LIME Applicability Work Update

draft-zhuang-lime-yang-oam-model-applicability-00

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Background and Approach

Background:
- Work item in charter, agreed in Dallas
- Call for volunteers – but no output
- Zhuangyan and Zitao Wang took initiative

Approach:
- Provide common guidelines to extend the LIME base model to generate a model for a specific OAM technology
- Demonstrate with specific examples

Questions and Issues

Question:
- Right scope?
  - Examples could be shortened to tables

Issues:
- Connected vs. connectionless (Greg Mirsky)
  - should be separate discussion
- Some inconsistencies with draft-tissa (e.g., RPCs)
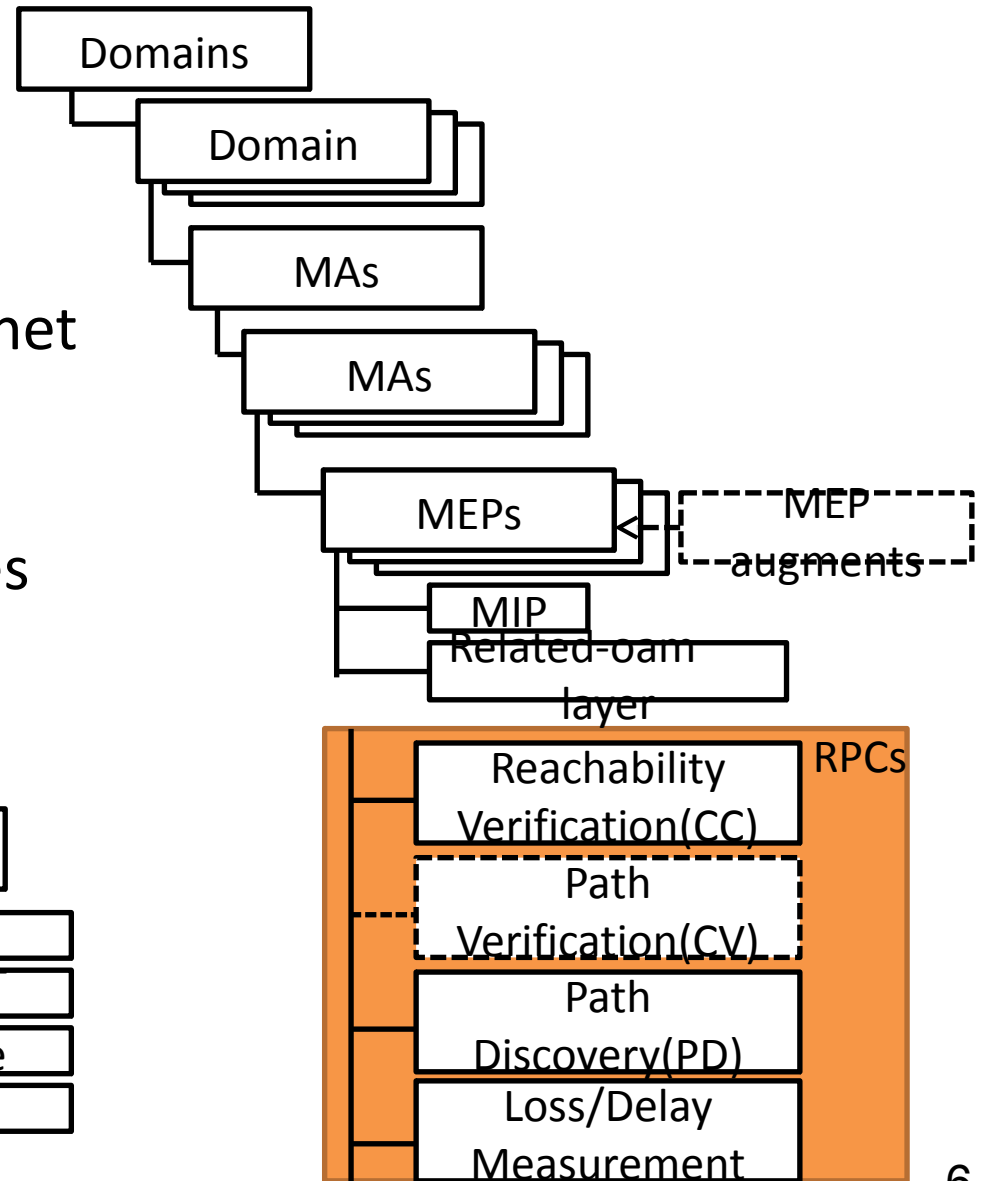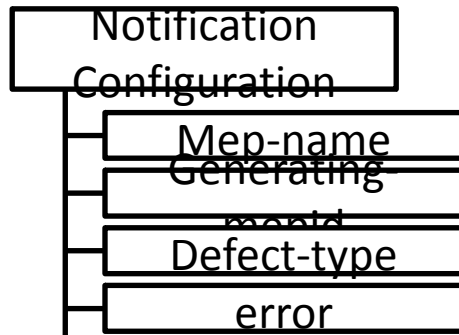- Items from list discussion

