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Recommendation ITU-T G.8011/Y.1307

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Recommendation ITU-T G.8011/Y.1307

Ethernet service characteristics

Summary

Recommendation ITU-T G.8011/Y.1307 describes a framework for defining network-oriented characteristics of Ethernet services based on MEF Forum (MEF) specifications. The framework is supported by the modelling of Ethernet layer networks described by ITU-T and MEF. The service definition, service attributes and operation, administration and maintenance (OAM) introduced in this framework are used to create numerous specific Ethernet services.

This Recommendation supersedes Recommendation ITU-T G.8011.1/Y.1307.1 (2016).

History

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Keywords

Ethernet, Ethernet connection, Ethernet service, framework, network-to-network interface, user-to-network interface.

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FOREWORD

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Recommendation ITU-T G.8011/Y.1307

Ethernet service characteristics

1 Scope

This Recommendation defines a framework to describe Ethernet services based on MEF Forum (MEF) specifications. The framework consists of a set of service definitions, service attributes and operation, administration and maintenance (OAM) for each Ethernet virtual connection (EVC), operator virtual connection (OVC), Ethernet connection (EC), Ethernet user-to-network interface (UNI) and Ethernet external network-to-network interface (ENNI). The resulting services that can be defined do not refer to a particular network technology implementation and are supported by ITU-T and MEF Ethernet layer architecture models.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T G.8010] Recommendation ITU-T G.8010/Y.1306 (2004), *Architecture of Ethernet layer networks*.

[ITU-T G.8013-2015] Recommendation ITU-T G.8013/Y.1731 (2015), *Operations, administration and maintenance (OAM) functions and mechanisms for Ethernet-based networks.*

[IEEE 802.1Q] IEEE 802.1Q (2014), *IEEE Standard for Local and metropolitan area networks – Bridges and Bridged Networks.*

[IEEE 802.1AX] IEEE 802.1AX (2014), *IEEE Standard for Local and metropolitan area networks – Link Aggregation.*

[IEEE 802.3] IEEE 802.3 (2015), *IEEE Standard for Ethernet.*

[MEF 6.2] MEF 6.2 (2014), *EVC Ethernet Services Definitions Phase 3.*

[MEF 10.3] MEF 10.3 (2013), *Ethernet Services Attributes Phase 3.*

[MEF 10.3.1] MEF 10.3.1 (2015), *Composite Performance Metric (CPM) Amendment to MEF 10.3.*

[MEF 10.3.2] MEF 10.3.2 (2015), *UNI Resiliency Enhancement Amendment to MEF 10.3.*

[MEF 12.2] MEF 12.2 (2014), *Carrier Ethernet Network Architecture Framework Part 2: Ethernet Services Layer.*

[MEF 13] MEF 13 (2005), *User Network Interface (UNI) Type 1 Implementation Agreement.*

[MEF 20] MEF 20 (2008), *User Network Interface (UNI) Type 2 Implementation Agreement.*

[MEF 22.3] MEF 22.3 (2018), *Transport Services for Mobile Networks.*

[MEF 23.2] MEF 23.2 (2016), *Carrier Ethernet Class of Service Phase 3 Implementation Agreement.*

[MEF 23.2.1] MEF 23.2.1 (2017), *Models for Bandwidth Profiles with Token Sharing.*

[MEF 26.2] MEF 26.2 (2016), *External Network Network Interface (ENNI) and Operator Service Attributes.*

[MEF 30.1] MEF 30.1 (2013), *Service OAM Fault Management Implementation Agreement: Phase 2,* plus Amendment MEF 30.1.1 (2014), *Correction to Requirement.*

[MEF 33] MEF 33 (2012), *Ethernet Access Services Definition.*

[MEF 35.1] MEF 35.1 (2015), *Service OAM Performance Monitoring Implementation Agreement.*

[MEF 43] MEF 43 (2014), *Virtual NID (vNID) Functionality for E-Access Services.*

