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Date: 8th June 2023

Subject: For Information: New Project for Addressing ONU Management at Scale

The Broadband Forum Fiber Access Networks (FAN) Work Area recently agreed to initiate a new project for the optimization of management of Optical Network Units (ONU) at scale. This project, called WT-505: ONU Management at Scale, is intended to be an enhancement of the existing specification, TR-385: ITU-T xPON YANG Modules. The following describes the issues and considerations that led to the need for the new project.

In contrast to many other transport technologies, a single PON interface can multiplex as many as 128 ONUs. It is also typical for a single Optical Line Termination (OLT) to contain many such PON interfaces.

At this level of dimensioning, the OLT YANG modeled configuration data becomes very large due to the high number of ONUs to be managed. With current TR-385 and TR-383 Broadband Forum YANG models, the management of large OLTs suffers severe performance degradation. Examples of such degradation are:

- Time to validate YANG constraints when configuring ONU data nodes (e.g., due to very large OLT interface and hardware component lists)
- Time to delete an ONU (time to retrieve all data nodes of the ONU)
- Time to perform a <copy-config> of a full OLT configuration.

Many Broadband Forum contributions have been submitted and discussed that demonstrate ONU management needs to be optimized to keep the OLT manageable. It has been determined that efficient optimization of ONU management requires the following measures:

- Collocate ONU data nodes per ONU, rather than have them interleaved with OLT data nodes (e.g., in the same interface or hardware component list) as per TR-385. This involves defining a list of ONUs in the OLT where each ONU entry contains all ONU data nodes.

- Bring a strong reduction of the configuration data size per ONU. This will be achieved using ONU templates combined with the use of shared ONU profiles.

IETF schema mount was considered as a solution for collocating ONU data nodes. There were drawbacks to this approach, however. The size of the datastore was not improved as the same data nodes are mounted per ONU. There is also a known lack of tooling that supports schema mount making it difficult for this solution to be broadly implemented in a timely manner. The following alternative has been agreed upon.

Complement current standard YANG models with new models that implement optimization measures for the data nodes applicable to ONU devices. These current models are found in Broadband Forum standards, e.g., TR-355, TR-383, TR-385, and standards from other organizations, e.g., IETF, IEEE, ITU-T.

This involves:

- Deriving from existing standard modules, the development of modules defining a list of ONU templates.
- Deriving from existing standard modules, the development of modules defining a list of ONU instances, where each instance refers to one or more ONU templates and gives the possibility to complement or overrule any data originating from templates.
- Deriving from existing standard modules, the definition of modules defining ONU profiles that can be shared between ONUs templates and instances. ONU profiles should be distinct from OLT profiles to allow validation rules that are specific to ONUs.

Deriving from existing standard modules means the modules will not be used as written. Rather, applicable portions of those modules are copied into new modules defining templates, profiles, etc. The modules developed in this project will reference the source YANG modules and specifications, and provide any license text as required by the source organization.

Sincerely,

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Broadband Forum Reference: LIAISE-595

Date of Upcoming Broadband Forum Meetings: See https://www.broadband-forum.org/category_meetings_and_events/upcoming-meetings