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White Paper

Demonstrating SD-WAN Business Value; Rethinking WAN for a Modern Age

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Introduction

Wide area network (WAN) infrastructure that connects enterprise branch offices has not changed for many years. Developments such as WAN optimization have provided incremental and measurable improvements in performance and cost containment. As a result, WAN infrastructure planning was easy, as changes were predictable, and increases in capacity were met by provisioning additional carrier MPLS (multiprotocol label switching) network capacity. Due to the increased adoption of software-as-a-service (SaaS), the nature of application usage and related data center use are changing at a rapid pace, and traditional methods for meeting those networking needs are neither cost-effective nor responsive enough to meet business needs. Modern users ought to demand a better solution.

Changes in Application Use

Application use in enterprises is changing from a model in which they are hosted within an enterprise data center towards a SaaS model. Sometimes these changes are planned or sometimes they gradually happen in a more organic fashion, but in either case, it changes the requirements of the network infrastructure. Network traffic to the data center is becoming less relevant, as the remote locations demand an increasing amount of traffic that goes directly to the Internet, bypassing the data center altogether.

This means that legacy architectures are no longer suited for the network traffic patterns required today. Traffic destined for SaaS destinations will first travel through the conventional MPLS WAN to arrive at the data center, only to exit the data center and arrive at the SaaS vendor's data center. In technology terms, this is called the WAN traffic trombone or hair pinning through the data center. This wasteful diversion of traffic results in poor performance, as the network traffic traverses through multiple hops in the network. No wonder that in some cases, remote end-users prefer to work from home, or visit a public Internet access point such as a coffee shop to gain better performing application access.

Not only are bandwidth requirements to the Internet changing, but the nature of network access has also often become more demanding. Network-based unified communication (UC) and voice over IP (VOIP) have increased in use. These models may utilize desk phones that transmit over the network, or voice apps such as Skype for Business that run on computers or tablets. In either case, the demands are the same, since voice traffic is more sensitive to the quality of the network traffic transmission than conventional web text data traffic. Slight disruption in timely delivery of packets results in lower voice quality. These new forms of communication require better management of network traffic latency, packet loss, jitter, and a dynamic quality of service (QoS).

CapEx-centric Data Centers Are Getting Outdated

A data center that serves as a hub for branches is CapEx-centric due to its complicated architecture and inability to scale well as the number of branches grows. Network infrastructure design in data centers was created when applications were primarily presented from within the data center. As applications migrate to the cloud, the hardware architecture is starting to show a mismatch with the demands found in practice.

Data Costs Are not the Only Source of Savings

Many customers who seek to refresh the WAN infrastructure focus on the potential data savings by using alternative networking technology to reduce MPLS costs. However, that is only part of the story. Operational expenditure (OpEx) costs are also important and it is additionally important to reduce friction in IT operations. Sending staff to troubleshoot via truck rolls (service visits) adds costs and time to problem resolution, so customers need to evaluate savings from many angles.

Revisit the WAN Architecture

For these reasons, we need to revisit the traditional WAN architecture. Traditional architectures were designed for an old world. The hub-and-spoke model was data-center-focused and suitable for the days when the vast majority

of applications were client-server-based and hosted in the data center. There is a mismatch in the architecture, which also results in higher costs. The WAN is designed to be over-provisioned to handle the worst case, which is that when all the WAN sites access the data center (whether accessing data center apps or Internet SaaS apps), it will potentially concentrate all their traffic in the data center. But, given this traditional architecture, this is the only way to ensure that the network behaves as the end-users expect.

