Multicast IP Network Performance Analysis

SmartMulticastIP™

Product Overview

Do you imagine your network supporting both audio/visual communication and data-sharing that spans multiple time zones in real-time? Do you wish for a technology that can be implemented with your existing IP infrastructure and lends optimum productivity, for a low cost? If your answer to these questions is "yes," then you are probably contemplating the use of IP multicast technology for your network. IP multicast technology bypasses the inconveniences associated with asynchronous tools such as email, faxes, and telephone tag. Instead, it provides collaborative, synchronous, multimedia tools such as text-chat and shared desktop, coupled with video and audio in an immediate response environment.

So how do you know which IP multicast devices will work best for you? Spirent Communications' SmartMulticastIP test application uses the unique SmartMetrics' test capabilities of SmartBits" SmartCards/modules to measure the IP multicast performance of routers and switches. The SmartMulticastIP GUI makes it easy for you to perform throughput, forwarding rate, and latency tests on systems ranging from a single device under test (DUT) to a full-blown internetwork. All SmartMulticastIP tests are also available via the SmartLibrary' API, allowing for integration with existing C, C++, or Tcl application sets.

SmartMulticastIP is designed for network managers and equipment manufacturers, as well as ISPs and carriers. It is ideally suited:

- To perform a comparative analysis of IP multicast devices.
- To evaluate the key performance parameters of IP multi cast devices under typical or extreme traffic load conditions.
- To re-qualify IP multicast devices after firmware upgrades.

Supported RFCs

- IETF Draft, Methodology for IP Multicast Benchmarking
- RFC 2432, Terminology for IP Multicast Benchmarking
- RFC 2236, Internet Group Management Protocol, Version 2
- RFC 2113, IP Router Alert Option
- RFC 1112, Host Extensions for IP Multicasting

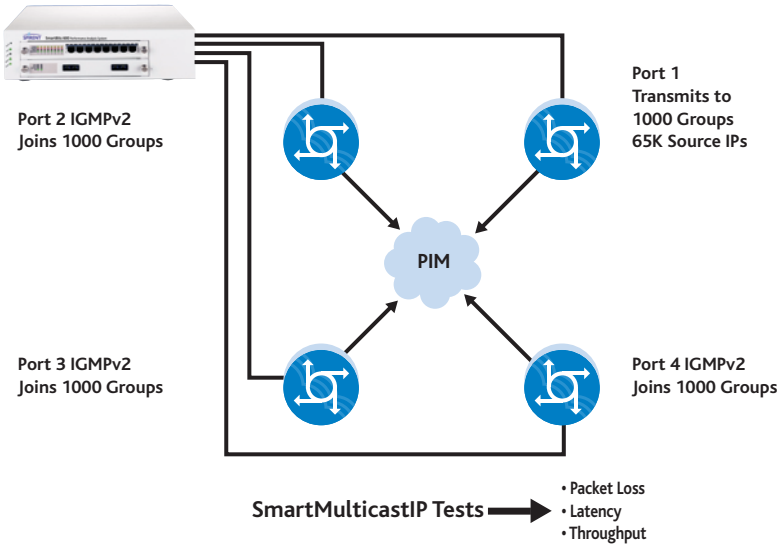
Key Features

- Throughput/Latency/Packet Loss per stream, per IGMP group, and per port.
- Scalable to 640 ports. Any port can transmit, transmit and receive, or just receive.
- 65K source IP addresses and multiple transmitters.
- Group membership verification and unicast ARPs.
- TOS/DiffServ field entry.
- Results appear in table format; you can save configurations and results to a file.
- Each port includes a full IGMP protocol stack, supporting version 1 or 2.
- User-configurable: test duration, frame length, frame transfer rate, number of groups.

Test Descriptions

SmartMulticastIP tests are based on RFC 2432, which defines terminology for benchmarking devices capable of forwarding multicast IP traffic. The following tests are supported:

- Mixed Class Throughput Test
- Min/Max/Avg. Forwarding Latency with Distribution Test
- Scaled Group Forwarding Matrix Test
- IGMP Group Join/Leave Latency Test
- Aggregated Multicast Throughput Test
- Group Capacity Test



Test environment using SmartMulticastIP

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Mixed Class Throughput Test

The Mixed Class Throughput test measures the DUT's ability to deliver both multicast and unicast traffic in a "real-world" situation. It does this by measuring the maximum rate at which ALL offered test frames, consisting of unicast and multicast traffic types, are successfully received by the DUT. The test runs with a fixed frame size for each traffic type, with a fixed port configuration. Multicast test frames contain a single group address.

