

MEF

Abstract Test Suite

MEF 25

UNI Type 2

Part 3: Service OAM

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Table of Contents

1. ABSTRACT	8
2. TERMINOLOGY	8
3. TERMINOLOGY MAPPING BETWEEN MEF, IEEE AND ITU-T	9
4. SCOPE	10
5. COMPLIANCE LEVELS	10
6. INTRODUCTION	10
7. TEST CONFIGURATION FOR UNI-C TYPE 2 SERVICE OAM	11
8. TEST CONFIGURATION FOR UNI-N TYPE 2 SERVICE OAM	12
9. DEFAULT PROTOCOL VALUES	12
10. CC MESSAGES GROUP DESTINATION MAC ADDRESSES	12
11. CC MESSAGES INTERVAL FIELD ENCODING	13
12. TEST STATUS DEFINITIONS	13
13. TEST CASES SUMMARY	14
14. TEMPLATE FOR ABSTRACT TEST CASES FOR UNI TYPE 2 SERVICE OAM	17
15. ABSTRACT TEST CASES FOR UNI-C TYPE 2 SERVICE OAM	18
15.1 UNI-C TYPE 2 CONFIGURATION REQUIREMENTS	19
TEST CASE 1C: UNI-MEG Administrative Configuration	19
TEST CASE 2C: Test-MEG Administrative Configuration	20
15.2 UNI-C TYPE 2 MAINTENANCE ENTITY REQUIREMENTS	21
TEST CASE 3C: MEP Instance on the Subscriber-MEG	21
TEST CASE 4C: Tagged OAM Frames on the Subscriber-MEG	22
TEST CASE 5C: MEP Instance on the Test-MEG	23
TEST CASE 6C: Tagged OAM Frames on the Test-MEG	24
TEST CASE 7C: MEP Instance on the UNI-MEG	25
TEST CASE 8C: Untagged OAM Frames on the UNI-MEG	26
TEST CASE 9C: IEEE 802.1 Bridge MEPs Corresponding to UNI-MEG	27

TEST CASE 10C: IEEE 802.1 Bridge MEPs Corresponding to Test-MEG	28
TEST CASE 11C: IEEE 802.1 Bridge MEPs Corresponding to Subscriber-MEG - Down-MEP	29
TEST CASE 12C: IEEE 802.1 Bridge MEPs Corresponding to Subscriber-MEG - Up-MEP	30

15.3 UNI-C TYPE 2 MEG END POINTS REQUIREMENTS 31

TEST CASE 13C: Configurable MEG-Level	31
TEST CASE 14C: Processing Received Multicast CCM Frames - Source Address	32
TEST CASE 15C: Processing Received Multicast CCM Frames - Sender ID TLV	33
TEST CASE 16C: Processing Received Multicast CCM Frames - Chassis ID Length	34
TEST CASE 17C: Processing Received Multicast CCM Frames - Port Status TLV	35
TEST CASE 18C: Processing Received Multicast CCM Frames - Interface Status TLV	36
TEST CASE 19C: Processing Received Multicast CCM Frames - CCM Interval	37
TEST CASE 20C: Processing Received Multicast CCM Frames - First TLV Offset	38
TEST CASE 21C: Processing Received Multicast CCM Frames - MEP ID	39
TEST CASE 22C: Processing Received Multicast CCM Frames - Short MA Name Length 1	40
TEST CASE 23C: Processing Received Multicast CCM Frames - Short MA Name Length 2	41
TEST CASE 24C: Processing Received Multicast CCM Frames	42
TEST CASE 25C: Processing & Response to Unicast & Multicast LBM Frames - Destination Address	43
TEST CASE 26C: Processing & Response to Unicast & Multicast LBM Frames - Source Address	44
TEST CASE 27C: Processing & Response to Unicast & Multicast LBM Frames - Sender ID TLV	45
TEST CASE 28C: Processing & Response to Unicast & Multicast LBM Frames - First TLV Offset	46
TEST CASE 29C: Processing & Response to Unicast & Multicast LBM Frames - LBR Header	47
TEST CASE 30C: Processing & Response to Unicast & Multicast LBM Frames - LBR Content	48
TEST CASE 31C: Generating Multicast CCM Frames - Destination Address	49
TEST CASE 32C: Generating Multicast CCM Frames - Source Address	50
TEST CASE 33C: Generating Multicast CCM Frames - Protocol Version Number	50
TEST CASE 34C: Generating Multicast CCM Frames - OpCode	51
TEST CASE 35C: Generating Multicast CCM Frames - Flags	52
TEST CASE 36C: Generating Multicast CCM Frames - First TLV Offset	53
TEST CASE 37C: Generating Multicast CCM Frames - Sequence Number	55
TEST CASE 38C: Generating Multicast CCM Frames - MEP ID	56
TEST CASE 39C: Generating Multicast CCM Frames - MAID Total Length	57
TEST CASE 40C: Generating Multicast CCM Frames - Maintenance Domain Name Format	58
TEST CASE 41C: Generating Multicast CCM Frames - Short MA Name Format	59
TEST CASE 42C: Generating Multicast CCM Frames - Short MA Name Length	60
TEST CASE 43C: Generating Multicast CCM Frames - Short MA Name	61
TEST CASE 44C: Generating Multicast CCM Frames - Sender ID TLV	62
TEST CASE 45C: Generating Multicast CCM Frames - Chassis ID Length	63
TEST CASE 46C: Generating Multicast CCM Frames - Management Address Domain Field	64
TEST CASE 47C: Generating Multicast CCM Frames - Management Address Field	65
TEST CASE 48C: Generating Multicast CCM Frames - Port Status TLV	66
TEST CASE 49C: Generating Multicast CCM Frames - Interface Status TLV	67
TEST CASE 50C: Generating Multicast CCM Frames - Organization Specific TLV	68
TEST CASE 51C: Generating Multicast CCM Frames - End TLV	68
TEST CASE 52C: Generating Multicast LBM Frames - Destination Address	70
TEST CASE 53C: Generating Unicast LBM Frames - Destination Address	70
TEST CASE 54C: Generating Unicast LBM Frames - Source Address	71
TEST CASE 55C: Generating Unicast LBM Frames - Protocol Version Number	72
TEST CASE 56C: Generating Unicast LBM Frames - OpCode	74
TEST CASE 57C: Generating Unicast LBM Frames - Flags	74
TEST CASE 58C: Generating Unicast LBM Frames - First TLV Offset	76
TEST CASE 59C: Generating Unicast LBM Frames - Loopback Transaction Identifier	76
TEST CASE 60C: Generating Unicast LBM Frames - Sender ID TLV	78
TEST CASE 61C: Generating Unicast LBM Frames - Chassis ID Length	79
TEST CASE 62C: Generating Unicast LBM Frames - Management Address Domain Field	80
TEST CASE 63C: Generating Unicast LBM Frames - Management Address Field	80
TEST CASE 64C: Generating Unicast LBM Frames - Data TLV	81
TEST CASE 65C: Generating Unicast LBM Frames - Organization Specific TLV	82

TEST CASE 66C: Generating Unicast LBM Frames - End TLV	83
15.4 UNI-C TYPE 2 CONTINUITY CHECK REQUIREMENTS	85
TEST CASE 67C: Administratively Enable and Disable CCM Transmission	85
TEST CASE 68C: Mandatory CCM Frame Rate	86
TEST CASE 69C: Optional CCM Frame Rate	87
TEST CASE 70C: Configurable CCM Frames Priority for Subscriber-MEG & Test-MEG	88
TEST CASE 71C: UNI-C Counter - Number of CCM Frames Transmitted	89
TEST CASE 72C: Lowest Priority CC Defect - DefRDICCM	90
TEST CASE 73C: CC Defect & Fault Alarm Hierarchy - DefRDICCM vs DefMACstatus	91
TEST CASE 74C: CC Defect & Fault Alarm Hierarchy - DefMACstatus vs DefRemoteCCM	92
TEST CASE 75C: CC Defect & Fault Alarm Hierarchy - DefRemoteCCM vs DefErrorCCM	93
TEST CASE 76C: CC Defect & Fault Alarm Hierarchy - DefErrorCCM vs DefXconCCM	94
TEST CASE 77C: CC Fault Alarm Time & CC Fault Reset Time	95
15.5 UNI-C TYPE 2 LOOPBACK REQUIREMENTS	96
TEST CASE 78C: Administratively Initiate & Stop Loopback Sessions	96
TEST CASE 79C: Configurable LBM Frames Priority	97
TEST CASE 80C: Configurable Number of LBM Transmissions per Session	98
TEST CASE 81C: Configurable Interval between LBM Transmissions	99
TEST CASE 82C: Configurable Timeout after a LBM Transmission	100
TEST CASE 83C: Configurable LBM Frame Size	101
TEST CASE 84C: UNI-C Counter – Number of LBM Frames Transmitted	102
TEST CASE 85C: UNI-C Counter – Number of LBM Frames Received	103
TEST CASE 86C: UNI-C Counter – Number of LBR Frames Received	104
TEST CASE 87C: UNI-C Statistic - Percentage of Unanswered LB Requests (Lost LBM/LBR)	105
TEST CASE 88C: UNI-C Statistic - Minimum, Maximum & Average Round-Trip Latency	106
16. ABSTRACT TEST CASES FOR UNI-N TYPE 2 SERVICE OAM	107
16.1 UNI-N TYPE 2 CONFIGURATION REQUIREMENTS	108
TEST CASE 1N: UNI-MEG Administrative Configuration	108
16.2 UNI-N TYPE 2 MAINTENANCE ENTITY REQUIREMENTS	109
TEST CASE 7N: MEP Instance on the UNI-MEG	109
TEST CASE 8N: Untagged OAM Frames on the UNI-MEG	110
TEST CASE 9N: IEEE 802.1 Bridge MEPs Corresponding to UNI-MEG	111
16.3 UNI-N TYPE 2 MEG END POINTS REQUIREMENTS	112
TEST CASE 13N: Configurable MEG-Level	112
TEST CASE 14N: Processing Received Multicast CCM Frames - Source Address	113
TEST CASE 15N: Processing Received Multicast CCM Frames - Sender ID TLV	114
TEST CASE 16N: Processing Received Multicast CCM Frames - Chassis ID Length	115
TEST CASE 17N: Processing Received Multicast CCM Frames - Port Status TLV	116
TEST CASE 18N: Processing Received Multicast CCM Frames - Interface Status TLV	117
TEST CASE 19N: Processing Received Multicast CCM Frames - CCM Interval	118
TEST CASE 20N: Processing Received Multicast CCM Frames - First TLV Offset	119
TEST CASE 21N: Processing Received Multicast CCM Frames - MEP ID	120
TEST CASE 22N: Processing Received Multicast CCM Frames - Short MA Name Length 1	121
TEST CASE 23N: Processing Received Multicast CCM Frames - Short MA Name Length 2	122
TEST CASE 24N: Processing Received Multicast CCM Frames	123
TEST CASE 25N: Processing & Response to Unicast & Multicast LBM Frames - Destination Address	124
TEST CASE 26N: Processing & Response to Unicast & Multicast LBM Frames - Source Address	125
TEST CASE 27N: Processing & Response to Unicast & Multicast LBM Frames - Sender ID TLV	126
TEST CASE 28N: Processing & Response to Unicast & Multicast LBM Frames - First TLV Offset	127

TEST CASE 29N: Processing & Response to Unicast & Multicast LBM Frames - LBR Header	128
TEST CASE 30N: Processing & Response to Unicast & Multicast LBM Frames - LBR Content	129
TEST CASE 31N: Generating Multicast CCM Frames - Destination Address	130
TEST CASE 32N: Generating Multicast CCM Frames - Source Address	131
TEST CASE 33N: Generating Multicast CCM Frames - Protocol Version Number	132
TEST CASE 34N: Generating Multicast CCM Frames - OpCode	133
TEST CASE 35N: Generating Multicast CCM Frames - Flags	134
TEST CASE 36N: Generating Multicast CCM Frames - First TLV Offset	135
TEST CASE 37N: Generating Multicast CCM Frames - Sequence Number	136
TEST CASE 38N: Generating Multicast CCM Frames - MEP ID	137
TEST CASE 39N: Generating Multicast CCM Frames - MAID Total Length	138
TEST CASE 40N: Generating Multicast CCM Frames - Maintenance Domain Name Format	139
TEST CASE 41N: Generating Multicast CCM Frames - Short MA Name Format	140
TEST CASE 42N: Generating Multicast CCM Frames - Short MA Name Length	141
TEST CASE 43N: Generating Multicast CCM Frames - Short MA Name	142
TEST CASE 44N: Generating Multicast CCM Frames - Sender ID TLV	143
TEST CASE 45N: Generating Multicast CCM Frames - Chassis ID Length	144
TEST CASE 46N: Generating Multicast CCM Frames - Management Address Domain Field	145
TEST CASE 47N: Generating Multicast CCM Frames - Management Address Field	146
TEST CASE 48N: Generating Multicast CCM Frames - Port Status TLV	147
TEST CASE 49N: Generating Multicast CCM Frames - Interface Status TLV	148
TEST CASE 50N: Generating Multicast CCM Frames - Organization Specific TLV	149
TEST CASE 51N: Generating Multicast CCM Frames - End TLV	150
TEST CASE 52N: Generating Multicast LBM Frames - Destination Address	151
TEST CASE 53N: Generating Unicast LBM Frames - Destination Address	152
TEST CASE 54N: Generating Unicast LBM Frames - Source Address	153
TEST CASE 55N: Generating Unicast LBM Frames - Protocol Version Number	154
TEST CASE 56N: Generating Unicast LBM Frames - OpCode	155
TEST CASE 57N: Generating Unicast LBM Frames - Flags	156
TEST CASE 58N: Generating Unicast LBM Frames - First TLV Offset	157
TEST CASE 59N: Generating Unicast LBM Frames - Loopback Transaction Identifier	158
TEST CASE 60N: Generating Unicast LBM Frames - Sender ID TLV	159
TEST CASE 61N: Generating Unicast LBM Frames - Chassis ID Length	160
TEST CASE 62N: Generating Unicast LBM Frames - Management Address Domain Field	161
TEST CASE 63N: Generating Unicast LBM Frames - Management Address Field	162
TEST CASE 64N: Generating Unicast LBM Frames - Data TLV	163
TEST CASE 65N: Generating Unicast LBM Frames - Organization Specific TLV	164
TEST CASE 66N: Generating Unicast LBM Frames - End TLV	165

16.4 UNI-N TYPE 2 CONTINUITY CHECK REQUIREMENTS **166**

TEST CASE 67N: Administratively Enable and Disable CCM Transmission	166
TEST CASE 68N: Mandatory CCM Frame Rate	167
TEST CASE 69N: Optional CCM Frame Rate	168
TEST CASE 71N: UNI-N Counter - Number of CCM Frames Transmitted	169
TEST CASE 72N: Lowest Priority CC Defect - DefRDICCM	170
TEST CASE 73N: CC Defect & Fault Alarm Hierarchy - DefRDICCM vs DefMACstatus	171
TEST CASE 74N: CC Defect & Fault Alarm Hierarchy - DefMACstatus vs DefRemoteCCM	172
TEST CASE 75N: CC Defect & Fault Alarm Hierarchy - DefRemoteCCM vs DefErrorCCM	173
TEST CASE 76N: CC Defect & Fault Alarm Hierarchy - DefErrorCCM vs DefXconCCM	174
TEST CASE 77N: CC Fault Alarm Time & CC Fault Reset Time	175

16.5 UNI-N TYPE 2 LOOPBACK REQUIREMENTS **176**

TEST CASE 78N: Administratively Initiate & Stop Loopback Sessions	176
TEST CASE 80N: Configurable Number of LBM Transmissions per Session	177
TEST CASE 81N: Configurable Interval between LBM Transmissions	178
TEST CASE 82N: Configurable Timeout after a LBM Transmission	179
TEST CASE 83N: Configurable LBM Frame Size	180
TEST CASE 84N: UNI-N Counter - Number of LBM Frames Transmitted	181

TEST CASE 85N: UNI-N Counter - Number of LBM Frames Received	182
TEST CASE 86N: UNI-N Counter - Number of LBR Frames Received	183
TEST CASE 87N: UNI-N Statistic - Percentage of Unanswered LB Requests (Lost LBM/LBR)	184
TEST CASE 88N: UNI-N Statistic - Minimum, Maximum & Average Round-Trip Latency	185

17. REFERENCES

186

1. ABSTRACT

This document is the third part of the Abstract Test Suite for User to Network Interface (UNI) Type 2. It defines test procedures based on a combination of requirements for Service OAM described in MEF 20 *UNI Type 2 Implementation Agreement*, ITU-T Y.1731 and IEEE 802.1ag. The overall Abstract Test Suite for UNI Type 2 will be composed of the following six parts: Link OAM, E-LMI, Service OAM, Protection, Enhanced UNI Attributes and L2CP handling.

2. Terminology

AIS	Alarm Indication Signal
CCM	Continuity Check Message
CoS	Class of Service
Down MEP	A MEP residing in a Bridge that receives CFM PDUs from, and transmits them towards, the direction of the LAN
EMS	Element Management System
ETH-AIS	Ethernet Alarm Indication Signal
EVC	Ethernet Virtual Connection
EVC-MA	Ethernet Virtual Connection Maintenance Association
FM	Fault Management
LBM	Loopback Message
LBR	Loopback Reply
MAC	Media Access Control
MA	Maintenance Association
MAID	Maintenance Association Identifier
MD	Maintenance Domain
MD Level	Maintenance Domain Level
ME	Maintenance Entity
MEG	Maintenance Entity Group
MEP	Maintenance association End Point
MP	Maintenance Point. One of either a MEP or a MIP
MTU	Maximum Transmission Unit
NE	Network Element
NMS	Network Management System
OAM	Operations, Administration, and Maintenance
OAM Domain	Equivalent to “Maintenance Domain” (MD)

Operator-MA	Operator Maintenance Association
P2P	Point-to-Point
PDU	Protocol Data Unit
RDI	Remote Defect Indication
SOAM	Service Operations, Administration, and Maintenance
Subscriber-MA	Subscriber Maintenance Association
Test-MA	Test Maintenance Association
UNI	User-to-Network Interface
UNI-C	Subscriber side UNI functions
UNI-MA	User-to-Network Interface Maintenance Association
UNI-N	Network side UNI functions
Up MEP	A MEP residing in a Bridge that transmits CFM PDUs towards, and receives them from, the direction of the Bridge Relay Entity
VID	VLAN Identifier
VLAN	Virtual LAN

3. Terminology Mapping between MEF, IEEE and ITU-T

MEF 20	IEEE 802.1ag	ITU-T Y.1731
MEG	MA	MEG
MAID	MAID	MEG ID
MEG Level	MD Level	MEG Level

4. Scope

The Service OAM part of the Abstract Test Suite for UNI Type 2 describes test procedures based on a combination of the requirements for Service OAM described in MEF 20 *UNI Type 2 Implementation Agreement*, ITU-T Y.1731 and IEEE 802.1ag.

An overview of the different groups of requirements that compose this test suite is provided as follows:

- Configuration Requirements
- Maintenance Entity Requirements
- MEG End Points Requirements
- Continuity Check Requirements
- Loopback Requirements

The UNI Type 2 Link OAM, E-LMI, Protection, Enhanced UNI Attributes and L2CP handling functionalities are outside the scope of this Abstract Test Suite.

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

5. Compliance Levels

The key words “**MUST**”, “**MUST NOT**”, “**REQUIRED**”, “**SHALL**”, “**SHALL NOT**”, “**SHOULD**”, “**SHOULD NOT**”, “**RECOMMENDED**”, “**MAY**”, and “**OPTIONAL**” in this document are to be interpreted as described in RFC 2119. All key words **MUST** be use upper case, bold text.

6. Introduction

This document supplements the existing MEF test specifications MEF 9 *Abstract Test Suite for Ethernet Services at the UNI*, MEF 14 *Abstract Test Suite for Traffic Management Phase 1*, MEF 18 *Abstract Test Suite for Circuit Emulation Services*, MEF 19 *Abstract Test Suite for UNI Type 1*, MEF 21 *Abstract Test Suite for UNI Type 2 – Part 1: Link OAM* and MEF 24 *Abstract Test Suite for UNI Type 2 – Part 2: E-LMI* by adding test procedures based on the requirements for Service OAM defined in the *User Network Interface (UNI) Type 2 Implementation Agreement*.

As with existing Abstract Test Suites, 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 in the Metro Ethernet Forum technical specification MEF 11 *User to Network Interface Requirements and Framework*.

Although some UNI-C test cases may require very specific test configurations, most UNI-C test cases defined in this document are to be executed using one of the two following test configurations. (Tester 1 and Tester 2) and (Tester 3 and Tester 4) may be combined into single test devices.

Diagram illustrating a network topology for testing, showing the sequence of components and the associated MEGs (MEG stands for Measurement End-to-end Group).

The network components and their connections are:

- Subscriber NE** (Leftmost)
- Operator A NE** (Middle-left)
- Operator B NE** (Middle-right)
- Subscriber NE** (Rightmost)

The network is divided into sections by dashed lines, indicating the boundaries of the **Simulated Service Provider Network** (Operator A NE and Operator B NE).

Each NE is associated with a **Local UNI-Tester** and a **Remote UNI-C**. The **Local UNI-Tester** is connected to the **Remote UNI-C** via a **Test MEG** (blue arrow).

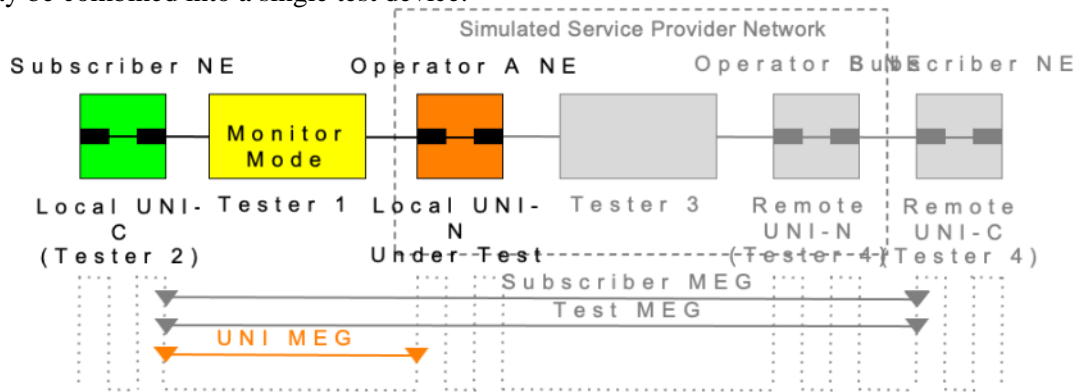
The **UNI MEG** (orange arrow) spans the entire network, from the first **Local UNI-Tester** to the last **Remote UNI-C**.

The **Subscriber MEG** (green arrow) spans the entire network, from the first **Local UNI-Tester** to the last **Remote UNI-C**.

Figure 1 illustrates the network configuration for the test. The setup includes a Subscriber NE, Operator A NE, a Simulated Service Provider Network (containing Operator A NE and Operator B NE), and another Subscriber NE. Each NE contains a 'Monitor Mode' block. The configuration is divided into two main sections by a dashed line: 'Local UNI-N (Tester 2)' and 'Remote UNI-N (Tester 4)'. The 'Local UNI-N (Tester 2)' section includes the first Subscriber NE and the first Operator A NE. The 'Remote UNI-N (Tester 4)' section includes the last Subscriber NE and the last Operator B NE. The 'Simulated Service Provider Network' section includes the two Operator NEs. The 'Local UNI-C Under Test' is located within the first Subscriber NE. The 'Test MEG' (Main End-to-End Measurement) is represented by a blue arrow spanning from the first Operator A NE to the last Operator B NE. The 'Subscriber MEG' (Subscriber Measurement) is represented by a green arrow spanning from the first Subscriber NE to the last Subscriber NE. The 'UNI MEG' (User Network Interface Measurement) is represented by an orange arrow spanning from the first Operator A NE to the last Operator A NE.

8. Test Configuration for UNI-N Type 2 Service OAM

Although some UNI-N test cases may require very specific test configurations, most UNI-N test cases defined in this document are to be executed using the following test configuration. Tester 1 and Tester 2 may be combined into a single test device.



9. Default Protocol Values

When not otherwise specified in the Test Procedure, use the default values for the following Service OAM Protocol parameters:

Parameter	Default Value
MEG-Level, UNI-MEG	1
MEG-Level, Test-MEG	5
MEG-Level, Subscriber-MEG	6
CCM frame rate	1 frame/s
CCM transmission, UNI-MEG	Enabled
CCM transmission, Test-MEG	Disabled
CCM transmission, Subscriber-MEG	Disabled
CCM frames priority, UNI-MEG	The highest priority supported by the UNI
CCM frames priority, Test-MEG	The CoS ID supported by the EVC, which yields the lowest frame loss performance
CCM frames priority, Subscriber-MEG	The CoS ID supported by the EVC, which yields the lowest frame loss performance
Minimum fault level	RDI
CC fault alarm time	2.5 s
CC fault reset time	10 s
LBM frames priority	The CoS ID supported by the EVC, which yields the lowest frame loss performance
Number of LBM transmissions per session	3
Interval between LBM transmissions	1 s
Timeout after a LBM transmission	5 s
LBM frame size	64 bytes

10. CC Messages Group Destination MAC Addresses

01-80-C2-00-00-3Y	
MEG-Level of CCM	Four address bits “y”
7	7
6	6
5	5
4	4
3	3
2	2
1	1
0	0

11. CC Messages Interval Field Encoding

Transmission Interval	CCM Interval Field
Invalid	0
3 1/3 ms	1
10 ms	2
100 ms	3
1 s	4
10 s	5
1 min	6
10 min	7

12. Test Status Definitions

MANDATORY status: This means that a test case **MUST** be executed because it verifies an absolute requirement or an absolute requirement dependent on an optional feature. If the requirement is absolute the test must be executed. If the requirement is absolute but dependent on an optional feature and that feature is supported, the test case must be executed. If the optional feature is not supported, the test case is not executed and it is declared as “not applicable”.

OPTIONAL status: This word means that a test case **MAY** or **MAY NOT** be executed because it verifies a requirement that is not absolute. The decision to execute such a test case will usually depend on the ability to support a particular feature that is not tied to an absolute requirement. If such a test case is not executed it is declared as “not applicable”.

13. Test Cases Summary

Number	Test Case Name	UNI Type	Test Status
1	UNI-MEG Administrative Configuration	UNI-C & UNI-N	Mandatory
2	Test-MEG Administrative Configuration	UNI-C	Mandatory
3	MEP Instance on the Subscriber-MEG	UNI-C	Mandatory
4	Tagged OAM Frames on the Subscriber-MEG	UNI-C	Optional
5	MEP Instance on the Test-MEG	UNI-C	Optional
6	Tagged OAM Frames on the Test-MEG	UNI-C	Optional
7	MEP Instance on the UNI-MEG	UNI-C & UNI-N	Mandatory
8	Untagged OAM Frames on the UNI-MEG	UNI-C & UNI-N	Mandatory
9	IEEE 802.1 Bridge MEPs Corresponding to UNI-MEG	UNI-C & UNI-N	Optional
10	IEEE 802.1 Bridge MEPs Corresponding to Test-MEG	UNI-C	Optional
11	IEEE 802.1 Bridge MEPs Corresponding to Subscriber-MEG – Down-MEP	UNI-C	Optional
12	IEEE 802.1 Bridge MEPs Corresponding to Subscriber-MEG – Up-MEP	UNI-C	Optional
13	Configurable MEG-Level	UNI-C & UNI-N	Mandatory
14	Processing Received Multicast CCM Frames – Source Address	UNI-C & UNI-N	Mandatory
15	Processing Received Multicast CCM Frames – Sender ID TLV	UNI-C & UNI-N	Mandatory if Sender ID TLVs are supported
16	Processing Received Multicast CCM Frames – Chassis ID Length	UNI-C & UNI-N	Mandatory if Sender ID TLVs are supported
17	Processing Received Multicast CCM Frames – Port Status TLV	UNI-C & UNI-N	Mandatory if Port Status TLVs are supported
18	Processing Received Multicast CCM Frames – Interface Status TLV	UNI-C & UNI-N	Mandatory if Interface Status TLVs are supported
19	Processing Received Multicast CCM Frames – CCM Interval	UNI-C & UNI-N	Mandatory
20	Processing Received Multicast CCM Frames – First TLV Offset	UNI-C & UNI-N	Mandatory
21	Processing Received Multicast CCM Frames – MEP ID	UNI-C & UNI-N	Mandatory
22	Processing Received Multicast CCM Frames – Short MA Name Length 1	UNI-C & UNI-N	Mandatory
23	Processing Received Multicast CCM Frames – Short MA Name Length 2	UNI-C & UNI-N	Mandatory
24	Processing Received Multicast CCM Frames	UNI-C & UNI-N	Mandatory
25	Processing & Response to Unicast & Multicast LBM Frames – Destination Address	UNI-C & UNI-N	Mandatory
26	Processing & Response to Unicast & Multicast LBM Frames – Source Address	UNI-C & UNI-N	Mandatory
27	Processing & Response to Unicast & Multicast LBM Frames – Sender ID TLV	UNI-C & UNI-N	Mandatory if Sender ID TLVs are supported
28	Processing & Response to Unicast & Multicast LBM Frames – First TLV Offset	UNI-C & UNI-N	Mandatory
29	Processing & Response to Unicast & Multicast LBM Frames – LBR Header	UNI-C & UNI-N	Mandatory
30	Processing & Response to Unicast & Multicast LBM Frames – LBR Content	UNI-C & UNI-N	Mandatory
31	Generating Multicast CCM Frames – Destination Address	UNI-C & UNI-N	Mandatory
32	Generating Multicast CCM Frames – Source Address	UNI-C & UNI-N	Mandatory

33	Generating Multicast CCM Frames – Protocol Version Number	UNI-C & UNI-N	Mandatory
34	Generating Multicast CCM Frames – OpCode	UNI-C & UNI-N	Mandatory
35	Generating Multicast CCM Frames – Flags	UNI-C & UNI-N	Mandatory
36	Generating Multicast CCM Frames – First TLV Offset	UNI-C & UNI-N	Mandatory
37	Generating Multicast CCM Frames – Sequence Number	UNI-C & UNI-N	Mandatory
38	Generating Multicast CCM Frames – MEP ID	UNI-C & UNI-N	Mandatory
39	Generating Multicast CCM Frames – MAID Total Length	UNI-C & UNI-N	Mandatory
40	Generating Multicast CCM Frames – Maintenance Domain Name Format	UNI-C & UNI-N	Optional
41	Generating Multicast CCM Frames – Short MA Name Format	UNI-C & UNI-N	Optional
42	Generating Multicast CCM Frames – Short MA Name Length	UNI-C & UNI-N	Mandatory
43	Generating Multicast CCM Frames – Short MA Name	UNI-C & UNI-N	Optional
44	Generating Multicast CCM Frames – Sender ID TLV	UNI-C & UNI-N	Mandatory if Sender ID TLVs are supported
45	Generating Multicast CCM Frames – Chassis ID Length	UNI-C & UNI-N	Mandatory if Sender ID TLVs are supported
46	Generating Multicast CCM Frames – Management Address Domain Field	UNI-C & UNI-N	Optional
47	Generating Multicast CCM Frames – Management Address Field	UNI-C & UNI-N	Optional
48	Generating Multicast CCM Frames – Port Status TLV	UNI-C & UNI-N	Mandatory if Port Status TLVs are supported
49	Generating Multicast CCM Frames – Interface Status TLV	UNI-C & UNI-N	Mandatory if Interface Status TLVs are supported
50	Generating Multicast CCM Frames – Organization Specific TLV	UNI-C & UNI-N	Mandatory if Organization TLVs are supported
51	Generating Multicast CCM Frames – End TLV	UNI-C & UNI-N	Mandatory
52	Generating Multicast LBM Frames – Destination Address	UNI-C & UNI-N	Optional
53	Generating Unicast LBM Frames – Destination Address	UNI-C & UNI-N	Mandatory
54	Generating Unicast LBM Frames – Source Address	UNI-C & UNI-N	Mandatory
55	Generating Unicast LBM Frames – Protocol Version Number	UNI-C & UNI-N	Mandatory
56	Generating Unicast LBM Frames – OpCode	UNI-C & UNI-N	Mandatory
57	Generating Unicast LBM Frames – Flags	UNI-C & UNI-N	Mandatory
58	Generating Unicast LBM Frames – First TLV Offset	UNI-C & UNI-N	Mandatory
59	Generating Unicast LBM Frames – Loopback Transaction Identifier	UNI-C & UNI-N	Mandatory
60	Generating Unicast LBM Frames – Sender ID TLV	UNI-C & UNI-N	Mandatory if Sender ID TLVs are supported
61	Generating Unicast LBM Frames – Chassis ID Length	UNI-C & UNI-N	Mandatory if Sender ID TLVs are supported
62	Generating Unicast LBM Frames – Management Address Domain Field	UNI-C & UNI-N	Optional
63	Generating Unicast LBM Frames – Management Address Field	UNI-C & UNI-N	Optional
64	Generating Unicast LBM Frames – Data TLV	UNI-C & UNI-N	Mandatory
65	Generating Unicast LBM Frames – Organization Specific TLV	UNI-C & UNI-N	Mandatory if Organization TLVs are supported
66	Generating Unicast LBM Frames – End TLV	UNI-C & UNI-N	Mandatory

67	Administratively Enable and Disable CCM Transmission	UNI-C & UNI-N	Mandatory
68	Mandatory CCM Frame Rate	UNI-C & UNI-N	Mandatory
69	Optional CCM Frame Rate	UNI-C & UNI-N	Optional
70	Configurable CCM Frames Priority for Subscriber-MEG & Test-MEG	UNI-C	Mandatory
71	UNI-C Counter – Number of CCM Frames Transmitted	UNI-C & UNI-N	Optional
72	Lowest Priority CC Defect – DefRDICCM	UNI-C & UNI-N	Mandatory
73	CC Defect & Fault Alarm Hierarchy – DefRDICCM vs DefMACstatus	UNI-C & UNI-N	Optional
74	CC Defect & Fault Alarm Hierarchy – DefMACstatus vs DefRemoteCCM	UNI-C & UNI-N	Optional
75	CC Defect & Fault Alarm Hierarchy – DefRemoteCCM vs DefErrorCCM	UNI-C & UNI-N	Optional
76	CC Defect & Fault Alarm Hierarchy – DefErrorCCM vs DefXconCCM	UNI-C & UNI-N	Optional
77	CC Fault Alarm Time & CC Fault Reset Time	UNI-C & UNI-N	Mandatory if IEEE clause 12.14 7 (Maintenance association End Point managed object) is implemented
78	Administratively Initiate & Stop Loopback Sessions	UNI-C & UNI-N	Mandatory
79	Configurable LBM Frames Priority	UNI-C	Mandatory
80	Configurable Number of LBM Transmissions per Session	UNI-C & UNI-N	Mandatory
81	Configurable Interval between LBM Transmissions	UNI-C & UNI-N	Mandatory
82	Configurable Timeout after a LBM Transmission	UNI-C & UNI-N	Optional
83	Configurable LBM Frame Size	UNI-C & UNI-N	Mandatory
84	UNI-N Counter – Number of LBM Frames Transmitted	UNI-C & UNI-N	Mandatory
85	UNI-N Counter – Number of LBM Frames Received	UNI-C & UNI-N	Mandatory
86	UNI-N Counter – Number of LBR Frames Received	UNI-C & UNI-N	Mandatory
87	UNI-N Statistic – Percentage of Unanswered LB Requests (Lost LBM/LBR)	UNI-C & UNI-N	Mandatory
88	UNI-N Statistic – Minimum, Maximum & Average Round-Trip Latency	UNI-C & UNI-N	Mandatory

14. Template for Abstract Test Cases for UNI Type 2 Service OAM

The following template is adopted for the definition of Abstract Test Cases for UNI Type 2 Service OAM

Abstract Test Suite for Service OAM	
Test Name	Name derived from reference document
Test Definition ID	A punctuated alphanumeric string assigned to each defined requirement and test procedure couple using the following convention: Four characters defining the UNI type + 4 to 8 characters defining the MEF requirement number. Example: UNIC-R60 ⁵ (UNIC: User Network Interface C under test, R60 ⁵ : MEF 20 requirement 60, fifth Test Case related to requirement 60)
Reference Document	MEF Reference document and section IEEE or ITU-T Reference document and section
Test Type	Functional, Conformance, Interoperability or Performance
Test Status	Mandatory, Optional or Recommended
MEF Requirement Description	Brief description of the MEF requirement that MUST or SHOULD be satisfied
Test Object	Succinct description of test purpose
Test Configuration	Succinct description of test bed configuration
Test Configuration Schematic	Test bed schematic. The variables can augment it.
CE-VLAN ID / EVC Map	A sample VLAN ID/EVC Map is suggested. Variables augment it.
Test Procedure	Succinct description of the test procedure
Units	Units can be time units, rates and counts in integers such as milliseconds, frames per second and numbers of valid frames
Variables	Variables such as number of UNIs, EVCs and CE-VLAN IDs and frame formats and lengths MUST be described
Results	Description of the textual, numerical and/or graphical format in which to display test results. Results can be Pass or Fail
Remarks	Description of any particular observations that might affect the test result

15. Abstract Test Cases for UNI-C Type 2 Service OAM

This section contains 88 Test Cases for UNI-C. The section is divided in 5 different subsections as follows:

Section 15.1

Configuration Requirements contains a total of 2 Test Cases covering the UNI Type 2 Requirements R16 and R17.

