VIAVI TestCenter

MPLS-TP Base Package

The MPLS-TP Base Package enables Network Equipment Manufacturers, Service Providers and large Enterprises to quickly evaluate and troubleshoot MPLS-TP functionality. The package provides support for testing connection setup, forwarding, OAM, and protection switching capabilities of MPLS-TP enabled LSRs as specified by the MPLS-TP IETF drafts and RFCs. By combining MPLS-TP, Carrier Ethernet, 1588v2 and Synchronous Ethernet packages, the TestCenter system provides the industry's most complete solution for testing converged mobile backhaul networks and devices.

Applications

- MPLS-TP and PWE3 compliance, performance, and interoperability testing for mobile backhaul and seamless MPLS applications
- VIAVI TestCenter supports configuration of both static and control-plane signaled MPLS-TP connections. This capability enables testing of MPLS-TP nodes operating in both non-IP (static, element-management driven) and IP/MPLS environments
- The MPLS-TP Base package supports both single and multisegment MPLS-TP topologies—enabling intra and inter AS provider testing and interoperability testing of both MPLS-TP and IP/MPLS domains
  - Emulate thousands of x2 connections of an LTE backhaul on one VIAVI TestCenter port using multi-segment pseudowires
- Emulate thousands of P2P MPLS-TP connections between cell site routers and Provider Edge routers in a 2G/3G backhaul
- Emulate MPLS pseudowires to test Seamless MPLS procedures between IP DSLAMs and Provider Edge routers in a residential backhaul
- Test the TDM-like OAM capabilities of your MPLS-TP domain by using a number of OAM tools. VIAVI TestCenter supports both BFD/LSP Ping and Y.1731-based OAM procedures for testing LSRs and switches
- Test the TDM-like redundancy capabilities of your MPLS-TP domain
  - Using the pseudowire redundancy features of VIAVI TestCenter, trigger pseudowire failures and test the switchover of user-plane traffic to a backup pseudowire in your DUT
  - Using redundancy testing capabilities of VIAVI TestCenter, trigger failures and test the switchover of user plane traffic from primary to backup LSPs or pseudowires in your DUT
  - Measure the switchover time for user traffic from primary to backup LSPs or pseudowires after occurrence of failure conditions

Applications Continued

- MPLS-TP Base Package is an integrated component of VIAVI TestCenter. It can be combined with Unicast Routing, MPLS Technologies, Access, Timing, and Carrier Ethernet Base packages to enable end-to-end testing of real-world networks
- Use topology emulation capabilities of VIAVI TestCenter to provide control-plane over MPLS emulation with stateful or stateless data-plane traffic
- The protocols that can be tested over MPLS include DHCP, IGMP/MLD, HTTP, FTP, and SIP data-plane traffic
- Test the DUT's ability to provide QoS to user data carried by MPLS-TP pseudowires, in adherence to SLAs.

Features & Benefits

Provisioning MPLS-TP

- VIAVI TestCenter allows creation of static MPLS-TP connections. Creating a static MPLS-TP connection on an emulated PE involves configuration of incoming and outgoing labels, a destination MAC address, and LSP/PW Source & Destination IDs
  - This capability allows testing of MPLS-TP transport nodes that are not capable of IP/MPLS control plane signaling
  - An easy-to-use MPLS-TP wizard drastically reduces chances of user-error when creating 1000s of MPLS-TP connections and makes the provisioning tasks less tedious
- VIAVI Test Center also allows creation of bi-directional LSPs & PWs using GMPLS & LDP (RFC 4447) signaling procedures
- Enables testing of MPLS-TP nodes in an IP/MPLS domain

MPLS-TP OAM procedures

- Supports BFD OAM procedures on static and control plane signaled MPLS-TP connections, enabling vendors and service providers who have deployed BFD based OAM on their DUTs
  - BFD CC & CV messages encapsulated in UDP/IP, PW-ACH or GAL/GACH formats
  - Support for BFD over VCCV (FEC 128 & FEC 129 LDP signaling mode)
  - Support for Fault OAM such as AIS, RDI, LDI and LKR
  - Extended LSP Ping and Traceroute in GAL/GACH formats and supported on both static and control plane signaled connections
- Supports Y.1731 Ethernet OAM procedures on MPLS-TP OAM connections, enabling vendors and service providers who have deployed Y.1731 based OAM on their DUTs
  - Test CC, AIS, LCK, LM, DM (2 way) and CSF procedures

