

MEF

Technical Specification

MEF 40

UNI and EVC Definition of Managed Objects

April 2013

Disclaimer

The information in this publication is freely available for reproduction and use by any recipient and is believed to be accurate as of its publication date. Such information is subject to change without notice and the Metro Ethernet Forum (MEF) is not responsible for any errors. The MEF does not assume responsibility to update or correct any information in this publication. No representation or warranty, expressed or implied, is made by the MEF concerning the completeness, accuracy, or applicability of any information contained herein and no liability of any kind shall be assumed by the MEF as a result of reliance upon such information.

The information contained herein is intended to be used without modification by the recipient or user of this document. The MEF is not responsible or liable for any modifications to this document made by any other party.

The receipt or any use of this document or its contents does not in any way create, by implication or otherwise:

any express or implied license or right to or under any patent, copyright, trademark or trade secret rights held or claimed by any MEF member company which are or may be associated with the ideas, techniques, concepts or expressions contained herein; nor

any warranty or representation that any MEF member companies will announce any product(s) and/or service(s) related thereto, or if such announcements are made, that such announced product(s) and/or service(s) embody any or all of the ideas, technologies, or concepts contained herein; nor

any form of relationship between any MEF member companies and the recipient or user of this document.

Implementation or use of specific Metro Ethernet standards or recommendations and MEF specifications will be voluntary, and no company shall be obliged to implement them by virtue of participation in the Metro Ethernet Forum. The MEF is a non-profit international organization accelerating industry cooperation on Metro Ethernet technology. The MEF does not, expressly or otherwise, endorse or promote any specific products or services.

© The Metro Ethernet Forum 2013. All Rights Reserved.

Table of Contents

1.	Abstract.....	1
2.	Terminology and Acronyms.....	1
3.	Scope.....	3
4.	Compliance Levels	3
5.	Introduction.....	3
5.1	The Basic Need.....	3
5.2	The General Structure.....	4
5.3	The Foundational Elements	4
5.4	Alignment with Other ITU-T MIBs and MEF Specifications.....	5
5.5	Correlation between ITU-T Q.840.1 and MEF UNI-EVC MIB	8
5.6	Overview of the UNI & EVC Configuration and Monitoring.....	12
6.	UNI-EVC MIB Overview	14
6.1	Service Interface Attributes	14
6.1.1	Interface Configuration Table.....	14
6.1.2	Interface Status Table	15
6.1.3	Interface Statistics Table.....	15
6.2	Service UNI Attributes	16
6.2.1	UNI Service Attributes Configuration Table.....	16
6.2.2	Service EVC per UNI Attributes Configuration Table.....	16
6.3	Service EVC Attributes	16
6.3.1	Service EVC Attributes Configuration Table.....	17
6.3.2	EVC UNI Configuration	17
6.3.3	EVC Status Table.....	17
6.4	Service Bandwidth Profile Attributes.....	18
6.4.1	Bandwidth Profile Group Configuration Table	18
6.4.2	Bandwidth Profile Configuration Table.....	18
6.4.3	Traffic Performance Data Set	19
6.5	Class of Service Identifier Attributes	19
6.6	L2CP Attributes	20
6.7	Service Notification and Configuration Objects	21
6.8	UNI-EVC MIB Conformance and Compliance	21
7.	UNI-EVC MIB Requirements	21
8.	UNI-EVC MIB Definitions.....	25
9.	References	73

List of Figures

Figure 1 – Generalized OSS/BSS-NMS-EMS-NE Model.....	4
Figure 2 – Relationship between 802.1 MIBs, UML Models, and UNI-EVC MIB.....	5
Figure 3 - UNI-EVC MIB Structure	13

List of Tables

Table 1 – Terminology and Acronyms	2
Table 2 - UNI Service Attribute Alignment	6
Table 3 - EVC per UNI Service Attribute Alignment	6
Table 4 - EVC Service Attribute Alignment.....	7
Table 5 - Layer 2 Control Protocols Service Attribute Alignment.....	7
Table 6 - Bandwidth Profile Service Attribute Alignment	7
Table 7 - Correlation between MEF-UNI-EVC-MIB and ITU-T Q.840.1 Attributes.....	12

1. Abstract

This document specifies the User Network Interface (UNI) and Ethernet Virtual Connection (EVC) Management Information Base (MIB) necessary to configure and monitor the Metro Ethernet Forum (MEF) UNI and EVC that satisfy the requirements and definitions found in MEF 4 [8], MEF 6.1 [9], MEF 6.1.1 [10], and MEF 10.2 [13], the management requirements found in MEF 15 [15], and the management objects as specified by MEF 7.2 [11] and ITU-T Q.840.1 [24].

2. Terminology and Acronyms

Term	Definition	Source
ASN.1	Abstract Syntax Notation One	OSI 8824 [29]
API	Application Programming Interface	
Bandwidth Profile	A characterization of Service Frame arrival times and lengths at a reference point and a specification of the disposition of each Service Frame based on its level of compliance with the Bandwidth Profile.	MEF 10.2 [13]
Bandwidth Profile Group	A collection of one or more bandwidth profiles associated with an interface or a service on an interface. Each bandwidth profile in the group is differentiated by a different Class of Service Identifier	This document
BSS	Business Support System	
Class of Service Frame Set	A set of Service or ENNI Frames that have a commitment from the Operator or Service Provider subject to a particular set of performance objectives.	MEF 23.1 [17]
Class of Service Identifier	The mechanism and/or values of the parameters in the mechanism to be used to identify the CoS Name that applies to a frame at a given UNI.	MEF 23.1 [17]
Class of Service Name	A designation given to one or more sets of performance objectives and associated parameters by the Service Provider or Operator.	MEF 23.1 [17]
CEN	Carrier Ethernet Network	MEF 12.1.1 [14]
CoS	Class of Service	MEF 10.2 [13]
EMS	Element Management System	MEF 7.2 [9]
ENNI	External Network Network Interface	MEF 26.1 [18]
EVC	Ethernet Virtual Connection	MEF 10.2 [13]
IEEE	Institute of Electrical and Electronics Engineers	
IETF	Internet Engineering Task Force	
ITU-T	International Telecommunication Union - Telecommunication Standardization Bureau	
L2CP	Layer 2 Control Protocol	MEF 6.1.1 [10]

Term	Definition	Source
L2CP Profile Group	A collection of one or more L2CP profiles associated with an interface or a service on an interface. Each L2CP profile in the group is differentiated by a different L2CP selection and processing type	This document
LAN	Local Area Network	MEF 4 [8]
MAC	Media Access Control	IEEE Std 802.3 [27]
MEF	Metro Ethernet Forum	
MEN	Metro Ethernet Network	MEF 4 [8]
ME-NE	Metro Ethernet Network Element	MEF 15 [15]
MIB	Management Information Base	RFC 2578 [2]
NE	Network Element	MEF 4 [8]
NMS	Network Management System	MEF 7.2 [9]
OAM	Operations, Administration, and Maintenance	MEF 17 [16]
OSS	Operations Support System	
OSS/J	OSS through Java Initiative. The OSS/J Initiative defines a set of APIs, with client access either by tightly or loosely coupled mechanisms, to foster an OSS component market.	[30]
OVC	Operator Virtual Connection	MEF 26.1 [18]
PDU	Protocol Data Unit	IEEE Std 802.1Q [25]
RFC	Request for Comment	
Service Frame	An Ethernet frame transmitted across the UNI toward the Service Provider or an Ethernet frame transmitted across the UNI toward the Subscriber	MEF 10.2 [13]
SMI	Structure of Management Interface	RFC 1157
SNMP	Simple Network Management Protocol	RFC 1157
SNMP Agent	An SNMP entity containing one or more command responder and/or notification originator applications (along with their associated SNMP engine). Typically implemented in an NE.	RFC 3411 [3]
SNMP Manager	An SNMP entity containing one or more command generator and/or notification receiver applications (along with their associated SNMP engine). Typically implemented in an EMS or NMS.	RFC 3411 [3]
SOAM	Service OAM	MEF 17 [16]
TC	Textual Conventions	RFC 4181 [6]
TLV	Type Length Value, a method of encoding Objects	
UML	Unified Modeling Language	Object Management Group (OMG)
UNI	User Network Interface	MEF 10.2 [13]
VLAN	Virtual LAN	IEEE Std 802.1Q [25]

Table 1 – Terminology and Acronyms

3. Scope

The scope of this document is to provide the SNMP UNI-EVC MIB that supports the MEF UNI and EVC that have been defined in MEF 4 [8], MEF 6.1 [9], MEF 6.1.1 [10], and MEF 10.2 [13], the management requirements found in MEF 15 [15], and the managed objects found in MEF 7.2 [11] and ITU-T Q.840.1 [24].

This document includes the MIB necessary to support the MEF UNI and EVC functionality: the **MEF-UNI-EVC-MIB** that includes the MIB objects necessary to configure and monitor UNIs and EVCs.

The primary purpose of this document is to provide a mechanism to enhance interoperability between equipment/software vendors and between Service Providers and/or Operators. This document provides the Metro Ethernet Forum (MEF) UNI and EVC configuration and monitoring within the Carrier Ethernet Networks (CENs) via SNMP MIBs.

4. Compliance Levels

The requirements that apply to this document are specified in the following sections. Items that are **REQUIRED** (contain the words **MUST** or **MUST NOT**) will be labeled as [Rx]. Items that are **RECOMMENDED** (contain the words **SHOULD** or **SHOULD NOT**) will be labeled as [Dx]. Items that are **OPTIONAL** (contain the words **MAY** or **OPTIONAL**) will be labeled as [Ox].

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [1]. All key words must be in upper case, bold text to distinguish them from other uses of the words. Any use of these key words (e.g., may and optional) without [Rx], [Dx] or [Ox] is not normative.

5. Introduction

5.1 The Basic Need

One of the aspects of defining Carrier Ethernet Networks (CENs) is the need to ensure the compatibility between equipment/software vendors and equipment operators in order to facilitate interoperability in local, metro, national, and international networks. One of the common ways to do this is through a common management interface using publically available or enterprise specific SNMP MIBs.

The value of standard MIBs lies in a combination of (a) allowing an Operator to manage multiple types of equipment with a common MIB, (b) allowing equipment vendors to build one MIB that will work with multiple Operators, and (c) to some extent the common MIB helps make the managed objects more uniform, which can in fact help networks interoperability.

A MIB is a collection of managed objects that can be used to provision an entity, query an entity for status information, or define notifications that are sent to a Network Management System (NMS) or an Element Management System (EMS). Collections of related objects are defined in MIB modules which are written using an adapted subset of OSI's Abstract Syntax One, or ASN.1 [29]. Standards for MIB modules are set by IETF and documented in various RFCs, primary of

which are RFC 2578 *Structure of Management Information Version 2 (SMIv2)* and RFC 4181 *Guidelines for Authors and Reviewers of MIB Documents*.

5.2 The General Structure

A generalized system model is shown by Figure 1 that illustrates the relationship between the OSS/BSS, NMS, EMS, and Network Elements (NEs). The primary focus of this specification defines the interaction between the EMS (SNMP Manager) and the NE (SNMP Agent) via SNMP using the MIB module defined in this specification. Object names in the figure are examples only.

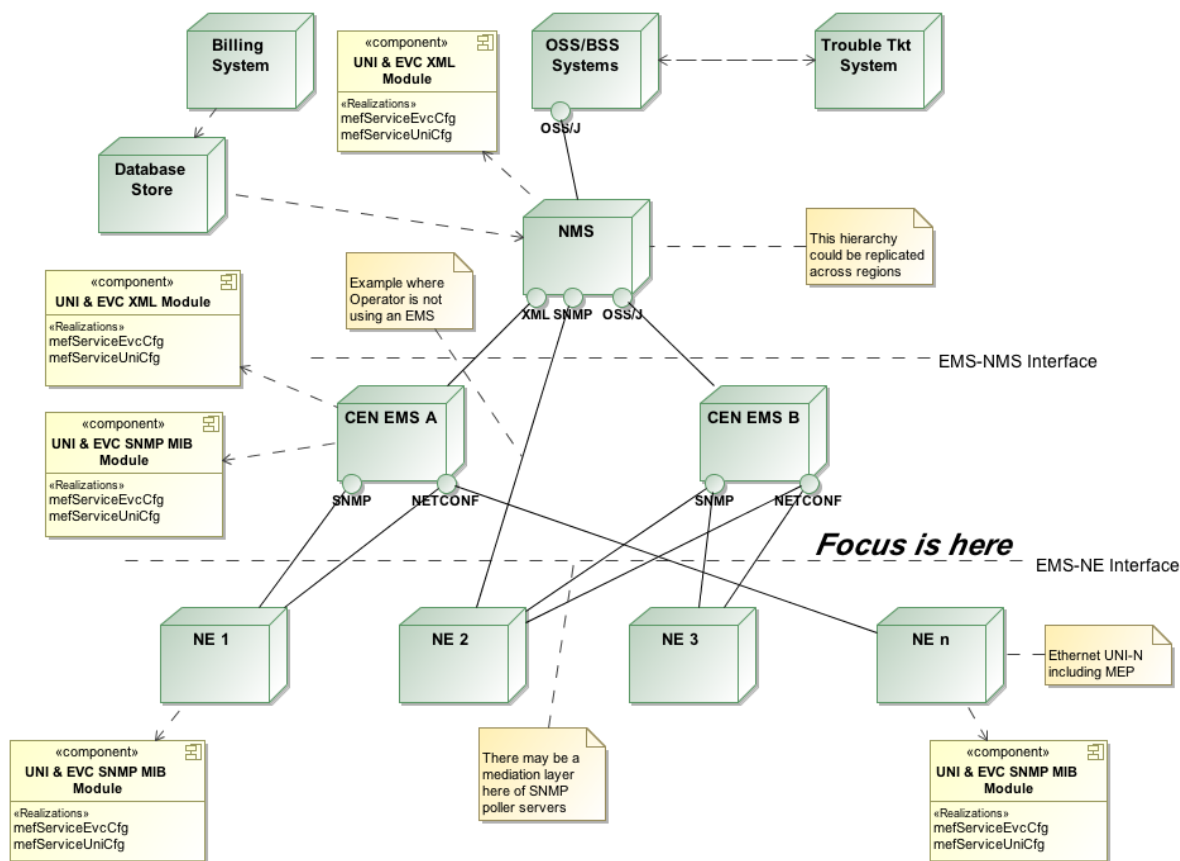


Figure 1 – Generalized OSS/BSS-NMS-EMS-NE Model

5.3 The Foundational Elements

MEF 4 [8] describes the generic architecture and framework of Metro Ethernet Networks (MEN) that includes the Ethernet Virtual Connection (EVC) and the UNI reference point.

MEF 6.1 [9] describes the Ethernet service definitions and parameters for the UNI reference point, including Point-to-Point, Multipoint-to-Multipoint, and Rooted-Multipoint Ethernet services, as well as the EVC.

MEF 6.1.1 [10] describes an amendment for MEF 6.1 specifically dealing with Layer 2 Control Protocol handling and processing.

MEF 7.2 [11] describes the overall Carrier Ethernet Management Information Model to identify and define the set of management information necessary to manage the Carrier Ethernet services as defined by the Metro Ethernet Forum. MEF 7.2 draws heavily upon the models defined in ITU-T Q.840.1 [24].

MEF 10.2 [13] and MEF 10.2.1 [12] describe the Ethernet Service Attributes at the UNI reference point.

MEF 15 [15] describes the network management requirements for Metro Ethernet Network Elements (ME-NEs) that support MEF UNI requirements to support Carrier Class Ethernet Services.

The relationship between the various documents and the UNI-EVC MIB presented in this specification is illustrated by Figure 2. The UML models found in MEF 7.2 and ITU-T G.8052, and the IEEE 802.3 [27], 802.1D [26], and 802.1Q [25] specifications, provide a baseline for the UNI-EVC MIB and the Ethernet interfaces.

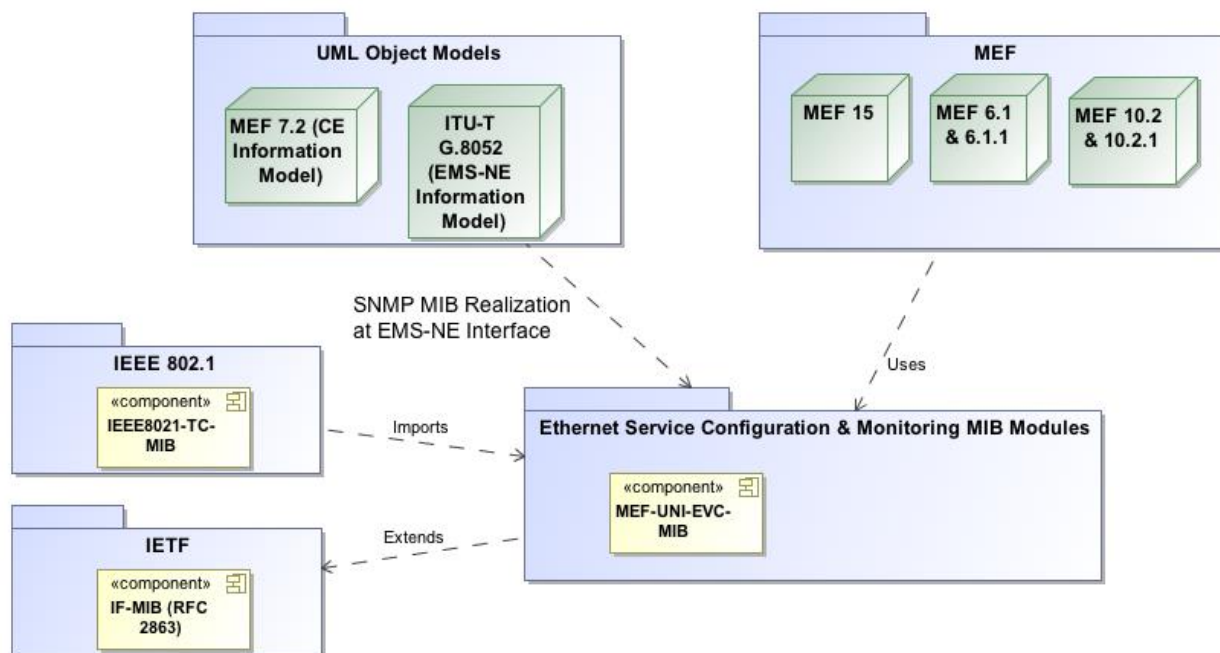


Figure 2 – Relationship between 802.1 MIBs, UML Models, and UNI-EVC MIB

5.4 Alignment with Other ITU-T MIBs and MEF Specifications

The UNI-EVC MIB is based upon MEF 6.1, MEF 6.1.1, and MEF 10.2 Service Attributes. A number of common elements are found in the IF-MIB, RFC 2863 [3], the MAU-MIB, RFC 4836 [7], and the EtherLike-MIB, RFC3635 [5], which are necessary to support MEF compliant interfaces.

The correlation of MEF 6.1, MEF 6.1.1 and MEF 10.2 Service Attributes are listed in Table 2 - Table 6.