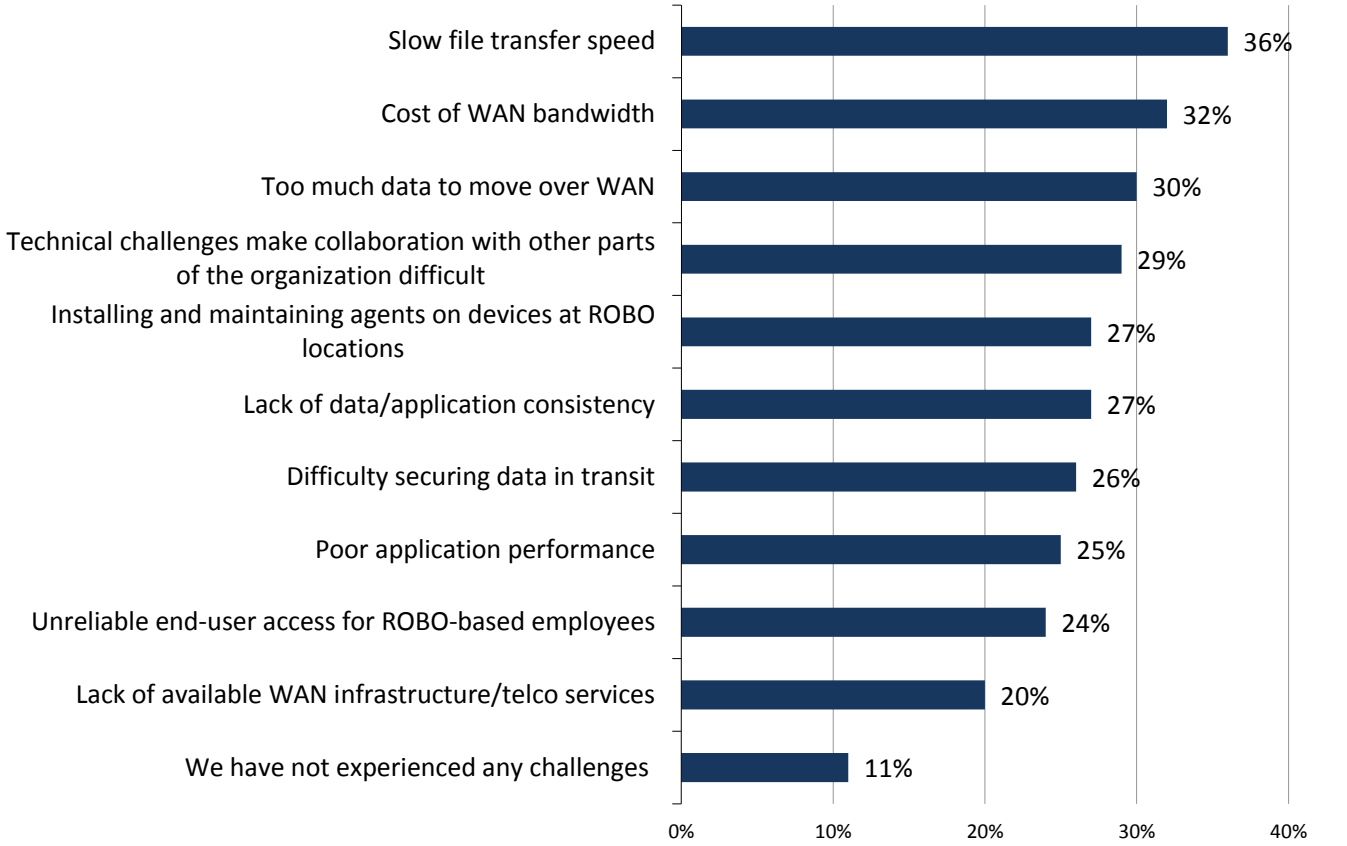
WAN Challenges Are Varied

In order to determine the IT priorities and challenges when it comes to supporting the technology requirements of remote office/branch office (ROBO) locations, and how organizations plan to address those challenges, ESG surveyed 347 North American senior IT professionals representing midmarket (100 to 999 employees) and enterprise-class (1,000 employees or more) organizations.

When respondents were asked about the biggest networking challenges they face when it comes to supporting IT requirements for remote office/branch office (ROBO) locations, the top responses were slow file transfer speed (36%) and cost of WAN bandwidth (32%). ESG believes that the fact that not one challenge dominated the responses indicates that organizations encounter a wide variety of challenges and incur associated costs. It is important to note, however, that costs vary depending on the number of locations, how dispersed they are, and the quality of the network service and equipment providers (see Figure 1).[1]

Figure 1. Challenges for Supporting IT Requirements for ROBO Locations

What challenges – if any – has your organization experienced in terms of delivering business applications and/or IT services from a centralized location such as a corporate data center or third-party cloud service provider over the WAN to your ROBO locations? (Percent of respondents, N=347, multiple responses accepted)



Source: Enterprise Strategy Group, 2016

[1] Source: ESG Research Report, *Remote Office/Branch Office Technology Trends*, May 2015.

A Better Solution

A WAN designed to meet the modern requirements of branch offices can reduce costs and increase service levels. This solution needs to address multiple pain points in the following ways:

- **Network infrastructure simplification:** Reduce unnecessary deployment and management of network infrastructure, such as head-end devices or appliances at branches, if they can be replaced by modern alternatives that combine multiple functions into simple appliances, augmented by cloud-hosted services.
- **Operational expenses:** Create a zero-touch deployment model that reduces truck rolls, onsite remote installation, configuration complexity, operations, management, and troubleshooting. In the same way that SaaS has modernized application deployment and management, the supporting network infrastructure needs to change accordingly to support this new model.
- **Bandwidth cost reduction:** A hybrid WAN that combines multiple transports such as MPLS networks along with broadband Internet links, controlled via a centralized orchestration system for policy management, monitoring, and troubleshooting, will meet these needs. By creating a unified network composed of different connections at the back-end, customers remove the need for disruptive changes to the application infrastructure, and minimize the changes needed for the network configurations.

