Technical Specification
MEF 19

Abstract Test Suite
for
UNI Type 1

April, 2007

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

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:

(a) 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

(b) 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

(c) 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 2007. All Rights Reserved.

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

Table of Contents

1. ABSTRACT 5

2. TERMINOLOGY 5

3. SCOPE 9

4. COMPLIANCE LEVELS 9

5. INTRODUCTION 9

6. TEST CONFIGURATION 10

7. TEMPLATE FOR ABSTRACT TEST CASES FOR UNI TYPE 1 11

8. ABSTRACT TEST CASES FOR UNI TYPE 1 COMMON CHARACTERISTICS 12

TEST CASE 1: Type 1 UNI-N Ethernet Physical Medium 13
TEST CASE 2: Type 1 UNI-N Ethernet Frame Format - Tagged, Untagged and Priority Tagged 14
TEST CASE 3: Type 1 UNI-N Minimum and Maximum Ethernet Frame Size 15

9. ABSTRACT TEST CASES FOR UNI TYPE 1.1 SPECIFIC CHARACTERISTICS 16

TEST CASE 4: Type 1.1 UNI-N CE-VLAN ID - Single EVC 17
TEST CASE 5: Type 1.1 UNI-N Configurable CE-VLAN ID/EVC Map - No CE-VLAN ID 18
TEST CASE 6: Type 1.1 UNI-N Bandwidth Profile per Ingress UNI 19
TEST CASE 7: Type 1.1 UNI-N BW Profile Rate Enforcement when CIR > 0 and EIR = 0 20
TEST CASE 8: Type 1.1 UNI-N Mandatory CIR Configuration Granularity 21
TEST CASE 9: Type 1.1 UNI-N Optional CIR Configuration Granularity 22
TEST CASE 10: Type 1.1 UNI-N CBS Configuration 23
TEST CASE 11: Type 1.1 UNI-N Mandatory Layer 2 Control Protocol Processing 24
TEST CASE 12: Type 1.1 UNI-N Optional Layer 2 Control Protocol Processing 25
TEST CASE 13: Type 1.1 UNI-N Optional Layer 2 Control Protocol Discard 26
TEST CASE 14: Type 1.1 UNI-N Point-to-Point EVC 27
TEST CASE 15: Type 1.1 UNI-N CE-VLAN ID Preservation 28
TEST CASE 16: Type 1.1 UNI-N CE-VLAN CoS Preservation 29
TEST CASE 17: Type 1.1 UNI-N Service Frame Unconditional Delivery 30

10. ABSTRACT TEST CASES FOR UNI TYPE 1.2 SPECIFIC CHARACTERISTICS 31

TEST CASE 18: Type 1.2 UNI-N Service Multiplexing 32
TEST CASE 19: Type 1.2 UNI-N Service Multiplexing - Minimum Number of EVCs 33
TEST CASE 20: Type 1.2 UNI-N Minimum Number of CE-VLAN IDs 34
TEST CASE 21: Type 1.2 UNI-N CE-VLAN ID Range 35
TEST CASE 22: Type 1.2 UNI-N Configurable CE-VLAN ID/EVC Map 36
TEST CASE 23: Type 1.2 UNI-N CE-VLAN ID/EVC Map Service Frame Discard 37
TEST CASE 24: Type 1.2 UNI-N All-to-One Bundling 38
TEST CASE 25: Type 1.2 UNI-N Bandwidth Profile per Ingress UNI 39
TEST CASE 26: Type 1.2 UNI-N Bandwidth Profile per EVC 40
TEST CASE 27: Type 1.2 UNI-N Bandwidth Profile per Class of Service 41
TEST CASE 28: Type 1.2 UNI-N Multiple Bandwidth Profiles 42
TEST CASE 29: Type 1.2 UNI-N BW Profile Rate Enforcement when CIR > 0 and EIR = 0 43
TEST CASE 30: Type 1.2 UNI-N BW Profile Rate Enforcement when CIR = 0 and EIR > 0 44
TEST CASE 31: Type 1.2 UNI-N BW Profile Rate Enforcement when CIR > 0 and EIR > 0 45
TEST CASE 32: Type 1.2 UNI-N Mandatory CIR Configuration Granularity 46
TEST CASE 33: Type 1.2 UNI-N Mandatory EIR Configuration Granularity 47
TEST CASE 34: Type 1.2 UNI-N Optional CIR Configuration Granularity 48
TEST CASE 35: Type 1.2 UNI-N Optional EIR Configuration Granularity 49
TEST CASE 36: Type 1.2 UNI-N CBS Configuration 51

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 37: Type 1.2 UNI-N EBS Configuration 52
TEST CASE 38: Type 1.2 UNI-N Optional Layer 2 Control Protocol Discard 53
TEST CASE 39: Type 1.2 UNI-N Optional Layer 2 Control Protocol Generation 54
TEST CASE 40: Type 1.2 UNI-N Concurrent Point-to-Point and Multipoint EVCs 55
TEST CASE 41: Type 1.2 UNI-N CE-VLAN ID Preservation 56
TEST CASE 42: Type 1.2 UNI-N CE-VLAN CoS Preservation 57
TEST CASE 43: Type 1.2 UNI-N Broadcast & Multicast Service Frame Unconditional Delivery 58
TEST CASE 44: Type 1.2 UNI-N Unicast Service Frame Unconditional Delivery 59

11. REFERENCES 60

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

1. Abstract

This document defines test procedures based on the requirements for the User to Network Interface (UNI) Type 1 mode or manual configuration mode. The UNI Type 1 mode provides data-plane connectivity services without control-plane or management-plane capabilities.

2. Terminology

All to One Bundling	A UNI attribute in which all CE-VLAN IDs are associated with a single EVC
Bandwidth Profile	A characterization of ingress 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. In this document the reference point is the UNI
Broadcast Service Frame	A Service Frame that has the broadcast destination MAC address
Bundling	A UNI attribute in which more than one CE-VLAN ID can be associated with an EVC
CBS	Committed Burst Size
CE	Customer Edge
CE-VLAN CoS	Customer Edge VLAN CoS
CE-VLAN ID	Customer Edge VLAN ID
CE-VLAN ID Preservation	An EVC attribute in which the CE-VLAN ID of an egress Service Frame is identical in value to the CE-VLAN ID of the corresponding ingress Service Frame
CE-VLAN ID/EVC Map	An association of CE-VLAN IDs with EVCs at a UNI
CE-VLAN Tag	Customer Edge VLAN Tag
CF	Coupling Flag
CIR	Committed Information Rate
Class of Service	A set of Service Frames that have a commitment from the Service Provider to receive a particular level of performance
Class of Service Identifier	Information derivable from a) the EVC to which the Service Frame is mapped or b) the combination of the EVC to which the Service Frame is mapped and a set of one or more CE-VLAN CoS values
CM	Color Mode
Color Mode	CM is a Bandwidth Profile parameter. The Color Mode parameter indicates whether the color-aware or color-blind property is employed by the Bandwidth Profile. It takes a value of “color-blind” or “color-aware” only
Color-aware	A Bandwidth Profile property where 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

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

Color-blind	A Bandwidth Profile property where a pre-determined level of Bandwidth Profile compliance for each Service Frame, if present, is ignored when determining the level of compliance for each Service Frame
Committed Burst Size	CBS is a Bandwidth Profile parameter. It limits the maximum number of bytes available for a burst of ingress Service Frames sent at the UNI speed to remain CIR-conformant
Committed Information Rate	CIR is a Bandwidth Profile parameter. It defines the average rate in bits/s of ingress Service Frames up to which the network delivers Service Frames and meets the performance objectives defined by the CoS Service Attribute
Coupling Flag	CF is a Bandwidth Profile parameter. The Coupling Flag allows the choice between two modes of operations of the rate enforcement algorithm. It takes a value of 0 or 1 only
Customer Edge	Equipment on the Subscriber side of the UNI
Customer Edge VLAN CoS	The user priority bits in the IEEE 802.1Q Tag in a Service Frame that is either tagged or priority tagged
Customer Edge VLAN ID	The identifier derivable from the content of a Service Frame that allows the Service Frame to be associated with an EVC at the UNI
Customer Edge VLAN Tag	The IEEE 802.1Q Tag in a tagged Service Frame
EBS	Excess Burst Size
Egress Service Frame	A Service Frame sent from the Service Provider network to the CE
EIR	Excess Information Rate
E-LAN Service	Ethernet LAN Service
E-Line Service	Ethernet Line Service
Ethernet LAN Service	An Ethernet Service Type distinguished by its use of a Multipoint-to-Multipoint EVC
Ethernet Line Service	An Ethernet Service Type distinguished by its use of a Point-to-Point EVC
Ethernet Virtual Connection	An association of two or more UNIs that limits the exchange of Service Frames to UNIs in the Ethernet Virtual Connection
EVC	Ethernet Virtual Connection
Excess Burst Size	EBS is a Bandwidth Profile parameter. It limits the maximum number of bytes available for a burst of ingress Service Frames sent at the UNI speed to remain EIR-conformant
Excess Information Rate	EIR is a Bandwidth Profile parameter. It defines the average rate in bits/s of ingress Service Frames up to which the network may deliver Service Frames without any performance objectives
FD	Frame Delay
FDV	Frame Delay Variation
FLR	Frame Loss Ratio
Frame	Short for Ethernet frame

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

Frame Delay	The time required to transmit a Service Frame from source to destination across the metro Ethernet network
Frame Delay Performance	A measure of the delays experienced by Service Frames belonging to the same CoS instance
Frame Delay Variation	The difference in delay of two Service Frames
Frame Delay Variation Performance	A measure of the variation in the delays experienced by Service Frames belonging to the same CoS instance
Frame Loss Ratio Performance	Frame Loss Ratio is a measure of the number of lost frames inside the MEN. Frame Loss Ratio is expressed as a percentage
Ingress Service Frame	A Service Frame sent from the CE into the Service Provider network
Layer 2 Control Protocol Service Frame	A Service Frame that is used for Layer 2 control, e.g., Spanning Tree Protocol
Layer 2 Control Protocol Tunneling	The process by which a Layer 2 Control Protocol Service Frame is passed through the Service Provider network without being processed and is delivered unchanged to the proper UNI(s)
Multicast Service Frame	A Service Frame that has a multicast destination MAC address
Multipoint-to-Multipoint EVC	An EVC with two or more UNIs. A Multipoint-to-Multipoint EVC with two UNIs is different from a Point-to-Point EVC because one or more additional UNIs can be added to it
Point-to-Point EVC	An EVC with exactly 2 UNIs
Service Frame	An Ethernet frame transmitted across the UNI toward the Service Provider or an Ethernet frame transmitted across the UNI toward the Subscriber
Service Level Agreement	The contract between the Subscriber and Service Provider specifying the agreed to service level commitments and related business agreements
Service Level Specification	The technical specification of the service level being offered by the Service Provider to the Subscriber
Service Multiplexing	A UNI service attribute in which the UNI can be in more than one EVC instance
Service Provider	The organization providing Ethernet Service(s)
SLA	Service Level Agreement
SLS	Service Level Specification
Subscriber	The organization purchasing and/or using Ethernet Services
UNI	User Network Interface
UNI-C	Compound architectural component on the Subscriber side of the UNI that represents all the functions required to connect a subscriber to a MEN
UNI-N	Compound architectural component on the Service Provider side of the UNI that represents all the functions required to connect a MEN to a MEN subscriber
Unicast Service Frame	A Service Frame that has a unicast destination MAC address

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

User Network Interface	The physical demarcation point between the responsibility of the Service Provider and the responsibility of the Subscriber
W_G	W_G is the amount of traffic accepted as Green over the time interval T that should be delivered to the egress UNI
W_Y	W_Y is the amount of traffic accepted as Yellow over the time interval T that may be delivered to the egress UNI

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

3. Scope

The **Abstract Test Suite for UNI Type 1** describes the test procedures based on the requirements for the User to Network Interface (UNI) Type 1 mode or manual configuration mode. Test Cases in this Test Specification are only defined for the UNI-N and each different physical interface MUST be tested independently.

The UNI Type 1 requirements are described in sections 5, 6.1 and 6.2 of MEF 13 *User Network Interface (UNI) Type 1 Implementation Agreement*.

Section 5 of MEF 13 defines the common characteristics of a UNI Type 1 such as the supported physical media and Ethernet frame formats.

Section 6.1 of MEF 13 defines the specific characteristics of a UNI Type 1.1 which is a subset of the UNI Type 1 and which is not meant to support service multiplexing.

Section 6.2 of MEF 13 defines the specific characteristics of a UNI Type 1.2 which is also a subset of the UNI Type 1 but which is meant to support service multiplexing.

UNI Type 2 mode (Service Management) and UNI Type 3 mode (Dynamic Connection Setup) are out of the scope of this document.

This document may be updated in the future to reflect new work done in the MEF Technical Committee.

