

# Virtual InfoCube - Implementation in BW 7.0



## Applies to:

SAP Net Weaver BW 7.0. For more information, visit the [EDW homepage](#)

## Summary

The article describes Virtual InfoCube, types & its implementation in a detailed way.

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**Created on:** June 20, 2011

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## Virtual InfoCubes

### Introduction

They only store data virtually, not physically and are made available to Reporting as Info-Providers. Virtual remote cube can be used to 'act like an InfoCube, feel like an InfoCube, but is not an InfoCube, The user can create this virtual InfoProvider, having the same structure similar to InfoCube, with dimensions, characteristics and key figures. But the actual generation of data for this cube, is, well depends on the user making.

The user can choose to create a virtual provider with a 'direct access' to R/3. This means that upon viewing the data in this virtual provider, a remote function call is called direct to R/3 to get the values on the fly. The user can also choose to get value from a function module of the user calling, so the implementation details are really up to the user.

### Create Virtual InfoCube

In BI7, just right click on any InfoArea, and choose create 'virtual provider'. For direct access, the user chooses Virtual Provider with 'direct access'. There's an option to use the old R/3 InfoSource. What this means is that the user can create an InfoSource with transfer rules and such, and when the user create the virtual InfoProvider, it will use the structure in the InfoSource automatically and the flow of data is automatically link R/3 with the transfer rules and the virtual InfoProvider. Note that no update rules exist with this kind of setup.

But in Bi7, the user have a more flexible approach in that the user can create a transformation to configure the 'transfer logic' of the user virtual InfoProvider, along with start routine, end routine or any other transformation technique visible with using a transformation rule.

But using BI7 setup, the user need to create a sort of 'pseudo' DTP, which doesn't actually do anything, meaning the user do not 'execute' it to start a data transfer. After all is done, the user need to right click on the virtual InfoProvider and choose 'Activate Direct Access'. If the user uses InfoSource, go to the InfoSource tab, and choose the InfoSource. If the user is using BI7 setup, choose the DTP related to the transformation and save it.

### Illustrated implementation Procedure

#### Data Source Creation

Firstly, while creating the Data Source, in the Extraction tab, you should choose the Allowed option in the drop down menu.

**Change DataSource ZAD\_VIC\_DS(PC\_FILE)**

The screenshot shows the 'Change DataSource' configuration window for 'ZAD\_VIC\_DS(PC\_FILE)'. The 'Extraction' tab is selected, and the 'Direct Access' dropdown menu is open, showing three options: 'Full Upload (Delta from InfoPackage Selection Only)', 'NO DTP Allowed for Direct Access', and 'Allowed'. The 'Allowed' option is highlighted in orange. The 'Adapter' is set to 'Load Text-type File from Local Workstation'. Other configuration details include 'Source System: PC\_FILE', 'Version: new', 'Active Version: Does Not Exist', 'File Name', 'Header Rows to be Ignored', 'Character Set Settings: Default Setting', 'System Codepage: 4103 UTF-16LE Unicode / ISO/IEC 10646', 'Data Format: Fixed Length', 'Convers. Lang.: User Master Record', and 'Number format: User Master Record'.

Then Save and activate the data-source after providing the required configuration and field details as shown below.

Do the same for all of the data sources that are being used.

### InfoObject Creation

Key figure InfoObjects will still be created in the usual way but Characteristics InfoObjects will need some modifications.

For example, In the Product Characteristic shown below, go to Master data/texts tab and select Direct Access from the drop down menu in Master Data Access Menu.

### Create Characteristic ZAD\_PD: Detail

The screenshot shows the SAP BW InfoObject configuration interface for 'ZAD\_PD'. The 'Master data/texts' tab is active. The 'Master Data Access' dropdown menu is highlighted with a red box and set to 'Direct Access'. Other visible fields include 'Long description' (product td), 'Short description' (product td), 'Version' (New), and 'Object Status' (Inactive, not executable). The 'Master Data InfoSource / Data Target / InfoProvider / Master Data Read Access' section contains several checkboxes and input fields, including 'InfoSource with Direct Update', 'Application Component', 'Character. is InfoProvider', 'InfoArea', and 'Characterist. is export data source'. The 'Name of Master Data Read Class' is set to 'CL\_RSR\_REMOTE\_MASTERDATA'.

