Technical Specification
MEF 44

vNID Definition of Managed Objects

January 2014

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1. List of Contributing Members

The following members of the MEF participated in the development of this document and have requested to be included in this list.

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2. Abstract

This document specifies the Virtual NID (vNID) Management Information Base (MIB) necessary to configure and monitor the Metro Ethernet Forum (MEF) Virtual NID functionality that satisfies the requirements and definitions found in MEF 43 [26] (vNID) by the Service Provider (SP). This document is based upon previous work found in MEF 4 [8], MEF 10.2 [13], MEF 26.1 [18], MEF 28 [19], the management requirements found in MEF 15 [15], the management objects as specified by MEF 7.2 [11] and ITU-T Q.840.1 [27], MEF 40 [24], and MEF 42 [25].

3. Terminology and Acronyms

Term	Definition	Source
AP	Access Provider	MEF 33 [22]
API	Application Programming Interface	
ASN.1	Abstract Syntax Notation One	OSI 8824 [32]
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]
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 23.1 [17]
EMS	Element Management System	MEF 7.2 [11]
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]
LAN	Local Area Network	MEF 4 [8]
MAC	Media Access Control	IEEE Std 802.3™-2012 [30]
MEF	Metro Ethernet Forum	
MIB	Management Information Base	RFC 2578 [2]
NE	Network Element	MEF 4 [8]
NMS	Network Management System	MEF 7.2 [11]
OAM	Operations, Administration, and Maintenance	MEF 17 [16]
OVC	Operator Virtual Connection	MEF 26.1 [18]
RFC	Request for Comment	
RMI	Remote Management Interface	MEF 43 [26]
RPE	Remote Processing Entity	MEF 43 [26]
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

Term	Definition	Source
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 [4]
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 [4]
SOAM	Service OAM	MEF 17 [16]
SP	Service Provider	MEF 10.2 [13]
SPPE	Service Provider Processing Entity	MEF 43 [26]
UML	Unified Modeling Language	Object Management Group (OMG)
UNI	User Network Interface	MEF 10.2 [13]
VLAN	Virtual LAN	IEEE Std 802.1Q™ - 2011 [28]
vNID	virtual Network Interface Device	MEF 43 [26]
vNID Service	Shorthand for "E-Access Service with vNID Functionality"	MEF 43 [26]
VUNI	Virtual UNI	MEF 28 [19]

Table 1 – Terminology and Acronyms

4. Scope

The scope of this document is to provide the SNMP vNID MIB that supports the vNID Service that has been defined in MEF 43 [26] (vNID) for the Service Provider. This document draws upon previous work defined in MEF 10.2 [13], MEF 10.2.1 [12], MEF 26.1 [18], MEF 28 [19], the management requirements found in MEF 15 [15], the managed objects found in MEF 7.2 [11] and ITU-T Q.840.1 [27], the UNI and EVC MIB objects found in MEF 40 [24], and the ENNI and OVC MIB objects found in MEF 42 [25] .

This document defines the MIB necessary to support the MEF vNID Service, **MEF-VNID-MIB**, which includes MIB objects necessary to configure and monitor the vNID Service, in which the Service Provider (SP) communicates via the Remote Management Interface (RMI) Connection to the Remote Processing Entity (RPE) as illustrated by Figure 1 (Figure 4 from MEF 43 and is reproduced below).

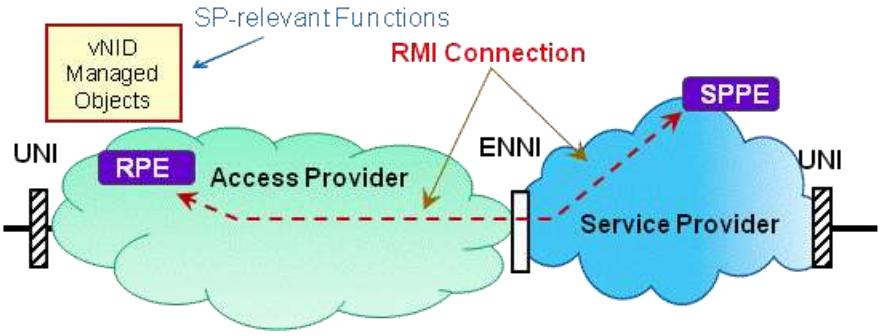

Figure 1 - Overview of Communication between SP and AP via RMI Connection

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

5. Compliance Levels

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.

Items that are **REQUIRED** (contain the words **MUST** or **MUST NOT**) are labeled as **[Rx]** for required. Items that are **RECOMMENDED** (contain the words **SHOULD** or **SHOULD NOT**) are labeled as **[Dx]** for desirable. Items that are **OPTIONAL** (contain the words **MAY** or **OPTIONAL**) are labeled as **[Ox]** for optional**.**

A paragraph preceded by **[CR*a*]<** specifies a conditional mandatory requirement that **MUST** be followed if the condition(s) following the "<" have been met. For example, "**[CR1]<[D38]**" indicates that Conditional Mandatory Requirement 1 must be followed if Desirable Requirement 38 has been met. A paragraph preceded by **[CD*b*]<** specifies a Conditional Desirable Requirement that **SHOULD** be followed if the condition(s) following the "<" have been met. A paragraph preceded by **[CO*c*]<** specifies a Conditional Optional Requirement that **MAY** be followed if the condition(s) following the "<" have been met.

6. Introduction

6.1 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 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. As will be discussed in Section 6.5, the use of a standard MIB is required, and is the cornerstone of vNID Service functionality.

A MIB is a collection of managed objects that can be used for functions such as 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 [32]. 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)* [2] and RFC 4181 *Guidelines for Authors and Reviewers of MIB Documents* [6].

6.2 The General Structure

A generalized system model is shown by Figure 2 that illustrates the relationship between the SPPE (Service Provider Processing Entity), RPE, EMS, and Network Elements (NEs). The primary focus of this specification defines the interaction between the SPPE (SNMP Manager) and the RPE (SNMP Agent) via SNMP using the MIB module defined in this specification. Object names in the figure are examples only.

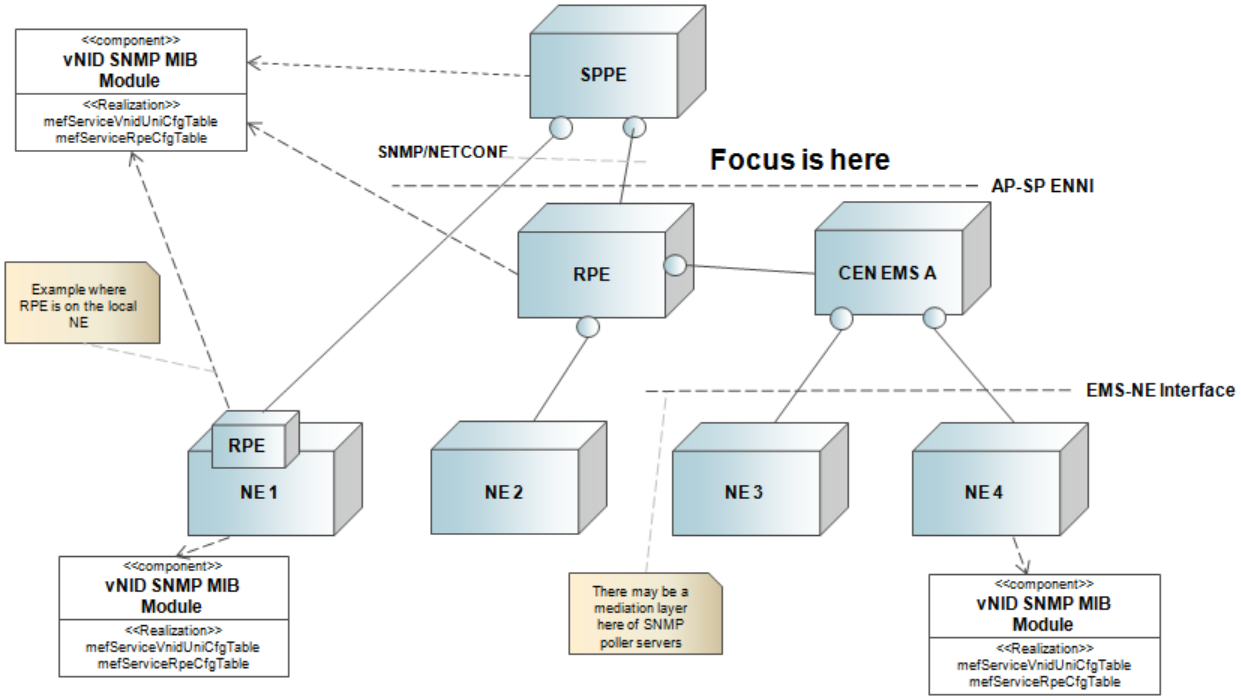

Figure 2 – Generalized SPPE-RPE-EMS-NE Model

6.3 The Foundational Elements

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 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 [27].

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

MEF 26.1 [18] describes the External Network Network Interface (ENNI) to support the extension of Ethernet services across multiple Operator CENs.

MEF 28 [19] describes the transparent extension of Ethernet services across multiple Network Operator CENs, where each Network Operator CEN is under the control of a distinct administrative authority

MEF 33 [22] defines Ethernet Access Services based upon OVC-base Ethernet services between a UNI and an ENNI.

MEF 43 [26] describes the Virtual NID Service offered by an Access Provider (AP) that allows a Service Provider (SP) to monitor and configure selected objects associated with a UNI and one or more OVCs in the AP's network

The relationship between the various documents and the vNID MIB presented in this specification is illustrated by Figure 3. The UML models found in MEF 7.2 and ITU-T G.8052, and the

IEEE Std 802.3-2012 [30] , IEEE Std 802.1D™-2004 [29], and IEEE Std 802.1Q-2011 [28] specifications, provide a baseline for the vNID MIB and the Ethernet interfaces.

