

Agilent RouterTester

## L2TP Conformance Test Suite

E7865A  
Technical Datasheet



Agilent Technologies' automated L2TP (Layer 2 Tunneling Protocol) Conformance Test Suite is the ideal solution for determining if L2TP implementation in edge aggregation devices and routers does indeed conform to IETF standard (RFC 2661). This test suite provides an out-of-the-box solution that will save considerable time and resources during development, integration and deployment phases.



**Agilent Technologies**

## Key Features

- **Comprehensive coverage of all aspects of the L2TP specification**
- **Tests both the L2TP Access Concentrator (LAC) and L2TP Network Server (LNS)**
- **Fully automated stimulus-and-response test suite**
- **Clear verdict assignment for each test case**
- **Easily customizable Tcl-based test scripts**

## Product Overview

The L2TP Conformance Test Suite has been designed to quickly and comprehensively verify that routers and edge devices that have been specifically designed to act as either the LAC or LNS do indeed conform to applicable protocol standards. Close to 190 automated test cases are included to cover all aspects of the L2TP protocol. Tests are organized as tests common to both LAC and the LNS and test cases that apply specifically to the LAC or the LNS. All test cases provide clear “pass” and “fail” verdicts.

Test script source code, written in the familiar Tcl scripting language, is available to users for modification to meet individual needs. Through a set of well-documented APIs, tests can be tailored to meet testing needs of a particular development phase. By utilizing Agilent’s L2TP Conformance Test Suite, network equipment manufacturers will achieve a higher confidence in their ability to provide LAC and LNS functionality. Equally, service providers can test VPN-enabled devices from different manufacturers and verify conformance and interoperability prior to the deployment of VPN services. The L2TP Conformance Test Suite is complementary to the L2TP Protocol emulation module available on RouterTester.

## Applicable Standards

The L2TP Conformance Test Suite is based on the IETF RFC 2661. Test cases cover testing of both the LAC and the LNS.

## Product Features

### L2TP Conformance Test Suite

The suite meets the fundamental criterion of automatic conformance verification to evolving standards as they apply to the L2TP specification. More than 250 test cases are provided to verify common protocol behavior relating to both the LAC and the LNS. Categories of tests include the following:

- Control Connection Establishment/Teardown
- Tunnel Authentication
- Incoming/Outgoing Calls
- AVP (Attribute Value Pair) related tests
- Data Transport
- Reliable Delivery

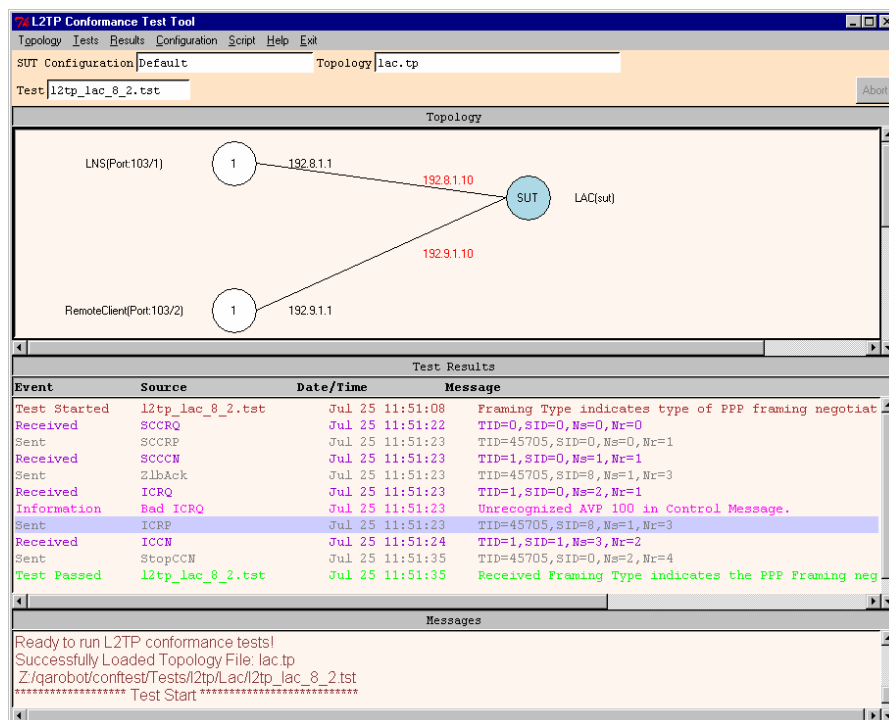
Test cases are designed against specific requirements of the specification (RFC 2661) and tests are designed to operate under various test scenarios and network topologies to ensure compliance of a System Under Test (SUT) under all possible operating environments. In addition, negative test cases are included to test the stability and robustness of the SUT.

