

Agilent N2X

IPv4 and IPv6 Protocol Conformance Test Suites

N5701A, N5702A, N5704A, N5705A,

N5706A, N5719A, N5725A



Technical Data Sheet

The most comprehensive IP routing conformance tests suites enable rapid protocol verification and problem isolation with the industry- leading N2X Test Manager.



Agilent Technologies

Key Features

- **Comprehensive IPv6, BGP4, OSPFv2, OSPFv3, IS-IS, BFD, and Graceful Restart conformance testing**
- **Industry-leading Test Manager designed to simplify conformance testing**
- **Rapid result diagnosis and problem isolation**
- **Extendable test suites**
- **Automatic configuration and control of the device under test**
- **Comprehensive test documentation and reporting tools**

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.

N2X Productivity Advantage delivers a rich set of automated applications designed to maximize testing productivity. Service providers and network equipment manufacturers will save months of engineering effort by eliminating the need for developing and supporting customized applications.

N2X Productivity Advantage incorporates a comprehensive protocol conformance solution with a unique Test Manager that provides industry-leading usability and reporting features for rapid result diagnosis and problem isolation.

The Agilent N2X delivers industry's most comprehensive range of IPv4 and IPv6 routing test suites for validating protocol conformance. The following test suites include test cases for the IPv6, graceful restart and traffic-engineering protocol extensions.

- N5701A - IPv6 Conformance Test Suite
- N5702A - OSPFv3 Conformance Test Suite
- N5704A - BGP4 Conformance Test Suite
- N5705A - IS-IS Conformance Test Suite
- N5706A - OSPFv2 Conformance Test Suite
- N5719A - Bidirectional Forwarding Detection (BFD) Conformance Test Software
- N5725A - Graceful Restart Conformance Test Suite

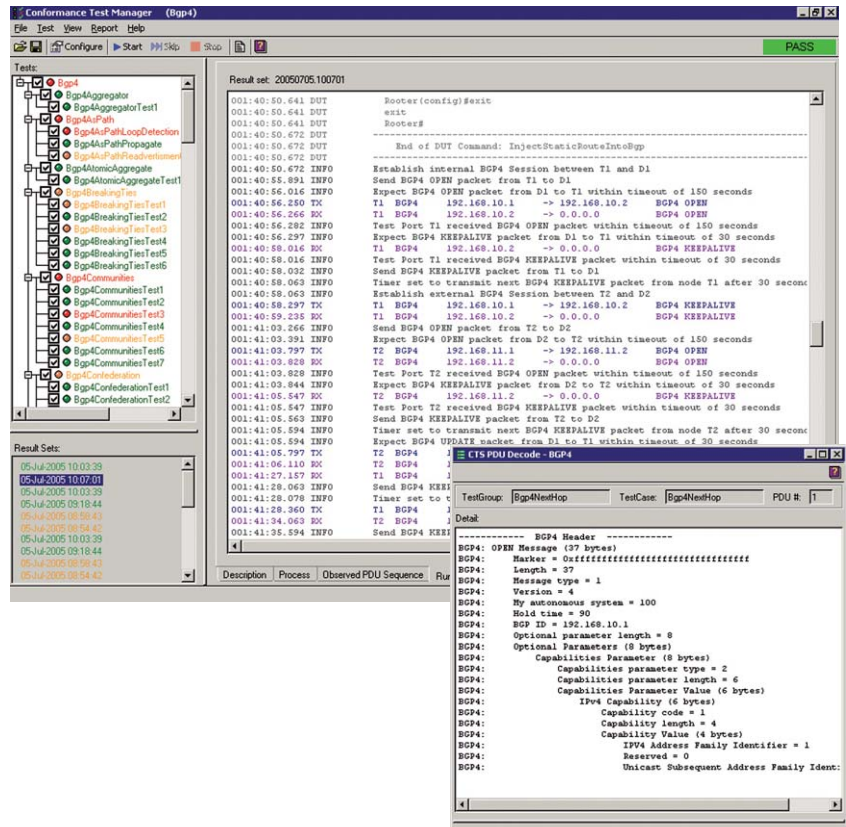


Figure 1: BGP4 Conformance Test Suite

Industry leading Test Manager

The N2X protocol conformance test solution incorporates a unique Test Manager with industry-leading usability and reporting features. This allows for rapid result diagnosis and problem isolation saving engineers time and effort in developing and validating protocol implementations. The Test Manager also has the flexibility to be easily integrated within a user's regression strategy. The tree-based navigation and test suite configuration, dynamic graphical protocol sequence diagram, and comprehensive reporting features of the N2X Conformance Test Manager simplify testing. Detailed packet-decode and filtering capabilities and granular test result evaluation (pass, conditional pass, inconclusive and fail for each individual test case) accelerate resolution of test-case errors.