MEF-UNI-EVC-MIB, IF-MIB, MAU-MIB, EtherLike-MIB Objects	MEF 6.1	MEF 10.2
---	---------	----------

mefServiceInterfaceCfgIdentifier, mefServiceUniCfgIdentifier	UNI Identifier	UNI Identifier
mefServiceInterfaceCfgType, ifMauType	Physical Medium	Physical Medium
ifSpeed, ifMauAutoNegAdminStatus	Speed	Physical Layer - Speed
dot3StatsDuplexStatus	Mode	Physical Layer - Mode
ifType	MAC Layer	MAC Service Layer
ifMtu	UNI MTU Size	UNI Maximum Transmission Unit Size
mefServiceUniCfgBundlingMultiplex	Service Multiplexing	Service Multiplexing
mefServiceUniCfgBundlingMultiplex	Bundling	Bundling
mefServiceUniCfgBundlingMultiplex	All to One Bundling	All to One Bundling
mefServiceUniCfgCeVidUntagged	CE-VLAN ID for untagged & priority tagged service frames	CE-VLAN ID for untagged & priority tagged Service Frames
mefServiceInterfaceStatusMaxVc	Maximum number of EVCs	Maximum Number of EVCs
mefServiceInterfaceCfgIngressBwpGrpIndex	Ingress Bandwidth Profile per UNI	Ingress Bandwidth Profile per Ingress UNI
mefServiceInterfaceCfgEgressBwpGrpIndex	Egress Bandwidth Profile per UNI	Egress Bandwidth Profile per Egress UNI
mefServiceInterfaceCfgL2cpGrpIndex	Layer 2 Control Protocols Processing	UNI Layer 2 Control Protocol Processing

Table 2 - UNI Service Attribute Alignment

MEF-UNI-EVC-MIB Objects	MEF 6.1	MEF 10.2
mefServiceEvcPerUniCfgIdentifier	UNI EVC ID	UNI EVC ID
mefServiceEvcPerUniCfgCeVlanMap	CE-VLAND ID / EVC Map	CE-VLAN ID/EVC Map
mefServiceEvcPerUniCfgIngressBwpGrpIndex	Ingress Bandwidth Profile per EVC	Ingress Bandwidth Profile per EVC
mefServiceEvcPerUniCfgIngressBwpGrpIndex plus mefServiceBwpCfgCosIndex	Ingress Bandwidth Profile per CoS Identifier	Ingress Bandwidth Profile per Class of Service Identifier
mefServiceEvcPerUniCfgEgressBwpGrpIndex	Egress Bandwidth Profile per EVC	Egress Bandwidth Profile per EVC
mefServiceEvcPerUniCfgEgressBwpGrpIndex plus mefServiceBwpCfgCosIndex	Egress Bandwidth Profile per CoS Identifier	Egress Bandwidth Profile per Class of Service Identifier

Table 3 - EVC per UNI Service Attribute Alignment

MEF-UNI-EVC- MIB Objects	MEF 6.1	MEF 10.2
mefServiceEvcCfgServiceType	EVC Type	Ethernet Virtual Connection Type (EVC Type)
mefServiceEvcCfgIdentifier	EVC ID	EVC ID
mefServiceEvcUniCfgTable	UNI List	UNI List
mefServiceEvcStatusMaxNumUni	Maximum Number of UNIs	Maximum Number of UNIs
mefServiceEvcCfgMtuSize	EVC MTU size	EVC Maximum Transmission Unit Size

mefServiceEvcCfgCevlanIdPreservation	CE-VLAN ID Preservation	CE-VLAN ID Preservation
mefServiceEvcCfgCevlanCosPreservation	CE-VLAN CoS Preservation	CE-VLAN CoS Preservation
mefServiceEvcCfgUnicastDelivery	Unicast Service Frame Delivery	Unicast Service Frame Delivery
mefServiceEvcCfgMulticastDelivery	Multicast Service Frame Delivery	Multicast Service Frame Delivery
mefServiceEvcCfgBroadcastDelivery	Broadcast Service Frame Delivery	Broadcast Service Frame Delivery
mefServiceEvcCfgL2cpGrpIndex	Layer 2 Control Protocol Processing	Layer 2 Control Protocol Service Frame Delivery
n/a	EVC Performance	EVC Performance

Table 4 - EVC Service Attribute Alignment

MEF-UNI-EVC-MIB Objects	MEF 6.1, MEF 6.1.1	MEF 10.2
mefServiceL2cpCfgType	Tunnel (Pass to EVC) / Discard / Peer	Discard, Peer, Pass to EVC, Peer and Pass to EVC
mefServiceL2cpCfgMacAddress, mefServiceL2cpCfgProtocol	STP/RSTP/MSTP	Bridge Block of protocols
mefServiceL2cpCfgMacAddress	Pause	Bridge Block of protocols
mefServiceL2cpCfgMacAddress, mefServiceL2cpCfgProtocol, mefServiceL2cpCfgSubType	LACP/LAMP	Bridge Block of protocols
mefServiceL2cpCfgMacAddress, mefServiceL2cpCfgProtocol, mefServiceL2cpCfgSubType	Link OAM	Bridge Block of protocols
mefServiceL2cpCfgMacAddress	Port Authentication	Bridge Block of protocols
mefServiceL2cpCfgMacAddress	E-LMI	Bridge Block of protocols
mefServiceL2cpCfgMacAddress	LLDP	Bridge Block of protocols
mefServiceL2cpCfgMacAddress	GARP	GARP Block of Protocols

Table 5 - Layer 2 Control Protocols Service Attribute Alignment

MEF-UNI-EVC-MIB Objects	MEF 6.1	MEF 10.2
mefServiceBwpCfgCir	CIR	Committed Information Rate
mefServiceBwpCfgCbs	CBS	Committed Burst Size
mefServiceBwpCfgEir	EIR	Excess Information Rate
mefServiceBwpCfgEbs	EBS	Excess Burst Size
mefServiceBwpCfgCm	CM	Color Mode
mefServiceBwpCfgCf	CF	Coupling Flag

Table 6 - Bandwidth Profile Service Attribute Alignment

[R1] The following objects found in the IF-MIB [3] **SHALL** be supported for MEF compliant Network Element UNI interfaces: *ifIndex*, *ifDescr*, *ifType*, *ifMtu*,

ifSpeed, ifPhysAddress, ifAdminStatus, ifOperStatus, ifLastChange, ifHighSpeed, ifAlias, and ifLinkUpDownTrapEnable.

- [R2] The *ifType* value **SHALL** be ethernetCsmacd(6) for MEF compliant Network Element UNI interfaces.
- [R3] The following notifications found in the IF-MIB [3] **SHALL** be supported for MEF compliant Network Element UNI interfaces: *linkDown* and *linkUp*.
- [D1] All the non-deprecated objects found in the IF-MIB [3] **SHOULD** be supported for MEF compliant Network Elements.
- [R4] The following objects found in the MAU-MIB [7] **SHALL** be supported for MEF compliant Network Element UNI interfaces: *ifMauType*, *ifMauAutoNegAdminStatus*.
- [D2] All the non-deprecated objects found in the the MAU-MIB [7] **SHOULD** be supported for MEF compliant Network Elements.
- [R5] The following objects found in the EtherLike-MIB [5] **SHALL** be supported for MEF compliant Network Element UNI interfaces: *dot3StatsDuplexStatus*, *dot3PauseAdminMode*.
- [D3] All the non-deprecated objects found in the EtherLike-MIB [5] **SHOULD** be supported for MEF compliant Network Elements.

5.5 Correlation between ITU-T Q.840.1 and MEF UNI-EVC MIB

One of the baseline documents is ITU-T Q.840.1 [24] which presents the requirements and analysis for NMS-EMS management interface of Ethernet for MENs. Table 7 presents a correlation between the MEF UNI-EVC MIB objects and ITU-T Q.840.1 Class Names and Attributes. Those items listed as "n/a" have no correlation with ITU-T Q.840.1.

UNI-EVC-MIB Object	ITU-T Q.840.1 Class Name	ITU-T Q.840.1 Attribute
MefServiceInterfaceCfgTable		
mefServiceInterfaceCfgType	ETH_FPP	fPPType, fPPSubType
mefServiceInterfaceCfgIdentifier	ETH_FPP	userLabel
mefServiceInterfaceCfgFrameFormat	n/a	n/a
mefServiceInterfaceCfgIngressBwpGrpIndex	ETH_FPP	ingressBandwidthPtr
mefServiceInterfaceCfgEgressBwpGrpIndex	ETH_FPP	egressBandwidthPtr
mefServiceInterfaceCfgL2cpGrpIndex	ETH_FPP_UNI	layer2Control ProtocolProcessing List
MefServiceInterfaceStatusTable		
mefServiceInterfaceStatusType	ETH_FPP	fPPType, fPPSubType
mefServiceInterfaceStatusMaxV	ETH_FPP	maxNumVirtual Connections
mefServiceInterfaceStatusMaxEndPointPerVc	n/a	n/a
MefServiceInterfaceStatisticsTable		
mefServiceInterfaceStatisticsIngressUndersized	ETH UNI Anomalies Performance Data Set	Undersized Frames

mefServiceInterfaceStatisticsIngressOversized	ETH UNI Anomalies Performance Data Set	Oversized Frames
mefServiceInterfaceStatisticsIngressFragments	ETH UNI Anomalies Performance Data Set	Fragments
mefServiceInterfaceStatisticsIngressCrcAlignment	ETH UNI Anomalies Performance Data Set	FCS and Alignment Errors
mefServiceInterfaceStatisticsIngressInvalidVid	ETH UNI Anomalies Performance Data Set	Invalid CE-VLAN ID
mefServiceInterfaceStatisticsIngressOctets	ETH UNI Traffic Performance Data Set	Octets Received OK
mefServiceInterfaceStatisticsIngressUnicast	ETH UNI Traffic Performance Data Set	Unicast Frames Received OK
mefServiceInterfaceStatisticsIngressMulticast	ETH UNI Traffic Performance Data Set	Multicast Frames Received OK
mefServiceInterfaceStatisticsIngressBroadcast	ETH UNI Traffic Performance Data Set	Broadcast Frames Received OK
mefServiceInterfaceStatisticsEgressOctets	ETH UNI Traffic Performance Data Set	Octets Transmitted OK
mefServiceInterfaceStatisticsEgressUnicast	ETH UNI Traffic Performance Data Set	Unicast Frames Transmitted OK
mefServiceInterfaceStatisticsEgressMulticast	ETH UNI Traffic Performance Data Set	Multicast Frames Transmitted OK
mefServiceInterfaceStatisticsEgressBroadcast	ETH UNI Traffic Performance Data Set	Broadcast Frames Transmitted OK
MefServiceUniCfgTable		
mefServiceUniCfgIdentifier	ETH_FPP_UNI	uniLabel
mefServiceUniCfgBundlingMultiplex	ETH_FPP_UNI	serviceMuxing Indicator, bundling
mefServiceUniCfgCeVidUntagged	ETH_FPP_UNI	ingressVLAN AssignmentUntagged
mefServiceUniCfgCePriorityUntagged	ETH_FPP_UNI	ingressVLAN PriorityAssignment Untagged
MefServiceEvcCfgTable		
mefServiceEvcCfgIndex	n/a	n/a
mefServiceEvcCfgIdentifier	ETH_FDFr_EVC	fDFrEvcID, userLabel
mefServiceEvcCfgServiceType	ETH_FDFr_EVC	fDFrEvcType
mefServiceEvcCfgMtuSize	ETH_FDFr_EVC	mtuSize
mefServiceEvcCfgCevlanIdPreservation	ETH_FDFr_EVC	uniCeVlanIdPreservation
mefServiceEvcCfgCevlanCosPreservation	ETH_FDFr_EVC	uniCeVlanCoSPreservation
mefServiceEvcCfgUnicastDelivery	ETH_Flow_Point	unicastServiceFrameDelivery
mefServiceEvcCfgMulticastDelivery	ETH_Flow_Point	multicastServiceFrameDelivery
mefServiceEvcCfgBroadcastDelivery	ETH_Flow_Point	broadcastServiceFrameDelivery
mefServiceEvcCfgL2cpGrpIndex	ETH_Flow_Point	layer2ControlProtocolProcessingList
mefServiceEvcCfgAdminState	ETH_FDFr_EVC	administrativeState
mefServiceEvcCfgRowStatus	n/a	n/a
MefServiceEvcUniCfgTable		
mefServiceEvcUniCfgType	ETH_Flow_Point	rootOrLeaf
mefServiceEvcUniCfgRowStatus	n/a	n/a
MefServiceEvcStatusTable		
mefServiceEvcStatusMaxMtuSize	ETH_FDFr_EVC	mtuSize

mefServiceEvcStatusMaxNumUni	ETH_FDFr_EVC	maxUNIEndPoints
mefServiceEvcStatusOperationalState	ETH_FDFr_EVC	operationalState
MefServiceEvcPerUniCfgTable		
mefServiceEvcPerUniCfgServiceType	n/a	n/a
mefServiceEvcPerUniCfgIdentifier	n/a	n/a
mefServiceEvcPerUniCfgCeVlanMap	ETH_Flow_Point	ethCeVlanID Mapping
mefServiceEvcPerUniCfgIngressBwpGrpIndex	ETH_Flow_Point	cosBandwidthMappingList
mefServiceEvcPerUniCfgEgressBwpGrpIndex	ETH_Flow_Point	cosBandwidthMappingList
MefServiceBwpGrpCfgTable		
mefServiceBwpGrpCfgIndex	n/a	n/a
mefServiceBwpCfgNextIndex	n/a	n/a
mefServiceBwpGrpCfgRowStatus	n/a	n/a
MefServiceBwpCfgTable		
mefServiceBwpCfgIndex	n/a	n/a
mefServiceBwpCfgIdentifier	ETHBandwidthProfile	ethBWProfileID / userLabel
mefServiceBwpCfgCir	ETHBandwidthProfile	cir
mefServiceBwpCfgCbs	ETHBandwidthProfile	cbs
mefServiceBwpCfgEir	ETHBandwidthProfile	eir
mefServiceBwpCfgEbs	ETHBandwidthProfile	ebs
mefServiceBwpCfgCm	ETHBandwidthProfile	colorMode
mefServiceBwpCfgCf	ETHBandwidthProfile	couplingFlag
mefServiceBwpCfgCosIndex	ETHCoSBandwidthMapping	serviceClassProfilePtr
mefServiceBwpCfgPerformanceEnable	n/a	n/a
mefServiceBwpCfgRowStatus	n/a	n/a
MefServiceCosCfgTable		
mefServiceCosCfgIndex	n/a	n/a
mefServiceCosCfgIdentifier	ETHServiceClassProfile	serviceClassID / userLabel
mefServiceCosCfgType	ETHServiceClassProfile	classifyType
mefServiceCosCfgIdentifierList	ETHServiceClassProfile	classifyValue
mefServiceCosCfgMacAddress	ETHServiceClassProfile	classifyValue
mefServiceCosCfgProtocol	ETHServiceClassProfile	classifyValue
mefServiceCosCfgSubType	ETHServiceClassProfile	classifyValue
mefServiceCosCfgRowStatus	n/a	n/a
MefServiceL2cpGrpCfgTable		
mefServiceL2cpGrpCfgIndex	n/a	n/a
mefServiceL2cpCfgNextIndex	n/a	n/a
mefServiceL2cpGrpCfgRowStatus	n/a	n/a
MefServiceL2cpCfgTable		
mefServiceL2cpCfgIndex	n/a	n/a
mefServiceL2cpCfgType	ETH_Flow_Point	layer2ControlProtocolProcessingList
mefServiceL2cpCfgMatchScope	ETH_Flow_Point	layer2ControlProtocolProcessingList
mefServiceL2cpCfgMacAddress	ETH_Flow_Point	layer2ControlProtocolProcessingList

mefServiceL2cpCfgProtocol	ETH_Flow_Point	layer2ControlProtocolProcessingList
mefServiceL2cpCfgSubType	ETH_Flow_Point	layer2ControlProtocolProcessingList
mefServiceL2cpCfgRowStatus	n/a	n/a
MefServicePerformanceTable		
mefServicePerformanceIngressGreenFrameCount	ETH Ingress Traffic Management Performance Data Set	ingressGreenFrameCount
mefServicePerformanceIngressYellowFrameCount	ETH Ingress Traffic Management Performance Data Set	ingressYellowFrameCount
mefServicePerformanceIngressRedFrameCount	ETH Ingress Traffic Management Performance Data Set	ingressRedFrameCount
mefServicePerformanceIngressGreenOctets	ETH Ingress Traffic Management Performance Data Set	ingressGreenOctetCount
mefServicePerformanceIngressYellowOctets	ETH Ingress Traffic Management Performance Data Set	ingressYellowOctetCount
mefServicePerformanceIngressRedOctets	ETH Ingress Traffic Management Performance Data Set	ingressRedOctetCount
mefServicePerformanceIngressGreenFrameDiscards	ETH Ingress Traffic Management Performance Data Set	greenFrameDiscards
mefServicePerformanceIngressYellowFrameDiscards	ETH Ingress Traffic Management Performance Data Set	yellowFrameDiscards
mefServicePerformanceIngressGreenOctetsDiscards	ETH Ingress Traffic Management Performance Data Set	greenOctetDiscards
mefServicePerformanceIngressYellowOctetsDiscards	ETH Ingress Traffic Management Performance Data Set	yellowOctetDiscards
mefServicePerformanceEgressGreenFrameCount	ETH Egress Traffic Management Performance Data Set	egressGreenFrameCount
mefServicePerformanceEgressYellowFrameCount	ETH Egress Traffic Management Performance Data Set	egressYellowFrameCount
mefServicePerformanceEgressGreenOctets	ETH Egress Traffic Management Performance Data Set	egressGreenOctetCount
mefServicePerformanceEgressYellowOctets	ETH Egress Traffic Management Performance Data Set	egressYellowOctetCount
mefServiceConfigurationAlarm		
mefServiceNotificationObjDateAndTime	n/a	n/a
mefServiceNotificationConfigurationChangeType	n/a	n/a
From IF-MIB		
ifIndex	ETH_FPP	ethFPPLinkID

ifDescr	n/a	n/a
ifType	MAUTransportPort	mauType
ifMtu	ETH_FPP	mtuSize
ifSpeed	ETH_FPP	Configured port speed
ifPhysAddress	ETH_FPP	ieee802dot3Address
ifAdminStatus	ETH_FPP	administrativeState
ifOperStatus	ETH_FPP	operationalState
ifLastChange	n/a	n/a
ifHighSpeed	n/a	n/a
ifAlias	n/a	n/a
ifLinkUpDownTrapEnable	n/a	n/a
From MAU-MIB		
ifMauType	MAUTransportPort	mauType
ifMauAutoNegAdminStatus	MAUTransportPort	mauAutoNegAdminState
From EtherLike-MIB		
dot3StatsDuplexStatus	M.3100:physicalPort	Duplex mode
dot3PauseAdminMode	M.3100:physicalPort	Interface Flow Control

Table 7 - Correlation between MEF-UNI-EVC-MIB and ITU-T Q.840.1 Attributes

5.6 Overview of the UNI & EVC Configuration and Monitoring

The basis of Carrier Ethernet Networks (CENs) is the designation of a reference point in the network known as a UNI which provides a demarcation between the CEN and a Subscriber. The association of UNI reference points for the purpose of delivering an Ethernet flow between subscriber sites across the CEN is accomplished by the Ethernet Virtual Connection (EVC).

With this in mind the basis for configuration of a CEN is the association of a physical interface that serves as the UNI reference point and the association of UNI reference points via the concept of an EVC. This document specifies a UNI-EVC MIB that provides configuration, status, and statistics. This is visually seen in Figure 3, where light colored boxes are object groups and dark colored boxes are object tables.

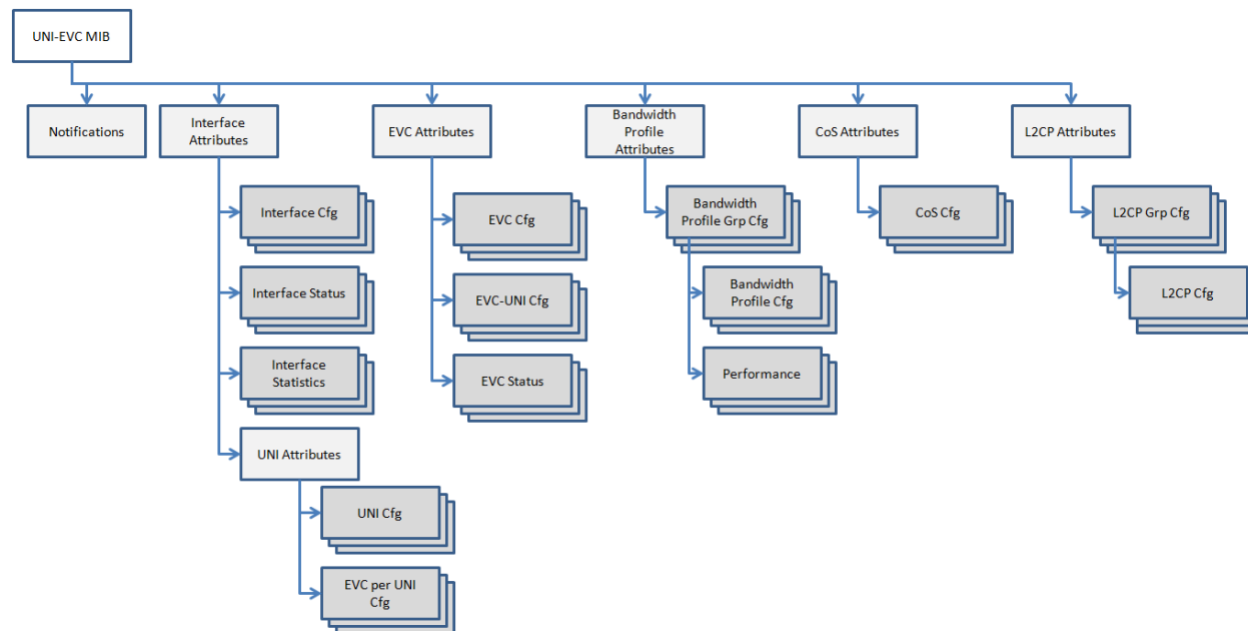


Figure 3 - UNI-EVC MIB Structure

The configuration of an interface using the UNI-EVC MIB is accomplished by configuring objects in the *mefServiceInterfaceCfgTable* and configuring an interface via the *mefServiceInterfaceCfgType* as a type "uni". Other interface options such as interface identifier, and frame format can be configured. Once an interface is fully configured the *ifAdminStatus* can be configured as "up".

Once the interface type and attributes are selected, the specific UNI attributes can be selected by writing objects in the *mefServiceUniCfgTable*. UNI attributes such as UNI identification, bundling and multiplexing options, and assignment of untagged traffic to a CE-VLAN can be configured.

After the interfaces in a network are designated as "uni", the EVC association can be configured. This is accomplished by adding an EVC to the *mefServiceEvcCfgTable* and assigning UNI interfaces to this EVC via the *mefServiceEvcUniCfgTable*. EVC service attributes such as EVC identification, type, MTU size, CE-VLAN and CE-CoS preservation can be selected.

The specific EVC attributes associated with a UNI can be configured via the *mefServiceEvcPerUniCfgTable*.

A bandwidth profile group is a collection of one or more bandwidth profiles associated with an interface or a service on an interface. When there is more than one bandwidth profile in the group, each is differentiated from other bandwidth profiles in the group by a different Class of Service Identifier as indicated by the *mefServiceBwpCfgCosIndex* object. Bandwidth profile groups are defined via the *mefServiceBwpGrpCfgTable* and the individual bandwidth profiles within that group by an entry in the *mefServiceBwpCfgTable*. A bandwidth profile group can be assigned to an interface (UNI), via the *mefServiceInterfaceCfgIngressBwpGrpIndex* and *mefServiceInterfaceCfgEgressBwpGrpIndex* objects, or to the UNIs in an EVC, via the *mefServiceEvcPerUniCfgIngressBwpGrpIndex* and *mefServiceEvcPerUniCfgEgressBwpGrpIndex* objects.

Class of Service Identifiers are configured via the *mefServiceCosCfgTable* and then can be associated with a UNI on an EVC, via the *mefServiceBwpCfgCosIndex* of the *mefServiceBwpCfgTable*.

