Driven by massive growth in data traffic, service providers are moving toward a single packet network infrastructure supporting multiple services at lower operational costs. With MPLS-TP, a profile of MPLS is emerging as the industry standard to enable connection-oriented packet transport to meet the growing demand. MPLS continues to be under active development with new mechanisms and applications emerging from the standards bodies, continually increasing its popularity. Additionally, success and familiarity with MPLS in the core is driving service providers to deploy it into access, aggregation, and backhaul networks supporting broadband, business, and mobility services. Network equipment manufacturers are responding by implementing new MPLS features into their core network products as well as adding MPLS features to other network devices, such as DSLAMs and cell site gateways.

As MPLS-based technologies and services continue to evolve, deploy, and increase in scale, the test challenges become increasingly more complex. Ixia continues to provide the most comprehensive test capability for validating the MPLS infrastructure and the services it supports.

Ixia helps answer critical MPLS questions, such as:

- Can my device or network reliably deliver multiple MPLS-based VPN services - L2, L3 (unicast, multicast) - simultaneously?
- Does my device maintain thousands of MPLS tunnels and pseudowires with the required level of forwarding performance?
- How high can I scale my MPLS-based VPN service?
- Does my device conform to the latest MPLS-related standards?
- Does MPLS traffic engineering provide sub-50ms recovery?
<table>
<thead>
<tr>
<th>Product</th>
<th>Feature</th>
<th>Benefit</th>
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<tbody>
<tr>
<td>IxNetwork</td>
<td>Protocol emulation and traffic generation</td>
<td>Validate the functionality, scale and interoperability of a single device or a system under test with integrated traffic generation</td>
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<tr>
<td>IxN2X</td>
<td>Protocol emulation and traffic generation</td>
<td>Validate the functionality, scale and interoperability of a single device or a system under test with integrated traffic generation</td>
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<tr>
<td>IxANVL</td>
<td>Protocol conformance testing and MEF certification preparation</td>
<td>Confirm the protocol implementation is compliant to the standard and interoperability with a 3rd party</td>
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<tr>
<td>IxAutomate</td>
<td>Canned benchmark testing</td>
<td>Leverage proven test methodology to quickly and easily perform repeatable benchmark testing</td>
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<thead>
<tr>
<th>Technology</th>
<th>Ixia Solution</th>
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</table>
| MPLS Core: OSPF/ISIS-TE, LDP (FEC-128, FEC-129), mLDP, RSVP-TE (P2P, P2MP), Graceful Restart, FRR, MBB, LSP Ping, LSP Traceroute, BFD-VCCV | IxNetwork - Emulation  
IxANVL - Conformance  
IxAutomate - Automation Suites  
IxN2X - Emulation |
| L3 VPNs: BGP/MPLS VPNs, 6VPE, 6PE, Inter-AS Option A, B, and C | IxNetwork - Emulation  
IxANVL - Conformance  
IxAutomate - Automation Suites  
IxN2X - Emulation |
| L2 VPNs: VPWS/PWE3, LDP-VPLS (w/ BGP-AD), BGP-VPLS, Multi-Segment PW, Inter-AS VPLS | IxNetwork - Emulation  
IxANVL - Conformance  
IxAutomate - Automation Suites  
IxN2X - Emulation |
| Multicast VPNs: Draft-Rosen (PIM/GRE, IPv4, IPv6), Next-Gen mVPN (BGP, RSVP-TE P2MP, mLDP, IPv4, IPv6) | IxNetwork - Emulation  
IxN2X - Emulation |
| Transport: MPLS-TP (Y.1731/BFD support for CC, CV, APS, OAM), Linear APS (1:1, 1+1, Unidirectional, Bidirectional, Revertive) | IxNetwork - Emulation |