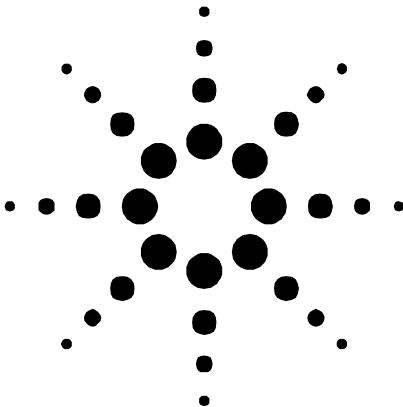




Multiservice Interworking Application

E7826A

Agilent Technologies Broadband Series Test System



The Agilent E7826A Multiservice Interworking Application combines two powerful test suites into one. The ATM LANE 1.0 Service Test Suite and the Frame Relay ATM Networking and Service Interworking Test Suite runs on the industry standard Agilent Broadband Series Test System (BSTS).



Agilent Technologies

ATMF Lan Emulation 1.0

ATM Forum 1.0 LAN Emulation Service Test Suite is designed to verify the conformance of the LAN Emulation Server (LES), the LAN Emulation Configuration Server (LECS) and the Broadcast and Unknown Server (BUS) of an Ethernet/IEEE 802.3 Emulated LAN to the ATM Forum LAN Emulation Over ATM 1.0 specification.

To accomplish this, the test suite can act as one or several (max. 3) LAN Emulation Clients (LECs) simultaneously and perform various expected procedures and interactions depending on the test case.

The LANE servers are checked for all appropriate messages, state transitions, error situations set out in the specification as well as to verify that they establish and accept the connections that they are required to handle.

ATM Network equipment manufacturers (NEMs) and network operators can expect to achieve higher confidence that the protocol allowing transparent LAN functionality over ATM backbones is behaving correctly with regard to the LANE service they are implementing.

The abstract test suite has been submitted to the ATM Forum for approval.

The test suite consists of 76 test cases divided into following areas:

