

Guide - VMware SD-WAN by VeloCloud Features & Benefits

Customer Buying Triggers

- Branch/remote offices that need to be brought up quickly, or that require more bandwidth or better link quality, or have applications such as voice or video (that are sensitive to congestion).
- Using SaaS applications (such as Salesforce.com, Google Mail, AWS, or Office 365), and need seamless connectivity without traffic backhaul to the data center.
- Need to provide VPN/encrypted services, offer per-packet load balancing for encrypted traffic or need to create on-the-fly point-to-point communications between endpoints securely.
- Want full management and visibility of their WAN and each edge end-point from a central console and be able to measure and monitor the health of their links, adapt and react to any issues, remediate link quality, and steer the traffic to the best links.
- Want to refresh of their CPE/router.
- Reduce the amount of equipment in the branch and reduce the cost of the branch office equipment.
- Moving enterprise applications the cloud and need fast and reliable access with optimal path selection from the branch office without traffic backhaul to the data center.
- Need to provide security at the branch office and integrate with security solutions in the cloud.

Product Design

SDN Approach

VMware SD-WAN by VeloCloud is built on an SDN model. It provides segregation of management, control and data planes.

- Prevents a failure in one service plan from affecting the rest
- Scales design using cloud hosted gateways
- Makes backup and failover of individual planes easier
- Cloud-based management allows for ubiquitous access across all device types
- VMware SD-WAN Edges connect to multiple VMware SD-WAN Gateways (VCG)
- All traffic traversing the overlay tunnel (VCMP) gets the benefit of Dynamic Multi-Path Optimization (DMPO)

Abstraction and Automation

VMware SD-WAN abstracts outcomes automatically. It eliminates manual programming. Configurations automatically synchronized across the network based on a device's position to achieve desired outcomes. VMware SD-WAN is self-learning and adaptive. Configurations automatically adapt to discovered environments.

Deployment Model

- The VMware SD-WAN Edge (VCE) securely connects to the VMware SD-WAN Orchestrator (VCO) and downloads its configuration.
- Business policy downloads from the VCO to the business policy framework within the VCE.
- Every 15 seconds, the VCE sends a secure heartbeat via HTTPS to the VCO to check for configuration changes.
- There are two processes running in the VMware SD-WAN Gateway - the Hub and the Controller. The controller is a route reflector. The Hub terminates connections and provides optimizations. Either or both of these processes can be run on the platform.
- VMware SD-WAN Gateways are stateless and contain no configuration or policy information. Each flow from the edge contains the policy the VMware SD-WAN Gateway (VCG) will follow.
- Hubless design - Customers can deploy edges without re-architecting data center networks.
- Customers can stand up an IPSEC tunnel from their data center routers to the VCG providing for connection to the SD-WAN for locations without hubs.
- Each branch connects to each other branch providing for direct traffic connections for latency sensitive traffic such as VOIP, and to the VCG realizing the benefits of SD-WAN, eliminating the need to create VPN configurations for all new SD-WAN branches.

Solution Components

VMware SD-WAN Edge

VMware SD-WAN Edges retain the policy configuration that they get from the VMware SD-WAN Orchestrator. They determine the best link for traffic to take and act as a DHCP Server and an OSPF-BGP router. They are high-availability (HA) capable and can replace traditional routers. VMware SD-WAN Edges are enterprise-class appliances that can be provisioned with zero touch deployment. They provide secure optimized connectivity to applications in any location including private data centers, public clouds and hybrid deployments. Edges perform deep application recognition, application and packet steering, performance metrics and end to end quality of service. They can host VNF services simplifying branch office deployments of network services. Edges deliver highly available deployment with a redundancy protocol and integrate with the existing network with support for OSPF routing protocol and benefit from dynamic learning and automation. The VMware SD-WAN Edge is available as hardware-based appliances, as a virtual appliance and on the cloud marketplace on AWS and Azure. It can also be loaded in a VM on a server or as a VNF.

Gateways use DPDK from Intel for performance when running on COTS. They use SR-IOV for direct access to the CPU core functions.

Edges can terminate fiber or Ethernet but they are not for legacy circuit termination.

VMware SD-WAN Orchestrator by VeloCloud

The VMware SD-WAN Orchestrator is a cloud hosted or on-prem secure and scalable web-based central management tool provides simplified configuration, provisioning, monitoring, fault management, logging, and reporting. The VCO enables the simple implementation of business

based policies for application delivery simplifying application traffic management. Orchestrators are multi-tenant capable and support role-based access.

VMware SD-WAN Hub by VeloCloud

A VMware SD-WAN Hub is a larger capacity Edge device that is deployed in the data center to terminate traffic coming from VMware SD-WAN Edge devices in the branch office or from Gateways.

VMware SD-WAN Gateways by VeloCloud

VMware SD-WAN operates a distributed network of gateways deployed around the world. Gateways can also be deployed on-premises at service provider sites. They provide scalability, redundancy and on-demand flexibility for traffic steering. Gateways optimize data paths from Edge devices to applications in the cloud, branches and data centers along with the ability to deliver network services to and from the cloud through service insertion. Gateways are multi-tenant capable and make cross network deployments possible to create a multi-region SD-WAN for global corporations.

