

Technical Specification MEF 14

Abstract Test Suite for Traffic Management Phase 1

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1. Abstract

This document defines the requirements and corresponding test procedures for Service Performance and Bandwidth Profile Service Attributes that may be specified as part of a Service Level Specification (SLS) for an Ethernet Service. Requirements are derived from Metro Ethernet Forum Technical Committee documents.

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 ad-

dress.

Bundling A UNI attribute in which more than one CE-VLAN ID can be as-

sociated 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 correspond-

ing 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 Ser-

vice 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 ModeCM 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.

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 de-

fined 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 en-

forcement 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

CF

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 Connec-

tion

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.

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 different Service

Frames belonging to the same CoS instance.

Frame Delay Variation The difference in delay of two Service Frames.

Frame Delay Variation

Performance ¹

A measure of the variation in the delays experienced by different

Service Frames belonging to the same CoS instance.

Frame Loss Ratio Perfor-

mance

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 net-

work.

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 speci-

fying the agreed to service level commitments and related busi-

ness agreements.



Service Level Specifica-

tion

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

Unicast Service Frame A Service Frame that has a unicast destination MAC address.

User Network Interface The physical demarcation point between the responsibility of the

Service Provider and the responsibility of the Subscriber.

3. Scope

This document defines the requirements and corresponding test procedures for Service Performance and Bandwidth Profile Service Attributes that may be specified as part of a Service Level Specification (SLS) for an Ethernet Service. As with MEF 9 Abstract Test Suite for Ethernet Services at the UNI [3], the tests in this specification are defined from the point of view of the Subscriber's equipment that is used to access the services.

The requirements defined in this document are based on Sections 6.7 and 7.10 of MEF 10 Ethernet Services Attributes Phase 1 [1]. Section 6.7 of MEF 10 [1] defines three EVC Related Performance Service Attributes: Frame Delay Performance, Frame Delay Variation Performance, and Frame Loss Ratio Performance. Section 7.10 of MEF 10 defines Bandwidth Profile Service Attributes of an Ethernet Service at the UNI. Bandwidth Profiles Service Attributes are defined per Ingress UNI, per EVC, and per Class of Service. Six parameters are applied to Bandwidth Profiles: Committed Information Rate (CIR), Committed Burst Size (CBS), Excess Information Rate (EIR), Excess Burst Size (EBS), Coupling Flag (CF) and Color Mode (CM). In the absence of a standard way to color Service Frames, tests are not defined in relation to CF and CM parameters that may be applied to a Bandwidth Profile. Such tests may be added in the future when Service Frame Coloring is further specified.

When combined with MEF 9 [3], this specification covers all of the EVC and UNI related Service Attributes specified in MEF 10 [1]. Together they provide a comprehensive set of Test Cases to determine the readiness of a Metro Ethernet Network (MEN) to deliver various Ethernet Services, such as Ethernet Line (E-Line) and Ethernet LAN (E-LAN) services when Service Performance and Bandwidth Profile Service Attributes are specified.

Implementation specifications are outside the scope of this document. This document may be updated in the future to reflect new work 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 [5]. All key words must be in upper case, bold text.

5. Introduction

This document completes MEF 9 [3] by adding requirements and test procedures for Service Performance and Bandwidth Profile Service Attributes defined in MEF 10 [1]. As with MEF 9, vendors can refer to the requirements and test procedures defined in this specification in the development and commercial cycles of their products, carriers can use them to ensure that the networks they deploy will have the ability to deliver Ethernet Services that support Service Level Specifications defined by the Technical Committee of the Metro Ethernet Forum and subscribers can attach to the MEN knowing that the Ethernet Services they access satisfy criteria based on accepted requirements and test procedures.

The definition of the requirements a MEN must satisfy to deliver Services to which Traffic and Performance parameters are applied is tightly based on the MEF 10 [1]. The Ethernet Service Definition Framework was created by the Metro Ethernet Forum (MEF) to provide the service attributes and parameters to create an Ethernet service. The relationship between the Ethernet Services Test Definition documents and the two MEF services documents is illustrated in Figure 1.

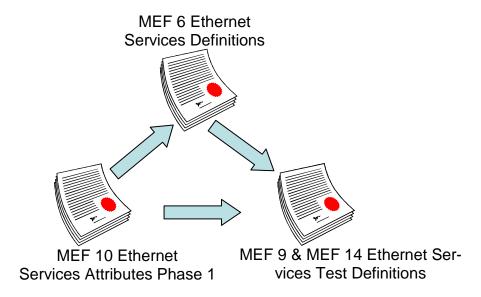


Figure 1: Relationship between different MEF Services Group documents and the Ethernet Services Test Definition Documents



The fundamental service constructs defined in MEF 10 [1] are Ethernet Service Types. These have two types of Service Attributes associated with them, those associated with the UNI, and those associated with the EVC. This specification defines requirements and test procedures based on the Performance Service Attributes which are associated with the EVC and on the Bandwidth Profile Service Attributes which are associated with the UNI. MEF 10 [1] also defines the type of parameter values associated with each of these Service Attributes.

A conceptual schematic of the relationship between the MEF Technical Committee Ethernet Services documents and the derived MEN requirements and correspondingly defined test definitions is represented in Figure 2.