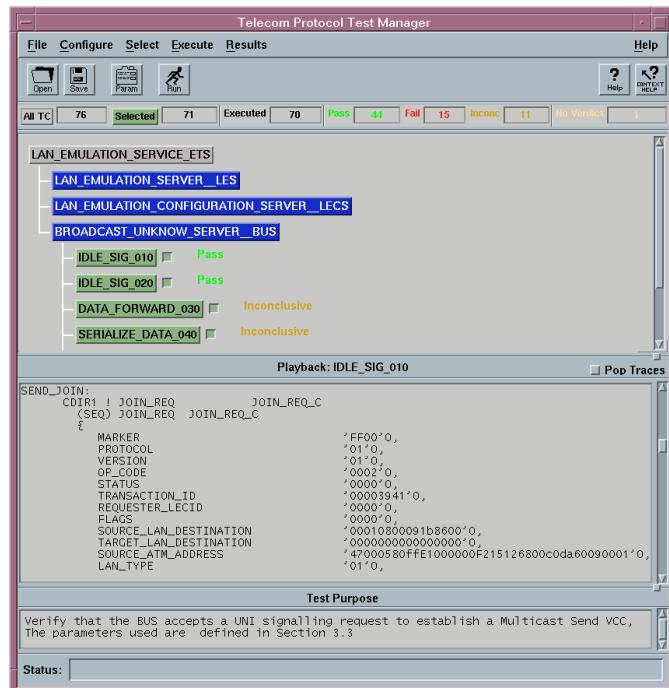
LES - Join, Normal Behavior, Not Valid,

Release & Termination, Registration,

ARP, Flush, Topology

LECS - LECS Address, Configuration

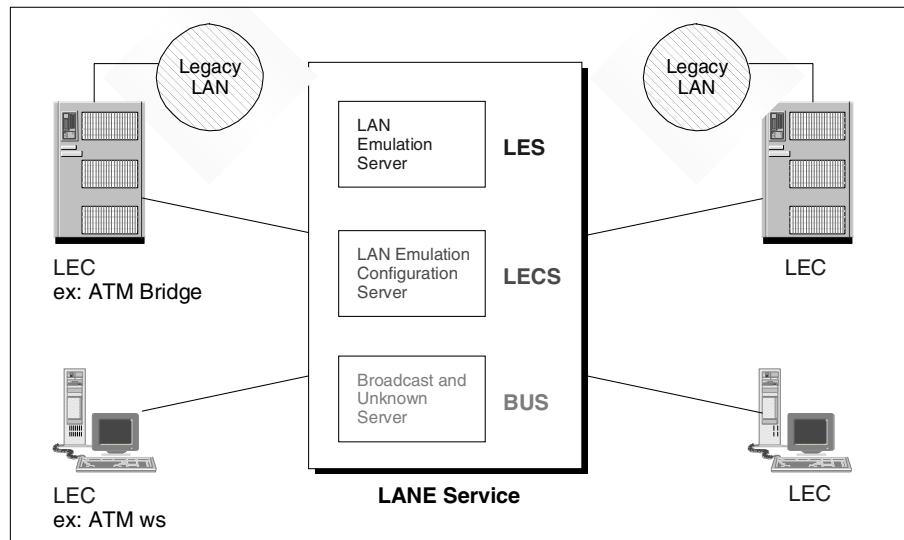
BUS



The Test Manager user interface that runs on the Agilent E4200/E4210 BSTS displays all relevant information about the test campaign at the top. The test suite browser displays a collapsible/expandable tree structure. Further down, trace and test case purpose windows provide detailed data.

Product Features

- Fully automated off-the-shelf test solution based on a recognized ATM Forum test matrix. The complete abstract test suite (ATS) is pending ATM Forum approval.
- Parameters can be set (interactive questions) to establish if and how the implementation supports signalling. Simply answer the questions accordingly, and the BSTS will handle all connection setups automatically.
- Automated stimulus-and- response testing simplifies the verification process of ATM products at all phases of R&D. A complete, automated suite of tests in a single package can help reduce design cycle costs by producing results more quickly and with less operator intervention.
- Flexible test case selection translates into either exhaustive testing or tailoring test case selection to suit the specific functions under test.



LANE clients connected to the LANE server. 1-2 LANE clients can be connected respectively to a single-port or dual-port tester.

- Clear verdict assignments for each test case run (such as PASS or FAIL) make focussing on problems to be fixed easier and are a good indicator of the quality of the IUT.
- Diagnostic information in test case traces can help pinpoint errors.
- Quickly and accurately verify the conformance of LANE products and implementations prior to market introduction.
- Flexible data recording and playback capabilities built-in to the interface's trace window simplify the review of messages transmitted. The operator can either pop traces to a separate window or keep track of overall results by generating variable-detail test campaign reports. The full exchange of messages produced by the test cases is recorded for later analysis.
- Test repeatability is achieved by saving test session setups and results. This allows quick regression testing of product's evolution.
- Test campaigns are easily configured via interactive True/False or value setting questions for most PICS, PIXIT and other types of statements.
- Selecting test cases based on previously assigned verdicts helps concentrate on problem areas. The test suite follows an internationally recognized protocol testing standard methodology as defined in ISO 9646.
- Comprehensive multilevel on-line help is available to guide the user through many aspects of testing, with the help of hyperlinks, diagrams and definitions.



Broadband Series Test System

Typical Applications

ATM network equipment manufacturers (NEMs) and network operators can expect to achieve higher confidence that the protocol allowing transparent LAN functionality over ATM backbones is behaving correctly with regard to the LANE service they are implementing.

The LANE Service test suite actually offers six capabilities bundled into one fully automated test package: it tests LANE Service on Intermediate Systems, such as switches, as well as on End Systems such as ATM interface cards.

A parameter can be set to select between the two configurations, that require respectively either dual or single ports.

In addition to these 2 configurations, 3 types of connections are supported: PVC; SVC based on the ATM Forum UNI 3.0 spec; and SVC based on the UNI 3.1 spec. In the case of SVCs, all LANE-specific aspects of signalling are handled automatically.

