

SD-WAN

What is it anyway?



Presenters

Moderator:

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Panelists:

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What SD-WAN isn't

- It is not a new type of circuit
- It is not a standalone technology
- It is not Software Defined Networking (SDN) on the LAN

What SD-WAN is

- SD-WAN is a generic term which describes an overlay technology that provides advantages over traditional networks
- There are many flavors that fall into two general camps - Cloud based/controlled and Hardware Peer to Peer
- It is implemented differently by different vendors, and features are not ubiquitous from one solution to the next
- Carrier based implementations (ie, Vonage, Masergy) are very different from Customer led implementations (ie, Cisco, Silverpeak, VeloCloud)

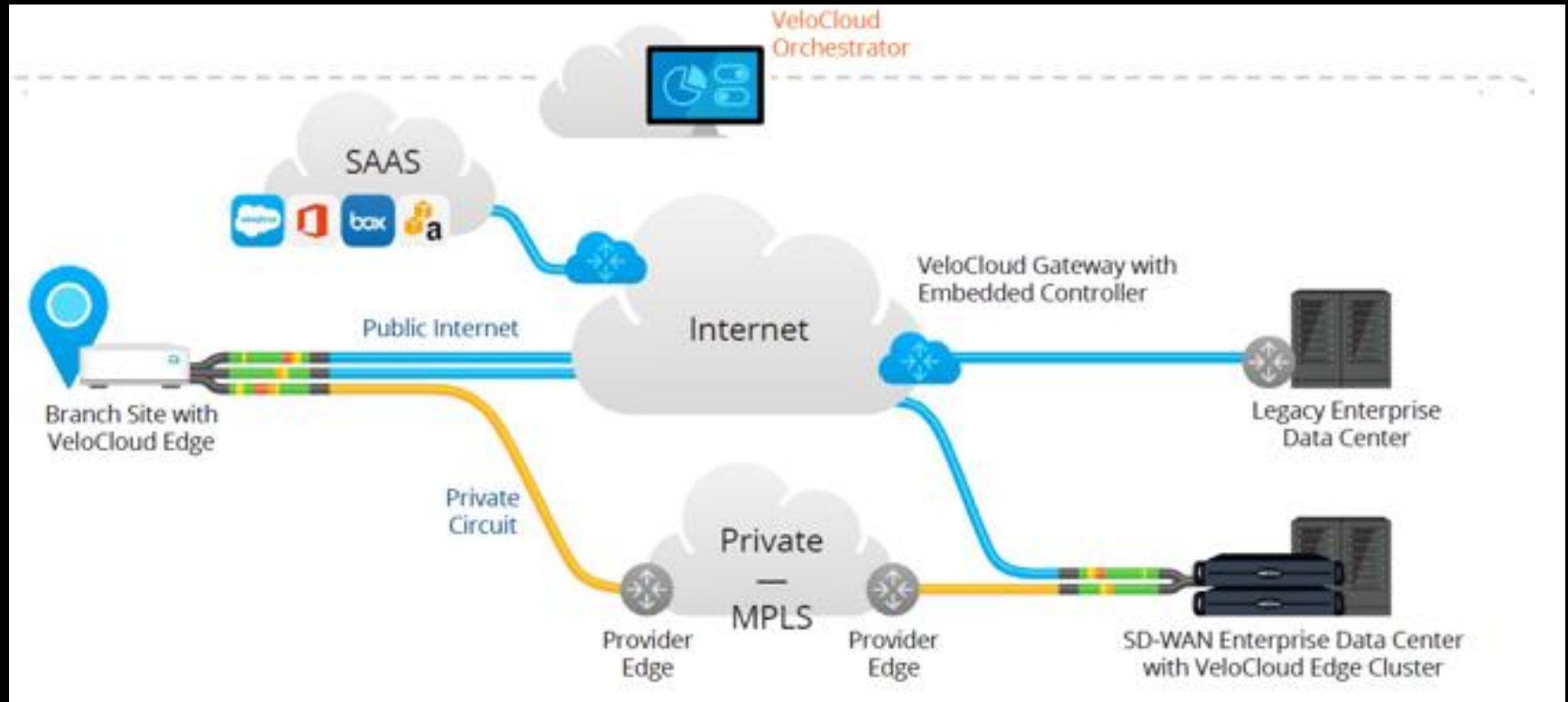
What are the advantages of deploying SD-WAN?

