Spirent TestCenter
# MPLS/LDP/RSVP-TE Base Package

Product Overview

MPLS enables revenue-generating services to be overlaid on top of connectionless IP networks, but the deployment of these protocols can be daunting and risks high if the service cannot be properly delivered. The Spirent TestCenter MPLS Base Package can emulate a variety of realistic and worst-case conditions as well as provide benchmark measurements to ensure a high-performance and stable base for these services. Users are able to expose the true performance of an MPLS-enabled router by providing stress testing of the routing software, the data forwarding hardware, and the overall system architecture under both static and dynamic conditions.

The MPLS Base Package enables network equipment manufacturers, service providers, and large enterprises to quickly evaluate and troubleshoot the MPLS-enabled functionality, performance, and scalability of any routing-enabled device or network for common applications such as traffic engineering and VPNs. The package works in conjunction with the Unicast Routing Base Package to allow users to emulate RSVP-TE and LDP sessions in realistic and advanced applications.

Because it is an integrated component of Spirent TestCenter, this package can work together with other TestCenter components to deliver easy, consistent Tcl support for all key metropolitan and enterprise protocols, including spanning tree, VLAN, DHCP, QoS, multicast, IPv4/IPv6 and routing. TestCenter includes RFC-based benchmarking methodologies for Layer 2 and Layer 3. Each TestCenter module supports multiple users and hot swapping.

Applications

Spirent TestCenter customers use the MPLS Base Package to quickly set up large and complex MPLS-enabled networks with data plane traffic going to each network advertised from all transmitting ports. The package helps them to evaluate key functional parameters of switches and routers combining MPLS with various network traffic including unicast, multicast, QoS marked traffic and routing messaging.
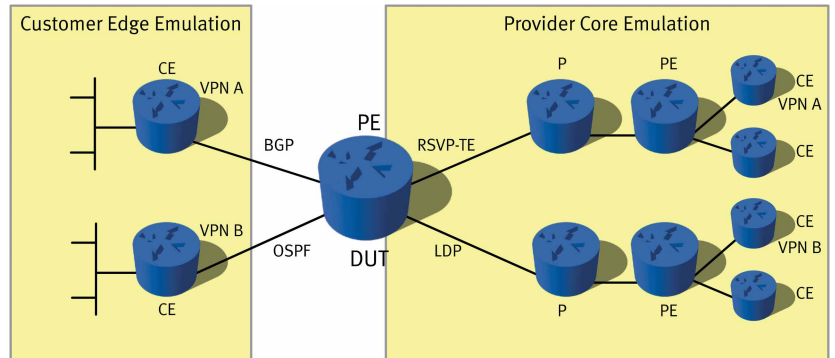
Customers can use the package's Flap Schedule and real-time graphs to evaluate over time key performance parameters of MPLS-enabled routers or networks in response to common undesirable events on the network control plane. They can evaluate key performance parameters of routers or networks under typical or extreme traffic load conditions for minutes, hours, and days, perform comparative analysis of MPLS-enabled routers and re-qualify MPLS-enabled routers after software or firmware upgrades. This package can evaluate an MPLS-enabled router or network's ability to deliver a service such as traffic-engineered QoS, Virtual Private LAN Services (VPLS), pseudo wire emulation (PWE), or Layer 3 provider provisioned VPNs (PPVPNs) via RFC-2547.

Benefits

- *Improve product/service reliability*—quickly and economically emulate very large, realistic networks and find issues in the lab before a service is deployed

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Spirent TestCenter

- Support for all major MPLS protocols
- Configuration wizards enable simple creation of complex PPVPN networks
- Integrated Flap Schedule allows for fail-over and convergence testing over short or extended times
- Integrated performance and functional test modes
- Dual stack IPv4 and IPv6
- Mix L2, L3, unicast, multicast, QoS and routing traffic
- Real-time results
- Easy, full-featured Tcl automation
- Multi-user and hot-swappable interface modules

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- *Increase productivity*—Reduce the learning curve with an easy-to-use GUI complete with configuration wizards and configurable views for setup and results
- *Reduce troubleshooting time*—Troubleshoot even large-scale test configurations without leaving the application environment
- *Reduce cost*—Perform complex tests with a single platform and single application
- *Real-world Network*—Emulate multiple protocols and schedule real-time events to perform negative and long-term stability testing
- *Security Verification*—Verify that data does not leak between customer services in PPVPN implementations

Key Features

- Supports RSVP-TE and LDP
- Supports 2547bis, 6PE, and PWE (Martini) VPNs
- Supports VPLS-LDP and VPLS-BGP for Layer 2 VPNs
- Generates thousands of LSPs
- All common attributes and TLVs are configurable
- Interactive configuration and testing
- Test wizards, setup wizards and traffic wizards
- Real-time results

RSVP-TE Features

- Thousands of RSVP-TE sessions per port
- Ingress and egress tunnels
- Implicit and explicit null labels
- Explicit routing support
- Traffic engineering parameters
- Configurable hello interval
- Configurable setup and hold priorities
- RSVP option flag support
- Optional include or exclude affinities