Note that there is often a misconception that hybrid WAN (a combination of multiple WAN paths) is the same as SD-WAN. ESG considers hybrid WAN to be a subset of SD-WAN, which offers multiple benefits and additional capabilities such as managing services. Although managing multiple hybrid network paths will enable savings by reducing MPLS costs, it cannot offer the variety of savings on OpEx or network infrastructure costs.

Case Studies

Let us examine some case studies from customers to illustrate this.

- **Devcon Construction**, a California-based construction company, supports up to 50 construction sites in California and Nevada. They prefer T1 and MPLS networks for reliability but may also use less reliable DSL, cable, and 4G wireless to connect their offices, since MPLS networks are not always available to be provisioned and when they are available may take days or weeks to provision. Use of unreliable connections led to problems for their VoIP and video collaboration. A large building blueprint file transfer would overwhelm the available bandwidth needed by other users and lack of visibility led to difficulties in troubleshooting. At least 20% of the sites required on-site IT visits for configuration, test, and provisioning. With VeloCloud, they have documented reduction of truck rolls to each branch for deployment and reduced multiple visits for configuration changes and for recurring troubleshooting visits. This enabled them to lower their WAN costs by 75% and reduce operating expenditures (OpEx) by 50% due to reduced on-site visits. Most importantly, they were able to get their work done and enable project managers to reliably and efficiently hold meetings via VoIP.
- **Redmond Inc.**, a manufacturer in Utah, relies on centralized VoIP and virtual desktop services hosted in its private data center and made available to every branch office location. By switching to VeloCloud SD-WAN and combining a network provided by cable, DSL, fiber, or 4G/3G wireless, they were able to install branch office equipment in about 30 minutes and avoid spending $40K per site in equipment upgrades. This resulted in a dramatic reduction of deployment time to hours down from weeks. There was no need to install data center hardware, such as a traditional head-end aggregation router, in order to retain high availability capability. By reducing the need to maintain hardware at the regional hub data center and moving the services to a cloud provider, they recorded significant savings.
- **Triton Management Services**, a financial services company operating in over 60 branch offices nationwide and open 24 hours per day and 7 days a week, chose an SD-WAN solution from VeloCloud to improve their services. Their offices were previously typically connected using dedicated Internet access via DSL with a few offices using MPLS connections. They suffered from failures on their direct Internet access, found that

troubleshooting was difficult to accomplish since branch office staff lacked IT expertise, and spent excessive time on the telephone troubleshooting issues that sometimes resulted in power cycling their equipment. Lack of remote visibility was a key impediment to effective troubleshooting. The VeloCloud solution not only allowed them to use both dedicated Internet access DSL and MPLS links in their branch offices with mitigated network impairments, but also provided improved troubleshooting through expanded network visibility. They were also able to replace their Cisco ASA 5500 series firewalls due to the VeloCloud Edge built-in firewall capabilities. The economic benefits stem from improving network reliability and reducing troubleshooting costs, enabling their business to operate 24/7.

- **Merichem Company**, a chemical technology services company, deployed VeloCloud to enable SD-WAN and cloud security. They leveraged VeloCloud service insertion to enable Zscaler as part of their VeloCloud deployment by implementing Internet security as a software-as-a-service solution. This enabled Merichem to reduce the amount of on-premises security hardware necessary, increase their ability to keep up with ever-changing security threats, and become more agile.
- **Freewire Broadband**, a provider of SLA-based Ethernet products for business and government, has chosen to offer an SD-WAN solution to augment their WAN offerings, allowing them to become a hybrid MSP. They find that they are able to provide better flexibility, control, and scalability for their offerings by using capabilities such as sub-second failover and service insertion.

Reducing the Total Cost of Ownership (TCO) for WAN Solutions

Let us examine how the cost savings are derived in the above case studies. The savings arise through the reduction of recurring costs, the lowering of operational expenditures, and the elimination of traditional WAN upgrades required by increasing demands for bandwidth. Enabling a diversity of choices in network service providers also drives down costs through competitive pricing. It is instructive to view this through the lens of a "before" and "after" network.

We examine the specific cost categories in further detail using illustrative examples. These are based on the migration of a single link MPLS-connection-based infrastructure to a VeloCloud-based network that uses two broadband Internet connections.

