*First Look*

# Modernizing Edge Connectivity and Control with the Dell EMC SD-WAN Solution Powered by VMware

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## Challenges: [1]

**31%** The percentage of organizations that view **cost reduction as a top business initiative** driving their technology spending over the next 12 months.

**29%** The percentage of organizations that view **maximizing application performance levels** as one of the top network infrastructure capabilities that will have the greatest impact on growing their business over the next 12 months.

Organizations are rapidly modernizing legacy WAN environments as applications continue to be distributed across on-premises data centers, multiple public clouds, and edge locations. Organizations require highly flexible solutions that eliminate the burdens of manual configurations, upgrades, and refreshes. Organizations also want to eliminate slow-to-provision, costly, and sub-optimal unitization MPLS links and augment or replace them with cheaper, more commoditized internet links. According to ESG research, organizations' most common objectives for digital transformation are to become more operationally efficient and deliver better customer experiences.[2] SD-WAN technologies enable this by modernizing WAN infrastructures and overcoming the challenges highlighted by reducing costs and maximizing application performance levels. SD-WAN technology also optimizes traffic flow by allowing secure direct access to internet applications from edge locations without hairpinning the traffic through a data center. These are just a few of the advantages SD-WAN offers, which helps explainwhy this technology is being widely adopted (see Figure 1).

**Figure 1. Legacy and Modern Network Architectures**
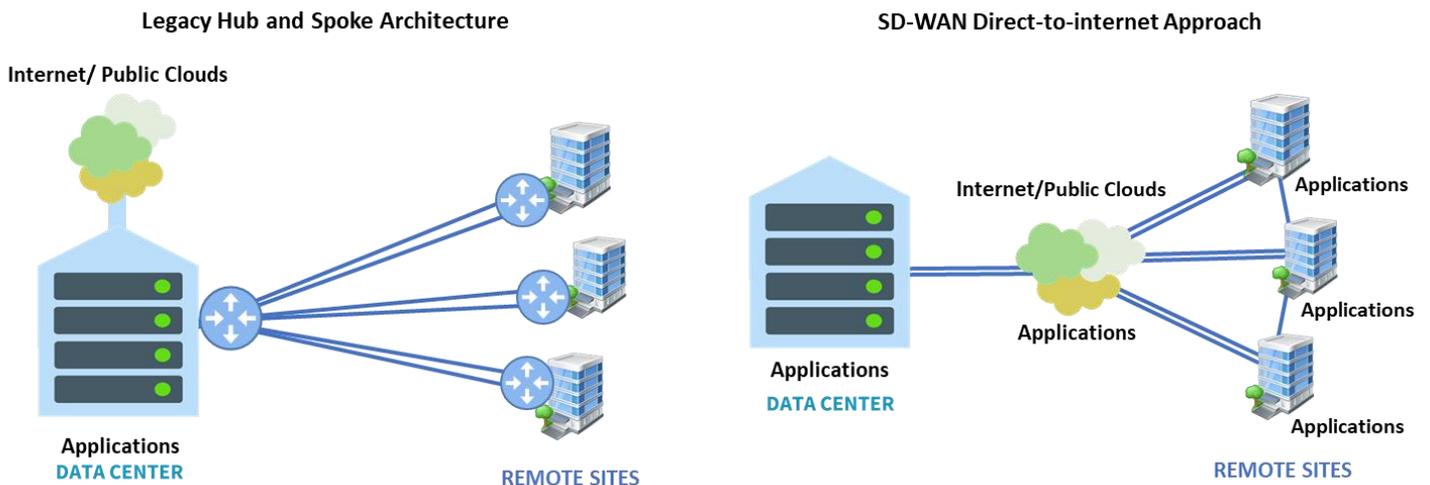


*Source: Enterprise Strategy Group*

## Dell EMC SD-WAN Solution Powered by VMware

Dell EMC's SD-WAN solution is a great example of Dell Technologies' "better together" philosophy. The solution combines VMware SD-WAN by VeloCloud software and gateways (acquired by VMware) and Dell EMC's reliable, open networking

platforms and global support group. This solution will enable organizations to cost-effectively optimize edge connectivity to cloud service providers (CSPs), data centers, and other edge locations. Organizations deploying the solution will benefit from optimized application performance, network agility, simplified implementations and management, and the proven global support capabilities from Dell Technologies.

