

# Multi-stack MPLS

## Benefits for Mission-Critical Businesses



## Multi-stack MPLS for Mission-Critical Networks

Mission-critical communication networks are essential for critical infrastructures such as energy, transportation, water, government, and defense. Traditionally, these networks have relied on SDH/SONET to deliver the deterministic performance, comprehensive OAM, and high reliability required for their operations. However, critical infrastructure enterprises are under increasing pressure from regulators, customers, and stakeholders to enhance customer satisfaction, bolster network security, and reduce carbon emissions. To meet these demands, they must capture and analyze significantly more real-time data regarding the behavior of their Operational Technology (OT), Informational Technology (IT), and consumers, thus evolving to become “Smart” (e.g., Smart Utility, Smart Grid, Smart Meters, Smart Highway, Smart City).

The traditional SDH/SONET transport networks are not equipped to handle the vast amounts of packet data required for this “Smart” evolution. Consequently, a new MPLS-based packet transport network (PTN) is required. The most suitable MPLS technology will vary on a service-by-service basis. MPLS-TP is designed to provide mission-critical performance, making it ideal for OT networks, while IP/MPLS is used in IT networks. Segment Routing Traffic Engineered (SR-TE) and RSVP-TE are utilized to add traffic engineering to IP/MPLS networks. With the push for IT/OT convergence, and even the business driver to deliver telco services, modern mission-critical networks need to support all these technologies within the same network.

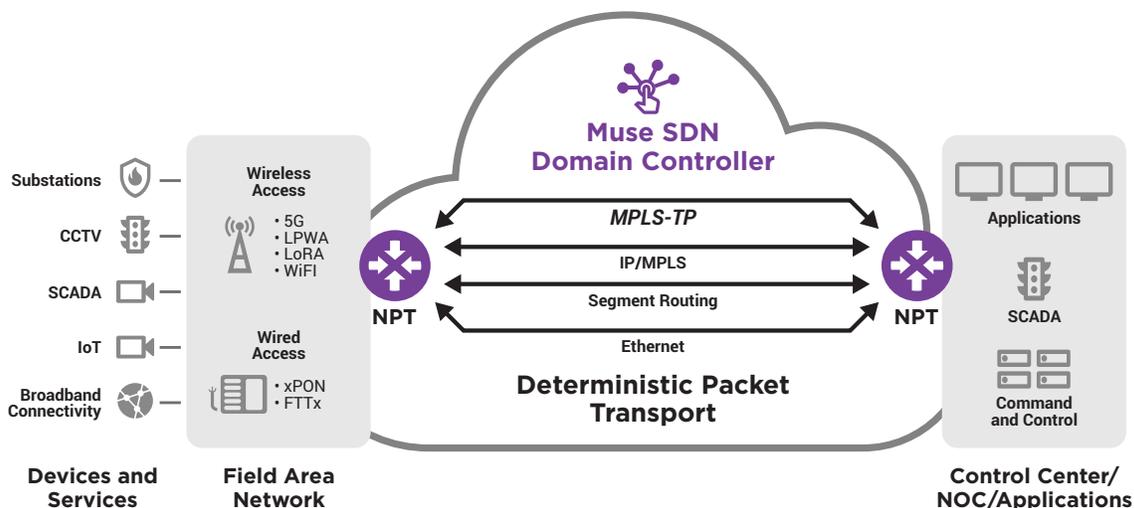
Ribbon has developed Multi-stack MPLS to support all these technologies on the same network element. With Multi-stack MPLS, mission-critical network operators can use the most appropriate packet transport technology for each service being transported, on a service-by-service basis.

**Converged Network**  
supporting both IT  
and OT services

**Risk-Free Transition**  
tailor made evolution  
for legacy services

**Optimized Multiservice**  
optimizes cost and  
performance

**Centralized Control**  
for integrated, intuitive  
control of the network



# Multi-stack MPLS

Your Challenges	Our Solutions
<b>Supporting IT and OT services from a converged packet network</b>	Multi-stack MPLS makes a converged packet network for IT and OT services a reality. The multi-stack implementation allows IP/MPLS and MPLS-TP to operate in the same network, and an MPLS gateway provides a simple transition between them.
<b>Need risk-free introduction of a modern packet transport network (PTN)</b>	Multi-stack MPLS allows risk-free transition from an SDH/SONET transport network to a modern packet transport network (PTN): <ul style="list-style-type: none"><li>• IT services, such as corporate voice and data, can be mapped directly to IP/MPLS.</li><li>• Mission-critical OT services, such as teleprotection and SCADA, can be mapped to packet, using Circuit Emulation Services (CES). MPLS-TP is used to provide the determinism and OAM, which is essential for these services to operate.</li></ul>
<b>The packet transport network (PTN) must support all OT and IT services and future evolution</b>	With Multi-stack MPLS the mission-critical network operator can use the most appropriate packet transport technology for each service being transported, on a service-by-service basis: <ul style="list-style-type: none"><li>• MPLS-TP is strictly connection-orientated and provides the predictability essential for error-free operation of OT services such as teleprotection and SCADA.</li><li>• IP/MPLS is the ubiquitous standard for transporting Layer 3 services. Its multicast capabilities make it widely used for video delivery and IP CCTV connectivity. RSVP-TE or SR-TE can be used for services requiring traffic engineering.</li><li>• The IP/MPLS capabilities provided by Multi-stack MPLS also allow easy introduction of commercial services for those companies wishing to evolve to become UTelcos</li></ul>
<b>How does the packet transport network (PTN) support the performance required for each of my services</b>	The OAM, QoS, and protection mechanisms used by IP/MPLS and MPLS-TP allow network performance to meet the requirements of each service being transported: <ul style="list-style-type: none"><li>• IP/MPLS guarantees QoS per application, regardless of the traffic being transported</li><li>• IP/MPLS uses fast reroute (FRR) mechanisms to allow traffic to be rerouted in the event of single and multiple failures.</li><li>• MPLS-TP embeds OAM functionality in the data plane</li><li>• MPLS-TP can enforce the same strict SLAs as those used in SDH/SONET.</li><li>• MPLS-TP uses predetermined alternative paths for protection, giving sub-50ms protection switching for all network topologies.</li><li>• Load control allows traffic to be prioritized and/or steered away from congested links.</li></ul>
<b>Controlling the network</b>	Ribbon's MUSE SDN domain controller provides the intuitive management and control which mission critical operators need to operate their Packet Transport network and eliminates manual provisioning errors. <ul style="list-style-type: none"><li>• Multi-layer network visualization supports both IP/MPLS and MPLS-TP</li><li>• Comprehensive lifecycle management</li></ul>

## About Ribbon

Ribbon Communications (Nasdaq: RBBN) delivers communications software, IP and optical networking solutions to service providers, enterprises and critical infrastructure sectors globally. We engage deeply with our customers, helping them modernize their networks for improved competitive positioning and business outcomes in today's smart, always-on and data-hungry world. Our innovative, end-to-end solutions portfolio delivers unparalleled scale, performance, and agility, including core to edge software-centric solutions, cloud-native offers, leading-edge security and analytics tools, along with IP and optical networking solutions for 5G. We maintain a keen focus on our commitments to Environmental, Social and Governance (ESG) matters, offering an annual Sustainability Report to our stakeholders. To learn more about Ribbon visit [rbbn.com](http://rbbn.com).

**Contact Us** Contact us to learn more about Ribbon solutions.