LDP Features

- Hundreds of LDP sessions per port
- Generate thousands of LSPs per port
- Direct and targeted hellos
- Downstream unsolicited and downstream on demand LSPs
- Configurable hello and keep alive timers
- Implicit and explicit null labels
- VC encapsulation for Martini and VPLS
- Incoming and outgoing LSPs

MPLS VPN Features

- RFC 2547bis Layer-3 VPNs
- Martini-draft Layer-2 VPNs (PWE emulation)
- Virtual Private LAN Service - LDP (VPLS - LDP)
- Virtual Private LAN Service - BGP (VPLS – LDP)
- Layer-3 IPv6 VPNs
- Thousands of emulated VRFs and VCs
- Emulates hundreds of Layer-3 PE routers
- Emulates hundreds of Layer-2 PE routers
- Easy-to-use configuration wizards

Related RFCs and Drafts

- RFC 2547bis – MPLS BGP VPNs
- RFC 2858 – Multi-Protocol BGP
- RFC 3107 – Carrying lable information in BGP4
- RFC 3031 – MPLS Architecture
- RFC 3032 – MPLS Label Stack Encoding
- RFC 3036 – LDP Specification
- RFC 3209 – RSVP for MPLS
- draft-martini-l2circuit-encap-mpls
- draft-martini-l2circuit-trans-mpls
- draft-lasserre-vkompella-ppvpn-vpls
- draft-ietf-l2vpn-bgp-00 and 02

Flap Schedule

- Create up to 64 steps with configurable time delays
- Flap through all the steps once or continuously cycle
- Each step can have multiple events
- Events include a combination of physical, protocol, and traffic conditions such as link down/up, traffic on/off, or simulating route flapping via a route withdraw and subsequent re-advertisement

Test Results

The MPLS Base package provides both real-time and final test results using spreadsheets and graphical formats. These results can be exported in comma separated value (.CSV) file format or HTML for spreadsheet or browser-based analysis and reporting.

MPLS Real-Time and Final Results

These results can be displayed by port, by stream, by predefined tracking options (including prefix length, VPN, ToS, protocol and destination TCP/UDP port) or by user-defined groups.

- LSP labels
- LSP setup latency and rate
- LSP setup mode
- VPN setup and throughput
- Control traffic (hellos, keep alive, etc.)
- Data traffic throughput and latency
- Comprehensive event log
- Tabular and graphical results
- Receive frame rate graph
- Percentage of expected frame rate graph
- Average latency graph
- Per stream latency distribution
- Detailed counters with min/ave/max latency and in/out of sequence
- Control plane transmit and receive to protocol decoder enables detailed troubleshooting and analysis without interrupting the test

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Supported Modules

Module	Description
CPR-1001A	10/100/1000 Copper RJ-45, 8 Port
EDM-1001A	10/100/1000 Dual Media, 4 Port
FBR-1001A	1G Fiber SFP, 8 Port
XFP-1001A	10G XFP, 1 Port
CPR-2001A	10/100/1000 Copper RJ-45, 8 Port
EDM-2001A	10/100/1000 Dual Media, 4 Port
FBR-2001A	1G Fiber SFP, 8 Port
CPR-2002A	10/100 Copper RJ-45, 8 Port
XFP-2001A	10G XFP, 1 Port

Requirements

- An SPT-2000A Spirent 2U chassis and controller or SPT-5000A Spirent 5U chassis and controller with the appropriate hardware modules
- Pentium™ or greater PC running Windows® 2000 SP4 or XP SP1/1A/2 with mouse/color monitor required for GUI operation
- Automated operation requires Pentium™ or greater PC running Windows® 2000 SP4 or XP SP1/1A/2, Red Hat Enterprise Workstation Linux 3.0 or SUN Solaris 7.0/8.0

Ordering Information

BPK-1006A/1006B	MPLS/LDP/RSVP-TE Base Package
BPK-1004A/1004B	Unicast Routing Base Package

Part numbers ending in "A" indicate a limited-performance version; those ending in "B" indicate the full performance version.

Other Related Spirent TestCenter Software

BPK-1001A	Packet Generator and Analyzer Base Package
BPK-1002A	STP/RSTP/PVST+Base Package
BPK-1003A	IGMP/MLD Host IP Multicast Base Package
BPK-1004A/1004B	Unicast Routing Base Package[1]
BPK-1005A/1005B	Multicast Routing Base Package
BPK-1006A/1006B	MPLS/LDP/RSVP-TE Base Package

Spirent Global Services

Spirent Global Services provides a variety of professional services, support services, and education services — all focused on helping customers meet their complex testing and service assurance requirements. For more information, visit the Global Services website at www.spirentcom.com/gs or contact your Spirent sales representative.

[1] Unicast Routing Base Package is required for MPLS2547 and VPLS-BGP test cases.

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