### Test Methodology

All tests follow a simple format: Initial State, Event, Response, Final State. Tests are run through a Graphical User Interface (GUI) and can be run individually or in a batch of related tests. During a test run, the tester emulates a network topology. This network will be composed of various types of entities such as PPP clients, PPP Servers, Access Concentrators (LAC) and Network Servers (LNS). While a test runs, the relevant emulated topology is shown graphically, and its configuration parameters can be viewed.

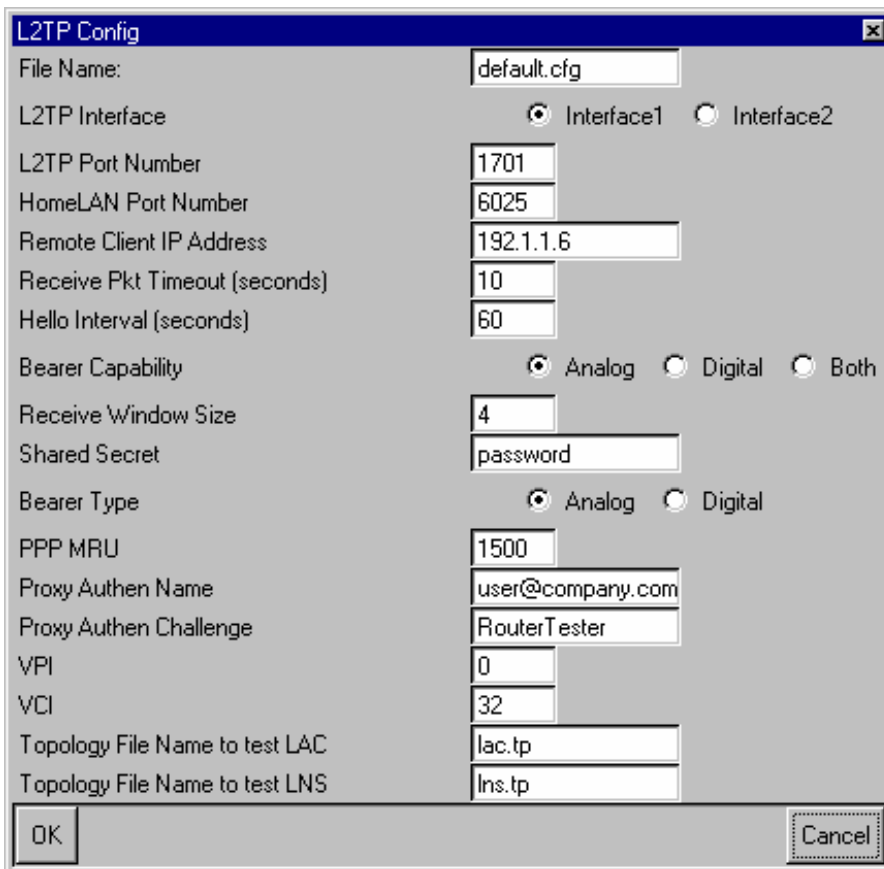
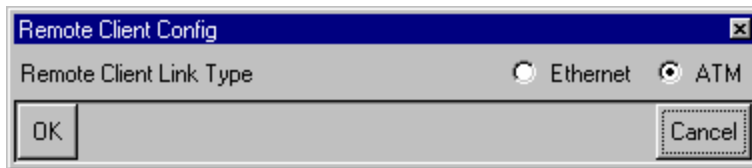
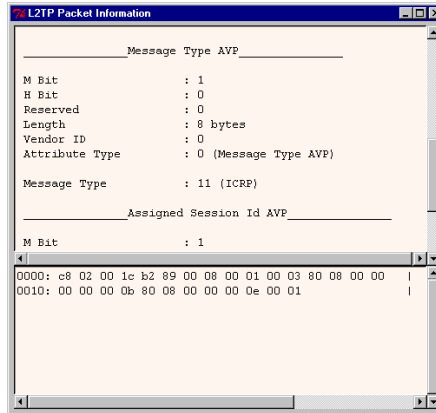
### Test Results and Diagnostics

Each test will address a particular section or sub-section in the protocol specification, and will return a “failed” result if the response from the SUT is not satisfactory. Each test will refer to a particular section of the protocol specification the test is designed against. Users can select from a variety of graphical and tabular texts to view results. Results can be edited for making comprehensive test reports. Test results can also be viewed in a very detailed manner. Every packet exchanged between the tester and the SUT is time-stamped and decoded for easy comprehension.