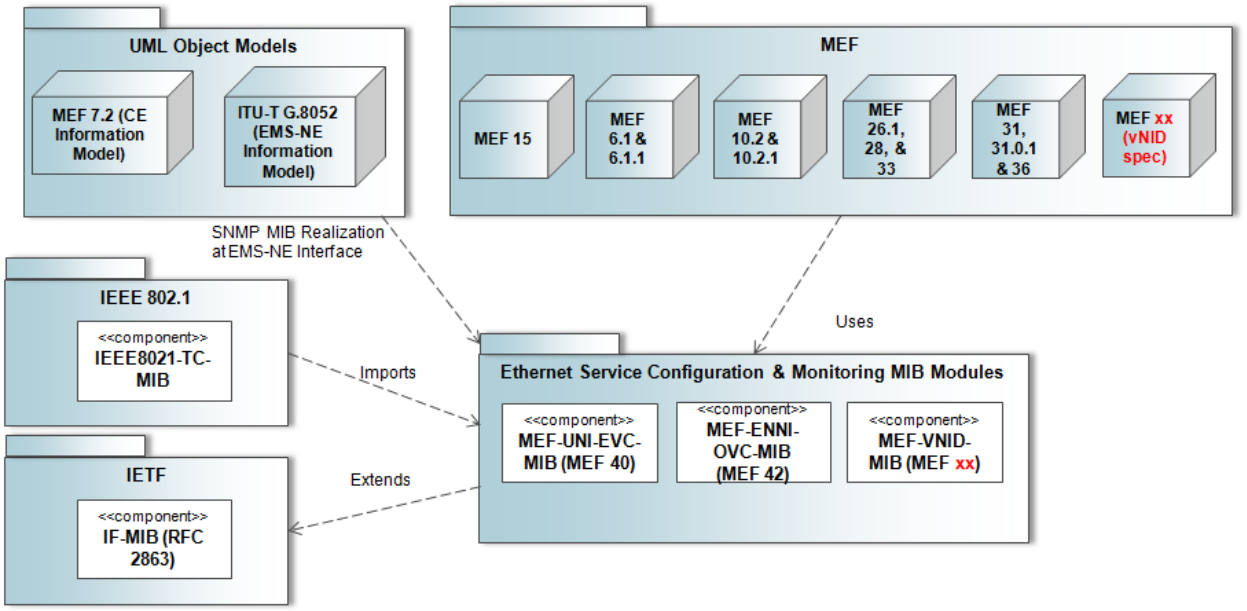

Figure 3 – Relationship between 802.1 MIBs, UML Models, and vNID MIB

6.4 Overview of the vNID Configuration and Monitoring

The basis of Carrier Ethernet Networks (CENs) is the designation of reference points in the network known as UNIs which provide the 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).

MEF 26.1 and MEF 28 enhanced this concept with the addition of an External Network Network Interface (ENNI) reference point between multiple CEN Operators, and the Operator Virtual Connection (OVC) as the building block for constructing an EVC spanning multiple Operator CENs. This is indicated by Figure 3 from MEF 26.1 and is reproduced below.

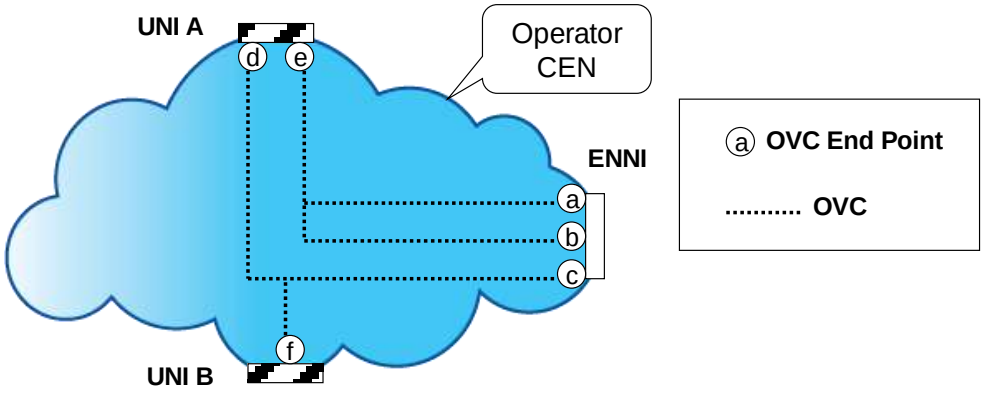

Figure 4 - Example of OVCs (Figure 3 of MEF 26.1)

With this in mind, the basis for configuration of a CEN is the association of a physical interface that serves as the ENNI reference point with the physical interfaces that serve as the UNI reference points via the concept of an OVC.

The vNID Service, which is represented in Figure 5 and Figure 6, specifies the functionality offered by an Access Provider (AP) that, when combined with Ethernet-Access Service, allows a Service Provider (SP) to manage selected objects associated with a UNI in the AP's network. The effect is that the AP provides functionality which would otherwise require the SP to place a Network Interface Device (NID) at the customer's location. Hence, the AP is said to be providing "virtual NID (vNID)" Service to the E-Access Service that the SP has purchased.

The vNID Service allows the SP to manage selected objects associated with the UNI in the AP's network, and set values for selected objects. This is accomplished via the SP communicating over a Remote Management Interface (RMI) connection to the AP (Figure 1).

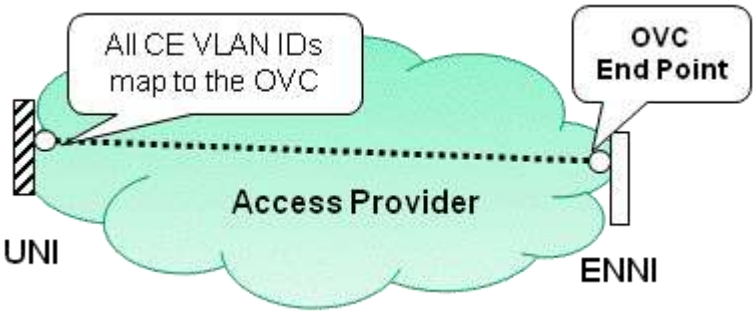

Figure 5 - Example Configuration of vNID Case B (Figure 5 of MEF 43)

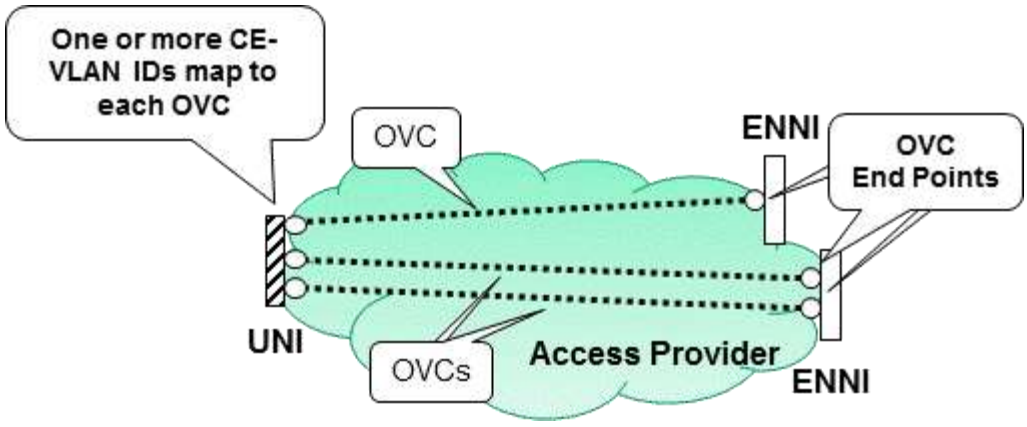

Figure 6 - Example Configuration of vNID Case A (Figure 6 of MEF 43)

Many of the objects that can be read or set by the SP are supported by existing MIBs, as described in Section 6.5. The vNID MIB specified in this document provides additional objects necessary to fulfill all of the requirements in MEF 43.

The structure of the vNID MIB is illustrated in Figure 7, where light colored boxes are object groups and dark colored boxes are object tables. The references to a specific table inside a box indicate the specific table in this document that describes the correlation with MEF 43 (vNID spec).

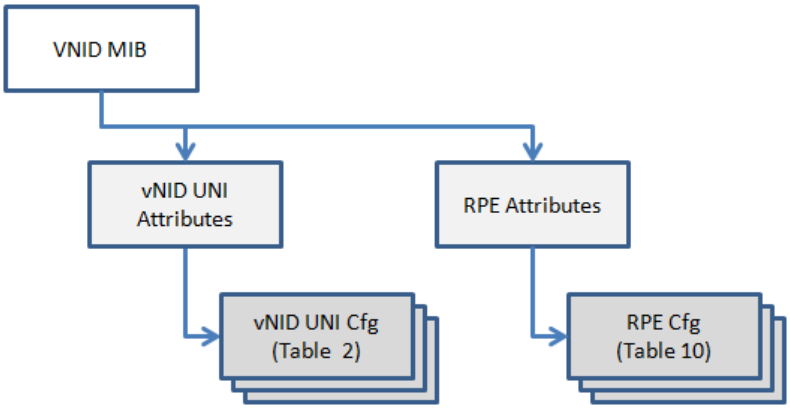

Figure 7 - vNID MIB Structure

As shown in Figure 1, an SP manages the UNI in the AP network via an RMI connection to the AP's RPE. The RPE may or may not be located at the UNI, and a single RPE may control access to a number of UNIs via the same RMI connection. The RPE is assumed to have a local representation of each UNI interface that it controls, including allocating a local ***ifIndex*** that can be used to identify the UNI, even if the UNI is not local to the RPE device.

The representation of the UNI on the RPE is created, and an ***ifIndex*** allocated for it, based on the Service Order for the vNID Service that is agreed between the SP and the AP. If the RPE is located at the UNI, the ***ifIndex*** may represent the physical UNI interface on the NE. Otherwise, the ***ifIndex*** is a virtual index on the RPE device that identifies the UNI to the SP. The mechanism by which the RPE manages the UNI in this case is out of scope.

Once created, the vNID UNI attributes can be managed by the SP via the ***mefServiceVnidUniCfgTable*** in the vNID MIB and via other attributes in other MIBs as specified in Table 2 - Table 6, using the allocated ***ifIndex***.

The RPE attributes specific to the SP can likewise be managed via the ***mefServiceRpeCfgTable***.

All objects specified in this document are scoped to a particular RMI connection. A given RPE may support multiple RMI connections, e.g. from different SPs. In that case, the RPE must maintain a separate instance of all the MIB tables and objects for each RMI connection, and must ensure that objects relating to one RMI connections cannot be accessed via a different RMI connection. Note that both the ***ifIndex*** values used to identify UNIs, and any other identifiers used in the MIBs, need only be unique over a given RMI connection – the RPE is free to reuse the same index values on other RMI connections. Similarly, the ***mefServiceRpeCfgTable*** (which has no index) is scoped to the given RMI connection; the objects it contains may have different values when accessed over a different RMI connection.

