

Agilent N2X

MEF Conformance Test Suites

N5590A & N5591A

Technical Data Sheet



Industry-first MEF 9 and MEF 14 Conformance Test suites provide comprehensive verification of Carrier Ethernet service specification at the UNI, thereby accelerating deployment.

Key Features

- **Comprehensive conformance testing to MEF 9 & MEF 14 specifications**
- **Significantly reduce the overall test-effort investment with predefined test cases**
- **Validate E-Line & E-LAN service transparency and traffic management**
- **Clear verdict assignment for each test case to allow faster problem isolation**

Product Overview

Agilent N2X is the industry's most comprehensive test solution for testing the development and deployment of network services for converging network infrastructures. Network equipment manufacturers and service providers that already use N2X to validate the performance of their multi-service network equipment can now quickly verify conformance to the MEF specifications and thereby accelerate the deployment of new revenue-generating Ethernet services.

N2X Productivity Advantage provides a rich set of automation tools like the MEF Conformance Test Suites (CTS) to save many months of test engineering effort. The test suites allow users to verify Carrier Ethernet services more efficiently and strengthen the testing capabilities offered by N2X Packets and Protocols application.

Agilent N2X delivers two distinct industry-first conformance test suites:

- N5590A – MEF 9 Conformance Test Suite
- N5591A – MEF 14 Conformance Test Suite

The Agilent N2X N5590A MEF 9 CTS provides more than 260 test cases for E-Line and E-LAN, verifying the conditions that need to be met in order for a device to comply with the cornerstone MEF 10 specification.

The N2X N5591A MEF 14 CTS provides 170 test cases for Frame Delay, Frame Delay Variation, Frame Loss Ratio, and Bandwidth Profile Rate Enforcement, verifying the ability of a device to meet the Service Performance and Bandwidth Profile Ethernet Service Attributes specified in MEF 10.

The N2X MEF Conformance Test Suites greatly enhance user productivity by:

- Sparing the user many months of engineering effort required to develop and maintain their own test applications;
- Providing a high quality, independent validation tool. Test engineers can focus on resolving implementation problems in the network equipment instead of debugging the test setup;
- Enabling rapid completion of complex test plans for faster problem resolution and further regression testing as users' products evolve;
- Pre-qualifying equipment prior to submission for formal MEF Certification Program approval;
- Post-certification regression testing by equipment vendors following software changes and by service providers following network upgrades to ensure continued compliance and interoperability.

The N2X solution is implemented in an easily extensible framework that enables additional conformance tests to be added in the future.

Relevant Specifications

N5590A – MEF 9 Conformance

Test Suite

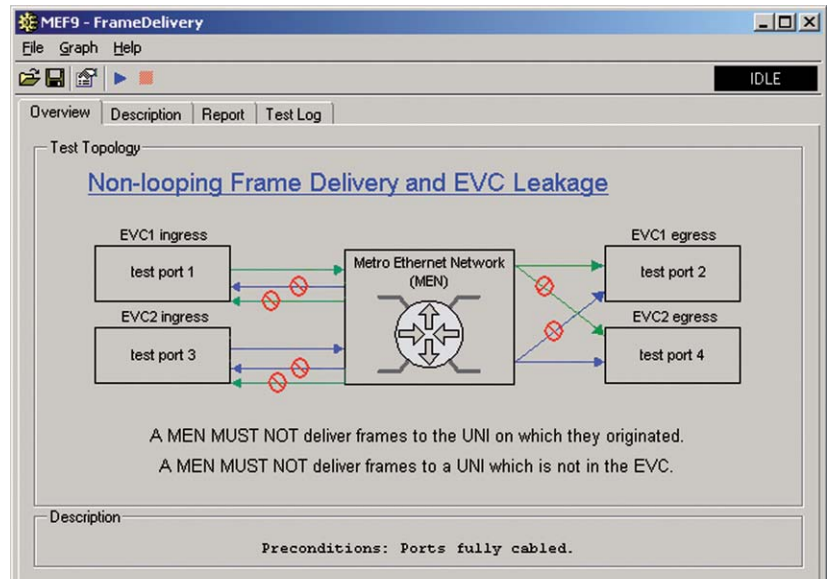
The N5590A implements all 260 test cases specified by MEF 9. Within each broad test case, various parameters can be set to implement a total of over 260 individual tests that mirror all aspects of the MEF 9 specification, as defined in the test plan for Ethernet Services at the UNI v1.4 (Iometrix, Inc. 7 July 2005)

Abstract Test Cases for Ethernet Services at the UNI for EVC Service Attributes

- Test Case 1: Non-looping Frame Delivery
- Test Case 2: EVC Leakage
- Test Case 3: Single Copy Broadcast, Multicast, Unknown DA Frame Delivery in MP-to-MP EVC
- Test Case 4: Service Frame with Invalid FCS Discard
- Test Case 5: Service Frame Discard Layer 2 Control Protocols
- Test Case 6: Service Frame Conditional Delivery
- Test Case 7: Service Frame Transparency Tag Exception 1
- Test Case 8: Service Frame Transparency Tag Exception 2
- Test Case 9: Service Frame Transparency Tag Exception 3
- Test Case 10: CE-VLAN ID Preservation Untagged
- Test Case 11: CE-VLAN ID Preservation Tagged
- Test Case 12: CE-VLAN CoS Preservation
- Test Case 13: EVC Layer 2 Control Protocol Processing

