

SECURE, AGILE SD-WANS FOR THE EDGE

Juniper and ZEDEDATA provide a cloud-managed SD-WAN solution for on-premises edge computing deployments with zero-trust security

Challenge

IT organizations are increasingly tasked with supporting hybrid remote and office work environments in addition to new IoT, edge computing, and AI solutions. They are often being asked to do more with fewer resources and with little to no IT expertise at remote sites.

Solution

The Juniper-ZEDEDATA joint solution deploys SD-WAN at remote sites at scale while providing flexibility to deploy and manage additional edge application workloads. Offering industry-leading networking and zero-trust security from edge silicon to cloud, it supports legacy consolidation and cloud-native software investments on choice of hardware.

Benefits

- AI-powered insights, anomaly detection, and automated troubleshooting for the WAN
- Breakthrough economics—50% reduction in bandwidth with Session Smart Routing's tunnel-free architecture and 75% infrastructure cost reduction with white box and server reuse
- Zero-touch provisioning
- Robust zero-trust security
- Support for additional applications in any format (virtual machines, containers, or clusters) on the base edge infrastructure

The sheer number of people and devices on networks, in addition to mobility requirements, is driving a need for implementing SD-WAN at highly distributed edge locations to enforce zero-trust security without a predefined network perimeter.

Juniper and ZEDEDATA have partnered to offer a comprehensive solution for a secure SD-WAN appliance at remote locations. With the combined offers, organizations can run additional workloads that maximize their infrastructure investment. Built on Juniper® Session Smart™ Routing, the solution greatly simplifies remotely provisioning WAN edge hardware, and it provides full life-cycle management and security for both Juniper network platforms and additional desired edge applications deployed in virtual machines, containers, or Kubernetes clusters. The solution also provides enterprise users with visibility and control for Day 1 and Day 2 management of edge nodes, applications, and high-performance routing with the ability to analyze and optimize their varied connectivity across many links.

The Challenge

IT organizations are increasingly tasked with supporting hybrid remote and office work environments in addition to new IoT, edge computing, and AI solutions. Unfortunately, most of today's SD-WAN solutions come with a high price tag, offer limited to no hardware choice, do not support legacy investments, and have limited functionality. Organizations are forced to purchase and maintain additional infrastructure to address their needs, and all of this complexity exposes the business to increasingly sophisticated cyberattacks and downtime with excessively high remediation costs.

The Juniper Networks and ZEDEDATA Solution

The Juniper and ZEDEDATA joint solution greatly simplifies standing up SD-WAN in the field. It doesn't require specialized IT skills, and it provides a foundation to consolidate application workloads to support diverse branch office, IoT, AI, 5G, networking, and security use cases. The solution supports autonomous operation with remote management and risk-free updates from the cloud. And it can be deployed in typical office environments or in more stringent environments such as manufacturing, oil and gas, utilities, renewable energy, healthcare, and retail.



Juniper Session Smart Routing supports multiple session optimization and intelligent routing features that enable high performance and quality for diverse applications and services. Through granular quality-of-service (QoS) controls, network administrators can efficiently shape and prioritize traffic to enforce different service-level agreements (SLAs) for different data flows. Innovative, application-aware routing intelligently steers traffic based on administratively defined policies and real-time network conditions, to automatically select the right network path (MPLS, 4G/5G, Internet) for the right application at the right time. And a unique lossless application delivery capability boosts WAN bandwidth utilization, helping improve performance over lower capacity WAN connections.

These capabilities are augmented by ZEDEDADA's zero-trust security model that provides the ideal foundation for edge computing applications distributed outside of the traditional data center. Features include support for hardware root of

trust, measured boot, encryption, I/O port blocking to prevent tampering, and distributed firewall to govern data flow from edge to cloud based on policy.

In addition to simplifying deployment of Juniper SD-WAN solutions, ZEDEDADA provides a rich set of visibility for both Day 1 and Day 2 remote management of edge nodes and applications. This is both by single edge node or application (CPU, memory, disk, network usage, network flow visualization) and across entire fleets. The cloud-based ZEDEDADA UI is designed with usability in mind for a mix of the IT and OT skillsets required to deploy and manage solutions at the distributed edge. Further simplifying deployment, ZEDEDADA is working with leading gateway and server hardware OEMs to preload EVE-OS from the factory. Once power and network are connected, it takes only a few clicks to securely onboard a device and begin to deploy Juniper Session Smart Routing and any additional desired applications in virtual machines, containers, or Kubernetes clusters.

Features and Benefits

Table 1: Juniper Session Smart Routing Differentiators

Requirement	Traditional WAN and Legacy Routing	Session Smart Routing
Data privacy	Tunnel overlays safeguard data privacy, but limit visibility and control.	Secure Vector Routing (SVR) 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 in-efficient.	Multipath session migration provides cost-effective protection against link failures and ISP outages. Server load balancing provides business continuity/disaster recovery for critical applications.
Optimal performance over low-speed links	High overhead tunneling protocols squander bandwidth and impair the performance of delay-sensitive applications.	SVR minimizes protocol overhead. Lossless application delivery optimizes bandwidth utilization and boosts application performance.
Low-cost remote site platform	Special-purpose middleboxes add cost and overhead. Legacy SD-WANs require expensive servers to support multiple dedicated virtualized network functions (VNFs).	Solution consolidates all network functions onto a single VNF that runs on inexpensive commercial off-the-shelf (COTS) or white box servers.
Easy turn-up and operations	Each middlebox has distinct CLI/EMS/APIs. Adds/moves/changes and troubleshooting are manual-intensive, time-consuming, and error-prone.	Unified administration, auto-device discovery, zero-touch provisioning (ZTP), and up-grades streamline deployment and management.