6.5 Fulfillment of vNID Service Specification Requirements

6.5.1 Alignment with Industry Standard and MEF MIBs

The vNID MIB is based upon MEF 43 [26] that defines the Virtual NID Service and Service Attributes as accessed by the SP via the RPE. This document draws from two previous service MIB documents and two SOAM MIB documents:

- MEF 40 [24] (UNI-EVC MIB), listed as (MEF 40) in the tables below,

- MEF 42 [25] (ENNI-OVC MIB), listed as (MEF 42) in the tables below
- MEF 31 [20] and 31.0.1 [21] (SOAM FM MIBs), listed as (MEF 31) in the tables below
- MEF 36 [23] (SOAM PM MIB), listed as (MEF 36) in the tables below

A number of common elements are found in industry standard MIBs that are necessary to be supported by the RPE for the vNID UNI:

- IF-MIB, RFC 2863 [3], listed as (IF-MIB) in the tables below
- MAU-MIB, RFC 4836 [7], listed as (MAU-MIB) in the tables below
- EtherLike-MIB, RFC3635 [5], listed as (Etherlike-MIB) in the tables below
- IEEE8023-DOT3-OAM-MIB (found in IEEE Std 802.3.1™-2011) [31], listed as (OAM-MIB) in the tables below
- IEEE8021-CFM-MIB and IEEE8021-CFM-V2-MIB [28], listed as (CFM MIB) in the tables below
- SNMPv2-SMI-MIB [2], listed as (SNMPv2 MIB) in the tables below

Objects from the vNID MIB are listed with (*) in the tables below. Objects names in **bold** are references to SNMP tables.

The correlation between the vNID MIB and other standard MIBs and MEF 43 are listed in Table 2 - Table 11 for vNID functionality as accessed by the SP via the RPE. Those Service Attributes that are related to the ENNI are not accessible via the RPE by the SP and are not covered. Those Service Attributes that relate to the RPE and the vNID UNI are covered in the sections below.

In each of the tables below the "SP Access" column indicates whether the SP has the ability to read (Read-only) or read or write (Read-write) the SNMP objects indicated. "Read-only*" indicates that the original MIB object is defined as "Read-write".

[R1] Those objects marked with "Read-only" in Table 2 - Table 11 **SHALL** be able to be read but not written by the SP and if written return an SNMP error even if the original MIB document indicated the object is "Read-write".

[R2] Those objects marked with "Read-write" in Table 2 - Table 11 **SHALL** be able to be read or written by the SP.

As specified in MEF 43, it is expected that the AP will wish to restrict access by the SP to attributes that are not listed as accessible via the RMI, although permitting access is not precluded. Many such attributes correspond with objects in the MEF MIBs and other MIBs referenced above. Therefore, the SNMP Agent implemented in the RPE needs to be able to block access to such objects, while allowing read-only or read-write access to other objects in the same MIB. This block should be enabled by default, but as access to the objects that are not listed as accessible is not precluded, the AP should be able to override it.

[R3] The RPE SNMP Agent **SHALL** support the ability to prohibit access by the SP to objects from MEF MIBs or common MIBs referenced above but not explicitly listed in [R4] - [R18] and [D2] - [D7] and return an SNMP error if accessed.

[D1] The accessibility of those objects from MEF MIBs or common MIBs referenced above but not explicitly listed in [R4] - [R18] and [D2] - [D7] by the SP **SHOULD** be prohibited by default and return an SNMP error if accessed.

6.5.2 vNID UNI Service Attribute Alignment

Specific SNMP objects listed in Table 2 are covered in the standard MIBs indicated, MEF 40 [24] Sections 6.1 and 6.2, and Section 7.1 in this document.

Attribute Name ([26] Tables 9, 23, 26)	MIB Object Name	SP Access
AP UNI Identifier	mefServiceVnidUniCfgApIdentifier (*)	Read-only
SP UNI Identifier	mefServiceVnidUniCfgSpIdentifier (*)	Read-write
Physical Medium	mefServiceInterfaceCfgType (MEF 40)	Read-only
	ifMauType (MAU-MIB)	Read-only
Speed	ifSpeed (IF-MIB)	Read-only
	ifMauDefaultType (MAU-MIB)	Read-write
Auto-Negotiation	ifMauAutoNegAdminStatus (MAU-MIB)	Read-write
Auto-Negotiated Speed	ifMauAutoNegCapabilityBits (MAU-MIB)	Read-only
	ifMauAutoNegCapAdvertisedBits (MAU-MIB)	Read-only
Mode	dot3StatsDuplexStatus (EtherLike-MIB)	Read-only
MAC Layer	ifType (IF-MIB)	Read-only
UNI MTU max	ifMtu (IF-MIB)	Read-only
UNI MTU Size	mefServiceVnidUniCfgUniMtuSize (*)	Read-write
Ingress Bandwidth Profile per UNI	mefServiceInterfaceCfgIngressBwpGrpIndex (MEF 40)	Read-only*
Egress Bandwidth Profile per UNI	mefServiceInterfaceCfgEgressBwpGrpIndex (MEF 40)	Read-only*
CE-VLAN ID for untagged & priority tagged service frames	mefServiceUniCfgCeVidUntagged (MEF 40)	Read-write
Maximum number of OVCs per UNI	mefServiceVnidUniCfgOvcPerUniMax (*)	Read-only
Maximum number of CE-VLAN IDs per OVC	mefServiceVnidUniCfgCeVlansMax (*)	Read-only

Table 2 - vNID UNI Service Attribute Alignment

6.5.3 vNID Bandwidth Profile Service Attribute Alignment

Specific SNMP objects listed in Table 3 are covered in Section 6.4 of MEF 40 [24] (UNI-EVC MIB).

Attribute Name ([26] Table 10)	MIB Object Name	SP Access
CIR	mefServiceBwpCfgCir (MEF 40)	Read-only*
CBS	mefServiceBwpCfgCbs (MEF 40)	Read-only*
EIR	mefServiceBwpCfgEir (MEF 40)	Read-only*
EBS	mefServiceBwpCfgEbs (MEF 40)	Read-only*
CM	mefServiceBwpCfgCm (MEF 40)	Read-only*
CF	mefServiceBwpCfgCf (MEF 40)	Read-only*

Table 3 - vNID Bandwidth Profile Service Attribute Alignment

6.5.4 vNID OVC End Point per UNI Service Attribute Alignment

Specific SNMP objects listed in Table 4 are covered in Section 6.5 of MEF 40 [24] (UNI-EVC MIB) and section 6.2.4 of MEF 42 [25] (ENNI-OVC MIB).

Attribute Name ([26] Tables 10,24, 27)	MIB Object Name	SP Access
UNI OVC Identifier	mefServiceOvcEndPtPerUniCfgIdentifier (MEF 42)	Read-only*
OVC End Point Map	mefServiceOvcEndPtPerUniCfgCeVlanMap (MEF 42)	Read-write
Class of Service Identifiers	mefServiceCosCfgType (MEF 40)	Read-only*
Class of Service Name for Service frames	mefServiceCosCfgIdentifier (MEF 40)	Read-only*
Class of Service Label for Service frames	mefServiceCosCfgIdentifier (MEF 40)	Read-only*
Ingress Bandwidth Profile Per OVC End Point at a UNI (CIR, CBS, EIR, EBS, CF, CM)	mefServiceOvcEndPtPerUniCfgIngressBwpGrpIndex (MEF 42)	Read-only*
Egress Bandwidth Profile Per OVC End Point at a UNI	mefServiceOvcEndPtPerUniCfgEgressBwpGrpIndex (MEF 42)	Read-only*
Egress Bandwidth Profile Per Class of Service Identifier at a UNI	mefServiceOvcEndPtPerUniCfgEgressBwpGrpIndex (MEF 42)	Read-only*

Table 4 - vNID OVC End Point per UNI Service Attribute Alignment

6.5.5 vNID OVC Service Attribute Alignment

Specific SNMP objects listed in Table 5 are covered in Sections 6.2.1 and 6.2.2 of MEF 42 [25] (ENNI-OVC MIB).

Attribute Name ([26] Table 11, 25, 28)	MIB Object Name	SP Access
OVC Identifier	mefServiceOvcCfgIdentifier (MEF 42)	Read-only*
OVC Type	mefServiceOvcCfgServiceType (MEF 42)	Read-only*
Maximum Number of UNI OVC End Points	mefServiceOvcStatusMaxNumUniOvcEndPt (MEF 42)	Read-only
OVC Maximum Transmission Unit Size	mefServiceOvcCfgMtuSize (MEF 42)	Read-only*
CE-VLAN ID Preservation	mefServiceOvcCfgCevlanIdPreservation (MEF 42)	Read-write
CE-VLAN CoS Preservation	mefServiceOvcCfgCevlanCosPreservation (MEF 42)	Read-only*
Color Forwarding	mefServiceOvcCfgColorForwarding (MEF 42)	Read-only*
Service Level Specification	n/a	n/a
Unicast Service Frame Delivery	mefServiceOvcCfgUnicastDelivery (MEF 42)	Read-only*
Multicast Service Frame Delivery	mefServiceOvcCfgMulticastDelivery (MEF 42)	Read-only*
Broadcast Service Frame Delivery	mefServiceOvcCfgBroadcastDelivery (MEF 42)	Read-only*

Table 5 - vNID OVC Service Attribute Alignment

6.5.6 vNID Port-Level and OVC-Level Counters

Specific SNMP MIB objects listed in Table 6 are covered in Sections 6.1.3 and 6.4.3 of MEF 40 [24] (UNI-EVC MIB).