Abstract Test Cases for Ethernet Services at the UNI for UNI Service Attributes

- Test Case 14: UNI Physical Layer
- Test Case 15: UNI MAC Layer
- Test Case 16: UNI Service Multiplexing of Point-to-Point EVCs
- Test Case 17: UNI Service Multiplexing of Multipoint-to-Multipoint EVCs
- Test Case 18: UNI Service Multiplexing of Point-to-Point and Multipoint-to-Multipoint EVCs
- Test Case 19: CE-VLAN ID for untagged and priority tagged Service Frames
- Test Case 20: CE-VLAN ID/EVC Map Service Frame Discard
- Test Case 21: UNI EVC Support
- Test Case 22: Maximum Number of EVCs
- Test Case 23: UNI Bundling and CE-VLAN ID Preservation
- Test Case 24: UNI All to One Bundling and CE-VLAN ID Preservation
- Test Case 25: UNI Layer 2 Control Protocols Processing Discard
- Test Case 26: UNI Layer 2 Control Protocols Processing Peer



The 'Configure Parameters' dialog box is open, showing configuration options for the test session. It has tabs for 'Configure Session' and 'Configure Test'. The 'Configure Test' tab is active, with sub-tabs for 'Topology', 'Test Cases', and 'Traffic'. Under 'MEF9 Parameters', the 'Ports' section includes fields for 'Ingress Ports' (101/1 101/3), 'Ingress UNIs' (00 01), 'Egress Ports' (101/2 101/4), and 'Egress UNIs' (07 23). Below this is an 'EVC/CE-VLAN ID Map' table:

UNI ID	CE-VLAN ID	EVC ID
00	2	EVC1
01	3	EVC2
07	2	EVC1
23	3	EVC2

The 'MAC addresses' section shows 'Tester base address' as 00:00:C0:01:01:01 and 'increment from port to port' as 00:00:01:00:00:00. A note states: 'MAC addresses will be assigned to ports according to their order in the Port list above.' Under 'Ethernet Service Type', the 'Ethernet Private Line' option is selected, and the 'CE-VLAN ID Preserved' checkbox is checked. Other options include 'Ethernet Virtual Private Line' and 'Ethernet LAN'. A 'Close' button is located at the bottom right.

MEF 9 Conformance Test Suite

N5591A – MEF 14 Conformance Test Suite

The N5591A implements all 10 test cases specified by MEF 14. Within each broad test case, various parameters can be set to implement a total of 170 individual tests that mirror all aspects of the MEF 14 specification, as defined in the Test Plan for Traffic Management Phase 1 Release 1.1 (Iometrix, Inc. February 23, 2006).

Abstract Test Cases for EVC Related Performance Service Attributes

- Test Case 1: Frame Delay Service Performance
- Test Case 2: Frame Delay Variation Service Performance
- Test Case 3: Frame Loss Ratio Service Performance

Abstract Test Cases for Bandwidth Profiles Service Attributes

- Test Case 4: Bandwidth Profile Rate Enforcement when $CIR > 0$ and $EIR = 0$
- Test Case 5: Bandwidth Profile Rate Enforcement when $CIR = 0$ and $EIR > 0$
- Test Case 6: Bandwidth Profile Rate Enforcement when $CIR > 0$ and $EIR > 0$
- Test Case 7: Bandwidth Profile per Ingress UNI
- Test Case 8: Bandwidth Profile per EVC
- Test Case 9: Bandwidth Profile per Class of Service
- Test Case 10: Multiple Bandwidth Profiles at the UNI

MEF 14 Test Cases 1, 2 and 3 - Service Performance

File Test Help

Configure Start Stop STOPPED

Overview Description Report Graphs Test Log

Test Topology

Service Performance

```

    graph LR
      A[EVC1 ingress  
test port 1] --> B[Metro Ethernet Network  
(MEN)]
      B --> C[EVC1 egress  
test port 2]
  
```

For all Service Frames declared Green and associated with a particular Class of Service Identifier on a Point-to-Point EVC that arrive at the UNI during a time interval T,

- Frame Delay Performance MUST be less than or equal to the Frame Delay Performance Objective
- Frame Delay Variation Performance MUST be less than or equal to the Frame Delay Variation Performance Objective
- Frame Loss Ratio Performance MUST be less than or equal to the Frame Loss Ratio Performance Objective

MEF 14 Parameters

Ports

Ingress Ports: 101/1
Ingress UNIs: 00
Egress Ports: 101/2
Egress UNIs: 10

EVC/ICE-VLAN ID Map

UNI ID	CE-VLAN ID	EVC ID
00	11	EVC1
10	11	EVC1

MAC addresses

Tester base address: 00:00:CD:01:01:01 increment from port to port 00:00:01:00:00:00
MAC addresses will be assigned to ports according to their order in the Port list above.

