BOPF Delegation Concept

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Agenda

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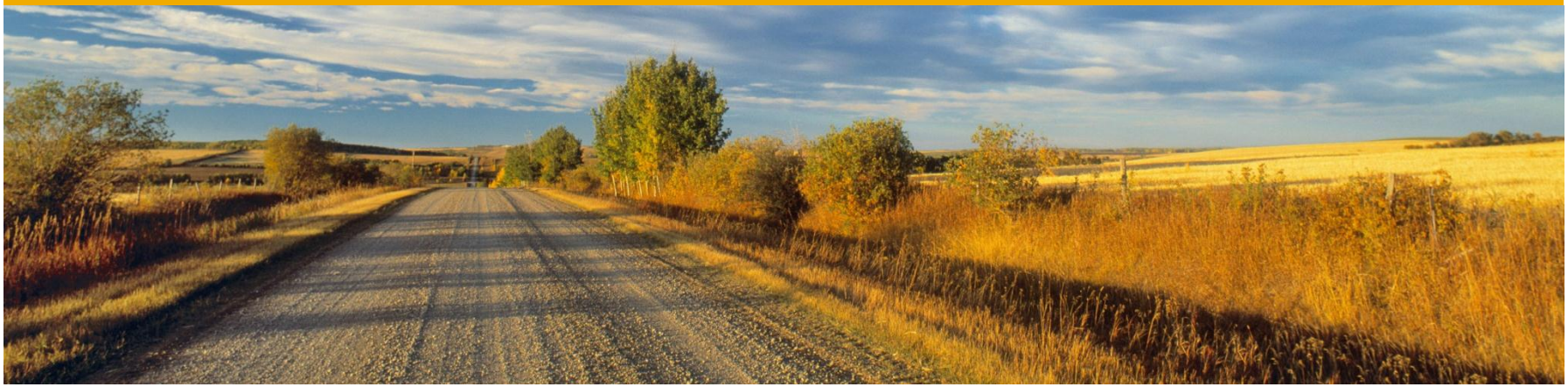
BOPF Delegation Concept

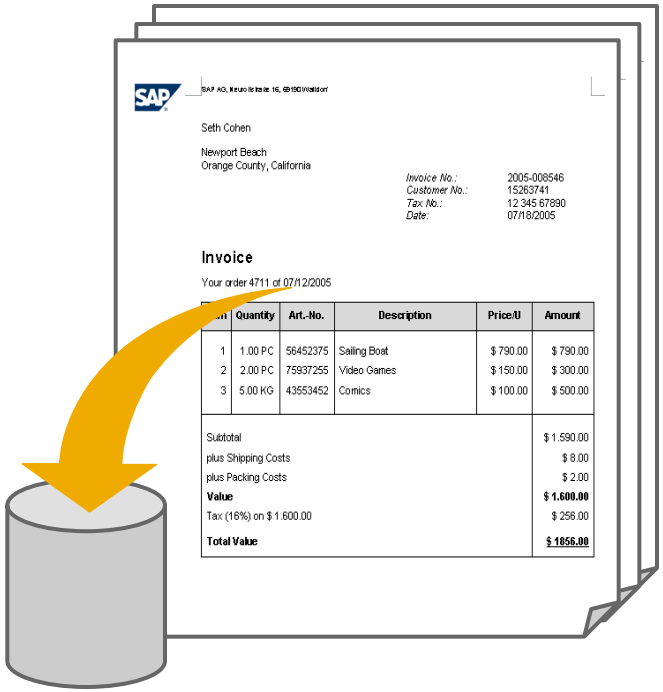
Use Case: Dependent Objects

Accessing Dependent Objects



Introduction

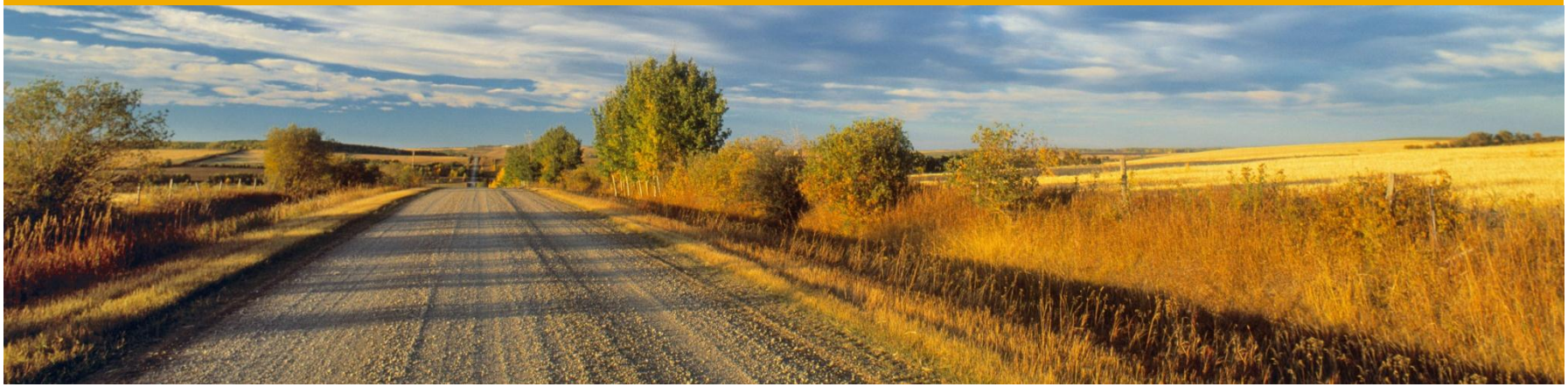
Introduction



The business object “ customer_invoice” is to save all documentsgenerated in addition to the invoice.

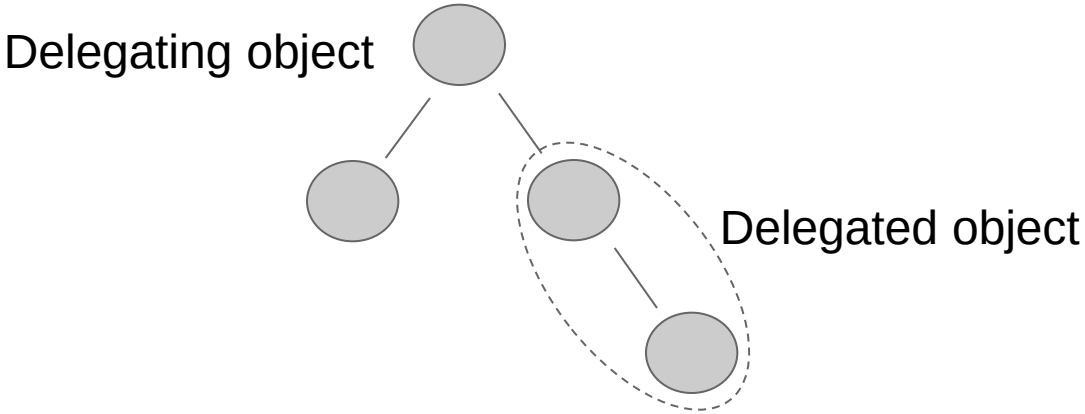
Many other business objects need this function too.

If parts of the logic of many business objects are redundant, it is advisable to extract this functional and to reuse it.



BOPF Delegation Concept

Overview



Principle: Parts of the model and functiona are delegated to a separate object (delegated object).