- Improves visibility, resiliency, bandwidth utilization, -How?
- Circuit - aggregation, optimization and load balancing
- IP Failover
- Application basis for choosing routes
- Policy orchestration and deployment to all nodes
- Single touch provisioning for new nodes

Bundled or with 3rd party management

- Many carriers sell SD-WAN as a bundled offering, providing both the overlay and some of the underlying circuits
- In these cases, they book-end the connectivity to provide jumping off points to your private Data Centers and Branches, their private network and services (MPLS and SIP trunking), as well as access to various Cloud Providers (AWS, Azure, Salesforce, RackSpace, etc.)-can we refine this sentence
- Another option is to purchase circuits independently or reuse existing circuits and contract directly with Manufacturer/VAR to deploy. This is most often used as a WAN replacement project.

Sample Deployment Models



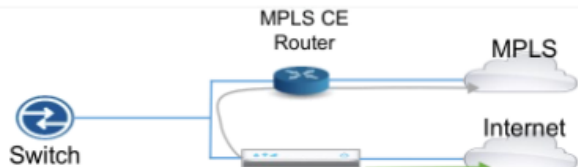
Deployment Strategies

Flexible Branch Topologies



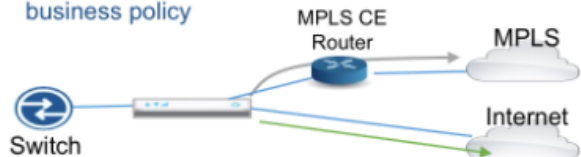
In front of existing branch devices

- No impact to existing branch devices, e.g. firewall, proxy
- Support migration path to virtual branch services



Co-exist with MPLS CE router

- Maximize performance and availability for hybrid WAN by co-existing with MPLS CE router
- Redirect traffic to VeloCloud to apply enterprise business policy



Multi-Path Includes MPLS

- Co-exist with existing MPLS CE router
- Apply enterprise business policy for traffic through both MPLS and Internet

SD-WAN Performance Improvements

Assured Application performance over MPLS, Internet broadband and LTE circuits

Continuous Monitoring

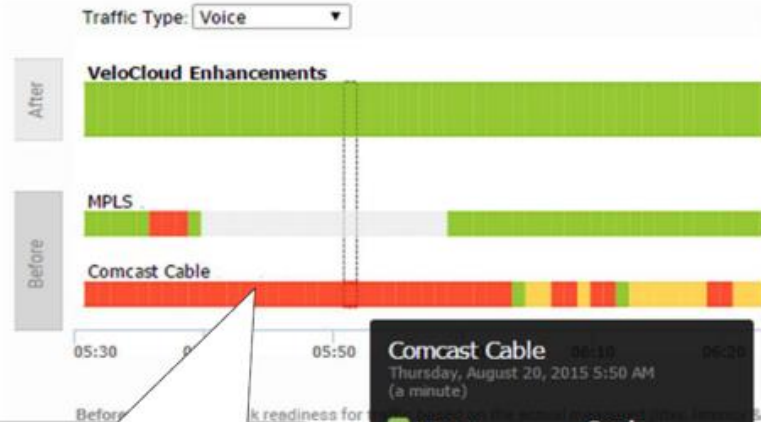
Automatic capacity testing
Continuous link & path quality monitoring

Dynamic App Steering

App aware per Packet Steering
Virtualized: apps not tied to links
Aggregated bandwidth for single flows
Policies abstracted by service groups
Backup link policy

On Demand Remediation

Error & jitter correction
Automatic steering for brownouts/blackout



Case Study: Retail Hybrid WAN

MPLS packet loss and outage
Performance issues on CABLE





























VeloCloud Delivers Excellent VoIP Quality

Sub-sec steering of VOIP without call drops
On-demand mitigation of packet loss & jitter