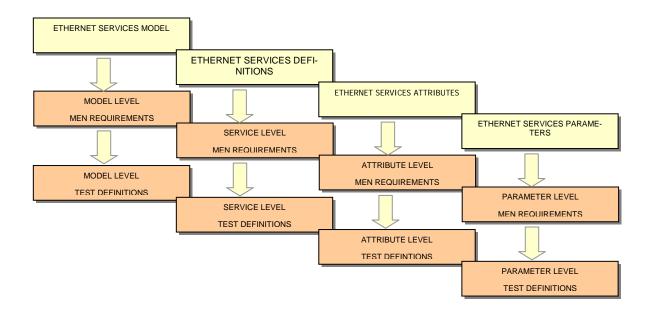


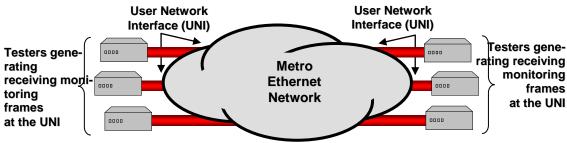
Figure 2: Relationship between Ethernet Service Documents and Abstract Test Cases for Ethernet Services at the UNI



6. Test Configuration

Although some tests may require very specific test configurations, most tests defined in this document are to be executed by attaching the Ethernet interface or interfaces of a Tester to the Ethernet interface or interfaces at the UNI. Since the UNI is the physical demarcation point which delimits the responsibilities of the Subscriber and the Service Provider, the Tester attached in this way sees a MEN from the point of view of the Subscriber's equipment and can test a MEN's ability to offer Ethernet Services to the Subscriber. We schematically represent the attachment of the Tester to the MEN in Figure 3

Test Configuration for Ethernet Services at the UNI



Testers physically attach to the MEN at the UNI Testers may be attached to the MEN at multiple UNIs

Figure 3: Test Configuration for Ethernet Services at the UNI

The Test Configuration for each Test Case describes the number of EVCs associating the number of UNIs in the Test Case and the number of CE-VLAN IDs mapped to the EVCs. Testers are attached to all UNIs in the configured EVCs in all Test Cases. CE-VLAN ID/EVC Maps are given for each Test Case.



In this document CE-VLAN ID/EVC Maps for the ingress and egress UNIs as in Figure 4, specific Bandwidth Profile Service Attributes as in Figure 5 and EVC Performance Service Attributes as in Figure 6 are suggested for each Test Case.

INGRESS UNI 'A' EGRESS UNI 'B'								
CE-VLAN ID EVC CE-VLAN ID EVC								
10	EVC ₁		10	EVC ₁				
Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEE 10 [Ethernet Services Attributes Phase 1]. Section 7.5.1								

Figure 4: CE-VLAN ID/EVC Maps for the ingress and egress UNIs

Per Ingress UNI								
UNI Bandwidth Profile Parameters								
UNI _A	CIR _A CBS _A EIR _A EBS _A							
Note 1 : (0 < CIR _A ≤ UNI Speed), (CBS _A ≥ maximum Service Frame size)								

Figure 5: Bandwidth Profile Service Attributes

CoS Iden- tifier	EVC Performance Service Attributes	Performance Objectives
	Frame Delay (FD) Performance	FD₁
1	Frame Delay Variation (FDV) Performance	FDV_1
	Frame Loss Ratio (FLR) Performance	FLR₁

Figure 6: EVC Performance Service Attributes



7. Template for Abstract Test Cases for Traffic Management

We adopt the following template for the definition of Abstract Test Cases for Management:

	ABSTRACT TE	ST SUITE FOR TRA	AFFIC MANA	AGEMENT: PH	ASE 1			
Test Name	Name derived from reference	ce document						
Test Definition ID	ing convention: 'one to thre section from which requiren	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' - 'paragraph number in the section from which requirement is derived'. This number always figures as the last number of an ID. Ethernet Services Model=M; Ethernet Services Definitions=S. Example: M.6.1-4						
Reference Doc- ument	Reference document and so	ection (and paragraph	when useful for	or clarity)				
Test Type	Functional, Conformance, I	nteroperability or Perfo	rmance					
Test Status	Mandatory, optional							
Requirement Description	Brief description of the serv	<u> </u>	e MEN MUST	Γ or SHOULD sati	sfy			
Test Object	Succinct description of test	purpose						
Test Configura- tion	Succinct description of test	bed configuration						
	A sample VLAN ID/EVC Ma	. 00	bles augment					
VLAN-ID/EVC		GRESS UNI 'A'			ESS UNI 'B'			
Мар	CE-VLA	N ID E	VC	CE-VLAN II	D EVC			
	10		/C ₁	10	EVC₁			
	Use of other C	E-VLAN IDs is perr to MEF 10 [Etherne	nitted provid	ed that configur	ation of the CE-VLA	7		
Bandwidth Pro- file		I UNI		andwidth Profi	le Parameters			
		JNI _A	CII		EIR _A EBS _A			
	Note 1: (0 < C	IR _A ≤ UNI Speed),	(CBS _A ≥ ma	ximum Service	Frame size)			
Service Perfor- mance	CoS Identifier	EVC Performa Frame Delay (FD) Frame Delay Varia Frame Loss Ratio	Performano ation (FDV) F	ee Performance	Performance Objectives FD ₁ FDV ₁ FLR ₁			
Test Procedure	Succinct description of the test procedure. CE-VLAN ID/EVC Maps are provided for all tests.							
	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.							
Units	Units can be time units, rate frames. For the most part u	es and counts in integer nits used are defined i	n RFCs 2285,	2544, 2889.	•			
Units Variables	Units can be time units, rate frames. For the most part units Variables such as number of	es and counts in integenits used are defined in the street of UNIs, EVCs and CE	n RFCs 2285, -VLAN IDs an	2544, 2889. d frame formats a	ind lengths MUST be de	escribed.		
	Units can be time units, rate frames. For the most part u	es and counts in intege nits used are defined i of UNIs, EVCs and CE umerical and/or graph	n RFCs 2285, -VLAN IDs an ical format in v	2544, 2889. d frame formats a which to display to	ind lengths MUST be de	escribed.		



