

LIME Base YANG Model Work Update

[draft-ietf-lime-yang-oam-model-00](#)

Qin WU

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Design Goal of LIME base model

- Look for common structure for all OAM technologies to provide consistent representation
- Using configuration model to provide consistent configuration and representation
- Using RPC model for OAM command(e.g., ping, traceroute) to provide consistent reporting and representation.
- Using Notification model to provide consistent reporting and representation.

Model Structure Overview

- Comprise three Sub Models:

- Configuration Sub Model

- (Domain) Which domain the fault can be localized?
 - (MA) Which group the test belong to?
 - Test results
 - Parameters for connectionless (under MA but in the outside of session)
 - Parameters for connection oriented (under sessions)
 - Related-oam-layer (allow correlate fault in other layer)

- RPC Sub Model

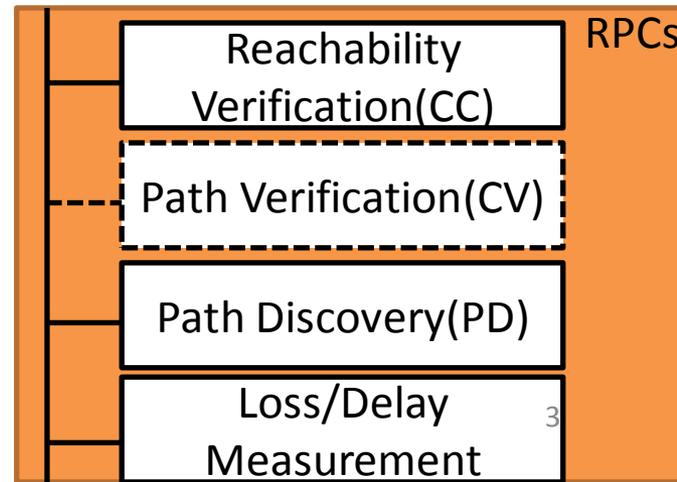
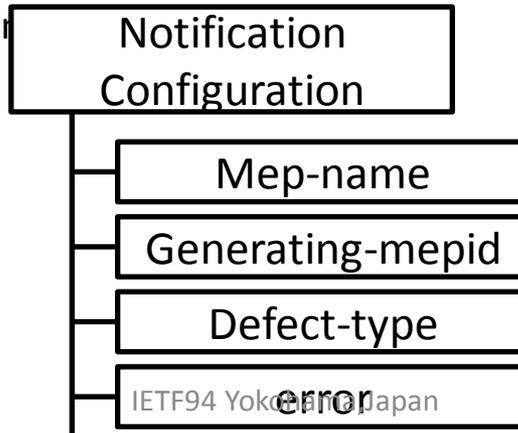
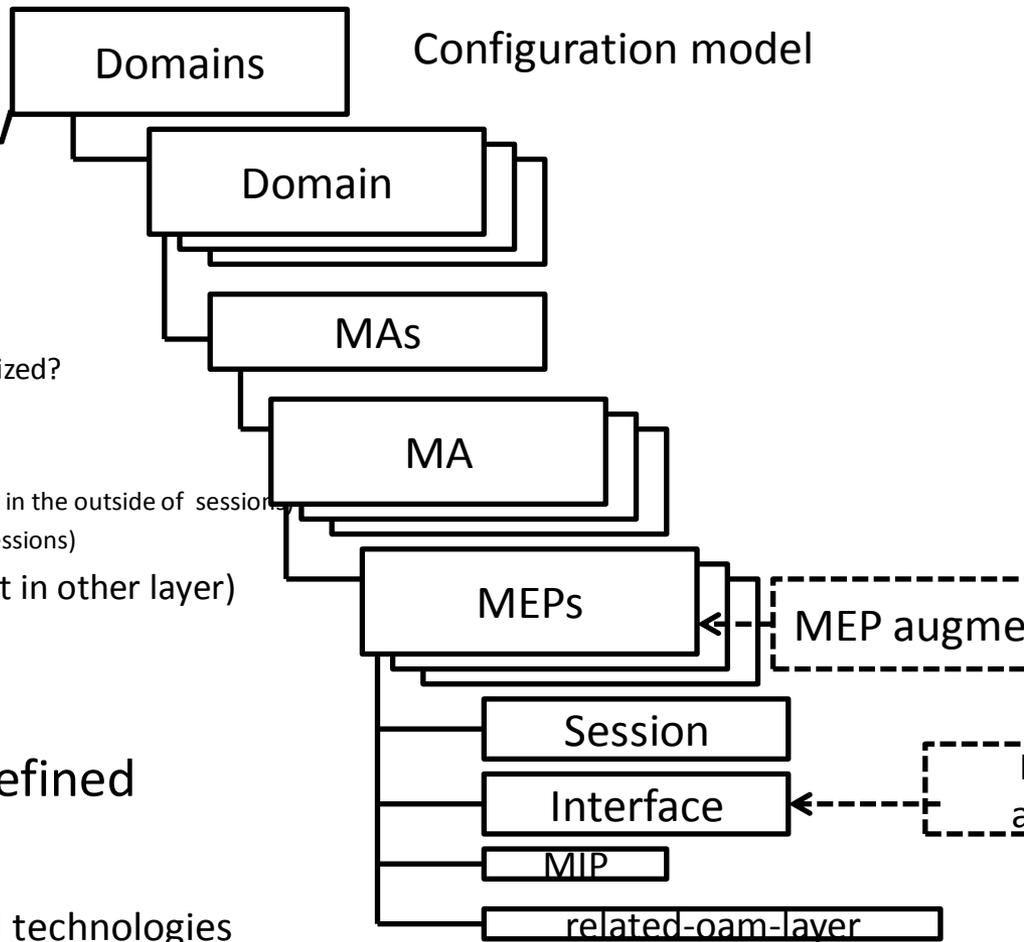
- Notification Sub Model