Now save and activate the InfoObject.

Do the same for all the characteristics InfoObjects involved in your development.

## Virtual InfoCube Creation

To create a Virtual InfoCube, go to RSA1 transaction, Right click on your InfoArea and select the Create InfoCube option.

Fill in the InfoCube Technical Details and the description.

Be sure to check the Based on Data Transfer Process for Direct Access radio-button.

**Edit InfoCube**

InfoCube: ZAD\_VC      Virtual Cube for AD\_COE

InfoArea: ZAD\_IA      Info Area for AD\_COE

Copy From: [ ] [ ]

**InfoProvider Type**

Standard InfoCube       Real Time

    With Physical Data Store

VirtualProvider       Do Not Transform Select.Cond.

    Without Physical Data Store

Based on Data Transfer Process for Direct Access

With InfoSource 3.x [ ]

Unique Source System Assgmt [ ]

Based on BAPI

    With Source System [ ]

Execute Conv. Exit

Based on Function Module

**System Type (Namespace)**

SAP (Delivered by SAP)

CUS (Generated by User)

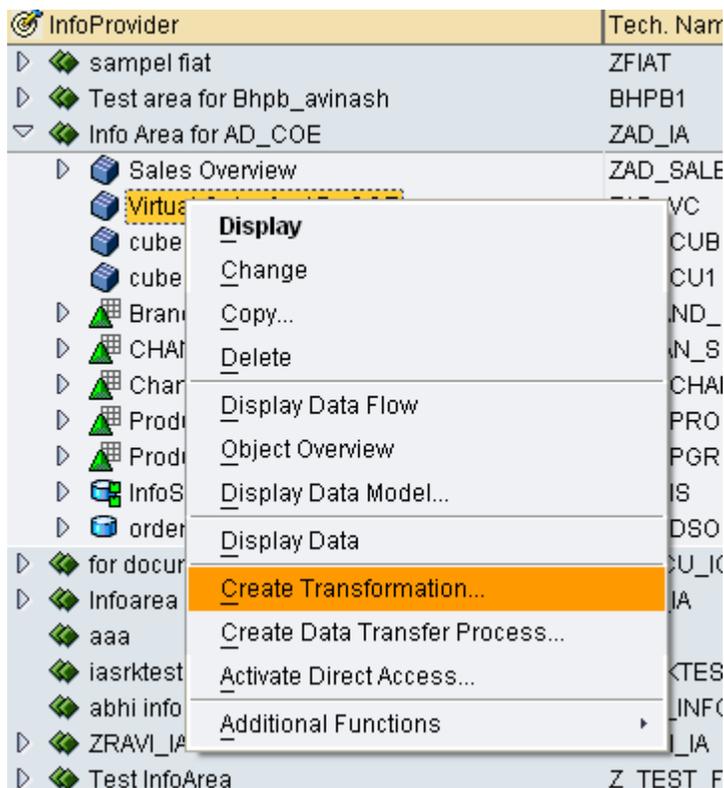
PAR (Partner)

    Namespace [ ]

**Delta Capability**

    Name of Delta Cache Class [ ]

Right Click on the InfoCube and select Create transformation



Input your DataSource Details as Source.

Do the Transformation mappings & Save and active the Transformation.

Pos	Key	Field	Descript.
1		PRODUCT	Product
2		SALESDOC	Sales Doc
3		CALENDARDAY	Calendar Day
4		CHANNEL	Channel
5		QUANTITY	Quantity
6		UNIT	Unit
7		REVENUE	Revenue
8		CURRENCY	Currency

Rule	Rule Name	Pos	Key	InfoObject	Icor	Descript.	Inte
=	ZAD_PROD	1	✓	ZAD_PROD	▲	Product	<input type="checkbox"/>
=	ZAD_CHAN	2	✓	ZAD_CHAN	▲	Channel	<input type="checkbox"/>
=	ODOC_NUMBER	3	✓	ODOC_NUMBER	▲	Sales document	<input type="checkbox"/>
⌚	OCALMONTH	4	✓	OCALMONTH	⌚	Calendar Year/Month	<input type="checkbox"/>
⌚	OCALMONTH2	5	✓	OCALMONTH2	⌚	Calendar month	<input type="checkbox"/>
⌚	OCALWEEK	6	✓	OCALWEEK	⌚	Calendar Year/Week	<input type="checkbox"/>
⌚	OCALYEAR	7	✓	OCALYEAR	⌚	Calendar Year	<input type="checkbox"/>
✗	ZAD_QTY	8		ZAD_QTY	▲	Quantity	<input type="checkbox"/>
✗	ZAD_REVN	9		ZAD_REVN	▲	Revenue	<input type="checkbox"/>

Now create the DTP by following the step shown below.