8. Abstract Test Cases for EVC Related Performance Service Attributes

In this section we assume familiarity with the MEF 10 Ethernet Services Attributes Phase 1 [1] and, in particular, its section 6.7 which defines EVC Related Performance Service Attributes. Abstract Test Cases based on the EVC Related Performance Service Attributes described in the MEF 10 [1] are defined. There are three Test Cases defined in this section.

Test Case 1: Frame Delay Service Performance

Test Case 2: Frame Delay Variation Service Performance

Test Case 3: Frame Loss Ratio Service Performance



Test Case 1: Frame Delay Service Performance

	ABSTRACT TEST SUITE FOR TRAFFIC MANAGEMENT: PHASE 1
Test Name	Frame Delay Service Performance
Test Definition ID	M.6.7.1
Reference Doc- ument	MEF 10 [Ethernet Services Attributes Phase 1]
Test Type	Conformance
Test Status	Mandatory
Requirement Description	For all Service Frames declared Green and associated with a particular Class of Service Identifier on a Point-to-Point EVC that arrive at the UNI during a time interval <i>T</i> , Frame Delay Performance MUST be less than or equal to the Frame Delay Performance Objective
Test Object	Verify that for all Service Frames declared Green and associated with a particular Class of Service Identifier on a Point-to-Point EVC that arrive at the UNI during a time interval <i>T</i> , Frame Delay Performance is less than or equal to the Frame Delay Performance Objective
Test Configuration	At least one EVC associating at least two UNIs is configured and at least one Bandwidth Profile with CIR > 0 is associated with at least one of the UNIs. Testers are attached to all UNIs in the configured EVCs
VLAN-ID/EVC Map	INGRESS UNI 'A' CE-VLAN ID 10 EVC 1
Bandwidth Profile	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$
	CoS Identifier EVC Performance Service Attributes Performance Objectives
Service Performance	1 Frame Delay (FD) Performance FD ₁
Test Procedure	Tester offers Service Frames at the ingress UNI into the configured EVCs and measures Frame Delay as the time elapsed from the reception of the first bit of the ingress Service Frame declared Green until the transmission of the last bit of the Service Frame at the egress UNI. Frame Delay Performance is then calculated for a time interval <i>T</i> , as the P-Percentile of the Frame Delay for all Service Frames successfully delivered between the UNI pairs. Service Frames may be offered at an average rate up to CIR _A
Units	Time units
Variables	Bandwidth Profile Parameters CIR _{A,} CBS _A , EIR _{A,} EBS _{A,} UNIs interface Speed, number of EVCs per UNI, number and values of CE-VLAN IDs, number and values of CoS ID, time interval <i>T</i> , Performance Objective FD ₁
Results	Pass or fail
Remarks	



Test Case 2: Frame Delay Variation Service Performance

	AB	STRACT TE	ST SUITE FO	R TRAFFIC MAN	IAC	SEMENT: PH	ASE 1		
Test Name	Frame Dela	ay Variation Se	rvice Performar	nce					
Test Definition ID	M.6.7.3								
Reference Doc- ument	MEF 10 [Et	hernet Service	s Attributes Pha	ase 1]					
Test Type	Conforman	ce							
Test Status	Mandatory	E	-110	- d d d 20b			(0	- Ideatte - D	tarra Datar
Requirement Description	EVC that ar to the Fram	rrive at the UNI e Delay Variat	I during a time i ion Performanc		lay	Variation Perfo	ormance	e MUST be less tha	n or equal
Test Object	Point-to-Po equal to the	int EVC that ar Frame Delay	rrive at the UNI Variation Perfo	d Green and associal during a time interval rmance Objective	al <i>T</i>	, Frame Delay	Variatio	n Performance is le	ess than or
Test Configuration				UNIs is configured esters are attached					> 0 is as-
			INGRESS UN	I 'A'		EG	RESS	UNI 'B'	
VLAN-ID/EVC		CE-VI	LAN ID	EVC		CE-VLAN	ID	EVC	
Map			10	EVC ₁		10	6.1	EVC ₁	
·				s permitted provided et Services Attribute					
Bandwidth				Per Ingres					
Profile	=		UNI _A		CIF	ndwidth Profi	EIRA	EBS _A	
	•	Note 1 : (0 < 9	,,	eed), (CBS _A ≥ maxii		,,		LDOA	
		CoS Iden-	EVC Po	rformance Service	Λ++	tributos	Perfo	ormance Objec-	<u> </u>
		tifier	EVC Pe	riorinance Service	Au	inbutes		tives	
Service Performance		1	Frame Delay	Variation (FDV) Per	forr	mance		FDV₁	
Test Procedure	the variation then calcula Frame pair 1. The 2. The	n in the Frame ated for a time that satisfies the two Service F two Service F	Delay between interval <i>T</i> , as the following two rames that comrames that comrames that comrames that com	ss UNI into the conf a pair of Green Set the P-Percentile of the characteristics: the pair arrive prise the pair arrive terage rate up to CIR	e di at at	e Frames. Fra ifference betwe the ingress UN	me Dela en the f	ay Variation Perform rame delays of a S the time interval <i>T</i>	nance is ervice
Units	Time units							<u> </u>	•
Variables	and values			A, EIRA, EBSA, UNI values of CoS ID, t					number
Results	Pass or fail								
Remarks									



