

Agilent Technologies E2950 Series for InfiniBand

E2951A Protocol Analyzer for InfiniBand 1x
E2953A Traffic Generator for InfiniBand 1x

E2952A Protocol Analyzer for InfiniBand 4x
E2954A Exerciser for InfiniBand 4x

Agilent's InfiniBand exercisers and analyzers lets you master InfiniBand validation, compliance-, and corner case testing

Readily Identify and Understand Your InfiniBand Prototype Design Problems

The Agilent E2950 Series offers debug and validation tools for R&D and QA engineers involved in InfiniBand hardware/software design (InfiniBand based semiconductors, switches, and routers) and test in the server and storage industry. It also helps to speed up design turn-on and system validation.

With its modular design approach, the E2950 Series is an excellent investment, enabling you to expand the system as the InfiniBand technology and standards evolve.

An interactive graphical user interface (GUI) allows you to handle all levels of the InfiniBand protocol, helping you to learn how InfiniBand works.

With the C++ interface the Agilent E2950 Series is not only a convenient R&D debugging tool, but also offers the foundation for structured and automated testing, including controlling multiport testing.

System Components and Architecture

The Agilent E2950 Series offers the following key products:

- Agilent E2951A protocol analyzer for InfiniBand 1x
- E2953A traffic generator for InfiniBand 1x
- Agilent E2952A Analyzer for InfiniBand 4x
- Agilent E2954A Exerciser for InfiniBand 4x
- Option #100 InfiniBand Compliance Test Suite (works together with the Traffic Generator or Exerciser)

The E2951A and E2952A protocol analyzers are standalone boxes pre-configured with a one or four 2.5 Gbit/s InfiniBand copper front end modules. The front end does not influence the physical protocol behavior of the observed InfiniBand Link..

The tools come with an integrated power supply, USB 1.0 or 2.0 connector to interface to the controlling PC and InfiniBand connector.

The E2953A traffic generator and E2954A exerciser are also standalone boxes with an integrated power supply and a USB connector to interface to the controlling PC.

They connect like an InfiniBand end device and send/receive data. The tools enable engineers to set up and repeat critical and worst-case traffic scenarios needed to test InfiniBand design, and to force incorrect InfiniBand traffic.

In addition to the 4x exerciser or 1x traffic generator, an optional InfiniBand Compliance Test Suite, option #100, contains pre-defined InfiniBand compliance tests which can be easily executed.

InfiniBand 1x or 4x Bundle

Bundle Promotions Offer Discount through June 2002

Get a 20% discount on InfiniBand 1x products when you buy both an E2951A protocol analyzer and an E2953A traffic generator/exerciser. Get a 25% discount on InfiniBand 4x products when you buy both an E2952A protocol analyzer and an E2954A exerciser. In the USA call 1-800-452-4844 ext 7675 or call your Agilent sales representative and ask about promotion 5.152 (1x bundle) or the E2955A InfiniBand 4x bundle.



Agilent Technologies

Agilent E2951A Protocol Analyzer for InfiniBand 1x

The Agilent E2951A analyzes on a physical and protocol level, providing an extensive analysis capability and verification of design efficiency.

Basic Capabilities

- Analysis of InfiniBand packets
- Up to 512 Mbyte of trace memory
- Packet time-stamp with 8 ns resolution
- Counting of skipped order sets
- MAD (Management Datagrams) decoding
- Real time performance analysis

Trigger Capabilities

- 0,1, X pattern trigger on all InfiniBand header bits and on bits of data payload
- Real-time error trigger on bad ICRC, VCRC, Invalid 10b codes, bad running disparity, skip-ordered set errors, end of bad packet, bad packet alignment and delete period
- Trigger on link-training sequences, message level, or packet sequence trigger

Graphical User Interface (GUI)

Hierarchical Data Representation

Regardless of whether a data representation on a higher “message level” or individual bit level is needed, the GUI gives you the required information with a mouse click.

Data Representation

- Timing information represented either as an absolute time stamp, as a time delta between time stamps, or as an idle time between packets
- Ability to collapse / uncollapse packet fields
- User-definable format and bit-ordering of packet fields

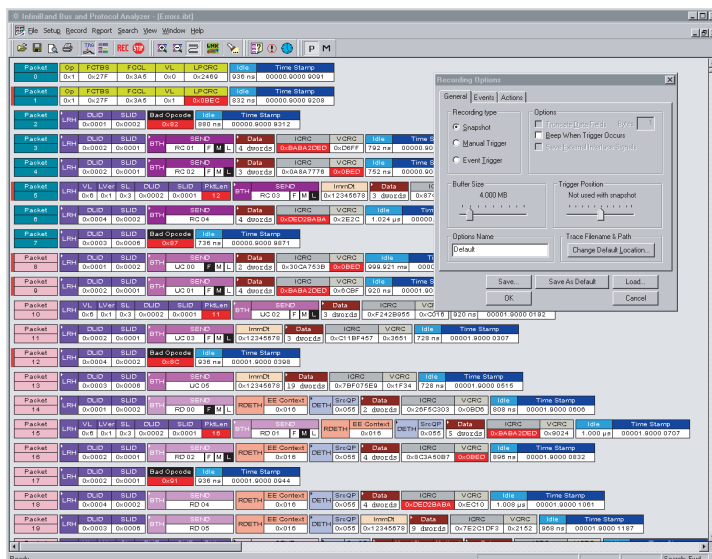


Figure 1: The Agilent E2951A protocol analyzer graphical user interface (GUI)