The cost comparison is based on deploying an infrastructure for a 250 branch network. This may apply to upgrading an existing network infrastructure or budgeting for greenfield environments. However, given the cost savings, it may be modified to apply to brownfield environments or to incrementally upgrading an existing branch network.

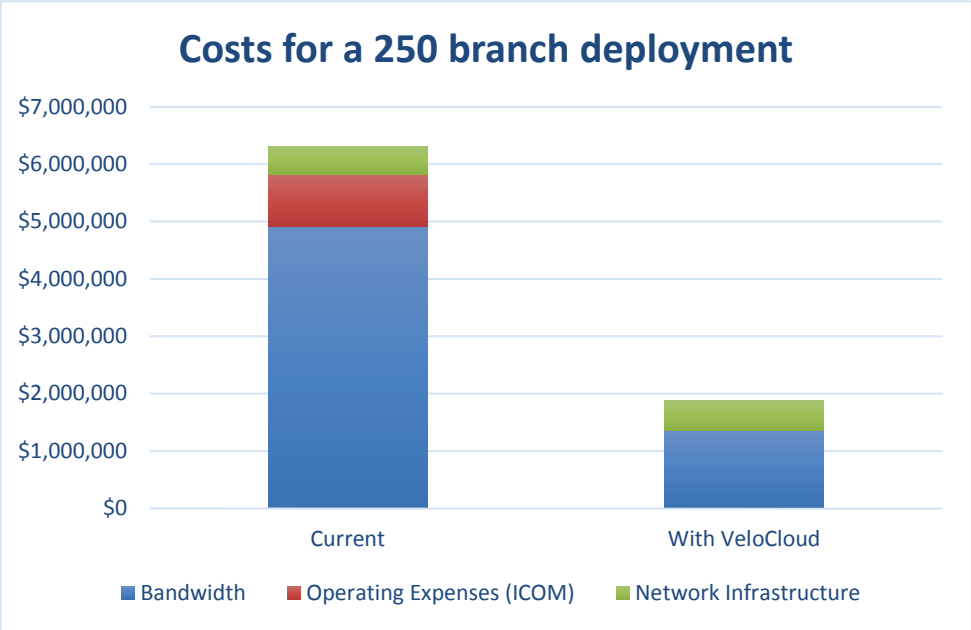
The Three Way Benefits

In this hypothetical enterprise with 250 branches, we determine how three cost areas**,** composed of bandwidth, OpEx**,** and network infrastructure costs were reduced, resulting in triple savings or 3.5x (comparing a spend of $1.875 million vs. $6.304 million) over three years (see Figure 2).

Part of the savings results from reductions in the cost of bandwidth. More importantly, OpEx, or ICOM (installation, configuration, operations, and management), costs were eliminated by moving many of the services to a cloud service, and converting the branch network to a new operating model that offers simplification and visibility. Since branch network function maintenance is now centralized with VeloCloud SD-WAN, it is no longer longer necessary to budget for truck-rolls.

In other words, rather than having the enterprise directly manage the physical branch network, this hypothetical enterprise now relies on a software-defined "branch-as-a-service," which converts manual, internally managed infrastructure to a centrally managed service.

Figure 2. Costs for a 250 Branch Deployment



Source: Enterprise Strategy Group, 2016

Bandwidth:

The majority of the cost savings result from this category. In the example shown, a single MPLS connection was replaced with a dual broadband Internet connection (one each from two providers to provide diversity in service levels), which can provide a high level of reliability along with higher bandwidth. For IT organizations not yet willing to make a complete change, it is possible to preserve the MPLS connection and contain the costs of growth by augmenting it with a low cost Internet connection. The deployment practice traditionally depended on the site.

Table 1. Traditional Deployment Practice by Site and Reliability Goal

Site	Reliability Goal	Deployment Practice
Data center(s), Headquarter(s)	99.998%	Dual MPLS
Regional office	99.99%	Single MPLS, Internet backup
Branch office	99.5%	Single MPLS
Small office/teleworker	98%	Internet VPN

Source: VeloCloud Networks, 2016

Table 2. Next-generation Deployment Practice by Application Type and Reliability Goal

Application Type	Reliability Goal	Connection Type	Status
Video Telepresence	99.998%	Dual MPLS	✓
		Single MPLS	×
		Dual Internet	×
		VeloCloud SD-WAN	✓
Voice	99.9%	Dual MPLS	✓
		Single MPLS	✓
		Dual Internet	×
		VeloCloud SD-WAN	✓
Business-critical apps (ERP)	99.9 – 99.99% (Varies by time)	Dual MPLS	✓
		Single MPLS	×
		Dual Internet	×
		VeloCloud SD-WAN	✓
Email, web, file shares	99.9%	Dual MPLS	✓
		Single MPLS	✓
		Dual Internet	✓
		VeloCloud SD-WAN	✓

Source: VeloCloud Networks, 2016

Summarizing the above two tables, modern day collaboration applications such as telepresence, voice over IP, and business-critical applications like ERP, demand higher levels of application reliability irrespective of where the application is consumed. With the current deployment practices, only data centers and corporate headquarters with dual MPLS can support these applications. Many of the branches fail to meet the reliability goals required to deploy these applications for end-user benefits. VeloCloud SD-WAN with 99.998% reliability assurance can enable branches of any size with any type of connection to deliver all of the modern day applications.

