A YANG Data Model for Optical Resource Performance Monitoring

CCAMP WG, IETF117

draft-yu-ccamp-optical-resource-pm-yang-01

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Major Updates Since IETF 116

- Added YANG module corresponding to the PM-related interfaces defined in TMF MTOSI
  - Added YANG module for retrieving the resources capabilities, e.g. holding-time, supporting indicators, sub-resources underlay
  - Added RPC to support the operation of clearing or resetting cached performance data
  - Added RPC to support querying resources associated with a TCA profile

- Added normative reference to ITU-T G.7710

Scope of the Draft (Ref: MTOSI)

3.1 Business Requirements

The following business requirements are stated:

R_TMF518_RPM_BR_0001	The Interface shall support the retrieval of current and historical performance measurements for network resources.
Source	TMF518_RPM, Version 1.0
R_TMF518_RPM_BR_0002	The Interface shall support the distribution of Threshold Crossing Alerts (TCAs) to subscribed OSs.
Source	TMF518_RPM, Version 1.0
R_TMF518_RPM_BR_0003	The Interface shall support the control of performance monitoring in the network. This includes PM control, e.g., the enabling and disabling of PM collection and TCA control, e.g., the enabling and disabling of TCA generation.
Source	TMF518_RPM, Version 1.0

Service Interfaces	Operations	Supporting Status by Our I-D
PerformanceManagementControl		
	clearPerformanceMonitoringData	Supported by this version
	disablePerformanceMonitoringData	Supported
	enablePerformanceMonitoringData	Supported
PerformanceManagementRetrieval		
	getAllCurrentPerformanceMonitoringData	Supported
	getAllPerformanceMonitoringPoints	Supported by this version
	getHistoryPerformanceMonitoringData	Supported
	getHoldingTime	Supported by this version
	getMePerformanceMonitoringCapabilities	Supported by this version
	getProfileAssociatedTerminationPoints	Supported by this version
	getPerformanceMonitoringDataIterator	Out of scope
	getPerformanceMonitoringPointsIterator	Out of scope
ThresholdCrossingAlertControl		
	createTcaParameterProfile	Supported
	deleteTcaParameterProfile	Supported
	disableThresholdCrossingAlert	Supported
	enableThresholdCrossingAlert	Supported
	getAllTcaParameterProfiles	Supported
	getTcaParameterProfile	Supported
	getTcaParameterProfilesIterator	Out of scope
	getTcaTpParameter	Supported
	setTcaParameterProfile	Supported
	setTcaTpParameter	Supported

- This data model is not a simple translation of MTOSI but a supplement to the missing capabilities of management in optical domain
- This model is harmonized with existing IETF data models, e.g. RFC8345(network topology) and inventory.
- The *iterator interfaces should be supported by the pagination mechanism of RESTCONF.
- Except for the *iterator interfaces, all the other MTOSI interfaces have been supported by the current version

YANG Modeling for Resource's Capabilities

Operations	Functionality
getAllPerformanceMonitoringPoints	This interface should allow MDSC to retrieve performance data over a list of termination points.
getHoldingTime	This interface should allow MDSC to retrieve number of hours PM data records held in PNC.
getMePerformanceMonitoringCapabilities	This interface should allow MDSC to retrieve a list of parameters supported by a specified NE at a specific layer.

```
module: ietf-optical-resource-pm
  +--rw performance-monitoring
     +.....................
     +--rw resources
        +--rw resource-list* [resource]
           +--rw resource            union
           +--ro  resource-type?      identityref
           +--rw holding-time?        uint8
           +--rw pm-parameter-list* [layer-rate]
           |  +--rw layer-rate        identityref
           |  +--rw indicator-name*    string
           +--rw sub-resources*       ../resource
```

Our proposed data model

- The resource-type includes objects defined in a topology, such as termination-point and tunnel-termination-point, and objects covered by hardware inventory, such as NE and board.
- getAllPerformanceMonitoringPoints:
  - GET
  - {restconf}/data/: ietf-optical-resource-pm:performance-monitoring/ resources/resource-list={resource}?fields= sub-resources
- getHoldingTime:
  - GET
  - {restconf}/data/: ietf-optical-resource-pm:performance-monitoring/ resources/resource-list={resource}/holding-time
- getMePerformanceMonitoringCapabilities:
  - GET
  - {restconf}/data/: ietf-optical-resource-pm:performance-monitoring/ resources/resource-list={resource}/pm-parameter-list={layer-rate}

The capability retrievals are suggested to be invoked on demand to avoid the scalability issues in large networks wherein there are large numbers of resources with performance monitoring points

YANG Modeling for clearPerformanceMonitoringData& getProfileAssociatedTerminationPoints in MTOSI