Physical Layer Protocol Analysis

The E2951A displays the following useful information:

- Number of skip-ordered sets, even when removed from recording
- Training sequences
- Link packets and data packets
- 8 bit /10 bit encoding for references
- Disparity errors
- ‘End of bad packet’ error
- ‘Packet delimiter’ error
- ‘Packet alignment’ error
- ‘Packet size’ error
- And much more

Link Layer Analysis

To simplify link layer analysis, the Agilent E2951A decodes InfiniBand packets into text strings and tool tips. Clear text messages inform the engineer what is occurring, eliminating the need for time-consuming studies of the InfiniBand reference lists.

Decoding includes:

- Separation of headers
- Demarcation of fields
- Decoding of data into text strings / tool tips

Network Layer Protocol Analyzer

The Agilent E2951A decodes the Global Route Header (GRH), consistent with the Ipv6 header based on Internet standards.

Decoding includes:

- Demarcation of fields
- Decoding of data into text strings / tool tips

Transport Layer Protocol Analysis

The GUI decodes and detects errors in:

- The transport functions SENDs, RDMA and Atomics
- Packet Sequence Numbers (PSNs)
- ACK/NAK protocols
- End-to-end message level flow control

Higher Layer Protocol Analysis

- Decodes MAD (Management Datagrams)

Filter and Search Functions

Recorded data can be filtered and searched by:

- Transmission unit size
- Packet size
- Queue pair
- Service level
- Virtual line assignment

System Description

The E2951A is a standalone box with integrated power supply, USB connector to interface to the controlling PC, indicators (LEDs), trigger I/O connectors, and InfiniBand 1x interface.

InfiniBand 1x Interface

The E2951A is preconfigured with a 2.5 Gbit/s InfiniBand front-end module. This frontend does not influence the physical protocol behavior of the observed InfiniBand link.

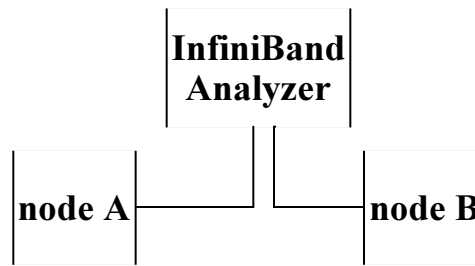


Figure 2: Agilent E2951A protocol analyzer set-up block diagram

InfiniBand Interface

- Two HSSDC2 connectors

External Trigger I/O

- 1x Input LVTTTL 50 Ω terminated; BNC connector
- 1xOutput LVTTTL; BNC connector

General Interfaces

- USB connection to the controlling host PC
- Status indicators for trigger active, data recording, and data upload
- Manual trigger switch

Host System Requirements

- Windows 2000
- Windows 98
- Windows NT (off-line mode)

General Specifications

Package

Dimensions: 350 x 88.1 x 304.1 mm
13.78 x 3.47 x 11.97 inches
(w x h x d)

Power Requirements

90-254 VAC, 47-63 Hz (universal input), 100 W maximum

Recording Memory Size

512 Mbytes for traffic capture, timing, and control information

Environmental Conditions

Operating Range:
0 to 40°C (32 to 104°F)
Storage Range:
-20 to 80°C (-4 to 176°F)
Humidity: 10 to 90%, non-condensing

Switches

Power: On/Off
Manual Trigger: Press to force trigger event

Indicators (LEDs)

- Power (PWR):
Illuminated when the analyzer is on
- Status:
Illuminated when the analyzer is functioning correctly
- Recording (REC):
Illuminated when the analyzer is actively recording traffic data
- Triggered (TRG):
Illuminated during power-on testing, and when the analyzer has detected a valid trigger condition
- Upload (UPLD):
Illuminated when the analyzer is uploading its recording memory to the host PC for displaying the traffic.
- Active:
Illuminated to indicate current status



Figure 3: The Agilent E2951A protocol analyzer for debugging and bring up any InfiniBand device

Agilent E2953A Traffic Generator for InfiniBand 1x

The E2953A generates predictable InfiniBand test traffic in a fully controllable way. The E2953A traffic generator for 1x can be programmed to generate arbitrary InfiniBand packets, behaving as an end-node within an InfiniBand network. The traffic generator scripts written in TCL and through a C++ interface. The user can write programs and link the generator libraries into an application.

By generating repeatable traffic, you can change the system parameters to verify operation, and upon encountering a problem, repeatedly force the error until the solution is found. It can monitor incoming traffic, participate in link training, transmit idle data and Skip-ordered sets, generate sequences of arbitrary packets, perform packet framing, and respond to incoming packets under software control.

