



# VMware SD-WAN by VeloCloud

Use your WAN links in a smart way

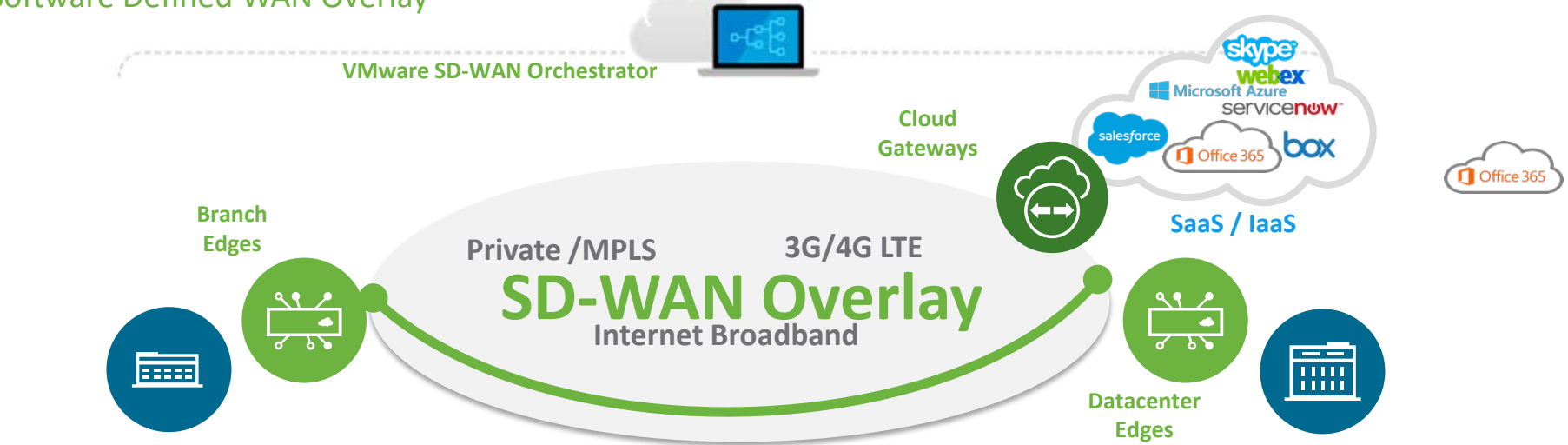
Tomáš Michaeli

Solution Architect / NSBU / VMware

Nov-2019

# VMware SD-WAN by VeloCloud Benefits

## Software Defined WAN Overlay



### Simplified WAN Management

Zero-touch deployments, simplified operations, one-click service insertion



### Assured Application Performance

Transport independent performance for the most demanding apps, leverages economical bandwidth



