

# Extend VMware SD-WAN to Amazon Web Services



As more and more workloads migrate to the cloud, limited WAN bandwidth, quality, and cost of private links are becoming a big concern to enterprise IT. The rise of infrastructure as a service (IaaS) and platform as a service (PaaS) through providers such as Amazon Web Services (AWS) further adds to IT concerns as IT continues to look for a scalable, secure, and optimized access to IaaS/PaaS from remote branches.

Legacy VPN technologies offered by vendors to access AWS are complex, time-consuming, and often lack enterprise-grade performance and security.

## VMware SD-WAN by VeloCloud

VMware SD-WAN™ by VeloCloud® aggregates available branch WAN connections—such as Internet broadband, MPLS private lines, and wireless LTE—and performs dynamic, application-aware, per-packet link steering and path conditioning to deliver enterprise-class quality for the most demanding applications. In addition, VMware SD-WAN has a unique globally distributed system of cloud gateways that brings SD-WAN to the doorstep of major cloud services, applications, and providers such as AWS. The single-pane-of-glass management orchestrator portal simplifies the deployment and monitoring efforts from hundreds of lines of CLI box by box to a couple of clicks on the user interface from one source and distributes to all branch sites.

## Extending VMware SD-WAN to AWS

VMware SD-WAN on AWS enables enterprises to rapidly and cost-effectively leverage the world-class VMware SD-WAN capabilities within their AWS deployments. VMware SD-WAN on AWS combines the elasticity and flexibility of the AWS cloud with the same optimization, security, simplified operations, and uncompromised user experience VMware SD-WAN provides for the most demanding networks and applications in the world.

This solution overview examines the various use cases for VMware SD-WAN on AWS, including the role of the VMware SD-WAN Orchestrator by VeloCloud in AWS. Tight integration between VMware SD-WAN and AWS has resulted in several compelling use cases that support the immediate needs of today's enterprises and service providers, as well as the ongoing evolution from legacy computing infrastructures to enterprise cloud data centers.

### Over-the-top deployment – hubless design

This design option does not require a hub device in the AWS environment, and works very well with customers’ existing networks and for those who have a large number of sites. The VMware SD-WAN Gateway by VeloCloud creates IPsec tunnels into AWS, greatly eliminating tunnel complexity.

Customers enjoy all the benefits of SD-WAN with minimal change to their data center setup. The VMware SD-WAN Orchestrator automatically selects the VMware SD-WAN Gateways based on the region and location closest to the AWS regions. Legacy VPN requires NxM VPN tunnels for N branches and M for AWS Virtual Private Cloud (VPC) instances. This design reduces VPN complexity from NxM tunnels to N tunnels because only one tunnel is needed between the VPC and the VMware SD-WAN Gateways. This simplifies the design and achieves scale at the same time.

High network availability on the WAN side can be achieved by provisioning dual Internet links where two IPsec connections can be established for redundancy. Internally, different VMware SD-WAN Gateways will be selected for each IPsec connection. For data center locations, it is recommended to provision redundant data centers with dual Internet links to achieve full redundancy.

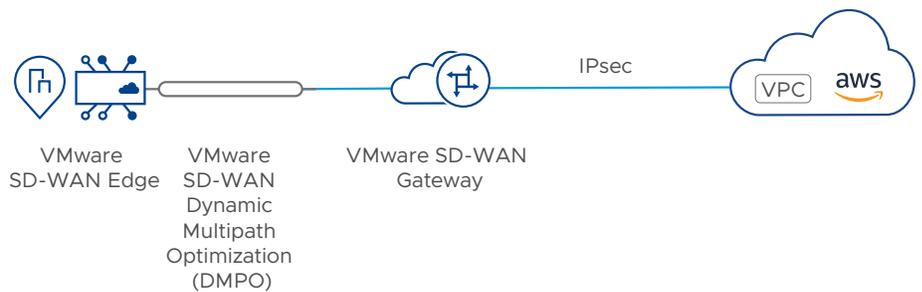


FIGURE 1: Over-the-top hubless design with AWS.