In order to effectively optimize application traffic, organizations need a solution that understands what applications are traversing the network. The Dell EMC SD-WAN Orchestrator automatically recognizes over 3,000 cloud-based applications and their components, which dramatically reduces the time spent manually identifying key applications. Instead, organizations can focus their time on creating comprehensive performance, security, and business policies. Those policies could include how the application traffic is segmented and prioritized. Existing policies can be easily changed, and new ones created in the portal can be automatically propagated across all deployed edge platforms and gateways. This can be a real advantage when bringing on new sites or adding new applications. To manage and optimize application performance across all branches, the Dell EMC Orchestrator continuously collects data from all deployed edge devices to monitor application, traffic, link, and tunnel conditions. If application performance is not meeting SLA metrics as defined in the policies, the Orchestrator will pinpoint where problems lie and enable organizations to take corrective actions. Circuit challenges (packet loss, latency, congestion) are handled automatically and in real time with preference given to priority applications that keep the business up and running while deprioritizing non-critical applications when circuits are behaving badly. In addition, for cloud-based applications, the Dell EMC solution will ensure that the optimal gateway is chosen to ensure application performance according to defined metrics. It is like building an express lane for your critical business applications on the internet superhighway.

With the IT landscape constantly growing in complexity, organizations need to leverage solutions that focus on productivity. The Dell EMC SD-WAN solution is especially beneficial to organizations with applications distributed across the public cloud, on-premises data centers, and edge locations. These businesses can leverage the Dell EMC Orchestrator software to centrally provision and monitor the WAN environment, which can drive greater operational efficiencies. This centralized visibility will help to minimize service visits; however, if service is required, Dell Technologies proven global support capabilities are available. The Dell EMC SD-WAN solution further simplifies deployments by taking advantage of Zero-touch Provisioning, which is instrumental when organizations rapidly add new sites or upgrade legacy sites. Once the Dell EMC open networking platform is installed and connected to the internet, the Orchestrator automatically downloads the appropriate configuration and policies based on the business's customer application priority. This can dramatically shorten deployment times, reduce costs, and accelerate the time to value for an organization.

For business-critical real-time traffic like voice and video, Dell EMC's SD-WAN solution ensures optimized application performance by utilizing Dynamic Multi-Path Optimization (DMPO) Technology. This technology continuously monitors link KPIs such as packet loss, latency, and jitter across all links. These metrics are closely monitored in real time to determine which link can deliver application traffic at the desired performance levels. Should any link go down or fall below the thresholds set for application service level agreements (SLAs), the solution dynamically steers traffic at a per-packet level with sub-second latency to an alternate link. Furthermore, to always ensure a positive experience, the technology duplicates application packets in real time to send over multiple designated links in case transmission issues occur. Maintaining a good quality experience for real-time traffic is essential for any SD-WAN solution and VMware SD-WAN by VeloCloud helped pioneer this technology.

Providing the underlying support for the VMware SD-WAN by VeloCloud software is Dell EMC open networking platforms. Leveraging the same reliable and proven hardware that many telecommunication providers rely on for their universal customer premise equipment (UCPE), enterprise customers should have confidence in the quality and engineering of these platforms. Taking advantage of Dell Technologies economies of scale, these solutions are cost effective and come with world-class support. All Dell EMC SD-WAN solutions have global support from Dell Technologies. These support capabilities will be critical for organizations that have operations distributed around the world and plan to deploy SD-WAN solutions to all their edge locations.

With SD-WAN rapidly becoming the choice for modernizing edge connectivity, organizations are faced with a wide variety of options to choose from. The combination of VMware SD-WAN software and Dell EMC hardware and global support makes the Dell EMC SD-WAN solution a compelling offering that enables organizations to minimize network complexity, simplify connections to CSPs, and maximize application performance while incurring lower capital and operational costs.

## ESG Demo Highlights

ESG performed joint testing of Dell EMC's SD-WAN solution to observe how an administrator can control and manage application performance and resiliency at the branch level. We deployed the SD-WAN solution at a testing site in Portland, Oregon.

