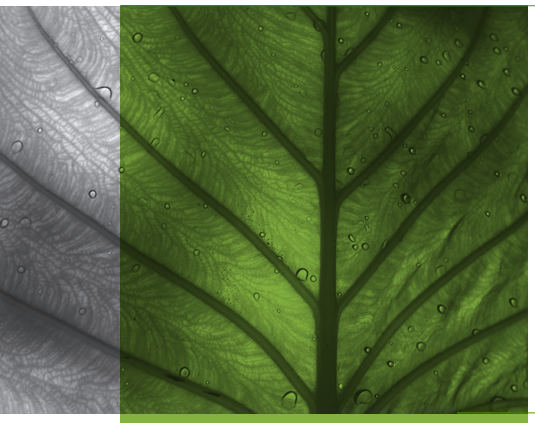

CREATING BUSINESS VALUE WITH AI-DRIVEN SD-WAN AS A MANAGED SERVICE

A Flexible Service Edge with AIOps provides WAN Assurance with high-performing applications and services

Challenge

MSPs must offer differentiated services, provide excellent customer service, and grow revenues, while managing costs. To do this they require a new approach that allows them to innovate and differentiate their service offerings.

Solution

The Flexible Service Edge including AI-driven SD-WAN provides a single unified edge platform that supports a range of services, from connectivity to managed router to full-featured SD-WAN. AI-driven SD-WAN delivers a flexible, application-aware network fabric that meets stringent enterprise performance, security, and availability requirements. Service providers can seamlessly upgrade from one service to another with only a change in licensing—meaning they only pay for what they need at the moment and disruption is kept to a minimum.

Benefits

- *Differentiated offering with multiple tiers depending on customer needs*
- *Proactive AI-driven operations and support for low Mean Time to Repair (MTTR)*
- *Accelerated performance for applications and revenue*
- *Managed security baked into the network*
- *Simplified, automated, and scaled service delivery and support*
- *Optimizes user experiences for enterprises ensuring customer satisfaction*
- *Next-gen security with IDS/IPS, URL filtering and zero-trust*

*The SD-WAN market continues to experience incredible compound annual growth of more than 18% over the last two years, a trend that **IDC estimates will continue through 2025**. For the enterprise, an MSP-delivered service can have a positive impact on CapEx as well as OpEx and remove the burden of incremental IT staff and negotiations with multiple vendors. This represents a tremendous opportunity for managed service providers (MSPs) who can deliver services to enterprises at lower costs while improving security and reliability.*

The challenge for MSPs is to differentiate services and provide excellent customer service while growing revenues and managing costs. Connectivity services may be the appropriate place to start, but to retain customers and expand market share, MSPs must provide even more value in the form of innovative new services with an accelerated time to market.

*Juniper provides this differentiation with a tunnel-free architecture that reduces overhead and improves application performance, reducing customer churn. The Juniper® **Flexible Service Edge (FSE)** provides an extensible foundation for service innovation, helping MSPs evolve their offerings and move up the value stack on their timeline. The Flexible Service Edge is a unified platform that can start as an intelligent Layer 3 network interface device (NID), upgrade to a managed router, and then finally to a Juniper **Session Smart Router**—providing all the benefits of the tunnel-free SD-WAN solution.*

With the Flexible Service Edge, service providers have a launching point to deliver a host of new service offerings that can help them along their journey from managed circuits to managed SD-WAN, unified communications, and total digital transformation. This solution can also be remotely upgraded without any hardware changes, software changes, or downtime, for fast and easy service turn-up.

*By integrating this architecture with the **Mist AI Cloud**, Juniper has created the industry's only **AI-driven SD-WAN** for distributed enterprises, a unique offering that creates unprecedented business value for an MSP's customer base.*

