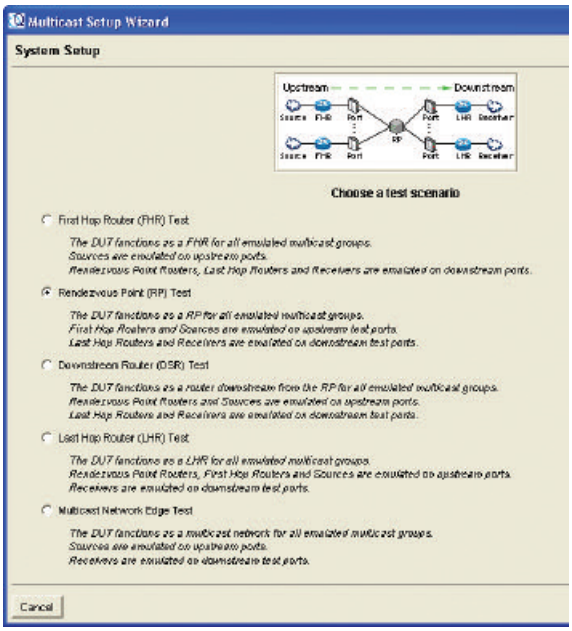
AX/4000
Multicast Routing Emulation

Product Overview

The AX/4000 Multicast Routing Emulation Option allows users to test multicast routing protocols, services and topologies in the lab before they are used in live networks.

Users can build complex multicast test scenarios, emulating all aspects of a multicast network. Multicast sources, receivers, first hop routers (FHRs), rendezvous points (RPs) downstream routers (DSRs) and last hop routers (LHRs) can all be emulated individually or collectively. Multicast VPN end-to-end testing is supported through the emulation of multicast elements and traffic within multiple independent VPNs.

Multicast testing is a complex process that requires several concurrent protocols, multiple network elements, mixed traffic types and multiple physical ports. In spite of these requirements, the AX/4000's Router Performance Tester (RPT) application greatly simplifies the configuration process. Easy-to-use wizards and test methodologies enable the user to set up a large multicast test in only a few minutes.



Applications

RPT easily allows multicast protocols and traffic to be mixed with their unicast counterparts to emulate a real world environment. Statistics for functional and performance testing are collected for data plane and control plane events.

"What if" scenarios can be dynamically implemented (with real-time results) to test the functionality or scalability of a particular device or even an entire network.

The AX/4000 broadband test system also fully supports negative testing. Flap events, link failures, control plane failures and data plane errors can be injected randomly or at set intervals to test the device's error detection and recovery mechanisms.

Multicast VPN testing allows scalability and functional testing of a multicast VPN core network. Multiple VPNs, each with their own multicast network elements, can be emulated to verify proper multicast routing and traffic forwarding.

Benefits

- *Quick and easy test setup:* RPT's built-in wizards for multicast testing guide the user through complex test setups
- *Built-in test methodologies:* Users have several canned tests from which to choose, freeing them from developing test plans on their own
- *Realistic test system behavior improves product quality:* Realistic emulated network topologies are easily created and visualized using RPT's topology editor

Key Features

- Emulates up to 32,000 multicast clients and up to 150 PIM-SM routers per port
- Generates register encapsulated messages and properly responds to register stop messages
- Real-time stateful information for each routing session
- Boot Strap Router (BSR) emulation
- Graphical and tabular output for results analysis and reporting
- Flap events for negative testing
- Comprehensive event log and real time bi-directional decode
- GUI to script for saving configuration as TCL script for test automation

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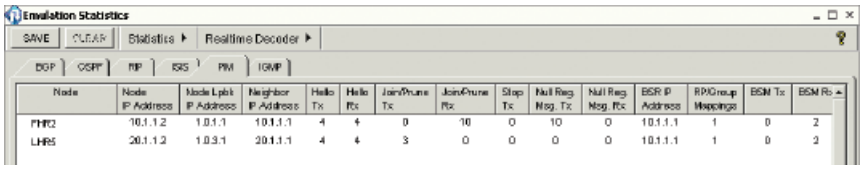