### Hybrid WAN

This option supports hybrid WAN and dual links. This scenario is ideal for sites with both private and public links that directly connect into the AWS data center. Customers benefit from integrated PKI design with the VMware SD-WAN Orchestrator and can keep policies consistent across edges. VMware SD-WAN Virtual Edge instances can be spun up from the AWS marketplace. Policies are consistent across edges as well as hub devices. For customers who have high multi-gig throughput needs, VMware SD-WAN Edges at the VPC can be clustered with unique resource-aware clustering technology offered by VMware.

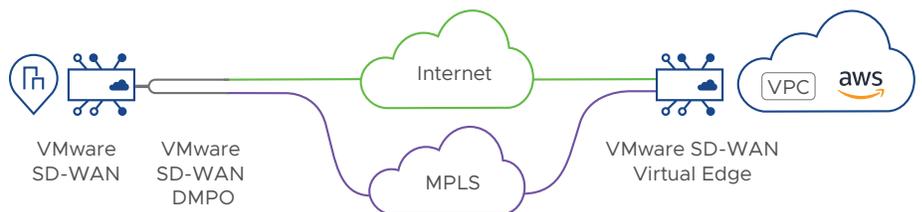


FIGURE 2: Hybrid WAN with a VMware SD-WAN Virtual Edge.

### AWS Direct Connect for enterprises and partners

Service providers and the AWS partner community have a unique advantage of working with VMware for SD-WAN solutions. They can truly offer differentiated solutions to their end customers by leveraging VMware SD-WAN Gateways in their private networks; offer guaranteed service-level agreements (SLAs); and even provide last- and mid-mile performance, optimization, and reliability. AWS Direct Connect provides an easy entryway into AWS for applications in the data center, and acts as an express connection from the service provider or partner gateway to AWS, as well as for enterprises. Service providers and partners can offer SD-WAN service with optimized paths to AWS.



FIGURE 3: AWS partners and enterprises using AWS Direct Connect.

### VMware SD-WAN Gateways for partner-managed cloud access

Another way VMware SD-WAN tightly integrates with AWS compared to any other solution is the ability to provide a consistent user experience regardless of the application's location. Service providers and AWS partners can use their gateways for access to partner-hosted apps in private clouds and the AWS data center. The distributed system of VMware SD-WAN Gateways is available to them for cloud applications in the public cloud. Alternative solutions require manual tunnels to be configured.