Test Case 3: Frame Loss Ratio Service Performance

	ABSTRACT TEST SUITE	FOR TRAFFIC MANA	GEMENT: PHASE	1			
Test Name	Frame Loss Ratio Service Performance	се					
Test Definition ID	M.6.7.5						
Reference Doc- ument	MEF 10 [Ethernet Services Attributes	Phase 1]					
Test Type	Conformance						
Test Status	Mandatory						
Requirement Description	For all Service Frames declared Greer EVC that arrive at the UNI during a tim Frame Loss Ratio Performance Object	ne interval <i>T</i> , Frame Loss R tive	Ratio Performance M	JST be less than or e	equal to the		
Test Object	Verify that for all Service Frames declar Point-to-Point EVC that arrive at the U equal to the Frame Loss Ratio Perforn	JNI during a time interval T_{ij}	, Frame Loss Ratio P	erformance is less th	an or		
Test Configuration	At least one EVC associating at least sociated with at least one of the UNIs.	two UNIs is configured and Testers are attached to a	d at least one Bandwi III UNIs in the configu	dth Profile with CIR > red EVCs	o is as-		
	INGRESS		EGRESS				
VLAN-ID/EVC	CE-VLAN ID	EVC	CE-VLAN ID	EVC			
Map	10	EVC ₁	10	EVC₁			
Мар	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.						
Bandwidth Profile	UNI UNI _A Note 1 : (0 < CIR _A ≤ UNI	Per Ingress U Ba CIR Speed), (CBS _A ≥ maximun	ndwidth Profile Para R _A CBS _A EIR _A	EBS _A			
	CoS Identifier EVC	Performance Service Att	ributes	formance Objec- tives			
Service Performance	1 Frame Los	es Ratio (FLR) Performance	е	FLR ₁			
Test Procedure	Tester offers Service Frames at the ingress UNI into the configured EVCs and over a time interval <i>T</i> counts the number of Service Frames declared Green at the ingress UNI and successfully received at the egress UNI. Frame Loss Ratio Performance is then calculated as the ratio, expressed as a percentage, of the number of Service Frames declared Green not delivered at the egress UNI divided by the total number of such Service Frames. Service Frames may be offered at an average rate up to CIR _A						
Units	Number of Service Frames						
Variables	Bandwidth Profile Parameters CIR _{A,} Cand values of CE-VLAN IDs, number a				number		
	,						
Results Remarks	Pass or fail						



9. Abstract Test Cases for Bandwidth Profiles Service Attributes

In this section we again assume familiarity with the MEF 10 [1] and, in particular, its section 7.10 which defines Bandwidth Profiles Service Attributes. Abstract Test Cases based on Bandwidth Profiles Service Attributes described in the MEF 10 [1] are defined. There are seven Test Cases defined in this section.

Test Case 4: Bandwidth Profile Rate Enforcement when CIR > 0 and EIR = 0

Test Case 5: Bandwidth Profile Rate Enforcement when CIR = 0 and EIR > 0

Test Case 6: Bandwidth Profile Rate Enforcement when CIR > 0 and EIR > 0

Test Case 7: Bandwidth Profile per Ingress UNI

Test Case 8: Bandwidth Profile per EVC

Test Case 9: Bandwidth Profile per Class of Service

Test Case 10: Multiple Bandwidth Profiles at the UNI



Test Case 4: Bandwidth Profile Rate Enforcement when CIR > 0 and EIR = 0

	AB	STRACT TEST SUITE F	OR TRAFFIC MAI	NAGEMEI	NT: PHASE	1	
Test Name	Bandwidth Pro	ofile Rate Enforcement wher	CIR > 0 and EIR = 0	0			
Test Definition ID	M.7.10.2.1-2						
Reference Doc- ument	·	net Services Attributes Pha	se 1]				
Test Type	Conformance						
Test Status	Mandatory						
Requirement Description	the egress UN interval <i>T</i> , prov	width Profile is associated w I MUST NOT exceed the ar vided that the ingress traffic	nount of traffic accep is greater than W_G	ted as Gre	en (W_G) at th	e ingress UNI durin	ig a time
Test Object	delivered at the a time interval	en a Bandwidth Profile is as: e egress UNI does not exce T, provided that the ingress	ed the amount of trait traffic is greater than	ffic accepte n W_{G}	ed as Green (W _G) at the ingress	UNI during
Test Configuration		VC associating at least two tached to all UNIs in the con		nd at least o	one Bandwidt	th Profile is applied	at the UNI.
		INGRESS UNI	'A'		EGRESS	UNI 'B'	
\/LANLID/E\/C		CE-VLAN ID	EVC	CE-V	VLAN ID	EVC	
VLAN-ID/EVC Map		10	EVC ₁		10	EVC₁	
Ινιαρ	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						
			Per Ingress	UNI			
Bandwidth		UNI	В	Bandwidth	Profile Paraı	meters	
Profile		UNIA		IR _A CBS		EBS _A	
1 10.110	Note 1 : $(0 < CIR_A < UNI Speed)$, $(CBS_A \ge maximum Service Frame size)$ Note 2 : $(EIR_A = 0)$ and $(EBS_A = 0)$						
Service Performance	Not Specified						
Test Procedure	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 egress UNI. The amount of traffic delivered at the egress UNI must not exceed W_0 where:						
Units		id Service Frames					
Variables	EVC (Point-to-	ofile Parameters CIR _A , CBS, Point and Multipoint-to-Mult offered Service Frames	A, UNIs interface spe ipoint), number and v	ed, number values of C	r of UNIs, nur E-VLAN IDs,	mber of EVCs per U time interval <i>T</i> , nur	JNI, type of mber and
Results							
	Pass or fail						