A Layer 2 Control Protocol (L2CP) profile group is a collection of one or more L2CP profiles associated with an interface or a service on an interface. Each L2CP profile in the group is differentiated by a different L2CP selection and processing type. A L2CP profile group is defined via the *mefServiceInterfaceL2cpGrpCfgTable* and the specific L2CP profile via the *mefServiceInterfaceL2cpCfgTable*. A L2CP profile is assigned to an interface (UNI) via the *mefServiceInterfaceCfgL2cpGrpIndex* object. A L2CP profile is assigned to an EVC via the *mefServiceEvcCfgL2cpGrpIndex* object.

Monitoring of interface status is accomplished by reading objects in the *mefServiceInterfaceStatusTable* and EVC status by reading objects in the *mefServiceEvcStatusTable*.

Performance statistics for an interface are available via *mefServiceInterfaceStatisticsTable*. Traffic Performance statistics are assigned to a bandwidth profile via the enabling of the *mefServiceBwpCfgPerformanceEnable* and results are read via the *mefServicePerformanceTable*.

6. UNI-EVC MIB Overview

The UNI-EVC MIB is divided into a number of different object groupings: the Interface Attributes, the UNI Attributes, the EVC Attributes, the Bandwidth Profile Attributes, the Class of Service Identifier Attributes, the L2CP Attributes, and the Notification Objects (as indicated by the light colored boxes of Figure 3). Included is a section that indicates MIB compliance.

6.1 Service Interface Attributes

The Service Interface Attributes are defined in the *mefServiceInterfaceCfgTable*, the *mefServiceInterfaceStatusTable*, and the *mefServiceInterfaceStatisticTable*. The objects include configuration, status, and statistic objects common for all MEF Ethernet Interfaces.

6.1.1 Interface Configuration Table

The *mefServiceInterfaceCfgTable* is indexed by the standard interface number *ifIndex* from the IF-MIB. Rows in this table are automatically created by the NE based upon the interfaces that are available on the NE. These interfaces can be configured as an MEF standard interface via this table.

Configuration service attribute options are organized into the following groups:

- Interface Type and Identification:
 - *mefServiceInterfaceCfgType*
 - *mefServiceInterfaceCfgIdentifier*
- Interface Physical Characteristics:
 - *mefServiceInterfaceCfgFrameFormat*

- Interface Bandwidth and Class of Service Identifier Profile and Processing Association:
 - *mefServiceInterfaceCfgIngressBwpGrpIndex*
 - *mefServiceInterfaceCfgEgressBwpGrpIndex*
 - *mefServiceInterfaceCfgL2cpGrpIndex*

6.1.2 Interface Status Table

The *mefServiceInterfaceStatusTable* is created automatically by the NE based upon the interfaces that are available on the NE.

Status service attribute options are organized into the following group:

- Interface characteristics:
 - *mefServiceInterfaceStatusType*
 - *mefServiceInterfaceStatusMaxVc*
 - *mefServiceInterfaceStatusMaxEndPointPerVc*

6.1.3 Interface Statistics Table

The *mefServiceInterfaceStatisticsTable* is created automatically by the NE based upon the interfaces that are available on the NE as defined by [15] and [24].

Statistic service attribute options are organized into the following groups:

- Ingress Statistics Counters:
 - *mefServiceInterfaceStatisticsIngressUndersized*
 - *mefServiceInterfaceStatisticsIngressOversized*
 - *mefServiceInterfaceStatisticsIngressFragments*
 - *mefServiceInterfaceStatisticsIngressCrcAlignment*
 - *mefServiceInterfaceStatisticsIngressInvalidVid*
 - *mefServiceInterfaceStatisticsIngressOctets*
 - *mefServiceInterfaceStatisticsIngressUnicast*
 - *mefServiceInterfaceStatisticsIngressMulticast*
 - *mefServiceInterfaceStatisticsIngressBroadcast*
- Egress Statistics Counters
 - *mefServiceInterfaceStatisticsEgressOctets*
 - *mefServiceInterfaceStatisticsEgressUnicast*
 - *mefServiceInterfaceStatisticsEgressMulticast*
 - *mefServiceInterfaceStatisticsEgressBroadcast*

6.2 Service UNI Attributes

UNI attributes are divided into UNI Service Attributes and EVC per UNI Attributes.

6.2.1 UNI Service Attributes Configuration Table

The Service UNI Attributes are defined in the *mefServiceUniCfgTable* and are indexed by *IfIndex*. The necessary status objects for the UNI are found in the *mefServiceInterfaceStatusTable*.

Rows in this table are automatically created by the NE with default values based upon an interface being selected as a type UNI via the *mefServiceInterfaceCfgType* object and are automatically deleted when an interface that is defined as a UNI is changed to not be a UNI.

The following attributes are settable for a UNI:

- *mefServiceUniCfgIdentifier*
- *mefServiceUniCfgBundlingMultiplex*
- *mefServiceUniCfgCeVidUntagged*
- *mefServiceUniCfgCePriorityUntagged*

6.2.2 Service EVC per UNI Attributes Configuration Table

EVC per UNI attributes are configured via the *mefServiceEvcPerUniCfgTable*. Rows in the table are automatically created with default values when a UNI is added to an EVC via the *mefServiceEvcUniCfgType* object and are deleted when an EVC is deleted or the UNI associated with the EVC is deleted.

Configuration service attribute options are organized into the following groups:

- EVC service type and identifier:
 - *mefServiceEvcPerUniCfgServiceType*
 - *mefServiceEvcPerUniCfgIdentifier*
- EVC CE-VLAN map:
 - *mefServiceEvcPerUniCfgCeVlanMap*
- EVC frame delivery:
 - *mefServiceEvcPerUniCfgIngressBwpGrpIndex*
 - *mefServiceEvcPerUniCfgEgressBwpGrpIndex*

6.3 Service EVC Attributes

EVC attributes are divided into EVC configuration attributes, EVC UNI configuration, and EVC status.

6.3.1 Service EVC Attributes Configuration Table

EVC attributes are configured via the *mefServiceEvcCfgTable*. The next available EVC index is found by reading the *mefServiceEvcNextIndex* object.

An EVC is written by creating a row based on the value of *mefServiceEvcNextIndex*. An EVC is deleted when a row in the *mefServiceEvcCfgTable* is deleted using the *mefServiceEvcCfgRowStatus* object.

Configuration service attribute options are organized into the following groups:

- EVC Identification, Type, and MTU Size:
 - *mefServiceEvcCfgIdentifier*
 - *mefServiceEvcCfgServiceType*
 - *mefServiceEvcCfgMtuSize*
- EVC CE VLAN ID and CoS Preservation:
 - *mefServiceEvcCfgCevlanIdPreservation*
 - *mefServiceEvcCfgCevlanCosPreservation*
- EVC Service Frame Delivery:
 - *mefServiceEvcCfgUnicastDelivery*
 - *mefServiceEvcCfgMulticastDelivery*
 - *mefServiceEvcCfgBroadcastDelivery*
- EVC Administration State and Profile Association:
 - *mefServiceEvcCfgAdminState*
 - *mefServiceEvcCfgL2cpGrpIndex*

6.3.2 EVC UNI Configuration

The UNIs associated with an EVC are configured by writing the *mefServiceEvcUniCfgTable* using the *mefServiceEvcCfgIndex* and the interface index, *ifIndex*, with the *mefServiceEvcUniCfgType* object, which indicates the UNI is a type of 'root' or 'leaf', and *mefServiceEvcUniCfgRowStatus*.

6.3.3 EVC Status Table

The *mefServiceEvcStatusTable* is created automatically by the NE based when the associated EVC is created and is deleted when the associated EVC is deleted.

The following status service attributes are available on the EVC:

- *mefServiceEvcStatusMaxMtuSize*
- *mefServiceEvcStatusMaxNumUni*
- *mefServiceEvcStatusOperationalState*

6.4 Service Bandwidth Profile Attributes

6.4.1 Bandwidth Profile Group Configuration Table

A Bandwidth Profile is a characterization of the Service Frame arrival times and lengths at a reference point and a specification of the disposition of each Service Frame. A group of bandwidth profiles associated with a service interface, or with an EVC on a UNI, is provided by the *mefServiceBwpGrpCfgTable*. The next available bandwidth profile group is found by reading *mefServiceBwpGrpNextIndex* object.

A bandwidth profile group is written by creating a row based on the value of *mefServiceBwpGrpNextIndex*. A bandwidth profile group can be assigned to an ingress or egress interface (UNI, ENNI) or service (EVC, OVC) by configuring the appropriate table bandwidth profile index (*mefServiceInterfaceCfgIngressBwpGrpIndex*, *mefServiceInterfaceCfgEgressBwpGrpIndex*, *mefServiceEvcPerUniCfgIngressBwpGrpIndex*, *mefServiceEvcPerUniCfgEgressBwpGrpIndex*) with the bandwidth profile group index value created in this specific table.

A bandwidth profile group is deleted when a row in the *mefServiceBwpGrpCfgTable* is deleted using the *mefServiceBwpGrpCfgRowStatus* object. Deleting a row in the *mefServiceBwpGrpCfgTable* also deletes the associated rows in the *mefServiceBwpCfgTable*.

6.4.2 Bandwidth Profile Configuration Table

The *mefServiceBwpCfgTable* indicates the specific bandwidth profiles that are associated with the bandwidth profile group, but associated via different Class of Service Identifiers. The next available bandwidth profile in a bandwidth profile group is found by reading the *mefServiceBwpCfgNextIndex* object. A bandwidth profile is written by creating a row based on the value of *mefServiceBwpCfgNextIndex*.

A bandwidth profile is deleted when a row in the *mefServiceBwpCfgTable* is deleted using the *mefServiceBwpCfgRowStatus* object.

Enabling the *mefServiceBwpCfgPerformanceEnable* object allows a Traffic Performance Data Set to be associated with a Bandwidth Profile. Disabling the object indicates that the counters are not enabled.

A bandwidth profile can be associated with a CoS Identifier through the use of the *mefServiceBwpCfgCosIndex* object. The CoS Identifier profile is first configured via the *mefServiceCosCfgTable* at the *mefServiceCosCfgIndex*. Once the CoS Identifier profile is created then the *mefServiceBwpCfgCosIndex* is set with the value of the *mefServiceCosCfgIndex*. If the bandwidth profile is not to be associated with a CoS Identifier (that is, it applies to all CoS Identifiers), then the *mefServiceBwpCfgCosIndex* is set to 0. In this case the Bandwidth Profile Group contains only a single Bandwidth Profile.

The following service attributes are settable for a specific bandwidth profile:

- *mefServiceBwpCfgIdentifier*
- *mefServiceBwpCfgCir*
- *mefServiceBwpCfgCbs*

- *mefServiceBwpCfgEir*
- *mefServiceBwpCfgEbs*
- *mefServiceBwpCfgCm*
- *mefServiceBwpCfgCf*

6.4.3 Traffic Performance Data Set

The *mefServicePerformanceTable* defines a particular Traffic Performance Data Set as defined by [15] and [24]. The Traffic Performance Data Set is associated with a Bandwidth Profile and inherits the indices of a Bandwidth Profile. This table is automatically created when a Bandwidth Profile is created, but the counters are only incremented when the associated *mefServiceBwpCfgPerformanceEnable* is enabled.

A Traffic Performance Data Set Profile consists of the following:

- Ingress Counters:
 - *mefServicePerformanceIngressGreenFrameCount*
 - *mefServicePerformanceIngressGreenOctets*
 - *mefServicePerformanceIngressYellowFrameCount*
 - *mefServicePerformanceIngressRedFrameCount*
 - *mefServicePerformanceIngressYellowOctets*
 - *mefServicePerformanceIngressRedOctets*
 - *mefServicePerformanceIngressGreenFrameDiscards*
 - *mefServicePerformanceIngressYellowFrameDiscards*
 - *mefServicePerformanceIngressGreenOctetsDiscards*
 - *mefServicePerformanceIngressYellowOctetsDiscards*
- Egress Counters:
 - *mefServicePerformanceEgressGreenFrameCount*
 - *mefServicePerformanceEgressGreenOctets*
 - *mefServicePerformanceEgressYellowFrameCount*
 - *mefServicePerformanceEgressYellowOctets*

6.5 Class of Service Identifier Attributes

A Class of Service Identifier (CoS ID) Frame Set is a set of Service or ENNI Frames that have a commitment from the Operator or Service Provider subject to a particular set of performance objective. This CoS ID profile characterization selection is provided by the *mefServiceCosCfgTable*. The next available CoS ID profile is found by reading the *mefServiceCosNextIndex* object.

A CoS ID profile is written by creating a row based on the value of *mefServiceCosNextIndex*. A CoS ID profile can be assigned to an ingress or egress interface, per EVC or OVC, or per bandwidth profile via the *mefServiceBwpCfgCosIndex*.

The following service attributes are settable for a CoS ID profile:

- *mefServiceCosCfgIdentifier*
- *mefServiceCosCfgType*
- *mefServiceCosCfgIdentifierList*
- *mefServiceCosCfgMacAddress*
- *mefServiceCosCfgProtocol*
- *mefServiceCosCfgSubType*

6.6 L2CP Attributes

The *mefServiceL2cpGrpCfgTable* defines a particular L2CP (Layer 2 Control Protocol) profile group. A L2CP profile group consists of one or more L2CP protocol profiles that are defined in the *mefServiceL2cpCfgTable*. Individual L2CP profile settings are created by adding a new row in the *mefServiceL2cpCfgTable* that is associated with a particular grouping of data and operation on that data set for the specific interface or EVC. Individual L2CP attributes are written to unique columns in the table.

A L2CP profile group once created can be assigned to an interface via the *mefServiceInterfaceCfgL2cpGrpIndex* object. A L2CP profile group can be assigned to an EVC via the *mefServiceEvcCfgL2cpGrpIndex* object. The value set to the *mefServiceInterfaceCfgL2cpGrpIndex* or *mefServiceEvcCfgL2cpGrpIndex* objects is the same as the *mefServiceL2cpGrpCfgIndex* for the associated L2CP profile group.

A L2CP profile group consists of the following:

- *mefServiceL2cpGrpNextIndex* - indicates the next available L2CP profile group index
- *mefServiceL2cpGrpCfgIndex* - the L2CP profile group index
- *mefServiceL2cpCfgNextIndex* - indicates the next available specific L2CP index within a profile group for a L2CP protocol
- *mefServiceL2cpGrpCfgRowStatus* - the status of the row and L2CP profile group

L2CP specific service attribute options are organized into the following groups:

- L2CP type and scope:
 - *mefServiceL2cpCfgType*
 - *mefServiceL2cpCfgMatchScope*
- L2CP matching criteria:
 - *mefServiceL2cpCfgMacAddress*
 - *mefServiceL2cpCfgProtocol*

- *mefServiceL2cpCfgSubType*

6.7 Service Notification and Configuration Objects

The following objects are specific to notifications and are included in the list of objects for the specific Service notifications:

- *mefServiceNotificationObjDateAndTime* - contains the time and date at the time that the notification event is detected
- *mefServiceNotificationConfigurationChangeType* - contains the type of event that caused the notification: entry added, entry deleted, or entry modified

The following Service notification can be generated:

- *mefServiceConfigurationAlarm* - is sent when the settings of the configurable item is changed

6.8 UNI-EVC MIB Conformance and Compliance

There are two conformance items: the *mefServiceUniMibCompliances* section and the *mefServiceUniMibGroups* conformance group.

The units of conformance are organized into the following mandatory groups:

- *mefServiceInterfaceMandatoryGroup*
- *mefServiceUniMandatoryGroup*
- *mefServiceEvcMandatoryGroup*
- *mefServiceBwpMandatoryGroup*
- *mefServiceCosMandatoryGroup*
- *mefServiceL2cpMandatoryGroup*
- *mefServicePerformanceMandatoryGroup*

The units of conformance are organized into the following optional groups:

- *mefServiceEvcOptionalGroup*
- *mefServicePerformanceOptionalGroup*
- *mefServiceNotificationsOptionalGroup*
- *mefServiceNotificationObjOptionalGroup*

7. UNI-EVC MIB Requirements

The UNI-EVC MIB defines the managed objects necessary to support MEF UNI and EVC functionality.

The UNI-EVC MIB is divided into the following groups:

- **mefServiceInterfaceAttributes** - defines the Interface objects necessary to support the general interface configuration and status of MEF compliant Network Elements. This group includes the *mefServiceInterfaceCfgTable*, *mefServiceInterfaceStatusTable* and the *mefServiceInterfaceStatisticsTable*.

- **mefServiceUniAttributes** - defines the UNI Service Attribute objects necessary to support UNI configuration and status of MEF compliant Network Elements. This group includes the *mefServiceUniCfgTable* and the *mefServiceEvcPerUniCfgTable*.
- **mefServiceEvcAttributes** - defines the EVC Service Attribute objects necessary to support EVC configuration and status of MEF compliant Network Elements. This group includes the *mefServiceEvcNextIndex* object, the *mefServiceEvcCfgTable*, *mefServiceEvcUniCfgTable*, and the *mefServiceEvcStatusTable*.
- **mefServiceBwpAttributes** - defines the Bandwidth Profile Service Attribute objects necessary to support Bandwidth Profile configuration of MEF compliant Network Elements. This group includes the *mefServiceBwpGrpNextIndex* object and the *mefServiceBwpGrpCfgTable*, the *mefServiceBwpCfgTable*, and the *mefServicePerformanceTable*.
- **mefServiceCosAttributes** - defines the "Class of Service Identifier" Service Attribute objects necessary to support Class of Service Identifier configuration of MEF compliant Network Elements. This group includes the *mefServiceCosNextIndex* object and the *mefServiceCosCfgTable*.
- **mefServiceL2cpAttributes** - defines the Layer 2 Control Protocols Service Attribute objects necessary to support Layer 2 Control Protocol configuration of MEF compliant Network Elements. This group includes the *mefServiceL2cpGrpNextIndex* object, the *mefServiceL2cpGrpCfgTable*, and the *mefServiceL2cpCfgTable*.
- **mefServiceNotification** - defines the Notification Service Attribute objects necessary to support notifications for MEF compliant Network Elements. This group includes all the objects from *mefServiceNotifications*, *mefServiceNotificationCfg*, and *mefServiceNotificationObj* groups.

[R6] The following objects from the *mefServiceInterfaceCfgTable* **SHALL** be supported for MEF compliant Network Elements: *mefServiceInterfaceCfgType*, *mefServiceInterfaceCfgIdentifier*, *mefServiceInterfaceCfgFrameFormat*, *mefServiceInterfaceCfgIngressBwpGrpIndex*, *mefServiceInterfaceCfgEgressBwpGrpIndex*, *mefServiceInterfaceCfgL2cpGrpIndex*.

[R7] The following objects from the *mefServiceInterfaceStatusTable* **SHALL** be supported for MEF compliant Network Elements: *mefServiceInterfaceStatusType*, *mefServiceInterfaceStatusMaxVc*, and *mefServiceInterfaceStatusMaxEndPointPerVc*.

[R8] All objects from the *mefServiceInterfaceStatisticsTable* **SHALL** be supported for MEF compliant Network Elements.

[R9] All objects from the *mefServiceUniCfgTable* and the *mefServiceEvcPerUniCfgTable* **SHALL** be supported for MEF compliant Network Elements.

[R10] The *mefServiceEvcNextIndex* object and the objects from the *mefServiceEvcCfgTable* **SHALL** be supported for MEF compliant Network Elements: *mefServiceEvcCfgIdentifier*, *mefServiceEvcCfgServiceType*, *mefServiceEvcCfgMtuSize*, *mefServiceEvcCfgCevlanIdPreservation*,

mefServiceEvcCfgCevlanCosPreservation, mefServiceEvcCfgL2cpGrpIndex, mefServiceEvcCfgAdminState, and mefServiceEvcCfgRowStatus.

- [D4] The following objects from the *mefServiceEvcCfgTable* **SHOULD** be supported for MEF compliant Network Elements: mefServiceEvcCfgUnicastDelivery, mefServiceEvcCfgMulticastDelivery, and mefServiceEvcCfgBroadcastDelivery.

The mefServiceEvcCfgUnicastDelivery, mefServiceEvcCfgMulticastDelivery, and mefServiceEvcCfgBroadcastDelivery objects are listed as a desired requirement since there is not a criteria defined within the body of MEF 10.2 or 6.1 on how the conditional delivery scope is defined.

- [R11] All objects from the mefServiceEvcUniCfgTable and the mefServiceEvcNextIndex object **SHALL** be supported for MEF compliant Network Elements.
- [R12] All objects from the mefServiceEvcStatusTable **SHALL** be supported for MEF compliant Network Elements.
- [R13] All objects from the mefServiceBwpGrpCfgTable, the mefServiceBwpCfgTable, and the mefServiceBwpGrpNextIndex object **SHALL** be supported for MEF compliant Network Elements.
- [R14] All objects from the mefServiceCosCfgTable and the mefServiceCosNextIndex object **SHALL** be supported for MEF compliant Network Elements.
- [R15] All objects from the mefServiceL2cpGrpCfgTable, mefServiceL2cpCfgTable and the mefServiceL2cpGrpNextIndex object **SHALL** be supported for MEF compliant Network Elements.
- [R16] The following objects from the mefServicePerformanceTable **SHALL** be supported for MEF compliant Network Elements:
mefServicePerformanceIngressGreenFrameCount,
mefServicePerformanceIngressGreenOctets,
mefServicePerformanceEgressGreenFrameCount,
mefServicePerformanceEgressGreenOctets.
- [R17] The following objects from the mefServicePerformanceTable **SHOULD** be supported for MEF compliant Network Elements:
mefServicePerformanceIngressYellowFrameCount,
mefServicePerformanceIngressRedFrameCount,
mefServicePerformanceIngressYellowOctets,
mefServicePerformanceIngressRedOctets,
mefServicePerformanceEgressYellowFrameCount,
mefServicePerformanceEgressYellowOctets,
mefServicePerformanceIngressGreenFrameDiscards,
mefServicePerformanceIngressYellowFrameDiscards,
mefServicePerformanceIngressGreenOctetsDiscards, and
mefServicePerformanceIngressYellowOctetsDiscards.