- Adopt model structure concept defined

- for Ethernet/MPLS-TP network;

- Make it adapt to various different OAM technologies

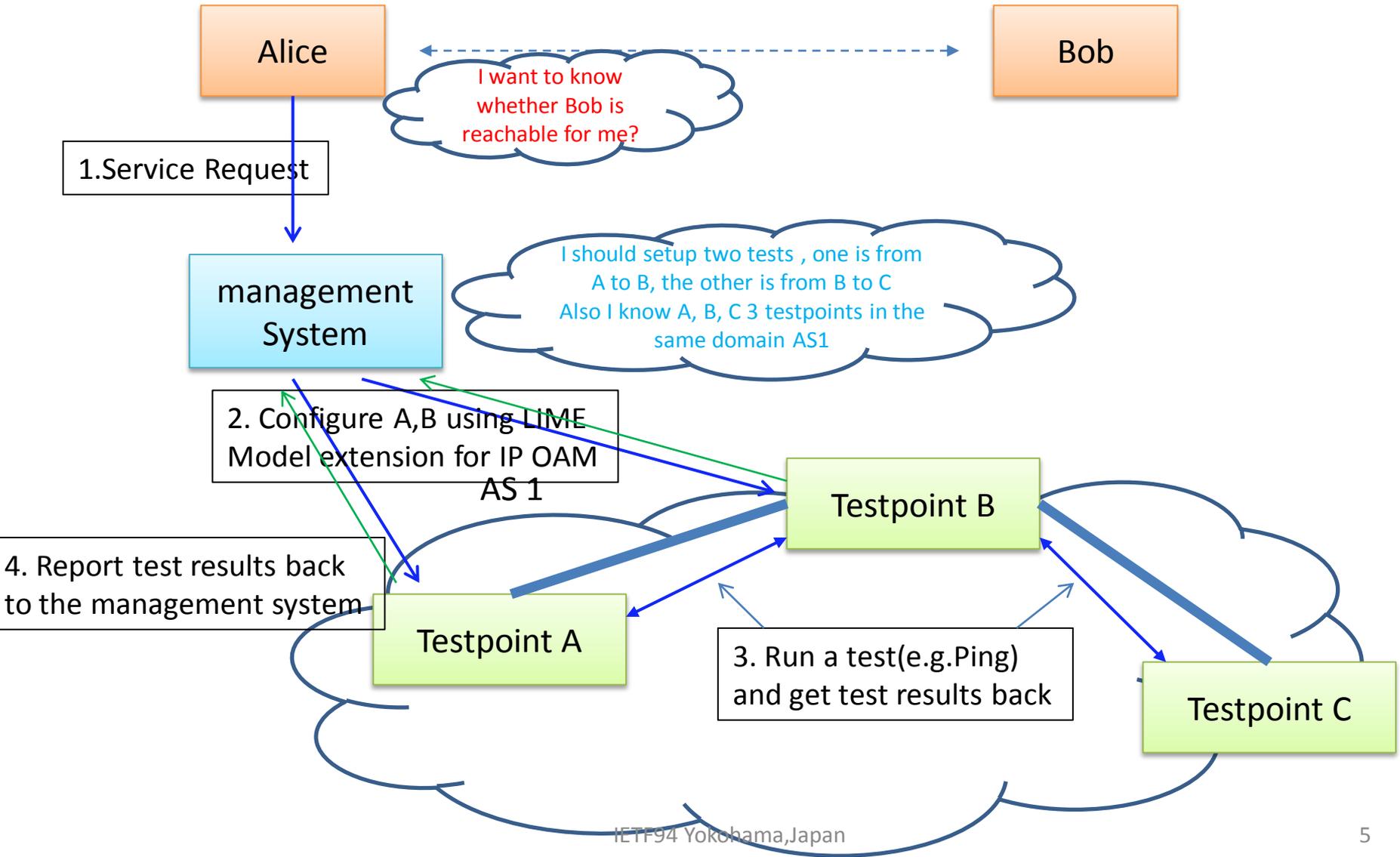
- Extend it to a technology in



Why such Model structure

- Model all OAM technologies in the same way
 - Option A is a good option: Model OAM from fault management perspective and performance management perspective
 - Option B is a bad option: Model OAM technologies from each OAM protocol perspective
- Model OAM from more abstract user perspective
 - Where to have troubleshooting
 - How to group these tests, e.g., based on location, based on the path to be applied
 - OAM technology is applied from which testpoint to which testpoint
 - What OAM technology is used