The test configurations (including tester and DUT parameters) can be saved and restored to ensure the exact replication of a previous test run. At the completion of each test, the test results (along with all the configuration and result details) are automatically saved and are subsequently available for loading using an integrated result-selection panel.

The N2X Conformance Test Manager and the conformance test suites together provide a comprehensive solution for ensuring protocol compliance and device interoperability.

Rapid result diagnosis and problem isolation

The Conformance Test Manager window instantly displays progress at multiple levels, to summarize the status of the test case, test group, and test suite. The progress and results for each test case and for the test as a whole can be viewed in real-time.

Users can view a log of test-case events, the actual PDU sequence, and PDU decodes. The outcome of each test case is color-coded for instant recognition of the result. These features enable users to assess the outcome of a particular test case or test group at a glance and isolate problems quickly.

Multiple instances of the Test Manager can be open at the same time. This allows for easy comparison between tests that use the same configuration but have been run at different times.

Extendable test suites

The N2X Conformance Test Suites can be readily extended to include corner cases, verify proprietary capabilities, or test features of new standards that have not yet been implemented.

The thoroughly documented test-case templates, on-line help, and comprehensive list of programming interfaces provide users with a step-by-step guide on how to write their own test scripts and make them available for execution through the N2X Test Manager.

A test case written by the user will benefit from all of the Test Manager's unique fault isolation and reporting features.

Automatic configuration and interaction with device under test

Automatic device-under-test (DUT) control and configuration capabilities further simplify the testing process and allow the N2X Conformance Test Suites to be integrated into the user's own test environment. The N2X Test Manager provides some commonly used device types with sample configuration parameters that the user can easily modify from within the GUI. The user can also create a new DUT type using the XML and Tcl templates provided. Once the DUT type has been setup, the user will never need to manually configure the DUT during test execution - saving a great deal of time and effort during testing.

Comprehensive test documentation and reporting tools

The N2X Conformance Test Manager has an integrated test description and expected-PDU sequence diagram that provide rapid understanding of the test purpose, procedure, implementation, and desired result. These features are crucial when trying to isolate and understand problems encountered during a test execution.

All information displayed before and after a test execution can be saved into many different file formats for future analysis or printing. This includes test-case description documentation, sequence diagrams, test-run results, as well as a purpose-designed test-run report.

Test Suites and Applicable Standards

N5701A IPv6 Conformance Test Suite

Provides more than 262 automated test cases, covering all the key aspects of IPv6 functionality including ICMPv6, NDP, IPv6 addressing, auto-configuration, transition mechanisms and security.

The E7885A N2X IPv6 Routing Emulation Software and E7898A IPv6 Access Protocol Bundle complement this test suite for verifying the performance, scalability and robustness of IPv6 systems.

The N5701A IPv6 conformance test suite is available with the following options:

N5701A-001 - IPv6 Basic CTS License

This suite comprises 170 test cases for the following standards.

- IPv6 Address Allocation Management (RFC 1881)
- An Architecture for IPv6 Unicast Address Allocation (RFC 1887)
- Path MTU Discovery for IPv6 (RFC1981)
- IPv6 Addressing Architecture (RFC 2373)
- An IPv6 Aggregatable Global Unicast Address Format (RFC 2374)
- IPv6 Multicast Address Assignments (RFC 2375)
- Internet Protocol v6 Specification (RFC 2460)
- Neighbor Discovery for IPv6 (RFC 2461)
- Internet Control Message Protocol for IPv6 (RFC 2463)
- IPv6 Packets over Ethernet Networks (RFC 2464)

- Format for Literal IPv6 Addresses in URL's (RFC 2732)
- Reserved IPv6 Subnet Anycast Addresses (RFC 2526)
- Extensions to IPv6 Neighbor Discovery for Inverse Discovery (RFC 3122)

N5701A-002 - IPv6 Extension CTS License

This suite comprises 37 test cases for the following standards.