### Managed On-ramp to the Cloud

Direct cloud access with performance, reliability and security

# Enterprise/Over-the-Top Deployments



Hub for SD-WAN to data center including private links

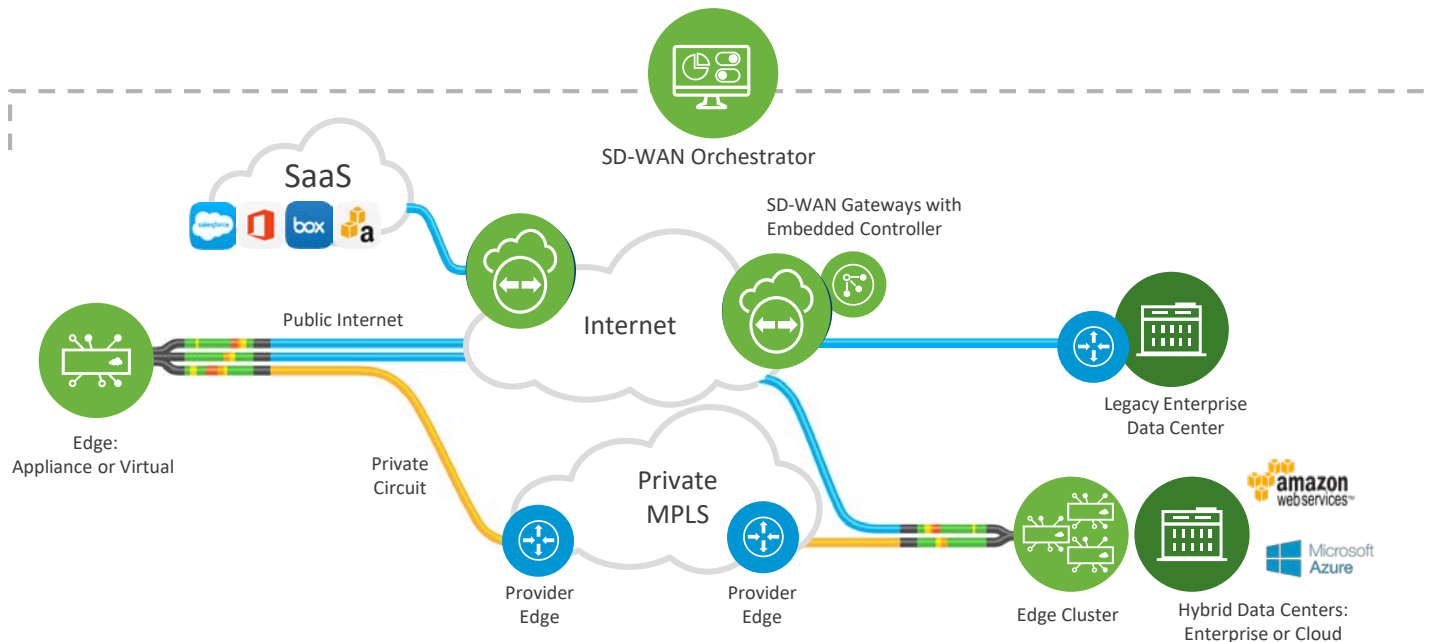


Hosted gateways for SD-WAN to SaaS/IaaS



Hub-less design for legacy data centers

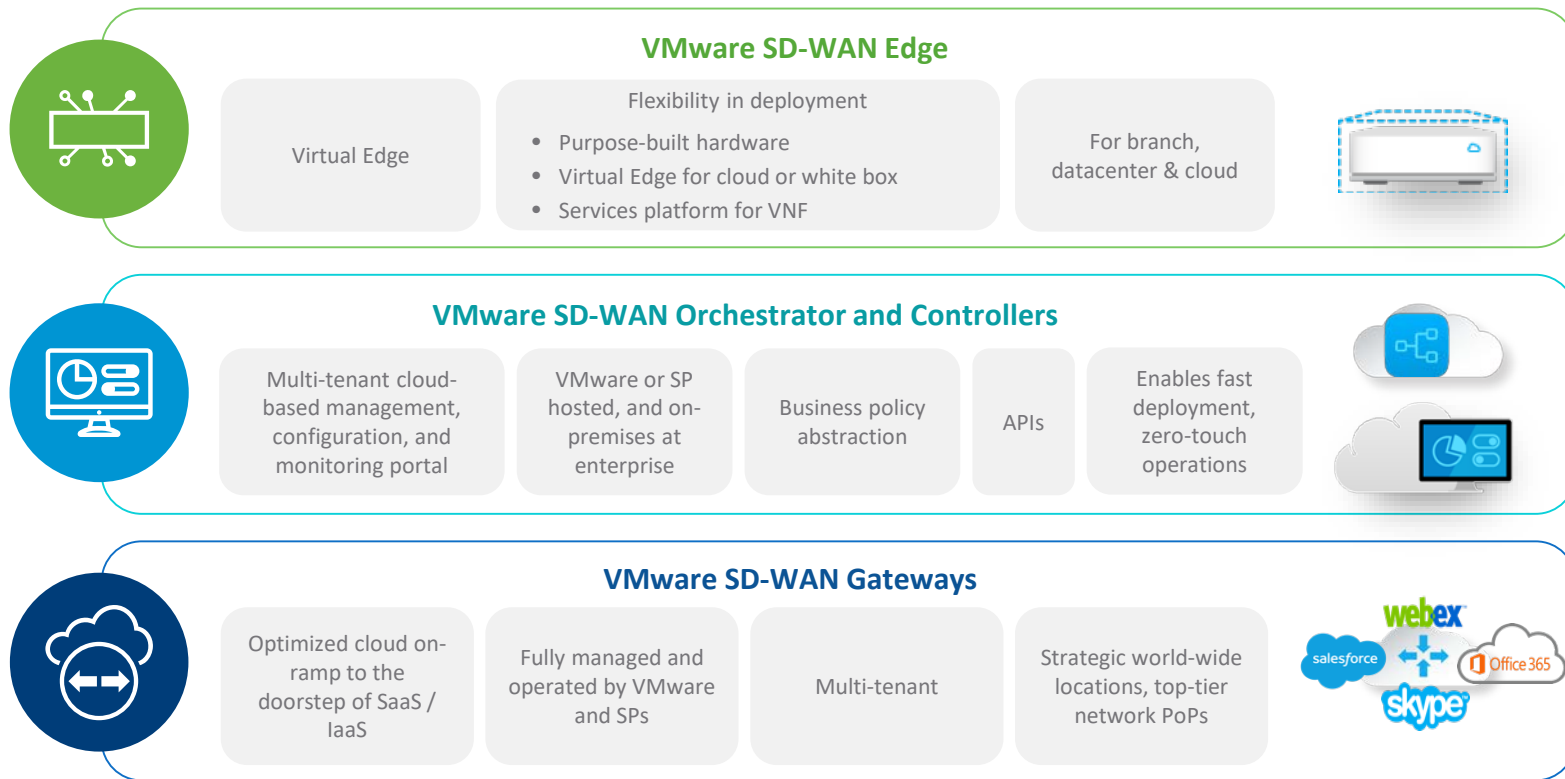
“Site to site  
SD-WAN plus benefits  
of  
cloud gateways for  
SaaS”











# Global Gateways



# Solution Components



# Multi-gigabit performance and scale

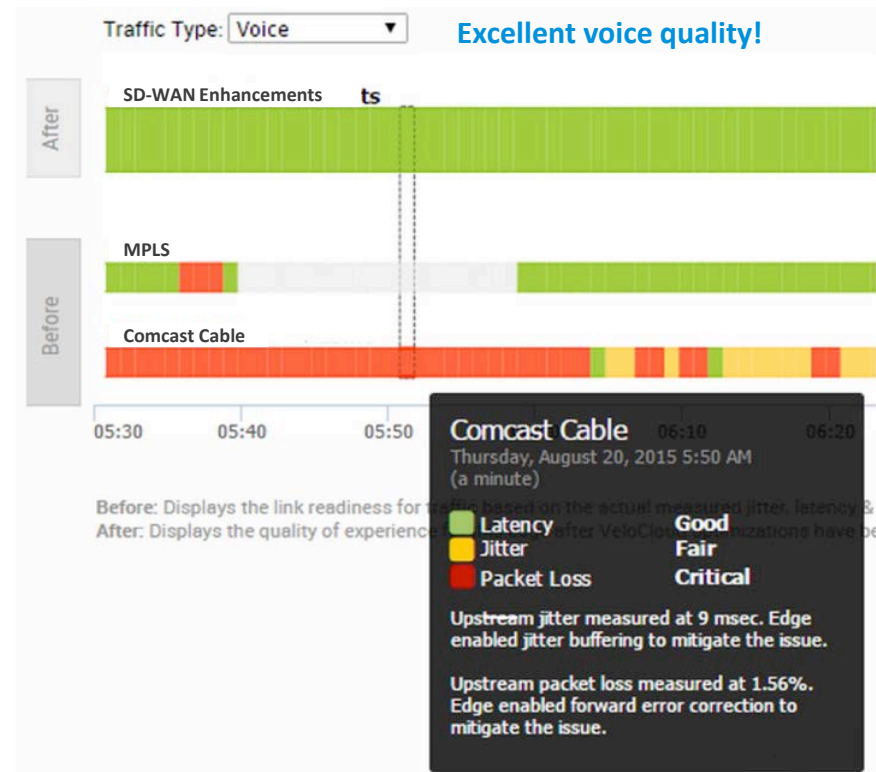
10-200 Mbps		100-1000 Mbps	200-1000 Mbps	1-10 Gbps	VNF Ready		Multi Gigabit
Edge 510	Edge 520	Edge 540	Edge 840	Edge 2000	Edge 520v	Edge 840v	Edge Cluster
4-Port GE 2-USB – LTE WiFi	10-Port GE 2-Port SFP 4-USB – LTE WiFi	10-Port GE 2-Port SFP 4-USB – LTE WiFi	6-Port GE 2-Port SFP+	6-Port GE 2-Port SFP+	10-Port GE 2-Port SFP 4-USB – LTE WiFi	6-Port GE 2-Port SFP+	
							

# Use Case 1:

## Better Application Performance

# Dynamic Multi-Path Optimization in Action

“Assured application performance over any type of link”



## Continuous Link Monitoring

- Automatic real-time link quality monitoring: Latency, Jitter, Packet Loss
- Drives automation and optimization

## Dynamic Per Packet Steering

- Sub-second steering without session drops
- Aggregated bandwidth for single flows

