SESP-2015
System Reference Data Base
From H/P to EGS-CC

24-26/03/2015

SESP-2015 – SRDB – From HP to EGS-CC

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Introduction

- Yesterday
  - HPSDB (Herschel / Planck System Data Base) has been specified to support the two main ESA requirements:
    - "Commonality" (understood as commonalities between the two spacecraft's and as sharing of the same data between different users of the data base),
      - This was achieved via the "physical instantiation" and "category flags",
    - "Smooth transition" (understood as the re-use of validated data between different phases of the program up to operations),
      - This was achieved via the "logical instantiation" and "category flags".
- Today
  - SRDB is an adaptation of HPSDB for the MTG program. Only one major change impacts the concept: capability to attach a former version of an object while, in HPSDB, only the most recent version can be attached.
- Tomorrow
  - SRDB to be adapted to interface with EGS-CC systems. The impacts on the "high level data model" (Product structure) should be limited, the impacts on the "low level data model" should be important but reduced thank to the abstraction level on SRDB (Items and pseudo-items).

Rules (to understand the next viewgraphs)

- This is an « **object** » (Blue border)

- This is an « **item** » (Green border)

- This is a « **pseudo-item** » (Underlined)

List of TM parameters
Category flag: AIT
Parameter reference: **M001**,
OffsetByte: 5,
Offsetbit: 7

- This is a « **modified inherited item** » (Violet border)

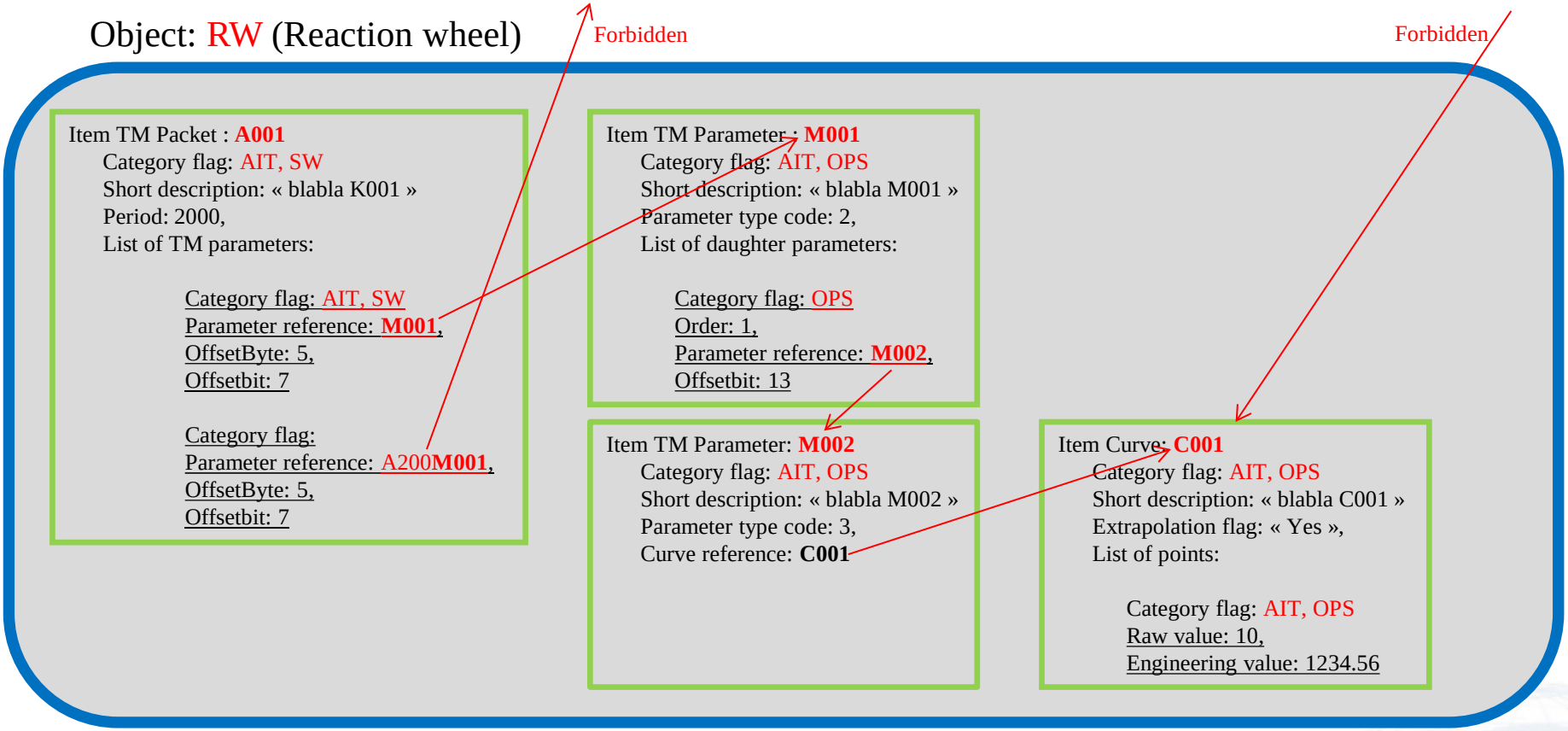
- This is **important** (Red color)

*A101*K001

- This is the **item core identifier** part (bold) **M001** **C001**
  - **A**xxx for TM packet identifier,
  - **C**xxxx for curve identifier,
  - **D**xxx for synthetic parameter identifier,
  - Gxxx for group item identifier.
  - **K**xxx fior constant identifier,
  - **M**xxx for TM parameter identifier.