[MEF 45] MEF 45 (2014), *Multi-CEN L2CP.*

[MEF 45.0.1] MEF 45.0.1 (2017), *Amendment to MEF 45: OVC Services Requirements for L2CP.*

[MEF 47] MEF 47 (2014), *Carrier Ethernet Services for Cloud implementation Agreement.*

[MEF 51] MEF 51 (2015), *OVC Services Definitions.*

[MEF 62] MEF 62 (2018), *Managed Access E-Line Service Implementation Agreement.*

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 Ethernet virtual connection (EVC): [MEF 10.3]

3.1.2 External NNI (ENNI): [MEF 26.2]

3.1.3 operator virtual connection (OVC): [MEF 26.2]

3.1.4 service frame: [MEF 10.3]

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 customer: The entity that has ownership authority over a set of flow points. The customer may have one or more service instances.

3.2.2 Ethernet service: An Ethernet service supports an Ethernet flow (as specified in [ITU-T G.8010]). It is determined by the topology of the Ethernet network and a corresponding set of attributes associated with the Ethernet connection (EC), the UNI ports and NNI ports.

3.2.3 network-to-network interface (NNI): An interface that is used for the interconnection of network elements within a transport network.

3.2.4 user-to-network interface (UNI): An interface that is used for the interconnection of customer equipment with a network element of the transport network.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

AP	Access Provider
APP	Application
CE	Carrier Ethernet
CEN	Carrier Ethernet Network
CoS	Class of Service
E-Access	Ethernet Access
EC	Ethernet Connection
EFD	Ethernet Flow Domain
E-LAN	Ethernet LAN
E-Line	Ethernet Line
E-LMI	Ethernet Link Management Interface
ENNI	External Network-to-Network Interface
EPL	Ethernet Private Line
EP-tree	Ethernet Private tree
ETH	Ethernet MAC layer network
E-Tree	Ethernet Tree
EVC	Ethernet Virtual Connection
EVPL	Ethernet Virtual Private Line
EVPLAN	Ethernet Virtual Private LAN
EVP-tree	Ethernet Virtual Private tree
FM	Fault Management
FP	Flow Point
GARP	Generic Attribute Registration Protocol
GVRP	GARP VLAN Registration Protocol
IA	Implementation Agreement
LAN	Local Area Network
L2CP	Layer 2 Control Protocol
MAC	Media Access Control
MEG	Maintenance Entity Group
MEN	Metro Ethernet Network
MPLS	Multi-Protocol Label Switching
MSTP	Multiple Spanning Tree Protocol
OAM	Operation, Administration and Maintenance
OTH	Optical Transport Hierarchy
O-Line	OVC Line

O-LAN	OVC LAN
O-Tree	OVC Tree
OVC	Operator Virtual Connection
PM	Performance Monitoring
RSTP	Rapid Spanning Tree Protocol
S-EC	Subscriber EC
SDH	Synchronous Digital Hierarchy
SLA	Service Level Agreement
SOAM	Service OAM
SONET	Synchronous Optical Network
SP	Service Provider
TFP	Termination Flow Point
TRAN	Transport Layer
TSMN	Transport Services for Mobile Networks
UNI	User-to-Network Interface
UNI-C	Customer side of UNI
UNI-N	Network side of UNI
UTA	UNI Tunnel Access
VLAN	Virtual LAN
VoIP	Voice over IP
VUNI	Virtual UNI

5 Conventions

None.

6 Carrier Ethernet Services and Attributes

6.1 Description of MEF Carrier Ethernet service

Carrier Ethernet service is defined in [MEF 6.2]. As depicted in Figure 1, the MEF network reference model defines Ethernet services that transport subscriber Ethernet frames across a service provider's Carrier Ethernet network (CEN). The service provider is responsible for the performance and availability of the service between the user-to-network interface (UNI) demarcation points.