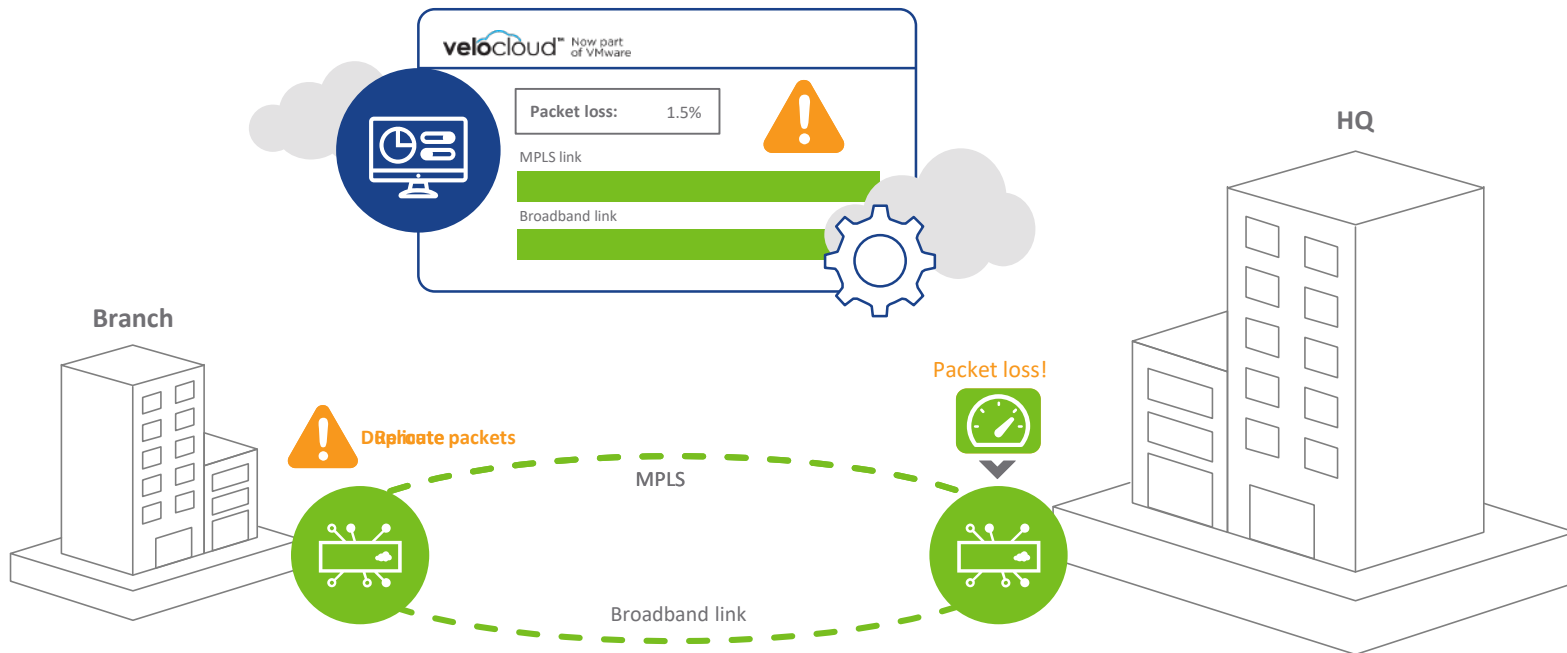
## On Demand Remediation

- Protects against concurrent degradation
- Enables single link performance



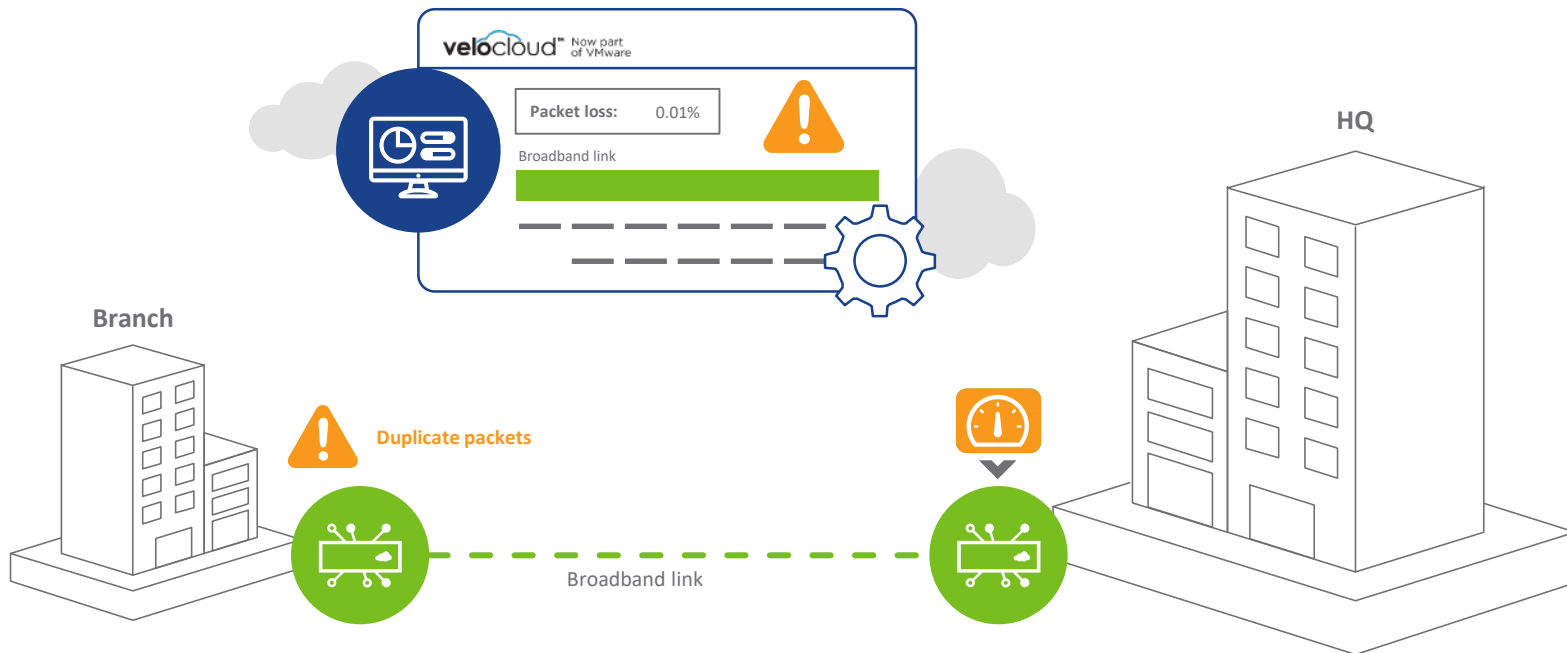
# Dynamically route and replicate data for **real-time traffic**

