



TSG CORRESPONDENCE

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**Re: Questions and comments regarding network resource models and measurements**

Dear Mr. Truss,

3GPP2 TSG-S WG5 thanks 3GPP SA5 for the response liaison received at our July 2004 meeting. During deliberations at and after that meeting 3GPP2 TSG-S WG5 would like to provide the following feedback (note that for readability purpose we used colors to reflect the history of the current discussion – “red” depicting the original 3GPP2 TSG-S WG5 comments, “green” 3GPPSA5’s response, and “blue” our reply):.

1. Definition of CLASS (as const string for class, const string for DN) in IDL is needed for querying and/or filtering

**INITIAL WG5 COMMENT:** 3GPP2 TSG-S WG5 believes that the definition of a constant string corresponding to the attribute TS32622::Top::objectClass is needed to enable the specification of scope and filter expressions e.g., within CM IRPs and the establishment of measurement jobs and threshold monitors within the PM IRP. This will also be useful in the specification of distinguished names in terms of the specification of IOC/MOC instances.

**SA5 RESPONSE:** 3GPP SA5 are not clear what the problem for 3GPP2 is, and request 3GPP2 TSG-S WG5 to provide examples of the problem. For your information, a contribution to SA5#38bis (S5-048399) has been agreed for approval at this meeting. This introduces the missing IDL definition for the Top MOC in TS 32.623, including the CONST STRING CLASS. All other NRM MOC IDLs already have the CONST STRING CLASS defined.

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WG5\_REPLY: Currently, the BasicCM IRP CORBA Solution Set of (3GPP TS 32.603) defines the getMoAttributes method's filter construct to be limited to attribute names (as defined in 3GPP TS 32.602). This does not allow filters to contain references to a specific IOC, only on attribute names. As an example, one cannot create a getMoAttributes request that accesses all "MscFunction" IOC instances that have a userLabel of "myMsc". 3GPP2 is proposing that the Filter Language defined in 3GPP TS 32.603 be extended as follows: "The filter may contain constraints on either the attribute names or the class name."

3GPP2 TSG-S WG5 is also proposing that the Filter Language defined in 3GPP TS 32.613 be defined as follows (in alignment with 3GPP TS 32.603): "The filter language used in the SS is the Extended Trader Constraint Language (see OMG Notification Service [6]). IRPAgents may throw a FilterComplexityLimit exception when a given filter is too complex. The filter may contain constraints on either the attribute names or the class name."

With respect to your response please note that contribution S5-048399 only addresses constant string inheritance and not filtering on the object class – therefore 3GPP2 TSG-S WG5 is restating the need for a class const string to be added into 3GPP TS 32.623.

## 2. Inheritance of Relationships

INITIAL\_WG5\_COMMENT: In a number of cases within 3GPP NRM IRPs, the way of extending class behavior is not following any known object oriented technique (e.g. inheritance, polymorphism). The general situation in which this occurs is as follows: A given NRM IRP imports an IOC from the Generic NRM IRP (as defined in TS32.622) and then adds additional relationships to that imported IOC. A specific example of this issue can be seen in the UTRAN NRM IRP. The UTRAN NRM IRP adds new containment to SubNetwork. See (TS 33.642) at clause 6.2.1.1 (e.g. ExternalGsmCell, ExternalUtranCell).

Within Object Theory, there are two mechanisms for achieving the desired goal. They are subclass/subtype and extend or polymorphism. The subclass/subtype and extend approach would impact many existing implementations and may not be considered to be the most effective solution. The second mechanism, polymorphism is recommended and the following implementation is suggested:

- In Generic NRM IRP, create a new abstract IOC, called NameContainableElement that inherits from IOC TS32622::Top.
- In Generic NRM IRP, the ManagedElement, ManagedFunction, and SubNetwork (and possibly other IOCs) should inherit from this new IOC (NameContainableElement).
- Any IOC within the Generic NRM IRP, any IOC that may contain (via naming) another IOC (defined in other NRM IRPs) should contain (via naming) NameContainableElement.
- Within the various radio-access technology and core NRM IRP specifications, any IOCs that may be name contained by another IOC (defined in Generic NRM IRP) should inherit from either ManagedFunction, ManagedElement, SubNetwork (i.e., those that have inherited from NameContainableElement), or directly from NameContainableElement.

