



BW 2.0 B

OLAP BAPI

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1 Overview

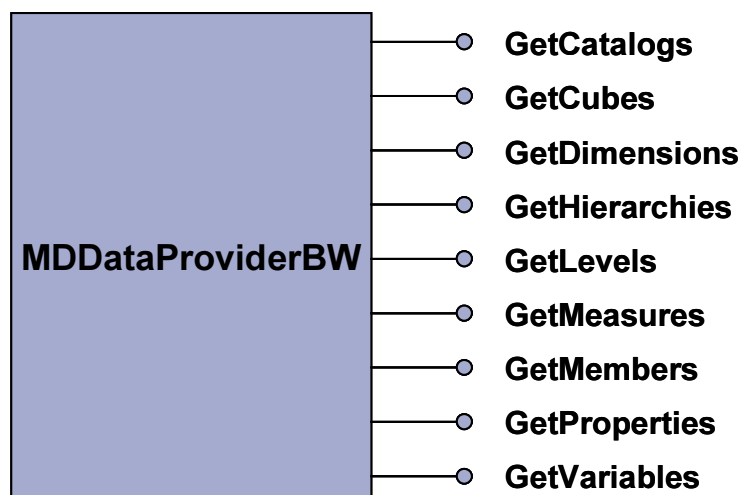
OLAP BAPIs provide third party vendors or customer developers an industry standard method of accessing BW data via their front-end presentation tool.

A rich set of functionality enables one to connect the BW server to a broad spectrum of applications with all flavors of OLAP architectures.

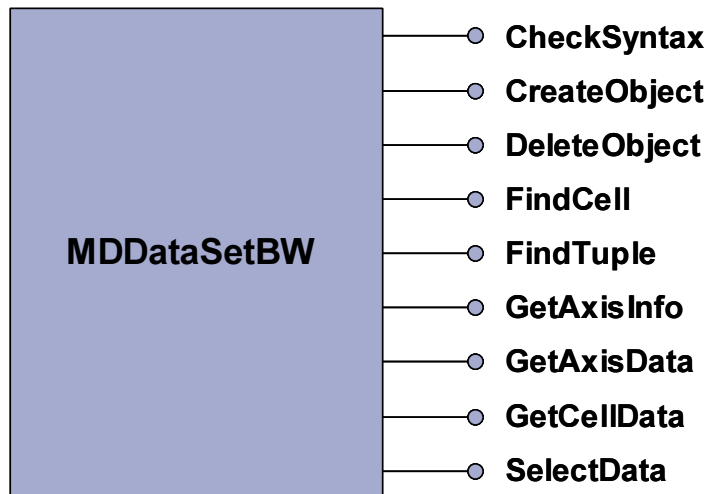
This document provides you with a description of all available BW OLAP BAPIs.

2 List of Individual Functions

2.1 Browse BW Meta- and Masterdata



2.2 Execute multidimensional result sets and fetch data



3 Description of Each Individual Function

3.1 MDDataProviderBW.GetCatalogs

This method delivers a list of the CATALOGS in the system. By CATALOG, we understand an InfoCube for which one or more queries were released for the ODBO interface. Releasing a query for the ODBO BAPI in the BEx Analyzer leads to the dialog in the BEx Analyzer for the query properties.

3.2 MDDataProviderBW.GetCubes

This method delivers a list of queries that are released for the ODBO BAPI. The list can be restricted for a particular CATALOG (InfoCube).

The following properties are delivered to a cube:

- **CatNam** CATALOG name (InfoCube)
- **CubeName** CUBE name (Query: InfoCube/query)
- **CubeType** CUBE type (only QUERY_CUBE at present)

Export table: **Cubes**

Name	Description
CAT_NAM	CATALOG to which the CUBE belongs
CUBE_NAM	Cube name
CUBE_TYPE	Cube type



CUBE_UID	UUID in compressed form
CREATED_ON	Time stamp in yyyyymmddhhmmss format
LST_SCHEMA_UPD	Time stamp in yyyyymmddhhmmss format
SCHEMA_UPD_BY	Last changed by
LST_DATA_UPD	Time stamp in yyyyymmddhhmmss format
DATA_UPD_BY	Last changed by
DSCRPTN	Description

3.3 MDDataProviderBW.GetDimensions

This method delivers a list of dimensions (characteristics) for a particular cube. QueryCube structures are treated in the same way as characteristics. If a structure contains key figure selections, then the structure is interpreted as MD_DIMTYPE_MEASURES dimension type, an additional structure of type Typ MD_DIMTYPE_OTHER.

