

MEF

Carrier Ethernet 2.0

Certification Blueprint

Version 1.1

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Introduction

The creation and deployment of the Carrier Ethernet 2.0 Services EPL, EVPL, EP-LAN, EVP-LAN, EP-Tree, EVP-Tree, Access EPL or Access EVPL require different combinations of service and performance attributes defined in MEF technical specifications. Consequently, the Carrier Ethernet 2.0 services certification program is designed to verify the conformance of each of these services independently.

This Carrier Ethernet 2.0 Services Certification Blueprint is the foundation document that specifies the complete list of attributes to be verified in order to certify each Carrier Ethernet 2.0 service.

Scope

The sets of service attributes required to create E-Line, E-LAN and E-Tree service types are defined in MEF 6.1 'Ethernet Services Definitions Phase 2' and the sets of service attributes required to create E-Access service types are defined in MEF 33 'Ethernet Access Services Definitions'.

Carrier Ethernet 2.0 services include bandwidth profile enforcement and MTU configuration, can support multiple classes of service with standardized performance objectives, enable service interconnections between service provider and operator MENS, and provide Service OAM functionalities.

Carrier Ethernet 2.0 Service OAM enables the subscriber and the service provider to check continuity of a given EVC across the entire service, to trace the path of a service or ping a target MEP (Maintenance association End Point) or configured MIP (Maintenance domain Intermediate Point), for subscriber and test MEG (Maintenance Entity Group) levels defined in MEF 30 'Service OAM FM Implementation Agreement'.

Carrier Ethernet 2.0 bandwidth profile attributes define standard CIR and EIR granularities allowing configurations to tightly fit customer bandwidth requirements. In addition, depending on the service type, Carrier Ethernet 2.0 allows for per UNI, per EVC or per Class of Service, ingress or egress bandwidth profiles. The granularity requirements for ingress bandwidth profiles are specified in MEF 13 'UNI Type 1 Implementation Agreement' and for egress bandwidth profiles in MEF 20 'UNI Type 2 Implementation Agreement'.

Standardized classes of service with their associated performance objectives and performance tiers are key aspects of Carrier Ethernet 2.0 services certification. Classes of service, performance objectives and performance tiers are defined in MEF 23.1 'Carrier Ethernet Class of Service Phase 2'.

Finally, Carrier Ethernet 2.0 E-Access services allow service providers to reach out-of-franchise customer locations through an Ethernet access provider's network, and deliver port-based and VLAN-based services end to end.

Out of Scope for Carrier Ethernet 2.0 Services Certification

Control and management protocols such as E-LMI, Link OAM, Service OAM UNI-MEG, Service OAM ENNI-MEG or protection mechanisms that may be operating at the demarcation point between the subscriber and the service provider (UNI-C to UNI-N) or between the operator and the service provider (ENNI-N to ENNI-N) are outside the scope of Carrier Ethernet 2.0 services certification. The deployment and verification of protocols operating at demarcation points are to be handled by the subscriber and service provider or operator and service provider.

Structure of the document

The Carrier Ethernet 2.0 Services Certification Blueprint is divided into four sections based on service types:

- Section 1: E-Line Services
- Section 2: E-LAN Services
- Section 3: E-Tree Services
- Section 4: E-Access Services

In each section, tables are populated with the complete list of attributes to be verified for the certification of each Carrier Ethernet 2.0 service.

The first three sections that cover the E-Line, E-LAN and E-Tree service types contain the following four tables of attributes and requirements:

1. UNI Service Attributes
2. EVC Per UNI Service Attributes
3. EVC Service Attributes
4. Service OAM Frames Handling

The fourth section that covers the E-Access service types contains the following six tables of attributes and requirements:

1. UNI Service Attributes
2. ENNI Service Attributes
3. OVC Per UNI Service Attributes
4. OVC End Point Per ENNI Service Attributes
5. OVC Service Attributes
6. Service OAM Frames Handling

Equipment and Services Certification Availability

The Carrier Ethernet 2.0 certification program will be made available to equipment vendors, chipset vendors, service providers and operators members of the MEF. The following table summarizes Carrier Ethernet 2.0 certifications per service type.

	Certifications available for: Equipment and Chipset Vendors	Certifications available for: Service Providers and Operators
E-Line Services	X	X
E-LAN Services	X	X
E-Tree Services	X	X
E-Access Services	X	X
Note 1: E-Access certification will be available for equipment vendors, however, the MEF Certification Committee may revisit this decision in the future depending on the results of the pilot phase or changing market needs. Note 2: Service providers are strongly encouraged but not required to use Carrier Ethernet 2.0 certified equipment in order to achieve CE 2.0 certification.		

Carrier Ethernet 2.0 Equipment Certification

To certify the compliance of equipment delivering a Carrier Ethernet 2.0 service EPL, EVPL, EP-LAN, EVP-LAN, EP-Tree, EVP-Tree, Access EPL or Access EVPL a vendor may submit one (option 1) or multiple (option 2) devices supporting all the required service attributes of the specific service as detailed in this blueprint and summarized in the table below:

E-Line, E-LAN, E-Tree	UNI	EVC	UNI
Option 1	UNI, EVC per UNI and EVC service attributes supported in single device		
Option 2	UNI, EVC per UNI and EVC service attributes supported in multiple devices		
E-Access	ENNI	OVC	UNI
Option 1	ENNI, OVC EP per ENNI, OVC, OVC per UNI and UNI service attributes supported in single device		
Option 2	ENNI, OVC EP per ENNI, OVC, OVC per UNI and UNI service attributes supported in multiple devices		

For Carrier Ethernet 2.0 equipment certification, MEF 23.1 service performance objectives are verified with the help using a Network Emulator to introduce the propagation delay associated with each performance tier as described in MEF 23.1.