Next Step

- Prepare another revision based on meeting guidance and the open issues raised on the list.

Backup Slides

Model Structure Proposed in LIME base model

- Adopt model structure concept defined for Ethernet /MPLS-TP network;
- Make it adapt to various different OAM technologies
- Extend it to a technology independent framework.

Domains

Domain

MAs

MAs

MEPs

MEP augments

MIP

Related-oam layer

Notification Configuration

Mep-name

Generating mepid

Defect-type

error

Reachability Verification(CC)

Path Verification(CV)

Path Discovery(PD)

Loss/Delay Measurement

RPCs

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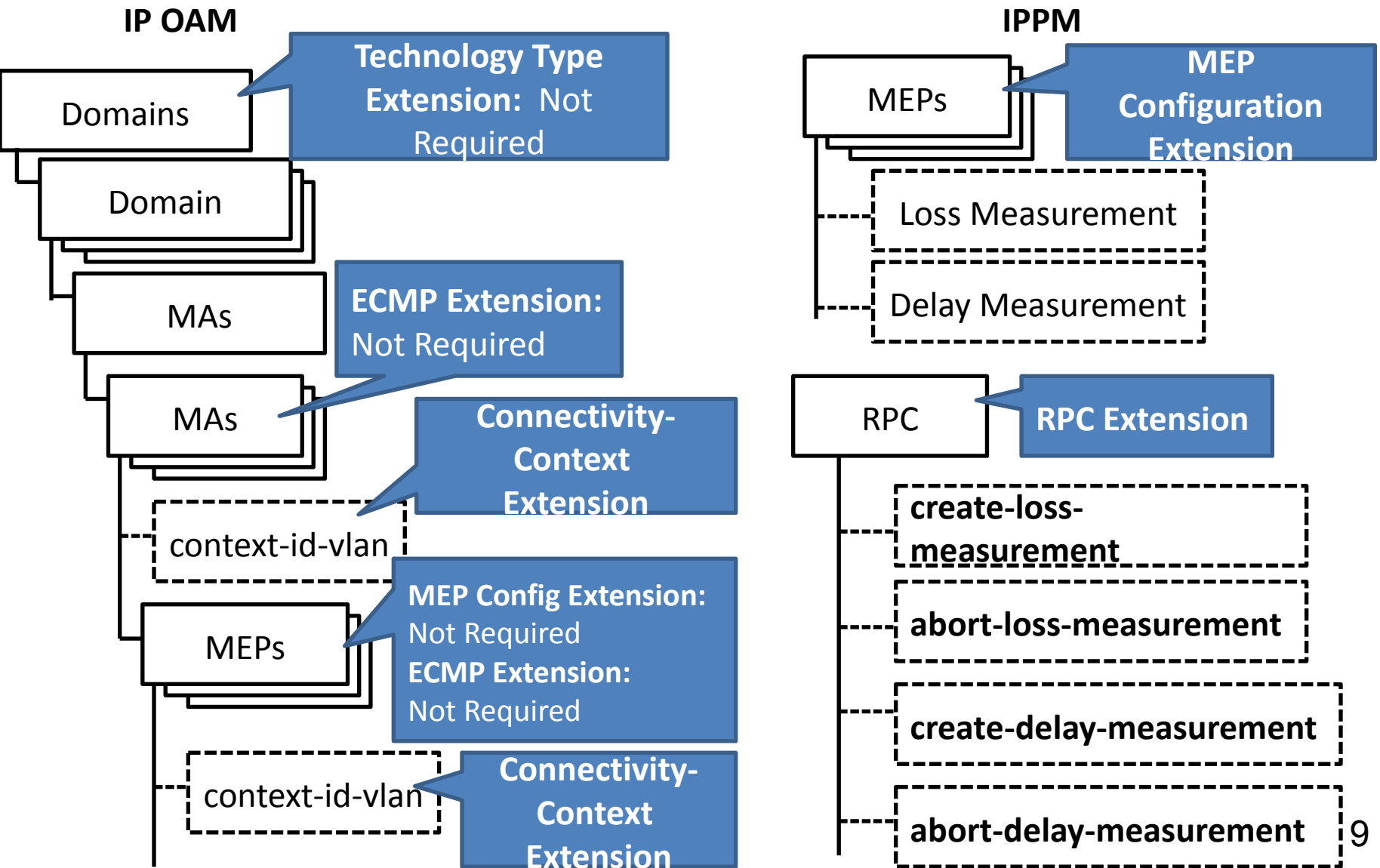# Guidelines For Extending the LIME Base Data Model