The entry for DIM_CARDINALITY is only an upper estimated value and not exact.

Defintion of a dimension (characteristic) in BW

Definition:

Evaluation group in the Business Information Warehouse such as cost center or product group. Characteristics are used in InfoCubes. There, they correspond to the key fields. Each data record in the InfoCube is uniquely defined by the combination of the characteristic values. Characteristics can have additional properties. In the Business Information Warehouse, these are called attributes .

Example:

The characteristic cost center could have the attribute person responsible.

Dependencies:

Attributes are still InfoObjects. The permitted values and the values for the assigned attributes are stored in the master data table for the characteristic. Texts for the characteristic values are stored in the text table. This table is generally language-dependent. Furthermore, a characteristic can have external hierarchies. If there are hierarchical relationships between characteristic values, then these are stored in additional tables - the hierarchy tables for the characteristic.

Import parameters:

- **DimUnam** Unique name of a dimension
- **DimNam** Name of a dimension
- **CubeNam** Cube Name



- **CatNam** CATALOG name

Export table: **Dimensions**

Name	Description
CAT_NAM	CATALOG to which the CUBE belongs
CUBE_NAM	Cube name
DIM_NAM	Characteristic
DIM_UNAM	Unique name of dimension
DIM_UID	UUID in compressed form
DIM_CAP	Description (caption)
DIM_ORDINAL	Ordinal number of dimension within the cube
DIM_TYPE	Type of dimension (TIME, MEASURE)
DIM_CARDINALITY	Cardinality of the dimension (Approx. number of members)
DFLT_HRY	Unique name of the default hierarchy
DSCRPTN	Description

3.4 MDDataProviderBW.GetMeasures

This method delivers a list of measures (key figures) for a particular cube

Import Parameters (Restrictions):

- **CatNam** CATALOG name
- **CubeNam** CUBE name (Query: InfoCube/query)
- **MesNam**
- **MesUnam**

Export table **Measures:**

Name	Description
CAT_NAM	CATALOG to which the CUBE belongs
CUBE_NAM	Cube name
MES_NAM	Key figure
MES_UNAM	Unique name of a member
MES_CAP	Description (caption)



MES_UID	UUID in compressed form
MES_AGGREGATOR	Aggregational behaviour for key figure
DATA_TYPE	Data type in ABAP Dictionary
NUM_PREC	Maximum precision (only given if data type is numeric)
NUM_SCALE	Display factor (if applicable)
MES_UNITS	Unit of measurement (dollars, item, if applicable)
DSCRPTN	Description

3.5 MDDataProviderBW.GetHierarchies

This method delivers a list of hierarchies for a dimension of a Cube. All active, external hierarchies are returned, as is a trivial hierarchy that refers to the master data table of the characteristic.

Import parameters:

- **HryUnam** Unique name of a hierarchy
- **HryNam** Name of a hierarchy
- **DimUnam** Unique name of a dimension
- **CubeNam** CUBE name (Query: InfoCube/query)
- **CatNam** CATALOG name

Export table: **Hierarchies**

Name	Description
CAT_NAM	CATALOG to which the CUBE belongs
CUBE_NAM	Cube name
DIM_UNAM	Unique name of dimension
HRY_NAM	Name of a hierarchy (hienm30, version3, dateto8)
HRY_UNAM	Unique name of a hierarchy
HRY_UID	UUID in compressed form
HRY_CAP	Description (caption)
DIM_TYPE	Type of dimension (TIME, MEASURE)
HRY_CARDINALITY	Cardinality of the dimension (Approx.



	number of members)
DFLT_MEM	Unique name of a member
ALL_MEM	Unique name of a member
DSCRPTN	Description

3.6 MDDataProviderBW.GetLevels

This method delivers a list of the levels for a hierarchy of a dimension of a cube.