4. 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. All key words **MUST** be use upper case, bold text.

5. Introduction

This document supplements the existing MEF test specifications MEF 9 *Abstract Test Suite for Ethernet Services at the UNI* and MEF 14 *Abstract Test Suite for Traffic Management Phase 1*, by adding test procedures based on the requirements for the User to Network Interface (UNI) Type 1 mode (manual configuration) defined in MEF 13 *User Network Interface (UNI) Type 1 implementation agreement*.

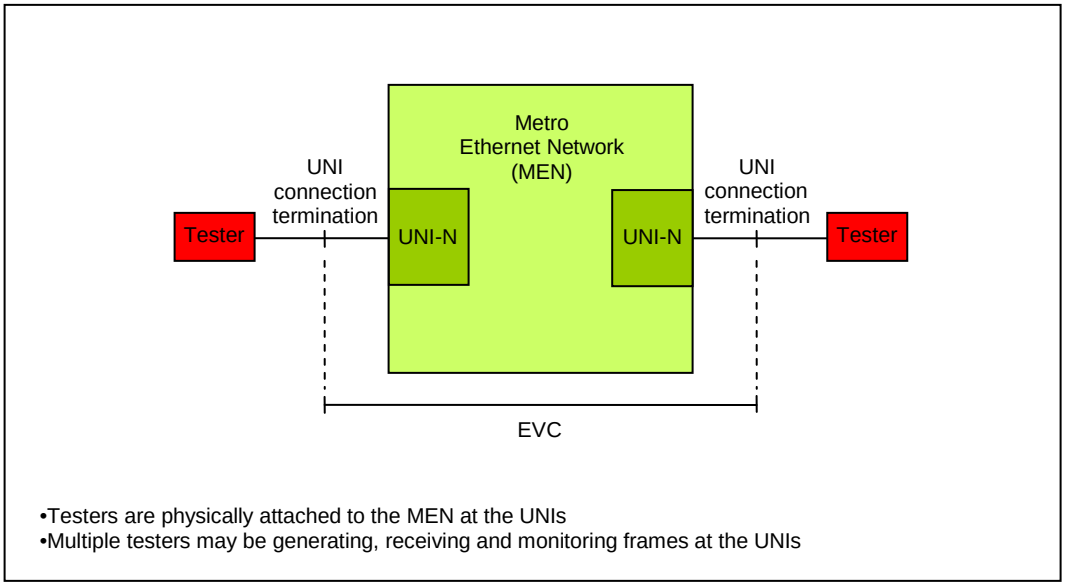
As with MEF 9 and MEF 14, vendors can refer to the requirements and test procedures defined in this specification in the development and commercial cycles of their products and carriers can use them to ensure that the network elements they deploy or add to their existing network will have the ability to deliver Ethernet Services based on the MEF technical specifications.

The requirements, framework and functional model on how the UNI reference point operates in a Metro Ethernet Network is defined on the Metro Ethernet Forum technical specification MEF 11 *User to Network Interface Requirements and Framework.*

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

6. Test Configuration

Although some Test Cases may require very specific test configurations, most Test Cases defined in this document are to be executed by attaching the Ethernet interface of a tester to the Ethernet User Network Interface (UNI).



Test Configuration for UNI Type 1

- In each Test Case, the Test Configuration section describes the number of EVCs associating the number of UNIs and the number of CE-VLAN IDs mapped to the EVCs
- Testers are attached to all UNIs in the configured EVCs
- CE-VLAN ID/EVC Maps are given for each Test Case
- Applicable Bandwidth Profile and Service Performance parameters are provided when necessary

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

7. Template for Abstract Test Cases for UNI Type 1

The following template is adopted for the definition of Abstract Test Cases for UNI Type 1:

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Name derived from reference document</td></tr>
<tr><td>Test Definition ID</td><td>A punctuated alphanumeric string assigned to each defined requirement and test procedure couple using the following convention: ‘one to three letter abbreviated source document name’. ‘section number’ - ‘specific requirement number in the section from which requirement is derived’. This number always figures as the last number of an ID. UNI Type 1 = U1; Ethernet Services Definitions = S; etc. Example: U1.5.1-1</td></tr>
<tr><td>Reference Document</td><td>Reference document (and section and paragraph when useful for clarity)</td></tr>
<tr><td>Test Type</td><td>Functional, Conformance, Interoperability or Performance</td></tr>
<tr><td>Test Status</td><td>Mandatory, Optional</td></tr>
<tr><td>Requirement Description</td><td>Brief description of the service requirement that MUST or SHOULD be satisfied</td></tr>
<tr><td>Test Object</td><td>Succinct description of test purpose</td></tr>
<tr><td>Test Configuration</td><td>Succinct description of test bed configuration</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>A sample CE-VLAN ID/EVC Map is suggested. Variables augment it.
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>10</td><td>EVC_1</td><td>10</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
</table></td></tr>
<tr><td>Bandwidth Profile</td><td>A sample Bandwidth Profile table is suggested. Variables augment it.
<table>
<tr><th colspan="5">Per Ingress UNI</th></tr>
<tr><th>UNI</th><th colspan="4">Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A</td><td>CBS_A</td><td>EIR_A</td><td>EBS_A</td></tr>
<tr><td colspan="5">Note 1 : ($0 < CIR_A \leq$ UNI Speed), ($CBS_A \geq$ maximum Service Frame size)</td></tr>
</table></td></tr>
<tr><td>Service Performance</td><td>A sample EVC Performance Objectives table is suggested. Variables augment it.
<table>
<tr><th>CoS Identifier</th><th>EVC Performance Service Attributes</th><th>Performance Objectives</th></tr>
<tr><td>1</td><td>Frame Delay (FD) Performance
Frame Delay Variation (FDV) Performance
Frame Loss Ratio (FLR) Performance</td><td>FD_1
FDV_1
FLR_1</td></tr>
</table></td></tr>
<tr><td>Test Procedure</td><td>Succinct description of the test procedure</td></tr>
<tr><td>Units</td><td>Units can be time units, rates and counts in integers such as milliseconds, frames per second and numbers of valid frames. For the most part units used are defined in RFCs 2285, 2544, 2889</td></tr>
<tr><td>Variables</td><td>Variables such as number of UNIs, EVCs and CE-VLAN IDs and frame formats and lengths MUST be described</td></tr>
<tr><td>Results</td><td>Description of the textual, numerical and/or graphical format in which to display test results. Results can be Pass or Fail</td></tr>
<tr><td>Remarks</td><td>Description of any particular observations that might effect the test result</td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

8. Abstract Test Cases for UNI Type 1 Common Characteristics

In this section we assume familiarity with MEF 13 *User Network Interface (UNI) Type 1 Implementation Agreement* and, in particular, its section 5 which defines the common characteristics of the UNI Type 1.

Three Abstract Test Cases based on the common characteristics of the UNI Type 1 are defined in this section.

Abstract Test Cases for UNI-N Type 1 Common Characteristics

Test Case 1: Type 1 UNI-N Ethernet Physical Medium
Test Case 2: Type 1 UNI-N Ethernet Frame Format - Tagged, Untagged and Priority Tagged
Test Case 3: Type 1 UNI-N Minimum and Maximum Ethernet Frame Size

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 1: Type 1 UNI-N Ethernet Physical Medium

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1 UNI-N Ethernet Physical Medium</td></tr>
<tr><td>Test Definition ID</td><td>U1.5.1-2</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1 UNI-N MUST support at least one of the following IEEE 802.3 Ethernet PHYs:
10BASE-T in Full-duplex mode
100BASE-T including 100BASE-TX and 100BASE-FX in Full-duplex mode
1000BASE-X including 1000BASE-SX, 1000BASE-LX, and 1000BASE-T in Full-duplex mode
10GBASE-SR, 10GBASE-LX4, 10GBASE-LR, 10GBASE-ER, 10GBASE-SW, 10GBASE-LW, and 10GBASE-EW in Full-duplex mode</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1 UNI-N supports at least one of the IEEE 802.3 Ethernet PHYs listed in the requirement description section above</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1 UNIs is configured and at least one CE-VLAN ID is mapped to the EVC. A per Ingress UNI bandwidth profile is applied at both UNIs. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th><th colspan="2">UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI</td><td>CIR CBS EIR EBS</td></tr>
<tr><td colspan="2">Note 1: (0 < CIR < Ingress UNI Speed), (CBS ≥ maximum Service Frame size)
Note 2: (Ingress CIR ≤ Egress UNI Speed)
Note 3: (EIR = 0) and (EBS = 0)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames bidirectionally at each UNI configured in the EVC and verifies that the corresponding Service Frames are successfully delivered at the associated UNI</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR, CBS, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 2: Type 1 UNI-N Ethernet Frame Format - Tagged, Untagged and Priority Tagged

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1 UNI-N Ethernet Frame Format - Tagged, Untagged and Priority Tagged</td></tr>
<tr><td>Test Definition ID</td><td>U1.5.2-4</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1 UNI-N MUST support the transmission and reception of untagged, VLAN-tagged and priority-tagged Ethernet frames according to IEEE 802.3-2002</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1 UNI-N supports the transmission and reception of untagged, VLAN-tagged and priority-tagged Ethernet frames according to IEEE 802.3-2002</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1 UNIs is configured and at least one CE-VLAN ID is mapped to the EVC. A per Ingress UNI bandwidth profile is applied at both UNIs. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th><th colspan="2">UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI</td><td>CIR CBS EIR EBS</td></tr>
<tr><td colspan="2">Note 1: (0 < CIR < Ingress UNI Speed), (CBS ≥ maximum Service Frame size)
Note 2: (Ingress CIR ≤ Egress UNI Speed)
Note 3: (EIR = 0) and (EBS = 0)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers tagged, untagged and priority tagged Service Frames bidirectionally at each UNI configured in the EVC and verifies that the corresponding Service Frames are received at the associated UNI. The VLAN ID of the tagged Service Frames must be the one configured in the CE-VLAN ID/EVC map</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR, CBS, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 3: Type 1 UNI-N Minimum and Maximum Ethernet Frame Size

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1 UNI-N Minimum and Maximum Ethernet Frame Size</td></tr>
<tr><td>Test Definition ID</td><td>U1.5.2-6</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1 UNI-N MUST support the transmission and reception of minimum and maximum size Ethernet frames as specified in IEEE 802.3-2002</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1 UNI-N supports the transmission and reception of minimum and maximum size Ethernet frames as specified in IEEE 802.3-2002</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1 UNIs is configured and at least one CE-VLAN ID is mapped to the EVC. A per Ingress UNI bandwidth profile is applied at both UNIs. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th><th colspan="2">UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI</td><td>CIR CBS EIR EBS</td></tr>
<tr><td colspan="2">Note 1: (0 < CIR < Ingress UNI Speed), (CBS ≥ maximum Service Frame size)
Note 2: (Ingress CIR ≤ Egress UNI Speed)
Note 3: (EIR = 0) and (EBS = 0)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers minimum and maximum size Service Frames, as specified in IEEE 802.3-2002, bidirectionally at each UNI configured in the EVC and verifies that the corresponding Service Frames are delivered at the associated UNI</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR, CBS, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

9. Abstract Test Cases for UNI Type 1.1 Specific Characteristics

In this section we assume familiarity with MEF 13 *User Network Interface (UNI) Type 1 Implementation Agreement* and, in particular, its section 6.1 which defines the specific characteristics of the UNI Type 1.1.

Fourteen Abstract Test Cases based on the specific characteristics of the UNI Type 1.1 are defined in this section.