VMware SD-WAN Controller and VeloCloud

The controller is a process that runs on the VMware SD-WAN Gateway. The VMware SD-WAN Gateway also runs the Hub process. Either can be on or off. The VMware SD-WAN Controller is a route reflector. The controller gets its policy info from the VMware SD-WAN Edge and carries out the functions that the VMware SD-WAN Edge specifies. The controller is stateless.

Top VMware SD-WAN Features

Cloud Hosted as a Service Model

The VMware SD-WAN Orchestrator, Gateways, and Controller are hosted in the cloud as provided as a service. VMware SD-WAN Edges are provided on a subscription. Customers only need to deploy the Edge devices in their branch office locations. The VMware SD-WAN Edges are auto provisioned, so the entire service can be deployed rapidly with minimal IT resources required and no upfront costs.

Dynamic Multi-Path Optimization (DMPO)

DMPO provides automatic link monitoring and per packet traffic steering, auto-detection of provider and auto-configuration of link characteristics, routing and QOS settings. DMPO delivers sub-second blackout and brownout protection to improve application availability. It remediates link degradation through forward error correction, activating jitter buffering and synthetic packet production and provides sub-second steering without session drops. DMPO aggregates bandwidth for single flows and uses multiple transports and picks the best one. It protects against concurrent degradation and enables single link performance.

Any Connection Type

The solution provides the ability to use any connection type including legacy, LTE, WiFi and Satellite along with landlines so that any site can be quickly connected to the network.

Zero Touch Provisioning

Appliances automatically authenticate, connect, and receive configuration instructions once they are connected to the Internet in a zero-touch deployment.



Security Service Chaining

Transparently forward select traffic to the cloud-based security service based on business-policy definition without any branch-by-branch or application-based configuration.

NFV Infrastructure

The solution provides for service chaining using an NFV infrastructure for service delivery. The VMware SD-WAN virtual edge devices can be deployed on a vCPE. Several of these are tested and in use.

Application Visibility

Recognition and classification of 2,500+ applications and sub applications without the need to deploy separate hardware or software probes within each branch location. The solution intelligently learns applications and adds them to the cloud-based application database. Services such as firewall, intelligent multi-path, and Smart QoS may be controlled through the solution's application-aware business policy control.

Application Performance Monitoring

VMware SD-WAN continuously computes a VMware SD-WAN Quality Score to assess performance of critical voice, video, or data applications at any given time with the ability to alert IT staff. This analysis provides administrators a comprehensive before-and-after view into application behavior on individual links and the VMware SD-WAN enhancements.

Network Agnostic Virtual Overlay

The VMware SD-WAN solution creates a virtual network overlay that can run over any underlying physical network. No changes are required to the underlying network.

PCI Data Segmentation

VMware SD-WAN Orchestrator can easily be used to create virtual network segments to isolate data including PCI data to ensure PCI audit compliance. The VMware SD-WAN solution is certified by PCI certification agencies including CoalFire.

Multi-region SD-WAN

The VMware SD-WAN solution allows for creating a multi-region SD-WAN overlay where virtual links can span SP networks without the need to change the underlying network, thereby enabling full connectivity for Global Corporations.

Cloud VPN

One-click site-to-site cloud VPN is a VPNC-compliant IPsec VPN to connect SD-WAN sites and non-SD-WAN sites while delivering real-time status and health of VPN sites.

Integration with VMware NSX Data Center

VMware SD-WAN can work with NSX Data Center to provide a complete network virtualization solution from the branch office to the data center and within the data center in support of distributed virtualized and microservices applications.

Business Benefits

Assured Application Performance

VMware SD-WAN provides an optimal user experience when accessing remote applications. This means better employee productivity.

Optimize Access to SaaS and Cloud

VMware SD-WAN-hosted Gateways provide optimized access to SaaS applications and to Enterprise applications that are hosted in the cloud. Performance and availability are improved.

Bring up New Sites Fast

Business can bring up sites fast as they can use LTE, WiFi or satellite at hard to service locations. Edge devices are auto provisioned lowering IT costs and time to deploy.

Subscription Model

VMware SD-WAN devices are available in a subscription model with no capital outlay required. VMware SD-WAN Gateways and Orchestrators are cloud hosted and provided as a service. Organizations can swap out hardware as they please as their performance requirements changes.

Full Lifecycle Management

- Provision
- Zero touch deployment
- Manage
- Build business policies

Router Replacement

VMware SD-WAN Edges act as a DHCP Server and an OSPF-BGP router. They are HA capable and can replace traditional routers. They are much less expensive than traditional routers and easy to configure in comparison. Entire fleets of VMware SD-WAN Edges can be configured from the centralized VMware SD-WAN Orchestrator. No device-by-device CLI is required. VMware SD-WAN Edges automatically adapt to changes in environments and provide sub-second traffic steering unlike routers which can take many seconds or even minutes to re-converge routes. Links are utilized as active/active on an VMware SD-WAN Edge, not active passive as on a router, so customers get better value and performance.

Lower Management Costs

Provisioning is easy. No CLI is required. Organizations do not need to depend on highly trained network administrators to managed remote locations.

Security and Compliance

VMware SD-WAN sets up a simple and secure VPN. It provides outcome driven network segmentation and can be used to provide local firewall services or link to cloud hosted security services.

Cost Reduction

Cost are reduced by lowering the reliance on MPLS and complimenting it cheaper broadband.
IT costs are lowered by centralized management and zero touch provisioning.