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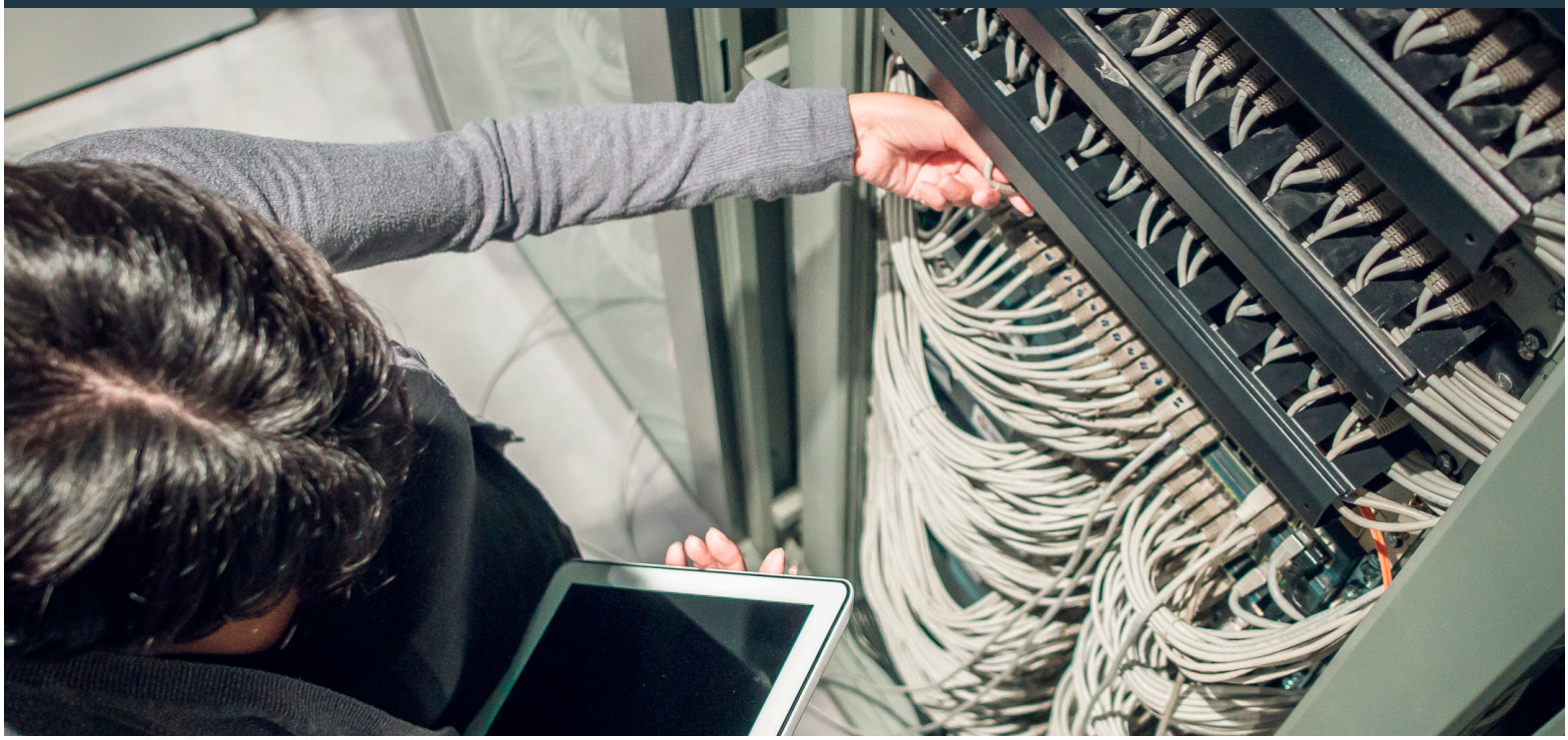
Innovative Solutions. Trusted Performance. Intelligently Engineered.