Import parameters:

- **LvlUnam** Unique name of a level
- **LvlNam** Name of a level
- **HryUnam** Unique name of a hierarchy
- **DimUnam** Unique name of a dimension
- **CubeNam** CUBE name (Query: InfoCube/query)
- **CatNam** CATALOG name

Export table: **Levels**

Name	Description
CAT_NAM	CATALOG to which the CUBE belongs
CUBE_NAM	Cube name
DIM_UNAM	Unique name of dimension
HRY_UNAM	Unique name of a hierarchy
LVL_NAM	Unique name of a hierarchy level
LVL_UNAM	Unique name of a hierarchy level
LVL_UID	UUID in compressed form
LVL_CAP	Description (caption)
LVL_NUMBER	Distance of a member from the root node (root = 0)
LVL_CARDINALITY	Cardinality of a level (approx. number of members)
LVL_TYPE	Level type (year, month, day...)
DSCRPTN	Description

3.7 MDDataProviderBW.GetMembers

This method returns a quantity of members according to the specified restrictions. For **CatNam, CubeNam, DimUnam, HryUnam, LvlUnam, MemNam, MemUnam, MemCap**, there are corresponding values to use as with other methods for MD_SCHEMA objects.

A feature of import fields for the restrictions is to be noted for **LvlNumber, MemType** and **Treeop**. These fields refer to the field BAPI6111GEN-CHAR2RESTR and are of type CHAR with a length of 2. In this way you can decide whether no restrictions, for example, to LEVEL have been set or a restriction with LEVEL 0 is required. This would not be possible using the corresponding NUMC types.

The following features for the tree operator are supported:

- MDTREEOP_CHILDREN = 1
- MDTREEOP_SIBLINGS = 2
- MDTREEOP_PARENT = 4
- MDTREEOP_SELF = 8
- MDTREEOP_DESCENDANTS = 16
- MDTREEOP_ANCESTORS = 32

The values can be combined by addition:

$$\text{MDTREEOP_CHILDREN} + \text{MDTREEOP_SELF} = 1 + 8 = 9$$

In this instance, the member specified by **MemUnam** would be returned as would its children.

The restrictions have to restrict at least one particular dimension. Several restrictions are interpreted to mean that they are linked together with AND.

Using the table **SelectedProperties**, the provider can enter a particular number of properties (attributes) that are required for the selected members in the resulting quantities. With the **AllProperties** flag, the client can specify that all properties are required. If this flag is not set, the **SelectedProperties** table is interpreted and no properties are returned if this is empty.

Export Tables:

- **Members**

Name	Description
LVL_NUMBER	Distance of a member from the root node (root = 0)
MEM_NAM	Member name
MEM_UNAM	Unique name of a member



MEM_TYPE	Type of member (REGULAR,ALL,MEASURE..)
MEM_UID	UUID in compressed form
MEM_CAP	Description (caption)
MEM_ORDINAL	General reference field for numbering
CHILDREN	Number of children for a member
PARENT_LVL	Distance of a member from the root node (root = 0)
PARENT_UNAM	Unique name of a member
DSCRPTN	Description

• **Optional Properties**

MEM_ORDINAL	General reference field for numbering
PRPTY_NAM	Master data attribute
PRPTY_VAL	Value of an attribute

3.8 MDDataProviderBW.GetProperties

This method delivers a list of properties (attributes) for a dimension (characteristic).