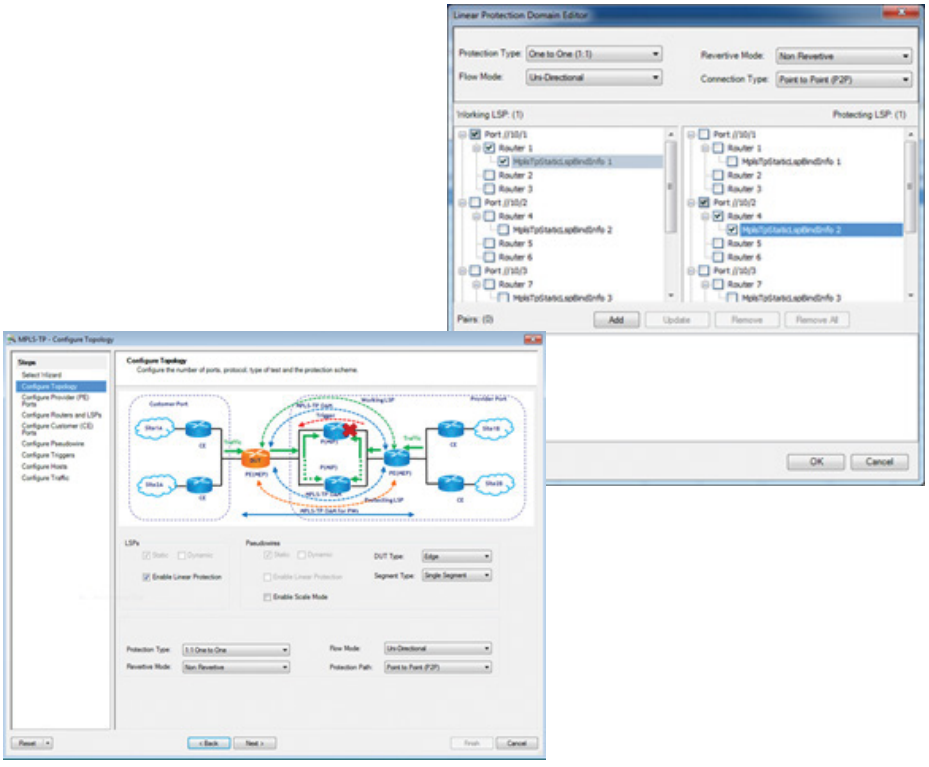
Features & Benefits Continued

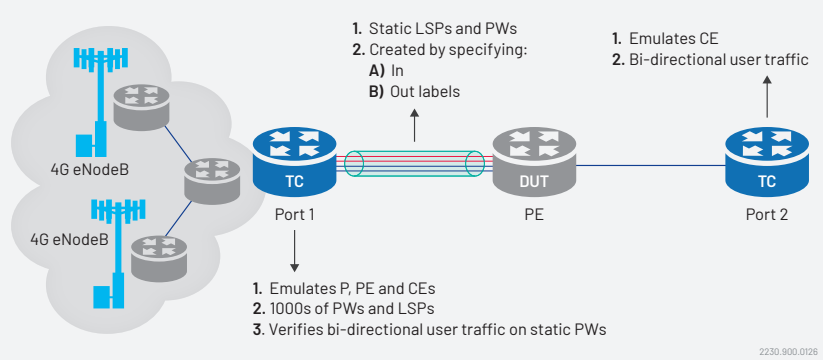
MPLS-TP Linear Protection

- VIAVI TestCenter allows creation of thousands of primary and backup LSPs on a) one port or b) across multiple ports (multi-homing scenarios)
  - Primary and backup LSPs can be easily created using MPLSTP wizard
  - BFD OAM can be enabled on the primary and backup LSPs
  - Failure switchover is triggered by injecting AIS from TestCenter toward the DUT or by stopping BFD on the TestCenter
  - Users can easily compute the time needed by the DUT to switch user traffic to backup LSP after failure is injected

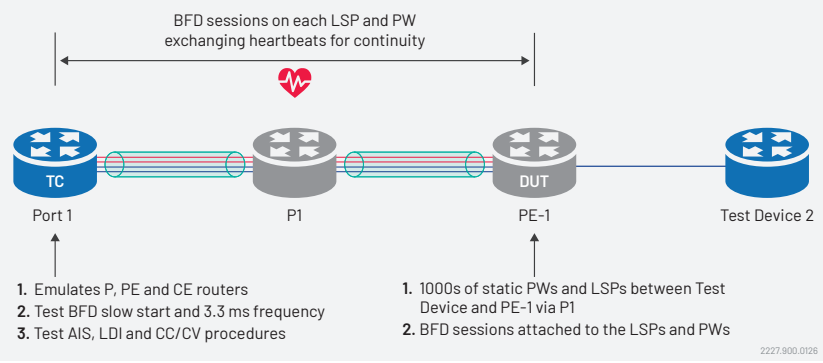
Seamless MPLS and pseudowire redundancy

- VIAVI TestCenter supports Seamless MPLS procedures, enabling vendors and Service Providers to extend MPLS all the way to access nodes and IP DSLAMs
  - Supports LDP Downstream on Demand procedures
  - Allows provisioning of 1000s of primary and backup pseudowires to test redundancy procedures
  - Injects failures on primary pseudowire and validates the DUT's ability to switchover traffic to backup pseudowire upon failure detection

