

MEEF

**Introducing the Specifications of the Metro
Ethernet Forum**

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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	Ethernet Services Attributes Phase I
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 Ethernet Services at the UNI
MEF 15	Requirements for Management of Metro Ethernet Phase 1 Network Elements
MEF 16	Ethernet Local Management Interface

* MEF 10 * replaced MEF 1 and MEF 5

This Presentation

- **Purpose**

- This presentation is intended as an introduction and companion to the MEF 16 Specification

- **Audience**

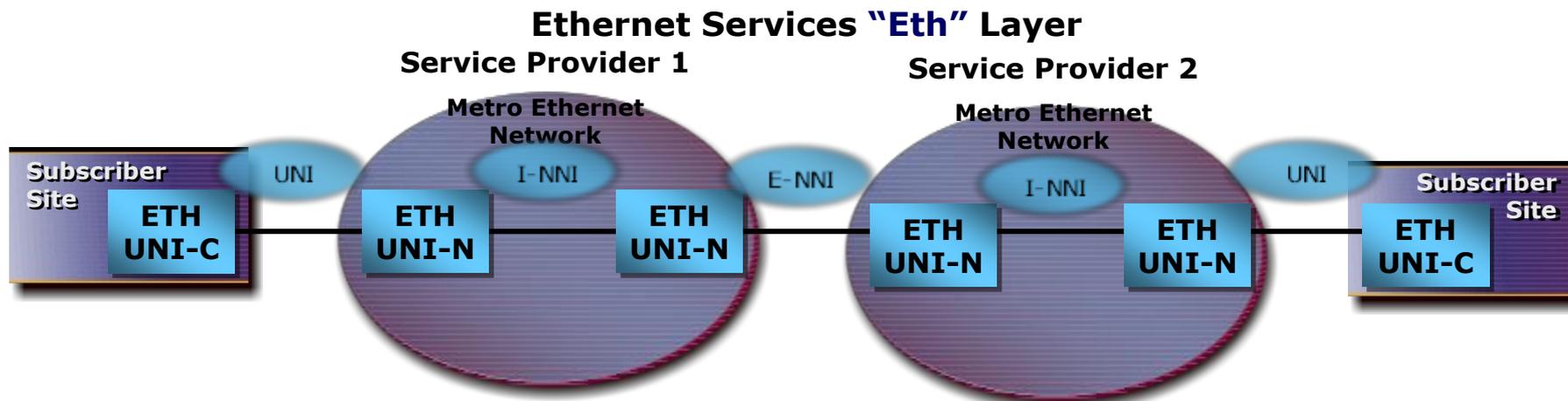
- It is intended for Product Marketing, Engineering staff of equipment manufacturers involved with products and services that deliver Carrier Ethernet
- It is intended for Service Provider Engineering staff involved in the management of products and services that comply to the MEF specifications

- **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

Introduction

MEF 16 Ethernet Local Management Interface (E-LMI)	
Purpose	Enables customer equipment to receive information regarding the status and attributes of Ethernet Services thus allowing automatic configuration and improved Subscriber network performance.
Audience	Equipment manufacturers of Customer Edge devices and of Service Provider equipment. Useful for Service Providers architecting their systems.



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
EVC- Ethernet Virtual Circuit

Content of the MEF 16 Specification

- **E-LMI Messages, Protocol and Procedures**
- **E-LMI Scope**
- **E-LMI Framing Mechanism**
- **EVC Status**
- **E-LMI Service Attributes and Parameters**
- **E-LMI Messages**
 - Approx 18 message types and sub-categories
- **E-LMI Procedures**
 - Approx 27 procedures and sub-categories

(These last two representing the bulk of the content of the specification which totals 35 pages)