Test Case 5: Bandwidth Profile Rate Enforcement when CIR = 0 and EIR > 0

Test Name Bandwidth Profile Rate Enforcement when CIR = 0 and EIR > 0 M.7.10.2.1-2 Reference Document Test Type Conformance Test Status Mandatory When a Bandwidth Profile is associated with a UNI, with a CIR = 0 and an EIR > 0, the amount of traffic delivered the egress UNI MUST NOT exceed the amount of traffic accepted as Yellow (W _Y) at the ingress UNI during a timinterval T, provided that the ingress traffic is greater than W _Y Test Object Test Configuration Test Configuration Bandwidth Profile is associated with a UNI, with a CIR = 0 and an EIR > 0, the amount of traffic delivered the egress UNI during a timinterval T, provided that the ingress traffic is greater than W _Y Test Configuration Test Configuration CE-VLAN ID EVC 10 EVC 10 EVC 10 EVC 10 EVC 10 Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs					
Reference Document Test Type					
Test Type Conformance Test Status Mandatory Requirement Description Test Object Test Object Test Object Test Configuration MEF 10 [Ethernet Services Attributes Phase 1] When a Bandwidth Profile is associated with a UNI, with a CIR = 0 and an EIR > 0, the amount of traffic delivered the egress UNI MUST NOT exceed the amount of traffic accepted as Yellow (W _Y) at the ingress UNI during a time interval T, provided that the ingress traffic is greater than W _Y Verify that when a Bandwidth Profile is associated with a UNI, with a CIR = 0 and an EIR > 0, the amount of traffic accepted as Yellow (W _Y) at the ingress UNI delivered at the egress UNI does not exceed the amount of traffic accepted as Yellow (W _Y) at the ingress UNI during a time interval T, provided that the ingress traffic is greater than W _Y Test Configuration At least one EVC associating at least two UNIs is configured and at least one Bandwidth Profile is applied at the Testers are attached to all UNIs in the configured EVCs INGRESS UNI 'A' EGRESS UNI 'B' CE-VLAN ID EVC 10 EVC 10 EVC 10 EVC 10 EVC					
Test Status Mandatory					
Requirement DescriptionWhen a Bandwidth Profile is associated with a UNI, with a CIR = 0 and an EIR > 0, the amount of traffic delivered the egress UNI MUST NOT exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI during a tin interval T , provided that the ingress traffic is greater than W_Y Test ObjectVerify that when a Bandwidth Profile is associated with a UNI, with a CIR = 0 and an EIR > 0, the amount of traffic delivered at the egress UNI does not exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI does not exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI does not exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI does not exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI does not exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI does not exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI does not exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI does not exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI does not exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI does not exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI does not exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI does not exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI does not exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI does not exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI does not exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI does not exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI does not exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI does not exceed the amount of traffic accepted as Yellow					
the egress UNI MUST NOT exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI during a tin interval T , provided that the ingress traffic is greater than W_Y Verify that when a Bandwidth Profile is associated with a UNI, with a CIR = 0 and an EIR > 0, the amount of traffic accepted as Yellow (W_Y) at the ingress UNI delivered at the egress UNI does not exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI during a tin interval T , provided that the ingress traffic is greater than W_Y Test Configuration At least one EVC associating at least two UNIs is configured and at least one Bandwidth Profile is applied at the Testers are attached to all UNIs in the configured EVCs INGRESS UNI 'A' EGRESS UNI 'B' CE-VLAN ID EVC 10 EVC 10 EVC 10 EVC					
Test Object delivered at the egress UNI does not exceed the amount of traffic accepted as Yellow (W_Y) at the ingress UNI does a time interval T , provided that the ingress traffic is greater than W_Y Test Configuration At least one EVC associating at least two UNIs is configured and at least one Bandwidth Profile is applied at the Testers are attached to all UNIs in the configured EVCs INGRESS UNI 'A' EGRESS UNI 'B' CE-VLAN ID EVC 10 EVC 10 EVC 10 EVC 10 EVC 10					
Configuration Testers are attached to all UNIs in the configured EVCs INGRESS UNI 'A' CE-VLAN ID EGRESS UNI 'B' CE-VLAN ID EVC 10 EVC 10 EVC 10 EVC 10					
VLAN-ID/EVC CE-VLAN ID EVC CE-VLAN ID EVC 10 EVC1 10 EVC1					
VLAN-ID/EVC 10 EVC ₁ 10 EVC ₁					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					
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					
Per Ingress UNI					
LINI Randwidth Profile Parameters					
Bandwidth					
Profile Note 1 : (CIR _A = 0) and (CBS _A = 0) Note 2 : (0 < EIR _A < UNI Speed), (EBS _A ≥ maximum Service Frame size)					
Service Performance Not Specified					
Test Procedure Tester offers Service Frames 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 egress UNI. The amount of traffic delivered at the egress UNI must not exceed W_Y where: • W_Y is the amount of traffic accepted as Yellow over the time interval T that may be delivered to the egress UNI					
Heite Number of volid Comice France					
Units Number of valid Service Frames					
Variables Bandwidth Profile Parameters EIR _A , EBS _A , UNIs interface speed, number of UNIs, number of EVCs per UNI, typ EVC (Point-to-Point and Multipoint-to-Multipoint), number and values of CE-VLAN IDs, time interval <i>T</i> , number a length λ of the offered Service Frames					
Bandwidth Profile Parameters EIR _A , EBS _A , UNIs interface speed, number of UNIs, number of EVCs per UNI, type Variables Variables Bandwidth Profile Parameters EIR _A , EBS _A , UNIs interface speed, number of UNIs, number of EVCs per UNI, type EVC (Point-to-Point and Multipoint-to-Multipoint), number and values of CE-VLAN IDs, time interval <i>T</i> , number a					