Key Features

- Generate arbitrary traffic for InfiniBand links
- C++ and TCL scripting language for test automation (e.g., Compliance testing)
- Response by user program or script
- Generate sequences of arbitrary packets with programmatic interpacket delay under software control
- Operate as a maximum-bandwidth data source or data sink (automatic packet generation)
- Emulate unlimited receiver buffer space (unlimited data sink)
- Ignore credits when transmitting packets (option 001)

- Test error recovery by generating packets with incorrect invalid headers, packet framing errors, disparity errors ICRC, VCRC, and 8b/10b code group errors
- Load generation with algorithmic data generator
- Analysis Switch packet latency
- Record and replay
- Provide traffic generator memory size up to 512 Mbyte transmit and 512 Mbyte receive
- Use pattern term in the analyzer to trigger the transmission of a packet sequence (in hardware)

Basic Capabilities

- Participate in link training
- Transmit idle data and Skip-ordered sets required by the IB specification automatically to keep link alive
- Calculate CRC and perform packet framing automatically
- Generate 8 bit/10 bit coding and running disparity
- Perform link-level flow control in hardware

System Description

The E2953A Traffic Generator for InfiniBand 1x is a standalone box with integrated power supply, USB 1.0 connector to interface to the controlling PC, indicators (LED's), trigger I/O connectors, and InfiniBand 1x interface.

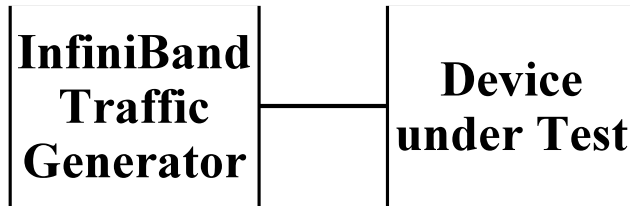


Figure 4: Agilent E2953A traffic generator block set-up diagram

External Trigger I/O:

- 1x Input LVTTTL 50 W terminated; BNC connector
- 1x Output LVTTTL; BNC connector

InfiniBand Interface

- One HSSDC2 connector

Control Interfaces

- USB 1.0 connection to the controlling host PC

Host System Requirements

- Windows 2000
- Windows 98
- Windows NT only in offline mode

General Specifications

Package

Dimensions: 350 x 88.1 x 304.1 mm
13.78 x 3.47 x 11.97 inches
(w x h x d)

Power Requirements

90-254 VAC, 47-63 Hz (universal input),
100W maximum

Environmental Conditions

Operating Range:

0 to 55°C (32 to 131°F)

Storage Range: -20 to 80°C (-4 to 176°F)

Humidity: 10 to 90%,

non-condensing

Switches: =

Power: On/Off

- RST: InfiniBand Link reset

Indicators: (LEDs)

- Power (PWR)

Illuminated when generator is on

- USB Link

Illuminated when USB connection to the host PC is established

- XMIT

Illuminated when InfiniBand link up and flashes when packets are transmitted

- RCVE

Illuminated when InfiniBand packets are received

- Error

Illuminated when error conditions exist



4 Figure 5: The Agilent E2953A traffic generator for speeding up InfiniBand 1x testing and validation

E2952A Analyzer for InfiniBand 4x

Agilent InfiniBand 4x protocol analyzer supports 4 wide 2.5Gb/s dual-simplex connections, the second speed class step in the InfiniBand evolution. This protocol analyzer lets you master InfiniBand validation, compliance, and corner case testing.

The analyzer for InfiniBand 1x as well as for InfiniBand 4x displays traffic on the InfiniBand link, and at the operation, packet or Management Datagram (MAD) level by using a graphical user interface, (GUI). The representation of the InfiniBand packets is color-coded, perfect for analysis purposes. Engineers involved in designing InfiniBand hardware or software need the analyzer to define recording, triggering and filtering conditions in order to process the InfiniBand traffic.

This great analysis tool with its capabilities and features help to expedite the development of different InfiniBand designs.

Applications

- Protocol analysis
- Troubleshooting
- Real-time performance analysis

Key Features and Specifications

- Optimized for high-level protocol analysis (IB messages, MAD decoding)
- Intuitive, easy-to-use graphical user interface, as well as a COM-API, specialized for InfiniBand
- Display of link and data packets with color-coded, expandable/collapsible, clearly labeled protocol fields
- The Graphical user Interface with powerful trigger-, storage-, filter-, and search capabilities for specific data, errors and other conditions
- Ability to view packet level, operations level, 10-bit codes or as decoded Management Datagrams (MADs)
- Recording and upload of InfiniBand traffic to analyze how InfiniBand designs work together
- MAD decoding (Subn LID, Subn directed, SubnAdm, Perf, BM, Dev Mgt, Comm mgt, SNMP, Vendor, Application, DTA)
- Real-time performance analysis
- Records, de-skews and displays a record of packets on the 4x link
- Display lane to lane skew information
- Record of Skip-ordered sets
- Adjustable trace memory depth up to 2 Gbytes

- External I/O for synchronization of other test equipment
- Field-upgradeable firmware

Benefits

- Increases test coverage
- Helps to guarantee compliance and interoperability
- Improves protocol analysis complexity
- Saves time and costs (hot mockup equipment, time, resources)
- Analyzes and optimizes product performance to improve product quality
- Packet time-stamp with 8 ns resolution
- Counts Skip-ordered sets
- Offers USB 2.0 for faster connections

Trigger Capabilities

- 0,1,X pattern trigger on all InfiniBand header bits and on bits of data payload
- Real-time error trigger on bad CRC, VCRC, Invalid 10b codes, bad running disparity, skip ordered-set errors, end of bad packet, bad packet alignment.
- Trigger on link-training sequences, message level or packet sequence trigger, link packet, and cable connection

Graphical User Interface (GUI)

Regardless of whether a data representation on a higher "message level" or individual bit level is needed, the GUI gives you the required information with a mouse click.