- [R18] All objects from `mefServiceNotifications`, `mefServiceNotificationCfg`, and `mefServiceNotificationObj` groups SHOULD be supported for MEF compliant Network Elements.

8. UNI-EVC MIB Definitions

```

MEF-UNI-EVC-MIB DEFINITIONS ::= BEGIN
IMPORTS
    NOTIFICATION-TYPE, MODULE-IDENTITY, OBJECT-TYPE, Unsigned32, enterprises,
    Counter32, Counter64
        FROM SNMPv2-SMI
        -- RFC 2578
    RowStatus, MacAddress, DateAndTime, TEXTUAL-CONVENTION, DisplayString
        FROM SNMPv2-TC
        -- RFC 2579
    OBJECT-GROUP, NOTIFICATION-GROUP, MODULE-COMPLIANCE
        FROM SNMPv2-CONF
        -- RFC 2580
    ifIndex
        FROM IF-MIB
        -- [RFC2863]
    EntityAdminState, EntityOperState
        FROM ENTITY-STATE-TC-MIB
        -- RFC 4268
    VlanId
        FROM Q-BRIDGE-MIB
        -- [RFC4363]
    IEEE8021PriorityValue
        FROM IEEE8021-TC-MIB;
        -- IEEE 802.1ap

mefUniEvcMib MODULE-IDENTITY
    LAST-UPDATED      "201301251200Z" -- January 25, 2013
    ORGANIZATION      "Metro Ethernet Forum"
    CONTACT-INFO
        "Web URL: http://metroethernetforum.org/
        E-mail: mibs@metroethernetforum.org
        Postal: Metro Ethernet Forum
                6033 W. Century Boulevard, Suite 1107
                Los Angeles, CA 90045
                U.S.A.
        Phone:   +1 310-642-2800
        Fax:     +1 310-642-2808"
    DESCRIPTION
        "This MIB module contains the management objects for the
        management of User Network Interfaces (UNIs) and Ethernet
        Virtual Connections (EVCs)

        Copyright 2013 Metro Ethernet Forum
        All rights reserved.

        *****
        Reference Overview

        A number of base documents have been used to create this MIB. The following
        are the abbreviations for the baseline documents:

        [MEF6.1] refers to MEF 6.1 'Ethernet Services Definitions - Phase 2',
                April 2008
        [MEF 6.1.1] refers to MEF 6.1.1 'Layer 2 Control Protocol Handling Amendment
                to MEF 6.1', January 2012
        [MEF 7.2] refers to MEF 7.2 'Carrier Ethernet Management Information Model',
                January 2013
        [MEF 10.2] refers to MEF 10.2 'Ethernet Services Attributes Phase 2',
                October 2009
        [MEF 26.1] refers to MEF 26.1 'External Network Network Interface (ENNI) -
                Phase 2', January 2012
        [Q.840.1] refers to 'ITU-T Requirements and analysis for NMS-EMS
                management interface of Ethernet over Transport and Metro Ethernet
                Network (EoT/MEN)', March 2007
        *****
        "
    REVISION      "201301251200Z" -- January 25, 2013

```

```

DESCRIPTION
    "Initial Version."
 ::= { enterprises mef(15007) mefService(2) 2 }

-- *****
-- Object definitions in the Service MIB Module
-- *****
mefServiceNotifications      OBJECT IDENTIFIER ::= { mefUniEvcMib 0 }
mefServiceObjects           OBJECT IDENTIFIER ::= { mefUniEvcMib 1 }
mefServiceMibConformance    OBJECT IDENTIFIER ::= { mefUniEvcMib 2 }

-- *****
-- Groups in the Service MIB Module
-- *****
mefServiceInterfaceAttributes OBJECT IDENTIFIER ::= { mefServiceObjects 1 }
mefServiceUniAttributes      OBJECT IDENTIFIER ::= { mefServiceObjects 2 }
mefServiceEvcAttributes      OBJECT IDENTIFIER ::= { mefServiceObjects 3 }

mefServiceBwpAttributes      OBJECT IDENTIFIER ::= { mefServiceObjects 4 }
mefServiceCosAttributes      OBJECT IDENTIFIER ::= { mefServiceObjects 5 }
mefServiceL2cpAttributes     OBJECT IDENTIFIER ::= { mefServiceObjects 6 }
mefServiceNotificationCfg    OBJECT IDENTIFIER ::= { mefServiceObjects 7 }
mefServiceNotificationObj    OBJECT IDENTIFIER ::= { mefServiceObjects 8 }

-- *****
-- Ethernet Service Textual Conventions
-- *****

MefServicePreservationType ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION
        "Configures the EVC preservation attributes."

        preserve(1)          The type of service is preserved, either
                             CE-VLAN ID or CE-VLAN CoS as indicated by
                             the specific object.
        noPreserve(2)       The type of service is not preserved, either
                             CE-VLAN ID or CE-VLAN CoS as indicated by
                             the specific object.

    "
    REFERENCE
        "[MEF 6.1] 6.1; [MEF 7.2] 6.2.1.3"
    SYNTAX      INTEGER {
        preserve          (1),
        noPreserve       (2)
    }

MefServiceDeliveryType ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION
        "A MEF service can have one of three different delivery types:

        discard(1)          Service Frames are discarded
        unconditional(2)    Service Frames are unconditionally
                             delivered no matter the content of the
                             Service Frame. An example of this is
                             a Point-to-Point EVC
        conditional(3)      Service Frame are conditionally
                             delivered to the destination UNI. The
                             condition is specified, for example via a

```

```

bandwidth profile or unicast MAC address
learning.
"
REFERENCE
"[MEF 6.1] 6.0"
SYNTAX    INTEGER {
    discard          (1),
    unconditional    (2),
    conditional      (3)
}
}

MefServiceInterfaceType ::= TEXTUAL-CONVENTION
    STATUS current
    DESCRIPTION
        "A MEF Interface can be one of several types:

        bUnild1(0)    UNI Type 1.1
        bUnild2(1)    UNI Type 1.2
        bUni2d1(2)    UNI Type 2.1
        bUni2d2(3)    UNI Type 2.2
        bEnni(4)      ENNI
        bEnniVuni(5)  VUNI on an ENNI
        "
    REFERENCE
        "[MEF 6.1] 6.0"
    SYNTAX    BITS {
        bUnild1(0),
        bUnild2(1),
        bUni2d1(2),
        bUni2d2(3),
        bEnni(4),
        bEnniVuni(5)
    }
}

```

```

MefServiceListType ::= TEXTUAL-CONVENTION
    DISPLAY-HINT "255t"
    STATUS current
    DESCRIPTION
        "An octet string containing a list of item values.

        An item value is an arbitrary string of octets from
        ASCII character 0x21 - 0x7E, but may not contain
        a delimiter character. Delimiter characters are
        defined to be one of the following:

        - An ASCII comma character (0x2C)
        - An ASCII colon character (0x3A)

        Delimiter characters are used to separate item values
        in a item list. Only a single delimiter character may
        occur between two item values. A item value may not
        have a zero length. These constraints imply certain
        restrictions on the contents of this object:

        - There cannot be a leading or trailing delimiter
          character.

        - There cannot be multiple adjacent delimiter
          characters.

        The 'comma' delimiter separates individual items or a
        sequence of items. The 'colon' delimiter indicates a range
        of items from the first item before the colon through the
        last item after the colon. Individual ranges in the same

```

item list need to be separated by a 'comma'.

Some examples of valid item lists are:

```
- ''          -- an empty list
- '1234'     -- list of one item
- '10,11,12' -- list of several items
- '10:20'    -- a list containing all the valid values from
              10 through 20
```

Note that although an item value may not have a length of zero, an empty string is still valid. This indicates an empty list (i.e. there are no tag values in the list).

The use of the item list is to select one or more items at one time with a single object instead of having separate row entries in a table for each individual item.

```
"
SYNTAX      OCTET STRING (SIZE (0..255))
```

```
-- *****
-- Ethernet Service Interface Configuration
-- *****
```

```
mefServiceInterfaceCfgTable OBJECT-TYPE
```

```
SYNTAX      SEQUENCE OF MefServiceInterfaceCfgEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
```

"This table represents the local interface configuration table for an MEF Ethernet compliant Network Element (NE). The primary purpose of this table is to provide configuration of the interface for a Metro Ethernet NE (ME-NE). Rows are automatically created by the SNMP Agent in the table based upon the MEF compliant interfaces that a ME-NE contains based upon the listed defaults. A SNMP Manager can modify values of each of the objects in the row.

This table may be sparsely populated based upon the number of ME-NE interfaces that the device supports.

Rows in this table are accessed by the IF-MIB interface object ifIndex.

Rows in this table and the values of the objects in the row are persistent (non-volatile) upon reboot.

```
"
REFERENCE
```

```
"[MEF 6.1], [MEF 7.2], [MEF 10.2], [Q.840.1]"
::= { mefServiceInterfaceAttributes 1 }
```

```
mefServiceInterfaceCfgEntry OBJECT-TYPE
```

```
SYNTAX      MefServiceInterfaceCfgEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
```

"The conceptual row of mefServiceInterfaceCfgTable."

```
INDEX { ifIndex }
::= { mefServiceInterfaceCfgTable 1 }
```

```
MefServiceInterfaceCfgEntry ::= SEQUENCE {
```

```
    mefServiceInterfaceCfgType          MefServiceInterfaceType,
    mefServiceInterfaceCfgIdentifier    DisplayString,
    mefServiceInterfaceCfgFrameFormat  INTEGER,
    mefServiceInterfaceCfgIngressBwpGrpIndex  Unsigned32,
```



```

    mefServiceInterfaceCfgEgressBwpGrpIndex    Unsigned32,
    mefServiceInterfaceCfgL2cpGrpIndex        Unsigned32
}

mefServiceInterfaceCfgType OBJECT-TYPE
SYNTAX      MefServiceInterfaceType
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "This object indicates the configured interface type. One
    bit in the vector can be set at one time based upon the
    possible values indicated by mefServiceInterfaceStatusType.
    "
REFERENCE
    "[MEF 6.1] 6.0; [MEF 7.2] 6.2.1.1, 6.2.1.2, 6.2.1.3"
DEFVAL { {bUnild1} }
 ::= { mefServiceInterfaceCfgEntry 1 }

mefServiceInterfaceCfgIdentifier OBJECT-TYPE
SYNTAX      DisplayString
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "This object indicates the interface identifier and is an arbitrary
    text string that is used to identify an interface. Unique string
    values are chosen to uniquely identify an interface.

    This object is used to add an identifier to a physical port. The
    mefServiceUniCfgIdentifier can be used to add a separate identifier
    that is associated with the service interface name.

    Octet values of 0x00 through 0x1f are illegal.

    MEF 26.1 restricts the maximum size identifiers to 45 octets.
    "
REFERENCE
    "[MEF 7.2] 6.2.1.4"
DEFVAL { "" }
 ::= { mefServiceInterfaceCfgEntry 2 }

mefServiceInterfaceCfgFrameFormat OBJECT-TYPE
SYNTAX      INTEGER {
    noTag      (1),
    ctag       (2),
    stag       (3),
    stagCtag   (4)
}
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "This object indicates the interface frame format type that the
    interface can recognize.

    noTag(1)      indicates that all data on the interface is
                   as untagged data
    ctag(2)       indicates that tagged data is associated with
                   CE-VLAN ID or a C-TAG
    stag(3)       indicates that tagged data is associated with
                   a provider tag or S-TAG
    stagCtag(4)   indicates that service traffic identified with
                   both an S-TAG (outer tag) and a C-TAG (inner tag)
    "
REFERENCE
    "[MEF 6.1] 6.0"

```

```

DEFVAL { noTag }
 ::= { mefServiceInterfaceCfgEntry 3 }

mefServiceInterfaceCfgIngressBwpGrpIndex OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "This object is the index number of the ingress bandwidth profile group
    associated with the current interface. A value of 0 indicates that no
    interface ingress bandwidth profile group is associated with the
    interface.

    This index indicates the specific bandwidth profile group previously
    configured via mefServiceBwpGrpCfgTable and mefServiceBwpCfgTable
    using this value for mefServiceBwpGrpCfgIndex. There may be multiple
    entries in mefServiceBwpCfgTable using this index, each containing
    bandwidth parameters for a different Class of Service Identifier.
    "
REFERENCE
    "[MEF 6.1] 6.0; [MEF 7.2] 6.2.1.2"
DEFVAL { 0 }
 ::= { mefServiceInterfaceCfgEntry 4 }

mefServiceInterfaceCfgEgressBwpGrpIndex OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "This object is the index number of the egress bandwidth profile group
    associated with the current interface. A value of 0 indicates that no
    interface egress bandwidth profile group is associated with the
    interface.

    This index indicates the specific bandwidth profile group previously
    configured via mefServiceBwpGrpCfgTable and mefServiceBwpCfgTable
    using this value for mefServiceBwpGrpCfgIndex. There may be multiple
    entries in mefServiceBwpCfgTable using this index, each containing
    bandwidth parameters for a different Class of Service Identifier.
    "
REFERENCE
    "[MEF 6.1] 6.0; [MEF 7.2] 6.2.1.2"
DEFVAL { 0 }
 ::= { mefServiceInterfaceCfgEntry 5 }

mefServiceInterfaceCfgL2cpGrpIndex OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "This object is the index of the L2CP profile group
    (mefServiceL2cpGrpCfgIndex) associated with the current interface. A
    value of 0 indicates that no interface L2CP profile group is associated
    with the interface.

    This index indicates the L2CP profile group previously configured via
    mefServiceL2cpGrpCfgTable and mefServiceL2cpCfgTable using the value
    of the mefServiceL2cpGrpCfgIndex. There may be multiple entries in
    mefServiceL2cpCfgTable using this index, each containing
    parameters for a different L2CP protocol.
    "
REFERENCE
    "[MEF 6.1] 6.0; [MEF 6.1.1] 8.0; [MEF 7.2] 6.2.1.2"
DEFVAL { 0 }

```

```

 ::= { mefServiceInterfaceCfgEntry 9 }

-- *****
-- Ethernet Service Interface Status
-- *****

mefServiceInterfaceStatusTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF MefServiceInterfaceStatusEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table represents the local interface status table for an
        MEF Ethernet compliant NE. The primary purpose of this table is to
        provide status information of the interface for a ME-NE. Rows are
        automatically created in the table based upon the interfaces that a MEF
        NE contains. This tables contains the same rows as the
        mefServiceInterfaceCfgTable. A SNMP Manager can access objects in each
        of the rows in the table.

        Rows in this table are accessed by the IF-MIB interface object ifIndex.

        Rows in this table are persistent (non-volatile) upon reboot, but the
        values of the objects in a row are not persistent.
        "
    REFERENCE
        "[MEF 6.1], [MEF 7.2], [MEF 10.2], [Q.840.1]"
    ::= { mefServiceInterfaceAttributes 2 }

mefServiceInterfaceStatusEntry OBJECT-TYPE
    SYNTAX      MefServiceInterfaceStatusEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The conceptual row of mefServiceInterfaceStatusTable."
    INDEX { ifIndex }
    ::= { mefServiceInterfaceStatusTable 1 }

MefServiceInterfaceStatusEntry ::= SEQUENCE {
    mefServiceInterfaceStatusType      MefServiceInterfaceType,
    mefServiceInterfaceStatusMaxVc     Unsigned32,
    mefServiceInterfaceStatusMaxEndPointPerVc Unsigned32
}

mefServiceInterfaceStatusType OBJECT-TYPE
    SYNTAX      MefServiceInterfaceType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object is a vector of bits that indicates the possible
        interface types that an interface can be configured to. An interface,
        for instance, can be configured to be a UNI type 1 or 2, or an ENNI.

        All the possible capabilities of an interface are indicated, one bit
        per possible type. At least one bit must be set for MEF compliant NEs.
        "
    REFERENCE
        "[MEF 6.1] 6.0"
    ::= { mefServiceInterfaceStatusEntry 1 }

mefServiceInterfaceStatusMaxVc OBJECT-TYPE
    SYNTAX      Unsigned32 (1..4095)
    MAX-ACCESS  read-only
    STATUS      current

```

```

DESCRIPTION
  "This object indicates the maximum number of virtual channels that the
  interface can support. A virtual connection can be an Ethernet Virtual
  Connection (EVC) or an Operator Virtual Connection (OVC) depending upon
  the type of interface that is selected.
  "
REFERENCE
  "[MEF 6.1] 6.0; [MEF 7.2] 6.2.1.2"
  ::= { mefServiceInterfaceStatusEntry 2 }

mefServiceInterfaceStatusMaxEndPointPerVc OBJECT-TYPE
SYNTAX      Unsigned32 (1..10)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "This object indicates the interface maximum number of end points per
  virtual channel. It can be used to indicate the maximum number of OVC
  end points per OVC. It has no current applicability for EVCs.
  "
REFERENCE
  "[MEF 26.1]"
  ::= { mefServiceInterfaceStatusEntry 3 }

-- *****
-- Ethernet Service Interface Statistics
-- *****

mefServiceInterfaceStatisticsTable OBJECT-TYPE
SYNTAX      SEQUENCE OF MefServiceInterfaceStatisticsEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
  "This table represents the local interface statistics table for an
  MEF Ethernet compliant NE. The primary purpose of this table is to
  provide statistics information of the interface for a ME-NE. Rows are
  automatically created in the table based upon the interfaces that a MEF
  NE contains. This table contains the same rows as the
  mefServiceInterfaceCfgTable. A SNMP Manager can access objects in each
  of the rows in the table.

  Rows in this table are accessed by the IF-MIB interface object ifIndex.

  Rows in this table are persistent (non-volatile) upon reboot, but the
  values of the objects in a row are not persistent.
  "
REFERENCE
  "[MEF 15], [Q.840.1]"
  ::= { mefServiceInterfaceAttributes 3 }

mefServiceInterfaceStatisticsEntry OBJECT-TYPE
SYNTAX      MefServiceInterfaceStatisticsEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
  "The conceptual row of mefServiceInterfaceStatisticsTable."
INDEX { ifIndex }
  ::= { mefServiceInterfaceStatisticsTable 1 }

MefServiceInterfaceStatisticsEntry ::= SEQUENCE {
  mefServiceInterfaceStatisticsIngressUndersized Counter32,
  mefServiceInterfaceStatisticsIngressOversized Counter32,
  mefServiceInterfaceStatisticsIngressFragments Counter32,
  mefServiceInterfaceStatisticsIngressCrcAlignment Counter32,

```

```

mefServiceInterfaceStatisticsIngressInvalidVid Counter32,
mefServiceInterfaceStatisticsIngressOctets Counter64,
mefServiceInterfaceStatisticsIngressUnicast Counter64,
mefServiceInterfaceStatisticsIngressMulticast Counter64,
mefServiceInterfaceStatisticsIngressBroadcast Counter64,
mefServiceInterfaceStatisticsEgressOctets Counter64,
mefServiceInterfaceStatisticsEgressUnicast Counter64,
mefServiceInterfaceStatisticsEgressMulticast Counter64,
mefServiceInterfaceStatisticsEgressBroadcast Counter64
}

mefServiceInterfaceStatisticsIngressUndersized OBJECT-TYPE
SYNTAX Counter32
UNITS "Ethernet frames"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "This object is incremented for each frame received
    on a NE interface that was smaller than 64 octets.

    This object defaults to '0'."
REFERENCE
    "[MEF 15] 8.2; [Q.840.1] 6.2.4"
 ::= { mefServiceInterfaceStatisticsEntry 1 }

mefServiceInterfaceStatisticsIngressOversized OBJECT-TYPE
SYNTAX Counter32
UNITS "Ethernet frames"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "This object is incremented for each frame received
    on a NE interface that was larger than the maximum MTU size.

    This object defaults to '0'."
REFERENCE
    "[MEF 15] 8.2; [Q.840.1] 6.2.4"
 ::= { mefServiceInterfaceStatisticsEntry 2 }

mefServiceInterfaceStatisticsIngressFragments OBJECT-TYPE
SYNTAX Counter32
UNITS "Ethernet frames"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "This object is incremented for each frame received
    on a NE interface that was less than 64 octets in length
    (excluding framing bits but including FCS octets) and had
    either a bad Frame Check Sequence (FCS) with an integral
    number of octets (FCS Error) or a bad FCS with a non-integral
    number of octets (Alignment Error).

    Note that it is entirely normal for this counter to
    increment. This is because it counts both runts (which are
    normal occurrences due to collisions) and noise hits.

    This object defaults to '0'."
REFERENCE
    "[MEF 15] 8.2; [Q.840.1] 6.2.4"
 ::= { mefServiceInterfaceStatisticsEntry 3 }

```

```
mefServiceInterfaceStatisticsIngressCrcAlignment OBJECT-TYPE
    SYNTAX      Counter32
    UNITS       "Ethernet frames"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object is incremented for each frame received
        on a NE interface that was from 64 octets to the maximum MTU
        size in length, but had either a bad Frame Check Sequence (FCS)
        with an integral number of octets (FCS Error) or a bad FCS with
        a non-integral number of octets (Alignment Error).

        This object defaults to '0'."
    "
    REFERENCE
        "[MEF 15] 8.2; [Q.840.1] 6.2.4"
    ::= { mefServiceInterfaceStatisticsEntry 4 }

mefServiceInterfaceStatisticsIngressInvalidVid OBJECT-TYPE
    SYNTAX      Counter32
    UNITS       "Ethernet frames"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object is incremented for each frame received
        on a NE interface with an invalid VLAN ID.

        This object defaults to '0'."
    "
    REFERENCE
        "[MEF 15] 8.2; [Q.840.1] 6.2.4"
    ::= { mefServiceInterfaceStatisticsEntry 5 }

mefServiceInterfaceStatisticsIngressOctets OBJECT-TYPE
    SYNTAX      Counter64
    UNITS       "octets"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object is incremented by the number of octets in a
        valid frame received on a NE interface.

        This object defaults to '0'."
    "
    REFERENCE
        "[MEF 15] 8.2; [Q.840.1] 6.2.4"
    ::= { mefServiceInterfaceStatisticsEntry 6 }

mefServiceInterfaceStatisticsIngressUnicast OBJECT-TYPE
    SYNTAX      Counter64
    UNITS       "Ethernet frames"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object is incremented for each valid unicast frame received
        on a NE interface.

        NEs that do not support 64 bit counters can return the
        upper half of the counter as all zeros.

        This object defaults to '0'."
    "
    REFERENCE
        "[MEF 15] 8.2; [Q.840.1] 6.2.4"
```

```

 ::= { mefServiceInterfaceStatisticsEntry 7 }

mefServiceInterfaceStatisticsIngressMulticast OBJECT-TYPE
SYNTAX Counter64
UNITS "Ethernet frames"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "This object is incremented for each valid multicast frame received
    on a NE interface.

    ME-NEs that do not support 64 bit counters can return the
    upper half of the counter as all zeros.

    This object defaults to '0'."
REFERENCE
    "[MEF 15] 8.2; [Q.840.1] 6.2.4"
 ::= { mefServiceInterfaceStatisticsEntry 8 }

mefServiceInterfaceStatisticsIngressBroadcast OBJECT-TYPE
SYNTAX Counter64
UNITS "Ethernet frames"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "This object is incremented for each valid broadcast frame received
    on a NE interface.

    ME-NEs that do not support 64 bit counters can return the
    upper half of the counter as all zeros.

    This object defaults to '0'."
REFERENCE
    "[MEF 15] 8.2; [Q.840.1] 6.2.4"
 ::= { mefServiceInterfaceStatisticsEntry 9 }

mefServiceInterfaceStatisticsEgressOctets OBJECT-TYPE
SYNTAX Counter64
UNITS "octets"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "This object is incremented by the number of octets in a frame
    transmitted on a NE interface.

    This object defaults to '0'."
REFERENCE
    "[MEF 15] 8.2; [Q.840.1] 6.2.4"
 ::= { mefServiceInterfaceStatisticsEntry 10 }

mefServiceInterfaceStatisticsEgressUnicast OBJECT-TYPE
SYNTAX Counter64
UNITS "Ethernet frames"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "This object is incremented for each unicast frame transmitted on a
    NE interface.

    ME-NEs that do not support 64 bit counters can return the
    upper half of the counter as all zeros."