Import Parameters:

- **CatNam** CATALOG name
- **CubeNam** CUBE name (Query: InfoCube/query)
- **DimUnam** Unique name of a dimension
- **HryUnam** Unique name of a hierarchy
- **LvlUnam** Unique name of a level
- **MemUnam**
- **PrptyNam**
- **PrptyType**

Export table **Properties:**

Name	Description
CAT_NAM	CATALOG to which the CUBE belongs
CUBE_NAM	Cube name
DIM_UNAM	Unique name of dimension



HRY_UNAM	Unique name of a hierarchy
LVL_UNAM	Unique name of a hierarchy level
MEM_UNAM	Unique name of a member
PRPTY_TYPE	Property type (MEMBER, CELL)
PRPTY_NAM	Property name
PRPTY_CAP	Description (caption)
DATA_TYPE	Data type in ABAP Dictionary
CHR_MAX_LEN	Maximum length of a value in characters or bytes
CHR_OCT_LEN	Maximum length (in bytes) of an attribute value if char.
NUM_PREC	Maximum precision (only given if data type is numeric)
NUM_SCALE	Display factor (if applicable)
DSCRPTN	Description

3.9 MDDataProviderBW.GetVariables

This method delivers a list of variables with processing through 'Manual Entry' to a QUERY_CUBE

The following information is delivered for **Variables**:

Name	Description
CAT_NAM	Name of CATALOGS (InfoCubes) to which the QUERY_CUBE belongs
CUBE_NAM	Name of CUBE in which the variable is used
VAR_NAM	Variable name. Restricted by delimiter '['.
VAR_CAP	Short description of variables
VAR_UID	Variable GUID
VAR_ORDINAL	Sort sequence of variables within the query
VAR_TYPE	Type of variables. This field displays for what kind of object the variable stands for as a placeholder. The field can adopt the following values: <ul style="list-style-type: none"> • SAP_VAR_TYPE_MEMBER • SAP_VAR_TYPE_HIERARCHY

	<ul style="list-style-type: none"> SAP_VAR_TYPE_NUMERIC
DATA_TYPE	<p>ABAP Data type of variables. This is either CHAR for types SAP_VAR_TYPE_MEMBER and SAP_VAR_TYPE_HIERARCHY or FLTP for type SAP_VAR_TYPE_NUMERIC</p>
CHR_MAX_LEN	<p>Max. length of a variable value.</p>
VAR_PROC_TYPE	<p>Processing type of variable. On the MDPROVIDER BAPI, only variables with the processing type 'Manual Entry' are delivered. The value for this column is always _PROC_TYPE_USER_INPUT with 2.0</p>
VAR_SEL_TYPE	<p>Selection type for variables. This field displays whether the variable allows an individual value, an interval or a complex selection of characteristic values. Possible values are:</p> <ul style="list-style-type: none"> SAP_VAR_SEL_TYPE_VALUE SAP_VAR_SEL_TYPE_INTERVAL SAP_VAR_SEL_TYPE_COMPLEX
VAR_ENTRY_TYPE	<p>Mandatory entry for variables. This column can have one of the following values:</p> <ul style="list-style-type: none"> SAP_VAR_INPUT_TYPE_OPTIONAL SAP_VAR_INPUT_TYPE_MANDATORY SAP_VAR_INPUT_TYPE_MANDATORY_NOT_INITIAL
REF_DIM	<p>For variables of type SAP_VAR_TYPE_MEMBER, this field specifies which dimension values you can select from for the variables.</p>
REF_HRY	<p>For variables of type SAP_VAR_TYPE_MEMBER, this field</p>

	specifies which hierarchy values you can select from for the variable.
DFLT_LOW	Maintained proposed value for variables, should one exist
DFLT_HIGH	Maintained to-proposed value, should one exist
DFLT_LOW_CAP	Text for maintained proposed value, should one exist
DFLT_HIGH_CAP	Text for maintain until- proposed value, should one exist
DSCRPTN	Long text for variables

