



SEGMENT ROUTING SOLUTIONS ARE KEY TO THE FUTURE OF NETWORK TRANSPORT

Is Your Network Future-Proof?

It's already happening—the steady migration of business applications, processes, and tools to the cloud. Add the growth of the Internet of Things (IoT) and the introduction of 5G, and it's inevitable that more devices will be connecting to your network to access applications, transfer data, and do their job.

That's not all. As cloud-hosted applications and content go viral, traffic surges will occur within and between data centers. Existing approaches to scaling network architectures seem to increase network complexity and drive up maintenance costs. Soon, service providers will reach a plateau where the high demand for capacity will outpace the revenue that can be generated by providing it. Large-scale service providers must find a way to cost-effectively scale their networks so they can run them more efficiently and profitably.

Segment Routing Is the Answer

Segment routing, a key part of Juniper Networks' strategic vision for an end-to-end transport architecture, connects end users to applications, wherever they are hosted. Using source packet routing, which improves efficiency by moving path-state information from intermediate routers into packet headers, segment routing reduces demands on the memory and CPU processing that transit routers require to maintain network state.

A segment-routed network provides cost-effective, scalable, and responsive network transport. It ensures application quality of experience (AppQoE) by swiftly delivering cloud-based applications and content across multiple network domains.

Juniper supports segment routing, especially MPLS Segment Routing (SR-MPLS), on both our Juniper Networks® MX Series 5G Universal Routing Platforms and PTX Series Packet Transport Routers.

Our Commitment to Segment Routing

At Juniper, we know that getting the best performance from segment routing requires the right mix of network infrastructure and control plane technologies. Our segment routing implementation supports hybrid networks that coexist with LDP, MPLS, and IP, providing cost-effective network transport with a guaranteed quality of service. We are fully committed to segment routing to efficiently deliver network transport services and create networks that are easier to plan, implement, and manage.

NorthStar Controller

Juniper Networks® NorthStar Controller is an industry-leading, carrier-grade solution for implementing segment routing. The NorthStar Controller automates provisioning across multiple domains, ensuring real-time, end-to-end application-level QoE and SLA guarantees.

The NorthStar Controller manages a packet's path through the network, simplifying network design, implementation, and operations by eliminating the need for end-to-end signaling protocols like RSVP-TE. NorthStar Controller also reduces the number of control plane technologies required by managing multiple network domains using a common protocol.

ASIC Technology

Juniper uses its ASIC technology, which features industry-leading label stack depth, to implement advanced segment routing features. For example, we took class-based forwarding, which enforces very fine-grained SLAs on a network, and have extended it to segment routing. Likewise, with fine-grained Operation, Administration, and Maintenance (OAM) and telemetry.

Segment Routing Migration

The migration from MPLS to segment routing is not a step-function change; it is a highly complex operation that requires replacing existing control planes. Juniper has developed features that allow both protocols to run on the same network, easing the transition. The NorthStar Controller plays a key role in this process, helping you plan, implement, and view exactly what is happening in the network and providing complete life-cycle management for the network migration process.

Juniper's Segment Routing delivers:

- Greater scale with increased bandwidth utilization
- Automation to simplify network management and operations
- Agility through automated network provisioning and traffic engineering
- Application awareness in the network control plane
- The best possible AppQoE

The Road to SR v6+

The latest iteration of segment routing, SRv6+, is still in the design phase. The IETF's initial drafts and standards place tremendous demand on the networking ASIC; while this is not a problem for Juniper, it could be an issue for merchant silicon. Working with the IETF and our customers, Juniper is proposing a set of enhancements that will make SRv6+ more ASIC friendly, bandwidth efficient, and secure, ensuring its broad adoption.

Putting It All Together

Juniper's comprehensive segment routing solutions reduce OpEx through architecture simplification. By incorporating extremely efficient technology and processes into the control plane, carriers and large-scale service providers can run their networks with greater agility and control, allowing them to quickly and automatically respond to changing Internet traffic patterns.

Juniper Named a Leader in the Gartner 2018 Magic Quadrant for Data Center Networking

"We believe that being recognized by Gartner as a Leader in the Magic Quadrant for Data Center Networking is a testament to the success of Juniper Networks' vision and strategy. To us, our relentless focus on engineering simplicity is resonating with our customers, partners, and analysts alike. Juniper has the breadth and depth of portfolio to solve enterprise needs from data center to branch, from hardware to software, from routing and switching to security, and from transport to orchestration. Our multicloud-ready solutions are enabling our customers to simplify their migration to multicloud environments."

— Rami Rahim, CEO of Juniper Networks

[Source](#)

Follow the Leader

An industry leader in IP networking, Juniper is leading the charge to build the network of the future. We empower you to connect and secure your applications anywhere and manage your resources as a cohesive infrastructure. As we continue to innovate, our significant understanding of service and cloud provider networks helps us solve today's biggest challenges.

At Juniper Networks, the future is looking good. Let us show it to you.

Visit us at www.juniper.net.

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