Abstract Test Cases for UNI-N Type 1.1 Specific Characteristics

Test Case 4: Type 1.1 UNI-N CE-VLAN ID - Single EVC
Test Case 5: Type 1.1 UNI-N Configurable CE-VLAN ID/EVC Map - No CE-VLAN ID
Test Case 6: Type 1.1 UNI-N Bandwidth Profile per Ingress UNI
Test Case 7: Type 1.1 UNI-N Bandwidth Profile Rate Enforcement when CIR > 0 and EIR = 0
Test Case 8: Type 1.1 UNI-N Mandatory CIR Configuration Granularity
Test Case 9: Type 1.1 UNI-N Optional CIR Configuration Granularity
Test Case 10: Type 1.1 UNI-N CBS Configuration
Test Case 11: Type 1.1 UNI-N Mandatory Layer 2 Control Protocol Processing
Test Case 12: Type 1.1 UNI-N Optional Layer 2 Control Protocol Processing
Test Case 13: Type 1.1 UNI-N Optional Layer 2 Control Protocol Discard
Test Case 14: Type 1.1 UNI-N Point-to-Point EVC
Test Case 15: Type 1.1 UNI-N CE-VLAN ID Preservation
Test Case 16: Type 1.1 UNI-N CE-VLAN CoS Preservation
Test Case 17: Type 1.1 UNI-N Service Frame Unconditional Delivery

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 4: Type 1.1 UNI-N CE-VLAN ID - Single EVC

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.1 UNI-N CE-VLAN ID - Single EVC</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.1.1-7, 8</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.1 UNI-N MUST be able to support a single EVC and to accept any CE-VLAN ID received from the UNI-C</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.1 UNI-N can support a single EVC and accept any CE-VLAN ID received from the UNI-C</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating at least two Type 1.1 UNIs is configured and all possible CE-VLAN IDs are mapped to the EVC. A per Ingress UNI bandwidth profile is applied at both UNIs. Testers with proper PHY that matches each UNI are attached to all UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th><th colspan="2">UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values allowed at the UNI-C</td><td>EVC_1</td><td>All possible values allowed at the UNI-C</td><td>EVC_1</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI</td><td>CIR CBS EIR EBS</td></tr>
<tr><td colspan="2">Note 1: (0 < CIR < Ingress UNI Speed), (CBS ≥ maximum Service Frame size)
Note 2: (Ingress CIR ≤ Egress UNI Speed)
Note 3: (EIR = 0) and (EBS = 0)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers tagged Service Frames with VLAN IDs = 1, …, 4095, untagged Service Frames and priority tagged Service Frames bidirectionally at each UNI configured in the EVC and verifies that the corresponding Service Frames are delivered at the associated UNI</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR, CBS, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 5: Type 1.1 UNI-N Configurable CE-VLAN ID/EVC Map - No CE-VLAN ID

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.1 UNI-N Configurable CE-VLAN ID/EVC Map - No CE-VLAN IDs</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.1.2-9</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.1 UNI-N MUST be configurable to map no CE-VLAN ID to an EVC. (Temporary disconnection without tearing down the EVC)</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.1 UNI-N can be configured to map no CE-VLAN ID to an EVC</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.1 UNIs is configured and no CE-VLAN ID is mapped to the EVC. A per Ingress UNI bandwidth profile is applied at both UNIs. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>None</td><td>EVC_1</td></tr>
</table>
<table>
<tr><th colspan="2">UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>None</td><td>EVC_1</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI</td><td>CIR CBS EIR EBS</td></tr>
<tr><td colspan="2">Note 1: (0 < CIR < Ingress UNI Speed), (CBS ≥ maximum Service Frame size)
Note 2: (Ingress CIR ≤ Egress UNI Speed)
Note 3: (EIR = 0) and (EBS = 0)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers tagged Service Frames with VLAN IDs = 1, …4095, untagged Service Frames and priority tagged Service Frames bidirectionally at each UNI configured in the EVC and verifies that the corresponding Service Frames are not delivered at the associated UNI</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR, CBS, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 6: Type 1.1 UNI-N Bandwidth Profile per Ingress UNI

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.1 UNI-N Bandwidth Profile per Ingress UNI</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.1.3-10</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.1 UNI-N MUST be able to support a per Ingress UNI bandwidth profile based on MEF 10</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.1 UNI-N can support a per Ingress UNI bandwidth profile based on MEF 10</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.1 UNIs is configured and all possible CE-VLAN IDs are mapped to the EVC. A per Ingress UNI bandwidth profile is applied at the ingress UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
<table>
<tr><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A CBS_A EIR_A EBS_A</td></tr>
<tr><td colspan="2">Note 1: ($0 < CIR_A <$ Ingress UNI Speed), ($CBS_A \geq$ maximum Service Frame size)
Note 2: (Ingress $CIR_A \leq$ Egress UNI Speed)
Note 3: ($EIR_A = 0$) and ($EBS_A = 0$)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers tagged Service Frames with VLAN IDs = 1, …4095, untagged Service Frames and priority tagged Service Frames of length λ into the configured EVC at the ingress UNI and verifies that over a time interval T at least one Service Frame of each CE-VLAN ID is delivered at the associated egress UNI. Service Frames are offered at equal average rates into the configured EVC, at an aggregate average rate greater than CIR_A. Tester also verifies that the amount of traffic delivered at the egress UNI falls within the range $X \leq W_G \leq Z$ where:
· W_G is the amount of traffic accepted as Green over the time interval T that should be delivered to the egress UNI.
· $X_A = (CIR_A * T + CBS_A - F)$ and $Z_A = (CIR_A * T + CBS_A + F)$</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR_A, CBS_A, UNIs interface speed, time interval T, tolerated variance F, number and length λ of the offered Service Frames</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 7: Type 1.1 UNI-N BW Profile Rate Enforcement when CIR > 0 and EIR = 0

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.1 UNI-N Bandwidth Profile Rate Enforcement when CIR > 0 and EIR = 0</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.1.3-12</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.1 UNI-N MUST be able to support color-blind bandwidth profile where EIR=EBS=0 and CIR and CBS are non-zero</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.1 UNI-N can support color-blind bandwidth profile where EIR=EBS=0 and CIR and CBS are non-zero</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.1 UNIs is configured and all possible CE-VLAN IDs are mapped to the EVC. One Bandwidth Profile where EIR=EBS=0 and CIR and CBS are non-zero is applied at the ingress UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
<table>
<tr><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A CBS_A EIR_A EBS_A</td></tr>
<tr><td colspan="2">Note 1: ($0 < CIR_A <$ Ingress UNI Speed), ($CBS_A \geq$ maximum Service Frame size)
Note 2: (Ingress $CIR_A \leq$ Egress UNI Speed)
Note 3: ($EIR_A = 0$) and ($EBS_A = 0$)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames of length λ at an average rate greater than CIR_A to the ingress UNI during a time interval T and measures the number of Service Frames delivered at the associated egress UNI. The amount of traffic delivered at the associated egress UNI must fall within the range $X \leq W_G \leq Z$ where:
· W_G is the amount of traffic accepted as Green over the time interval T that should be delivered to the egress UNI.
· $X_A = (CIR_A*T + CBS_A - F)$ and $Z_A = (CIR_A*T + CBS_A + F)$</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR_A, CBS_A, UNIs interface speed, time interval T, tolerated variance F, number and length λ of the offered Service Frames</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 8: Type 1.1 UNI-N Mandatory CIR Configuration Granularity

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.1 UNI-N Mandatory CIR Configuration Granularity</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.1.3-13</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.1 UNI-N MUST allow configuration to modify CIR in the following granularities
· 1 Mbps steps up to 10 Mbps [CIR range 1]
· 5 Mbps steps beyond 10 Mbps and up to 100 Mbps [CIR range 2]
· 50 Mbps steps beyond 100 Mbps and up to 1 Gbps [CIR range 3]
· 500 Mbps steps beyond 1 Gbps [CIR range 4]</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.1 UNI-N allows configuration to modify CIR in the granularities described in the requirement description section above</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.1 UNIs is configured. All possible CE-VLAN IDs are mapped to the EVC and one Bandwidth Profile is applied at the ingress UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
<table>
<tr><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A CBS_A EIR_A EBS_A</td></tr>
<tr><td colspan="2">Note 1: ($0 < CIR_A <$ Ingress UNI Speed), ($CBS_A \geq$ maximum Service Frame size)
Note 2: (Ingress $CIR_A \leq$ Egress UNI Speed)
Note 3: ($EIR_A = 0$) and ($EBS_A = 0$)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames of length λ at an average rate greater than CIR_A to the ingress UNI during a time interval T and measures the number of Service Frames delivered at the associated egress UNI. The amount of traffic delivered at the egress UNI must fall within the range $X \leq W_G \leq Z$ where:
· W_G is the amount of traffic accepted as Green over the time interval T that should be delivered to the egress UNI.
· $X_A = (CIR_A*T + CBS_A - F)$ and $Z_A = (CIR_A*T + CBS_A + F)$

Begin the test with CIR_A set to the minimum value (i.e. 1 Mbps) and increment CIR_A by the step value defined for the CIR range.
Repeat the test for each CIR_A value until CIR_A has been incremented to the UNI speed</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR_A, CBS_A, UNIs interface speed, time interval T, tolerated variance F, number and length λ of the offered Service Frames</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 9: Type 1.1 UNI-N Optional CIR Configuration Granularity

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.1 UNI-N Optional CIR Configuration Granularity</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.1.3-14</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Optional</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.1 UNI-N SHOULD allow configuration to modify CIR in the following granularities:
· 64 Kbps (DS0 rate) steps up to 1.422 Mbps (VC11 rate) or 1.932 Mbps (VC12 rate) [CIR range 1]
· 1.422 Mbps (VC11 rate) or 1.932 Mbps (VC12 rate) steps up to 50 Mbps [CIR range 2]
· 43.008 Mbps (VC3 rate) steps beyond 50 Mbps and up to 150 Mbps [CIR range 3]
· 133.12 Mbps (VC4 rate) steps beyond 150 Mbps [CIR range 4]</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.1 UNI-N allows configuration to modify CIR in the granularities described in the requirement description section above</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.1 UNIs is configured. All possible CE-VLAN IDs are mapped to the EVC and one Bandwidth Profile is applied at the ingress UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
<table>
<tr><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A CBS_A EIR_A EBS_A</td></tr>
<tr><td colspan="2">Note 1: ($0 < CIR_A <$ Ingress UNI Speed), ($CBS_A \geq$ maximum Service Frame size)
Note 2: (Ingress $CIR_A \leq$ Egress UNI Speed)
Note 3: ($EIR_A = 0$) and ($EBS_A = 0$)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames of length λ at an average rate greater than CIR_A to the ingress UNI during a time interval T and measures the number of Service Frames delivered at the associated egress UNI. The amount of traffic delivered at the egress UNI must fall within the range $X \leq W_G \leq Z$ where:
· W_G is the amount of traffic accepted as Green over the time interval T that should be delivered to the egress UNI.
· $X_A = (CIR_A * T + CBS_A - F)$ and $Z_A = (CIR_A * T + CBS_A + F)$

Begin the test with CIR_A set to the minimum value (i.e. 64 Kbps) and increment CIR_A by the step value defined for the CIR range.
Repeat the test for each CIR_A value until CIR_A has been incremented to the UNI speed</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR_A, CBS_A, UNIs interface speed, time interval T, tolerated variance F, number and length λ of the offered Service Frames</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 10: Type 1.1 UNI-N CBS Configuration

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.1 UNI-N CBS Configuration</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.1.3-15</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.1 UNI-N MUST be able to at least support CBS values that are equal to or greater than 8 x MTU = 8 x 1522 bytes = 12176 bytes</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.1 UNI-N can at least support CBS values that are equal to or greater than 8 x MTU = 8 x 1522 bytes = 12176 bytes</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.1 UNIs is configured. All possible CE-VLAN IDs are mapped to the EVC and one Bandwidth Profile is applied at the ingress UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
<table>
<tr><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A CBS_A EIR_A EBS_A</td></tr>
<tr><td colspan="2">Note 1: ($0 < CIR_A <$ Ingress UNI Speed), ($CBS_A \geq$ 12176 bytes)
Note 2: (Ingress $CIR_A \leq$ Egress UNI Speed)
Note 3: ($EIR_A = 0$) and ($EBS_A = 0$)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames of length λ at an average rate equal to CIR_A to the ingress UNI during a time interval T. At time $T/2$ tester injects a burst of ingress Service Frames greater than CBS_A. Tester measures the number of Service Frames delivered at the associated egress UNIs. The amount of traffic delivered at each egress UNI must fall within the range $X \leq W_G \leq Z$ where:
· W_G is the amount of traffic accepted as Green over the time interval T that should be delivered to the egress UNI
· $X_A = (CIR_A*T + CBS_A - F)$ and $Z_A = (CIR_A*T + CBS_A + F)$</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR_A, CBS_A, UNIs interface speed, time interval T, tolerated variance F, number and length λ of the offered Service Frames</td></tr>
<tr><td>Results</td><td>Pass, fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 11: Type 1.1 UNI-N Mandatory Layer 2 Control Protocol Processing

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.1 UNI-N Mandatory Layer 2 Control Protocol Processing</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.1.4-16</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.1 UNI-N MUST be able to pass the following L2 Control Protocols to the EVC:
· Spanning Tree Protocol (STP),
· Rapid Spanning Tree Protocol (RSTP),
· Multiple Spanning Tree Protocol (MSTP)
· All LANs Bridge Management Group Block of Protocol
· Generic Attribute Registration Protocol (GARP)</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.1 UNI-N can pass each L2 Control Protocol described in the requirement description section above to the EVC</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.1 UNIs is configured and all possible CE-VLAN IDs are mapped to the EVC. A per Ingress UNI bandwidth profile is applied at the UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
<table>
<tr><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A CBS_A EIR_A EBS_A</td></tr>
<tr><td colspan="2">Note 1: ($0 < CIR_A <$ Ingress UNI Speed), ($CBS_A \geq$ maximum Service Frame size)
Note 2: (Ingress $CIR_A \leq$ Egress UNI Speed)
Note 3: ($EIR_A = 0$) and ($EBS_A = 0$)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames carrying Layer 2 Control protocols described in the requirement description section above at the ingress UNI and verifies that the corresponding Service Frames are delivered at the associated egress UNI. The L2CPs Destination Address and Ethertype/Length fields must be defined as per the IEEE standards</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames carrying the L2CPs</td></tr>
<tr><td>Variables</td><td>L2CP, Bandwidth Profile Parameters CIR_A, CBS_A, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 12: Type 1.1 UNI-N Optional Layer 2 Control Protocol Processing