Ethernet service frames are transported across the CEN through virtual connections. [MEF 6.2] defines three service types: an E-Line, which is a point-to-point Ethernet virtual connection (EVC), an E-LAN, which is a multipoint-to-multipoint EVC and an E-Tree, which uses a rooted multipoint EVC. The MEF's service definition is built on virtual connections, as specified in [IEEE 802.1Q], established over lower-layer transport services. Therefore, Ethernet service frames, as specified in [IEEE 802.3], can be transported over a variety of different technologies such as synchronous optical network (SONET)/synchronous digital hierarchy (SDH), multi-protocol label switching (MPLS), bundled-copper and fibre. The underlying transport mechanisms may vary on a link-by-link basis. Thus, service providers can offer CE services independent of the underlying transport technology.

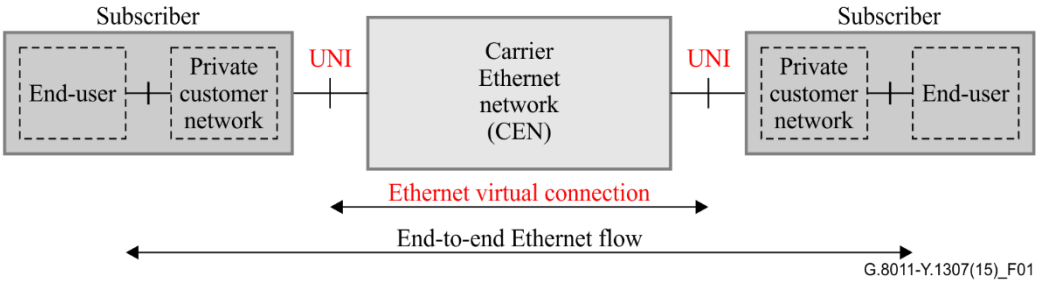

Figure 1 – Basic MEF framework reference model

Building on the basic reference model illustrated in Figure 1, SPs needed the capability to extend service delivery outside of their franchise. To enable this connectivity, the MEF created a UNI tunnelled access [MEF 26.2] and an Ethernet access (E-Access) service definition [MEF 33]. Figure 2 illustrates a CE service using an E-Access service [MEF 33]. As the SP does not have the facilities to deliver CE service end-to-end, it uses an access provider (AP) from an external network-to-network interface (ENNI) to the end subscriber. By connecting together two operator virtual connections (OVCs), they can deliver the end-to-end service. The case where the SP does not have to deploy an additional network interface device (NID) is described as a virtual NID E-access service [MEF 43].

Another means to deliver end-to-end connectivity is achieved by using a UNI tunnelled access [MEF 26.2], which resembles an E-Access service but has the AP UNI functionality located at both ENNI and remote UNI.

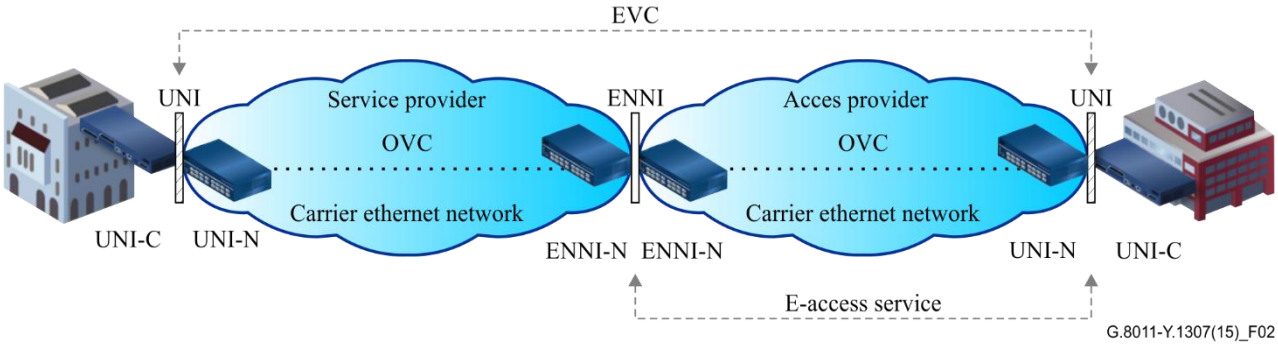

Figure 2 – E-Access service example

The application of this service definition to mobile backhaul is described in [MEF 22.2]. The mobile backhaul application defines the addition of resiliency, availability and synchronization to the service definition.