**Increase availability** and **reduce latency** with real-time remediation and steering



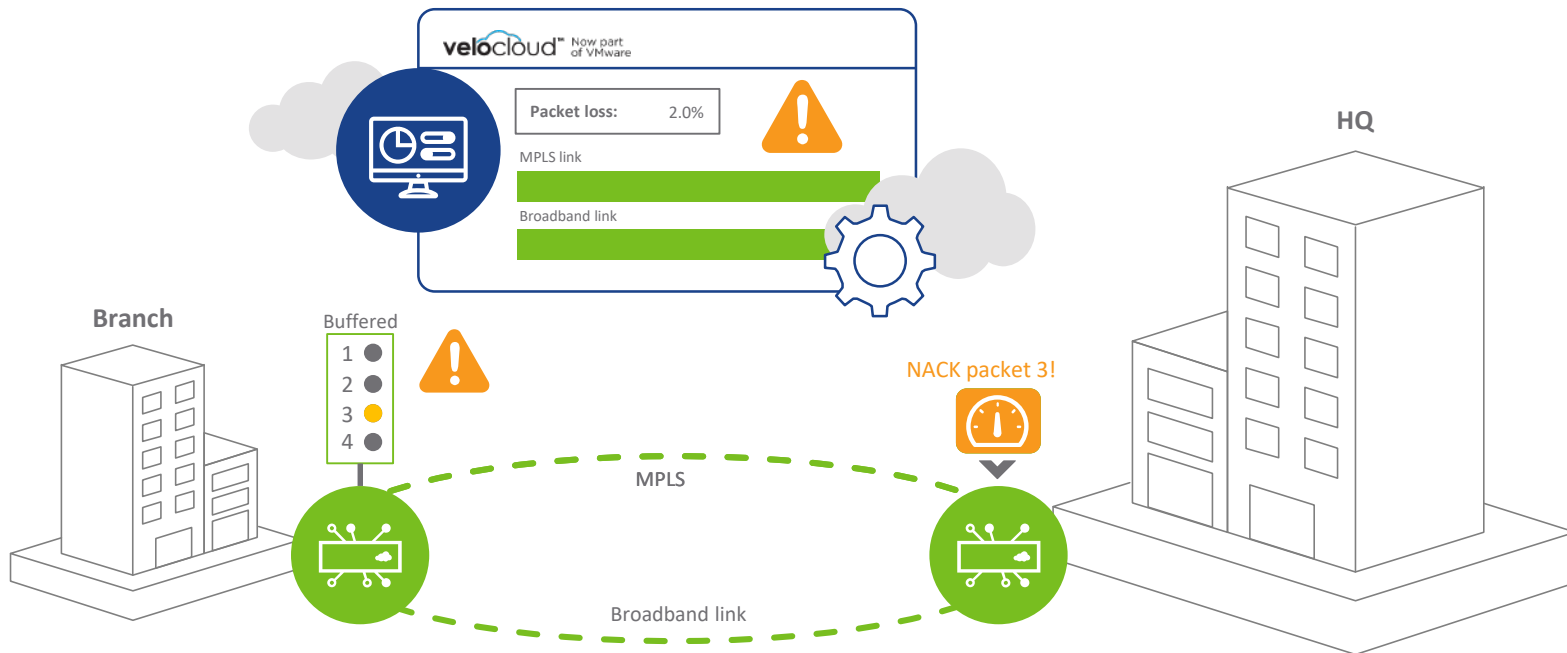
# Dynamically route and replicate data for **real-time traffic**

**Increase availability** and **reduce latency** with real-time remediation



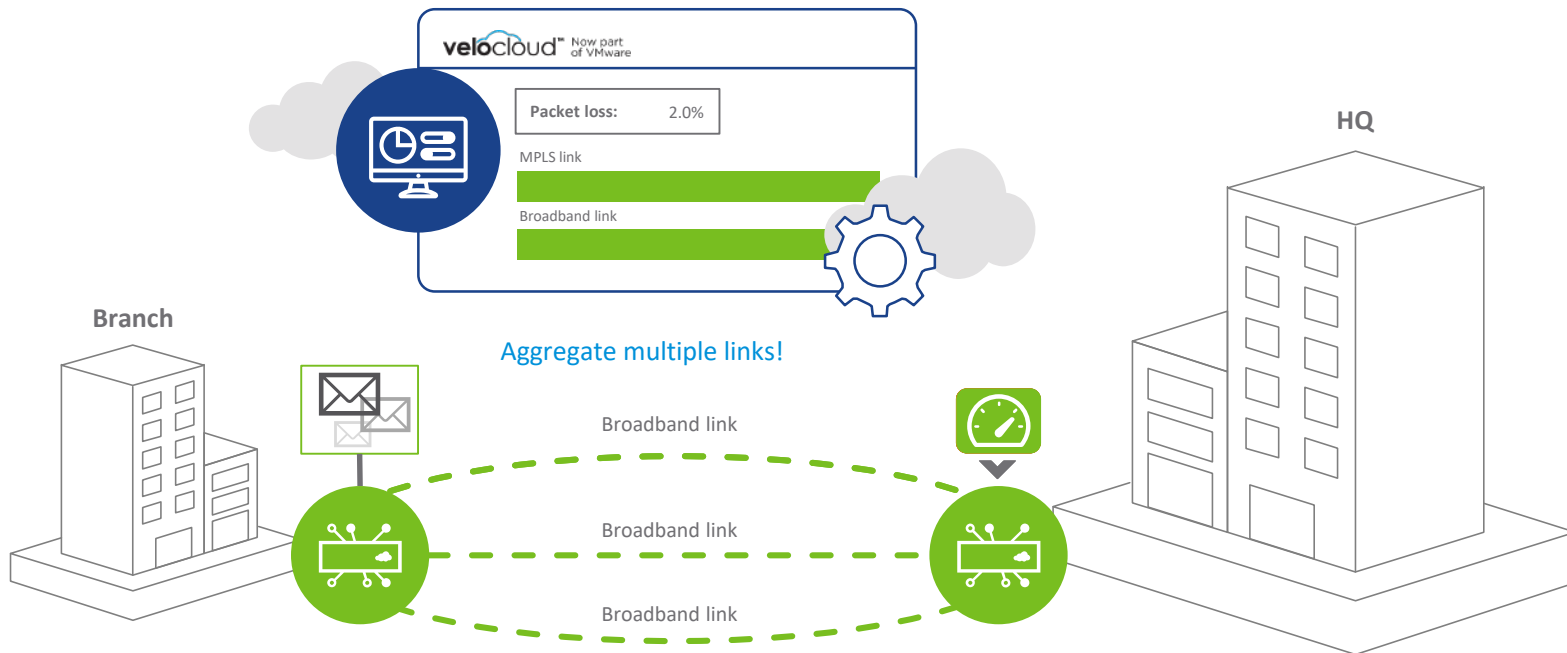
# Dynamically route and replicate data for **transactional traffic**