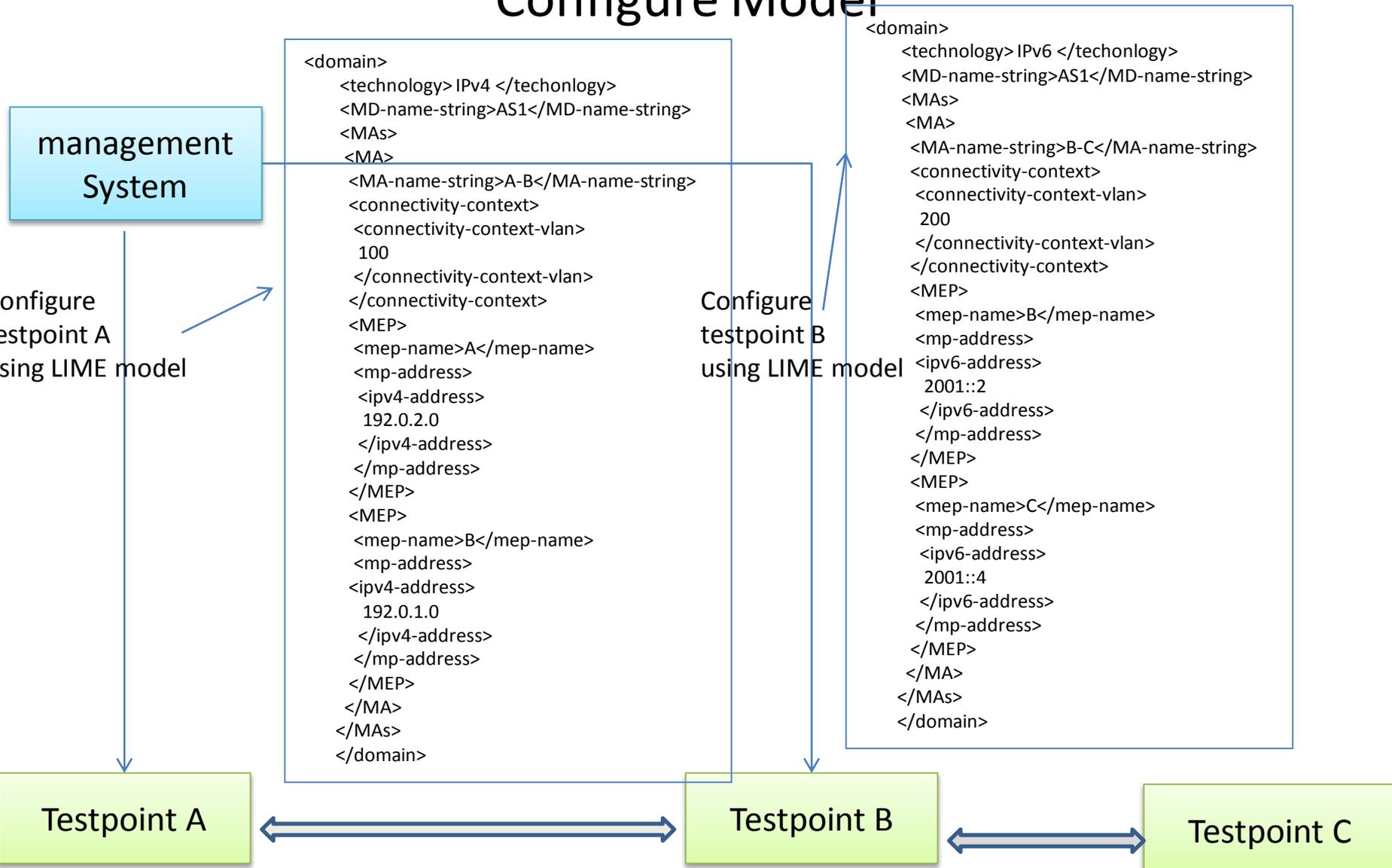
Use Case A for LIME model



Applicability of LIME model to IP Ping and Traceroute

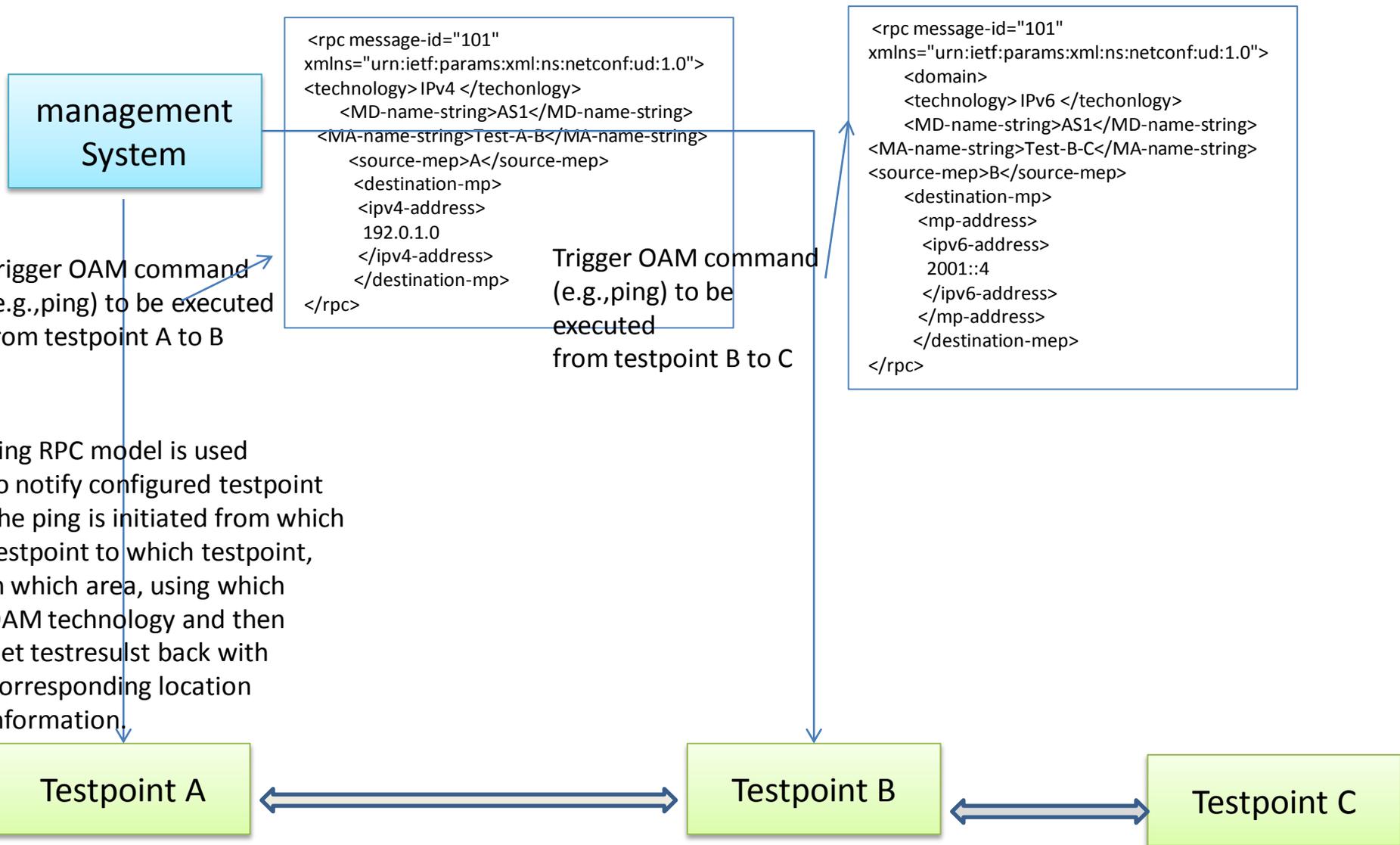
- In case of IP Ping and Traceroute, the technology type under domain is set as IPv4 or IPv6
- MD-name under domain is set by the management system as “AS1”
- In the use case A, the management system decide to have two separate tests to check whether Bob is reachable to Alice, therefore two MA-name is assigned by the management system to these two test, one is “test-A-B”, the second is “test-B-C”
- In some other cases, MA-name can be used to represent tunnel-name or lag-name and distinct test for different Tunnel or LAG.