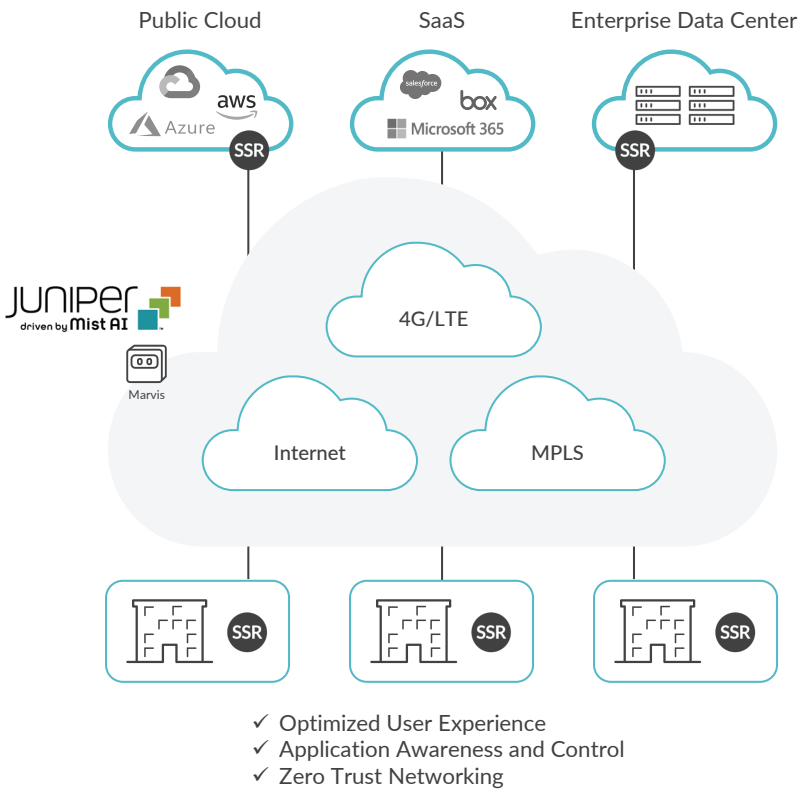

Figure 1. AI-driven SD-WAN

State of the Industry

Most SD-WAN solutions available today repackage legacy technologies along with abstraction, segmentation, analytics, and orchestration. While this approach may yield some business benefit, it does not provide an opportunity for MSPs to differentiate their service offerings.

All SD-WAN solutions use two or more WAN transport networks by building an overlay network with encapsulation such as generic routing encapsulation (GRE), Virtual Extensible LAN (VXLAN), IPsec, dynamic multipoint VPN (DMVPN), or a proprietary tunneling technology. Overlays and tunnels attempt to mask network weaknesses and inflexibility by introducing wrappers, but these increase complexity. This causes costly overhead and prevents end-to-end networking, which hinders performance.

To deliver a differentiated service cost effectively, MSPs require a transformational approach to SD-WAN.

AI-driven SD-WAN

AI-driven SD-WAN is an advanced, service-centric offering for your customers that takes software-defined routing to a new level. Ideal for cloud-centric businesses of all sizes, it provides agile, secure, and resilient WAN connectivity with breakthrough economics and simplicity. AI-driven SD-WAN eliminates the inherent inefficiencies and cost constraints of conventional networking products and legacy SD-WAN solutions, reducing bandwidth consumption by 30% or more compared to alternative networking platforms.

The solution offers your customers a flexible, application-aware network fabric that meets stringent enterprise performance, security, and availability requirements (Figure 1).

The Session Smart Routers (SSRs) in AI-driven SD-WAN support many use cases and modernization initiatives, including multi-cloud connectivity, IoT and Managed services. You can stretch AI-driven SD-WAN from the edge to the data center to the cloud and beyond. Public cloud support includes AWS, Microsoft Azure, and Google Cloud.

