VMware SD-WAN for Microsoft 365

Productivity and experience together

User experience is directly proportional to network efficiency

Communication and collaboration are integral to any business—big or small—in order to be productive and to serve a dispersed workforce and customer base. Microsoft is leading the way with its Microsoft 365 productivity suite, enabling organizations to enjoy the agility, accessibility and economics of the cloud, while at the same time avoiding the complexity of traditional infrastructure needed to deliver the same services.

For a customer experience with distributed software as a service (SaaS) services such as Microsoft 365 (formerly Office 365), direct Internet connectivity offers agility, accessibility, cost effectiveness, and generally better latency compared to traditional "hub-and-spoke" architectures typical for customer private wide area networks (WANs). Using local Internet egress as close to end user locations as possible (ideally right from the enterprise branch office) helps to avoid constraints of private WAN backhauling and legacy/centralized network perimeters—a frequent source of congestion, packet loss, and jitter. This impacts not only real time communications such as Skype for Business or Microsoft Teams media experiences, but also other key performance-sensitive workloads such as Exchange Online and SharePoint Online.

Cloud service providers, Microsoft in this case, typically optimize the localization and routing of their services within their network, also called the first mile. This optimization delivers the best performance by distributing service "front doors" scaled out across locations worldwide. However, the quality of experience (QoE) and perception by the end user primarily depends on the quality of the network connecting users at branches to Microsoft 365 locations. Microsoft runs a large worldwide network which is well optimized for different distributed application scenarios such as Microsoft 365 in the first mile (or the Microsoft Global Network). The overall performance depends on efficiency over the first mile, mid mile and last mile. The mid mile and last mile connect users to Microsoft entry points and therefore are outside of the Microsoft network.

MICROSOFT 365 NETWORK CONNECTIVITY

- **Optimize Microsoft 365 traffic:** Use the endpoint categories to differentiate Office 365 from generic Internet traffic for more efficient routing.

- **Enable local egress:** Egress Microsoft 365 data connections through Internet as close to the use as practical with matching DNS resolution.

- **Enable direct connectivity:** Enable direct egress for Microsoft 365 connections. Avoid network hairpins and minimize network latency to Microsoft's global network.

- **Modernize security for SaaS:** Avoid intrusive network security for Microsoft 365 connections. Assess bypassing proxies, traffic inspection devices, and duplicate security already available in Microsoft 365.
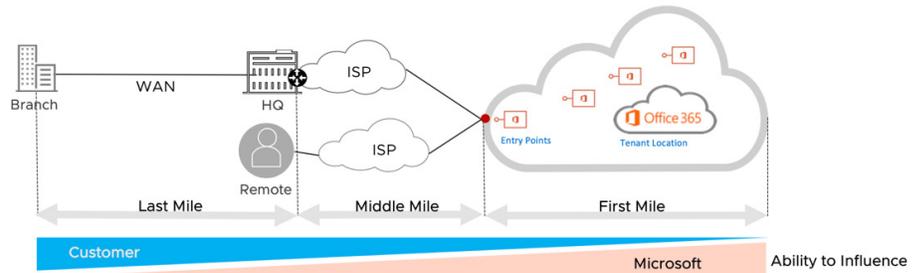

FIGURE 1: Efficiency over last and mid mile plays a key role in making cloud a success

VMware SD-WAN™ by VeloCloud® enables customers to extend the best route and performance to the last mile, using strategically deployed cloud gateways.

