MEF

Introducing the Specifications of the Metro Ethernet Forum

MEF 17

Service OAM Framework and Requirements

Introducing the Specifications of the Metro Ethernet Forum

- **MEF 2**   Requirements and Framework for Ethernet Service Protection
- **MEF 3**   Circuit Emulation Service Definitions, Framework and Requirements in Metro Ethernet Networks
- **MEF 4**   Metro Ethernet Network Architecture Framework Part 1: Generic Framework
- **MEF 6**   Metro Ethernet Services Definitions Phase I
- **MEF 7**   EMS-NMS Information Model
- **MEF 8**   Implementation Agreement for the Emulation of PDH Circuits over Metro Ethernet Networks
- **MEF 9**   Abstract Test Suite for Ethernet Services at the UNI
- **MEF 10.1**   Ethernet Services Attributes Phase 2*
- **MEF 11**   User Network Interface (UNI) Requirements and Framework
- **MEF 12**   Metro Ethernet Network Architecture Framework Part 2: Ethernet Services Layer
- **MEF 13**   User Network Interface (UNI) Type 1 Implementation Agreement
- **MEF 14**   Abstract Test Suite for Traffic Management Phase 1
- **MEF 15**   Requirements for Management of Metro Ethernet Phase 1 Network Elements
- **MEF 16**   Ethernet Local Management Interface
- **MEF 17   Service OAM Framework and Requirements**
- **MEF 18**   Abstract Test Suite for Circuit Emulation Services
- **MEF 19**   Abstract Test Suite for UNI Type 1

* MEF 10 .1 replaces and enhances MEF 10 Ethernet Services Definition Phase 1 and replaced MEF 1 and MEF 5.

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This Presentation

- **Purpose:**
  - This presentation is an introduction to MEF 17
  - MEF 17 defines requirements and a framework for service Operations, Administration and Maintenance (OAM) within MEF compliant Metro Ethernet Networks (MEN).

- **Audience**
  - Equipment Manufacturers building devices that will carry Carrier Ethernet Services.
  - Useful for Service Providers architecting their systems

- **Other Documents**
  - Presentations of the other specifications and an overview of all specifications is available on the MEF web site
  - Other materials such as white papers and case studies are also available

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Purpose of MEF 17

MEF 17	Service OAM Requirements & Framework – Phase 1
Purpose	Provides requirements to be satisfied by the Service OAM mechanisms in MENs and framework for discussing and implementing those mechanisms. It also provides context for several MEF specifications (UNI type 2 and E-NNI) and the work of other standards bodies
Audience	Equipment Manufacturers building devices and Service Providers architecting their systems.

Ethernet Services "Eth" Layer
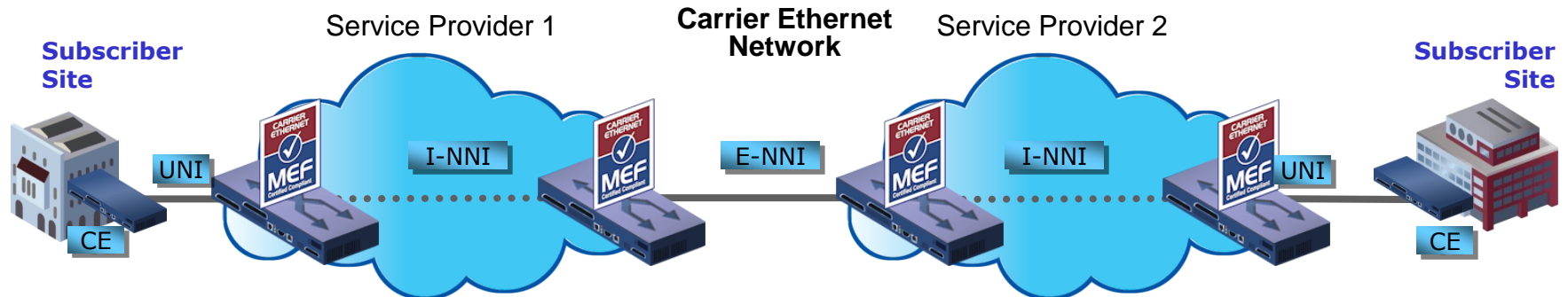
UNI: User Network Interface, UNI-C: UNI-customer side, UNI-N network side