Proving the value of SD-WAN:

Customer Proof-of-Concept Data Illustrates the Real-World Benefits of SD-WAN Technology

Technology Report

Driving network performance improvements

The word optimization is defined as “an act, process, or methodology of making something as fully perfect, functional, or effective as possible.”

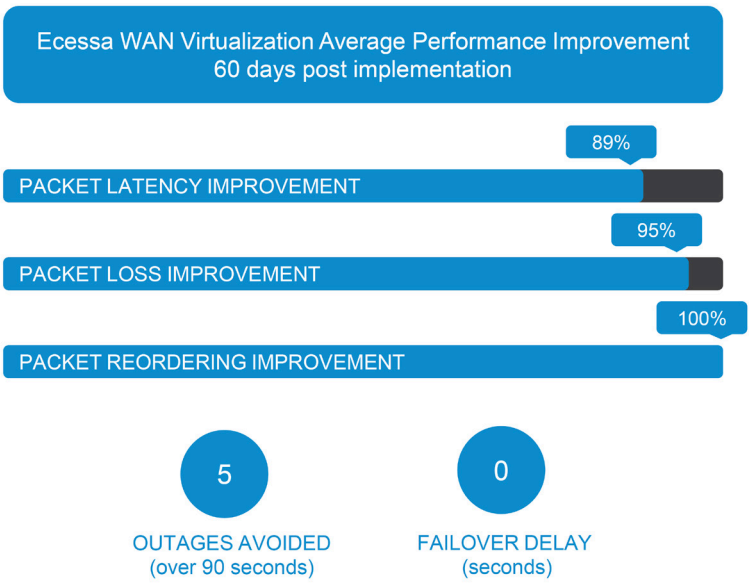
When it comes to networks, much of what we do can’t be seen, but it can be measured. And despite its flashy name, the data shows that WAN optimization is less than a perfect solution. Today, “as fully functional or effective as possible” isn’t enough of a promise for your organization’s network uptime and usability.

What can improve your network’s performance in a more sustainable and cost saving way? WAN optimization’s friend—or enemy, depending on your own point-of-view—SD-WAN.

Software Defined Wide Area Networking, or SD-WAN, offers significant improvements over WAN optimization alone.

At Ecessa, we help organizations complete live Proof of Concept (PoC) deployments so they can see the return on investment of a SD-WAN solution before they commit to a full investment. We’ve completed PoCs for industry leading organizations in retail, hospitality, industrial, finance, healthcare and more.

Based on real customer data over a 60-day period, SD-WAN has driven the following network performance improvements in the areas of packet latency, packet loss, packet reordering, number of outages that occurred which were avoided, and the delay time to failover to another WAN link.



60-day measurement of network performance improvements driven by Ecessa SD-WAN

SD-WAN allows for multiple WAN connections to replace the traditional individual private WAN connection, aggregating bandwidth and duplicating traffic, allowing the links to work continuously. It enables software defined control of WANs, and is a must-have feature that compliments WAN optimization.

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Graph 1 – latency

SD-WAN gives millisecond-level management to multiple WAN connections that guarantee businesses do not have outages, experience degraded performance or pay too much for connectivity.

When optimization isn't enough

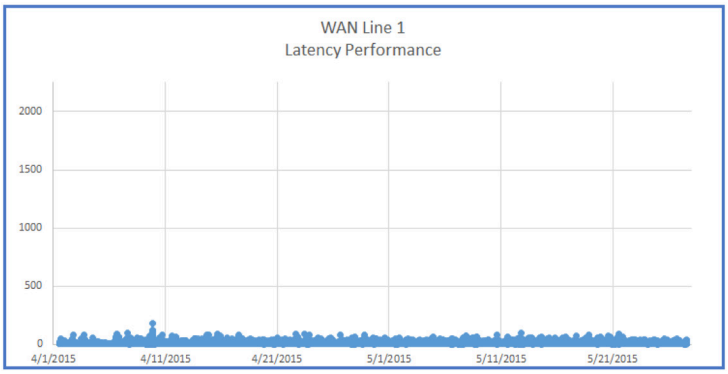
A leading premium grocer provides a great example of a situation where WAN optimization is not enough. The regional retail chain needed more bandwidth, and more reliable bandwidth; SD-WAN optimizes their solution. Before we started the SD-WAN effort, they experienced frequent outages, dropped VoIP calls, missed credit card transactions and had to regularly deploy late night changes and emergency patches. Today they've been up and running without incident for several months, a significant improvement over their previous daily issues.