**Increase availability** and **reduce latency** with real-time remediation and steering



# Dynamically route and replicate data for **bulk traffic**

Increase availability and reduce latency with real-time remediation and steering



## Use Case 2: Multitenancy and Segmentation

# End to end security and segmentation

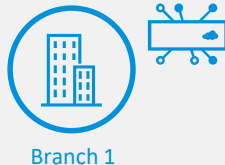
## End to end services, analytics and policy

VeloCloud Orchestrator and Controller

Data Center

■ Corp-HR  
10.1.0.0/24

■ Voice  
10.1.0.0/24



Branch 1

■ Corp-HR  
10.2.0.0/24

■ Corp-MKT  
10.2.0.0/24

■ Voice  
10.2.0.0/24



Branch 2

■ Corp-MKT  
10.3.0.0/24

■ PCI  
10.3.0.0/24

■ Guest  
10.4.0.0/24



Retail 1

VeloCloud  
Edge

NSX routing domain  
Corp-HR



HRIS Payroll

NSX routing domain  
Corp-MKT



CRM Analyst

NSX routing domain  
PCI



PCI Network

VMware NSX  
VMware ESXi

### Roadmap

SD-WAN  
analytics

VMware vRealize  
Network Insight  
& Ecosystem

Policy  
automation  
via API

NSX Manager  
- Security policies

Simple enterprise-wide segment creation

Segment-aware topology

Isolation & overlapping IP

Segment-aware policies

On-premises and cloud

# Outcome Driven Segmentation

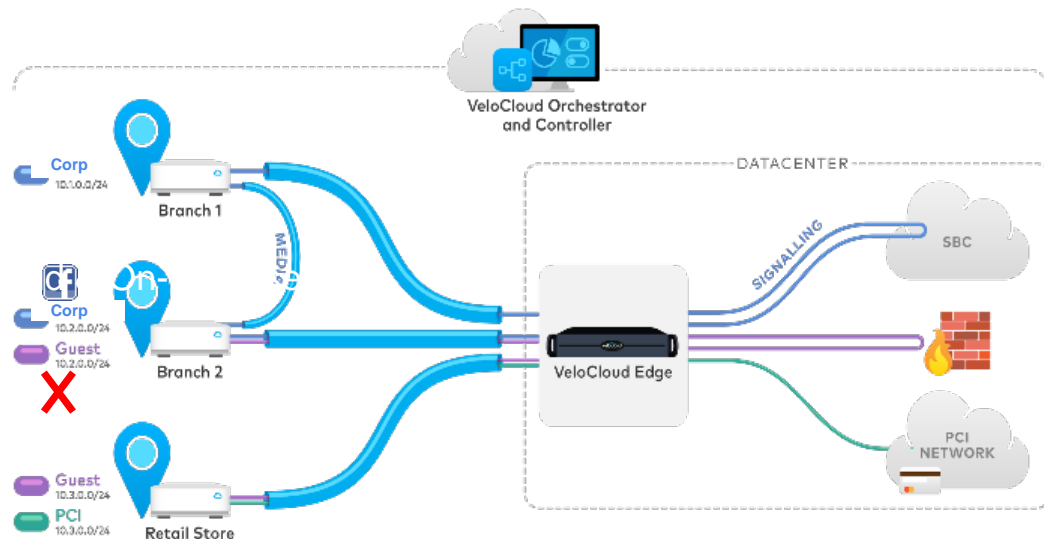
Simple enterprise wide segment creation

Segment Aware Topology

Isolation & Overlapping IP

Segment Aware Policies

On-Premises and Cloud



# PCI DSS 3.2 Certified SD-WAN

## AOC\* Summary

PCI DSS Requirement	Description of Requirement	Compliant to PCI DSS Requirements (Select One)	
		YES	NO
1	Install and maintain a firewall configuration to protect cardholder data	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Do not use vendor-supplied defaults for system passwords and other security parameters	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Protect stored cardholder data	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Encrypt transmission of cardholder data across open, public networks	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	Protect all systems against malware and regularly update anti-virus software or programs	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	Develop and maintain secure systems and applications	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7	Restrict access to cardholder data by business need to know	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8	Identify and authenticate access to system components	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9	Restrict physical access to cardholder data	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10	Track and monitor all access to network resources and cardholder data	<input checked="" type="checkbox"/>	<input type="checkbox"/>
11	Regularly test security systems and processes	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12	Maintain a policy that addresses information security for all personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Appendix A1	Additional PCI DSS Requirements for Shared Hosting Providers	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Appendix A2	Additional PCI DSS Requirements for Entities using SSL/early TLS	<input checked="" type="checkbox"/>	<input type="checkbox"/>



Validated on: November 13, 2017  
Security Standards: PCI DSS v3.2

Validated Certificate affirms that Coalfire has completed a full assessment, documented our findings and signed off on the audit report, in accordance with industry best practices.



### Orchestration

- Multi-tenant
- TLS 1.2
- Role-based access control / Radius
- 2-Factor authentication
- Event and firewall logs / APIS
- Built-in certification server

### Data Plane

- IPsec with AES 256
- PKI
- Local access control
- Segmentation for hosted controller



# Multitenant CPE Software

## Store-in-Store / Multiple Tenants

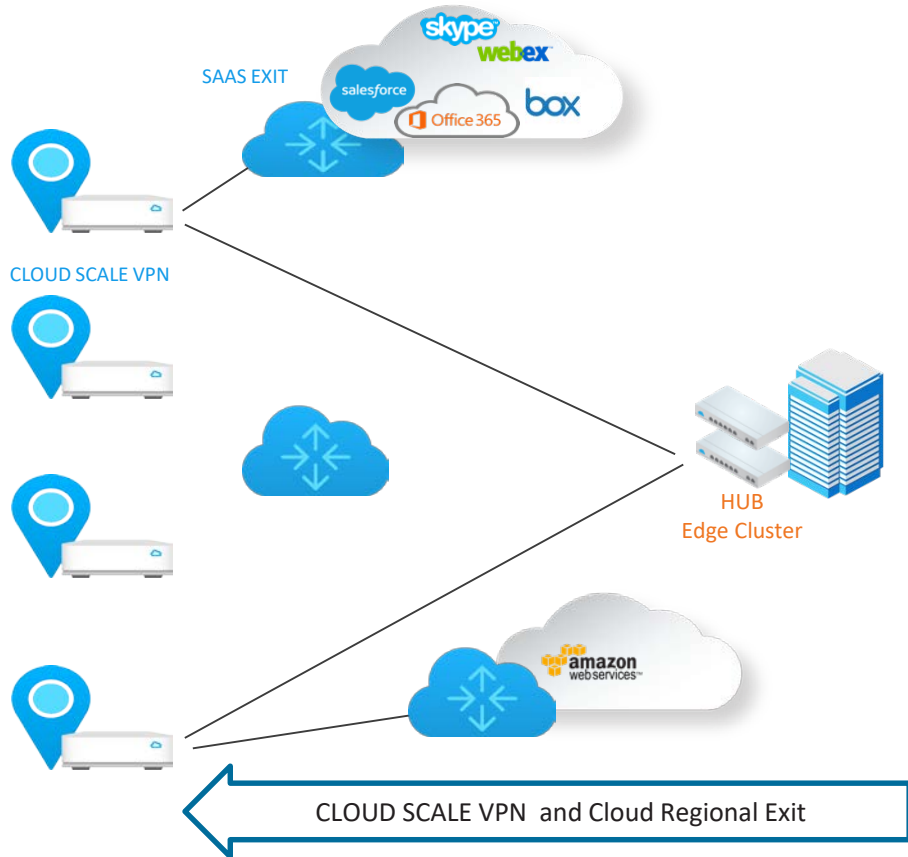
- Per tenant management portal view
- Per tenant QoS and Dynamic Multipath Optimization
- Overlay Bandwidth Cap

