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SD-WAN

Five Considerations for Deploying and Using Hybrid WANs

Get the most from your hybrid WAN deployment

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INTRODUCTION

As more organizations deploy cloud computing services and bandwidth-hungry applications such as video conferencing and real-time data backup, they are looking for cost-effective ways to enhance both the reliability and performance of their corporate networks.

While multiprotocol label switching (MPLS) is typically considered to be highly reliable and provides adequate performance, it's also costly. And while internet access—via technologies such as cable and digital subscriber line (DSL)—is relatively low cost, there are potential issues with availability and performance.

Because of these drawbacks, many companies are evaluating hybrid WANs, which enable them to supplement an enterprise WAN service such as MPLS with low-cost internet bandwidth. In fact, one of the main benefits of hybrid WANs is cost savings. Bandwidth requirements are growing quickly, but enterprises can't always put traffic on MPLS because it would be prohibitively expensive. This new hybrid design enables organizations to combine multiple internet connections with an enterprise-class WAN that has a high quality of service (QoS).

Organizations seeking to deploy hybrid WANs need to take several factors into consideration to get the most from their deployments and to ensure that they are delivering optimal benefits to the business. This white paper addresses five issues to think about as you deploy and use hybrid WANs.

CONSIDERATION #1

The internet link is not just for failover.

It is important to keep in mind that failover alone is not a reason to deploy a hybrid WAN. Many companies that use a hybrid WAN use the internet link to access sites (on the cloud or otherwise), and use their MPLS as the WAN link for business applications. Only when a failure occurs in the MPLS network do organizations use the internet link for WAN traffic. However, there can be quality issues in the MPLS network, and there are times when the internet link might be higher quality. You should not need a full outage to fail over.

Technology from Oracle chooses the best path at every time of day for every packet of every application. The solution uses an organization's internet link if the MPLS exhibits quality issues. It doesn't wait for a full failure to reroute traffic—thus ensuring that applications always get the best path through the network. This practice is called *quality-based routing*.

Oracle's appliances provide WAN virtualization technology that aggregates any data link to form one virtual WAN. The appliances intelligently monitor and analyze the various connections forming the virtual WAN down to packet level, and make intelligent routing decisions based on QoS, latency, and other company-defined rules.

CONSIDERATION #2

Bandwidth demand is not predictable.

Internet links generally provide more bandwidth than MPLS. If you pin specific traffic to each link—and change only when an outage occurs—then you are not taking advantage of the abundant bandwidth that exists in the internet link.

Many companies assume that specific applications or websites should use specific links, and they base these decisions on the expected bandwidth demand. Yet as business application traffic spikes, that traffic should be able to use the internet link. You should use all the resources available to accomplish the priorities of the organization, regardless of which link is used.

Oracle's appliances are capable of aggregating broadband links to deliver high performance and reliability. They can be seamlessly added to existing networks to deliver more bandwidth—as well as reduced WAN operating expenses and greater reliability. Oracle's patented Adaptive Private Network (APN) technology combines IP bandwidth sources and provides high-quality connectivity between sites, ensuring application continuity.

With APN technology, organizations can increase bandwidth by leveraging internet links that are currently used only as virtual private network (VPN) backup connections or for local internet access. The bandwidth management algorithm is dynamic and takes into account instantaneous use of bandwidth by local and remote sites. Policies can be established for up to 16 classes of application traffic.

CONSIDERATION #3

Don't assume the networks are symmetrical; traffic moves both ways.

It's important to remember that network traffic moves in more than one direction, and quality measurements—such as latency in one direction—will not necessarily be the same as in the other. Online applications are typically bidirectional flows of IP packets, but individual packets move only in one direction, while a corresponding packet moves in the return direction.

Latency is often measured as a round trip, but that masks the fact that it is not symmetrical. In fact, latency is typically not symmetrical with the internet, and any method that uses round-trip latency to compare the latency of WAN paths is flawed.

Therefore, it's vital that you be able to assess the quality of your network links and make decisions on traffic steering in each direction. Solutions from Oracle enable organizations to better understand the behavior of the links they are acquiring from service providers. With these tools, they can see the actual performance of every link—including uptime, latency, jitter and loss in each direction—and thus make traffic decisions in each direction.

Given the importance of high-quality performance of online business applications and the need to deliver exceptional services to customers, this ability to monitor quality in both directions is crucial. It takes on even greater importance for companies that do much of their business online, such as retailers and financial services providers.

CONSIDERATION #4

You can have QoS even over the Internet links.

Not all traffic is equal. Businesses make all kinds of transactions over their networks on a continuous basis—some of these interactions are critical, while others are far less important. When you get into a failover situation with your network, whether it's from MPLS to broadband Internet or the other way around, it's important to assess all of the priorities to ensure that the most essential traffic is getting through. This is because during failover your network is likely to be in a congested state, as it now has less bandwidth.

All organizations have different concepts of what's most important, so priorities must be enforced during a WAN failover. Technology is available to ensure that there is always sufficient bandwidth for essential network traffic, even across non-MPLS links, by prioritizing the important traffic and caching lower-priority traffic until there is sufficient bandwidth.

For example, Oracle's dynamic bandwidth reservation is based on the ability to predict network congestion and constantly adapt to instantaneous available bandwidth. It also performs traffic shaping to remove burstiness, with prioritization based on application classes defined by configuration policies.

Policies can be set for as many as 16 classes of application traffic, ensuring that in cases of poor-quality lines or restricted bandwidth, higher-priority business applications can take precedence over lower-priority processes. This ensures that during a WAN failover, the most important traffic will be given the highest priority.

CONSIDERATION #5

It doesn't have to be difficult to make a hybrid WAN work.

Setting up and managing these new WAN configurations can be challenging for many organizations—but it does not need to be that way. Ease of deployment and management is important, especially for organizations with limited IT resources. A network environment that is easy to set up and maintain, such as a hybrid WAN, can result in significant cost avoidance. It also frees IT from routine maintenance issues and provides more time for strategic initiatives to help the business grow.

Again, there are solutions on the market that effectively address this challenge. For example, Oracle SD-WAN Aware is a centralized management system that enables IT and network managers to configure, monitor, and analyze an Oracle SD-WAN.

By using a centralized system that features easy-to-understand maps and graphs showing network performance, companies can decrease the amount of time it takes to configure and monitor WANs, as well as reduce the number of errors that can occur. Managers can access detailed performance data and events correlated across WANs, which results in an easier-to-manage network with visibility into network quality and application performance.

Performance statistics show the quality of each link and path in the network, so managers know which links are performing poorly. They can quickly address the issues with network providers or find alternative providers if the problems are persistent. Management tools can also give organizations insight into their network capacity by providing data about how much bandwidth is available. Each of these considerations can have a huge impact on how much your company can benefit from a hybrid WAN. Technology in and of itself is not the answer if it's not applied in the best possible way. And with network performance and access so critical to business operations today, companies need to make optimal use of their WAN environments.

CONCLUSION

IT executives at these organizations deploying or planning to implement hybrid WANs need to explore how they can help their companies to ensure success with hybrid WANs. Fortunately, solutions are available to help maximize the value derived from these networks, ensure data traffic is flowing smoothly, and certify that network links are used as efficiently and effectively as possible.

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