

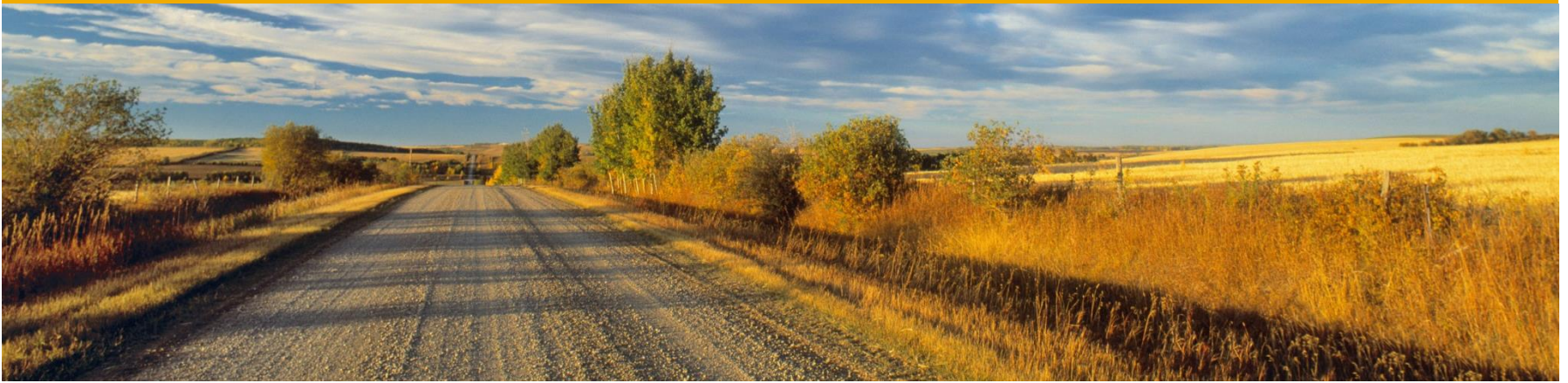
BOPF Business Configuration Objects

SAP AG, 2012



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Introduction

Business Configuration Object (BCO)

Scenario

In order to fulfill different requirements of multiple customers, business applications often consist of configurable feature sets. The corresponding default configuration data is usually delivered by the application developers. In the customer's system landscape this configuration data can individually be adjusted.

Example

If a customer only accepts euros the corresponding business application should not offer other currencies.

Problems

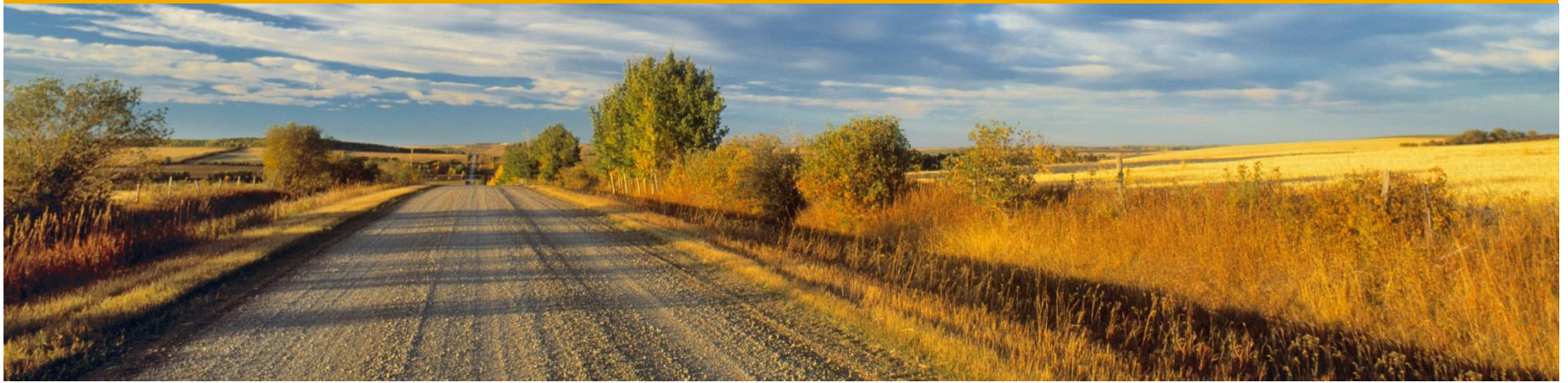
- Coping with configuration data and offering user interfaces to maintain configuration settings are common requirements for many business applications. However the implementation is always time consuming.
- Complex business applications have often complex configuration data. This data can have dependencies and needs to be validated.