- This is the item instantiation identifier part (Italic) *A101*M001 *RW*C001

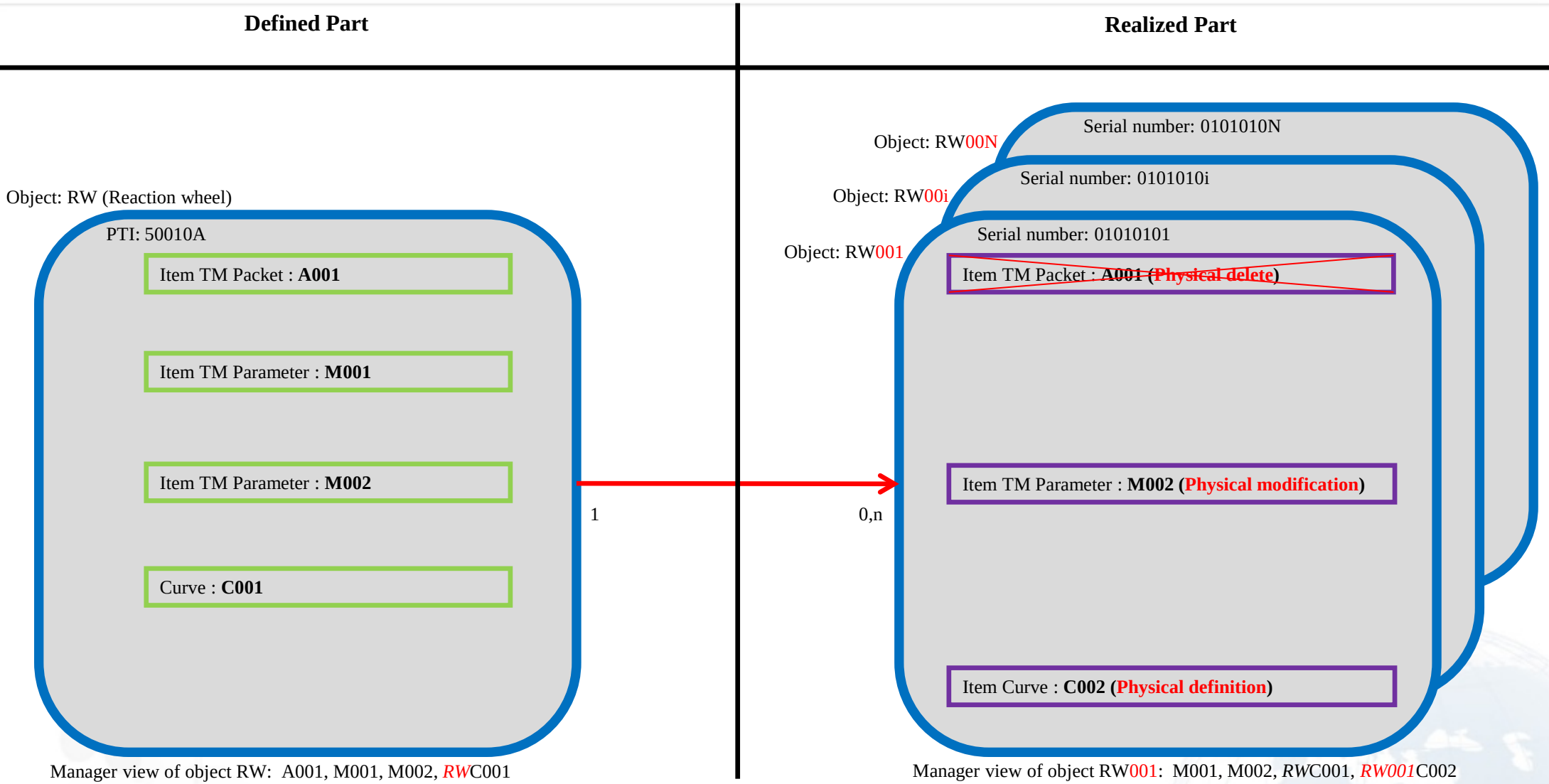
Definitions: Object / item / pseudo-item