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.1 UNI-N Optional Layer 2 Control Protocol Processing</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.1.4-17</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Optional</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.1 UNI-N SHOULD be able to pass the following L2 Control Protocols to the EVC:
· Link Aggregation Control Protocol (LACP)
· Marker Protocol
· Authentication (802.1x)</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.1 UNI-N can pass each L2 Control Protocols described in the requirement description section above to the EVC</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.1 UNIs is configured and all possible CE-VLAN IDs are mapped to the EVC. A per Ingress UNI bandwidth profile is applied at the UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
<table>
<tr><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A CBS_A EIR_A EBS_A</td></tr>
<tr><td colspan="2">Note 1: ($0 < CIR_A <$ Ingress UNI Speed), ($CBS_A \geq$ maximum Service Frame size)
Note 2: (Ingress $CIR_A \leq$ Egress UNI Speed)
Note 3: ($EIR_A = 0$) and ($EBS_A = 0$)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames carrying Layer 2 Control protocols described in the requirement description section above at the ingress UNI and verifies that the corresponding Service Frames are delivered at the associated egress UNI. The L2CPs Destination Address and Ethertype/Length fields must be defined as per the IEEE standards</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames carrying the L2CPs</td></tr>
<tr><td>Variables</td><td>L2CP, Bandwidth Profile Parameters CIR_A, CBS_A, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 13: Type 1.1 UNI-N Optional Layer 2 Control Protocol Discard

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.1 UNI-N Optional Layer 2 Control Protocol Discard</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.1.4-18</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Optional</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.1 UNI-N SHOULD be able to discard 802.3x PAUSE frames</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.1 UNI-N can discard 802.3x PAUSE frames</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.1 UNIs is configured and all possible CE-VLAN IDs are mapped to the EVC. A per Ingress UNI bandwidth profile is applied at the UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
<table>
<tr><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A CBS_A EIR_A EBS_A</td></tr>
<tr><td colspan="2">Note 1: ($0 < CIR_A <$ Ingress UNI Speed), ($CBS_A \geq$ maximum Service Frame size)
Note 2: (Ingress $CIR_A \leq$ Egress UNI Speed)
Note 3: ($EIR_A = 0$) and ($EBS_A = 0$)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers 802.3x PAUSE frames at the ingress UNI and verifies that they are not delivered at the associated egress UNI.. The L2CPs Destination Address and Ethertype/Length fields must be defined as per the IEEE standards</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames carrying the L2CPs</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR_A, CBS_A, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 14: Type 1.1 UNI-N Point-to-Point EVC

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.1 UNI-N Point-to-Point EVC</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.1.5-19</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.1 UNI-N MUST be able to support point-to-point EVC</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.1 UNI-N can support point-to-point EVC</td></tr>
<tr><td>Test Configuration</td><td>One point-to-point EVC associating two Type 1.1 UNIs is configured and all possible CE-VLAN IDs are mapped to the EVC. A per Ingress UNI bandwidth profile is applied at both UNIs. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
<table>
<tr><th colspan="2">UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI</td><td>CIR CBS EIR EBS</td></tr>
<tr><td colspan="2">Note 1: (0 < CIR < Ingress UNI Speed), (CBS ≥ maximum Service Frame size)
Note 2: (Ingress CIR ≤ Egress UNI Speed)
Note 3: (EIR = 0) and (EBS = 0)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames bidirectionally at each UNI configured in the EVC and verifies that the corresponding Service Frames are delivered at the associated UNI</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR, CBS, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 15: Type 1.1 UNI-N CE-VLAN ID Preservation

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.1 UNI-N CE-VLAN ID Preservation</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.1.6-20</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.1 UNI-N MUST be able to support CE-VLAN ID preservation</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.1 UNI-N can support CE-VLAN ID preservation</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.1 UNIs is configured and all possible CE-VLAN IDs are mapped to the EVC. A per Ingress UNI bandwidth profile is applied at both UNIs. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
<table>
<tr><th colspan="2">UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI</td><td>CIR CBS EIR EBS</td></tr>
<tr><td colspan="2">Note 1: (0 < CIR < Ingress UNI Speed), (CBS ≥ maximum Service Frame size)
Note 2: (Ingress CIR ≤ Egress UNI Speed)
Note 3: (EIR = 0) and (EBS = 0)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers tagged Service Frames with VLAN IDs = 1,…, 4095, untagged Service Frames and priority tagged Service Frames bidirectionally at each UNI configured in the EVC and verifies that the corresponding Service Frames are delivered at the associated UNI with CE-VLAN ID preservation</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR, CBS, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 16: Type 1.1 UNI-N CE-VLAN CoS Preservation

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.1 UNI-N CE-VLAN CoS Preservation</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.1.7-21</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.1 UNI-N MUST be able to support CE-VLAN CoS preservation</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.1 UNI-N can support CE-VLAN CoS preservation</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.1 UNIs is configured and all possible CE-VLAN IDs are mapped to the EVC. A per Ingress UNI bandwidth profile is applied at both UNIs. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
<table>
<tr><th colspan="2">UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI</td><td>CIR CBS EIR EBS</td></tr>
<tr><td colspan="2">Note 1: (0 < CIR < Ingress UNI Speed), (CBS ≥ maximum Service Frame size)
Note 2: (Ingress CIR ≤ Egress UNI Speed)
Note 3: (EIR = 0) and (EBS = 0)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers tagged Service Frames with all possible CoS values bidirectionally at each UNI configured in the EVC and verifies that the corresponding Service Frames are delivered at the associated UNI with CE-VLAN CoS preservation</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR, CBS, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 17: Type 1.1 UNI-N Service Frame Unconditional Delivery

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.1 UNI-N Service Frame Unconditional Delivery</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.1.8-22</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.1 UNI-N MUST be able to deliver unicast, multicast and broadcast Service Frames, except 802.3x PAUSE frames unconditionally</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.1 UNI-N can deliver unicast, multicast and broadcast Service Frames, except 802.3x PAUSE frames unconditionally</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.1 UNIs is configured and all possible CE-VLAN IDs are mapped to the EVC. A per Ingress UNI bandwidth profile is applied at both UNIs. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
<table>
<tr><th colspan="2">UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI</td><td>CIR CBS EIR EBS</td></tr>
<tr><td colspan="2">Note 1: (0 < CIR < Ingress UNI Speed), (CBS ≥ maximum Service Frame size)
Note 2: (Ingress CIR ≤ Egress UNI Speed)
Note 3: (EIR = 0) and (EBS = 0)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers unicast, multicast and broadcast Service Frames bidirectionally at each UNI configured in the EVC and verifies that the corresponding Service Frames are delivered at the associated UNI</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR, CBS, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

10. Abstract Test Cases for UNI Type 1.2 Specific Characteristics

In this section we assume familiarity with MEF 13 *User Network Interface (UNI) Type 1 Implementation Agreement* and, in particular, its section 6.2 which defines the specific characteristics of the UNI Type 1.2.

Twenty-seven Abstract Test Cases based on the specific characteristics of the UNI Type 1.2 are defined in this section.

Abstract Test Cases for UNI-N Type 1.2 Specific Characteristics

Test Case 18: Type 1.2 UNI-N Service Multiplexing
Test Case 19: Type 1.2 UNI-N Service Multiplexing - Minimum Number of EVCs
Test Case 20: Type 1.2 UNI-N Minimum Number of CE-VLAN IDs
Test Case 21: Type 1.2 UNI-N CE-VLAN ID Range
Test Case 22: Type 1.2 UNI-N Configurable CE-VLAN ID/EVC Map
Test Case 23: Type 1.2 UNI-N CE-VLAN ID/EVC Map Service Frame Discard
Test Case 24: Type 1.2 UNI-N All-to-One Bundling
Test Case 25: Type 1.2 UNI-N Bandwidth Profile per Ingress UNI
Test Case 26: Type 1.2 UNI-N Bandwidth Profile per EVC
Test Case 27: Type 1.2 UNI-N Bandwidth Profile per Class of Service
Test Case 28: Type 1.2 UNI-N Multiple Bandwidth Profiles
Test Case 29: Type 1.2 UNI-N Bandwidth Profile Rate Enforcement when CIR > 0 and EIR = 0
Test Case 30: Type 1.2 UNI-N Bandwidth Profile Rate Enforcement when CIR = 0 and EIR > 0
Test Case 31: Type 1.2 UNI-N Bandwidth Profile Rate Enforcement when CIR > 0 and EIR > 0
Test Case 32: Type 1.2 UNI-N Mandatory CIR Configuration Granularity
Test Case 33: Type 1.2 UNI-N Mandatory EIR Configuration Granularity
Test Case 34: Type 1.2 UNI-N Optional CIR Configuration Granularity
Test Case 35: Type 1.2 UNI-N Optional EIR Configuration Granularity
Test Case 36: Type 1.2 UNI-N CBS Configuration
Test Case 37: Type 1.2 UNI-N EBS Configuration
Test Case 38: Type 1.2 UNI-N Optional Layer 2 Control Protocol Discard
Test Case 39: Type 1.2 UNI-N Optional Layer 2 Control Protocol Generation
Test Case 40: Type 1.2 UNI-N Concurrent Point-to-Point and Multipoint EVCs
Test Case 41: Type 1.2 UNI-N CE-VLAN ID Preservation
Test Case 42: Type 1.2 UNI-N CE-VLAN CoS Preservation
Test Case 43: Type 1.2 UNI-N Broadcast & Multicast Service Frame Unconditional Delivery
Test Case 44: Type 1.2 UNI-N Unicast Service Frame Unconditional Delivery

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 18: Type 1.2 UNI-N Service Multiplexing

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N Service Multiplexing</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.1-23</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N MUST be able to support Service Multiplexing as defined in MEF 10</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can support Service Multiplexing as defined in MEF 10</td></tr>
<tr><td>Test Configuration</td><td>At least two EVCs, each one associating a given Type 1.2 ingress UNI and at least one other Type 1.2 UNI are configured and at least one CE-VLAN ID is mapped per EVC. Per EVC bandwidth profiles are applied at all UNIs. Testers with proper PHY that matches each UNI are attached to all UNIs in the configured EVCs</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th><th colspan="2">UNI ‘B’</th><th colspan="2">UNI ‘C’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td></td><td></td><td>11*</td><td>EVC_1</td></tr>
<tr><td>12</td><td>EVC_2</td><td>12</td><td>EVC_2</td><td></td><td></td></tr>
<tr><td colspan="6">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="6">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both ingress and egress UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER EVC</th></tr>
<tr><th>EVC</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>EVC_1</td><td>CIR_1 CBS_1 EIR_1 EBS_1</td></tr>
<tr><td>EVC_2</td><td>CIR_2 CBS_2 EIR_2 EBS_2</td></tr>
<tr><td colspan="2">Note 1: ($0 < CIR_{1,2} <$ Ingress UNI Speed), ($CBS_{1,2} \geq$ maximum Service Frame size)
Note 2: (Σ Ingress CIRs $\leq$ Egress UNI Speed)
Note 3: ($EIR_{1,2} = 0$) and ($EBS_{1,2} = 0$)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped CE-VLAN IDs bidirectionally at each UNI configured in the EVCs and verifies that the corresponding Service Frames are successfully delivered on the proper EVC at the associated UNIs.</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Number of UNIs, number of EVCs per UNI, Bandwidth Profile Parameters CIR_1, CBS_1, CIR_2, CBS_2, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 19: Type 1.2 UNI-N Service Multiplexing - Minimum Number of EVCs