Data Representation

- Timing information represented either as an absolute time stamp, as a time delta between time stamps, or as an idle time between packets
- Ability to collapse /uncollapse packet fields
- User-definable format and bit-ordering of packet fields

Physical Layer Protocol Analysis

The E2952A displays the following useful information:

- Number of Skip ordered sets even when removed from recording
- Idle-time even when removed from recording
- Training sequences
- Packets and data packets
- 8 bit /10 bit encoding for references
- Disparity errors
- End of bad packet 'error
- 'Packet delimiter' error
- 'Packet alignment' error

- 'Packet size' error

Link Layer Analysis

To simplify link layer analysis, the Agilent E2952A decodes InfiniBand packets into text strings and tool tips. Clear text messages inform the engineer of what is occurring, eliminating the need for time-consuming studies of the InfiniBand reference lists.

Decoding includes:

- Separation of headers
- Demarcation of fields
- Decoding of data into text strings/tool tips

Network Layer Protocol Analysis

The Agilent E2952A decodes the Global Route Header (GRH), consistent with the Ipv6 header set by Internet standards. Decoding includes:

- Demarcation of fields
- Decoding of data into text strings/tool tips

Transport Layer Protocol Analysis

The GUI decodes and detects errors in:

- The transport functions SENDs, RDMA and Atomic
- Packet Sequence Numbers (PSNs)
- ACK/NAK protocols
- End-to-end message level flow control

Higher Layer Protocol Analysis

- MAD (Management Datagrams)
- SDP (Sockets Direct Protocol)
- SRP (SCSI RDMA Protocol)

Filter and Search Functions

Recorded data can be filtered and searched by:

- Transmission unit size
- Packet size
- Queue pair
- Service level
- Virtual line assignment

System Description

The E2952A is a standalone box with integrated power supply, USB 2.0 connector to interface to the controlling host PC, indicators (LEDs), trigger I/O connectors, and InfiniBand 4x interface.

InfiniBand 4x Interface

The E2952A is preconfigured with four 2.5 Gbit/s InfiniBand copper front-end. This front-end does not influence the physical protocol behavior of the observed InfiniBand link.

Interfaces

Two connectors
InfiniBand MicroGigaCN

External Trigger I/O

- 1x Input LVTTTL 50 Ohm terminated; BNC connector
- 1x Output LVTTTL; BNC connector

General Interfaces

- USB 2.0 connection to the controlling host PC
- Status indicators for trigger active, data recording, and data upload
- Manual trigger switch

Host System Requirements

- Windows 2000
- Windows 98
- Windows ME
- Windows XP
- USB 1.1 (minimum)
- USB 2.0 (preferred)

General Specifications

Recording memory size

2 Gbytes for traffic capture, timing, and control information

Environmental Conditions

Operating Range:

0 to 40 °C (32 to 104 °F)

Storage Range:

-20 to 80 °C (-4 to 176 °F)

Humidity:

10 to 90%, non-condensing

Switches

Power: On/Off

Manual Trigger: Press to force trigger event

Indicators (LEDs)

- Power (PWR)
Illuminated when the analyzer is on
- Status
Illuminated during Power-On Self Test (POST)
- Recording (REC)
Illuminated when the analyzer is actively recording traffic data
- Triggered (TRG)
Illuminated when the analyzer has detected a trigger condition
- Upload (UPLD)
Illuminated when the analyzer is uploading its recording memory to the host PC for displaying the traffic
- Active:
Illuminated to indicate current status

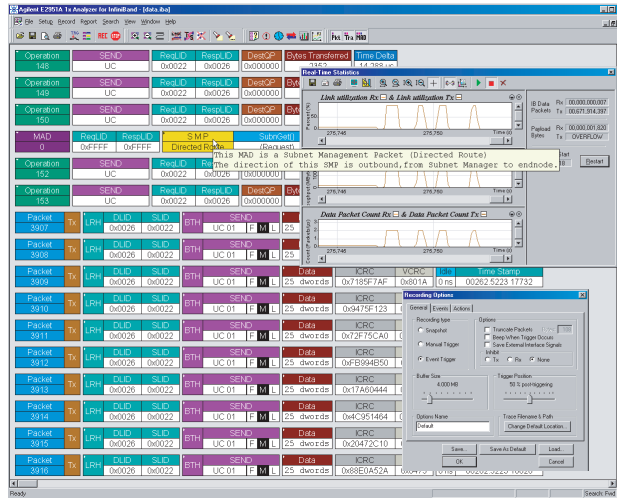


Figure 6: The Agilent E2952A protocol analyzer graphical user interface (GUI) for a detailed view of InfiniBand protocol

The Agilent E2954A Exerciser for InfiniBand 4x

The E2954A is a developmental continuation of the InfiniBand 1x traffic generator for the InfiniBand 4x speed class. The exerciser lets you master InfiniBand validation compliance, and corner case testing.

The E2954A Exerciser is aimed at design, R&D, and QA engineers involved in InfiniBand component, module, system design or software development. It helps speed up InfiniBand test execution, ensure compliance to InfiniBand I/O specifications, provide increased test coverage, save costs as compared to "hot mock-up" methods and improve product quality with real-time performance measurements.