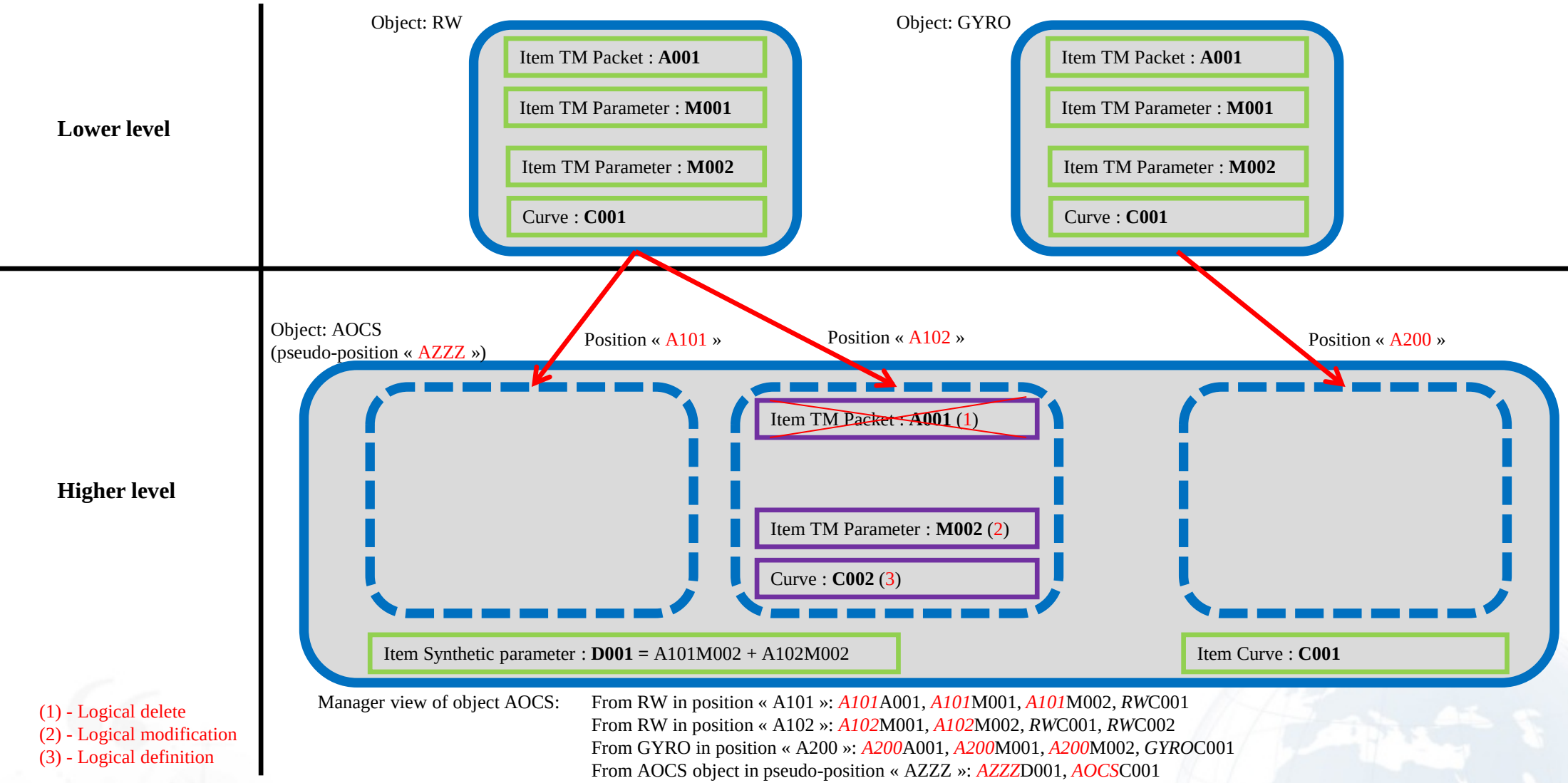
Manager view of object RW: A001, M001, M002, *RW*C001 (this view is consistent)
AIT user view of object RW: A001, M001 (without the pseudo-item, M002, *RW*C001 (this view is consistent)
OPS user view of object RW: M001, M002, *RW*C001 (this view is consistent)
SW user view of object RW: A001

Main constraint: any object view is consistent.

Physical instantiation



Logical instantiation



Manager view of object AOCS:
From RW in position « A101 »: *A101*A001, *A101*M001, *A101*M002, *RW*C001
From RW in position « A102 »: *A102*M001, *A102*M002, *RW*C001, *RW*C002
From GYRO in position « A200 »: *A200*A001, *A200*M001, *A200*M002, *GYRO*C001
From AOCS object in pseudo-position « AZZZ »: *AZZZ*D001, *AOCS*C001

(1) - Logical delete
(2) - Logical modification
(3) - Logical definition

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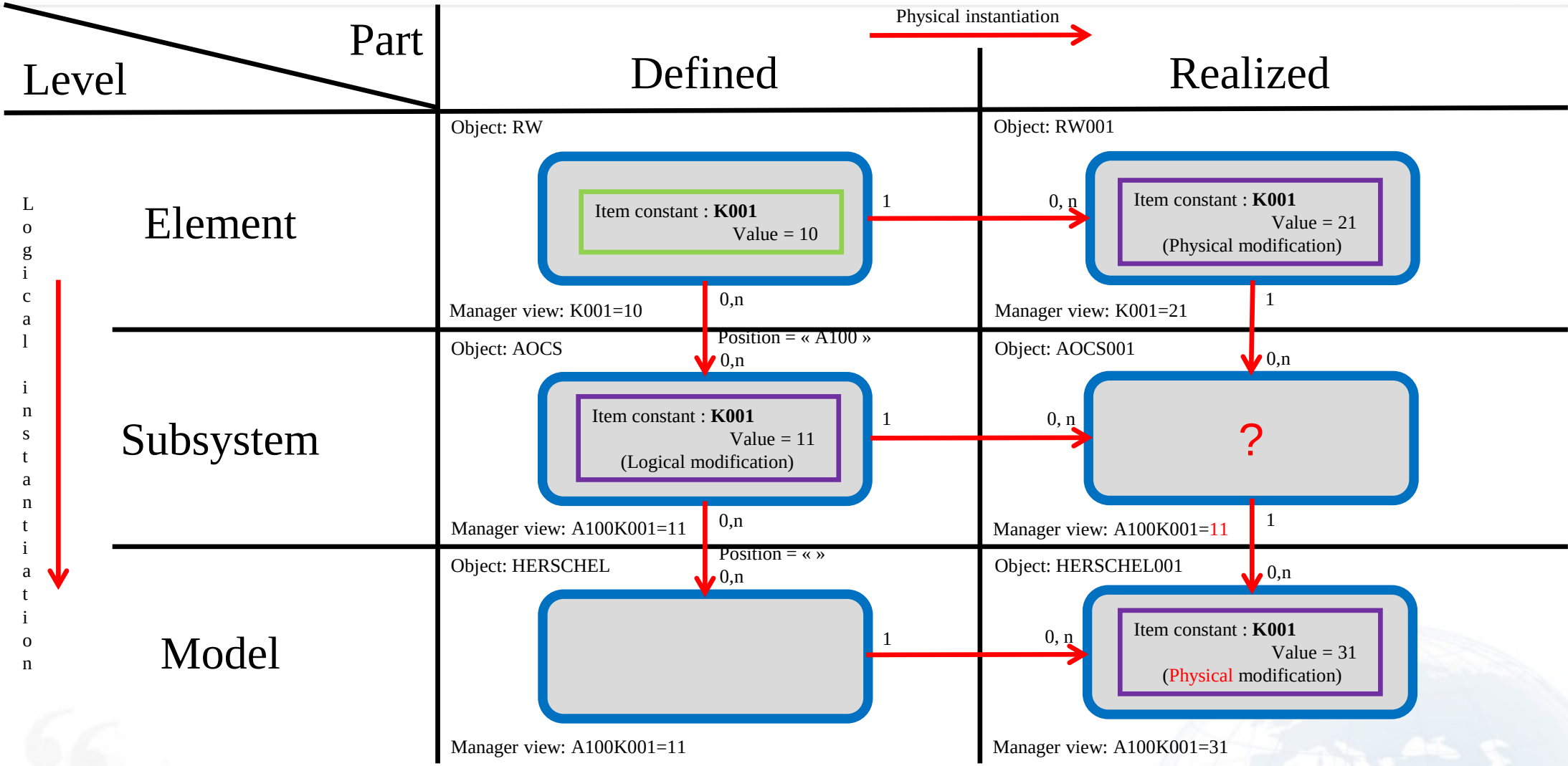
Physical and Logical instantiations