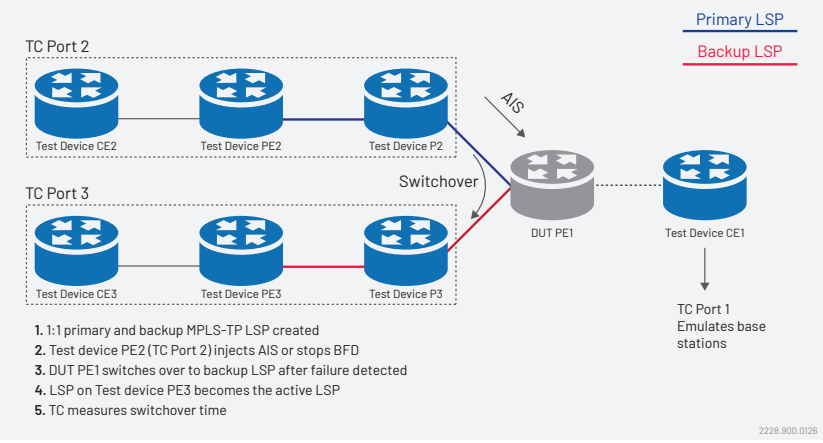




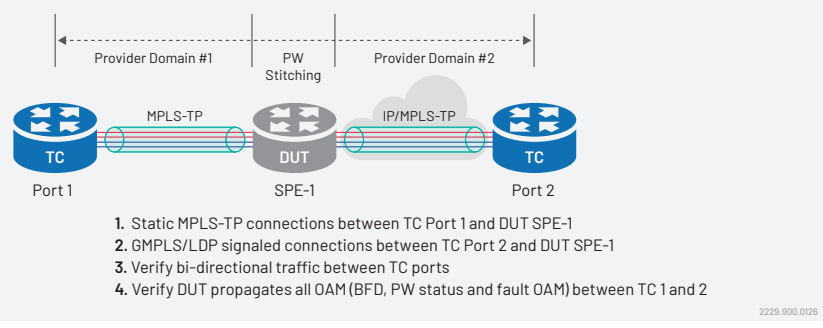
Testing static MPLS-TP connections



Testing BDF OAM on MPLS-TP



Testing Linear Protection on MPLS-TP



Testing MPLS-TP and IP/MPLS interoperability

Technical Specifications

Product Feature	Description	
MPLS-TP Static Connections Configuration	• Connection type (LSP or PW) • Source and destination global ID • PW source and destination node ID • LSP source and destination node ID • PW source and destination attachment circuit ID • LSP source and destination tunnel number	• Incoming label • Outgoing label • PW VCCV configuration • LSP ID • Enable control word • Fault OAM configuration
MPLS-TP BFD Configuration	• Enable BFD • Enable GAL/GACH encapsulation • Encapsulation (Raw or UDP)	• CC/CV • TLVs for CV message • BFD My Discriminator
MPLS-TP Y.1731 Configuration	• Y.1731 ME level • Y.1731 ICC formatted string • MEP ID • Initial TST sequence number • Y.1731 AIS, CC, LCK and CSF period • Y.1731 static incoming and outgoing label	• Enable DM/LM/LB response • DMM/DMR delay • LB/LM/DM priority • CC/AIS/LCK/CSF priority • Support for configurable MPLS TTL and EXP bits on inner and outer labels
MPLS-TP Control Plane Configuration (LDP/RSVP/GMPLS)	• Similar to IP/MPLS	
MPLS-TP Results (LDP/RSVP/BFD/ GMPLS)	• Similar to IP/MPLS	
MPLS-TP Results (LSP/Y.1731 OAM)	• TX AIS/LDI/LKR count • RX AIS/LDI/LKR count • TX AIS/LDI/LKR timestamp • RX AIS/LDI/LKR timestamp • Latest TX/RX fault type	• CC TX/RX state • MEPs • Unexpected MEG IDs/ME Levels/Timeouts • Bad CC RX count • Dropped Packet count

Ordering Information

Part Number	Description
BPK-1160B	MPLS-TP Test Package B
BPK-1192A	MPLS-TP Performance Monitoring Base Package
BPK-1191A	MPLS-TP Protection Switching Base Package
Associated MBH Packages	
BPK-1180A	Synchronous Ethernet Base Package
BPK-1155A	IEEE-1588v2 Timing and Synchronization Base Package
BPK-1059A/B	802.1AG/Y.1731 EOAM Fault Management Base Package A/B
BPK-1150A	Y.1731 EOAM Performance Monitoring Base Package A
BPK-1004A/B	Unicast Routing Base Package A/B
BPK-1006A/B	MPLS/LDP/RSVP-TE Base Package A/B

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