Definition of Business Configuration Objects (BCO)

Business Configuration Objects are special Business Objects to manage configuration data. It can be developed and consumed like any other BOPF business object. In contrast to a common Business Object, the node instances are transported.

Advantages of Business Configuration Objects

- **Easy Creation of Customization User Interfaces**
Creation of a customization user interface is very simple as common infrastructure can be reused (e.g. FBI, Gateway, SADL). Also the Test UI can be used for development.
- **Easy BCO Consumption**
Consumption and modification of a configuration object is equal to accessing common BOPF business objects (service & transaction manager is used)
- **Configuration logic can easily be implemented**
BCOs can have specific actions, determinations and validations. This allows for instance to validate configuration settings or derive dependent customization values.
- **Configuration data can be structured**
BCOs can be modeled as deeply structured trees of nodes to cover corresponding configuration data.
- **Rapid development**
All functionality to transport the modified node instances of the configuration object is provided by BOPF. In addition, the customer namespace restrictions are automatically validated.



Consumption of a Business Configuration Object

Consumption of a Business Configuration Object

Business Configuration Objects can be consumed like any other Business Object via service and transaction manager.

In addition, a Business Configuration Object offers special actions, validations and determinations described on the following slides to handle the transport of changed node instances.

BCO Reuse Implementation Entities

In contrast to common Business Objects, the changed node instances of a BCO must be transported. Thereto TABUs for all changed instances needs to be written to a customizing request. All required logic is available as library classes and must be part of each BCO. There are for instance:

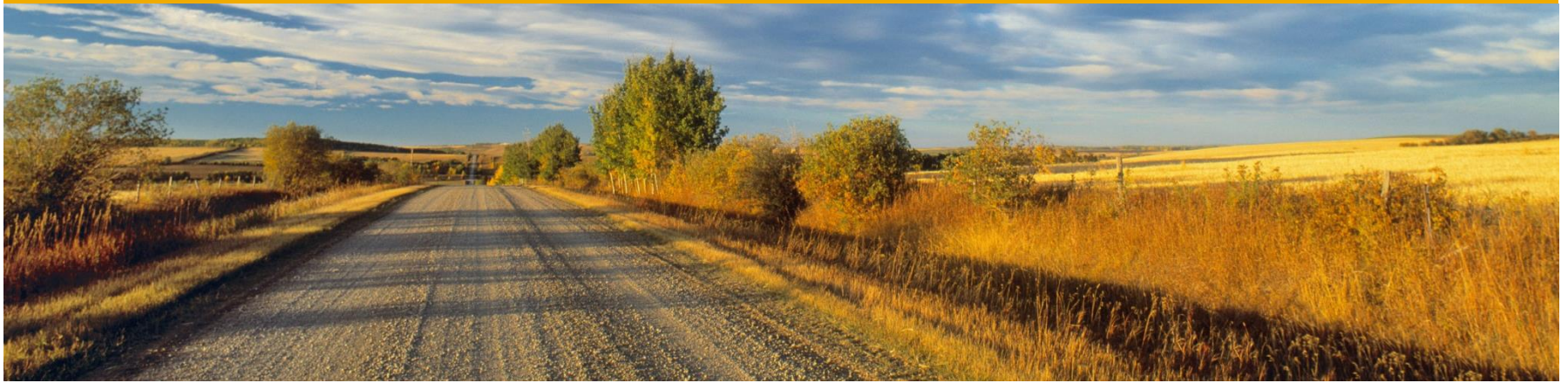
- Validations to check if the transport is a customizing request
- Validations to check if the changed instances are compliant to customer namespace restrictions (defined on the node's database table)
- Actions writting TABUs for each changed node instance to the customizing request
- Determinations writting TABUs for each changed node instanec to the customizing request while saving
- Query to return all related customizing requests

Initialization Phase

Setting the Default Customizing Request

At the beginning of a transaction, the following steps are executed in order to define a default customizing request. This request will be used to store the TABU entries of changed BCO node instances.

