

## SOLUTION BRIEF

Communications Service Providers  
Machine Learning for Wide Area Networks



# Netrolix\* AI-WAN Brings Machine Learning to Branch Office WANs

Netrolix taps power of Intel® CPUs for machine learning analysis of latency, congestion, and jitter, enabling fast Internet-based network performance for branch office users.



### Overview

Enterprise wide area networks (WANs) were built for two-way data communication with branch offices. But these WANs cannot deliver the performance needed to support growing use of software as a service (SaaS) and other cloud-based services. Most companies are adding broadband Internet connections to support these services, but these don't have the same service levels as legacy WAN connections, which can impact application performance and leave employees frustrated. Intel® Network Builders member Netrolix\* is leveraging artificial intelligence to analyze network data to improve throughput by making more intelligent routing decisions.

### The Challenge

Enterprise wide area networks (WANs) were originally built to provide retailers, banks, and other geographically dispersed organizations with a way to securely provide branch offices with access to corporate-located computer systems. Now, WANs are evolving to support access to cloud-based services and distributed applications, to respond to increased security threats, and to support an increase in bandwidth consumption driven by real-time applications like voice over IP and video streaming.

Most WANs were built using dedicated carrier services such as T1, multiprotocol label switching (MPLS), and others. These links are stressed by the bandwidth needed in today's branch office, and directing SaaS and Internet traffic to the corporate data center for routing to the Internet adds latency that can make applications unusably slow. Now, branch offices are adding broadband Internet access services to their WAN to improve SaaS responsiveness and maintain employee productivity. Branch office routers are being replaced or augmented by software defined WAN (SD-WAN) gateways, which utilize software defined networking (SDN) to make intelligent decisions about which network to use for any data flow. Even with the intelligence of an SD-WAN gateway, the addition of broadband services replaces service-level guaranteed network connections with best-efforts Internet access.

Add to this unpredictable performance the fact that utilizing multiple network connections complicates branch office data security as hackers looking for any opening to a corporate network now have an expanded attack vector. To defend their branch networks, many organizations are adding new security services to the standard branch-office firewall, such as corporate-quality unified threat management (UTM) applications, to provide more protection in a pervasive threat environment.

To tackle the throughput and security challenge, Netrolix developed an artificial intelligence-based WAN (AI-WAN) solution that can analyze real-time and historical data to better direct data flows through the network.

## The Solution

AI-WAN combines Netrolix Software Defined Gateways (SDG) with the company’s Machine Learning controller technology that provides deep analysis of network routes to identify the least congested and fastest data path through the network.

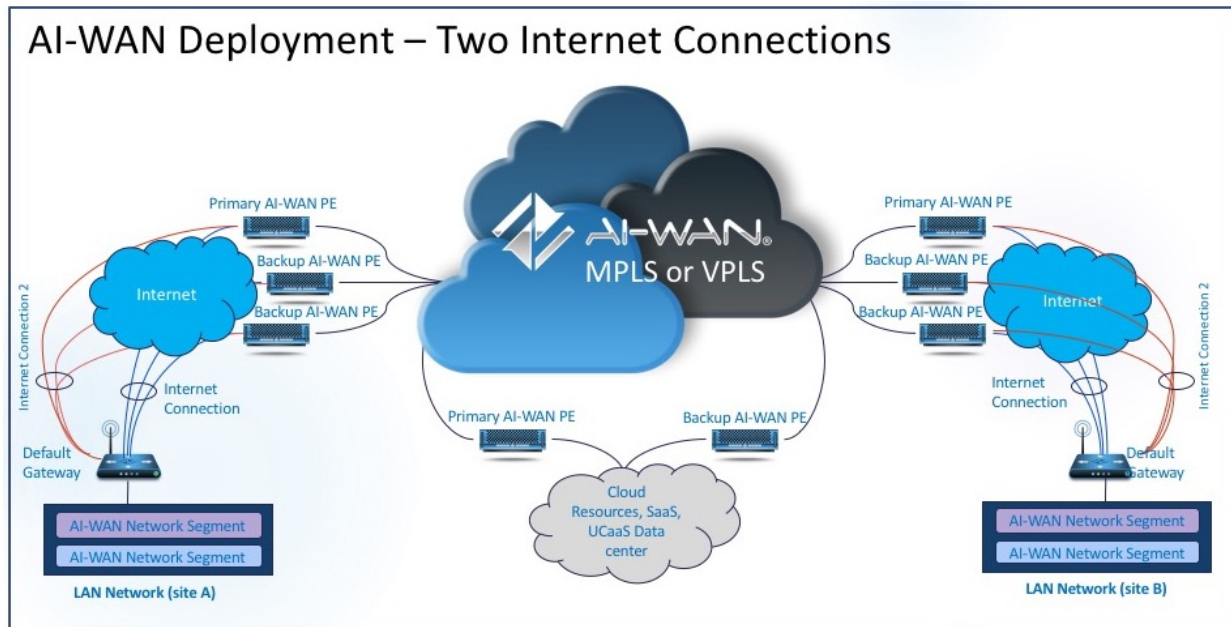


Figure 1. AI-WAN service supporting two Internet connections to two sites.<sup>1</sup>

### Netrolix SDG Hardware

The Netrolix Software Defined Gateway (SDG) is a multifunction network appliance that can be deployed as a router, switch, firewall, or SD-WAN appliance. The SDG features Netrolix software running on an Intel® Xeon® processor-powered branch-office server that can provide full SD-WAN capabilities with intelligent switching of data across IP, multiprotocol label switching (MPLS), virtual private LAN service (VPLS), and virtual private network (VPN) connections, or it can be deployed as a termination point for carrier services.