MEF

Carrier Ethernet 2.0 E-Line Services

Carrier Ethernet 2.0 - E-Line Services Certification Blueprint

UNI Service Attribute	Service Attribute Parameters and Values	Reference	Certification Applicability		
UNI Identifier	Arbitrary text string to identify the UNI.	MEF 6.1 Tables 3, 10 and 14	EPL <input type="checkbox"/>	EVPL <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
Physical Medium	Physical interface listed in IEEE 802.3-2005, except for PON interfaces.	MEF 6.1 Tables 3, 10 and 14	EPL <input checked="" type="checkbox"/>	EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Speed	10 Mbps, 100 Mbps, 10/100 Mbps Auto-neg, 10/100/1000 Auto-neg, 1 Gbps or 10 Gbps.	MEF 6.1 Tables 3, 10 and 14	EPL <input checked="" type="checkbox"/>	EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Mode	MUST be Full Duplex.	MEF 6.1 Tables 3, 10 and 14	EPL <input checked="" type="checkbox"/>	EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
MAC Layer	IEEE 802.3-2005.	MEF 6.1 Tables 3, 10 and 14	EPL <input checked="" type="checkbox"/>	EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
UNI MTU Size	MUST be \geq 1522 bytes.	MEF 6.1 Tables 3, 10 and 14	EPL <input checked="" type="checkbox"/>	EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Service Multiplexing	Yes or No. MUST be No for EPL. SHOULD be Yes at one or more UNIs for EVPL.	MEF 6.1 Tables 3, 10 and 14 MEF 13 Section 6.2.1 (Note 1)	EPL <input type="checkbox"/>	EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Bundling	Yes or No. MUST be No for EPL. If Yes for EVPL, then CE-VLAN ID Preservation MUST be Yes.	MEF 6.1 Tables 3, 10 and 14 MEF 13 Section 6.2.2 (Note 2)	EPL <input type="checkbox"/>	EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
All to One Bundling	Yes or No. MUST be Yes for EPL. MUST be No for EVPL.	MEF 6.1 Tables 3, 10 and 14	EPL <input checked="" type="checkbox"/>	EVPL <input type="checkbox"/>	Not verified <input type="checkbox"/>
CE-VLAN ID for untagged and priority tagged Service Frames	All untagged and priority tagged Service Frames at the UNI MUST map to the same EVC as is used for all other Service Frames for EPL. MUST specify CE-VLAN ID for untagged and priority tagged Service Frames in the range of 1-4094 for EVPL.	MEF 6.1 Tables 3, 10 and 14	EPL <input checked="" type="checkbox"/>	EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Maximum Number of EVCs	MUST be 1 for EPL. MUST be \geq 1 for EVPL.	MEF 6.1 Tables 3, 10 and 14	EPL <input checked="" type="checkbox"/>	EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Ingress BWP per UNI	MUST NOT specify for EPL. OPTIONAL for EVPL, if supported, MUST specify <CIR, CBS, EIR, EBS, CM, CF>. MUST NOT be combined with any other type of ingress bandwidth profile.	MEF 6.1 Tables 3, 10 and 14 MEF 13 Section 6.2.5 (Note 3)	EPL <input type="checkbox"/>	EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Egress BWP per UNI	MUST NOT specify for EPL. OPTIONAL for EVPL, if supported, MUST specify <CIR, CBS, EIR, EBS, CM, CF>. MUST NOT be combined with any other type of egress bandwidth profile.	MEF 6.1 Tables 3, 10 and 14 MEF 20 Section 12 (Note 4)	EPL <input type="checkbox"/>	EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
L2CP Processing	L2CP processing MUST be as specified in MEF 6.1.1. (EPL Option 1 and Option 2 verified separately)	MEF 6.1.1 Tables B, C, D, E, J and K (Note 5)	EPL <input checked="" type="checkbox"/>	EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>

EVC per UNI Service Attribute	Service Attribute Parameters and Values	Reference	Certification Applicability		
UNI EVC ID	A string formed by the concatenation of the UNI ID and the EVC ID.	MEF 6.1 Tables 4, 11 and 15	EPL <input type="checkbox"/>	EVPL <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
CE-VLAN ID / EVC Map	All Service Frames at the UNI MUST map to a single Point-to-Point EVC for EPL. MUST specify mapping table of CE-VLAN IDs to the EVC ID for EVPL.	MEF 6.1 Tables 4, 11 and 15	EPL <input checked="" type="checkbox"/>	EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Ingress BWP Per EVC	OPTIONAL. If supported, MUST specify <CIR, CBS, EIR, EBS, CM, CF>. MUST NOT be combined with any other type of ingress bandwidth profile.	MEF 6.1 Tables 4, 11 and 15 MEF 13 Section 6.2.5 (Note 3)	EPL <input checked="" type="checkbox"/>	EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Ingress BWP Per Class of Service identifier (CoS ID)	OPTIONAL. If supported, MUST specify CoS ID, and MUST specify <CIR, CBS, EIR, EBS, CM, CF> for each CoS. MUST NOT be combined with any other type of ingress bandwidth profile.	MEF 6.1 Tables 4, 11 and 15 MEF 13 Section 6.2.5 (Note 3)	EPL <input checked="" type="checkbox"/>	EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Egress BWP Per EVC	MUST NOT specify.	MEF 6.1 Tables 4, 11 and 15	EPL <input type="checkbox"/>	EVPL <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
Egress BWP Per CoS ID	MUST NOT specify.	MEF 6.1 Tables 4, 11 and 15	EPL <input type="checkbox"/>	EVPL <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>