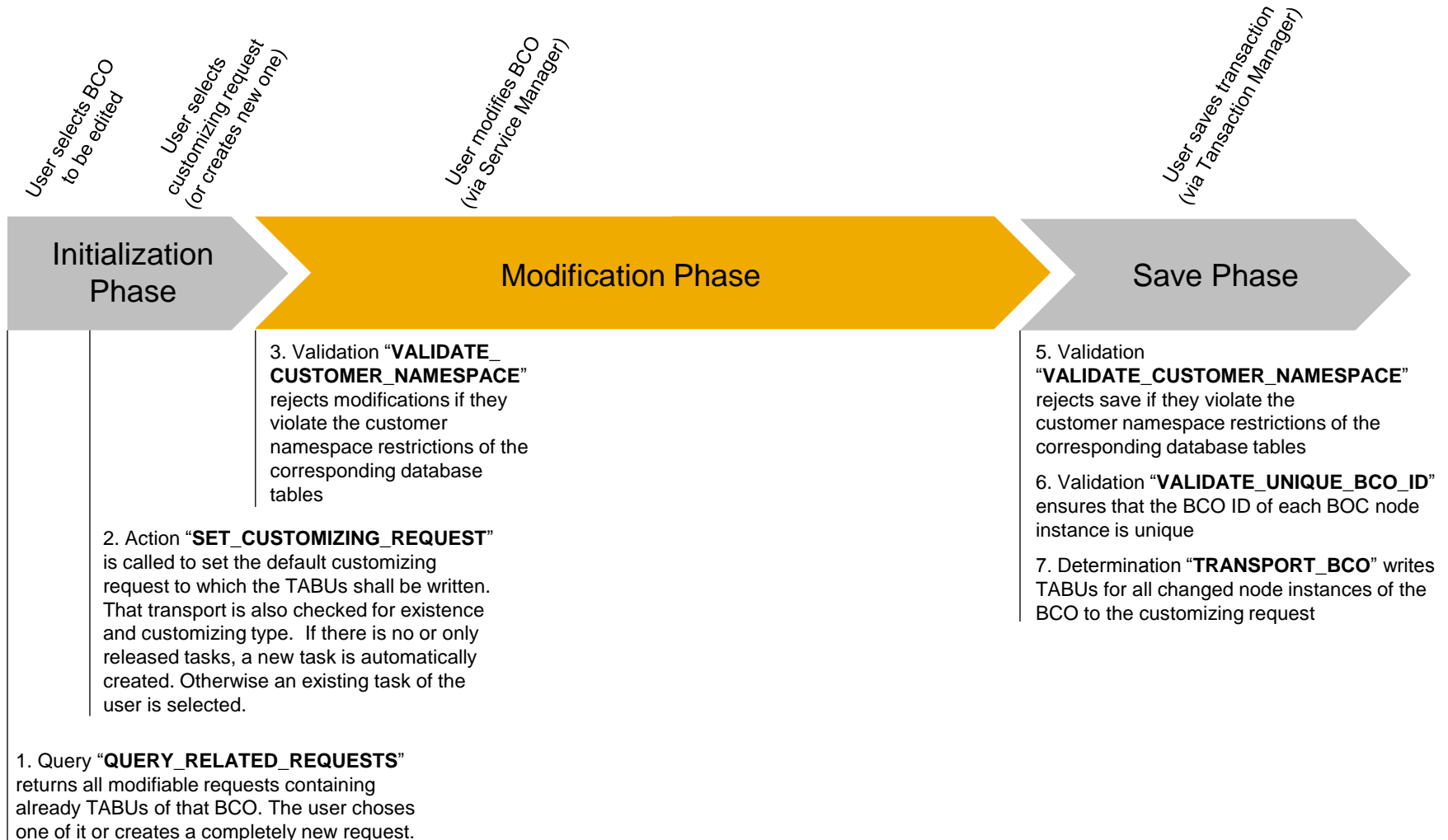
- 1. Consumer calls query “QUERY_RELATED_REQUEST”**
This query returns all requests having tasks already containing TABUs of node instances of the current business object.
- 2. Consumer chooses request via action “SET_CUSTOMIZING_REQUEST”**
The chosen request must be set via action “SET_CUSTOMIZING_REQUEST”. If the request does not contain any non-released task, a new task is automatically created.