Applications

- Functional validation tests (application/vendor specific)
- Compliance testing
- Regression testing of corner cases
- Error injection
- Stress testing
- Emulation of HCAs / TCAs / switches with fully programmable characteristics
- C++ and TCL scripting language for test automation (e.g. Compliance tests)

Key Features and Specifications

- Generate and receive arbitrary IB packets under programmatic control
- Provide C++ and TCL scripting language for test automation (e.g., Compliance tests)
- Respond to incoming packets in real-time, controlled by a user program/script
- Generate sequences of packets with programmable inter-packet delay
- Configure as a maximum bandwidth data sink or data source (emulating unlimited buffer space when receiving / ignoring credits when transmitting)
- Recover error by generating packets with incorrect ICRC, VCRC, invalid headers, packet framing errors, disparity errors, and 8b/10b code group errors
- Generate with algorithmic data generator
- Analyze packet latency
- Record and replay
- 2 Mbytes transmit and 2 Mbytes receive trace memory
- Trigger / synchronize through

external I/O or receive pattern terms

- Provide optional compliance test software (Option #100) containing pre written tests, which automatically verify a large number of compliance statements defined in the InfiniBand spec, providing a pass/fail result

Benefits:

- Makes InfiniBand designs compliant with specification
- Emulates any InfiniBand device (HCA, TCA, Switch, Router)
- Speeds up test execution (no change of physical setup)
- Provides repeatable tests
- Increases test coverage
- Saves costs (hot mockup equipment, time, resources)
- Analyzes design behavior

System Description

The E2954A Exerciser for InfiniBand 4x is a standalone box with integrated power supply, USB connector to interface to the controlling PC, indicators (LEDs), trigger I/O connectors, and InfiniBand 4x interface.

External Trigger I/O

- 1x Input LVTTTL 50 W terminated; BNC connector
- 1x Output LVTTTL; BNC connector

Interfaces

- One InfiniBand MicroGigaCN connector

Control Interfaces

- USB connection to the controlling host PC
- 125 MHz transmit clock output SMA connector

Host System Requirements

- Windows 2000
- Windows 98
- Windows NT only in offline mode

General Specifications

Package Dimensions:

350 x 88.1 x 304.1mm

13.78 x 3.47 x 11.97 inches (w x h x d)

Power Requirements

90-254 VAC,47-63 Hz (universal input),

100W maximum

Environmental Conditions

Operating Range:

0 to 55 °C (32 to 131 °F)

Storage Range:

-20 to 80 °C (-4 to 176°F)

Humidity:

10 to 90%, non-condensing

Switches:

Power:On/Off

Indicators: (LEDs)

- Power (PWR)
 - flashes while configuration
 - Illuminated steady when configuration is finished
- Error
 - Illuminated when error conditions
- Link
 - Illuminated when InfiniBand linkup
- Rx
 - Flashes when InfiniBand packets received
- Tx
 - Flashes when InfiniBand packets transmitted

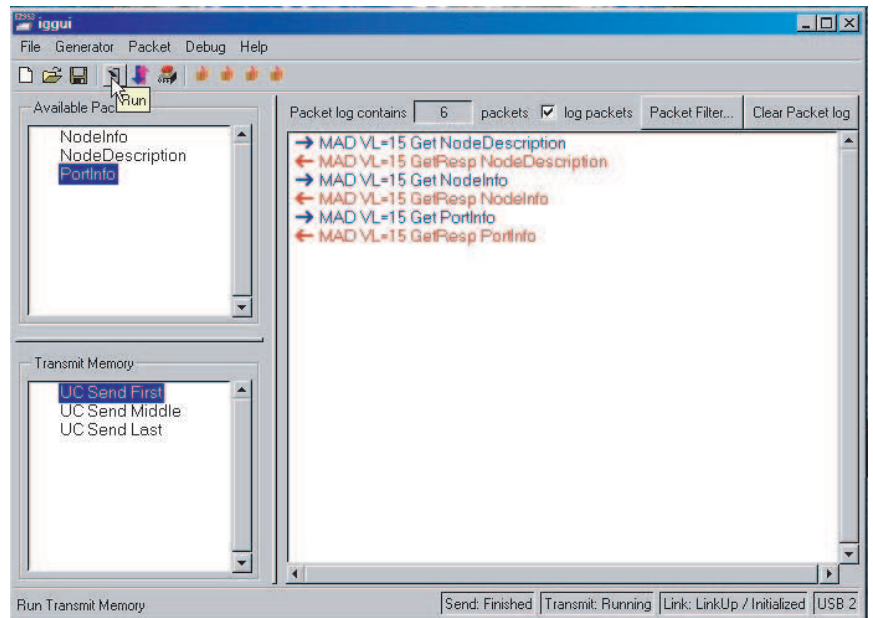


Figure 7: The Agilent E2954A exerciser graphical user interface (GUI) for fast test execution

