

Lanner and 128 Technology Deploy 5,000-Store Retail SD-WAN

Auto parts chain improves uptime and simplicity, deploying SD-WAN in an average of 80 stores per night with zero-touch deployment

Lanner

At a Glance

Nationwide auto parts retail chain adopted 128 Technology SD-WAN running on Lanner whitebox servers powered by Intel Atom® processors to simplify network and improve uptime.¹

- Challenge: Dropped calls results in loss of \$100 in sales on average
- Solution: Deployed SD-WAN to 5,000 stores
- Result: 100% voice network uptime with SD-WAN
- Result: 100% data network uptime with SD-WAN

In order to maintain high customer responsiveness, increase sales, and reduce wide area network costs and complexities, large-scale retailers are turning to software-defined wide area networking (SD-WAN) systems. SD-WANs run on virtualized servers that deliver high availability and agile branch office connectivity. Intel® Network Builders partner Lanner Inc. recently worked with SD-WAN expert 128 Technology to deliver SD-WAN for 5,000 stores of a nationwide auto parts retailer.

Improving WAN Connectivity and Lowering Costs

Software-defined wide area networking (SD-WAN) is changing the game for organizations with large branch offices that need an agile WAN with flexible connectivity for lower cost.

Retail chains fit this trend because they have, in the past several years, deployed advanced IT technologies in order to manage their increasingly data-driven businesses. These applications help to manage inventories, record and report transactions, and maintain customer databases. Often times the applications are located in the cloud or in network edge servers. Retail chains are in the early stages of deploying advanced retail applications, including location-based services, branded smartphone app integration, and the use of augmented reality/virtual reality (AR/VR) for product demonstration.

Supporting these applications has meant building networking and compute capabilities that utilize a growing collection of fixed-function appliances. Because of the large number of systems in place, this approach is often too complex and expensive to implement redundancy, contributing to increased downtime.

One option for companies is to replace these networks with virtualized servers. These servers reduce hardware costs by replacing multiple, stand-alone appliances with cost-effective Intel® architecture-based servers. The compute capacity of multicore processors allows multiple applications to run simultaneously on a single server, simplifying management and making it more cost effective to add a backup server.

SD-WAN can be one of the applications that run on virtualized servers, and indeed has been one of the drivers of this transition. SD-WAN provides more secure and reliable WAN services across legacy multiprotocol label switching (MPLS) networks and broadband internet access, allowing branch offices to maintain dedicated links back to corporate headquarters and support broadband internet connections to cloud services.

Session Smart™ SD-WANs from 128 Technology

128 Technology is an innovative pioneer in SD-WAN. What sets them apart is that their 128T Session Smart routers are not based on packet encapsulation-based network tunnels that are traditionally used in SD-WAN. Instead, the routers utilize

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128 Technology's Secure Vector Routing (SVR), which is a new routing architecture that enables the network to differentiate the way it delivers applications and services in a more secure and scalable way.

SVR replaces tunnel-based network overlays with a session-based approach, utilizing distributed control, simple intelligent service-based routing, and in-band (data plane) session-based signaling.

The scalability advantage of SVR is significant. In a corporate WAN, each branch office needs its own tunnel, but network equipment can only support several thousand tunnels, limiting the size of the branch office WAN. However, there are no caps on the number of sessions that can be supported by the network, enabling 128 Technology to build networks of any size.

SVR is fully compatible and interoperable with existing network protocols and architectures, allowing it to be gradually introduced into an existing IP network without affecting the network endpoints or hosts. Features of the 128T SD-WAN router include the following:

- Centralized policy management and orchestration that simplifies administration, provisioning, monitoring, and analytics.
- Open APIs and analytics for integration with orchestration and automation tools, as well as analytics and service monitoring platforms to proactively improve network-wide performance and reliability.
- Dynamic hybrid WAN that creates a transport agnostic networking and dynamic multi-path routing environment supporting MPLS, internet, LTE, and satellite connections. This allows the branch office to optimize their network connections for low cost without reducing reliability.

- Dynamic detection of application traffic with the ability to take action to guarantee performance.
- Secure virtual networks outside of the traditional enterprise network with routing and security policies that are established across firewall/NAT boundaries.
- Zero-touch deployment that brings new platforms online at lightning speed to improve operational efficiency, and helps reduce errors by provisioning network services without manual intervention.