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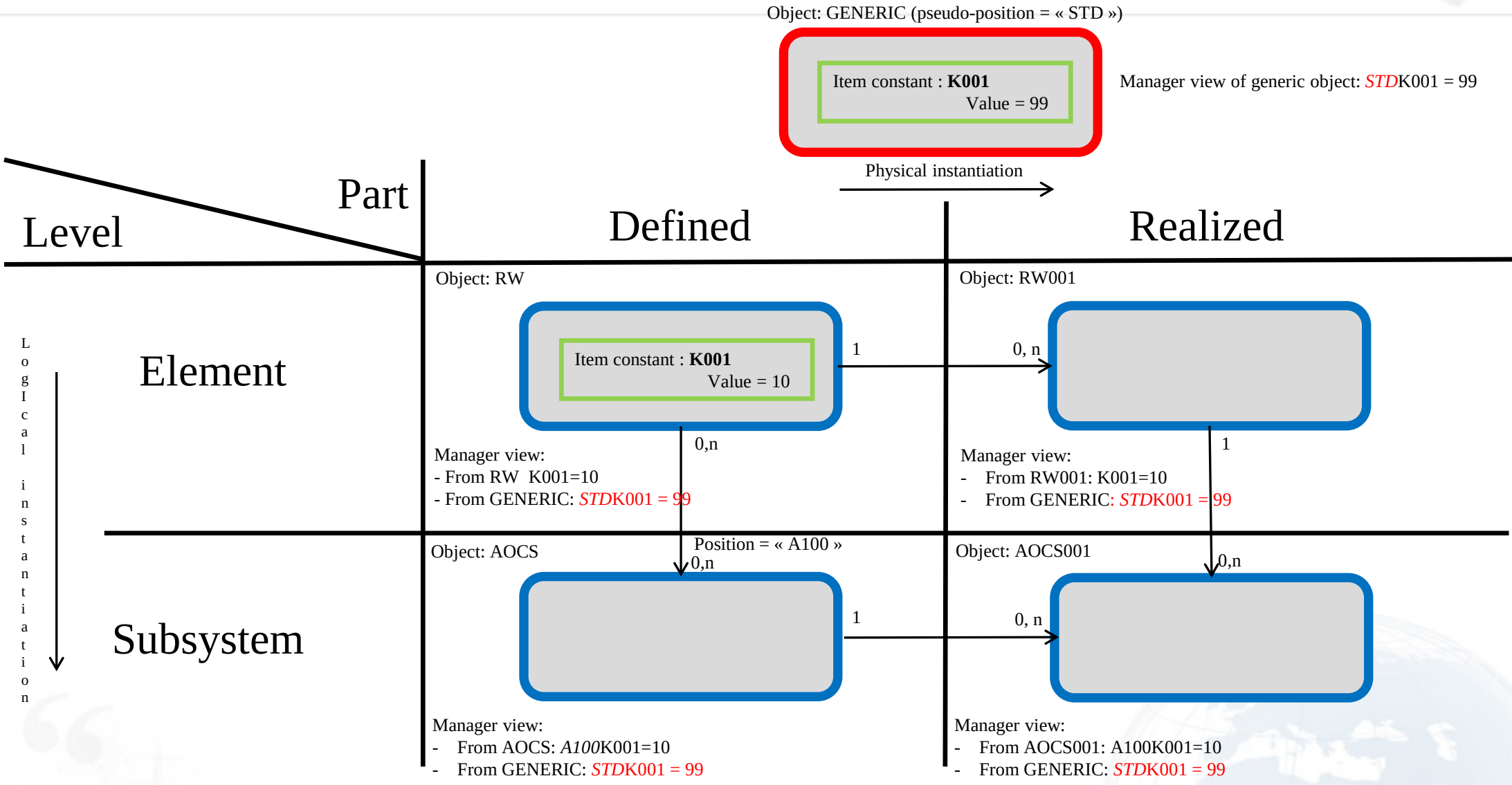
Generic object