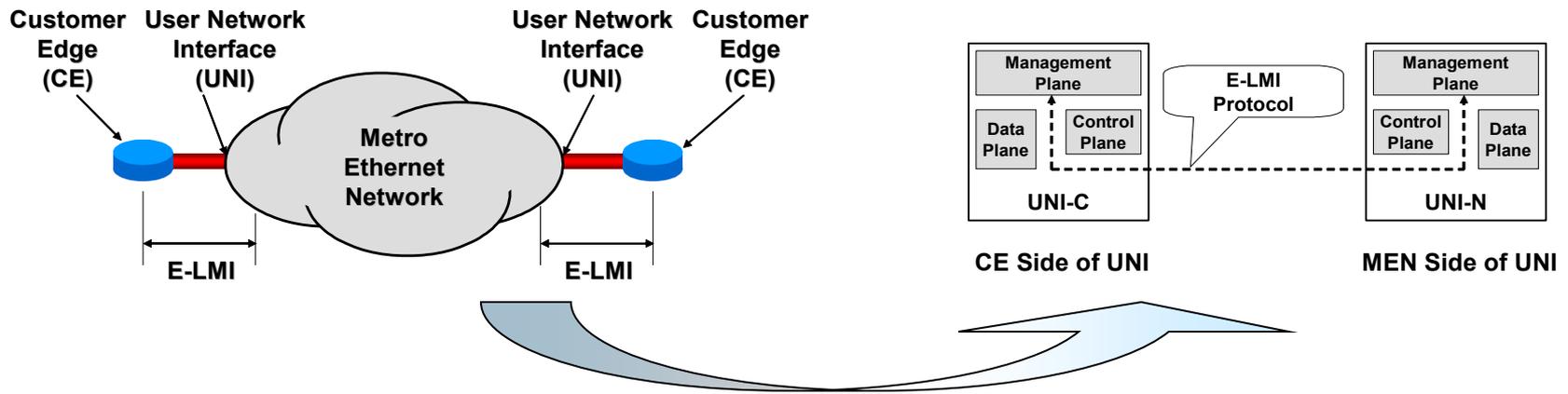
Background to the Specification

- **The E-LMI protocol is based on**
 - ITU-T Q.933, X.36 and other relevant recommendations
 - Frame Relay Local Management Interface (FR-LMI) Implementation Agreement documentas defined by the Frame Relay Forum & related ITU-T recommendations

Scope

- **Scope**

- The E-LMI protocol has a local significance at the UNI between the MEN and the CE.



- The E-LMI protocols & procedures allows auto configuration of the CE.
- The protocol also provides the status of an (EVC) notifying the Customer when an EVC is added, deleted and its status etc.

Framing Mechanism, Status, Attributes

- **E-LMI Framing Mechanism**

- Describes the framing mechanism for transferring E-LMI messages between the UNI-C and UNI-N, based on the IEEE 802.3 untagged MAC-frame format.

- **Status**

- Point-to-Point EVCs may be “new”, “active”, or “inactive”
 - In addition, multipoint-to-multipoint with some active EVCs are termed “partially active”

- **E-LMI Service Attributes and Parameters**

- The set of service attributes required to be provided by the MEN to enable auto-configuration

E-LMI Messages

Two messages are defined for the E-LMI protocol:

- STATUS and
- STATUS ENQUIRY

This section (5.5) of the specification describes the E-LMI message format, information elements, and sub-information elements (shown on the right), which are included in these E-LMI messages

- **General Message Format and Information Element Coding**
- **E-LMI STATUS and STATUS ENQUIRY Messages**
 - STATUS Message
 - STATUS Enquiry
- **E-LMI Message Elements**
 - Protocol Version
 - Message Type
 - Report Type Information Element
 - Sequence Numbers Information Element
 - CE-VLAN ID/EVC Map Information Element
 - UNI Status Information Element
 - EVC Status Information Element
 - Data Instance (DI) Information Element
 - Bandwidth Profile Sub-information Element
 - EVC Map Entry Sub-information Element
 - UNI Identifier Sub-information Element
 - EVC Identifier Sub-information Element
 - EVC Parameters Sub-information Element

E-LMI Procedures

The behavior of the E-LMI protocol is defined by procedures to be carried re:

- The events at the CE and the MEN
- The E-LMI messages received by the UNI-C and the UNI-N

These procedures (summarized on the right) are characterized by messages that will be exchanged at the UNI.

The procedures are modeled on Frame Relay Local Management Interface procedures

- **System parameters**
- **Periodic Polling**
- **Sequence Numbers**
- **Full Status**
- **Full Status Continued**
- **Asynchronous Status**
- **Data Instance Triggered Update**
 - UNI-C Procedures
 - UNI-N Procedures
- **Reporting a New EVC**
- **Error Procedures**
 - UNI-N Operation
 - UNI-C Operation
 - Examples of Error Procedures
- **Handling of Error Conditions**
 - Protocol Version Error
 - Message too short
 - Message type errors
 - General information element errors (6 types)
 - E-LMI Operational Status Determination
- **UNI-C Procedures**
- **UNI-N Procedures**

Summary and Next Actions

- **After reading this document you should now be familiar with**
 - The scope and depth of MEF 16 and know that it details the messages and procedures that traverse the UN-C and UNI-N link
- **Next Actions**
 - Read the full MEF 16 specification
 - Read the related Frame Relay documents called out in the MEF 16
 - For Network Equipment manufactures: use this information to implement the management functions

For Full Details ...

... visit www.metroethernetforum.org
to access the MEF 16 specification