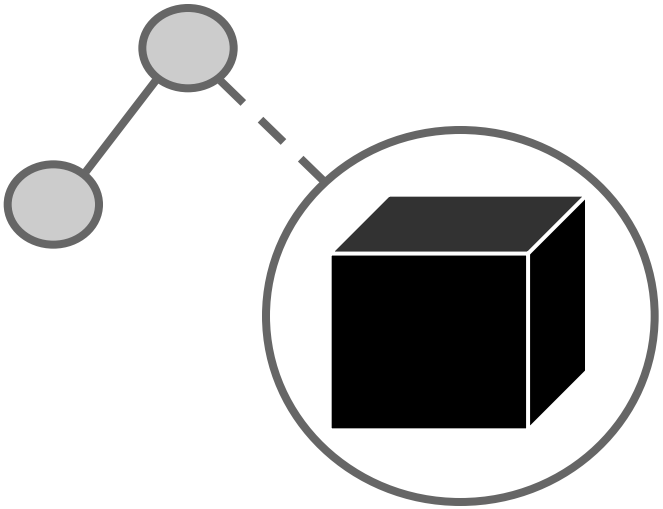
The delegating object can define additional constraints on the delegated part, e.g.:

- Overrule dynamic properties
- Perform additional validations
- Restrict dynamic value sets

This delegated object contains

- Its own business logic (e.g. actions, determinations, validations)
- Its own persistency, buffer handling, and delegations to delegated objects

Black Box Approach

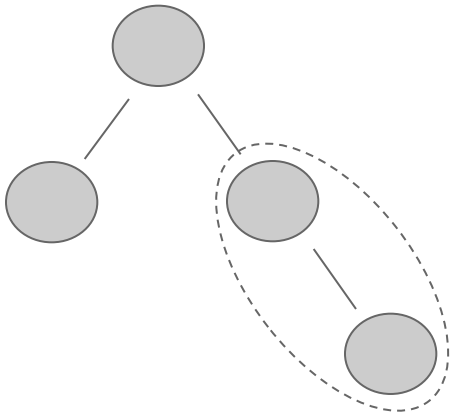


BOPF implements a Black Box Approach

- At design time, only a representation node of the delegated model exists.
- At runtime, the complete model is assembled and used.
- **Pro:** Model changes of the delegated object do not invalidate the model of the delegating object.
- **Con:** Modeling of additional logic in delegated parts not always possible.

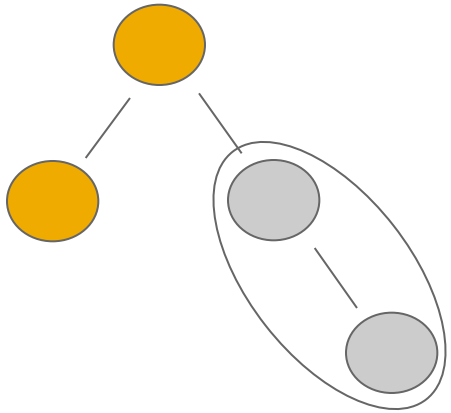
Viewpoints of the Delegation Concept

Service Consumer Model View



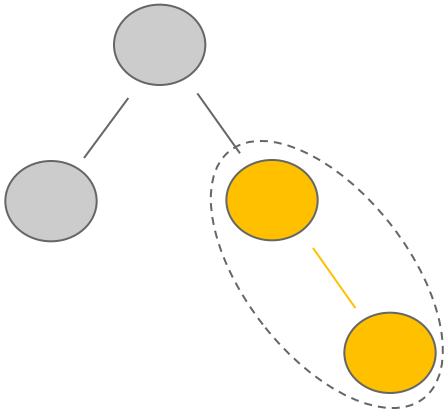
The delegation is not visible for the service consumer.

Delegating Object Model View



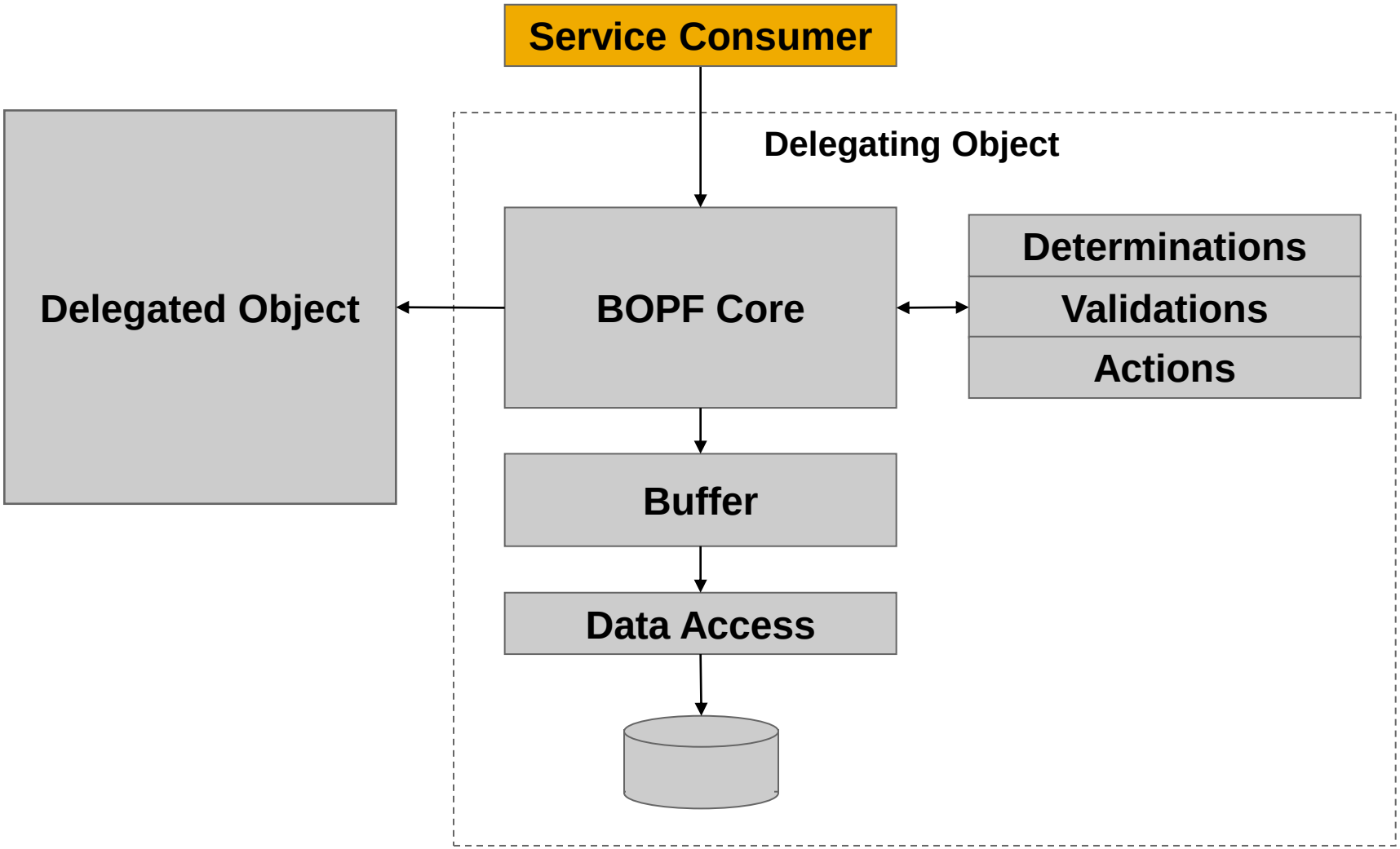
Only the delegation node is visible.