Applicability of LIME model to IP Ping and Traceroute Configure Model



Applicability of LIME model to IP Ping and Traceroute

rpc element RPC Model for Ping



Applicability of LIME model to IP Ping and Traceroute

Notification Model for IP Traceroute

Notification example

```
<notification
xmlns="urn:ietf:params:netconf:capability:notification:1.0">
<technology>IPv4 </techonology>
<MD-name-string>AS1</MD-name-string>
<MA-name-string>A-B</MA-name-string>
<mep-name>A</mep-name>
<defect-type>misconnection</defect-type>
<error>
<error-code>Destination-Unreachable-icmp-error
</error-code>
<error-code>mtu-error</error-code>
</error>
</notification>
```

See section 1.1 of rfc6241 notification: A server-initiated message indicating that a certain event has been recognized by the server.

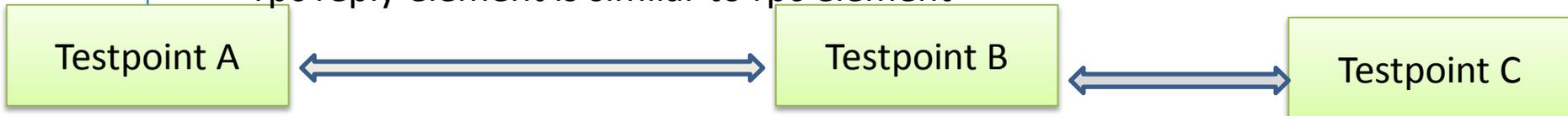
management
System



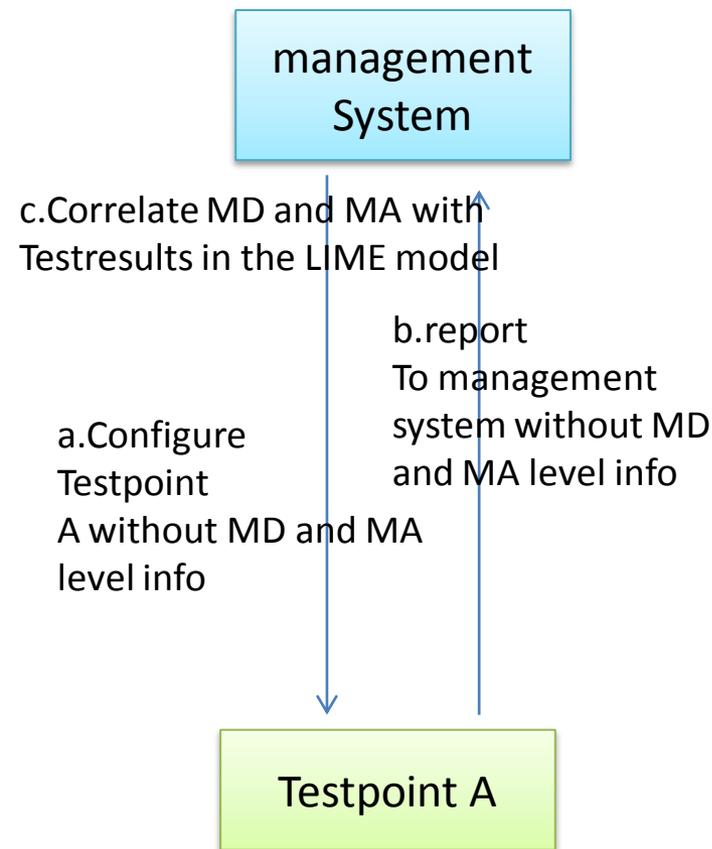
Notification model is used
By testpoint receiving defect
To report defect type and
Testpoint generating defect,
Back to the management
System.

