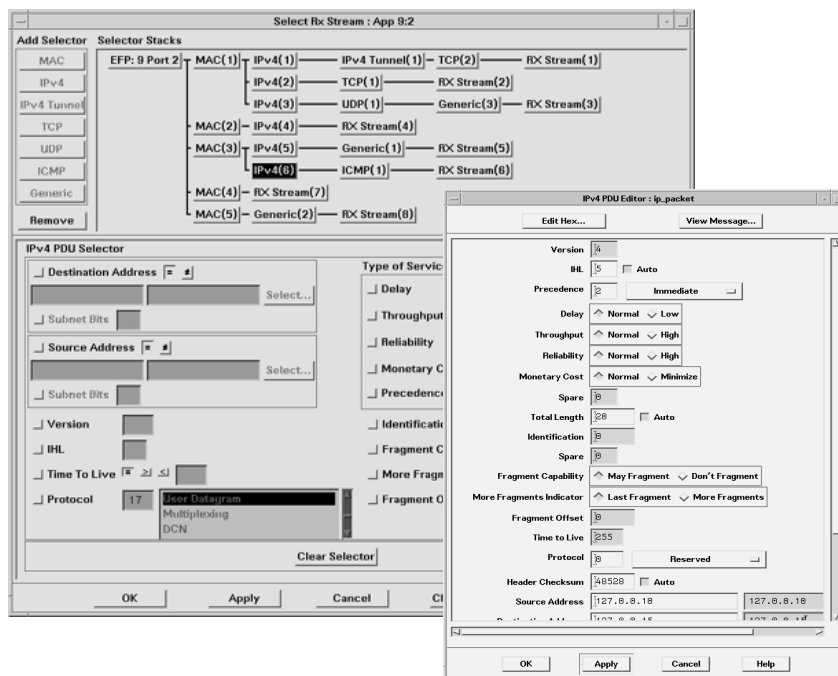


## Switch-Router Test Solution

Agilent Technologies Broadband Series Test System

E5118A



The Agilent E5118A Switch-Router Test Solution for the BSTS enables you to characterize multi-layer forwarding performance and packet/cell interworking over LAN and ATM interfaces, with the optional addition of Frame Relay.

### Bundle Features

**Interworking performance testing in the industry-standard BSTS platform**

- Common router interfaces in one solution: Ethernet, ATM, and Frame Relay (with E5118A Option 501)

**Functional interworking testing**

- Encoding and decoding of Internet protocols including LAN, LANE, and Frame Relay (with E5118A Option 501) over multiple interfaces

**Interworking performance characterization**

- Powerful traffic generation and real-time measurement capability: IP QoS/CoS over 10/100 Mb/s Ethernet, ATM QoS, AAL-5 and Frame Relay packet performance
- Measurement and capture timestamp correlation between all interfaces

The Agilent Technologies E5118A BSTS Switch-Router Test Solution provides the industry's most powerful tools for characterizing cell/frame/packet forwarding functionality and performance of high-speed switch-router hardware designs. It also provides extensive LAN/ ATM/ IP interworking testing over ATM line interfaces and 10/100 Mb/s Ethernet.

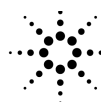
The ATM Stream Processor (ASP) operates with your choice of line interface module (LIF), from 1.5 Mb/s to 155 Mb/s. It provides powerful multi-stream traffic generation and analysis of ATM and

AAL-5 QoS parameters. The 10/100 Mb/s Ethernet Frame Processor (EFP) is a dual-port module with multi-stream traffic and measurement capability for TCP, UDP, and IP over Ethernet.

Add E5118A option 501 for Frame Relay functional testing and LAN/WAN/ATM interworking characterization. The T1/E1 Frame Processor (FP) is a dual-port module with multi-stream frame generation and analysis capability. In addition to LAN protocols, it also decodes Frame Relay, FR-SVC, and FUNI protocols. This option also includes a Cell Protocol Processor

(CPP) module, used for running automated test suites. The Telcordia (Bellcore) FR/ATM interworking test suite and ATM Forum LANE v1.0 conformance test suite is included with this option.