The MDX Grammar has been enhanced with a SAP specific variable clause. This has the following general structure:

```

<select_statement> ::= [WITH <formula_specification>]
    SELECT [<axis_specification>,<axis_specification>...]
    FROM [<cube_specification>]
    WHERE [< slicer_specification>]
    [<cell_props>]
    [<sap_variables>]
<sap_variables> : SAP VARIABLES <sap_variables_list>
<sap_variables_list> : <sap_variable> | <sap_variables_list> ',' <sap_variable>
<sap_variable> : <variable_value_list>
<variable_value_list>: <variable_value_specification>
    | <variable_value_list> <variable_value_specification>
<variable_value_specification>: <var_single_value_specification>
    | <var_interval_value_specification>
<var_single_value_specification> : <variable_name> <sign> <variable_value>
<var_interval_value_specification> : <variable_name> <sign> <variable_value>':'< variable_value>
<sign> : INCLUDING | EXCLUDING
<variable_value> : <member> | <unsigned_numeric_literal>
    
```

Example

1. This example sets an individual value for the variable [ODBBRANC]

```

select [DUYZ7E3E5GH2F0W4D7OGO6RKD].members on columns,
non empty [ODB_CUST].members on rows from [ODBOSCEN1/MKTBRANCH]
SAP VARIABLES [ODBBRANC] INCLUDING [ODB_BRANC].[CHEM]
    
```

2. This example excludes an individual variable

```

select [DUYZ7E3E5GH2F0W4D7OGO6RKD].members on columns,
    
```

```
non empty [ODB_CUST].members on rows from [ODBOSCEN1/MKTBRANCH]
SAP VARIABLES [ODBBRANC] EXCLUDING [ODB_BRANC].[CHEM]
```

3. This example specifies an interval

```
select [2M19UOW3BTEMXNZMHSSSEP631].members on columns,
non empty [0CALYEAR].members on rows from [ODBOSCEN1/MKTCUST]
SAP VARIABLES [ODBCUST] INCLUDING [ODB_CUST].[B01] : [ODB_CUST].[C05]
```

4. This example specifies a complex selection

```
select [4G3SFZOHUNDFDZN137S0IQ425].members on columns,
non empty [ODB_BRANC].members on rows from [ODBOSCEN1/MKTPROD]
SAP VARIABLES [ODBPROD] INCLUDING [ODB_PROD].[CP01230111]
[ODBPROD] INCLUDING [ODB_PROD].[LP10101190]
[ODBPROD] INCLUDING [ODB_PROD].[PP98010102]:[ODB_PROD].[PR48666001]
```

3.10 MDDatasetBW.CreateObject

With this method a runtime object for an MDX Command in **CommandText** is generated. The method returns an object handle **DataSetID** as an export parameter. This handle has to be specified in the following calls that relate to the created object as parameters.

Import table: **CommandText**

Export parameter: **Datasetid**

3.11 MDDatasetBW.CheckSyntax

This method checks the syntax of the MDX Command for the runtime object with object handle DataSetID.

3.12 MDDatasetBW.SelectData

With this method, an MDX Command is carried out and the dataset that corresponds to the command (meaning a multi-dimensional resulting quantity) is constructed.

As several Command objects can be processed in parallel within a session, the input parameter DataSetID has to be set. A client application with the method MDDatasetBW.CreateObject can create such an object handle, by which an MDX command must also be set before execution.

The GetAxisInfo, GetAxisData and GetCellData methods are available to the client application for retrieving the resulting quantity.

3.13 MDDatasetBW.GetAxisInfo

This method provides meta data for all axis.

Export Tables:

- **AxisInfo** # of dimensions and tuples

Name	Description
AXIS	Zero-based number of axis in dataset
DIMS	Counter for number of dimensions on an axis
COORDINATES	Zero-based counter for number of coordinates on an axis

- **AxisDimensions** list of dimensions

Name	Description
AXIS	Zero-based number of axis in dataset
DIM_UNAM	Unique name of dimension
DIM_KEY	Zero-based ordinal of a dimension on an axis
DIM_PRPTY_COUNT	Number of optional, specific properties in the dataset

- **AxisLevels** list of hierarchy levels

Name	Description
I_AXIS	Zero-based number of axis in dataset
DIM_KEY	Zero-based ordinal of a dimension on an axis
LVL_KEY	Zero based ordinal of a lvl projected on an axis
LVL_UNAM	Unique name of a hierarchy level