Network Infrastructure:

The VeloCloud approach eliminates a variety of legacy branch on-premises equipment with the VeloCloud Edge appliance or virtualized software, which are sold on an annual subscription basis. The initial outlay costs per branch with legacy equipment are still significant, and can exceed $340,000, followed by additional annual support costs. The network infrastructure is composed of routers, layer 7 firewalls, WAN optimizers and VPN devices, as well as data center head-end devices. With a new approach, this can be replaced by a predictable recurring cost of up to $175,000 per year that represents equipment at each branch and in hosted cloud services.

The new architecture is more modern and suitable for accessing SaaS-based applications compared with an architecture made up of data-center-hosted applications. However, legacy applications hosted within data centers will not disappear overnight, so there is a need to maintain legacy network infrastructure. Velocloud can be viewed as a cost avoidance and expansion containment solution to defer upgrades during migration to SaaS-based applications.

The VeloCloud solution offers interoperability with existing network infrastructure so it does not require a wholesale conversion to use cloud-based apps, or for the entire branch network to use VeloCloud-based connections. A subset of branches may deploy the system, which enables an incremental upgrade.

Operational Expenses:

The operational changes not only reduce OpEx budgets, but they also affect the business by reducing friction and shifting to a zero-touch branch model. In the example, the OpEx ICOM budget is eliminated altogether since the processes for maintaining branch hardware are replaced by VeloCloud-based appliances and cloud-based services. This benefit is difficult to quantify, yet constitutes important benefits that reduce the costs of network downtime, intermittent or degraded connections, and interruptions caused by dispatching troubleshooting staff. These effects

may be substantial and can result in reduced productivity, as well as decreased customer and employee satisfaction.

Since savings vary depending on telecom providers and bandwidth, consider the following categorized infrastructure costs as samples. The assumptions shown in Table 3 form the basis for our cost model.

- **Network connections:** MPLS costs are estimated to average about $600 per 3 Mbps in the US and Internet costs, such as cable broadband, are estimated as $75 for speeds of 15 Mbps down/5 Mbps up.
- **Network infrastructure:** Central head-end costs are $40,000 for two aggregation services routers in a data center to serve all branches. Per-branch costs might range from a router all the way to an appliance that provides router, firewall, WAN optimization, WAN path control, VPN, and annual support. We assume these branch devices are paid up front, including software licensing costs, and are followed by an annual support contract.