SD-WAN Differentiators

	✔	✔	✔	✔	✔	✔	WAN OPTIMIZATION	Networking
✔	✔	✔	✔	✔	✔	✔	SAME IP ADDRESS FAIL-OVER	
✔	✔	✔	✔	✔	✔	✔	VOIP SESSION REASSIGNMENT	
	✔	✔	✔	✔	✔		MPLS HYBRID CAPABLE	
✔	✔	✔	✔	✔	✔	✔	VPN TRAFFIC OPTIMIZATION	
✔	✔	✔	✔	✔	✔	✔	CENTRALIZED POLICY ENGINE	
✔	✔		✔	✔		✔	SUPPORTS LEGACY WAN INTERFACE	
✔	✔		✔	✔	✔	✔	PREMISE DECISION MAKING	LOC
✔	✔	✔	✔	✔		✔	CLOUD DECISION MAKING	
	✔	✔			✔		BUILT-IN FIREWALL	Security
	✔	✔			✔	✔	INTRUSION PREVENTION	
	✔	✔	✔	✔	✔	✔	AES-256 ENCRYPTION	
✔	✔	✔	✔	✔		✔	HOSTS OWN POPS	POPs
5	2	28	4	4		2	NUMBER OF POPS	
	✔	✔					INTERNATIONAL POPS	

SD-WAN - Cloud Optimization

						AWS	Optimized Apps
						AZURE/MICROSOFT CLOUD	
						CITRIX XENDESKTOP / XENAPP	
						GOOGLE G-SUITE	
						HP HELION	
						IBM SOFTLAYER	
						NETSUITE	
						RACKSPACE CLOUD	
						SALESFORCE	

SD-WAN DEMO

Case Study 1- Health Insurance Provider

- Rapidly Growing , Multi-Location, Contact Center
- Problem
 - Network failures were causing contact center to go down
 - No insight into outages or voice quality issues
- Solution
 - SD-WAN – 2 fiber connections and 1 coax connection
 - Carrier and physical carrier redundancy
 - Active/active/active
 - Monitored by internal NOC

SCREENSHOTS SD-WAN PORTAL



SITE HEALTHY

This site is up and running without any issues.

Overview

Performance

Configuration

Events

Bandwidth Utilization

20 %

Used capacity of the Bigleaf service package, over the last hour

Average Latency

3 ms

Round-trip from the Bigleaf network to the site over the last hour, after optimizations