Section 15.2

Maintenance Entity Requirements contains a total of 10 Test Cases covering the UNI Type 2 Requirements R32, R33, R34, R35 and R36.

Section 15.3

MEG End Points Requirements contains a total of 54 Test Cases covering the UNI Type 2 Requirements R39, R40, R41, R42 and R43.

Section 15.4

Continuity Check Requirements contains a total of 11 Test Cases covering the UNI Type 2 Requirements R44, R45, R46, R47, R48, R49, R50, R51 and R52.

Section 15.5

Loopback Requirements contains a total of 11 Test Cases covering the UNI Type 2 Requirements R53, R54, R55, R56, R57, R58, R59 and R60.

15.1 UNI-C Type 2 Configuration Requirements

TEST CASE 1C: UNI-MEG Administrative Configuration

Abstract Test Suite for Service OAM	
Test Name	UNI-MEG Administrative Configuration
Test Definition ID	UNIC-R16
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 8
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-C Type 2 MUST be administratively configurable with the UNI-N MEP ID and MEG-Level corresponding to the UNI-MEG
Test Object	Verify that a UNI-C Type 2 can be administratively configurable with the UNI-N MEP ID and MEG-Level corresponding to the UNI-MEG
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C and the local UNI-N. Configure the UNI-C with the UNI-N MEP ID. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that they contain the configured UNI-C MEP ID, that their MEG-Level is equal to "1" and that the RDI bit of the Flags field is clear. Re-configure the UNI-N with a different MEP ID but do not update the UNI-C configuration with this new information. Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that they contain the configured UNI-C MEP ID, that their MEG-Level is equal to "1" and that the RDI bit of the Flags field is set
Units	MEG-Level, MEP ID and RDI bit values
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 2C: Test-MEG Administrative Configuration

Abstract Test Suite for Service OAM													
Test Name	Test-MEG Administrative Configuration												
Test Definition ID	UNIC-R17												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 8												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MUST be administratively configurable with the MEG-Level for the Test-MEG												
Test Object	Verify that a UNI-C Type 2 can be administratively configurable with the MEG-Level for the Test-MEG												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a Test-MEG with a MEG-Level = “5”, with a unique MAID. Configure MEP instances with specific MEP IDs for each end point of each configured EVC. Enable CCM transmission on the Test-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration for Service OAM. It shows a sequence of network elements: Subscriber NE (green), Operator A NE (orange), Operator B NE (pink), and Subscriber NE (green). Each NE is connected to a Monitor Mode block (yellow). The Local UNI-C Under Test is connected to Local UNI-N (Tester-2) via a Monitor Mode block. The Remote UNI-N is connected to Remote UNI-C (Tester 4) via a Monitor Mode block. A Simulated Service Provider Network connects the two Monitor Mode blocks. Arrows indicate the flow of UNI MEG and Test MEG between the UNIs.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that their MEG-Level is equal to “5”												
Units	MEG-Level value												
Variables	None												
Results	Pass or fail												
Remarks													

15.2 UNI-C Type 2 Maintenance Entity Requirements

TEST CASE 3C: MEP Instance on the Subscriber-MEG

Abstract Test Suite for Service OAM																	
Test Name	MEP Instance on the Subscriber MEG																
Test Definition ID	UNIC-R32 ¹																
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2																
Test Type	Conformance																
Test Status	Mandatory																
MEF Requirement Description	A UNI-C Type 2 MUST be able to support a MEP instance on the Subscriber-MEG for each configured EVC																
Test Object	Verify that a UNI-C Type 2 is able to support a MEP instance on the Subscriber-MEG for each configured EVC																
Test Configuration	Configure at least two EVCs associating at least two UNIs (local + remote) and configure a Subscriber-MEG with a MEG-Level = “6”, with a unique MAID for each EVC. Configure MEP instances with specific MEP IDs for each end point of each configured EVC. Enable CCM transmission on the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames																
Test Configuration Schematic	<p>The diagram illustrates the test configuration for MEP instances on the Subscriber MEG. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Each NE is represented by a colored box (green, orange, pink, and green respectively) with a black square in the center. Below each NE box is a yellow box labeled 'Monitor Mode'. The network is divided into three sections by dashed lines: 'Subscriber NE', 'Operator A NE', and 'Operator B NE'. The 'Subscriber NE' section contains 'Local UNI-C Under Test' and 'Remote UNI-C'. The 'Operator A NE' section contains 'Local UNI-N (Tester-2)'. The 'Operator B NE' section contains 'Remote UNI-N (Tester-4)'. A green arrow labeled 'Subscriber MEG Test MEG' points from the 'Local UNI-C Under Test' to the 'Remote UNI-C'. A grey arrow labeled 'UNI MEG' points from the 'Local UNI-C Under Test' to the 'Local UNI-N (Tester-2)'. Below the network diagram, there are two tables: 'LOCAL UNI' and 'REMOTE UNI'. The 'LOCAL UNI' table has two columns: 'CE-VLAN ID' and 'EVC'. The 'REMOTE UNI' table has two columns: 'CE-VLAN ID' and 'EVC'. The 'LOCAL UNI' table has two rows: '10' and '11'. The 'REMOTE UNI' table has two rows: '10' and '11'. Below the tables, there is a note: 'Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1'.</p>																
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr><tr><td>11</td><td>EVC₂</td><td>11</td><td>EVC₂</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁	11	EVC ₂	11	EVC ₂
LOCAL UNI		REMOTE UNI															
CE-VLAN ID	EVC	CE-VLAN ID	EVC														
10	EVC ₁	10	EVC ₁														
11	EVC ₂	11	EVC ₂														
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that CCM frames are transmitted from each configured MEP instances (verify MEP IDs) and that the MEG-Level of each CCM frame is equal to “6”																
Units	MEG-Level and MEP ID values																
Variables	Number of EVCs																
Results	Pass or fail																
Remarks																	

TEST CASE 4C: Tagged OAM Frames on the Subscriber-MEG

Abstract Test Suite for Service OAM																	
Test Name	Tagged OAM Frames on the Subscriber MEG																
Test Definition ID	UNIC-R32 ²																
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2																
Test Type	Conformance																
Test Status	Optional																
MEF Requirement Description	The OAM frames on the Subscriber-MEG SHOULD be tagged and use the smallest CE-VLAN ID mapped into that EVC																
Test Object	Verify that the OAM frames on the Subscriber-MEG are tagged and use the smallest CE-VLAN ID mapped into that EVC																
Test Configuration	Configure at least two EVCs associating at least two UNIs (local + remote) and configure a Subscriber-MEG with a MEG-Level = “6”, with a unique MAID for each EVC. Configure MEP instances with specific MEP IDs for each end point of each configured EVCs. Enable CCM transmission on the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames																
Test Configuration Schematic	<p>The diagram illustrates the test configuration within a Simulated Service Provider Network. It shows four Network Elements (NEs): Subscriber NE (green), Operator A NE (orange), Operator B NE (pink), and another Subscriber NE (green). Each NE has a 'Monitor Mode' box. Below the NEs, four test points are identified: Local UNI-C Under Test, Local UNI-N (Tester-2), Remote UNI-N (Tester-4), and Remote UNI-C (Tester 4). A green arrow labeled 'Subscriber MEG' spans from the first Local UNI-C to the Remote UNI-C. A grey arrow labeled 'UNI MEG' spans from the first Local UNI-C to the Local UNI-N. Dashed lines indicate network boundaries between the Subscriber NE and Operator A NE, and between Operator A NE and Operator B NE.</p>																
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr><tr><td>10, 11</td><td>EVC₁</td><td>10, 11</td><td>EVC₁</td></tr><tr><td>12, 13</td><td>EVC₂</td><td>12, 13</td><td>EVC₂</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10, 11	EVC ₁	10, 11	EVC ₁	12, 13	EVC ₂	12, 13	EVC ₂
LOCAL UNI		REMOTE UNI															
CE-VLAN ID	EVC	CE-VLAN ID	EVC														
10, 11	EVC ₁	10, 11	EVC ₁														
12, 13	EVC ₂	12, 13	EVC ₂														
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that there are CCM frames transmitted from each configured MEP instances (verify MEP IDs) and that they are tagged with the smallest CE-VLAN ID mapped into each EVC																
Units	CCM frames VLAN tag and MEP ID values																
Variables	Number of EVCs																
Results	Pass or fail																
Remarks																	

TEST CASE 5C: MEP Instance on the Test-MEG

Abstract Test Suite for Service OAM																	
Test Name	MEP Instance on the Test-MEG																
Test Definition ID	UNIC-R33 ¹																
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2																
Test Type	Conformance																
Test Status	Optional																
MEF Requirement Description	A UNI-C Type 2 SHOULD be able to support a MEP instance on the Test-MEG for each configured EVC																
Test Object	Verify that a UNI-C Type 2 is able to support a MEP instance on the Test-MEG for each configured EVC																
Test Configuration	Configure at least two EVCs associating at least two UNIs (local + remote) and configure a Test-MEG with a MEG-Level = “5”, with a unique MAID for each EVC. Configure MEP instances with specific MEP IDs for each end point of each configured EVCs. Enable CCM transmission on the Test-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames																
Test Configuration Schematic																	
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr><tr><td>11</td><td>EVC₂</td><td>11</td><td>EVC₂</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁	11	EVC ₂	11	EVC ₂
LOCAL UNI		REMOTE UNI															
CE-VLAN ID	EVC	CE-VLAN ID	EVC														
10	EVC ₁	10	EVC ₁														
11	EVC ₂	11	EVC ₂														
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that CCM frames are transmitted from each configured MEP instance (verify MEP IDs) and that the MEG-Level of each CCM frame is equal to “5”																
Units	MEG-Level and MEP ID values																
Variables	Number of EVCs																
Results	Pass or fail																
Remarks																	

TEST CASE 6C: Tagged OAM Frames on the Test-MEG

Abstract Test Suite for Service OAM																	
Test Name	Tagged OAM Frames on the Test-MEG																
Test Definition ID	UNIC-R33 ²																
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2																
Test Type	Conformance																
Test Status	Optional																
MEF Requirement Description	The OAM frames on the Test-MEG SHOULD be tagged and use the smallest CE-VLAN ID mapped into that EVC																
Test Object	Verify that the OAM frames on the Test-MEG are tagged and use the smallest CE-VLAN ID mapped into that EVC																
Test Configuration	Configure at least two EVCs associating at least two UNIs (local + remote) and configure a Test-MEG with a MEG-Level = “5”, with a unique MAID for each EVC. Configure MEP instances with specific MEP IDs for each end point of each configured EVC. Enable CCM transmission on the Test-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames																
Test Configuration Schematic	<p>The diagram illustrates a network topology for testing. It shows a 'Simulated Service Provider Network' containing three main sections: 'Subscriber NE', 'Operator A NE', and 'Operator B NE'. Each section has a 'Monitor Mode' block. Below these, specific UNI instances are identified: 'Local UNI-C Under Test' (green), 'Local UNI-N (Tester-2)' (orange), 'Remote UNI-N (Tester-4)' (pink), and 'Remote UNI-C (Tester 4)' (green). Arrows at the bottom represent different MEGs: 'Subscriber MEG' (grey), 'UNI MEG' (blue), and 'Test MEG' (blue). The 'Test MEG' is shown spanning from the Local UNI-C to the Remote UNI-C.</p>																
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr><tr><td>10, 11</td><td>EVC₁</td><td>10, 11</td><td>EVC₁</td></tr><tr><td>12, 13</td><td>EVC₂</td><td>12, 13</td><td>EVC₂</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10, 11	EVC ₁	10, 11	EVC ₁	12, 13	EVC ₂	12, 13	EVC ₂
LOCAL UNI		REMOTE UNI															
CE-VLAN ID	EVC	CE-VLAN ID	EVC														
10, 11	EVC ₁	10, 11	EVC ₁														
12, 13	EVC ₂	12, 13	EVC ₂														
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that there are CCM frames transmitted from each configured MEP instances (verify MEP IDs) and that they are tagged with the smallest CE-VLAN ID mapped into each EVC																
Units	CCM frames VLAN tag and MEP ID values																
Variables	Number of EVCs																
Results	Pass or fail																
Remarks																	

TEST CASE 7C: MEP Instance on the UNI-MEG

Abstract Test Suite for Service OAM													
Test Name	MEP Instance on the UNI-MEG												
Test Definition ID	UNIC-R34 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MUST be able to support a single MEP instance on the UNI-MEG, regardless of whether any EVC is configured for that UNI or not												
Test Object	Verify that a UNI-C Type 2 can support a single MEP instance on the UNI-MEG, regardless of whether any EVC is configured for that UNI or not												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C and the local UNI-N. Enable CCM transmission on the UNI-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE (green), Operator A NE (orange), Operator B NE (pink), and Subscriber NE (green). Below these are four test nodes: Local UNI-C Under Test (green), Local UNI-N (Tester-2) (orange), Remote UNI-N (pink), and Remote UNI-C (Tester 4) (green). Each node has a 'Monitor Mode' box. A 'Simulated Service Provider Network' connects Operator A NE and Operator B NE. Arrows indicate the flow of 'UNI MEG' (orange) and 'Test MEG' (grey) between the test nodes.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that they contain the configured MEP ID and that their MEG-Level is equal to “1”. Delete the configured EVC(s) and use Tester 1 to verify that the Continuity Check Messages are still transmitted by the UNI-C under test, that they still contain the configured MEP ID and that their MEG-Level is still equal to “1”												
Units	MEG-Level and MEP ID values												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 8C: Untagged OAM Frames on the UNI-MEG

Abstract Test Suite for Service OAM	
Test Name	Untagged OAM Frames on the UNI-MEG
Test Definition ID	UNIC-R34 ²
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-C Type 2 must be able to support a single MEP instance on the UNI-MEG, this UNI-MEG is called the “default UNI-MEG” and MUST use Untagged OAM frames
Test Object	Verify that a UNI-C Type 2 is able to support a single MEP instance on the UNI-MEG and that it uses untagged OAM frames
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that their MEG-Level is equal to “1” and that they are untagged
Units	MEG-Level value and CCM frames VLAN tag (absence)
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 9C: IEEE 802.1 Bridge MEPs Corresponding to UNI-MEG

Abstract Test Suite for Service OAM	
Test Name	IEEE 802.1 Bridge MEPs Corresponding to UNI-MEG
Test Definition ID	UNIC-R35 ¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2
Test Type	Conformance
Test Status	Optional
MEF Requirement Description	When the CE is an IEEE 802.1 Bridge, the MEPs corresponding to the UNI-MEG on a UNI-C Type 2 SHOULD be Down-MEPs
Test Object	Verify that when the CE is an IEEE 802.1 Bridge, the MEPs corresponding to the UNI-MEG on a UNI-C Type 2 are Down-MEPs
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure Down-MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration for the UNI-MEG MEP test. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. A Local UNI-C Under Test is connected to Operator A NE. A Local UNI-N (Tester-2) is connected to Operator A NE. A Remote UNI-N (Tester-4) is connected to Operator B NE. A Remote UNI-C (Tester 4) is connected to Operator B NE. A Subscriber MEG Test MEG is shown between the Local UNI-N and the Remote UNI-N. A UNI MEG is shown between the Local UNI-C and the Local UNI-N. A Monitor Mode box is connected to the Local UNI-C. Arrows indicate the direction of traffic flow.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-C under test and if the bridge implements IEEE 802.1ag clause 12.14.7, use the management system of the UNI-C under test to verify that the value indicating the direction in which the MEP is facing on the interface is "Down"
Units	MEP direction
Variables	None
Results	Pass or fail
Remarks	To perform this test, the bridge must implement IEEE 802.1ag clause 12.14.7 (Maintenance association End Point managed object). If this is not the case, there is no obligation to perform the test

TEST CASE 10C: IEEE 802.1 Bridge MEPs Corresponding to Test-MEG

Abstract Test Suite for Service OAM													
Test Name	IEEE 802.1 Bridge MEPs Corresponding to Test-MEG												
Test Definition ID	UNIC-R35 ²												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2												
Test Type	Conformance												
Test Status	Optional												
MEF Requirement Description	When the CE is an IEEE 802.1 Bridge, the MEPs corresponding to Test-MEG on a UNI-C Type 2 SHOULD be Down-MEPs												
Test Object	Verify that when the CE is an IEEE 802.1 Bridge, the MEPs corresponding to Test-MEG on a UNI-C Type 2 are Down-MEPs												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a Test-MEG with a MEG-Level = “5”, with a unique MAID. Configure Down-MEP instances with specific MEP IDs for each end point of each configured EVC. Enable CCM transmission on the Test-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates a network topology for testing. A dashed box labeled "Simulated Service Provider Network" contains four nodes: "Subscriber NE" (green), "Operator A NE" (orange), "Operator B NE" (pink), and "Subscriber NE" (green). Below these are four test points: "Local UNI-C Under Test" (green), "Local UNI-N (Tester-2)" (orange), "Remote UNI-N (Tester-4)" (pink), and "Remote UNI-C (Tester 4)" (green). Arrows show "Subscriber MEG" (grey) and "UNI MEG" (grey) directions. A blue arrow labeled "Test MEG" points from the Local UNI-C to the Remote UNI-C.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and if the bridge implements IEEE 802.1ag clause 12.14.7, use the management system of the UNI-C under test to verify that the values indicating the directions in which the MEPs are facing on the interface are “Down”												
Units	MEP direction												
Variables	None												
Results	Pass or fail												
Remarks	To perform this test, the bridge must implement IEEE 802.1ag clause 12.14.7 (Maintenance association End Point managed object). If this is not the case, there is no obligation to perform the test												

TEST CASE 11C: IEEE 802.1 Bridge MEPs Corresponding to Subscriber-MEG – Down-MEP

Abstract Test Suite for Service OAM													
Test Name	IEEE 802.1 Bridge MEPs Corresponding to Subscriber-MEG – Down-MEP												
Test Definition ID	UNIC-R36 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag												
Test Type	Conformance												
Test Status	Optional												
MEF Requirement Description	When the CE is an IEEE 802.1 Bridge, the MEPs corresponding to Subscriber-MEG on a UNI-C Type 2 MAY either be Up-MEP or Down-MEP												
Test Object	Verify that when the CE is an IEEE 802.1 Bridge, the MEPs corresponding to Subscriber-MEG on a UNI-C Type 2 are Down-MEPs												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a Subscriber-MEG with a MEG-Level = “6”, with a unique MAID. Configure Down-MEP instances with specific MEP IDs for each end point of each configured EVC. Enable CCM transmission on the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a sequence of network elements: Subscriber NE (green), Operator A NE (orange), Operator B NE (pink), and Subscriber NE (green). Below these are Local UNI-C Under Test and Remote UNI-C. A Simulated Service Provider Network connects the Operator NEs. Testers 1, 2, 3, and 4 are positioned at various points. A green arrow indicates the Subscriber MEG Test MEG direction, and a grey arrow indicates the UNI MEG direction.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and if the bridge implements IEEE 802.1ag clause 12.14.7, use the management system of the UNI-C under test to verify that the values indicating the directions in which the MEPs are facing on the interface are “Down”												
Units	MEP direction												
Variables	None												
Results	Pass or fail												
Remarks	To perform this test, the bridge must implement IEEE 802.1ag clause 12.14.7 (Maintenance association End Point managed object). If this is not the case, there is no obligation to perform the test												

TEST CASE 12C: IEEE 802.1 Bridge MEPs Corresponding to Subscriber-MEG – Up-MEP

Abstract Test Suite for Service OAM													
Test Name	IEEE 802.1 Bridge MEPs Corresponding to Subscriber-MEG – Up-MEP												
Test Definition ID	UNIC-R36 ²												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2												
Test Type	Conformance												
Test Status	Optional												
MEF Requirement Description	When the CE is an IEEE 802.1 Bridge, the MEPs corresponding to Subscriber-MEG on a UNI-C Type 2 MAY either be Up-MEP or Down-MEP												
Test Object	Verify that when the CE is an IEEE 802.1 Bridge, the MEPs corresponding to Subscriber-MEG on a UNI-C Type 2 are Up-MEPs												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a Subscriber-MEG with a MEG-Level = “6”, with a unique MAID. Configure Up-MEP instances with specific MEP IDs for each end point of each configured EVC. Enable CCM transmission on the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration within a Simulated Service Provider Network. It shows a sequence of components: Subscriber NE (green box), Operator A NE (orange box), Operator B NE (pink box), and Subscriber NE (green box). Below these are four test points: Local UNI-C Under Test, Local UNI-N (Tester 2), Remote UNI-N (Tester 4), and Remote UNI-C (Tester 4). A green arrow labeled 'Subscriber MEG (Test MEG)' spans from the first to the last test point. A grey arrow labeled 'UNI MEG' spans from the first to the second test point. Each test point is associated with a 'Monitor Mode' box (yellow for local, pink for remote).</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and if the bridge implements IEEE 802.1ag clause 12.14.7, use the management system of the UNI-C under test to verify that the values indicating the directions in which the MEPs are facing on the interface are “Up”												
Units	MEP direction												
Variables	None												
Results	Pass or fail												
Remarks	To perform this test, the bridge must implement IEEE 802.1ag clause 12.14.7 (Maintenance association End Point managed object). If this is not the case, there is no obligation to perform the test												

15.3 UNI-C Type 2 MEG End Points Requirements

TEST CASE 13C: Configurable MEG-Level

Abstract Test Suite for Service OAM													
Test Name	Configurable MEG-Level												
Test Definition ID	UNIC-R39												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MUST support a configurable MEG-Level for the MEPs												
Test Object	Verify that a UNI-C Type 2 can support a configurable MEG-Level for the MEPs												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, on the Test-MEG and on the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic													
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that CCM frames are transmitted from each configured MEP instance (verify MEP IDs) and that the MEG-Level of the UNI-MEG is = “1”, the MEG-Level of the Test-MEG is = “5”, and the MEG-Level of Subscriber-MEG is = “6”												
Units	MEG-Level and MEP ID values												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 14C: Processing Received Multicast CCM Frames – Source Address

Abstract Test Suite for Service OAM													
Test Name	Processing Received Multicast CCM Frames – Source Address												
Test Definition ID	UNIC-R40 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.3.2)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG – Source address validation												
IEEE Requirement Description	The receiving system SHALL consider a CCM PDU invalid and discard it if the source address parameter contains a Group address, and not an Individual MAC address												
Test Object	Verify that any CCM frame received with a source address parameter that contains a Group MAC address is considered invalid and discarded												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The schematic diagram illustrates the test configuration. It shows a network topology with four Network Elements (NEs): Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. The Subscriber NEs are connected to the Operator NEs. The Operator A NE is connected to the Operator B NE. The diagram shows Local UNI-C Under Test, Local UNI-N (Tester 2), Remote UNI-N (Tester 4), and Remote UNI-C. It also shows Impairment or Monitor blocks. Arrows indicate the flow of Subscriber MEG, Test MEG, and UNI MEG.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 2 and Tester 4 to send Continuity Check Messages with a source address parameter that contains a Group MAC address to the UNI-C under test and use the management system of the UNI-C under test to verify that the received CCMs are not catalogued (MEP IDs of the remote MEPs) in the UNI-C MEP CCM Database for the UNI-MEG, for the Test-MEG and for the Subscriber-MEG												
Units	CCM database MEP ID values												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 15C: Processing Received Multicast CCM Frames – Sender ID TLV

Abstract Test Suite for Service OAM													
Test Name	Processing Received Multicast CCM Frames – Sender ID TLV												
Test Definition ID	UNIC-R40 ²												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.5.3)												
Test Type	Conformance												
Test Status	Mandatory if Sender ID TLVs are supported												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG – Sender ID TLV validation												
IEEE Requirement Description	The receiving system SHALL consider a CCM PDU invalid and discard it if the Sender ID TLV Length field is not large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields												
Test Object	Verify that any CCM frame received with a Sender ID TLV Length field that is not large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields is considered invalid and discarded												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration across a network. It shows four Network Elements (NEs): Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Each NE contains a Local UNI-C Under Test and a Local UNI-N (Tester-2). The Local UNI-C Under Test is connected to the Local UNI-N (Tester-2) via a Local UNI-MEG. The Local UNI-N (Tester-2) is connected to the Remote UNI-N (Tester-4) via a Test MEG. The Remote UNI-N (Tester-4) is connected to the Remote UNI-C (Tester 4) via a Subscriber MEG. The diagram also shows impairment monitors and a simulated service provider network.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 2 and Tester 4 to send Continuity Check Messages with Sender ID TLV Length field not large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields to the UNI-C under test and use the management system of the UNI-C under test to verify that the received CCMs are not catalogued (MEP IDs of the remote MEPs) in the UNI-C MEP CCM Database for the UNI-MEG, for the Test-MEG and for the Subscriber-MEG												
Units	CCM database MEP ID values												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 16C: Processing Received Multicast CCM Frames – Chassis ID Length

Abstract Test Suite for Service OAM															
Test Name	Processing Received Multicast CCM Frames – Chassis ID Length														
Test Definition ID	UNIC-R40 ³														
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.5.3.1)														
Test Type	Conformance														
Test Status	Mandatory if Sender ID TLVs are supported														
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG – Chassis ID length validation														
IEEE Requirement Description	The receiving system SHALL consider a CCM PDU invalid and discard it if the Chassis ID Length field is not 0, nor less than (TLV Length field value – 1)														
Test Object	Verify that any CCM frame received with a Chassis ID Length field that is not 0, nor less than (TLV Length field value – 1) is considered invalid and discarded														
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames														
Test Configuration Schematic															
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th></tr><tr><td>10</td><td>EVC₁</td></tr></table>	LOCAL UNI		CE-VLAN ID	EVC	10	EVC ₁	<table><tr><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th></tr><tr><td>10</td><td>EVC₁</td></tr></table>	REMOTE UNI		CE-VLAN ID	EVC	10	EVC ₁	Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1
LOCAL UNI															
CE-VLAN ID	EVC														
10	EVC ₁														
REMOTE UNI															
CE-VLAN ID	EVC														
10	EVC ₁														
Test Procedure	Use Tester 2 and Tester 4 to send Continuity Check Messages with a Chassis ID Length field that is not 0, nor less than (TLV Length field value – 1) to the UNI-C under test and use the management system of the UNI-C under test to verify that the received CCMs are not catalogued (MEP IDs of the remote MEPs) in the UNI-C MEP CCM Database for the UNI-MEG, for the Test-MEG and for the Subscriber-MEG														
Units	CCM database MEP ID values														
Variables	None														
Results	Pass or fail														
Remarks															

TEST CASE 17C: Processing Received Multicast CCM Frames – Port Status TLV

Abstract Test Suite for Service OAM													
Test Name	Processing Received Multicast CCM Frames – Port Status TLV												
Test Definition ID	UNIC-R40 ⁴												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.5.4)												
Test Type	Conformance												
Test Status	Mandatory if Port Status TLVs are supported												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG – Port Status TLV validation												
IEEE Requirement Description	The receiving system SHALL consider a CCM PDU invalid and discard it if the Port Status TLV contains a value other than (0x01) or (0x02)												
Test Object	Verify that any CCM frame received with a Port Status TLV that contains a value other than (0x01) or (0x02) is considered invalid and discarded												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic													
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 2 and Tester 4 to send Continuity Check Messages with a Port Status TLV that contains a value other than (0x01) or (0x02) to the UNI-C under test and use the management system of the UNI-C under test to verify that the received CCMs are not catalogued (MEP IDs of the remote MEPs) in the UNI-C MEP CCM Database for the UNI-MEG, for the Test-MEG and for the Subscriber-MEG												
Units	CCM database MEP ID values												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 18C: Processing Received Multicast CCM Frames – Interface Status TLV

Abstract Test Suite for Service OAM													
Test Name	Processing Received Multicast CCM Frames – Interface Status TLV												
Test Definition ID	UNIC-R40 ⁵												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.5.5)												
Test Type	Conformance												
Test Status	Mandatory if Interface Status TLVs are supported												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG – Interface Status TLV validation												
IEEE Requirement Description	The receiving system SHALL consider a CCM PDU invalid and discard it if the Interface Status TLV contains a value other than (0x01), (0x02), (0x03), (0x04), (0x05), (0x06) or (0x07)												
Test Object	Verify that any CCM frame received with an Interface Status TLV that contains a value other than (0x01), (0x02), (0x03), (0x04), (0x05), (0x06) or (0x07) is considered invalid and discarded												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration across a simulated service provider network. It shows four Network Elements (NEs): Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Each NE contains a Local UNI (UNI-C or UNI-N) and an Impairment or Monitor block. The Local UNI-C Under Test is connected to Local UNI-N (Tester-2). Local UNI-N (Tester-2) is connected to Remote UNI-N (Tester-4). Remote UNI-N (Tester-4) is connected to Remote UNI-C. The diagram also shows the flow of three MEGs: Subscriber MEG (green), Test MEG (blue), and UNI MEG (orange). The Subscriber MEG flows from Local UNI-N (Tester-2) to Remote UNI-N (Tester-4). The Test MEG flows from Local UNI-N (Tester-2) to Remote UNI-C. The UNI MEG flows from Local UNI-C Under Test to Local UNI-N (Tester-2).</p>												
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 2 and Tester 4 to send Continuity Check Messages with an Interface Status TLV that contains a value other than (0x01), (0x02), (0x03), (0x04), (0x05), (0x06) or (0x07) to the UNI-C under test and use the management system of the UNI-C under test to verify that the received CCMs are not catalogued (MEP IDs of the remote MEPs) in the UNI-C MEP CCM Database for the UNI-MEG, for the Test-MEG and for the Subscriber-MEG												
Units	CCM database MEP ID values												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 19C: Processing Received Multicast CCM Frames – CCM Interval

Abstract Test Suite for Service OAM													
Test Name	Processing Received Multicast CCM Frames – CCM Interval												
Test Definition ID	UNIC-R40 ⁶												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.6.1.3)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG – CCM Interval validation												
IEEE Requirement Description	The receiving system SHALL consider a CCM PDU invalid and discard it if the CCM Interval field contains the value 0												
Test Object	Verify that any CCM frame received with a CCM Interval field that contain the value 0 is considered invalid and discarded												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic													
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 2 and Tester 4 to send Continuity Check Messages with a CCM Interval field that contain the value 0 to the UNI-C under test and use the management system of the UNI-C under test to verify that the received CCMs are not catalogued (MEP IDs of the remote MEPs) in the UNI-C MEP CCM Database for the UNI-MEG, for the Test-MEG and for the Subscriber-MEG												
Units	CCM database MEP ID values												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 20C: Processing Received Multicast CCM Frames – First TLV Offset

Abstract Test Suite for Service OAM													
Test Name	Processing Received Multicast CCM Frames – First TLV Offset												
Test Definition ID	UNIC-R40 ⁷												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.6.2)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG – First TLV Offset validation												
IEEE Requirement Description	The receiving system SHALL consider a CCM PDU invalid and discard it if the First TLV Offset field of the Common CFM Header in a CCM does not contain a value greater than or equal to 70												
Test Object	Verify that any CCM frame received with a First TLV Offset field of the Common CFM Header that does not contain a value greater than or equal to 70 is considered invalid and discarded												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a sequence of network elements: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Each NE contains an 'Impairment or Monitor' block. Below these, specific UNI instances are identified: Local UNI-C Under Test, Local UNI-N (Tester-2), Remote UNI-N (Tester-4), and Remote UNI-C (Tester 4). Three MEGs are shown: Subscriber MEG (green arrow), Test MEG (blue arrow), and UNI MEG (orange arrow). The Test MEG path spans from the Local UNI-N to the Remote UNI-C. The Subscriber MEG path spans from the Local UNI-C to the Remote UNI-C. The UNI MEG path is shown between the Local UNI-C and Local UNI-N.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 2 and Tester 4 to send Continuity Check Messages with a First TLV Offset field of the Common CFM Header that does not contain a value greater than or equal to 70 to the UNI-C under test and use the management system of the UNI-C under test to verify that the received CCMs are not catalogued (MEP IDs of the remote MEPs) in the UNI-C MEP CCM Database for the UNI-MEG, for the Test-MEG and for the Subscriber-MEG												
Units	CCM database MEP ID values												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 21C: Processing Received Multicast CCM Frames – MEP ID

Abstract Test Suite for Service OAM													
Test Name	Processing Received Multicast CCM Frames – MEP ID												
Test Definition ID	UNIC-R40 ⁸												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.6.4)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG – MEP ID validation												
IEEE Requirement Description	The receiving system SHALL consider a CCM PDU invalid and discard it if the MEP ID is not in the range 1-8191												
Test Object	Verify that any CCM frame received with a MEP ID that is not in the range 1-8191 is considered invalid and discarded												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates a network topology for testing. It shows four Network Elements (NEs) connected in a line: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Each NE contains an impairment monitor. Below the NEs, four UNI instances are identified: Local UNI-C Under Test, Local UNI-N (labeled as Tester-2), Remote UNI-N (labeled as Tester-4), and Remote UNI-C (labeled as Tester 4). Three MEGs are shown: Subscriber MEG (green), Test MEG (blue), and UNI MEG (orange). Arrows indicate the flow of these MEGs across the network elements.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 2 and Tester 4 to send Continuity Check Messages with a MEP ID that is not in the range 1-8191 to the UNI-C under test and use the management system of the UNI-C under test to verify that the received CCMs are not catalogued (MEP IDs of the remote MEPs) in the UNI-C MEP CCM Database for the UNI-MEG, for the Test-MEG and for the Subscriber-MEG												
Units	CCM database MEP ID values												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 22C: Processing Received Multicast CCM Frames – Short MA Name Length 1

