

Technology Whitepaper

Taking Hybrid WANs Further

Mosaic NetworX SoftWave® SD-WANaaS is built on VMWare NSX® SD-WAN by VeloCloud™.

Hybrid WAN is getting a lot of airplay lately. Its time has come. Gartner analyst Bjarne Munch recently published an insightful report called “Hybrid Will Be the New Normal for Next Generation Enterprise WAN.”

Hybrid refers to using a mix of public Internet with private circuits for enterprise WAN transport as shown in the first panel of the graphic below.

In this whitepaper, we will explore the additional two ways to take the hybrid WAN further: the Branch appliances and Cloud network infrastructure and the Cloud gateways and On-premise data center appliances.

Hybrid WAN Adoption

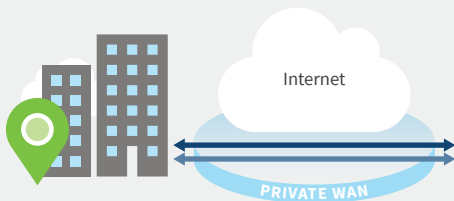
The reasons driving the adoption of hybrid WAN are numerous:

- Branch offices need reliable and direct connectivity to cloud services
- Broadband Internet delivers better price performance
- Critical applications require better availability than individual private circuits
- Broadband provides fast turn up before long lead time private circuits are

Optimized Hybrid WAN

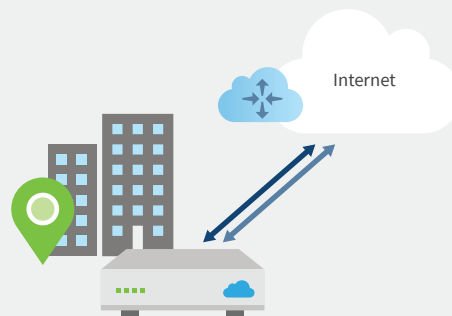
Hybrid WAN architectures should enable the use of broadband Internet services, along with private networks, as both an integrated and active part of the WAN. The use of broadband Internet simply as a

Integrated Public & Private Networks



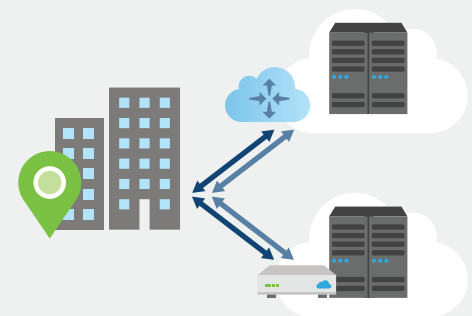
Hybrid Transport

Branch Appliances & Cloud Network Infrastructure



Hybrid Network Deployment

Cloud Gateways & On-Premise Data Center Appliances



Hybrid Data Center Support



separate network for uses such as guest web surfing, or as a standby network in cases of failure does not capture the benefits of a true hybrid WAN.

Broadband Internet does not have the same predictable performance, capacity, or reliability as private circuits. Thus businesses that have already started using the Internet, are often still using it for less critical purposes. However, businesses that want to leverage the cost and other advantages of broadband are becoming increasingly application-centric and therefore dependent on a private network-like experience. Therefore next generation hybrid WAN architectures should not only integrate broadband but also apply technologies to give it enterprise-grade performance and availability.

“60% say WAN performance key challenge for cloud growth”

Cisco Global Cloud Network Survey

Mosaic NetworX's solution for providing enterprise grade performance is what we call “dynamic multi-path optimization”. Broadband, as well as private network capacity and performance is continuously monitored. Traffic by application and business priority is then dynamically steered to the best link and path at each moment in time. This dynamic use of different services delivers the advantage of virtualization. If necessary, on-demand remediation techniques such as error correction and jitter buffering are also automatically applied. Another key benefit is the enhanced visibility across multiple sites and providers.

Optimized hybrid WAN also improves reliability over single MPLS connections, as well as better availability than MPLS with Internet failover that is not seamless.

Hybrid Deployment

Solutions for deploying hybrid WAN transport should also leverage a hybrid deployment model. Technology for deploying and optimizing hybrid WAN transport should not be restricted to traditional on-premise deployments.

On-premise deployments might suffice to leverage broadband Internet to access private data centers and applications, but still add IT effort and complexity. Recall that one of the key drivers of hybrid WAN is the need to access cloud applications and data centers. On-premise-only solutions for enabling hybrid WAN result in suboptimal backhauling of traffic and thus fail to fully leverage the Internet as an ideal transport for accessing the cloud! To not only integrate broadband Internet, but also to optimize the performance requires dual-ended or symmetrical solutions so the location of headend services is a requirement that must be addressed.

Cloud-Delivered WAN

A true cloud WAN solution delivers on the promise of hybrid WAN by not only leveraging the Internet for transport - it also leverages the advantages of the cloud for a hybrid deployment architecture.

Mirroring the migration of data centers and applications to the cloud, the network infrastructure supporting the data center and applications should also be deliverable from the cloud.

In addition to providing the optimal, most direct access to applications for superior performance, advantages include:

- Ease of deployment
- Ability to monitor and control paths including peering through the Internet difficult to achieve with on-premise deployments

As hybrid deployment architecture, while some capabilities should be delivered from the cloud, the ideal combination includes the capabilities offered by an on-premise footprint via a CPE appliance



at the remote branch combined with gateways distributed throughout the cloud.

While cloud-delivered services have significant advantages for data center infrastructure, cloud-only services have disadvantages for supporting the branch.

First, it is logistically difficult to locate cloud services near the widely distributed branch offices. Second, unlike data centers fitted with highly available, high-capacity bandwidth to access nearby or co-located cloud services, enterprise branches have a “last mile” problem that cannot be covered by distant cloud-only solutions. Alternatively, attempts to address this need for on-premise, last mile services without a purpose-built appliance results in added IT complexity at the remote site.

Flexible Data Center Deployment

As outlined in earlier sections, distributed cloud gateways provide the ideal architecture for supporting cloud data centers and SaaS applications. For private data centers the key advantage is that no IT installation is required.

However, there are scenarios where the benefit of having an on-premise deployment in the data center outweighs the disadvantages. When the data center connectivity is not robust enough, then having the optimization all the way is desired. For supporting

hybrid connectivity, the only way to insert gateway services into the private connection is via an on-premise presence. Finally, single management provisioning and monitoring for an end-to-end installation can be achieved including the VPN configurations. The disadvantage of course is the requirement to install additional functionality, whether an appliance or virtual appliance in the data center.

Flexible data center deployments can support both alternatives. This topology shows a hybrid WAN where public and private networks are parallel. Alternatively, Internet-only branches can connect using either on-premise or cloud gateways to regional HQ or data centers that provide access to the rest of the private network infrastructure.

In Summary

Hybrid WANs leverage both private networks as well as broadband Internet in an integrated architecture. Technology to optimize the performance of applications over the hybrid WAN, particularly to address the unpredictable performance of Internet connectivity is a requirement. Additionally, hybrid deployment is an ideal architecture for building a hybrid WAN. Look for solutions that effectively combine a zero IT touch branch appliance with both distributed gateways in the cloud as well as on-premise data center appliances.

Hybrid Deployments

- Integrated **public** and **private** networks
- **On-premise branch** appliance connected to **cloud network**
- Both **cloud gateways** and **on-premise edges** for data centers