Operations	Functionality
clearPerformanceMonitoringData	This interface shall allow MDSC to clear or reset the performance register on TPs or NEs.
getProfileAssociatedTerminationPoints	The Interface shall allow MDSC to retrieve the names of all the TPs known to the PNC that are associated with a specified Threshold Crossing Alert (TCA) Parameter Profile.

```
module: ietf-optical-resource-pm
rpc
  +---x clear-performance-monitoring-data
       +--ro input
       |   +--ro resources*   leafref
       +--ro output
           +--ro failed-resources*   leafref
```

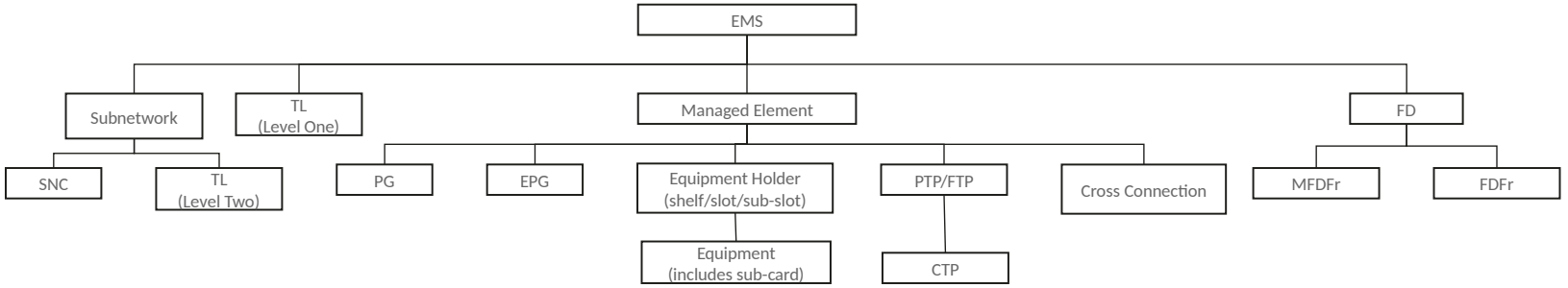
```
module: ietf-optical-resource-pm
rpc
  +---x get-profile-associated-termination-points
       +--ro input
       |   +--ro profile-id?       leafref
       +--ro output
           +--ro resource-list*   leafref
```

Open Discussion

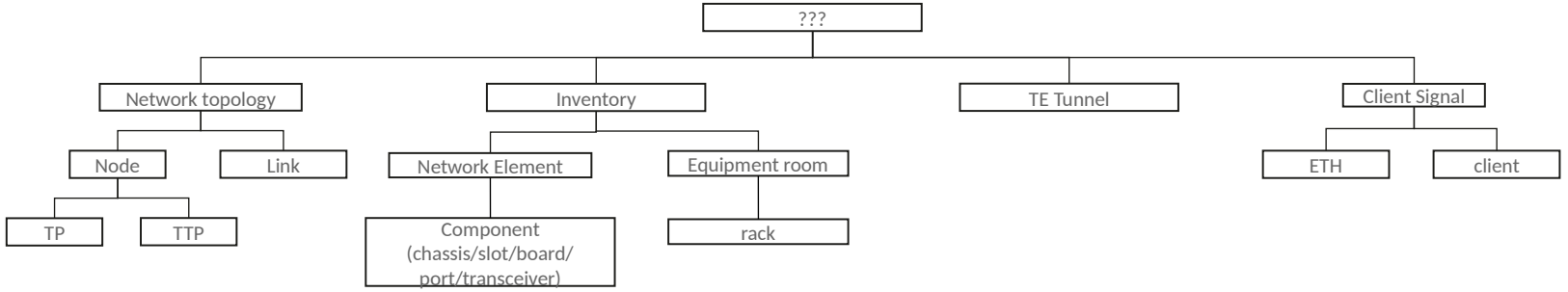
getMePerformanceMonitoringCapabilities	This interface should allow MDSC to retrieve what parameters are supported by a specified NE at a specific layer.

- Layer-rate is a traditional classification in TMF. There are 200+ values in the TMF supporting document, including ODUk/OTUk/STM-n/OMS/OTS and different granularities for VC concatenation.
- Question 1: How can we describe layer-rate with existing IETF topology data models?
- Question 2: Are there more differences between management and control, just like layer-rate?
- Question3: What is the mapping between the management objects and ACTN objects?

TMF Objects



ACTN Objects



Much more work needed for ACTN models to align with TMF MTOSI.

Next Step

- Define optical-specific PM indicator (reference to ITU-T G.7710)
- Call for WG adoption

- Call for interest & joint contribution

Thank You