You will see the following screen for DTP.

Data Transfer Process: ZAD\_VIC\_DS / PC\_FILE -> ZAD\_VC

ID: DTP\_DASXFMWNUOYDURRESZQOCKYJB

DTP Type: DTP for Direct Access

Version: Active | Saved

Extraction | Update | Execute

Data Source: DataSource | ZAD\_VIC\_DS | PC\_FILE | ds

Adapter: Load Text-Type File from Local Workstation | Properties

File Name: D:\Documents and Settings\adlin.sundararaj\Desktop\vaDi

Header Rows to be Ignored: 1

Character Set Settings: Default Setting

System Codepage: 4103 UTF-16LE Unicode / ISO/IEC 10646

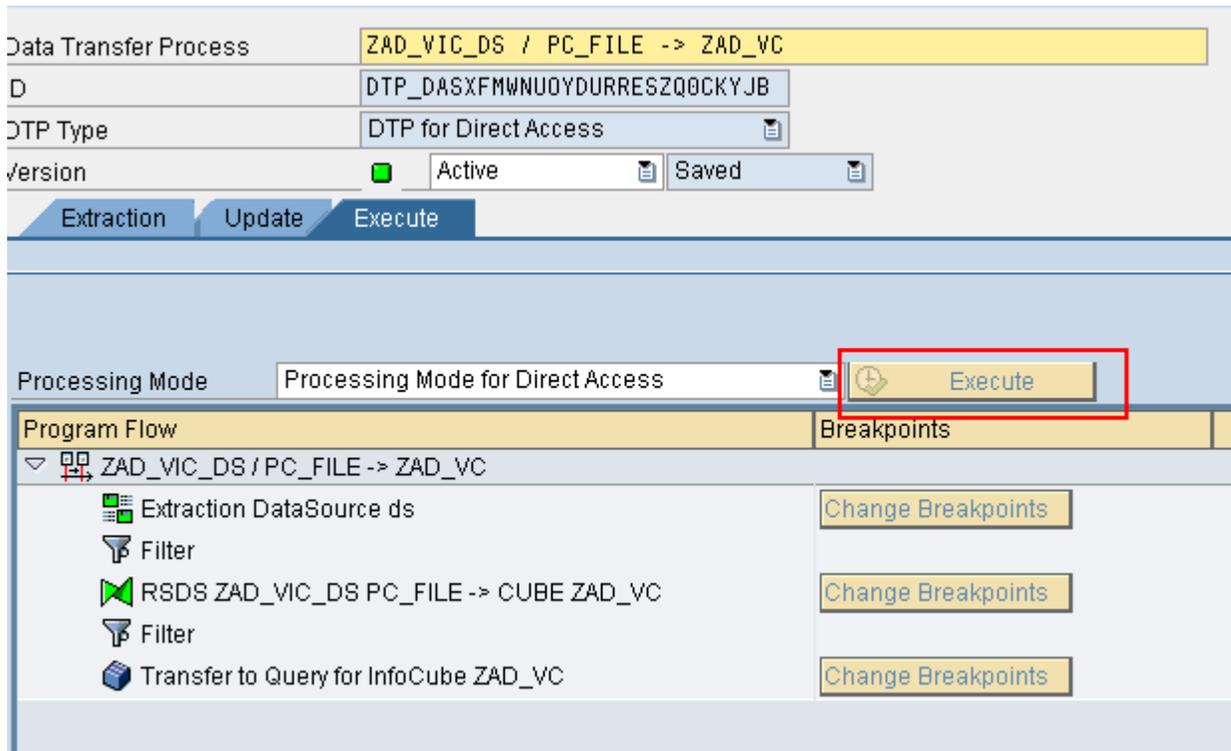
Data Format: Separated with Separator (for Example, CSV)