	HIGH	NORMAL	LOW
REAL-TIME	35	15	1
TRANSACTIONAL	20	7	1
BULK	15	5	1



## Use Case 3: Connecting to Cloud

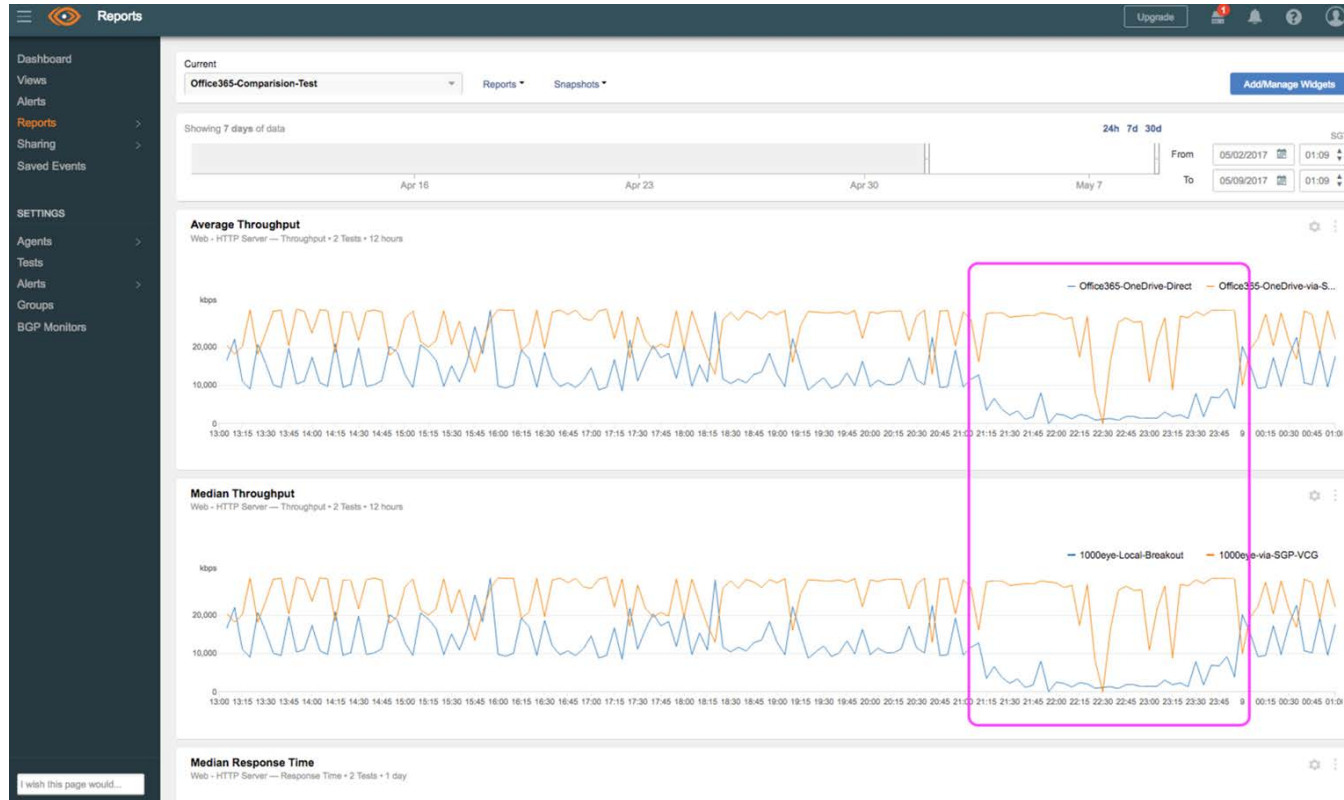
# Cloud Scale VPN



- Enables both simple and secure access with integrated PKI
- Enterprise-Wide and Cloud
- Automated VPN to 3<sup>rd</sup> party cloud applications
- Virtual VeloCloud Edge automates VPN to IaaS
- Scalable any-any connectivity
- Dynamic branch-branch tunnels
- One-click enablement

# Optimized Performance for Cloud Apps – Office 365

- O365 on a Single Link (Brownout condition) from Branch in Thailand to Gateway in Singapore