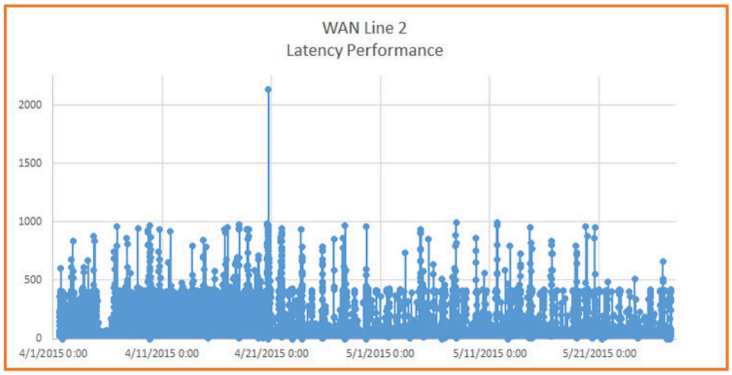
The graphs on the following pages illustrate how the Ecessa solution has vastly improved network performance and changed their daily operations.

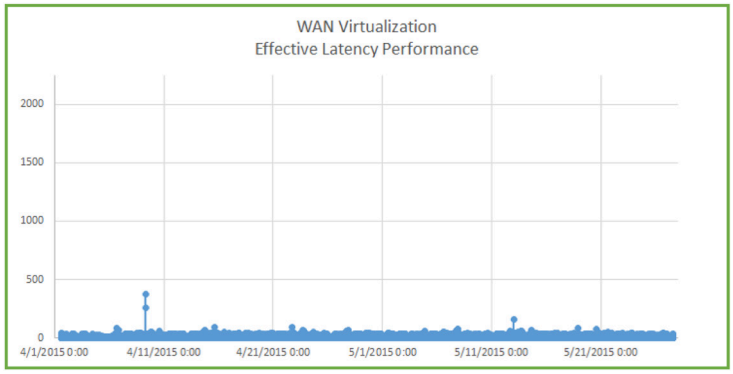
Network latency is an expression of how much time it takes for a packet of data to get from one designated point to another. In our PoCs it is the measurement of Round Trip Time (RTT) for the virtual tunnels.

We test latency by sending test pings and measuring the time needed to traverse the WAN lines.

Note the performance improvement in the bottom chart when SD-WAN is applied to the two WAN links.







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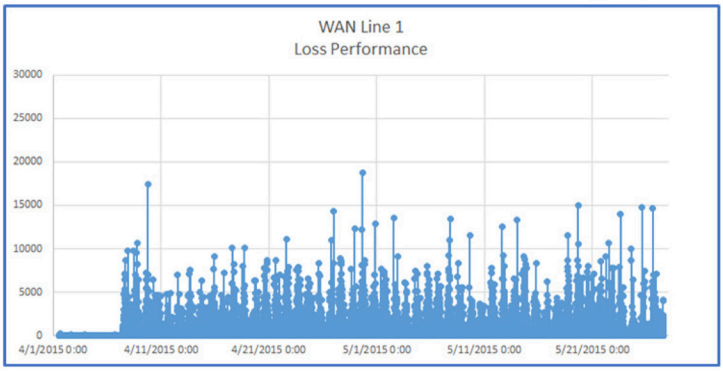
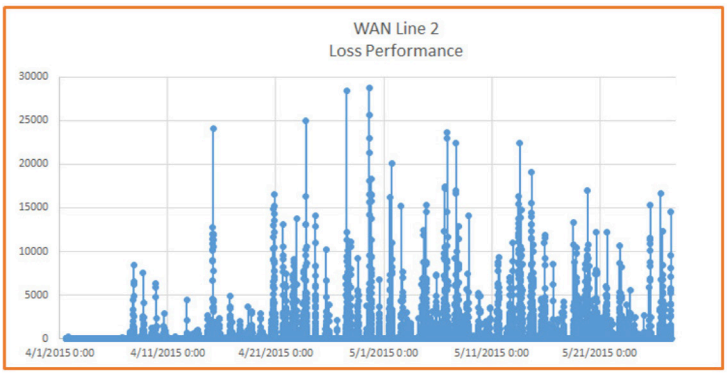
Graph 2 - packet loss