Test Case 6: Bandwidth Profile Rate Enforcement when CIR > 0 and EIR > 0

	,	ABSTRACT TEST SUITE FO	R TRAFFIC MA	ANAGEMENT: PHASE	1		
Test Name	Bandwidth	Profile Rate Enforcement when 0	CIR > 0 and EIR >	. 0			
Test Definition ID	M.7.10.2.1-	-2					
Reference Doc- ument	MEF 10 [Et	thernet Services Attributes Phase	1]				
Test Type	Conforman	nce					
Test Status	Mandatory						
Requirement Description	the egress as Yellow (andwidth Profile is associated with UNI MUST NOT exceed the amo (W_y) at the ingress UNI during a t	ount of traffic acceing ime interval <i>T</i> , pro	pted as Green (W_G) plus ovided that the ingress tra	the amount of traffic accepted ffic is greater than $(W_G + W_V)$		
Test Object	delivered at accepted as $(W_G + W_y)$		I the amount of traduring a time inte	affic accepted as Green (rval <i>T</i> , provided that the i	$W_{\rm G}$) plus the amount of traffic ngress traffic is greater than		
Test Configuration		e EVC associating at least two UI e attached to all UNIs in the config		and at least one Bandwid	th Profile is applied at the UNI.		
		INGRESS UNI 'A	\'	EGRESS	UNI 'B'		
VLAN-ID/EVC		CE-VLAN ID	EVC	CE-VLAN ID	EVC		
Map		10	EVC ₁	10	EVC ₁		
		Use of other CE-VLAN IDs is proconforms to MEF 10 [Ethernet 5			CE-VLAN IDs		
			Per Ingres	s UNI			
Bandwidth		UNI		Bandwidth Profile Para			
Profile		UNI _A		CIR _A CBS _A EIR _A	EBS _A		
	Note 1 : $(0 < CIR_A < UNI Speed)$, $(CBS_A \ge maximum Service Frame size)$ Note 2 : $(0 < EIR_A < UNI Speed)$, $(EBS_A \ge maximum Service Frame size)$ Note 3 : $(CIR_A + EIR_A < UNI Speed)$						
Service Performance	Not Specified						
	Tester offers Service Frames 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 egress UNI. The amount of traffic delivered at the egress UNI must not exceed $(W_G + W_y)$ where:						
Test Procedure							
	. e	egress UNI $W_{\scriptscriptstyle Y}$ is the amount of traffic accept					
Units	. <i>V</i> U	egress UNI $W_{\scriptscriptstyle Y}$ is the amount of traffic accept					
Units Variables	Number of Sandwidth UNI, type of	egress UNI W_{Y} is the amount of traffic accept UNI	ed as Yellow over	the time interval T that m	nay be delivered to the egress		
	Number of Sandwidth UNI, type of	egress UNI W_{γ} is the amount of traffic accept UNI valid Service Frames Profile Parameters CIR _{A,} CBS _{A,} of EVC (Point-to-Point and Multipold length λ of the offered Service I	ed as Yellow over	the time interval T that m	nay be delivered to the egress		



Test Case 7: Bandwidth Profile per Ingress UNI

	AE	BSTRACT TEST SUITE FO	R TRAFFIC MAN	IAG	SEMENT: PHASE 1				
Test Name	Bandwidth	Profile per Ingress UNI							
Test Definition ID	M.7.10.3	.7.10.3							
Reference Doc- ument	MEF 10 [E	thernet Services Attributes Pha	se 1]						
Test Type	Conforman	nce							
Test Status	Mandatory								
Requirement		er Ingress UNI Bandwidth Profile	e is associated with	ıаl	JNI, the Bandwidth Pro	file MUST be applie	ed to all		
Description		rvice Frames at that UNI when a per Ingress UNI Bandw	dalah Duefile ie eese	-:-4	ad with a LINII tha Daw	desidate Duefile is son	المصالم عال		
Test Object	ingress Se	rvice Frames at that UNI			·				
Test Configuration	EVCs and	o EVCs associating at least two at least one CE-VLAN ID is ma of the UNIs. Testers are attache	pped per EVC. A p	oer	Ingress UNI Bandwidth				
		INGRESS UNI	'A'		EGRESS U	JNI 'B'			
		CE-VLAN ID	EVC		CE-VLAN ID	EVC			
VLAN-ID/EVC		10	EVC ₁		10	EVC₁			
Мар		12	EVC ₂		12	EVC ₂			
		Use of other CE-VLAN IDs is				E-VLAN IDs			
		conforms to MEF 10 [Etherne	et Services Attribute	es F	nase 1], Section 7.5.1				
			Per Ingres						
Dondwidth		UNI			ndwidth Profile Parar				
Bandwidth Profile		UNIA	•	CIF	<i>x x x</i>	EBS _A			
1 101110		Note 1 : (0 < CIR _A < UNI Spe	ed), (CBS _A ≥ maxi	mur	m Service Frame size)				
Comice									
Service Performance	Not Specifi	ied							
		ers Service Frames of length λ in							
	interval T a	at least one Service Frame from	n each of the EVCs	is c	delivered at the associa	ted egress UNIs. S	Service		
	Frames are offered at equal average rates into each of the configured EVCs at the ingress UNI, at an aggregate average rate greater than the CIR _A . Tester also verifies that the amount of traffic delivered at the egress UNI does								
		$d(W_G + W_Y)$ where:							
Test Procedure	. 1	W_G is the amount of traffic acce	epted as Green ove	r th	e time interval T that sh	ould be delivered t	o the		
	(egress UNI	•						
		W_Y is the amount of traffic acce	pted as Yellow ove	r th	e time interval T that m	ay be delivered to t	he egress		
	'	UNI							
Units		valid Service Frames							
		Profile Parameters CIR _{A,} CBS,							
Variables		of EVC (Point-to-Point and Multi), nı	umber and values of CE	E-VLAN IDs, time in	terval <i>T</i> ,		
Results		ad length λ of the offered Service	e riailles						
	Pass or tai								
Remarks	Pass or fai								