Trigger testpoint A to report defect upon
Defect condition is met.

rpc reply element is similar to rpc element



What about testpoint doesn't support MD and MA

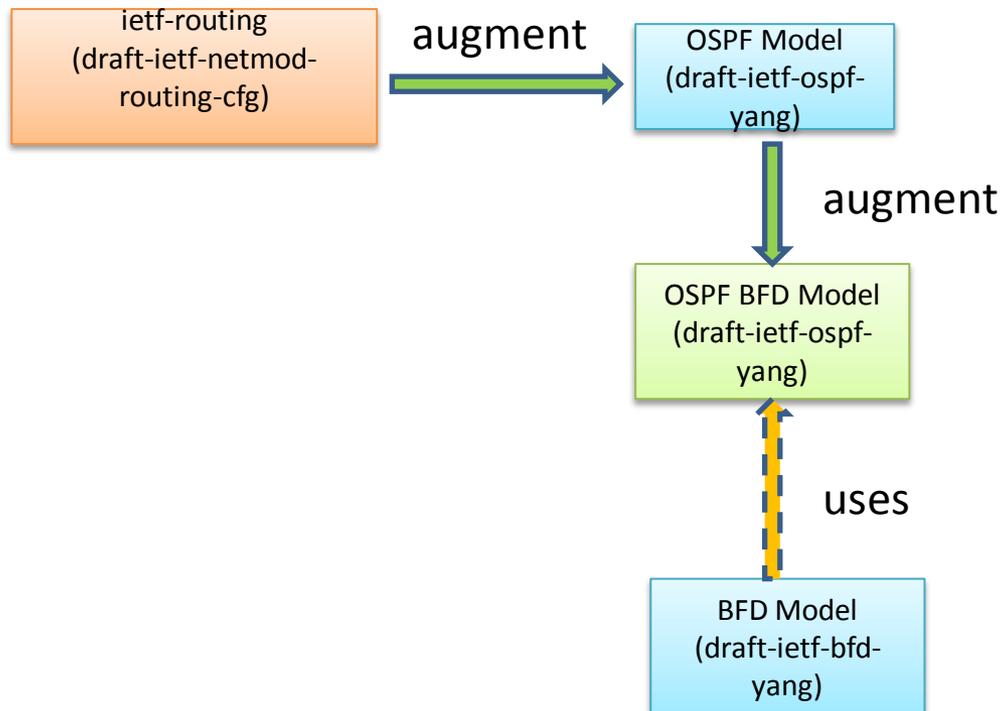


1. MD and MA is not CFM specific information in the LIME model, MD and MA stand for management information or context information that help pinpoint fault type and location.
2. If every testpoint report test results together with MD and MA, we can make fault diagnosis or fault comparison more easier.
3. MD and MA is set by the management system and sent by the management system to the testpoint using LIME model, MD and MA will not be injected into ping, traceroute.
4. If the testpoint doesn't want to receive MD and MA information, we can have two different models, one is with MD and MA for management system, the other is one without MD and MA for testpoint A
 - The cost is the management system should know how to map MD and MA back to LIME model when testpoint reports back test results.

Applicability of LIME model to BFD

Here is an example of applicability of OSPF model to BFD,

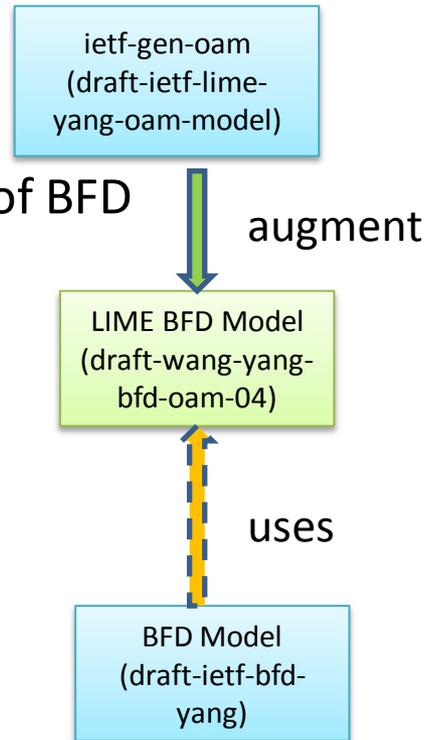
1. OSPF model is a model extension to ietf-routing base model and base model for OSPF BFD model,
2. OSPF BFD model use grouping defined in BFD base model