Table 2: ZEDEDADA Differentiators

Requirement	Traditional IoT Device Management	ZEDEDADA Edge Orchestration
ZTP	Often requires custom configuration for each device.	Fully automated bootstrapping, authentication, and certificate management for both underlying hardware and OS, with credentials stored in silicon-based root of trust (TPM).
Security	Offers basic security functions including Transport Layer Security (TLS) communication and role-based access control (RBAC).	Support for hardware root of trust, measured boot, encryption, I/O port blocking prevents tampering, and distributed firewall.
Application support	Only supports monolithic image updates, or in some cases containers.	Support for any application format spans virtual machines, containers, and Kubernetes clusters.
Ecosystem	Additional functionality can be gained by working with partners on a case-by-case basis.	Built-in edge application marketplace greatly simplifies development and deployment of software-defined solutions.
Open architecture	Some may leverage open source but without vendor-neutral governance.	Utilization of EVE-OS from the Linux Foundation for edge nodes prevents vendor lock-in.

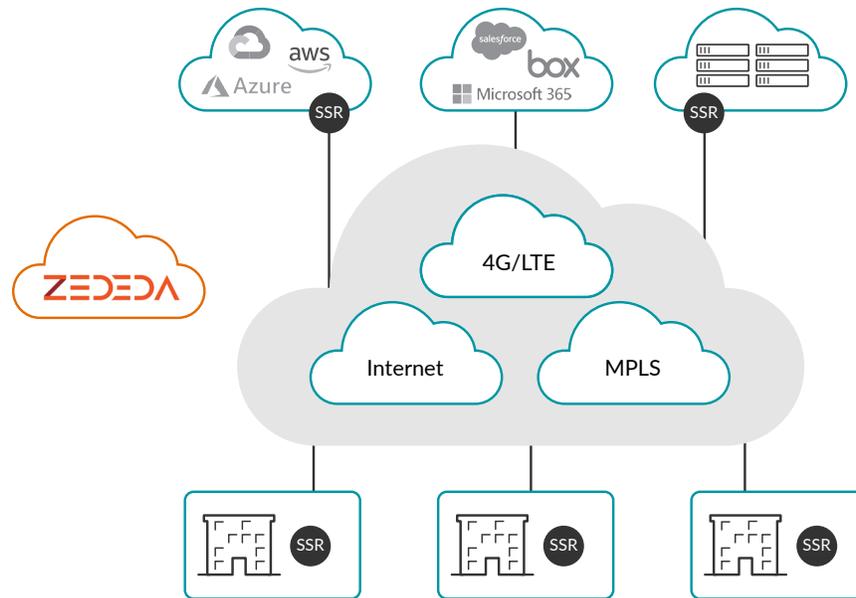


Figure 1. ZEDEDA hardware and software orchestration

Solution Components

Session Smart Routing enhances the quality of service from your critical applications and delivers reliability and a superior customer experience. Zero-trust security is baked into the solution: no application, device, or user can initiate a session on the zero-trust fabric that is not explicitly allowed based on business policies. Finally, by routing and policing traffic at the edge, traffic patterns are optimized and latency is lowered.

You can easily scale policies across thousands of customer sites. Managed by Juniper Session Smart Conductor, Session Smart Routers create a service-centric fabric for campuses, branches, data centers, and cloud resources across the distributed enterprise.

The Juniper solution includes the following components:

- The Layer 3 Juniper Session Smart NID, which sets a new standard for WAN management, providing deep visibility, real-time monitoring, and actionable analytics
- The Juniper Session Smart Flexible Edge, which delivers a high-capacity edge router with full-featured traffic engineering and SLAs more commonly seen in the largest distributed enterprises or even service providers
- The Juniper SD-WAN driven by Mist AI™, that forwards traffic based on administrator-defined policies and real-time network conditions, automatically selecting the best path for the right application at the right time for ultimate performance, resiliency, and service quality

The ZEDEDA solution includes the following components:

- The cloud-based ZEDCloud orchestration console that provides a universal portal to manage diverse edge hardware and applications
- EVE-OS as a bare-metal, open-source operating system for edge nodes

Summary—Simplifying SD-WAN Economics and Scale

The joint Juniper and ZEDEDA secure, agile SD-WAN solution takes software-defined, distributed routing to the next level, satisfying demanding enterprise performance, resiliency, and security requirements, all while preparing IT departments for additional application workloads at the edge. Session Smart SD-WAN is a tunnel-free architecture, combined with intelligent service-based routing that provides end-to-end visibility and granular control over individual data flows, enabling application-specific SLAs with ultimate efficiency. Purchased as a subscription, ZEDEDA provides an optimal orchestration foundation for deployment and full life-cycle management of both hardware and applications at distributed edge sites.

Next Steps

To learn more about ZEDEDA, contact your account representative or visit <https://zededa.com/>.

To learn more about Juniper Session Smart SD-WAN solutions, please visit www.juniper.net.

About Juniper Networks

At Juniper Networks, we are dedicated to dramatically simplifying network operations and driving superior experiences for end users. Our solutions deliver industry-leading insight, automation, security and AI to drive real business results. We believe that powering connections will bring us closer together while empowering us all to solve the world's greatest challenges of well-being, sustainability and equality.



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