Abstract Test Suite for Service OAM													
Test Name	Processing Received Multicast CCM Frames – Short MA Name Length 1												
Test Definition ID	UNIC-R40 ⁹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.6.5.5)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG – Short MA Name length validation 1												
IEEE Requirement Description	The receiving system SHALL consider a CCM PDU invalid and discard it if the Short MA Name Length does not contain a value greater than or equal to 1												
Test Object	Verify that any CCM frame received with a Short MA Name Length that does not contain a value greater than or equal to 1 is considered invalid and discarded												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration across a Simulated Service Provider Network. It shows four Network Elements (NE): Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Each NE contains a Local UNI (UNI-C or UNI-N) and an Impairment or Monitor block. The Local UNI-C Under Test is connected to Local UNI-N (Tester-2) via a Local UNI-MEG. Local UNI-N is connected to Remote UNI-N via a Local UNI-MEG. Remote UNI-N is connected to Remote UNI-C (Tester 4) via a Remote UNI-MEG. A Subscriber-MEG connects Local UNI-N to Remote UNI-N. A Test-MEG connects Local UNI-N to Remote UNI-N. A UNI-MEG connects Local UNI-N to Remote UNI-N. The diagram also shows impairment monitors and various MEPs (MEP 1, MEP 3, MEP 4) and their associated MAIDs.</p>												
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 2 and Tester 4 to send Continuity Check Messages with a Short MA Name Length that does not contain a value greater than or equal to 1 to the UNI-C under test and use the management system of the UNI-C under test to verify that the received CCMs are not catalogued (MEP IDs of the remote MEPs) in the UNI-C MEP CCM Database for the UNI-MEG, for the Test-MEG and for the Subscriber-MEG												
Units	CCM database MEP ID values												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 23C: Processing Received Multicast CCM Frames – Short MA Name Length 2

Abstract Test Suite for Service OAM													
Test Name	Processing Received Multicast CCM Frames – Short MA Name Length 2												
Test Definition ID	UNIC-R40 ¹⁰												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.6.5.5)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG – Short MA Name length validation 2												
IEEE Requirement Description	The receiving system SHALL consider a CCM PDU invalid and discard it if the Short MA Name Length indicates that the Short MA Name runs over the 48-octet limit for the MAID												
Test Object	Verify that any CCM frame received with a Short MA Name Length that indicates that the Short MA Name runs over the 48-octet limit for the MAID is considered invalid and discarded												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic													
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 2 and Tester 4 to send Continuity Check Messages with a Short MA Name Length that indicates that the Short MA Name runs over the 48-octet limit for the MAID to the UNI-C under test and use the management system of the UNI-C under test to verify that the received CCMs are not catalogued (MEP IDs of the remote MEPs) in the UNI-C MEP CCM Database for the UNI-MEG, for the Test-MEG and for the Subscriber-MEG												
Units	CCM database MEP ID values												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 24C: Processing Received Multicast CCM Frames

Abstract Test Suite for Service OAM													
Test Name	Processing Received Multicast CCM Frames												
Test Definition ID	UNIC-R40 ¹¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.1.3)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG												
IEEE Requirement Description	Further to the successful PDU validation tests (described in Test Cases 14 through 23) a receiving MEP SHALL examine every CCM to be sure that its MAID matches that configured in the receiving MEP, check to ensure that its own MEPID does <i>not</i> match that in the received CCM and catalog CCMs in its MEP CCM Database												
Test Object	Verify that further to the successful PDU validation tests (described in Test Cases 14 through 23) the receiving MEP examines every CCM to be sure that its MAID matches that configured in the receiving MEP, checks to ensure that its own MEPID does <i>not</i> match that in the received CCM and catalog CCMs in its MEP CCM Database												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates a network topology for testing. It shows four Network Elements (NEs): Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Each NE contains an 'Impairment or Monitor' block. Below the NEs, four specific UNI instances are identified: Local UNI-C (Tester 1), Local UNI-N (Tester 2), Remote UNI-N (Tester 3), and Remote UNI-C (Tester 4). Arrows indicate the flow of different MEGs: a green arrow for 'Subscriber MEG' from Local UNI-C to Remote UNI-C; a blue arrow for 'Test MEG' from Local UNI-N to Remote UNI-N; and an orange arrow for 'UNI MEG' from Local UNI-C to Local UNI-N.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 2 and Tester 4 to send valid Continuity Check Messages to the UNI-C under test and use the management system of the UNI-C under test to verify that the received CCMs are catalogued (MEP IDs of the remote MEPs) in the UNI-C MEP CCM Database for the UNI-MEG, for the Test-MEG and for the Subscriber-MEG												
Units	CCM database MEP ID values												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 25C: Processing & Response to Unicast & Multicast LBM Frames – Destination Address

Abstract Test Suite for Service OAM													
Test Name	Processing & Response to Unicast & Multicast LBM Frames – Destination Address												
Test Definition ID	UNIC-R41 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.2.2)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to process and respond to both Unicast and Multicast LBM frames for each required MEG – Destination address validation												
IEEE Requirement Description	When an LBM is received by an MEP Loopback Responder, if the destination address matches neither the MAC address of the receiving MEP, nor the Group MAC address listed in the MAC addresses Table in section 10, appropriate to the MD Level (MEG-Level) of the receiving MEP, the MEP SHALL discard the LBM												
Test Object	Verify that any LBM frame received with a destination address that does not match the MAC address of the receiving MEP, nor the Group MAC address listed in the MAC addresses Table in section 10, appropriate to the MD Level (MEG-Level) is considered invalid and discarded												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic													
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct Tester 2 and Tester 4 to send Loopback Messages with a destination address that does not match the MAC address of the receiving MP, nor the Group MAC address listed in the MAC addresses Table in section 10, appropriate to the MD Level (MEG-Level) to the UNI-C under test. Use Tester 1 and Tester 3 to monitor the messages transmitted by the UNI-C under test and to verify that it does not generate any Loopback Replies (because the received LBMs are considered invalid and discarded)												
Units	OpCode value												
Variables	LBM frame type (Unicast or Multicast)												
Results	Pass or fail												
Remarks													

TEST CASE 26C: Processing & Response to Unicast & Multicast LBM Frames – Source Address

Abstract Test Suite for Service OAM													
Test Name	Processing & Response to Unicast & Multicast LBM Frames – Source Address												
Test Definition ID	UNIC-R41 ²												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.3.2)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to process and respond to both Unicast and Multicast LBM frames for each required MEG – Source address validation												
IEEE Requirement Description	The receiving system SHALL consider an LBM PDU invalid and discard it if the source address parameter contains a Group address, and not an Individual MAC address												
Test Object	Verify that any LBM frame received with a source address parameter that contains a Group MAC address is considered invalid and discarded												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration across four Network Elements (NE): Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. The first and last Subscriber NEs are connected to their respective Operator NEs. The first Operator NE (Operator A NE) contains a Local UNI-C Under Test and a Local UNI-N (Tester-2). The second Operator NE (Operator B NE) contains a Remote UNI-N (Tester-4) and a Remote UNI-C. The diagram shows three MEGs: Subscriber MEG (green), Test MEG (blue), and UNI MEG (orange). The Subscriber MEG spans from the first Subscriber NE to the Remote UNI-C. The Test MEG spans from the Local UNI-C Under Test to the Remote UNI-C. The UNI MEG spans from the Local UNI-C Under Test to the Local UNI-N (Tester-2). The diagram is divided into three sections: Subscriber NE, Simulated Service Provider Network, and Subscriber NE. The Simulated Service Provider Network section contains Operator A NE and Operator B NE. The Subscriber NE section contains Subscriber NE and Subscriber NE. The diagram shows the flow of traffic between these components and the associated MEGs.</p>												
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct Tester 2 and Tester 4 to send Loopback Messages with a source address parameter that contains a Group MAC address to the UNI-C under test. Use Tester 1 and Tester 3 to monitor the messages transmitted by the UNI-C under test and to verify that it does not generate any Loopback Replies (because the received LBMs are considered invalid and discarded)												
Units	OpCode value												
Variables	LBM frame type (Unicast or Multicast)												
Results	Pass or fail												
Remarks													

TEST CASE 27C: Processing & Response to Unicast & Multicast LBM Frames – Sender ID TLV

Abstract Test Suite for Service OAM															
Test Name	Processing & Response to Unicast & Multicast LBM Frames – Sender ID TLV														
Test Definition ID	UNIC-R41 ³														
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.5.3)														
Test Type	Conformance														
Test Status	Mandatory if Sender ID TLVs are supported														
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to process and respond to both Unicast and Multicast LBM frames for each required MEG – Sender ID TLV validation														
IEEE Requirement Description	The receiving system SHALL consider an LBM PDU invalid and discard it if the Sender ID TLV Length field is not large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields														
Test Object	Verify that any LBM frame received with a Sender ID TLV Length field that is not large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields is considered invalid and discarded														
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames														
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a sequence of network elements: Subscriber NE (green), Impairment or Monitor (yellow), Operator A NE (orange), Impairment or Monitor (yellow), Operator B NE (pink), and Subscriber NE (green). Below these are four test points: Local UNI-C Under Test, Local UNI-N (Tester-2), Remote UNI-N, and Remote UNI-C (Tester 4). A dashed box labeled 'Simulated Service Provider Network' encompasses the two impairment/monitor blocks and the two operator NE blocks. Three horizontal arrows represent MEGs: a green arrow for 'Subscriber MEG' spanning from the first to the last NE, a blue arrow for 'Test MEG' spanning from the first to the last NE, and an orange arrow for 'UNI MEG' spanning from the first to the second NE. Vertical dashed lines separate the components.</p>														
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>			LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI													
CE-VLAN ID	EVC	CE-VLAN ID	EVC												
10	EVC ₁	10	EVC ₁												
Test Procedure	Instruct Tester 2 and Tester 4 to send Loopback Messages with Sender ID TLV Length field not large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields to the UNI-C under test. Use Tester 1 and Tester 3 to monitor the messages transmitted by the UNI-C under test and to verify that it does not generate any Loopback Replies (because the received LBMs are considered invalid and discarded)														
Units	OpCode value														
Variables	LBM frame type (Unicast or Multicast)														
Results	Pass or fail														
Remarks															

TEST CASE 28C: Processing & Response to Unicast & Multicast LBM Frames – First TLV Offset

Abstract Test Suite for Service OAM													
Test Name	Processing & Response to Unicast & Multicast LBM Frames – First TLV Offset												
Test Definition ID	UNIC-R41 ⁴												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.6.2)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to process and respond to both Unicast and Multicast LBM frames for each required MEG – First TLV Offset validation												
IEEE Requirement Description	The receiving system SHALL consider an LBM PDU invalid and discard it if the First TLV Offset field of the Common CFM Header in an LBM does not contain a value greater than or equal to 4												
Test Object	Verify that any LBM frame received with a First TLV Offset field of the Common CFM Header that does not contain a value greater than or equal to 4 is considered invalid and discarded												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration schematic. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. The Subscriber NEs are connected to the Operator NEs via Local UNI-C and Local UNI-N. The Operator NEs are connected to each other via a Simulated Service Provider Network. The Local UNI-C is connected to Local UNI-N. The Local UNI-N is connected to Remote UNI-N. The Remote UNI-N is connected to Remote UNI-C. The Local UNI-C is labeled as 'Local UNI-C Under Test'. The Local UNI-N is labeled as 'Local UNI-N (Tester 2)'. The Remote UNI-N is labeled as 'Remote UNI-N (Tester 3)'. The Remote UNI-C is labeled as 'Remote UNI-C (Tester 4)'. The diagram also shows the flow of MEGs: Subscriber MEG (green arrow), Test MEG (blue arrow), and UNI MEG (orange arrow). The Subscriber MEG flows from the Subscriber NE to the Operator A NE. The Test MEG flows from the Operator A NE to the Operator B NE. The UNI MEG flows from the Operator A NE to the Operator B NE.</p>												
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct Tester 2 and Tester 4 to send Loopback Messages with a First TLV Offset field of the Common CFM Header that does not contain a value greater than or equal to 4 to the UNI-C under test. Use Tester 1 and Tester 3 to monitor the messages transmitted by the UNI-C under test and to verify that it does not generate any Loopback Replies (because the received LBMs are considered invalid and discarded)												
Units	OpCode value												
Variables	LBM frame type (Unicast or Multicast)												
Results	Pass or fail												
Remarks													

TEST CASE 29C: Processing & Response to Unicast & Multicast LBM Frames – LBR Header

Abstract Test Suite for Service OAM													
Test Name	Processing & Response to Unicast & Multicast LBM Frames – LBR Header												
Test Definition ID	UNIC-R41 ⁵												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.2.2)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to process and respond to both Unicast and Multicast LBM frames for each required MEG												
IEEE Requirement Description	Further to the successful PDU validation tests (described in Test Cases 25 through 28), the receiving MEP generates an LBR and transmits it to the originating MEP. The source address parameter of the received LBM is used as the destination address parameter for the transmitted LBR, the source address parameter for the LBR is the MAC address of the replying MEP and the OpCode field is changed from LBM to LBR												
Test Object	Verify that further to the successful PDU validation tests (described in Test Cases 25 through 28) the receiving MEP generates an LBR and transmits it to the originating MEP with the source address parameter of the received LBM used as the destination address parameter for the transmitted LBR, with the MAC address of the replying MEP used as the source address parameter for the LBR and with the OpCode field changed from LBM to LBR												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic													
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct Tester 2 and Tester 4 to send valid Loopback Messages to the UNI-C under test. Use Tester 1 and Tester 3 to monitor the Loopback Reply messages transmitted by the UNI-C under test and to verify that the source address parameter of the received LBM is used as the destination address parameter for the transmitted LBR, the source address parameter for the LBR is the MAC address of the replying MEP and the OpCode field is changed from LBM to LBR												
Units	Source address, destination address and OpCode values												
Variables	LBM frame type (Unicast or Multicast)												
Results	Pass or fail												
Remarks													

TEST CASE 30C: Processing & Response to Unicast & Multicast LBM Frames – LBR Content

Abstract Test Suite for Service OAM													
Test Name	Processing & Response to Unicast & Multicast LBM Frames – LBR Content												
Test Definition ID	UNIC-R41 ⁶												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.2.2)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to process and respond to both Unicast and Multicast LBM frames for each required MEG												
IEEE Requirement Description	A receiving MEP that receives a valid LBM, shall not interpret any of the other fields or TLVs than the source address, destination address and OpCode. The contents of any TLVs that do not violate the validation criteria (described in Test Cases 25 through 28), shall be ignored, not interpreted by the receiver and SHALL be copied to the LBR												
Test Object	Verify that when a receiving MEP receives a valid LBM, it does not interpret any of the other fields or TLVs than the source address, destination address and OpCode, and the contents of any TLVs that do not violate the validation criteria (described in Test Cases 25 through 28), are ignored and copied to the LBR												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a sequence of network elements: Subscriber NE (green box), Operator A NE (orange box), Operator B NE (pink box), and Subscriber NE (green box). Between Operator A and Operator B is a 'Simulated Service Provider Network' indicated by a dashed line. Below these are four test points: Local UNI-C Under Test (Tester 1, green box), Local UNI-N (Tester 2, orange box), Remote UNI-N (Tester 3, pink box), and Remote UNI-C (Tester 4, green box). Arrows show the flow of MEGs: a green arrow for 'Subscriber MEG' from Tester 1 to Tester 4, a blue arrow for 'Test MEG' from Tester 2 to Tester 3, and an orange arrow for 'UNI MEG' from Tester 1 to Tester 2.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct Tester 2 and Tester 4 to send valid Loopback Messages to the UNI-C under test. Use Tester 1 and Tester 3 to monitor the Loopback Reply messages transmitted by the UNI-C under test and to verify that any TLVs that do not violate the validation criteria (described in Test Cases 25 through 28), are ignored and copied to the LBR												
Units	LBR TLV fields value												
Variables	LBM frame type (Unicast or Multicast)												
Results	Pass or fail												
Remarks													

TEST CASE 31C: Generating Multicast CCM Frames – Destination Address

Abstract Test Suite for Service OAM													
Test Name	Generating Multicast CCM Frames – Destination Address												
Test Definition ID	UNIC-R42 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.3.1)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Destination address validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; CCMs monitoring a service instance distinguished by its VID use the Group MAC addresses listed in the MAC addresses Table in section 10, as the destination address												
Test Object	Verify that the destination address parameter of the CCM frames generated by the UNI-C under test is one of the Group MAC addresses listed in the MAC addresses Table in section 10												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration within a Simulated Service Provider Network. It shows four Network Elements (NEs): Subscriber NE, Operator A NE, Operator B NE, and another Subscriber NE. Each NE contains an 'Impairment or Monitor' block. Below these are four test points: Local UNI-C Under Test, Local UNI-N (labeled as Tester 2), Remote UNI-N (labeled as Tester 3), and Remote UNI-C (labeled as Tester 4). Three Multicast End Points (MEGs) are shown: a green 'Subscriber MEG' spanning all NEs, a blue 'Test MEG' spanning from Local UNI-N to Remote UNI-C, and an orange 'UNI MEG' spanning from Local UNI-C to Local UNI-N. Arrows indicate the direction of traffic for each MEG.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that their destination address parameter contains one of the Group MAC addresses listed in the MAC addresses Table in section 10												
Units	Destination address												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 32C: Generating Multicast CCM Frames – Source Address

Abstract Test Suite for Service OAM													
Test Name	Generating Multicast CCM Frames – Source Address												
Test Definition ID	UNIC-R42 ²												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.3.2)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Source address validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The CCM frames source address is the Individual MAC address of the MEP transmitting the PDU. The source address parameter contains an individual, and not a Group, MAC address												
Test Object	Verify that the source address parameter of the CCM frames generated by the UNI-C under test contains an individual, and not a Group, MAC address												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the network topology for testing the source address of Multicast CCM frames. It shows a path from a Local UNI-C Under Test through a Local UNI-N (Tester-2) to a Remote UNI-N (Tester-4) and finally to a Remote UNI-C. The path is monitored by Impairment or Monitor blocks. The diagram also shows the configuration of MEGs (Subscriber MEG, Test MEG, UNI MEG) and their respective levels and MAIDs.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that their source address parameter contains an individual, and not a Group, MAC address												
Units	Source address												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 33C: Generating Multicast CCM Frames – Protocol Version Number

Abstract Test Suite for Service OAM													
Test Name	Generating Multicast CCM Frames – Protocol Version Number												
Test Definition ID	UNIC-R42 ³												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.4.2)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Protocol Version Number validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The protocol version number is always 0												
Test Object	Verify that the protocol version number of the CCM frames generated by the UNI-C under test is always 0												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration for generating Multicast CCM frames. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. The Local UNI-C Under Test is connected to Local UNI-N (Tester-2). The Remote UNI-N and Remote UNI-C are connected to Tester 4. A Simulated Service Provider Network connects the operators. Arrows indicate the flow of Subscriber MEG, Test MEG, and UNI MEG.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that their protocol version number is always 0												
Units	Protocol version number												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 34C: Generating Multicast CCM Frames – OpCode

Abstract Test Suite for Service OAM													
Test Name	Generating Multicast CCM Frames – OpCode												
Test Definition ID	UNIC-R42 ⁴												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.4.3)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – OpCode validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The OpCode field specifies the format and meaning of the remainder of the CFM PDU. The value for CCM PDUs is (0x01)												
Test Object	Verify that the OpCode value of the CCM frames generated by the UNI-C under test is (0x01)												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration across a Simulated Service Provider Network. On the left, a Subscriber NE connects to a Local UNI-C Under Test (green box). This is followed by an Impairment or Monitor block (yellow) labeled 'Meep 1' and a Local UNI-N (orange box) connected to Tester-2. The network continues through another Impairment or Monitor block (yellow) labeled 'Meep 3' to a Remote UNI-N (pink box) connected to Tester-4. Finally, a Subscriber NE connects to a Remote UNI-C (green box). Three multicast flows are shown: a green arrow for 'Subscriber MEG' spanning from the Local UNI-C to the Remote UNI-C; a blue arrow for 'Test MEG' spanning from the Local UNI-N to the Remote UNI-N; and an orange arrow for 'UNI MEG' spanning from the Local UNI-C to the Local UNI-N.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that their OpCode value is (0x01)												
Units	OpCode value												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 35C: Generating Multicast CCM Frames – Flags

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – Flags

Test Definition ID	UNIC-R42 ⁵												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.6.1)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Flags validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Flags field of the Common CFM Header is split into three parts for the CCM: the RDI field, the Reserved field and the CCM Interval field. The most significant bit of the Flags field is the RDI bit. This bit is set to 1 if the transmitting MEP’s presentRDI variable is set, and 0 if not. The bits of the Flags field not including the RDI field and the CCM Interval field are set to 0 by the transmitting MEP. The least-significant three bits of the Flags field constitute the CCM Interval field. The CCM Interval field is encoded as specified in the CCM Interval Table in section 11												
Test Object	Verify that the Flags field bits of the CCM frames generated by the UNI-C under test that are not included in the CCM Interval field are set to 0 and that the CCM Interval field contains a value in the range 1-7												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration for MEF 20 UNI Type 2. It shows a network topology with four Network Elements (NEs): Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Below these are four User Network Interfaces (UNIs): Local UNI-C Under Test, Local UNI-N (Tester-2), Remote UNI-N (Tester-4), and Remote UNI-C (Tester 4). A Simulated Service Provider Network connects the Operator A NE and Operator B NE. The diagram shows the flow of three types of MEGs: Subscriber MEG (green), UNI MEG (orange), and Test MEG (blue). The Subscriber MEG flows from Local UNI-C Under Test to Remote UNI-C (Tester 4). The UNI MEG flows from Local UNI-C Under Test to Local UNI-N (Tester-2). The Test MEG flows from Local UNI-C Under Test to Remote UNI-N (Tester-4). The diagram also shows the flow of CCM frames from the UNIs to the Operator A NE and Operator B NE.</p>												
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the Flags field bits that are not included in the CCM Interval field are set to 0 and that the CCM Interval field contains a value in the range 1-7												
Units	Flags field value												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 36C: Generating Multicast CCM Frames – First TLV Offset

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – First TLV Offset
Test Definition ID	UNIC-R42 ⁶

Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.6.2)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – First TLV Offset validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The First TLV Offset field of the Common CFM Header in a CCM contains a value greater than or equal to 70												
Test Object	Verify that the First TLV Offset field of the Common CFM Header in the CCM frames generated by the UNI-C under test contains a value greater than or equal to 70												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. The Local UNI-C Under Test is connected to Local UNI-N (Tester-2) via a Simulated Service Provider Network. The Remote UNI-N (Tester-4) is connected to Remote UNI-C (Tester 4). The diagram shows the flow of Subscriber MEG, Test MEG, and UNI MEG frames between the components.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the First TLV Offset field contains a value greater than or equal to 70												
Units	First TLV Offset field value												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 37C: Generating Multicast CCM Frames – Sequence Number

Abstract Test Suite for Service OAM													
Test Name	Generating Multicast CCM Frames – Sequence Number												
Test Definition ID	UNIC-R42 ⁷												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.6.3)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Sequence Number validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; A MEP transmits either a 0 in the Sequence Number field of the CCM frames, or copies to it the contents of the CCIscntCCMs variable												
Test Object	Verify that the Sequence Number field of the CCM frames generated by the UNI-C under test contains either a 0 or a copy of the CCIscntCCMs variable												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration for generating multicast CCM frames. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Each NE is connected to a corresponding Local or Remote UNI. The Local UNI-C is under test, while the Local UNI-N and Remote UNI-N are monitored by Tester-2 and Tester-4 respectively. The Remote UNI-C is also monitored by Tester-4. Impairment or Monitor blocks are placed between the NEs. Arrows indicate the flow of frames: Subscriber MEG (green), Test MEG (blue), and UNI MEG (orange).</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the Sequence Number field contains either a 0 or a copy of the CCIscntCCMs variable												
Units	Sequence Number value												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 38C: Generating Multicast CCM Frames – MEP ID

Abstract Test Suite for Service OAM													
Test Name	Generating Multicast CCM Frames – MEP ID												
Test Definition ID	UNIC-R42 ⁸												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.6.4)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – MEP ID validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The MEP ID TLV specifies from which MEP the CCM was transmitted and is in the range 1-8191												
Test Object	Verify that the MEP ID TLV of the CCM frames generated by the UNI-C under test contains a value in the range 1-8191												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates a network topology for testing. It shows four Network Elements (NE): Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. The Local UNI-C Under Test is connected to Local UNI-N (Tester-2) through a Simulated Service Provider Network. Remote UNI-N (Tester-3) and Remote UNI-C (Tester-4) are also connected. Impairment or Monitor blocks are placed on the links between the NEs. Arrows indicate the flow of frames: UNI MEG (orange), Test MEG (blue), and Subscriber MEG (green).</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the MEP ID TLV contains a value in the range 1-8191												
Units	MEP ID value												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 39C: Generating Multicast CCM Frames – MAID Total Length

Abstract Test Suite for Service OAM													
Test Name	Generating Multicast CCM Frames – MAID Total Length												
Test Definition ID	UNIC-R42 ⁹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.6.5)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – MAID total length validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The total length of the MAID field, including padding, if present, SHALL be exactly 48 octets.												
Test Object	Verify that the total length of the MAID field, including padding, of the CCM frames generated by the UNI-C under test is exactly 48 octets												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration across a network. It shows four Network Elements (NE): Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Each NE contains a Local UNI (UNI-C Under Test, Local UNI-N (Tester-2), Remote UNI-N (Tester-4), and Remote UNI-C) and an Impairment or Monitor block. The network is divided into three sections: Subscriber NE, Operator A NE, and Operator B NE. The Simulated Service Provider Network connects the Local UNI-N (Tester-2) and Remote UNI-N (Tester-4). Arrows indicate the flow of frames: UNI MEG (orange), Test MEG (blue), and Subscriber MEG (green). The Subscriber MEG flows from the Local UNI-C Under Test to the Remote UNI-C. The Test MEG flows from the Local UNI-C Under Test to the Remote UNI-C. The UNI MEG flows from the Local UNI-C Under Test to the Local UNI-N (Tester-2).</p>												
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the total length of the MAID field, including padding is exactly 48 octets												
Units	MAID field total length												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 40C: Generating Multicast CCM Frames – Maintenance Domain Name Format

Abstract Test Suite for Service OAM													
Test Name	Generating Multicast CCM Frames – Maintenance Domain Name Format												
Test Definition ID	UNIC-R42 ¹⁰ -R48 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.6.5.1)												
Test Type	Conformance												
Test Status	Optional												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP must be able to generate Multicast CCM frames. The Maintenance Domain Name SHOULD use the “null” format (value equal to 0x01)												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Maintenance Domain Name Format specifies the format of the Maintenance Domain Name field. When no Maintenance Domain Name is present, the value is equal to 0x01												
Test Object	Verify that the Maintenance Domain Name of the CCM frames generated by the UNI-C under test uses the “null” format (value equal to 0x01)												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration across a network. It is divided into three main sections: Subscriber NE, Simulated Service Provider Network, and Subscriber NE. In the first Subscriber NE section, there is a Local UNI-C Under Test (green box) and a Local UNI-N (Tester-2) (orange box). In the Simulated Service Provider Network section, there is a Remote UNI-N (Tester-4) (pink box) and a Remote UNI-C (Tester 4) (green box). Arrows indicate the flow of traffic: Subscriber MEG (green arrow) flows from the Local UNI-C to the Remote UNI-C; Test MEG (blue arrow) flows from the Local UNI-N to the Remote UNI-N; and UNI MEG (orange arrow) flows from the Local UNI-C to the Local UNI-N. The diagram also shows impairment or monitor blocks between the UNIs and the network.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the Maintenance Domain Name of the CCM frames generated by the UNI-C under test uses the “null” format (value equal to 0x01)												
Units	Maintenance Domain Name format												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 41C: Generating Multicast CCM Frames – Short MA Name Format

Abstract Test Suite for Service OAM													
Test Name	Generating Multicast CCM Frames – Short MA Name Format												
Test Definition ID	UNIC-R42 ¹¹ -R48 ²												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.6.5.4)												
Test Type	Conformance												
Test Status	Optional												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP must be able to generate Multicast CCM frames. The Short MA Name SHOULD use the “text” format (value equal to 0x02)												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Short MA Name format specifies the format of the Short MA Name field. The “text” format or character string value is 0x02												
Test Object	Verify that the Short MA Name format of the CCM frames generated by the UNI-C under test uses the “text” format (value equal to 0x02)												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic													
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the Short MA Name format of the CCM frames generated by the UNI-C under test uses the “text” format (value equal to 0x02)												
Units	Short MA Name format												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 42C: Generating Multicast CCM Frames – Short MA Name Length

Abstract Test Suite for Service OAM													
Test Name	Generating Multicast CCM Frames – Short MA Name Length												
Test Definition ID	UNIC-R42 ¹²												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.6.5.5)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Short MA name length validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Short MA Name length in a CCM contains a value greater than or equal to 1 and does not indicate that the Short MA Name runs over the 48-octet limit for the MAID												
Test Object	Verify that the Short MA Name length of the CCM frames generated by the UNI-C under test contains a value greater than or equal to 1 and does not indicate that the Short MA Name runs over the 48-octet limit for the MAID												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHY’s that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Each NE is represented by a colored box (green, orange, pink, and green respectively). Below each NE, there are labels for Local UNI-C Under Test, Local UNI-N (Tester-2), Remote UNI-N (Tester-4), and Remote UNI-C. A dashed box labeled 'Simulated Service Provider Network' connects the two Operator NEs. Arrows indicate the flow of frames: Subscriber MEG (green), Test MEG (blue), and UNI MEG (orange). The flow is from the Local UNI-C Under Test through the Local UNI-N (Tester-2) and Remote UNI-N (Tester-4) to the Remote UNI-C.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the Short MA Name length of the CCM frames generated by the UNI-C under test contains a value greater than or equal to 1 and does not indicate that the Short MA Name runs over the 48-octet limit for the MAID												
Units	Short MA Name length												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 43C: Generating Multicast CCM Frames – Short MA Name

Abstract Test Suite for Service OAM													
Test Name	Generating Multicast CCM Frames – Short MA Name												
Test Definition ID	UNIC-R42 ¹³ -R48 ³												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.6.5.6)												
Test Type	Conformance												
Test Status	Optional												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP must be able to generate Multicast CCM frames. The Short MA Name is provisioned, has a maximum length of 45 ASCII characters and SHOULD default to a Representative Value that is uniquely related, but not necessarily equal, to the EVC ID or UNI ID as following: a. The Representative Value of the UNI ID for the default UNI-MEG b. The Representative Value of the EVC ID for the Test-MEG c. The Representative Value of the EVC ID for the Subscriber-MEG												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Short MA Name field contains the Short MA Name, in the format specified by the Short MA Name Format field												
Test Object	Verify that the Short MA Name has a maximum length of 45 ASCII characters and defaults to a Representative Value that is uniquely related, but not necessarily equal to the UNI ID for the default UNI-MEG, the EVC ID for the Test-MEG and the EVC ID for the Subscriber-MEG												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic													
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the Short MA Name of the CCM frames generated by the UNI-C under test is uniquely related, but not necessarily equal to the UNI ID for the default UNI-MEG, the EVC ID for the Test-MEG and the EVC ID for the Subscriber-MEG												
Units	Short MA Name length												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 44C: Generating Multicast CCM Frames – Sender ID TLV

Abstract Test Suite for Service OAM													
Test Name	Generating Multicast CCM Frames – Sender ID TLV												
Test Definition ID	UNIC-R42 ¹⁴												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.3)												
Test Type	Conformance												
Test Status	Mandatory if Sender ID TLVs are supported												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Sender ID TLV validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Sender ID TLV identifies the Bridge on which the transmitting MEP is configured, and may also include a management address for that Bridge. The Sender ID TLV Type is equal to (0x01) and the Length field is large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields												
Test Object	Verify that the Sender ID TLV Type of the CCM frames generated by the UNI-C under test is equal to (0x01) and that the Sender ID Length field is large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates a Simulated Service Provider Network with four nodes: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Each node contains a Local UNI-C or Local UNI-N and a Remote UNI-N or Remote UNI-C. The Local UNI-C is labeled 'Local UNI-C Under Test'. The Local UNI-N is labeled 'Local UNI-N (Tester-2)'. The Remote UNI-N is labeled 'Remote UNI-N (Tester-4)'. The Remote UNI-C is labeled 'Remote UNI-C (Tester 4)'. The diagram shows three MEGs: Subscriber MEG (green), Test MEG (blue), and UNI MEG (orange). Arrows indicate the flow of these MEGs between the nodes.</p>												
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the Sender ID TLV Type of the CCM frames generated by the UNI-C under test is equal to (0x01) and that the Sender ID Length field is large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields												
Units	Sender ID TLV Type and Length values												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 45C: Generating Multicast CCM Frames – Chassis ID Length

Abstract Test Suite for Service OAM													
Test Name	Generating Multicast CCM Frames – Chassis ID Length												
Test Definition ID	UNIC-R42 ¹⁵												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.3)												
Test Type	Conformance												
Test Status	Mandatory if Sender ID TLVs are supported												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Chassis ID length validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The chassis ID length is the length, in octets, of the Chassis ID field, it is either 0, or is less than (TLV Length field value – 1)												
Test Object	Verify that the Chassis ID length of the CCM frames generated by the UNI-C under test is either 0 or less than (TLV Length field value – 1)												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. The Local UNI-C Under Test is connected to Local UNI-N (Tester-2). The Remote UNI-N (Tester-4) is connected to Remote UNI-C. A Simulated Service Provider Network connects the two sides. Arrows indicate traffic flow for Subscriber MEG, Test MEG, and UNI MEG.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the Chassis ID length of the CCM frames generated by the UNI-C under test is either 0 or less than (TLV Length field value – 1)												
Units	Chassis ID length value												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 46C: Generating Multicast CCM Frames – Management Address Domain Field

Abstract Test Suite for Service OAM													
Test Name	Generating Multicast CCM Frames – Management Address Domain Field												
Test Definition ID	UNIC-R42 ¹⁶												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.3)												
Test Type	Conformance												
Test Status	Optional												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Management Address Domain field validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Management Address Domain Length field contains the length, in octets, of the Management Address Domain field. If 0, or if the TLV’s Length field indicates that the Management Address Domain Length field is not present, then the Management Address Domain, Management Address Length, and Management Address fields are not present												
Test Object	Verify that the Management Address Domain field of the CCM frames generated by the UNI-C under test is empty												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration across four Network Elements (NE): Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. The first and last NE are connected to the two operators respectively. Within each operator, there is a Local UNI-C Under Test and a Local UNI-N (labeled as Tester-2). Similarly, the second operator has a Remote UNI-N (labeled as Tester-4) and a Remote UNI-C. A Simulated Service Provider Network connects the two operators. Three types of Multicast Ethernet Groups (MEG) are shown: Subscriber MEG (green arrows), Test MEG (blue arrows), and UNI MEG (orange arrows). The Subscriber MEG and Test MEG span from the Local UNI-C to the Remote UNI-C. The UNI MEG is localized within the first Subscriber NE.</p>												
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the Management Address Domain field of the CCM frames generated by the UNI-C under test is empty												
Units	Management Address Domain field												
Variables	None												
Results	Pass or fail												
Remarks	The Management Address Domain field SHOULD be empty in the Sender ID TLV by default as a security precaution (MEF Service OAM FM IA)												

TEST CASE 47C: Generating Multicast CCM Frames – Management Address Field

Abstract Test Suite for Service OAM													
Test Name	Generating Multicast CCM Frames – Management Address Field												
Test Definition ID	UNIC-R42 ¹⁷												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.3)												
Test Type	Conformance												
Test Status	Optional												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Management Address field validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Management Address length and the Management Address fields are not present if the Management Address Domain Length field is not present or contains a 0, or if the Management Address Length field is not present or contains a 0												
Test Object	Verify that the Management Address field of the CCM frames generated by the UNI-C under test is empty												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic													
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the Management Address field of the CCM frames generated by the UNI-C under test is empty												
Units	Management Address field												
Variables	None												
Results	Pass or fail												
Remarks	The Management Address field SHOULD be empty in the Sender ID TLV by default as a security precaution (MEF Service OAM FM IA)												