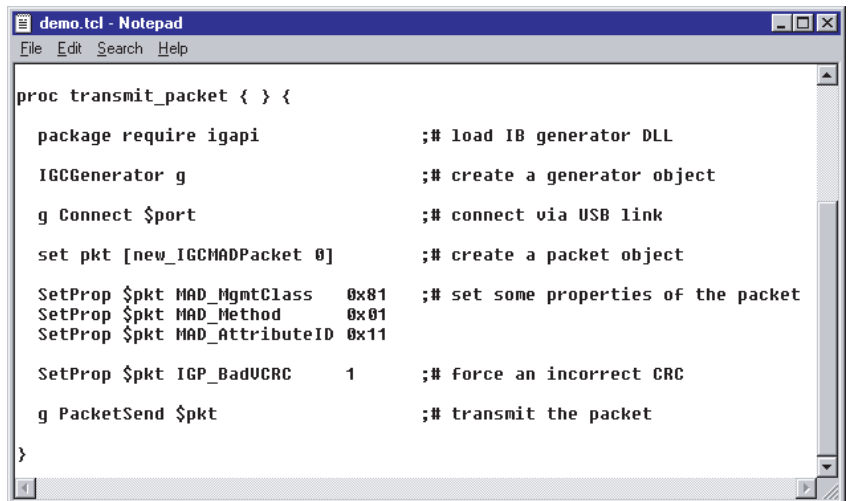


Figure 8: Agilent E2954A exerciser TLC interface to create their own test environment

Option #100 InfiniBand Compliance Test Suite

To make the test equipment even easier to use, Agilent also provides optional compliance test software, E2954A option #100, which includes pre-written tests users can run to automatically verify a large number of compliance statements defined in the InfiniBand I/O specification, providing a pass/fail result.

The option contains 18 InfiniBand compliance tests. Additional free upgrades at least until January, 2003, are included, depending on the availability of test descriptions from the Compliance and Interoperability Work Group CIWG of the InfiniBand Trade Association IBTA.

The test suite consists of a standalone GUI. Individual tests are chosen and execute with a simple click on run. The GUI is included in the E2953A or E2954A software with some compliance test examples. The user interface is completely realized in tcl/tk command language.

Additionally, user written tests are possible via C++ or TCL script and are easy to include in the test suite and the customer can create his own InfiniBand test suites or test environments.

Target Application

The InfiniBand Compliance test suite GUI executes compliance test and individual user-written tests by a GUI. The quality of the InfiniBand design can be verified without much programming effort. Additionally fast regression testing is possible.

Test Method

The compliance tests allow you to send correct and incorrect packets to the DUT and verify its behavior. You can test channel adapters, switches and routers.

Test Description

The tests are based on the InfiniBand Architecture Test Specification, version 0.8 from May, 2001, available from the InfiniBand Trade Association.

Test Examples or Assertions

- Packet with Bad DLID
- Packet with Bad ICRC
- Packet with GRH and VL15
- Packet with Bad VCRC
- Packet Receive Statemachine 'MARKED BAD PKT'
- Packet Receive Statemachine 'BAD PKT'
- Packet with Bad LVer
- Packet with Bad PktLen
- The SL Field Shall be Ignored by DUT When Using VL15
- LMC Check
- Number of VLs Supported
- State Transitions
- SM Packets Send and Receive in States 'Initialize' and 'Arm'
- Ignoring Invalid Link State Settings
- EUI-64 GUID Assigned by Manufacturer
- 4 Running Disparity Errors in a Sequence
- Basic Directed Route SMP Response
- Correct SMP Packet -- Expect Response
- S LID Check

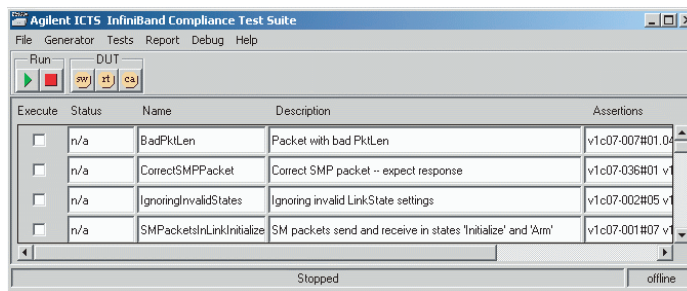


Figure 9: InfiniBand Compliance Test Suite Option #100 graphical user interface(GUI) to speed up test execution