Test Case 8: Bandwidth Profile per EVC

	AB	STRACT TEST SUITE FO	R TRAFFIC MAN	AG	EMENT: PHASE 1		
Test Name B	Bandwidth Profile per EVC						
Test Definition ID	M.7.10.4						
Reference Doc- ument	MEF 10 [Ethernet Services Attributes Phase 1]						
Test Type C	Conformanc	се					
	/landatory						
Description	When a UNI is associated with a per EVC Bandwidth Profile, the Bandwidth Profile MUST be applied to all ingress Service Frames at the UNI on that EVC						
Test Object S	Verify that when a UNI is associated with a per EVC Bandwidth Profile, the Bandwidth Profile is applied to all ingress Service Frames at the UNI on that EVC						
Configuration	At least two EVCs associating at least two UNIs are configured such that each associated UNI is in at least two of the same EVCs and at least one CE-VLAN ID is mapped per EVC. A per EVC Bandwidth Profile is associated with at least one of the UNIs. Testers are attached to all UNIs in the configured EVCs						
	Ī	INGRESS UNI 'A'			EGRESS UNI 'B'		
	ŀ	CE-VLAN ID	EVC		CE-VLAN ID	EVC	
VLAN-ID/EVC		10	EVC ₁	Ī	10	EVC ₁	
Мар		12	EVC ₂		12	EVC ₂	
	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						
	Per EVC						
		EVC			ndwidth Profile Paran		
Bandwidth	EVC ₁ CIR ₁ CBS ₁ EIR ₁ EBS ₁						_
Profile	EVC ₂ CIR ₂ CBS ₂ EIR ₂ EBS ₂						
	Note 1 : (CIR ₁ = 0), (CBS ₁ = 0) and (EIR ₁ = 0) and (EBS ₁ = 0) Note 2 : (0 < CIR ₂ < UNI Speed), (CBS ₂ \ge maximum Service Frame size) Note 3 : (\sum CIR < UNI Speed)						
Service Performance	Not Specified						
aږ S aı	Tester offers Service Frames 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 egress UNI. For EVC ₁ , the amount of traffic delivered at the egress UNI must be 0 and for every other configured EVC, the amount of traffic delivered at the egress UNI must not exceed $(W_G + W_Y)$ where:						
	 W_G is the amount of traffic accepted as Green over the time interval <i>T</i> that should be delivered to the egress UNI W_Y is the amount of traffic accepted as Yellow over the time interval <i>T</i> that may be delivered to the egress UNI 						
		valid Service Frames					E) (0
Variables U	Bandwidth Profile Parameters CIR ₂ , CBS ₂ , EIR ₂ , EBS ₂ , UNIs interface speed, number of UNIs, number of EVCs per UNI, type of EVC (Point-to-Point and Multipoint-to-Multipoint), number and values of CE-VLAN IDs, time interval T , number and length λ of the offered Service Frames						
n n	Pass or fail						



Test Case 9: Bandwidth Profile per Class of Service

ABSTRACT TEST SUITE FOR TRAFFIC MANAGEMENT: PHASE 1							
Test Name	Bandwidth Profile per Class of Service						
Test Definition ID	M.7.10.5						
Reference Doc- ument	MEF 10 [Ethernet Services Attributes Phase 1]						
Test Type	Conformance						
Test Status	Mandatory		- D d - 2 did-	Destile the Deside Salt	Des Classification	P - d t-	
Requirement Description	When a UNI is associated with a per Class of Service Bandwidth Profile, the Bandwidth Profile MUST be applied to all ingress Service Frames at the UNI with that specific Class of Service Identifier						
Test Object	Verify that when a UNI is assoct to all ingress Service Frames a	t the UNI with that sp	ecific Class	of Service Identifier			
Test Configura- tion	At least one EVC associating at least two UNIs is configured and at least one CE-VLAN ID is mapped per EVC. A per Class of Service Bandwidth Profile is associated with at least one of the UNIs. At least two CoS Identifiers are used to identify the Class of Service applicable to the Service Frames offered at the UNI. Testers are attached to all UNIs in the configured EVCs						
	INGRESS UNI 'A'			EGRESS U	JNI 'B'		
\/ AN ID/E\/O	CE-VLAN I	ID EV	3	CE-VLAN ID	EVC		
VLAN-ID/EVC Map	10	EVO		10	EVC₁		
Map		CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs MEF 10 [Ethernet Services Attributes Phase 1], Section 7.5.1					
	Per Class of Service						
	EVC CoS Iden- tifier CoS Bandwidth Profile Parameters						
Bandwidth	EVC ₁ 1	1		S ₁₁ EIR ₁₁ EBS ₁₁			
Profile	$\frac{2}{l}$ l						
	Note 1 : (CIR ₁₁ = 0), (CBS ₁₁ = 0) and (EIR ₁₁ = 0) and (EBS ₁₁ = 0) Note 2 : (0 < CIR ₁₂ < UNI Speed), (CBS ₁₂ \geq maximum Service Frame size)						
	Note 3 : (∑CIR < UNI Speed)						
Service Performance	Not Specified						
Tast Procedure	Tester offers Service Frames 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 CoS IDs and measures the number of Service Frames delivered at the egress UNI. For CoS ID 1, the amount of traffic delivered at the egress UNI must be 0 and for every other configured CoS ID, the amount of traffic delivered at the egress UNI must not exceed $(W_G + W_Y)$ where:						
Test Procedure	 W_G is the amount of traffic accepted as Green over the time interval <i>T</i> that should be delivered to the egress UNI W_Y is the amount of traffic accepted as Yellow over the time interval <i>T</i> that may be delivered to the egress UNI 						
Units	Number of valid Service Frame						
Variables	Bandwidth Profile Parameters CIR ₁₂ , CBS ₁₂ , EIR ₁₂ , EBS ₁₂ , UNIs interface Speed, number of UNIs, number of EVCs per UNI, number of CoS Identifiers per EVC, type of EVC (Point-to-Point and Multipoint-to-Multipoint), number and values of CE-VLAN IDs, number and values of CE-VLAN CoS, time interval <i>T</i> , number and length <i>λ</i> of the offered Service Frames						
Results	Pass or fail						
Remarks						`	



