



TSG CORRESPONDENCE

Mr. Richard Robinson  
Chair, 3GPP2 TSG-S  
Sprint  
M/S KSOPHD0504-5D124  
6220 Sprint Parkway  
Overland Park, KS 66251-6118  
[richard.w.robinson@mail.sprint.com](mailto:richard.w.robinson@mail.sprint.com)

20 September 2004

Mr. Michael Truss  
Chair, 3GPP TSG-SA WG5  
Motorola Ireland Ltd.  
Mahon Industrial Estate  
Blackrock  
Cork, Ireland  
[Michael.Truss@motorola.com](mailto:Michael.Truss@motorola.com)

**Re: Questions and comments regarding the modeling of links**

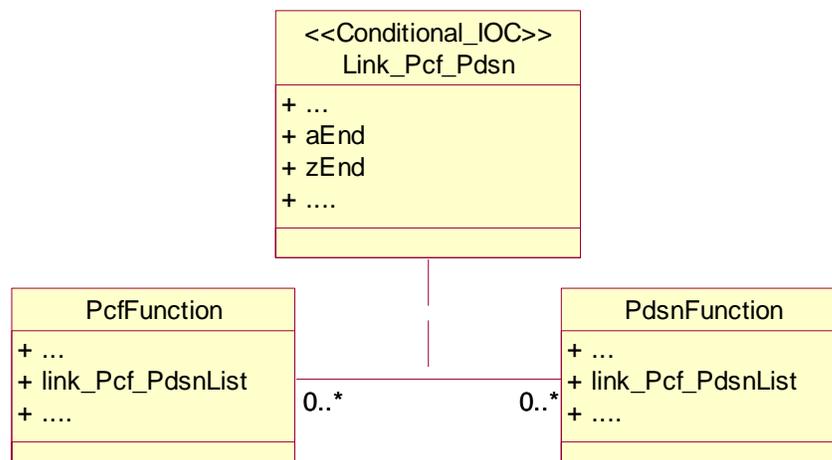
Dear Mr. Truss,

3GPP2 TSG-S WG5 thanks 3GPP SA5 for the liaison received at our August 2004 meeting. During deliberations at and after that meeting 3GPP2 TSG-S WG5 would like to provide the following feedback:

- 1. 3GPP SA5: What are the perceived benefits and motivation for introducing the associative object class to model the links?**

3GPP2 TSG-S WG5 RESPONSE: The association class allows the interfaces to be modeled in an optional way. As an example, the following UML diagram is provided:

---



**Figure 1: Excerpt from 3GPP2 Radio Network NRM Containment/Naming and Association 2**

Link Relationships are represented in 3GPP2 using the following method:

- ✚ Definition of Link Object
- ✚ Definition of link-related Attributes

In case that the Link object is instantiated, than the applicable attributes contain the following information:

- ✚ Link\_Pcf\_Pdsn.aEnd contains the DN of one PcfFunction instance
- ✚ Link\_Pcf\_Pdsn.zEnd contains the DN of one PdsnFunction instance
- ✚ PcfFunction.link\_Pcf\_PdsnList contains one or more DN's of Link\_Pcf\_Pdsn instances
- ✚ PdsnFunction.link\_Pcf\_PdsnList contains one or more DN's of Link\_Pcf\_Pdsn instances

We realize that some vendors or operators prefer that links not be modeled and some vendors or operator prefer that links are modeled. This is why we have modeled these as conditional IOC's. Note also that some 3GPP2 defined IOC's allow the implementation of the relationships using direct references. Another reason why the association class concept was introduced as a stereotyped conditional construct, rather than as a normal construct.

The Link\_Pcf\_Pdsn IOC is a conditional IOC.

- ✚ It may only exist if there is an association between a particular PdsnFunction object and a particular PcfFunction object.
- ✚ If the Link\_Pcf\_Pdsn IOC instance exists, than there is an association between this PcfFunction instance and this PdsnFunction instance.

Also note that not all defined PcfFunction objects and PdsnFunction objects will have an association since not all PCFs and PDSNs will communicate with each other.

In addition, we add the following text to our containment pictures:

*Note: If Link Managed Object Classes (and their subclasses) used to manage relationships between xxxFunction object, than these are only to be created when there is an existing association between the network elements.*

**2. What is the name binding / containment for the new associative object classes including the situation where neither of the classes involved in the relation can be identified as being a superior (or manager) type entity?**

3GPP2 TSG-S WG5 RESPONSE: 3GPP2 TSG-S WG5 contains the link IOCs underneath the SubNetwork IOC. We felt that the majority of these interfaces do not have a clear owner. As an example, the majority of them are bi-directional. We felt it would be misleading to always pick an owner for each interface.

In addition, this leads to issues when dealing in a multiple vendor environment. What does the link represent when one Function object is owned by one vendor and the other Function object is owned by the other vendor? In this case, where does the vendor put the link IOC when it doesn't own the other object used in its naming? We solved this by putting all of the link objects under the SubNetwork objects.

Also, we have created an IOC called Link that is used as the abstract class all links inherit from. The Link IOC is defined as follows (from 3GPP2 S.S0028-002-B, OAM&P for cdma2000 (3GPP2 Generic NRM IRP)):

**1.1.1.1 IOC Link**

**1.1.1.1.1 Definition**

This IOC represents the relationship between two instances. It is derived from ManagedFunction.

