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The Power of the Next-Generation WAN

THE POWER OF THE NEXT GENERATION WAN

The Wide-Area Network has evolved from a data and communications pipeline into a strategic enterprise technology. A number of business and technological factors are driving this significant shift.

The enterprise WAN once was little more than an expensive and necessary connection between a branch and headquarters for the applications that the enterprise developed and managed in-house. "It used to be that every application was developed in-house and delivered to end users within the enterprise over an MPLS connection, explains Karl Brown, Senior Director of Product Marketing for Citrix. "Therefore, the WAN was merely a collection of MPLS links".

Those days, however, are gone. IT and business leaders are starting to realize that organizations don't have to build and operate everything internally, so they are turning to a new way of delivering technology — Infrastructure as a Service (IaaS) and Software as a Service (SaaS) — for a variety of business applications. These days many applications are developed and hosted externally, while mobile and branch users are consuming applications in multiple locations.

Meanwhile, business agility continues to be a top-level priority in today's fast-paced world. Enterprises must be able to adapt quickly and cost-effectively to ever-changing markets and customer demands.

Technology leaders today also must also assist business leaders in creating revenue growth as business leaders are their customers. This requires tremendous agility and flexibility in order to respond quickly and deliver new applications to workforce and solution partners.

Fortunately, cloud computing is enabling business and IT leaders to reevaluate their IT strategies and leverage the cloud as a way to reduce costs, maximize value, and increase agility. With flexible cloud service offerings, organizations now can select which applications and usage scenarios best meet the demands of the contemporary workplace.

"The cloud-based model provides a more efficient and flexible way to address business requirements than a traditional data center, while addressing scalability and cost requirements without compromising security," Brown says.

The shift toward cloud computing, cloud applications and mobile technology is creating new demands for the enterprise WAN.

As enterprises continue to adopt emerging technologies, new, flexible WAN solutions are business-critical — and something that the enterprise WAN needs to reliably deliver. The net-net: It's time to overhaul the WAN with innovative hybrid solutions so the network can become a strategic business asset.

Evolution of the WAN as A Business Necessity

Businesses rely on branch offices to serve customers, to be near partners and suppliers and to expand into new markets. As server and desktop virtualization increase rapidly, the challenge is to meet customer expectations for quality of service and quickly deliver services and applications to mobile and branch users without performance or reliability issues.

Evolution of WAN
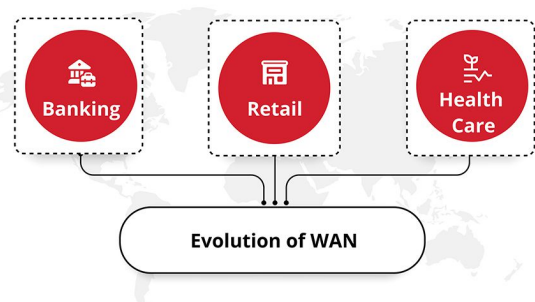
Enterprise Application Evolution is Pushing SD-WAN to the Business Forefront
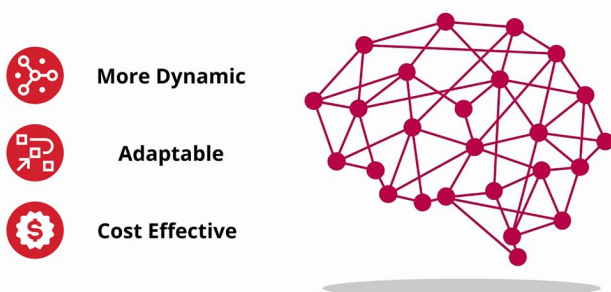
The traditional way to meet these performance and reliability requirements is to upgrade network bandwidth. But this solution is not practical for cost reasons and because it doesn't ensure prioritization for mission-critical applications.

Further, WAN optimization by itself no longer can guarantee enterprises the network capacity, agility and reliability they need to meet the data, communications and applications demands of mobile and remote employees, partners and customers.

"That's why WAN evolution is needed today and that shift is to a software-defined enterprise WAN," writes research analyst Zeus Kerravala. Open Networking Foundation describes software-defined networking (SDN) as an architecture that "decouples the network control and forwarding functions, enabling the network control to become directly programmable and the underlying infrastructure to be abstracted for applications and network services."

By separating control and configuration from forwarding functions, network architecture becomes more dynamic, adaptable and cost effective. For IT professionals, SDN translates into greater transparency into the network and simplified management.

Network Architecture

- More Dynamic
- Adaptable
- Cost Effective

The Traditional Way to Meet These Performance and Reliability Requirements is to Upgrade Network Bandwidth.