Delegated Object Model View

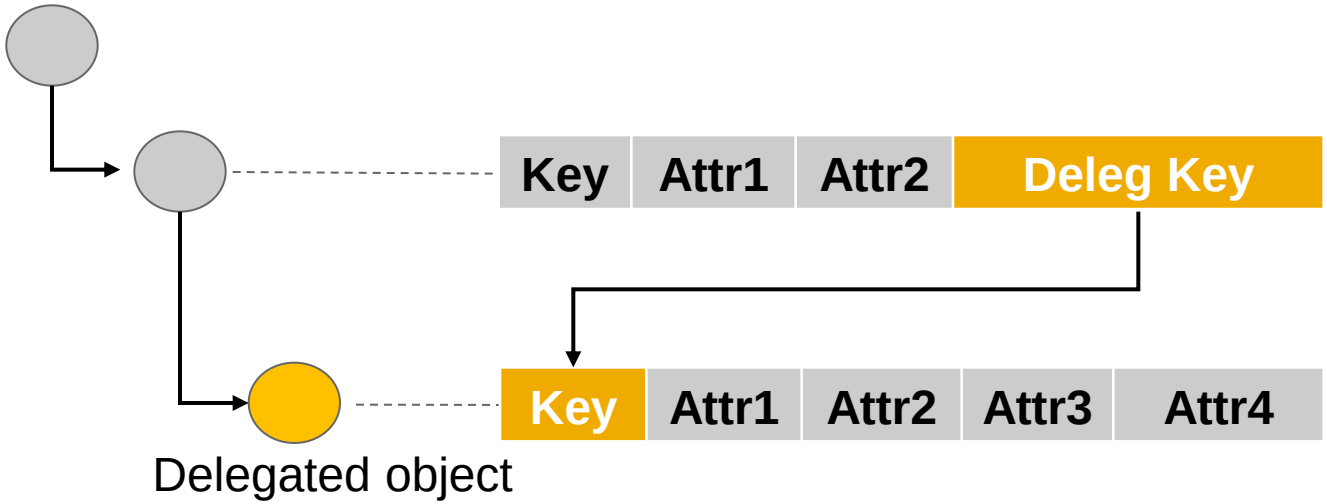


Only the internal structure of the delegated object is visible.

Architecture

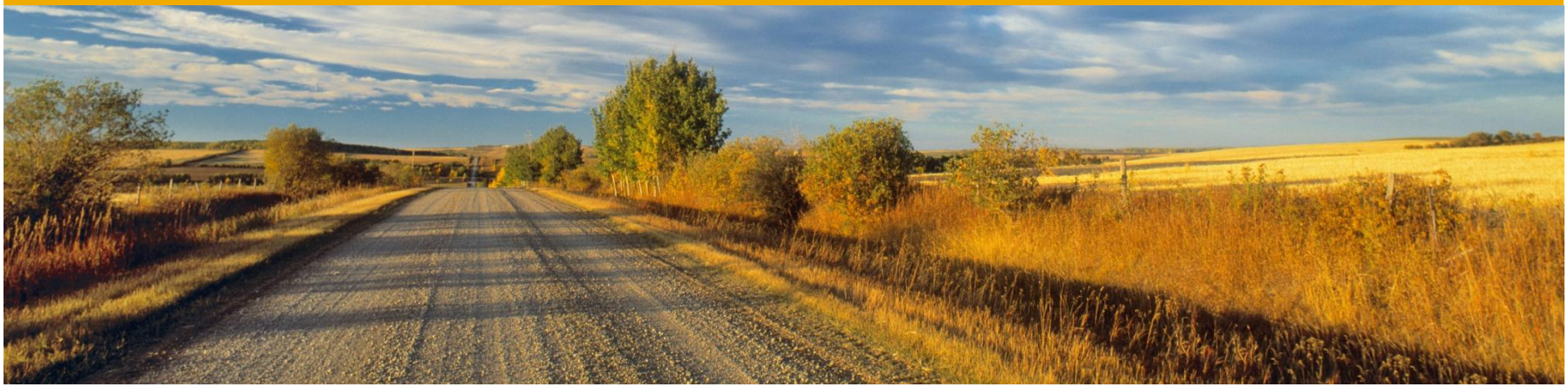


Connection



Usually, the delegating object persists a foreign key of the delegated object:

- The key is created by the delegated object and has to be unique.
- The key is usually an attribute of the hosting node (e.g. a GUID or ID) but it can also be the technical key of the hosting node (e.g. `KEY`).



Use Case: Dependent Object

Overview

The BOPF delegation concept is used to include dependent objects.

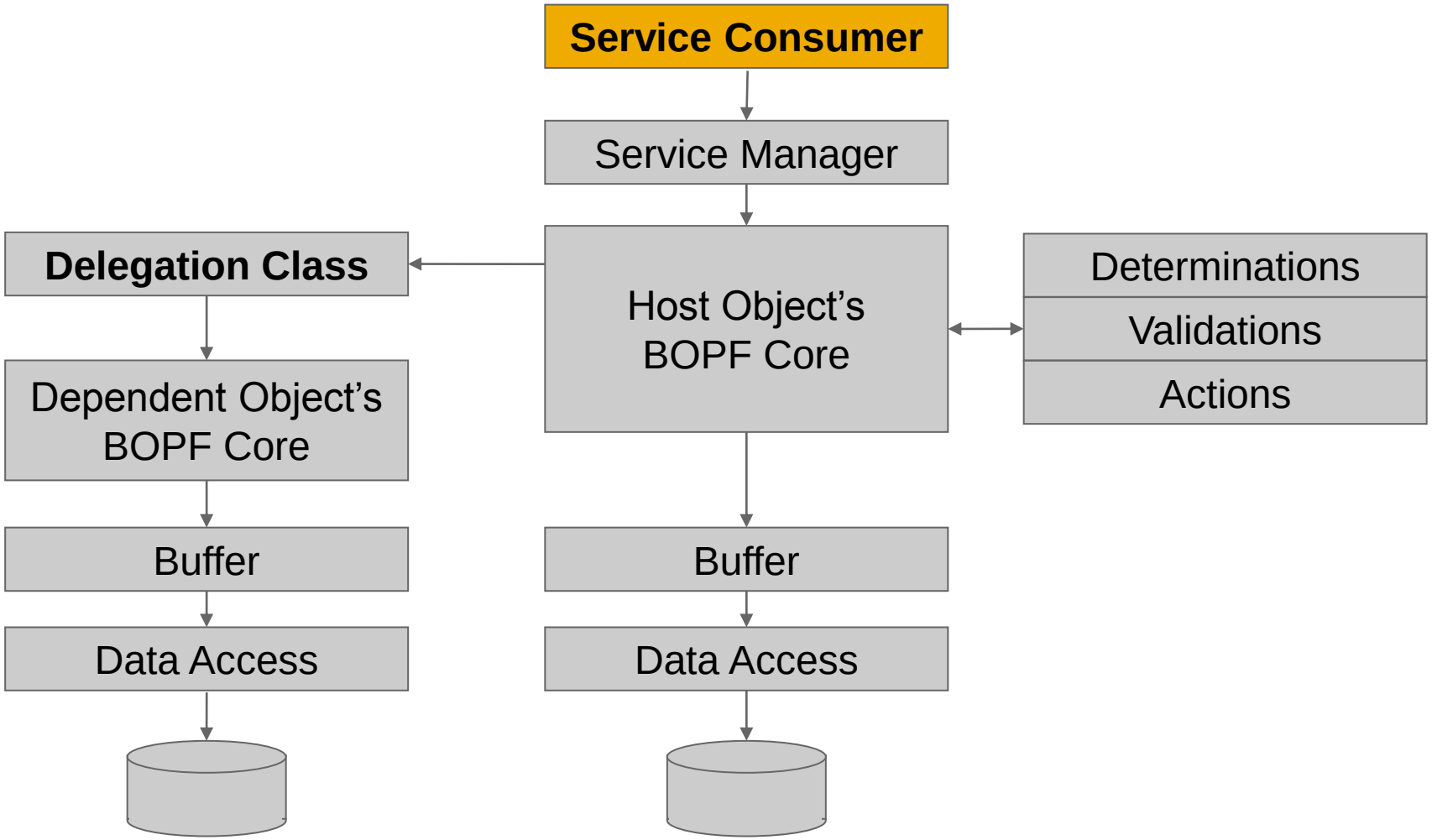
Naming

- Delegating object is called “Host Object” (HO)
- Delegated object is called “Dependent Object” (DO)