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N Service Multiplexing - Minimum Number of EVCs</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.1-24</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Optional</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N SHOULD at least be able to support a minimum number of EVCs as described in the following table
<table>
<tr><th>Link Speed</th><th>10/100 Mbps</th><th>1 Gbps</th><th>10 Gbps</th></tr>
<tr><th>Minimum Number of EVCs</th><td>8</td><td>64</td><td>512</td></tr>
</table></td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can support a minimum number of EVCs as described in the requirement description table above</td></tr>
<tr><td>Test Configuration</td><td>At least eight EVCs, each one associating a given Type 1.2 ingress UNI and at least one other Type 1.2 UNI are configured and at least one CE-VLAN ID is mapped per EVC. Per EVC bandwidth profiles are applied at all UNIs. Testers with proper PHY that matches each UNI are attached to all UNIs in the configured EVCs</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th><th colspan="2">UNI ‘B’</th><th colspan="2">UNI ‘C’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>1</td><td>EVC_1</td><td></td><td></td><td>1</td><td>EVC_1</td></tr>
<tr><td>2</td><td>EVC_2</td><td></td><td></td><td>2</td><td>EVC_2</td></tr>
<tr><td>3</td><td>EVC_3</td><td></td><td></td><td>3</td><td>EVC_3</td></tr>
<tr><td>4</td><td>EVC_4</td><td></td><td></td><td>4</td><td>EVC_4</td></tr>
<tr><td>5</td><td>EVC_5</td><td>5</td><td>EVC_5</td><td></td><td></td></tr>
<tr><td>6</td><td>EVC_6</td><td>6</td><td>EVC_6</td><td></td><td></td></tr>
<tr><td>7</td><td>EVC_7</td><td>7</td><td>EVC_7</td><td></td><td></td></tr>
<tr><td>8</td><td>EVC_8</td><td>8</td><td>EVC_8</td><td></td><td></td></tr>
</table>
Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1
This mapping applies for 10/100 Mbps UNI speeds. The same mapping principles should be applied for the 1Gbps and 10Gbps UNI speeds but with respectively 64 and 512 EVCs</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER EVC</th></tr>
<tr><th>EVC</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>EVC_1</td><td>CIR_1 CBS_1 EIR_1 EBS_1</td></tr>
<tr><td>EVC_2</td><td>CIR_2 CBS_2 EIR_2 EBS_2</td></tr>
<tr><td>.
.
.</td><td>. . . .
. . . .
. . . .</td></tr>
<tr><td>EVC_8</td><td>CIR_8 CBS_8 EIR_8 EBS_8</td></tr>
</table>
Note 1: ($0 < CIR_{1,2,3,4,5,6,7,8} <$ Ingress UNI Speed), ($CBS_{1,2,3,4,5,6,7,8} \geq$ maximum Service Frame size)
Note 2: (Σ Ingress CIRs $\leq$ Egress UNI Speed)
Note 3: ($EIR_{1,2,3,4,5,6,7,8} = 0$) and ($EBS_{1,2,3,4,5,6,7,8} = 0$)</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped CE-VLAN IDs bidirectionally at each UNI configured in the EVCs and verifies that the corresponding Service Frames are delivered at the associated UNIs</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>UNIs interface speed, number of UNIs, number of EVCs per UNI, Bandwidth Profile Parameters CIR_1, CBS_1, CIR_2, CBS_2, CIR_3, CBS_3, CIR_4, CBS_4, CIR_5, CBS_5, CIR_6, CBS_6, CIR_7, CBS_7, CIR_8, CBS_8</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 20: Type 1.2 UNI-N Minimum Number of CE-VLAN IDs

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N Minimum Number of CE-VLAN Ids</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.2-25.1</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Optional</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N SHOULD be able to support at least a minimum number of CE-VLAN IDs as described in the following table
<table>
<tr><th>Link Speed</th><th>10/100 Mbps</th><th>1 Gbps</th><th>10 Gbps</th></tr>
<tr><td>Minimum Number of CE-VLAN IDs</td><td>8</td><td>64</td><td>512</td></tr>
</table></td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can at least support a minimum number of CE-VLAN IDs as described in the requirement description table above</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.2 UNIs is configured and at least eight CE-VLAN IDs are mapped to the EVC. A per Ingress UNI bandwidth profile is applied at both UNIs. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th><th colspan="2">UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11, 12, 13, 14, 15, 16, 17, 18</td><td>EVC_1</td><td>11, 12, 13, 14, 15, 16, 17, 18</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">This mapping applies for 10/100 Mbps UNI speeds. The same mapping principles should be applied for the 1Gbps and 10Gbps UNI speeds but with respectively 64 and 512 CE-VLAN IDs</td></tr>
</table></td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI</td><td>CIR CBS EIR EBS</td></tr>
<tr><td colspan="2">Note 1: (0 < CIR < Ingress UNI Speed), (CBS ≥ maximum Service Frame size)
Note 2: (Ingress CIR ≤ Egress UNI Speed)
Note 3: (EIR = 0) and (EBS = 0)</td></tr>
</table></td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped CE-VLAN IDs bidirectionally at each UNI configured in the EVC and verifies that the corresponding Service Frames are delivered at the associated UNI</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>UNIs interface speed, number of mapped CE-VLAN IDs, Bandwidth Profile Parameters CIR, CBS</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 21: Type 1.2 UNI-N CE-VLAN ID Range

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N CE-VLAN ID Range</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.2-25.2</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Optional</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N should be able to support a minimum number of CE-VLAN IDs that SHOULD be configurable in the range of 1-4095</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can at support a minimum number of CE-VLAN IDs configurable in the range of 1-4095</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.2 UNIs is configured and at least eight CE-VLAN IDs are mapped to the EVC. A per Ingress UNI bandwidth profile is applied at both UNIs. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th><th colspan="2">UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>1, 56, 212, 1087, 1460, 2228, 3999, 4095</td><td>EVC_1</td><td>1, 56, 212, 1087, 1460, 2228, 3999, 4095</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">This mapping applies for 10/100 Mbps UNI speeds. The same mapping principles should be applied for the 1Gbps and 10Gbps UNI speeds but with respectively 64 and 512 CE-VLAN IDs, including VLAN IDs 1 and 4095</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI</td><td>CIR CBS EIR EBS</td></tr>
<tr><td colspan="2">Note 1: (0 < CIR < Ingress UNI Speed), (CBS ≥ maximum Service Frame size)
Note 2: (Ingress CIR ≤ Egress UNI Speed)
Note 3: (EIR = 0) and (EBS = 0)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped CE-VLAN IDs bidirectionally at each UNI configured in the EVC and verifies that the corresponding Service Frames are delivered at the associated UNI</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>UNIs interface speed, number of mapped CE-VLAN IDs, Bandwidth Profile Parameters CIR, CBS</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 22: Type 1.2 UNI-N Configurable CE-VLAN ID/EVC Map

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N Configurable CE-VLAN ID/EVC Map</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.1.3-26</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N MUST have a configurable CE-VLAN ID/EVC mapping table</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can have a configurable CE-VLAN ID/EVC mapping table</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.2 UNIs is configured and at least one CE-VLAN ID is mapped per EVC. At least two different mapping configurations are required. A per Ingress UNI bandwidth profile is applied at both UNIs. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map Configuration 1</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th><th colspan="2">UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both ingress and egress UNIs</td></tr>
</table>
</td></tr>
<tr><td>CE-VLAN ID/EVC Map Configuration 2</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th><th colspan="2">UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>12</td><td>EVC_1</td><td>12</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI</td><td>CIR CBS EIR EBS</td></tr>
<tr><td colspan="2">Note 1: (0 < CIR < Ingress UNI Speed), (CBS ≥ maximum Service Frame size)
Note 2: (Ingress CIR ≤ Egress UNI Speed)
Note 3: (EIR = 0) and (EBS = 0)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped and unmapped CE-VLAN IDs bidirectionally at each UNI configured in the EVC as per the CE-VLAN ID/EVC map 1 and verifies that the Service Frames with the mapped CE-VLAN IDs are delivered and the ones with the unmapped CE-VLAN IDs are not delivered at the associated UNI.
Change the configuration to the CE-VLAN ID/EVC map 2.
Tester offers Service Frames with mapped and unmapped CE-VLAN IDs bidirectionally at each UNI configured in the EVC as per the CE-VLAN ID/EVC map 2 and verifies that the Service Frames with the mapped CE-VLAN IDs are delivered and the ones with the unmapped CE-VLAN IDs are not delivered at the associated egress UNI</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>CE-VLAN ID/EVC maps, Bandwidth Profile Parameters CIR¸ CBS, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 23: Type 1.2 UNI-N CE-VLAN ID/EVC Map Service Frame Discard

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N CE-VLAN ID/EVC Map Service Frame Discard</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.1.3-27</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N MUST be able to drop the frames if a match in the CE-VLAN ID/EVC map table cannot be found</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can drop the frames if a match in the CE-VLAN ID/EVC map table cannot be found</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.2 UNIs is configured and at least one CE-VLAN ID is mapped per EVC. A per Ingress UNI bandwidth profile is applied at the UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both ingress and egress UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A CBS_A EIR_A EBS_A</td></tr>
<tr><td colspan="2">Note 1: ($0 < CIR_A <$ Ingress UNI Speed), ($CBS_A \geq$ maximum Service Frame size)
Note 2: (Ingress CIR ≤ Egress UNI Speed)
Note 3: ($EIR_A = 0$) and ($EBS_A = 0$)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped and unmapped CE-VLAN IDs at the ingress UNI configured in the EVC and verifies that the Service Frames with the mapped CE-VLAN IDs are delivered and the ones with the unmapped CE-VLAN IDs are not delivered at the associated egress UNI</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR_A, CBS_A, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 24: Type 1.2 UNI-N All-to-One Bundling

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N All-to-One Bundling</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.4-28</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N MUST be able to support All-to-one bundling</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can support All-to-one bundling</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.2 UNIs is configured and all possible CE-VLAN IDs are mapped to the EVC. A per Ingress UNI bandwidth profile is applied at both UNIs. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
<table>
<tr><th colspan="2">UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>All possible values</td><td>EVC_1</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI</td><td>CIR CBS EIR EBS</td></tr>
<tr><td colspan="2">Note 1: (0 < CIR < Ingress UNI Speed), (CBS ≥ maximum Service Frame size)
Note 2: (Ingress CIR ≤ Egress UNI Speed)
Note 3: (EIR = 0) and (EBS = 0)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers tagged Service Frames with VLAN IDs= 1, …, 4095, untagged Service Frames and priority tagged Service bidirectionally at each UNI configured in the EVC and verifies that the corresponding Service Frames are delivered at the associated UNI with CE-VLAN ID preservation</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR, CBS, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 25: Type 1.2 UNI-N Bandwidth Profile per Ingress UNI

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N Bandwidth Profile per Ingress UNI</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.5-29</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N MUST be able to support a per Ingress UNI bandwidth profile based on MEF 10</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can support a per Ingress UNI bandwidth profile based on MEF 10</td></tr>
<tr><td>Test Configuration</td><td>Two EVCs associating two Type 1.2 UNIs are configured and at least one CE-VLAN ID is mapped per EVC. A per Ingress UNI bandwidth profile is applied at the ingress UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVCs</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th><th></th><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th></th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11</td><td>EVC_1</td><td></td><td>11</td><td>EVC_1</td></tr>
<tr><td>12</td><td>EVC_2</td><td></td><td>12</td><td>EVC_2</td></tr>
<tr><td colspan="5">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A CBS_A EIR_A EBS_A</td></tr>
<tr><td colspan="2">Note 1: ($0 < CIR_A <$ Ingress UNI Speed), ($CBS_A \geq$ maximum Service Frame size)
Note 2: (Ingress $CIR_A \leq$ Egress UNI Speed)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped CE-VLAN IDs of length λ into the configured EVCs at the ingress UNI and verifies that over a time interval T at least one Service Frame of each CE-VLAN ID is delivered at the associated egress UNI. Service Frames are offered at equal average rates into the configured EVCs at the ingress UNI, at an aggregate average rate greater than CIR_A. Tester also verifies that the amount of traffic delivered at the egress UNI falls within the range $X \leq (W_G + W_Y) \leq Z$ where:
· W_G is the amount of traffic accepted as Green over the time interval T that should be delivered to the egress UNI
· W_Y is the amount of traffic accepted as Yellow over the time interval T that may be delivered to the egress UNI
· $X_A = ((CIR_A + EIR_A)*T + CBS_A + EBS_A - F)$ and $Z_A = ((CIR_A + EIR_A)*T + CBS_A + EBS_A + F)$</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR_A, CBS_A, EIR_A, EBS_A, UNIs interface speed, time interval T, tolerated variance F, number and length λ of the offered Service Frames</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 26: Type 1.2 UNI-N Bandwidth Profile per EVC