Automatic BCO Mode

Automatic BCO Mode

Interaction of User Interface and BCO Default Entities



Automatic BCO Mode

Modification Phase

Determination TRANSPORT

If a BCO node instance is created, updated or deleted during that transaction, the determination writes the corresponding TABUs on the default transport at save. This ensures that the BCO instances are always in sync with their TABU entries.

Automatic BCO Mode

Save Phase

1. Determination “TRANSPORT_BCO”

At the save phase the TABU entries of all changed BCO node instances are automatically written to the transport task defined by the action SET_CUSTOMIZING_REQUEST before.

2. Validation “VALIDATE_UNIQUE_BCO_ID”

This validation ensures that the alternative key values of the BCO ID (second attribute of the database table) are always unique.

3. Validation “VALIDATE_CUSTOMER_NAMESPACE”

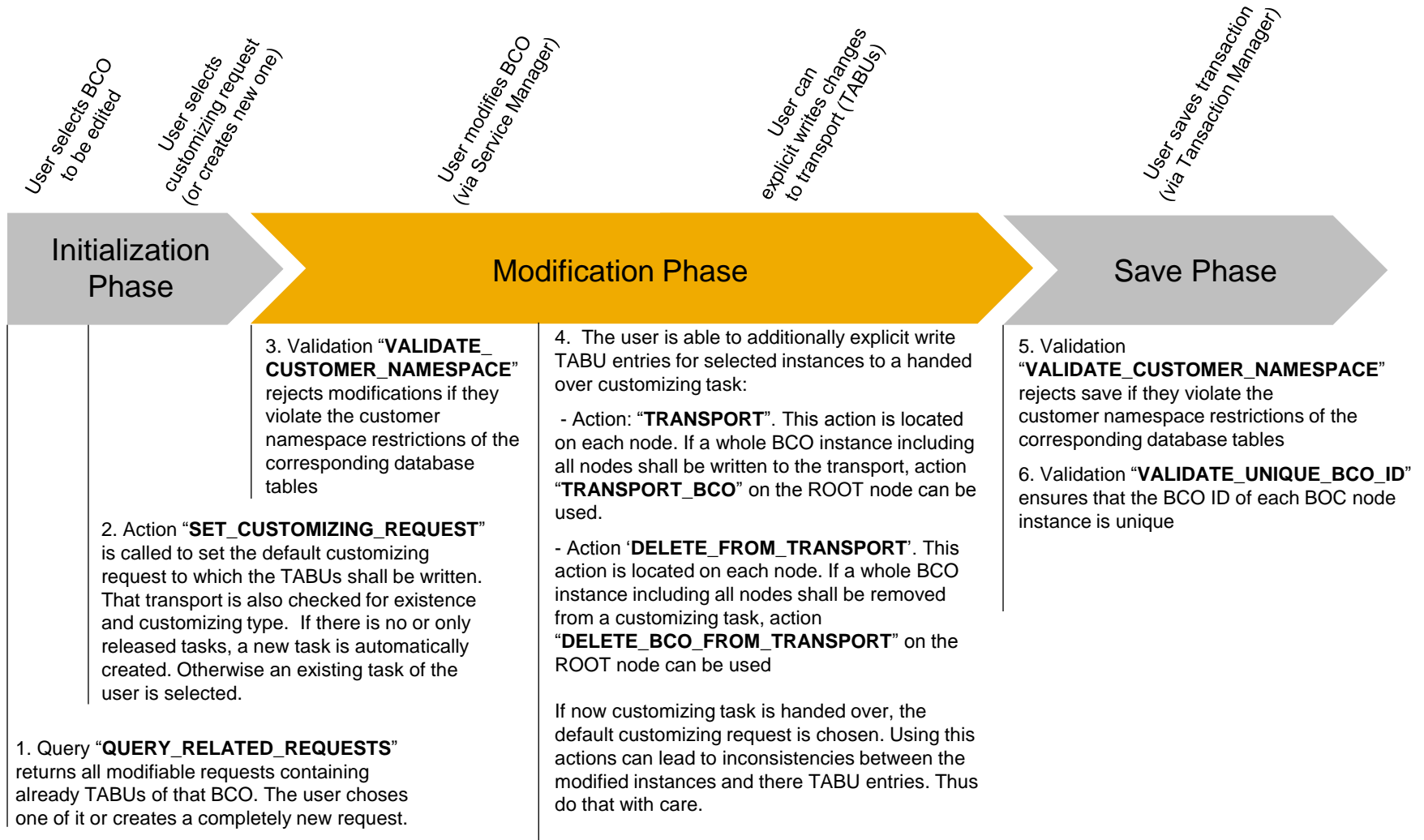
If the database table of the node is type “G” and a customer namespace is maintained, this validation finally checks if the key of the BCO instances fits to the customer namespace restriction.