Note that the polymorphism solution (as a pattern) may be applied to relationships that are not name containment.

Regarding the specific implementation of either mechanism, 3GPP2 TSG-S WG5 would like to work together with 3GPP SA5 to agree on a common approach.

SA5\_RESPONSE: We acknowledge the issue raised. We are working on an impact analysis of the potential changes to address the issue. Based on this analysis, SA5 will decide how to proceed e.g. raising the necessary R6 CRs. We also had a contribution input to SA5#38bis (S5-046663r1), that address this issue. This contribution is still under discussion; no conclusions have been drawn so far.

However, this has raised the following question on the 3GPP2 LS that we would like to ask you for clarification: Regarding bullet 2 (“In Generic NRM IRP, the ManagedElement, ManagedFunction, and SubNetwork (and possibly other IOCs) should inherit from this new IOC (NameContainableElement)”) we ask if it is a mistake to include this bullet. It seems that the proposal may be inconsistent if that bullet is included.

WG5 REPLY: 3GPP2 TSG-S WG5 is appreciating the efforts made so far by 3GPP SA5, but also asking for an expedited resolution (which is needed rather soon due to impacting reuse of the 3GPP Generic NRM IRP). Regarding question on bullet 2 please note that bullet is included by intention, not by mistake.

3. *Solid diamonds for containment need to be clarified*

INITIAL WG5 COMMENT: The 3GPP UML Repertoire (currently specified in Annex G of TS32.102) requires the use of a strong aggregation (filled diamond) and the «names» stereotype to indicate named containment. The UML diagrams within the various 3GPP IRP IS documents do not conform to this rule. This is problematic as it is not possible to differentiate named containment from simple aggregation from the specification. This will likely lead to differences in implementation between vendors and impact the interoperability of IRPManagers and IRPAgents.

SA5 RESPONSE: We recognize this as an outstanding issue. We have outstanding actions to update the existing TS 32.xxx specifications to align with latest UML repertoire given in TS 32.152 which already addresses this point i.e. clarifies necessary usage of solid diamonds that should be used in our UML diagrams.

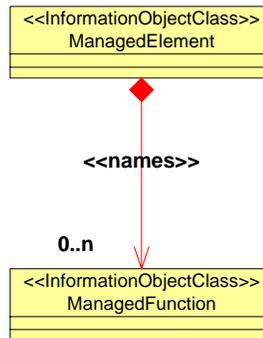
WG5 REPLY: 3GPP2 TGS-S WG5 is looking forward to the finalization of these corrections.

4. *Simplified name containment diagram is suggested as it is sufficient to have containment between Managed Element and Managed Function*