Min/Max/Avg. Forwarding Latency with Distribution Test

This test is useful in determining how a DUT delivers multicast traffic across multiple destination ports. It is particularly important in multimedia applications where the payload is time-sensitive. The Forwarding Latency test measures minimum, maximum, and average multicast forwarding latency from a single source port for a fixed frame size, frame rate, and port configuration. A latency distribution histogram with 16 discrete time buckets is also generated; results are available for all destination ports in the test.

Scaled Group Forwarding Matrix Test

The Scaled Group Forwarding Matrix test measures the DUT's multicast forwarding performance as the number of multicast groups is scaled upward. The test measures the multicast forwarding rate of the DUT for a fixed port configuration. Trials are performed multiple times with fixed-size test frames containing an increasing number of group addresses.

IGMP Group Join/Leave Latency Test

The Join test measures the time it takes the DUT to set up multicast forwarding tables. Specifically, this is the amount of time it takes for the DUT to start forwarding multicast frames, from the point when an IGMP membership report (a join) is sent to the DUT on a receiving port. This may involve significant routing protocol overhead. Multiple receiving ports may join groups at approximately the same time. The joins occur after a source port has already formed/joined the group and has begun transmitting test frames. The Leave test measures the time it takes the DUT to tear down multicast forwarding tables. This may involve significant routing protocol overhead. The Group Leave Latency test measures the amount of time it takes for the DUT to stop forwarding multicast frames, from the point when an IGMP Leave Group Request is sent to the DUT on a receiving port.

Aggregated Multicast Throughput Test

Using a fixed frame size, the Aggregated Multicast Throughput test measures the DUT's multicast forwarding performance as the number of destination ports is scaled upward. The test measures the maximum rate at which ALL offered multicast test frames to be forwarded through *n* destination ports, are successfully forwarded by the DUT. Individual throughput measurements are performed for each *n* value of interest.

Group Capacity Test

The Group Capacity test measures the maximum number of group memberships that the DUT can support. In this test, the DUT forwards test frames on all groups at a set rate.

Requirements

- An SMB-600 or SMB-6000B chassis and one or more SmartBits SmartCards/modules.
- An IBM or compatible Pentium PC running Windows 98/2000/NT, with mouse and color monitor.
- Microsoft Excel 97/2000 application for Windows (optional, but highly recommended).

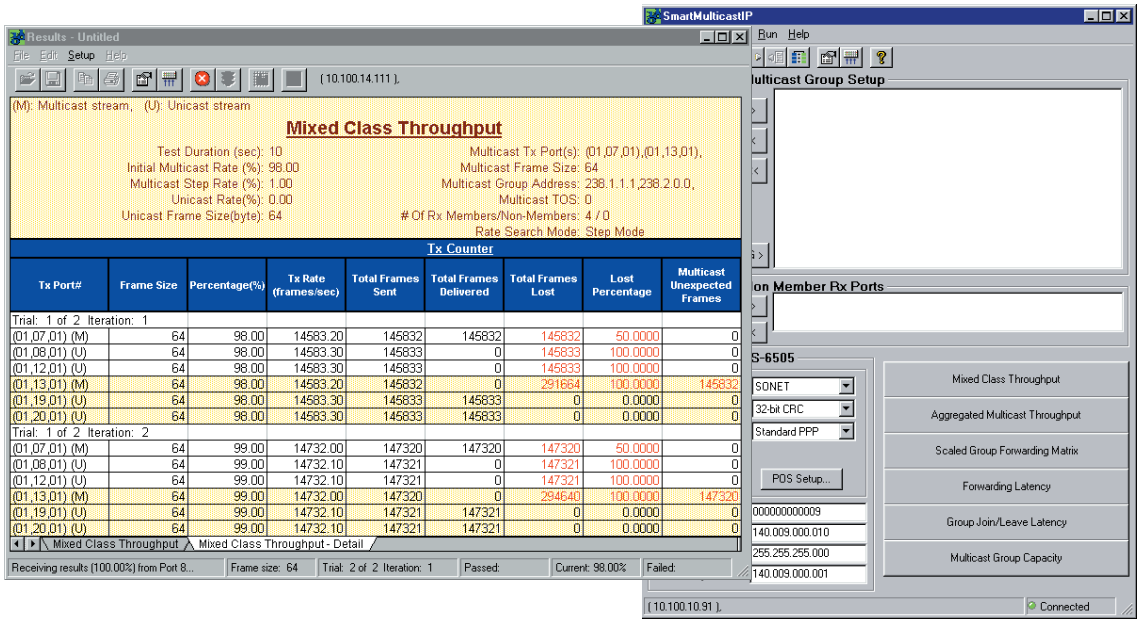
Ordering Information

SWF-1204A

SmartMulticastIP

SUS-SMB

12-month Software Update Support Service



SmartMulticastIP windows

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