- Using the Dell EMC Orchestrator, ESG examined the network transport links available at an edge location (in this case, a branch office). We saw two links from two internet service providers, Comcast and Frontier Communications. We found that we could monitor both link throughput and actual available bandwidth of these links. The Orchestrator measures and reports the real-time available bandwidth
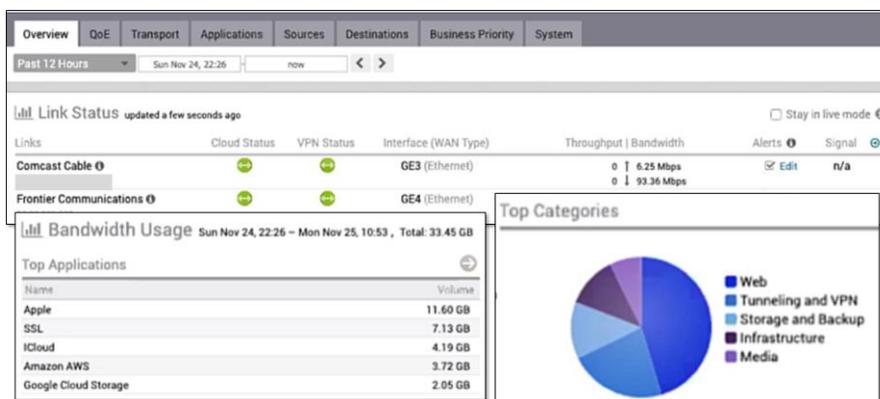


regardless of the bandwidth quoted by the ISP. IT administrators can use these measurements to determine how to route data across specific links in real time, leveraging Dell EMC's SD-WAN solution to optimize cost versus bandwidth consumption depending on the needs of the organization.

- An administrator can monitor network and link utilization across all applications. With the Dell EMC Orchestrator, an IT administrator can use this data to decide how to prioritize traffic from multiple applications, while managing how the priority will affect overall network throughput, latency, and subsequently, overall application performance. Traffic priority can be managed by modifying relevant business policies, removing the need to travel to the branch location to configure traffic policy on the Dell EMC SD-WAN Edge device manually. Policies directing how traffic flows to other

locations can be created and modified centrally, regardless of the number of edge locations within the organization's network.

- The *Transport* tab of the Dell EMC Orchestrator shows bandwidth consumption (downstream and upstream) over time. We observed how an administrator could examine bandwidth consumption, gauging how much of the available bandwidth is actually used by the organization. The Dell EMC Orchestrator can provide additional control over monthly network bandwidth expenses by examining application bandwidth usage over specific ISPs.



- Next, we examined bandwidth consumption on the *Applications* tab. We looked at bandwidth consumption per application, ranked by bytes sent and received across all available networks over a seven-day period. This view in the Dell EMC Orchestrator can track individual application activity, allowing an IT administrator to improve visibility and control of network bandwidth consumption at the branch level.



  Because application activity can be viewed across all branches via a central console, an IT administrator can easily and quickly detect potential performance issues across the organization's network, decreasing the operational expense of monitoring multiple branch sites individually.

- We created and modified business policies with the Dell EMC Orchestrator to prioritize the transport of packets of a given application. An administrator can set up and change traffic priority in real time with minimal effort or network experience so that application performance is in line with changing business needs.



## First Impressions

As organizations continue to grapple with the complexity of highly distributed application environments and shrinking IT budgets, they seek solutions that will simplify IT environments and minimize ongoing capital and operational costs. This is especially true in large enterprises with hundreds or thousands of edge locations to manage and control. At the same time, they must ensure that performance across critical applications is optimized to help end-users meet ongoing business needs, especially when those end-users are dealing with applications deployed on-premises and in the cloud.

Based on ESG's initial review, Dell EMC's SD-WAN solution powered by VMware can optimize performance (using DPMO) for critical business applications originating on-premises, in the cloud, or at the edge without incurring unnecessary infrastructure and operational costs. We also found that the Dell EMC Orchestrator provides granular visibility of application usage at each location to help optimize performance of specific applications and identify potential performance issues quickly. Organizations can easily configure and bring sites online leveraging Zero Touch Provisioning (ZTP), and centrally manage application performance across multiple edge locations via the creation and modification of business policies that dictate traffic priority in the Orchestrator. We also saw how organizations can monitor bandwidth usage at the application and network link levels against current available bandwidth to determine how to better manage monthly network expenses. Finally, the entire solution is backed by Dell Technologies support organization, which provides 24x7 support with four-hour response times, where available globally.