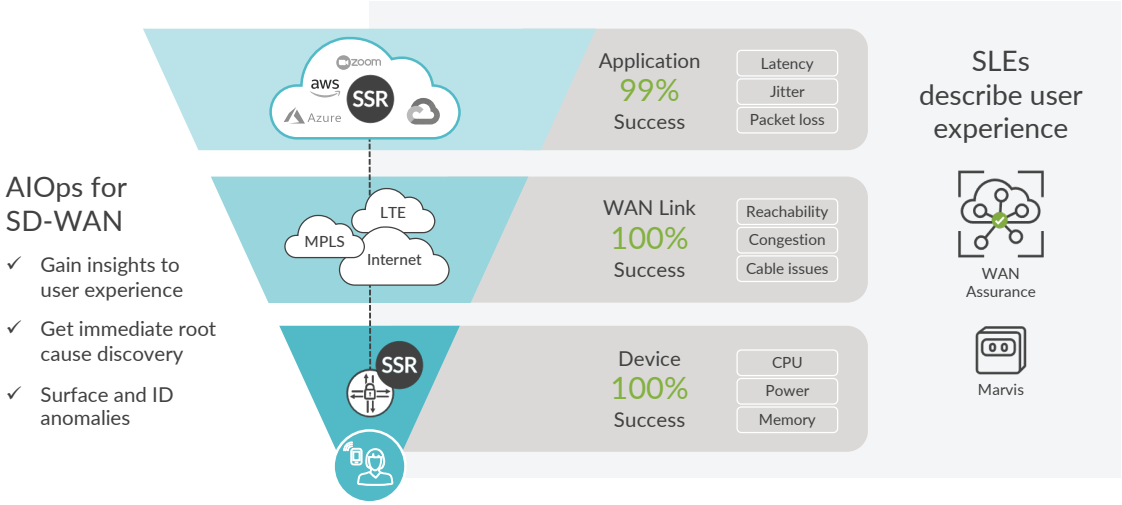

Figure 2: WAN Assurance Delivers Service Level Experiences

AI-driven SD-WAN optimizes for user experience, with guaranteed application performance, instant failover for all applications (including uninterrupted voice and video calls), and continual insights with recommended actions to assure the highest Service Level Experiences (SLEs). AI-driven SD-WAN enforces user-based security policies and application Service Level Agreements (SLAs) applied in real-time.

AI-driven SD-WAN provides a deny-by-default approach for zero-trust security. A stateful firewall protects applications and infrastructure against data loss and malicious attacks. Key capabilities include L3/L4 DoS/DDoS protection, adaptive payload encryption, Network Address Translation (NAT) and VPN functionality. A branch security pack includes intrusion detection and prevention (IDS/IPS) along with URL filtering.

AI-driven SD-WAN provides your customers with continuous connectivity without requiring expensive hot-standby tunnels like legacy solutions. In the event of a link failure or network outage, the solution seamlessly redirects traffic over an alternative path without disrupting sessions or impairing application performance.

AI-driven SD-WAN is fully software-based for ultimate flexibility and economics. The software runs on any commercial off-the-shelf or white box server platform, eliminating middlebox sprawl. Additionally, enterprises can take advantage of Juniper-branded options that provide small and medium branch platforms with multiple WAN link options including LTE.

Integration with Mist Cloud allows for central onboarding of SSRs: field engineers can simply plug in the device, scan the QR code, and cause it to automatically provision and come online. The solution supports zero-touch provisioning (ZTP) for plug-and-play installation at remote sites with minimal or no IT expertise required.

The solution includes Juniper WAN Assurance, a cloud service that brings AI-powered automation and service levels to the Juniper AI-driven SD-WAN solution. Driven by the power of Mist AI and Marvis Virtual Network Assistant, WAN Assurance simplifies operations with insights, proactive anomaly detection and remediation, and automated troubleshooting.

The resultant AIOps ensures your customers can understand and improve their users' experience across the SD-WAN (Figure 2).

For an example of WAN Assurance in action, see the short explainer video.

A Flexible Service Edge for Continuous Innovation and Growth

The AI-driven SD-WAN is the apex of a set of solutions in the Flexible Service Edge. Customers that may not be quite ready for the top-tier offering can start with simple connectivity and upgrade to a managed routing solution through licensing options. Because the Flexible Service Edge runs as a single network element, it provides a simpler topology than competing solutions that require separate "boxes" for individual network functions.

Transformational and Strategic Approach

The Flexible Service Edge is a solution for today, tomorrow, and beyond. As the end user organization and MSP's customers grow, the Flexible Service Edge can be used to securely connect hybrid/multicloud environments as strictly network/cloud security solutions, in IoT environments, data center interconnect, and more. This is a very versatile addition to the MSP's toolbox.

Benefits of the Flexible Services Edge

The following table highlights the benefits of the Flexible Service Edge.

Table 1: Benefits of the FSE

Benefit	Description
Service Centric Fabric	• Multi-cloud, multiservice edge and 5G • Differentiated user experience for maximum satisfaction • High scale to manage costs • Agility for time to market • Maintains service and tenancy context
Improved Business Outcomes	• Reduced MTTR by as much as 96% • Reduced truck rolls by as much as 85% • Tunnel-free architecture offers 30-50% bandwidth reduction • Allows expansion into high margin businesses • Cost competitive for both low and high value services
ZTP for Cloud Scale	• Supports traditional SD-WAN or 5G, IoT and edge compute • Rapidly and cost-effectively deploy and upgrade 100's or 1000's of end-points • Full analytics and policy
Freedom from Legacy Architectures	• High agility and cost-effective economics delivered from the cloud • Single network element reduces complexity and technology sprawl • Far better scale than with tunnel-based architectures • Programmable software-based solution • Distributed, elastic and mobile
Secure Edge	• Mitigates the security risks of many IoT end points • Goes well beyond perimeter security • Baked-in security with zero-trust, deny-by-default fabric • Secure Vector Routing provides fine-grained security on a session level.