Attribute Name ([26] §7.2.3.1)	MIB Object Name	SP Access
Port-Level Counters	mefServiceInterfaceStatisticsIngressUndersized (MEF 40)	Read-only

	mefServiceInterfaceStatisticsIngressOversized (MEF 40)	Read-only
	mefServiceInterfaceStatisticsIngressFragments (MEF 40)	Read-only
	mefServiceInterfaceStatisticsIngressCrcAlignment (MEF 40)	Read-only
	mefServiceInterfaceStatisticsIngressInvalidVid (MEF 40)	Read-only
	mefServiceInterfaceStatisticsIngressOctets (MEF 40)	Read-only
	mefServiceInterfaceStatisticsIngressUnicast (MEF 40)	Read-only
	mefServiceInterfaceStatisticsIngressMulticast (MEF 40)	Read-only
	mefServiceInterfaceStatisticsIngressBroadcast (MEF 40)	Read-only
	mefServiceInterfaceStatisticsEgressOctets (MEF 40)	Read-only
	mefServiceInterfaceStatisticsEgressUnicast (MEF 40)	Read-only
	mefServiceInterfaceStatisticsEgressMulticast (MEF 40)	Read-only
	mefServiceInterfaceStatisticsEgressBroadcast (MEF 40)	Read-only
OVC-Level Counters	mefServicePerformanceIngressGreenFrameCount (MEF 40)	Read-only
	mefServicePerformanceIngressGreenOctets (MEF 40)	Read-only
	mefServicePerformanceIngressYellowFrameCount (MEF 40)	Read-only
	mefServicePerformanceIngressRedFrameCount (MEF 40)	Read-only
	mefServicePerformanceIngressYellowOctets (MEF 40)	Read-only
	mefServicePerformanceIngressRedOctets (MEF 40)	Read-only
	mefServicePerformanceIngressGreenFrameDiscards (MEF 40)	Read-only
	mefServicePerformanceIngressYellowFrameDiscards (MEF 40)	Read-only
	mefServicePerformanceIngressGreenOctetsDiscards (MEF 40)	Read-only
	mefServicePerformanceIngressYellowOctetsDiscards (MEF 40)	Read-only

Table 6 - vNID Port-Level and OVC-Level Counters Attribute Alignment

6.5.7 vNID Link OAM Requirement Alignment

Specific SNMP objects listed in Table 7 are supported via the IEEE IEEE8023-DOT3-OAM-MIB [31], which replaced the original RFC 4878 OAM MIB.

Link OAM Function ([26] Table 14)	MIB Object Name	SP Access
Link OAM Support	dot3OamOperStatus	Read-only
Enable/Disable Link OAM	dot3OamAdminState (OAM-MIB);	Read-write
Verification of Active mode when Link OAM is enabled	dot3OamMode (OAM- MIB)	Read-only*
Link OAM Loopback	dot3OamLoopbackStatus (OAM-MIB)	Read-write
Link OAM State	dot3OamOperStatus (OAM-MIB)	Read-only

Table 7 - vNID Link OAM Requirement Alignment

6.5.8 vNID SOAM Fault Management Requirement Alignment

Specific SNMP objects listed in Table 8 are supported via the IEEE CFM MIB [28], MEF 31 [20] and MEF 31.0.1 [21].

SOAM FM Function ([26] Table 15)	MIB Object Name	SP Access
Configuration of UNI ME, SP and EVC ME, Test ME, Sub-	dot1agCfmMdFormat (CFM), dot1agCfmMdName (CFM), dot1agCfmMdMdLevel (CFM), dot1agCfmMdMhfCreation (CFM), dot1agCfmMdMhfIdPermission (CFM), dot1agCfmMdMaNextIndex (CFM), dot1agCfmMdRowStatus (CFM)	Read-write

scriber ME - MD		
Configuration of UNI ME, SP and EVC ME, Test ME, Subscriber ME - MA	dot1agCfmMaNetFormat (CFM), dot1agCfmMaNetName (CFM), dot1agCfmMaNetRowStatus (CFM), ieee8021CfmMaComponentId (CFM), ieee8021CfmMaCompPrimarySelectorType (CFM), ieee8021CfmMaCompPrimarySelectorOrNone (CFM), ieee8021CfmMaCompMhfCreation (CFM), ieee8021CfmMaCompIdPermission (CFM), ieee8021CfmMaCompNumberOfVids (CFM), ieee8021CfmMaCompNumberOfVids (CFM), mefSoamNetCfgY1731Compliant (MEF 31), mefSoamNetCfgMegIdFormat (MEF 31), mefSoamNetCfgMegLevel (MEF 31), mefSoamMegCfgPortStatusTlvIncluded (MEF 31), mefSoamMegCfgInterfaceStatusTlvIncluded (MEF 31)	Read-write
Configuration of UNI ME, SP and EVC ME, Test MEP - MEP	dot1agCfmMaMepListRowStatus (CFM), dot1agCfmMepIfIndex (CFM), dot1agCfmMepDirection (CFM), dot1agCfmMepPrimaryVid (CFM), dot1agCfmMepActive (CFM), mefSoamCcCfgDropEligible (MEF 31)	Read-write
Loopback Message Support	dot1agCfmMepTransmitLbmStatus (CFM), dot1agCfmMepTransmitLbmDestMacAddress (CFM), dot1agCfmMepTransmitLbmDestMepId (CFM), dot1agCfmMepTransmitLbmDestIsMepId (CFM), dot1agCfmMepTransmitLbmMessages (CFM), dot1agCfmMepTransmitLbmDataTlv (CFM), dot1agCfmMepTransmitLbmVlanPriority (CFM), dot1agCfmMepTransmitLbmVlanDropEnable (CFM), mefSoamLbCfgMulticastEnabled (MEF 31), mefSoamLbCfgInterval (MEF 31), mefSoamLbCfgFrameSize (MEF 31), mefSoamLbCfgDataPattern (MEF 31), mefSoamLbCfgTestTlvIncluded (MEF 31), mefSoamLbCfgTestTlvPattern (MEF 31)	Read-write
Linktrace Message Support	dot1agCfmMepTransmitLtmStatus (CFM), dot1agCfmMepTransmitLtmFlags (CFM), dot1agCfmMepTransmitLtmTargetMacAddress (CFM), dot1agCfmMepTransmitLtmTargetMepId (CFM), dot1agCfmMepTransmitLtmTargetIsMepId (CFM), dot1agCfmMepTransmitLtmTtl (CFM)	Read-write
CCM	dot1agCfmMepCciEnabled (CFM), dot1agCfmMepCcmLtmPriority (CFM)	Read-write
UNI ME, EVC, and SP ME CCM Transmission Period	dot1agCfmMaNetCcmInterval (CFM)	Read-write
Loopback, Linktrace, and Continuity Results Support	dot1agCfmMepFngState (CFM), dot1agCfmMepHighestPrDefect (CFM), dot1agCfmMepDefects (CFM), dot1agCfmMepErrorCcmLastFailure (CFM), dot1agCfmMepXconCcmLastFailure (CFM), dot1agCfmMepCcmSequenceErrors (CFM), dot1agCfmMepCciSentCcms (CFM), dot1agCfmMepUnexpLtrIn (CFM), dot1agCfmMepLbrOut (CFM), dot1agCfmMepTransmitLbmResultOK (CFM), dot1agCfmMepTransmitLtmResult (CFM), dot1agCfmLtrTtl (CFM), dot1agCfmLtrForwarded (CFM), dot1agCfmLtrTerminalMep (CFM), dot1agCfmLtrLastEgressIdentifier (CFM), dot1agCfmLtrNextEgressIdentifier (CFM), dot1agCfmLtrNextEgressIdentifier (CFM), dot1agCfmLtrChassisIdSubtype (CFM), dot1agCfmLtrChassisId (CFM), dot1agCfmLtrManAddressDomain (CFM), dot1agCfmLtrManAddress (CFM), dot1agCfmLtrIngress (CFM), dot1agCfmLtrIngressMac (CFM), dot1agCfmLtrIngressPortIdSubtype (CFM), dot1agCfmLtrIngressPortId (CFM), dot1agCfmLtrEgress (CFM), dot1agCfmLtrEgressMac (CFM), dot1agCfmLtrEgressPortIdSubtype (CFM), dot1agCfmLtrEgressPortId (CFM), dot1agCfmLtrOrganizationSpecificTlv (CFM), dot1agCfmMepDbRMepState	Read-only

	(CFM), dot1agCfmMepDbRMepFailedOkTime (CFM), dot1agCfmMepDbMacAddress (CFM), dot1agCfmMepDbRdi (CFM), dot1agCfmMepDbPortStatusTlv (CFM), dot1agCfmMepDbInterfaceStatusTlv (CFM), dot1agCfmMepDbChassisIdSubtype (CFM), dot1agCfmMepDbChassisId (CFM), dot1agCfmMepDbManAddressDomain (CFM), dot1agCfmMepDbManAddress (CFM), mefSoamLbStatsNumLbrIn-CrcErrors (MEF 31), mefSoamLbrMulticastReplyMac (MEF 31), mefSoamLt-LtmTransmitted (MEF 31), mefSoamLtLtrReceived (MEF 31), mefSoamLtLt-mReceived (MEF 31), mefSoamLtLtrTransmitted (MEF 31)	
Configuration of AIS	mefSoamAisCfgEnabled (MEF 31), mefSoamAisCfgInterval (MEF 31), mefSoamAisCfgPriority (MEF 31), mefSoamAisCfgMdLevel (MEF 31), mefSoamAisCfgDropEligible (MEF 31)	Read-write
AIS Status and Counters	mefSoamAisStatsOutStatus (MEF 31) , mefSoamAisStatsOutCounter (MEF 31), mefSoamAisStatsInStatus (MEF 31), mefSoamAisStatsInCounter (MEF 31) , mefSoamAisStatsInMacAddr (MEF 31)	Read-only
Configuration of LCK	mefSoamLckCfgAdminState (MEF 31), mefSoamLckCfgInterval (MEF 31), mefSoamLckCfgPriority (MEF 31), mefSoamLckCfgMdLevel (MEF 31)	Read-write
LCK Status and Counters	mefSoamLckStatsInStatus (MEF 31), mefSoamLckStatsInCounter (MEF 31), mefSoamLckStatsOutStatus (MEF 31), mefSoamLckStatsOutCounter (MEF 31)	Read-only

Table 8 - vNID SOAM FM Requirement Alignment

6.5.9 vNID SOAM Performance Monitoring Requirement Alignment

Specific SNMP objects listed in Table 9 are supported via the SOAM Performance Monitoring MIB [23].