6.2 Description of MEF Carrier Ethernet service attributes

As shown in Figure 1, an Ethernet virtual connection (EVC) connects two UNIs together to deliver CE services. The service attributes and parameters for this service are defined in [MEF 10.3], [MEF 10.3.1] and [MEF 10.3.2]. The attributes detailing the interaction of layer 2 control protocols in multi-CEN environments are defined in [MEF 45]. The resulting service attributes are categorized per UNI, per EVC per UNI and per EVC, as shown in Table 1.

Table 1 – Ethernet service attributes

UNI service attributes	EVC per UNI service attributes	EVC service attributes
UNI identifier	UNI EVC ID	EVC type
Physical layer	CoS identifiers	EVC ID
Synchronous mode	Ingress bandwidth profile per EVC	UNI list
Number of links	Ingress bandwidth profile per CoS identifier	Maximum number of UNIs
Service frame format	Egress bandwidth profile per EVC	EVC maximum service frame size
UNI maximum service frame size	Egress bandwidth profile per egress equivalence identifier	CE-VLAN ID preservation
Service multiplexing	Egress equivalence class identifier	CE-VLAN CoS preservation
Bundling	Colour identifier	Unicast data service frame delivery
All to one bundling	Source media access control (MAC) address limit	Multicast data service frame delivery
CE-VLAN ID for untagged and priority tagged service frames	Test maintenance entity group (MEG)	Broadcast data service frame delivery
Maximum number of EVCs	Subscriber MEG	Layer 2 control protocol processing
Ingress bandwidth profile per UNI		EVC performance
Egress bandwidth profile per UNI		
Layer 2 control protocols Processing		
CE-VLAN ID/EVC map		
Link OAM		
UNI MEG		
Ethernet link management interface (E-LMI)		
UNI resiliency		

As shown in Figure 2, CE services can be delivered by connecting together OVCs through an ENNI, therefore using different operator CENs.

MEF has defined a set of three standardized classes of service (CoS) in [MEF 23.2], as well as a fourth for synchronization in [MEF 22.2] in support of mobile backhaul. Elastic services that allow modification of service attributes related to CoS, in support of cloud services, are specified in [MEF 47]. In addition, CoS performance objectives for a number of defined metrics are specified and grouped into performance tiers.

Link aggregation [IEEE 802.1AX] is used for UNI resiliency.

6.3 Description of MEF Carrier Ethernet service architecture

The MEF has defined a Carrier Ethernet architecture in [MEF 12.2]. This work is aligned with and builds on the topological constructs of the Ethernet layer architecture model in ITU-T G.8010 and its

amendments [ITU-T G.8010]. Figure 3 shows a base model of an Ethernet service and the relationship between the EVC, the OVC, as well as the underlying ECs including end points and flow points (FPs).

In addition, MEF has further detailed two modes of operation for configuration of the customer side of UNI (UNI-C) and the network side of UNI (UNI-N). These are UNI type 1 [MEF 13] and UNI type 2 [MEF 20].