The levels of the FSE are described in the following sections.

Provide connectivity with the Session Smart NID

The Flexible Service Edge Solution can function as an intelligent Layer 3 Network Interface Device (NID), to enable or improve internet access, cloud connectivity or VPN services. The FSE gives service providers maximum flexibility and extensibility by supporting multiple access methods, including internet, Carrier Ethernet and 4G/5G/LTE. It provides detailed visibility into application-level usage and performance data so service providers can monitor service quality and streamline diagnostics to provide a superior customer experience.

Table 2 highlights the key features and benefits of an MSP's Layer 3 NID solution.

Table 2: Features and Benefits for Layer 3 NID

Feature	Benefits
Complete analytics solution with intelligent instrumentation	Provide valuable insights into key usage and performance data (such as bandwidth utilization and link quality) on a per session, per segment basis.
Application-relevant statistics	Track and reports on application-level SLAs.
Multiservice enterprise edge	Standardized and 5G-ready. A single WAN edge termination point for all fixed and wireless access services.
Multidimensional visibility	Allow informed decisions from always visible traffic rates and shapes, error conditions, circuit utilization and link states.
Easy installation and setup	Provide easy turn up and a plug-and-play deployment.
Runs as a single network element	Cost reduction and topology simplification

Leverage analytics to upsell to the Session Smart Managed Router

Because MSPs now understand the attributes that impact service quality at the application level, they can more clearly demonstrate to customers when they should upgrade to a more robust service, such as a Managed Router. With the FSE, service providers can easily configure, monitor and control routing for their customers. Because moving up the value chain to the Juniper Session Smart Managed Router requires only a license change but no new hardware, service providers can quickly begin delivering high-margin services with minimal disruption.

The Session Smart Managed Router includes all of the features and benefits of the Layer 3 NID as well as those shown in the following table.

Table 3: Features and Benefits of a Managed Routing Solution

Feature	Benefits
Full featured enterprise edge router with Unified Communication support	Help customers prioritize applications with granular traffic engineering
Full ICSA-certified firewall	Provide filters as needed for devices, users, and applications.
Tunnel free architecture	Low overhead and flexible traffic forwarding based on applications and services
Fast failover and redundant configuration	Provide high availability with service guarantees
Visibility and analytics	Make timely configuration corrections based on real time information about your customer's traffic

Transform into a strategic business partner with AI-driven SD-WAN

When customers are ready, service providers can unleash the full functionality of the Juniper Session Smart Router (SSR) including high-value services like managed AI-driven SD-WAN. The MSP now establishes itself as a strategic partner enabling its customers' digital transformation journey.

AI-driven SD-WAN supports all of the features of the Flexible Services Edge. Additional features and benefits are shown in Table 4.

Table 4: Features and Benefits of MSP-Delivered AI-driven SD-WAN

Feature	Benefits
Application-aware routing	Support demanding application-level SLAs Stateful failover for priority applications.
AIOps	Continual insights with recommended actions to assure the highest Service Level Experiences (SLEs) and optimal user experience
WAN Assurance	Quickly identify and correct issues in the WAN, whether related to applications, devices or network connections.
Zero trust network	Provide highest security as sessions are only allowed based on explicit business policies.
Session aware data plane	Provide ultimate service quality and resiliency by selecting best path for the right application at the right time
Unified Communications	Provide support for managed voice and video.

Summary

The Flexible Service Edge lets MSPs launch a variety of high-value, cloud-centric services—quickly and cost-effectively. This allows MSPs to enable new functionality and deliver new services in an incremental, non-disruptive fashion with a simple software license update. The solution serves as an extensible platform for innovation, integrating with Mist AI to provide an AI-driven SD-WAN. These solutions redefine the potential of the WAN Edge, helping MSPs to extend their value proposition, strengthen customer relationships, and restore margin and revenue growth in today's hypercompetitive marketplace.

Next Steps

To learn how to deliver Juniper's Flexible Services Edge options including AI-driven SD-WAN, contact your Juniper account representative or visit https://www.juniper.net/us/en/solutions/sd-wan/managed-sd-wan.html.

About Juniper Networks

Juniper Networks brings simplicity to networking with products, solutions and services that connect the world. Through engineering innovation, we remove the constraints and complexities of networking in the cloud era to solve the toughest challenges our customers and partners face daily. At Juniper Networks, we believe that the network is a resource for sharing knowledge and human advancement that changes the world. We are committed to imagining groundbreaking ways to deliver automated, scalable and secure networks to move at the speed of business.

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