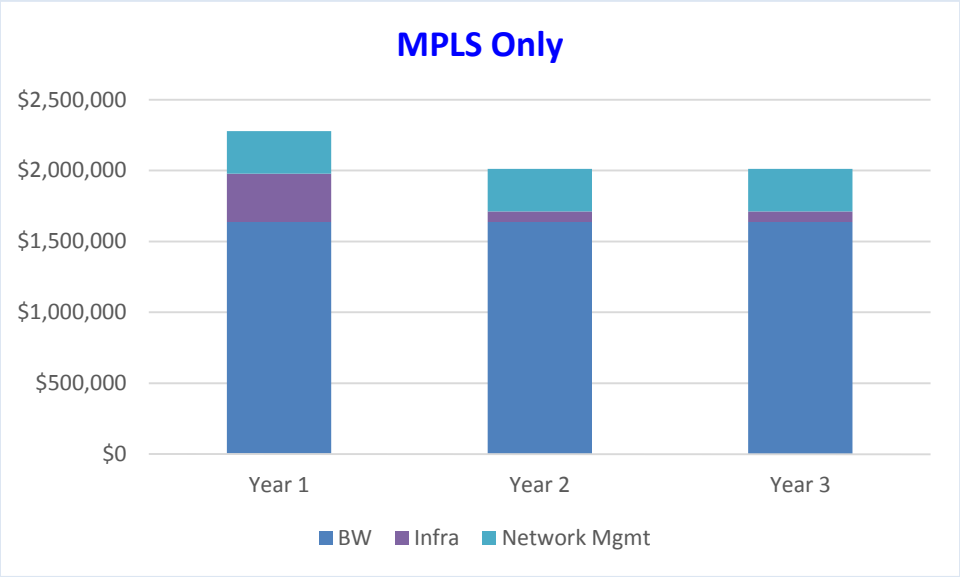
Table 3. Cost Structure

Branch network infrastructure	Quantity per location	Current model	Future model	Potential savings
Branch router	1	$900	0	$900 upgrade eliminated
Branch router support contract per year	1	$300	0	$300 per year eliminated
Virtualization license used in a branch router (one time cost)	1	$2,300	0	One-time cost eliminated
Total branch network infrastructure costs		$3500		
VeloCloud infrastructure cost	1		$700	Annual subscription
Bandwidth costs via MPLS	1	$600 (average) for MPLS	$150 for dual Internet at $75 for each 15 Mbps down/5 up connection	

Source: Enterprise Strategy Group, 2016

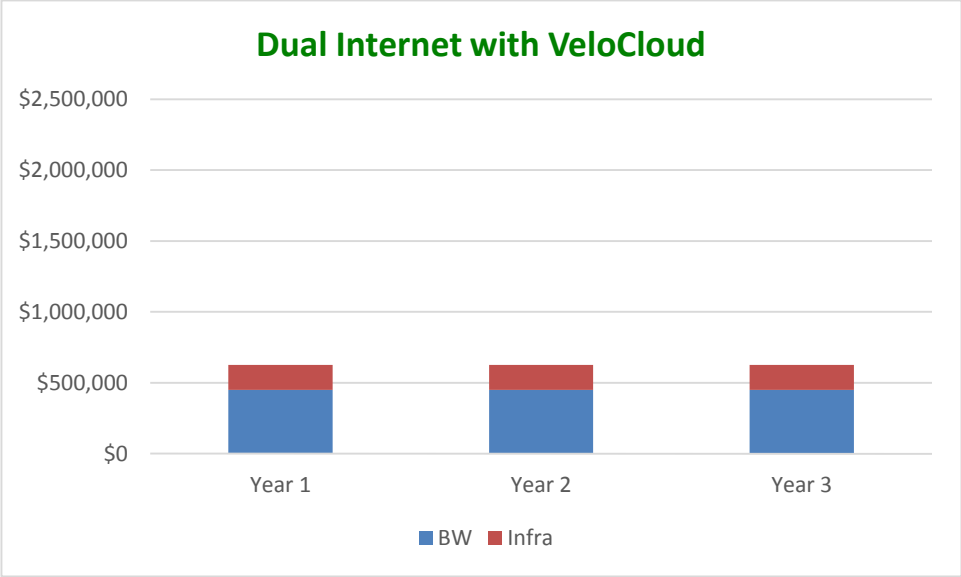
In the following two figures, we can see the comparisons of the cost structure in a three-year budget cycle. Recurring bandwidth costs are reduced and the high up-front network infrastructure costs are replaced by a predictable subscription cost for a “branch-as-a-service.”

Figure 3. MPLS Only - Costs for a 250 Branch Deployment



Source: VeloCloud Networks, 2016.

Figure 4. Dual Internet - Costs for a 250 Branch Deployment



Source: VeloCloud Networks, 2016.

How to Make a Transition?

Conventional Infrastructure—Choosing a Transition

In a conventional WAN, MPLS networks are provisioned, and additional bandwidth upgrades are purchased, as demand increases. MPLS networks in North America are typically provided at lower speeds on the branch side compared to broadband, and may range from 3 Mbps to 10 Mbps, which is the range we use in our analysis. WAN optimization may be used to defer the trigger point when bandwidth upgrades are required but given the current trend increases in bandwidth usage, purchasing additional MPLS networks eventually becomes necessary. An

enterprise that adopts a new SD-WAN architecture can reduce the recurring costs and slow the pace of bandwidth upgrades. But how and when an organization adopts these technologies depends on the existing infrastructure, and to some extent on how far along the organization is in existing contracts for MPLS networks. Canceling existing contracts may trigger early termination fees. Enterprises may be hesitant to adapt to new architectures as well, so it benefits them to go forward on incremental transition paths.

The benefit of the VeloCloud-delivered SD-WAN architecture is that it works with what organizations have today and enables different forms of adoption based on individual needs. The deployment does not have to be a complete conversion of the network, as existing MPLS networks can continue to be used while alternatives are being examined.

The benefits resulting from SD-WAN fall into four general categories:

- **Device consolidation:** reducing multiple appliances in the branch and the data center.
- **Dynamic multipath optimization:** reducing bandwidth costs without performance degradation.
- **Visibility to network performance, configuration, and status:** better awareness and control.
- **Troubleshooting improvements:** reducing truck rolls for deployment, configuration, and troubleshooting.