Auto Parts Chain Builds High-Reliability SD-WAN

Lanner and 128 teamed up for the rollout of a 5,000-site network for a major chain of auto part stores. The chain's main goal for the new network was to improve voice connectivity because calls for them on average resulted in \$100 in sales from ordering oil changes, new tires, or other merchandise and services. Network outages became costly in terms of lost sales, which meant the goal for the new network was 100% uptime.

Other goals included reducing bandwidth use at each store and reducing the hardware that was needed to deploy the network, which meant lower overall network costs and maintenance. The previous network required separate load balancers, routers, switches, firewalls, WAN optimizers, and VPN concentrators, making the in-store network extremely complex. This entire infrastructure was replaced with Lanner whitebox servers and 128 Technology SD-WAN software.

Converting up to 80 Stores per Night

Once the company chose Lanner and 128 Technology, it was important to convert as many of the 5,000 stores as possible, as fast as possible. With 128T's zero-touch deployment capability, the company was able to deploy, on average, 80 stores per night using only store management for the installation, eliminating the need for onsite technicians.



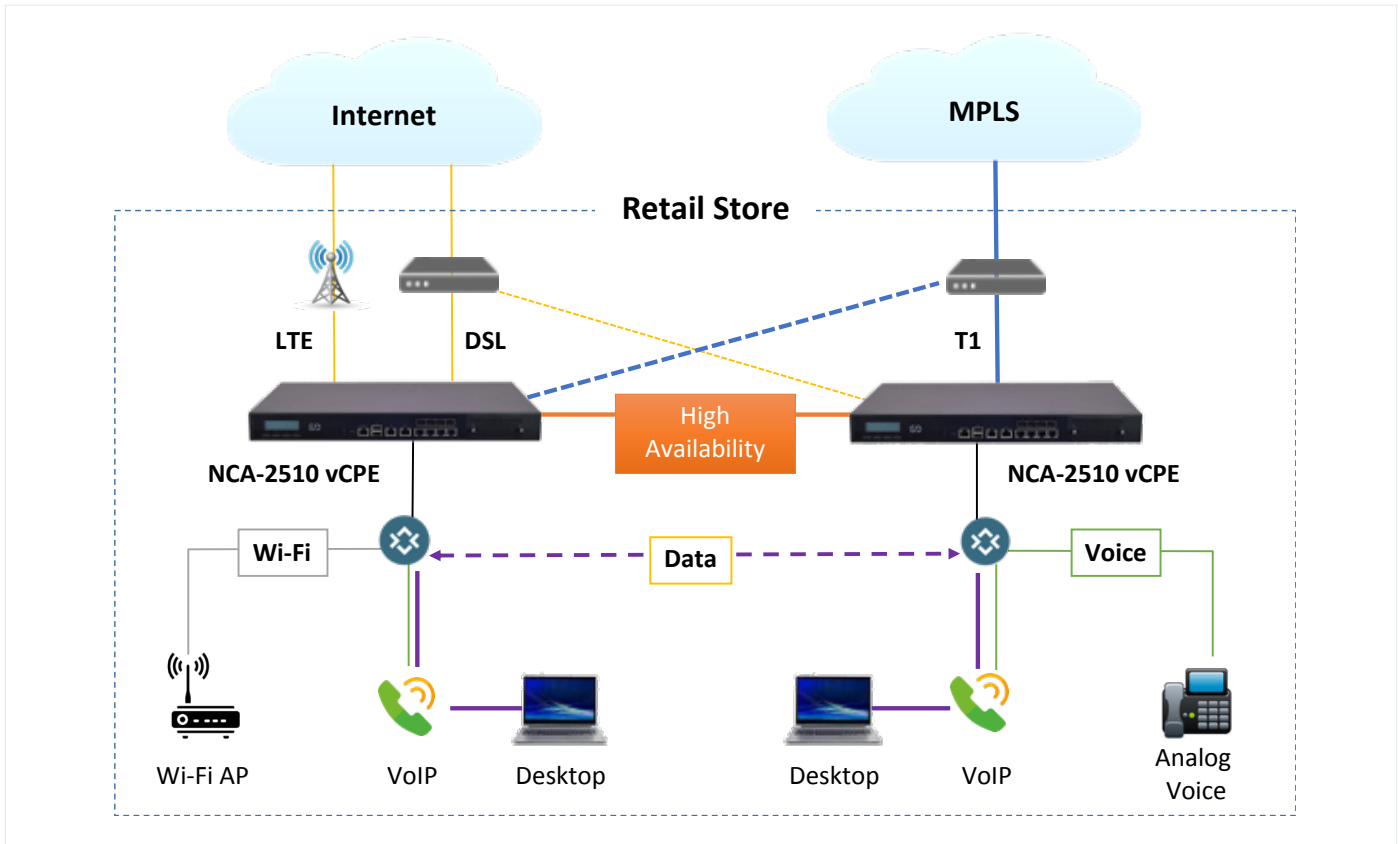


Figure 1. High availability SD-WAN for retail connectivity

As shown in Figure 1, each installation included two Lanner servers working in high availability (HA) mode, which offered redundancy for instantaneous failover, ensuring services were available in the event of a hardware failure. Additionally, HA mode allowed servers to be taken down for maintenance with no service disruption.

In the new network, each server runs the 128T software with one server connected to the MPLS VPN network, and the other server connected to the broadband internet. The second server also has the LTE wireless backup connection. Both of those servers are connected to Ethernet switches that also provide connectivity for the, on average, 20 devices in the store, including the point of sales (POS) terminals and phone handsets. Voice calls utilize the MPLS network and data and VPN traffic utilize the broadband internet connection.

While serving different networks, each server is in HA mode for backup with the LTE connection serving as an additional backup in the event that all of the wired connections are lost. The LTE link also facilitates the connection for configuration during the zero-touch deployment. The server is installed, connected to the network and power, and then turned on. The wireless SIM card is automatically activated and able to download the configuration instructions that allow the servers to be configured.

Lanner Whitebox Servers Based on Intel Technology

The auto part retail chain utilized Lanner’s whitebox server family of multi-core servers based on the Intel Atom® processors C3000. Lanner has a portfolio of more than 10 whitebox solutions that are predefined for SD-WAN