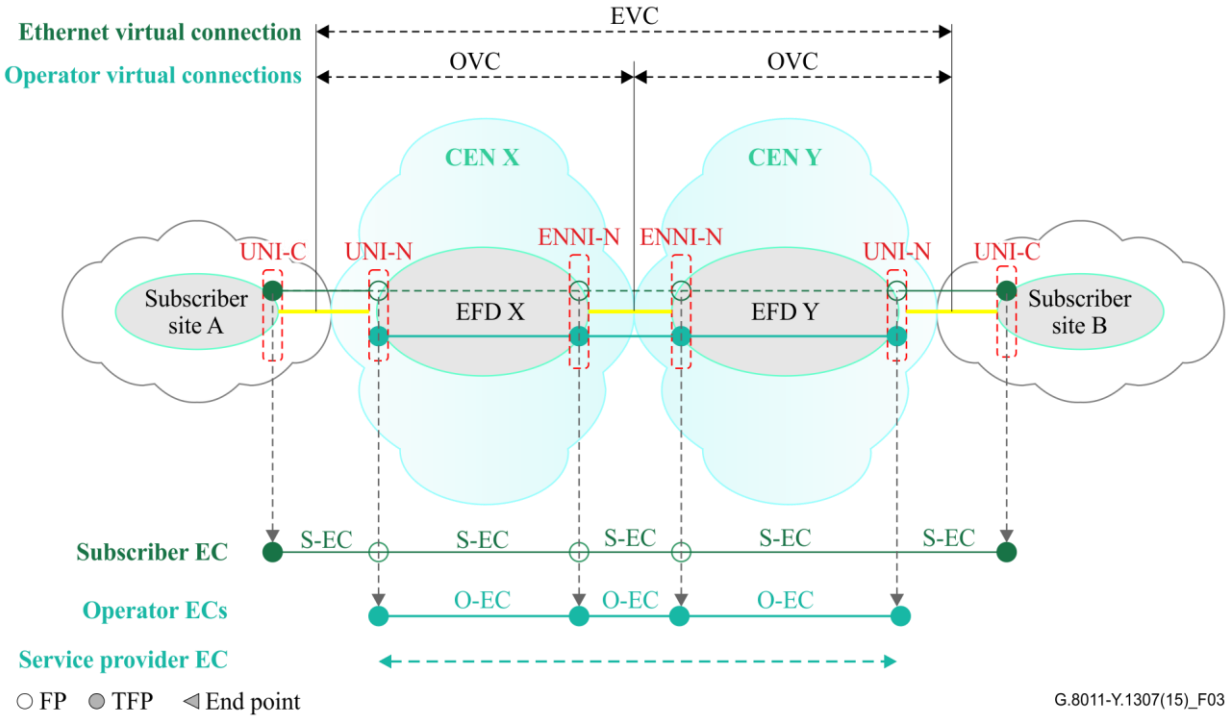

Figure 3 – Base MEF architecture

6.4 Description of MEF Carrier Ethernet OAM

Connectivity monitoring can be achieved via Ethernet OAM mechanisms defined in [ITU-T G.8013-2015]. Additional specifications on the use of service OAM (SOAM) for fault management and performance monitoring are defined in [MEF 30.1] and [MEF 35.1] respectively.

6.5 Description of MEF OVC service

An operator virtual connection (OVC) is defined in [MEF 26.2]. The OVC service is described in [MEF 51]. The technical specification defines OVC services that can be offered by an operator of a Carrier Ethernet network (CEN). The OVC services are constructed using the OVC, the OVC end points at the ENNI and the UNI. [MEF 51] contains the general OVC-based services (O-Line, O-LAN and O-Tree) along with Transit E-Line and Transit E-LAN service definitions that are built on the general OVC-based services.

Appendix I

Summary of MEF specifications

(This appendix does not form an integral part of this Recommendation.)

Table I.1 lists the MEF specifications that are included by reference in this Recommendation. They are listed sequentially and grouped according to the parts in clause 6.

This set of MEF specifications is based on CE 2.0, but there are variations to include the latest specification revisions and also to exclude information modelling and data model specifications.