Applicability of LIME model to BFD

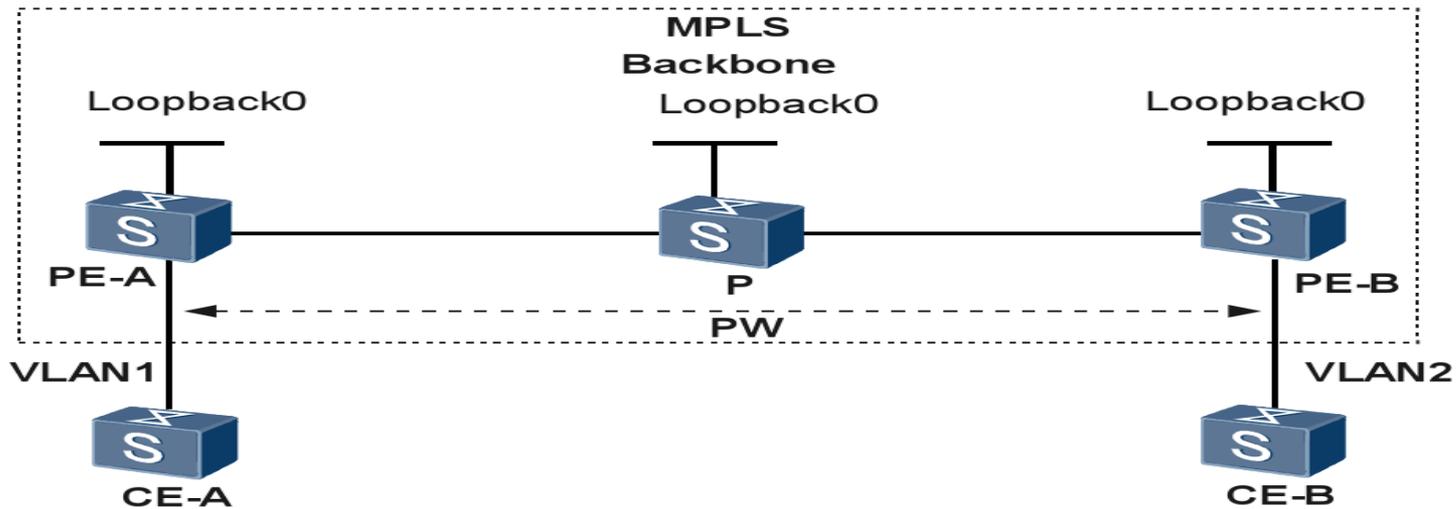
LIME model follow the same idea:

- LIME BFD model is a model extension to LIME base model
 - LIME BFD model reuses grouping defined in BFD model.
 - LIME BFD model is an application of BFD i.e., use BFD in the LIME BFD model
- To provide consistent reporting, representation and configuration.



Use case B for Applicability of LIME model to LSP Ping

Figure 1. MPLS LSP Ping Echo Request and Echo Reply Paths



- PE-A initiates an MPLS LSP Ping request for an FEC at the target device PE-B
- PE-B receives the IP packet, processes the MPLS echo request, and sends an MPLS echo reply to PE-A through alternate route
- PE-A receives the MPLS echo reply in response to the MPLS echo request and know connectivity of an LDP LSP.

Applicability of LIME model to LSP Ping

- MD-Name can be set by the management system as area-A or AS-1
- MA-Name can be set as LDP-FEC, Tunnel-Name, LAG-Name or other meanings based on test for different path
- Source address and destination address of LSP ping corresponds to source MEP and destination MEP

Next Step

- Do we need separate operation model?
 - No? we use rpc and notification to report the state
- Fix the open issues raised on the list
- Solicit more comments and reviews on the draft
- Prepare another revision based on the discussion