Optimizing connectivity for Microsoft 365

VMware SD-WAN optimizes connectivity to Microsoft 365 by leveraging the benefits of the Internet while also remediating its drawbacks. It combines the flexibility and economics of a self-healing overlay to optimize connectivity to your business-critical Microsoft 365 applications. VMware SD-WAN, a certified Microsoft 365 networking partner, empowers organizations with the best delivery of Microsoft 365 services and an enhanced user experience.
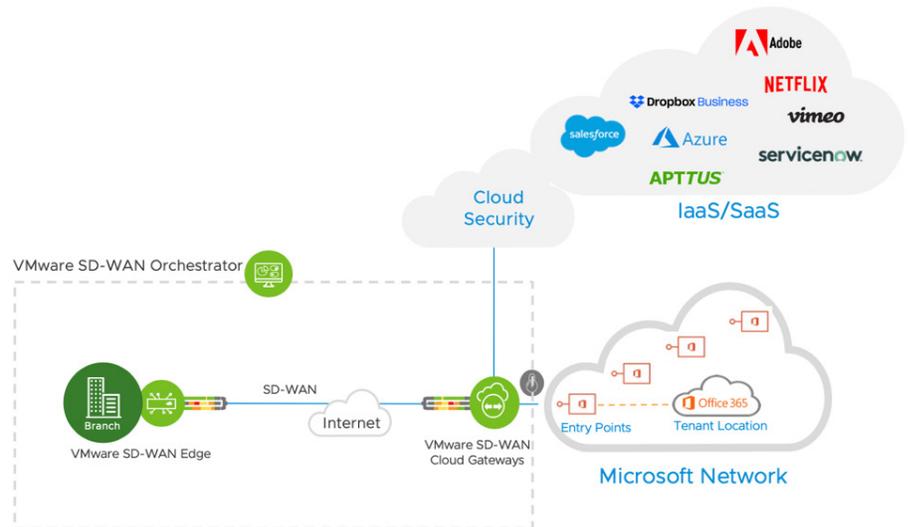

FIGURE 2: VMware SD-WAN: Identifying, optimizing and securing Microsoft 365 traffic

The key components of the VMware SD-WAN solution include:

- **VMware SD-WAN™ Edge by VeloCloud®**, virtual or physical, expands WAN bandwidth by logically combining WAN links to offer capacity that individual applications need. A VMware SD-WAN Edge automatically joins the software-defined wide area network (SD-WAN) fabric once it is powered on and connected to the Internet. These Edge devices differentiate traffic (inbound and outbound) and apply customizable business policy to the Microsoft 365 traffic in accordance with *Office 365 Network Connectivity Principles*, making it much easier compared to the complex configurations required with traditional and fixed WAN technologies.

KEY COMPONENTS OF VMWARE SD-WAN AND MICROSOFT 365 SOLUTION

The combination of these key components reflects Microsoft 365 connectivity principles to get the Microsoft network as fast as practically possible, without any change required from the customer side.

• **VMware SD-WAN Edges** to expand application capacity

• **VMware SD-WAN Orchestrator** for real time insight

• **VMware SD-WAN Gateways** for highly available cloud services and a resilient overlay network

• **VMware SD-WAN™ Orchestrator by VeloCloud®**, the brain of the architecture, automatically pulls the Microsoft 365 URLs and IP address ranges published by Microsoft across all Microsoft 365 service endpoints, and seamlessly updates the application recognition engine on thousands of VMware SD-WAN Edges with a single click. The VMware SD-WAN Orchestrator also offers a single pane of glass for real time insights into network and application performance.
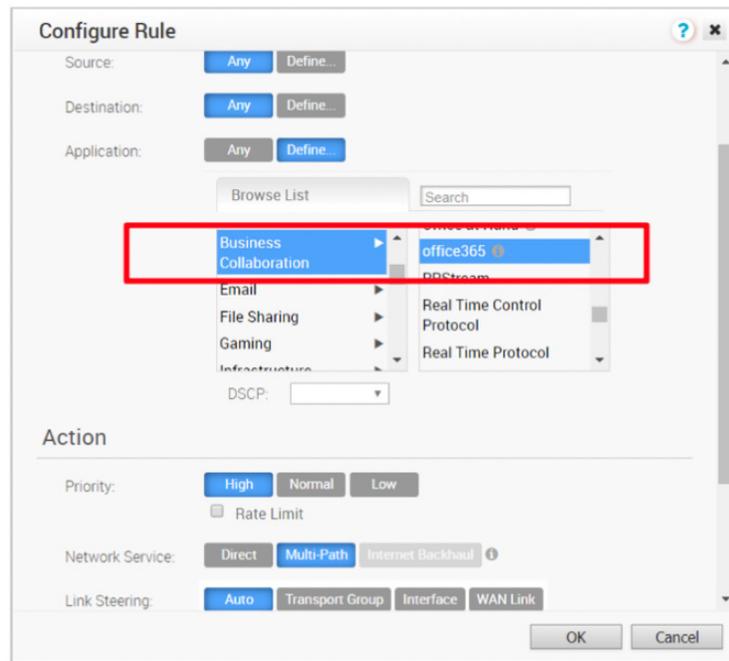

FIGURE 3: Default and automated policy settings for Microsoft 365 in VMware SD-WAN Orchestrator