NNI: Network to Network Interface, E-NNI: External NNI; I-NNI Internal NNI

CE: Customer Equipment

MEF certified Carrier Ethernet products

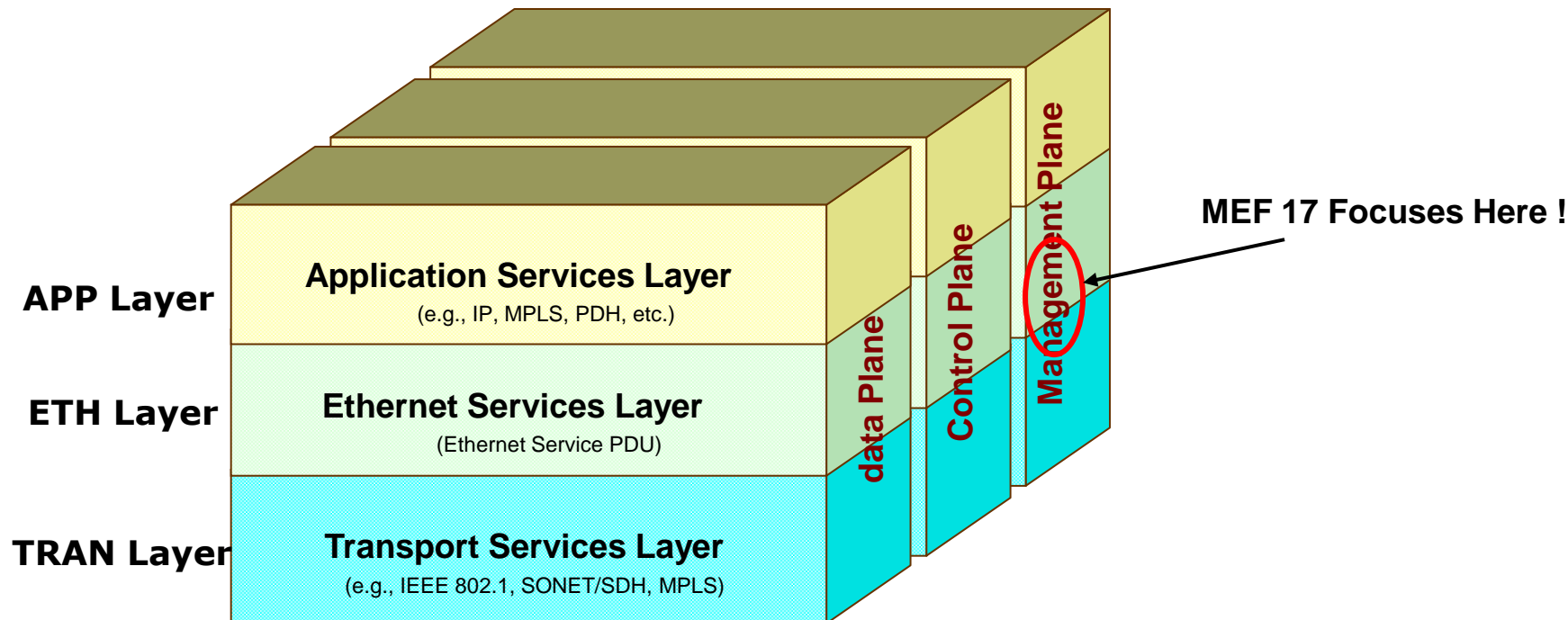**MEF**

OAM Concepts and Scope of MEF17

MEF 17 addresses the following specific functional areas of service OAM:

- **Fault Management : detection, verification, localization and notification of faults**
- **Performance Monitoring (including performance parameter measurements)**
- **Auto-discovery (including discovering service aware network elements within provider networks)**
- **Intra-provider and inter-provider service OAM**

**Note that provisioning aspects of Ethernet services and MENs are not addressed in MEF 17**

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Ethernet Services Layer

- **The MEN layered network model includes data, control and management planes. These planes may be present for all three Layers of this model, namely Transport Service Layer (TRAN Layer), Ethernet Service Layer (ETH Layer) and Application Service Layer (APP Layer). MEF 17 focuses on the management plane of the Ethernet Services Layer.**

MEF 17 Focuses Here !

APP Layer — Application Services Layer (e.g., IP, MPLS, PDH, etc.)