Data Separator: ; | Hex

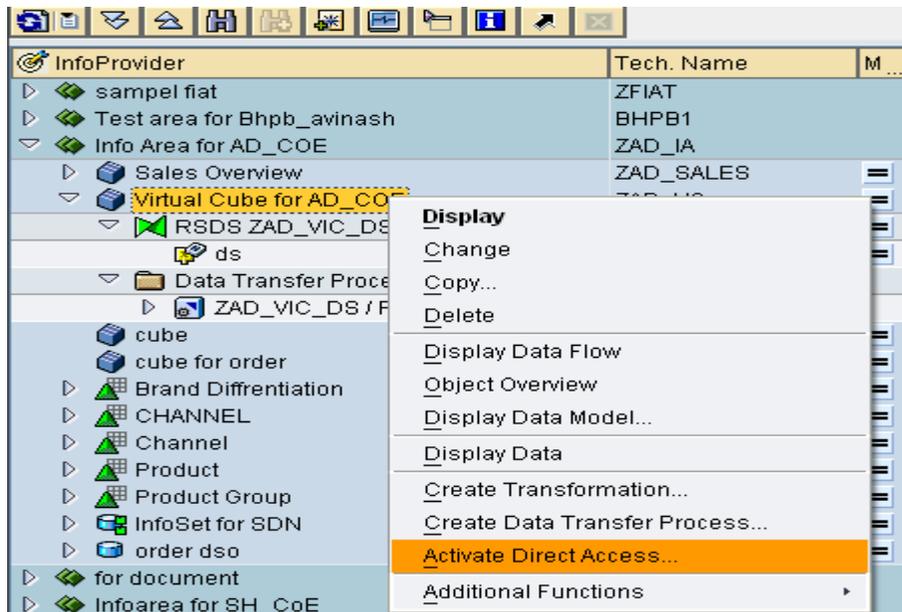
Escape Sign: " | Hex

Save and activate the DTP.

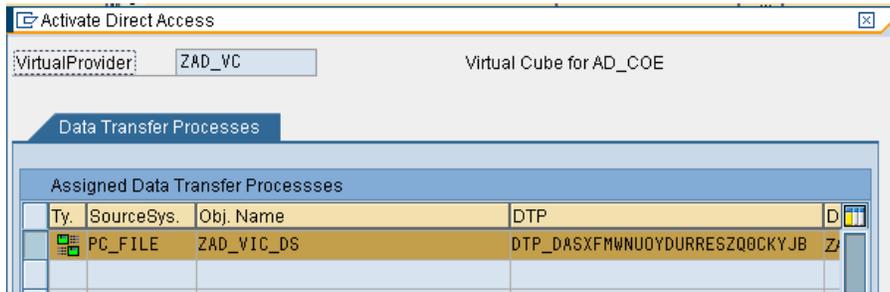
You will notice that the Execute button is grayed out. This is due to the fact that the data will be accessed directly with the help of that Datasource.



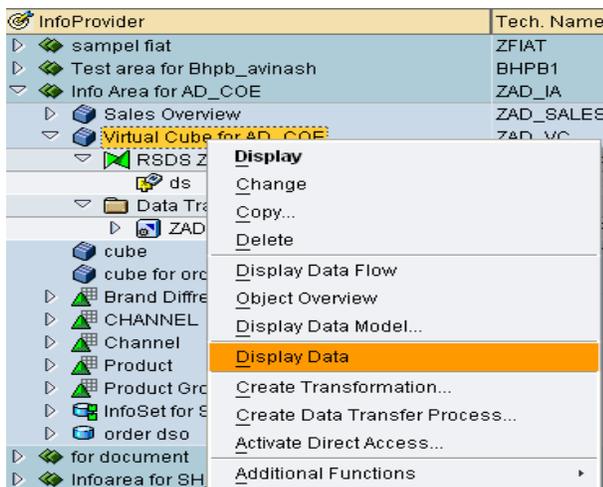
Now right click on the cube and Select the Activate Direct Access option from the context menu.



Now save the DTP as shown below.



Now, to confirm that the data has been loaded, right click on the cube and select Display Data from the context menu.



You will see the following screen. Click on the Field Selection for Output button (Circled in Red below) to select the fields you want to display in the output.