```

```

        This object defaults to '0'.
    "
REFERENCE
    "[MEF 15] 8.2; [Q.840.1] 6.2.4"
    ::= { mefServiceInterfaceStatisticsEntry 11 }

mefServiceInterfaceStatisticsEgressMulticast    OBJECT-TYPE
SYNTAX      Counter64
UNITS       "Ethernet frames"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This object is incremented for each multicast frame transmitted on a
    NE interface.

    ME-NEs that do not support 64 bit counters can return the
    upper half of the counter as all zeros.

    This object defaults to '0'.
    "
REFERENCE
    "[MEF 15] 8.2; [Q.840.1] 6.2.4"
    ::= { mefServiceInterfaceStatisticsEntry 12 }

mefServiceInterfaceStatisticsEgressBroadcast OBJECT-TYPE
SYNTAX      Counter64
UNITS       "Ethernet frames"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This object is incremented for each broadcast frame transmitted on a
    NE interface.

    ME-NEs that do not support 64 bit counters can return the
    upper half of the counter as all zeros.

    This object defaults to '0'.
    "
REFERENCE
    "[MEF 15] 8.2; [Q.840.1] 6.2.4"
    ::= { mefServiceInterfaceStatisticsEntry 13 }

-- *****
-- Ethernet UNI Interface Configuration
-- *****

mefServiceUniCfgTable OBJECT-TYPE
SYNTAX      SEQUENCE OF MefServiceUniCfgEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "This table represents the specific UNI attributes configuration table
    for an MEF Ethernet compliant NE. The primary purpose of this table
    is to provide configuration of the UNI for a ME-NE. Rows are
    automatically created in the table when an interface is configured as
    type UNI via the mefServiceInterfaceCfgType object based upon the
    listed defaults by the SNMP Agent. Rows are deleted if the interface
    is configured to a non-UNI by the SNMP Agent. A SNMP Manager can modify
    values of each of the objects in the row.

    This table may be sparsely populated based upon the number of ME-NE
    interfaces that are configured as type UNI.

```


Rows in this table are accessed by the IF-MIB interface object ifIndex.

Rows in this table and the values of the objects in the row are persistent (non-volatile) upon reboot.

```

"
REFERENCE
  "[MEF 6.1], [MEF 7.2], [MEF 10.2], [Q.840.1]"
  ::= { mefServiceUniAttributes 1 }

mefServiceUniCfgEntry OBJECT-TYPE
  SYNTAX      MefServiceUniCfgEntry
  MAX-ACCESS  not-accessible
  STATUS      current
  DESCRIPTION
    "The conceptual row of mefServiceUniCfgTable."
  INDEX { ifIndex }
  ::= { mefServiceUniCfgTable 1 }

MefServiceUniCfgEntry ::= SEQUENCE {
    mefServiceUniCfgIdentifier      DisplayString,
    mefServiceUniCfgBundlingMultiplex  INTEGER,
    mefServiceUniCfgCeVidUntagged    VlanId,
    mefServiceUniCfgCePriorityUntagged IEEE8021PriorityValue
}

mefServiceUniCfgIdentifier OBJECT-TYPE
  SYNTAX      DisplayString
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
    "This object indicates the UNI identifier. This is distinct from
    the mefServiceInterfaceCfgIdentifier and allows the naming of the
    UNI separately from the Interface name. The identifier is
    an arbitrary text string that is used to identify an interface.
    Unique string values are chosen to uniquely identify the UNI.

    This object is used to add an identifier to a service interface. The
    mefServiceInterfaceCfgIdentifier can be used to add a separate
    identifier that is associated with the physical interface name.

    Octet values of 0x00 through 0x1f are illegal.

    MEF 26.1 restricts the maximum size identifiers to 45 octets."
"
REFERENCE
  "[MEF 6.1] 6.0, [MEF 7.2] 6.2.1.2"
  DEFVAL { "" }
  ::= { mefServiceUniCfgEntry 1 }

mefServiceUniCfgBundlingMultiplex OBJECT-TYPE
  SYNTAX      INTEGER {
    allToOne          (1),
    bundling          (2),
    multiplex         (3),
    bundlingMultiplex (4)
  }
  MAX-ACCESS  read-create
  STATUS      current
  DESCRIPTION
    "Configures bundling and multiplexing options for the UNI. This object
    is an enumerated list of possible multiplexing and bundling options
    on a UNI that is unambiguous and provides only the legal possibilities.

```

```

    allToOne(1)          All to One Bundling, used for Private services:
                        EPL, EP-LAN, and EP-Tree

    bundling(2)          Bundling, indicates one or more CE-VLANS per
                        service, used for virtual private CE-VLAN
                        preservation services: EVPL, EVP-LAN, EVP-Tree

    multiplex(3)         Service Multiplexing, indicates one or more EVCs
                        per UNI, used for virtual private CE-VLAN
                        preservation or non-preservation services:
                        EVPL, EVP-LAN, EVP-Tree

    bundlingMultiplex(4) Service Multiplexing plus Bundling, indicates one
                        or more EVCs per UNI that are composed of one or
                        more CE-VLANS, used for virtual CE-VLAN
                        preservation services: EVPL, EVP-LAN, EVP-Tree
"
REFERENCE
    "[MEF 6.1] 6.0, [MEF 7.2] 6.2.1.2"
DEFVAL { allToOne }
::= { mefServiceUniCfgEntry 2 }

mefServiceUniCfgCeVidUntagged OBJECT-TYPE
SYNTAX      VlanId
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "Configures the CE VLAN ID associated with untagged and priority
    Service Frames. It allows the identification of untagged and
    priority tagged traffic with a specific CE-VLAN ID. This object
    is ignored for all to one bundling at the UNI."
"
REFERENCE
    "[MEF 6.1] 6.0, [MEF 7.2] 6.2.1.2"
DEFVAL { 1 }
::= { mefServiceUniCfgEntry 3 }

mefServiceUniCfgCePriorityUntagged OBJECT-TYPE
SYNTAX      IEEE8021PriorityValue
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "Configures the CE VLAN Priority associated with untagged Service
    Frames. It allows the assignment of a specific VLAN priority to
    untagged traffic. This object is ignored for all to one bundling
    at the UNI."
"
REFERENCE
    "[MEF 7.2] 6.2.1.2"
DEFVAL { 0 }
::= { mefServiceUniCfgEntry 4 }

-- *****
-- Ethernet EVC Configuration
-- *****

mefServiceEvcNextIndex OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This object contains an unused value for an EVC on a
    MEF compliant NE, or a zero to indicate that none exist. This value

```

needs to be read by the SNMP Manager in order to find an available index for row-creation of an EVC and then used when a row is created. This value is automatically updated by the SNMP Agent after the row is created.

Referential integrity is necessary, i.e., the index needs to be persistent upon a reboot or restart of a NE. The index is never to be reused for a new EVC on the same MEF compliant NE until it wraps to zero. The index value keeps increasing up to that time. This is to facilitate access control based on a fixed index for an EMS, since the index is not reused.

```

"
DEFVAL { 1 }
 ::= { mefServiceEvcAttributes 1 }

mefServiceEvcCfgTable OBJECT-TYPE
SYNTAX      SEQUENCE OF MefServiceEvcCfgEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "This table represents the specific EVC attributes configuration table
    for an MEF Ethernet compliant NE. The primary purpose of this table
    is to provide configuration of the EVC for a ME-NE.

    Rows in this table are accessed by the SNMP Manager via the EVC
    number object mefServiceEvcCfgIndex. A new row is created in the
    table by the SNMP Manager by first reading the mefServiceEvcNextIndex
    to find an available EVC number and using this value when the row
    is created. If an object in the row is not defined during row
    creation time the object is set to the default value by the
    SNMP Agent. Rows are deleted by the SNMP Manager via the
    mefServiceEvcCfgRowStatus object.

    Rows in this table and the values of the objects in the row are
    persistent (non-volatile) upon reboot.
    "
REFERENCE
    "[MEF 6.1], [MEF 7.2], [MEF 10.2], [Q.840.1]"
 ::= { mefServiceEvcAttributes 2 }

mefServiceEvcCfgEntry OBJECT-TYPE
SYNTAX      MefServiceEvcCfgEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "The conceptual row of mefServiceEvcCfgTable."
INDEX { mefServiceEvcCfgIndex }
 ::= { mefServiceEvcCfgTable 1 }

MefServiceEvcCfgEntry ::= SEQUENCE {
    mefServiceEvcCfgIndex          Unsigned32,
    mefServiceEvcCfgIdentifier     DisplayString,
    mefServiceEvcCfgServiceType    INTEGER,
    mefServiceEvcCfgMtuSize        Unsigned32,
    mefServiceEvcCfgCevlanIdPreservation MefServicePreservationType,
    mefServiceEvcCfgCevlanCosPreservation MefServicePreservationType,
    mefServiceEvcCfgUnicastDelivery MefServiceDeliveryType,
    mefServiceEvcCfgMulticastDelivery MefServiceDeliveryType,
    mefServiceEvcCfgBroadcastDelivery MefServiceDeliveryType,
    mefServiceEvcCfgL2cpGrpIndex   Unsigned32,
    mefServiceEvcCfgAdminState     EntityAdminState,
    mefServiceEvcCfgRowStatus      RowStatus
}

```

```

mefServiceEvcCfgIndex OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The specific instance of an EVC number."
    ::= { mefServiceEvcCfgEntry 1 }

mefServiceEvcCfgIdentifier OBJECT-TYPE
    SYNTAX      DisplayString
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object indicates the EVC identifier. The identifier is
        an arbitrary text string that is used to identify an EVC.
        Unique string values are chosen to uniquely identify the EVC.

        Octet values of 0x00 through 0x1f are illegal.

        MEF 26.1 restricts the maximum size identifiers to 45 octets."
    REFERENCE
        "[MEF 6.1] 6.1; [MEF 7.2] 6.2.1.3"
    DEFVAL { "" }
    ::= { mefServiceEvcCfgEntry 2 }

mefServiceEvcCfgServiceType OBJECT-TYPE
    SYNTAX      INTEGER {
        pointToPoint          (1),
        multipointToMultipoint (2),
        rootedMultipoint      (3)
    }
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object configures the EVC service type for the ME-NE.

        pointToPoint(1)          EVC Point-to-Point service,
                                used for EPL and EVPL services

        multipointToMultipoint(2) EVC Multipoint-to-Multipoint Service,
                                used for EP-LAN and EVP-LAN services

        rootedMultipoint(3)      EVC Rooted-Multipoint Service,
                                used for EP-Tree and EVP-Tree services"
    REFERENCE
        "[MEF 6.1] 6.1; [MEF 7.2] 6.2.1.3"
    DEFVAL { pointToPoint }
    ::= { mefServiceEvcCfgEntry 3 }

mefServiceEvcCfgMtuSize OBJECT-TYPE
    SYNTAX      Unsigned32 (1522..16384)
    UNITS       "octets"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This object indicates the configured EVC maximum service frame format
        size. It must be less than or equal to the
        mefServiceEvcStatusMaxMtuSize."
    REFERENCE
        "[MEF 6.1] 6.1; [MEF 7.2] 6.2.1.3"
    DEFVAL { 1522 }

```

```

 ::= { mefServiceEvcCfgEntry 4 }

mefServiceEvcCfgCevlanIdPreservation OBJECT-TYPE
    SYNTAX      MefServicePreservationType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object configures the EVC CE-VLAN ID preservation.

        preserve(1)          The CE-VLAN ID is preserved. The ingress CE-VLAN
                             is the CE-VLAN ID at the egress UNI
        noPreserve(2)       The CE-VLAN ID is not preserved. The ingress
                             CE-VLAN ID may not be the CE-VLAN ID at the egress
                             UNI

        "
    REFERENCE
        "[MEF 6.1] 6.1; [MEF 7.2] 6.2.1.3"
    DEFVAL { preserve }
 ::= { mefServiceEvcCfgEntry 5 }

mefServiceEvcCfgCevlanCosPreservation OBJECT-TYPE
    SYNTAX      MefServicePreservationType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object configures EVC CE-VLAN CoS preservation.

        preserve(1)          The CE-VLAN CoS is preserved. The ingress CE-VLAN
                             CoS is the CE-VLAN CoS at the egress UNI
        noPreserve(2)       The CE-VLAN CoS is not preserved. The ingress
                             CE-VLAN CoS may not be the CE-VLAN CoS at the
                             egress UNI

        "
    REFERENCE
        "[MEF 6.1] 6.1; [MEF 7.2] 6.2.1.3"
    DEFVAL { preserve }
 ::= { mefServiceEvcCfgEntry 6 }

mefServiceEvcCfgUnicastDelivery OBJECT-TYPE
    SYNTAX      MefServiceDeliveryType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object configures EVC Unicast delivery condition.

        "
    REFERENCE
        "[MEF 6.1] 6.1; [MEF 7.2] 6.2.1.3"
    DEFVAL { unconditional }
 ::= { mefServiceEvcCfgEntry 7 }

mefServiceEvcCfgMulticastDelivery OBJECT-TYPE
    SYNTAX      MefServiceDeliveryType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object configures EVC Multicast delivery condition.

        "
    REFERENCE
        "[MEF 6.1] 6.1; [MEF 7.2] 6.2.1.3"
    DEFVAL { unconditional }
 ::= { mefServiceEvcCfgEntry 8 }

mefServiceEvcCfgBroadcastDelivery OBJECT-TYPE

```

```

SYNTAX      MefServiceDeliveryType
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object configures EVC Broadcast delivery condition.
    "
REFERENCE
    "[MEF 6.1] 6.1; [MEF 7.2] 6.2.1.3"
DEFVAL { unconditional }
::= { mefServiceEvcCfgEntry 9 }

mefServiceEvcCfgL2cpGrpIndex OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "This object is the index of the L2CP profile group
    (mefServiceL2cpGrpCfgIndex) associated with the current EVC on an
    interface. A value of 0 indicates that no EVC L2CP profile group is
    associated with the EVC.

    This index indicates the L2CP profile group previously configured via
    the mefServiceL2cpGrpCfgTable and mefServiceL2cpCfgTable using the value
    of the mefServiceL2cpGrpCfgIndex. There may be multiple entries in
    mefServiceL2cpCfgTable using this index, each containing
    parameters for a different L2CP protocol.
    "
REFERENCE
    "[MEF 6.1] 6.1; [MEF 6.1.1] 8.0; [MEF 7.2] 6.2.1.3"
DEFVAL { 0 }
::= { mefServiceEvcCfgEntry 10 }

mefServiceEvcCfgAdminState OBJECT-TYPE
SYNTAX      EntityState
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object specifies the administrative state of the EVC.

    If mefServiceEvcCfgAdminState is set to 'locked', the EVC will be
    administratively locked.

    If mefServiceEvcCfgAdminState is set to 'unlocked', the EVC will be
    administratively unlocked if previously locked.

    Other values of mefServiceEvcCfgAdminState are undefined.
    "
REFERENCE
    "[MEF 7.2] 6.2.1.3"
DEFVAL { unlocked }
::= { mefServiceEvcCfgEntry 11 }

mefServiceEvcCfgRowStatus OBJECT-TYPE
SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "The status of the row.

    The writable columns in a row cannot be changed if the row
    is active. All columns must have a valid value before a row
    can be activated.
    "
::= { mefServiceEvcCfgEntry 12 }

```

```

-- *****
-- Ethernet UNIs on a EVC Configuration
-- *****

mefServiceEvcUniCfgTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF MefServiceEvcUniCfgEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table represents the specific EVC attributes configuration table
        for an MEF Ethernet compliant NE. The primary purpose of this table
        is to provide configuration of the EVC for a ME-NE at each MEF
        compliant interface.

        Rows in the table can only be created after the EVC is created.
        Interfaces are added to the EVC and are selected as either a type 'root'
        or 'leaf' by the creation of the row by the SNMP Manager as addressed
        by mefServiceEvcCfgIndex and ifIndex. Rows are deleted by the SNMP
        Manager via the mefServiceEvcUniCfgRowStatus object.

        Rows in this table are accessed by the EVC number object
        mefServiceEvcCfgIndex and the IF-MIB interface object ifIndex by
        the SNMP Manager.

        Rows in this table and the values of the objects in the row are
        persistent (non-volatile) upon reboot.
        "
    REFERENCE
        "[MEF 6.1], [MEF 7.2], [MEF 10.2], [Q.840.1]"
        ::= { mefServiceEvcAttributes 3 }

mefServiceEvcUniCfgEntry OBJECT-TYPE
    SYNTAX      MefServiceEvcUniCfgEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The conceptual row of mefServiceEvcUniCfgTable."
    INDEX { mefServiceEvcCfgIndex, ifIndex }
    ::= { mefServiceEvcUniCfgTable 1 }

MefServiceEvcUniCfgEntry ::= SEQUENCE {
    mefServiceEvcUniCfgType      INTEGER,
    mefServiceEvcUniCfgRowStatus RowStatus
}

mefServiceEvcUniCfgType OBJECT-TYPE
    SYNTAX      INTEGER {
        root          (1),
        leaf          (2),
        unknown       (3)
    }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This object configures UNI type on an EVC.

        root(1)          Valid setting for all service types. A UNI set
                        to this value may send frames to UNIs configured
                        as 'root' or 'leaf'
        leaf(2)          Valid setting for Root-Multipoint EVCs only. A
                        UNI set to this value may send frames to UNIs
                        'root'

```

```

        unknown(3)          UNI port is not configured or illegally
                           configured. This value cannot be written, but
                           is only returned when the type is unknown.
    "
REFERENCE
    "[MEF 10.2]"
DEFVAL { root }
::= { mefServiceEvcUniCfgEntry 1 }

mefServiceEvcUniCfgRowStatus OBJECT-TYPE
SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "The status of the row.

    The writable columns in a row cannot be changed if the row
    is active. All columns must have a valid value before a row
    can be activated.
    "
::= { mefServiceEvcUniCfgEntry 2 }

-- *****
-- Ethernet Service EVC Status
-- *****

mefServiceEvcStatusTable OBJECT-TYPE
SYNTAX      SEQUENCE OF MefServiceEvcStatusEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "This table represents the EVC status table for an
    MEF Ethernet compliant NE. The primary purpose of this table is to
    provide status information of the EVC for a ME-NE. Rows are
    automatically created in the table by the SNMP Agent when a row is
    created in the mefServiceEvcCfgTable. This table contains the same
    rows as the mefServiceEvcCfgTable. Rows are automatically deleted
    in this table by the SNMP Agent when the corresponding row is deleted
    in the mefServiceEvcCfgTable.

    Rows in this table are accessed via the EVC number object
    mefServiceEvcCfgIndex by the SNMP Manager.

    Rows in this table are persistent (non-volatile) upon reboot, but the
    values of the objects in a row are not persistent.
    "
REFERENCE
    "[MEF 10.2]"
::= { mefServiceEvcAttributes 4 }

mefServiceEvcStatusEntry OBJECT-TYPE
SYNTAX      MefServiceEvcStatusEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "The conceptual row of mefServiceEvcStatusTable."
INDEX { mefServiceEvcCfgIndex }
::= { mefServiceEvcStatusTable 1 }

MefServiceEvcStatusEntry ::= SEQUENCE {
    mefServiceEvcStatusMaxMtuSize      Unsigned32,
    mefServiceEvcStatusMaxNumUni      Unsigned32,
    mefServiceEvcStatusOperationalState  INTEGER

```



```

}

mefServiceEvcStatusMaxMtuSize OBJECT-TYPE
    SYNTAX      Unsigned32 (1522..16384)
    UNITS       "octets"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object indicates the EVC maximum configurable service
         frame format size. The actual configured size is set via the
         mefServiceEvcCfgMtuSize object.
        "
    REFERENCE
        "[MEF 6.1] 6.1; [MEF 7.2] 6.2.1.3"
    ::= { mefServiceEvcStatusEntry 1 }

mefServiceEvcStatusMaxNumUni OBJECT-TYPE
    SYNTAX      Unsigned32 (2..16384)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object indicates the maximum number of UNIs in an EVC. For
         a Point-to-Point EVC this value is '2'. For a Multipoint EVC the
         value can be '2' or greater.
        "
    REFERENCE
        "[MEF 6.1] 6.1; [MEF 7.2] 6.2.1.3"
    ::= { mefServiceEvcStatusEntry 2 }

mefServiceEvcStatusOperationalState OBJECT-TYPE
    SYNTAX      EntityOperState
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object indicates the operational state (current
         capability) of the EVC.

        If the value is 'enabled', the EVC is able to ingress and
         egress service frames and has been set to active.

        If the value is 'disabled' the EVC is not able to ingress and
         egress service frames, has detected an operational failure
         condition, or has failed an internal test.

        If the value is 'testing' the EVC has been placed into a test mode,
         either a troubleshooting mode or a test mode.

        If the value is 'unknown' the EVC is unable to report the operational
         state.
        "
    REFERENCE
        "[MEF 7.2] 6.2.1.3"
    ::= { mefServiceEvcStatusEntry 3 }

-- *****
-- Ethernet EVC per UNI Attributes Configuration
-- *****

mefServiceEvcPerUniCfgTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF MefServiceEvcPerUniCfgEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION

```

"This table represents the specific EVC per UNI attributes configuration table for an MEF Ethernet compliant NE. The primary purpose of this table is to provide configuration of the EVC per UNI attributes for a MEF NE. Rows are automatically created in the table by the SNMP Agent with the indicated default values when an interface is added to the EVC via the mefServiceEvcUniCfgType object and are deleted when the corresponding row is deleted in the mefServiceEvcCfgTable or an interface is removed from the EVC.

