



# TeraRouting Tester Software Module

# Multicast Routing

## Product Overview

The Multicast Routing protocol software module works together with all of the basic TeraRouting Tester™ (TRT) features such as the Flap Scheduler, Traffic Generator, and integrated results. The Multicast Routing software module supports functional and performance tests for multicast routing and registration protocols.

By using the Multicast Routing module, users can build complex multicast scenarios, emulating all aspects of a multicast network. Multicast sources, receivers, first hop routers, rendezvous points, and last hop routers can all be emulated individually or collectively. “What if” scenarios can be dynamically implemented (with real-time results) in order to test the functionality or scalability of a particular device or even an entire network.

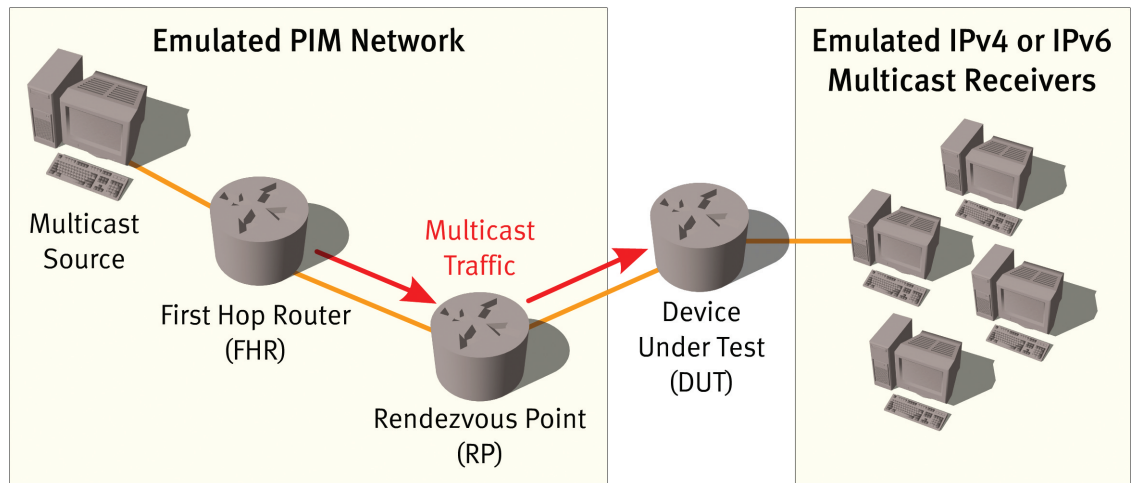
Configuring a complex multicast test takes only minutes with TRT’s intuitive GUI. Tests can also be fully automated for repeatability. Results can be saved as .csv or .html files for management reports.

## Key Features

- Concurrent operation with Unicast routing protocols
- Mixed traffic types
- PIM-SM and PIM-SSM
- IGMP versions 1, 2, and 3
- MLD versions 1 and 2
- IPv4 and IPv6 support
- All common attributes are dynamically configurable.
- Integrated traffic generation for emulated groups.

## IGMP/MLD Emulation Features

- 20,000 groups per port
- Up to 1,000 hosts per group
- VLAN support
- IGMP/MLD Joins and Leaves
- Source filters (for IGMPv3 and MLDv2) for up to 64 sources per group
- Robustness variable (for IGMPv3 and MLDv2)



*Conduct performance, conformance, and functional multicast testing*

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### PIM Emulation Features

- Emulate up to 400 PIM routers per port
- Emulate First Hop Routers (FHRs), Last Hop Routers (LHRs), and Rendezvous Points (RPs)
- VLAN and ATM support
- Configurable Hello Interval, Hold Time, and Priority
- Configurable Join/Prune Delay and Hold Time
- Join (\*,G), (S,G) or (\*,\*,RP) Multicast groups
- Configurable message frequency
- Bootstrap messages
- Predefined “flap” events for negative testing

### IGMP/MLD Real-time and Final Results

- TX/RX frame counts
- Session state
- Type errors
- Checksum errors
- Version errors
- Join/Leave timestamps

### PIM-SM Real-time and Final Results

- Sent/Received Hellos
- Sent/Received Joins
- Sent/Received Prunes
- Sent/Received Register messages
- Sent/Received Bootstrap messages
- Group information
- Neighbor counts

### Related RFCs

- RFC 1112 – Host Extensions for IP Multicast (IGMPv1)
- RFC 2236 – IGMPv2
- RFC 2362 – Protocol Independent Multicast – Sparse Mode
- RFC 2710 – Multicast Listener Discovery (MLD) Protocol
- RFC 3376 – IGMPv3
- draft-ietf-pim-sm-v2-new-xx – PIM-SM version 2
- draft-vida-ml-d-v2-xx – MLD version 2

