.
      go_msglist->add_symsg( ).
      CONTINUE.
    ENDIF.

* Determine earliest possible start for the condition:
* - start of contract
* - start of condition ***

    IF id_abs_from IS INITIAL OR ls_contract-recnbeg > id_abs_from.
      lv_start_date = ls_contract-recnbeg.
    ELSE.
```

```
      lv_start_date = id_abs_from.
    ENDIF.

*** Move start date to condition_start_date to preserve the value prior assigment to the
conditions
    lv_cond_start_date = lv_start_date.

    IF is_ztrm_pt_brfplus-RECALCSTARTDATE is not initial.
      if is_ztrm_pt_brfplus-RECALCSTARTDATE > lv_start_date.
        lv_start_date = is_ztrm_pt_brfplus-RECALCSTARTDATE.
      endif.
    endif.

* If the start date is after the frequency start MMDD, then bump up to next year:
    IF lv_start_date+4(4) > lv_start_mmdd.
      lv_start_date(4) = lv_start_date(4) + 1.
    ENDIF.
* Set start MMDD to frequency start MMDD:
    lv_start_date+4(4) = lv_start_mmdd.

* Determine end date for condition as earliest of:
* - end of contract
* - end of condition IS_CONDITION
* - end of TAX_COND customizing record
    IF id_abs_to IS INITIAL.
      lv_end_date = '99991231'.
    ELSE.
      lv_end_date = id_abs_to.
    ENDIF.
    IF ls_contract-recnendabs IS NOT INITIAL AND ls_contract-recnendabs < lv_end_date.
      lv_end_date = ls_contract-recnendabs.
    ENDIF.


**** Set condition start date independent of the recalculation date *****

    IF is_condition IS INITIAL.
      ls_condition-condvalidfrom = lv_cond_start_date.
*      ls_condition-condvalidto = lv_end_date.
    ENDIF.
```

```
* Determine end of calculations date based on current date and
* number of years for cash flow forecasting into the future:
    CONCATENATE sy-datum(4) lv_start_mmdd INTO lv_last_calc_date.
    IF lv_last_calc_date < sy-datum.
      lv_last_calc_date(4) = lv_last_calc_date(4) + 1.
    ENDIF.
    lv_end_year = lv_last_calc_date(4) + ls_contract_type-cfperiod.
    CONCATENATE lv_end_year lv_start_mmdd INTO lv_last_calc_date.
    SUBTRACT 1 FROM lv_last_calc_date.

* If the condition only starts in the future after the current end of
* cash flow forecasting, do not create the condition yet:
    IF lv_start_date > lv_last_calc_date.
      CONTINUE.
    ENDIF.

* Determine end date for calculations as earliest of:
* - current tax year + number of years of cash flow forecasting for condition type
* - end of condition
    IF lv_last_calc_date < lv_end_date OR lv_end_date = '99991231'.
      lv_end_date = lv_last_calc_date.
    ENDIF.

*build year table
    CALL METHOD set_year_values_brfplus
      EXPORTING
        iv_start_date      = lv_start_date
        iv_end_date        = lv_end_date
        is_rhythm          = ls_rhythm
        is_condition       = ls_condition
        iv_start_mmdd      = lv_start_mmdd
        condtype           = ls_cond-condtype
        condtypevalid_from = lv_cond_start_date
      CHANGING
        ct_year            = lt_year_temp.

    append lines of lt_year_temp to lt_year.

    append ls_condition to it_condition.

  endloop.
```

```
**** Retrieve BRFplus Function ID
  move is_ztrm_pt_brfplus-application to lv_appl_name.
  CREATE OBJECT lo_brfp_manager
    EXPORTING
      iv_application_name = lv_appl_name.
  CALL METHOD lo_brfp_manager->get_function
    IMPORTING
      et_function = lt_func.

  move is_ztrm_pt_brfplus-function to func_name.


  Loop at lt_func into ls_func where name = func_name.
  endloop.

**** error message
  if sy-subrc = 4.
    l_bapiret2-type       = 'E'.
    l_bapiret2-id         = 'ZTRM_OBT'.
    l_bapiret2-number     = '002'.
    move func_name to l_bapiret2-message_v1.
    exit.
  endif.
  move ls_func-id to brfplus_function_id.

********* Start Call BRFplus once ****
* calculate amount for one condition
  CALL METHOD calculate_amount_brfplus
    EXPORTING
      brfplus_function_id  = brfplus_function_id
      it_year              = lt_year
      it_cond          =     lt_cond
*     it_tax_rate          = lt_tax_rate
      iv_objnr             = is_condition-objnr
      io_object            = io_object
      io_msglist           = go_msglist
      IT_MAIN_PARTNER      =
      lt_MAIN_PARTNER
      IT_OBJECT_REL =
      lt_OBJECT_REL
```

```
      LS_CONTRACT          = LS_CONTRACT
      IT_COND_CALC_OLD     = lt_COND_CALC_old
      is_ztrm_pt_brfplus   = is_ztrm_pt_brfplus
    CHANGING
      ct_calc_value        = lt_calc_value
      ct_calc_used_objects = ct_calc_used_objects.
  IF io_msglist->has_messages_of_msgty( 'E' ) = abap_true.
*      CONTINUE.
  ENDIF.

**** Add values which have already been calculated
  clear ls_calc_value.

  if is_ztrm_pt_brfplus-RECALCSTARTDATE is not initial.
    Loop at lt_COND_CALC_old into wa_COND_CALC_old.
      move wa_COND_CALC_old-CONDTYPE to ls_calc_value-CONDTYPE.
      move wa_COND_CALC_old-CALCVALUE to ls_calc_value-CALCVALUE.
      move wa_COND_CALC_old-VALUEVALIDFROM to  ls_calc_value-valid_from.
      move wa_COND_CALC_old-VALUEVALIDTO to ls_calc_value-valid_to.
      append ls_calc_value to Lt_calc_value.
    endloop.
  endif.

******* End Call BRFplus ******
  LOOP AT lt_cond INTO ls_cond.
    lv_condamount = abap_false.

    Loop at Lt_calc_value into ls_calc_value where
      CONDTYPE = ls_cond-cONDTYPE.

* add calculated values in global attribute gt_calc_value
      IF NOT ls_calc_value IS INITIAL
         AND ls_calc_value-calcvalue NE 0.
         move-corresponding ls_calc_value to gs_calc_value.
        APPEND gs_calc_value TO gt_calc_value.
      ENDIF.

      IF ls_calc_value-calcvalue NE 0.
        lv_condamount = abap_true.
      ENDIF.
*      ENDIF.
```

```
    ENDLOOP.

* add current condition to condition list if at least one records exists
    IF lv_condamount = abap_true.

      clear ls_condition.
      read table it_condition into ls_condition with key condtype = ls_cond-cONDTYPE.

      CALL METHOD add_condition_value
        EXPORTING
          is_condition = ls_condition
        CHANGING
          ct_condition = ct_condition.
    ENDIF.
  ENDLOOP.

  SORT gt_calc_value BY condtype valid_from valid_to.

gt_calc_used_objects = ct_calc_used_objects.

endmethod.
```

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