TEST CASE 48C: Generating Multicast CCM Frames – Port Status TLV

Abstract Test Suite for Service OAM													
Test Name	Generating Multicast CCM Frames – Port Status TLV												
Test Definition ID	UNIC-R42 ¹⁸												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.4)												
Test Type	Conformance												
Test Status	Mandatory if Port Status TLVs are supported												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Port Status TLV validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Port Status TLV indicates the ability of the Bridge Port on which the transmitting MEP resides to pass ordinary data, regardless of the status of the MAC. The Port Status TLV Type is equal to (0x02) and the Port Status TLV field contains one of the following values (0x01) psBlocked or (0x02) psUp												
Test Object	Verify that the Port Status TLV Type of the CCM frames generated by the UNI-C under test is equal to (0x02) and that the Port Status TLV field contains one of the following values (0x01) psBlocked or (0x02) psUp												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHY’s that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates a network topology for testing Service OAM frames. It shows four Network Elements (NEs): Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Each NE contains an 'Impairment or Monitor' block. Below the NEs, four UNI instances are identified: Local UNI-C Under Test, Local UNI-N (Tester 2), Remote UNI-N (Tester 4), and Remote UNI-C. Three MEGs are shown: Subscriber MEG (green arrow), Test MEG (blue arrow), and UNI MEG (orange arrow). The Subscriber MEG and Test MEG span from the first Subscriber NE to the last Subscriber NE. The UNI MEG spans from the Local UNI-C Under Test to the Local UNI-N (Tester 2).</p>												
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the Port Status TLV Type of the CCM frames generated by the UNI-C under test is equal to (0x02) and that the Port Status TLV field contains one of the following values (0x01) psBlocked or (0x02) psUp												
Units	Port Status TLV Type and TLV field values												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 49C: Generating Multicast CCM Frames – Interface Status TLV

Abstract Test Suite for Service OAM													
Test Name	Generating Multicast CCM Frames – Interface Status TLV												
Test Definition ID	UNIC-R42 ¹⁹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.5)												
Test Type	Conformance												
Test Status	Mandatory if Interface Status TLVs are supported												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Interface Status TLV validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Interface Status TLV indicates the status of the interface on which the MEP transmitting the CCM is configured, or the next-lower interface in the IETF RFC 2863 IF-MIB. The Interface Status TLV Type is equal to (0x04) and the Interface Status TLV field contains one of the following values (0x01) isUp, (0x02) isDown, (0x03) isTesting, (0x04) isUnknown, (0x05) isDormant, (0x06) isNotPresent or (0x07) isLowerLayerDown												
Test Object	Verify that the Interface Status TLV Type of the CCM frames generated by the UNI-C under test is equal to (0x04) and that the Interface Status TLV field contains one of the following values (0x01) isUp, (0x02) isDown, (0x03) isTesting, (0x04) isUnknown, (0x05) isDormant, (0x06) isNotPresent or (0x07) isLowerLayerDown												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates a network topology for testing Service OAM. It shows four Network Elements (NEs): Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. The Local UNI-C Under Test is connected to Local UNI-N (Tester-2) via a link with an Impairment or Monitor block. The Remote UNI-N (Tester-4) is connected to Remote UNI-C via a link with an Impairment or Monitor block. The Local UNI-N and Remote UNI-N are connected through a Simulated Service Provider Network. The diagram also shows the configuration of three MEGs: Subscriber MEG (green arrow), Test MEG (blue arrow), and UNI MEG (orange arrow). The Subscriber MEG spans from Local UNI-C to Remote UNI-C. The Test MEG spans from Local UNI-N to Remote UNI-N. The UNI MEG spans from Local UNI-C to Local UNI-N.</p>												
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the Interface Status TLV Type of the CCM frames generated by the UNI-C under test is equal to (0x04) and that the Interface Status TLV field contains one of the following values (0x01) isUp, (0x02) isDown, (0x03) isTesting, (0x04) isUnknown, (0x05) isDormant, (0x06) isNotPresent or (0x07) isLowerLayerDown												
Units	Interface Status TLV Type and TLV field values												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 50C: Generating Multicast CCM Frames – Organization Specific TLV

Abstract Test Suite for Service OAM													
Test Name	Generating Multicast CCM Frames – Organization Specific TLV												
Test Definition ID	UNIC-R42 ²⁰												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.2)												
Test Type	Conformance												
Test Status	Mandatory if Organization TLVs are supported												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Organization Specific TLV validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; Any organization can define TLVs for use in Connectivity Fault Management. The Organization TLV Type is equal to 31 (0x1F)												
Test Object	Verify that the Organization TLV Type of the CCM frames generated by the UNI-C under test is equal to 31 (0x1F)												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the network setup for testing Multicast CCM frames. It shows a path from a Local UNI-C Under Test through a Simulated Service Provider Network (connecting Operator A NE and Operator B NE) to a Remote UNI-C (Tester 4). Various MEGs (Subscriber MEG, Test MEG, UNI MEG) are shown being transmitted between these endpoints. Testers (Tester-2, Tester-4) are positioned at the local and remote UNI-Ns to monitor the traffic.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the Organization Specific TLV Type of the CCM frames generated by the UNI-C under test is equal to 31 (0x1F)												
Units	Organization Specific TLV Type value												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 51C: Generating Multicast CCM Frames – End TLV

Abstract Test Suite for Service OAM													
Test Name	Generating Multicast CCM Frames – End TLV												
Test Definition ID	UNIC-R42 ²¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.7)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-C Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – End TLV validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The End TLV is required and is the last TLV in the CFM PDU and is Required. The End TLV Type is equal to (0x00)												
Test Object	Verify that the End TLV Type of the CCM frames generated by the UNI-C under test is equal to (0x00)												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic													
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the End TLV Type of the CCM frames generated by the UNI-C under test is equal to (0x00)												
Units	End TLV Type value												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 52C: Generating Multicast LBM Frames – Destination Address

Abstract Test Suite for Service OAM													
Test Name	Generating Multicast LBM Frames – Destination Address												
Test Definition ID	UNIC-R43 ¹ -R54 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.3.1)												
Test Type	Conformance												
Test Status	Optional												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MAY be able to generate Multicast LBM frames. For each LB session, Multicast destinations MAY be supported using the reserved CCM multicast MAC DA in the range of 01-80-C2-00-00-30 to 01-80-C2-00-00-37 that corresponds to the MEG-Level of the MEP												
Test Object	Verify that when the UNI-C under test uses Loopback messages to check bidirectional connectivity between itself and the other MEPs in the same MEG, the destination address parameter of the LBM frames generated by the UNI-C under test contains one of the Group MAC address listed in the MAC addresses Table in section 10												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates a network topology for testing. It shows a 'Simulated Service Provider Network' divided into two parts: 'Subscriber NE' and 'Operator A NE' and 'Operator B NE'. In the 'Subscriber NE' section, there is a 'Local UNI-C Under Test' (green box) and a 'Local UNI-N (Tester 2)' (orange box). In the 'Operator A NE' section, there is a 'Local UNI-N (Tester 2)' (orange box) and a 'Remote UNI-N (Tester 4)' (pink box). In the 'Operator B NE' section, there is a 'Remote UNI-N (Tester 4)' (pink box) and a 'Remote UNI-C (Tester 4)' (green box). Below the network diagram, three MEGs are shown: 'Subscriber MEG' (green), 'Test MEG' (blue), and 'UNI MEG' (orange). Arrows indicate connections between the UNIs and the MEGs.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct the local UNI-C under test to send Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to monitor the LBM messages transmitted by the UNI-C under test and to verify that the destination address parameter of the LBM message destined to the local UNI-N on the UNI-MEG, to the remote UNI-C on the Subscriber-MEG and on the Test-MEG contains one of the Group MAC address listed in the MAC addresses Table in section 10												
Units	Destination address												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 53C: Generating Unicast LBM Frames – Destination Address

Abstract Test Suite for Service OAM													
Test Name	Generating Unicast LBM Frames – Destination Address												
Test Definition ID	UNIC-R43 ²												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.3.1)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to generate Unicast LBM frames. For each LB session, the destination address MUST be configurable to any Unicast MAC DA												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The LBM frames are addressed to a single specific MP												
Test Object	Verify that the destination address parameter of the LBM message sent by the UNI-C under test contain the Unicast address of the its peer MEPs												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration across a Simulated Service Provider Network. It shows four Network Elements (NE): Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Each NE contains a Local UNI-C Under Test and a Local UNI-N (Tester-2). The Local UNI-C Under Test is connected to the Local UNI-N (Tester-2) via a Subscriber MEG. The Local UNI-N (Tester-2) is connected to the Remote UNI-N (Tester-4) via a Test MEG. The Remote UNI-N (Tester-4) is connected to the Remote UNI-C (Tester 4) via a Subscriber MEG. Arrows indicate the flow of UNI MEG and Test MEG frames.</p>												
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct the local UNI-C under test to send Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to monitor the LBM messages transmitted by the UNI-C under test and to verify that the destination address parameter of the LBM message destined to the local UNI-N on the UNI-MEG contains the Unicast address of the local UNI-N, that the destination address parameter of the LBM message destined to the remote UNI-C on the Subscriber-MEG contains the Unicast address of the remote UNI-C and that the destination address parameter of the LBM message destined to the remote UNI-C on the Test-MEG also contains the Unicast address of the remote UNI-C												
Units	Destination address												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 54C: Generating Unicast LBM Frames – Source Address

Abstract Test Suite for Service OAM

Test Name	Generating Unicast LBM Frames – Source Address												
Test Definition ID	UNIC-R43 ³												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.3.2)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to generate Unicast LBM frames – Source address validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The LBM frames source address is the Individual MAC address of the MEP transmitting the PDU. The source address parameter contains an individual, and not a Group, MAC address												
Test Object	Verify that the source address parameter of the LBM frames generated by the UNI-C under test contains an individual, and not a Group, MAC address												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic													
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct the local UNI-C under test to send Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to monitor the LBM messages transmitted by the UNI-C under test and to verify that the source address parameter of the LBM messages destined to the local UNI-N on the UNI-MEG, to the remote UNI-C on the Subscriber-MEG and to the remote UNI-C on the Test-MEG contain an individual, and not a Group, MAC address												
Units	Source address												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 55C: Generating Unicast LBM Frames – Protocol Version Number

Abstract Test Suite for Service OAM	
Test Name	Generating Unicast LBM Frames – Protocol Version Number
Test Definition ID	UNIC-R43 ⁴

Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.4.2)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to generate Unicast LBM frames – Protocol Version Number validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The protocol version number is always 0												
Test Object	Verify that the protocol version number of the LBM frames generated by the UNI-C under test is always 0												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic													
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct the local UNI-C under test to send Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to monitor the LBM messages transmitted by the UNI-C under test and to verify that the protocol version number of the LBM messages destined to the local UNI-N on the UNI-MEG, to the remote UNI-C on the Subscriber-MEG and to the remote UNI-C on the Test-MEG is always 0												
Units	Protocol version number												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 56C: Generating Unicast LBM Frames – OpCode

Abstract Test Suite for Service OAM	
Test Name	Generating Unicast LBM Frames – OpCode
Test Definition ID	UNIC-R43 ⁵
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.4.3)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to generate Unicast LBM frames – OpCode validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The OpCode field specifies the format and meaning of the remainder of the CFM PDU. The value for LBM PDUs is (0x03)
Test Object	Verify that the OpCode value of the LBM frames generated by the UNI-C under test is (0x03)
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates a network topology for testing Service OAM. It shows four Network Elements (NEs): Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Each NE contains a Local UNI-C Under Test and a Local UNI-N. The Local UNI-C Under Test is connected to the Local UNI-N via a MEGP 1. The Local UNI-N is connected to the Local UNI-C via a MEGP 3. The Local UNI-C Under Test is also connected to the Local UNI-N via a MEGP 3. The Local UNI-N is connected to the Local UNI-C via a MEGP 3. The Local UNI-C Under Test is connected to the Local UNI-N via a MEGP 3. The Local UNI-N is connected to the Local UNI-C via a MEGP 3. The Local UNI-C Under Test is connected to the Local UNI-N via a MEGP 3. The Local UNI-N is connected to the Local UNI-C via a MEGP 3. The Local UNI-C Under Test is connected to the Local UNI-N via a MEGP 3. The Local UNI-N is connected to the Local UNI-C via a MEGP 3. 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TEST CASE 57C: Generating Unicast LBM Frames – Flags

Abstract Test Suite for Service OAM													
Test Name	Generating Unicast LBM Frames – Flags												
Test Definition ID	UNIC-R43 ⁶												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.7.1)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to generate Unicast LBM frames – Flags validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; In an LBM, the Flags field of the Common CFM Header is set to 0 by the transmitting MEP												
Test Object	Verify that the Flags field bits of the LBM frames generated by the UNI-C under test that are set to 0												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates a network topology for testing Service OAM. It shows a 'Simulated Service Provider Network' with four main components: 'Subscriber NE', 'Operator A NE', 'Operator B NE', and 'Subscriber NE'. Each NE is connected to a corresponding 'Local UNI' or 'Remote UNI'. The 'Local UNI-C Under Test' is connected to 'Local UNI-N (Tester 2)'. The 'Remote UNI-N (Tester 4)' is connected to 'Remote UNI-C (Tester 4)'. The network is divided into three segments: 'Subscriber MEG', 'UNI MEG', and 'Test MEG'. The 'Subscriber MEG' connects the Subscriber NE to the Operator A NE. The 'UNI MEG' connects the Operator A NE to the Operator B NE. The 'Test MEG' connects the Operator B NE to the Subscriber NE. The diagram also shows 'Impairment or Monitor' blocks on the links between the NEs.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct the local UNI-C under test to send Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to monitor the LBM messages transmitted by the UNI-C under test and to verify that the Flags field bits of the LBM messages destined to the local UNI-N on the UNI-MEG, to the remote UNI-C on the Subscriber-MEG and to the remote UNI-C on the Test-MEG are set to 0												
Units	Flags field value												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 58C: Generating Unicast LBM Frames – First TLV Offset

Abstract Test Suite for Service OAM													
Test Name	Generating Unicast LBM Frames – First TLV Offset												
Test Definition ID	UNIC-R43 ⁷												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.7.2)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to generate Unicast LBM frames – First TLV Offset validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The First TLV Offset field of the Common CFM Header in a LBM contains a value greater than or equal to 4												
Test Object	Verify that the First TLV Offset field of the Common CFM Header in the LBM frames generated by the UNI-C under test contains a value greater than or equal to 4												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration for generating unicast LBM frames. It shows a Simulated Service Provider Network divided into three segments: Subscriber NE, Operator A NE, and Operator B NE. Each segment contains a Local UNI-C Under Test, a Local UNI-N (Tester 2), and a Remote UNI-N (Tester 4). The diagram shows the flow of MEGs (Subscriber MEG, Test MEG, and UNI MEG) between these components. The Subscriber MEG is generated by the Local UNI-C and sent to the Local UNI-N. The Test MEG is generated by the Local UNI-N and sent to the Remote UNI-N. The UNI MEG is generated by the Local UNI-N and sent to the Remote UNI-N. The diagram also shows the flow of LBM frames from the Local UNI-C to the Local UNI-N and from the Remote UNI-N to the Remote UNI-C.</p>												
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct the local UNI-C under test to send Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to monitor the LBM messages transmitted by the UNI-C under test and to verify that the First TLV Offset field of the LBM messages destined to the local UNI-N on the UNI-MEG, to the remote UNI-C on the Subscriber-MEG and to the remote UNI-C on the Test-MEG contain a value greater than or equal to 4												
Units	First TLV Offset field value												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 59C: Generating Unicast LBM Frames – Loopback Transaction Identifier

Abstract Test Suite for Service OAM													
Test Name	Generating Unicast LBM Frames – Loopback Transaction Identifier												
Test Definition ID	UNIC-R43 ⁸												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.7.3)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to generate Unicast LBM frames – Loopback Transaction Identifier validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; A MEP copies the contents of the nextLBMtransID variable to the Loopback Transaction Identifier field of the LBM frames												
Test Object	Verify that the Loopback Transaction Identifier field of the LBM frames generated by the UNI-C under test contains a copy of the nextLBMtransID variable												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration within a Simulated Service Provider Network. It shows four main components: Local UNI-C Under Test (green), Local UNI-N (Tester 2) (orange), Remote UNI-N (Tester 3) (pink), and Remote UNI-C (Tester 4) (green). Each component is associated with an impairment or monitor block. The network is divided into three sections: Subscriber NE, Operator A NE, and Operator B NE. Arrows indicate the flow of Service OAM frames: Subscriber MEG (green), Test MEG (blue), and UNI MEG (orange). The Local UNI-C Under Test sends frames to the Local UNI-N, which then forwards them to the Remote UNI-N and Remote UNI-C. The Remote UNI-N also sends frames back to the Local UNI-N, which then forwards them to the Local UNI-C Under Test.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct the local UNI-C under test to send Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to monitor the LBM messages transmitted by the UNI-C under test and to verify that the Loopback Transaction Identifier field of the LBM messages destined to the local UNI-N on the UNI-MEG, to the remote UNI-C on the Subscriber-MEG and to the remote UNI-C on the Test-MEG contain a copy of the nextLBMtransID variable												
Units	Loopback Transaction Identifier field value												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 60C: Generating Unicast LBM Frames – Sender ID TLV

Abstract Test Suite for Service OAM													
Test Name	Generating Unicast LBM Frames – Sender ID TLV												
Test Definition ID	UNIC-R43 ⁹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.3)												
Test Type	Conformance												
Test Status	Mandatory if Sender ID TLVs are supported												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to generate Unicast LBM frames – Sender ID TLV validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Sender ID TLV identifies the Bridge on which the transmitting MEP is configured, and may also include a management address for that Bridge. The Sender ID TLV Type is equal to (0x01) and the Length field is large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields												
Test Object	Verify that the Sender ID TLV Type of the LBM frames generated by the UNI-C under test is equal to (0x01) and that the Sender ID Length field is large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic													
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct the local UNI-C under test to send Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to monitor the LBM messages transmitted by the UNI-C under test and to verify that the Sender ID TLV Type field of the LBM messages destined to the local UNI-N on the UNI-MEG, to the remote UNI-C on the Subscriber-MEG and to the remote UNI-C on the Test-MEG is equal to (0x01) and that the Sender ID Length field is large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields												
Units	Sender ID TLV Type and Length values												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 61C: Generating Unicast LBM Frames – Chassis ID Length

Abstract Test Suite for Service OAM													
Test Name	Generating Unicast LBM Frames – Chassis ID Length												
Test Definition ID	UNIC-R43 ¹⁰												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.3)												
Test Type	Conformance												
Test Status	Mandatory if Sender ID TLVs are supported												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to generate Unicast LBM frames – Chassis ID length validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The chassis ID length is the length, in octets, of the Chassis ID field, it is either 0, or is less than (TLV Length field value – 1)												
Test Object	Verify that the Chassis ID length of the LBM frames generated by the UNI-C under test is either 0 or less than (TLV Length field value – 1)												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration within a Simulated Service Provider Network. It shows three Network Elements (NE): Subscriber NE, Operator A NE, and Operator B NE. Each NE contains an 'Impairment or Monitor' block. Below these, four UNI instances are identified: Local UNI-C Under Test (green), Local UNI-N (Tester 2) (orange), Remote UNI-N (Tester 4) (pink), and Remote UNI-C (green). Arrows indicate the flow of Service OAM frames: a green arrow for 'Subscriber MEG' from Local UNI-C to Remote UNI-C; a blue arrow for 'Test MEG' from Local UNI-C to Remote UNI-N; and an orange arrow for 'UNI MEG' from Local UNI-C to Local UNI-N.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct the local UNI-C under test to send Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to monitor the LBM messages transmitted by the UNI-C under test and to verify that the Chassis ID length of the LBM messages destined to the local UNI-N on the UNI-MEG, to the remote UNI-C on the Subscriber-MEG and to the remote UNI-C on the Test-MEG is either 0 or less than (TLV Length field value – 1)												
Units	Chassis ID length value												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 62C: Generating Unicast LBM Frames – Management Address Domain Field

Abstract Test Suite for Service OAM													
Test Name	Generating Unicast LBM Frames – Management Address Domian Field												
Test Definition ID	UNIC-R43 ¹¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.3)												
Test Type	Conformance												
Test Status	Optional												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to generate Unicast LBM frames												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Management Address Domain Length field contains the length, in octets, of the Management Address Domain field. If 0, or if the TLV's Length field indicates that the Management Address Domain Length field is not present, then the Management Address Domain, Management Address Length, and Management Address fields are not present												
Test Object	Verify that the Management Address Domain field of the LBM frames generated by the UNI-C under test is empty												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates a network topology for testing. It shows a 'Simulated Service Provider Network' with three main sections: 'Subscriber NE', 'Operator A NE', and 'Operator B NE'. Each section contains a 'Local UNI' and a 'Remote UNI'. The 'Local UNI-C Under Test' is connected to the 'Local UNI-N (Tester-2)'. The 'Remote UNI-N (Tester-4)' is connected to the 'Remote UNI-C (Tester 4)'. Arrows indicate the flow of MEGs: 'Subscriber MEG' (green arrow from Local UNI-N to Remote UNI-N), 'Test MEG' (blue arrow from Local UNI-N to Remote UNI-N), and 'UNI MEG' (orange arrow from Local UNI-C to Remote UNI-C).</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct the local UNI-C under test to send Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to monitor the LBM messages transmitted by the UNI-C under test and to verify that the Management Address Domain field of the LBM messages destined to the local UNI-N on the UNI-MEG, to the remote UNI-C on the Subscriber-MEG and to the remote UNI-C on the Test-MEG is empty												
Units	Management Address Domain field												
Variables	None												
Results	Pass or fail												
Remarks	The Management Address Domain field SHOULD be empty in the Sender ID TLV by default as a security precaution (MEF Service OAM FM IA)												

TEST CASE 63C: Generating Unicast LBM Frames – Management Address Field

Abstract Test Suite for Service OAM													
Test Name	Generating Unicast LBM Frames – Management Address Field												
Test Definition ID	UNIC-R43 ¹²												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.3)												
Test Type	Conformance												
Test Status	Optional												
MEF Requirement Description	A UNI-C Type 2 MEP implementation MUST be able to generate Unicast LBM frames												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Management Address length and the Management Address fields are not present if the Management Address Domain Length field is not present or contains a 0, or if the Management Address Length field is not present or contains a 0												
Test Object	Verify that the Management Address field of the LBM frames generated by the UNI-C under test is empty												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic													
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct the local UNI-C under test to send Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to monitor the LBM messages transmitted by the UNI-C under test and to verify that the Management Address field of the LBM messages destined to the local UNI-N on the UNI-MEG, to the remote UNI-C on the Subscriber-MEG and to the remote UNI-C on the Test-MEG is empty												
Units	Management Address field												
Variables	None												
Results	Pass or fail												
Remarks	The Management Address field SHOULD be empty in the Sender ID TLV by default as a security precaution (MEF Service OAM FM IA)												

TEST CASE 64C: Generating Unicast LBM Frames – Data TLV

Abstract Test Suite for Service OAM													
Test Name	Generating Unicast LBM Frames – Data TLV												
Test Definition ID	UNIC-R43 ¹³												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.6)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	UNI-C Type 2 MEP implementation MUST be able to generate Unicast LBM frames – Data TLV validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Data TLV contains zero or more octets of arbitrary data and serves several purposes, including the transmission of different frame sizes to test MTU capabilities, and the testing for data-specific error dependencies. The Data TLV may be included in the Loopback Messages and the Data TLV Type is equal to (0x03)												
Test Object	Verify that the Data TLV Type of the LBM frames generated by the UNI-C under test is equal to (0x03)												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration within a Simulated Service Provider Network. It shows three Network Elements (NEs): Subscriber NE, Operator A NE, and Operator B NE. Each NE contains a Local UNI-C (under test) and a Local UNI-N (monitored by Tester 1, 2, 3, or 4). Impairment or Monitor blocks are placed between the UNIs. Three MEGs are defined: Subscriber MEG (green), Test MEG (blue), and UNI MEG (orange). Arrows indicate the flow of traffic between the UNIs and the MEGs.</p>												
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct the local UNI-C under test to send Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to monitor the LBM messages transmitted by the UNI-C under test and to verify that the Data TLV Type of the LBM messages destined to the local UNI-N on the UNI-MEG, to the remote UNI-C on the Subscriber-MEG and to the remote UNI-C on the Test-MEG is equal to (0x03)												
Units	Data TLV Type value												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 65C: Generating Unicast LBM Frames – Organization Specific TLV

Abstract Test Suite for Service OAM													
Test Name	Generating Unicast LBM Frames – Organization Specific TLV												
Test Definition ID	UNIC-R43 ¹⁴												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.2)												
Test Type	Conformance												
Test Status	Mandatory if Organization TLVs are supported												
MEF Requirement Description	UNI-C Type 2 MEP implementation MUST be able to generate Unicast LBM frames – Organization Specific TLV validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; Any organization can define TLVs for use in Connectivity Fault Management. The Organization TLV Type is equal to 31 (0x1F)												
Test Object	Verify that the Organization TLV Type of the LBM frames generated by the UNI-C under test is equal to 31 (0x1F)												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates a network topology for testing Service OAM. It shows four Network Elements (NEs): Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Each NE contains an 'Impairment or Monitor' block. Below the NEs are four UNI-C instances: Local UNI-C Under Test, Local UNI-N (Tester-2), Remote UNI-N (Tester-4), and Remote UNI-C. Arrows indicate the flow of three types of MEGs: UNI MEG (orange), Subscriber MEG (green), and Test MEG (blue). The UNI MEG flows from Local UNI-C Under Test to Local UNI-N (Tester-2). The Subscriber MEG flows from Local UNI-C Under Test to Remote UNI-C. The Test MEG flows from Local UNI-C Under Test to Remote UNI-N (Tester-4). The diagram also shows a 'Simulated Service Provider Network' connecting the Operator A NE and Operator B NE.</p>												
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct the local UNI-C under test to send Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to monitor the LBM messages transmitted by the UNI-C under test and to verify that the Organization Specific TLV Type of the LBM messages destined to the local UNI-N on the UNI-MEG, to the remote UNI-C on the Subscriber-MEG and to the remote UNI-C on the Test-MEG is equal to 31 (0x1F)												
Units	Organization Specific TLV Type value												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 66C: Generating Unicast LBM Frames – End TLV

Abstract Test Suite for Service OAM

Test Name	Generating Unicast LBM Frames – End TLV												
Test Definition ID	UNIC-R43 ¹⁵												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.7)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	UNI-C Type 2 MEP implementation MUST be able to generate Unicast LBM frames – End TLV validation												
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The End TLV is required and is the last TLV in the CFM PDU and is Required. The End TLV Type is equal to (0x00)												
Test Object	Verify that the End TLV Type of the LBM frames generated by the UNI-C under test is equal to (0x00)												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration within a Simulated Service Provider Network. It shows three Network Elements (NEs): Subscriber NE, Operator A NE, and Operator B NE. Each NE contains a Local UNI-C Under Test and a Local UNI-N (labeled as Tester-2). The Subscriber NE also includes a Remote UNI-N (labeled as Tester-4) and a Remote UNI-C (labeled as Tester 4). The diagram shows the flow of MEGs (Management Entity Groups) between these components: Subscriber MEG (green arrow), Test MEG (blue arrow), and UNI MEG (orange arrow). The flow is from the Local UNI-C Under Test to the Local UNI-N (Tester-2), then to the Remote UNI-N (Tester-4), and finally to the Remote UNI-C (Tester 4). The flow is also from the Local UNI-C Under Test to the Local UNI-N (Tester-2), then to the Remote UNI-N (Tester-4), and finally to the Remote UNI-C (Tester 4). The flow is also from the Local UNI-C Under Test to the Local UNI-N (Tester-2), then to the Remote UNI-N (Tester-4), and finally to the Remote UNI-C (Tester 4).</p>												
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct the local UNI-C under test to send Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to monitor the LBM messages transmitted by the UNI-C under test and to verify that the End TLV Type of the LBM messages destined to the local UNI-N on the UNI-MEG, to the remote UNI-C on the Subscriber-MEG and to the remote UNI-C on the Test-MEG is equal to (0x00)												
Units	End TLV Type value												
Variables	None												
Results	Pass or fail												
Remarks													

15.4 UNI-C Type 2 Continuity Check Requirements

TEST CASE 67C: Administratively Enable and Disable CCM Transmission

Abstract Test Suite for Service OAM													
Test Name	Administratively Enable and Disable CCM Transmission												
Test Definition ID	UNIC-R44 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 8												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MUST have the capability to administratively enable and disable CCM transmission on all local MEPs												
Test Object	Verify that the UNI-C Type 2 under test has the capability to administratively enable and disable CCM transmission on all local MEPs												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the network topology for the test. It shows four Network Elements (NEs): Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. The Local UNI-C Under Test is connected to Local UNI-N (Tester-2). Local UNI-N is connected to Remote UNI-N (Tester-3). Remote UNI-N is connected to Remote UNI-C (Tester-4). The diagram shows the flow of UNI MEG, Subscriber MEG, and Test MEG frames between the local and remote UNIs.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that CCM frames are transmitted from each configured MEP instance (verify MEP IDs) and that the MEG-Level of the UNI-MEG is = “1”, the MEG-Level of the Test-MEG is = “5”, and the MEG-Level of Subscriber-MEG is = “6”. Disable CCM transmission on the UNI-MEG and verify that only CCMs with MEG-Level = 5 and 6 are still being transmitted. Disable CCM transmission on the Test-MEG and verify that only CCMs with MEG-Level = 6 are still being transmitted. Disable CCM transmission on the Subscriber-MEG and verify that no CCMs are transmitted. Re-enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG and verify that CCM frames are transmitted from each configured MEP instance (verify MEP IDs) and that the MEG-Level of the UNI-MEG is = “1”, the MEG-Level of the Test-MEG is = “5”, and the MEG-Level of Subscriber-MEG is = “6”												
Units	MEP IDs MEG-Level values												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 68C: Mandatory CCM Frame Rate

Abstract Test Suite for Service OAM													
Test Name	Mandatory CCM Frame Rate												
Test Definition ID	UNIC-R45 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 8												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MUST support a CCM frame rate of 1 frame per second												
Test Object	Verify that the UNI-C Type 2 under test supports a CCM frame rate of 1 frame per second												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic													
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the CCM Interval field of the CCM frames generated by the UNI-C under test contains the value 4. Also use Tester 2 and Tester 4 to verify that the CCMs are received within the CCM maximum lifetime												
Units	CCM frame rate												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 69C: Optional CCM Frame Rate

Abstract Test Suite for Service OAM													
Test Name	Optional CCM Frame Rate												
Test Definition ID	UNIC-R45 ²												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 8												
Test Type	Conformance												
Test Status	Optional												
MEF Requirement Description	A UNI-C Type 2 MAY support other frame rates specified in section 7.1.1 of ITU-T Y.1731												
ITU-T Requirement Description	When Ethernet Continuity Check is enabled, a MEP periodically transmits CCM frames as often as the configured transmission period. Transmission period can be one of the following seven values: 3.33ms, 10ms, 100ms, 1s, 10s, 1min or 10min												
Test Object	Verify that the UNI-C Type 2 under test supports transmission periods of: 3.33ms, 10ms, 100ms, 10s, 1min or 10min												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration within a Simulated Service Provider Network. On the left, the Subscriber NE contains a Local UNI-C Under Test and a Local UNI-N (labeled as Tester-2). On the right, the Operator NE contains a Remote UNI-N (labeled as Tester-4) and a Remote UNI-C (labeled as Tester 4). Between the UNIs, there are impairment or monitor blocks. Three MEGs are shown: Subscriber MEG (green), Test MEG (blue), and UNI MEG (orange). Arrows indicate the transmission paths for these MEGs across the network components.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Configure the transmission period of the UNI-C under test MEPs to 3.33ms. Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the CCM Interval field of the CCM frames contains the value 1. Also use Tester 2 and Tester 4 to verify that the CCMs are received within the CCM maximum lifetime. Configure the transmission period of the UNI-C under test MEPs to 10ms and repeat the test. Configure the transmission period of the UNI-C under test MEPs to 100ms and repeat the test. Configure the transmission period of the UNI-C under test MEPs to 10s and repeat the test. Configure the transmission period of the UNI-C under test MEPs to 1min and repeat the test. Configure the transmission period of the UNI-C under test MEPs to 10min and repeat the test.												
Units	CCM frame rate												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 70C: Configurable CCM Frames Priority for Subscriber-MEG & Test-MEG

Abstract Test Suite for Service OAM													
Test Name	Configurable CCM Frames Priority for Subscriber-MEG & Test-MEG												
Test Definition ID	UNIC-R47 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 8												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MUST support a configurable priority for transmitted CCM frames for Test-MEG and subscriber-MEG												
Test Object	Verify that the CoS ID of the CCM frames transmitted by the UNI-C Type 2 under test is configurable and set in the transmitted CCM PDUs												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C and for each end point of each configured EVC. Enable CCM transmission on the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration within a Simulated Service Provider Network. It shows two network elements: Operator A NE and Operator B NE. Under Operator A NE, there is a Local UNI-C Under Test and a Local UNI-N (labeled as Tester-2). Under Operator B NE, there is a Remote UNI-N (labeled as Tester-4) and a Remote UNI-C (labeled as Tester 4). Each NE has an associated 'Impairment or Monitor' block. Below the network elements, three MEGs (Management Entity Groups) are shown with their paths: 'UNI MEG' (grey arrow), 'Subscriber MEG' (green arrow), and 'Test MEG' (blue arrow). The paths for Subscriber MEG and Test MEG span across both Operator A and Operator B NEs.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the CCM frames transmitted from each configured MEP instance are C-tagged with a specific COS ID*												
Units	CCM PDUs CoS ID												
Variables	None												
Results	Pass or fail												
Remarks	*The CoS ID supported by the EVC which yields the lowest frame loss performance												

TEST CASE 71C: UNI-C Counter – Number of CCM Frames Transmitted

Abstract Test Suite for Service OAM													
Test Name	UNI-C Counter – Number of CCM Frames Transmitted												
Test Definition ID	UNIC-R49 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 8												
Test Type	Conformance												
Test Status	Optional												
MEF Requirement Description	A UNI-C Type 2 SHOULD support counters for each MEP that counts the number of CCM frames transmitted												
Test Object	Verify that the UNI-C Type 2 under test supports counters for each MEP that counts the number of CCM frames transmitted												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration within a Simulated Service Provider Network. On the left, a Subscriber NE contains a Local UNI-C Under Test and a Local UNI-N (labeled as Tester 2). On the right, another Subscriber NE contains a Remote UNI-N (labeled as Tester 3) and a Remote UNI-C (labeled as Tester 4). The network path includes impairment or monitor blocks. Three MEGs are shown: a green Subscriber MEG flowing from left to right, a blue Test MEG flowing from left to right, and an orange UNI MEG flowing from right to left.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Reset the UNI-C under test counters. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG and use Tester 1 and Tester 3 to monitor and count the Continuity Check Messages transmitted by the UNI-C under test. Disable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG and verify that the number of CCMs with MEG-Level = 1 counted by the Tester 1 is equal to the number of CCM frames transmitted indicated by the UNI-C MEP counter for the UNI-MEG, that the number of CCMs with MEG-Level = 5 counted by the Tester 1 and Tester 3 is equal to the number of CCM frames transmitted indicated by the UNI-C MEP counter for the Test-MEG and that the number of CCMs with MEG-Level = 6 counted by the Tester 1 and Tester 3 is equal to the number of CCM frames transmitted indicated by the UNI-C MEP counter for the Subscriber-MEG												
Units	Number of CCM frames												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 72C: Lowest Priority CC Defect – DefRDICCM