- Routing Aspects of IPv6 Transition (RFC 2185)
- IPv6 Stateless Address Auto configuration (RFC 2462)
- Generic Packet Tunneling in IPv6 (RFC 2473)
- Transmission of IPv6 over IPv4 Domains without Explicit Tunnels (RFC 2529)
- Transition Mechanisms for IPv6 Hosts & Routers (RFC 2893)
- Privacy Extensions for Stateless Address Autoconfiguration in IPv6 (RFC 3041)
- Connection of IPv6 Domains over IPv4 Clouds (RFC 3056)

N5701A-003 - IPv6 Security CTS License

- Security Architecture for Internet Protocol (RFC 2401)
- IP Authentication Header (RFC 2402)
- IP Encapsulating Security Payload (RFC 2406)
- IP Authentication using Keyed MD5 (RFC 1828)
- Encapsulating Security Payload DES-CBC Transform (RFC 1829)

N5702A OSPFv3 Conformance Test Suite

This suite comprises 134 test cases for the following standards and is the most comprehensive suite designed to accelerate the conformance. The E7885A N2X IPv6 Routing Emulation Software complements this test suite for verifying the performance, scalability and robustness of OSPFv3 implementations. verification of OSPFv3 capabilities.

N5702A-001 - OSPFv3 Basic CTS License

- OSPF Version 2 (RFC 2328)
- OSPF for IPv6 (RFC 2740)

N5704A BGP4 Conformance Test Suite

This suite comprises 148 test cases for the following standards and is designed to accelerate the conformance verification of BGP4, extensions for IPv6 and emerging Graceful Restart capabilities.

The E7882A N2X IPv4 Routing Emulation Software and E7885A N2X IPv6 Routing Emulation Software complement this test suite for verifying the performance, scalability and robustness of BGP4 and BGP4+ (BGP4 for IPv6) implementations, and BGP4 Graceful Restart.

The N5704A BGP4 conformance test suite is available with the following options:

N5704A-001 - BGP4 Basic CTS License

This suite comprises 83 test cases for the following standards.

- Border Gateway Protocol

- (RFC1771/draft-ietf-idr-bgp4-25)
- BGP Communities Attribute (RFC1997)
- BGP Route Reflection (RFC2796/draft-ietf-idr-rfc2796bis-01)
- Autonomous System Confederations (RFC3065/draft-ietf-idr-rfc-3065bis-02)

N5704A-002 - BGP4 Extension CTS License

This suite comprises 65 test cases for the following standards.

- BGP Extended Communities Types (draft-ietf-idr-bgp-ext-communities09)
- Subcodes for BGP Cease Notification Message (draft-ietf-idrcease-subcode-06)
- Graceful Restart (draft-ietf-idrrestart-10)
- MP-BGP IPv6 NLRI (RFC 2545) Multiprotocol Extensions for BGP (RFC2858)
- Route Refresh Capability for BGP-4 (RFC 2918)
- Capabilities Advertisement with BGP-4 (RFC 3392)

N5705A IS-IS Conformance Test Suite

This suite comprises 194 test cases for the following standards and delivers comprehensive verification of routing conformance to the industry's evolving IS-IS standards. It includes test cases for Graceful Restart and Traffic-Engineering protocol extensions.

The E7882A N2X IPv4 Routing Emulation Software and E7885A N2X IPv6 Routing Emulation Software complement this test suite for verifying the performance, scalability and robustness of IS-IS and IS-ISv6 (IS-IS for IPv6) implementations, and IS-IS Graceful Restart.

Bidirectional Forwarding Detection
 IETF draft-ietf-bfd-base-04.txt
 BFD for IPv4 and IPv6 (Single Hop)
 IETF draft-ietf-bfd-v4v6-1hop-06.txt
 Bidirectional Forwarding Detection
 Management Information Base IETF
 draft-ietf-bfd-mib-03.txt
 The N5705A IS-IS conformance test
 suite is available with the following
 options:

N5705A-001 - IS-IS Basic CTS

License

This suite comprises 156 test cases for
 the following standards.

IS-IS intra domain Routing Protocol
 (ISO/MEC 10589)
 IS-IS for TCP/IP (RFC 1195)
 3-Way Handshake (RFC 3373)

N5705A-002 - IS-IS Extension CTS

License

This suite comprises 38 test cases for
 the following standards.