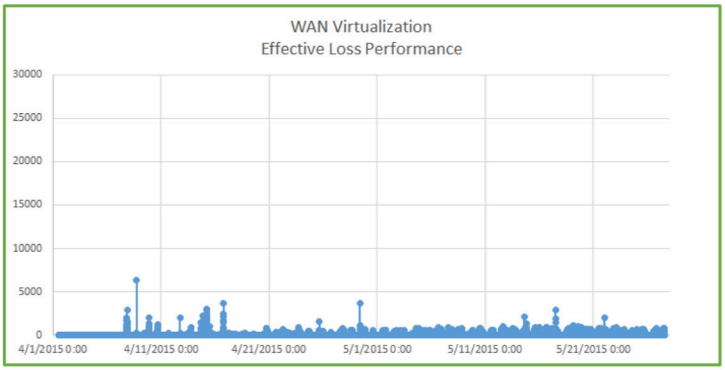
Packet loss is the failure of one or more transmitted packets to arrive at their destination.

We use the same test pings mentioned on the previous page to measure how many test pings return versus how many are sent.

In the bottom chart, note the performance improvement when SD-WAN is applied to the two WAN links.







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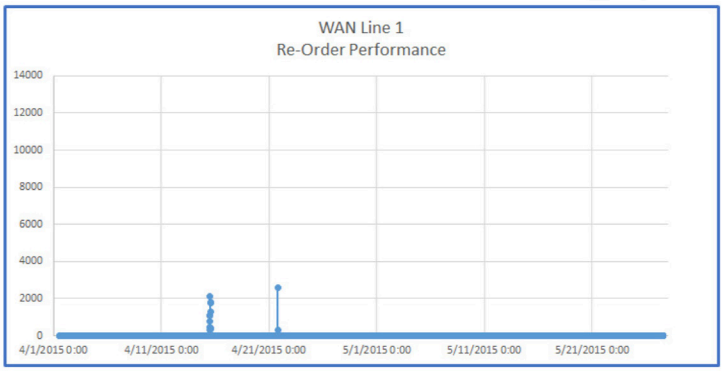
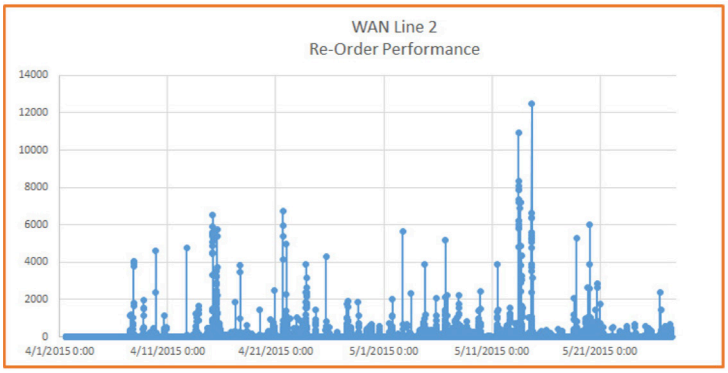
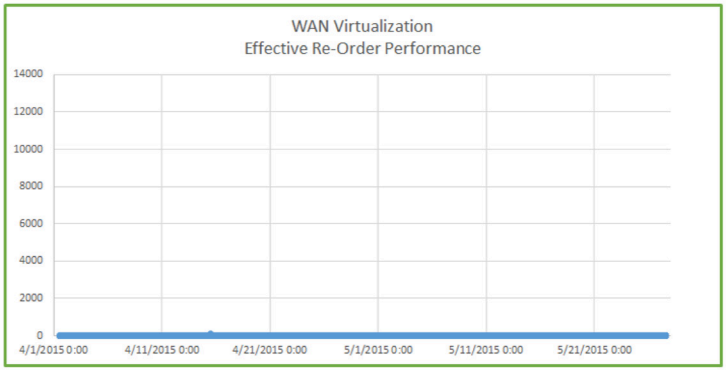
Graph 3 - packet re-order