Manual BCO Mode

Manual BCO Mode

Interaction of User Interface and BCO Default Entities



Manual BCO Mode

Modification Phase

a) Action TRANSPORT

The action is located on each node can be explicitly called and writes the TABUs for all instances handed over in IT_KEY. Via parameter, the scope (including subtree) can be defined.

b) Action TRANSPORT_BCO

In order to explicitly write a whole BCO instance to a transport, the action can be called. It is located at the root node and affects the whole BCO composition subtree.

Manual BCO Mode

Modification Phase

a) **Action: DELETE_FROM_TRANSPORT**

This action deletes a selected BCO node instance from a transport. It is located on each node writes the TABUs for all instances handed over in IT_KEY. The transport task number can be handed over via parameter – otherwise the default transport request is chosen.

b) **Action: DELETE_BCO_FROM_TRANSPORT**

This action deletes a whole BCO instance including all of its sub node instances from a transport. It is located only at the ROOT node of the BCO. The transport task number can be handed over via parameter – otherwise the default transport request is chosen.

Manual BCO Mode

Save Phase

1. Validation “VALIDATE_UNIQUE_BCO_ID”

This validation ensures that the alternative key values of the BCO ID (second attribute of the database table) are always unique.

2. Validation “VALIDATE_CUSTOMER_NAMESPACE”

If the database table of the node is type “G” and a customer namespace is maintained, this validation finally checks if the key of the BCO instances fits to the customer namespace restriction.



Creation of a Business Configuration Object

The following instructions are necessary until the Design Time automatically provides those entities for Business Configuration Objects

Creation of a Business Configuration Object (1/3)

BCO and Database Tables

1. Create a new Business Object
(choose category “Configuration Object” as category)
2. Each database table must be type „C“ or „G“ as it contains configuration data:
 - C: Customer table, data is maintained by the customer only
 - G: Customer table, SAP may insert new data records, but may not overwrite or delete existing data records. The customer namespace must be defined

Field	Key	Initi...	Data element	Data Type	Length	Deci...	Short Description
<u>MANDT</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>MANDT</u>	CLNT	3		0 Client
<u>BCO_ID</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>/BOBF/CONF_BCO_ID</u>	CHAR	40		0 BCO ID
<u>DB_KEY</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>/BOBF/CONF_KEY</u>	RAW	16		0 NodeID
<u>ROOT_ELEMENT</u>	<input type="checkbox"/>	<input type="checkbox"/>	<u>INT4</u>	INT4	10		0 Natural Number

In case of “G” a char-typed BCO ID element must be introduced on the node’s data structure. Afterwards the database table must be adapted. Add one or more character typed BCO ID fields after the MANDT and select them as “Key”. Ensure that the data structure is not included via an include but all of the data structure elements are components of the table. Also create an index covering MANDT and DB_KEY. Also add an unique alternative key on this field and maintain action validation “/BOBF/CL_LIB_V_ALT_KEY” to SAVE in order to ensure uniqueness.