Ethernet Service Type

Ethernet Private Line CE-VLAN ID Preserved
 Ethernet Virtual Private Line
 Ethernet LAN

Test stopped

MEF 14 Conformance Test Suite

Software Requirements

- N5590A MEF 9 Conformance Test Suite
- N5591A MEF 14 Conformance Test Suite

Each conformance test suite has a Software and Support Agreement (SSA) contract option associated with it. The contract options are:

- PS-S12-101 - 1 year contract included with initial purchase
- PS-S12-102 - 1 year contract extended to 2 years
- PS-S12-103 - 1 year contract extended to 3 years

Please ensure that you have a current SSA in order to automatically receive future releases and technical product support.

The E7880B Packets Application software license is a pre-requisite to support the MEF conformance test suites.

Hardware Compatibility

Both the N5590A MEF 9 CTS and the N5591A MEF 14 CTS are supported on the XR, XR-2, XS and XS-2 Ethernet test cards. The XP and XP-2 test cards support the MEF 9 CTS but do not support the MEF 14 CTS.

Recommended Ordering Configuration

Ethernet services may be realized via VPLS technology, therefore any associated control plane testing requires a XR card and associated protocol emulation licenses.

A maximum of 6 ports is required to exercise all the test cases in the MEF 9 suite. For the MEF 14 suite, a maximum of 3 test ports is needed. To ensure a flexible test system that will be suitable for future requirements, the recommended configuration is:

- N5541A 4-slot N2X Chassis
- N5551B 4-port 10/100/1000BASE-T and 1000BASE-X (SFP) XR-2 Test Card (two cards recommended)
- N5544A System Controller
- N5590A MEF 9 Conformance Test Suite
- N5591A MEF 14 Conformance Test Suite
- E7880B Packets or E7881B Packets and Protocols Application
- E7884A L2 MPLS VPN Emulation Software

Minimum Ordering Configuration

- N5541A 4-slot N2X Chassis
- N5551B 4-port 10/100/1000BASE-T and 1000BASE-X (SFP) XR-2 Test Card
- N5544A System Controller
- N5590A MEF 9 Conformance Test Suite and/or N5591A MEF 14 Conformance Test Suite
- E7880B Packets Application

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Agilent N2X

Agilent's N2X multi-service tester combines leading-edge services with carrier grade infrastructure testing and emulation. The N2X solution set allows network equipment manufacturers and service providers to more comprehensively test new services end-to-end, resulting in higher quality of service and lower network operating costs.

Software and Support Agreement

To protect your investment in the Agilent N2X, every new system includes an initial 12-month comprehensive system-based warranty and Software and Support Agreement (SSA).

Renewing Agilent support services ensures uninterrupted technical support and software upgrades, giving you confidence in N2X throughout the life of your system.

The N2X technical support portion of your SSA includes assistance with product operation and measurements, and verification that the N2X equipment is in correct working order.

Warranty and Support

Hardware Warranty

All N2X hardware is warranted against defects in materials and workmanship for a period of 1 year from the date of shipment.

Software Warranty

All N2X software is warranted for a period of 90 days. The applications are warranted to execute and install properly from the media provided. This warranty only covers physical defects in the media, whereby the media is replaced at no charge during the warranty period.

Ordering Information

To order and configure the test system, consult your local Agilent field engineer.

Sales, Service and Support

N2X must be serviced by an approved Agilent Technologies service centre, please contact us for more information.

United States:

Agilent Technologies
Test and Measurement Call Center
P.O. Box 4026
Englewood, CO 80155-4026
1-800-452-4844

Canada:

Agilent Technologies Canada Inc.
2660 Matheson Blvd. E
Mississauga, Ontario
L4W 5M2
1-877-894-4414

Europe:

Agilent Technologies
European Marketing Organisation
P.O. Box 999
1180 AZ Amstelveen
The Netherlands
(31 20) 547-2323

United Kingdom

07004 666666

Japan:

Agilent Technologies Japan Ltd.
Measurement Assistance Center
9-1, Takakura-Cho, Hachioji-Shi,
Tokyo 192-8510, Japan
Tel: (81) 426-56-7832
Fax: (81) 426-56-7840

Latin America:

Agilent Technologies
Latin American Region Headquarters
5200 Blue Lagoon Drive, Suite #950
Miami, Florida 33126
U.S.A.
Tel: (305) 269-7500
Fax: (305) 267-4286

Asia Pacific:

Agilent Technologies
19/F, Cityplaza One, 1111 King's Road,
Taikoo Shing, Hong Kong, SAR
Tel: (852) 3197-7777
Fax: (852) 2506-9233

Australia/New Zealand:

Agilent Technologies Australia Pty Ltd
347 Burwood Highway
Forest Hill, Victoria 3131
Tel: 1-800-629-485 (Australia)
Fax: (61-3) 9272-0749
Tel: 0-800-738-378 (New Zealand)
Fax: (64-4) 802-6881

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