Not surprisingly, the SDN market is experiencing fast growth. Research firm IDC forecasted the worldwide market for SDN among enterprise and cloud services providers at $900 billion by 2018.[2] The first place where SDN can add measurable value is in the WAN. With a software-defined WAN, deployment costs are reduced because of lower bandwidth costs, which means lower capital and operating expenses.

IT leaders are looking at time, cost, and infrastructure — how quickly a new application can be made available to internal users, the cost of delivery, and how flexibly the application can be adopted without changing the existing infrastructure. Consider these three real-life user scenarios.

● Banking

Banks often have MPLS connections as both primary and backup solutions. They likely have centralized applications, and when blackouts or brownouts occur on one MPLS connection, they lose connectivity for the application. When this happens, employees in branch locations who are using that application must wait for network connectivity to be re-established, then log back in, authenticate themselves and resume their transaction. These types of delays can negatively impact customer satisfaction and employee productivity.

● Retail

A retail chain has acquired new stores and wants to connect it to the company's MPLS-based WAN. However, adding this new location to the WAN will take three to six months — significantly longer than Internet access services, especially business-grade DSL –because MPLS networks must be tightly engineered to ensure reliable bandwidth. This delay is hurting the business's profitability.

- **Healthcare**

A medical organization was using MPLS connectivity exclusively for its network. While its limited bandwidth was sufficient for certain healthcare applications, the hospital needed to prioritizebilling and critical applications. That required augmenting MPLS traffic to achieve higher reliability.


"A solution that lowers costs, provides flexibility to use additional types of WAN services, and increases reliability will help IT better support their internal customers," says Brown. "A WAN virtualization solution addresses this challenge" .

A virtualized WAN or Software-Defined WAN — not the old, traditional link aggregation method — delivers reliability plus Internet economics for the Enterprise WAN. WAN virtualization allows the use of multiple WAN connections — from existing MPLS and other private WANs to a variety of Internet WAN links such as DSL, fiber, and cable.

Further, a Software-Defined WAN ensures network reliability, which is critical to supporting real-time applications and cloud access. It also offers better bandwidth economics and involves lower operating expenses while enabling newer applications.

Virtual WAN Benefits

- Dramatically Lowers Costs for Expanding capacity.Allows Enterprises to Augment MPLS Connections With Cheaper Broadband Connections in Order to Expand Capacity for the Delivery of High-Priority Application Traffic, While Increasing Reliability Over a Standalone MPLS-Based WAN.

- Delivers Superior User Experience Through Improved Quality for All Application Types. Offers Enterprises Better Mobile Workspace User Experience and High Quality for Voice or Video Over IP Services. The Experience is Enabled Through the Bonded Internet Appliances That Continuously Measure and Monitor the Latency, Jitter and Packet Loss of Every WAN Connection and Dynamically Makes Routing Decisions Using Best Quality Paths.

- Utilizes Backup Links. Many Enterprises Already Have Back-Up Links in Place Today but are Not Able to Utilize Them Until a Failure Occurs. Our SD WAN Enables Enterprises to Easily and Seamlessly Pool Active and Back Up Link Bandwidth, Therefore Eliminating Wasted Bandwidth.

- Ensures Availability of High-Priority applications.Provides Enterprises With a Failover System When a Connection Goes Down to Ensure That Adequate Bandwidth on the Best-Performing Remaining Paths Are Used to Deliver Business-Critical Applications.

- Easily Manages and Monitors WAN performance.Presents Enterprises With a Simple, End-to-End Management System That Provides Visibility Into Virtual WAN Through the Dashboard Control Center.

- Securely Connects the Cloud to the Branch Location. Enables Enterprises to Combine Data Center and Cloud Application Delivery Through the Use of Advanced Encryption Between Devices When Using the Internet.

Bonded WAN Links
Internet (DIA, DSL, Cable)
MPLS
4G LTE/Satellite

Branch   Data Center
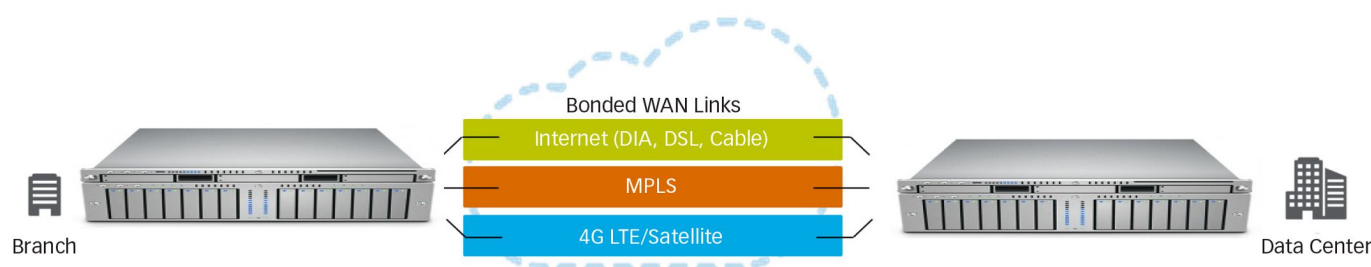
It also provides an alternative to expensive MPLS-only connection. According to one estimate, it changes the price per bit of bandwidth for the enterprise Intranet, delivering anywhere from 30 to 100 times better cost/bit, by allowing enterprises for the first time to take advantage of Internet economics to augment and/or replace MPLS connections[3] .