Table I.1 – Table of reference to MEF specifications

MEF	MEF specification title	Group name
6.2 [MEF 6.2]	EVC Ethernet Services Definitions Phase 3	Service definition
10.3 [MEF 10.3]	Ethernet Services Attributes Phase 3	Service attributes
10.3.1 [MEF 10.3.1]	Composite Performance Metric (CPM) Amendment to [MEF 10.3]	Service attributes
10.3.2 [MEF 10.3.2]	UNI Resiliency Enhancement Amendment to MEF 10.3	Service attributes
12.2 [MEF 12.2]	Carrier Ethernet Network Architecture Framework Part 2: Ethernet Services Layer	Architecture
13 [MEF 13]	User Network Interface (UNI) Type 1 Implementation Agreement	Architecture
20 [MEF 20]	User Network Interface (UNI) Type 2 Implementation Agreement	Architecture
22.3 [MEF 22.3]	Transport Services for Mobile Networks.	Service definition
23.2 [MEF 23.2]	Carrier Ethernet Class of Service Phase 3 Implementation Agreement	Service attributes
23.2.1 [MEF 23.2.1]	Models for Bandwidth Profiles with Token Sharing	Service attributes
26.2 [MEF 26.2]	External Network Network Interface (ENNI) and Operator Service Attributes	Service attributes
30.1 [MEF 30.1]	Service OAM Fault Management Implementation Agreement: Phase 2	OAM
30.1.1 [MEF 30.1]	Amendment to [MEF 30.1] – Correction to Requirement	OAM
33 [MEF 33]	Ethernet Access Services Definition	Service definition
35.1 [MEF 35.1]	Service OAM Performance Monitoring Implementation Agreement	OAM
43 [MEF 43]	Virtual NID (vNID) Functionality for E-Access Services	Service definition
45 [MEF 45]	Multi-CEN L2CP	Service attributes
45.0.1 [MEF 45.0.1]	Amendment to MEF 45: OVC Services Requirements for L2CP	Service attributes
47 [MEF 47]	Carrier Ethernet Services for Cloud implementation Agreement	Service definition
51 [MEF 51]	OVC Services Definitions	Service definition
62 [MEF 62]	Managed Access E-Line Service Implementation Agreement	Service definition

The following clauses provide a brief summary of the content of the referenced MEF specifications.

I.1 Architecture documents

MEF 12.2 – Carrier Ethernet Network Architecture Framework Part 2: Ethernet Services Layer

[MEF 12.2] provides the architecture framework to model the Ethernet services layer of MEF compliant Carrier Ethernet networks. The Ethernet services layer architecture framework describes the high-level topological and functional constructs used to model the various architectural components of the Ethernet service subscriber and provider networks, their associated functional elements and their interconnect relationships. The architecture framework also describes the relationship between Ethernet services layer interfaces, functional elements and their reference points, and other architectural elements in the transport layer (TRAN) and application (APP) layers of the [b-MEF 4].

MEF 13 – User Network Interface (UNI) Type 1 Implementation Agreement

The main objective of [MEF 13] is to specify the MEF UNI characteristics and operation in manual configuration mode. This allows existing Ethernet devices (e.g., switch, router, work-station) acting as CEs to be instantly compliant to [MEF 13] with no additional software or hardware upgrades. The main functionality of [MEF 13] is to allow data-plane Ethernet connectivity between the UNI-C and UNI-N. [MEF 13] references MEF UNI requirements and framework for all concepts, constructs and terminology. The UNI type 1 mode provides the minimum data-plane connectivity services with no control-plane or management-plane capabilities.

MEF 20 – User Network Interface (UNI) Type 2 Implementation Agreement

[MEF 20] adds new functionalities to MEF UNI type 1 [MEF 13], such as E-LMI based on [MEF 16], link OAM based on clause 57 of [b-IEEE 802.3], service OAM based on [b-ITU-T Y.1731] and [b-IEEE 802.1ag] and protection using link aggregation based on clause 43 of [b-IEEE 802.3].

I.2 Service attribute documents

MEF 10.3 – Ethernet Services Attributes Phase 3

[MEF 10.3] defines the attributes of Ethernet services observable at a UNI and from user-to-network interface to user-to-network interface (UNI to UNI). In addition, a framework for defining specific instances of Ethernet services is also described.

MEF 10.3.1 – Composite Performance Metric (CPM) Amendment to MEF 10.3

[MEF 10.3.1] adds a section to [MEF 10.3] to define the composite performance metric. The one-way composite performance metric (CPM) specifies how often an EVC meets or exceeds the frame delay, inter-frame delay variation and frame loss service performance over a time interval.