Applicable Standards or Specifications

ATM Forum LAN Emulation Over ATM 1.0

Abstract Test Suite

Reference

Test matrix August 1996, ATM Forum contribution # 96-1124.
ATS: December 1996, ATM Forum contribution #96-1668

Standard Body

ATM Forum approval of the abstract for this suite is pending

Areas Tested

Test Suite Structure

Test Group	Number of Test Cases
LES	
Join - Normal Behaviours	9
Not Valid	13
Release and Termination	5
Registration	12
ARP	7
Flush	1
Topology	2
LECS	
LECS Address	3
Configuration	17
BUS	7
Total Number of Cases	76

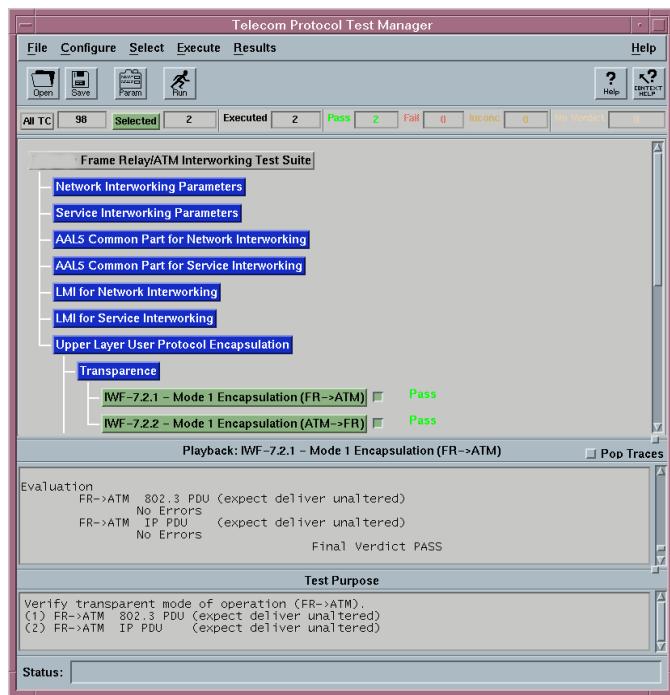
Configuration & Use With Other BSTS Line Interfaces, Hardware Modules & Test Software

Hardware Requirements

- Testing LANE on intermediate systems: 2 CPP + 2 LIF (any LIF)
- Testing LANE on end systems: 1 CPP + 1 LIF (any LIF)

Software Requirements

- Base System V3.02 or higher
- UNI Signalling Test Application (E4214A), V3.02 or higher.



The Test Manager user interface that runs on the Agilent BSTS displays all relevant information about the test campaign at the top. The test suite browser displays a collapsible/expandable tree structure. Further down, trace and test case purpose windows provide detailed data.

Frame Relay Over ATM Network and Service Interworking Test Suite

The Telcordia FR/ATM Interworking Test Suite is designed to verify FR/ATM PVC Interworking functions.

Based on Telcordia's SR-3989 test plan, the test suite consists of 98 test cases, that cover both network and service interworking functions.

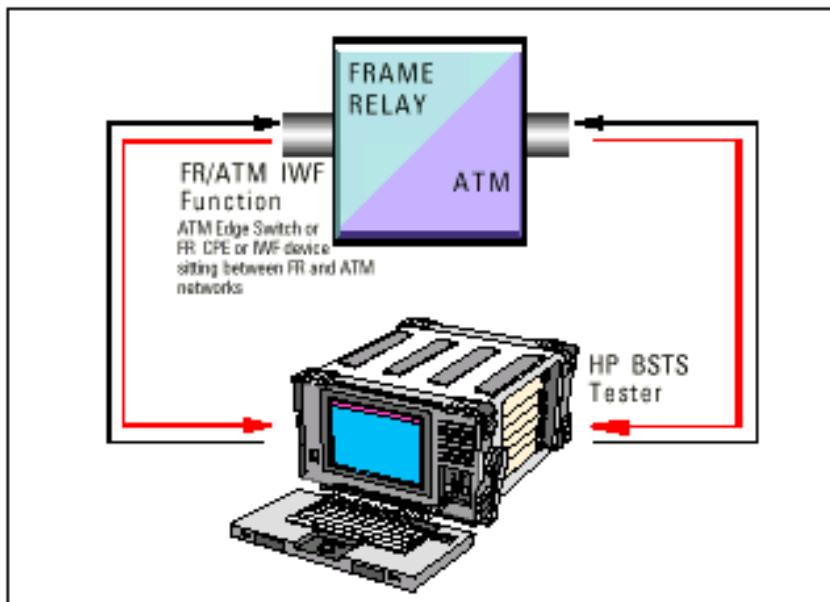
Agilent is among the first to offer the capability of FR/ATM interworking testing, taking full advantage of the Frame Processor module running on the industry-leading Agilent Broadband Series Test System (BSTS).