SD-WAN is most noted for the dynamic multipath cost savings since it reduces bandwidth service costs over the long term. These savings accumulate over time to provide the most visible and predictable form of cost reduction. The benefits are provided for both central IT and the branch office, in the following budget categories:

- **Branch IT infrastructure CapEx savings:** Many branches house a variety of networking infrastructure hardware, including firewalls, VPN, or WAN optimization devices. Those may be eliminated since the VeloCloud device includes similar functionality, making the WAN edge less complex.
- **Data center infrastructure CapEx savings:** The IT-maintained data center head-ends can be minimized or eliminated by leveraging the network of VeloCloud Gateways. This model requires no data center installs or changes to the network design. Redundancy, often deployed via MPLS High Availability, is included in the VeloCloud Gateway cloud head-end, so there's no need for the customer to maintain it.
- **Branch OpEx savings:** Organizations can realize up-front savings in deployment time and troubleshooting efficiency by reducing truck rolls. Traditional methods require truck rolls for deployment and installation, as well as configuration changes. Configuration is not a one-time event and may be a recurring occurrence to modify VNF, link configuration, QoS, and security settings.
- **Data center OpEx savings:** As mentioned earlier, the architectural changes enable elimination or reduction in devices. Fewer devices mean fewer devices to maintain and troubleshoot, which reduces operational expenses. The reductions come from the hosting of virtual network functions (VNFs) within the VeloCloud Edge appliances or virtual machines, which have integrated firewall and VPN functions. Many functions previously hosted within the enterprise data center are now hosted in the cloud. For example, VeloCloud Gateway is cloud-delivered at a top tier data center, which eliminates gateway capacity within the data center, and is a service that is sold as part of the VeloCloud subscription. Replacing IT-maintained hardware with a SaaS service reduces the installation OpEx on top of the data center CapEx. VeloCloud Orchestrator provides install, configuration, and monitoring functions. This simplifies management and training, as well as troubleshooting and coordination, since one vendor will provide them. VeloCloud Orchestrator provides a single point of visibility for the network, applications, and security.

These changes together reduce the need for specialized IT staff on-premises or on-call to dispatch to branches. ESG believes that a branch office manager without IT training should be able to perform many tasks with VeloCloud Edge appliance management automation. This eliminates truck rolls and enables the change in remote IT staffing to use less highly trained personnel.

Since dynamic multipathing provides the most clearly understood savings, we will provide details on other paths to SD-WAN adoption. The schedule may be aligned with a migration to a SaaS-based app infrastructure and the decommissioning of legacy data center applications.

SD-WAN Method—Different Paths to Adoption

- **Migrating to SaaS:** As branches move more applications to SaaS, it is appropriate to re-architect branches to optimize access to the cloud, as opposed to the data center. This is a form of the next option, the new start, but it is optimized to access the cloud, with appropriate controls and security relevant to the enterprise.
- **New branch or starting afresh:** Organizations looking to add new branches can simply purchase two broadband networks from two different Internet providers. There is no need to purchase an MPLS network and router to deploy. This design works since it's unlikely for two broadband providers to suffer a simultaneous failure, and combining these networks via SD-WAN can provide enterprise-grade network service similar to an MPLS network. This is the least expensive solution.
- **Augment what you have:** Organizations that want to augment an existing branch's network with broadband Internet prior to the expiration of the existing MPLS network's contract agreement term can add the VeloCloud SD-WAN and install the SD-WAN device alongside the existing MPLS network router and broadband. This will improve service levels and eliminate the need to upgrade MPLS networks. SD-WAN that combines MPLS and broadband provides the service quality needed by applications that are sensitive to network quality, such as VoIP or video conferencing. This choice also reduces the need to install WAN optimization to defer the MPLS network upgrade.
- If the MPLS network contract is finally expiring, it's possible to treat the network as a new branch, or augment it, since there is no early termination of contract fee. If early trials of SD-WAN are successful, it's possible to terminate the MPLS contracts in other branch offices, and convert them to broadband-only solutions, or use a hybrid approach with a lower tier MPLS network.

Let's examine the scenario of starting with a branch office connected by a traditional 3 Mbps MPLS network, which may run out of capacity soon, but is still within contract. Given the limitations of the existing network, the enterprise is forced to choose a solution to procure additional bandwidth. We will focus on bandwidth costs in this case, and assume the existing network infrastructure costs are the same.

Continue along with the status quo: Order additional MPLS network ports, simply expanding upon the existing path, and place the enterprise on a contract that extends a commitment further into the future. The network costs increase by two times but this option preserves the per-Mbps cost.