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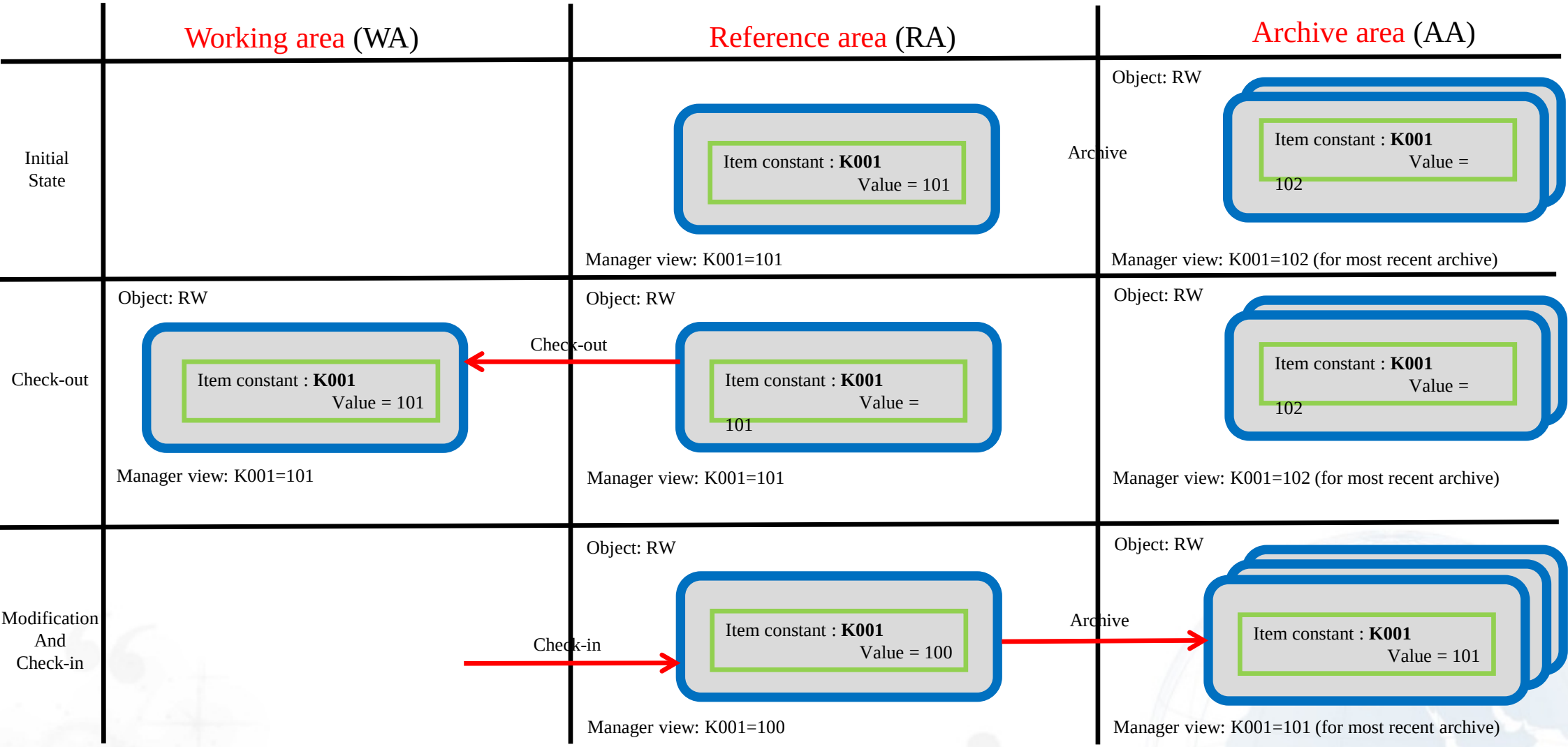
Areas