### 'ZAD\_VC', Select. Screen

Field Selectn for Output Execute in Bckgrnd Execute + Debug

Product	Field	to	Field	Buttons
Product	<input type="text"/>	to	<input type="text"/>	↕
Product(SID)	<input type="text"/>	to	<input type="text"/>	↕
Product Group[Product	<input type="text"/>	to	<input type="text"/>	↕
Product Group[Product(SID)	<input type="text"/>	to	<input type="text"/>	↕
<b>Sales Organization</b>				
Sales document	<input type="text"/>	to	<input type="text"/>	↕
Sales document(SID)	<input type="text"/>	to	<input type="text"/>	↕
Channel	<input type="text"/>	to	<input type="text"/>	↕
Channel(SID)	<input type="text"/>	to	<input type="text"/>	↕
<b>Data Package</b>				
Change Run ID	<input type="text"/>	to	<input type="text"/>	↕
Change Run ID(SID)	<input type="text"/>	to	<input type="text"/>	↕
Record type	<input type="text"/>	to	<input type="text"/>	↕
Record type(SID)	<input type="text"/>	to	<input type="text"/>	↕
Request ID	<input type="text"/>	to	<input type="text"/>	↕
Request ID(SID)	<input type="text"/>	to	<input type="text"/>	↕

Check the Fields you wish to see in the output and Press Execute

The data in cube confirms that the Direct-update to the Virtual InfoCube works.

## Different Types

A distinction is made between the following types:

- SAP Remote Cube
- Remote Cube
- Virtual InfoCube with Services

### SAP Remote Cube

An SAP Remote Cube is a Remote Cube that allows the definition of queries with direct access to transaction data in other SAP systems.

Use SAP RemoteCubes if:

- The user need very up-to-date data from an SAP source system
- The user only access a small amount of data from time to time
- Only a few users execute queries simultaneously on the database.

Do not use SAP Remote Cubes if:

- The user request a large amount of data in the first query navigation step, and no appropriate aggregates are available in the source system
- A lot of users execute queries simultaneously
- The user frequently access the same data

### Creating a SAP RemoteCube

The SAP Remote Cube can be used in reporting in cases where it does not differ from other InfoProviders.

- a. Choose the InfoSource tree or InfoProvider tree in the Administrator Workbench under Modeling.
- b. In the context menu, choose Create InfoCube.
- c. Select SAP Remote Cube as InfoCube type and enter the user InfoSource.
- d. The user can define if a unique source system is assigned to the InfoCube using an indicator. Otherwise the user case the characteristic (OLOGSYS) is added to the InfoCube definition.
- e. In the next screen if necessary before activation.
- f. The user can then assign source systems to the SAP Remote Cube. To do this, choose Assign Source System from the context menu in the user SAP Remote Cube. In the dialog box that follows, choose one or several source systems and select Save Assignments. The source system assignments are local to the system and are not transported.

### Structure

SAP Remote Cubes are defined based on an InfoSource with flexible updating. They copy the characteristics and key figures of the InfoSource. Master data and hierarchies are not read directly in the source system. They are already replicated in BW when the user executes a query. The transaction data is called during execution of a query in the source system.

During this process, the selections are provided to the InfoObjects if the transformation is only simple mapping of the InfoObject. If the user has specified a constant in the transfer rules, the data is transferred only if this constant can be fulfilled. With more complex transformations such as routines or formulas, the selections cannot be transferred. It takes longer to read the data in the source system because the amount of data is not limited. To prevent this user can create an inversion routine for every transfer routine. Inversion is not possible with formulas, which is why SAP recommends that the user use formulas instead of routines.