The SDG monitors other local networking devices to collect network statistics and to report back performance data required for remote management of these devices. Packet-related network statistics from the SDG are uploaded to the Machine Learning platform to be analyzed with data from other SDGs across the network in order to show network and equipment performance metrics. Configuration and management data is available via a web-based portal that enables remote installation of the equipment, along with ongoing configuration and performance and path analysis.

### Machine Learning Controller

The Netrolix Machine Learning controller platform analyzes real-time and historical information on network performance including data center locations, service provider tendencies, current congestion issues, time of day, and historical traffic patterns. It also shows anomalies in the network to detect early security breaches or failures in equipment.

### Netrolix SDG Product Line

- SDG100 uses Intel® Celeron® processor J1900, and is designed for supporting throughput of up to 100 Mbps switching and 300 Mbps routing.
- SDG400 uses the Intel Celeron processor G3920 for supporting throughput of up to 400 Mbps for switching and routing speeds up to 600 Mbps.
- SDG800 uses the Intel® Core™ i5-6500 processor and is designed for supporting throughput of 800 Mbps for switching and 1 Gbps for routing.
- SDG1000 uses the Intel Core I7-6700K processor and is designed for supporting throughput of up to 1 Gbps for switching and up to 3 Gbps for routing.
- SDG2000 uses two Intel Xeon processor E5-2620 V4 CPUs and is designed for supporting throughput of up to 2 Gbps for switching and 5 Gbps for routing.

The AI-WAN service uses real-time information to adjust for dynamic network conditions and route packets around congestion. These decisions get better over time as more data is collected and included in the analysis. This information contributes to selecting the data path with least congestion and fastest throughput, but also with best network uptime as data can be rerouted instantly around down networks.

## AI-WAN Data Security Services

The AI-WAN system offers both on-site and hosted unified threat management (UTM) services and is also able to leverage the Machine Learning technology for the company's Security Shield\* services. Both UTM offerings provide full antivirus, firewalling, intrusion prevention/detection service (IDS/IPS), and active detection and prevention (ADP) functionality. Both UTM capabilities can identify and respond to attacks including, when appropriate, a complete network lockdown.

Netrolix Security Shield enhances these capabilities through the creation of unique security profiles for each device, location, and network in an enterprise. The Machine Learning technology analyzes data from these devices to spot traffic anomalies that are consistent with malware or network attacks. When the system sees irregular traffic features on any of the connected LAN devices, it can alert the network manager or engage the UTM service to mitigate the impact of the attack.

## SDGs Utilize Intel Technology

The extensive family of Netrolix SDG devices are built using a number of Intel® architecture processors based on the performance required for the device. These processors range from Intel Celeron processor J1900 for small branch offices to dual Intel Xeon processors E5-2600 CPUs for enterprise locations. The ability to leverage multiple product lines enables Netrolix to support a wide range of customer locations with the same code base, while supporting additional throughput and service levels.

## Conclusion

Netrolix's patented Machine Learning AI-WAN finds pathways for the user's branch office network by analyzing real time and historical data, while tracking latency performance and monitoring for abnormalities. Netrolix is connected to every ISP across the globe and leverages servers built using Intel CPUs as the backbone of their Machine Learning technology, helping them process enormous amounts of information quickly through AI-WAN.

## About Netrolix

Netrolix is a network as a service (NaaS) provider focused on WAN services. The company leverages its AI-WAN solution, which includes edge hardware and Machine Learning analytics, to provide an array of connectivity and security products, including AI-WAN, Netrolix Cloud Connect,\* Security Shield, Software Defined Gateways, Global VPN, and advanced monitoring through their portal. Learn more at <http://netrolix.com>.

## About Intel® Network Builders

Intel® Network Builders is an ecosystem of independent software vendors (ISVs), operating system vendors (OSVs), original equipment manufacturers (OEMs), telecom equipment manufacturers (TEMs), system integrators (SIs), enterprises, and service providers coming together to accelerate the adoption of network functions virtualization (NFV)-based and software defined networking (SDN)-based solutions in telecom networks and in public, private, and hybrid clouds. The Intel Network Builders program connects service providers and enterprises with the infrastructure, software, and technology vendors that are driving new solutions to the market. Learn more at <http://networkbuilders.intel.com>.



\* Figure provided courtesy of Netrolix.

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