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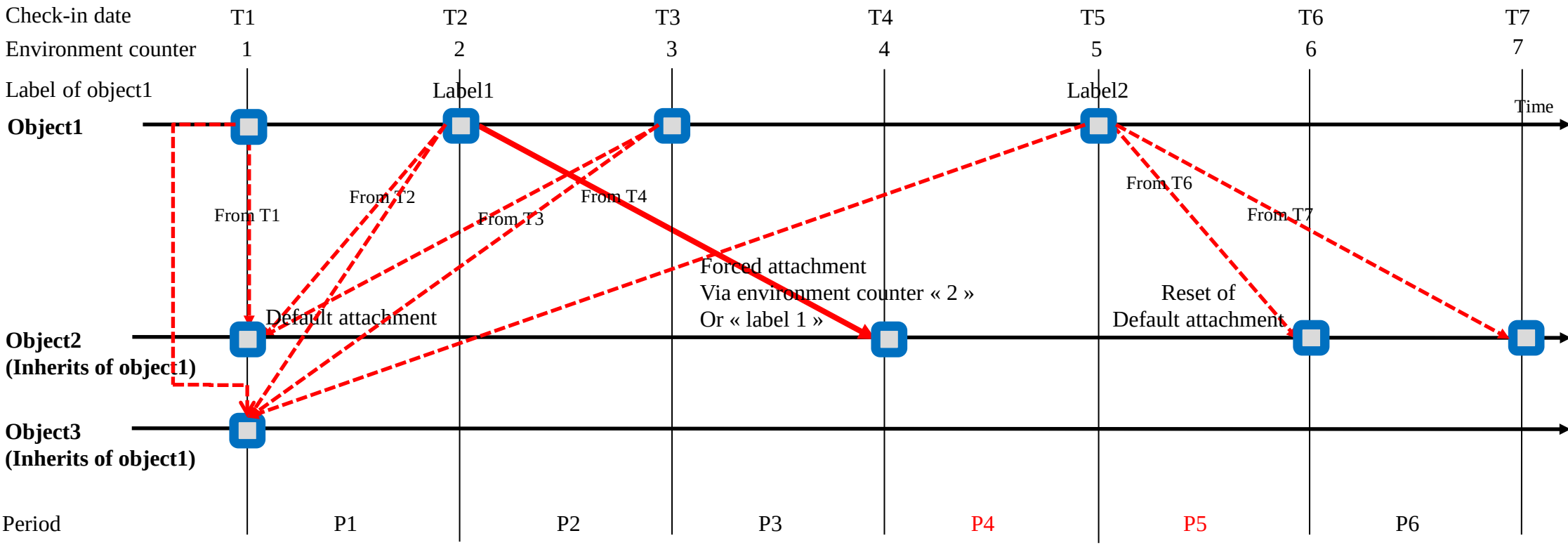
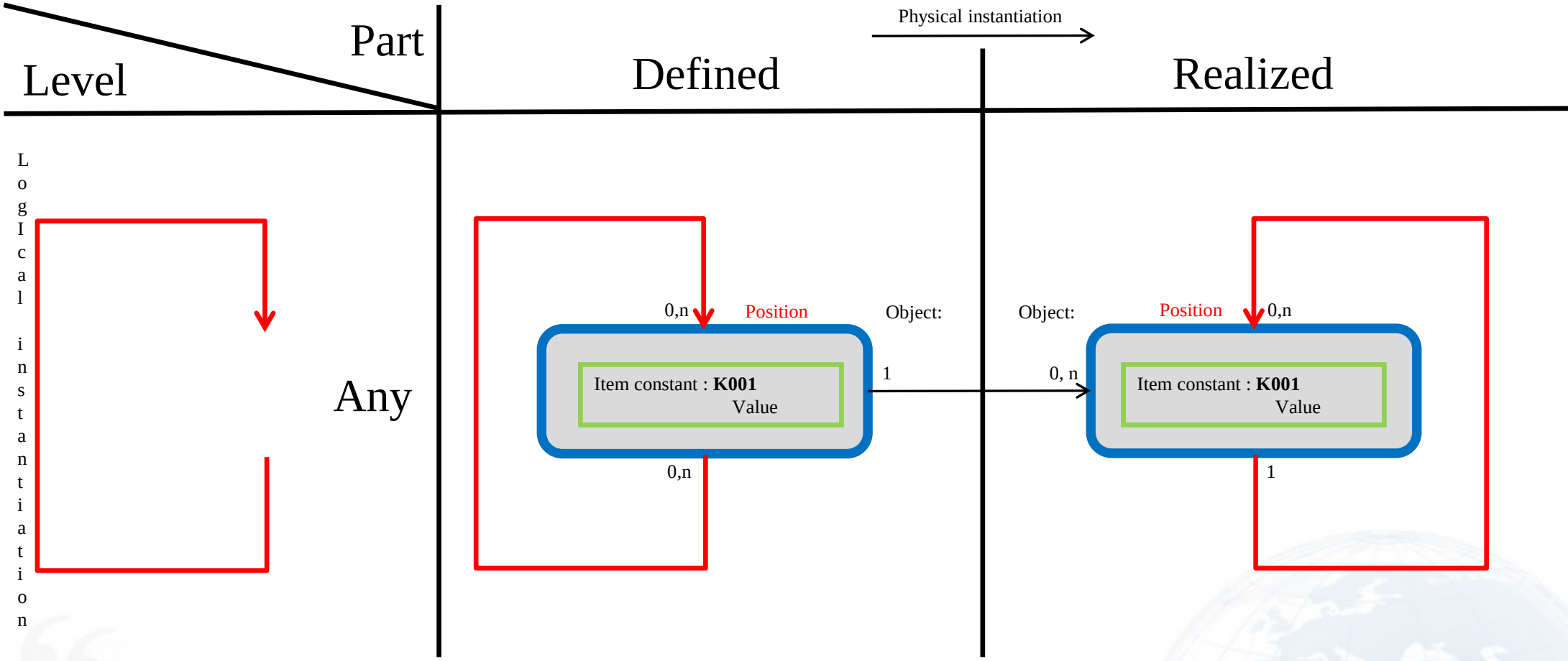
Object versionning



Manager view:

During period P1: Object2 inherits of object1 at T1 (Automatic propagation) –	Object3 inherits of object1 at T1 (Automatic propagation) -	Common object1 view
During period P2: Object2 inherits of object1 at T2 (Automatic propagation) –	Object3 inherits of object1 at T2 (Automatic propagation) -	Common object1 view
During period P3: Object2 inherits of object1 at T3 (Automatic propagation) –	Object3 inherits of object1 at T3 (Automatic propagation) -	Common object1 view
During period P4: Object2 inherits of object1 at T2 (No automatic propagation) -	Object3 inherits of object1 at T4 (Automatic propagation) -	Different object1 view
During period P5: Object2 inherits of object1 at T2 (No automatic propagation) -	Object3 inherits of object1 at T5 (Automatic propagation) -	Different object1 view
During period P6: Object2 inherits of object1 at T5 (Automatic propagation) -	Object3 inherits of object1 at T5 (Automatic propagation) -	Common object1 view