Import the Base Model into the Technology-Specific OAM

- Model.
- Use "augment" to Insert additional data into the Base Model .
- Use "identity" and "identityref" to Identify new technology
- types.
- Use choice and case nodes instead of typedef.
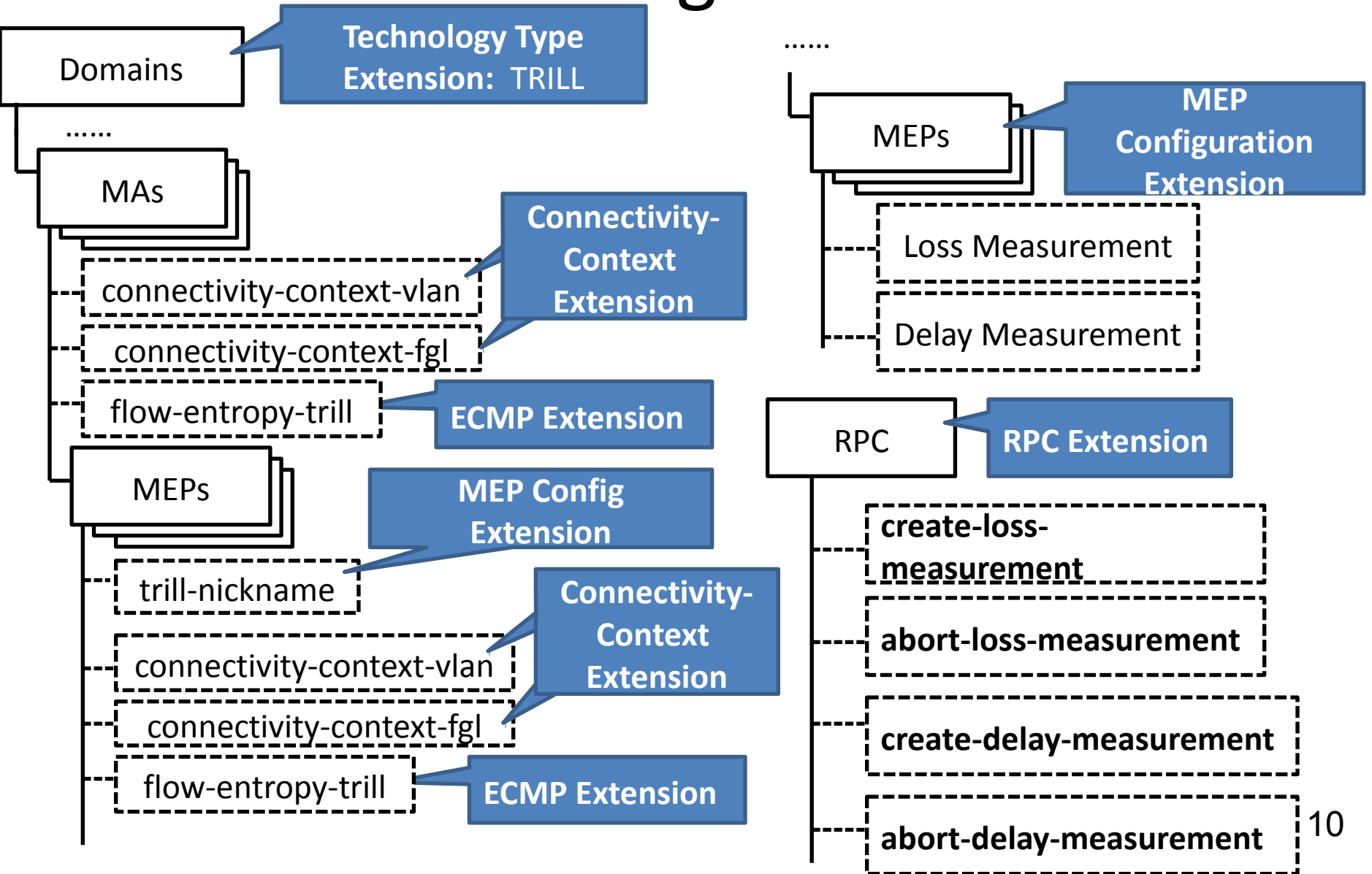- Use "feature" to define optional functionality within the data model