Stage 1 SD-WAN: This is an incremental choice to augment the MPLS network with broadband and SD-WAN. The additional SD-WAN traffic splits between MPLS and broadband while providing business class services.

End of MPLS contract: The MPLS network contract ends, at which point there is a choice: either eliminate MPLS altogether and rely on broadband (skip to stage 3) or perhaps reduce the MPLS network to a lower speed (move to stage 2). Some companies see sufficient savings in skipping directly to stage 2, even with contract termination fees. This is feasible if the IT group evaluates VeloCloud in several sites, calculates the reduction in TCO, and determines the benefit of making the switch directly.

Stage 2: Continue using VeloCloud, reduce the MPLS bandwidth tier, and perhaps add a broadband link to augment increased total bandwidth at lower cost.

Stage 3: Eliminate MPLS altogether, and rely on SD-WAN based on broadband. Note that this method can offer the same reliability as a hybrid MPLS/Internet method.

Table 4 show how the stage 3 infrastructure can handle over 13 times the traffic, with one-fourth the bandwidth cost. This provides headroom and expansion capability for additional demand. Using an MPLS and broadband

combination immediately provides headroom to handle future demands at slightly higher bandwidth costs. Once one moves to stage 3, the cost is now reduced, while the bandwidth is expanded.

Table 4. Adoption Stages and Bandwidth Costs

	MPLS network costs	Broadband costs	VeloCloud monthly subscription (depends on Mbps usage)	Total	Cost per Mbps
Existing MPLS-only network	~ $600 for 3 Mbps network ports	N/A	N/A	$600 for 3 Mbps	$200
Stage 1: Expanded MPLS-only network	~ $1,200 for 2x 3 Mbps network ports	N/A	N/A	$1,200 for 6 Mbps	$200
Stage 2: VeloCloud SD-WAN hybrid solution with 1 MPLS and 1 broadband	$600 for 3 Mbps network port	$75 for one 20 Mbps down/5 up broadband connection	$50*	$675 for 23 Mbps	$29
Stage3: VeloCloud SD-WAN with two broadband networks	Use no MPLS network	$150 for two 20 Mbps broadband connections from two providers	$50*	$150 for 40 Mbps	$3.75

Source: Enterprise Strategy Group, 2016

*Illustrative cost for this example. Will vary with customer deployment.

Savings may be realized through other methods, such as the use of multiple DSL links, or combining 4G wireless links (which are charged on bandwidth usage, as opposed to a fixed rate, which may lower effective monthly costs when usage is low). Many metropolitan areas offer a wide range of broadband networks, but some areas, particularly residential zones, may have limited choices.

It is important to note here that the availability of WAN bandwidth for the critical traffic is an important consideration. Unlike many other SD-WAN solutions that rely solely on the MPLS connection for critical traffic, the VeloCloud SD-WAN solution assures MPLS-comparable SLAs on the Internet links to provide an aggregate bandwidth of 21.5 Mbps for critical traffic. In summary, the VeloCloud solution provides an increased bandwidth for critical traffic as though the customer upgraded their MPLS network by comparable capacity.

The WAN cost savings discussed covered only direct WAN circuit costs. VeloCloud's SD-WAN solution also provides IT operations savings and equipment capital expenditure savings. IT operations savings is achieved by eliminating or reducing on-site remote office or branch office visits by IT for deployment and changes, enabling quick remote troubleshooting, and optionally eliminating the need to install devices in or reconfigure data center networks. With fixed IT staffing, the effort and hours saved can be reallocated toward other, perhaps more strategic, projects. The ability of SD-WAN to run on off-the-shelf x86 servers and enable the migration of network services from the branch to cloud or regional enterprise data centers can yield significant equipment expenditure savings as well.

The Bigger Truth

As application usage evolves, the WAN needs to evolve in response. Apps are moving to be hosted in the cloud by SaaS vendors, and communication increasingly relies on VoIP and video conferencing, which require reliable and increasing network bandwidth. However, the WAN has continued to rely on MPLS networks for its quality, but the capabilities increasingly do not match the needs imposed by modern applications.

VeloCloud's SD-WAN solution provides a modern approach to providing network services to branch offices. It delivers benefits on multiple fronts: 1) more "private network-like" bandwidth at lower costs, 2) direct access to the Internet for SaaS apps, and 3) better visibility for operational simplicity and troubleshooting.

The end result is an infrastructure that provides more than these economic benefits. It provides choice and flexibility. The choice in network providers stems from the ability to mix and match networks into a unified environment. The flexibility comes from being able to add capacity in increments you choose, when you want to.

Ultimately, it's an infrastructure that provides a combination of pure economic benefits and flexibility that helps organizations to operate their businesses for the long term.

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