Packet re-ordering percentage is the measurement of how many packets arrive out of proper sequential order. We measure this by sending test packets and monitoring how many return out of proper order; if packets 5, 6, and 7 return before packets 2, 3, and 4 we count that as 50% re-ordering. Note the performance improvement in the bottom graph when SD-WAN is applied to the two WAN links.







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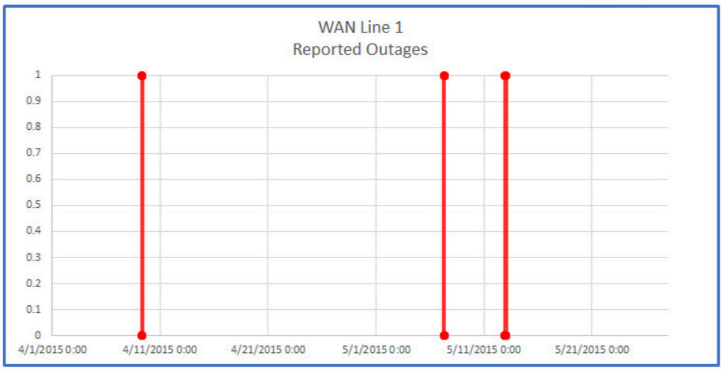
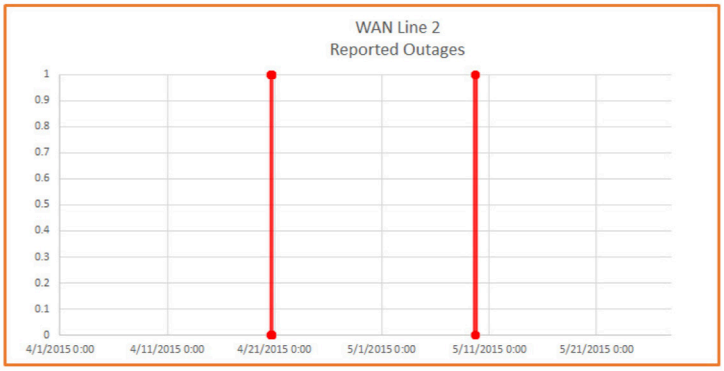
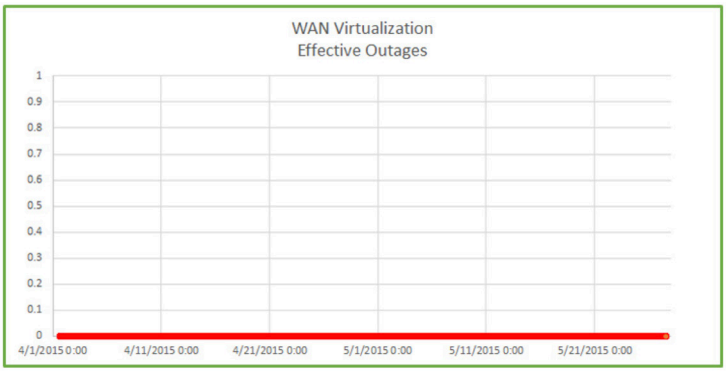
Graph 4 - WAN link outages

SD-WAN eliminated WAN link outages. We use test pings to monitor the health of WAN links, along with the previously mentioned micro parametric performance data (latency, loss, re-ordering) and macro stability data like the complete loss of test pings. If there are 3 test pings lost in a row, we indicate an outage issue and monitor for recovery within 90 seconds; if we do not see a recovery within 90 seconds, we flag this as an outage. The five outage events reported to the left lasted 90 seconds or longer. In fact, a total of 23 outages (18 of which lasted less than 90 seconds) occurred and were avoided.