Test Case 10: Multiple Bandwidth Profiles at the UNI

	ABSTR	ACT TEST SUI	TE FOR TRAF	FIC MANA	AGEMENT: PHASE	1	
Test Name	Multiple Bandwidth Profiles at the UNI						
Test Definition ID	M.7.10.6						
Reference Doc- ument	MEF 10 [Ethernet Services Attributes Phase 1]						
Test Type	Conformance						
Test Status	Optional						
Requirement Description	Multiple models of Bandwidth Profile application MAY exist simultaneously at the UNI						
Test Object Test Configuration	Verify that multiple models of Bandwidth Profile application can exist simultaneously at the UNI At least two EVCs associating at least two UNIs are configured such that each associated UNI is in at least two of the same EVCs 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 associated with at least one of the UNIs. Testers are attached to all UNIs in the configured EVCs						
		INGRESS UNI 'A'			EGRESS UNI 'B'		
\/ ANI ID/E\/O		CE-VLAN ID	EV	С	CE-VLAN ID	EVC	
VLAN-ID/EVC Map		10	EV		10	EVC ₁	
Ινιαρ		12	EV		12	EVC ₂	
	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						
	Per EVC						
	EVC				h Profile Parameters		
	EVC ₁			CIR₁ CE			
	Note 1	: (0 < CIR ₁ < UN	I Speed), (CBS	_i ≥ maximum	Service Frame size)		
Bandwidth	Per Class of Service						
Profile	EVC	CoS Iden- tifier	CE-VLAN CoS		h Profile Parameters		
	EVC ₂	2	1		BS ₂₁ EIR ₂₁ EBS ₂₁		=
	Note 2	_	7 25 = 0) and (E		BS ₂₂ EIR ₂₂ EBS ₂₂		
	Note 2 : $(CIR_{21} = 0)$, $(CBS_{21} = 0)$ and $(EIR_{21} = 0)$, $(EBS_{21} = 0)$ Note 3 : $(0 < CIR_{22} < UNI Speed)$, $(CBS_{22} \ge maximum Service Frame size)$ Note 4 : $(\Sigma CIR < UNI Speed)$						
Service Performance	Not Specified						
Test Procedure	Tester offers Service Frames of length <i>λ</i> into the configured EVCs at the ingress UNI during a time interval <i>T</i> , 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 egress UNI. For CoS ID 1, the amount of traffic delivered at the egress UNI must be 0 and for every other configured EVC and CoS ID, the amount of traffic delivered at the egress UNI must not exceed (<i>W</i> _G + <i>W</i> _Y) where: • <i>W</i> _G is the amount of traffic accepted as Green over the time interval <i>T</i> that should be delivered to the egress UNI • <i>W</i> _Y is the amount of traffic accepted as Yellow over the time interval <i>T</i> that may be delivered to the egress UNI						
Units	Number of valid Se						
Variables	Bandwidth Profile Parameters CIR ₁ , CBS ₁ , EIR ₁ , EBS ₁ , CIR ₂₂ , CBS ₂₂ , EIR ₂₂ , EBS ₂₂ , UNIs interface Speed, number of UNIs, number of EVCs per UNI, number of CoS Identifiers per EVC, type of EVC (Point-to-Point and Multipoint-to-Multipoint), number and values of CE-VLAN IDs, number and values of CE-VLAN CoS, time interval <i>T</i> , number and length λ of the offered Service Frames						
Results	Pass or fail						
Remarks							



10. References

Reference	Reference Details				
[1] Ethernet Services Attributes Phase 1	MEF 10 [Ethernet Services Attributes Phase 1]				
[2] Services Definitions	MEF 6 [Ethernet Services Definitions]				
[3] Abstract Test Suite for Ethernet Services at the UNI	MEF 9 [Abstract Test Suite for Ethernet Services at the UNI]				
[4] IEEE 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)				
[5] RFC 2119	RFC 2119, "Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, http://www.ietf.org/rfc/rfc2119.txt (Normative)				
[6] RFC 2285	RFC 2285, "Benchmarking Terminology for LAN Switching Devices", R. Mandeville, http://www.ietf.org/rfc/rfc2285.txt				
[7] RFC 2544	RFC 2544, "Benchmarking Methodology for Network Interconnect Devices", S. Bradner, J. McQuaid, http://www.ietf.org/rfc/rfc2544.txt				
[8] RFC 2889	RFC 2889, "Benchmarking Methodology for LAN Switching Devices", R. Mandeville, J. Perser, http://www.ietf.org/rfc/rfc2889.txt				