Abstract Test Suite for Service OAM													
Test Name	Lowest Priority CC Defect – DefRDICCM												
Test Definition ID	UNIC-R51 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.1.2)												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-C Type 2 MEP MUST support the minimum CC fault priority level defined in IEEE 802.1ag for which a CC alarm will be generated. An alarm will be generated only if the fault has equal or greater priority than this minimum fault level												
IEEE Requirement Description	A number of separate defects are maintained by a MEP. The defects are ranked by priority. If a higher priority defect occurs after a lower priority defect has triggered a Fault Alarm, but before the Fault Alarm has reset, then the MEP will immediately issue another Fault Alarm. Only the highest-priority defect is reported in the Fault Alarm												
Test Object	Verify that if a higher priority defect occurs after a lower priority defect has triggered a Fault Alarm, but before the Fault Alarm has reset, then the MEP will immediately issue another Fault Alarm. Only the highest-priority defect is reported in the Fault Alarm. (No defect vs DefRDICCM)												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a sequence of network elements: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Below these are the corresponding UNIs: Local UNI-C, Local UNI-N, Remote UNI-N, and Remote UNI-C. Testers 1, 2, 3, and 4 are positioned between the UNIs. A Simulated Service Provider Network connects the UNIs. Arrows indicate the flow of Subscriber MEG, Test MEG, and UNI MEG frames.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Clear all alarms. Use Tester 2 and Tester 4 to stop transmitting CCMs to the UNI-C under test on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Use Tester 1 and Tester 3 to monitor the CCMs transmitted by the UNI-C under test and to verify that the RDI bit of the Flags field is set in all messages and use the management system of the UNI-C under test to verify that the DefRDICCM defect triggers a Fault Alarm												
Units	Fault Alarm hierarchy												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 73C: CC Defect & Fault Alarm Hierarchy – DefRDICCM vs DefMACstatus

Abstract Test Suite for Service OAM													
Test Name	CC Defect & Fault Alarm Hierarchy – DefRDICCM vs DefMACstatus												
Test Definition ID	UNIC-R50 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.1.2)												
Test Type	Conformance												
Test Status	Optional												
MEF Requirement Description	A UNI-C Type 2 SHOULD support the CC defect and fault alarm hierarchy per clause 20.1.2 of IEEE 802.1ag. If this is supported, the highest priority alarm MUST be made available to management and SHOULD mask lower priority alarms												
IEEE Requirement Description	A number of separate defects are maintained by a MEP. The defects are ranked by priority. If a higher priority defect occurs after a lower priority defect has triggered a Fault Alarm, but before the Fault Alarm has reset, then the MEP will immediately issue another Fault Alarm. Only the highest-priority defect is reported in the Fault Alarm												
Test Object	Verify that if a higher priority defect occurs after a lower priority defect has triggered a Fault Alarm, but before the Fault Alarm has reset, then the MEP will immediately issue another Fault Alarm. Only the highest-priority defect is reported in the Fault Alarm. (DefRDICCM vs DefMACstatus)												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic													
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Clear all alarms. Use Tester 2 and Tester 4 to stop transmitting CCMs to the UNI-C under test on the UNI-MEG, the Test-MEG and the Subscriber-MEG and use the management system to verify that the DefRDICCM defects trigger Fault Alarms on the three local UNI-C MEPs. Before the CC fault reset time expires, use Tester 2 and Tester 4 to send CCMs with Port Status TLV values equal to “psBlocked” (0x01) or with Interface TLV values not equal to “isUp” (0x01) to the UNI-C under test on the UNI-MEG, the Test-MEG and the Subscriber-MEG and use the management system to verify that the DefMACstatus defects trigger new Fault Alarms on the three local UNI-C MEPs and that the lower priority alarms are masked by the new ones												
Units	Fault Alarm hierarchy												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 74C: CC Defect & Fault Alarm Hierarchy – DefMACstatus vs DefRemoteCCM

Abstract Test Suite for Service OAM													
Test Name	CC Defect & Fault Alarm Hierarchy – DefMACstatusCCM vs DefRemoteCCM												
Test Definition ID	UNIC-R50 ²												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.1.2)												
Test Type	Conformance												
Test Status	Optional												
MEF Requirement Description	A UNI-C Type 2 SHOULD support the CC defect and fault alarm hierarchy per clause 20.1.2 of IEEE 802.1ag. If this is supported, the highest priority alarm MUST be made available to management and SHOULD mask lower priority alarms												
IEEE Requirement Description	A number of separate defects are maintained by a MEP. The defects are ranked by priority. If a higher priority defect occurs after a lower priority defect has triggered a Fault Alarm, but before the Fault Alarm has reset, then the MEP will immediately issue another Fault Alarm. Only the highest-priority defect is reported in the Fault Alarm												
Test Object	Verify that if a higher priority defect occurs after a lower priority defect has triggered a Fault Alarm, but before the Fault Alarm has reset, then the MEP will immediately issue another Fault Alarm. Only the highest-priority defect is reported in the Fault Alarm. (DefMACstatus vs DefRemoteCCM)												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic													
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Clear all alarms. Use Tester 2 and Tester 4 to send CCMs with Port Status TLV values equal to “psBlocked” (0x01) or with Interface TLV values not equal to “isUp” (0x01) to the UNI-C under test on the UNI-MEG, the Test-MEG and the Subscriber-MEG and use the management system to verify that the DefMACstatus defects trigger Fault Alarms on the three local UNI-C MEPs. Before the CC fault reset time expires, use Tester 2 and Tester 4 to send CCMs with the RDI bit of the Flags field set to the UNI-C under test on the UNI-MEG, the Test-MEG and the Subscriber-MEG and use the management system to verify that the DefRemoteCCM status defects trigger new Fault Alarms on the three local UNI-C MEPs and that the lower priority alarms are masked by the new ones												
Units	Fault Alarm hierarchy												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 75C: CC Defect & Fault Alarm Hierarchy – DefRemoteCCM vs DefErrorCCM

Abstract Test Suite for Service OAM													
Test Name	CC Defect & Fault Alarm Hierarchy – DefRemoteCCM vs DefErrorCCM												
Test Definition ID	UNIC-R50 ³												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.1.2)												
Test Type	Conformance												
Test Status	Optional												
MEF Requirement Description	A UNI-C Type 2 SHOULD support the CC defect and fault alarm hierarchy per clause 20.1.2 of IEEE 802.1ag. If this is supported, the highest priority alarm MUST be made available to management and SHOULD mask lower priority alarms												
IEEE Requirement Description	A number of separate defects are maintained by a MEP. The defects are ranked by priority. If a higher priority defect occurs after a lower priority defect has triggered a Fault Alarm, but before the Fault Alarm has reset, then the MEP will immediately issue another Fault Alarm. Only the highest-priority defect is reported in the Fault Alarm												
Test Object	Verify that if a higher priority defect occurs after a lower priority defect has triggered a Fault Alarm, but before the Fault Alarm has reset, then the MEP will immediately issue another Fault Alarm. Only the highest-priority defect is reported in the Fault Alarm. (DefRemoteCCM vs DefErrorCCM)												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration within a Simulated Service Provider Network. It shows four main components: Subscriber NE (green), Operator A NE (orange), Operator B NE (pink), and Subscriber NE (green). Below these are four MEPs: Local UNI-C Under Test (green), Local UNI-N (Tester-2) (orange), Remote UNI-N (Tester-4) (pink), and Remote UNI-C (green). Arrows indicate the flow of MEGs: UNI MEG (orange) from Local UNI-C to Local UNI-N; Test MEG (blue) from Local UNI-N to Remote UNI-N; and Subscriber MEG (green) from Remote UNI-N to Remote UNI-C.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Clear all alarms. Use Tester 2 and Tester 4 to send CCMs with the RDI bit of the Flags field set to the UNI-C under test on the UNI-MEG, the Test-MEG and the Subscriber-MEG and use the management system to verify that the DefRemoteCCM defects trigger Fault Alarms on the three local UNI-C MEPs. Before the CC fault reset time expires, use Tester 2 and Tester 4 to send invalid CCMs (with a multicast source address) to the UNI-C under test on the UNI-MEG, the Test-MEG and the Subscriber-MEG and use the management system to verify that the DefErrorCCM status defects trigger new Fault Alarms on the three local UNI-C MEPs and that the lower priority alarms are masked by the new ones												
Units	Fault Alarm hierarchy												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 76C: CC Defect & Fault Alarm Hierarchy – DefErrorCCM vs DefXconCCM

Abstract Test Suite for Service OAM													
Test Name	CC Defect & Fault Alarm Hierarchy – DefErrorCCM vs DefXconCCM												
Test Definition ID	UNIC-R50 ⁴												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.1.2)												
Test Type	Conformance												
Test Status	Optional												
MEF Requirement Description	A UNI-C Type 2 SHOULD support the CC defect and fault alarm hierarchy per clause 20.1.2 of IEEE 802.1ag. If this is supported, the highest priority alarm MUST be made available to management and SHOULD mask lower priority alarms												
IEEE Requirement Description	A number of separate defects are maintained by a MEP. The defects are ranked by priority. If a higher priority defect occurs after a lower priority defect has triggered a Fault Alarm, but before the Fault Alarm has reset, then the MEP will immediately issue another Fault Alarm. Only the highest-priority defect is reported in the Fault Alarm												
Test Object	Verify that if a higher priority defect occurs after a lower priority defect has triggered a Fault Alarm, but before the Fault Alarm has reset, then the MEP will immediately issue another Fault Alarm. Only the highest-priority defect is reported in the Fault Alarm. (DefErrorCCM vs DefXconCCM)												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates a network topology for testing. It shows four Network Elements (NEs): Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Each NE contains a Local UNI-C Under Test and a Local UNI-N (Tester-2). The Local UNI-N (Tester-2) is connected to a Remote UNI-N (Tester-4), which is connected to a Remote UNI-C. The diagram also shows three MEGs: Subscriber MEG (green), Test MEG (blue), and UNI MEG (orange). Arrows indicate the flow of CCMs between these MEGs and the UNIs.</p>												
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Clear all alarms. Use Tester 2 and Tester 4 to send invalid CCMs (with a multicast source address) to the UNI-C under test on the UNI-MEG, the Test-MEG and the Subscriber-MEG and use the management system to verify that the DefErrorCCM defects trigger Fault Alarms on the three local UNI-C MEPs. Before the CC fault reset time expires, use Tester 2 and Tester 4 to send CCMs with a valid but unknown Short MA Name to the UNI-C under test on the UNI-MEG, the Test-MEG and the Subscriber-MEG and use the management system to verify that the DefXconCCM status defects trigger new Fault Alarms on the three local UNI-C MEPs and that the lower priority alarms are masked by the new ones												
Units	Fault Alarm hierarchy												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 77C: CC Fault Alarm Time & CC Fault Reset Time

Abstract Test Suite for Service OAM													
Test Name	CC Fault Alarm Time & CC Fault Reset Time												
Test Definition ID	UNIC-R52 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.1.2)												
Test Type	Conformance												
Test Status	Mandatory if IEEE clause 12.14 7 (Maintenance association End Point managed object) is implemented												
MEF Requirement Description	A UNI-C Type 2 MEP MUST support a CC fault Alarm time and a CC Fault Reset Time												
IEEE Requirement Description	A Fault Alarm is issued when the MEP Fault Notification Generator state machine detects that a configured time period (default, 2.5s) has passed with one or more defects indicated, and Fault Alarms are enabled. The state machine can transmit no further Fault Alarms until it is reset by the passage of a configured time period (default, 10s) during which no defect indication is present												
Test Object	Verify that the UNI-C Type 2 MEP under test supports a CC fault Alarm time and a CC Fault Reset Time												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Enable CCM transmission on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the network topology for the test. It shows a sequence of network elements: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. The Local UNI-C Under Test is connected to the Local UNI-N (Tester-2), which is connected to the Remote UNI-N (Tester-4), which is connected to the Remote UNI-C. The diagram also shows the flow of MEGs: Subscriber MEG, Test MEG, and UNI MEG.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	If IEEE clause 12.14 7 (Maintenance association End Point managed object) is implemented, verify that the variable someRMEPCCMdefect is cleared and clear all alarms. Use Tester 2 and Tester 4 to stop transmitting CCMs to the UNI-C under test on the UNI-MEG, the Test-MEG and the Subscriber-MEG. Use the management system of the UNI-C under test to verify that 2.5 seconds after the variable someRMEPCCMdefect changes from clear to set and the DefRemoteCCM is triggered, a Fault alarm is transmitted. Use Tester 2 and Tester 4 to start transmitting CCMs to the UNI-C under test on the UNI-MEG, the Test-MEG and the Subscriber-MEG and verify that the variable someRMEPCCMdefect changes from set to clear. Use the management system of the UNI-C under test to verify that 10 seconds after the variable someRMEPCCMdefect changes from set to clear the Fault alarm is cleared												
Units	CC Fault Alarm & CC Fault Reset times												
Variables	None												
Results	Pass or fail												
Remarks													

15.5 UNI-C Type 2 Loopback Requirements

TEST CASE 78C: Administratively Initiate & Stop Loopback Sessions

Abstract Test Suite for Service OAM													
Test Name	Administratively Initiate & Stop Loopback Sessions												
Test Definition ID	UNIC-R53 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 8												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	Each LB session MUST have the ability to be administratively initiated and stopped												
Test Object	Verify that the UNI-C Type 2 under test has the ability to administratively initiate and stop LB sessions												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates a network topology for testing loopback sessions. It shows a 'Simulated Service Provider Network' with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Below these are specific UNI instances: Local UNI-C Under Test, Local UNI-N (Tester 2), Remote UNI-N (Tester 4), and Remote UNI-C. Arrows indicate the flow of MEGs: Subscriber MEG (green), Test MEG (blue), and UNI MEG (orange). The diagram also shows 'Impairment or Monitor' blocks for each NE.</p>												
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct the local UNI-C under test to send Loopback Messages (repeatedly until aborted) to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to verify that LBM frames are transmitted from each configured MEP instance (verify MEP IDs) and that the MEG-Level of the UNI-MEG is = “1”, the MEG-Level of the Test-MEG is = “5”, and the MEG-Level of Subscriber-MEG is = “6”. Instruct the local UNI-C under test to abort the loopback session on the UNI-MEG and use Tester 1 and Tester 3 to verify that only LBMs with MEG-Level = 5 and 6 are still being transmitted. Instruct the local UNI-C under test to abort the loopback session on the Test-MEG and use Tester 1 and Tester 3 to verify that only LBMs with MEG-Level = 6 are still being transmitted. Instruct the local UNI-C under test to abort the loopback session on the Subscriber-MEG and use Tester 1 and Tester 3 to verify that no LBMs are transmitted. Instruct the local UNI-C under test to send Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to verify that LBM frames are transmitted from each configured MEP instance (verify MEP IDs) and that the MEG-Level of the UNI-MEG is = “1”, the MEG-Level of the Test-MEG is = “5”, and the MEG-Level of Subscriber-MEG is = “6”												
Units	MEP IDs MEG-Level values												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 79C: Configurable LBM Frames Priority

Abstract Test Suite for Service OAM													
Test Name	Configurable LBM Frames Priority												
Test Definition ID	UNIC-R55 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 8												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	For each LB session, the priority of LBM frames MUST be configurable												
Test Object	Verify that the CoS ID of the LBM frames transmitted by the UNI-C Type 2 under test is configurable and set in the transmitted LBM PDUs												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C and for each end point of each configured EVC. Enable CCM transmission on the Test-MEG and the Subscriber-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates a network topology for testing LBM frames. It shows a 'Simulated Service Provider Network' divided into two parts: 'Operator A NE' and 'Operator B NE'. In Operator A NE, there is a 'Local UNI-C Under Test' (green box) and a 'Local UNI-N (Tester-2)' (orange box). In Operator B NE, there is a 'Remote UNI-N (Tester-4)' (pink box) and a 'Remote UNI-C (Tester 4)' (green box). Between the operators, there are 'Impairment or Monitor' blocks (yellow boxes). Below the network, there are three horizontal arrows representing MEGs: a green arrow for 'Subscriber MEG', a blue arrow for 'Test MEG', and a grey arrow for 'UNI MEG'. Testers 1, 2, 3, and 4 are positioned around these MEGs to monitor them.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Use Tester 1 and Tester 3 to monitor the Continuity Check Messages transmitted by the UNI-C under test and to verify that the CCM frames transmitted from each configured MEP instance are C-tagged with a specific COS ID*. Instruct the local UNI-C under test to send 3 Loopback Messages to the remote UNI-C on both Subscriber-MEG and Test-MEG and use Tester 1 and Tester 3 to monitor the LBM frames transmitted by the UNI-C under test and to verify that the LBM frames transmitted from each configured MEP instance are C-tagged with a specific COS ID* equal to the COS ID of the CCM frames.												
Units	CCM and LBM PDUs CoS ID												
Variables	None												
Results	Pass or fail												
Remarks	*The CoS ID supported by the EVC which yields the lowest frame loss performance												

TEST CASE 80C: Configurable Number of LBM Transmissions per Session

Abstract Test Suite for Service OAM													
Test Name	Configurable Number of LBM Transmissions per Session												
Test Definition ID	UNIC-R56 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 8												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	For each LB session, the number of LBM transmissions MUST be configurable												
Test Object	Verify that for each LB session, the number of LBM transmissions is configurable												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic													
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct the local UNI-C under test to send 3 Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to verify that LBM frames are transmitted from each configured MEP instance (verify MEP IDs) and that the MEG-Level of the UNI-MEG is = “1”, the MEG-Level of the Test-MEG is = “5”, and the MEG-Level of Subscriber-MEG is = “6”. Instruct the local UNI-C under test to send 1024 Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to verify that LBM frames are transmitted from each configured MEP instance (verify MEP IDs) and that the MEG-Level of the UNI-MEG is = “1”, the MEG-Level of the Test-MEG is = “5”, and the MEG-Level of Subscriber-MEG is = “6”. Instruct the local UNI-C under test to send Loopback Messages (repeatedly until aborted) to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to verify that LBM frames are transmitted from each configured MEP instance (verify MEP IDs) and that the MEG-Level of the UNI-MEG is = “1”, the MEG-Level of the Test-MEG is = “5”, and the MEG-Level of Subscriber-MEG is = “6”.												
Units	MEP IDs MEG-Level values												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 81C: Configurable Interval between LBM Transmissions

Abstract Test Suite for Service OAM													
Test Name	Configurable Interval between LBM Transmissions												
Test Definition ID	UNIC-R57 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 8												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	For each LB session, the interval between LBM transmissions MUST be configurable												
Test Object	Verify that for each LB session, the interval between LBM transmissions is configurable												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration within a Simulated Service Provider Network. It shows two Subscriber NEs connected to Operator A NE and Operator B NE. The network includes Local UNI-C Under Test, Local UNI-N (Tester-2), Remote UNI-N (Tester-4), and Remote UNI-C (Tester 4). Arrows indicate the flow of Subscriber MEG, Test MEG, and UNI MEG frames between the components.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct the local UNI-C under test to send 3 Loopback Messages with a period of 1 second to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to verify that the interval between LBM transmissions is 1 second. Instruct the local UNI-C under test to send 3 Loopback Messages at an interval of ‘T’ seconds with (‘T’ > 1) to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to verify that the interval between LBM transmissions is ‘T’ seconds. Instruct the local UNI-C under test to send 3 Loopback Messages with a period of 0 second (send the next LBM upon receipt of last LBR) to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Using the MEP counters, verify that the total number of (LBMs transmitted) is never greater than the number of (LBRs received +1)												
Units	LBM transmissions interval and number of LBM and LBR frames												
Variables	Interval between LBM transmissions												
Results	Pass or fail												
Remarks													

TEST CASE 82C: Configurable Timeout after a LBM Transmission

Abstract Test Suite for Service OAM													
Test Name	Configurable Timeout after a LBM Transmission												
Test Definition ID	UNIC-R58 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 8												
Test Type	Conformance												
Test Status	Optional												
MEF Requirement Description	For each LB session, the timeout after a LBM transmission, for an expected LBR result MAY be configurable												
Test Object	Verify that for each LB session, the timeout after a LBM transmission, for an expected LBR result is configurable												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic													
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct the local UNI-C under test to send 3 Loopback Messages with a period of 0 second (send the next LBM upon receipt of last LBR) and with a timeout of 5 seconds to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Instruct the local UNI-N (Tester 2) and the remote UNI-C (Tester 4) not to respond to any of the received LBMs. Use Tester 1 and Tester 3 to monitor the LBMs sent by the UNI-C under test and to verify that the interval between LBM transmissions is at least 5 seconds												
Units	LBM transmissions interval												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 83C: Configurable LBM Frame Size

Abstract Test Suite for Service OAM													
Test Name	Configurable LBM Frame Size												
Test Definition ID	UNIC-R59 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	For each LB session, the size of the LBM frame MUST be configurable. This requires that the optional Data TLV MUST be supported to allow for frames up to the MTU size												
Test Object	Verify that for each LB session, the size of the LBM frame is configurable and that the optional Data TLV is supported to allow for frames up to the MTU size												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration across a Simulated Service Provider Network. It shows four Network Elements (NE): Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Each NE contains a Local UNI (UNI-C or UNI-N) and a Remote UNI (UNI-N or UNI-C). The Local UNI-C is labeled 'Local UNI-C Under Test'. The Local UNI-N is labeled '(Tester-2)'. The Remote UNI-N is labeled '(Tester-3)'. The Remote UNI-C is labeled '(Tester-4)'. The diagram shows three MEGs: Subscriber MEG (green), Test MEG (blue), and UNI MEG (orange). The Subscriber MEG connects Local UNI-C to Local UNI-N. The Test MEG connects Local UNI-N to Remote UNI-N. The UNI MEG connects Local UNI-C to Remote UNI-N. The diagram also shows impairment monitors (yellow boxes) and a loopback message (green arrow) from Local UNI-C to Local UNI-N.</p>												
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Instruct the local UNI-C under test to send three 64-byte Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to monitor the LBMs sent by the UNI-C under test and to verify that the LBM frame size is 64 bytes. Instruct the local UNI-C under test to send three Loopback Messages (frame size equal to the maximum transmission unit of the EVC) to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG. Use Tester 1 and Tester 3 to monitor the LBMs sent by the UNI-C under test and to verify that the LBM frame size is equal to the maximum transmission unit of the EVC												
Units	LBM frame size												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 84C: UNI-C Counter – Number of LBM Frames Transmitted

Abstract Test Suite for Service OAM													
Test Name	UNI-C Counter – Number of LBM Frames Transmitted												
Test Definition ID	UNIC-R60 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	For each LB session, counters for LBM frames transmitted MUST be maintained												
Test Object	Verify that the UNI-C Type 2 under test maintains counters for each MEP that counts the number of LBM frames transmitted												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the network topology for the test. It shows a sequence of components: Subscriber NE (green box), Impairment or Monitor (yellow box), Operator A NE (orange box), Impairment or Monitor (yellow box), Operator B NE (pink box), and Subscriber NE (green box). Below these, four UNI instances are identified: Local UNI-C Under Test, Local UNI-N (Tester-2), Remote UNI-N (Tester-3), and Remote UNI-C (Tester-4). Arrows indicate the flow of three types of MEGs: Subscriber MEG (green arrow), Test MEG (blue arrow), and UNI MEG (orange arrow). The Subscriber MEG and Test MEG flow from the local UNI-C to the remote UNI-C. The UNI MEG flows from the local UNI-C to the local UNI-N.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Reset the UNI-C under test counters. Instruct the local UNI-C under test to send 3 Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG and use Tester 1 and Tester 3 to monitor and count the LBMs transmitted by the UNI-C under test. Verify that the number of LBMs with MEG-Level = 1 counted by the Tester 1 is equal to the number of LBM frames transmitted indicated by the UNI-C MEP counter for the UNI-MEG, that the number of LBMs with MEG-Level = 5 counted by the Tester 1 and Tester 3 is equal to the number of LBM frames transmitted indicated by the UNI-C MEP counter for the Test-MEG and that the number of LBMs with MEG-Level = 6 counted by the Tester 1 and Tester 3 is equal to the number of LBM frames transmitted indicated by the UNI-C MEP counter for the Subscriber-MEG												
Units	Number of LBM frames												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 85C: UNI-C Counter – Number of LBM Frames Received

Abstract Test Suite for Service OAM													
Test Name	UNI-C Counter – Number of LBM Frames Received												
Test Definition ID	UNIC-R60 ²												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	For each LB session, counters for LBM frames Received MUST be maintained												
Test Object	Verify that the UNI-C Type 2 under test maintains counters for each MEP that counts the number of LBM frames received												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a sequence of Network Elements (NEs): Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Each NE contains a Local UNI (UNI-C or UNI-N) and a Remote UNI (UNI-N or UNI-C). The Local UNI-C is labeled 'Local UNI-C Under Test'. The Local UNI-N is labeled 'Local UNI-N (Tester 2)'. The Remote UNI-N is labeled 'Remote UNI-N (Tester 3)'. The Remote UNI-C is labeled 'Remote UNI-C (Tester 4)'. The diagram also shows the flow of MEGs: Subscriber MEG (green arrow), Test MEG (blue arrow), and UNI MEG (orange arrow). A dashed box labeled 'Simulated Service Provider Network' encloses the Operator A and Operator B NEs.</p>												
CE-VLAN ID/EVC Map	<table><thead><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</th></tr><tr><th>CE-VLAN ID</th><th>EVC</th><th>CE-VLAN ID</th><th>EVC</th></tr></thead><tbody><tr><td>10</td><td>EVC₁</td><td>10</td><td>EVC₁</td></tr></tbody></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Reset the UNI-C under test counters. Instruct the local UNI-N (Tester 2) and the remote UNI-C (Tester 4) to send 3 Loopback Messages to the UNI-C under test on the UNI-MEG, on the Test-MEG and on the Subscriber-MEG. Use Tester 1 and Tester 3 to monitor and count the LBMs transmitted by the local UNI-N (Tester 2) and the remote UNI-C (Tester 4). Verify that the number of LBMs with MEG-Level = 1 counted by the Tester 1 is equal to the number of LBM frames received indicated by the UNI-C MEP counter for the UNI-MEG, that the number of LBMs with MEG-Level = 5 counted by the Tester 1 and Tester 3 is equal to the number of LBM frames received indicated by the UNI-C MEP counter for the Test-MEG and that the number of LBMs with MEG-Level = 6 counted by the Tester 1 and Tester 3 is equal to the number of LBM frames received indicated by the UNI-C MEP counter for the Subscriber-MEG												
Units	Number of LBM frames												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 86C: UNI-C Counter – Number of LBR Frames Received

Abstract Test Suite for Service OAM													
Test Name	UNI-C Counter – Number of LBR Frames Received												
Test Definition ID	UNIC-R60 ³												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	For each LB session, counters for LBR frames Received MUST be maintained												
Test Object	Verify that the UNI-C Type 2 under test maintains counters for each MEP that counts the number of LBR frames received												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration within a Simulated Service Provider Network. It shows two Subscriber NEs connected to Operator A NE and Operator B NE. The network includes Local UNI-C Under Test, Local UNI-N (Tester 2), Remote UNI-N (Tester 3), and Remote UNI-C (Tester 4). It also shows Subscriber MEG, Test MEG, and UNI MEG paths.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Reset the UNI-C under test counters. Instruct the local UNI-C under test to send 3 Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG and use Tester 1 and Tester 3 to monitor and count the LBRs transmitted by the UNI-C under test and also count the number of LBRs transmitted by the local UNI-N (Tester 2) and the remote UNI-C (Tester 4). Verify that the number of LBRs with MEG-Level = 1 counted by the Tester 1 is equal to the number of LBR frames received indicated by the UNI-C MEP counter for the UNI-MEG, that the number of LBRs with MEG-Level = 5 counted by the Tester 1 and Tester 3 is equal to the number of LBR frames received indicated by the UNI-C MEP counter for the Test-MEG and that the number of LBRs with MEG-Level = 6 counted by the Tester 1 and Tester 3 is equal to the number of LBR frames received indicated by the UNI-C MEP counter for the Subscriber-MEG												
Units	Number of LBR frames												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 87C: UNI-C Statistic – Percentage of Unanswered LB Requests (Lost LBM/LBR)

Abstract Test Suite for Service OAM													
Test Name	UNI-C Statistic – Percentage of Unanswered LB Requests (Lost LBM/LBR)												
Test Definition ID	UNIC-R60 ⁴												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	For each LB session, statistics on the percentage of unanswered LB requests (lost LBM/LBR) MUST be maintained												
Test Object	Verify that the UNI-C Type 2 under test maintains statistics on the percentage of unanswered LB requests (lost LBM/LBR)												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration within a Simulated Service Provider Network. It shows three main network elements: Subscriber NE, Operator A NE, and Operator B NE. Each NE contains an 'Impairment or Monitor' block. The Subscriber NE is connected to Operator A NE, which is connected to Operator B NE. The Subscriber NE contains a 'Local UNI-C Under Test' and a 'Local UNI-N (Tester 2)'. Operator A NE contains a 'Local UNI-N (Tester 2)'. Operator B NE contains a 'Remote UNI-N (Tester 4)' and a 'Remote UNI-C'. The network is configured with three MEGs: Subscriber MEG (green), Test MEG (blue), and UNI MEG (orange). Arrows indicate the flow of these MEGs between the UNIs and the network elements.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Reset the UNI-C under test counters and statistics. Instruct the local UNI-C under test to send 3 Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG and use Tester 1 and Tester 3 to verify that the number of LBMs transmitted by the UNI-C under test and is equal to the number of LBRs transmitted by the local UNI-N (Tester 2) and the remote UNI-C (Tester 4). Verify that the percentage of unanswered LB requests is 0% for the 3 UNI-C under test MEPs. DO NOT Reset the UNI-C under test counters and statistics. Instruct the local UNI-C under test to send 3 Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG and instruct the local UNI-N (Tester 2) and the remote UNI-C (Tester 4) not to respond to any of the received LBMs. Verify that the percentage of unanswered LB requests is 50% for the 3 UNI-C under test MEPs. Reset the UNI-C under test counters and statistics. Instruct the local UNI-C under test to send 3 Loopback Messages to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG and instruct the local UNI-N (Tester 2) and the remote UNI-C (Tester 4) not to respond to any of the received LBMs. Verify that the percentage of unanswered LB requests is 100% for the 3 UNI-C under test MEPs												
Units	Percentage of unanswered LB requests												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 88C: UNI-C Statistic – Minimum, Maximum & Average Round-Trip Latency

Abstract Test Suite for Service OAM													
Test Name	UNI-C Statistic – Minimum, Maximum & Average Round-Trip Latency												
Test Definition ID	UNIC-R60 ⁵												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	For each LB session, statistics on the minimum, maximum and average round-trip latency MUST be maintained												
Test Object	Verify that the UNI-C Type 2 under test maintains statistics on the minimum, maximum and average round-trip latency												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1” and with a unique MAID, a Test-MEG with a MEG-Level = “5” and with a unique MAID, and a Subscriber-MEG with a MEG-Level = “6” and with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C, local UNI-N and for each end point of each configured EVC. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the network topology for the test. It shows four Network Elements (NEs): Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Each NE contains an 'Impairment or Monitor' block. The topology is divided into three sections: Local UNI-C Under Test (Subscriber NE), Local UNI-N (Operator A NE), and Remote UNI-N (Operator B NE), and Remote UNI-C (Subscriber NE). The Local UNI-C Under Test is connected to the Local UNI-N, which is connected to the Remote UNI-N, which is connected to the Remote UNI-C. Arrows indicate the flow of Service OAM frames: Subscriber MEG (green), Test MEG (blue), and UNI MEG (orange). The Local UNI-C Under Test sends Subscriber MEG to the Local UNI-N, which sends it to the Remote UNI-N, which sends it to the Remote UNI-C. The Remote UNI-C sends Test MEG back to the Local UNI-N, which sends it back to the Local UNI-C Under Test. The Local UNI-C Under Test also sends UNI MEG to the Local UNI-N, which sends it to the Remote UNI-N, which sends it to the Remote UNI-C.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10	EVC ₁	10	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10	EVC ₁	10	EVC ₁										
Test Procedure	Reset the UNI-C under test counters and statistics. Instruct the local UNI-C under test to send Loopback Messages (repeatedly until aborted) to the local UNI-N on the UNI-MEG, and to the remote UNI-C on both Subscriber-MEG and Test-MEG for a period of time T and verify the UNI-C under test maintains statistics on the minimum, maximum and average round-trip latency												
Units	Minimum, maximum and average round-trip latency												
Variables	None												
Results	Pass or fail												
Remarks													

16. Abstract Test Cases for UNI-N Type 2 Service OAM

This section contains 78 Test Cases for UNI-N. The section is divided in 5 different subsections as follows:

Section 16.1

Configuration Requirements contains a total of 1 Test Case covering the UNI Type 2 Requirements R15.

Section 16.2

Maintenance Entity Requirements contains a total of 3 Test Cases covering the UNI Type 2 Requirements R35, R37 and R38.

Section 16.3

MEG End Points Requirements contains a total of 54 Test Cases covering the UNI Type 2 Requirements R39, R40, R41, R42 and R43.

Section 16.4

Continuity Check Requirements contains a total of 10 Test Cases covering the UNI Type 2 Requirements R44, R45, R46, R48, R49, R50, R51 and R52.

Section 16.5

Loopback Requirements contains a total of 10 Test Cases covering the UNI Type 2 Requirements R53, R54, R56, R57, R58, R59 and R60.