SOAM FM Function ([26] Table 16)	MIB Object Name	SP Access
SOAM PM support	(See the 'Configuration' row below)	Read-write
Availability Δt	mefSoamLmCfgAvailabilityNumConsecutiveMeasPdus (MEF36)	Read-write
Configuration of PM-1 Parameters	(all objects from MEF 36) mefSoamLmCfgType, mefSoamLmCfgVersion, mefSoamLmCfgEnabled, mefSoamLmCfgMeasurementEnable, mefSoamLmCfgMessagePeriod, mefSoamLmCfgPriority, mefSoamLmCfgFrameSize, mefSoamLmCfgDataPattern, mefSoamLmCfgTestTlvIncluded, mefSoamLmCfgTestTlvPattern, mefSoamLmCfgMeasurementInterval, mefSoamLmCfgNumIntervalsStored, mefSoamLmCfgDestMacAddress, mefSoamLmCfgDestMepId, mefSoamLm-CfgDestIsMepId, mefSoamLmCfgStartTimeType, mefSoamLmCfgFixed-StartDateAndTime, mefSoamLmCfgRelativeStartTime, mefSoamLmCfgStop-TimeType, mefSoamLmCfgFixedStopDateAndTime, mefSoamLmCfgRela-tiveStopTime, mefSoamLmCfgRepetitionTime, mefSoamLmCfgAlignMeasure-mentIntervals, mefSoamLmCfgAlignMeasurementOffset, mefSoamLmCf-gAvailabilityMeasurementInterval, mefSoamLmCfgAvailabilityFlrThreshold, mefSoamLmCfgAvailabilityNumConsecutiveIntervals, mefSoamLmCfgAvaila-bilityNumConsecutiveHighFlr, mefSoamLmCfgSessionType, mefSoamLm-CfgRowStatus, mefSoamDmCfgType, mefSoamDmCfgVersion, mefSoamDmCfgEnabled, mefSoamDmCfgMeasurementEnable, mefSoamDmCfgMessagePeriod, mefSoamDmCfgPriority, mefSoamDmCfg-FrameSize, mefSoamDmCfgDataPattern, mefSoamDmCfgTestTlvIncluded, mefSoamDmCfgTestTlvPattern, mefSoamDmCfgMeasurementInterval, mefSoamDmCfgNumIntervalsStored, mefSoamDmCfgDestMacAddress, mefSoamDmCfgDestMepId, mefSoamDmCfgDestIsMepId, mefSoamDmCfg-SourceMacAddress, mefSoamDmCfgStartTimeType, mefSoamDmCfgFixed-	Read-write

	StartDateAndTime, mefSoamDmCfgRelativeStartTime, mefSoamDmCfgStopTimeType, mefSoamDmCfgFixedStopDateAndTime, mefSoamDmCfgRelativeStopTime, mefSoamDmCfgRepetitionTime, mefSoamDmCfgAlignMeasurementIntervals, mefSoamDmCfgAlignMeasurementOffset, mefSoamDmCfgNumMeasBinsPerFrameDelayInterval, mefSoamDmCfgNumMeasBinsPerInterFrameDelayVariationInterval, mefSoamDmCfgInterFrameDelayVariationSelectionOffset, mefSoamDmCfgNumMeasBinsPerFrameDelayRangeInterval, mefSoamDmCfgSessionType, mefSoamDmCfgRowStatus, mefSoamDmCfgMeasBinLowerBound,	
Reading PM-1 Measurements	(all objects from MEF 36) mefSoamPmMepOperNextIndex, mefSoamPmMepLmSingleEndedResponder, mefSoamPmMepSlmSingleEndedResponder, mefSoamPmMepDmSingleEndedResponder, mefSoamLmCfgSessionStatus, mefSoamLmCurrentAvailStatsIndex, mefSoamLmCurrentAvailStatsStartTime, mefSoamLmCurrentAvailStatsElapsedTime, mefSoamLmCurrentAvailStatsSuspect, mefSoamLmCurrentAvailStatsForwardHighLoss, mefSoamLmCurrentAvailStatsBackwardHighLoss, mefSoamLmCurrentAvailStatsForwardConsecutiveHighLoss, mefSoamLmCurrentAvailStatsBackwardConsecutiveHighLoss, mefSoamLmCurrentAvailStatsForwardAvailable, mefSoamLmCurrentAvailStatsBackwardAvailable, mefSoamLmCurrentAvailStatsForwardUnavailable, mefSoamLmCurrentAvailStatsBackwardUnavailable, mefSoamLmCurrentAvailStatsForwardMinFlr, mefSoamLmCurrentAvailStatsForwardMaxFlr, mefSoamLmCurrentAvailStatsForwardAvgFlr, mefSoamLmCurrentAvailStatsBackwardMinFlr, mefSoamLmCurrentAvailStatsBackwardMaxFlr,mefSoamLmCurrentAvailStatsBackwardAvgFlr,mefSoamLmCurrentStatsIndex, mefSoamLmCurrentStatsStartTime, mefSoamLmCurrentStatsElapsedTime, mefSoamLmCurrentStatsSuspect, mefSoamLmCurrentStatsForwardTransmittedFrames, mefSoamLmCurrentStatsForwardReceivedFrames, mefSoamLmCurrentStatsForwardMinFlr, mefSoamLmCurrentStatsForwardMaxFlr, mefSoamLmCurrentStatsForwardAvgFlr, mefSoamLmCurrentStatsBackwardTransmittedFrames, mefSoamLmCurrentStatsBackwardReceivedFrames, mefSoamLmCurrentStatsBackwardMinFlr, mefSoamLmCurrentStatsBackwardMaxFlr, mefSoamLmCurrentStatsBackwardAvgFlr, mefSoamLmCurrentStatsSoamPdusSent, mefSoamLmCurrentStatsSoamPdusReceived, mefSoamLmHistoryAvailStatsIndex, mefSoamLmHistoryAvailStatsEndTime, mefSoamLmHistoryAvailStatsElapsedTime, mefSoamLmHistoryAvailStatsSuspect, mefSoamLmHistoryAvailStatsForwardHighLoss, mefSoamLmHistoryAvailStatsBackwardHighLoss, mefSoamLmHistoryAvailStatsForwardConsecutiveHighLoss, mefSoamLmHistoryAvailStatsBackwardConsecutiveHighLoss, mefSoamLmHistoryAvailStatsForwardAvailable, mefSoamLmHistoryAvailStatsBackwardAvailable, mefSoamLmHistoryAvailStatsForwardUnavailable, mefSoamLmHistoryAvailStatsBackwardUnavailable, mefSoamLmHistoryAvailStatsForwardMinFlr, mefSoamLmHistoryAvailStatsForwardMaxFlr, mefSoamLmHistoryAvailStatsForwardAvgFlr, mefSoamLmHistoryAvailStatsBackwardMinFlr, mefSoamLmHistoryAvailStatsBackwardMaxFlr, mefSoamLmHistoryAvailStatsBackwardAvgFlr, mefSoamLmHistoryStatsEndTime, mefSoamLmHistoryStatsElapsedTime, mefSoamLmHistoryStatsSuspect, mefSoamLmHistoryStatsForwardTransmittedFrames, mefSoamLmHistoryStatsForwardReceivedFrames, mefSoamLmHistoryStatsForwardMinFlr, mefSoamLmHistoryStatsForwardMaxFlr, mefSoamLmHistoryStatsForwardAvgFlr, mefSoamLmHistoryStatsBackwardTransmittedFrames, mefSoamLmHistoryStatsBackwardReceivedFrames, mefSoamLmHistoryStatsBackwardMinFlr, mefSoamLmHistoryStatsBackwardMaxFlr, mefSoamLmHistoryStatsBackwardAvgFlr, mefSoamLmHistoryStatsSoamPdusSent, mefSoamLmHistoryStatsSoamPdusReceived, mefSoamDmCfgSessionStatus, mefSoamDmCur-	Read-only

	rentStatsIndex, mefSoamDmCurrentStatsStartTime, mefSoamDmCurrent-StatsElapsedTime, mefSoamDmCurrentStatsSuspect, mefSoamDmCurrentStats-FrameDelayTwoWayMin, mefSoamDmCurrentStatsFrameDelayTwoWayMax, mefSoamDmCurrentStatsFrameDelayTwoWayAvg, mefSoamDmCurrentStats-FrameDelayForwardMin, mefSoamDmCurrentStatsFrameDelayForwardMax, mefSoamDmCurrentStatsFrameDelayForwardAvg, mefSoamDmCurrentStats-FrameDelayBackwardMin, mefSoamDmCurrentStatsFrameDelayBackwardMax, mefSoamDmCurrentStatsFrameDelayBackwardAvg, mefSoamDmCurrent-StatsIfdvForwardMin, mefSoamDmCurrentStatsIfdvForwardMax, mefSoamDmCurrentStatsIfdvForwardAvg, mefSoamDmCurrentStatsIfdvBack-wardMin, mefSoamDmCurrentStatsIfdvBackwardMax, mefSoamDmCurrent-StatsIfdvBackwardAvg, mefSoamDmCurrentStatsIfdvTwoWayMin, mefSoamDmCurrentStatsIfdvTwoWayMax, mefSoamDmCurrent-StatsIfdvTwoWayAvg, mefSoamDmCurrentStatsFrameDelayRangeForward-Max, mefSoamDmCurrentStatsFrameDelayRangeForwardAvg, mefSoamDm-CurrentStatsFrameDelayRangeBackwardMax, mefSoamDmCurrentStats-FrameDelayRangeBackwardAvg, mefSoamDmCurrentStatsFrameDelay-RangeTwoWayMax, mefSoamDmCurrentStatsFrameDelayRangeTwoWayAvg, mefSoamDmCurrentStatsSoamPdusSent, mefSoamDmCurrentStats-SoamPdusReceived, mefSoamDmCurrentStatsBinsCounter, mefSoamDmHisto-ryStatsEndTime, mefSoamDmHistoryStatsElapsedTime, mefSoamDmHisto-ryStatsSuspect, mefSoamDmHistoryStatsFrameDelayTwoWayMin, mefSoamDmHistoryStatsFrameDelayTwoWayMax, mefSoamDmHistoryStats-FrameDelayTwoWayAvg, mefSoamDmHistoryStatsFrameDelayForwardMin, mefSoamDmHistoryStatsFrameDelayForwardMax, mefSoamDmHistoryStats-FrameDelayForwardAvg, mefSoamDmHistoryStatsFrameDelayBackwardMin, mefSoamDmHistoryStatsFrameDelayBackwardMax, mefSoamDmHistoryStats-FrameDelayBackwardAvg, mefSoamDmHistoryStatsIfdvForwardMin, mefSoamDmHistoryStatsIfdvForwardMax, mefSoamDmHistoryStatsIfdvFor-wardAvg, mefSoamDmHistoryStatsIfdvBackwardMin, mefSoamDmHisto-ryStatsIfdvBackwardMax, mefSoamDmHistoryStatsIfdvBackwardAvg, mefSoamDmHistoryStatsIfdvTwoWayMin, mefSoamDmHistoryStatsIfdvTwo-WayMax, mefSoamDmHistoryStatsIfdvTwoWayAvg, mefSoamDmHisto-ryStatsFrameDelayRangeForwardMax, mefSoamDmHistoryStatsFrameDelay-RangeForwardAvg, mefSoamDmHistoryStatsFrameDelayRangeBackwardMax, mefSoamDmHistoryStatsFrameDelayRangeBackwardAvg, mefSoamDmHisto-ryStatsFrameDelayRangeTwoWayMax, mefSoamDmHistoryStatsFrameDelay-RangeTwoWayAvg, mefSoamDmHistoryStatsSoamPdusSent, mefSoamDmHis-toryStatsSoamPdusReceived, mefSoamDmHistoryStatsBinsCounter	

Table 9 - vNID SOAM PM Requirement Alignment

Most of the objects from MEF 36 [23] are listed in Table 9, except those items not required by MEF 43 [26], such as objects in ***mefSoamLmMeasuredStatsTable***, ***mefSoamLmThresholdCfg-Table***, and ***mefSoamDmThresholdCfgTable***.