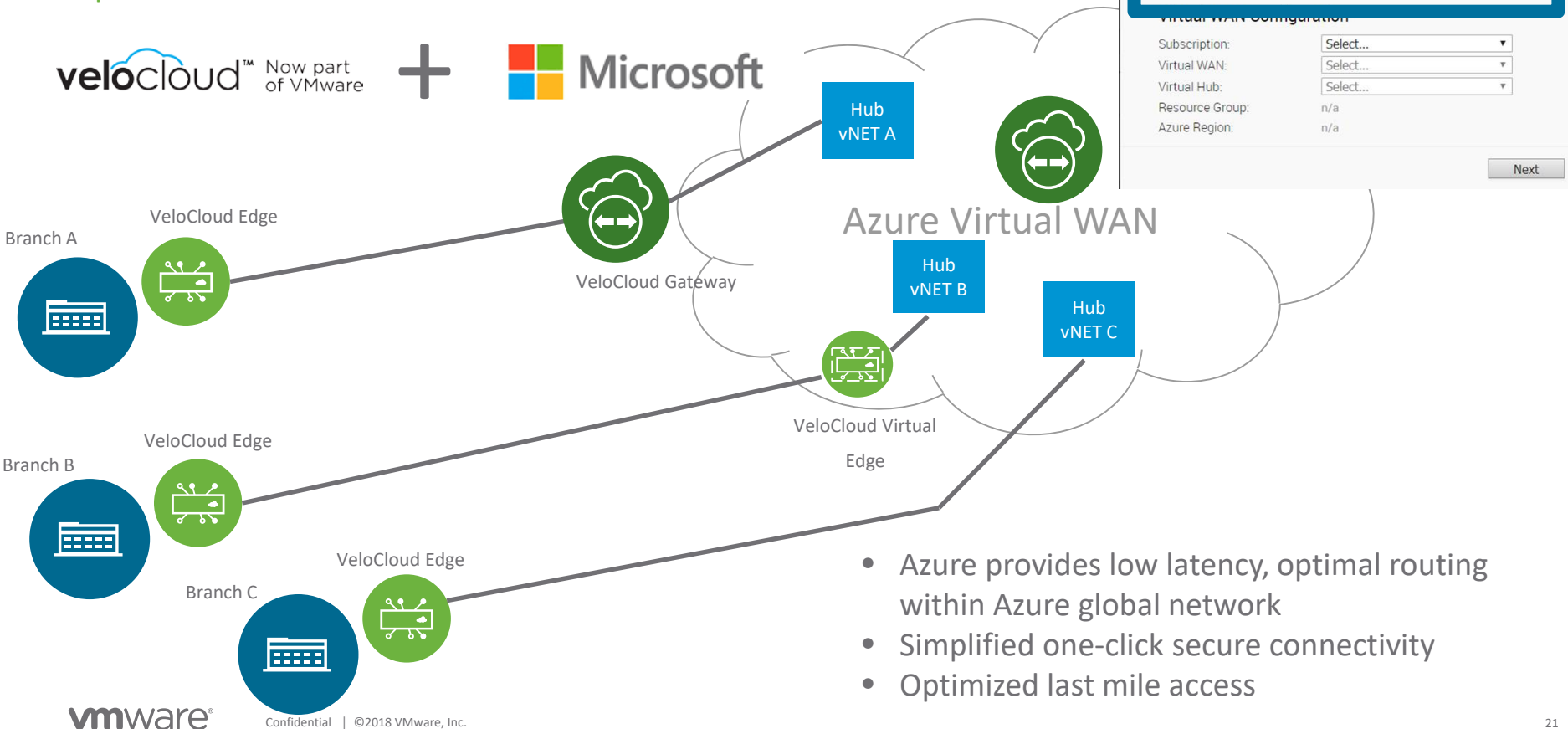
VeloCloud

Non-SDWAN

# On-Ramp to Azure Virtual WAN

Sept 2018 Announcement

velocloud™ Now part of VMware



- Azure provides low latency, optimal routing within Azure global network
- Simplified one-click secure connectivity
- Optimized last mile access

## Use Case 4: Simplified Operations

## Transactional

Link Steering: **Auto** **Transport Group** Interface WAN Link ⓘ

Transport Group: **Public Wired** ⌵

☐ Mandatory  
☒ Preferred  
☐ Available

☒ **Error Correct Before Steering** ⓘ

Loss (%): **4.00**

Inner Packet DSCP Tag: **Leave as is** ⌵

Outer Packet DSCP Tag: **0 - CS0/DF** ⌵

NAT: **Disabled** Enabled ⓘ

Service Class: **Real Time** **Transactional** Bulk

## Real Time

Link Steering: **Auto** **Transport Group** Interface WAN Link ⓘ

Transport Group: **Public Wired** ⌵

☐ Mandatory  
☒ Preferred  
☐ Available

☒ **Error Correct Before Steering** ⓘ

Loss (%): **2.00**

Jitter (ms): **15**

Inner Packet DSCP Tag: **Leave as is** ⌵

Outer Packet DSCP Tag: **0 - CS0/DF** ⌵

NAT: **Disabled** Enabled ⓘ

Service Class: **Real Time** Transactional Bulk

Available for link selection = preferred and service class = Real Time or Transactional

# One-Click VPN Deployment

Cloud VPN On

Edge to Non-VeloCloud Site

Enable: ☒

AWS West VPC

Edge to VeloCloud Hubs

Enable: ☒

Select VeloCloud Hubs...

VeloCloud Hubs	E2E	Backhaul
San Jose Hub	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
New York Hub	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Chicago Hub	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Edge to Edge VPN

Enable: ☒

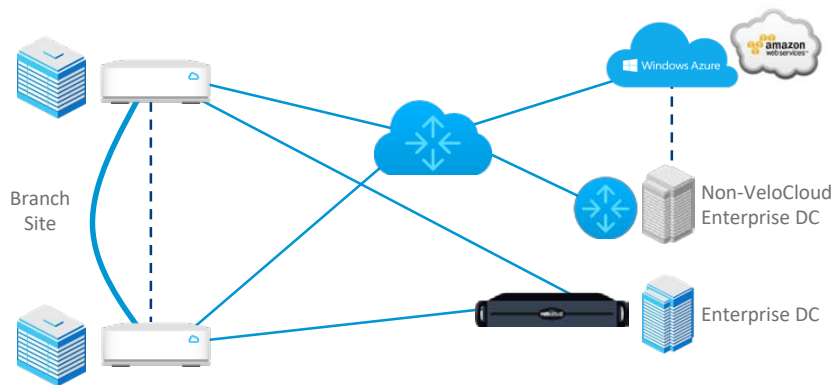
Use Cloud Gateways: ☐

Use VeloCloud Hubs for VPN ☒

Select Hubs...