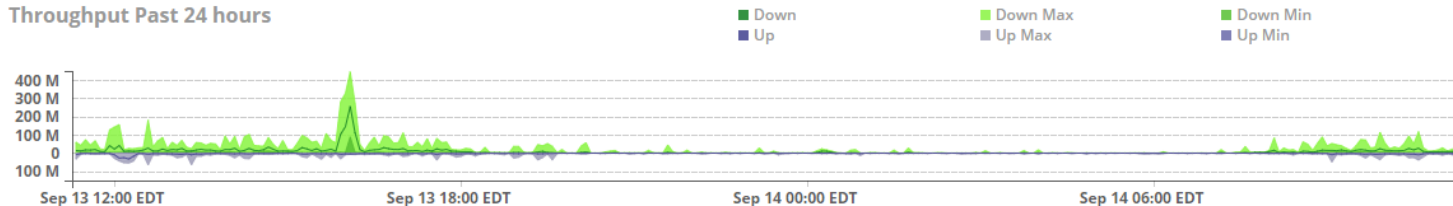
Average Packet Loss

0.00 %

Through the Bigleaf service over the last hour, after optimizations

OVERALL

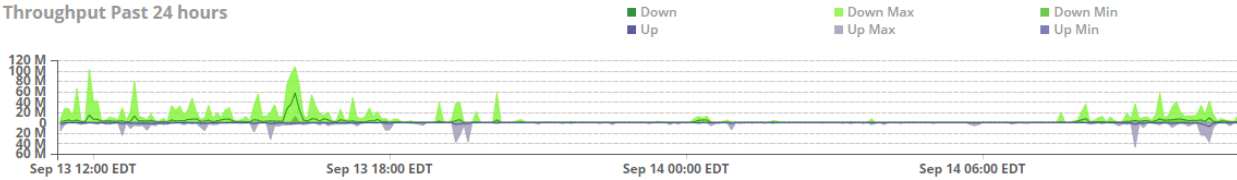
Throughput Past 24 hours



SCREENSHOTS SD-WAN PORTAL

WAN CIRCUIT 1 Comcast Fiber

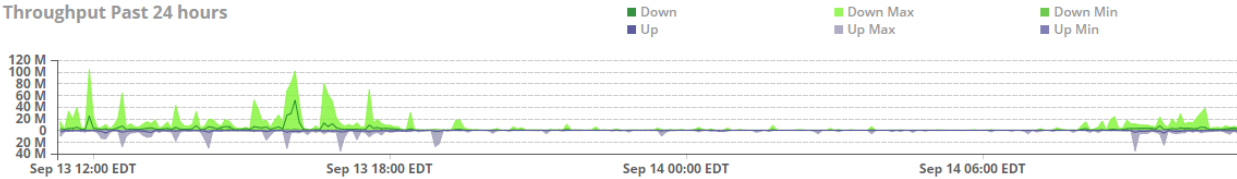
Throughput Past 24 hours



Circuit Performance ██████████ Healthy

WAN CIRCUIT 2 Birch Fiber

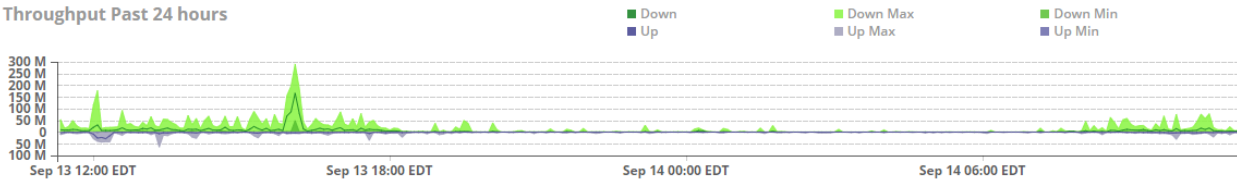
Throughput Past 24 hours



Circuit Performance ██████████ Healthy

WAN CIRCUIT 3 AT&T

Throughput Past 24 hours

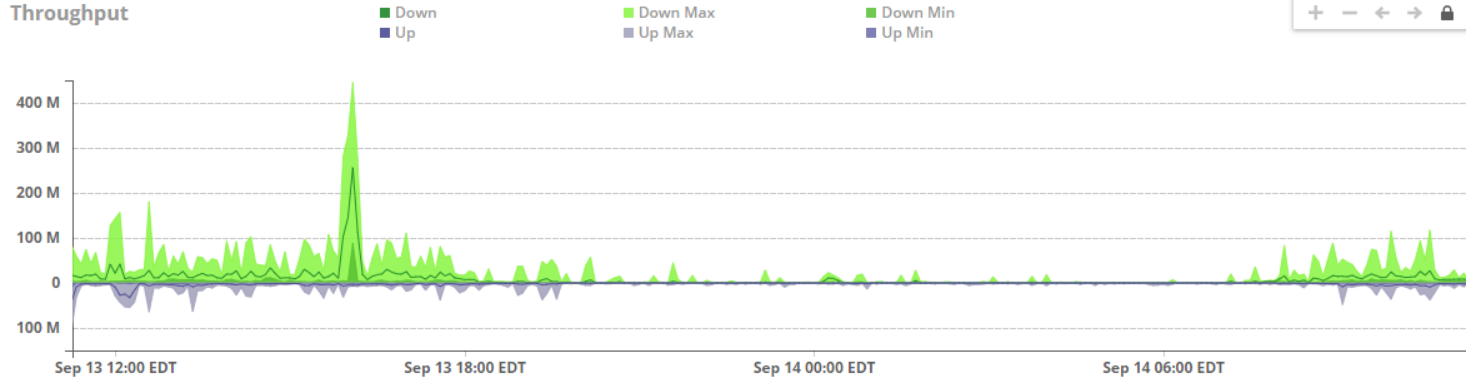


Circuit Performance ██████████ Healthy

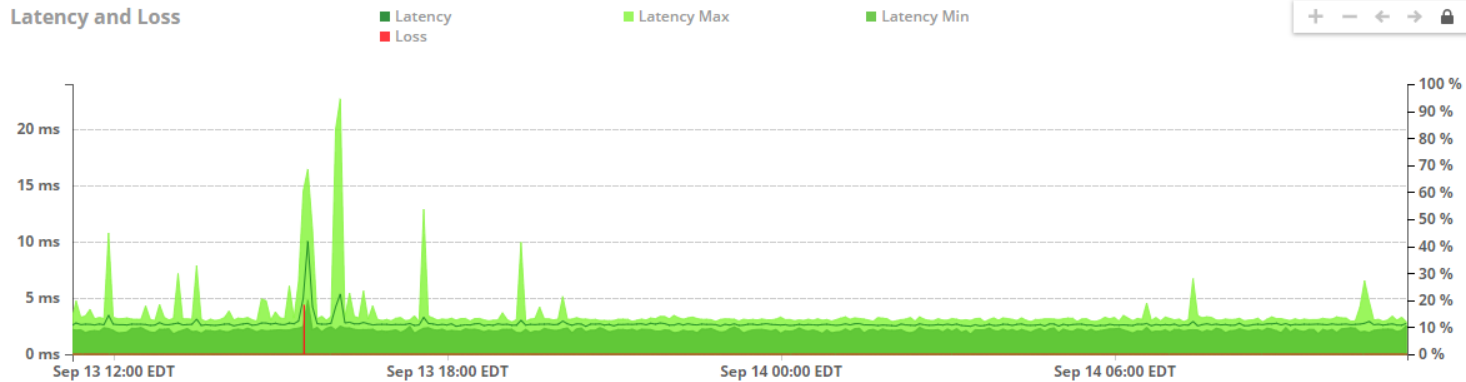
SCREENSHOTS SD-WAN PORTAL

OVERALL

Throughput



Latency and Loss



SCREENSHOTS SD-WAN PORTAL

Filter by severity level

- Error
- Warning
- Resolved
- Info

Filter by circuit

- Comcast Fiber
- Birch Fiber
- AT&T

[Expand All Alarms](#)

[Collapse All Alarms](#)

Events

Display results from **09/07/2018** to **09/14/2018**

DATE	Circuit	EVENT	SEVERITY	
Sep 13, 16:13 2018	Comcast Fiber	downlink loss alarm resolved.	RESOLVED	»
Sep 13, 16:09 2018	Comcast Fiber	downlink loss alarm resolved.	RESOLVED	»
Sep 13, 16:08 2018	Birch Fiber	downlink latency alarm resolved.	RESOLVED	»
Sep 13, 15:37 2018	Comcast Fiber	downlink latency alarm resolved.	RESOLVED	»
Sep 13, 15:35 2018	Comcast Fiber	uplink latency alarm resolved.	RESOLVED	»
Sep 13, 15:28 2018	Comcast Fiber	downlink loss alarm resolved.	RESOLVED	»
Sep 13, 15:28 2018	Comcast Fiber	uplink loss alarm resolved.	RESOLVED	»
Sep 13, 00:24 2018	Birch Fiber	downlink jitter alarm resolved.	RESOLVED	»
Sep 12, 16:33 2018	Birch Fiber	downlink latency alarm resolved.	RESOLVED	»
Sep 12, 13:59 2018	Birch Fiber	downlink latency alarm resolved.	RESOLVED	»