6.5.10 vNID RPE Service Attribute Alignment

Specific SNMP objects listed in Table 10 are covered in Section 7.2 in this document and the SNMPv2 MIB [2].

Attribute Name ([26] Table 18)	vNID MIB Object Name	SP Access
n/a	sysUpTime (SNMPv2 MIB) mefServiceSystemTime (*)	Read-only
RPE IP Type	mefServiceRpeCfgIpType (*)	Read-only

ICMP Enablement for IPv4	mefServiceRpeCfgIcmp (*)	Read-only
IPv4 Address	mefServiceRpeCfgIpv4 (*)	Read-only
IPv4 Subnet Mask	mefServiceRpeCfgIpv4Subnet (*)	Read-only
IPv4 Gateway Address	mefServiceRpeCfgIpv4GatewayAddress (*)	Read-only
Indication of Ability to Support IPv6	mefServiceRpeCfgIpSupported (*)	Read-only
IPv6 Auto configuration Enablement	mefServiceRpeCfgIpSupported (*)	Read-only
IPv6 Prefix Length	mefServiceRpeCfgIpv6PrefixLength (*)	Read-only
IPv6 Address	mefServiceRpeCfgIpv6 (*)	Read-only
IPv6 Static Suffix	mefServiceRpeCfgIpv6StaticSuffix (*)	Read-only
IPv6 Gateway Address	mefServiceRpeCfgIPv6GatewayAddress (*)	Read-only
ICMP Enablement for IPv6	mefServiceRpeCfgIcmp (*)	Read-only
List of RMI Management Protocols Supported	mefServiceRpeCfgProtocol (*)	Read-only
RPE Notification IP Address(es)	mefServiceRpeCfgIpNotification1 (*), mefServiceRpeCfgIpNotification2 (*), mefServiceRpeCfgIpNotification3 (*)	Read-write

Table 10 - vNID RPE Service Attribute Alignment

6.5.11 vNID Notification Requirement Alignment

Specific SNMP notification types listed in Table 11 are supported via the indicated MIB. No new notifications are specified in the vNID MIB.

Notification Name ([26] Tables 20, 21, 22)	MIB Notification Name
UNI Link Down	linkDown (IF-MIB)
UNI Link Up	linkup (IF-MIB)
SOAM Config Error Assert	mefSoamConfigErrorAssertAlarm (SOAM-FM-MIB)
SOAM Config Error Clear	mefSoamConfigErrorClearAlarm (SOAM-FM-MIB)
SOAM MEP Operational Status, SOAM MEP Administrative Status	mefSoamMepOperStatusAlarm (SOAM-FM-MIB)
SOAM MEP Defect	mefSoamMepDefectAlarm (SOAM-FM-MIB)
SOAM LCK	mefSoamLckAlarm (SOAM-FM-MIB)
SOAM AIS	mefSoamAisAlarm (SOAM-FM-MIB)
SOAM Availability Change	mefSoamAvailabilityChangeAlarm (SOAM-PM-MIB)
SOAM LM Session State Change	mefSoamLmSessionStartStopAlarm (SOAM-PM-MIB)
SOAM DM Session State Change	mefSoamDmSessionStartStopAlarm (SOAM-PM-MIB)

Link OAM Critical Link Events Rx, Link OAM Dying Gasp Rx, Link OAM Link Fault Rx, Link OAM Critical Link Event Tx, Link OAM Critical Link Fault Tx	dot3OamNonThresholdEvent (OAM-MIB)

Table 11 - vNID Notification Requirements

6.6 Specific Requirements from non-MEF MIBs and this document

[R4] The following objects found in the IF-MIB [3] **SHALL** be supported by the RPE for the vNID UNI: ***ifIndex***, ***ifType***, ***ifMtu***, ***ifSpeed***, and ***ifAdminStatus***.

[R5] The ***ifType*** value **SHALL** be ethernetCsmacd(6) for the vNID UNI.

[R6] The following object found in the SNMPv2-SMI MIB **SHALL** be supported by the RPE for the vNID UNI: ***sysUpTime***.

[R7] The following notifications found in the IF-MIB [3] **SHALL** be supported by the RPE for the vNID UNI: ***linkDown*** and ***linkUp***.

[R8] The following objects found in the MAU-MIB [7] **SHALL** be supported by the RPE for the vNID UNI: ***ifMauType***, ***ifMauDefaultType***, ***ifMauAutoNegAdminStatus, ifMauAutoNegCapabilityBits, ifMauAutoNegCapAdvertisedBits***.

[R9] The following object found in the EtherLike-MIB [5] **SHALL** be supported by the RPE for the vNID UNI: ***dot3StatsDuplexStatus***.

[R10] The following objects found in the IEEE8023-DOT3-OAM-MIB [31] **SHALL** be supported by the RPE for the vNID UNI: ***dot3OamAdminState***, ***dot3OamMode***, ***dot3OamLoopbackStatus***, ***dot3OamOperStatus***.

[R11] The following notification found in the IEEE8023-DOT3-OAM-MIB [31] **SHALL** be supported by the RPE for the vNID UNI: ***dot3OamNonThresholdEvent***.

6.7 Specific Requirements from SOAM MEF MIBs and this document

[R12] All the mandatory objects from the IEEE8021-CFM-MIB and IEEE8021-CFM-V2-MIB [28] listed in Table 8 **SHALL** be supported by the RPE for the vNID UNI.

[D2] All the optional objects from the IEEE8021-CFM-MIB and IEEE8021-CFM-V2-MIB [28] listed in Table 8 **SHOULD** be supported by the RPE for the vNID UNI.

[R13] All the mandatory objects from the SOAM FM MIB [20] [21] listed in Table 8 **SHALL** be supported by the RPE for the vNID UNI.

[D3] All the optional objects from the SOAM FM MIB [20] [21] listed in Table 8 **SHOULD** be supported by the RPE for the vNID UNI.

[R14] All the mandatory notifications from the SOAM FM MIB [20] [21] listed in Table 11, **SHALL** be supported by the RPE for the vNID UNI.

[D4] Optional notifications from the SOAM FM MIB [20] [21] listed in Table 11, including ***mefSoamLckAlarm*** and ***mefSoamAisAlarm*** **SHOULD** be supported by the RPE for the vNID UNI.

[R15] All the mandatory objects from the SOAM PM MIB [23] listed in Table 9 **SHALL** be supported by the RPE for the vNID UNI.

[D5] All the optional objects from the SOAM PM MIB [23] listed in Table 9 **SHOULD** be supported by the RPE for the vNID UNI.

[R16] All the mandatory notifications from the SOAM PM MIB [23] listed in Table 11, including ***mefSoamAvailabilityChangeAlarm***, ***mefSoamLmSessionStart-StopAlarm***, and ***mefSoamDmSessionStartStopAlarm***, **SHALL** be supported by the RPE for the vNID UNI.

6.8 Specific Requirements from MEF 40, MEF 42 and this document

This document draws heavily upon the SNMP MIB objects found in MEF 40 [24], the UNI-EVC MIB, and in MEF 42 [25], the ENNI-OVC MIB.

[R17] All the mandatory objects from the UNI-EVC MIB [24] listed in Table 2 - Table 4, and Table 6 **SHALL** be supported by the RPE for the vNID UNI.

[D6] All the optional objects from the UNI-EVC MIB [24] listed in Table 2 - Table 4, and Table 6 **SHOULD** be supported by the RPE for the vNID UNI.

[R18] All the mandatory objects from the ENNI-OVC MIB [25] listed in Table 4 and Table 5 and ***mefServiceOvcCfgAdminState*** **SHALL** be supported by the RPE for the vNID UNI.

[D7] All the optional objects from the ENNI-OVC MIB [25] indicated by Table 4 and Table 5 **SHOULD** be supported by the RPE for the vNID UNI.

7. vNID MIB Overview

The vNID MIB is divided into two different object groupings: vNID UNI Attributes and RPE Attributes. Inherited attributes from other MIBs are covered in Sections 6.5.

7.1 vNID UNI Service Attributes

vNID UNI Service Attribute enhancements are covered in the vNID UNI Configuration Table.

Rows in the ***mefServiceVnidUniCfgTable*** table are automatically created on the RPE based upon the vNID Service being provided for the UNI by the AP, according to the Service Order agreed between the SP and the AP. Similarly rows are deleted when the vNID Service is removed.

The following objects in the vNID UNI table are supported in the ***mefServiceVnidUniCfgTable***:

- ***mefServiceVnidUniCfgType*** - indicates the type of vNID UNI Service
- ***mefServiceVnidUniCfgApIdentifier*** - the vNID AP identifier which is distinct from the ***mefServiceInterfaceCfgIdentifier*** and the ***mefServiceUniCfgIdentifier***
- ***mefServiceVnidUniCfgSpIdentifier*** - the vNID SP identifier which is distinct from the ***mefServiceInterfaceCfgIdentifier*** and the ***mefServiceUniCfgIdentifier***
- ***mefServiceVnidUniCfgUniMtuSize*** - configures the maximum MTU size available for the vNID UNI Service
- ***mefServiceVnidUniCfgOvcPerUniMax*** - indicates the maximum number OVCs that maybe on a UNI.
- ***mefServiceVnidUniCfgCeVlansMax*** - indicates the quantity of CE-VLANs that can be mapped to a single OVC at the UNI.