Product Features

- Fully automated stimulus-response testing simplifies the verification process of ATM products at all phases of R&D.
- Flexible test case selection translates into either exhaustive testing or tailoring test case selection to suit the specific functions under test.
- Clear verdict assignments for each test case run (such as PASS or FAIL)
- Diagnostic information in test case traces can help pinpoint errors.
- Troubleshoot interworking problems in ATM edge switches, FR routers or IWF devices sitting between FR and ATM networks.
- Flexible data recording and playback capabilities built-in to the interface's trace window simplify the review of frames and cells transmitted.
- Test repeatability is achieved by saving test session setups and results. Test campaigns are easily configured via interactive True/False or value setting questions for most PICS, PIXIT and other types of statements.
- The test suite follows an internationally recognized protocol testing standard methodology defined in ISO9646.



Broadband Series Test System



Intended test configuration, FR/ATM network and service interworking function

Typical Applications

Frame Relay has become the technology of choice for providing WAN service, and ATM is the technology of choice for the WAN backbone.

Interworking is crucial to network operators, and to the equipment manufacturers that supply them.

Network Equipment Manufacturers (NEM) and network operators can quickly and accurately verify the conformance of their products and implementations prior to market introduction with this new automated test suite.

ATM NEMs typically lack the time to develop their own executable tests.

Now they can benefit from a Telcordia-based off-the-shelf automated executable test suite that can significantly reduce their testing efforts and time to market.

Customers already owning a BSTS will now be able to test according to Telcordia's test plan, which until now, was not made executable for Agilent's dedicated ATM test platform, the BSTS Series tester.

This test suite also complements a growing family of ATM and Frame Relay protocol testing applications.

Applicable Standards or Specifications

- Frame Relay/ATM PVC Network Interworking Implementation Agreement (FRF.5)
- Frame Relay/ATM PVC Service Interworking Implementation Agreement (FRF.8)
- ITU I.365.1 Frame Relaying Service Specific Convergence Sublayer (FR-SSCS)
- ITU I.555 Frame Relaying Bearer Service Interworking

Abstract Test Suite Reference

Specification

The suite is based on the Telcordia "Frame Relay Over ATM Interworking Test Plan", Telcordia SR-3989, Vol. 1, July 1996. There is no translation of this test plan into TTCN and the ETS (Executable Test Suite) was developed directly into "C".

Standard Body

Not applicable since the SR-3989 test plan is proprietary to Telcordia Technologies. No Frame Relay or ATM Forum approval of any abstract will be sought.

Areas Tested

Test Suite Structure

Test Group	Specific To*	No. of Test Cases
Network Interworking Parameters	N	26
Service Interworking Parameters	S	14
AAL5 Common Part for Network Interworking	N	13
AAL5 Common Part for Service Interworking	S	13
LMI Management for Network IW	N	11
LMI Management for Service IW	S	11
Upper Layer User Protocol Encapsulation	S	10
Total Number of Test Cases		98

* Test Group Specific to: N = Network IW/ S = Service IW

Configuration & Use With other BSTS Line Interfaces, Hardware Modules & Test Software

Hardware Requirements

- E4200/E4210 BSTS Base Platform
- E4209A Cell Protocol Processor and one LIF
- E4206A Frame Processor T1/E1 or E4207A V-Interface Frame Processor

Software Requirements

- Base System V3.02 or higher

Warranty & Support Options

Agilent Broadband Series Test System software and firmware products are supplied on transportable media such as disk, CD-ROM or integrated circuits. The warranty covers physical defects in the media, and defective media is replaced at no charge during the warranty period. When installed in an Agilent Broadband Series Test System, the software/firmware media has the same warranty period as the product.



Broadband Series Test System



Agilent Technologies Broadband Series Test System

The Agilent Technologies BSTS is the industry-standard ATM/BISDN test system for R&D engineering, product development, field trials and QA testing. The latest leading edge, innovative solutions help you lead the fast-packet revolution and reshape tomorrow's networks. It offers a wide range of applications:

- ATM traffic management and signalling
- Packet over SONET/SDH (POS)
- switch/router interworking and performance
- third generation wireless testing
- complete, automated conformance testing

The BSTS is modular to grow with your testing needs. Because we build all BSTS products without shortcuts according to full specifications, you'll catch problems other test equipment may not detect.

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