Edge	order
San Jose Hub	1
Chicago Hub	2
New York Hub	3

Dynamic E2E VPN: ☒

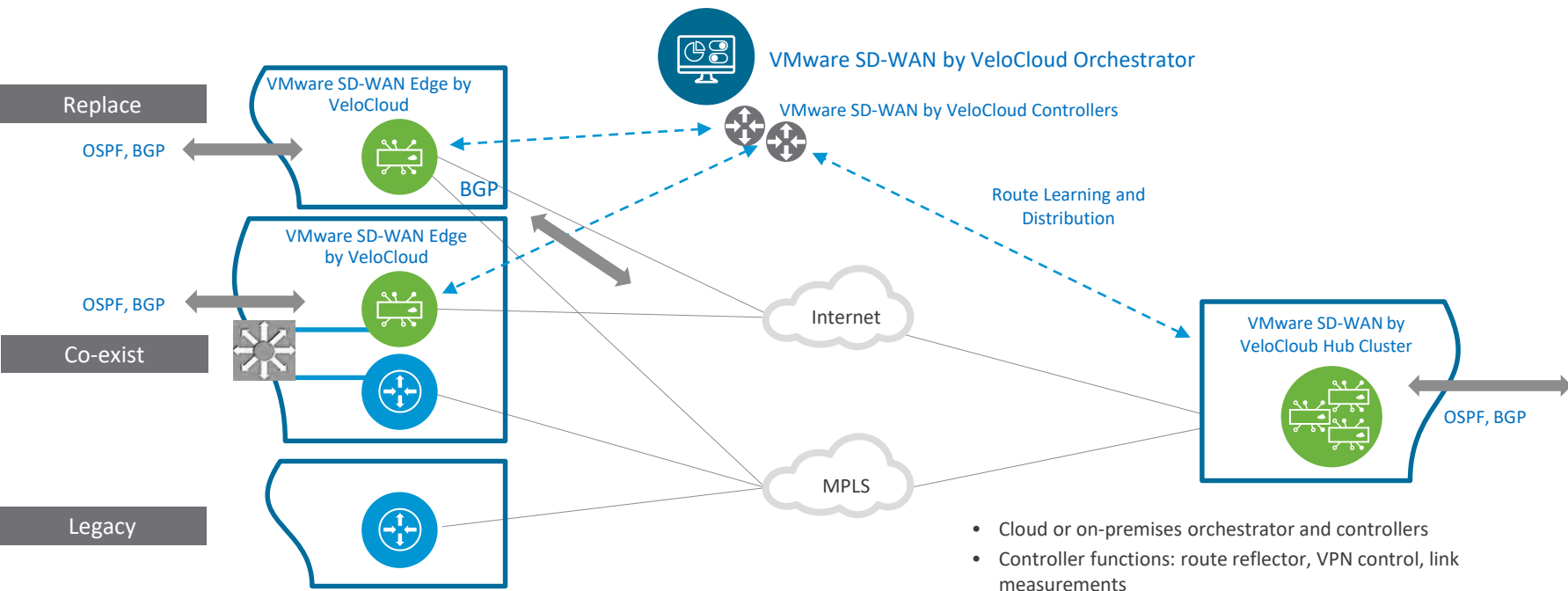


## Automatic VPN setup

- To enterprise DC hub with dynamic branch to branch
- Eliminates N x N manual tunnels to cloud with cloud gateway aggregation
- Interoperable IPsec for no touch legacy DC
- End-to-end encryption

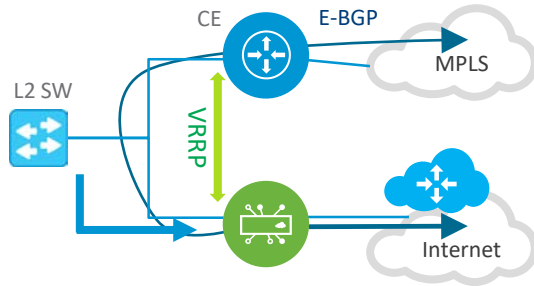


# Incremental and Interoperable SD-WAN Rollouts



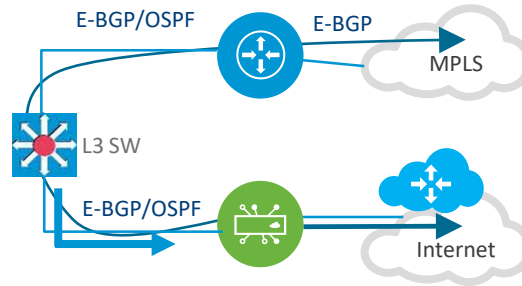
# Branch Deployment Options

## Co-exist (L2)



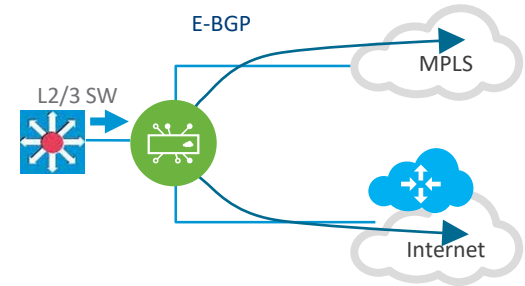
- Use VRRP to make VCE the default gateway when it is up
- Provide failover/redundancy with existing CE

## Co-exist (L3)



- Use routing protocol (OSPF or BGP) to direct traffic to the VCE when it is up
- Provide failover/redundancy with existing CE

## CPE Replacement



- VCE is the default gateway for the branch traffic
- Deploy VCE in HA pair to meet the redundancy/availability requirement

# ROI of SD-WAN

## WAN Simplification

### Key Features

- ✓ Zero IT touch deployment
- ✓ Outcome driven policies
- ✓ Remote management, visibility and troubleshooting

### ROI Opportunities

- Reduce on-site IT visits, accelerate deployment
- Minimize configuration and troubleshooting time
- Enables use of optimal ISP by site

## Assured Application Performance

- ✓ Transport independent performance
- ✓ Sub-second brownout protection via mid flow steering & remediation

- Increase utilization of circuits
- Eliminate redundant / dedicated circuits
- Enables use of economical broadband
- Savings with “over the top” services eg VOIP

## Architecture for the Cloud

- ✓ Distributed cloud gateways-as-a-service
- ✓ Virtual Edges for public cloud

- Reduced capex and opex for access to SaaS and hybrid cloud
- Reduced redundancy & disaster recovery costs

## Flexible Services Platform

- ✓ VNF ready SD-WAN platform
- ✓ SD-WAN as VNF for vCPEs
- ✓ Distributed services insertion
- ✓ Automatic segmentation, VPN

- Fewer truck rolls and capex
- Reduced hardware warranty and spares
- Eliminate per branch security expenses
- Reduced audit & compliance expenses

# International Financial Services Provider: Allianz



2500 Locations in France

The company provides insurance and financial services in France and internationally



## Before Cloud-Delivered SD-WAN

- Agents complaining on availability of the network
- No high availability no resilience

## With Cloud-Delivered SD-WAN

- Better employee satisfaction and no calls to IT
- Better application performance
- High-bandwidth availability

## Competitive Advantage Outcome

- Increased revenue from expanded services and consistent uptime

# Business Insurance: Simply Business



425,000 customers



QoS for Call Centre



Expensive MPLS

Exceptional QoS expected for call center experience; Cloud application support

UC

Cloud

**SB** Simply  
Business

## Before Cloud-Delivered SD-WAN

- Poor voice quality
- Slow network connections
- Lack of network visibility, management, and control
- Inability to expand to new sites quickly and easily

## With Cloud-Delivered SD-WAN

- Easy and simple network configuration and management
- Implement change network-wide through a single profile
- Optimized bandwidth and QoS

## Competitive Advantage Outcome

- Serve more customers faster, easier, and with exceptional voice and data connections

# “VMware Named as a Leader in the Gartner Magic Quadrant for WAN Edge.” - Gartner

## Magic Quadrant

Figure 1. Magic Quadrant for WAN Edge Infrastructure



Source: Gartner (October 2018)

Positioned  
Furthest on  
Completeness  
of Vision  
Leader in the  
Ability to  
Execute



# Thank You