Carrier Ethernet 2.0 - E-Line Services Certification Blueprint

EVC Service Attribute	Service Attribute Parameters and Values	Reference	Certification Applicability		
EVC Type	MUST be Point-to-Point.	MEF 6.1 Tables 5, 12 and 16	EPL ■	EVPL ■	Not verified □
EVC ID	An arbitrary string, unique across the MEN, for the EVC supporting the service instance.	MEF 6.1 Tables 5, 12 and 16	EPL □	EVPL □	Not verified ■
UNI List	MUST list the two UNIs associated with the EVC. The UNI type MUST be Root for each UNI.	MEF 6.1 Tables 5, 12 and 16	EPL ■	EVPL ■	Not verified □
Maximum Number of UNIs	MUST be 2.	MEF 6.1 Tables 5, 12 and 16	EPL ■	EVPL ■	Not verified □
EVC MTU Size	MUST be ≥ 1522 bytes. MUST be ≤ minimum of UNI MTU sizes.	MEF 6.1 Tables 5, 12 and 16	EPL ■	EVPL ■	Not verified □
CE-VLAN ID Preservation	MUST be Yes for EPL. MUST be either Yes or No for EVPL.	MEF 6.1 Tables 5, 12 and 16	EPL ■	EVPL ■	Not verified □
CE-VLAN CoS Preservation	MUST be Yes for EPL. MUST be either Yes or No for EVPL.	MEF 6.1 Tables 5, 12 and 16	EPL ■	EVPL ■	Not verified □
Unicast Service Frame Delivery	MUST deliver unconditionally for EPL. Deliver unconditionally or deliver conditionally for EVPL. If delivered conditionally, MUST specify the delivery criteria.	MEF 6.1 Tables 5, 12 and 16	EPL ■	EVPL ■	Not verified □
Multicast Service Frame Delivery	MUST deliver unconditionally for EPL. Deliver unconditionally or deliver conditionally for EVPL. If delivered conditionally, MUST specify the delivery criteria.	MEF 6.1 Tables 5, 12 and 16	EPL ■	EVPL ■	Not verified □
Broadcast Service Frame Delivery	MUST deliver unconditionally for EPL. Deliver unconditionally or deliver conditionally for EVPL. If delivered conditionally, MUST specify the delivery criteria.	MEF 6.1 Tables 5, 12 and 16	EPL ■	EVPL ■	Not verified □
L2CP Processing	L2CP processing MUST be as specified in MEF 6.1.1.	MEF 6.1.1 Tables B, C, D, E, J and K (Note 5)	EPL ■	EVPL ■	Not verified □
EVC Performance	At least one CoS is REQUIRED. MUST specify CoS ID. MUST list values/objectives for each performance attribute with objectives and parameters defined in MEF 23.1	MEF 6.1 Tables 5, 12 and 16 MEF 23.1 Section 6.7 (Note 6)	EPL ■	EVPL ■	Not verified □

Service OAM Frames Handling	Requirements	Reference	Certification Applicability		
Connectivity Check messages	All CCM frames at the default Test and Subscriber MEG levels MUST be tunneled.	MEF 6.1 Section 9.1.1 MEF 30 Section 7.1 (Note 7)	EPL ■	EVPL ■	Not verified □
Linktrace messages where at least one MIP is configured	Where at least one MIP is configured in the MEN at the default Test or Subscriber MEG level, Linktrace frames with the corresponding target MAC DA and MEG level MUST be peered.	MEF 6.1 Section 9.1.1 MEF 30 Section 7.1 (Note 7)	EPL ■	EVPL ■	Not verified □
Linktrace messages without any MIPs configured	Where no MIPs are configured in the MEN at the default Test or Subscriber MEG level, Linktrace frames with the corresponding target MAC DA and MEG level MUST be tunneled.				
Unicast Loopback messages where at least one MIP is configured	Where at least one MIP is configured in the MEN at the default Test or Subscriber MEG level, Loopback frames with the corresponding target unicast MAC DA and MEG level MUST be peered.	MEF 6.1 Section 9.1.1 MEF 30 Section 7.1 (Note 7)	EPL ■	EVPL ■	Not verified □
Unicast Loopback messages where at least one MIP is configured	Where at least one MIP is configured in the MEN at the default Test or Subscriber MEG level, Loopback frames with the corresponding MEG level and a target unicast DA not equal to the MAC address of any MIPs MUST be tunneled.				
Multicast Loopback messages	All multicast Loopback frames at the default Test and Subscriber MEG levels MUST be tunneled.	MEF 6.1 Section 9.1.1 MEF 30 Section 7.1 (Note 7)	EPL ■	EVPL ■	Not verified □

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Carrier Ethernet 2.0 E-LAN Services

Carrier Ethernet 2.0 - E-LAN Services Certification Blueprint

UNI Service Attribute	Service Attribute Parameters and Values	Reference	Certification Applicability		
UNI Identifier	Arbitrary text string to identify the UNI.	MEF 6.1 Tables 3, 18 and 21	EP-LAN <input type="checkbox"/>	EVP-LAN <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
Physical Medium	Physical interface listed in IEEE 802.3-2005, except for PON interfaces.	MEF 6.1 Tables 3, 18 and 21	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Speed	10 Mbps, 100 Mbps, 10/100 Mbps Auto-neg, 10/100/1000 Auto-neg, 1 Gbps or 10 Gbps.	MEF 6.1 Tables 3, 18 and 21	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Mode	MUST be Full Duplex.	MEF 6.1 Tables 3, 18 and 21	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
MAC Layer	IEEE 802.3-2005.	MEF 6.1 Tables 3, 18 and 21	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
UNI MTU Size	MUST be ≥ 1522 bytes.	MEF 6.1 Tables 3, 18 and 21	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Service Multiplexing	Yes or No. MUST be No for EP-LAN. SHOULD be Yes at one or more UNIs for EVP-LAN.	MEF 6.1 Tables 3, 18 and 21 MEF 13 Section 6.2.1 (Note 1)	EP-LAN <input type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Bundling	Yes or No. MUST be No for EP-LAN. If Yes for EVP-LAN, then CE-VLAN ID Preservation MUST be Yes.	MEF 6.1 Tables 3, 18 and 21 MEF 13 Section 6.2.2 (Note 2)	EP-LAN <input type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
All to One Bundling	Yes or No. MUST be Yes for EP-LAN. MUST be No for EVP-LAN.	MEF 6.1 Tables 3, 18 and 21	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input type="checkbox"/>	Not verified <input type="checkbox"/>
CE-VLAN ID for untagged and priority tagged Service Frames	All untagged and priority tagged Service Frames at the UNI MUST map to the same EVC as is used for all other Service Frames for EP-LAN. MUST specify CE-VLAN ID for untagged and priority tagged Service Frames in the range of 1-4094 for EVP-LAN.	MEF 6.1 Tables 3, 18 and 21	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Maximum Number of EVCs	MUST be 1 for EP-LAN. MUST be ≥ 1 for EVP-LAN.	MEF 6.1 Tables 3, 18 and 21	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Ingress BWP per UNI	OPTIONAL. If supported, MUST specify <CIR, CBS, EIR, EBS, CM, CF>. MUST NOT be combined with any other type of ingress bandwidth profile.	MEF 6.1 Tables 3, 18 and 21 MEF 13 Section 6.2.5 (Note 3)	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Egress BWP per UNI	OPTIONAL. If supported, MUST specify <CIR, CBS, EIR, EBS, CM, CF>. MUST NOT be combined with any other type of egress bandwidth profile.	MEF 6.1 Tables 3, 18 and 21 MEF 20 Section 12 (Note 4)	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
L2CP Processing	L2CP processing MUST be as specified in MEF 6.1.1.	MEF 6.1.1 Section 8 (Note 5)	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>