16.1 UNI-N Type 2 Configuration Requirements

TEST CASE 1N: UNI-MEG Administrative Configuration

Abstract Test Suite for Service OAM	
Test Name	UNI-MEG Administrative Configuration
Test Definition ID	UNIN-R15
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 8
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MUST be administratively configurable with the UNI-C MEP ID and MEG-Level corresponding to the UNI-MEG
Test Object	Verify that a UNI-N Type 2 can be administratively configurable with the UNI-C MEP ID and MEG-Level corresponding to the UNI-MEG
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C and the local UNI-N. Configure the UNI-N with the UNI-C MEP ID. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that they contain the configured UNI-N MEP ID, that their MEG-Level is equal to "1" and that the RDI bit of the Flags field is clear. Re-configure the UNI-C with a different MEP ID but do not update the UNI-N configuration with this new information. Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that they contain the configured UNI-N MEP ID, that their MEG-Level is equal to "1" and that the RDI bit of the Flags field is set
Units	MEG-Level, MEP ID and RDI bit values
Variables	None
Results	Pass or fail
Remarks	

16.2 UNI-N Type 2 Maintenance Entity Requirements

TEST CASE 7N: MEP Instance on the UNI-MEG

Abstract Test Suite for Service OAM													
Test Name	MEP Instance on the UNI-MEG												
Test Definition ID	UNIN-R37 ¹												
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2												
Test Type	Conformance												
Test Status	Mandatory												
MEF Requirement Description	A UNI-N Type 2 MUST be able to support a single MEP instance on the UNI-MEG, regardless of whether any EVC is configured for that UNI or not												
Test Object	Verify that a UNI-N Type 2 can support a single MEP instance on the UNI-MEG, regardless of whether any EVC is configured for that UNI or not												
Test Configuration	Configure at least one EVC associating at least two UNIs (local + remote) and configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances with specific MEP IDs for the local UNI-C and the local UNI-N. Enable CCM transmission on the UNI-MEG. Testers with proper PHYs that match the UNIs are monitoring the Service OAM frames												
Test Configuration Schematic	<p>The diagram illustrates the test configuration within a Simulated Service Provider Network. It shows three main network elements: Subscriber NE, Operator A NE, and Operator B NE. Within the Subscriber NE, there is a Local UNI-C (labeled as Tester 2) and a Monitor Mode block. Within the Operator A NE, there is a Local UNI-N (labeled as Under-Test). Within the Operator B NE, there are Remote UNI-N and Remote UNI-C (labeled as Tester 4). A dashed line separates the Subscriber NE from the Operator A NE. Arrows indicate the flow of UNI MEG (orange arrow) and Test MEG (grey arrow) between the Local UNI-C and the Local UNI-N, and between the Local UNI-N and the Remote UNI-N. The Monitor Mode block is connected to the Local UNI-C.</p>												
CE-VLAN ID/EVC Map	<table><tr><th colspan="2">LOCAL UNI</th><th colspan="2">REMOTE UNI</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>EVC₁</td><td>10*</td><td>EVC₁</td></tr></table> <p>Use of other CE-VLAN IDs is permitted provided that configuration of the CE-VLAN IDs conforms to MEF 10.1</p>	LOCAL UNI		REMOTE UNI		CE-VLAN ID	EVC	CE-VLAN ID	EVC	10*	EVC ₁	10*	EVC ₁
LOCAL UNI		REMOTE UNI											
CE-VLAN ID	EVC	CE-VLAN ID	EVC										
10*	EVC ₁	10*	EVC ₁										
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that they contain the configured MEP ID and that their MEG-Level is equal to “1”. Delete the configured EVC(s) and use Tester 1 to verify that the Continuity Check Messages are still transmitted by the UNI-N under test, that they still contain the configured MEP ID and that their MEG-Level is still equal to “1”												
Units	MEG-Level and MEP ID values												
Variables	None												
Results	Pass or fail												
Remarks													

TEST CASE 8N: Untagged OAM Frames on the UNI-MEG

Abstract Test Suite for Service OAM	
Test Name	Untagged OAM Frames on the UNI-MEG
Test Definition ID	UNIN-R37 ²
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 must be able to support a single MEP instance on the UNI-MEG, this UNI-MEG is called the “default UNI-MEG” and MUST use Untagged OAM frames
Test Object	Verify that a UNI-N Type 2 is able to support a single MEP instance on the UNI-MEG and that it uses untagged OAM frames
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Local UNI-C (Tester 2) is connected to Operator A NE. Local UNI-N (Under-Test) is connected to Operator A NE. Remote UNI-N and Remote UNI-C (Tester 4) are connected to Operator B NE. A Monitor Mode block is connected to Local UNI-C. A Subscriber MEG and Test MEG are shown between Local UNI-N and Remote UNI-C. A UNI MEG is shown between Local UNI-C and Local UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that their MEG-Level is equal to “1” and that they are untagged
Units	MEG-Level value and CCM frames VLAN tag (absence)
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 9N: IEEE 802.1 Bridge MEPs Corresponding to UNI-MEG

Abstract Test Suite for Service OAM	
Test Name	IEEE 802.1 Bridge MEPs Corresponding to UNI-MEG
Test Definition ID	UNIN-R38 ¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2
Test Type	Conformance
Test Status	Optional
MEF Requirement Description	When the CE is an IEEE 802.1 Bridge, the MEPs corresponding to the UNI-MEG on a UNI-N Type 2 SHOULD be Down-MEPs
Test Object	Verify that when the CE is an IEEE 802.1 Bridge, the MEPs corresponding to the UNI-MEG on a UNI-N Type 2 are Down-MEPs
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure Down-MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration for the UNI-MEG MEP test. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. The Subscriber NE on the left is connected to Operator A NE. Operator A NE is connected to Operator B NE, which is then connected to the Subscriber NE on the right. The Subscriber NE on the left has a Local UNI-C (Tester 2) and a Local UNI-N (Under-Test). The Subscriber NE on the right has a Remote UNI-N and a Remote UNI-C (Tester 4). A Subscriber MEG (Test MEG) is shown between the Local UNI-N and the Remote UNI-C. A UNI MEG is shown between the Local UNI-C and the Local UNI-N. A Monitor Mode box is connected to the Local UNI-C. The network is divided into three sections: Subscriber NE, Operator A NE, and Operator B NE. The Local UNI-C (Tester 2) is connected to the Local UNI-N (Under-Test) via a UNI MEG. The Local UNI-N (Under-Test) is connected to the Remote UNI-N via a Subscriber MEG (Test MEG). The Remote UNI-N is connected to the Remote UNI-C (Tester 4) via a Subscriber MEG (Test MEG). The Remote UNI-C (Tester 4) is connected to the Local UNI-C (Tester 2) via a Subscriber MEG (Test MEG).</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and if the bridge implements IEEE 802.1ag clause 12.14.7, use the management system of the UNI-N under test to verify that the value indicating the direction in which the MEP is facing on the interface is "Down"
Units	MEP direction
Variables	None
Results	Pass or fail
Remarks	To perform this test, the bridge must implement IEEE 802.1ag clause 12.14.7 (Maintenance association End Point managed object). If this is not the case, there is no obligation to perform the test

16.3 UNI-N Type 2 MEG End Points Requirements

TEST CASE 13N: Configurable MEG-Level

Abstract Test Suite for Service OAM	
Test Name	Configurable MEG-Level
Test Definition ID	UNIN-R39
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MUST support a configurable MEG-Level for the MEPs
Test Object	Verify that a UNI-N Type 2 can support a configurable MEG-Level for the MEPs
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration for the Configurable MEG-Level test. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Local UNI-C (Tester 2) and Local UNI-N (Under-Test) are connected to Operator A NE. Remote UNI-N and Remote UNI-C (Tester 4) are connected to Operator B NE. A Monitor Mode block is connected to Local UNI-C. A Subscriber MEG Test MEG is shown between Local UNI-N and Remote UNI-N. A UNI MEG is shown between Local UNI-C and Local UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that CCM frames are transmitted from the UNI-N MEP instance (verify MEP ID) and that the MEG-Level of the UNI-MEG is = "1"
Units	MEG-Level and MEP ID values
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 14N: Processing Received Multicast CCM Frames – Source Address

Abstract Test Suite for Service OAM	
Test Name	Processing Received Multicast CCM Frames – Source Address
Test Definition ID	UNIN-R40 ¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.3.2)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG – Source address validation
IEEE Requirement Description	The receiving system SHALL consider a CCM PDU invalid and discard it if the source address parameter contains a Group address, and not an Individual MAC address
Test Object	Verify that any CCM frame received with a source address parameter that contains a Group MAC address is considered invalid and discarded
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. A Simulated Service Provider Network connects Operator A NE and Operator B NE. Local UNI-C (Tester 2) is connected to Operator A NE. Local UNI-N Under-Test is connected to Operator A NE. Remote UNI-N (Tester 4) is connected to Operator B NE. Remote UNI-C (Tester 4) is connected to Operator B NE. A Monitor Mode block is connected to Local UNI-C. A UNI MEG is shown between Local UNI-C and Local UNI-N. A Subscriber MEG Test MEG is shown between Local UNI-N and Remote UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 2 to send Continuity Check Messages with a source address parameter that contains a Group MAC address to the UNI-C under test and use the management system of the UNI-C under test to verify that the received CCMs are not catalogued (MEP IDs of the remote MEPs) in the UNI-C MEP CCM Database for the UNI-MEG
Units	CCM database MEP ID values
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 15N: Processing Received Multicast CCM Frames – Sender ID TLV

Abstract Test Suite for Service OAM	
Test Name	Processing Received Multicast CCM Frames – Sender ID TLV
Test Definition ID	UNIN-R40 ²
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.5.3)
Test Type	Conformance
Test Status	Mandatory if Sender ID TLVs are supported
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG – Sender ID TLV validation
IEEE Requirement Description	The receiving system SHALL consider a CCM PDU invalid and discard it if the Sender ID TLV Length field is not large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields
Test Object	Verify that any CCM frame received with a Sender ID TLV Length field that is not large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields is considered invalid and discarded
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Below these, there are four test entities: Local UNI-C (Tester 2), Local UNI-N (Under-Test), Remote UNI-N (Tester 4), and Remote UNI-C (Tester 4). A 'Simulated Service Provider Network' connects the two Operator NEs. A 'UNI MEG' (orange arrow) connects Local UNI-C and Local UNI-N. A 'Subscriber MEG' (grey arrow) connects Local UNI-N and Remote UNI-N. A 'Test MEG' (grey arrow) connects Remote UNI-N and Remote UNI-C. A 'Monitor Mode' block is connected to Local UNI-C. A 'Subscriber NE' block is connected to Local UNI-C. A 'Subscriber NE' block is connected to Remote UNI-C.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 2 to send Continuity Check Messages with Sender ID TLV Length field not large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields to the UNI-N under test and use the management system of the UNI-N under test to verify that the received CCMs are not catalogued (MEP ID of the remote MEP) in the UNI-N MEP CCM Database for the UNI-MEG
Units	CCM database MEP ID values
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 16N: Processing Received Multicast CCM Frames – Chassis ID Length

Abstract Test Suite for Service OAM	
Test Name	Processing Received Multicast CCM Frames – Chassis ID Length
Test Definition ID	UNIN-R40 ³
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.5.3.1)
Test Type	Conformance
Test Status	Mandatory if Sender ID TLVs are supported
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG – Chassis ID length validation
IEEE Requirement Description	The receiving system SHALL consider a CCM PDU invalid and discard it if the Chassis ID Length field is not 0, nor less than (TLV Length field value – 1)
Test Object	Verify that any CCM frame received with a Chassis ID Length field that is not 0, nor less than (TLV Length field value – 1) is considered invalid and discarded
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. On the left, a 'Subscriber NE' (green box) is connected to a 'Local UNI-C (Tester 2)' and a 'Monitor Mode' (yellow box). This is connected to a 'Local UNI-N (Under-Test)' which is connected to a 'Simulated Service Provider Network' (grey box). The network is connected to a 'Remote UNI-N (Tester 4)' and a 'Remote UNI-C (Tester 4)'. Arrows indicate the flow of 'UNI MEG' (orange) and 'Subscriber MEG' (grey) frames.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 2 to send Continuity Check Messages with a Chassis ID Length field that is not 0, nor less than (TLV Length field value – 1) to the UNI-N under test and use the management system of the UNI-N under test to verify that the received CCMs are not catalogued (MEP ID of the remote MEP) in the UNI-N MEP CCM Database for the UNI-MEG
Units	CCM database MEP ID values
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 17N: Processing Received Multicast CCM Frames – Port Status TLV

Abstract Test Suite for Service OAM	
Test Name	Processing Received Multicast CCM Frames – Port Status TLV
Test Definition ID	UNIN-R40 ⁴
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.5.4)
Test Type	Conformance
Test Status	Mandatory if Port Status TLVs are supported
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG – Port Status TLV validation
IEEE Requirement Description	The receiving system SHALL consider a CCM PDU invalid and discard it if the Port Status TLV contains a value other than (0x01) or (0x02)
Test Object	Verify that any CCM frame received with a Port Status TLV that contains a value other than (0x01) or (0x02) is considered invalid and discarded
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. A Local UNI-C (Tester 2) is connected to a Local UNI-N (Under-Test) via a Monitor Mode block. A Remote UNI-N (Tester 4) is connected to a Remote UNI-C (Tester 4). A Simulated Service Provider Network connects the two Operator NEs. Arrows indicate the flow of Subscriber MEG and Test MEG frames between the Local and Remote UNI-Ns.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 2 to send Continuity Check Messages with a Port Status TLV that contains a value other than (0x01) or (0x02) to the UNI-N under test and use the management system of the UNI-N under test to verify that the received CCMs are not catalogued (MEP ID of the remote MEP) in the UNI-N MEP CCM Database for the UNI-MEG
Units	CCM database MEP ID values
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 18N: Processing Received Multicast CCM Frames – Interface Status TLV

Abstract Test Suite for Service OAM	
Test Name	Processing Received Multicast CCM Frames – Interface Status TLV
Test Definition ID	UNIN-R40 ⁵
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.5.5)
Test Type	Conformance
Test Status	Mandatory if Interface Status TLVs are supported
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG – Interface Status TLV validation
IEEE Requirement Description	The receiving system SHALL consider a CCM PDU invalid and discard it if the Interface Status TLV contains a value other than (0x01), (0x02), (0x03), (0x04), (0x05), (0x06) or (0x07)
Test Object	Verify that any CCM frame received with an Interface Status TLV that contains a value other than (0x01), (0x02), (0x03), (0x04), (0x05), (0x06) or (0x07) is considered invalid and discarded
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. The first Subscriber NE is connected to Operator A NE via a 'Monitor Mode' block. Operator A NE is connected to Operator B NE via a 'Simulated Service Provider Network'. Operator B NE is connected to the second Subscriber NE. Below these components, four test points are identified: Local UNI-C (Tester 2), Local UNI-N (Under-Test), Remote UNI-N (Tester 4), and Remote UNI-C (Tester 4). Arrows indicate the flow of frames: 'Subscriber MEG' frames flow from the first Subscriber NE to the Local UNI-N (Under-Test), and 'Test MEG' frames flow from the Local UNI-N (Under-Test) to the Remote UNI-N (Tester 4). A dashed line separates the 'Subscriber MEG' and 'Test MEG' flows.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 2 to send Continuity Check Messages with an Interface Status TLV that contains a value other than (0x01), (0x02), (0x03), (0x04), (0x05), (0x06) or (0x07) to the UNI-N under test and use the management system of the UNI-N under test to verify that the received CCMs are not catalogued (MEP ID of the remote MEP) in the UNI-N MEP CCM Database for the UNI-MEG
Units	CCM database MEP ID values
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 19N: Processing Received Multicast CCM Frames – CCM Interval

Abstract Test Suite for Service OAM	
Test Name	Processing Received Multicast CCM Frames – CCM Interval
Test Definition ID	UNIN-R40 ⁶
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.6.1.3)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG – CCM Interval validation
IEEE Requirement Description	The receiving system SHALL consider a CCM PDU invalid and discard it if the CCM Interval field contains the value 0
Test Object	Verify that any CCM frame received with a CCM Interval field that contain the value 0 is considered invalid and discarded
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 2 to send Continuity Check Messages with a CCM Interval field that contain the value 0 to the UNI-N under test and use the management system of the UNI-N under test to verify that the received CCMs are not catalogued (MEP ID of the remote MEP) in the UNI-N MEP CCM Database for the UNI-MEG
Units	CCM database MEP ID values
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 20N: Processing Received Multicast CCM Frames – First TLV Offset

Abstract Test Suite for Service OAM	
Test Name	Processing Received Multicast CCM Frames – First TLV Offset
Test Definition ID	UNIN-R40 ⁷
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.6.2)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG – First TLV Offset validation
IEEE Requirement Description	The receiving system SHALL consider a CCM PDU invalid and discard it if the First TLV Offset field of the Common CFM Header in a CCM does not contain a value greater than or equal to 70
Test Object	Verify that any CCM frame received with a First TLV Offset field of the Common CFM Header that does not contain a value greater than or equal to 70 is considered invalid and discarded
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 2 to send Continuity Check Messages with a First TLV Offset field of the Common CFM Header that does not contain a value greater than or equal to 70 to the UNI-N under test and use the management system of the UNI-N under test to verify that the received CCMs are not catalogued (MEP ID of the remote MEP) in the UNI-N MEP CCM Database for the UNI-MEG
Units	CCM database MEP ID values
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 21N: Processing Received Multicast CCM Frames – MEP ID

Abstract Test Suite for Service OAM	
Test Name	Processing Received Multicast CCM Frames – MEP ID
Test Definition ID	UNIN-R40 ⁸
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.6.4)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG – MEP ID validation
IEEE Requirement Description	The receiving system SHALL consider a CCM PDU invalid and discard it if the MEP ID is not in the range 1-8191
Test Object	Verify that any CCM frame received with a MEP ID that is not in the range 1-8191 is considered invalid and discarded
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. A Local UNI-C (Tester 2) is connected to a Local UNI-N (Under-Test) via a Monitor Mode block. A Remote UNI-N (Tester 4) is connected to a Remote UNI-C (Tester 4). A Simulated Service Provider Network connects the Operator A NE and Operator B NE. Arrows indicate the flow of Subscriber MEG and Test MEG frames between the Local UNI-N and Remote UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 2 to send Continuity Check Messages with a MEP ID that is not in the range 1-8191 to the UNI-N under test and use the management system of the UNI-N under test to verify that the received CCMs are not catalogued (MEP ID of the remote MEP) in the UNI-N MEP CCM Database for the UNI-MEG
Units	CCM database MEP ID values
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 22N: Processing Received Multicast CCM Frames – Short MA Name Length 1

Abstract Test Suite for Service OAM	
Test Name	Processing Received Multicast CCM Frames – Short MA Name Length 1
Test Definition ID	UNIN-R40 ⁹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.6.5.5)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG – Short MA Name length validation 1
IEEE Requirement Description	The receiving system SHALL consider a CCM PDU invalid and discard it if the Short MA Name Length does not contain a value greater than or equal to 1
Test Object	Verify that any CCM frame received with a Short MA Name Length that does not contain a value greater than or equal to 1 is considered invalid and discarded
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Local UNI-C (Tester 2) and Local UNI-N (Under-Test) are connected to Operator A NE. Remote UNI-N and Remote UNI-C (Tester 4) are connected to Operator B NE. A 'Simulated Service Provider Network' connects Operator A NE and Operator B NE. Arrows indicate 'UNI MEG' and 'Subscriber MEG Test MEG' flows.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 2 to send Continuity Check Messages with a Short MA Name Length that does not contain a value greater than or equal to 1 to the UNI-N under test and use the management system of the UNI-N under test to verify that the received CCMs are not catalogued (MEP ID of the remote MEP) in the UNI-N MEP CCM Database for the UNI-MEG
Units	CCM database MEP ID values
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 23N: Processing Received Multicast CCM Frames – Short MA Name Length 2

Abstract Test Suite for Service OAM	
Test Name	Processing Received Multicast CCM Frames – Short MA Name Length 2
Test Definition ID	UNIN-R40 ¹⁰
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.6.5.5)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG – Short MA Name length validation 2
IEEE Requirement Description	The receiving system SHALL consider a CCM PDU invalid and discard it if the Short MA Name Length indicates that the Short MA Name runs over the 48-octet limit for the MAID
Test Object	Verify that any CCM frame received with a Short MA Name Length that indicates that the Short MA Name runs over the 48-octet limit for the MAID is considered invalid and discarded
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Local UNI-C (Tester 2) is connected to Local UNI-N (Under-Test). Remote UNI-N (Tester 4) and Remote UNI-C (Tester 4) are also shown. A Simulated Service Provider Network connects the Operator A NE and Operator B NE. Arrows indicate the flow of UNI MEG and Test MEG frames.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 2 to send Continuity Check Messages with a Short MA Name Length that indicates that the Short MA Name runs over the 48-octet limit for the MAID to the UNI-N under test and use the management system of the UNI-N under test to verify that the received CCMs are not catalogued (MEP ID of the remote MEP) in the UNI-N MEP CCM Database for the UNI-MEG
Units	CCM database MEP ID values
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 24N: Processing Received Multicast CCM Frames

Abstract Test Suite for Service OAM	
Test Name	Processing Received Multicast CCM Frames
Test Definition ID	UNIN-R40 ¹¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.1.3)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to process received Multicast CCM frames for each required MEG
IEEE Requirement Description	Further to the successful PDU validation tests (described in Test Cases 14 through 23) a receiving MEP SHALL examine every CCM to be sure that its MAID matches that configured in the receiving MEP, check to ensure that its own MEPID does <i>not</i> match that in the received CCM and catalog CCMs in its MEP CCM Database
Test Object	Verify that further to the successful PDU validation tests (described in Test Cases 14 through 23) the receiving MEP examines every CCM to be sure that its MAID matches that configured in the receiving MEP, checks to ensure that its own MEPID does <i>not</i> match that in the received CCM and catalog CCMs in its MEP CCM Database
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 2 to send valid Continuity Check Messages to the UNI-N under test and use the management system of the UNI-N under test to verify that the received CCMs are catalogued (MEP ID of the remote MEP) in the UNI-N MEP CCM Database for the UNI-MEG
Units	CCM database MEP ID values
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 25N: Processing & Response to Unicast & Multicast LBM Frames – Destination Address

Abstract Test Suite for Service OAM	
Test Name	Processing & Response to Unicast & Multicast LBM Frames – Destination Address
Test Definition ID	UNIN-R41 ¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.2.2)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to process and respond to both Unicast and Multicast LBM frames for each required MEG – Destination address validation
IEEE Requirement Description	When an LBM is received by an MEP Loopback Responder, if the destination address matches neither the MAC address of the receiving MEP, nor the Group MAC address listed in the MAC addresses Table in section 10, appropriate to the MD Level (MEG-Level) of the receiving MEP, the MEP SHALL discard the LBM
Test Object	Verify that any LBM frame received with a destination address that does not match the MAC address of the receiving MEP, nor the Group MAC address listed in the MAC addresses Table in section 10, appropriate to the MD Level (MEG-Level) is considered invalid and discarded
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. A Subscriber NE (green) is connected to a Local UNI-C (Tester 2) in Monitor Mode (yellow). This connects to a Simulated Service Provider Network (dashed box). Inside, Operator A NE (orange) connects to a Local UNI-N (Tester 3) Under-Test. Operator B NE (grey) connects to a Remote UNI-N (Tester 4) and a Remote UNI-C (Tester 4). Arrows show a UNI MEG (orange) and a Test MEG (grey) being sent from the Subscriber MEG to the Remote UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct Tester 2 to send Loopback Messages with a destination address that does not match the MAC address of the receiving MP, or the Group MAC address listed in the MAC addresses Table in section 10, appropriate to the MD Level (MEG-Level) to the UNI-N under test. Use Tester 1 to monitor the messages transmitted by the UNI-N under test and to verify that it does not generate any Loopback Replies (because the received LBMs are considered invalid and discarded)
Units	OpCode value
Variables	LBM frame type (Unicast or Multicast)
Results	Pass or fail
Remarks	

TEST CASE 26N: Processing & Response to Unicast & Multicast LBM Frames – Source Address

Abstract Test Suite for Service OAM	
Test Name	Processing & Response to Unicast & Multicast LBM Frames – Source Address
Test Definition ID	UNIN-R41 ²
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.3.2)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to process and respond to both Unicast and Multicast LBM frames for each required MEG – Source address validation
IEEE Requirement Description	The receiving system SHALL consider an LBM PDU invalid and discard it if the source address parameter contains a Group address, and not an Individual MAC address
Test Object	Verify that any LBM frame received with a source address parameter that contains a Group MAC address is considered invalid and discarded
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. The Local UNI-C (Tester 2) is connected to the Local UNI-N (Under-Test). The Remote UNI-N (Tester 4) and Remote UNI-C (Tester 4) are also connected. A Simulated Service Provider Network connects the Operator A NE and Operator B NE. A Subscriber MEG and Test MEG are indicated between the Local UNI-N and Remote UNI-N. A UNI MEG is indicated between the Local UNI-C and Local UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct Tester 2 to send Loopback Messages with a source address parameter that contains a Group MAC address to the UNI-N under test. Use Tester 1 to monitor the messages transmitted by the UNI-C under test and to verify that it does not generate any Loopback Replies (because the received LBMs are considered invalid and discarded)
Units	OpCode value
Variables	LBM frame type (Unicast or Multicast)
Results	Pass or fail
Remarks	

TEST CASE 27N: Processing & Response to Unicast & Multicast LBM Frames – Sender ID TLV

Abstract Test Suite for Service OAM	
Test Name	Processing & Response to Unicast & Multicast LBM Frames – Sender ID TLV
Test Definition ID	UNIN-R41 ³
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.5.3)
Test Type	Conformance
Test Status	Mandatory if Sender ID TLVs are supported
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to process and respond to both Unicast and Multicast LBM frames for each required MEG – Sender ID TLV validation
IEEE Requirement Description	The receiving system SHALL consider an LBM PDU invalid and discard it if the Sender ID TLV Length field is not large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields
Test Object	Verify that any LBM frame received with a Sender ID TLV Length field that is not large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields is considered invalid and discarded
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Local UNI-C (Tester 2) is connected to Local UNI-N (Under-Test). Remote UNI-N (Tester 4) and Remote UNI-C (Tester 4) are also shown. A 'Simulated Service Provider Network' connects the Operator A NE and Operator B NE. A 'Subscriber MEG' is shown between Local UNI-N and Remote UNI-N. A 'UNI MEG' is shown between Local UNI-C and Local UNI-N. A 'Test MEG' is shown between Local UNI-N and Remote UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct Tester 2 to send Loopback Messages with Sender ID TLV Length field not large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields to the UNI-N under test. Use Tester 1 to monitor the messages transmitted by the UNI-N under test and to verify that it does not generate any Loopback Replies (because the received LBMs are considered invalid and discarded)
Units	OpCode value
Variables	LBM frame type (Unicast or Multicast)
Results	Pass or fail
Remarks	

TEST CASE 28N: Processing & Response to Unicast & Multicast LBM Frames – First TLV Offset

Abstract Test Suite for Service OAM	
Test Name	Processing & Response to Unicast & Multicast LBM Frames – First TLV Offset
Test Definition ID	UNIN-R41 ⁴
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.46 & 21.6.2)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to process and respond to both Unicast and Multicast LBM frames for each required MEG – First TLV Offset validation
IEEE Requirement Description	The receiving system SHALL consider an LBM PDU invalid and discard it if the First TLV Offset field of the Common CFM Header in an LBM does not contain a value greater than or equal to 4
Test Object	Verify that any LBM frame received with a First TLV Offset field of the Common CFM Header that does not contain a value greater than or equal to 4 is considered invalid and discarded
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE (green), Operator A NE (orange), Operator B NE (grey), and Subscriber NE (grey). Below these are four test instances: Local UNI-C (Tester 2) in Monitor Mode (yellow), Local UNI-N (Tester 3) in Under-Test (orange), Remote UNI-N (Tester 4) in Under-Test (orange), and Remote UNI-C (Tester 4) in Monitor Mode (yellow). A 'Simulated Service Provider Network' connects the Operator NEs. A 'Subscriber MEG' and 'Test MEG' are indicated between the Local and Remote UNI-Ns. A 'UNI MEG' is indicated between the Local UNI-C and Local UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct Tester 2 to send Loopback Messages with a First TLV Offset field of the Common CFM Header that does not contain a value greater than or equal to 4 to the UNI-N under test. Use Tester 1 to monitor the messages transmitted by the UNI-N under test and to verify that it does not generate any Loopback Replies (because the received LBMs are considered invalid and discarded)
Units	OpCode value
Variables	LBM frame type (Unicast or Multicast)
Results	Pass or fail
Remarks	

TEST CASE 29N: Processing & Response to Unicast & Multicast LBM Frames – LBR Header

Abstract Test Suite for Service OAM	
Test Name	Processing & Response to Unicast & Multicast LBM Frames – LBR Header
Test Definition ID	UNIN-R41 ⁵
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.2.2)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to process and respond to both Unicast and Multicast LBM frames for each required MEG
IEEE Requirement Description	Further to the successful PDU validation tests (described in Test Cases 25 through 28), the receiving MEP generates an LBR and transmits it to the originating MEP. The source address parameter of the received LBM is used as the destination address parameter for the transmitted LBR, the source address parameter for the LBR is the MAC address of the replying MEP and the OpCode field is changed from LBM to LBR
Test Object	Verify that further to the successful PDU validation tests (described in Test Cases 25 through 28) the receiving MEP generates an LBR and transmits it to the originating MEP with the source address parameter of the received LBM used as the destination address parameter for the transmitted LBR, with the MAC address of the replying MEP used as the source address parameter for the LBR and with the OpCode field changed from LBM to LBR
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Local UNI-C (Tester 2) and Local UNI-N Under-Test (Tester 3) are connected to Operator A NE. Remote UNI-N (Tester 4) and Remote UNI-C (Tester 4) are connected to Operator B NE. A Simulated Service Provider Network connects Operator A NE and Operator B NE. Arrows indicate the flow of UNI MEG and Test MEG frames between the local and remote UNI-N and UNI-C components.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct Tester 2 to send valid Loopback Messages to the UNI-N under test. Use Tester 1 to monitor the Loopback Reply messages transmitted by the UNI-N under test and to verify that the source address parameter of the received LBM is used as the destination address parameter for the transmitted LBR, the source address parameter for the LBR is the MAC address of the replying MEP and the OpCode field is changed from LBM to LBR
Units	Source address, destination address and OpCode values
Variables	LBM frame type (Unicast or Multicast)
Results	Pass or fail
Remarks	

TEST CASE 30N: Processing & Response to Unicast & Multicast LBM Frames – LBR Content

Abstract Test Suite for Service OAM	
Test Name	Processing & Response to Unicast & Multicast LBM Frames – LBR Content
Test Definition ID	UNIN-R41 ⁶
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.2.2)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to process and respond to both Unicast and Multicast LBM frames for each required MEG
IEEE Requirement Description	A receiving MEP that receives a valid LBM, shall not interpret any of the other fields or TLVs than the source address, destination address and OpCode. The contents of any TLVs that do not violate the validation criteria (described in Test Cases 25 through 28), shall be ignored, not interpreted by the receiver and SHALL be copied to the LBR
Test Object	Verify that when a receiving MEP receives a valid LBM, it does not interpret any of the other fields or TLVs than the source address, destination address and OpCode, and the contents of any TLVs that do not violate the validation criteria (described in Test Cases 25 through 28), are ignored and copied to the LBR
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Local UNI-C (Tester 2) and Local UNI-N (Under-Test) are connected to Operator A NE. Remote UNI-N and Remote UNI-C (Tester 4) are connected to Operator B NE. A Monitor Mode block is connected to Local UNI-C. A Subscriber MEG and Test MEG are shown between Local UNI-N and Remote UNI-N. A UNI MEG is shown between Local UNI-C and Local UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct Tester 2 to send valid Loopback Messages to the UNI-N under test. Use Tester 1 to monitor the Loopback Reply messages transmitted by the UNI-N under test and to verify that any TLVs that do not violate the validation criteria (described in Test Cases 25 through 28), are ignored and copied to the LBR
Units	LBR TLV fields value
Variables	LBM frame type (Unicast or Multicast)
Results	Pass or fail
Remarks	

TEST CASE 31N: Generating Multicast CCM Frames – Destination Address

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – Destination Address
Test Definition ID	UNIN-R42 ¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.3.1)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Destination address validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; CCMs monitoring a service instance distinguished by its VID use the Group MAC addresses listed in the MAC addresses Table in section 10, as the destination address
Test Object	Verify that the destination address parameter of the CCM frames generated by the UNI-N under test is one of the Group MAC addresses listed in the MAC addresses Table in section 10
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that their destination address parameter contains one of the Group MAC addresses listed in the MAC addresses Table in section 10
Units	Destination address
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 32N: Generating Multicast CCM Frames – Source Address

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – Source Address
Test Definition ID	UNIN-R42 ²
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.3.2)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Source address validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The CCM frames source address is the Individual MAC address of the MEP transmitting the PDU. The source address parameter contains an individual, and not a Group, MAC address
Test Object	Verify that the source address parameter of the CCM frames generated by the UNI-N under test contains an individual, and not a Group, MAC address
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that their source address parameter contains an individual, and not a Group, MAC address
Units	Source address
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 33N: Generating Multicast CCM Frames – Protocol Version Number

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – Protocol Version Number
Test Definition ID	UNIN-R42 ³
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.4.2)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Protocol Version Number validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The protocol version number is always 0
Test Object	Verify that the protocol version number of the CCM frames generated by the UNI-N under test is always 0
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Local UNI-C (Tester 2) and Local UNI-N (Under-Test) are connected to Operator A NE. Remote UNI-N (Tester 4) and Remote UNI-C (Tester 4) are connected to Operator B NE. A Monitor Mode block is connected to Local UNI-C. A Subscriber MEG and Test MEG are shown as arrows between Local UNI-C and Remote UNI-C. A UNI MEG is shown as an arrow between Local UNI-C and Local UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that their protocol version number is always 0
Units	Protocol version number
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 34N: Generating Multicast CCM Frames – OpCode

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – OpCode
Test Definition ID	UNIN-R42 ⁴
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.4.3)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – OpCode validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The OpCode field specifies the format and meaning of the remainder of the CFM PDU. The value for CCM PDUs is (0x01)
Test Object	Verify that the OpCode value of the CCM frames generated by the UNI-N under test is (0x01)
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that their OpCode value is (0x01)
Units	OpCode value
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 35N: Generating Multicast CCM Frames – Flags

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – Flags
Test Definition ID	UNIN-R42 ⁵
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.6.1)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Flags validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Flags field of the Common CFM Header is split into three parts for the CCM: the RDI field, the Reserved field and the CCM Interval field. The most significant bit of the Flags field is the RDI bit. This bit is set to 1 if the transmitting MEP's presentRDI variable is set, and 0 if not. The bits of the Flags field not including the RDI field and the CCM Interval field are set to 0 by the transmitting MEP. The least-significant three bits of the Flags field constitute the CCM Interval field. The CCM Interval field is encoded as specified in the CCM Interval Table in section 11
Test Object	Verify that the Flags field bits of the CCM frames generated by the UNI-N under test that are not included in the CCM Interval field are set to 0 and that the CCM Interval field contains a value in the range 1-7
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that the Flags field bits that are not included in the CCM Interval field are set to 0 and that the CCM Interval field contains a value in the range 1-7
Units	Flags field value
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 36N: Generating Multicast CCM Frames – First TLV Offset

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – First TLV Offset
Test Definition ID	UNIN-R42 ⁶
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.6.2)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – First TLV Offset validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The First TLV Offset field of the Common CFM Header in a CCM contains a value greater than or equal to 70
Test Object	Verify that the First TLV Offset field of the Common CFM Header in the CCM frames generated by the UNI-N under test contains a value greater than or equal to 70
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. The Local UNI-C (Tester 2) is connected to the Local UNI-N Under-Test (Tester 3). The Remote UNI-N (Tester 4) and Remote UNI-C (Tester 4) are also shown. A Simulated Service Provider Network connects the Operator A NE and Operator B NE. A Subscriber MEG and Test MEG are indicated between the Local UNI-N Under-Test and the Remote UNI-N. A UNI MEG is indicated between the Local UNI-C and the Local UNI-N Under-Test.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that the First TLV Offset field contains a value greater than or equal to 70
Units	First TLV Offset field value
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 37N: Generating Multicast CCM Frames – Sequence Number

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – Sequence Number
Test Definition ID	UNIN-R42 ⁷
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.6.3)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Sequence Number validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; A MEP transmits either a 0 in the Sequence Number field of the CCM frames, or copies to it the contents of the CCIscntCCMs variable
Test Object	Verify that the Sequence Number field of the CCM frames generated by the UNI-N under test contains either a 0 or a copy of the CCIscntCCMs variable
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration for generating Multicast CCM frames. It shows a network topology with four main components: a Subscriber NE (green), Operator A NE (orange), Operator B NE (grey), and a Subscriber NE (grey). The Subscriber NE (green) is connected to the Operator A NE (orange) via a Monitor Mode block. The Operator A NE (orange) is connected to the Operator B NE (grey), which is connected to the Subscriber NE (grey). The Subscriber NE (grey) is connected to a Remote UNI-N (Tester 4). The Remote UNI-N (Tester 4) is connected to a Remote UNI-C (Tester 4). The Local UNI-N (Under-Test) is connected to the Local UNI-C (Tester 2) via a Monitor Mode block. The Local UNI-N (Under-Test) is connected to the Operator A NE (orange). The Local UNI-N (Under-Test) is connected to the Remote UNI-N (Tester 4) via a Subscriber MEG (Test MEG). The Local UNI-C (Tester 2) is connected to the Local UNI-N (Under-Test) via a UNI MEG.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that the Sequence Number field contains either a 0 or a copy of the CCIscntCCMs variable
Units	Sequence Number value
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 38N: Generating Multicast CCM Frames – MEP ID