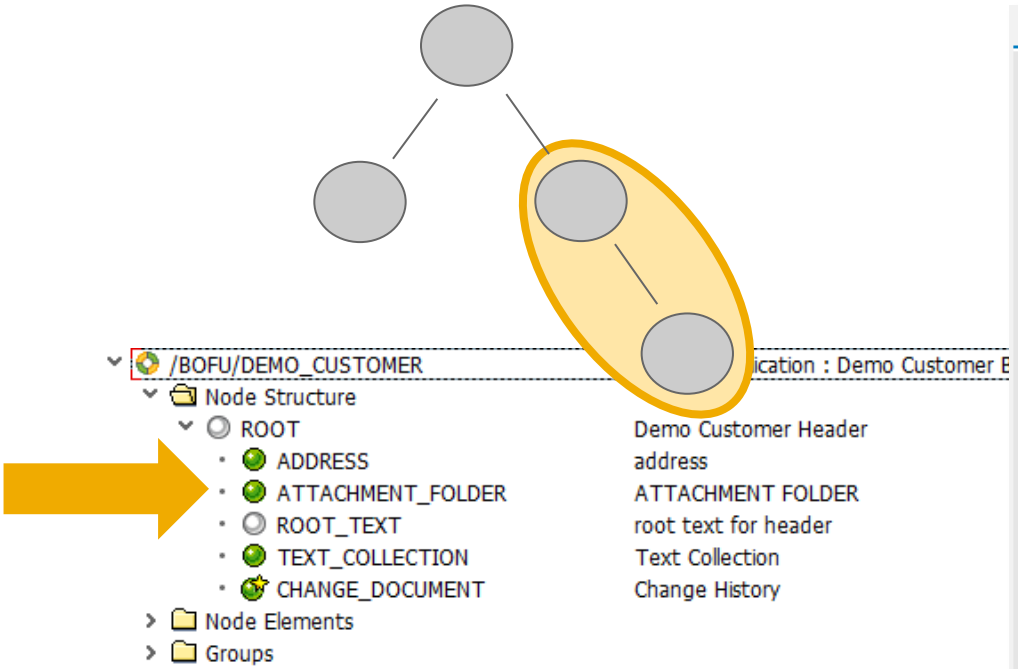
Dependent objects rules

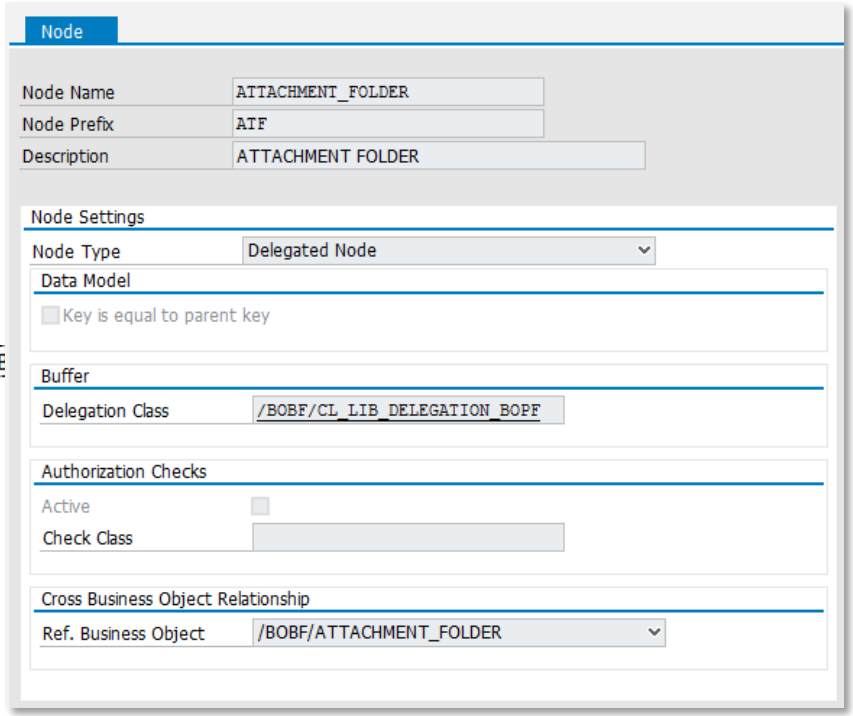
- Only host objects are allowed to access dependent objects.
- A dependent object can also be a host object containing another dependent object.
- Each dependent object instance belongs to exactly one host object.
- The dependent object cannot call its own host object.
- All model entities of the dependent object are visible for service consumer of the host object, except for queries
- All nodes of the Dependent Object are locked always by the Host Object

Architecture



Delegated Nodes





Delegated nodes are placeholders for dependent objects.

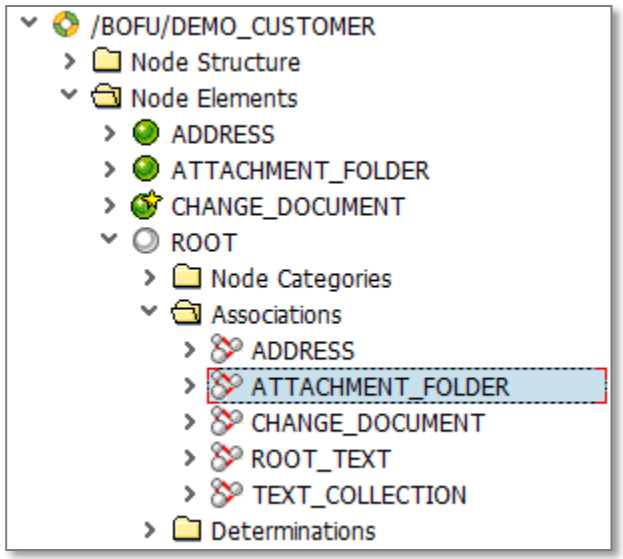
These nodes are modeled and can be used within the configuration like normal nodes.