EVC per UNI Service Attribute	Service Attribute Parameters and Values	Reference	Certification Applicability		
UNI EVC ID	A string formed by the concatenation of the UNI ID and the EVC ID.	MEF 6.1 Tables 6, 19 and 22	EP-LAN <input type="checkbox"/>	EVP-LAN <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
CE-VLAN ID / EVC Map	All Service Frames at the UNI MUST map to a single Multipoint-to-Multipoint EVC for EP-LAN. MUST specify mapping table of CE-VLAN IDs to the EVC ID for EVP-LAN.	MEF 6.1 Tables 6, 19 and 22	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Ingress BWP Per EVC	OPTIONAL. If supported, MUST specify <CIR, CBS, EIR, EBS, CM, CF>. MUST NOT be combined with any other type of ingress bandwidth profile.	MEF 6.1 Tables 6, 19 and 22 MEF 13 Section 6.2.5 (Note 3)	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Ingress BWP Per CoS ID	OPTIONAL. If supported, MUST specify CoS ID, and MUST specify <CIR, CBS, EIR, EBS, CM, CF> for each CoS. MUST NOT be combined with any other type of ingress bandwidth profile.	MEF 6.1 Tables 6, 19 and 22 MEF 13 Section 6.2.5 (Note 3)	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Egress BWP Per EVC	OPTIONAL. If supported, MUST specify <CIR, CBS, EIR, EBS, CM, CF>. MUST NOT be combined with any other type of egress bandwidth profile.	MEF 6.1 Tables 6, 19 and 22 MEF 20 Section 12 (Note 4)	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Egress BWP Per CoS ID	OPTIONAL. If supported, MUST specify CoS ID, and MUST specify <CIR, CBS, EIR, EBS, CM, CF> for each CoS. MUST NOT be combined with any other type of egress bandwidth profile.	MEF 6.1 Tables 6, 19 and 22 MEF 20 Section 12 (Note 4)	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>

Carrier Ethernet 2.0 - E-LAN Services Certification Blueprint

EVC Service Attribute	Service Attribute Parameters and Values	Reference	Certification Applicability		
EVC Type	MUST be Multipoint-to-Multipoint.	MEF 6.1 Tables 7, 20 and 23	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
EVC ID	An arbitrary string, unique across the MEN, for the EVC supporting the service instance.	MEF 6.1 Tables 7, 20 and 23	EP-LAN <input type="checkbox"/>	EVP-LAN <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
UNI List	MUST list the UNIs associated with the EVC. The UNI type MUST be Root for each UNI.	MEF 6.1 Tables 7, 20 and 23	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Maximum Number of UNIs	MUST be ≥ 2.	MEF 6.1 Tables 7, 20 and 23	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
EVC MTU Size	MUST be ≥ 1522 bytes. MUST be ≤ minimum of UNI MTU sizes.	MEF 6.1 Tables 7, 20 and 23	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
CE-VLAN ID Preservation	MUST be Yes for EP-LAN. MUST be either Yes or No for EVP-LAN.	MEF 6.1 Tables 7, 20 and 23	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
CE-VLAN CoS Preservation	MUST be Yes for EP-LAN. MUST be either Yes or No for EVP-LAN.	MEF 6.1 Tables 7, 20 and 23	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Unicast Service Frame Delivery	Deliver unconditionally or deliver conditionally. If delivered conditionally, MUST specify the delivery criteria.	MEF 6.1 Tables 7, 20 and 23	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Multicast Service Frame Delivery	Deliver unconditionally or deliver conditionally. If delivered conditionally, MUST specify the delivery criteria.	MEF 6.1 Tables 7, 20 and 23	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Broadcast Service Frame Delivery	Deliver unconditionally or deliver conditionally. If delivered conditionally, MUST specify the delivery criteria.	MEF 6.1 Tables 7, 20 and 23	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
L2CP Processing	L2CP processing MUST be as specified in MEF 6.1.1.	MEF 6.1.1 Section 8 (Note 5)	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
EVC Performance	At least one CoS is REQUIRED. MUST specify CoS ID. MUST list values/objectives for each performance attribute with objectives and parameters defined in MEF 23.1	MEF 6.1 Tables 7, 20 and 23 MEF 23.1 Section 6.7 (Note 6)	EP-LAN <input type="checkbox"/>	EVP-LAN <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>