Rows are accessed via the IF-MIB interface object ifIndex and the EVC number object mefServiceEvcCfgIndex by the SNMP Manager.

Rows in this table and the value of the objects in the row are persistent (non-volatile) upon reboot.

"

REFERENCE

"[MEF 6.1] 6.1; [MEF 7.2] 6.2.1.3"
 ::= { mefServiceUniAttributes 2 }

mefServiceEvcPerUniCfgEntry OBJECT-TYPE

SYNTAX MefServiceEvcPerUniCfgEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "The conceptual row of mefServicePerUniCfgTable."
 "

INDEX { ifIndex, mefServiceEvcCfgIndex }
 ::= { mefServiceEvcPerUniCfgTable 1 }

MefServiceEvcPerUniCfgEntry ::= SEQUENCE {

mefServiceEvcPerUniCfgServiceType	INTEGER,
mefServiceEvcPerUniCfgIdentifier	DisplayString,
mefServiceEvcPerUniCfgCeVlanMap	MefServiceListType,
mefServiceEvcPerUniCfgIngressBwpGrpIndex	Unsigned32,
mefServiceEvcPerUniCfgEgressBwpGrpIndex	Unsigned32

}

mefServiceEvcPerUniCfgServiceType OBJECT-TYPE

SYNTAX INTEGER {
 epl (1),
 evpl (2),
 eplan (3),
 evplan (4),
 eptree (5),
 evptree (6)
 }

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object indicates the specific Ethernet service type. The value is derived from the EVC object 'mefServiceEvcCfgType' and the UNI object 'mefServiceUniCfgBundlingMultiplex'.

epl(1) Ethernet Private Line Service (EPL)
 Point-to-Point EVC, all to one bundling

evpl(2) Ethernet Virtual Private Line (EVPL)
 Point-to-Point EVC, bundling and/or multiplexing

eplan(3) Ethernet Private LAN Service (EP-LAN)
 Multipoint-to-Multipoint EVC, all to one bundling

evplan(4) Ethernet Virtual Private LAN Service (EVP-LAN)
 Multipoint-to-Multipoint EVC, bundling and/or multiplexing

```

    eptree(5)   Ethernet Private Tree Service (EP-Tree)
                Rooted-Multipoint EVC, all to one bundling

    evptree(6) Ethernet Virtual Private Tree Service (EVP-Tree)
                Rooted-Multipoint EVC, bundling and/or multiplexing
    "
REFERENCE
    "[MEF 6.1] 6.1; [MEF 7.2] 6.2.1.3"
DEFVAL { epl }
::= { mefServiceEvcPerUniCfgEntry 1 }

mefServiceEvcPerUniCfgIdentifier OBJECT-TYPE
SYNTAX      DisplayString (SIZE(0..90))
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This object indicates the concatenated EVC-UNI identifier. It is
    the concatenation of the mefServiceUniCfgIdentifier and the
    mefServiceEvcCfgIdentifier."
    "
REFERENCE
    "[MEF 6.1] 6.1; [MEF 7.2] 6.2.1.3"
::= { mefServiceEvcPerUniCfgEntry 2 }

mefServiceEvcPerUniCfgCeVlanMap OBJECT-TYPE
SYNTAX      MefServiceListType
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "This object indicates the CE-VLANs associated with the specific
    EVC on a UNI. CE-VLAN IDs have value of 0 to 4095. The CE-VLAN ID
    list can be a single value or multiple values separated by a delimiter.

    Some valid values are: '100', '1:10', '10,20,30', '1:4095'. In the
    first example only CE-VLAN ID 100 is associated with the VLAN map.
    In the second example the CE-VLAN map includes CE-VLAN IDs 1 through
    10 (range of values). The third example indicates three separate values
    that make up the CE-VLAN map. The last example indicates all CE-VLAN IDs
    are included in the map (range of values)."
    "
REFERENCE
    "[MEF 6.1] 6.1; [MEF 7.2] 6.2.1.3"
DEFVAL { "1:4095" }
::= { mefServiceEvcPerUniCfgEntry 3 }

mefServiceEvcPerUniCfgIngressBwpGrpIndex OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "This object is the index number of the ingress bandwidth profile group
    associated with the current EVC on a UNI. A value of 0 indicates that
    no ingress bandwidth profile group is associated with the EVC on a UNI.

    This index indicates the specific bandwidth profile group previously
    configured via mefServiceBwpGrpCfgTable and mefServiceBwpCfgTable
    using this value for mefServiceBwpGrpCfgIndex. There may be multiple
    entries in mefServiceBwpCfgTable using this index, each containing
    bandwidth parameters for a different Class of Service Identifier."
    "
REFERENCE
    "[MEF 6.1] 6.1; [MEF 7.2] 6.2.1.3"
DEFVAL { 0 }

```

```

 ::= { mefServiceEvcPerUniCfgEntry 4 }

mefServiceEvcPerUniCfgEgressBwpGrpIndex OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This object is the index number of the egress bandwidth profile group
        associated with the current EVC on a UNI. A value of 0 indicates that
        no egress bandwidth profile group is associated with the EVC on a UNI.

        This index indicates the specific bandwidth profile group previously
        configured via mefServiceBwpGrpCfgTable and mefServiceBwpCfgTable
        using this value for mefServiceBwpGrpCfgIndex. There may be multiple
        entries in mefServiceBwpCfgTable using this index, each containing
        bandwidth parameters for a different Class of Service Identifier.
        "
    REFERENCE
        "[MEF 6.1] 6.1; [MEF 7.2] 6.2.1.3"
    DEFVAL { 0 }
 ::= { mefServiceEvcPerUniCfgEntry 5 }

-- *****
-- Ethernet Service Bandwidth Profile Group Table
-- *****

mefServiceBwpGrpNextIndex OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object contains an unused value for a bandwidth profile group on a
        MEF compliant NE, or a zero to indicate that none exist. This value
        needs to be read by the SNMP Manager in order to find an available
        index for row creation of a bandwidth profile group and then used when
        a row is created. This value is automatically updated by the SNMP Agent
        after the row is created.

        Referential integrity is necessary, i.e., the index needs to be
        persistent upon a reboot or restart of a NE. The index
        is never to be reused for a new bandwidth profile group on the same MEF
        compliant NE until it wraps to zero. The index value keeps
        increasing up to that time. This is to facilitate access control based
        on a fixed index for an EMS, since the index is not reused.
        "
    REFERENCE
        "[MEF 6.1] 6.0, 6.1, 6.2, 6.3; [MEF 7.2] 6.2.1.2, 6.2.1.3"
    DEFVAL { 1 }
 ::= { mefServiceBwpAttributes 1 }

mefServiceBwpGrpCfgTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF MefServiceBwpGrpCfgEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table supports bandwidth profile group settings. Rows in this table
        are created by the SNMP Manager by first reading the
        mefServiceBwpGrpNextIndex object to find an available bandwidth
        profile group number and using this value when the row is created. If
        an object in the row is not defined during row creation time the object
        is set to the default value by the SNMP Agent. Rows are deleted by the
        SNMP Manager via the mefServiceBwpGrpCfgRowStatus object and the
        corresponding rows in the mefServiceBwpCfgTable and

```

mefServicePerformanceTable are deleted by the SNMP Agent.

Once a row in this table is created, an entry can be created in the mefServiceBwpCfgTable using the index from this table and the value of mefServiceBwpCfgNextIndex object.

A row in the mefServiceBwpCfgTable indicates how a specific bandwidth profile will be handled.

Rows in this table are accessed via the bandwidth profile group object mefServiceEvcCfgIndex by the SNMP Manager.

Rows in this table and the values of the objects in the row are persistent (non-volatile) upon reboot.

"

REFERENCE

"[MEF 6.1], [MEF 6.1.1] 8.0, [MEF 7.2], [MEF 10.2]"

::= { mefServiceBwpAttributes 2 }

mefServiceBwpGrpCfgEntry OBJECT-TYPE

SYNTAX MefServiceBwpGrpCfgEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Bandwidth profile group settings table entry."

INDEX { mefServiceBwpGrpCfgIndex }

::= { mefServiceBwpGrpCfgTable 1 }

MefServiceBwpGrpCfgEntry ::= SEQUENCE {

mefServiceBwpGrpCfgIndex Unsigned32,

mefServiceBwpCfgNextIndex Unsigned32,

mefServiceBwpGrpCfgRowStatus RowStatus

}

mefServiceBwpGrpCfgIndex OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Bandwidth profile group index number"

::= { mefServiceBwpGrpCfgEntry 1 }

mefServiceBwpCfgNextIndex OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object indicates the value to be used as the index of the bandwidth profile table entries. This value is automatically incremented when a row is created in the bandwidth profile table by the SNMP Agent. When the SNMP Manager wants to create a new row in the bandwidth profile table the value of this object is used to create the specific row."

"

DEFVAL { 1 }

::= { mefServiceBwpGrpCfgEntry 2 }

mefServiceBwpGrpCfgRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The status of the row."

```

    The writable columns in a row cannot be changed if the row
    is active. All columns must have a valid value before a row
    can be activated.
    "
 ::= { mefServiceBwpGrpCfgEntry 3 }

-- *****
-- Ethernet Service Bandwidth Profile Table
-- *****

mefServiceBwpCfgTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF MefServiceBwpCfgEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table supports bandwidth profile settings and allows multiple
        bandwidth profiles to be configured on an interface or a Virtual Service,
        based upon different Class of Service Identifiers.

        Rows in this table are created by the SNMP Manager by first reading
        the mefServiceBwpCfgNextIndex object to find an available bandwidth
        profile number and using this value when the row is created. If
        an object in the row is not defined during row creation time the object
        is set to the default value by the SNMP Agent.

        Rows are deleted by the SNMP Manager via the mefServiceBwpCfgRowStatus
        object or by the SNMP Agent when the corresponding row in the
        mefServiceBwpGrpCfgTable is deleted. Corresponding rows in the
        mefServicePerformanceTable are deleted by the SNMP Agent.

        If resources in the ME-NE are not available to create a new bandwidth
        profile or to enable a Performance Data Set an error is returned when
        the row is created.

        A bandwidth profile can be associated to a CoS Identifier via the
        mefServiceBwpCfgCosIndex. The value set to the
        mefServiceBwpCfgCosIndex object is the value of the associated
        CoS Identifier indicated by the mefServiceCosCfgIndex object.

        Rows in this table are accessed by the SNMP Manager via the bandwidth
        profile group object mefServiceBwpGrpCfgIndex and the individual
        bandwidth profile in the group by the mefServiceBwpCfgIndex.

        Rows in this table and the values of the objects in the row are
        persistent (non-volatile) upon reboot.
        "
 ::= { mefServiceBwpAttributes 3 }

mefServiceBwpCfgEntry OBJECT-TYPE
    SYNTAX      MefServiceBwpCfgEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Bandwidth profile settings table entry."
    INDEX { mefServiceBwpGrpCfgIndex, mefServiceBwpCfgIndex }
 ::= { mefServiceBwpCfgTable 1 }

MefServiceBwpCfgEntry ::= SEQUENCE {
    mefServiceBwpCfgIndex      Unsigned32,
    mefServiceBwpCfgIdentifier DisplayString,
    mefServiceBwpCfgCir        Unsigned32,
    mefServiceBwpCfgCbs        Unsigned32,
    mefServiceBwpCfgEir        Unsigned32,
    mefServiceBwpCfgEbs        Unsigned32,

```

```

mefServiceBwpCfgCm          INTEGER,
mefServiceBwpCfgCf          INTEGER,
mefServiceBwpCfgCosIndex    Unsigned32,
mefServiceBwpCfgPerformanceEnable INTEGER,
mefServiceBwpCfgRowStatus    RowStatus
}

mefServiceBwpCfgIndex OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "This object indicates the bandwidth profile index number. Multiple
    bandwidth profiles can be set for the same bandwidth profile group,
    allowing for unique bandwidth profiles for each CoS Identifier.
    "
 ::= { mefServiceBwpCfgEntry 1 }

mefServiceBwpCfgIdentifier OBJECT-TYPE
SYNTAX      DisplayString
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object indicates the bandwidth profile identifier for the
    associated bandwidth profile index and is an arbitrary
    text string that is used to identify a bandwidth profile. Unique
    string values are chosen to uniquely identify the bandwidth
    profile.

    Octet values of 0x00 through 0x1f are illegal.

    MEF 26.1 restricts the maximum size identifiers to 45 octets.
    "
REFERENCE
    "[MEF 6.1] 6.0, 6.1, 6.2, 6.3; [MEF 7.2] 6.2.1.2, 6.2.1.3"
DEFVAL { "" }
 ::= { mefServiceBwpCfgEntry 2 }

mefServiceBwpCfgCir OBJECT-TYPE
SYNTAX      Unsigned32 (0..10000000)
UNITS       "kbits/s"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object indicates the Committed Information Rate (CIR) in kbits/s
    and defines the average rate in kbits/sec up to which
    the network delivers Service Frames. Service Frames that meet
    the CIR are said to be in profile or in conformance to performance
    objectives. These frames are generally identified as 'Green'
    Service Frames.
    "
REFERENCE
    "[MEF 6.1] 6.0, 6.1, 6.2, 6.3; [MEF 7.2] 6.2.1.2, 6.2.1.3"
DEFVAL { 1000000 }
 ::= { mefServiceBwpCfgEntry 3 }

mefServiceBwpCfgCbs OBJECT-TYPE
SYNTAX      Unsigned32 (0..10000000)
UNITS       "bytes"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object indicates the Committed Burst Size (CBS) in bytes. It limits
    the maximum number of bytes available for a burst of Service Frames sent

```

```

        at interface speed to remain CIR-conformant.
    "
REFERENCE
    "[MEF 10.2]"
DEFVAL { 12 }
::= { mefServiceBwpCfgEntry 4 }

mefServiceBwpCfgEir OBJECT-TYPE
SYNTAX      Unsigned32 (0..10000000)
UNITS       "kbits/s"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object indicates the Excess Information Rate (EIR) in kbits/s
    and defines the average rate in kbits/sec of Service Frames up to
    which the network may deliver Service Frames but without performance
    objectives. Service Frames that meet the EIR as set to be in out-of-
    profile or not in conformance to performance objectives. These
    frames are not guaranteed to be delivered and are generally identified
    as 'Yellow' service frames.
    "
REFERENCE
    "[MEF 6.1] 6.0, 6.1, 6.2, 6.3; [MEF 7.2] 6.2.1.2, 6.2.1.3"
DEFVAL { 0 }
::= { mefServiceBwpCfgEntry 5 }

mefServiceBwpCfgEbs OBJECT-TYPE
SYNTAX      Unsigned32 (0..10000000)
UNITS       "bytes"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object indicates the Excess Burst Size (EBS) in bytes. It limits
    the maximum number of bytes available for a burst of Service Frames
    sent at the interface speed to remain EIR-conformant.
    "
REFERENCE
    "[MEF 6.1] 6.0, 6.1, 6.2, 6.3; [MEF 7.2] 6.2.1.2, 6.2.1.3"
DEFVAL { 0 }
::= { mefServiceBwpCfgEntry 6 }

mefServiceBwpCfgCm OBJECT-TYPE
SYNTAX      INTEGER {
        colorBlind      (1),
        colorAware      (2)
    }
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object configures the bandwidth profile color mode.

    colorBlind(1)    A bandwidth profile property where ingress
                    Service Frames are not pre-colored for either
                    green or yellow, and if present, is ignored when
                    determining the level of compliance for each
                    Service Frame
    colorAware(2)    A bandwidth profile property were a pre-determined
                    level of Bandwidth Profile compliance for each
                    Service Frame is taken into account when determining
                    the level of compliance for each Service Frame.
                    Each service frame can be colored red (discarded),
                    yellow (conditional delivery), or green (unconditional
                    delivery.
    "

```



```

REFERENCE
  "[MEF 6.1] 6.0, 6.1, 6.2, 6.3; [MEF 7.2] 6.2.1.2, 6.2.1.3"
DEFVAL { colorBlind }
::= { mefServiceBwpCfgEntry 7 }

mefServiceBwpCfgCf OBJECT-TYPE
SYNTAX      INTEGER {
    couplingYellowEirOnly      (0),
    couplingYellowEirPlusCir   (1)
}
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
  "This object configures the bandwidth profile coupling flag and has
  the effect of controlling the volume of the Service Frames that are
  declared Yellow.

  couplingYellowEirOnly(0)      The long term average bit rate of Service
                                Frames that are declared Yellow is bounded
                                by EIR.
  couplingYellowEirPlusCir(1)   The long term average bit rate of Service
                                Frames that are declared Yellow is bounded
                                by CIR + EIR depending on the volume of
                                the offered Service Frames that are
                                declared Green.
  "
REFERENCE
  "[MEF 6.1] 6.0, 6.1, 6.2, 6.3; [MEF 7.2] 6.2.1.2, 6.2.1.3"
DEFVAL { couplingYellowEirOnly }
::= { mefServiceBwpCfgEntry 8 }

mefServiceBwpCfgCosIndex OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
  "This object is the index number of the CoS ID profile
  associated with the current bandwidth profile. A value of 0 indicates
  that no CoS ID profile is associated with the bandwidth profile and the
  bandwidth profile applies to all CoS IDs.

  This index indicates a specific CoS ID profile previously configured via
  mefServiceCosCfgTable as indicated by the mefServiceCosCfgIndex object.
  "
REFERENCE
  "[MEF 6.1] 6.1; [MEF 7.2] 6.2.1.3"
DEFVAL { 0 }
::= { mefServiceBwpCfgEntry 9 }

mefServiceBwpCfgPerformanceEnable OBJECT-TYPE
SYNTAX      INTEGER {
    disablePerformanceDataSet (1),
    enablePerformanceDataSet  (2)
}
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
  "This object indicates whether a performance data set is configured
  for a specific bandwidth profile. This allows for only specific
  bandwidth profiles to be monitored if there are limitations in the
  ME-NE being accessed.

  disablePerformanceDataSet(1) A performance data set is enabled for this
                                bandwidth profile

```

```

        enablePerformanceDataSet(2)  A performance data set is not enabled for
                                     this bandwidth profile.
    "
REFERENCE
    "[MEF 6.1] 6.1; [MEF 7.2] 6.2.1.3"
DEFVAL { disablePerformanceDataSet }
::= { mefServiceBwpCfgEntry 10 }

mefServiceBwpCfgRowStatus OBJECT-TYPE
SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "The status of the row.

    The writable columns in a row cannot be changed if the row
    is active. All columns must have a valid value before a row
    can be activated.
    "
::= { mefServiceBwpCfgEntry 11 }

-- *****
-- Ethernet Service Class of Service Identifier Profile Table
-- *****

mefServiceCosNextIndex OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This object contains an unused value for a Class of Service Identifier
    (CoS ID) profile on a MEF compliant NE, or a zero to indicate that none
    exist. This value needs to be read by the SNMP Manager in order to find
    an available index for row-creation of a CoS ID profile and then used
    when a row is created. This value is automatically updated by the SNMP
    Agent after the row is created.

    Referential integrity is necessary, i.e., the index needs to be
    persistent upon a reboot or restart of a NE. The index
    is never to be reused for a new CoS ID profile on the same MEF compliant
    NE until it wraps to zero. The index value keeps
    increasing up to that time. This is to facilitate access control based
    on a fixed index for an EMS, since the index is not reused.
    "
REFERENCE
    "[MEF 6.1] 6.0, 6.1, 6.2, 6.3; [MEF 7.2] 6.2.1.2, 6.2.1.3"
DEFVAL { 1 }
::= { mefServiceCosAttributes 1 }

mefServiceCosCfgTable OBJECT-TYPE
SYNTAX      SEQUENCE OF MefServiceCosCfgEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "This table supports Class of Service Identifier profile settings.

    Rows in this table are created by the SNMP Manager by first reading
    the mefServiceCosNextIndex object to find an available Cos
    profile number and using this value when the row is created. If
    an object in the row is not defined during row creation time the object
    is set to the default value by the SNMP Agent.

    Rows are deleted by the SNMP Manager via the mefServiceCosCfgRowStatus

```

object.