Creation of a Business Configuration Object (2/3)

BCO Default Entities for ROOT nodes

1. **Create Query „QUERY_RELATED_REQUESTS“**
Description: Get all request related to DB of this BO
Class: /BOBF/CL_LIB_Q_BCO_REL_REQUEST
Result Structure: /BOBF/S_LIB_Q_BCO_REQUEST
Result Table Type: /BOBF/T_LIB_Q_BCO_REQUEST
2. **Action „SET_CUSTOMIZING_REQUEST“**
Description: Set the Default Customizing Request
Class: /BOBF/CL_LIB_A_BCO_SET_REQUEST
Parameter: /BOBF/S_LIB_A_BCO_SET_REQUEST
Cardinality: Static Action (No Node Instances)
Change Mode: Only Read Mode
3. ***Create Action „TRANSPORT_BCO“**
Description: Manual Transport of BCO incl. Subnodes
Class: /BOBF/CL_LIB_A_BCO_TRA_BCO
Action Parameter: /BOBF/S_LIB_A_BCO_TRA_BCO
Cardinality: Multiple Node Instances
Change Mode: Only Read Mode
4. ***Create Action „DELETE_BCO_FROM_TRANSPORT“**
Description: Delete whole BCO instance from Transport
Class: /BOBF/CL_LIB_A_BCO_DEL_BCO_TRA
Action Parameter: /BOBF/S_LIB_A_BCO_DEL_BCO_TRA
Change Mode: Only Read Mode
5. ****Create Determination „TRANSPORT_BCO“**
Description: Manual Transport of BCO incl. Subnodes
Class: /BOBF/CL_LIB_D_BCO_TRANSPORT
Category: Transient
Change Mode: Only Read Mode
Request Nodes: All Subnodes of the BO (CREATE, UPDATE, DELETE)
Determination Time: During Save (Before Writing Data)

***) Only available in Manual BCO Mode**

*****) Only available in Automatic BCO Mode**

Creation of a Business Configuration Object (3/3)

BCO Default Entities for all Subnodes (including ROOT)

- 1. Alternative Key**
Uniqueness: **BCO_ID** (=second attribute of the database table - Name and Type of the BCO_ID attribute can be changed)
Data Type: Unique
Data Table Type: /BOBF/CONF_BCO_ID
Data Table Type: /BOBF/T_CONF_BCO_ID
- 2. Action Validation:** **VALIDATE_UNIQUE_BCO_ID**
Description: Ensure that BCO ID is unique at save
Class: /BOBF/CL_LIB_V_ALT_KEY
Configured to action: SAVE
- 3. Action Validation:** **VALIDATE_CUSTOMER_NAMESPACE**
Description: Check for compliant Customer Namespace
Configured to action: CREATE, UPDATE, DELETE and SAVE
Class: /BOBF/CL_LIB_V_BCO_CUST_NAMESP
- 4. *Action:** **TRANSPORT_INSTANCE**
Description: Manual Transport of Node Instances
Class: /BOBF/CL_LIB_A_BCO_TRA_INS
Change Mode: Only Read Mode
Cardinality: Multiple Node Instances
Parameter: /bobf/s_lib_a_bco_tra_ins
- 5. *Action:** **DELETE_INSTANCE_FROM_TRANSPORT**
Description: Delete BCO node instance from Transport
Class: /BOBF/CL_LIB_A_BCO_DEL_INS_TRA
Action Parameter: /BOBF/S_LIB_A_BCO_DEL_INS_TRA
Change Mode: Only Read Mode

*) Only available in Manual BCO Mode

**) Only available in Automatic BCO Mode

Further Hints

- Only the ROOT node of the BCO must be separate loadable
- Dependent Objects are not supported within BCOs
- You can use determination “/BOBF/CL_LIB_D_BCO_WRITE_KEY” to fill the with the key of the instance in case of one character-typed key field



Thank you

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