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N Bandwidth Profile per EVC</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.5-30</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N MUST be able to support a per EVC bandwidth profile based on MEF 10</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can support a per EVC bandwidth profile based on MEF 10</td></tr>
<tr><td>Test Configuration</td><td>Two EVCs associating two Type 1.2 UNIs are configured and at least one CE-VLAN ID is mapped per EVC. Per EVC bandwidth profiles are applied at the ingress UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVCs</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th><th></th><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th></th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11</td><td>EVC_1</td><td></td><td>11</td><td>EVC_1</td></tr>
<tr><td>12</td><td>EVC_2</td><td></td><td>12</td><td>EVC_2</td></tr>
<tr><td colspan="5">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER EVC</th></tr>
<tr><th>EVC</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>EVC_1</td><td>CIR_1 CBS_1 EIR_1 EBS_1</td></tr>
<tr><td>EVC_2</td><td>CIR_2 CBS_2 EIR_2 EBS_2</td></tr>
<tr><td colspan="2">Note 1: ($CIR_1 = 0$), ($CBS_1 = 0$) and ($EIR_1 = 0$) and ($EBS_1 = 0$)
Note 2: ($0 < CIR_2 <$ Ingress UNI Speed), ($CBS_2 \geq$ maximum Service Frame size)
Note 3: (Σ Ingress CIRs $\leq$ Egress UNI Speed)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped CE-VLAN IDs of length λ into the configured EVCs at the ingress UNI during a time interval T, at an aggregate average rate in excess of the sum of the CIRs of all the configured EVCs and measures the number of Service Frames delivered at the associated egress UNI. For each EVC the amount of traffic delivered at the associated egress UNI must fall within the range $X \leq (W_G + W_Y) \leq Z$ where:
· W_G is the amount of traffic accepted as Green over the time interval T that should be delivered to the egress UNI
· W_Y is the amount of traffic accepted as Yellow over the time interval T that may be delivered to the egress UNI
· $X_1 = ((CIR_1 + EIR_1)*T + CBS_1 + EBS_1 - F)$ and $Z_1 = ((CIR_1 + EIR_1)*T + CBS_1 + EBS_1 + F)$
· $X_2 = ((CIR_2 + EIR_2)*T + CBS_2 + EBS_2 - F)$ and $Z_2 = ((CIR_2 + EIR_2)*T + CBS_2 + EBS_2 + F)$</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR_2, CBS_2, EIR_2, EBS_2, UNIs interface speed, time interval T, tolerated variance F, number and length λ of the offered Service Frames</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 27: Type 1.2 UNI-N Bandwidth Profile per Class of Service

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N Bandwidth Profile per Class of Service</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.5-31.1</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Optional</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N SHOULD be able to support a per CoS bandwidth profile based on MEF 10</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can support a per CoS bandwidth profile based on MEF 10</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.2 UNIs is configured and at least one CE-VLAN ID is mapped per EVC. Per Class of Service bandwidth profiles are applied at the ingress UNI. Two CoS Identifiers are used to identify the Class of Service applicable to the Service Frames offered at the UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both ingress and egress UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="4">PER CLASS OF SERVICE</th></tr>
<tr><th>EVC</th><th>CoS Identifier</th><th>CE-VLAN CoS</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td rowspan="2">EVC_1</td><td>1</td><td>1</td><td>CIR_{11} CBS_{11} EIR_{11} EBS_{11}</td></tr>
<tr><td>2</td><td>7</td><td>CIR_{12} CBS_{12} EIR_{12} EBS_{12}</td></tr>
<tr><td colspan="4">Note 1: ($CIR_{11} = 0$), ($CBS_{11} = 0$) and ($EIR_{11} = 0$) and ($EBS_{11} = 0$)
Note 2: ($0 < CIR_{12} <$ Ingress UNI Speed), ($CBS_{12} \geq$ maximum Service Frame size)
Note 3: (Σ Ingress CIRs ≤ Egress UNI Speed)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped CE-VLAN IDs of length λ into the configured EVC at the ingress UNI during a time interval T, at an aggregate average rate in excess of the sum of the CIRs of the configured CoS IDs and measures the number of Service Frames delivered at the associated egress UNI. For each CoS ID, the amount of traffic delivered at the associated egress UNI must fall within the range $X \leq (W_G + W_Y) \leq Z$ where:
· W_G is the amount of traffic accepted as Green over the time interval T that should be delivered to the egress UNI
· W_Y is the amount of traffic accepted as Yellow over the time interval T that may be delivered to the egress UNI
· $X_{11} = ((CIR_{11} + EIR_{11})*T + CBS_{11} + EBS_{11} - F)$ and $Z_{11} = ((CIR_{11} + EIR_{11})*T + CBS_{11} + EBS_{11} + F)$
· $X_{12} = ((CIR_{12} + EIR_{12})*T + CBS_{12} + EBS_{12} - F)$ and $Z_{12} = ((CIR_{12} + EIR_{12})*T + CBS_{12} + EBS_{12} + F)$</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR_{12}, CBS_{12}, EIR_{12}, EBS_{12}, time interval T, tolerated variance F, number and length λ of the offered Service Frames</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 28: Type 1.2 UNI-N Multiple Bandwidth Profiles

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N Multiple Bandwidth Profiles</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.5-31.2</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Optional</td></tr>
<tr><td>Requirement Description</td><td>Multiple models of bandwidth profile MAY exist at a UNI-N Type 1.2.</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can support multiple models of bandwidth profile</td></tr>
<tr><td>Test Configuration</td><td>Two EVCs associating two Type 1.2 UNIs are configured and at least one CE-VLAN ID is mapped per EVC. A per EVC bandwidth profile and a per Class of Service bandwidth profile are applied at the ingress UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11</td><td>EVC_1</td><td>11</td><td>EVC_1</td></tr>
<tr><td>12</td><td>EVC_2</td><td>12</td><td>EVC_2</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER EVC</th></tr>
<tr><th>EVC</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>EVC_1</td><td>CIR_1 CBS_1 EIR_1 EBS_1</td></tr>
<tr><td colspan="2">Note 1: ($0 < CIR_1 <$ ingress UNI Speed), ($CBS_1 \geq$ maximum Service Frame size)</td></tr>
</table>
<table>
<tr><th colspan="4">PER CLASS OF SERVICE</th></tr>
<tr><th>EVC</th><th>CoS Identifier</th><th>CE-VLAN CoS</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td rowspan="2">EVC_2</td><td>1</td><td>1</td><td>CIR_{21} CBS_{21} EIR_{21} EBS_{21}</td></tr>
<tr><td>2</td><td>7</td><td>CIR_{22} CBS_{22} EIR_{22} EBS_{22}</td></tr>
<tr><td colspan="4">Note 2: ($CIR_{21} = 0$), ($CBS_{21} = 0$) and ($EIR_{21} = 0$) and ($EBS_{21} = 0$)
Note 3: ($0 < CIR_{22} <$ ingress UNI Speed), ($CBS_{22} \geq$ maximum Service Frame size)
Note 4: ($\sum$ Ingress CIRs < Ingress UNI Speed)
Note 5: (Σ Ingress CIRs ≤ Egress UNI Speed)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped CE-VLAN IDs of length λ into the configured EVCs at the ingress UNI during a time interval T, at an aggregate average rate in excess of the sum of the CIRs of all the configured EVCs and CoS IDs and measures the number of Service Frames delivered at the associated egress UNI. For EVC_1 and for each CoS ID of EVC_2, the amount of traffic delivered at the associated egress UNI must fall within the range $X \leq (W_G + W_Y) \leq Z$ where:
· W_G is the amount of traffic accepted as Green over the time interval T that should be delivered to the egress UNI
· W_Y is the amount of traffic accepted as Yellow over the time interval T that may be delivered to the egress UNI
· $X_1 = ((CIR_1 + EIR_1)*T + CBS_1 + EBS_1 - F)$ and $Z_1 = ((CIR_1 + EIR_1)*T + CBS_1 + EBS_1 + F)$
· $X_{21} = ((CIR_{21} + EIR_{21})*T + CBS_{21} + EBS_{21} - F)$ and $Z_{21} = ((CIR_{21} + EIR_{21})*T + CBS_{21} + EBS_{11} + F)$
· $X_{22} = ((CIR_{22} + EIR_{22})*T + CBS_{22} + EBS_{22} - F)$ and $Z_{22} = ((CIR_{22} + EIR_{22})*T + CBS_{22} + EBS_{22} + F)$</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR_1, CBS_1, EIR_1, EBS_1, CIR_{22}, CBS_{22}, EIR_{22}, EBS_{22}, UNIs interface Speed, time interval T, tolerated variance F, number and length λ of the offered Service Frames</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 29: Type 1.2 UNI-N BW Profile Rate Enforcement when CIR > 0 and EIR = 0

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N Bandwidth Profile Rate Enforcement when CIR > 0 and EIR = 0</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.5-33.1</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N MUST be able to support color-blind bandwidth profiling to enforce CIR, CBS, EIR and EBS</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can support color-blind bandwidth profiling to enforce CIR, CBS, EIR and EBS when CIR > 0 and EIR = 0</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.2 UNIs is configured and at least one CE-VLAN ID is mapped to the EVC. One Bandwidth Profile where EIR=EBS=0 and CIR and CBS are non-zero is applied at the ingress UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both ingress and egress UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A CBS_A EIR_A EBS_A</td></tr>
<tr><td colspan="2">Note 1: ($0 < CIR_A <$ Ingress UNI Speed), ($CBS_A \geq$ maximum Service Frame size)
Note 2: (Ingress $CIR_A \leq$ Egress UNI Speed)
Note 3: ($EIR_A = 0$) and ($EBS_A = 0$)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped CE-VLAN IDs of length λ at an average rate greater than CIR_A to the ingress UNI during a time interval T and measures the number of Service Frames delivered at the associated egress UNI. The amount of traffic delivered at the associated egress UNI must fall within the range $X \leq W_G \leq Z$ where:
· W_G is the amount of traffic accepted as Green over the time interval T that should be delivered to the egress UNI
· $X_A = (CIR_A * T + CBS_A - F)$ and $Z_A = (CIR_A * T + CBS_A + F)$</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR_A, CBS_A, UNIs interface speed, time interval T, tolerated variance F, number and length λ of the offered Service Frames</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 30: Type 1.2 UNI-N BW Profile Rate Enforcement when CIR = 0 and EIR > 0

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N Bandwidth Profile Rate Enforcement when CIR = 0 and EIR > 0</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.5-33.2</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N MUST be able to support color-blind bandwidth profiling to enforce CIR, CBS, EIR and EBS</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can support color-blind bandwidth profiling to enforce CIR, CBS, EIR and EBS when CIR = 0 and EIR > 0</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.2 UNIs is configured and at least one CE-VLAN ID is mapped to the EVC. One Bandwidth Profile where CIR=CBS=0 and EIR and EBS are non-zero is applied at the ingress UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both ingress and egress UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="5">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th colspan="4">Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A</td><td>CBS_A</td><td>EIR_A</td><td>EBS_A</td></tr>
<tr><td colspan="5">Note 1: (CIR_A = 0) and (CBS_A = 0)
Note 2: (0 < EIR_A < Ingress UNI Speed), (EBS_A ≥ maximum Service Frame size)
Note 3: (Ingress EIR_A ≤ Egress UNI Speed)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped CE-VLAN IDs of length λ at an average rate greater than EIR_A to the ingress UNI during a time interval T and measures the number of Service Frames delivered at associated egress UNI. The amount of traffic delivered at the associated egress UNI must fall within the range $X \leq W_Y \leq Z$ where:
· W_Y is the amount of traffic accepted as Yellow over the time interval T that may be delivered to the egress UNI
· $X_A = (EIR_A*T + EBS_A - F)$ and $Z_A = (EIR_A*T + EBS_A + F)$</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters EIR_A, EBS_A, UNIs interface speed, time interval T, tolerated variance F, number and length λ of the offered Service Frames</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 31: Type 1.2 UNI-N BW Profile Rate Enforcement when CIR > 0 and EIR > 0

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N Bandwidth Profile Rate Enforcement when CIR > 0 and EIR > 0</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.5-33.3</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N MUST be able to support color-blind bandwidth profiling to enforce CIR, CBS, EIR and EBS</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can support color-blind bandwidth profiling to enforce CIR, CBS, EIR and EBS when CIR > 0 and EIR > 0</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.2 UNIs is configured and at least one CE-VLAN ID is mapped to the EVC. One Bandwidth Profile where CIR, CBS, EIR and EBS are non-zero is applied at the ingress UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both ingress and egress UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A CBS_A EIR_A EBS_A</td></tr>
<tr><td colspan="2">Note 1: ($0 < CIR_A <$ Ingress UNI Speed), ($CBS_A \geq$ maximum Service Frame size)
Note 2: ($0 < EIR_A <$ Ingress UNI Speed), ($EBS_A \geq$ maximum Service Frame size)
Note 3: ($CIR_A + EIR_A <$ Ingress UNI Speed)
Note 4: (Σ Ingress CIRs + EIRs ≤ Egress UNI Speed)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped CE-VLAN IDs of length λ at an average rate greater than $CIR_A + EIR_A$ to the ingress UNI during a time interval T and measures the number of Service Frames delivered at the associated egress UNI. The amount of traffic delivered at the associated egress UNI must fall within the range $X \leq (W_G + W_Y) \leq Z$ where:
· W_G is the amount of traffic accepted as Green over the time interval T that should be delivered to the egress UNI
· W_Y is the amount of traffic accepted as Yellow over the time interval T that may be delivered to the egress UNI
· $X_A = ((CIR_A + EIR_A)*T + CBS_A + EBS_A - F)$ and $Z_A = ((CIR_A + EIR_A)*T + CBS_A + EBS_A + F)$</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR_A, CBS_A, EIR_A, EBS_A, UNIs interface speed, time interval T, tolerated variance F, number and length λ of the offered Service Frames</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 32: Type 1.2 UNI-N Mandatory CIR Configuration Granularity