Technical Specifications

Supported Protocols

- Protocol Independent Multicast Sparse Mode (PIM-SM for IPv4 and IPv6)
- Protocol Independent Multicast Source Specific Mode (PIM-SSM for IPv4 and IPv6)
- Internet Group Management Protocol (IGMP) versions 1, 2 and 3
- Multicast Listener Discovery (MLD) Protocol versions 1 and 2
- BGP-4 and BGP-4+
- OSPFv2
- RIP
- ISIS

Supported Test Methodology Wizards

- First Hop Router (FHR) Test (including register encapsulated messages)
- Rendezvous Point (RP) Test
- Downstream Router (DSR) Test
- Last Hop Router (LHR) Test
- Multicast Network Edge Test
- Multicast VPN FHR and RP Test (end-to-end)
- Multicast VPN RP and LHR Test (end-to-end)

Supported Interfaces

- OC-3c/12c/48c POS and ATM*
- 10/100 and Gigabit Ethernet*

*Multicast VPN testing currently not supported with POS interfaces

Supported RFCs and Drafts

- RFC 1112 - Host Extensions for IP Multicasting, August 1989
- RFC 2236 - Internet Group Management Protocol, Version 2, November 1996
- RFC 2362 – Protocol Independent Multicast – Sparse Mode (PIM-SM): Protocol Specification, June 1998
- RFC 2710 - Multicast Listener Discover (MLD) for IPv6, October 1999
- RFC 3376 - Internet Group Management Protocol, Version 3, October 2002
- draft-ietf-pim-sm-v2-new-09 - Protocol Independent Multicast Sparse Mode (PIM-SM): Protocol Specification (Revised), August 2004
- draft-vida-mld-v2-07 – Multicast Listener Discovery Version 2 (MLDv2) for IPv6, June 2003

Requirements

All AX/4000 multicast test solutions require the Router Performance Tester (RPT) application or API (included with the Multicast Routing Emulation Option) and mAX-IP or mAX-IP*ex* hardware interfaces. Contact Spirent for the latest information on supported interfaces.

Ordering Information

Multicast VPN Edge Test Option (P/N 405209)

PIM-SM and PIM-SSM Emulation (P/N 401585)

IGMP Emulation (P/N 405202)

PIM-SMv6 and PIM-SSMv6 Emulation (P/N 404592)

MLDv1/v2 Emulation (P/N 404594)

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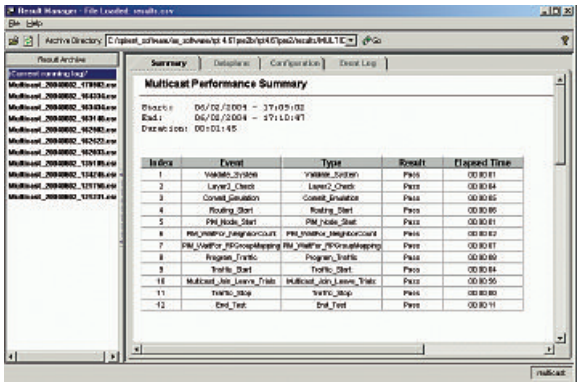

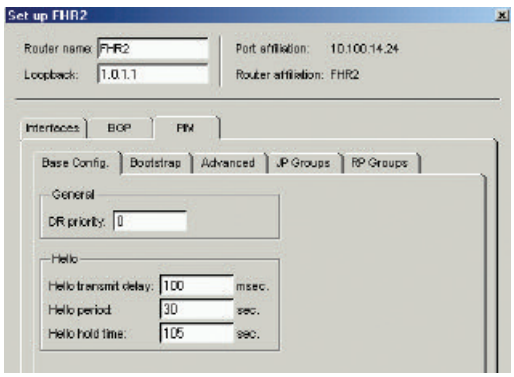

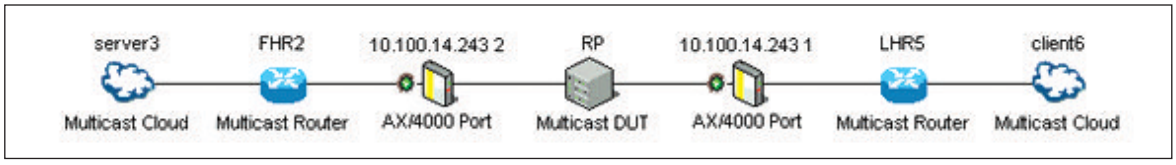

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