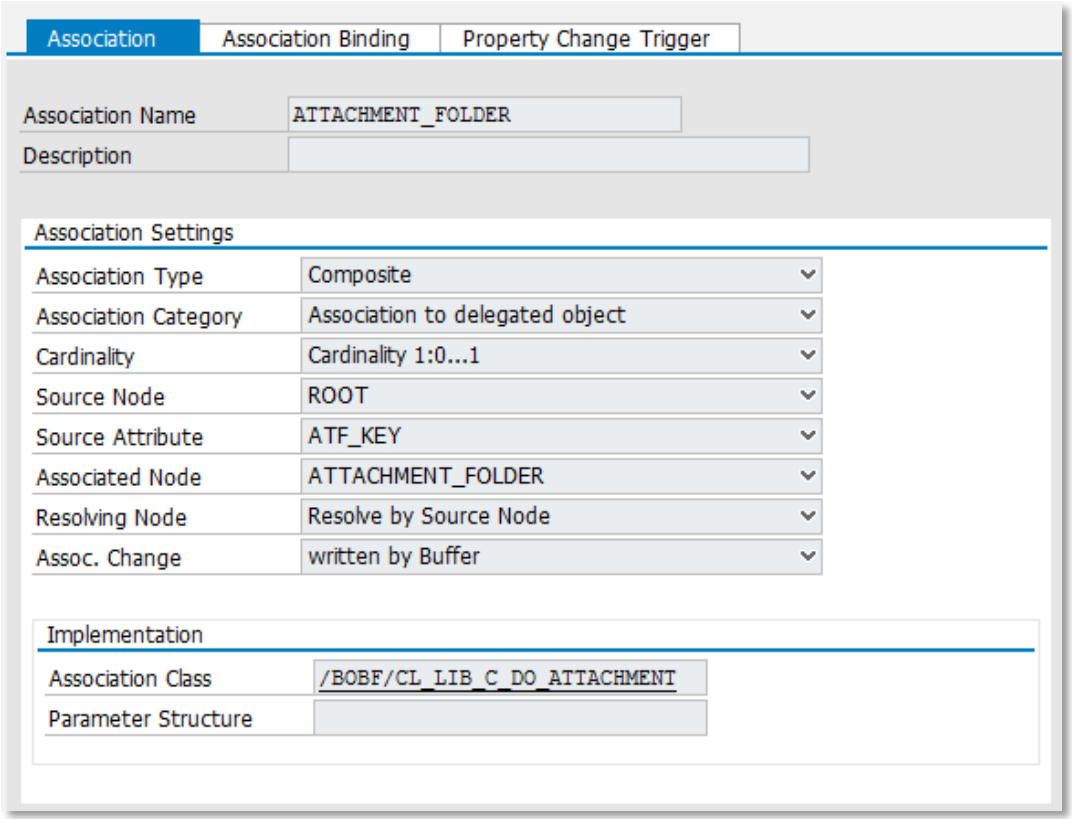
During runtime, these nodes are replaced by the complete structure of the dependent object.

Delegated nodes can also be assigned to a consistency group.

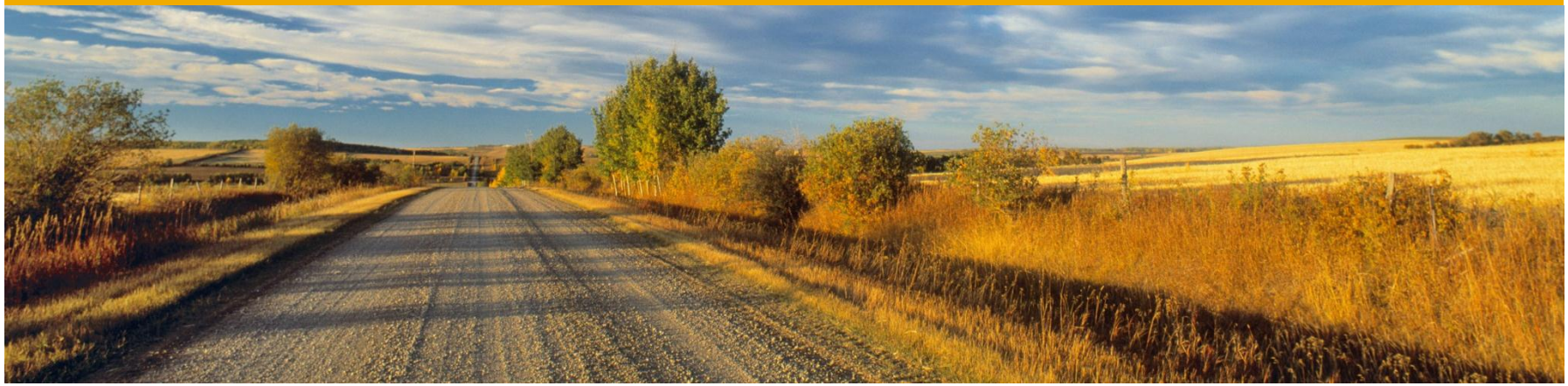
Only internal calls can perform queries on delegated nodes. These calls are delegated to the dependent object.

Connection Between Delegated Node and Delegation Object



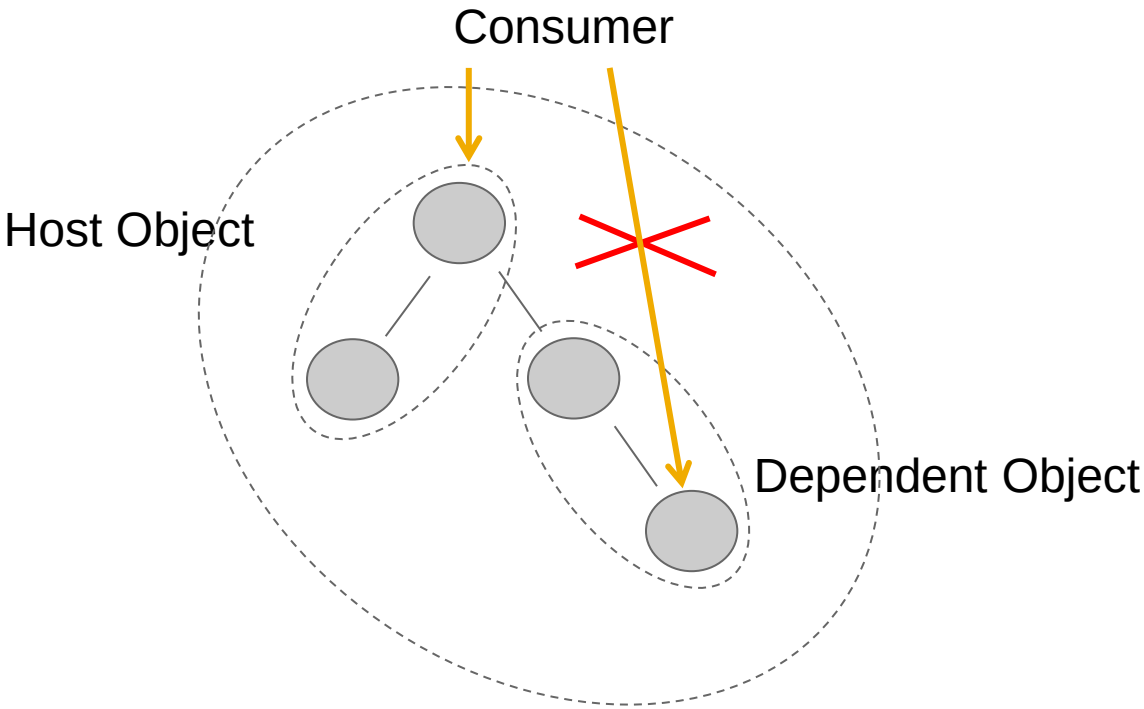


All associations from and to the delegated object are only known by the delegating object. Since the buffer layer cannot provide these associations, they have to be implemented. These associations are usually foreign key associations.



