

YANG Data Models for Transport TE FGNM Extension Model

CCAMP WG, IETF119

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The Motivation of This Draft

- Find out a way to support FCAPS;
- Align the modeling of ACTN standard and traditional TMF;
- Inherit more functionalities of traditional interfaces;
- Improve the ease of integration with current data model;

How to Support FCAPS by ACTN Interfaces?

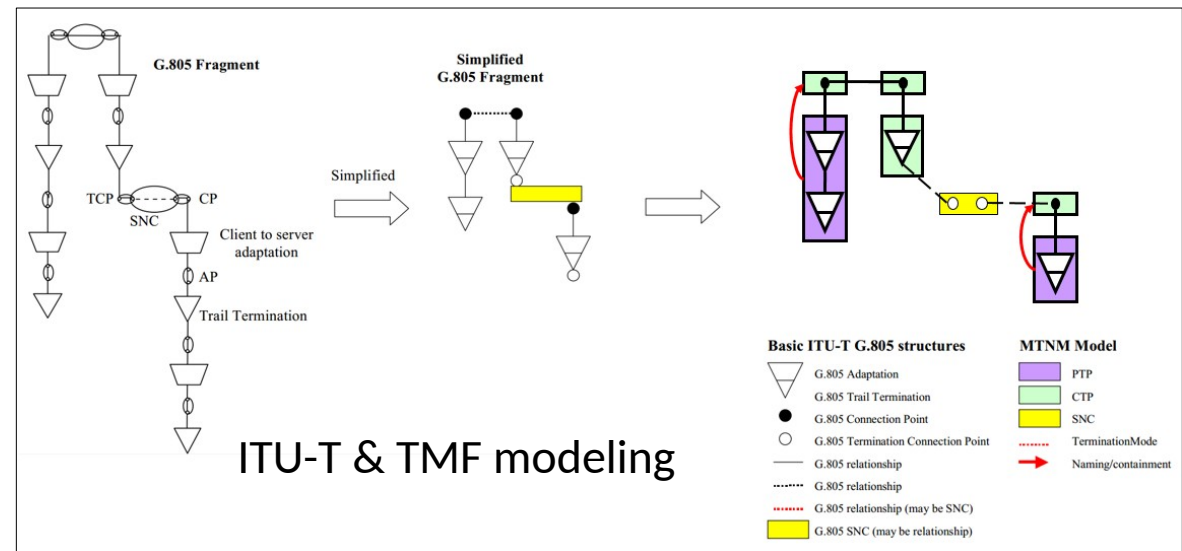
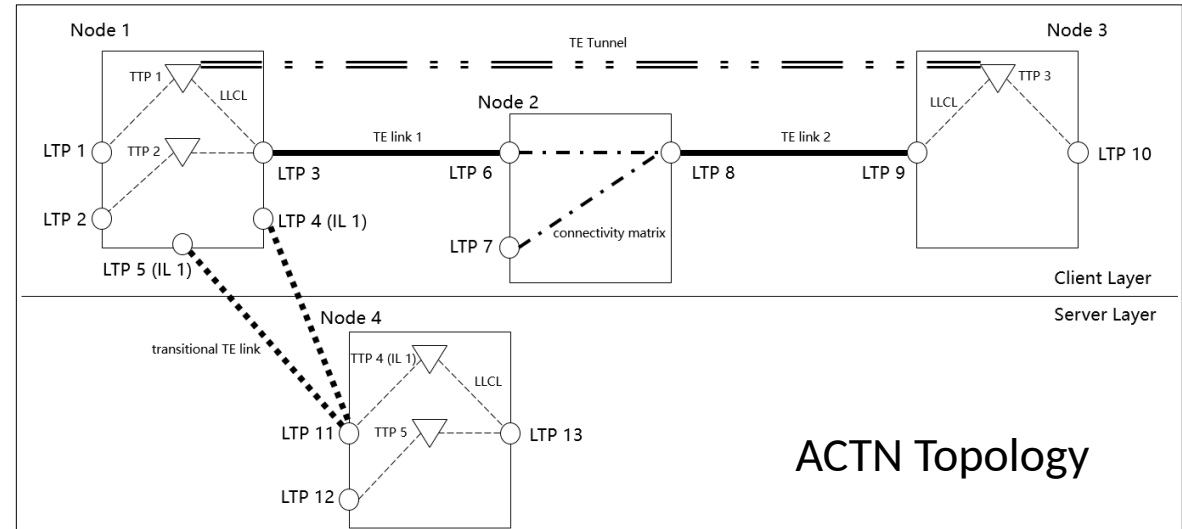
	Option1. Rebuild a Series of FCAPS Interfaces	Option2: Inherit the Traditional Interfaces
Potential Implications	Some new researches (similar to ITU-T G.874/G.875 etc.) are needed, e.g. to explain how alarm is generated on the ACTN modeling object.	The ACTN modeling should be able to map to traditional modeling.
Advantage	No history burden and better design of interfaces	<ul style="list-style-type: none">➤ Existing researches of FCAPS are mature and there is no theoretical defect➤ It is easier to integrate with traditional upper system, operators don't need to pay too much➤ Less learning cost will be introduced➤ It take less time to get a series of mature interfaces.