ETH Layer — Ethernet Services Layer (Ethernet Service PDU)

TRAN Layer — Transport Services Layer (e.g., IEEE 802.1, SONET/SDH, MPLS)

data Plane | Control Plane | Management Plane

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Ethernet Services Reference Points

- **Ethernet services may be realized across a single or multiple (sub) networks**

- **These (sub) networks are attached via internal or external NNI's (described in MEF 4)**
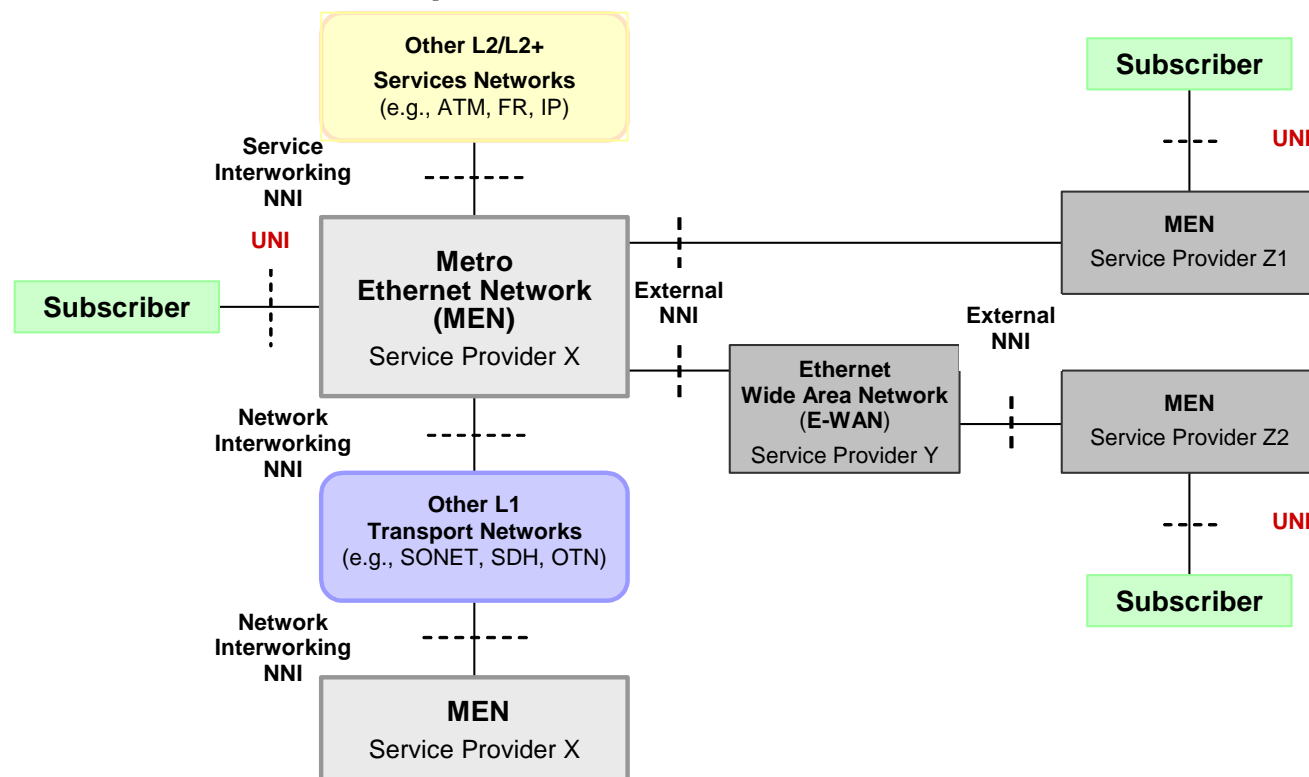
OAM Domains

OAM Domain:
a network or sub-network, operating at the ETH Layer and belonging to the same administrative entity, within which OAM frames can be exchanged

OAM Components

- **MEF 17 introduces a set of components required for efficient implementation of service OAM:**
  - Maintenance Entity (ME)
  - Maintenance Entity Group (MEG)
  - MEG End Point (MEP)
  - MEG Intermediate Point (MIP)
  - Traffic Conditioning Point (TrCP)
  - MEG Level
  - MEG Class of Service (CoS)
- **Each of these plays an important role in defining point in the ETH network within which OAM frames play some role**

Service OAM Requirements

- **OAM service-capable elements :**
    - Discover other elements in the MEN
    - Monitor the connectivity status of other elements (active, not-active, partially active).
    - Estimate Frame Loss Ratio (FLR) Performance: given as the % of lost frames as defined in MEF 10
    - Estimate Frame Delay Performance: given as time required to transmit a servie frame from souce to destination UNI as defined in MEF10
    - Estimate Frame Delay Variation (FDV) Performance: give as the difference in delay of two service frames as defined in MEF 10

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Service OAM Requirements (Cont)