## Integration

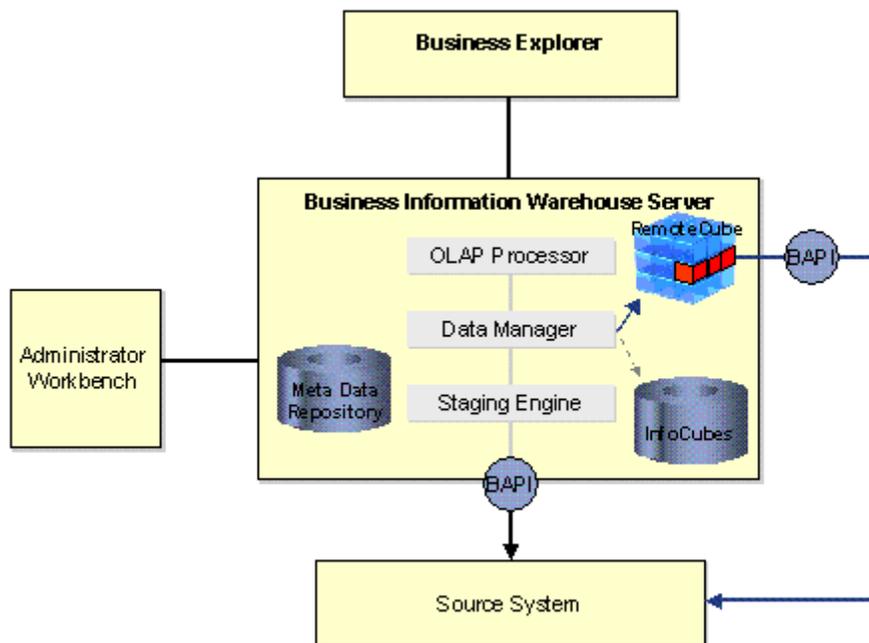
To be assigned to an SAP Remote Cube, a source system must meet the following requirements:

- BW Service API functions (contained in the SAP R/3 plug-in) are installed.
- The Release status of the source system is at least 4.0B
- In BW, a source system ID has been created for the source system
- Data Sources from the source system that are released for direct access are assigned to the InfoSource of the SAP Remote Cube. There are active transfer rules for these combinations.

## Remote Cube

A Remote Cube is an InfoCube whose transaction data is not managed in the Business Information Warehouse but externally. Only the structure of the Remote Cube is defined in BW. The data is read for reporting using a BAPI from another system. Using a Remote Cube, the user can carry out reporting using data in external systems without having to physically store transaction data in BW. The user can, for example, include an external system from market data providers using a Remote Cube. By doing this, the user can reduce the administrative work on the BW side and also save memory space.

## Structure



When reporting using a Remote Cube, the Data Manager, instead of using a Basic Cube filled with data, calls the Remote Cube BAPI and transfers the parameters.

- Selection
- Characteristics
- Key figures

As a result, the external system transfers the requested data to the OLAP Processor.

## Integration

To report using a Remote Cube the user has to carry out the following steps:

- In BW, create a source system for the external system that the user wants to use.
- Define the required InfoObjects.
- Load the master data:
  - Create a master data InfoSource for each characteristic
  - Load texts and attributes
- Define the Remote Cube
- Define the queries based on the Remote Cube

## Virtual InfoCubes with Services

A virtual InfoCube with services is an InfoCube that does not physically store its own data in BW. The data source is a user-defined function module. The user has a number of options for defining the properties of the data source more precisely. Depending on these properties, the data manager provides services to convert the parameters and data.

The user uses a virtual InfoCube with services if the user wants to display data from non-BW data sources in BW without having to copy the data set into the BW structures. The data can be local or remote. The user can also use the user own calculations to change the data before it is passed to the OLAP processor.

This function is used primarily in the SAP Strategic Enterprise Management (SEM) application.

In comparison to the Remote Cube, the virtual InfoCube with services is more generic. It offers more flexibility, but also requires more implementation effort.

## Structure

When the user creates an InfoCube the user can specify the type. If the user chooses Virtual InfoCube with Services as the type for the user InfoCube, an extra Detail pushbutton appears on the interface. This pushbutton opens an additional dialog box, in which the user defines the services.

1. Enter the name of the function module that the user wants to use as the data source for the virtual InfoCube. There are different default variants for the interface of this function module. One method for defining the correct variant, together with the description of the interfaces, is given at the end of this documentation.

2. The next step is to select options for converting/simplifying the selection conditions. The user does this by selecting the Convert Restrictions option. These conversions only change the transfer table in the user-defined function module. The result of the query is not changed because the restrictions that are not processed by the function module are checked later in the OLAP processor.

Options:

- No restrictions: if this option is selected, any restrictions are passed to the InfoCube.
- Only global restrictions: If this option is selected, only global restrictions (FEMS = 0) are passed to the function module. Other restrictions (FEMS > 0) that are created, for example, by setting restrictions on columns in queries, are deleted.
- Simplify selections: Currently this option is not yet implemented.
- Expand hierarchy restrictions: If this option is selected, restrictions on hierarchy nodes are converted into the corresponding restrictions on the characteristic value.