All LAN/WAN/ATM interfaces offer real-time measurement capability with synchronized timestamps. This enables you to perform time-correlated capture and measurements across multiple ports. Additional interfaces, such as HSSI and Packet over SONET/SDH (POS), are also available for the BSTS.



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## Key Bundle Features

### ATM Access and Interworking

You can validate cell and frame/packet forwarding functionality and QoS of ATM switches and multi-service access devices:

- 8 traffic streams with ATM/ AAL-5 payloads
- Standards-compliant O.191 test cell
- Real-time ATM/ AAL-5 QoS and performance measurements
- LAN protocol analysis over ATM

### 10/100 Mb/s Ethernet Access and Interworking

You can validate forwarding functionality and measure QoS/CoS performance of multi-layer switch-routers in real-time using the EFP module:

- 2 ports in one slot
- 8 traffic streams with real-time parameter control. This can be used for testing MAC and IP lookup table limits, and for defining differentiated classes of service (CoS).
- Up to 8 user-defined streams, based on layer 2 to 7 pattern matching. This can be used for real-time protocol analysis and IP QoS measurements.
- LAN encodes and decodes over Ethernet

### Internet Protocol Analysis

The LAN application software provides Multilayer/LAN/ATM and Multilayer/LAN/Ethernet test capability. Over 100 protocols are decoded from multilayer protocol suites, including: TCP/IP, LANE, AppleTalk, Banyan/Vines, DECnet, IBM/SNA, ISO, Novell/IPX, Microsoft LAN Manager, SUN, Xerox/XNS, and X-Windows

### Time-correlated Measurements

Synchronized timestamps enable correlated analysis across multiple interfaces. This enables testing of a wide range of interworking devices and access networks:

- ATM switches, IP routers
- Access concentrators, multi-service platforms
- End-to-end xDSL access testing (from the ADSL modem's Ethernet port to the DSLAM's ATM port)

## E5118A Option 501 Features

### Frame Relay Access and Interworking

You can validate frame forwarding functionality and performance over native Frame Relay T1/E1 (1.5/2 Mb/s) interfaces:

- 2 ports in one slot
- 8 traffic streams with DL-CORE/ Frame Relay payloads
- Real-time DL-CORE/ Frame Relay performance measurements
- LAN/FR protocol analysis

### Frame Relay Protocol Analysis

The Frame Relay application software provides native-FR and FR/ATM test capability. When combined with the LAN application software, it provides Multiprotocol/LAN/native-FR and Multiprotocol/LAN/FR/ATM test capability.

- Frame Relay protocols: DL-CORE/LAPF
- Frame Relay SVC protocol decodes
- FUNI decodes

### Automated Protocol Testing

Automated test suites for the BSTS simplify interoperability and conformance testing:

- ATM Forum LANE v1.0 conformance test suite: verifies LES, LECS, and BUS
- FR/ATM interworking test suite: automatically implements the Telcordia (Bellcore) SR-3989 test plan

Plus your choice of any two low-speed ATM Line Interface modules from the following:

## Product Numbers

- **E5118A** BSTS  
Switch-Router Test  
Solution

Contents include:

- **E4210B** BSTS Form-13  
Mainframe Chassis
- **E1607A** 0-155 Mb/s ATM  
Stream Processor  
(ASP)
- **E6282A** 10/100 Mb/s  
Ethernet Frame  
Processor (EFP)
- **E4212A** AAL Test Software
- **E4215B** LAN protocols test  
software
- **E6272B** LAN Emulation  
(LANE) test  
software

*NB: Upgrade credits or bundle credits are not available for individual software applications included in the E5118A BSTS Switch-Router Test bundle.*

## Switch-Router Standards

### IETF - TCP/IP Protocol Suite, Packet Performance, and Interworking:

- RFC768 (UDP)
- RFC791 (IPv4)
- RFC792 (ICMP)
- RFC793 (TCP)
- RFC1209 (IP over SMDs)
- RFC1242 (packet performance terminology)
- RFC1483 (IP over AAL-5)
- RFC1490 (Multiprotocol over AAL-5)
- RFC1577 (IP and ARP over ATM)
- RFC2215 (TSPEC, token bucket algorithm)