- ## OAM service-capable elements :
  - Prevent OAM frames from "leaking" outside of the appropriate OAM domain to which it applies.
  - Ensure that OAM frames traverse the MEN following the same paths service frames
  - Remain independent of but allow interoperability with the underlying transport layer and its OAM capabilities
  - Remain independent of the application layer technologies and OAM capabilities
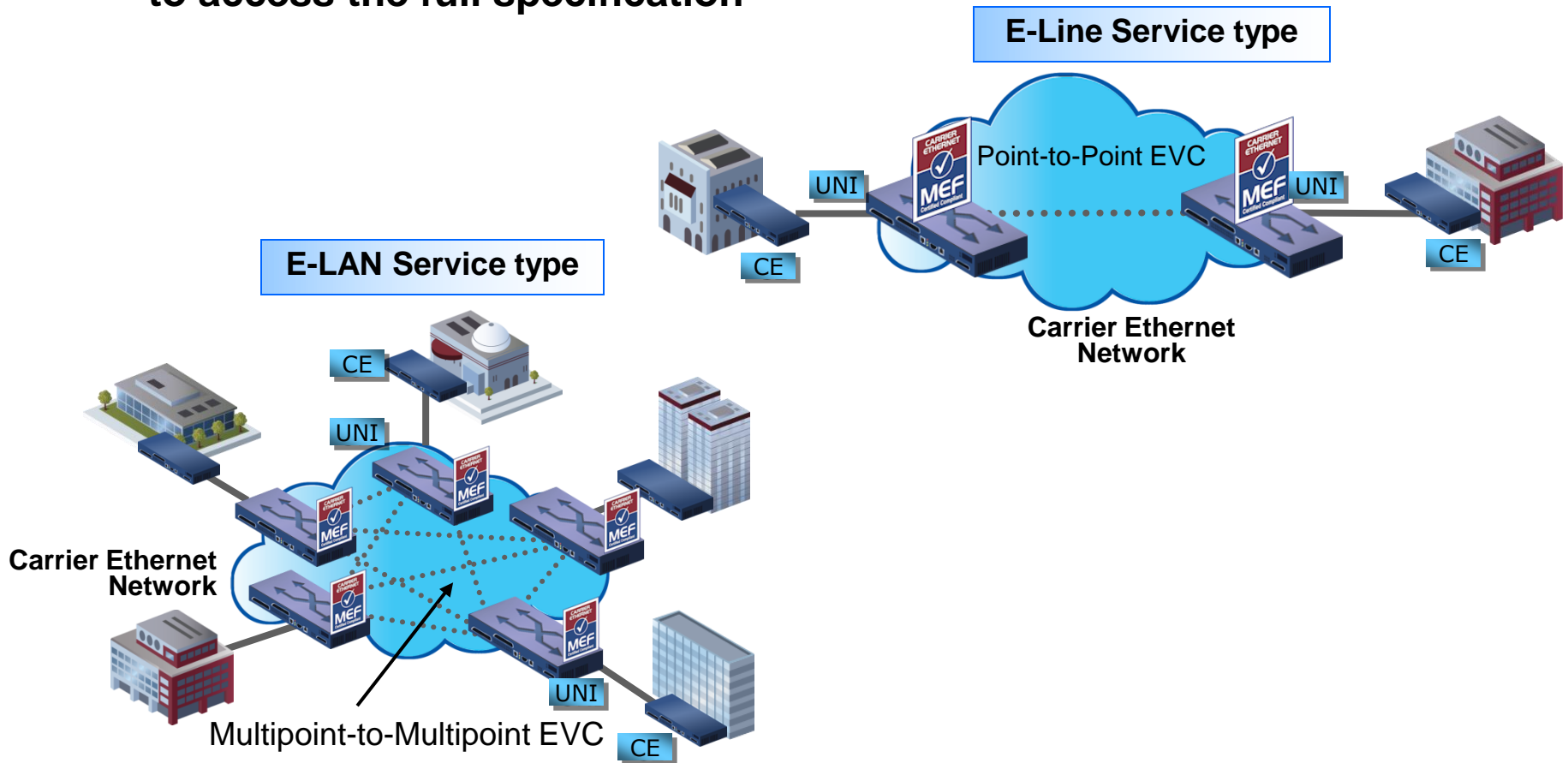
Final Word

- **OAM**
  - In the context of MEF 17, mechanisms are defined that support <u>service-level</u> OAM in MENs.

- **Next Actions**
  - Read the full MEF 17 specification (note, review of MEF 10 and MEF 15 may also be helpful)
  - Understand the principal service OAM components and capabilities

For Full Details …

Please visit www.metroethernetforum.org

to access the full specification

E-Line Service type

Point-to-Point EVC

UNI

CE

Carrier Ethernet
Network

E-LAN Service type

CE

UNI

Carrier Ethernet
Network

Multipoint-to-Multipoint EVC

UNI

CE

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Accelerating Worldwide Adoption of Carrier-class Ethernet Networks and Services

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