MEF 10.3.2 – Amendment to MEF 10.3 – UNI Resiliency Enhancement

[MEF 10.3.2] enhances the UNI resiliency service attribute (defined in [MEF 10.3]) to include multiple physical links that can carry different service frames simultaneously at a UNI.

MEF 23.2 – Carrier Ethernet Class of Service Phase 3 Implementation Agreement

[MEF 23.2] defines a set of three CoS names called CoS labels for EVCs and OVCs. [MEF 23.2] also defines values for CoS performance objectives (CPOs) grouped in performance tier sets, as well as performance parameters.

MEF 23.2.1 - Models for Bandwidth Profiles with Token Sharing Amendment to MEF 23.2

[MEF 23.2.1] defines a new normative section that defines a set of token sharing Bandwidth Profile models. These models allow for multiple Bandwidth Profile Flows in an Envelope thus enabling token sharing among the Bandwidth Profile Flows.

MEF 26.2 – External Network Network Interface (ENNI) and Operator Service Attributes

The MEF defines a reference point between two Carrier Ethernet networks (CENs), where each operator CEN is under the control of a distinct administrative authority. This reference point is termed the external network-to-network interface or ENNI. The ENNI is intended to support the extension of Ethernet services across multiple operator CENs. [MEF 26.2] specifies the requirements at the ENNI reference point as well as the interface functionality in sufficient detail to ensure interoperability between two operator CENs including link OAM. [MEF 26.2] also defines the connectivity attributes UNI to UNI, UNI to ENNI and ENNI to ENNI such that multiple operator CENs can be interconnected and the Ethernet services and attributes in [MEF 6.2] and [MEF 10.3] can be realized.

MEF 45 – Multi-CEN L2CP

[MEF 45] specifics the service attributes and requirements for handling layer 2 control protocol (L2CP) frames in a Carrier Ethernet network.

MEF 45.0.1 – OVC Services Requirements for L2CP

[MEF 45.0.1] modifies [MEF 45] to add a new subsection to section 10 of [MEF 45] to identify L2CP attributes necessary to support E-Access and E-Transit Services as defined in [MEF 51].

I.3 Service definition documents

MEF 6.2 – EVC Ethernet Services Definitions Phase 3

[MEF 6.2] defines three service constructs called Ethernet service types and six Ethernet services with service attributes and parameters as specified in [MEF 10.3] and in [MEF 45]. These service types are used to create point-to-point, multipoint-to-multipoint and rooted-multipoint Ethernet services that are either port or virtual LAN (VLAN) based.

MEF 22.3 – Transport Services for Mobile Networks

[MEF 22.3] identifies the requirements for MEF Ethernet Services and MEF External Interfaces (EIs such as User-Network Interface (UNI)s) for use in Mobile Backhaul networks based on MEF specifications. In addition, new interface and service attributes have been specified where needed. The services and requirements in [MEF 22.3] are based on the services defined in [MEF 6.2], [MEF 33] and [MEF 51] as well as the attributes in [MEF 10.3], [MEF 26.2] and in [MEF 22.3].

MEF 33 – Ethernet Access Services Definition

[MEF 33] defines Ethernet access services, which are OVC-based Ethernet services in contrast to the EVC-based services which are defined in [MEF 6.2]. [MEF 33] uses the UNI service attributes and parameters options defined in the [MEF 6.2] and ENNI and OVC service attributes defined in [MEF 26.2] and applies them to create new Ethernet access services between a UNI and an ENNI. These new carrier-to-carrier Ethernet access services enable Ethernet service providers to reach out-of-franchise customer locations through an Ethernet access provider's network and deliver E-Line and E-LAN service types end-to-end. [MEF 33] defines the UNI, OVC, OVC per UNI, OVC end point per ENNI and ENNI requirements for point-to-point OVC-based Ethernet services. In addition, an informative appendix is provided showing use cases of some of the defined services.