- Traffic Engineering Extensions
 (RFC 3784)
- IS-IS Graceful Restart (RFC 3847)

N5706A OSPFv2 Conformance Test Suite

This is the most comprehensive test
 suite for the conformance verification
 of OSPFv2 capabilities. It includes test
 cases for graceful restart and traffic-
 engineering protocol extensions.

The E7882A N2X IPv4 Routing
 Emulation Software complements
 this test suite for verifying
 the performance, scalability
 and robustness of OSPFv2
 implementations, including OSPF
 Graceful Restart.

The N5706A OSPFv2 conformance test
 suite is available with the following
 options:

N5706A-001 - OSPFv2 Basic CTS

License

This suite comprises 64 test cases for
 the following standards.

- OSPFv2 (RFC 2328)
- Opaque LSA (RFC 2370) **N5706A-
 002 - OSPFv2 Extension CTS**
License

This suite comprises 76 test cases for
 the following standards.

- The OSPF Not-So-Stubby Area
 (NSSA) Option (RFC 3101)
- Graceful Restart (RFC 3623)
- Traffic Engineering (TE) Extensions
 to OSPFv2 (RFC 3630)

N5719A BFD Conformance Test Suite

This suite comprehensively tests for
 conformance to IETF recommendations
 for Bidirectional Forwarding Detection
 (BFD), which is a protocol used in
 IP/MPLS networks – especially on
 Ethernet links – to accelerate the
 detection of link and node failures.

The test cases verify:

- Session initialization
- Session establishment
- Asynchronous and demand-mode
 sessions (association of received
 BFD packets)
- Echo packet generation and
 reception
- Authentication
- BFD timer negotiation
- BFD timer manipulation
- BFD state machine
- BFD management system
 configuration
- Negative testing (handling of invalid
 BFD control packets)
- Frame formats
- Backward compatibility

The N5583A N2X Bidirectional
 Forwarding Detection (BFD) Emulation
 Software complements this test
 suite for verifying the performance,
 scalability and robustness of Carrier
 Ethernet devices.

N5719A-001 BFD CTS License

This test suite comprises over 140 test cases for the following recommendations.

N5725A Graceful Restart Conformance Test Suite

This suite comprises 74 test cases for the following standards and is designed to ensure conformance to the evolving Graceful Restart protocol extensions for BGP4, OSPFv2 and IS-IS protocol implementations, thereby accelerate deployment of high-availability networks. If you have licenses for N5704A-002 BGP, N5705A-002 IS-IS, or N5706A-002 OSPFv2 conformance test suites, then you will have access to the same test cases offered in this N5725A Graceful Restart conformance test suite.

The E7882A N2X IPv4 Routing Emulation Software complements this test suite for verifying the performance, scalability and robustness of BGP4, OSPF, and IS-IS Graceful Restart implementations.

N5725A-001 - Graceful Restart Basic CTS License

- BGP Graceful Restart (draft-ietf-idrrestart-10)
- OSPFv2 Graceful Restart (RFC 3623)
- IS-IS Graceful Restart (RFC 3847)

Software Requirements

Each conformance test suite can be purchased with these Software and Support Agreement (SSA) options:

- PS-S12-001 – 1-year agreement included with initial purchase
- PS-S12-102 – 1-year agreement extended to 2 years
- PS-S12-103 – 1-year agreement extended to 3 years

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

The following N2X software licenses are a pre-requisite for all protocol conformance test suites:

E7880B Packets Application Software or E7881B Packets and Protocols Application Software.

Hardware Requirements

The IPv6, OSPFv3 and BFD conformance test suites are only supported on the Ethernet routing test cards (XR, XS, XR-2 and XS-2). All of the other suites are supported on both Ethernet and POS routing test cards.

N2X XP test cards do not support the N2X conformance test suites.

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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.

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.

Software Updates

With the purchase of any new system controller Agilent will provide 1 year of complimentary software updates. At the end of the first year you can enroll into the Software and Support Agreement (SSA) contract for continuing software product enhancements.

Support

Technical support is available throughout the support life of the product. Support is available to verify that the equipment works properly, to help with product operation, and to provide basic measurement assistance for the use of the specified capabilities, at no extra cost, upon request.

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.

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