7.2 RPE Service Attributes

There is one instance of the ***mefServiceRpeCfgTable*** table per RMI. The ***mefServiceRpeCfgTable*** is automatically created on the RPE based upon the vNID Service being provided by the AP, according to the Service Order agreed between the SP and the AP. Similarly the instance is deleted when the vNID Service is removed.

The following objects in the RPE table are supported in the ***mefServiceRpeCfgTable***:

- ***mefServiceSystemTime*** - local time, date, and time zone
- ***mefServiceRpeCfgProtocol*** - indicates the RPE supported protocols
- ***mefServiceRpeCfgIpSupported*** - indicates whether IPv4 or IPv6 is supported
- ***mefServiceRpeCfgIpType*** - type of RPE IP address, i.e. IPv4 or IPv6
- ***mefServiceRpeCfgIcmp*** - indicates whether IPv4 or IPv6 ICMP is enabled on the RPE
- ***mefServiceRpeCfgIpv4*** - IPv4 address
- ***mefServiceRpeCfgIpv4Subnet*** - IPv4 subnet mask

- ***mefServiceRpeCfgIpv4GatewayAddress*** - IPv4 gateway address
- ***mefServiceRpeCfgIpv6PrefixLength*** - IPv6 prefix length
- ***mefServiceRpeCfgIpv6*** - IPv6 address when auto configuration is not enabled
- ***mefServiceRpeCfgIpv6StaticSuffix*** - IPv6 suffix address when auto configuration is enabled
- ***mefServiceRpeCfgIpv6GatewayAddress*** - IPv6 gateway address when auto configuration is not enabled
- ***mefServiceRpeCfgIpNotification1*** - Notification destination 1
- ***mefServiceRpeCfgIpNotification2*** - Notification destination 2
- ***mefServiceRpeCfgIpNotification3*** - Notification destination 3

7.3 Notification and Notification Configuration Objects

The vNID spec contains references to existing Notifications found in other MEF and standard MIBs and does not define any new notifications.

7.4 vNID MIB Conformance and Compliance

There are two conformances items: the ***mefServiceVnidMibCompliances*** section and the ***mefServiceVnidMibGroups*** conformance group.

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

- mefServiceVnidUniMandatoryGroup
- mefServiceRpeMandatoryGroup

8. vNID MIB Requirements

The vNID MIB defines the managed objects necessary to support the MEF vNID Service.

[R19] The objects from the ***mefServiceVnidUniCfgTable*** **SHALL** be supported by the RPE for the vNID UNI.

[R20] The objects from the ***mefServiceRpeCfgTable*** **SHALL** be supported by the RPE for the vNID UNI.

9. vNID MIB Definitions

```
MEF-VNID-MIB DEFINITIONS ::= BEGIN
  IMPORTS
    MODULE-IDENTITY, OBJECT-TYPE, Unsigned32, enterprises
              FROM SNMPv2-SMI            -- RFC 2578
    TEXTUAL-CONVENTION, DisplayString, DateAndTime
              FROM SNMPv2-TC             -- RFC 2579
    OBJECT-GROUP, MODULE-COMPLIANCE
              FROM SNMPv2-CONF           -- RFC 2580
    ifIndex
              FROM IF-MIB                -- RFC 2863
    InetAddress, InetAddressType
              FROM INET-ADDRESS-MIB;     -- RFC 4001

mefVnidMib MODULE-IDENTITY
    LAST-UPDATED    "201401171200Z" -- January 17, 2014
    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 Virtual NID Services and intended for Metro Ethernet
             Network Elements (NE).

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            All rights reserved.

    ********************************************************************
    Reference Overview

    [vNID] refers to MEF 43, 'Virtual NID (vNID) Functionality for E-Access
        Services', January 2014
    ********************************************************************
          "
    REVISION        "201401171200Z" -- January 17, 2014
    DESCRIPTION
            "Initial Version."
    ::= { enterprises mef(15007) mefService(2) 4 }


-- ********************************************************************
-- Object definitions in the Service vNID MIB Module
-- ********************************************************************
mefServiceVnidObjects            OBJECT IDENTIFIER ::= { mefVnidMib 1 }
mefServiceVnidMibConformance     OBJECT IDENTIFIER ::= { mefVnidMib 2 }

-- ********************************************************************
-- Groups in the Service vNID MIB Module
-- ********************************************************************
mefServiceVnidUniAttributes    OBJECT IDENTIFIER ::= { mefServiceVnidObjects 1 }
mefServiceRpeAttributes        OBJECT IDENTIFIER ::= { mefServiceVnidObjects 2 }


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

```
-- ****************************************************************************

MefServiceVnidType ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION
        "This object configures vNID type at the UNI.

         other(0)            UNI is not configured for vNID Services.

         vNidBasicCase(1)    vNID Service Case B (Basic) indicates there is a
                             single OVC to the UNI. All traffic from the UNI is
                             mapped to that OVC.

         vNidAdvancedCase(2) vNID Service Case A (Advanced) indicates there is
                             one or more OVCs, each with a different CE-VLAN ID
                             map at a UNI. The CE-VLAN ID map may contain one or
                             more CE-VLAN IDs.
        "
   REFERENCE
       "[vNID] 6.0 R1, R2"
    SYNTAX      INTEGER {
        other                (0),
        vNidBasicCase        (1),
        vNidAdvancedCase     (2)
    }


-- ****************************************************************************
-- Ethernet vNID UNI Service Attributes Configuration
-- ****************************************************************************

mefServiceVnidUniCfgTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF MefServiceVnidUniCfgEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
       "This table represents the vNID Service UNI configuration attributes
        at a specific vNID UNI. The purpose of this table is to allow
        management of a vNID UNI.

        Rows are automatically created on the RPE based upon the vNID service
        being provided for the UNI by the AP, according to the Service Order
        agreed between the SP and the AP. Similarly rows are deleted when the
        vNID service is removed.

        This table may be sparsely populated.

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

        The RPE for the AP's vNID Service may or may not be located at the
        vNID UNI; in either case, the RPE may allow the SP to manage multiple
        vNID UNIs over the same RMI connection.

        Hence, rows in this table are accessed by the IF-MIB interface
        object ifIndex, so as to allow the SP to identify a specific vNID UNI.
        The ifIndex may identify the physical UNI port, if the RPE is located
        at the UNI; or it may be a 'virtual' ifIndex allocated by the RPE to
        represent the UNI, if the RPE is not located at the UNI.  In the latter
        case, the RPE must allocate unique ifIndex values for all the UNIs
        managed over the same RMI connection. Note that the RPE may support
        multiple RMI connections (e.g. from different SPs) - in this case,
        it is permissible for the RPE to reuse the same ifIndex values for
        UNIs managed over different RMI connections.
```

```
        Rows in this table and the values of the objects in the row are
        persistent (non-volatile) upon reboot.
      "
    REFERENCE
      "[vNID] 7.2.1.1"
    ::= { mefServiceVnidUniAttributes 1 }

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

MefServiceVnidUniCfgEntry ::= SEQUENCE {
      mefServiceVnidUniCfgType             MefServiceVnidType,
      mefServiceVnidUniCfgApIdentifier     DisplayString,
      mefServiceVnidUniCfgSpIdentifier     DisplayString,
      mefServiceVnidUniCfgUniMtuSize       Unsigned32,
      mefServiceVnidUniCfgOvcPerUniMax     Unsigned32,
      mefServiceVnidUniCfgCeVlansMax       Unsigned32
    }

mefServiceVnidUniCfgType OBJECT-TYPE
    SYNTAX      MefServiceVnidType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
      "This object indicates the type of vNID Service at the
       specific UNI that is designated to support vNID Services.
      "
    REFERENCE
      "[vNID] 6.0 R1, R2"
    DEFVAL { other }
    ::= { mefServiceVnidUniCfgEntry 1 }

mefServiceVnidUniCfgApIdentifier OBJECT-TYPE
    SYNTAX      DisplayString (SIZE(0..45))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
      "This object indicates the vNID AP identifier. This is distinct from
       the mefServiceInterfaceCfgIdentifier and the mefServiceUniCfgIdentifier.
       The identifier is an arbitrary text string that is used to identify an
       vNID UNI interface that is accessible by the SP.

       Octet values of 0x00 through 0x1f are illegal.
      "
    REFERENCE
      "[vNID] R4, R5, R6"
    DEFVAL { "" }
    ::= { mefServiceVnidUniCfgEntry 2 }

mefServiceVnidUniCfgSpIdentifier OBJECT-TYPE
    SYNTAX      DisplayString (SIZE(0..45))
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
      "This object indicates the vNID SP identifier. This is distinct from
       the mefServiceInterfaceCfgIdentifier and the mefServiceUniCfgIdentifier.
```

```
        The identifier is an arbitrary text string that is used to identify an
        vNID UNI interface that is accessible by the SP.