applications. They come in extra-small, small, medium, large, and extra-large configurations based on the number of network ports, the processor, storage, and other features. All of the company’s whitebox servers will run 128 software.

Most of the deployments for this network were based on the Lanner NCA-2510, which is a virtualization-optimized (1U 19" rackmount) server that utilizes Intel Atom processors C3000 and is available with up to 16 cores and up to 128 GB of memory. The NCA-2510 supports up to four 10 GbE small form-factor pluggable (SFP+) optical connections in addition to a quad-port Gigabit Intel® Ethernet Server Adapter I350.

The NCA-2510 leverages other Intel virtualization technologies, including single root input/output virtualization (SR-IOV) and Intel® Virtualization Technology for Directed I/O (Intel® VT-d). For encryption performance, the system features Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI), and Intel® QuickAssist Technology (Intel® QAT). Combined, these technologies give the device the features and throughput for virtual CPE, universal CPE, SD-WAN, and software-defined security applications.

Intel Atom processors C3000 enable cost and infrastructure optimization by bringing the efficient performance and intelligence of the Intel Atom processor into a dense, low-power system-on-a-chip (SoC) designed specifically for network and edge solutions. The Intel Atom processor C3000 can be utilized for a variety of light scale-out workloads that require very low power, high density, and high I/O integration, including network routers, switches, storage, security appliances, dynamic web serving, and more.

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With this solution the auto parts chain was able to outfit 5,000 stores in less than one year, and since the deployment, they have seen 99.997% store availability, 100% voice platform availability and 100% data platform availability with a 90% reduction in trouble tickets. The HA functionality played a key role in this uptime as it allowed for the network to stay operational while remote rebooting or troubleshooting took place.

Conclusion

SD-WAN provides a simplified network system for branch offices that is being adopted by retailers such as the auto parts retailer that selected Lanner and 128 Technology for its nationwide network build-out. With cost-effective Intel® architecture-based whitebox servers from Lanner and scalable SD-WAN software from 128 Technology, this retail chain was able to improve its network uptime, reduce its costs, and simplify its network at more than 5,000 stores across the country.

Learn More

128 Technology Homepage: <https://www.128technology.com/>

Lanner Homepage: <http://www.lannerinc.com>

Lanner NCA2510 webpage:

<http://www.lannerinc.com/products/network-appliances/white-box-hardware-solutions/nca-2510>

Edge Talk – Episode 2: Powering Tunnel-free SD-WAN with Whitebox uCPE:

<https://www.youtube.com/watch?v=KRw5vf6ETpk&feature=youtu.be>

Intel Atom® processor family: <https://www.intel.com/atom>

Intel® Network Builders: <https://networkbuilders.intel.com>



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¹ Data provided by Lanner, September 2020.

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