### Test Customization

All of Agilent's Conformance Test Suites provide users with open access to test scripts. Test scripts are written in the widely used Tcl scripting language. Test engineers can easily edit the scripts to create their own customized test cases using Tcl/Tk. The QBOL scripting license is also included.



## L2TP Protocol Behavior Tested (RFC 2661)

### Control/Connection Establishment

Control Connection Establishment	Sections 3.1, 4.4.3, 5.1, 5.0, 9.1
Tunnel Authentication	Sections 4.4.3, 5.1.1
Tie Breaker	Section 4.4.3
Keepalive (Hello)	Section 5.5
Reliable Delivery	Sections 3.0, 3.1, 4.4.3, 5.8
Control Connection Teardown	Sections 4.4.3, 5.7

### AVP Hiding

AVP Hiding	Sections 4.3, 4.4.1
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### Session Establishment

Incoming Call	Sections 4.4.4, 5.2.1, 9.1
Incoming Call: Proxy LCP/Authentication	Section 4.4.5
Outgoing Call	Sections 4.4.3, 4.4.4, 5.5.2, 5.2.2, 6.9
General	Sections 3.1, 4.4.4, 4.4.3, 5.0
Session Teardown	Sections 4.4.4, 5.6, 6.12, 7.4.1, 7.4.2, 7.5.1, 7.5.2

### Data Transport

Sequence Numbers	Sections 3.0, 3.1, 4.4.4, 5.4
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### L2TP over UDP

L2TP over UDP	Section 8.1
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### Error Messages

Invalid Control Message	Sections 4.4.1, 7.2.1, 7.4.1, 7.4.2, 7.5.1, 7.5.2
Invalid Header	Sections 3.1, 4.4.3, 4.4.4
Missing Mandatory AVP	Sections 6.1, 3.2, 6.4, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.13, 6.14
Invalid Mandatory AVP	Sections 4.1, 4.4.1, 5.3
Invalid Non-Mandatory AVP	Sections 4.1, 4.4.1, 7.1

## System Configuration & Product Numbers

The controller manages the test modules and provides the common point of control for the multi-port test system. All test modules (for any series) are connected to the system controller through a Fast Ethernet hub.

### RouterTester

Product number: E7865A

### Minimum Requirements

Hardware: A system controller and two test modules

### QA Robot

Product number: E7865A

### Minimum Requirements

On QA Robot, L2TP Conformance Test Suite will run with only PPPoE clients.

Hardware: A system controller, chassis, two CPUs and one interface per CPU.

## Acronyms

API	Application Programming Interface
AVP	Attribute Value Pair
GUI	Graphical User Interface
IETF	Internet Engineering Task Force
LAC	L2TP Access Concentrator
L2TP	Layer Two Tunneling Protocol
LNS	L2TP Network Server
PPP	Point to Point Protocol
RFC	Request for Comment
SUT	System Under Test
Tcl	Tool Command Language
Tcl/TK	Tcl Toolkit
VPN	Virtual Private Network

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## Agilent's RouterTester system

Agilent's RouterTester system offers a powerful and versatile test platform to address the evolving test needs of metro/edge platforms, core routers and optical switches. RouterTester provides Network Equipment Manufacturers and Service Providers with the industry's leading tools for wire speed, multiport traffic generation and performance analysis of today's networking devices.

## Warranty and Support

### Hardware Warranty

All RouterTester and QA Robot hardware is warranted against defects in materials and workmanship for a period of 3 years from the date of shipment.

### Software Warranty

All RouterTester and QA Robot 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 Enhancement Service (SES) 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.

### 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.  
2880 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  
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### Latin America:

Agilent Technologies  
Latin American Region Headquarters  
5200 Blue Lagoon Drive, Suite #950  
Miami, Florida 33126  
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19/F, Cityplaza One, 1111 King's Road,  
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