Configurable number of levels



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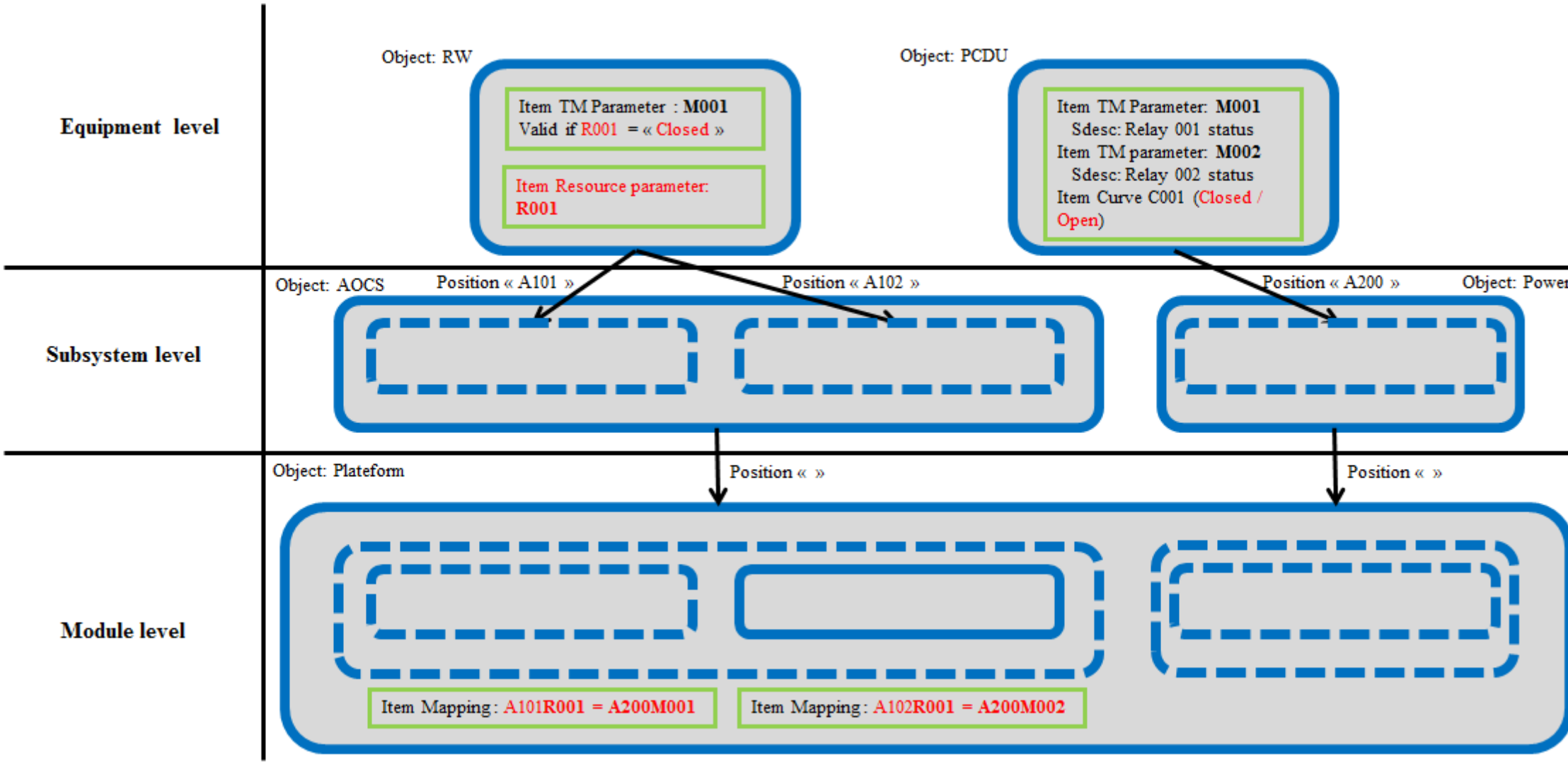
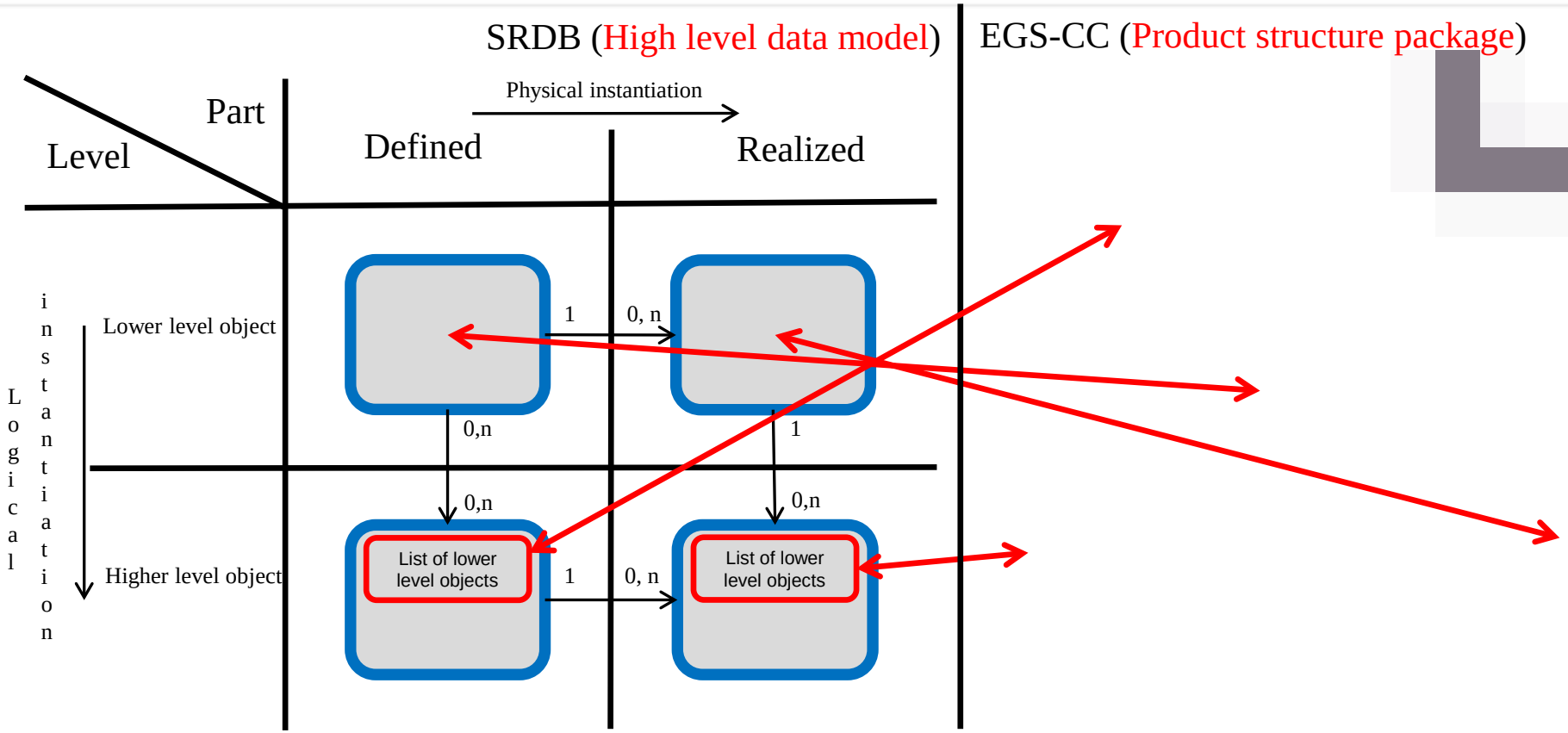
Resource