        Octet values of 0x00 through 0x1f are illegal.
       "
    REFERENCE
       "[vNID] R7, R8, R9"
    DEFVAL { "" }
    ::= { mefServiceVnidUniCfgEntry 3 }

mefServiceVnidUniCfgUniMtuSize OBJECT-TYPE
    SYNTAX      Unsigned32 (1522..16384)
    UNITS       "octets"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
       "This object indicates the configured UNI MTU size that is equal or
        less than ifMtu (UNI MTU max), the maximum size that the AP offers to
        the SP.
       "
    REFERENCE
       "[vNID] R18, R19"
    DEFVAL { 1522 }
    ::= { mefServiceVnidUniCfgEntry 4 }

mefServiceVnidUniCfgOvcPerUniMax OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       "This object indicates the maximum number of OVCs that may be on a
        UNI.
       "
    REFERENCE
       "[vNID] R103, R107"
    DEFVAL { 1 }
    ::= { mefServiceVnidUniCfgEntry 5 }

mefServiceVnidUniCfgCeVlansMax OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       "This object indicates the maximum number of CE-VLAN IDs that can
        be mapped to a single OVC at the UNI. A value = 1 indicates that the
        UNI can only map single CE-VLANs to an OVC. A value > 1 indicates that
        up to the indicated maximum can be mapped to a single OVC.
       "
    REFERENCE
       "[vNID] R108, D21"
    DEFVAL { 1 }
    ::= { mefServiceVnidUniCfgEntry 6 }


-- ****************************************************************************
-- Ethernet Remote Processing Entity (RPE) Service Attributes Configuration
-- ****************************************************************************

mefServiceRpeCfgTable OBJECT IDENTIFIER ::= { mefServiceRpeAttributes 1 }
--      This table represents the specific RPE service attributes configuration
--      table for an MEF Ethernet compliant RPE. The primary
--      purpose of this table is to provide management of the RPE providing
--      vNID Services for a NE.  These objects are automatically created on the
```

```
--      RPE based upon the vNID service being provided by the AP, according to
--      the Service Order agreed between the SP and the AP. Similarly the
--      objects are deleted when the vNID service is removed.

mefServiceSystemTime OBJECT-TYPE
    SYNTAX      DateAndTime
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       "This object specifies the RPE local time, date, and time zone.

        It is a read-only value. The method for configuring the system
        Time is not defined.
       "
    REFERENCE
       "[vNID] 7.2.5.1 R90, R92, R93, R94, R95, R96"
    ::= { mefServiceRpeCfgTable 1 }

mefServiceRpeCfgProtocol OBJECT-TYPE
    SYNTAX      BITS {
                     bSnmpv2c(0),
                     bSnmpv3(1),
                     bNetconf(2)
                }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       "A vector of bits that indicates the type of RMI management protocols
        that are supported by the vNID RPE. It is not used to configure these
        protocols, only report the supported state of these protocols.

        A bit set to '1' indicates the specific protocol is enabled.

        A bit set to '0' indicates the specific protocol is disabled.

        bSnmpv2c(0)     SNMPv2c enable
        bSnmpv3(1)      SNMPv3 enable
        bNetconf(2)     NETCONF enable
       "
    REFERENCE
       "[vNID] 7.2.4.2 R80, R81, O9, O10"
    ::= { mefServiceRpeCfgTable 2 }

mefServiceRpeCfgIpSupported OBJECT-TYPE
    SYNTAX      BITS {
                     bIPv4(0),
                     bIPv6Auto(1),
                     bIPv6Static(2)
                }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       "A vector of bits that indicates which IP protocols can be supported by
        the vNID RPE. It is not used to configure these protocols, only report
        the supported state of these protocols.

        A bit set to '1' indicates the specific IP protocol can be supported.

        A bit set to '0' indicates the specific IP protocol cannot be supported.

        bIPv4(0)        IPv4 support enable
        bIPv6Auto(1)    IPv6 auto configuration mode support enable
        bIPv6Static(2)  IPv6 static configuration mode support enable
```

```
      "
    REFERENCE
       "[vNID] 7.2.4.2 R76, D18, R82, CR14, CR15"
    ::= { mefServiceRpeCfgTable 3 }

mefServiceRpeCfgIpType OBJECT-TYPE
    SYNTAX      BITS {
                     bIPv4(0),
                     bIPv6Auto(1),
                     bIPv6Static(2)
                }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       "A vector of bits that indicates which IP protocols are currently
        supported by the vNID RPE. It is not used to configure these
        protocols, only report the active state of these protocols.

        A bit set to '1' indicates the specific IP protocol is enabled.

        A bit set to '0' indicates the specific IP protocol is disabled.

        bIPv4(0)        IPv4 support enable
        bIPv6Auto(1)    IPv6 auto configuration mode support enable
        bIPv6Static(2)  IPv6 static configuration mode support enable
       "
    REFERENCE
       "[vNID] 7.2.4.2 R75"
    ::= { mefServiceRpeCfgTable 4 }

mefServiceRpeCfgIcmp OBJECT-TYPE
    SYNTAX      BITS {
                     bIPv4(0),
                     bIPv6(1)
                }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       "A vector of bits that indicates which IP ICMP protocols
        are currently supported by the vNID RPE. It is not used to
        configure these protocols, only report the active state of
        these protocols.

        A bit set to '1' indicates the specific ICMP protocol is enabled.

        A bit set to '0' indicates the specific ICMP protocol is disabled.

        bIPv4(0)      IPv4 ICMP supported enable
        bIPv6(1)      IPv6 ICMP supported enabled
       "
    REFERENCE
       "[vNID] 7.2.4.2 R78, CR22"
    ::= { mefServiceRpeCfgTable 5 }

mefServiceRpeCfgIpv4 OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       "This object is the RPE IPv4 address if mefServiceRpeCfgIpType
        'bIPv4' is set, otherwise the value of this object is ignored.
       "
    REFERENCE
```

```
       "[vNID] 7.2.4.2 R79"
    ::= { mefServiceRpeCfgTable 6 }

mefServiceRpeCfgIpv4Subnet OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       "This object is the RPE IPv4 subnet address if mefServiceRpeCfgIpType
        'bIPv4' is set, otherwise the value of this object is ignored.
       "
    REFERENCE
       "[vNID] 7.2.4.2 R80"
    ::= { mefServiceRpeCfgTable 7 }

mefServiceRpeCfgIpv4GatewayAddress OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       "This object is the RPE IPv4 gateway address if mefServiceRpeCfgIpType
        'ipv4' is set, otherwise the value of this object is ignored.
       "
    REFERENCE
       "[vNID] 7.2.4.2 R81"
    ::= { mefServiceRpeCfgTable 8 }

mefServiceRpeCfgIpv6PrefixLength OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       "This object indicates the length of the IPv6 prefix length if the RPE
        mefServiceRpeCfgIpType 'ipv6' is set, otherwise the value of this
        object is ignored.
       "
    REFERENCE
       "[vNID] 7.2.4.2 CR16, CR17"
    ::= { mefServiceRpeCfgTable 9 }

mefServiceRpeCfgIpv6 OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       "This object indicates the IPv6 address when IPv6 auto configuration is
        not enabled, otherwise the value of this object is ignored.
       "
    REFERENCE
       "[vNID] 7.2.4.2 CR18"
    ::= { mefServiceRpeCfgTable 10 }

mefServiceRpeCfgIpv6StaticSuffix OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       "This object indicates the IPv6 static suffix when IPv6 auto
        configuration is enabled, otherwise the value of this object
        is ignored.
       "
    REFERENCE
       "[vNID] 7.2.4.2 CR19"
```

```
    ::= { mefServiceRpeCfgTable 11 }

mefServiceRpeCfgIpv6GatewayAddress OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       "This object indicates the IPv6 gateway address when IPv6 auto
        configuration is not enabled, otherwise the value of this object
        is ignored.
       "
    REFERENCE
       "[vNID] 7.2.4.2 CR20"
    ::= { mefServiceRpeCfgTable 12 }

mefServiceRpeCfgIpNotification1 OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
       "IP Notification destination address 1 of the vNID RPE.

        A value of 0 indicates no trap host address is configured
        via this object for the RPE.
       "
    REFERENCE
       "[vNID] 7.2.4.2 R86"
    ::= { mefServiceRpeCfgTable 13 }

mefServiceRpeCfgIpNotification2 OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
       "IP Notification destination address 2 of the vNID RPE.

        A value of 0 indicates no trap host address is configured
        via this object for the RPE.
       "
    REFERENCE
       "[vNID] 7.2.4.2 R86"
    ::= { mefServiceRpeCfgTable 14 }

mefServiceRpeCfgIpNotification3 OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
       "IP Notification destination address 3 of the vNID RPE.

        A value of 0 indicates no trap host address is configured
        via this object for the RPE.
       "
    REFERENCE
       "[vNID] 7.2.4.2 R86"
    ::= { mefServiceRpeCfgTable 15 }


-- ****************************************************************************
-- vNID MIB Module - Conformance Information
-- ****************************************************************************

mefServiceVnidMibCompliances OBJECT IDENTIFIER ::=
```

```
    { mefServiceVnidMibConformance 1 }
mefServiceVnidMibGroups      OBJECT IDENTIFIER ::=
    { mefServiceVnidMibConformance 2 }


-- ****************************************************************
-- vNID MIB Units of conformance
-- ****************************************************************

mefServiceVnidUniMandatoryGroup OBJECT-GROUP
    OBJECTS {
      mefServiceVnidUniCfgType,
      mefServiceVnidUniCfgApIdentifier,
      mefServiceVnidUniCfgSpIdentifier,
      mefServiceVnidUniCfgUniMtuSize,
      mefServiceVnidUniCfgOvcPerUniMax,
      mefServiceVnidUniCfgCeVlansMax
    }
    STATUS      current
    DESCRIPTION
       "Mandatory objects for the vNID UNI Service Attributes group."
    ::= { mefServiceVnidMibGroups 1 }

mefServiceVnidRpeMandatoryGroup OBJECT-GROUP
    OBJECTS {
      mefServiceSystemTime,
      mefServiceRpeCfgProtocol,
      mefServiceRpeCfgIpSupported,
      mefServiceRpeCfgIpType,
      mefServiceRpeCfgIcmp,
      mefServiceRpeCfgIpv4,
      mefServiceRpeCfgIpv4Subnet,
      mefServiceRpeCfgIpv4GatewayAddress,
      mefServiceRpeCfgIpv6PrefixLength,
      mefServiceRpeCfgIpv6,
      mefServiceRpeCfgIpv6StaticSuffix,
      mefServiceRpeCfgIpv6GatewayAddress,
      mefServiceRpeCfgIpNotification1,
      mefServiceRpeCfgIpNotification2,
      mefServiceRpeCfgIpNotification3
      }
    STATUS      current
    DESCRIPTION
       "Mandatory objects for the vNID RPE Service Attributes
        group."
    ::= { mefServiceVnidMibGroups 2 }


-- ****************************************************************
-- vNID MIB Module Compliance statements
-- ****************************************************************

mefServiceVnidMibCompliance MODULE-COMPLIANCE
    STATUS       current
    DESCRIPTION "The compliance statement for the Ethernet Service vNID MIB."
    MODULE
        MANDATORY-GROUPS {
            mefServiceVnidUniMandatoryGroup,
            mefServiceVnidRpeMandatoryGroup
        }

    ::= { mefServiceVnidMibCompliances 1 }
```

```
END
```

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