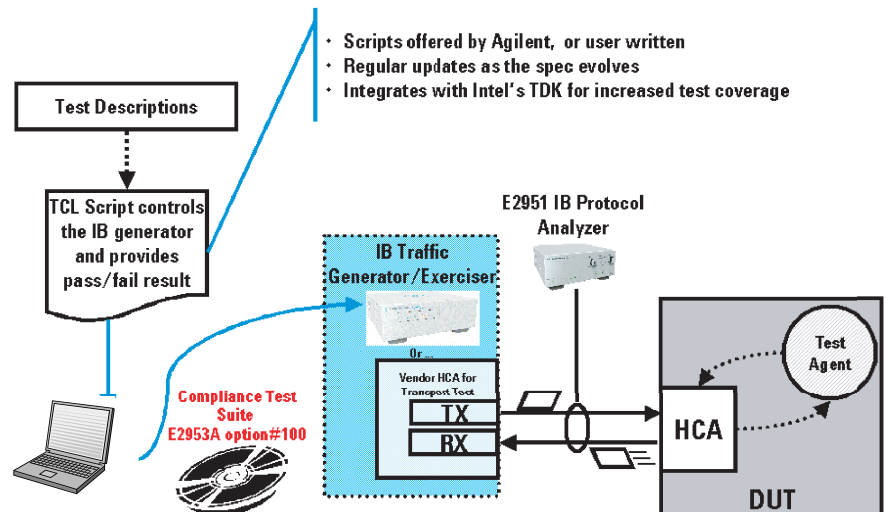


Figure 10: Compliance test setup with the Agilent E2950 Series

Application Examples of the E2950 Series

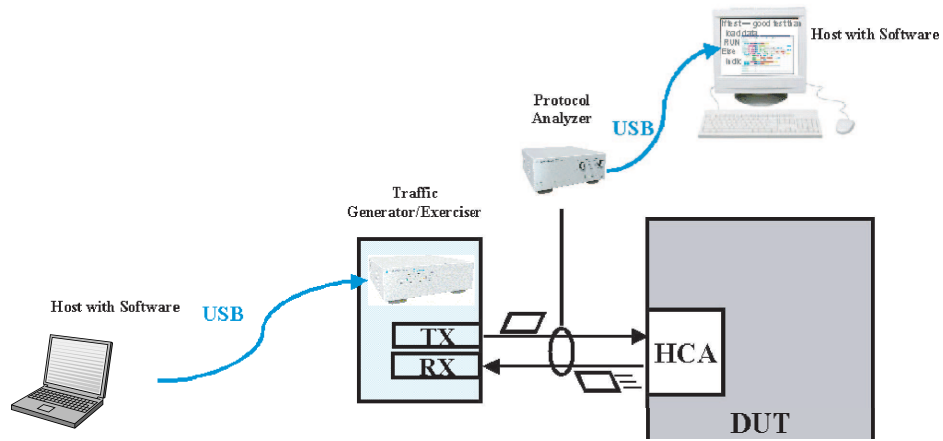


Figure 11: Possible setup of the E2950 series for increased test coverage

Analyze InfiniBand Traffic Between Two InfiniBand Devices

The Agilent E2951A or E2952A plugs in between the two devices under test. All traffic between these two devices is now monitored. This is a typical application when debugging root cause hardware or software problems within an InfiniBand system. The external trigger I/O of the E2950A or E2952A allows triggering of other test equipment, for example, a logic analyzer if needed.

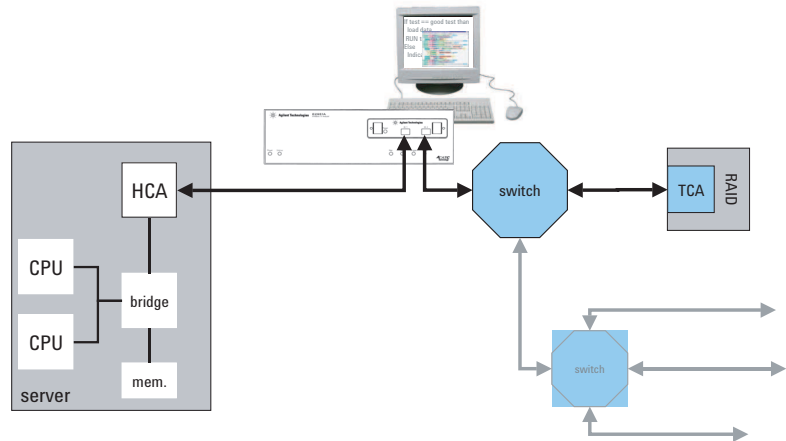


Figure 12: Analyzer test setup to show the InfiniBand traffic in the fabric

Test HCA / Server Using Traffic Generator and Analyzer

The combination of an E2953A/E2954A traffic generator/exerciser and an E2951A/E2952A protocol analyzer is used to validate a switch or a HCA and server. This setup allows you to stress the switch, HCA, or server from the I/O site, monitor system performance, and test with worst case scenarios in a fully predictable and controllable way. The protocol analyzer is optional in this particular test setup.

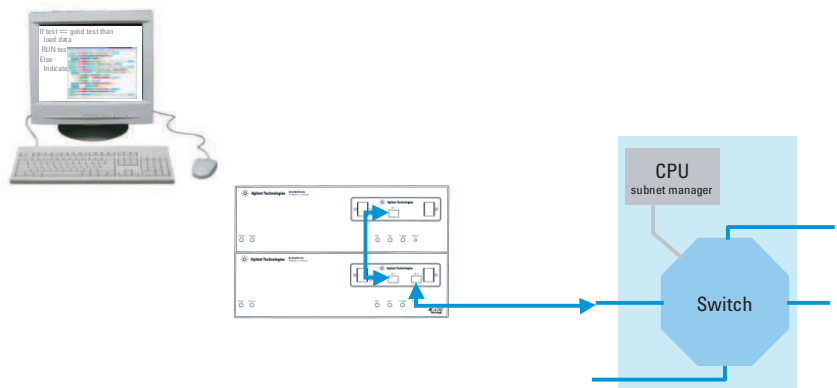


Figure 13: Switch test setup for validation purposes, with the traffic generator/exerciser and option analyzer

Verify 4 Port IB Switch

One generator in combination with an analyzer can be used to verify a dedicated connection. This repeatable and predictable test setup is needed to verify switch performance under heavy and critical load conditions. Verification of traffic policing, correct handling of routing table, handling of virtual lanes (VL), etc., are some measurement examples performed with this setup.