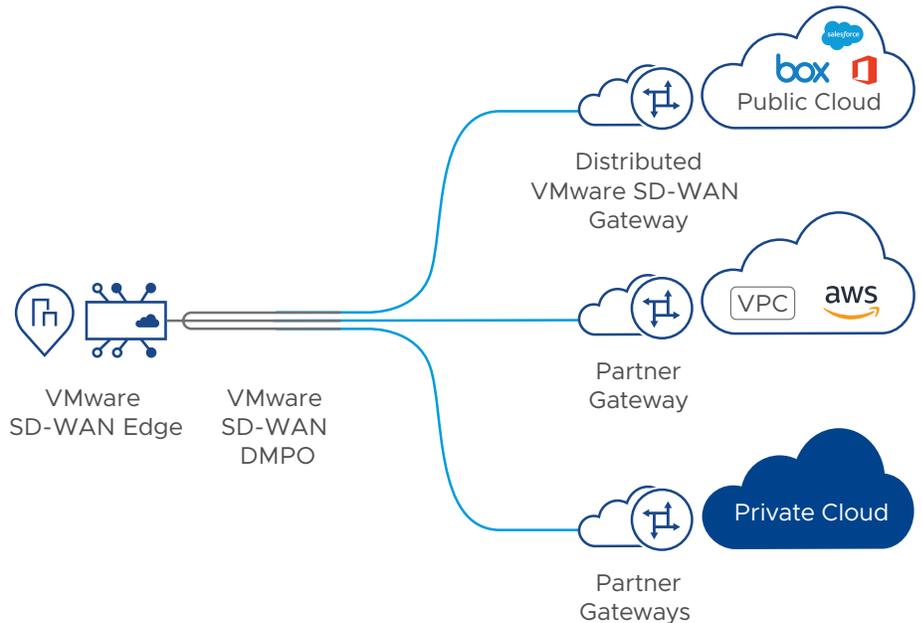


FIGURE 4: VMware SD-WAN Gateways for improved user experience.

### Service provider/AWS partner off-network expansion with AWS

Regional service providers and partners can now federate gateways using VMware SD-WAN Cloud Gateway Federation (CGF) with other regional service providers via AWS. Regional providers offer a managed, network-integrated SD-WAN service with VMware SD-WAN Gateways present in their backbone to a specific region to their enterprise customers. For global enterprises that span multiple regions, providing access can be challenging traditionally. With off-network expansion, providers can now connect their customer data centers through AWS and leverage a set of partner VMware SD-WAN Gateways to support enterprise customers. VMware SD-WAN Gateways connect via network-to-network interfaces (NNIs). Multiple partners can benefit from each other in a cost-effective manner.

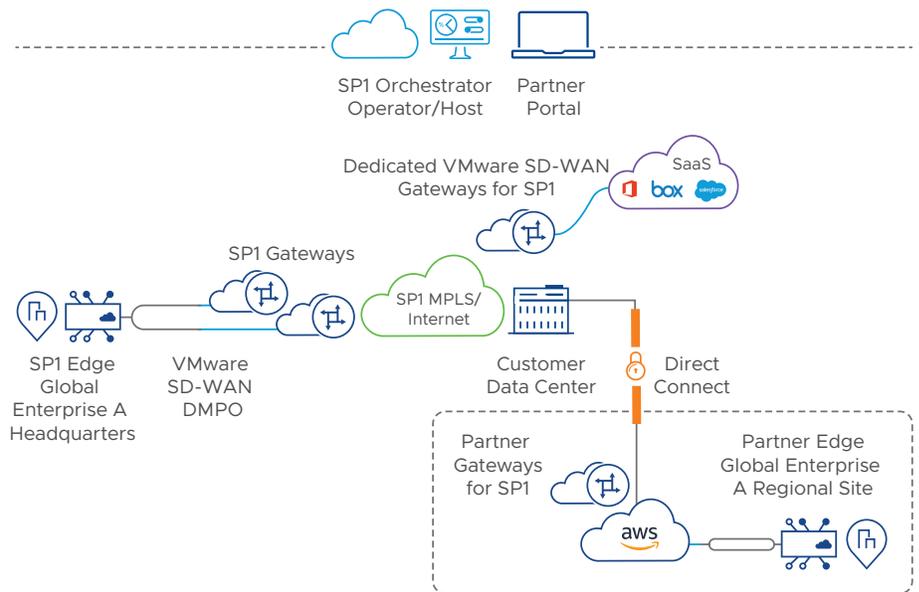


FIGURE 5: Off-network expansion via AWS for partners.

### VMware SD-WAN Orchestrators and VMware SD-WAN Edges

For each of the scenarios previously mentioned, orchestration, management, and monitoring are critical aspects. VMware SD-WAN Orchestrators are hosted on AWS, providing users with the same level of availability, reliability, and security as they have enjoyed with AWS. More than one-third of VMware SD-WAN Gateways in AWS belong to partners or service providers, ensuring a consistent experience across the board. VMware SD-WAN mitigates major WAN challenges today with unique application-aware Dynamic Multipath Optimization (DMPO) technology and advanced cloud infrastructure. It can also be extended to the public cloud with a VMware SD-WAN Edge presence in AWS with a range of use cases to ensure consistent and outstanding user experience.