VMware SD-WAN™ Gateways by VeloCloud®, unique to the VMware SD-WAN cloud infrastructure, are strategically deployed and highly available cloud devices. To deliver a resilient overlay network that takes into account real time WAN link performance, VMware developed VMware SD-WAN Dynamic Multipath Optimization™ (DMPO). DMPO is used between all of the VMware SD-WAN components that process and forward data traffic: the VMware SD-WAN Edges and the VMware SD-WAN Gateways. DMPO performs continuous, unidirectional measurements of performance metrics such as loss, latency, and jitter of every packet on every tunnel between any two DMPO endpoints, the VMware SD-WAN Edge or the VMware SD-WAN Gateway. VMware SD-WAN per-packet steering allows independent decisions in both uplink and downlink directions without introducing any asymmetric routing. DMPO uses both passive and active monitoring approaches. It identifies traffic using Layer 2 to 7 attributes; for example, virtual local area network (VLAN), IP address, protocol, and applications.
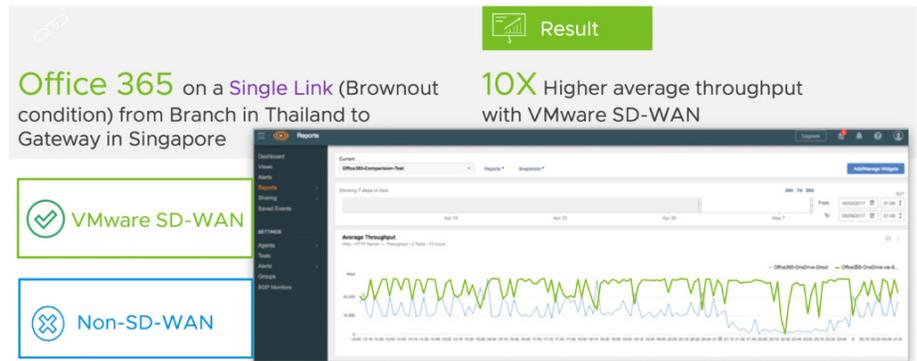
FIGURE 4: DMPO: Optimizing performance over even a single link

VMware SD-WAN performs application-aware, per-packet steering based on business policy configurations and real time link conditions. In a scenario where it may not be possible to steer the traffic flow onto the better link (i.e., single link deployment) or multiple links have issues at the same time, DMPO enables error correction for the duration of the disruption, delivering optimal performance even over a single link.

VMware SD-WAN gives you the flexibility to inspect user traffic through various means that suit your security requirements and desired application performance outcomes. With VMware SD-WAN Edge business policy framework, the network engineer can easily—and securely—direct traffic types bound for the Internet along the optimum path for best security, best performance, or a mix of both.

For example, Microsoft 365 traffic can benefit a great deal from VMware SD-WAN built-in optimization over multiple Internet links and being sent via VMware SD-WAN Gateways. Other business Internet applications can be redirected from the VMware SD-WAN Edge over an IPSec tunnel to a nearby Cloud Security Service. Traffic from a guest Wi-Fi user at this branch can break-out directly to the Internet. Additionally, application traffic can be backhauled to a VMware SD-WAN Edge in the data center, where it can be forwarded through a corporate firewall for compliance reasons before going to the Internet.

VMware SD-WAN also provides edge-to-edge segmentation that can be centrally provisioned and pushed to some or all SD-WAN branch sites, making it scalable, easy to manage, and cost-effective. Each segment is treated as a separate configuration entity having its own set of cloud VPN, business policy, firewall, and quality of service (QoS) configuration elements.

VMware SD-WAN is a cloud delivered solution for network operators and application owners who want to ensure high application performance and availability for their end users while ensuring operational efficiencies. It can detect slight degradation that would affect application performance, improve performance over a single link using congestion mitigation technology, and adapt without any noticeable impact on the user experience.

About VeloCloud, now part of VMware

VeloCloud, now part of VMware has been named a Leader in the 2019 Gartner Magic Quadrant for WAN Edge Infrastructure and placed highest for the ability to execute and furthest for Completeness of Vision. VeloCloud, now part of VMware simplifies branch WAN networking by automating deployment and improving performance over private, broadband Internet and LTE links for today's increasingly distributed enterprises. VMware SD-WAN by VeloCloud includes: a choice of public, private or hybrid cloud network for enterprise-grade connection to cloud and enterprise applications; branch office enterprise appliances and optional data center appliances; software-defined control and automation; and virtual services delivery.

For more information about VMware SD-WAN, visit *velocloud.com*.