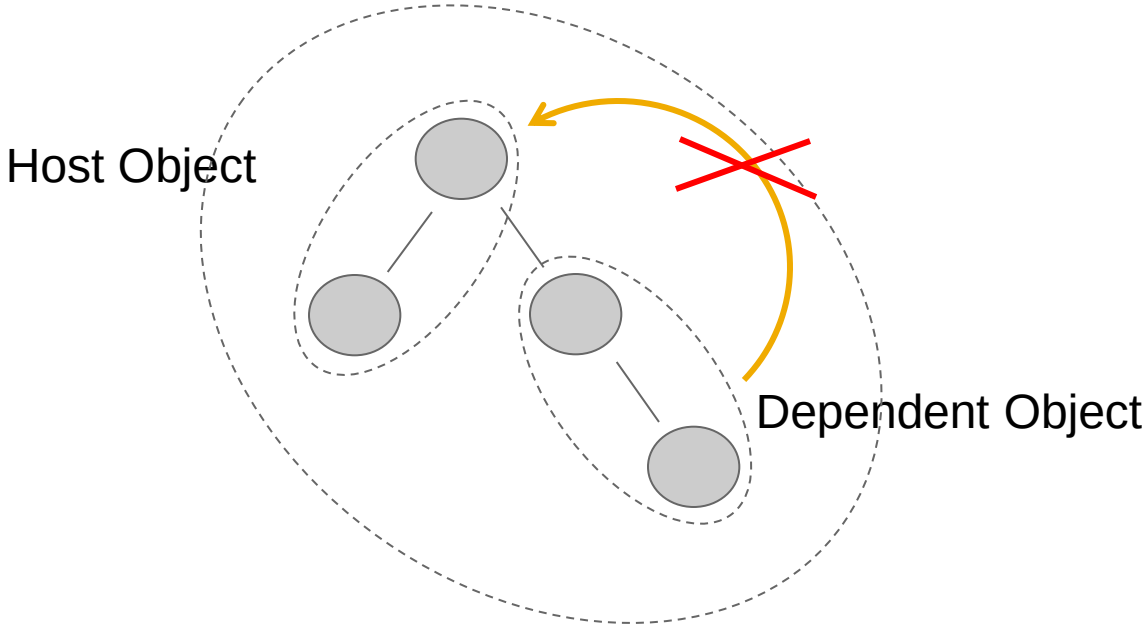
Accessing Dependent Objects

Using Dependent Object Entities as a Consumer



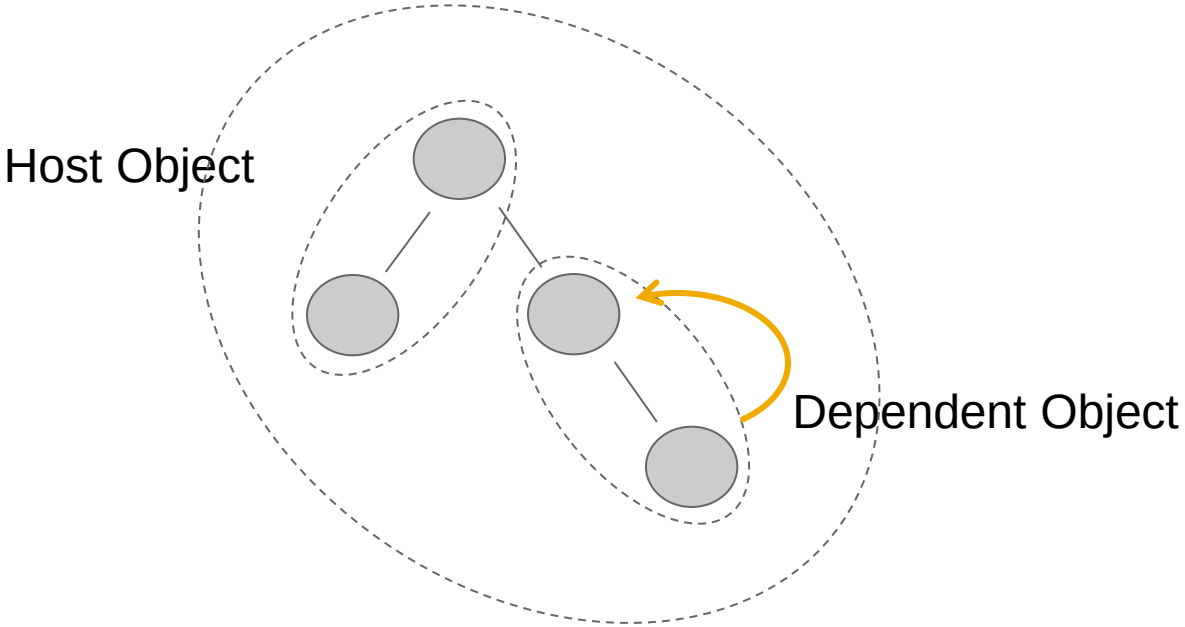
The consumer must only access the host object via the service manager. This service manager offers access to all entities (e.g. actions) including those from the dependent object.

Using Host Object Entities as a Depedent Object Entity



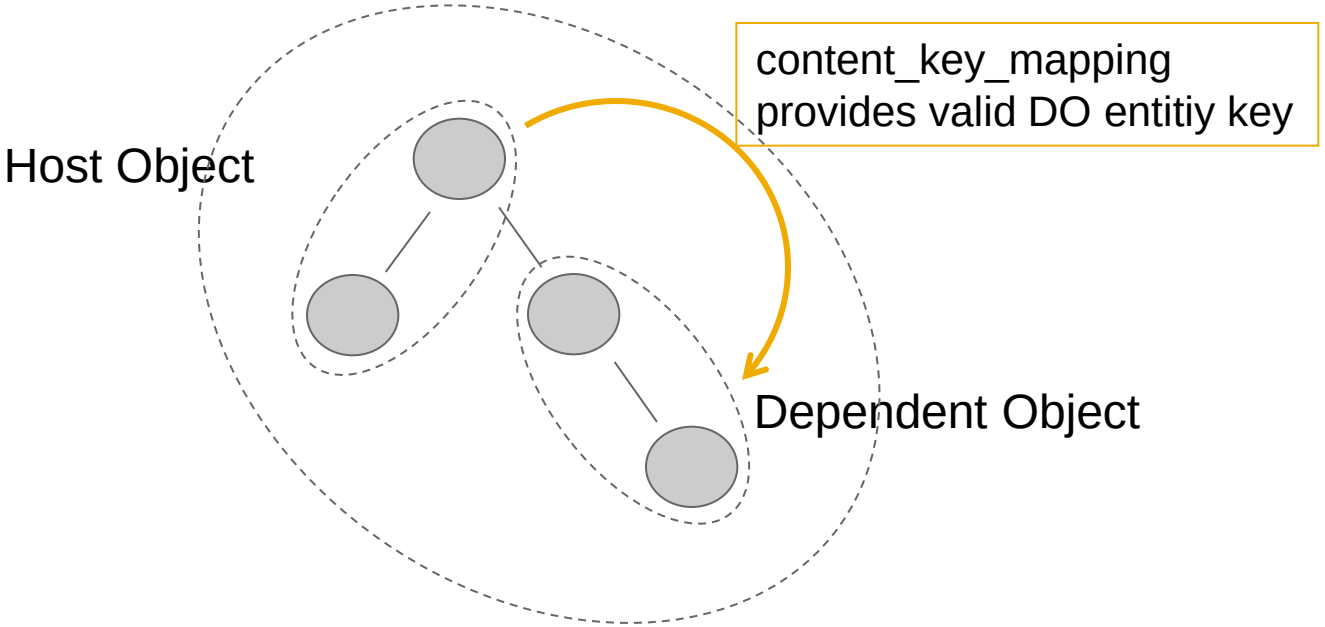
Entities of the dependent object must not use entities from the host object. This is because each host object could have a different set of entities. For instance, invoking a certain action on the host object root node only works for a certain host object.

Using Dependent Object Entities as a Dependent Object Entity



The dependent object entities may access entities from the dependent object by the help of the dependent object's constant interface, just by using io_read and io_modify.

Using Dependent Object Entities as a Host Entity



In order to access an entity of the dependent object out of an entity implementation (e.g. action) of the host object, its key must be first mapped.

This is because the same dependent object could be included multiple times in the same host object. However each node of a business object must be unique. Thus at runtime, a mapping is needed.