As the next-generation alternative to WAN optimization, the virtualized WAN can address the key pain points facing technology leaders today:

● **Greater Flexibility** to serve these new apps and how they are consumed.

● **Costly Network Capacity,** especially during peak periods when users access apps or use video-based product and technical training materials at work.

● **Increased Reliability** to meet high network availability requirements to prevent disruption and seamlessly deliver applications, video, secure connectivity, and virtualized desktop services. Most importantly, the new WAN is a strategic business asset and value add. Here are three key reasons :

1. If you can architect a WAN that understands what applications and data are traversing across it, you now have the flexibility to prioritize mission-critical applications. This allows applications that power the business to have priority over all other traffic.

2. Application-fluency allows the new WAN to drive down IT costs by taking advantage of more cost-effective transport services. While mission-critical applications get access to the highest quality connections, typically an MPLS connection, traffic from other applications can ride

across less costly broadband connections without any impact on the user.

3. By architecting an application-fluent WAN that uses a mesh of cost effective transport services, you ensure reliability. Together, these allow business to confidently and cost-effectively migrate toward virtual desktops and cloud-based applications, thus ensuring end users always have access to applications and data.

A Flexible WAN is What Will Allow This Evolution

To meet ever-shifting business requirements, IT must be able to deliver application workloads simply, reliably, flexibly, at scale, and cost-effectively.

The bottom line: Organizations need to enable IT agility. That includes improving the desktop experience with fast service delivery; reducing bandwidth requirements and costs while aligning bandwidth with business priorities;accelerating traditional enterprise applications for higher user productivity; accelerating desktop and application delivery to remote and branch users; and gaining better insight into branch performance.

A flexible WAN solution allows organizations to address the needs of an agile enterprise: It connects and accelerates applications, optimizes bandwidth utilization across third-party public cloud and private networks. offers a platform for cloud-enabling third-party applications, and provides visibility into application performance to optimize the user experience.

Brown explains, "Importantly, we must recognize that businesses require an efficient and cost-effective way to leverage cloud services and new applications.

The new virtualized WAN allows organizations to deliver application-centric services that leverage the power of hybrid clouds, no matter whether apps and data live on-premises or off-premises.

247 Networks Presents Bonded Internet and SD WAN

247 Networks has developed a solution that literally builds a bridge over which high-performance cloud-based applications and data can be delivered on demand to users anywhere, all while consuming little bandwidth   .

This solution, Bonded Internet, addresses evolving WAN requirements for application awareness, greater reliability and quality of service, and cost-effective scaling of bandwidth. For instance, the WAN optimization edition connects and accelerates applications, optimizes bandwidth utilization across third-party public cloud and private networks, offers a platform for cloud-enabling third party applications, and provides visibility into application performance to optimize the user experience   .

The new Virtual WAN solution allows enterprises to create one logical WAN network based upon bonding multiple network services together in order to maximize WAN capacity and reliability. The Virtual WAN solution augments the Bonded Internet.

WAN optimization solution for delivering the mobile workspace cost-effectively to remote branches through its unique application acceleration technologies for applications. The following capa-bilities set the Bonded Internet Virtual WAN solution apart:
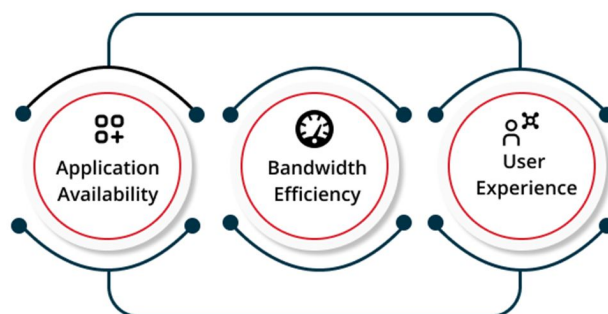
Application Availability:
Supports the fastest adaptation to network blackouts and brownouts, which ensures applications are always available.

Bandwidth Efficiency:
Provides the most efficient use of bandwidth as it makes path selection decisions on a packet-by-packet basis and application basis. For instance, MPLS tariffs can be in the hundreds of dollars per megabit per second, while business broadband can be in the tens of dollars.

User Experience:
Provides the best user experience as it measures WAN link performance on a per-packet basis and in both directions versus every few seconds and on a round-trip basis.

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