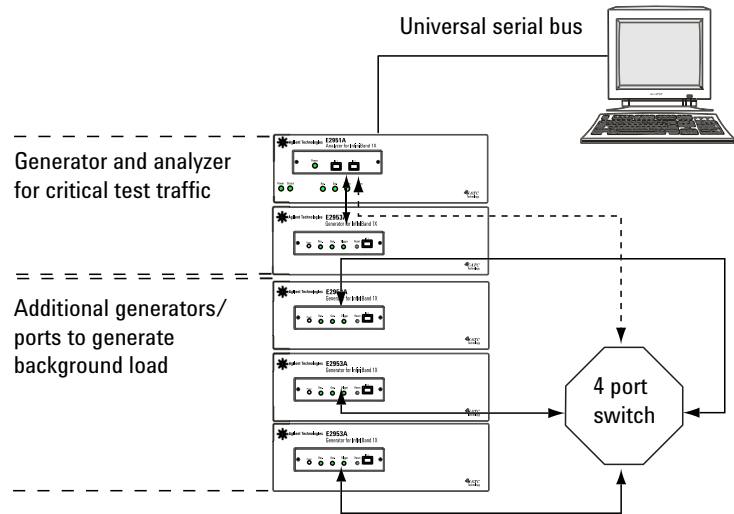


Figure 14: Switch test setup for performance analysis with the protocol analyzer and traffic generator/exerciser

Ordering Information

E2951A

Includes:

- Protocol Analyzer for InfiniBand 1x
- Graphical User Interface
- COM-API (COM application programming interface)
- USB cable
- Two InfiniBand 1x cable
- Power cable
- Software media

E2953A

Includes:

- Traffic Generator for InfiniBand 1x
- Graphical User Interface GUI (example GUI)
- C++ and TCL Interface (includes application examples)
- USB cable
- One InfiniBand 1x cable
- Power cable
- Software media

E2953A option #100

Includes:

- License key
- Software media

The E2953A Traffic generator for InfiniBand 1x is required. This means choosing the Agilent E2953A Traffic Generator for InfiniBand 1x option #100 adds the Compliance Test Suite to the hardware order.

E2952A

Includes:

- Protocol Analyzer for InfiniBand 4x
- Graphical User Interface
- COM-API (COM application programming interface)
- USB cable
- Two InfiniBand 4x cable
- Power cable
- Software media

E2954A

Includes:

- Exerciser for InfiniBand 4x
- Graphical User Interface GUI (example GUI)
- C++ and TCL Interface (includes application examples)
- USB cable
- One InfiniBand 4x cable
- Power cable
- Software media

E2954A option #100

Includes:

- License key
- Software media

The E2954A Exerciser for InfiniBand 4x is required. This means choosing the Agilent E2954A Exerciser for InfiniBand 4x option #100 adds the Compliance Test Suite to the hardware order.

E2955A

Includes:

- Protocol Analyzer for InfiniBand 4x
- Graphical User Interface
- COM-API (COM application programming interface)
- USB cable
- Two InfiniBand 4x cable
- Power cable
- Exerciser for InfiniBand 4x
- Graphical User Interface GUI (example GUI)
- C++ and TCL Interface (includes application examples)
- USB cable
- One InfiniBand 4x cable
- Power cable
- Software media

InfiniBand 1x Compliance Test Bundle

From now through June 2002, pay 20 % less when you order both an E2951A protocol analyzer and an E2953A traffic generator/exerciser. Please mention promotion #5.152 with your request or order.

Includes:

- Protocol Analyzer for InfiniBand 1x
- Graphical User Interface
- COM-API (COM application programming interface)
- USB cable
- Two InfiniBand 1x cable
- Power cable

- Traffic Generator for InfiniBand 1x
- Graphical User Interface
- C++ and TCL Interface
- USB cable
- One InfiniBand 1x cable
- Power cable
- Software media

Agilent Technologies' Test and Measurement Support, Services, and Assistance

Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every instrument and system we sell has a global warranty. Support is available for at least five years beyond the production life of the product. Two concepts underlay Agilent's overall support policy: "Our Promise" and "Your Advantage."

Our Promise

Our Promise means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. Many self-help tools are available.

Your Advantage

Your Advantage means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and on-site education and training, as well as design, system integration, project management, and other professional services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.

Related Agilent Literature

- Test Tools for Infiniband, Brochure, p/n 5988-2424EN

You can find the current Literature and software at
www.agilent.com/find/E2950_series

Windows is a registered trademark of Microsoft Corporation



Agilent Email Updates

www.agilent.com/find/emailupdates

Get the latest information on the products
and applications you select.

**For more information,
please visit us at:
www.agilent.com/find/infiniband**

By internet, phone, or fax, get assistance with all your test & measurement needs

Online assistance:
www.agilent.com/find/assist

Phone or Fax
United States:
(tel) 1 800 452 4844

Canada:
(tel) 1 877 894 4414
(fax) (905) 206 4120

Europe:
(tel) (31 20) 547 2000

Japan:
(tel) (81) 426 56 7832
(fax) (81) 426 56 7840

Latin America:
(tel) (305) 267 4245
(fax) (305) 267 4286

Australia:
(tel) 1 800 629 485
(fax) (61 3) 9272 0749

New Zealand:
(tel) 0 800 738 378
(fax) 64 4 495 8950

Asia Pacific:
(tel) (852) 3197 7777
(fax) (852) 2506 9284

Product specifications and descriptions in this document subject to change without notice.

Copyright © 2002 Agilent Technologies
Printed in Germany June 14 2002
5988-1784EN