Service OAM Frames Handling	Requirements	Reference	Certification Applicability		
Connectivity Check messages	All CCM frames at the default Test and Subscriber MEG levels MUST be tunneled.	MEF 6.1 Section 9.1.1 MEF 30 Section 7.1 (Note 7)	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Linktrace messages where at least one MIP is configured	Where at least one MIP is configured in the MEN at the default Test or Subscriber MEG level, Linktrace frames with the corresponding target MAC DA and MEG level MUST be peered.	MEF 6.1 Section 9.1.1 MEF 30 Section 7.1 (Note 7)	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Linktrace messages without any MIPs configured	Where no MIPs are configured in the MEN at the default Test or Subscriber MEG level, Linktrace frames with the corresponding target MAC DA and MEG level MUST be tunneled.				
Unicast Loopback messages where at least one MIP is configured	Where at least one MIP is configured in the MEN at the default Test or Subscriber MEG level, Loopback frames with the corresponding target unicast MAC DA and MEG level MUST be peered.	MEF 6.1 Section 9.1.1 MEF 30 Section 7.1 (Note 7)	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Unicast Loopback messages where at least one MIP is configured	Where at least one MIP is configured in the MEN at the default Test or Subscriber MEG level, Loopback frames with the corresponding MEG level and a target unicast DA not equal to the MAC address of any MIPs MUST be tunneled.				
Multicast Loopback messages	All multicast Loopback frames at the default Test and Subscriber MEG levels MUST be tunneled.	MEF 6.1 Section 9.1.1 MEF 30 Section 7.1 (Note 7)	EP-LAN <input checked="" type="checkbox"/>	EVP-LAN <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>

MEF

Carrier Ethernet 2.0 E-Tree Services

Carrier Ethernet 2.0 - E-Tree Services Certification Blueprint

UNI Service Attribute	Service Attribute Parameters and Values	Reference	Certification Applicability		
UNI Identifier	Arbitrary text string to identify the UNI.	MEF 6.1 Tables 3, 24 and 27	EP-Tree <input type="checkbox"/>	EVP-Tree <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
Physical Medium	Physical interface listed in IEEE 802.3-2005, except for PON interfaces.	MEF 6.1 Tables 3, 24 and 27	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Speed	10 Mbps, 100 Mbps, 10/100 Mbps Auto-neg, 10/100/1000 Auto-neg, 1 Gbps or 10 Gbps.	MEF 6.1 Tables 3, 24 and 27	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Mode	MUST be Full Duplex.	MEF 6.1 Tables 3, 24 and 27	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
MAC Layer	IEEE 802.3-2005.	MEF 6.1 Tables 3, 24 and 27	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
UNI MTU Size	MUST be ≥ 1522 bytes.	MEF 6.1 Tables 3, 24 and 27	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Service Multiplexing	Yes or No. MUST be No for EP-Tree. SHOULD be Yes at one or more UNIs for EVP-Tree.	MEF 6.1 Tables 3, 24 and 27 MEF 13 Section 6.2.1 (Note 1)	EP-Tree <input type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Bundling	Yes or No. MUST be No for EP-Tree. If Yes for EVP-Tree, then CE-VLAN ID Preservation MUST be Yes.	MEF 6.1 Tables 3, 24 and 27 MEF 13 Section 6.2.2 (Note 2)	EP-Tree <input type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
All to One Bundling	Yes or No. MUST be Yes for EP-Tree. MUST be No for EVP-Tree.	MEF 6.1 Tables 3, 24 and 27	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input type="checkbox"/>	Not verified <input type="checkbox"/>
CE-VLAN ID for untagged and priority tagged Service Frames	All untagged and priority tagged Service Frames at the UNI MUST map to the same EVC as is used for all other Service Frames for EP-Tree. MUST specify CE-VLAN ID for untagged and priority tagged Service Frames in the range of 1-4094 for EVP-Tree.	MEF 6.1 Tables 3, 24 and 27	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Maximum Number of EVCs	MUST be 1 for EP-Tree. MUST be ≥ 1 for EVP-Tree.	MEF 6.1 Tables 3, 24 and 27	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Ingress BWP per UNI	OPTIONAL. If supported, MUST specify <CIR, CBS, EIR, EBS, CM, CF>. MUST NOT be combined with any other type of ingress bandwidth profile.	MEF 6.1 Tables 3, 24 and 27 MEF 13 Section 6.2.5 (Note 3)	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Egress BWP per UNI	OPTIONAL. If supported, MUST specify <CIR, CBS, EIR, EBS, CM, CF>. MUST NOT be combined with any other type of egress bandwidth profile.	MEF 6.1 Tables 3, 24 and 27 MEF 20 Section 12 (Note 4)	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
L2CP Processing	L2CP processing MUST be as specified in MEF 6.1.1.	MEF 6.1.1 Section 8 (Note 5)	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>

EVC per UNI Service Attribute	Service Attribute Parameters and Values	Reference	Certification Applicability		
UNI EVC ID	A string formed by the concatenation of the UNI ID and the EVC ID.	MEF 6.1 Tables 8, 25 and 28	EP-Tree <input type="checkbox"/>	EVP-Tree <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
CE-VLAN ID / EVC Map	All Service Frames at the UNI MUST map to Rooted-Multipoint EVC for EP-Tree. MUST specify mapping table of CE-VLAN IDs to the EVC ID for EVP-Tree.	MEF 6.1 Tables 8, 25 and 28	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Ingress BWP Per EVC	OPTIONAL. If supported, MUST specify <CIR, CBS, EIR, EBS, CM, CF>. MUST NOT be combined with any other type of ingress bandwidth profile.	MEF 6.1 Tables 8, 25 and 28 MEF 13 Section 6.2.5 (Note 3)	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Ingress BWP Per CoS ID	OPTIONAL. If supported, MUST specify CoS ID, and MUST specify <CIR, CBS, EIR, EBS, CM, CF> for each CoS. MUST NOT be combined with any other type of ingress bandwidth profile.	MEF 6.1 Tables 8, 25 and 28 MEF 13 Section 6.2.5 (Note 3)	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Egress BWP Per EVC	OPTIONAL. If supported, MUST specify <CIR, CBS, EIR, EBS, CM, CF>. MUST NOT be combined with any other type of egress bandwidth profile.	MEF 6.1 Tables 8, 25 and 28 MEF 20 Section 12 (Note 4)	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Egress BWP Per CoS ID	OPTIONAL. If supported, MUST specify CoS ID, and MUST specify <CIR, CBS, EIR, EBS, CM, CF> for each CoS. MUST NOT be combined with any other type of egress bandwidth profile.	MEF 6.1 Tables 6, 19 and 22 MEF 20 Section 12 (Note 4)	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>

