INTELLIGENCE AND SECURITY FOR BRANCH OFFICES WITH AI-DRIVEN SD-WAN

Start leveraging Juniper Session Smart SD-WAN for experience-first networking in distributed enterprises

Many enterprises are inherently distributed, with branch and campus offices spread across cities, countries, and continents. Unfortunately, a lack of effective security at many of these offices can lead to catastrophic losses and irreparable harm to the organization's brand and reputation. Organizations have had to face stolen customer credit cards, leaked personal information, and ransomware attacks that completely halted business activities.

Lack of security is one concern for enterprises, but there are many others. Additionally, we have experienced a paradigm shift toward software in the cloud, where everything is elastic, distributed, and mobile-friendly. Software as a Service (SaaS) applications are now ubiquitous and that shift is disrupting the business world. At the same time, enterprises are experiencing many more cyberattacks that come from within and outside the network perimeter. Adding to these vulnerabilities is the constant need for connectivity. Enterprise connectivity to public, private, and hybrid clouds is a necessity, but it does not always result in a smooth user experience. Winning on all of these fronts requires a fundamentally different and holistic approach to enterprise networking that will deliver the best user experiences from client to cloud. Achieving the necessary security, cloud friendliness, and connectivity requires a solution that leverages visibility, data science, and the power of artificial intelligence (AI).

The Juniper® AI-Driven Enterprise packages all of these elements together to deliver proactive and predictive AI operations that help enable the Self-Driving Network™. These modern networks are built on client and application awareness, whereby the network intelligently routes client and application traffic to ensure the ultimate user experience.

Challenges to Distributed Networks

Here are just a few of the challenges facing today's distributed networks.

- **Poor user experiences**: Transient link performance degradations, such as increased packet drop rate, latency, and jitter due to congestion degrade the user experiences for SaaS and cloud-based applications.

- **Variable application performance requirements**: Online real-time collaboration tools are sensitive to jitter and latency, while file exchange and other applications require significant bandwidth.

- **Increased risk of cyberattacks**: Cybersecurity threats such as spam e-mails, viruses, phishing attacks, malware, spyware, ransomware, and denial-of-service (DoS) attacks frequently target enterprises and expose sensitive and confidential information.

- **Congested WAN links**: Branch office locations connect to the WAN by multiple technologies, including very-high-bit-rate digital subscriber line (VDSL), asymmetric digital subscriber line (ADSL), LTE, and Ethernet. Some technologies are asymmetric, whereby their uplink bandwidth is only a fraction of their downlink. These low-throughput uplinks can easily become congested.

- **Lack of security in connected devices**: Printers, scanners, meeting room multimedia devices, surveillance cameras, building access control sensors, and smart-building IoT-based systems require connectivity. Unfortunately, the emerging IoT field is dominated by vendors and products that often lack any security capabilities.

Juniper offers a secure solution to these challenges that combines the virtualized Juniper® Session Smart™ Router, and the versatile Juniper Networks® NFX Series Network Services Platforms, which are powered by AI to deliver network operation insights and self-driving capabilities.

Session Smart Router

The Juniper Session Smart Router delivers AI-Driven SD-WAN to enterprises. Its innovations elevate experience-first networking to the next level with the following features:

- **Tunnel-less routing** eliminates the need for tunnels and overlays, which saves up to 30% bandwidth.

- **Session awareness** recognizes the source, destination, and directionality of traffic to connect related bidirectional flows and turn them into a session.
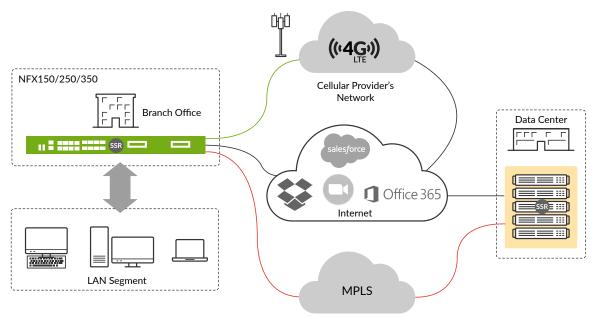
Figure 1. Juniper Session Smart SD-WAN

- **Service centricity** understands the named services and applications, the service topology, and the business policies of enterprise networks.

- **Waypoint setting** selects, manages, and enforces particular paths based upon the requirements for applications and services.

- **Software-based** system runs on Juniper Networks NFX150, NFX250, and NFX350 Network Services Platforms, as well as any x86 commodity hardware on-prem and in the cloud.

- **Simple management** provides a centralized, intuitive, and easy-to-use web-based management platform.

- **AI-driven network insights, and AI operations** provide visibility into user experience, end-to-end impact analysis, and automatic corrections and identification for gateway misconfigurations.

NFX Series Network Services Platforms

NFX Series delivers the solutions enterprises need to secure their SD-WAN-driven branch office locations. NFX Series platforms offer the following features:

- **Resiliency**: Redundant AC or DC power supplies help ensure uninterrupted operations.

- **Built-in security**: Industry-leading stateless and stateful firewall, deep packet inspection (DPI), intrusion prevention system (IPS), antivirus, URL filtering, up to 16 Media Access Control Security (MACsec)-256 enabled ports support enterprise security.

- **Best-in-class hypervisor**: CPU pinning, SR-IOV and VirtIO interfaces, memory huge pages for agile third-party virtualized network function (VNF) management, and up to 2 TB SSD storage support advanced virtualized environments.

- **LTE module**: Integrated modem operates over 3G and 4G networks, and field-replaceable SIM cards, active/backup link failover, zero-touch provisioning (ZTP), carrier aggregation (up to 320 Mbps downlink), and complete Junos® operating system integration provide next-generation wireless WAN support.

- **Three flexible modes of operation**: "Throughput" for best throughput performance, "compute" for maximum resource allocation for VNFs, and "hybrid" which balances between "throughput" and "compute" provide hardware resource allocation tailored to customer needs.

- **Consolidated security, routing, and switching**: MPLS, IPv4/IPv6, Network Address Translation (NAT), IPsec, generic routing encapsulation (GRE), BGP, OSPF, multicast protocols, and Dynamic Host Configuration Protocol (DHCP) client and server are all available in one offering.

- **Management flexibility**: CLI, Network Configuration Protocol (NETCONF), Contrail® Service Orchestration, automation, and integration with third-party network management platforms provide multiple management options.

Figure 2. NFX Series Network Services Platforms

A Secure SD-WAN for Distributed Enterprises

Juniper's solution combining the Session Smart Router, deployed on NFX Series Network Services Platforms, enables secure, AI-Driven SD-WAN in the distributed enterprise. The session-aware and application-centric Session Smart Router elevates experience-first networking to the next level. NFX Series platforms consolidate industry-leading routing, switching, and security for the AI-Driven Enterprise. And the solution's best-in-class built-in hypervisor enables the provisioning and deployment of virtualized Smart Session Routers in a resilient, federated solution. Juniper Session Smart SD-WAN brings intelligence and security into the distributed enterprise.

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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