RFC Compliance Testing
SmartApplications™

Product Overview

SmartApplications provides easy-to-use, automated performance analysis for bridges, switches, and routers per RFC 1242, Benchmarking Terminology for Network Interconnection Devices and RFC 2544, Benchmarking Methodology for Network Interconnect Devices. This application provides comprehensive testing in multi-topology environments, including support for Ethernet, Token Ring, ATM, and Frame Relay.

The unique combination of the SmartBits® Performance Analyzer's load generation capabilities and measurement accuracy, along with the industry-standard test suite provided by SmartApplications, allows you to generate a full and sustained load and perform accurate evaluations of Throughput, Latency, Packet Loss, and Back-to-Back performance limits.

Test Descriptions

Throughput

This test determines the throughput rate that can be supported by a device under test (DUT) or system under test (SUT) without a single packet being dropped. For each port pair, SmartApplications generates traffic at full wire rate (or the rate specified in the test setup) for the duration specified in the test setup. If any packets are dropped on any port, SmartApplications will decrease the load to 50% and retest. SmartApplications will then proceed with a binary search for the maximum rate at which no packets are dropped. This rate is the throughput for the device under test, measured for each packet size specified in the test setup.

Latency

This test measures the time it takes for a DUT to forward a packet while under load. SmartApplications generates 100% load (or the rate specified in the test setup) for a specified period of time. Mid-way through the test, SmartApplications measures the latency of one packet for each port pair.

For store-and-forward devices, latency is measured from the time the last bit of the input frame reaches the input port, to the time the first bit of the output frame is seen on the output port. For cut-through devices, latency is measured from the time the first bit of the input frame reaches the input port, to the time the first bit of the output frame is seen on the output port. This test is repeated for each packet size specified in the test setup.

Packet Loss

This test indicates the performance of a DUT in a heavily loaded state, by measuring the percentage of packets that are not forwarded due to lack of resources.

SmartApplications generates 100% load (or the rate specified in the test setup) for the period of time specified. At the end of the test, SmartApplications reports the percentage of packets that should have been forwarded but are dropped for each port pair. This test is repeated for each packet size specified in the test setup.

SmartApplications: RFC Compliancy Testing of Throughput, Latency, Packet Loss, Back to Back
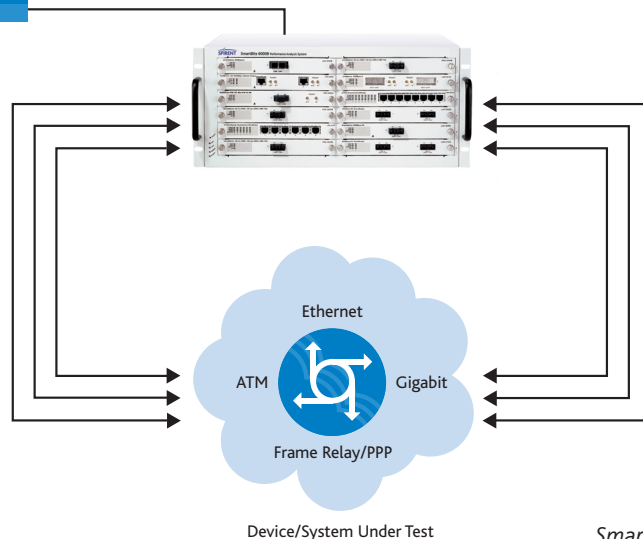
Ethernet

ATM   Gigabit

Frame Relay/PPP

Device/System Under Test

SmartApplications test environment

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Back-to-Back Performance

This test measures the buffer capacity of a DUT by sending bursts of traffic at the maximum frame rate and measuring the longest burst size (in total number of packets) at which no packets are dropped. SmartApplications generates a burst of traffic at full load, and if all packets are forwarded, the burst size is increased and the test is rerun. If one packet is dropped on any port pair, however, it halves the burst size and repeats the test. SmartApplications will then proceed with a binary search for the maximum burst size at which no packets are dropped. This test is repeated for each packet size specified in the test setup.

Test Features

- Tests across multiple topologies, including Ethernet (10/100/1000 Mbps), Token Ring (4/16 Mbps), ATM (25 Mbps, DS1/DS3, E1/E3, OC-3c, OC-12c), and Frame Relay/PPP (V.35, T1). Cross topology support includes:
    - Ethernet to: Ethernet, Token Ring, ATM, and Frame Relay/PPP.
    - ATM to: Ethernet and Frame Relay/PPP. (Throughput and Packet Loss tests only.)
    - ATM to ATM: Throughput, Packet Loss, and Latency tests.
    - Frame Relay/PPP to: Frame Relay/PPP, Ethernet, Token Ring, and ATM. (Supports one DLCI per transmitting port.)
- Tests ATM with LANE SVC, Classical IP (per RFC 1577) PVC/SVC, or SNAP (per RFC 1483) PVC/SVC traffic.
- Tests at layer 2 or specify network addresses and test at layer 3.
- Runs tests individually or uses automatic mode to run your choice of tests automatically.
- Tests full or half duplex.
- Tests in unidirectional or bi-directional mode. Bi-directional testing is intended for full-duplex implementations and will send traffic in both directions during the test.
- Tests one-to-one port pairs, one-to-many ports, or many-to-one port pairs.
- Supports Ethernet 802.3 framing.
- Simulates a router with next-hop capability per RFC 2544.

- Uses GPS (Global Positioning System) with multiple remote SmartBits chassis for end-to-end performance testing, including remote one-way latency measurements.

Test Results

- Test results are displayed in real time.
- Reports are available in a variety of formats, including Excel and HTML.
- An error log provides debug information.
- Charting capability allows customization of results.
- Choose horizontal tabular report format or traditional non-tabular format.
- Cut-through and store-and-forward latency measure ments are displayed individually.

Requirements

- An SMB-200, SMB-2000, SMB-600, or SMB-6000B chassis with the appropriate SmartCards/modules for the test.
- The proper cabling for the test (for example, category 5, straight-through or crossover, depending on the DUT).
- An IBM or compatible Pentium™ PC running Windows® 98/2000/NT, with mouse and color monitor.
- An RS-232 modem (not null modem) cable; or for Ethernet control, an RJ-45 straight-through cable and a 10 Mbps half duplex Ethernet controller card (in the PC).

Ordering Information

SmartApplications is automatically provided with each SmartBits chassis. For software updates, upgrades, and technical support, please order:

SUS-SMB

12-month Software Update Support Service

SUS-SMB-2YR

24-month Software Update Support Service

SUS-SMB-RNWL

Additional 12 months Software Update Support Service Renewal

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