Carrier Ethernet 2.0 - E-Tree Services Certification Blueprint

EVC Service Attribute	Service Attribute Parameters and Values	Reference	Certification Applicability		
EVC Type	MUST be Rooted-Multipoint.	MEF 6.1 Tables 9, 26 and 29	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
EVC ID	An arbitrary string, unique across the MEN, for the EVC supporting the service instance.	MEF 6.1 Tables 9, 26 and 29	EP-Tree <input type="checkbox"/>	EVP-Tree <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
UNI List	MUST list the UNIs associated with the EVC. The UNI Type for at least 1 UNI MUST be Root. All UNIs that are not UNI Type Root MUST be UNI Type Leaf.	MEF 6.1 Tables 9, 26 and 29	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Maximum Number of UNIs	MUST be ≥ 2.	MEF 6.1 Tables 9, 26 and 29	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
EVC MTU Size	MUST be ≥ 1522 bytes. MUST be ≤ minimum of UNI MTU sizes.	MEF 6.1 Tables 9, 26 and 29	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
CE-VLAN ID Preservation	MUST be Yes for EP-Tree. MUST be either Yes or No for EVP-Tree.	MEF 6.1 Tables 9, 26 and 29	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
CE-VLAN CoS Preservation	MUST be Yes for EP-Tree. MUST be either Yes or No for EVP-Tree.	MEF 6.1 Tables 9, 26 and 29	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Unicast Service Frame Delivery	Deliver unconditionally or deliver conditionally. If delivered conditionally, MUST specify the delivery criteria.	MEF 6.1 Tables 9, 26 and 29	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Multicast Service Frame Delivery	Deliver unconditionally or deliver conditionally. If delivered conditionally, MUST specify the delivery criteria.	MEF 6.1 Tables 9, 26 and 29	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Broadcast Service Frame Delivery	Deliver unconditionally or deliver conditionally. If delivered conditionally, MUST specify the delivery criteria.	MEF 6.1 Tables 9, 26 and 29	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
L2CP Processing	L2CP processing MUST be as specified in MEF 6.1.1.	MEF 6.1.1 Section 8 (Note 5)	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
EVC Performance	At least one CoS is REQUIRED. MUST specify CoS ID. MUST list values/objectives for each performance attribute with objectives and parameters defined in MEF 23.1	MEF 6.1 Tables 9, 26 and 29 MEF 23.1 Section 6.7 (Note 6)	EP-Tree <input type="checkbox"/>	EVP-Tree <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>

Service OAM Frames Handling	Requirements	Reference	Certification Applicability		
Connectivity Check messages	All CCM frames at the default Test and Subscriber MEG levels MUST be tunneled.	MEF 6.1 Section 9.1.1 MEF 30 Section 7.1 (Note 7)	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Linktrace messages where at least one MIP is configured	Where at least one MIP is configured in the MEN at the default Test or Subscriber MEG level, Linktrace frames with the corresponding target MAC DA and MEG level MUST be peered.	MEF 6.1 Section 9.1.1 MEF 30 Section 7.1 (Note 7)	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Linktrace messages without any MIPs configured	Where no MIPs are configured in the MEN at the default Test or Subscriber MEG level, Linktrace frames with the corresponding target MAC DA and MEG level MUST be tunneled.				
Unicast Loopback messages where at least one MIP is configured	Where at least one MIP is configured in the MEN at the default Test or Subscriber MEG level, Loopback frames with the corresponding target unicast MAC DA and MEG level MUST be peered.	MEF 6.1 Section 9.1.1 MEF 30 Section 7.1 (Note 7)	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Unicast Loopback messages where at least one MIP is configured	Where at least one MIP is configured in the MEN at the default Test or Subscriber MEG level, Loopback frames with the corresponding MEG level and a target unicast DA not equal to the MAC address of any MIPs MUST be tunneled.				
Multicast Loopback messages	All multicast Loopback frames at the default Test and Subscriber MEG levels MUST be tunneled.	MEF 6.1 Section 9.1.1 MEF 30 Section 7.1 (Note 7)	EP-Tree <input checked="" type="checkbox"/>	EVP-Tree <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>

