NEXT-GENERATION RETAIL NETWORKS ACCELERATE DIGITAL TRANSFORMATION

Overview

Forward-looking retailers are continuously seeking innovative ways to improve business performance and maintain a competitive edge in today's global economy. Many are fusing in-store and online technologies, using data analytics, machine learning (ML), and artificial intelligence (AI) to reinvent the customer experience and streamline business processes. In-store location beacons, smart sensors, and surveillance cameras can provide valuable insights into consumer behavior. And digital signage and interactive mobile apps can entice shoppers and transform customer engagements.

By delivering rich, omnichannel shopping experiences that blend physical and digital interactions, providing the right information at the right point in the buyer journey, retailers can increase online and foot traffic, boosting conversion rates and upsell opportunities. And by optimizing operations and merchandising, retailers can increase workforce productivity, improve inventory management, and reduce expenses.

Digital Retail Applications

- **Process Automation**—Use AI and ML to streamline workflows and optimize operations
- **Immersive Experiences**—Use digital signage, smart shopping carts, and interactive mobile apps to engage consumers
- **Omnichannel Retailing**—Blend in-store, online, and social interactions to improve customer loyalty
- **Intelligent Merchandizing**—Use beacons and sensors to analyze shopper patterns and optimize store layouts
- **Kiosks**—Introduce self-serve terminals with bots and live sales and support specialists

The Challenge: Ensuring Fast, Reliable, and Secure Connectivity

Digital retail applications fundamentally reshape network traffic flows, introducing performance, security, and service quality challenges for system architects. Historically, most retailers hosted applications in central data centers or colocation centers. They connected retail sites over MPLS networks or private WANs, over which they had deep visibility and tight control.

In the new model, retail applications and services are hosted in public and private clouds (as well as in data centers). And high volumes of business-critical application traffic flows over best-effort public Internet connections over which the retailer has little visibility and control.
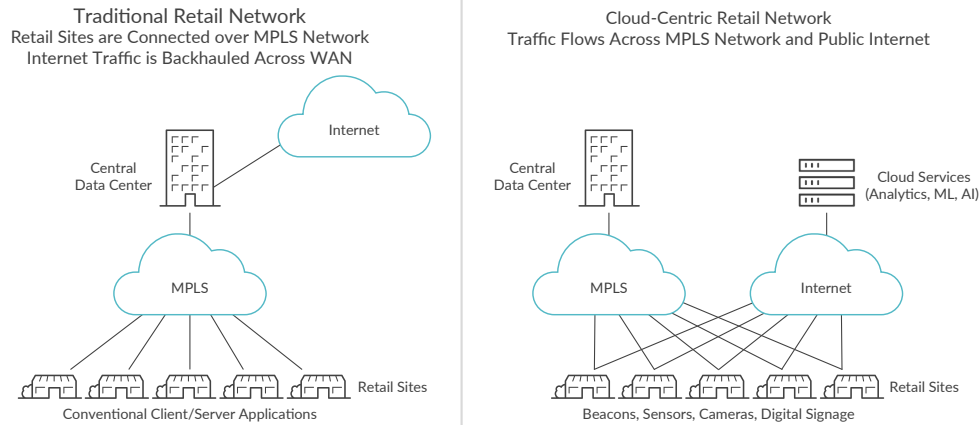
Traditional Retail Network
Retail Sites are Connected over MPLS Network
Internet Traffic is Backhauled Across WAN

Cloud-Centric Retail Network
Traffic Flows Across MPLS Network and Public Internet

Figure 1: Traditional vs. cloud-centric retail network

Traditional retail store networks, designed to support conventional business applications and IT services, aren't well suited for the digital era. Retailers must re-architect their networks to meet the increased performance, agility, and resiliency demands of a cloud-first world.

Juniper Session Smart SD-WAN Solution

The Juniper Session Smart™ SD-WAN solution, powered by the Juniper Session Smart™ Router, is an advanced, service-centric networking solution that takes the software-defined WAN to a whole new level. Ideal for next-generation retail networks, the solution provides fast, secure, and reliable WAN connectivity with unmatched simplicity and economics.

The Session Smart SD-WAN solution eliminates the inherent inefficiencies and cost constraints of traditional branch office networking products and legacy SD-WAN solutions, as it meets stringent next-generation retail network requirements:

- **Economics—**A fully software-based solution, Session Smart SD-WAN runs on commercial off-the-shelf servers for ultimate economics and choice. Unlike with a traditional service function chaining approach, the Session Smart SD-WAN solution performs multiple logical network functions (router, stateful firewall, WAN optimizer, etc.) in a single virtualized network function (VNF), significantly reducing CPU and memory requirements. Secure Vector Routing (SVR) and lossless application delivery expand bandwidth capacity by as much as 50%. And native analytics obviate the need for external network monitoring and analysis solutions.

- **Scalability—**The solution supports up to triple the number of routers per head-end and delivers up to four times the hardware performance of alternative solutions. Zero-touch provisioning (ZTP) enables plug-and-play installation at

remote sites, allowing retailers to turn up hundreds of locations per week.

- **Security—**Its pioneering SVR approach provides strong data security without the overhead of traditional encryption protocols. Deny-all (zero trust) routing, L3/L4 denial of service/distributed DoS (DoS/DDoS) protection, payload encryption, and Network Address Translation (NAT) and VPN functionality all work together to protect applications and infrastructure against data loss and malicious attacks.