If resources in the ME-NE are not available to create a new CoS profile an error is returned when the row is created.

Rows in this table are accessed by the SNMP Manager via the CoS profile object `mefServiceCosCfgIndex`.

Rows in this table and the values of the objects in the row are persistent (non-volatile) upon reboot.

```

"
 ::= { mefServiceCosAttributes 2 }

mefServiceCosCfgEntry OBJECT-TYPE
    SYNTAX      MefServiceCosCfgEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Class of Service Identifier settings table entry."
    INDEX { mefServiceCosCfgIndex }
    ::= { mefServiceCosCfgTable 1 }

MefServiceCosCfgEntry ::= SEQUENCE {
    mefServiceCosCfgIndex      Unsigned32,
    mefServiceCosCfgIdentifier DisplayString,
    mefServiceCosCfgType       INTEGER,
    mefServiceCosCfgIdentifierList MefServiceListType,
    mefServiceCosCfgMacAddress MacAddress,
    mefServiceCosCfgProtocol    Unsigned32,
    mefServiceCosCfgSubType     Unsigned32,
    mefServiceCosCfgRowStatus   RowStatus
}

mefServiceCosCfgIndex OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Class of Service Identifier profile index number."
    ::= { mefServiceCosCfgEntry 1 }

mefServiceCosCfgIdentifier OBJECT-TYPE
    SYNTAX      DisplayString
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object indicates the Class of Service Name for the
         associated CoS profile index and is an arbitrary text string that is
         used to identify a CoS ID profile. Unique string values are chosen to
         uniquely identify the profile.

         Octet values of 0x00 through 0x1f are illegal.

         MEF 26.1 restricts the maximum size identifiers to 45 octets."
    REFERENCE
        "[MEF 6.1] 6.0, 6.1, 6.2, 6.3; [MEF 7.2] 6.2.1.2, 6.2.1.3"
    DEFVAL { "" }
    ::= { mefServiceCosCfgEntry 2 }

mefServiceCosCfgType OBJECT-TYPE
    SYNTAX      INTEGER {
        interface (1),
        evc       (2),
    }

```

```

        pcp          (3),
        dscp         (4),
        l2cp         (5)
    }
MAX-ACCESS    read-create
STATUS        current
DESCRIPTION
    "This object configures the CoS ID type and indicates the interpretation
    of the mefServiceCosIdentifierList object.

    interface(1) This value indicates that the CoS ID profile is associated
    with the interface, i.e. UNI or ENNI
    vc(2)         This value indicates that the CoS ID profile is associated
    with the virtual channel, i.e. EVC or OVC
    pcp(3)        This value indicates that the CoS ID profile is associated
    with the outer tag's Priority Code Point (priority bits)
    dscp(4)       This value indicates that the CoS ID profile is associated
    the IP's frames DSCP (priority) setting
    l2cp(5)       This value indicates that the CoS ID profile is associated
    a Layer 2 Control Protocol
    "
REFERENCE
    "[MEF 6.1] 6.0, 6.1, 6.2, 6.3; [MEF 7.2] 6.2.1.2, 6.2.1.3"
DEFVAL { pcp }
::= { mefServiceCosCfgEntry 3 }

mefServiceCosCfgIdentifierList OBJECT-TYPE
SYNTAX        MefServiceListType
MAX-ACCESS    read-write
STATUS        current
DESCRIPTION
    "This object indicates the list of CoS identifiers associated with
    the specific CoS ID profile. Interpretation of the values in the list
    are based upon the mefServiceCosCfgType object.

    For each of the mefServiceCosCfgType types valid range is:

    interface - the value of this object is ignored for the 'interface'
    type
    vc         - the value of this object is ignored for the 'vc' type
    pcp        - the value of this object has a range of '0:7'
    dscp       - the value of this object has a range of '0:63' for IPv4
    and '0:16384' for IPv6
    l2cp       - the value of this object indicates the matching criteria:
    '1' - destination MAC address only
    '2' - destination MAC address plus Ethernet protocol
    '3' - destination MAC address plus Ethernet protocol
    plus subtype

    CoS identifier list can be a single value or multiple values separated
    by a delimiter.

    Some valid values are: '1', '1:3', '1,3,5', '0:7'. In the first example
    only one item, '1', is included in the CoS ID list. In the second example
    values 1, 2, and 3 are included in the CoS ID list (range of values). In
    the third example three individual values are included. In the fourth
    example eight values are included: 0 through 7 (range of values).
    "
REFERENCE
    "[MEF 6.1] 6.0, 6.1, 6.2, 6.3; [MEF 7.2] 6.2.1.2, 6.2.1.3"
DEFVAL { "0:7" }
::= { mefServiceCosCfgEntry 4 }

mefServiceCosCfgMacAddress OBJECT-TYPE

```

```

SYNTAX      MacAddress
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object configures the L2CP Destination MAC address for CoS
    Identifier type of 'l2cp' and is ignored for other types.

    Valid values are 01-80-C2-00-00-00 through 01-80-C2-00-00-0F and
    01-80-C2-00-00-20 through 01-80-C2-00-00-2F
    "
DEFVAL { '000000000000'H }
 ::= { mefServiceCosCfgEntry 5 }

mefServiceCosCfgProtocol OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object configures the L2CP Ethernet protocol for CoS Identifier
    type of 'l2cp' and is ignored for other types. It is also ignored if
    mefServiceCosCfgIdentifierList has a value of '1'.

    The protocol is defined in the Ethertype field of the Ethertype
    frame. For instance the Ethertype for Link OAM is 0x8809, for
    E-LMI it is 0x88EE, for LLDP it is 0x88CC.

    Valid protocol values are defined by MEF 6.1 and MEF 6.1.1.
    "
REFERENCE
    "[MEF 6.1] 6.0, 8.0; [MEF 6.1.1] 8.0; [MEF 7.2] 6.2.1.2"
DEFVAL { 0 }
 ::= { mefServiceCosCfgEntry 6 }

mefServiceCosCfgSubType OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object configures the L2CP subtype protocol for CoS Identifier
    type of 'l2cp' and is ignored for other types. It is also ignored if
    mefServiceCosCfgIdentifierList has a value of '1' or '2'.

    For instance, the subtype for LACP is '2' and Link OAM is '3'.

    Valid subtype values are defined by MEF 6.1 and MEF 6.1.1.
    "
REFERENCE
    "[MEF 6.1] 6.0, 8.0; [MEF 6.1.1] 8.0; [MEF 7.2] 6.2.1.2"
DEFVAL { 0 }
 ::= { mefServiceCosCfgEntry 7 }

mefServiceCosCfgRowStatus OBJECT-TYPE
SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "The status of the row.

    The writable columns in a row cannot be changed if the row
    is active. All columns must have a valid value before a row
    can be activated.
    "
 ::= { mefServiceCosCfgEntry 8 }

```

```

-- *****
-- Ethernet Service L2CP Profile Group Table
-- *****

mefServiceL2cpGrpNextIndex OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object contains an unused value for a L2CP profile group on a
        MEF compliant NE, or a zero to indicate that none exist. This value
        needs to be read by the SNMP Manager in order to find an available
        index for row-creation of a L2CP profile group and then used when
        a row is created. This value is automatically updated by the SNMP Agent
        after the row is created.

        Referential integrity is necessary, i.e., the index needs to be
        persistent upon a reboot or restart of a NE. The index
        is never to be reused for a new L2CP profile group on the same MEF
        compliant NE until it wraps to zero. The index value keeps
        increasing up to that time. This is to facilitate access control based
        on a fixed index for an EMS, since the index is not reused.
        "
    REFERENCE
        "[MEF 6.1], [MEF 6.1.1] 8.0, [MEF 7.2], [MEF 10.2]"
    DEFVAL { 1 }
    ::= { mefServiceL2cpAttributes 1 }

mefServiceL2cpGrpCfgTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF MefServiceL2cpGrpCfgEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table supports a group of L2CP settings for an interface via the
        mefServiceInterfaceCfgL2cpGrpIndex object or for a service via the
        mefServiceEvcCfgL2cpGrpIndex object.

        Rows in this table are created by the SNMP Manager by first reading
        the mefServiceL2cpGrpNextIndex object to find an available L2CP
        profile group number and using this value when the row is created.
        If an object in the row is not defined during row creation time the
        object is set to the default value by the SNMP Agent.

        Rows are deleted by the SNMP Manager via the
        mefServiceL2cpGrpCfgRowStatus object and corresponding rows in the
        mefServiceL2cpCfgTable are deleted by the SNMP Agent.

        Once a row in this table is created, an entry can be created in the
        mefServiceL2cpCfgTable using the index from this table and the
        value of mefServiceL2cpCfgNextIndex object. A row in the
        mefServiceL2cpCfgTable indicates how a specific L2CP will be
        handled.

        Rows in this table are accessed by the L2CP group number object
        mefServiceL2cpGrpCfgIndex.

        Rows in this table and the values of the objects in the row are
        persistent (non-volatile) upon reboot.
        "
    REFERENCE
        "[MEF 6.1], [MEF 6.1.1] 8.0, [MEF 7.2], [MEF 10.2]"
    ::= { mefServiceL2cpAttributes 2 }

```

```

mefServiceL2cpGrpCfgEntry OBJECT-TYPE
    SYNTAX      MefServiceL2cpGrpCfgEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "L2CP profile group settings table entry on an interface."
    INDEX { mefServiceL2cpGrpCfgIndex }
    ::= { mefServiceL2cpGrpCfgTable 1 }

MefServiceL2cpGrpCfgEntry ::= SEQUENCE {
    mefServiceL2cpGrpCfgIndex      Unsigned32,
    mefServiceL2cpCfgNextIndex    Unsigned32,
    mefServiceL2cpGrpCfgRowStatus RowStatus
}

mefServiceL2cpGrpCfgIndex OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "L2CP profile group index number, indicating the specific L2CP profile
        group
        "
    ::= { mefServiceL2cpGrpCfgEntry 1 }

mefServiceL2cpCfgNextIndex OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object indicates the value to be used as the index of the L2CP
        table entries. This value is automatically incremented when a row
        is created in the L2CP table by the SNMP Agent. When the SNMP
        Manager wants to create a new row in the L2CP table the value
        of this object is used to create the specific item row.

        A group of L2CP protocols is indicated by the use of the
        mefServiceL2cpCfgTable, which allows more than one
        Layer 2 Protocol to be associated within a L2CP profile group.
        "
    DEFVAL { 1 }
    ::= { mefServiceL2cpGrpCfgEntry 2 }

mefServiceL2cpGrpCfgRowStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The status of the row.

        The writable columns in a row cannot be changed if the row
        is active. All columns must have a valid value before a row
        can be activated.
        "
    ::= { mefServiceL2cpGrpCfgEntry 3 }

-- *****
-- Ethernet Service L2CP Profile Table
-- *****

mefServiceL2cpCfgTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF MefServiceL2cpCfgEntry
    MAX-ACCESS  not-accessible

```

```

STATUS      current
DESCRIPTION
  "This table supports L2CP profile settings. Each row in the table
  indicates a specific L2CP and its processing type. Once a row is
  created in the mefServiceL2cpGrpCfgTable one or more rows can be
  created in the mefServiceL2cpCfgTable table to indicate a group
  of Layer 2 Control Protocols that are handled as one L2CP profile
  group.

  Rows in this table are created by the SNMP Manager by first reading
  the mefServiceL2cpCfgNextIndex object to find an available L2CP
  profile number and using this value when the row is created. If
  an object in the row is not defined during row creation time the object
  is set to the default value by the SNMP Agent.

  Rows are deleted by the SNMP Manager via the
  mefServiceL2cpGrpCfgRowStatus object or by the SNMP Agent when
  the corresponding row is deleted in the mefServiceL2cpGrpCfgTable.

  Rows in this table are accessed by the L2CP group number object
  mefServiceL2cpGrpCfgIndex and the individual L2CP profile in the
  group via the mefServiceL2cpCfgIndex object.

  Rows in this table and the values of the objects in the row are
  persistent (non-volatile) upon reboot.
  "
REFERENCE
  "[MEF 6.1], [MEF 7.2], [MEF 10.2]"
  ::= { mefServiceL2cpAttributes 3 }

mefServiceL2cpCfgEntry OBJECT-TYPE
SYNTAX      MefServiceL2cpCfgEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
  "L2CP settings table entry on an interface or a service."
INDEX { mefServiceL2cpGrpCfgIndex, mefServiceL2cpCfgIndex }
  ::= { mefServiceL2cpCfgTable 1 }

MefServiceL2cpCfgEntry ::= SEQUENCE {
    mefServiceL2cpCfgIndex      Unsigned32,
    mefServiceL2cpCfgType       INTEGER,
    mefServiceL2cpCfgMatchScope INTEGER,
    mefServiceL2cpCfgMacAddress MacAddress,
    mefServiceL2cpCfgProtocol   Unsigned32,
    mefServiceL2cpCfgSubType     Unsigned32,
    mefServiceL2cpCfgRowStatus  RowStatus
}

mefServiceL2cpCfgIndex OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
  "This object configures the L2CP index number on an interface or a
  Service and is used to create/access a L2CP profile within a L2CP
  group.
  "
  ::= { mefServiceL2cpCfgEntry 1 }

mefServiceL2cpCfgType OBJECT-TYPE
SYNTAX      INTEGER {
    discard (1),
    tunnel (2),

```



```

        peer      (3),
        passToEvc (4)
    }
    MAX-ACCESS read-create
    STATUS current
    DESCRIPTION
        "This object configures the L2CP processing type setting.

        discard(1)    the indicated L2CP is discarded
        tunnel(2)     the indicated L2CP is tunneled (passed)
        peer(3)       the indicated L2CP is peered with the NE
        passToEvc(4)  the indicated L2CP is passed to the EVC for
                    EVC processing of the L2CP. Final L2CP
                    disposition is based the L2CP profile for
                    the EVC to be tunneled, discarded, or peered.
                    This value is not valid for EVC based
                    L2CP.

        "
    REFERENCE
        "[MEF 6.1] 6.0, 8.0; [MEF 6.1.1] 8.0; [MEF 7.2] 6.2.1.2"
    DEFVAL { tunnel }
    ::= { mefServiceL2cpCfgEntry 2 }

mefServiceL2cpCfgMatchScope OBJECT-TYPE
    SYNTAX INTEGER {
        destinationAddressOnly (1),
        daPlusProtocol (2),
        daPlusProtocolPlusSubtype (3)
    }
    MAX-ACCESS read-create
    STATUS current
    DESCRIPTION
        "This object configures the L2CP selection matching scope.

        destinationAddressOnly(1)    L2CP selection is determined by
                                    MAC Destination Address only
        daPlusProtocol(2)             L2CP selection is determined by
                                    MAC Destination Address plus
                                    Ethernet protocol
        daPlusProtocolPlusSubtype(3)  L2CP selection is determined by
                                    MAC Destination Address plus
                                    Ethernet protocol plus subtype

        "
    REFERENCE
        "[MEF 6.1] 6.0, 8.0; [MEF 6.1.1] 8.0; [MEF 7.2] 6.2.1.2"
    DEFVAL { destinationAddressOnly }
    ::= { mefServiceL2cpCfgEntry 3 }

mefServiceL2cpCfgMacAddress OBJECT-TYPE
    SYNTAX MacAddress
    MAX-ACCESS read-create
    STATUS current
    DESCRIPTION
        "This object configures the L2CP Destination MAC address.

        Valid values are 01-80-C2-00-00-00 through 01-80-C2-00-00-0F and
        01-80-C2-00-00-20 through 01-80-C2-00-00-2F

        "
    DEFVAL { '0180C2000000'H }
    ::= { mefServiceL2cpCfgEntry 4 }

mefServiceL2cpCfgProtocol OBJECT-TYPE
    SYNTAX Unsigned32
    MAX-ACCESS read-create

```

```

STATUS      current
DESCRIPTION
    "This object configures the L2CP Ethernet protocol. The protocol is
    defined in the Ethertype field of the Ethertype frame. For instance the
    Ethertype for Link OAM is 0x8809, for E-LMI it is 0x88EE, for
    LLDP it is 0x88CC.

    Valid protocol values are defined by MEF 6.1 and MEF 6.1.1.
    "
REFERENCE
    "[MEF 6.1] 6.0, 8.0; [MEF 6.1.1] 8.0; [MEF 7.2] 6.2.1.2"
DEFVAL { 0 }
::= { mefServiceL2cpCfgEntry 5 }

mefServiceL2cpCfgSubType OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object configures L2CP subtype for the protocol selected. For
    instance, the subtype for LACP is '2' and Link OAM is '3'.

    Valid subtype values are defined by MEF 6.1 and MEF 6.1.1.
    "
REFERENCE
    "[MEF 6.1] 6.0, 8.0; [MEF 6.1.1] 8.0; [MEF 7.2] 6.2.1.2"
DEFVAL { 0 }
::= { mefServiceL2cpCfgEntry 6 }

mefServiceL2cpCfgRowStatus OBJECT-TYPE
SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "The status of the row.

    The writable columns in a row cannot be changed if the row
    is active. All columns must have a valid value before a row
    can be activated.
    "
::= { mefServiceL2cpCfgEntry 7 }

-- *****
-- Ethernet Service Traffic Performance Data Set Table
-- *****

mefServicePerformanceTable OBJECT-TYPE
SYNTAX      SEQUENCE OF MefServicePerformanceEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "This table supports Traffic Performance Data Set profile settings on
    a Bandwidth Profile.

    A row in this table is automatically created when a row in the
    mefServiceBwpCfgTable is created. This table contains the same rows as
    the mefServiceBwpCfgTable.

    A row in this table is deleted when a row in the mefServiceBwpCfgTable
    is deleted. Counters in the table are only enabled when the associated
    object, mefServiceBwpCfgPerformanceEnable, is enabled.

    Rows in this table are accessed via the bandwidth profile group

```

object mefServiceBwpGrpCfgIndex and the individual bandwidth profile in the group by the mefServiceBwpCfgIndex object. A SNMP Manager can access objects in each of the rows in the table.

Rows in this table are persistent (non-volatile) upon reboot, but the values of the objects in a row are not persistent.

"

```
::= { mefServiceBwpAttributes 4 }
```

```
mefServicePerformanceEntry OBJECT-TYPE
```

```
SYNTAX      MefServicePerformanceEntry
```

```
MAX-ACCESS  not-accessible
```

```
STATUS      current
```

```
DESCRIPTION
```

```
"Traffic Performance Data Set profile settings table entry."
```

```
INDEX { mefServiceBwpGrpCfgIndex, mefServiceBwpCfgIndex }
```

```
::= { mefServicePerformanceTable 1 }
```

```
MefServicePerformanceEntry ::= SEQUENCE {
```

```
    mefServicePerformanceIngressGreenFrameCount      Counter64,
```

```
    mefServicePerformanceIngressYellowFrameCount     Counter64,
```

```
    mefServicePerformanceIngressRedFrameCount        Counter64,
```

```
    mefServicePerformanceIngressGreenOctets          Counter64,
```

```
    mefServicePerformanceIngressYellowOctets         Counter64,
```

```
    mefServicePerformanceIngressRedOctets            Counter64,
```

```
    mefServicePerformanceIngressGreenFrameDiscards   Counter64,
```

```
    mefServicePerformanceIngressYellowFrameDiscards Counter64,
```

```
    mefServicePerformanceIngressGreenOctetsDiscards  Counter64,
```

```
    mefServicePerformanceIngressYellowOctetsDiscards Counter64,
```

```
    mefServicePerformanceEgressGreenFrameCount      Counter64,
```

```
    mefServicePerformanceEgressYellowFrameCount     Counter64,
```

```
    mefServicePerformanceEgressGreenOctets          Counter64,
```

```
    mefServicePerformanceEgressYellowOctets         Counter64
```

```
}
```

```
mefServicePerformanceIngressGreenFrameCount OBJECT-TYPE
```

```
SYNTAX      Counter64
```

```
UNITS       "Ethernet frames"
```

```
MAX-ACCESS  read-only
```

```
STATUS      current
```

```
DESCRIPTION
```

```
"This object indicates the number of green frames that were received on a ME-NE for the associated bandwidth profile.
```

```
ME-NEs that do not support 64 bit counters can return the upper half of the counter as all zeros.
```

```
This object defaults to '0'.
```

"

```
REFERENCE
```

```
"[MEF 15] 8.2; [Q.840.1] 6.2.4"
```

```
::= { mefServicePerformanceEntry 1 }
```

```
mefServicePerformanceIngressYellowFrameCount OBJECT-TYPE
```

```
SYNTAX      Counter64
```

```
UNITS       "Ethernet frames"
```

```
MAX-ACCESS  read-only
```

```
STATUS      current
```

```
DESCRIPTION
```

```
"This object indicates the number of yellow frames that were received on the ME-NE for the associated bandwidth profile.
```

ME-NEs that do not support 64 bit counters can return the upper half of the counter as all zeros.

This object defaults to '0'.

"

REFERENCE

"[MEF 15] 8.2; [Q.840.1] 6.2.4"

::= { mefServicePerformanceEntry 2 }

mefServicePerformanceIngressRedFrameCount OBJECT-TYPE

SYNTAX Counter64

UNITS "Ethernet frames"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object indicates the number of red frames that were received on the ME-NE for the associated bandwidth profile.

ME-NEs that do not support 64 bit counters can return the upper half of the counter as all zeros.