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Graph 5 - overall performance improvement

When you look at the measurements side by side, the improvements in performance are even more clearly visible. SD-WAN improves not only the performance of the broadband connection (WAN 2), it also provides quality of service above that of the MPLS link (WAN 1). The combined performance of SD-WAN dramatically exceeds that of either individual link.

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Implementing a SD-WAN solution

It's important to start by understanding your goals with metrics and scorecards. It's imperative to gather real network performance data to set a baseline and analyze and assess what benefits you can realistically achieve. Setting up SD-WAN to improve your network performance and continuing to gather data will allow your organization to measure against the baseline and understand how – and how much – SD-WAN makes an impact on your network. Once the value has been established, it's time to make plans to expand SD-WAN to more locations, which additional features you want to set up and to do any fine tuning. Network architecture is complex and there is never just one solution to fit all problems.

Make sure you think about some of these must have functions in your network:

Firewall

Security is top of mind for all IT professionals today and this is a must have feature for all network entry points. Each solution has a different level of sophistication, but the basics are identifying policies for which items can come or go through your WAN connections.

Voice over IP (VoIP) Proxy

Digital telephones are everywhere today; that old copper line that you used growing up is being replaced with fiber, wireless, or standard Gigabit Ethernet. Regardless of how it finds its way to your door, once on premise you need to decode those small packets as voice. Prioritization and redundancy for the voice traffic quickly becomes less of a "nice to have" and more of a critical aspect to the network.

Quality of Service (QoS)

There is a lot of data streaming through your network every millisecond and not all WAN optimization gear can help prioritize where that data goes once it leaves your network closet. Make sure that you are sending that Point of Sale data through the best WAN connection and that guest Wi-Fi traffic can take the less expensive broadband connection, if it is up and running.

WAN Optimization

Inspecting, compressing, and caching data before it leaves is always a good idea; much like the old adage of clean before you move. Clean house, make sure employees are not using precious bandwidth for low priority distractions. WAN optimization is a great complementary technology to SD-WAN – a high performing network needs both.

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Time to impact & the PoC process

We collect data as part of our PoC process, because we know that looking at SD-WAN as a solution makes a huge impact. We're able deliver organizations real data from their own networks to support decisions and understand the ROI before they buy. The Ecessa Deployment Plan makes benefiting from SD-WAN easy by taking you through the process step-by-step – we think of it as a guided tour. In a matter of a month – not months – we can set the baseline, go live and launch. Here's a look at the phases of the process.

PHASE 1: BASELINE

- Install Ecessa equipment in Translucent/Bridge mode
- Gather network performance data for a few days
- Analyze data and define metrics for PoC success

PHASE 2: GO LIVE

- Enable/turn on Ecessa SD-WAN features
- Gather network performance data for a few days
- Analyze data and capture improvement metrics

PHASE 3: LAUNCH

- Review performance scorecard with customer
- Create plans for additional sites, features or updates
- Schedule the next Ecessa SD-WAN site deployments

For more information, contact Ecessa at (800) 669-6242 or visit www.ecessa.com.

REPORT AUTHOR Mike Siegler has a Bachelor of Arts in Mathematics, a Bachelor of Science in Electrical Engineering, and a Master of Science in the Management of Technology (MoT). He has worked in Engineering and Technology Development for the last 15 years at firms such as Digi International, Seagate Technology, Medtronic, General Electric and United Technologies. Currently, Mike is the Vice President of Development and Technical Support at Ecessa Corporation, improving wide area network performance for businesses of all sizes.

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