- An example in CCAMP is the two performance monitoring drafts: service PM and resource PM;
- Option 1 looks like Abstract Control (AC) approach and option 2 looks like Fine-Grain network Management (FGNM) approach.
- We don't tend to argue which approach is better. Both options have got their owned supporters.
- This document will focus on option 2.

Can ACTN Modeling 1:1 Map to TMF Modeling?

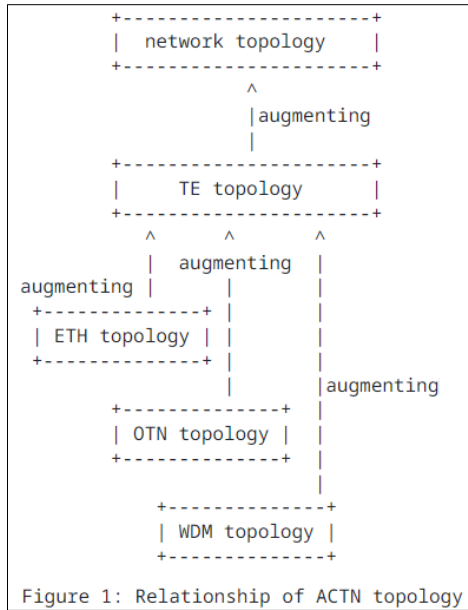
ACTN Object	TMF Object
Network	NA
Node	Management Element
Link	Topology Link
TP	PTP
TTP	CTP/FTP
Tunnel	SNC/XC
NE	Management Element
component	equipment holder/equipment
Client signal	NA
Ethernet Client signal	NA
NA	Protection Group
NA	Equipment Protection Group

Table 2: Mapping of ACTN objects with TMF objects

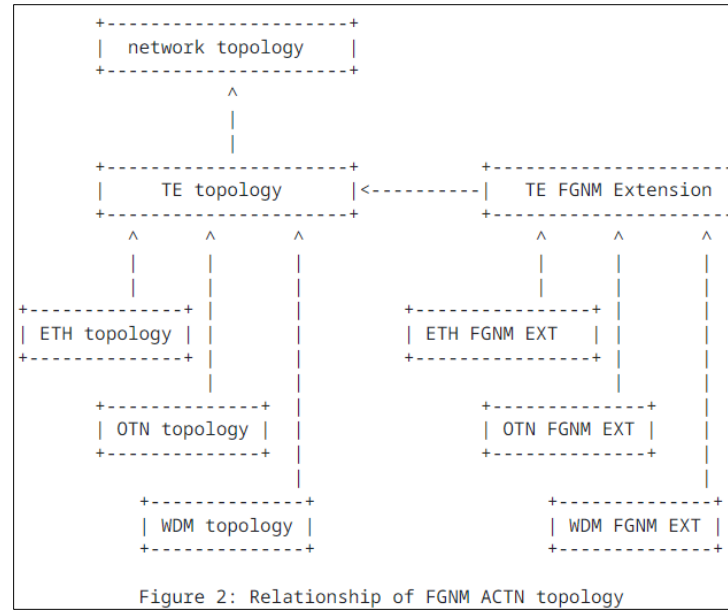


It is not certain whether the current attributes of ACTN can cover the attributes of TMF objects.