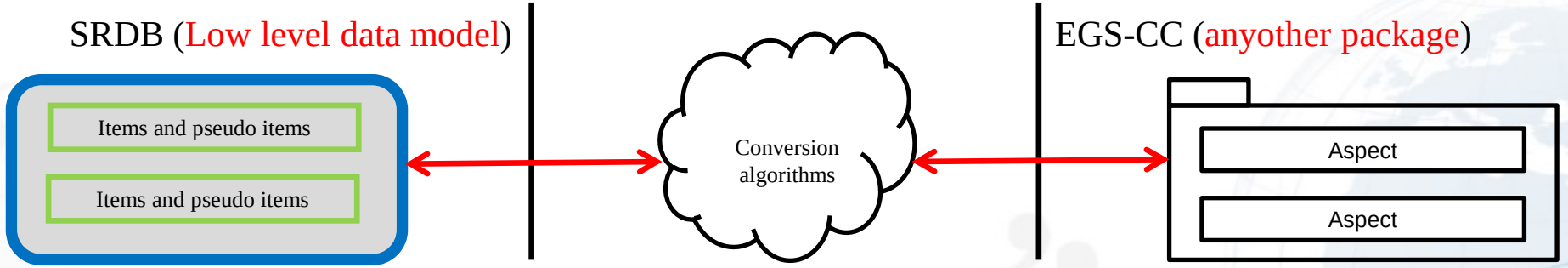


In exported files for operations A101M001 will be valid if A200M001 is « closed » and A102M001 will be valid if A200M002 is « closed »

In exported files for operations A101M001 will be valid if A200M001 is « closed » and A102M001 will be valid if A200M002 is « closed »

EGS-CC mapping





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Groups

Lower level

Object: RW

Item TM Packet : **A001**

Item TM Parameter : **M001**

Item TM Parameter : **M002**

Item group: **G001**

Object: GYRO

Item TM Packet : **A001**

Item TM Parameter : **M001**

Item TM Parameter : **M002**

Item group: **G001**

Higher level

Object: AOCS
(pseudo-position « *AZZZ* »)

Position « *A101* »

Position « *A102* »

Position « *A200* »

Item Group : **G001** = *A101*G001 + *A102*G001 + *A200*A001

Item Group : **G002** = *A101*M001 + *A102*M001

Manager view of object AOCS Groups:

- From RW in position « *A101* »: *A101*G001 (*A101*A001, *A101*M001, *A101*M002)
- From RW in position « *A102* »: *A102*G001 (*A102*A001, *A102*M001, *A102*M002)
- From GYRO in position « *A200* »: *A200*G001 (*A200*M001, *A200*M002)
- From AOCS object in pseudo-position « *ZZZZ* »:
  - *AZZZ*G001 (*A101*A001, *A101*M001, *A101*M002, *A102*A001, *A102*M001, *A102*M002, *A200*A001)
  - AZZZG002 (*A101*M001, *A102*M001)

Full and flat XML views

Flat
AOCS
Subsystem
XML view

```
<SRDBSW>
        <OBJ_DF IdView="AOCS">
                <HW_ACQUISITION_PAR_DF IdView="STDM001"/>
                <HW_ACQUISITION_PAR_DF IdView="STDM002"/>
                <HW_ACQUISITION_PAR_DF IdView="A101M001"/>
                <HW_ACQUISITION_PAR_DF IdView="A101M002"/>
                <HW_ACQUISITION_PAR_DF IdView="A102M001"/>
                <HW_ACQUISITION_PAR_DF IdView="A102M002"/>
                <HW_ACQUISITION_PAR_DF IdView="AZZZM001"/>
                <HW_ACQUISITION_PAR_DF IdView="AZZZM002"/>
        </OBJ_DF>
</SRDBSW>
```

Full
AOCS
Subsystem
XML view

```
<SRDBSW>
        <OBJ_GN IdView="Generic" ObjLevel="Generic" PseudoPosition="STD">
                <HW_ACQUISITION_PAR_GN IdView="M001"/>
                <HW_ACQUISITION_PAR_GN IdView="M002"/>
        </OBJ_GN>
        <OBJ_DF IdView="RW">
                <HW_ACQUISITION_PAR_DF IdView="M001" ObjLevel="Element" />
                <HW_ACQUISITION_PAR_DF IdView="M002"/>
        </OBJ_DF>
        <OBJ_DF IdView="AOCS" PseudoPosition="AZZZ" ObjLevel="Subsystem" >
                <OBJ_ATTACH_LIST>
                        <OBJ_ATTACH PositionIdentifier="A101" ObjectId="RW"/>
                        <OBJ_ATTACH PositionIdentifier="A102" ObjectId="RW">
                                <HW_ACQUISITION_PAR_DF IdView="M002"/>
                        </OBJ_ATTACH>
                </OBJ_ATTACH_LIST>
                <HW_ACQUISITION_PAR_DF IdView="M001"/>
                <HW_ACQUISITION_PAR_DF IdView="M002"/>
        </OBJ_DF>
</SRDBSW>
```

Conclusion

- From Herschel / Planck experience:
  - The HPSDB concept has been validated,
  - Some limitations / improvements have been identified.
- For MTG:
  - The feed-back from Herschel / Planck has been integrated,
  - New requirements have been integrated (resource, owner flag, list of aliases, …).
- For EGS-CC compatibility implementation:
  - Still to be done but:
    - SRDB “High level data model” should map with EGS-CC “product structure”,
    - SRDB “low level data model” mapping to be done with EGSE-CC however the abstraction of this level under form of “items and pseudo-items should facilitate this mapping.