### Supported Modules

Module	Description
<b>ATM-3451A</b>	ATM OC-3c (STM-1c), 2-port, multi-mode, 1300nm, TeraMetrics
<b>ATM-3451As</b>	ATM OC-3c (STM-1c), 2-port, single mode, 1310nm, TeraMetrics
<b>ATM-3453A</b>	ATM OC-3c/OC-12c (STM-1c/STM-4c), 2-port, multi-mode, 1300nm, TeraMetrics
<b>ATM-3453As</b>	ATM OC-3c/OC-12c (STM-1c/STM-4c), 2-port, single mode, 1310nm, TeraMetrics
<b>LAN-3301A</b>	10/100/1000Base-T Ethernet, Copper, 2-port, TeraMetrics
<b>LAN-3302A</b>	10/100Base-TX Ethernet, Copper, 2-port, TeraMetrics
<b>LAN-3311A</b>	1000Base-X Ethernet, GBIC, 2-port, TeraMetrics
<b>LAN-3321A</b>	10/100/1000 Mbps and Gigabit Ethernet Fiber, 2-port, TeraMetrics XD
<b>LAN-3325A</b>	10/100/1000 Mbps and Gigabit Ethernet Fiber, 4-port, TeraMetrics XD
<b>LAN-3327A</b>	10/100/1000 Mbps and Gigabit Ethernet Fiber, 1-port, TeraMetrics XD
<b>POS-3505As</b>	POS OC-48c (STM-16c), 1-port, single mode, 1310nm, TeraMetrics
<b>POS-3505AR</b>	POS OC-48c (STM-16c), 1-port, single mode, 1550nm, TeraMetrics
<b>POS-3511A</b>	POS OC-3c/OC-12c (STM-1c/STM-4c), 2-port, multi-mode, 1300nm, TeraMetrics
<b>POS-3511As</b>	POS OC-3c/OC-12c (STM-1c/STM-4c), 2-port, single mode, 1310nm, TeraMetrics
<b>POS-3519As</b>	POS OC-192c (STM-64c), 1-port, 2-slot, single mode, 1310nm, TeraMetrics
<b>POS-3519AR</b>	POS OC-192c (STM-64c), 1-port, 2-slot, single mode, 1550nm, TeraMetrics
<b>XLW-3721A</b>	10GBase Ethernet, Optical, XENPAK, 1-port, 2-slot, TeraMetrics

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TeraRouting Tester Multicast Routing results window

**Requirements**

- TeraRouting Tester software (SWF-1230A).
- A SmartBits 600x/6000x chassis and the appropriate modules.
- An IBM or compatible Pentium™ PC running Windows® 2000/NT/XP, with mouse and color monitor.

**Ordering Information**

**SWF-1230A**

TeraRouting Tester with RIP software module

**SWF-1231A**

OSPF software module for TRT

**SWF-1232A**

IS-IS software module for TRT

**SWF-1233A**

MPLS (RSVP-TE, LDP, VPN) software module for TRT

**SWF-1234A**

BGP software module for TRT

**SWF-1235A**

IPv6 software module for TRT

**SWF-1236A**

Multicast (IGMP, MLD, PIM) software module for TRT

**SWF-1239A**

All available software modules for TRT

**SWF-1255A**

SmartBits API and Scripting Automation Interface

Spirent Communications offers a variety of ServiceEdge™ maintenance and support packages. For more information, visit the Spirent website at [www.spirentcom.com](http://www.spirentcom.com) or contact your Spirent sales representative.

Event Log								
Protocol	Port	Entity	Direction	State	Event Type	Time (sec)	Parameters	
PIM	SMB 1 2-1	192...	Tx	Hello	Hello	1277.44	Hello hold...	
PIM	SMB 1 1-1	192...	Tx	Hello	Hello	1279.42	Hello hold...	
PIM	SMB 1 2-1	192...	Tx	Hello	Hello	1307.55	Hello hold...	
PIM	SMB 1 1-1	192...	Tx	Hello	Hello	1309.45	Hello hold...	
PIM	SMB 1 2-1	192...	Tx	Hello	Hello	1337.58	Hello hold...	
PIM	SMB 1 1-1	192...	Tx	Hello	Hello	1339.48	Hello hold...	
PIM	SMB 1 2-1	192...	Rx	Nei...	Hello	1367.59	Hello hold...	
PIM	SMB 1 2-1	192...	Tx	Nei...	Hello	1367.61	Hello hold...	
PIM	SMB 1 2-1	192...	Tx	Nei...	Hello	1367.82	Hello hold...	
PIM	SMB 1 2-1	192...	Tx	Nei...	Join/Prune	1367.93	Number o...	
PIM	SMB 1 1-1	192...	Tx	Hello	Hello	1369.51	Hello hold...	
PIM	SMB 1 2-1	192...	Tx	Nei...	Hello	1397.91	Hello hold...	
PIM	SMB 1 1-1	192...	Tx	Hello	Hello	1399.54	Hello hold...	
PIM	SMB 1 2-1	192...	Rx	Nei...	Hello	1427.66	Hello hold...	
PIM	SMB 1 2-1	192...	Tx	Nei...	Hello	1427.94	Hello hold...	
PIM	SMB 1 2-1	192...	Tx	Nei...	Join/Prune	1428.05	Number o...	
PIM	SMB 1 1-1	192...	Tx	Hello	Hello	1429.57	Hello hold...	
PIM	SMB 1 2-1	192...	Rx	Nei...	Hello	1457.69	Hello hold...	
PIM	SMB 1 1-1	192...	Tx	Hello	Hello	1459.6	Hello hold...	
PIM	SMB 1 2-1	192...	Tx	Nei...	Hello	1458	Hello hold...	

TeraRouting Tester Multicast Routing Event Log

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