Sep 12, 13:10 2018	Birch Fiber	downlink jitter alarm resolved.	RESOLVED	»
Sep 12, 11:22 2018	Comcast Fiber	downlink loss alarm resolved.	RESOLVED	»
Sep 12, 11:20 2018	Birch Fiber	downlink latency alarm resolved.	RESOLVED	»

Case Study 2- Retailer installs Carrier SD-WAN

Grocery retailer with 340 sites total including stores, distribution centers, Headquarters and Data Center.

Had MPLS over T1 or EoC with 3G wireless backup. 99.99% SLA = 24 minutes of downtime average per day. Was often higher than that.

Replaced with Sprint/VeloCloud managed SD-WAN with Public Internet over cable or DSL with 4G LTE wireless backup over Cradlepoint antennas.

Better visibility into performance at each store and stores are no longer even aware when the primary circuit fails.

Was able to either increase bandwidth by an order of magnitude (5-10x) while saving \$400,000 per year on WAN.

Allowed replacement of POTS lines at stores with VoIP for additional savings of \$100/store/month = \$400,000/year additional savings.

Case Study 2- Retailer installs Carrier SD-WAN

Benefits reported by the Client:

- Applications can be prioritized down to the packet level and balanced over multiple circuits.
- More cost-effective last mile services such as cable broadband and wireless services are now a viable option
- Immediate failover capabilities using technologies like dynamic path switching offers much improved reliability.
- Increased network visibility via embedded analytic tools
- Traffic is encrypted on both public and private networks for added security
- The solution can be provisioned and deployed relatively effortlessly and quickly (45 minutes plug-n-play)

FAQ

- What is the difference between MPLS and SD-WAN?
- How does it handle QOS?
- How is SIP trunking provisioned?
- Do I get rid of my firewalls and routers?