MEF

Carrier Ethernet 2.0 E-Access Services

Carrier Ethernet 2.0 - E-Access Services Certification Blueprint

UNI Service Attribute	Service Attribute Parameters and Values	Reference	Certification Applicability		
UNI Identifier	Any string.	MEF 33 Tables 4 and 9 MEF 10.2 Table 12	Access EPL <input type="checkbox"/>	Access EVPL <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
Physical Medium	A standard Ethernet PHY (IEEE 802.3-2005, IEEE 802.3ae-2002).	MEF 33 Tables 4 and 9 MEF 10.2 Table 12	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Speed	10 Mbps, 100 Mbps, 10/100 Mbps Auto-neg, 1 Gbps or 10 Gbps.	MEF 33 Tables 4 and 9 MEF 10.2 Table 12	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Mode	Full Duplex.	MEF 33 Tables 4 and 9 MEF 10.2 Table 12	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
MAC Layer	IEEE 802.3-2005.	MEF 33 Tables 4 and 9 MEF 10.2 Table 12	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
UNI MTU Size	Integer ≥ 1522 bytes.	MEF 33 Tables 4 and 9 MEF 10.2 Table 12	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
CE-VLAN ID for untagged and priority tagged Service Frames	MUST be a value from 1-4094 for Access EPL. MUST specify if untagged / priority tagged frames are to be supported and if supported, the CE-VLAN ID for untagged and priority tagged Service Frames must be included in the OVC Endpoint Map for Access EVPL.	MEF 33 Tables 4 and 9	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Maximum Number of OVCs per UNI	MUST be 1 for Access EPL. MUST be ≥ 1 for Access EVPL.	MEF 33 Tables 4 and 9	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Maximum Number of CE-VLAN IDs per OVC	The OVC Endpoint Map MUST support a value = 1 for Access EVPL. The OVC Endpoint Map SHOULD support a value > 1 for Access EVPL. This attribute does not apply to Access EPL.	MEF 33 Table 9	Access EPL <input type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Ingress BWP per UNI	MUST NOT specify.	MEF 33 Tables 4 and 9	Access EPL <input type="checkbox"/>	Access EVPL <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
Egress BWP per UNI	MUST NOT specify.	MEF 33 Tables 4 and 9	Access EPL <input type="checkbox"/>	Access EVPL <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>

ENNI Service Attribute	Service Attribute Parameters and Values	Reference	Certification Applicability		
Operator ENNI Identifier	A string that is unique across the Operator MEN.	MEF 33 Tables 8 and 13 MEF 26 Table 12	Access EPL <input type="checkbox"/>	Access EVPL <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
Physical Layer	One of the following PHYs in full duplex mode: 1000Base-SX, 1000Base-LX, 1000Base T, 10GBase-SR, 10GBase-LX4, 10GBase-LR, 10GBase-ER, 10GBase-SW, 10GBase-LW, 10GBase-EW.	MEF 33 Tables 8 and 13 MEF 26 Table 12	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Frame Format	An ENNI Frame can have zero or more VLAN tags. When an ENNI Frame has a single tag, that tag is an S-Tag. When an ENNI Frame has two tags, the outer tag is an S-Tag and the next tag is a C-Tag as defined in IEEE Std 802.1ad-2005.	MEF 33 Tables 8 and 13 MEF 26 Table 12	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Number of Links	An integer with value 1 or 2.	MEF 33 Tables 8 and 13 MEF 26 Table 12	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Protection Mechanism	Link Aggregation, none, or other.	MEF 33 Tables 8 and 13 MEF 26 Table 12	Access EPL <input type="checkbox"/>	Access EVPL <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
ENNI MTU Size	An integer number of bytes ≥ 1526.	MEF 33 Tables 8 and 13 MEF 26 Table 12	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
End Point Map	Each S-VLAN ID value associated with an instance of Access EPL or Access EVPL Service MUST map to a distinct End Point, of Type = "OVC"	MEF 33 Tables 8 and 13	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Maximum Number of OVCs	An integer ≥ 1	MEF 33 Tables 8 and 13 MEF 26 Table 12	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Maximum Number of OVC End Points (OVC EPs) per OVC	An integer ≥ 1	MEF 33 Tables 8 and 13 MEF 26 Table 12	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>

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OVC per UNI Service Attribute	Service Attribute Parameters and Values	Reference	Certification Applicability		
UNI OVC ID	A string formed by the concatenation of the UNI identifier and the OVC identifier.	MEF 33 Tables 5 and 10 MEF 26 Table 10	Access EPL <input type="checkbox"/>	Access EVPL <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
OVC EP Map	MUST contain all CE-VLAN ID values {1, 2, ...4095} mapped to a single OVC End Point for Access EPL. MUST specify mapping table of CE-VLAN ID to OVC EP and MUST NOT contain all CE-VLAN ID values mapped to a single OVC EP for Access EVPL.	MEF 33 Tables 5 and 10	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Class of Service Identifier (CoS ID) for Service Frames	The CoS ID for Service Frames MUST be the OVC EP to which the Service Frame is mapped; that OVC MUST have a single CoS Name.	MEF 33 Tables 5 and 10	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Ingress BWP per OVC EP at a UNI	Required, MUST allow configuration to support CIR values up to 70% of the UNI speed, in the following increments: 1 – 10 Mb/s, increments of 1 Mb/s 10 – 100 Mb/s, increments of 10 Mb/s 100 – 1000 Mb/s, increments of 100 Mb/s 1 – 10 Gb/s, increments of 1 Gb/s. These required CIR increments are subject to the limit imposed by the UNI speed. MAY support other values of CIR. MUST allow configuration of EIR = 0, EBS = 0, CF = 0, Color Mode = "color blind". MAY support other values of EIR, EBS, CF, and Color Mode. MUST have CBS >= 12176 bytes. MUST NOT be combined with any other type of ingress bandwidth profile.	MEF 33 Tables 5 and 10	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Ingress BWP per CoS ID at a UNI	Not used.	MEF 33 Tables 5 and 10	Access EPL <input type="checkbox"/>	Access EVPL <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
Egress BWP per OVC EP at a UNI	MUST NOT specify.	MEF 33 Tables 5 and 10	Access EPL <input type="checkbox"/>	Access EVPL <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
Egress BWP Per CoS ID at a UNI	MUST NOT specify.	MEF 33 Tables 5 and 10	Access EPL <input type="checkbox"/>	Access EVPL <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>