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N Mandatory CIR Configuration Granularity</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.5-34.1</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N MUST allow configuration to modify CIR in the following granularities
· 1 Mbps steps up to 10 Mbps [CIR range 1]
· 5 Mbps steps beyond 10 Mbps and up to 100 Mbps [CIR range 2]
· 50 Mbps steps beyond 100 Mbps and up to 1 Gbps [CIR range 3]
· 500 Mbps steps beyond 1 Gbps [CIR range 4]</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N allows configuration to modify CIR in the granularities described in the requirement description section above</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.2 UNIs is configured. At least one CE-VLAN ID is mapped to the EVC and one Bandwidth Profile is applied at the ingress UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both ingress and egress UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="5">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th colspan="4">Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A</td><td>CBS_A</td><td>EIR_A</td><td>EBS_A</td></tr>
<tr><td colspan="5">Note 1: ($0 < CIR_A <$ Ingress UNI Speed), ($CBS_A \geq$ maximum Service Frame size)
Note 2: (Ingress $CIR_A \leq$ Egress UNI Speed)
Note 3: ($EIR_A = 0$) and ($EBS_A = 0$)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped CE-VLAN IDs of length λ at an average rate greater than CIR_A to the ingress UNI during a time interval T and measures the number of Service Frames delivered at the associated egress UNI. The amount of traffic delivered at the associated egress UNI must fall within the range $X \leq W_G \leq Z$ where:
· W_G is the amount of traffic accepted as Green over the time interval T that should be delivered to the egress UNI
· $X_A = (CIR_A * T + CBS_A - F)$ and $Z_A = (CIR_A * T + CBS_A + F)$
Begin the test with CIR_A set to the minimum value (i.e. 1 Mbps) and increment CIR_A by the step value defined for the CIR range.
Repeat the test for each CIR_A value until CIR_A has been incremented to the UNI speed</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR_A, CBS_A, UNIs interface speed, time interval T, tolerated variance F, number and length λ of the offered Service Frames</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 33: Type 1.2 UNI-N Mandatory EIR Configuration Granularity

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N Mandatory EIR Configuration Granularity</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.5-34.2</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N MUST allow configuration to modify EIR in the following granularities
· 1 Mbps steps up to 10 Mbps [EIR range 1]
· 5 Mbps steps beyond 10 Mbps and up to 100 Mbps [EIR range 2]
· 50 Mbps steps beyond 100 Mbps and up to 1 Gbps [EIR range 3]
· 500 Mbps steps beyond 1 Gbps [EIR range 4]</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N allows configuration to modify EIR in the granularities described in the requirement description section above</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.2 UNIs is configured. At least one CE-VLAN ID is mapped to the EVC and one Bandwidth Profile is applied at the ingress UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both ingress and egress UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="5">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th colspan="4">Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A</td><td>CBS_A</td><td>EIR_A</td><td>EBS_A</td></tr>
<tr><td colspan="5">Note 1: ($CIR_A = 0$) and ($CBS_A = 0$)
Note 2: ($0 < EIR_A <$ Ingress UNI Speed), ($EBS_A \geq$ maximum Service Frame size)
Note 3: (Ingress $EIR_A \leq$ Egress UNI Speed)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped CE-VLAN IDs of length λ at an average rate greater than EIR_A to the ingress UNI during a time interval T and measures the number of Service Frames delivered at the associated egress UNI. The amount of traffic delivered at the associated egress UNI must fall within the range $X \leq W_Y \leq Z$ where:
· W_Y is the amount of traffic accepted as Yellow over the time interval T that may be delivered to the egress UNI
· $X_A = (EIR_A*T + EBS_A - F)$ and $Z_A = (EIR_A*T + EBS_A + F)$
Begin the test with EIR_A set to the minimum value (i.e. 1 Mbps) and increment EIR_A by the step value defined for the EIR range.
Repeat the test for each EIR_A value until EIR_A has been incremented to the UNI speed</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters EIR_A, EBS_A, UNIs interface speed, time interval T, tolerated variance F, number and length λ of the offered Service Frames</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 34: Type 1.2 UNI-N Optional CIR Configuration Granularity

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N Optional CIR Configuration Granularity</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.5-35.1</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Optional</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N SHOULD allow configuration to modify CIR in the following granularities
· 64 Kbps (DS0 rate) steps up to 1.422 Mbps (VC11 rate) or 1.932 Mbps (VC12 rate) [CIR range 1]
· 1.422 Mbps (VC11 rate) or 1.932 Mbps (VC12 rate) steps up to 50 Mbps [CIR range 2]
· 43.008 Mbps (VC3 rate) steps beyond 50 Mbps and up to 150 Mbps [CIR range 3]
· 133.12 Mbps (VC4 rate) steps beyond 150 Mbps [CIR range 4]</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N allows configuration to modify CIR in the granularities described in the requirement description section above</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.2 UNIs is configured. At least one CE-VLAN ID is mapped to the EVC and one Bandwidth Profile is applied at the ingress UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both ingress and egress UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A CBS_A EIR_A EBS_A</td></tr>
<tr><td colspan="2">Note 1 : ($0 < CIR_A <$ Ingress UNI Speed), ($CBS_A \geq$ maximum Service Frame size)
Note 2 : (Ingress $CIR_A \leq$ Egress UNI Speed)
Note 3 : ($EIR_A = 0$) and ($EBS_A = 0$)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped CE-VLAN IDs of length λ at an average rate greater than CIR_A to the ingress UNI during a time interval T and measures the number of Service Frames delivered at the associated egress UNI. The amount of traffic delivered at the associated egress UNI must fall within the range $X \leq W_G \leq Z$ where:
· W_G is the amount of traffic accepted as Green over the time interval T that should be delivered to the egress UNI
· $X_A = (CIR_A*T + CBS_A - F)$ and $Z_A = (CIR_A*T + CBS_A + F)$
Begin the test with CIR_A set to the minimum value (i.e. 64 Kbps) and increment CIR_A by the step value defined for the CIR range.
Repeat the test for each CIR_A value until CIR_A has been incremented to the UNI speed</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR_A, CBS_A, UNIs interface speed, time interval T, number and length λ of the offered Service Frames, amount of traffic X and amount of traffic Z</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

Remarks	

TEST CASE 35: Type 1.2 UNI-N Optional EIR Configuration Granularity

ABSTRACT TEST SUITE FOR UNI TYPE 1	
Test Name	Type 1.2 UNI-N Optional EIR Configuration Granularity
Test Definition ID	U1.6.2.5-35.2
Reference Document	MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]
Test Type	Conformance
Test Status	Optional
Requirement Description	A Type 1.2 UNI-N **SHOULD** allow configuration to modify EIR in the following granularities · 64 Kbps (DS0 rate) steps up to 1.422 Mbps (VC11 rate) or 1.932 Mbps (VC12 rate) [EIR range 1] · 1.422 Mbps (VC11 rate) or 1.932 Mbps (VC12 rate) steps up to 50 Mbps [EIR range 2] · 43.008 Mbps (VC3 rate) steps beyond 50 Mbps and up to 150 Mbps [EIR range 3] · 133.12 Mbps (VC4 rate) steps beyond 150 Mbps [EIR range 4]
Test Object	Verify that a Type 1.2 UNI-N allows configuration to modify EIR in the granularities described in the requirement description section above
Test Configuration	One EVC associating two Type 1.2 UNIs is configured. At least one CE-VLAN ID is mapped to the EVC and one Bandwidth Profile is applied at the ingress UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC
CE-VLAN ID/EVC Map	**INGRESS UNI 'A'** / **EGRESS UNI 'B'** **CE-VLAN ID** | **EVC** / **CE-VLAN ID** | **EVC** 11* | EVC_1 / 11* | EVC_1 Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1 The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both ingress and egress UNIs
Bandwidth Profile	**PER INGRESS UNI** **UNI** | **Bandwidth Profile Parameters** UNI_A | CIR_A CBS_A EIR_A EBS_A Note 1: ($CIR_A = 0$) and ($CBS_A = 0$) Note 2: ($0 < EIR_A <$ Ingress UNI Speed), ($EBS_A \geq$ maximum Service Frame size) Note 3: (Ingress $EIR_A \leq$ Egress UNI Speed)
Service Performance	Not Specified
Test Procedure	Tester offers Service Frames with mapped CE-VLAN IDs of length λ at an average rate greater than EIR_A to the ingress UNI during a time interval T and measures the number of Service Frames delivered at the associated egress UNI. The amount of traffic delivered at the associated egress UNI must fall within the range $X \leq W_Y \leq Z$ where: · W_Y is the amount of traffic accepted as Yellow over the time interval T that may be delivered to the egress UNI · $X_A = (EIR_A*T + EBS_A - F)$ *and* $Z_A = (EIR_A*T + EBS_A + F)$ Begin the test with EIR_A set to the minimum value (i.e. 64 Kbps) and increment EIR_A by the step value defined for the EIR range. Repeat the test for each EIR_A value until EIR_A has been incremented to the UNI speed
Units	Number of valid Service Frames
Variables	Bandwidth Profile Parameters EIR_A, EBS_A, UNIs interface speed, time interval T, tolerated variance F, number and length λ of the offered Service Frames

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

Results	Pass or fail
Remarks	

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 36: Type 1.2 UNI-N CBS Configuration

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N CBS Configuration</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.5-36.1</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N MUST be able to at least support CBS values that are equal to or greater than 8 x MTU = 8 x 1522 bytes = 12176 bytes</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can at least support CBS values that are equal to or greater than 8 x MTU = 8 x 1522 bytes = 12176 bytes</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.2 UNIs is configured. At least one CE-VLAN ID is mapped to the EVC and one Bandwidth Profile is applied at the ingress UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both ingress and egress UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="5">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th colspan="4">Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A</td><td>CBS_A</td><td>EIR_A</td><td>EBS_A</td></tr>
<tr><td colspan="5">Note 1: ($0 < CIR_A <$ Ingress UNI Speed), ($CBS_A \geq$ 12176 bytes)
Note 2: (Ingress $CIR_A \leq$ Egress UNI Speed)
Note 3: ($EIR_A = 0$) and ($EBS_A = 0$)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped CE-VLAN IDs of length λ at an average rate equal to CIR_A to the ingress UNI during a time interval T. At time $T/2$ tester injects a burst of ingress Service Frames greater than CBS_A. Tester measures the number of Service Frames delivered at the associated egress UNI. The amount of traffic delivered at the associated egress UNI must fall within the range $X \leq W_G \leq Z$ where:
· W_G is the amount of traffic accepted as Green over the time interval T that should be delivered to the egress UNI
· $X_A = (CIR_A * T + CBS_A - F)$ and $Z_A = (CIR_A * T + CBS_A + F)$</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR_A, CBS_A, UNIs interface speed, time interval T, tolerated variance F, number and length λ of the offered Service Frames, burst size</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 37: Type 1.2 UNI-N EBS Configuration

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N EBS Configuration</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.5-36.2</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N MUST be able to at least support EBS values that are equal to or greater than 8 x MTU = 8 x 1522 bytes = 12176 bytes</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can at least support EBS values that are equal to or greater than 8 x MTU = 8 x 1522 bytes = 12176 bytes</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.2 UNIs is configured. At least one CE-VLAN ID is mapped to the EVC and one Bandwidth Profile is applied at the ingress UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both ingress and egress UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="5">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th colspan="4">Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A</td><td>CBS_A</td><td>EIR_A</td><td>EBS_A</td></tr>
<tr><td colspan="5">Note 1: (CIR_A = 0) and (CBS_A = 0)
Note 2: (0 < EIR_A < Ingress UNI Speed), (EBS_A ≥ 12176 bytes)
Note 3: (Ingress EIR_A ≤ Egress UNI Speed)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped CE-VLAN IDs of length λ at an average rate equal to EIR_A to the ingress UNI during a time interval T. At time $T/2$ tester injects a burst of ingress Service Frames greater than EBS_A. Tester measures the number of Service Frames delivered at the associated egress UNI. . The amount of traffic delivered at the associated egress UNI must fall within the range $X \le W_Y \le Z$ where:
· W_Y is the amount of traffic accepted as Yellow over the time interval T that may be delivered to the egress UNI
· $X_A = (EIR_A*T + EBS_A - F)$ and $Z_A = (EIR_A*T + EBS_A + F)$</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters EIR_A, EBS_A, UNIs interface speed, time interval T, tolerated variance F, number and length λ of the offered Service Frames, burst size</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 38: Type 1.2 UNI-N Optional Layer 2 Control Protocol Discard