**1.1.1.1.2 Attributes**

Attribute name	Defined in	Visibility	Support Qualifier	Read Qualifier	Write Qualifier
linkId	--	+	M	M	--
objectClass	Top	+ <sup>inherited</sup>	M <sup>inherited</sup>	M <sup>inherited</sup>	-- <sup>inherited</sup>
objectInstance	Top	+ <sup>inherited</sup>	M <sup>inherited</sup>	M <sup>inherited</sup>	-- <sup>inherited</sup>
userLabel	ManagedFunction	+ <sup>inherited</sup>	M <sup>inherited</sup>	M <sup>inherited</sup>	M <sup>inherited</sup>
aEnd	--	+	M	M	--
zEnd	--	+	M	M	--
linkType	--	+	O	M	--
protocolName	--	+	O	M	--
protocolVersion	--	+	O	M	--

### 1.1.1.1.3 Notifications

Name	Qualifier	Notes
notifyAckStateChanged	See Alarm IRP (3GPP TS 32.111-2) [05]	
notifyAttributeValueChange	O	
notifyChangedAlarm	See Alarm IRP (3GPP TS 32.111-2) [05]	
notifyClearedAlarm	See Alarm IRP (3GPP TS 32.111-2) [05]	
notifyNewAlarm	See Alarm IRP (3GPP TS 32.111-2) [05]	
notifyObjectCreation	O	
notifyObjectDeletion	O	
notifyComments	See Alarm IRP (3GPP TS 32.111-2) [05]	
notifyAlarmListRebuilt	See Alarm IRP (3GPP TS 32.111-2) [05]	
notifyPotentialFaultyAlarmList	See Alarm IRP (3GPP TS 32.111-2) [05]	

### 1.1.2 Information attributes definition

#### 1.1.2.1 Definition and legal values

Attribute Name	Definition	Legal Values
aEnd	The value of this attribute shall be the Distinguished Name of the alphabetically first instance in the Link IOC to which this link/relation is modeled. As an example, with Link_Pcf_Pdsn, aEnd would contain the PcfFunction Distinguished Name. Note that if the Link IOC names are the same (e.g., Link_Msc_Msc), no ordering can be implied.	--
linkId	It contains 'name+value' that is the RDN, when naming an instance, of this object class containing this attribute. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.	--
linkType	This attribute defines the type of the link.	Signalling, Bearer, OAM&P, Other or multiple combinations of the above types.
objectClass	As defined in 32.622 [28]: An attribute which captures the name of the class from which the object instance is an occurrence of.	--
objectInstance	As defined in 32.622 [28]: An information which captures the Distinguished Name of any object.	--
protocolName	Protocol name.	--
protocolVersion	Protocol version.	--
userLabel	Based on definition from 32.622 [28]: A user-friendly (and user assigned) name of the associated instance.	--
zEnd	The value of this attribute shall be the Distinguished Name of the alphabetically second instance in the Link IOC to which this link/relation is modeled. As an example, with Link_Pcf_Pdsn, zEnd would contain the PdsnFunction Distinguished Name. Note that if the	--

Attribute Name	Definition	Legal Values
	Link IOC names are the same (e.g., Link_Msc_Msc), no ordering can be implied.	

3. **3GPP SA5: Are there any guidance rules for naming the link class as 3GPP SA5 would use "reference point Link" (e.g *CxLink*), 3GPP2 would use *Link\_nodeA\_nodeB* (e.g *Link\_Eir\_Msc*).**

3GPP2 TSG-S WG5 RESPONSE: When we investigated what to model the Reference Points, we noticed that the name of the Reference Points changed quite often and that there were actually multiple names for the same Reference Point. There is also the case where there are different Reference Points depending on whether the interface between two functions is a signaling interface, a bearer interface or both. We also noticed that 3GPP and 3GPP2 had different names for the same Reference Point. To get around this, we name our classes starting with "Link" and concatenating the two associated functions, e.g., *Link\_Pcf\_Pdsn*. Note that we have guidelines of putting the function names in the link objects alphabetically. In our specification text, we then describe the different Reference Points associated with this. We feel that this name is more descriptive and doesn't require operators in the field to understand the Reference Point nomenclature.

Also note that we have attributes associated with the two functions associated with the link object. These attribute names are composed of the names of the managed IOC's concatenated with the word "*List*". This attribute name will be used in both linked IOC's (e.g. *link\_Pcf\_PdsnList* attribute will be defined in both, the *PcfFunction* and *PdsnFunction* IOCs, and contains a list of *Link\_Pcf\_Pdsn* Distinguished Names). Note that for consistency, we use the "*List*" term even when there is a maximum of one DN in the list.

4. **3GPP SA5: Please provide your guidelines / production rules with regard to how the modeling of links has to be transformed to CORBA, CMIP and XML technologies?**

3GPP2 TSG-S WG5 RESPONSE: We feel that these IOCs are transformed into CORBA and XML technologies like any other IOC. They will have an associated CORBA interface that contains constant strings specific to each of the link IOCs. Where required, CORBA typedefs will be defined for the CORBA types. There will be XSD definitions for both, the Link IOC and all of the associated link IOCs.

At this point, 3GPP2 does not support CMIP interfaces, but we feel that the modeling is very analogous to other IOCs.

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,



Richard Robinson  
Chair, 3GPP2 TSG-S

cc: Hideo Okinaka                      Chair, 3GPP2 SC                      [okinaka@ma.kcom.ne.jp](mailto:okinaka@ma.kcom.ne.jp)  
Henry Cuschieri                      3GPP2 Secretariat                      [hcuschieri@tiaonline.org](mailto:hcuschieri@tiaonline.org)  
Niels Peter Skov Andersen                      Chair, 3GPP TSG-SA                      [NPA001@motorola.com](mailto:NPA001@motorola.com)