This object defaults to '0'.

"

REFERENCE

"[MEF 15] 8.2; [Q.840.1] 6.2.4"

::= { mefServicePerformanceEntry 3 }

mefServicePerformanceIngressGreenOctets OBJECT-TYPE

SYNTAX Counter64

UNITS "octets"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object indicates the number of valid green octets that were received on the ME-NE for the associated bandwidth profile.

This object defaults to '0'.

"

REFERENCE

"[MEF 15] 8.2; [Q.840.1] 6.2.4"

::= { mefServicePerformanceEntry 4 }

mefServicePerformanceIngressYellowOctets OBJECT-TYPE

SYNTAX Counter64

UNITS "octets"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object indicates the number of valid yellow octets that were received on the ME-NE for the associated bandwidth profile.

This object defaults to '0'.

"

REFERENCE

"[MEF 15] 8.2; [Q.840.1] 6.2.4"

::= { mefServicePerformanceEntry 5 }

mefServicePerformanceIngressRedOctets OBJECT-TYPE

SYNTAX Counter64

UNITS "octets"

MAX-ACCESS read-only

STATUS current

DESCRIPTION
 "This object indicates the number of valid red octets that were received on the ME-NE for the associated bandwidth profile.

This object defaults to '0'.

"

REFERENCE
 "[MEF 15] 8.2; [Q.840.1] 6.2.4"
 ::= { mefServicePerformanceEntry 6 }

mefServicePerformanceIngressGreenFrameDiscards OBJECT-TYPE

SYNTAX Counter64
 UNITS "Ethernet frames"
 MAX-ACCESS read-only
 STATUS current

DESCRIPTION
 "This object indicates the number of green frames that were discarded due to congestion within the ME-NE for the associated bandwidth profile.

ME-NEs that do not support 64 bit counters can return the upper half of the counter as all zeros.

This object defaults to '0'.

"

REFERENCE
 "[MEF 15] 8.2; [Q.840.1] 6.2.4"
 ::= { mefServicePerformanceEntry 7 }

mefServicePerformanceIngressYellowFrameDiscards OBJECT-TYPE

SYNTAX Counter64
 UNITS "Ethernet frames"
 MAX-ACCESS read-only
 STATUS current

DESCRIPTION
 "This object indicates the number of yellow frames that were discarded due to congestion within the ME-NE for the associated bandwidth profile.

ME-NEs that do not support 64 bit counters can return the upper half of the counter as all zeros.

This object defaults to '0'.

"

REFERENCE
 "[MEF 15] 8.2; [Q.840.1] 6.2.4"
 ::= { mefServicePerformanceEntry 8 }

mefServicePerformanceIngressGreenOctetsDiscards OBJECT-TYPE

SYNTAX Counter64
 UNITS "octets"
 MAX-ACCESS read-only
 STATUS current

DESCRIPTION
 "This object indicates the number of valid green octets that were discarded due to congestion within the ME-NE for the associated bandwidth profile.

This object defaults to '0'.

"

REFERENCE
 "[MEF 15] 8.2; [Q.840.1] 6.2.4"
 ::= { mefServicePerformanceEntry 9 }

```

mefServicePerformanceIngressYellowOctetsDiscards OBJECT-TYPE
    SYNTAX      Counter64
    UNITS       "octets"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object indicates the number of valid yellow octets
        that were discarded due to congestion within the ME-NE for the
        associated bandwidth profile.

        This object defaults to '0'."
    REFERENCE
        "[MEF 15] 8.2; [Q.840.1] 6.2.4"
    ::= { mefServicePerformanceEntry 10 }

mefServicePerformanceEgressGreenFrameCount OBJECT-TYPE
    SYNTAX      Counter64
    UNITS       "Ethernet frames"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object indicates the number of green frames that were
        transmitted on the ME-NE for the associated bandwidth profile.

        ME-NEs that do not support 64 bit counters can return the
        upper half of the counter as all zeros.

        This object defaults to '0'."
    REFERENCE
        "[MEF 15] 8.2; [Q.840.1] 6.2.4"
    ::= { mefServicePerformanceEntry 11 }

mefServicePerformanceEgressYellowFrameCount OBJECT-TYPE
    SYNTAX      Counter64
    UNITS       "Ethernet frames"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object indicates the number of yellow frames that were
        transmitted on the ME-NE for the associated bandwidth profile.

        ME-NEs that do not support 64 bit counters can return the
        upper half of the counter as all zeros.

        This object defaults to '0'."
    REFERENCE
        "[MEF 15] 8.2; [Q.840.1] 6.2.4"
    ::= { mefServicePerformanceEntry 12 }

mefServicePerformanceEgressGreenOctets OBJECT-TYPE
    SYNTAX      Counter64
    UNITS       "octets"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object indicates the number of valid green octets
        that were transmitted on the ME-NE for the associated bandwidth
        profile.

        This object defaults to '0'."

```

```

"
REFERENCE
  "[MEF 15] 8.2; [Q.840.1] 6.2.4"
 ::= { mefServicePerformanceEntry 13 }

mefServicePerformanceEgressYellowOctets OBJECT-TYPE
SYNTAX      Counter64
UNITS       "octets"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "This object indicates the number of valid yellow octets
   that were transmitted on the ME-NE for the associated bandwidth
   profile.

   This object defaults to '0'."
"
REFERENCE
  "[MEF 15] 8.2; [Q.840.1] 6.2.4"
 ::= { mefServicePerformanceEntry 14 }

-- *****
-- Notification Configuration Objects
-- *****

mefServiceNotificationCfgAlarmEnable OBJECT-TYPE
SYNTAX      BITS {
                bServiceConfigurationAlarm(0)
            }
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
  "This object is a vector of bits that indicates whether a specific
   notification is enabled.

   A bit set to '1' enables the specific notification generation.

   A bit set to '0' disables the specific notification.

   If a particular alarm is not supported the BIT value of the enable/disable
   is set to '0'.

   bServiceConfigurationAlarm(0) enables/disables mefServiceConfigurationAlarm

   The value of this object is persistent (non-volatile) upon reboot."
"
DEFVAL { { } }
 ::= { mefServiceNotificationCfg 1 }

-- *****
-- Notification Data Objects
-- *****

mefServiceNotificationObjDateAndTime OBJECT-TYPE
SYNTAX      DateAndTime
MAX-ACCESS  accessible-for-notify
STATUS      current
DESCRIPTION
  "This object contains the time and date at the time that
   the notification event is detected, not the time of the notification
   generation."

```

```

    This object is used only for notifications. The mechanism to set and keep
    current the date and time is not specified.
    "
 ::= { mefServiceNotificationObj 1 }

mefServiceNotificationConfigurationChangeType OBJECT-TYPE
    SYNTAX          INTEGER {
                    entryAdded      (1),
                    entryDeleted    (2),
                    entryModified    (3)
                    }
    MAX-ACCESS      accessible-for-notify
    STATUS          current
    DESCRIPTION
        "The Notification Configuration Change Type of the object that caused the
        generation.

        entryAdded(1)    indicates that the specific object/service was added
        entryDelete(2)   indicates that the specific object/service was deleted
        entryModified(3) indicates that the specific object/service was modified

        This object is only used for the notification.
        "
    REFERENCE
        "[MEF 7.2] 6.2.1.1, 6.2.1.2, 6.2.1.3"
 ::= { mefServiceNotificationObj 2 }

-- *****
-- NOTIFICATIONS (TRAPS)
-- *****

mefServiceConfigurationAlarm NOTIFICATION-TYPE
    OBJECTS          {
                    mefServiceNotificationObjDateAndTime,
                    mefServiceNotificationConfigurationChangeType
                    }
    STATUS          current
    DESCRIPTION
        "An mefServiceConfigurationAlarm notification is sent when the configuration
        of an object or service is added, deleted, or modified.

        The ME-NE that receives the notification can identify
        the system from the network source address of the notification,
        and can identify the configuration change by the indices in the
        standard snmpTrapOID object.
        "
    REFERENCE
        "[MEF 7.2] 6.2.1.1, 6.2.1.2, 6.2.1.3"
 ::= { mefServiceNotifications 1 }

-- *****
-- SERVICE-UNI MIB Module - Conformance Information
-- *****

mefServiceUniEvcMibCompliances OBJECT IDENTIFIER ::= { mefServiceMibConformance 1 }
mefServiceUniEvcMibGroups      OBJECT IDENTIFIER ::= { mefServiceMibConformance 2 }

-- *****
-- SERVICE-UNI MIB Units of conformance
-- *****

```



```

mefServiceInterfaceMandatoryGroup OBJECT-GROUP
  OBJECTS {
    mefServiceInterfaceCfgType,
    mefServiceInterfaceCfgIdentifier,
    mefServiceInterfaceCfgFrameFormat,
    mefServiceInterfaceCfgIngressBwpGrpIndex,
    mefServiceInterfaceCfgEgressBwpGrpIndex,
    mefServiceInterfaceCfgL2cpGrpIndex,
    mefServiceInterfaceStatusType,
    mefServiceInterfaceStatusMaxVc,
    mefServiceInterfaceStatusMaxEndPointPerVc,
    mefServiceInterfaceStatisticsIngressUndersized,
    mefServiceInterfaceStatisticsIngressOversized,
    mefServiceInterfaceStatisticsIngressFragments,
    mefServiceInterfaceStatisticsIngressCrcAlignment,
    mefServiceInterfaceStatisticsIngressInvalidVid,
    mefServiceInterfaceStatisticsIngressOctets,
    mefServiceInterfaceStatisticsIngressUnicast,
    mefServiceInterfaceStatisticsIngressMulticast,
    mefServiceInterfaceStatisticsIngressBroadcast,
    mefServiceInterfaceStatisticsEgressOctets,
    mefServiceInterfaceStatisticsEgressUnicast,
    mefServiceInterfaceStatisticsEgressMulticast,
    mefServiceInterfaceStatisticsEgressBroadcast
  }
  STATUS      current
  DESCRIPTION
    "Mandatory objects for the Interface group."
  ::= { mefServiceUniEvcMibGroups 1 }

mefServiceUniMandatoryGroup OBJECT-GROUP
  OBJECTS {
    mefServiceUniCfgIdentifier,
    mefServiceUniCfgBundlingMultiplex,
    mefServiceUniCfgCeVidUntagged,
    mefServiceUniCfgCePriorityUntagged,
    mefServiceEvcPerUniCfgServiceType,
    mefServiceEvcPerUniCfgIdentifier,
    mefServiceEvcPerUniCfgCeVlanMap,
    mefServiceEvcPerUniCfgIngressBwpGrpIndex,
    mefServiceEvcPerUniCfgEgressBwpGrpIndex
  }
  STATUS      current
  DESCRIPTION
    "Mandatory objects for the UNI Attributes group."
  ::= { mefServiceUniEvcMibGroups 2 }

mefServiceEvcMandatoryGroup OBJECT-GROUP
  OBJECTS {
    mefServiceEvcNextIndex,
    mefServiceEvcCfgIdentifier,
    mefServiceEvcCfgServiceType,
    mefServiceEvcCfgMtuSize,
    mefServiceEvcCfgCevlanIdPreservation,
    mefServiceEvcCfgCevlanCosPreservation,
    mefServiceEvcCfgL2cpGrpIndex,
    mefServiceEvcCfgAdminState,
    mefServiceEvcCfgRowStatus,
    mefServiceEvcUniCfgType,
    mefServiceEvcUniCfgRowStatus,
    mefServiceEvcStatusMaxMtuSize,
    mefServiceEvcStatusMaxNumUni,
  }

```

```

    mefServiceEvcStatusOperationalState
  }
  STATUS      current
  DESCRIPTION
    "Mandatory objects for the EVC Attributes group."
  ::= { mefServiceUniEvcMibGroups 3 }

mefServiceEvcOptionalGroup OBJECT-GROUP
  OBJECTS {
    mefServiceEvcCfgUnicastDelivery,
    mefServiceEvcCfgMulticastDelivery,
    mefServiceEvcCfgBroadcastDelivery
  }
  STATUS      current
  DESCRIPTION
    "Optional objects for the EVC Attributes group."
  ::= { mefServiceUniEvcMibGroups 4 }

mefServiceBwpMandatoryGroup OBJECT-GROUP
  OBJECTS {
    mefServiceBwpGrpNextIndex,
    mefServiceBwpCfgNextIndex,
    mefServiceBwpGrpCfgRowStatus,
    mefServiceBwpCfgIdentifier,
    mefServiceBwpCfgCir,
    mefServiceBwpCfgCbs,
    mefServiceBwpCfgEir,
    mefServiceBwpCfgEbs,
    mefServiceBwpCfgCm,
    mefServiceBwpCfgCf,
    mefServiceBwpCfgCosIndex,
    mefServiceBwpCfgPerformanceEnable,
    mefServiceBwpCfgRowStatus
  }
  STATUS      current
  DESCRIPTION
    "Mandatory objects for the Bandwidth Profile Attributes group."
  ::= { mefServiceUniEvcMibGroups 5 }

mefServiceCosMandatoryGroup OBJECT-GROUP
  OBJECTS {
    mefServiceCosNextIndex,
    mefServiceCosCfgIdentifier,
    mefServiceCosCfgType,
    mefServiceCosCfgIdentifierList,
    mefServiceCosCfgMacAddress,
    mefServiceCosCfgProtocol,
    mefServiceCosCfgSubType,
    mefServiceCosCfgRowStatus
  }
  STATUS      current
  DESCRIPTION
    "Mandatory objects for the Class of Service Attributes group."
  ::= { mefServiceUniEvcMibGroups 6 }

mefServiceL2cpMandatoryGroup OBJECT-GROUP
  OBJECTS {
    mefServiceL2cpGrpNextIndex,
    mefServiceL2cpCfgNextIndex,
    mefServiceL2cpGrpCfgRowStatus,

```

```

    mefServiceL2cpCfgType,
    mefServiceL2cpCfgMatchScope,
    mefServiceL2cpCfgMacAddress,
    mefServiceL2cpCfgProtocol,
    mefServiceL2cpCfgSubType,
    mefServiceL2cpCfgRowStatus
}
STATUS      current
DESCRIPTION
    "Mandatory objects for the L2CP Attributes group."
::= { mefServiceUniEvcMibGroups 7 }

mefServicePerformanceMandatoryGroup OBJECT-GROUP
OBJECTS {
    mefServicePerformanceIngressGreenFrameCount,
    mefServicePerformanceIngressGreenOctets,
    mefServicePerformanceEgressGreenFrameCount,
    mefServicePerformanceEgressGreenOctets
}
STATUS      current
DESCRIPTION
    "Mandatory objects for the Bandwidth Profile Performance group."
::= { mefServiceUniEvcMibGroups 8 }

mefServicePerformanceOptionalGroup OBJECT-GROUP
OBJECTS {
    mefServicePerformanceIngressYellowFrameCount,
    mefServicePerformanceIngressRedFrameCount,
    mefServicePerformanceIngressYellowOctets,
    mefServicePerformanceIngressRedOctets,
    mefServicePerformanceEgressYellowFrameCount,
    mefServicePerformanceEgressYellowOctets,
    mefServicePerformanceIngressGreenFrameDiscards,
    mefServicePerformanceIngressYellowFrameDiscards,
    mefServicePerformanceIngressGreenOctetsDiscards,
    mefServicePerformanceIngressYellowOctetsDiscards
}
STATUS      current
DESCRIPTION
    "Optional objects for the Bandwidth Profile Performance group."
::= { mefServiceUniEvcMibGroups 9 }

mefServiceNotificationObjOptionalGroup OBJECT-GROUP
OBJECTS {
    mefServiceNotificationCfgAlarmEnable,
    mefServiceNotificationObjDateAndTime,
    mefServiceNotificationConfigurationChangeType
}
STATUS      current
DESCRIPTION
    "Optional objects for the Notification Object group."
::= { mefServiceUniEvcMibGroups 10 }

mefServiceNotificationsOptionalGroup NOTIFICATION-GROUP
NOTIFICATIONS {
    mefServiceConfigurationAlarm
}
STATUS      current
DESCRIPTION
    "Optional notifications for the Notifications group."

```

```

 ::= { mefServiceUniEvcMibGroups 11 }

-- *****
-- UNI-EVC MIB Module Compliance statements
-- *****

mefServiceUniMibCompliance MODULE-COMPLIANCE
    STATUS          current
    DESCRIPTION     "The compliance statement for the Ethernet Service
                    UNI-EVC MIB."
    MODULE
        MANDATORY-GROUPS {
            mefServiceInterfaceMandatoryGroup,
            mefServiceUniMandatoryGroup,
            mefServiceEvcMandatoryGroup,
            mefServiceBwpMandatoryGroup,
            mefServiceCosMandatoryGroup,
            mefServiceL2cpMandatoryGroup,
            mefServicePerformanceMandatoryGroup
        }

    GROUP mefServiceEvcOptionalGroup
    DESCRIPTION "The mefServiceEvcOptionalGroup is an optional
                requirement."

    GROUP mefServicePerformanceOptionalGroup
    DESCRIPTION "The mefServicePerformanceOptionalGroup is an optional
                requirement."

    GROUP mefServiceNotificationObjOptionalGroup
    DESCRIPTION "The mefServiceNotificationObjOptionalGroup is an optional
                requirement."

    GROUP mefServiceNotificationsOptionalGroup
    DESCRIPTION "The mefServiceNotificationsOptionalGroup is an optional
                requirement."

 ::= { mefServiceUniEvcMibCompliances 1 }

END

```

9. References

- [1] Bradner, S., *Key words for use in RFCs to Indicate Requirement Levels*, RFC 2119, March 1997. (Normative)
- [2] McCloghrie, K., et al., *Structure of Management Information Version 2 (SMIV2)*, RFC 2578, April 1999.
- [3] McCloghrie, K., et al., *The Interfaces Group MIB*, RFC 2863, June 2000.
- [4] Harrington, D, et al, *An Architecture for Describing Simple Network Management Protocol (SNMP) Management Frameworks*, RFC 3411, December 2002.
- [5] Flick, J., *Definitions of Managed Objects for the Ethernet-like Interface Types*, RFC 3635, September 2003.
- [6] Heard, C., *Guidelines for Authors and Reviewers of MIB Documents*, RFC 4181, September 2005.
- [7] Beili, E., *Definitions of Managed Objects for IEEE 802.3 Medium Attachment Units (MAUs)*, RFC 4836, April 2007.
- [8] Metro Ethernet Forum, MEF 4, *Metro Ethernet Network Architecture Framework - Part 1: Generic Framework*, May 2004.
- [9] Metro Ethernet Forum, MEF 6.1, *Ethernet Services Definitions - Phase 2*, April 2008.
- [10] Metro Ethernet Forum, MEF 6.1.1, *Layer 2 Protocol Handling Amendment to MEF6.1*, January 2012.
- [11] Metro Ethernet Forum, MEF 7.2, *Carrier Ethernet Management Information Model*, January 2013.
- [12] Metro Ethernet Forum, MEF 10.2.1, *Ethernet Services Attributes Phase 2*, January 2011.
- [13] Metro Ethernet Forum, MEF 10.2, *Ethernet Services Attributes Phase 2*, October 2009.
- [14] Metro Ethernet Forum, MEF 12.1.1, *Carrier Ethernet Network Architecture Framework Part 2: Ethernet Services Layer - External Interface Extensions*, October 2011.
- [15] Metro Ethernet Forum, MEF 15, *Requirements for Management of Metro Ethernet Phase 1 Network Elements*, November 2005.
- [16] Metro Ethernet Forum, MEF 17, *Service OAM Requirements & Framework – Phase 1*, April 2007.
- [17] Metro Ethernet Forum, MEF 23.1, *Carrier Ethernet Class of Service - Phase 2*, January 2012.
- [18] Metro Ethernet Forum, MEF 26.1, *External Network Network Interface (ENNI) - Phase 1*, January 2012

- [19] Metro Ethernet Forum, MEF 31, *Service OAM Fault Management Definition of Managed Objects*, January 2011
- [20] Metro Ethernet Forum, MEF 31.0.1, *Amendment to Service OAM Fault Management Definition of Managed Objects*, January 2012
- [21] International Telecommunication Union, Recommendation G.8011/Y.1307, *Ethernet over Transport – Ethernet services framework*, August 2004.
- [22] International Telecommunication Union, Recommendation G.8021/Y.1341, *Characteristics of Ethernet transport network equipment functional blocks*, December 2007.
- [23] International Telecommunication Union, Recommendation G.8051/Y.1345, *Management aspects of the Ethernet-over-Transport (EoT) capable network element*, October 2007.
- [24] International Telecommunication Union, Recommendation Q.840.1, *Requirements and Analysis for NMS-EMS Management Interface of Ethernet over Transport and Metro Ethernet Network*, March 2007
- [25] IEEE Std 802.1Q-2011, *IEEE Standard for Local and metropolitan area networks – Media Access Control (MAC) Bridges and Virtual Bridge Local Area Networks*, 31 August 2011
- [26] IEEE Std 802.1D-2004, *IEEE Standard for Local and metropolitan area networks – Media Access Control (MAC) Bridges*, 9 June 2004.
- [27] IEEE Std 802.3-2008, *IEEE Standard for Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications*, 26 December 2008.
- [28] IEEE Std 802.1ap-2008, *IEEE Standard for Local and metropolitan area networks - Virtual Bridged Local Area Networks Amendment 8: Management Information Base (MIB) Definitions for VLAN Bridges*, March 2009
- [29] International Organization for Standardization, *International Standard 8824 Information processing systems - Open Systems Interconnection - Specification of Abstract Syntax Notation One (ASN.1)*, December, 1987.
- [30] Srinivasa Samudrala, Ed., *The OSS through Java™ API Roadmap*, Version 3.1, January 2006 (http://www.ossj.org/downloads/docs/wp_ossj_api_roadmap.pdf)