### ATM access:

- ITU-T I.361 (ATM cell layer)
- ITU-T I.363 (AAL-5)

### Ethernet access:

- DIX Ethernet II
- IEEE 802.2 (LLC)
- IEEE 802.3 (MAC)

### Frame Relay access:

- ANSI T1.403 (DS1 interface)
- ITU-T G.703, G.704, G.823 (E1 interface)
- ITU-T Q.921, Q.922 (DL-CORE and LAPF)

- Frame Relay Forum FRF.5 (FR/ATM, FR-SSCS)
- ITU-T I.365.1, I.555 (FR-SSCS)
- ATM Forum af-saa-0030.000 (FUNI) Letter Ballot, 06/1995

### Frame Relay LMI:

- ITU-T Q.933 Annex A
- ANSI T1.617 Annex D
- NTT Technical Reference of Frame Relay Interface ver. 1, 09/1993

### Frame Relay SVC:

- ITU-T Q.931, Q.933
- ANSI T1.607, T1.617 Annex D

### Frame Relay/ ATM Interworking Test Suite:

- Frame Relay Forum FRF.5, FRF.8
- Telcordia (Bellcore) SR-3989, Vol. 1, 07/1996

### ATM Forum LAN Emulation:

- af-lane-0021.000 (LANE v1.0), 01/1995
- af-lane-0050.000 (addendum), 12/1995
- ATM Forum/95-1081R3 LANE (LUNI) draft 3, 08/1996

*NB. You can either choose two of the same type of line interface, or two different line interfaces from the list below.*

- **Option 101** 2 Mb/s E1
- **Option 102** 34 Mb/s E3
- **Option 103** 1.5/45 Mb/s DS-1/DS-3
- **Option 104** 25.6 Mb/s
- **Option 105** 155 Mb/s Single Mode Optical OC-3c/STM-1
- **Option 106** 155 Mb/s Electrical
- **Option 107** 155 Mb/s UTP-5
- **Option 108** 6.3 Mb/s J2 Electrical
- **Option 109** 6.3 Mb/s J2 Optical
- **Option 110** 52 Mb/s Optical OC-1/STM-0

### **E5118A option 501 Add Frame Relay Test Solution**

Order option 501 and receive the following additional products:

- **E4206A** T1/E1 Frame Processor module (FP)
- **E4209B** 155 Mb/s Cell Protocol Processor (CPP)

#### **FP/ CPP Application Software**

- **E4216A** Frame Relay test software
- **E6275A** FUNI test software
- **E6278A** Frame Relay SVC protocol viewer
- **E7293B** ATM Forum LANE 1.0 conformance test suite
- **E7840A** Telcordia (Bellcore) Frame Relay / ATM interworking test suite

### **Configuration and Use With Other BSTS Modules and Applications**

The E5118A Switch-Router Test Solution simplifies BSTS configuration by providing the chassis, HP-UX controller, SCSI hard drive, as well as the modules and software applications required for switch-router testing.

You can maximize the return on your test equipment investment by selecting additional line interfaces, dedicated hardware modules, and test software that suit your specific needs.

### **Additional Ordering Information**

A selection of monitors are available for use with the Switch-Router Test Solution, as well as an optional CD drive. These items are not included in the bundle. The screens are multi-sync and can be used for the V743 UNIX controller.

- E4210B option ADJ - 20" color screen (1280 x 1024)
- E4210B option AQ5 - 17" color screen (1280 x 1024)
- E4210B option AQ3 - 15" color screen (1024 x 768)
- E4210B option AM8 - CD drive

### **Warranty & Support Options**

#### **Hardware**

All BSTS hardware components are warranted for a period of 3 years. Products must be returned to an authorized Agilent service center for service.

#### **Software**

Agilent Broadband Series Test System software and firmware products are supplied on transportable media such as disk, CD 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.

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## 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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