MEF 43 – Virtual NID (vNID) Functionality for E-Access Services

[MEF 43] specifies the functionality offered by an access provider (AP) that, when combined with an Ethernet-Access (E-Access) service, allows a service provider (SP) to monitor and configure selected objects associated with a given UNI and one or more OVC end points at that UNI in the AP's network. The effect is that the AP provides functionality similar to what would otherwise require the SP to place a network interface device (NID) at the customer's location. Hence, the AP is said to be providing "virtual NID (vNID)" functionality to the E-Access service that the SP has purchased. This

is accomplished via the SP communicating over a remote management interface (RMI) connection to the AP, using an RMI protocol.

In addition, [MEF 43] provides guidance, where necessary, on how the SP and AP should interact to configure and manage these capabilities. This framework is presented to explain the assumptions of what interactions between the SP and AP need to be supported via the RMI protocol and what interactions are assumed to be supported via the service order process.

MEF 47 – Carrier Ethernet Services for Cloud Implementation Agreement

[MEF 47] identifies the requirements for MEF Ethernet services and MEF external interfaces (EIs such as UNIs) as well as a management interface for use in support of Cloud services. This support includes elastic behaviour of Ethernet service attributes that can be modified during the lifetime of the service. Support for Cloud services falls into two broad categories: 1) interconnection of a Cloud provider's data centres which is referred to as data centre interconnect (DCI) and 2) interconnection of Cloud consumers (e.g., enterprises) and Cloud provider data centres which is referred to as data centre access (DCA). The services and requirements in this Implementation Agreement are based on the services defined in [MEF 6.2] and the attributes defined in [MEF 10.3] and this IA. Support of Cloud services is addressed for a single Cloud provider (CP) using one or more Carrier Ethernet networks (CENs) and point-to-point Ethernet services.

MEF 51 – OVC Services Definitions

[MEF 51] specifies operator virtual connection (OVC) services based mainly on the service attributes defined in [b-MEF 26.1]; there are also some service attributes defined in [MEF 51] that go beyond [b-MEF 26.1]. The key service constructs are the OVC itself and the OVC end points at the external interfaces (EIs) such as the external network network interface (ENNI) and the user network interface (UNI). Per [b-MEF 26.1], at least one OVC end point is at an ENNI. Three general OVC services are defined, based on OVC type. In addition, two E-Access and two E-Transit services are defined, based on OVC type and the EIs involved.

MEF 62 – Managed Access E-Line Service

[MEF 62] defines an Access E-Line Service that includes a specific set of management and Class of Service capabilities. The service defined in this IA is based on applicable functionality and associated requirements from existing MEF specifications, including [MEF 26.2], [MEF 30.1], [MEF 35.1], and [MEF 51].

I.4 OAM documents

MEF 30.1 – Service OAM Fault Management Implementation Agreement: Phase 2

[MEF 30.1] specifies an IA for SOAM that builds upon the framework and requirements specified by [b-MEF 17]. In particular, this IA specifies SOAM requirements for MEGs and for FM. SOAM in general and FM in particular are defined in [IEEE 802.1Q] and [b-ITU-T G.8013-2011]. This IA details how to use these functions to achieve the MEF requirements of SOAM in general and SOAM FM in particular.

MEF 35.1 – Service OAM Performance Monitoring Implementation Agreement

[MEF 35.1] specifies an IA for service operations, administration, and maintenance (SOAM) that satisfies and extends the performance monitoring (PM) framework and requirements described in [b-MEF 17]. Existing PM functions are defined by [b-ITU-T G.8013-2013] and [b-ITU-T G.8021]. [MEF 35.1] details how to use these functions in order to achieve the requirements of MEF SOAM PM.

Appendix II

Summary of changes from ITU-T G.8011/Y.1307 (2012)

(This appendix does not form an integral part of this Recommendation.)

This appendix has been removed. For further information see the 2016 edition of this Recommendation.

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[b-ITU-T G.8013-2011] Recommendation ITU-T G.8013/Y.1731 (2011), *OAM functions and mechanisms for Ethernet based networks*.

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