Existing OAM technologies

Toolset	Description	Transport Technology
IP Ping	Ping ([IntHost], [NetTerms]) is a simple application for testing reachability that uses ICMP Echo messages ([ICMPv4], [ICMPv6]).	IPv4/IPv6
IP Traceroute	Traceroute ([TCPIP-Tools], [NetTools]) is an application that allows users to trace the path between an IP source and an IP destination, i.e., to identify the nodes along the path. If more than one path exists between the source and destination, Traceroute traces *a* path. The most common implementation of Traceroute uses UDP probe messages, although there are other implementations that use different probes, such as ICMP or TCP. Paris Traceroute [PARIS] is an extension that attempts to discover all the available paths from A to B by scanning different values of header fields.	IPv4/IPv6
BFD	Bidirectional Forwarding Detection (BFD) is defined in [BFD] as a framework for a lightweight generic OAM tool. The intention is to define a base tool that can be used with various encapsulation types, network environments, and various medium types.	generic
MPLS OAM	MPLS LSP Ping, as defined in [MPLS-OAM], [MPLS-OAM-FW], and [LSP-Ping], is an OAM tool for point-to-point and point-to-multipoint MPLS LSPs. It includes two main functions: Ping and Traceroute. BFD [BFD-LSP] is an alternative means for detecting MPLS LSP data-plane failures.	MPLS

MPLS-TP OAM	MPLS-TP OAM is defined in a set of RFCs. The OAM requirements for MPLS Transport Profile (MPLS-TP) are defined in [MPLS-TP-OAM]. Each of the tools in the OAM toolset is defined in its own RFC, as specified in Appendix A.1.	MPLS-TP
Pseudowire OAM	The PWE3 OAM architecture defines Control Channels that support the use of existing IETF OAM tools to be used for a pseudo-wire (PW). The Control Channels that are defined in [VCCV] and [PW-G-ACh] may be used in conjunction with ICMP Ping, LSP Ping, and BFD to perform CC and CV functionality. In addition, the channels support use of any of the MPLS-TP-based OAM tools for completing their respective OAM functionality for a PW.	Pseudowire
OWAMP and TWAMP	The One-Way Active Measurement Protocol [OWAMP] and the Two-Way Active Measurement Protocol [TWAMP] are two protocols defined in the IP Performance Metrics (IPPM) working group in the IETF. These protocols allow various performance metrics to be measured, such as packet loss, delay, delay variation, duplication, and reordering.	IPv4/IPv6
TRILL OAM	The requirements of OAM in TRILL are defined in [TRILL-OAM]. These requirements include Continuity Checking, Connectivity Verification, path tracing, and performance monitoring. During the writing of this document, the detailed definition of the TRILL OAM tools is work in progress.	TRILL

Applicability of LIME Model to Various Technologies : **IP OAM**

IP OAM

IPPM

Domains

Technology Type Extension: Not Required

Domain

MAs

ECMP Extension: Not Required

MAs

Connectivity-Context Extension

context-id-vlan

MEPs

MEP Config Extension: Not Required
ECMP Extension: Not Required

context-id-vlan

Connectivity-Context Extension

MEPs

MEP Configuration Extension

Loss Measurement

Delay Measurement

RPC

RPC Extension

create-loss-measurement

abort-loss-measurement

create-delay-measurement

abort-delay-measurement

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Applicability of LIME Model to Various Technologies : **TRILL OAM**

Domains

Technology Type Extension: TRILL

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MAs

connectivity-context-vlan

connectivity-context-fgl

Connectivity-Context Extension

flow-entropy-trill

ECMP Extension

MEPs

trill-nickname

MEP Config Extension

connectivity-context-vlan

connectivity-context-fgl

Connectivity-Context Extension

flow-entropy-trill

ECMP Extension

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MEPs

MEP Configuration Extension

Loss Measurement

Delay Measurement

RPC

RPC Extension

create-loss-measurement

abort-loss-measurement

create-delay-measurement

abort-delay-measurement

Applicability of LIME Model to Various Technologies : **NVO3 OAM**