- **DimPrptys** list of dimension properties

Name	Description
LVL_KEY	Zero based ordinal of a lvl projected on an axis
PRPTY_NAM	Master data attribute
DATA_TYPE	Data type in ABAP Dictionary
CHR_MAX_LEN	Maximum length of a value in characters or bytes

3.14 MDDatasetBW.GetAxisData

This method delivers a list of tuples on an axis. The mandatory properties are returned in the table **MndtryPrptys**, the optional properties are returned in the two tables **OptionPrptysKeys** and **OptionPrptysVals**. The table **OptionPrptysKeys** corresponds to the column headers in the AxisData rowset in ODBO while the table **OptionPrptysVals** corresponds to the content of these columns.

Import Parameter **Axis** Zero-based Number of Axis in Dataset

Export Tables:

- **MndtryPrptys** List of keys

Name	Description
TUPLE_ORDINAL	Zero-based ordinal number of an axis tuple
DIM_KEY	Zero-based ordinal of a dimension on an axis
MEM_UNAM	Unique name of a member
MEM_CAP	Description (caption)
LVL_UNAM	Unique name of a hierarchy level
LVL_NUMBER	Distance of a member from the root node (root = 0)
CHILDREN	Number of children for a member
DRILLED_DOWN	Flag whether member is hierarchically opened or not
PARENT_SAME_AS_PREV	Flag as to whether parent node same as previous member

- **OptionPrptysKeys** Keys of dimension properties combinations

Name	Description
DIM_KEY	Zero-based ordinal of a dimension on an axis
PRPTY_NAM	Property name
PRPTY_KEY	Numeric key with 3 numbers

- **OptionPrptysVals** Values of dimension properties combinations

Name	Description
TUPLE_ORDINAL	Zero-based ordinal number of an axis tuple



PRPTY_KEY	Numeric key with 3 numbers
PRPTY_VAL	Value of an attribute

3.15 MDDatasetBW.GetCellData

This method returns data for a part of the cell set.

Import Parameters:

- **StartRow** Start cell in the cell set
- **EndRow** End cell in the cell

Export Table: **Data** List of values with ordinal between StartRow and EndRow

Name	Description
CELL_ORDINAL	Ordinal number of a cell in a Dataset
VALUE	String representation of a float number
FORMATTED_VALUE	Formatted value of a cell
VALUE_TYPE	Date, Time, Normal or Overflow
CURRENCY	Currency key
UNIT	Unit key
MWKZ	Grouping of the key figures
NUM_SCALE	Scaling factor of a number
NUM_PREC	Number of places after decimal point for output
CELL_STATUS	Status of a cell (E)mpty, (N)ull
BACK_COLOR (only 2.0B)	Background color of a cell

3.16 MDDatasetBW.FindTuple

This method finds the ordinal of tuple on the specified axis

Import parameters:

- **Axis**
- **StartOrdinal**

Import table **Members**

Export parameter **Tuple**

3.17 MDDatasetBW.FindCell

With this method, the first cell from the **StartCell** for which the restriction **Members** is valid, is searched for in the dataset (meaning a multi-dimensional result quantity). Returns the cell ordinal of the cell which fits the selection.

Import parameter **StartCell**

Import table **Members**

Export parameter **Cell**

3.18 MDDatasetBW.DeleteObject

This method removes the command object DataSetID from the stack.

4 Error Handling

Each method has an extra exporting table called **Return**. This table provides the error and success messages and warnings which appeared while executing the method.

4.1 Return Table

Name	Description
TYPE	Message type: S Success, E Error, W Warning, I Info, A Abort
ID	Messages, message class
NUMBER	Messages, message number
MESSAGE	Message text
LOG_NO	Application log: log number
LOG_MSG_NO	Application log: Internal message serial number
MESSAGE_V1	Messages, message variables
MESSAGE_V2	Messages, message variables
MESSAGE_V3	Messages, message variables
MESSAGE_V4	Messages, message variables



PARAMETER	Parameter name
ROW	Lines in parameter
FIELD	Field in parameter
SYSTEM	Logical system from which message originates