3. Pack RFC: This option packs the parameter tables in BAPI format before the function module is called and unpacks the data table that is returned by the function module after the call is performed. Since this option is only useful in conjunction with a remote function call, the user have to define a logical system that is used to determine the target system for the remote function call, if the user select this option.

4. SID support: If the data source of the function module can process SIDs, the user should select this option. If this is not possible, the characteristic values are read from the data source and the data manager

determines the SIDs dynamically. In this case, wherever possible, restrictions that are applied to SID values are converted automatically into the corresponding restrictions for the characteristic values.

5. with navigation attributes: If this option is selected, navigation attributes and restrictions applied to navigation attributes are passed to the function module. If this option is not selected, the navigation attributes are read in the data manager once the user-defined function module has been executed. In this case, in the query, the user need to have selected the characteristics that correspond to these attributes. Restrictions applied to the navigation attributes are not passed to the function module in this case.

6. Internal format (key figures): In SAP systems a separate format is often used to display currency key figures. The value in this internal format is different from the correct value in that the decimal places are shifted. The user uses the currency tables to determine the correct value for this internal representation. If this option is selected, the OLAP processor incorporates this conversion during the calculation.

### Dependencies

If the user uses a remote function call, SID support must be switched off and the hierarchy restrictions must be expanded.

### Description of the interfaces for user user-defined function modules

#### Variant 1:

```

IMPORTING
  infocube           LIKE bapi6200-infocube
  keydate           LIKE bapi6200-keydate
  return            LIKE bapiret2

TABLES
  selection         STRUCTURE bapi6200s1
  characteristics  STRUCTURE bapi6200fd
  keyfigures       STRUCTURE bapi6200fd
  data             STRUCTURE bapi6100da

EXCEPTIONS
  communication_failure
  system_failure

```

#### Variant 2:

```

IMPORTING
  i_infoprov       TYPE rsinfoprov
  i_keydate        TYPE rrsrdate
  i_th_sfc         TYPE rsdri_th_isfc
  i_th_sfk         TYPE rsdri_th_isfk
  i_t_range        TYPE rsdri_t_range
  i_tx_rangetab    TYPE rsdri_tx_rangetab
  i_first_call     TYPE rs_bool
  i_packagesize    TYPE i

EXPORTING
  e_t_data         TYPE standard table
  e_end_of_data    TYPE rs_bool
  e_t_msg          TYPE rs_t_msg

```

### Additional parameters for variant 2 for transferring hierarchy restrictions

With hierarchy restrictions, an entry for the 'COMPOP' = 'HI' (for hierarchy) field is created at the appropriate place in table I\_T\_RANGE (for FEMS 0) or I\_TX\_RANGETAB (for FEMS > 0), and the 'LOW' field contains used to read the corresponding hierarchy restriction from table I\_TSX\_HIER, using field 'POSIT' Table i\_tsx\_hier has the following type:

```
i_tsx_hier          TYPE rsdri_tsx_hier
```

### Variant 3:

SAP advises against using this interface.

The interface is intended for internal use only and only half of it is given here.

Note that SAP may change the structures used in the interface.

```
IMPORTING
  i_infoprov          TYPE rsinfoprov
  i_keydate           TYPE rrsrdate
  i_th_sfc            TYPE rsdd_th_sfc
  i_th_sfk            TYPE rsdd_th_sfk
  i_tsx_seldr         TYPE rsdd_tsx_seldr
  i_first_call        TYPE rs_bool
  i_packagesize       TYPE i
EXPORTING
  e_t_data            TYPE standard table
  e_end_of_data       TYPE rs_bool
  e_t_msg             TYPE rs_t_msg
```

### Method for determining the correct variant for the interface

The following list describes the procedure for determining the correct interface for the user-defined function module. Go through the list from top to the bottom.

The first appropriate case is the variant that the user should use:

- If Pack RFC is activated: Variant 1
- If SID Support is deactivated: Variant 2

## Related Content

[Virtual InfoCubes with Services](#)

<http://forums.sdn.sap.com/thread.jspx?threadID=1642963>

<http://forums.sdn.sap.com/thread.jspx?threadID=1104081>

For more information, visit the [EDW homepage](#)

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