Content Key Mapping

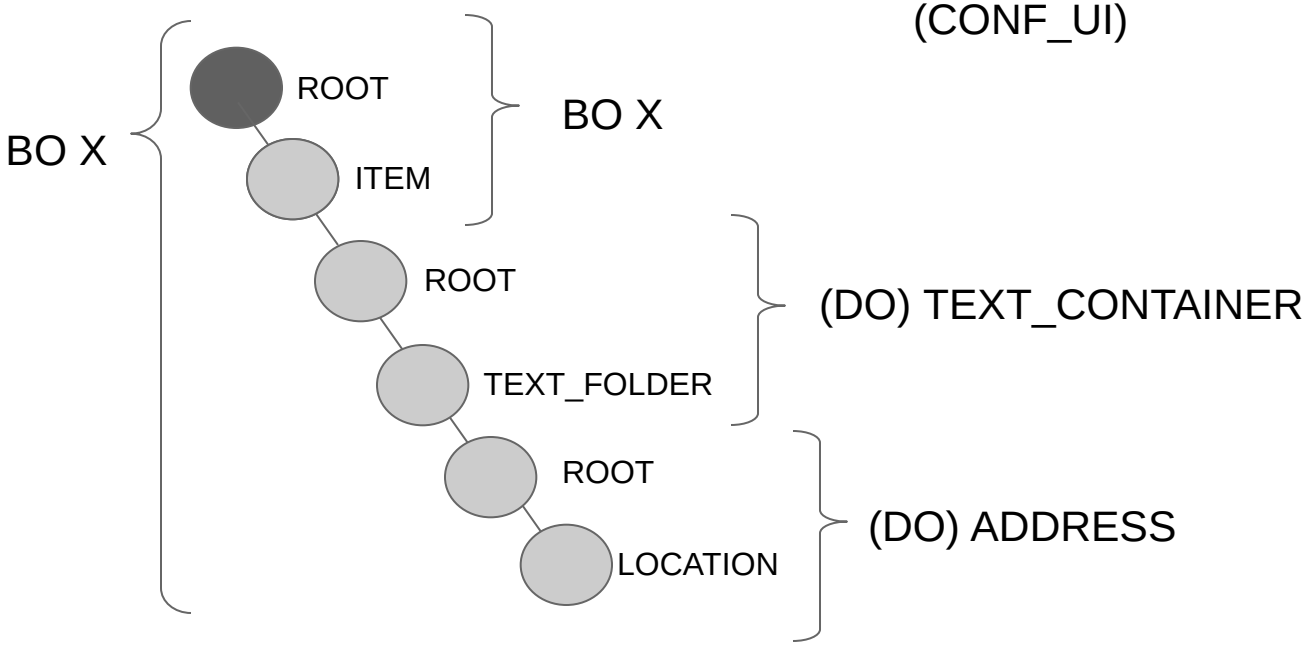
Use the method GET_CONTENT_KEY_MAPPING of the configuration of the host object in order to receive the valid key of an entity of the dependent object:

- **IV_CONTENT_CAT**
  (E.g. /BOBF/IF_CONF_C=>SC_CONTENT_ACT for an action
  /BOBF/IF_CONF_C=>SC_CONTENT_ASS for an association
  /BOBF/IF_CONF_C=>SC_CONTENT_NOD for a node)
- **IV_DO_CONTENT_KEY**
  Key of the entity out of the DO's constant interface
- **IV_DO_ROOT_NODE_KEY**
  Key of the representation node of the Host Object's constant interface
- **EV_CONTENT_KEY**
  Key of the entity, which can be used to address this entity by the help of core services like retrieve, do_action, retrieve_by_association…

Example Use Case:
Usage of two Dependent Objects

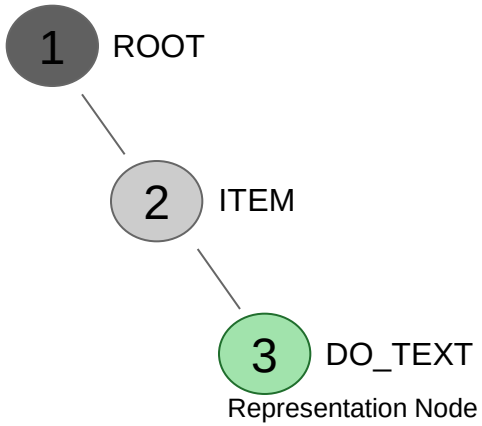
Runtime Viewpoint

Designtime Viewpoint
(CONF_UI)



Designtime Viewpoints of the a Business Object and its Dependent Objects

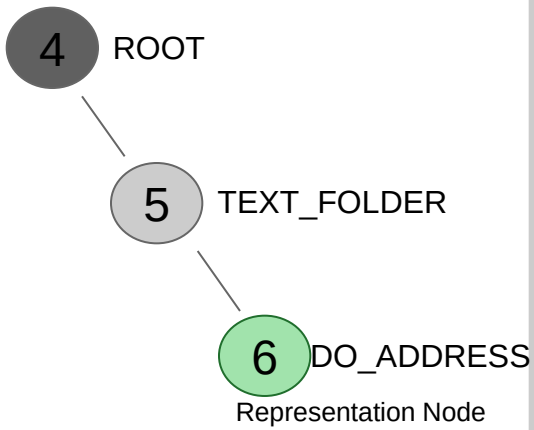
BO Customer Invoice



IF_CONST_CUST_C

ROOT = „1“
ITEM = „2“
DO_TEXT = „3“

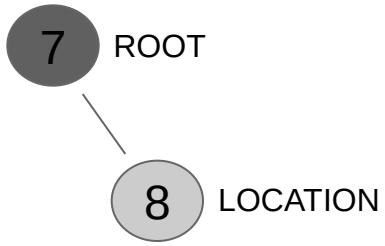
DO Text Container



IF_CONST_TEXT_C

ROOT = „4“
TEXT_FOLDER = „5“
DO_ADDRESS = „6“

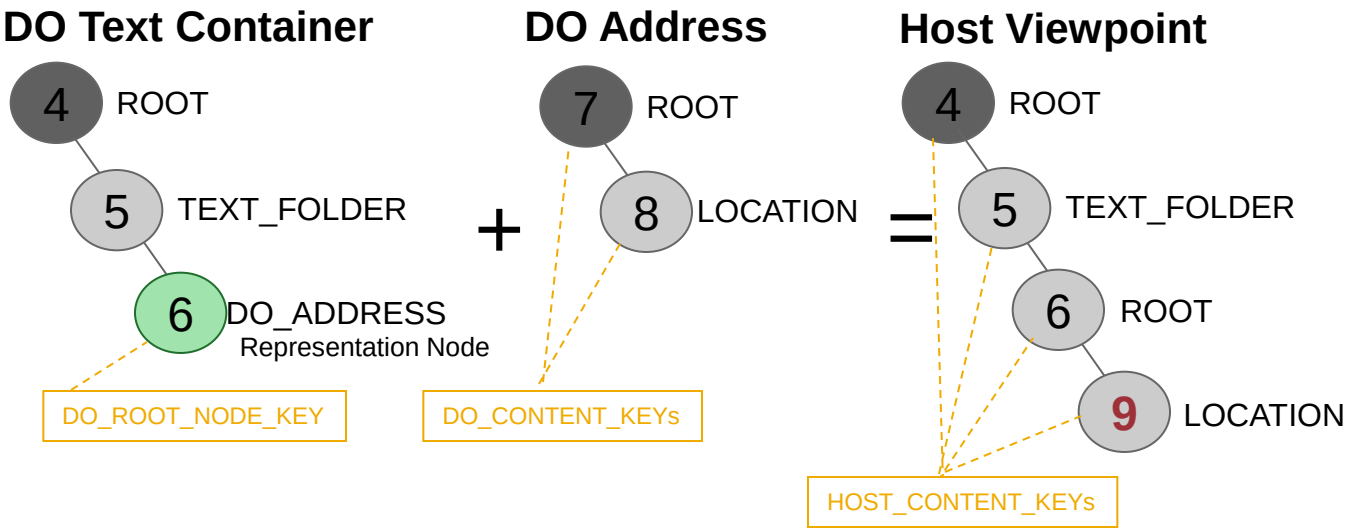
DO Address



IF_CONST_ADDRESS_C

ROOT = „7“
LOCATION = „8“

Creating the Content Key Mapping Table (1)