OVC EP per ENNI Service Attribute	Service Attribute Parameters and Values	Reference	Certification Applicability		
OVC EP ID	A string that is unique across the Operator MEN.	MEF 33 Tables 7 and 12 MEF 26 Table 9	Access EPL <input type="checkbox"/>	Access EVPL <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
CoS ID for ENNI Frames	The CoS Identifier for ENNI Frames MUST be the OVC EP to which the ENNI Frame is mapped; that OVC MUST have a single CoS Name which is associated with the entire set of S-Tag PCP values {0-7}.	MEF 33 Tables 7 and 12	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Ingress BWP per OVC EP	Required, MUST allow configuration to support CIR values up to 70% of the ENNI speed, in the following increments: 1 – 10 Mb/s, increments of 1 Mb/s 10 – 100 Mb/s, increments of 10 Mb/s 100 – 1000 Mb/s, increments of 100 Mb/s 1 – 10 Gb/s, increments of 1 Gb/s. These required CIR increments are subject to the limit imposed by the UNI speed. MAY support other values of CIR. MUST allow configuration of EIR = 0, EBS = 0, CF = 0, Color Mode = "color aware". MAY support other values of EIR, EBS, CF, and Color Mode. MUST have CBS >= 12176 bytes. MUST NOT be combined with any other type of ingress bandwidth profile.	MEF 33 Tables 7 and 12	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Ingress BWP per ENNI CoS ID	Not used.	MEF 33 Tables 7 and 12	Access EPL <input type="checkbox"/>	Access EVPL <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
Egress BWP per OVC EP	MUST NOT specify.	MEF 33 Tables 7 and 12	Access EPL <input type="checkbox"/>	Access EVPL <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
Egress BWP per ENNI CoS ID	MUST NOT specify.	MEF 33 Tables 7 and 12	Access EPL <input type="checkbox"/>	Access EVPL <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>

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OVC Service Attribute	Service Attribute Parameters and Values	Reference	Certification Applicability		
OVC Identifier	A string that is unique across the Operator MEN.	MEF 33 Tables 6 and 11 MEF 26 Table 4	Access EPL <input type="checkbox"/>	Access EVPL <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
OVC Type	MUST be Point-to-Point.	MEF 33 Tables 6 and 11	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
OVC EP List	Exactly 2, one OVC EP at the UNI, one at the ENNI.	MEF 33 Tables 6 and 11	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Maximum Number of UNI OVC EP	MUST be 1.	MEF 33 Tables 6 and 11	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Maximum Number ENNI OVC EP	MUST be 1.	MEF 33 Tables 6 and 11	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
OVC MTU Size	MUST be an integer number of bytes ≥ 1526 .	MEF 33 Tables 6 and 11	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
CE-VLAN ID Preservation	MUST be Yes.	MEF 33 Tables 6 and 11	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
CE-VLAN CoS ID Value Preservation	MUST be Yes.	MEF 33 Tables 6 and 11	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
S-VLAN ID Preservation	N/A as only one ENNI in the service instance.	MEF 33 Tables 6 and 11	Access EPL <input type="checkbox"/>	Access EVPL <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
S-VLAN CoS ID Value Preservation	N/A as only one ENNI in the service instance.	MEF 33 Tables 6 and 11	Access EPL <input type="checkbox"/>	Access EVPL <input type="checkbox"/>	Not verified <input checked="" type="checkbox"/>
Color Forwarding	SHOULD be yes. When Ingress BWP at UNI has EIR = 0 frames egressing at ENNI MUST be marked green.	MEF 33 Tables 6 and 11	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Service Level Specification	MUST list values/objectives for each performance attribute with objectives and parameters defined in MEF 23.1	MEF 33 Tables 6 and 11 MEF 23.1 Section 6.7 (Note 6)	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Unicast Frame Delivery	MUST deliver unconditionally for Access EPL. Deliver unconditionally or deliver conditionally for Access EVPL. If delivered conditionally, MUST specify the delivery criteria.	MEF 33 Tables 6 and 11	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Multicast Frame Delivery	MUST deliver unconditionally for Access EPL. Deliver unconditionally or deliver conditionally for Access EVPL. If delivered conditionally, MUST specify the delivery criteria.	MEF 33 Tables 6 and 11	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Broadcast Frame Delivery	MUST deliver unconditionally for Access EPL. Deliver unconditionally or deliver conditionally for Access EVPL. If delivered conditionally, MUST specify the delivery criteria.	MEF 33 Tables 6 and 11	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>

Service OAM Frames Handling	Requirements	Reference	Certification Applicability		
Connectivity Check messages	The Access EPL and Access EVPL Services MUST be configurable to tunnel all SOAM frames at the default Test and Subscriber MEG levels as defined in MEF 30, section 7.1.	MEF 33 Section 6.3 MEF 30 Section 7.1	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Linktrace messages	The Access EPL and Access EVPL Services MUST be configurable to tunnel all SOAM frames at the default Test and Subscriber MEG levels as defined in MEF 30, section 7.1.	MEF 33 Section 6.3 MEF 30 Section 7.1	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>
Loopback messages	The Access EPL and Access EVPL Services MUST be configurable to tunnel all SOAM frames at the default Test and Subscriber MEG levels as defined in MEF 30, section 7.1.	MEF 33 Section 6.3 MEF 30 Section 7.1	Access EPL <input checked="" type="checkbox"/>	Access EVPL <input checked="" type="checkbox"/>	Not verified <input type="checkbox"/>

---NOTES---

Note 1: Refer to MEF 13 section 6.2.1 for minimum number of EVCs that should be supported for each UNI Speed.

Note 2: Refer to MEF 13 section 6.2.2 for minimum number of CE-VLAN IDs that should be supported for each UNI Speed.

Note 3: Refer to MEF 13 section 6.2.5 for ingress bandwidth profile configuration granularity requirements.

Note 4: Refer to MEF 20 section 12 for egress bandwidth profile configuration granularity requirements.

Note 5: Refer to MEF 6.1.1 section 8 for L2CP processing requirements. MEF 6.1.1 section 8 replaces MEF 6.1 section 8.

Note 6: Refer to MEF 23.1 for applicable performance attributes and objectives. Performance objectives are not defined Multipoint services.

Note 7: Refer to MEF 30 for default MEG levels.