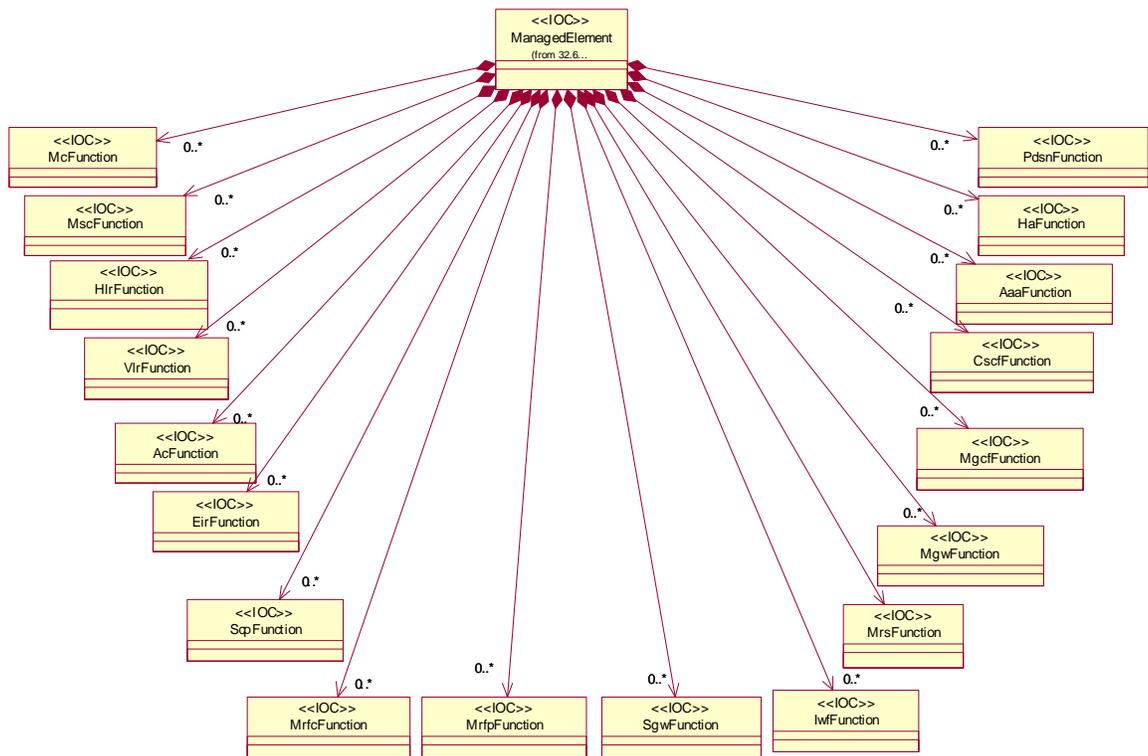
INITIAL WG5 COMMENT: The diagrams for name containment within 3GPP SA5 NRM IRP specifications are very complex, and difficult to read, especially for name containment of ManagedFunction subclasses/subtypes by ManagedElement subclasses/subtypes. It is sufficient to establish a name containment relationship between ManagedElement and ManagedFunction within TS32.622. With said name containment relationship established in TS32.622, it is no longer necessary to draw the complicated and difficult to read diagrams within the RAN technology specific network resource model specifications. It is sufficient to document within the normative text for a specific ManagedElement subclass/subtype as to which specific ManagedFunction subclasses/subtypes that said ManagedElement subclass/subtype may contain via the «names» stereotype applied to a UML composition relationship.

SA5 RESPONSE: From the information given 3GPP SA5 do not understand the current problem and request further clarification for 3GPP2 TSG-S WG5. We believe our existing approach is correct and do not currently consider any changes are necessary in this area.

WG5 REPLY: 3GPP2 TSG-S WG5 is recommending that the diagram shown in Figure 1 could be added into TS 32.622. This would allow the subsequent NRM UML diagrams to not need to include “spider” diagrams, as the Figure 2 used in 3GPP2 (similar to UML diagrams within the 3GPP Core NRM IRP IS). In addition 3GPP SA5 specifications need to specify that containment is maintained through subclassing.



**Figure 1: Recommended Containment Diagram**



**Figure 2: Current 3GPP2 Core Network Diagram**

5. Missing cardinality

INITIAL WG5 COMMENT: Many of the UML structural diagrams within Interface IRP and NRM IRP IS documents that depict containment (named and otherwise) are missing cardinality. From an UML perspective, this is problematic as there is no concept of default cardinality within UML. Lack of the cardinality specification within the UML diagrams will lead to differences in implementation.

SA5 RESPONSE: 3GPP SA5 agree this information is missing. We have outstanding actions to make necessary changes to address this in our impacted specifications.

WG5 REPLY: 3GPP2 TGS-S WG5 is looking forward to the finalization of these corrections.

6. MOReference name as term is misleading as not an IOR

INITIAL WG5 COMMENT: The MOReference type is used to define attributes that enable one IOC/MOC instance to refer to another IOC/MOC reference. The MOReference type is specified as a string that contains a distinguished name referent. 3GPP2 TSG-S WG5 feels that this is convoluted, and should be simplified to use the DistinguishedName type which is also a string that resolves to/contains a distinguished name. Additionally, when this type is applied in CORBA Solution Sets, it is also confusing, as CORBA uses a concept of IORs (Inter-ORB references) to identify remote interfaces, and MOReference is a string, not an IOR. The use of the DistinguishedName type will allow for a more simple and cleaner Interface IRP or NRM IRP specification.

SA5 RESPONSE: 3GPP SA5 are not clear what the problem is and request 3GPP2 TSG-S WG5 to provide examples of the problem.