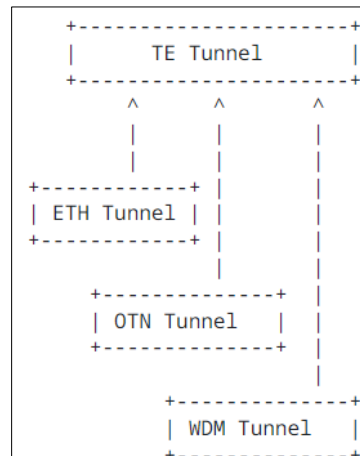
How to do the Extension?



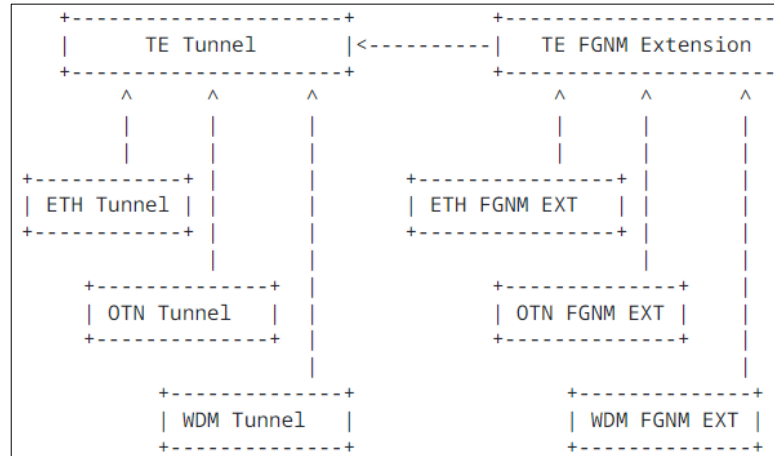
Add FGNM Extension



The FGNM is optional if people choose option 1 to manage the network.



Add FGNM Extension



What to be Extended in TE Topology YANG Model?

- Extension on the topology objects is still under discussion;
- Lifecycle and usage of TTP;
 - TTP can be already existing or potentially existing.
 - Potentially existing TTPs are optional to provide when retrieving topology for scalability issue.
 - A fixed pattern string can be used as the name of TTP.
 - This name can be an optional identifier of TTP, so that the client can reference the potentially existing TTPs;
 - An operation to retrieve TTPs by TP (improve ease of integration);

```
rpcs:
  +---x query-ttp-by-tps
    +--ro input
      | +--ro tp-list* [tp-id]
      |   +--ro tp-id    leafref
    +--ro output
      +--ro result?      enumeration
      +--ro result-list* [tp-id]
        +--ro tp-id      leafref
        +--ro ttp-list*
          +--ro tunnel-tp-id? leafref
          +--ro ttp-name?    string
          +--ro using-status? enumeration
```

What to be Extended in TE Tunnel YANG Model?

➤ Modeling of P2MP and MP2MP tunnel;

➤ Restoration

- Lock of Restoration
- Lock of Restoration Reversion
- Scheduling of Reversion Time
- Priority of Restoration

```
augment /te:te/te:tunnels/te:tunnel/te:restoration:  
  +--rw restoration-lock?          boolean  
  +--rw restoration-reversion-lock? boolean  
  +--rw scheduled-reversion-time?  yang:date-and-time  
  +--rw restoration-priority?     enumeration
```

➤ TTP Hop (Path Constraint)

```
augment /te:te/te:tunnels/te:tunnel/te:primary-paths/te:primary-path  
  /te:explicit-route-objects-always  
  /te:route-object-include-exclude/te:type:  
  +--:(ttp-hop)  
    +--rw ttp-hop  
      +--rw node-id?    nw:node-id  
      +--rw (id-or-name)?  
        +--:(id)  
          | +--rw ttp-id?    binary  
          +--:(name)  
            +--rw ttp-name?  string
```

Next Step

- Investigate what could be extended for FGNM TE Topology & TE Tunnel YANG;
- Investigate what is technology specific FGNM extension for Topology and Tunnel YANG;

Call for interest!

Thank You ☐