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N Optional Layer 2 Control Protocol Discard</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.6-37</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Optional</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N SHOULD be able to discard the following L2 Control Protocols
· Spanning Tree Protocol (STP),
· Rapid Spanning Tree Protocol (RSTP),
· Multiple Spanning Tree Protocol (MSTP)
· All LANs Bridge Management Group Block of Protocol
· Generic Attribute Registration Protocol (GARP)
· Link Aggregation Control Protocol (LACP)
· Marker Protocol
· Authentication (802.1x)
· 802.3x (PAUSE) frames</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can discard each L2 Control Protocol described in the requirement description section above</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.2 UNIs is configured and at least one CE-VLAN ID is mapped to the EVC. A per Ingress UNI bandwidth profile is applied at the UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both ingress and egress UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="5">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th colspan="4">Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A</td><td>CBS_A</td><td>EIR_A</td><td>EBS_A</td></tr>
<tr><td colspan="5">Note 1: ($0 < CIR_A <$ Ingress UNI Speed), ($CBS_A \geq$ maximum Service Frame size)
Note 2: (Ingress $CIR_A \leq$ Egress UNI Speed)
Note 3: ($EIR_A = 0$) and ($EBS_A = 0$)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames carrying Layer 2 Control protocols described in the requirement description section above at the ingress UNI and verifies that the corresponding Service Frames are not delivered at the associated egress UNI. The L2CPs Destination Address and Ethertype/Length fields must be defined as per the IEEE standards</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames carrying the L2CPs</td></tr>
<tr><td>Variables</td><td>L2CP, Bandwidth Profile Parameters CIR_A, CBS_A, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 39: Type 1.2 UNI-N Optional Layer 2 Control Protocol Generation

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N Optional Layer 2 Control Protocol Generation</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.6-38</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Optional</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N SHOULD NOT generate 802.3x PAUSE frames</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N does not generate 802.3x PAUSE frames</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.2 UNIs is configured. At least one CE-VLAN ID is mapped to the EVC and one Bandwidth Profile is applied at the ingress UNI. A per Ingress UNI bandwidth profile is applied at the UNI. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">INGRESS UNI ‘A’</th><th colspan="2">EGRESS UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both ingress and egress UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="5">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th colspan="4">Bandwidth Profile Parameters</th></tr>
<tr><td>UNI_A</td><td>CIR_A</td><td>CBS_A</td><td>EIR_A</td><td>EBS_A</td></tr>
<tr><td colspan="5">Note 1: ($0 < CIR_A <$ Ingress UNI Speed/2), ($CBS_A \geq$ maximum Service Frame size)
Note 2: ($EIR_A = 0$) and ($EBS_A = 0$)
Note 3: (Ingress $CIR_A \leq$ Egress UNI Speed)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped CE-VLAN IDs at the ingress UNI, at an average rate equal to the UNI speed and verifies that no 802.3x PAUSE frames are sent back to its test interfaces</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames carrying he L2CPs</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR_A, CBS_A, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 40: Type 1.2 UNI-N Concurrent Point-to-Point and Multipoint EVCs

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N Concurrent Point-to-Point and Multipoint EVCs</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.7-40</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N MUST be able to support Point-to-Point and Multipoint EVCs concurrently</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can support Point-to-Point and Multipoint EVCs concurrently</td></tr>
<tr><td>Test Configuration</td><td>One Multipoint and one Point-to-Point EVCs associating one Type 1.2 ingress UNI and two Type 1.2 egress UNIs are configured and at least one CE-VLAN ID is mapped per EVC. Per EVC bandwidth profiles are applied at all UNIs. Testers with proper PHY that matches each UNI are attached to all UNIs in the configured EVCs</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th><th colspan="2">UNI ‘B’</th><th colspan="2">UNI ‘C’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td>12</td><td>EVC_2</td><td>12</td><td>EVC_2</td><td></td><td></td></tr>
<tr><td colspan="6">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="6">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both ingress and egress UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER EVC</th></tr>
<tr><th>EVC</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>EVC_1</td><td>CIR_1 CBS_1 EIR_1 EBS_1</td></tr>
<tr><td>EVC_2</td><td>CIR_2 CBS_2 EIR_2 EBS_2</td></tr>
<tr><td colspan="2">Note 1: ($0 < CIR_{1,2} <$ Ingress UNI Speed), ($CBS_{1,2} \geq$ maximum Service Frame size)
Note 2: (Σ Ingress CIRs $\leq$ Egress UNI Speed)
Note 3: ($EIR_{1,2} = 0$) and ($EBS_{1,2} = 0$)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped CE-VLAN IDs bidirectionally at each UNI configured in the EVCs and verifies that the corresponding Service Frames are successfully delivered on the proper EVC at the associated UNIs.</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR_1, CBS_1, CIR_2, CBS_2, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 41: Type 1.2 UNI-N CE-VLAN ID Preservation

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N CE-VLAN ID Preservation</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.8-41</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N MUST be able to support CE-VLAN ID preservation</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can support CE-VLAN ID preservation</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.2 UNIs is configured and at least one CE-VLAN ID is mapped to the EVC. A per Ingress UNI bandwidth profile is applied at both UNIs. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th><th colspan="2">UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both ingress and egress UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI</td><td>CIR CBS EIR EBS</td></tr>
<tr><td colspan="2">Note 1: (0 < CIR < Ingress UNI Speed), (CBS ≥ maximum Service Frame size)
Note 2: (Ingress CIR ≤ Egress UNI Speed)
Note 3: (EIR = 0) and (EBS = 0)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers Service Frames with mapped CE-VLAN IDs bidirectionally at each UNI configured in the EVC and verifies that the corresponding Service Frames are delivered at the associated UNI with CE-VLAN ID preservation</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR, CBS, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 42: Type 1.2 UNI-N CE-VLAN CoS Preservation

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N CE-VLAN CoS Preservation</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.9-42</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N MUST be able to support CE-VLAN CoS preservation</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can support CE-VLAN CoS preservation</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.2 UNIs is configured and at least one CE-VLAN ID is mapped to the EVC. A per Ingress UNI bandwidth profile is applied at both UNIs. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th><th colspan="2">UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both ingress and egress UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI</td><td>CIR CBS EIR EBS</td></tr>
<tr><td colspan="2">Note 1: (0 < CIR < Ingress UNI Speed), (CBS ≥ maximum Service Frame size)
Note 2: (Ingress CIR ≤ Egress UNI Speed)
Note 3: (EIR = 0) and (EBS = 0)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers tagged Service Frames with mapped CE-VLAN ID with all possible CoS values bidirectionally at each UNI configured in the EVC and verifies that the corresponding Service Frames are delivered at the associated UNI with CE-VLAN CoS preservation</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR, CBS, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 43: Type 1.2 UNI-N Broadcast & Multicast Service Frame Unconditional Delivery

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N Broadcast & Multicast Service Frame Unconditional Delivery</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.2.10-43</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N MUST be able to deliver multicast and broadcast Service Frames unconditionally, except:
Spanning Tree Protocol (STP),
Rapid Spanning Tree Protocol (RSTP),
Multiple Spanning Tree Protocol (MSTP)
All LANs Bridge Management Group Block of Protocol
Generic Attribute Registration Protocol (GARP)
Link Aggregation Control Protocol (LACP)
Marker Protocol
Authentication (802.1x)
802.3x (PAUSE) frames</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can deliver multicast and broadcast Service Frames unconditionally, except the L2CPs listed in the requirement description above</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.2 UNIs is configured and at least one CE-VLAN ID is mapped to the EVC. A per Ingress UNI bandwidth profile is applied at both UNIs. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVC</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th><th colspan="2">UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both ingress and egress UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI</td><td>CIR CBS EIR EBS</td></tr>
<tr><td colspan="2">Note 1: (0 < CIR < Ingress UNI Speed), (CBS ≥ maximum Service Frame size)
Note 2: (Ingress CIR ≤ Egress UNI Speed)
Note 3: (EIR = 0) and (EBS = 0)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers multicast and broadcast Service Frames (except the L2CPs listed in the requirement description above) bidirectionally at each UNI configured in the EVC and verifies that the corresponding Service Frames are delivered at the associated UNI</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Frame Format (broadcast, multicast), Bandwidth Profile Parameters CIR, CBS, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

TEST CASE 44: Type 1.2 UNI-N Unicast Service Frame Unconditional Delivery

<table>
<tr><th colspan="2">ABSTRACT TEST SUITE FOR UNI TYPE 1</th></tr>
<tr><td>Test Name</td><td>Type 1.2 UNI-N Unicast Service Frame Unconditional Delivery</td></tr>
<tr><td>Test Definition ID</td><td>U1.6.1.8-44</td></tr>
<tr><td>Reference Document</td><td>MEF 13 [User Network Interface (UNI) Type 1 Implementation Agreement]</td></tr>
<tr><td>Test Type</td><td>Conformance</td></tr>
<tr><td>Test Status</td><td>Mandatory</td></tr>
<tr><td>Requirement Description</td><td>A Type 1.2 UNI-N MUST be able to deliver all unicast Service Frames unconditionally</td></tr>
<tr><td>Test Object</td><td>Verify that a Type 1.2 UNI-N can deliver all unicast Service Frame unconditionally</td></tr>
<tr><td>Test Configuration</td><td>One EVC associating two Type 1.2 UNIs is configured and at least one CE-VLAN ID is mapped to the EVC. A per Ingress UNI bandwidth profile is applied at both UNIs. Testers with proper PHY that matches each UNI are attached to both UNIs in the configured EVCs</td></tr>
<tr><td>CE-VLAN ID/EVC Map</td><td>
<table>
<tr><th colspan="2">UNI ‘A’</th><th colspan="2">UNI ‘B’</th></tr>
<tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr>
<tr><td>11*</td><td>EVC_1</td><td>11*</td><td>EVC_1</td></tr>
<tr><td colspan="4">Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1</td></tr>
<tr><td colspan="4">The CE-VLAN ID for untagged and priority tagged Service Frames is configured to 11 at both ingress and egress UNIs</td></tr>
</table>
</td></tr>
<tr><td>Bandwidth Profile</td><td>
<table>
<tr><th colspan="2">PER INGRESS UNI</th></tr>
<tr><th>UNI</th><th>Bandwidth Profile Parameters</th></tr>
<tr><td>UNI</td><td>CIR CBS EIR EBS</td></tr>
<tr><td colspan="2">Note 1: (0 < CIR < Ingress UNI Speed), (CBS ≥ maximum Service Frame size)
Note 2: (Ingress CIR ≤ Egress UNI Speed)
Note 3: (EIR = 0) and (EBS = 0)</td></tr>
</table>
</td></tr>
<tr><td>Service Performance</td><td>Not Specified</td></tr>
<tr><td>Test Procedure</td><td>Tester offers unicast Service Frames with mapped CE-VLAN IDs with varying destination addresses bidirectionally at each UNI configured in the EVC and verifies that the corresponding Service Frames are delivered at the associated UNI</td></tr>
<tr><td>Units</td><td>Number of valid Service Frames</td></tr>
<tr><td>Variables</td><td>Bandwidth Profile Parameters CIR, CBS, UNIs interface speed</td></tr>
<tr><td>Results</td><td>Pass or fail</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.

11. References

References	Details
IEEE 802.3	IEEE P 802.3 – 2002, 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, 8 March 2002. (Normative)
IEEE 802.3ae	IEEE 802.3ae-2002Information Technology - Local & Metropolitan Area Networks - Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications - Media Access Control Parameters, Physical Layers and Management Parameters for 10 Gb/s Operation
IEEE 802.1Q	IEEE 802.1Q, 2003 Edition, IEEE Standards for Local and metropolitan area networks—Virtual Bridged Local Area Networks
MEF 4	Metro Ethernet Network Architecture Framework - Part 1: Generic Framework
MEF 6	Ethernet Services Definitions
MEF 10	Ethernet Services Attributes Phase 1
MEF 11	User Network Interface (UNI) Requirements and Framework
MEF 13	User Network Interface (UNI) Implementation Agreement
RFC 2119	RFC 2119, “Key words for use in RFCs to Indicate Requirement Levels”, S. Bradner, http://www.ietf.org/rfc/rfc2119.txt (Normative)
RFC 2285	RFC 2285, “Benchmarking Terminology for LAN Switching Devices”, R. Mandeville, http://www.ietf.org/rfc/rfc2285.txt
RFC 2544	RFC 2544, “Benchmarking Methodology for Network Interconnect Devices”, S. Bradner, J. McQuaid, http://www.ietf.org/rfc/rfc2544.txt
RFC 2889	RFC 2889, “Benchmarking Methodology for LAN Switching Devices”, R. Mandeville, J. Perser, http://www.ietf.org/rfc/rfc2889.txt

© The Metro Ethernet Forum 2007. Any reproduction of this document, or any portion thereof, shall contain the following statement: "Reproduced with permission of the Metro Ethernet Forum." No user of this document is authorized to modify any of the information contained herein.