WG5 REPLY: As requested – 3GPP2 TSG-S WG5 recommending that the TS 32.603 reference, i.e.,

```
struct MOReference
{
    DN otherMO;
};
```

should either not be used (as not necessary – recommended to just use DN) or it should be changed as follows:

```
typedef DN AssociatedMO;
```

7. 3GPP2 TSG-S WG5 recommends to adopt 3GPP2 defined text for the legal values of managedElementType

INITIAL WG5 COMMENT: The set of legal values is composed of <network element name> (with initial letter lower case) from all Managed Object Classes contained directly or indirectly underneath this managed object class of the form: <Network element name>Function. As an example, if a particular ManagedElement has PdsnFunction and AaaFunction as contained classes, the managedElementType set would contain “pdsn” and “aaa”. The managedElementType attribute may contain both 3GPP2/3GPP-defined and vendor-defined network element names. Managed Object Classes that are not of the form <>Function will not appear in the managedElementType attribute.

SA5 RESPONSE: 3GPP SA5 in general agree with the recommendation. We have in fact already created a CR to improve the definition of managedElementType to address this, and that CR has been approved and implemented in the latest R5 and R6 TS versions. We kindly ask 3GPP2 TSG-S WG5 to review the result in 3GPP TS 32.622 V540 and V620 and inform 3GPP SA5 whether this is in line with the wishes of 3GPP2 TSG-S WG5.

WG5 REPLY: The current 3GPP definition on this topic is as follows:

*The legal values of this attribute are the names of the IOC(s) that are (a) derived/subclassed from ManagedFunction and (b) directly name-contained by ManagedElement IOC (on the first level below ManagedElement), but with the string “Function” excluded.*

*The capitalisation (usage of upper/lower case) of characters in this attribute is insignificant. Thus, the IRPManager should be case insensitive when reading these values.*

*Two examples of legal values are:*

- *NodeB;*
- *HLR,VLR.*

3GPP2 TSG-S WG5 studied these changes compared to our original proposal, and is suggesting the following changes to this description:

The legal values of this attribute are the names of the IOC(s) that are (a) directly or indirectly derived/subclassed from ManagedFunction, (b) have an object class name of the form <>Function, and (c) are directly name-contained by ManagedElement IOC (on the first level below ManagedElement), but with the string “Function” excluded. The managedElementType attribute may contain both standardized and vendor-defined network element names.

The capitalization (usage of upper/lower case) of characters in this attribute is insignificant. Thus, the IRPManager should be case insensitive when reading these values.

Two examples of legal values are:

- Set containing the following element: “NodeB”.
- Set containing the following elements: “HLR” and “VLR”.

8. 3GPP2 TSG-S WG5 recommends investigate potential IS template change for SA5

INITIAL WG5 COMMENT: In many cases the tables defining the notifications that may be emitted by a given IOC are repetitive. TSG-S WG5 feels that the specification of IOCs can be streamlined by the addition of tables specifying the set of common notifications for a set of IOCs and the identification of membership of a particular IOC within an IOC set for purposes of notification

SA5 RESPONSE: 3GPP SA5 appreciate this suggestion and are now considering the changes required to the template. We have outstanding actions to address the necessary template changes.

WG5 REPLY: 3GPP2 TGS-S WG5 is looking forward to the finalization of these adjustments.

9. Measurement Name

INITIAL WG5 COMMENT: 3GPP2 TSG-S WG5 recommends removal of the measurement name length limit constraint in 3GPP TS 32.401 or make the limit longer (e.g. 64).

SA5 RESPONSE: 3GPP SA5 are considering extending measurement name length limit. We are not opposed to the idea and believe it is worth studying again. There are some potential negative impacts, for example increased in measurement result file lengths that we need to consider first. We however already had input contributions to SA5#38bis (S5-048542—545) that address this issue.

WG5 REPLY: Please note again that this is very imperative to 3GPP2, since we require the use of IETF performance measurement types that require the use of long names. We recommend that either the name length limit be removed or be made longer (e.g., 64), but in the same context also recommend a guideline stating that measurement type names with length above 32 should be an allowable exception, while the majority should be within the current boundaries.

3GPP2 TSG-S would appreciate consideration of these aspects of concern and welcome further discussions. If you have additional questions, please contact: Randy Scheer ([rjscheer@lucent.com](mailto:rjscheer@lucent.com)).

Regards,



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