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – MEP ID
Test Definition ID	UNIN-R42 ⁸
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.6.4)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – MEP ID validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The MEP ID TLV specifies from which MEP the CCM was transmitted and is in the range 1-8191
Test Object	Verify that the MEP ID TLV of the CCM frames generated by the UNI-N under test contains a value in the range 1-8191
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. A 'Simulated Service Provider Network' connects Operator A NE and Operator B NE. On the left, a 'Subscriber NE' (green box) is connected to a 'Local UNI-C (Tester 2)' (yellow box) in 'Monitor Mode'. This is connected to a 'Local UNI-N (Under-Test)' (orange box). This 'Local UNI-N' is connected to a 'Remote UNI-N (Tester 4)' (grey box), which is further connected to a 'Remote UNI-C (Tester 4)' (grey box). A 'Subscriber MEG' and a 'Test MEG' are shown as arrows spanning the network from the local UNI-N to the remote UNI-N. A 'UNI MEG' is also shown as an arrow from the local UNI-C to the local UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that the MEP ID TLV contains a value in the range 1-8191
Units	MEP ID value
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 39N: Generating Multicast CCM Frames – MAID Total Length

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – MAID Total Length
Test Definition ID	UNIN-R42 ⁹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.6.5)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – MAID total length validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The total length of the MAID field, including padding, if present, SHALL be exactly 48 octets.
Test Object	Verify that the total length of the MAID field, including padding, of the CCM frames generated by the UNI-N under test is exactly 48 octets
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Local UNI-C (Tester 2) and Local UNI-N Under-Test (Tester 3) are connected to Operator A NE. Remote UNI-N (Tester 4) and Remote UNI-C (Tester 4) are connected to Operator B NE. A Simulated Service Provider Network connects Operator A NE and Operator B NE. A UNI MEG is shown between Local UNI-C and Local UNI-N. A Subscriber MEG is shown between Local UNI-N and Remote UNI-N. A Test MEG is shown between Remote UNI-N and Remote UNI-C.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that the total length of the MAID field, including padding is exactly 48 octets
Units	MAID field total length
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 40N: Generating Multicast CCM Frames – Maintenance Domain Name Format

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – Maintenance Domain Name Format
Test Definition ID	UNIN-R42 ¹⁰ -R48 ¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.6.5.1)
Test Type	Conformance
Test Status	Optional
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP must be able to generate Multicast CCM frames. The Maintenance Domain Name SHOULD use the “null” format (value equal to 0x01)
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Maintenance Domain Name Format specifies the format of the Maintenance Domain Name field. When no Maintenance Domain Name is present, the value is equal to 0x01
Test Object	Verify that the Maintenance Domain Name of the CCM frames generated by the UNI-N under test uses the “null” format (value equal to 0x01)
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that the Maintenance Domain Name of the CCM frames generated by the UNI-N under test uses the “null” format (value equal to 0x01)
Units	Maintenance Domain Name format
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 41N: Generating Multicast CCM Frames – Short MA Name Format

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – Short MA Name Format
Test Definition ID	UNIN-R42 ¹¹ -R48 ²
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.6.5.4)
Test Type	Conformance
Test Status	Optional
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP must be able to generate Multicast CCM frames. The Short MA Name SHOULD use the “text” format (value equal to 0x02)
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Short MA Name format specifies the format of the Short MA Name field. The “text” format or character string value is 0x02
Test Object	Verify that the Short MA Name format of the CCM frames generated by the UNI-N under test uses the “text” format (value equal to 0x02)
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Local UNI-C (Tester 2) and Local UNI-N (Under-Test) are connected to Operator A NE. Remote UNI-N (Tester 4) and Remote UNI-C (Tester 4) are connected to Operator B NE. A Simulated Service Provider Network connects Operator A NE and Operator B NE. A Monitor Mode block is connected to Local UNI-C. A UNI MEG is shown between Local UNI-C and Local UNI-N. A Subscriber MEG Test MEG is shown between Local UNI-N and Remote UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that the Short MA Name format of the CCM frames generated by the UNI-N under test uses the “text” format (value equal to 0x02)
Units	Short MA Name format
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 42N: Generating Multicast CCM Frames – Short MA Name Length

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – Short MA Name Length
Test Definition ID	UNIN-R42 ¹²
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.6.5.5)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Short MA name length validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Short MA Name length in a CCM contains a value greater than or equal to 1 and does not indicate that the Short MA Name runs over the 48-octet limit for the MAID
Test Object	Verify that the Short MA Name length of the CCM frames generated by the UNI-N under test contains a value greater than or equal to 1 and does not indicate that the Short MA Name runs over the 48-octet limit for the MAID
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Local UNI-C (Tester 2) and Local UNI-N Under-Test (Tester 3) are connected to Operator A NE. Remote UNI-N (Tester 4) and Remote UNI-C (Tester 4) are connected to Operator B NE. A Subscriber MEG Test MEG is shown between Local UNI-C and Remote UNI-C. A UNI MEG is shown between Local UNI-C and Local UNI-N Under-Test.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that the Short MA Name length of the CCM frames generated by the UNI-N under test contains a value greater than or equal to 1 and does not indicate that the Short MA Name runs over the 48-octet limit for the MAID
Units	Short MA Name length
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 43N: Generating Multicast CCM Frames – Short MA Name

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – Short MA Name
Test Definition ID	UNIN-R42 ¹³ -R48 ³
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.6.5.6)
Test Type	Conformance
Test Status	Optional
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP must be able to generate Multicast CCM frames. The Short MA Name is provisioned, has a maximum length of 45 ASCII characters and SHOULD default to a Representative Value that is uniquely related, but not necessarily equal, to UNI ID as following: a. The Representative Value of the UNI ID for the default UNI-MEG
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Short MA Name field contains the Short MA Name, in the format specified by the Short MA Name Format field
Test Object	Verify that the Short MA Name has a maximum length of 45 ASCII characters and defaults to a Representative Value that is uniquely related, but not necessarily equal to the UNI ID for the default UNI-MEG
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that the Short MA Name of the CCM frames generated by the UNI-N under test is uniquely related, but not necessarily equal to the UNI ID for the default UNI-MEG
Units	Short MA Name length
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 44N: Generating Multicast CCM Frames – Sender ID TLV

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – Sender ID TLV
Test Definition ID	UNIN-R42 ¹⁴
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.3)
Test Type	Conformance
Test Status	Mandatory if Sender ID TLVs are supported
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Sender ID TLV validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Sender ID TLV identifies the Bridge on which the transmitting MEP is configured, and may also include a management address for that Bridge. The Sender ID TLV Type is equal to (0x01) and the Length field is large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields
Test Object	Verify that the Sender ID TLV Type of the CCM frames generated by the UNI-N under test is equal to (0x01) and that the Sender ID Length field is large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. A Simulated Service Provider Network connects Operator A NE and Operator B NE. Local UNI-C (Tester 2) is connected to Operator A NE. Local UNI-N (Under-Test) is connected to Operator A NE. Remote UNI-N (Tester 4) is connected to Operator B NE. Remote UNI-C (Tester 4) is connected to Operator B NE. A Monitor Mode block is connected to Local UNI-C. A Subscriber MEG Test MEG is shown between Local UNI-C and Remote UNI-C. A UNI MEG is shown between Local UNI-C and Local UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that the Sender ID TLV Type of the CCM frames generated by the UNI-N under test is equal to (0x01) and that the Sender ID Length field is large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields
Units	Sender ID TLV Type and Length values
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 45N: Generating Multicast CCM Frames – Chassis ID Length

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – Chassis ID Length
Test Definition ID	UNIN-R42 ¹⁵
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.3)
Test Type	Conformance
Test Status	Mandatory if Sender ID TLVs are supported
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Chassis ID length validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The chassis ID length is the length, in octets, of the Chassis ID field, it is either 0, or is less than (TLV Length field value – 1)
Test Object	Verify that the Chassis ID length of the CCM frames generated by the UNI-N under test is either 0 or less than (TLV Length field value – 1)
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration for generating Multicast CCM frames. It shows a network topology with a Subscriber NE (green box) connected to a Local UNI-C (Tester 2) and a Monitor Mode box (yellow). The Monitor Mode box is connected to a Local UNI-N (Under-Test) and a Local UNI-C (Tester 1). The Local UNI-N is connected to a Simulated Service Provider Network (grey box). The Simulated Service Provider Network is connected to a Remote UNI-N (Tester 4) and a Remote UNI-C (Tester 4). The Remote UNI-N is connected to a Subscriber NE (grey box). Arrows indicate the flow of UNI MEG (orange) and Test MEG (grey) frames between the Local UNI-N and the Remote UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that the Chassis ID length of the CCM frames generated by the UNI-N under test is either 0 or less than (TLV Length field value – 1)
Units	Chassis ID length value
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 46N: Generating Multicast CCM Frames – Management Address Domain Field

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – Management Address Domain Field
Test Definition ID	UNIN-R42 ¹⁶
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.3)
Test Type	Conformance
Test Status	Optional
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Management Address Domain field validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Management Address Domain Length field contains the length, in octets, of the Management Address Domain field. If 0, or if the TLV's Length field indicates that the Management Address Domain Length field is not present, then the Management Address Domain, Management Address Length, and Management Address fields are not present
Test Object	Verify that the Management Address Domain field of the CCM frames generated by the UNI-N under test is empty
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main entities: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. A 'Simulated Service Provider Network' connects Operator A NE and Operator B NE. On the left, a 'Local UNI-C (Tester 1)' is connected to Operator A NE, and a 'Local UNI-N (Under-Test)' is also connected to Operator A NE. On the right, a 'Remote UNI-N (Tester 3)' and a 'Remote UNI-C (Tester 4)' are connected to Operator B NE. A 'Subscriber MEG (Test MEG)' is shown as a horizontal line spanning from Local UNI-C to Remote UNI-C. A 'UNI MEG' is shown as a horizontal line spanning from Local UNI-C to Local UNI-N. Arrows indicate the direction of traffic or monitoring between these components.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that the Management Address Domain field of the CCM frames generated by the UNI-N under test is empty
Units	Management Address Domain field
Variables	None
Results	Pass or fail
Remarks	The Management Address Domain field SHOULD be empty in the Sender ID TLV by default as a security precaution (MEF Service OAM FM IA)

TEST CASE 47N: Generating Multicast CCM Frames – Management Address Field

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – Management Address Field
Test Definition ID	UNIN-R42 ¹⁷
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.3)
Test Type	Conformance
Test Status	Optional
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Management Address field validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Management Address length and the Management Address fields are not present if the Management Address Domain Length field is not present or contains a 0, or if the Management Address Length field is not present or contains a 0
Test Object	Verify that the Management Address field of the CCM frames generated by the UNI-N under test is empty
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. On the left, a green box labeled 'Subscriber NE' is connected to a yellow box labeled 'Monitor Mode'. Below the 'Monitor Mode' box is 'Local UNI-C (Tester 2)'. To the right of the 'Monitor Mode' box is an orange box labeled 'Local UNI-N Under-Test'. This 'Local UNI-N Under-Test' is connected to a grey box labeled 'Operator A NE'. To the right of 'Operator A NE' is another grey box labeled 'Operator B NE'. Below 'Operator A NE' is 'Local UNI-N (Tester 3)'. Below 'Operator B NE' is 'Remote UNI-N (Tester 4)'. To the right of 'Remote UNI-N (Tester 4)' is a grey box labeled 'Subscriber NE'. Below 'Remote UNI-N (Tester 4)' is 'Remote UNI-C (Tester 4)'. Arrows show the flow of frames: a red arrow labeled 'UNI MEG' from 'Local UNI-N Under-Test' to 'Remote UNI-N (Tester 4)'; a blue arrow labeled 'Subscriber MEG Test MEG' from 'Local UNI-N Under-Test' to 'Remote UNI-N (Tester 4)'. Dashed boxes group the components into 'Local UNI-C (Tester 2)', 'Local UNI-N Under-Test', 'Simulated Service Provider Network' (Operator A NE and Operator B NE), and 'Remote UNI-N (Tester 4)'.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that the Management Address field of the CCM frames generated by the UNI-N under test is empty
Units	Management Address field
Variables	None
Results	Pass or fail
Remarks	The Management Address field SHOULD be empty in the Sender ID TLV by default as a security precaution (MEF Service OAM FM IA)

TEST CASE 48N: Generating Multicast CCM Frames – Port Status TLV

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – Port Status TLV
Test Definition ID	UNIN-R42 ¹⁸
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.4)
Test Type	Conformance
Test Status	Mandatory if Port Status TLVs are supported
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Port Status TLV validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Port Status TLV indicates the ability of the Bridge Port on which the transmitting MEP resides to pass ordinary data, regardless of the status of the MAC. The Port Status TLV Type is equal to (0x02) and the Port Status TLV field contains one of the following values (0x01) psBlocked or (0x02) psUp
Test Object	Verify that the Port Status TLV Type of the CCM frames generated by the UNI-N under test is equal to (0x02) and that the Port Status TLV field contains one of the following values (0x01) psBlocked or (0x02) psUp
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. A Simulated Service Provider Network connects Operator A NE and Operator B NE. Local UNI-C (Tester 2) is connected to Operator A NE. Local UNI-N Under-Test is connected to Operator A NE. Remote UNI-N (Tester 4) is connected to Operator B NE. Remote UNI-C (Tester 4) is connected to Operator B NE. A UNI MEG is shown between Local UNI-C and Local UNI-N. A Subscriber MEG is shown between Local UNI-N and Remote UNI-N. A Test MEG is shown between Local UNI-N and Remote UNI-C.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that the Port Status TLV Type of the CCM frames generated by the UNI-N under test is equal to (0x02) and that the Port Status TLV field contains one of the following values (0x01) psBlocked or (0x02) psUp
Units	Port Status TLV Type and TLV field values
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 49N: Generating Multicast CCM Frames – Interface Status TLV

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – Interface Status TLV
Test Definition ID	UNIN-R42 ¹⁹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.5)
Test Type	Conformance
Test Status	Mandatory if Interface Status TLVs are supported
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Interface Status TLV validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Interface Status TLV indicates the status of the interface on which the MEP transmitting the CCM is configured, or the next-lower interface in the IETF RFC 2863 IF-MIB. The Interface Status TLV Type is equal to (0x04) and the Interface Status TLV field contains one of the following values (0x01) isUp, (0x02) isDown, (0x03) isTesting, (0x04) isUnknown, (0x05) isDormant, (0x06) isNotPresent or (0x07) isLowerLayerDown
Test Object	Verify that the Interface Status TLV Type of the CCM frames generated by the UNI-N under test is equal to (0x04) and that the Interface Status TLV field contains one of the following values (0x01) isUp, (0x02) isDown, (0x03) isTesting, (0x04) isUnknown, (0x05) isDormant, (0x06) isNotPresent or (0x07) isLowerLayerDown
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows three main network elements: Subscriber NE, Operator A NE, and Operator B NE. Subscriber NE contains a green box labeled 'Monitor Mode' and a yellow box labeled 'Local UNI-C (Tester 2)'. Operator A NE contains an orange box labeled 'Local UNI-N Under-Test (Tester 3)'. Operator B NE contains a grey box labeled 'Remote UNI-N (Tester 4)' and a grey box labeled 'Remote UNI-C (Tester 4)'. A dashed line labeled 'Simulated Service Provider Network' connects Operator A NE and Operator B NE. Arrows indicate the flow of frames: 'UNI MEG' (orange arrow) flows from Local UNI-C to Local UNI-N, and 'Test MEG' (grey arrow) flows from Local UNI-N to Remote UNI-N. A dashed line labeled 'Subscriber MEG' connects Local UNI-C and Remote UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that the Interface Status TLV Type of the CCM frames generated by the UNI-N under test is equal to (0x04) and that the Interface Status TLV field contains one of the following values (0x01) isUp, (0x02) isDown, (0x03) isTesting, (0x04) isUnknown, (0x05) isDormant, (0x06) isNotPresent or (0x07) isLowerLayerDown
Units	Interface Status TLV Type and TLV field values
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 50N: Generating Multicast CCM Frames – Organization Specific TLV

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – Organization Specific TLV
Test Definition ID	UNIN-R42 ²⁰
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.2)
Test Type	Conformance
Test Status	Mandatory if Organization TLVs are supported
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – Organization Specific TLV validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; Any organization can define TLVs for use in Connectivity Fault Management. The Organization TLV Type is equal to 31 (0x1F)
Test Object	Verify that the Organization TLV Type of the CCM frames generated by the UNI-N under test is equal to 31 (0x1F)
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE (green), Operator A NE (orange), Operator B NE (grey), and a Subscriber NE (grey). A Local UNI-C (Tester 2) is connected to the Subscriber NE. A Local UNI-N (Under-Test) is connected to Operator A NE. A Remote UNI-N (Tester 4) is connected to Operator B NE. A Remote UNI-C (Tester 4) is connected to the Subscriber NE. A Monitor Mode block is connected to the Local UNI-C. A Simulated Service Provider Network connects Operator A NE and Operator B NE. Arrows indicate the flow of UNI MEG and Test MEG frames between the Local UNI-N and Remote UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that the Organization Specific TLV Type of the CCM frames generated by the UNI-N under test is equal to 31 (0x1F)
Units	Organization Specific TLV Type value
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 51N: Generating Multicast CCM Frames – End TLV

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast CCM Frames – End TLV
Test Definition ID	UNIN-R42 ²¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.7)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	When CCM transmission is enabled for a MEP in a UNI-N Type 2 implementation, the MEP MUST be able to generate Multicast CCM frames – End TLV validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The End TLV is required and is the last TLV in the CFM PDU and is Required. The End TLV Type is equal to (0x00)
Test Object	Verify that the End TLV Type of the CCM frames generated by the UNI-N under test is equal to (0x00)
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Local UNI-C (Tester 2) and Local UNI-N Under-Test (Tester 3) are connected to Operator A NE. Remote UNI-N (Tester 4) and Remote UNI-C (Tester 4) are connected to Operator B NE. A Subscriber MEG and Test MEG are shown spanning the network. A UNI MEG is shown between Local UNI-C and Local UNI-N Under-Test.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that the End TLV Type of the CCM frames generated by the UNI-N under test is equal to (0x00)
Units	End TLV Type value
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 52N: Generating Multicast LBM Frames – Destination Address

Abstract Test Suite for Service OAM	
Test Name	Generating Multicast LBM Frames – Destination Address
Test Definition ID	UNIN-R43 ¹ -R54 ¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.3.1)
Test Type	Conformance
Test Status	Optional
MEF Requirement Description	A UNI-N Type 2 MEP implementation MAY be able to generate Multicast LBM frames. For each LB session, Multicast destinations MAY be supported using the reserved CCM multicast MAC DA in the range of 01-80-C2-00-00-30 to 01-80-C2-00-00-37 that corresponds to the MEG-Level of the MEP
Test Object	Verify that when the UNI-N under test uses Loopback messages to check bidirectional connectivity between itself and the other MEPs in the same MEG, the destination address parameter of the LBM frames generated by the UNI-C under test contains one of the Group MAC address listed in the MAC addresses Table in section 10
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct the local UNI-N under test to send Loopback Messages to the local UNI-C on the UNI-MEG. Use Tester 1 to monitor the LBM messages transmitted by the UNI-N under test and to verify that the destination address parameter of the LBM message destined to the local UNI-C on the UNI-MEG contains one of the Group MAC address listed in the MAC addresses Table in section 10
Units	Destination address
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 53N: Generating Unicast LBM Frames – Destination Address

Abstract Test Suite for Service OAM	
Test Name	Generating Unicast LBM Frames – Destination Address
Test Definition ID	UNIN-R43 ²
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.3.1)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to generate Unicast LBM frames. For each LB session, the destination address MUST be configurable to any Unicast MAC DA
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The LBM frames are addressed to a single specific MP
Test Object	Verify that the destination address parameter of the LBM message sent by the UNI-N under test contain the Unicast address of the its peer MEPs
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct the local UNI-N under test to send Loopback Messages to the local UNI-C on the UNI-MEG. Use Tester 1 to monitor the LBM messages transmitted by the UNI-N under test and to verify that the destination address parameter of the LBM message destined to the local UNI-C on the UNI-MEG contains the Unicast address of the local UNI-C
Units	Destination address
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 54N: Generating Unicast LBM Frames – Source Address

Abstract Test Suite for Service OAM	
Test Name	Generating Unicast LBM Frames – Source Address
Test Definition ID	UNIN-R43 ³
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.3.2)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to generate Unicast LBM frames – Source address validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The LBM frames source address is the Individual MAC address of the MEP transmitting the PDU. The source address parameter contains an individual, and not a Group, MAC address
Test Object	Verify that the source address parameter of the LBM frames generated by the UNI-N under test contains an individual, and not a Group, MAC address
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration for generating unicast LBM frames. It shows a network topology with three main components: Subscriber NE (green), Operator A NE (orange), and Operator B NE (grey). The Subscriber NE is connected to Operator A NE, which is connected to Operator B NE. The Subscriber NE is also connected to a Local UNI-C (Tester 2) and a Local UNI-N (Under-Test). The Local UNI-N is connected to a Remote UNI-N (Tester 4) and a Remote UNI-C (Tester 4). A Subscriber MEG (Test MEG) is shown spanning from the Local UNI-N to the Remote UNI-N. A UNI MEG is shown spanning from the Local UNI-C to the Local UNI-N. The diagram also shows a Monitor Mode block connected to the Local UNI-C.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct the local UNI-N under test to send Loopback Messages to the local UNI-C on the UNI-MEG. Use Tester 1 to monitor the LBM messages transmitted by the UNI-N under test and to verify that the source address parameter of the LBM messages destined to the local UNI-C on the UNI-MEG contain an individual, and not a Group, MAC address
Units	Source address
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 55N: Generating Unicast LBM Frames – Protocol Version Number

Abstract Test Suite for Service OAM	
Test Name	Generating Unicast LBM Frames – Protocol Version Number
Test Definition ID	UNIN-R43 ⁴
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.4.2)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to generate Unicast LBM frames – Protocol Version Number validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The protocol version number is always 0
Test Object	Verify that the protocol version number of the LBM frames generated by the UNI-N under test is always 0
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration for generating unicast LBM frames. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. A Simulated Service Provider Network connects Operator A NE and Operator B NE. Local UNI-C (Tester 2) is connected to Operator A NE. Local UNI-N Under-Test is connected to Operator A NE. Remote UNI-N (Tester 4) is connected to Operator B NE. Remote UNI-C (Tester 4) is connected to Operator B NE. A Monitor Mode block is connected to Local UNI-C. A Subscriber MEG Test MEG is shown between Local UNI-C and Remote UNI-N. A UNI MEG is shown between Local UNI-C and Local UNI-N Under-Test.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct the local UNI-N under test to send Loopback Messages to the local UNI-C on the UNI-MEG. Use Tester 1 to monitor the LBM messages transmitted by the UNI-N under test and to verify that the protocol version number of the LBM messages destined to the local UNI-C on the UNI-MEG is always 0
Units	Protocol version number
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 56N: Generating Unicast LBM Frames – OpCode

Abstract Test Suite for Service OAM	
Test Name	Generating Unicast LBM Frames – OpCode
Test Definition ID	UNIN-R43 ⁵
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.4.3)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to generate Unicast LBM frames – OpCode validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The OpCode field specifies the format and meaning of the remainder of the CFM PDU. The value for LBM PDUs is (0x03)
Test Object	Verify that the OpCode value of the LBM frames generated by the UNI-N under test is (0x03)
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration for generating unicast LBM frames. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Local UNI-C (Tester 2) and Local UNI-N Under-Test (Tester 3) are connected to Operator A NE. Remote UNI-N (Tester 4) and Remote UNI-C (Tester 4) are connected to Operator B NE. A Monitor Mode block is connected to Local UNI-C. A Subscriber MEG and Test MEG are shown between Local UNI-C and Remote UNI-C. A UNI MEG is shown between Local UNI-C and Local UNI-N Under-Test.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct the local UNI-N under test to send Loopback Messages to the local UNI-C on the UNI-MEG. Use Tester 1 to monitor the LBM messages transmitted by the UNI-N under test and to verify that the OpCode of the LBM messages destined to the local UNI-C on the UNI-MEG is (0x03)
Units	OpCode value
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 57N: Generating Unicast LBM Frames – Flags

Abstract Test Suite for Service OAM	
Test Name	Generating Unicast LBM Frames – Flags
Test Definition ID	UNIN-R43 ⁶
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.7.1)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to generate Unicast LBM frames – Flags validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; In an LBM, the Flags field of the Common CFM Header is set to 0 by the transmitting MEP
Test Object	Verify that the Flags field bits of the LBM frames generated by the UNI-N under test that are set to 0
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. A Local UNI-C (Tester 2) is connected to a Local UNI-N (Under-Test) via a Monitor Mode block. A Remote UNI-N (Tester 4) is connected to a Remote UNI-C (Tester 4). A Simulated Service Provider Network connects the Operator A NE and Operator B NE. Arrows indicate the flow of UNI MEG and Subscriber MEG Test MEG frames.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct the local UNI-N under test to send Loopback Messages to the local UNI-C on the UNI-MEG. Use Tester 1 to monitor the LBM messages transmitted by the UNI-N under test and to verify that the Flags field bits of the LBM messages destined to the local UNI-C on the UNI-MEG are set to 0
Units	Flags field value
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 58N: Generating Unicast LBM Frames – First TLV Offset

Abstract Test Suite for Service OAM	
Test Name	Generating Unicast LBM Frames – First TLV Offset
Test Definition ID	UNIN-R43 ⁷
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.7.2)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to generate Unicast LBM frames – First TLV Offset validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The First TLV Offset field of the Common CFM Header in a LBM contains a value greater than or equal to 4
Test Object	Verify that the First TLV Offset field of the Common CFM Header in the LBM frames generated by the UNI-N under test contains a value greater than or equal to 4
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration for generating unicast LBM frames. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. The Subscriber NE on the left is connected to Operator A NE via a 'Monitor Mode' block. Operator A NE is connected to Operator B NE, which is then connected to the Subscriber NE on the right. Below these components, the network is divided into three sections: Local UNI-C (Tester 2), Local UNI-N Under-Test (Tester 3), and Remote UNI-N (Tester 4) and Remote UNI-C (Tester 4). Arrows indicate the flow of frames: a 'UNI MEG' frame is sent from the Local UNI-N Under-Test to the Local UNI-C, and a 'Test MEG' frame is sent from the Local UNI-N Under-Test to the Remote UNI-C.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct the local UNI-N under test to send Loopback Messages to the local UNI-C on the UNI-MEG. Use Tester 1 to monitor the LBM messages transmitted by the UNI-N under test and to verify that the First TLV Offset field of the LBM messages destined to the local UNI-C on the UNI-MEG contain a value greater than or equal to 4
Units	First TLV Offset field value
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 59N: Generating Unicast LBM Frames – Loopback Transaction Identifier

Abstract Test Suite for Service OAM	
Test Name	Generating Unicast LBM Frames – Loopback Transaction Identifier
Test Definition ID	UNIN-R43 ⁸
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.7.3)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to generate Unicast LBM frames – Loopback Transaction Identifier validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; A MEP copies the contents of the nextLBMtransID variable to the Loopback Transaction Identifier field of the LBM frames
Test Object	Verify that the Loopback Transaction Identifier field of the LBM frames generated by the UNI-N under test contains a copy of the nextLBMtransID variable
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct the local UNI-N under test to send Loopback Messages to the local UNI-C on the UNI-MEG. Use Tester 1 to monitor the LBM messages transmitted by the UNI-N under test and to verify that the Loopback Transaction Identifier field of the LBM messages destined to the local UNI-C on the UNI-MEG contain a copy of the nextLBMtransID variable
Units	Loopback Transaction Identifier field value
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 60N: Generating Unicast LBM Frames – Sender ID TLV

Abstract Test Suite for Service OAM	
Test Name	Generating Unicast LBM Frames – Sender ID TLV
Test Definition ID	UNIN-R43 ⁹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.3)
Test Type	Conformance
Test Status	Mandatory if Sender ID TLVs are supported
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to generate Unicast LBM frames – Sender ID TLV validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Sender ID TLV identifies the Bridge on which the transmitting MEP is configured, and may also include a management address for that Bridge. The Sender ID TLV Type is equal to (0x01) and the Length field is large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields
Test Object	Verify that the Sender ID TLV Type of the LBM frames generated by the UNI-N under test is equal to (0x01) and that the Sender ID Length field is large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct the local UNI-N under test to send Loopback Messages to the local UNI-C on the UNI-MEG. Use Tester 1 to monitor the LBM messages transmitted by the UNI-N under test and to verify that the Sender ID TLV Type field of the LBM messages destined to the local UNI-C on the UNI-MEG is equal to (0x01) and that the Sender ID Length field is large enough to contain all of the fields indicated as being present by the Chassis ID Length, Management Address Domain Length, and/or Management Address Length fields
Units	Sender ID TLV Type and Length values
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 61N: Generating Unicast LBM Frames – Chassis ID Length

Abstract Test Suite for Service OAM	
Test Name	Generating Unicast LBM Frames – Chassis ID Length
Test Definition ID	UNIN-R43 ¹⁰
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.3)
Test Type	Conformance
Test Status	Mandatory if Sender ID TLVs are supported
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to generate Unicast LBM frames – Chassis ID length validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The chassis ID length is the length, in octets, of the Chassis ID field, it is either 0, or is less than (TLV Length field value – 1)
Test Object	Verify that the Chassis ID length of the LBM frames generated by the UNI-N under test is either 0 or less than (TLV Length field value – 1)
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration for generating unicast LBM frames. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Local UNI-C (Tester 2) and Local UNI-N Under-Test (Tester 3) are connected to Operator A NE. Remote UNI-N (Tester 4) and Remote UNI-C (Tester 4) are connected to Operator B NE. A Simulated Service Provider Network connects Operator A NE and Operator B NE. Arrows indicate the flow of UNI MEG and Subscriber MEG Test MEG frames.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct the local UNI-N under test to send Loopback Messages to the local UNI-C on the UNI-MEG. Use Tester 1 to monitor the LBM messages transmitted by the UNI-N under test and to verify that the Chassis ID length of the LBM messages destined to the local UNI-C on the UNI-MEG is either 0 or less than (TLV Length field value – 1)
Units	Chassis ID length value
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 62N: Generating Unicast LBM Frames – Management Address Domain Field

Abstract Test Suite for Service OAM	
Test Name	Generating Unicast LBM Frames – Management Address Domain Field
Test Definition ID	UNIN-R43 ¹¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.3)
Test Type	Conformance
Test Status	Optional
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to generate Unicast LBM frames
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Management Address Domain Length field contains the length, in octets, of the Management Address Domain field. If 0, or if the TLV's Length field indicates that the Management Address Domain Length field is not present, then the Management Address Domain, Management Address Length, and Management Address fields are not present
Test Object	Verify that the Management Address Domain field of the LBM frames generated by the UNI-N under test is empty
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows three main network elements: Subscriber NE, Operator A NE, and Operator B NE. Subscriber NE contains a green box labeled 'Monitor Mode' and a yellow box labeled 'Local UNI-C (Tester 2)'. Operator A NE contains an orange box labeled 'Local UNI-N Under-Test' and a grey box labeled 'Tester 3'. Operator B NE contains a grey box labeled 'Remote UNI-N (Tester 4)' and a grey box labeled 'Remote UNI-C (Tester 4)'. A dashed line labeled 'Simulated Service Provider Network' connects Operator A NE and Operator B NE. Arrows indicate the flow of traffic: a blue arrow labeled 'UNI MEG' points from Local UNI-N Under-Test to Local UNI-C (Tester 2); a blue arrow labeled 'Test MEG' points from Local UNI-N Under-Test to Remote UNI-N (Tester 4). Below the network diagram, there are labels for 'Subscriber MEG' and 'Test MEG' with corresponding arrows.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct the local UNI-N under test to send Loopback Messages to the local UNI-C on the UNI-MEG. Use Tester 1 to monitor the LBM messages transmitted by the UNI-N under test and to verify that the Management Address Domain field of the LBM messages destined to the local UNI-C on the UNI-MEG is empty
Units	Management Address Domain field
Variables	None
Results	Pass or fail
Remarks	The Management Address Domain field SHOULD be empty in the Sender ID TLV by default as a security precaution (MEF Service OAM FM IA)

TEST CASE 63N: Generating Unicast LBM Frames – Management Address Field

Abstract Test Suite for Service OAM	
Test Name	Generating Unicast LBM Frames – Management Address Field
Test Definition ID	UNIN-R43 ¹²
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.3)
Test Type	Conformance
Test Status	Optional
MEF Requirement Description	A UNI-N Type 2 MEP implementation MUST be able to generate Unicast LBM frames
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Management Address length and the Management Address fields are not present if the Management Address Domain Length field is not present or contains a 0, or if the Management Address Length field is not present or contains a 0
Test Object	Verify that the Management Address field of the LBM frames generated by the UNI-N under test is empty
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration for generating unicast LBM frames. It shows a network topology with four main components: Subscriber NE (green), Operator A NE (orange), Operator B NE (grey), and Subscriber NE (grey). The Subscriber NE on the left is connected to the Operator A NE via a 'Monitor Mode' block. The Operator A NE is connected to the Operator B NE via a 'Simulated Service Provider Network'. The Operator B NE is connected to the Subscriber NE on the right. Below the network diagram, the components are labeled as 'Local UNI-C (Tester 2)', 'Local UNI-N Under-Test', 'Remote UNI-N (Tester 4)', and 'Remote UNI-C (Tester 4)'. Arrows indicate the flow of frames: a 'UNI MEG' frame is sent from the Local UNI-N Under-Test to the Local UNI-C (Tester 2), and a 'Test MEG' frame is sent from the Local UNI-N Under-Test to the Remote UNI-N (Tester 4).</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct the local UNI-N under test to send Loopback Messages to the local UNI-C on the UNI-MEG. Use Tester 1 to monitor the LBM messages transmitted by the UNI-N under test and to verify that the Management Address field of the LBM messages destined to the local UNI-C on the UNI-MEG is empty
Units	Management Address field
Variables	None
Results	Pass or fail
Remarks	The Management Address field SHOULD be empty in the Sender ID TLV by default as a security precaution (MEF Service OAM FM IA)

TEST CASE 64N: Generating Unicast LBM Frames – Data TLV

Abstract Test Suite for Service OAM	
Test Name	Generating Unicast LBM Frames – Data TLV
Test Definition ID	UNIN-R43 ¹³
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.6)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	UNI-N Type 2 MEP implementation MUST be able to generate Unicast LBM frames – Data TLV validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The Data TLV contains zero or more octets of arbitrary data and serves several purposes, including the transmission of different frame sizes to test MTU capabilities, and the testing for data-specific error dependencies. The Data TLV may be included in the Loopback Messages and the Data TLV Type is equal to (0x03)
Test Object	Verify that the Data TLV Type of the LBM frames generated by the UNI-N under test is equal to (0x03)
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. The Local UNI-C (Tester 2) is connected to the Local UNI-N (Under-Test) via a Monitor Mode block. The Remote UNI-N (Tester 4) and Remote UNI-C (Tester 4) are also shown. A Simulated Service Provider Network connects the Operator A NE and Operator B NE. A Subscriber MEG Test MEG is shown between the Local UNI-N and Remote UNI-N. A UNI MEG is shown between the Local UNI-C and Local UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct the local UNI-N under test to send Loopback Messages to the local UNI-C on the UNI-MEG. Use Tester 1 to monitor the LBM messages transmitted by the UNI-N under test and to verify that the Data TLV Type of the LBM messages destined to the local UNI-C on the UNI-MEG is equal to (0x03)
Units	Data TLV Type value
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 65N: Generating Unicast LBM Frames – Organization Specific TLV