Table, used by get_content_key_mapping of the configuration object of DO Text Container:

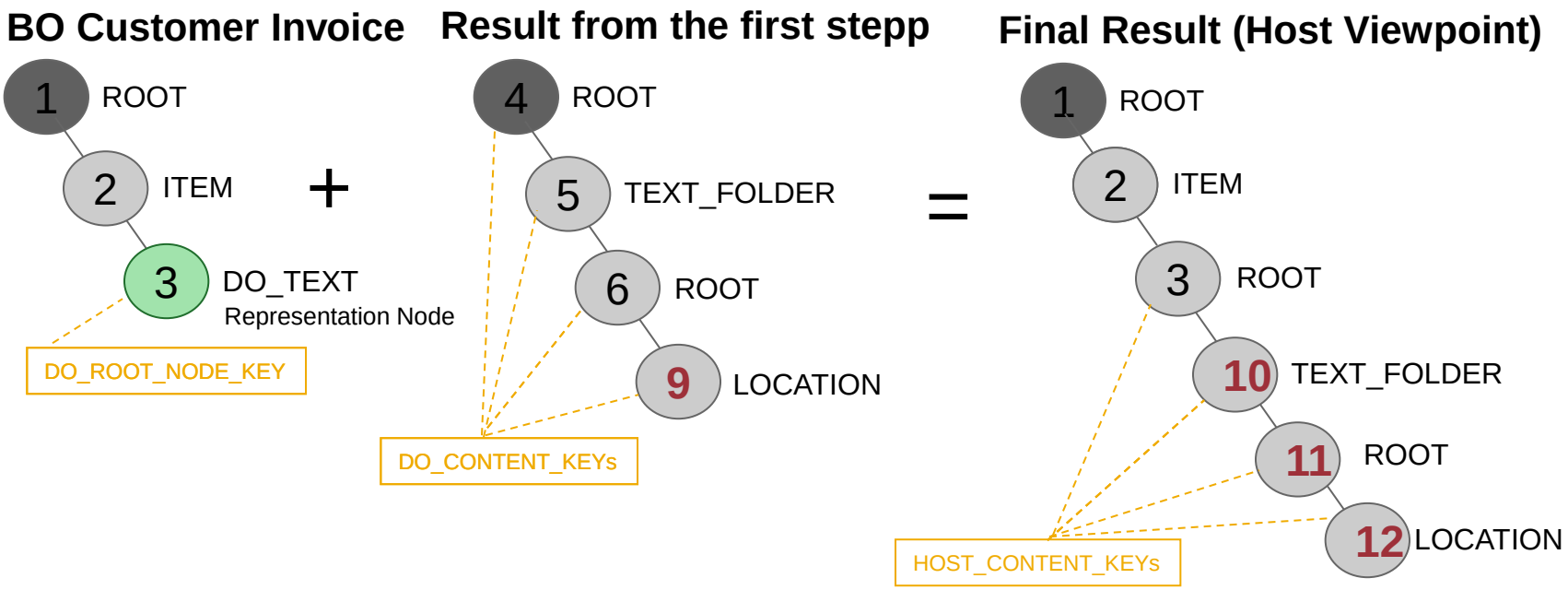
7 ROOT:

CONTENT_CAT	Node
HOST_CONTENT_KEY	6 DO_ADDRESS
DO_CONTENT_KEY	7 ROOT
DO_ROOT_NODE_KEY	6 DO_ADRESS

8 LOCATION:

CONTENT_CAT	Node
HOST_CONTENT_KEY	9 (new)
DO_CONTENT_KEY	8 LOCATION
DO_ROOT_NODE_KEY	6 DO_ADDRESS

Creating the Content Key Mapping Table (2)



Table, used by get_content_key_mapping of the configuration object of BO customer invoice

4 ROOT:

CONTENT_CAT	Node
HOST_CONTENT_KEY	3 DO_TEXT
DO_CONTENT_KEY	4 ROOT
DO_ROOT_NODE_KEY	3 DO_TEXT

6 ROOT:

CONTENT_CAT	Node
HOST_CONTENT_KEY	11 (new)
DO_CONTENT_KEY	6 ROOT
DO_ROOT_NODE_KEY	3 DO_TEXT

5 TEXT_FOLDER:

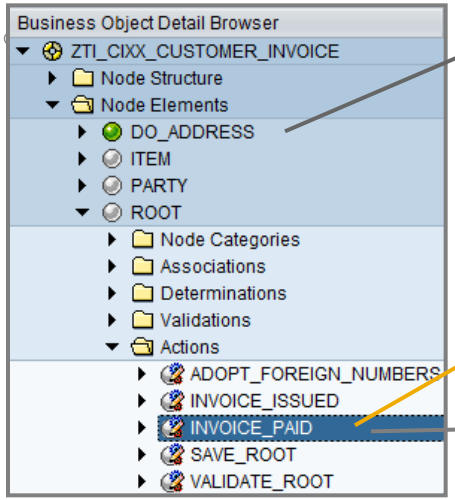
CONTENT_CAT	Node
HOST_CONTENT_KEY	10 (new)
DO_CONTENT_KEY	5 TEXT_FOLDER
DO_ROOT_NODE_KEY	3 DO_TEXT

9 Location

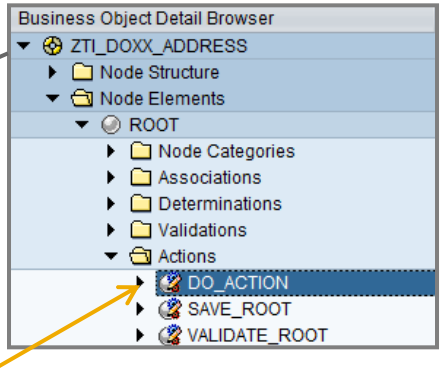
CONTENT_CAT	Node
HOST_CONTENT_KEY	12 (new)
DO_CONTENT_KEY	9 LOCATION
DO_ROOT_NODE_KEY	3 DO_TEXT

Example of Content Key Mapping

Host Object



Dependend Object



Scenario:
Action INVOICE_PAID of the HO calls action DO_ACTION of the DO

```
data:
  lo_conf          type ref to /bobf/if_frw_configuration,
  lv_do_action_key type        /bobf/act_key,
  lt_key           type        /bobf/t_frw_key.

" 1. get configuration
try.
    lo_conf = /bobf/cl_frw_factory=>get_configuration( iv_bo_key = zti_cixx_customer_invoice_c=>sc_bo_key ).
  catch /bobf/cx_frw.
endtry.

" 2. get key of the do's action by the help of content key mapping
lo_conf->get_content_key_mapping(
  exporting
    iv_content_cat      = /bobf/if_conf_c=>sc_content_act
    iv_do_content_key   = zti_doxx_address_c=>sc_action-root-do_action
    iv_do_root_node_key = zti_cixx_customer_invoice_c=>sc_node-do_address
  receiving
    ev_content_key      = lv_do_action_key ).

" 3. call the do's action
io_modify->do_action(
  exporting
    iv_act_key    = lv_do_action_key
    it_key        = lt_key ).
```

Thereto the DO‘s action key must received by the help of content key mapping first

Finally the DO‘s action can be called

Thank you

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