- **Availability—**Session Smart SD-WAN provides continuous connectivity without requiring expensive hot-standby tunnels like conventional branch office networking or legacy SD-WAN solutions. In the event of a link failure or ISP outage, the solution seamlessly redirects traffic over an alternative path without disrupting sessions or impairing application performance.

- **Visibility—**Unlike alternative solutions that encapsulate all data flows into a single overlay tunnel, the Session Smart SD-WAN's tunnel-free architecture gives network administrators full visibility into individual data flows, so they can efficiently monitor end-to-end sessions, track key performance indicators (KPIs), and troubleshoot problems. Single-pane-of-glass, centralized management simplifies ongoing administration and operations at unstaffed retail locations, and makes it easy to institute uniform policies across clouds.

- **Performance—**The solution supports a variety of WAN optimization features, traffic steering, quality-of-service (QoS) functions, and session-aware routing capabilities, along with a tunnel-free architecture to ensure high performance and service quality for diverse applications and services.

Session Smart SD-WAN Eliminates Retail Network Cost and Complexity

Table 1: Traditional/Legacy SD-WAN vs. Session Smart SD-WAN Capabilities

Requirement	Traditional WAN and Legacy SD-WAN	Juniper Session Smart SD-WAN
Simple, low-cost platform	Discrete branch office networking and security middleboxes add cost and overhead. Legacy SD-WANs require expensive servers to support multiple dedicated VNFs.	Session Smart SD-WAN consolidates all network functions onto a single VNF that runs on inexpensive commercial off-the-shelf (COTS) servers. Plug-and-play installation streamlines rollouts.
Strong security	Tunnel overlays safeguard data privacy, but limit visibility and control, and impair performance.	Secure Vector Routing protects data privacy, while enabling granular traffic management and visibility.
Application- specific service assurances	Tunnel overlays inhibit traffic management and prevent application-specific SLAs.	Fine-grained traffic management and application-aware routing enable application-specific, policy-based SLAs.
Continuous connectivity	Idle hot-standby tunnels are costly and inefficient.	Multipath session migration provides cost-effective protection against link failures and ISP outages. Server load balancing provides business continuity and disaster recovery (BC/DR) for critical applications.
Optimal performance over low-speed links	High-overhead tunneling protocols squander bandwidth and impair the performance of delay-sensitive applications.	Secure Vector Routing minimizes protocol overhead. Lossless application delivery optimizes bandwidth utilization and boosts application performance.
Visibility	Tunnel overlays inhibit visibility and control.	Tunnel-free architecture provides visibility into individual data flows, enabling end-to-end session monitoring and troubleshooting.

Major U.S. Pharmacy Chain Reduces Network Cost and Complexity

Session Smart SD-WAN is helping a leading U.S. pharmacy and healthcare company modernize its vast retail data network. The solution replaces an expensive and complicated legacy network, providing agile, secure, and reliable connectivity to thousands of stores, over low-cost broadband Internet services.

- Extensive packet shaping and prioritization capabilities ensure high service quality for delay-sensitive data flows like unified communications (UC) and telemedicine traffic.

- Policy-based access controls and strong security capabilities protect retail site and data center IT infrastructure against cyber attacks and data breaches.

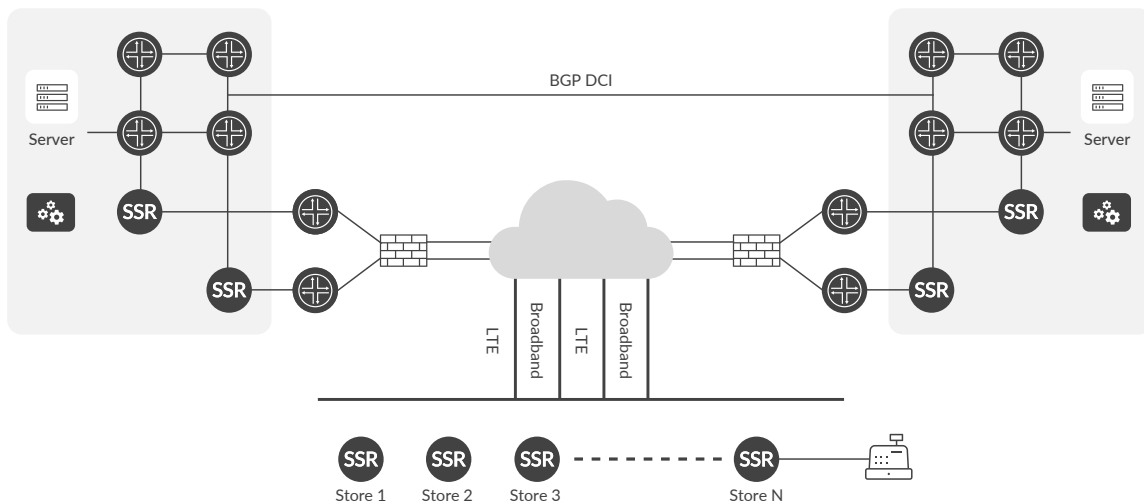- Seamless 4G failover support ensures continuous availability for business-critical applications.

Figure 2: Session Smart SD-WAN for next-generation retail store

Once fully deployed, the Juniper Session Smart SD-WAN solution will save this U.S. pharmacy chain around $50 million in network infrastructure costs alone.

For More Information

To find out more about how the Session Smart SD-WAN solution might transform your retail network, please contact your Juniper account manager and visit www.juniper.net.

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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