Abstract Test Suite for Service OAM	
Test Name	Generating Unicast LBM Frames – Organization Specific TLV
Test Definition ID	UNIN-R43 ¹⁴
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.2)
Test Type	Conformance
Test Status	Mandatory if Organization TLVs are supported
MEF Requirement Description	UNI-N Type 2 MEP implementation MUST be able to generate Unicast LBM frames – Organization Specific TLV validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; Any organization can define TLVs for use in Connectivity Fault Management. The Organization TLV Type is equal to 31 (0x1F)
Test Object	Verify that the Organization TLV Type of the LBM frames generated by the UNI-N under test is equal to 31 (0x1F)
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct the local UNI-N under test to send Loopback Messages to the local UNI-C on the UNI-MEG. Use Tester 1 to monitor the LBM messages transmitted by the UNI-N under test and to verify that the Organization Specific TLV Type of the LBM messages destined to the local UNI-C on the UNI-MEG is equal to 31 (0x1F)
Units	Organization Specific TLV Type value
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 66N: Generating Unicast LBM Frames – End TLV

Abstract Test Suite for Service OAM	
Test Name	Generating Unicast LBM Frames – End TLV
Test Definition ID	UNIN-R43 ¹⁵
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (21.5.7)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	UNI-N Type 2 MEP implementation MUST be able to generate Unicast LBM frames – End TLV validation
IEEE Requirement Description	An implementation that conforms to the provisions of this standard for Connectivity Fault Management SHALL Transmit required CFM PDUs in the formats specified in Clause 21; The End TLV is required and is the last TLV in the CFM PDU and is Required. The End TLV Type is equal to (0x00)
Test Object	Verify that the End TLV Type of the LBM frames generated by the UNI-N under test is equal to (0x00)
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. A Local UNI-C (Tester 2) is connected to a Local UNI-N (Under-Test) via a Monitor Mode block. A Remote UNI-N (Tester 4) is connected to a Remote UNI-C (Tester 4). A Simulated Service Provider Network connects Operator A NE and Operator B NE. A Subscriber MEG (Test MEG) is shown between the Local UNI-C and the Remote UNI-C. A UNI MEG is shown between the Local UNI-C and the Local UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct the local UNI-N under test to send Loopback Messages to the local UNI-C on the UNI-MEG. Use Tester 1 to monitor the LBM messages transmitted by the UNI-N under test and to verify that the End TLV Type of the LBM messages destined to the local UNI-C on the UNI-MEG is equal to (0x00)
Units	End TLV Type value
Variables	None
Results	Pass or fail
Remarks	

16.4 UNI-N Type 2 Continuity Check Requirements

TEST CASE 67N: Administratively Enable and Disable CCM Transmission

Abstract Test Suite for Service OAM	
Test Name	Administratively Enable and Disable CCM Transmission
Test Definition ID	UNIN-R44 ¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MUST have the capability to administratively enable and disable CCM transmission on all local MEPs
Test Object	Verify that the UNI-N Type 2 under test has the capability to administratively enable and disable CCM transmission on all local MEPs
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that CCM frames are transmitted from the UNI-N MEP instance (verify MEP ID) and that the MEG-Level of the UNI-MEG is = "1". Disable CCM transmission on the UNI-MEG and verify that no CCMs are transmitted. Re-enable CCM transmission on the UNI-MEG and verify that CCM frames are transmitted from the UNI-N MEP instance (verify MEP ID) and that the MEG-Level of the UNI-MEG is = "1"
Units	MEP IDs MEG-Level values
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 68N: Mandatory CCM Frame Rate

Abstract Test Suite for Service OAM	
Test Name	Mandatory CCM Frame Rate
Test Definition ID	UNIN-R45 ¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MUST support a CCM frame rate of 1 frame per second
Test Object	Verify that the UNI-N Type 2 under test supports a CCM frame rate of 1 frame per second
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that the CCM Interval field of the CCM frames generated by the UNI-N under test contains the value 4. Also use Tester 2 to verify that the CCMs are received within the CCM maximum lifetime
Units	CCM frame rate
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 69N: Optional CCM Frame Rate

Abstract Test Suite for Service OAM	
Test Name	Optional CCM Frame Rate
Test Definition ID	UNIN-R45 ²
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2
Test Type	Conformance
Test Status	Optional
MEF Requirement Description	A UNI-N Type 2 MAY support other frame rates specified in section 7.1.1 of ITU-T Y.1731
ITU-T Requirement Description	When Ethernet Continuity Check is enabled, a MEP periodically transmits CCM frames as often as the configured transmission period. Transmission period can be one of the following seven values: 3.33ms, 10ms, 100ms, 1s, 10s, 1min or 10min
Test Object	Verify that the UNI-N Type 2 under test supports transmission periods of: 3.33ms, 10ms, 100ms, 10s, 1min or 10min
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Local UNI-C (Tester 2) and Local UNI-N (Under-Test) are connected to Operator A NE. Remote UNI-N (Tester 4) and Remote UNI-C (Tester 4) are connected to Operator B NE. A Simulated Service Provider Network connects Operator A NE and Operator B NE. Arrows indicate UNI MEG and Test MEG flows between the UNIs.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Configure the transmission period of the UNI-N under test MEP to 3.33ms. Use Tester 1 to monitor the Continuity Check Messages transmitted by the UNI-N under test and to verify that the CCM Interval field of the CCM frames contains the value 1. Also use Tester 2 to verify that the CCMs are received within the CCM maximum lifetime. Configure the transmission period of the UNI-N under test MEP to 10ms and repeat the test. Configure the transmission period of the UNI-N under test MEP to 100ms and repeat the test. Configure the transmission period of the UNI-N under test MEP to 10s and repeat the test. Configure the transmission period of the UNI-N under test MEP to 1min and repeat the test. Configure the transmission period of the UNI-N under test MEP to 10min and repeat the test.
Units	CCM frame rate
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 71N: UNI-N Counter – Number of CCM Frames Transmitted

Abstract Test Suite for Service OAM	
Test Name	UNI-N Counter – Number of CCM Frames Transmitted
Test Definition ID	UNIN-R49 ¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2
Test Type	Conformance
Test Status	Optional
MEF Requirement Description	A UNI-N Type 2 SHOULD support counters for each MEP that counts the number of CCM frames transmitted
Test Object	Verify that the UNI-N Type 2 under test supports counters for each MEP that counts the number of CCM frames transmitted
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. On the left, a 'Subscriber NE' (Local UNI-C) contains a 'Monitor Mode' box and is associated with 'Tester 1' and 'Tester 2'. This connects to 'Operator A NE' (Local UNI-N Under-Test), which is associated with 'Tester 3'. Both are part of a 'Simulated Service Provider Network'. This network connects to 'Operator B NE' (Remote UNI-N) and another 'Subscriber NE' (Remote UNI-C), associated with 'Tester 4'. Arrows show 'UNI MEG' frames originating from the Local UNI-C and 'Test MEG' frames being received at the Remote UNI-C.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Reset the UNI-N under test counters. Enable CCM transmission on the UNI-MEG and use Tester 1 to monitor and count the Continuity Check Messages transmitted by the UNI-N under test. Disable CCM transmission on the UNI-MEG and verify that the number of CCMs with MEG-Level = 1 counted by the Tester 1 is equal to the number of CCM frames transmitted indicated by the UNI-C MEP counter for the UNI-MEG
Units	Number of CCM frames
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 72N: Lowest Priority CC Defect – DefRDICCM

Abstract Test Suite for Service OAM	
Test Name	Lowest Priority CC Defect – DefRDICCM
Test Definition ID	UNIN-R51 ¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.1.2)
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	A UNI-N Type 2 MEP MUST support the minimum CC fault priority level defined in IEEE 802.1ag for which a CC alarm will be generated. An alarm will be generated only if the fault has equal or greater priority than this minimum fault level
IEEE Requirement Description	A number of separate defects are maintained by a MEP. The defects are ranked by priority. If a higher priority defect occurs after a lower priority defect has triggered a Fault Alarm, but before the Fault Alarm has reset, then the MEP will immediately issue another Fault Alarm. Only the highest-priority defect is reported in the Fault Alarm
Test Object	Verify that if a higher priority defect occurs after a lower priority defect has triggered a Fault Alarm, but before the Fault Alarm has reset, then the MEP will immediately issue another Fault Alarm. Only the highest-priority defect is reported in the Fault Alarm. (No defect vs DefRDICCM)
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows three main network elements: Subscriber NE, Operator A NE, and Operator B NE. A 'Simulated Service Provider Network' connects them. On the Subscriber NE side, there is a 'Local UNI-C (Tester 2)' and a 'Monitor Mode' block. On the Operator A NE side, there is a 'Local UNI-N Under-Test'. On the Operator B NE side, there are 'Remote UNI-N' and 'Remote UNI-C (Tester 4)'. Arrows indicate the flow of 'UNI MEG' (orange) and 'Test MEG' (grey) frames between the UNIs.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Clear all alarms. Use Tester 2 to stop transmitting CCMs to the UNI-N under test on the UNI-MEG. Use Tester 1 to monitor the CCMs transmitted by the UNI-N under test and to verify that the RDI bit of the Flags field is set in all messages and use the management system of the UNI-N under test to verify that the DefRDICCM defect triggers a Fault Alarm
Units	Fault Alarm hierarchy
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 73N: CC Defect & Fault Alarm Hierarchy – DefRDICCM vs DefMACstatus

Abstract Test Suite for Service OAM	
Test Name	CC Defect & Fault Alarm Hierarchy – DefRDICCM vs DefMACstatus
Test Definition ID	UNIN-R50 ¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.1.2)
Test Type	Conformance
Test Status	Optional
MEF Requirement Description	A UNI-N Type 2 SHOULD support the CC defect and fault alarm hierarchy per clause 20.1.2 of IEEE 802.1ag. If this is supported, the highest priority alarm MUST be made available to management and SHOULD mask lower priority alarms
IEEE Requirement Description	A number of separate defects are maintained by a MEP. The defects are ranked by priority. If a higher priority defect occurs after a lower priority defect has triggered a Fault Alarm, but before the Fault Alarm has reset, then the MEP will immediately issue another Fault Alarm. Only the highest-priority defect is reported in the Fault Alarm
Test Object	Verify that if a higher priority defect occurs after a lower priority defect has triggered a Fault Alarm, but before the Fault Alarm has reset, then the MEP will immediately issue another Fault Alarm. Only the highest-priority defect is reported in the Fault Alarm. (DefRDICCM vs DefMACstatus)
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. A Simulated Service Provider Network connects Operator A NE and Operator B NE. Local UNI-C (Tester 2) is connected to Operator A NE. Local UNI-N (Under-Test) is connected to Operator A NE. Remote UNI-N (Tester 4) is connected to Operator B NE. Remote UNI-C (Tester 4) is connected to Operator B NE. A Monitor Mode block is shown between Subscriber NE and Operator A NE. Arrows indicate the flow of UNI MEG and Test MEG frames.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Clear all alarms. Use Tester 2 to stop transmitting CCMs to the UNI-N under test on the UNI-MEG and use the management system to verify that the DefRDICCM defects trigger Fault Alarms on the local UNI-N MEP. Before the CC fault reset time expires, use Tester 2 to send CCMs with Port Status TLV values equal to “psBlocked” (0x01) or with Interface TLV values not equal to “isUp” (0x01) to the UNI-N under test on the UNI-MEG and use the management system to verify that the DefMACstatus defects trigger new Fault Alarms on the local UNI-N MEP and that the lower priority alarms are masked by the new ones
Units	Fault Alarm hierarchy
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 74N: CC Defect & Fault Alarm Hierarchy – DefMACstatus vs DefRemoteCCM

Abstract Test Suite for Service OAM	
Test Name	CC Defect & Fault Alarm Hierarchy – DefMACstatusCCM vs DefRemoteCCM
Test Definition ID	UNIN-R50 ²
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.1.2)
Test Type	Conformance
Test Status	Optional
MEF Requirement Description	A UNI-N Type 2 SHOULD support the CC defect and fault alarm hierarchy per clause 20.1.2 of IEEE 802.1ag. If this is supported, the highest priority alarm MUST be made available to management and SHOULD mask lower priority alarms
IEEE Requirement Description	A number of separate defects are maintained by a MEP. The defects are ranked by priority. If a higher priority defect occurs after a lower priority defect has triggered a Fault Alarm, but before the Fault Alarm has reset, then the MEP will immediately issue another Fault Alarm. Only the highest-priority defect is reported in the Fault Alarm
Test Object	Verify that if a higher priority defect occurs after a lower priority defect has triggered a Fault Alarm, but before the Fault Alarm has reset, then the MEP will immediately issue another Fault Alarm. Only the highest-priority defect is reported in the Fault Alarm. (DefMACstatus vs DefRemoteCCM)
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main entities: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Below these, specific components are identified: Local UNI-C (Tester 2), Local UNI-N (Under-Test), Remote UNI-N, and Remote UNI-C. A 'Simulated Service Provider Network' connects Operator A NE and Operator B NE. Arrows indicate the flow of 'UNI MEG' and 'Test MEG' frames between the local and remote UNI-N and UNI-C components.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Clear all alarms. Use Tester 2 to send CCMs with Port Status TLV values equal to "psBlocked" (0x01) or with Interface TLV values not equal to "isUp" (0x01) to the UNI-N under test on the UNI-MEG and use the management system to verify that the DefMACstatus defects trigger Fault Alarms on the local UNI-N MEP. Before the CC fault reset time expires, use Tester 2 to send CCMs with the RDI bit of the Flags field set to the UNI-N under test on the UNI-MEG and use the management system to verify that the DefRemoteCCM status defects trigger new Fault Alarms on the local UNI-N MEP and that the lower priority alarms are masked by the new ones
Units	Fault Alarm hierarchy
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 75N: CC Defect & Fault Alarm Hierarchy – DefRemoteCCM vs DefErrorCCM

Abstract Test Suite for Service OAM	
Test Name	CC Defect & Fault Alarm Hierarchy – DefRemoteCCM vs DefErrorCCM
Test Definition ID	UNIN-R50 ³
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.1.2)
Test Type	Conformance
Test Status	Optional
MEF Requirement Description	A UNI-N Type 2 SHOULD support the CC defect and fault alarm hierarchy per clause 20.1.2 of IEEE 802.1ag. If this is supported, the highest priority alarm MUST be made available to management and SHOULD mask lower priority alarms
IEEE Requirement Description	A number of separate defects are maintained by a MEP. The defects are ranked by priority. If a higher priority defect occurs after a lower priority defect has triggered a Fault Alarm, but before the Fault Alarm has reset, then the MEP will immediately issue another Fault Alarm. Only the highest-priority defect is reported in the Fault Alarm
Test Object	Verify that if a higher priority defect occurs after a lower priority defect has triggered a Fault Alarm, but before the Fault Alarm has reset, then the MEP will immediately issue another Fault Alarm. Only the highest-priority defect is reported in the Fault Alarm. (DefRemoteCCM vs DefErrorCCM)
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main entities: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. A 'Simulated Service Provider Network' connects Operator A NE and Operator B NE. On the left, a 'Subscriber NE' (green box) is connected to a 'Monitor Mode' block (yellow box), which is connected to 'Local UNI-C (Tester 2)' (green box). This Local UNI-C is connected to 'Operator A NE' (orange box). 'Operator A NE' is connected to 'Local UNI-N (Under-Test)' (orange box). 'Operator A NE' is also connected to the 'Simulated Service Provider Network'. The 'Simulated Service Provider Network' connects to 'Operator B NE' (grey box). 'Operator B NE' is connected to 'Remote UNI-N (Tester 4)' (grey box) and 'Remote UNI-C (Tester 4)' (grey box). Arrows indicate the flow of frames: 'UNI MEG' (orange arrow) flows from Local UNI-C to Local UNI-N. 'Subscriber MEG Test MEG' (purple arrow) flows from Local UNI-N to Remote UNI-N. 'Subscriber MEG Test MEG' (purple arrow) also flows from Remote UNI-N to Remote UNI-C.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Clear all alarms. Use Tester 2 to send CCMs with the RDI bit of the Flags field set to the UNI-N under test on the UNI-MEG and use the management system to verify that the DefRemoteCCM defects trigger Fault Alarms on the local UNI-N MEP. Before the CC fault reset time expires, use Tester 2 to send invalid CCMs (with a multicast source address) to the UNI-N under test on the UNI-MEG and use the management system to verify that the DefErrorCCM status defects trigger new Fault Alarms on the local UNI-N MEP and that the lower priority alarms are masked by the new ones
Units	Fault Alarm hierarchy
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 76N: CC Defect & Fault Alarm Hierarchy – DefErrorCCM vs DefXconCCM

Abstract Test Suite for Service OAM	
Test Name	CC Defect & Fault Alarm Hierarchy – DefErrorCCM vs DefXconCCM
Test Definition ID	UNIN-R50 ⁴
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.1.2)
Test Type	Conformance
Test Status	Optional
MEF Requirement Description	A UNI-N Type 2 SHOULD support the CC defect and fault alarm hierarchy per clause 20.1.2 of IEEE 802.1ag. If this is supported, the highest priority alarm MUST be made available to management and SHOULD mask lower priority alarms
IEEE Requirement Description	A number of separate defects are maintained by a MEP. The defects are ranked by priority. If a higher priority defect occurs after a lower priority defect has triggered a Fault Alarm, but before the Fault Alarm has reset, then the MEP will immediately issue another Fault Alarm. Only the highest-priority defect is reported in the Fault Alarm
Test Object	Verify that if a higher priority defect occurs after a lower priority defect has triggered a Fault Alarm, but before the Fault Alarm has reset, then the MEP will immediately issue another Fault Alarm. Only the highest-priority defect is reported in the Fault Alarm. (DefErrorCCM vs DefXconCCM)
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. A Simulated Service Provider Network connects Operator A NE and Operator B NE. Local UNI-C (Tester 2) is connected to Operator A NE. Local UNI-N (Under-Test) is connected to Operator A NE. Remote UNI-N (Tester 4) is connected to Operator B NE. Remote UNI-C (Tester 4) is connected to Operator B NE. A Monitor Mode block is connected to Local UNI-C. Arrows indicate UNI MEG and Subscriber MEG Test MEG flows.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Clear all alarms. Use Tester 2 to send invalid CCMs (with a multicast source address) to the UNI-N under test on the UNI-MEG and use the management system to verify that the DefErrorCCM defects trigger Fault Alarms on the local UNI-N MEP. Before the CC fault reset time expires, use Tester 2 to send CCMs with a valid but unknown Short MA Name to the UNI-N under test on the UNI-MEG and use the management system to verify that the DefXconCCM status defects trigger new Fault Alarms on the local UNI-N MEP and that the lower priority alarms are masked by the new ones
Units	Fault Alarm hierarchy
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 77N: CC Fault Alarm Time & CC Fault Reset Time

Abstract Test Suite for Service OAM	
Test Name	CC Fault Alarm Time & CC Fault Reset Time
Test Definition ID	UNIN-R52 ¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2 IEEE 802.1ag (20.1.2)
Test Type	Conformance
Test Status	Mandatory if IEEE clause 12.14 7 (Maintenance association End Point managed object) is implemented
MEF Requirement Description	A UNI-N Type 2 MEP MUST support a CC fault Alarm time and a CC Fault Reset Time
IEEE Requirement Description	A Fault Alarm is issued when the MEP Fault Notification Generator state machine detects that a configured time period (default, 2.5s) has passed with one or more defects indicated, and Fault Alarms are enabled. The state machine can transmit no further Fault Alarms until it is reset by the passage of a configured time period (default, 10s) during which no defect indication is present
Test Object	Verify that the UNI-N Type 2 MEP under test supports a CC fault Alarm time and a CC Fault Reset Time
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Enable CCM transmission on the UNI-MEG. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	If IEEE clause 12.14 7 (Maintenance association End Point managed object) is implemented, verify that the variable someRMEPCCMdefect is cleared and clear all alarms. Use Tester 2 to stop transmitting CCMs to the UNI-N under test on the UNI-MEG. Use the management system of the UNI-N under test to verify that 2.5 seconds after the variable someRMEPCCMdefect changes from clear to set and the DefRemoteCCM is triggered, a Fault alarm is transmitted. Use Tester 2 to start transmitting CCMs to the UNI-N under test on the UNI-MEG and verify that the variable someRMEPCCMdefect changes from set to clear. Use the management system of the UNI-N under test to verify that 10 seconds after the variable someRMEPCCMdefect changes from set to clear the Fault alarm is cleared
Units	CC Fault Alarm & CC Fault Reset times
Variables	None
Results	Pass or fail
Remarks	

16.5 UNI-N Type 2 Loopback Requirements

TEST CASE 78N: Administratively Initiate & Stop Loopback Sessions

Abstract Test Suite for Service OAM	
Test Name	Administratively Initiate & Stop Loopback Sessions
Test Definition ID	UNIN-R53 ¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	Each LB session MUST have the ability to be administratively initiated and stopped
Test Object	Verify that the UNI-N Type 2 under test has the ability to administratively initiate and stop LB sessions
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. On the left, a 'Subscriber NE' (green box) is connected to a 'Local UNI-C (Tester 2)' (yellow box labeled 'Monitor Mode'). This is connected to an 'Operator A NE' (orange box), which is the 'Local UNI-N Under-Test'. This is connected to an 'Operator B NE' (grey box), which is connected to a 'Remote UNI-N (Tester 4)' and a 'Remote UNI-C (Tester 4)'. A 'Simulated Service Provider Network' connects Operator A NE and Operator B NE. Arrows show 'UNI MEG' (orange) and 'Test MEG' (grey) frames being sent from the local UNI-N to the local UNI-C and from the remote UNI-N to the remote UNI-C.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct the local UNI-N under test to send Loopback Messages (repeatedly until aborted) to the local UNI-C on the UNI-MEG. Use Tester 1 to verify that LBM frames are transmitted from the UNI-N MEP instance (verify MEP ID) and that the MEG-Level of the UNI-MEG is = "1". Instruct the local UNI-N under test to abort the loopback session on the UNI-MEG and use Tester 1 to verify that no LBMs are transmitted. Instruct the local UNI-N under test to send Loopback Messages to the local UNI-C on the UNI-MEG. Use Tester 1 to verify that LBM frames are transmitted from the UNI-N MEP instance (verify MEP ID) and that the MEG-Level of the UNI-MEG is = "1"
Units	MEP IDs MEG-Level values
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 80N: Configurable Number of LBM Transmissions per Session

Abstract Test Suite for Service OAM	
Test Name	Configurable Number of LBM Transmissions per Session
Test Definition ID	UNIN-R56 ¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	For each LB session, the number of LBM transmissions MUST be configurable
Test Object	Verify that for each LB session, the number of LBM transmissions is configurable
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows three main network elements: Subscriber NE, Operator A NE, and Operator B NE. Subscriber NE contains a Local UNI-C (labeled as Tester 2) and a Local UNI-N (labeled as Under-Test). Operator A NE is connected to both Local UNI-C and Local UNI-N. Operator B NE contains a Remote UNI-N (labeled as Tester 4) and a Remote UNI-C (labeled as Tester 4). A Simulated Service Provider Network connects Operator A NE and Operator B NE. A Monitor Mode block is connected to Local UNI-C. Arrows indicate the flow of UNI MEG and Test MEG frames between the local and remote UNI-C and UNI-N instances.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct the local UNI-N under test to send 3 Loopback Messages to the local UNI-C on the UNI-MEG. Use Tester 1 to verify that LBM frames are transmitted from the UNI-N MEP instance (verify MEP ID) and that the MEG-Level of the UNI-MEG is = "1". Instruct the local UNI-N under test to send 1024 Loopback Messages to the local UNI-C on the UNI-MEG. Use Tester 1 to verify that LBM frames are transmitted from the UNI-N MEP instance (verify MEP ID) and that the MEG-Level of the UNI-MEG is = "1". Instruct the local UNI-N under test to send Loopback Messages (repeatedly until aborted) to the local UNI-C on the UNI-MEG. Use Tester 1 to verify that LBM frames are transmitted from the UNI-N MEP instance (verify MEP ID) and that the MEG-Level of the UNI-MEG is = "1"
Units	MEP IDs MEG-Level values
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 81N: Configurable Interval between LBM Transmissions

Abstract Test Suite for Service OAM	
Test Name	Configurable Interval between LBM Transmissions
Test Definition ID	UNIN-R57 ¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	For each LB session, the interval between LBM transmissions MUST be configurable
Test Object	Verify that for each LB session, the interval between LBM transmissions is configurable
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE (green), Operator A NE (orange), Operator B NE (grey), and Subscriber NE (grey). Local UNI-C (Tester 2) and Local UNI-N (Under-Test) are connected to Operator A NE. Remote UNI-N and Remote UNI-C (Tester 4) are connected to Operator B NE. A Simulated Service Provider Network connects Operator A NE and Operator B NE. Arrows indicate the flow of UNI MEG and Subscriber MEG Test MEG frames.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct the local UNI-N under test to send 3 Loopback Messages with a period of 1 second to the local UNI-C on the UNI-MEG. Use Tester 1 to verify that the interval between LBM transmissions is 1 second. Instruct the local UNI-N under test to send 3 Loopback Messages at an interval of 'T' seconds with ('T' > 1) to the local UNI-C on the UNI-MEG. Use Tester 1 to verify that the interval between LBM transmissions is equal to 'T' seconds.. Instruct the local UNI-N under test to send 3 Loopback Messages with a period of 0 second (send the next LBM upon receipt of last LBR) to the local UNI-C on the UNI-MEG. Using the MEP counters, verify that the total number of (LBMs transmitted) is never greater than the number of (LBRs received +1)
Units	LBM transmissions interval and number of LBM and LBR frames
Variables	Interval between LBM transmissions
Results	Pass or fail
Remarks	

TEST CASE 82N: Configurable Timeout after a LBM Transmission

Abstract Test Suite for Service OAM	
Test Name	Configurable Timeout after a LBM Transmission
Test Definition ID	UNIN-R58 ¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2
Test Type	Conformance
Test Status	Optional
MEF Requirement Description	For each LB session, the timeout after a LBM transmission, for an expected LBR result MAY be configurable
Test Object	Verify that for each LB session, the timeout after a LBM transmission, for an expected LBR result is configurable
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Local UNI-C (Tester 2) and Local UNI-N (Under-Test) are connected to Operator A NE. Remote UNI-N (Tester 4) and Remote UNI-C (Tester 4) are connected to Operator B NE. A Monitor Mode box is connected to Local UNI-C. Arrows indicate the flow of UNI MEG and Test MEG frames between the UNIs.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct the local UNI-N under test to send 3 Loopback Messages with a period of 0 second (send the next LBM upon receipt of last LBR) and with a timeout of 5 seconds to the local UNI-C on the UNI-MEG. Instruct the local UNI-C (Tester 2) not to respond to any of the received LBMs. Use Tester 1 to monitor the LBMs sent by the UNI-N under test and to verify that the interval between LBM transmissions is at least 5 seconds
Units	LBM transmissions interval
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 83N: Configurable LBM Frame Size

Abstract Test Suite for Service OAM	
Test Name	Configurable LBM Frame Size
Test Definition ID	UNIN-R59 ¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	For each LB session, the size of the LBM frame MUST be configurable. This requires that the optional Data TLV MUST be supported to allow for frames up to the MTU size
Test Object	Verify that for each LB session, the size of the LBM frame is configurable and that the optional Data TLV is supported to allow for frames up to the MTU size
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Local UNI-C (Tester 2) and Local UNI-N (Under-Test) are connected to Operator A NE. Remote UNI-N and Remote UNI-C are connected to Operator B NE. A 'Simulated Service Provider Network' connects Operator A NE and Operator B NE. A 'Monitor Mode' box is connected to Local UNI-C. Arrows indicate 'Subscriber MEG' and 'Test MEG' paths. A 'UNI MEG' label is at the bottom.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Instruct the local UNI-N under test to send three 64-byte Loopback Messages to the local UNI-C on the UNI-MEG. Use Tester 1 to monitor the LBMs sent by the UNI-N under test and to verify that the LBM frame size is 64 bytes. Instruct the local UNI-N under test to send three Loopback Messages (frame size equal to the maximum transmission unit of the UNI) to the local UNI-C on the UNI-MEG. Use Tester 1 to monitor the LBMs sent by the UNI-N under test and to verify that the LBM frame size is equal to the maximum transmission unit of the EVC
Units	LBM frame size
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 84N: UNI-N Counter – Number of LBM Frames Transmitted

Abstract Test Suite for Service OAM	
Test Name	UNI-N Counter – Number of LBM Frames Transmitted
Test Definition ID	UNIN-R60 ¹
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	For each LB session, counters for LBM frames transmitted MUST be maintained
Test Object	Verify that the UNI-N Type 2 under test maintains counters for each MEP that counts the number of LBM frames transmitted
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. A Simulated Service Provider Network connects Operator A NE and Operator B NE. Local UNI-C (Tester 2) is connected to Operator A NE. Local UNI-N (Under-Test) is connected to Operator A NE. Remote UNI-N (Tester 4) is connected to Operator B NE. Remote UNI-C (Tester 4) is connected to Operator B NE. A Monitor Mode box is connected to Local UNI-C. A Subscriber MEG and Test MEG are shown as arrows between Local UNI-C and Remote UNI-N. A UNI MEG is shown as an arrow between Local UNI-C and Local UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Reset the UNI-N under test counters. Instruct the local UNI-N under test to send 3 Loopback Messages to the local UNI-C on the UNI-MEG and use Tester 1 to monitor and count the LBMs transmitted by the UNI-N under test. Verify that the number of LBMs with MEG-Level = 1 counted by the Tester 1 is equal to the number of LBM frames transmitted indicated by the UNI-N MEP counter for the UNI-MEG
Units	Number of LBM frames
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 85N: UNI-N Counter – Number of LBM Frames Received

Abstract Test Suite for Service OAM	
Test Name	UNI-N Counter – Number of LBM Frames Received
Test Definition ID	UNIC-R60 ²
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	For each LB session, counters for LBM frames Received MUST be maintained
Test Object	Verify that the UNI-N Type 2 under test maintains counters for each MEP that counts the number of LBM frames received
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Below these, there are four UNI instances: Local UNI-C (Tester 2), Local UNI-N (Under-Test), Remote UNI-N, and Remote UNI-C. A 'Monitor Mode' block is connected to Local UNI-C. A 'Subscriber MEG' and 'Test MEG' are indicated between Local UNI-C and Local UNI-N. A 'UNI MEG' is indicated between Local UNI-C and Remote UNI-N. The diagram also shows a 'Simulated Service Provider Network' connecting Operator A NE and Operator B NE.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Reset the UNI-N under test counters. Instruct the local UNI-C (Tester 2) to send 3 Loopback Messages to the UNI-N under test on the UNI-MEG. Use Tester 1 to monitor and count the LBMs transmitted by the local UNI-C (Tester 2). Verify that the number of LBMs with MEG-Level = 1 counted by the Tester 1 is equal to the number of LBM frames received indicated by the UNI-N MEP counter for the UNI-MEG
Units	Number of LBM frames
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 86N: UNI-N Counter – Number of LBR Frames Received

Abstract Test Suite for Service OAM	
Test Name	UNI-N Counter – Number of LBR Frames Received
Test Definition ID	UNIN-R60 ³
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	For each LB session, counters for LBR frames Received MUST be maintained
Test Object	Verify that the UNI-C Type 2 under test maintains counters for each MEP that counts the number of LBR frames received
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. Local UNI-C (Tester 2) is connected to Operator A NE. Local UNI-N Under-Test is also connected to Operator A NE. Remote UNI-N and Remote UNI-C (Tester 4) are connected to Operator B NE. A Monitor Mode block is connected to Local UNI-C. A Subscriber MEG and Test MEG are shown between Local UNI-C and Remote UNI-N. A UNI MEG is shown between Local UNI-C and Local UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Reset the UNI-N under test counters. Instruct the local UNI-N under test to send 3 Loopback Messages to the local UNI-C on the UNI-MEG and use Tester 1 to monitor and count the LBMs transmitted by the UNI-N under test and also count the number of LBRs transmitted by the local UNI-C (Tester 2). Verify that the number of LBRs with MEG-Level = 1 counted by the Tester 1 is equal to the number of LBR frames received indicated by the UNI-N MEP counter for the UNI-MEG
Units	Number of LBR frames
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 87N: UNI-N Statistic – Percentage of Unanswered LB Requests (Lost LBM/LBR)

Abstract Test Suite for Service OAM	
Test Name	UNI-N Statistic – Percentage of Unanswered LB Requests (Lost LBM/LBR)
Test Definition ID	UNIN-R60 ⁴
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	For each LB session, statistics on the percentage of unanswered LB requests (lost LBM/LBR) MUST be maintained
Test Object	Verify that the UNI-N Type 2 under test maintains statistics on the percentage of unanswered LB requests (lost LBM/LBR)
Test Configuration	Configure a UNI-MEG with a MEG-Level = "1", with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a sequence of network elements: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. A Local UNI-C (Tester 2) is connected to a Local UNI-N (Under-Test) via a Monitor Mode block. A Remote UNI-N (Tester 4) is connected to a Remote UNI-C (Tester 4). A Subscriber MEG and Test MEG are shown between the Local UNI-N and Remote UNI-N. A UNI MEG is shown between the Local UNI-C and Local UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	<p>Reset the UNI-N under test counters and statistics. Instruct the local UNI-N under test to send 3 Loopback Messages to the local UNI-C on the UNI-MEG and use Tester 1 to verify that the number of LBMs transmitted by the UNI-N under test and is equal to the number of LBRs transmitted by the local UNI-C (Tester 2). Verify that the percentage of unanswered LB requests is 0% for the UNI-N under test MEP.</p> <p>DO NOT Reset the UNI-N under test counters and statistics. Instruct the local UNI-N under test to send 3 Loopback Messages to the local UNI- on the UNI-MEG and instruct the local UNI-C (Tester 2) not to respond to any of the received LBMs. Verify that the percentage of unanswered LB requests is 50% for the UNI-N under test MEP. Reset the UNI-N under test counters and statistics. Instruct the local UNI-N under test to send 3 Loopback Messages to the local UNI-C on the UNI-MEG and instruct the local UNI-C (Tester 2) not to respond to any of the received LBMs. Verify that the percentage of unanswered LB requests is 100% for the UNI-N under test MEP</p>
Units	Percentage of unanswered LB requests
Variables	None
Results	Pass or fail
Remarks	

TEST CASE 88N: UNI-N Statistic – Minimum, Maximum & Average Round-Trip Latency

Abstract Test Suite for Service OAM	
Test Name	UNI-N Statistic – Minimum, Maximum & Average Round-Trip Latency
Test Definition ID	UNIN-R60 ⁵
Reference Document	MEF 20 UNI Type 2 Implementation Agreement Section 10.2
Test Type	Conformance
Test Status	Mandatory
MEF Requirement Description	For each LB session, statistics on the minimum, maximum and average round-trip latency MUST be maintained
Test Object	Verify that the UNI-N Type 2 under test maintains statistics on the minimum, maximum and average round-trip latency
Test Configuration	Configure a UNI-MEG with a MEG-Level = “1”, with a unique MAID. Configure MEP instances on the local UNI-C and the local UNI-N with specific MEP IDs. Tester 1 with proper PHYs that match the UNIs is monitoring the Service OAM frames
Test Configuration Schematic	<p>The diagram illustrates the test configuration. It shows a network topology with four main components: Subscriber NE, Operator A NE, Operator B NE, and Subscriber NE. A Local UNI-C (Tester 2) is connected to a Local UNI-N (Under-Test) via a Monitor Mode block. A Remote UNI-N (Tester 4) is connected to a Remote UNI-C (Tester 4). A Simulated Service Provider Network connects the Operator A NE and Operator B NE. A Subscriber MEG and Test MEG are shown as paths between the Local UNI-C and Remote UNI-N.</p>
CE-VLAN ID/EVC Map	Not Specified
Test Procedure	Reset the UNI-N under test counters and statistics. Instruct the local UNI-N under test to send Loopback Messages (repeatedly until aborted) to the local UNI-C on the UNI-MEG for a period of time T and verify the UNI-N under test maintains statistics on the minimum, maximum and average round-trip latency
Units	Minimum, maximum and average round-trip latency
Variables	None
Results	Pass or fail
Remarks	

17. References

References	Details
UNI Type 2 IA	MEF 20 [UNI Type 2 Implementation Agreement]
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