



Question(s): 10, 14/15

[Ref. TD 552 (WP3/15) Annex D]

Source: ITU-T Study Group 15

Title: LS on generation of YANG modules from Transport Technology UML information models

LIAISON STATEMENT

For action to:

For comment to: ONF IMP, TM Forum, MEF, ETSI NFV, OIF, BBF, IETF (netmod wg, lime wg, ccamp wg, teas wg, OPS area, RTG area), IEEE 802.1, IEEE 802.3, ITU-T SG2 Q7/WP2

For information to:

Approval: Joint ITU-T Q10, 14/15 meeting (Munich, 17-20 May 2016)

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In October 2015, we informed some of you that Q14/15 had initiated work on protocol-specific data modelling for the management of transport specific technologies (such as OTN, Carrier Ethernet, and MPLS-TP) and that these protocol-specific data models would be developed based on the protocol-neutral UML information models specified by Q14/15, including G.7711 for generic transport resources, G.874.1 for OTN, G.8052 for Carrier Ethernet, and G.8152 (draft) for MPLS-TP, which are consistent with the data plane functions (including OAM) specified in the corresponding equipment and management requirements Recommendations.

This liaison statement is to inform you about the progress of the protocol-specific data modelling work in Q14/15, in particular regarding YANG data model development. We are pleased to inform you that we are now able to generate YANG data models automatically from the UML information models using an Open Source mapping tool.

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Attached herewith, for your information and comments, to demonstrate the feasibility of automatic YANG generation are the YANG modules of the following three Q14/15 defined base UML information models:

- G.874.1 “*Optical transport network (OTN): Protocol neutral management information model for the network element view*” v2.11
- G.8052/Y.1346 “*Protocol-neutral management information model for the Ethernet transport capable network element*” v1.10
- G.7711/Y.1702 “*Generic protocol-neutral information model for transport resources*” v1.02

These YANG modules were generated automatically by using the open source UML to YANG mapping tool 《xmi2yang tool-v2.0》 (<https://github.com/OpenNetworkingFoundation/EAGLE-Open-Model-Profile-and-Tools/tree/UmlYangTools>). The 《xmi2yang tool-v2.0》 tool is developed based on the UML-YANG mapping guidelines defined in and available at <https://community.opensourcesdn.org/wg/EAGLE/document/106>.

The YANG modules output from the 《xmi2yang tool-v2.0》 tool have been validated by using the YANG tool available at <http://www.yangvalidator.com/>.

The current mapping tool is a beta version. A feature under development is the mapping of UML operations to YANG, whereas the rules of mapping UML operations into YANG “action” or “rpc” statements are already defined in the UML-YANG mapping guidelines. Your review and comments on the UML-YANG translation guidelines and the automatic tooling will be very much appreciated.

We expect other open source mapping tools will become available to allow automatic generation of additional protocol specific data models (e.g., JSON) from UML models.

The translation of the "base UML model" to YANG is to demonstrate the feasibility of automatic translation from UML to YANG. This provides confidence that the base UML model can be pruned and refactored (i.e., take a subset of the base model and in some cases simplify the structure) to provide purpose-specific UML models from which protocol-specific APIs (e.g., encoded YANG or JSON) may be compiled, such as the current work by the Transport API (TAPI) project in ONF. The use of the base UML model (with suitable pruning and refactoring) provides a coherent and inter-operable suite of purpose specific data models. This approach avoids the need for hand crafted pair-wise mediation when the same base network resources are used for different purposes (e.g., YANG models for OAM and topology that reference the same underlying resources but have been developed independently without referencing a common base model).

ATTACHMENTS

- [WD1014-14r1: G.874.1 and the YANG mapping](#)
 - [WD1014-15r1: G.8052 and the YANG mapping](#)
 - [WD1014-16r1: G.7711 and the YANG mapping](#)
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