Connectionless OAM yang model

Deepak Kumar
Qin WU
Zitao Wang
Reshad Rahman
Srihari Raghavan
Model design

#1 choose test point
-- augment network topology yang model.

#2 define the parameters of these test points

#3 define the rpc and notification (data retrieval procedure)

#1 Testpoint

Alice

management System

Bob

Network topo model

#2
Tp-address
Relative layer
Support tools (ect.)

#3
CC, CV, path-discovery, etc.

#3 define the rpc and notification (data retrieval procedure)
Connection-less OAM model

• TP Address
  – Generic Representation of Test Point Address

• Tools
  – Describe Toolset for Fault detection and Isolation

• Oam Layers
  – In future, it can provide way to relate Oam Test Points for Connection Less
  – Default Level 0(same layer), so if relationship is not known it’s not required to be implemented
  – Provide OAM Test points to relate to each other as same layer, client layer, and server layer.

• Path Discovery Data
  – Generic grouping for path discovery data

• Continuity check data
  – Generic grouping for continuity check data
Connection Less OAM Method Model

• RPC
  – Continuity Check
    • Support Reachability Verification
      – Continuity Checks are used to verify that a destination is reachable, and are typically sent proactively, though they can be invoked on-demand as well.
  – Path Discovery / Fault localization
    • Identify nodes along the route to destination Test point
Details of TP-address

```
+--rw (tp-address)?
 | +--:(mac-address)
 |  | +--rw mac-address?           yang:mac-address
 | +--:(ipv4-address)
 |  | +--rw ipv4-address?          inet:ipv4-address
 | +--:(ipv6-address)
 |  | +--rw ipv6-address?          inet:ipv6-address
 | +--:(src-dst-address)
 |  | +--rw src-ip-address?        inet:ip-address
 |  | +--rw dst-ip-address?        inet:ip-address
 |  | +--rw Interface?             if:interface-ref
 | +--:(fec)
 |  | +--rw fec-type?              fec-type
 |  | +--rw (fec-value)
 |  | ......
```

FEC is required for MPLS OAM (RFC)

Add for BFD.
(src-ip-address, dst-ip-address, interface)
Details of location-type based list

+--rw (location-type)?
  +--:(ipv4-location-type)
  |  +--rw test-point-ipv4-location-list
  |  |  +--rw test-point-locations* [ipv4-location]
  |  |  +--rw ipv4-location    inet:ipv4-address
  ... 
  +--:(ipv6-location-type)
  |  +--rw test-point-ipv6-location-list
  |  |  +--rw test-point-locations* [ipv6-location]
  |  |  +--rw ipv6-location    inet:ipv6-address
  ... 
  +--:(mac-location-type)
  +--:(tunnel-location-type)

Ipv4 Test point location list
Ipv4 Test point address
Ipv6 Test point location type
Usage of "tools" attribute

Usage example:
The tools container can serve as a constraint condition when the base model be extended to specific OAM technology.
For example: If we want to extend to a Multi-Part Messages ICMP:
"../coam:tools-ip/coam:rfc4884" should be set to "true":
Then add these specific details:

- Domain test-point-locations
  - ipv4-location
    - augment "path....."{
      when "../coam:tools-ip/coam:rfc4884 = 'true'"

IETF96, Berlin, Germany
Usage of “OAM layer”

- Testpoint A
- Testpoint B

#Tp-address
#Support tools
......

#relative-oam-layers:
level: -1;
tp-address: address of B

#Tp-address
#Support tools
......

#relative-oam-layers:
level: 1;
tp-address: address of A

- Management System
  - b. Report to management system with OAM level info
  - c. Correlate testpoints with test results in the LIME model

- a. Configure test points
- Testpoints

IETF96, Berlin, Germany
ML discussion Recap

• connectionless OAM model should be limited to continuity check, reachability verification.
• The test-point and many other acronyms should add to Terminology section.
• Some parameters in tool may not appropriate, such as RFC5880, RFC5885, RFC5882, RFC6375, RFC6428.
• The description of the model provided in Section 3 doesn't map to the model hierarchy.
• The oper object should be made clear in the document.
• The IPv4-location and IPv6-location (cc-ipv4-sessions-statistics and cc-ipv6-sessions-statistics) should be collapsed into one.
• Break Model in Two modules Oam Data and Oam Data retrieval Methods
• Long-lived oam session
• Does it make sense to present oam-layer in this model?
• Whether it need a pair of source and destination addresses and TLV address?
• Is FEC really an attribute of TP-location?
• Does it really need to enumerate all of the tools?

Agree, and fix in 01 version

Agree, and fix in 04

Agree, fix in next revision

Discussed in Interim
Next Step

• Fix the open issues raised on the list
• Add Common Session Information as it’s applicable to BFD and TWAMP/OWAMP
• Performance Monitoring to be added as separate draft
Appendix: Model Structure

- **Domain test-point-locations**
  - ipv4-location
  - tp-address

**Ietf-network model**

**Feature: connectionless**

- **Key: ipv4-location or ipv6-location or tunnel-location or mac-address-location or ip-prefix-location, etc**

**Choice: Test point address**

- **FEC**
  - ipv6-address
  - ipv4-address

**Case: toolset for fault detection and isolation**

- tools-mpls
- tools-bfd
- tools-pw

**Domain Oam-layer**

- **Key: index**
  - **index**
  - **level**

**Choice: Test point address**

- **mac-address**
- **ipv4-address**
- **ipv6-address**

IETF96, Berlin, Germany