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Cloud-Ready WAN with Cisco Next-Gen SD-WAN

for SaaS & IaaS

Chandra Balaji Rajaram
Hamzah Kardame

BRKCRS-2113

cisco Live!
Barcelona | January 27-31, 2020

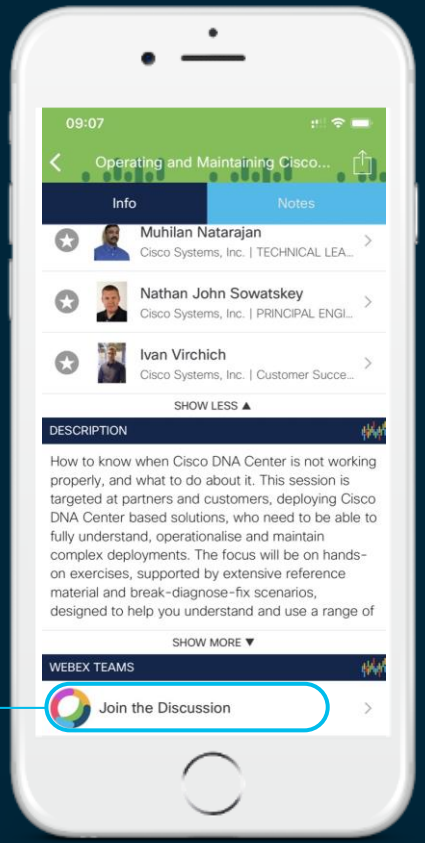
Cisco Webex Teams

Questions?

Use Cisco Webex Teams to chat with the speaker after the session

How

1. Find this session in the Cisco Events Mobile App
2. Click “Join the Discussion”
3. Install Webex Teams or go directly to the team space
4. Enter messages/questions in the team space



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Agenda

- Introduction
- SaaS Adoption & Challenges
- Optimize SaaS with SD-WAN Cloud onRamp
- Securing Cloud onRamp for SaaS
- Cloud onRamp for IaaS – Value Proposition
- Multicloud Designs
- Demo
- Conclusion

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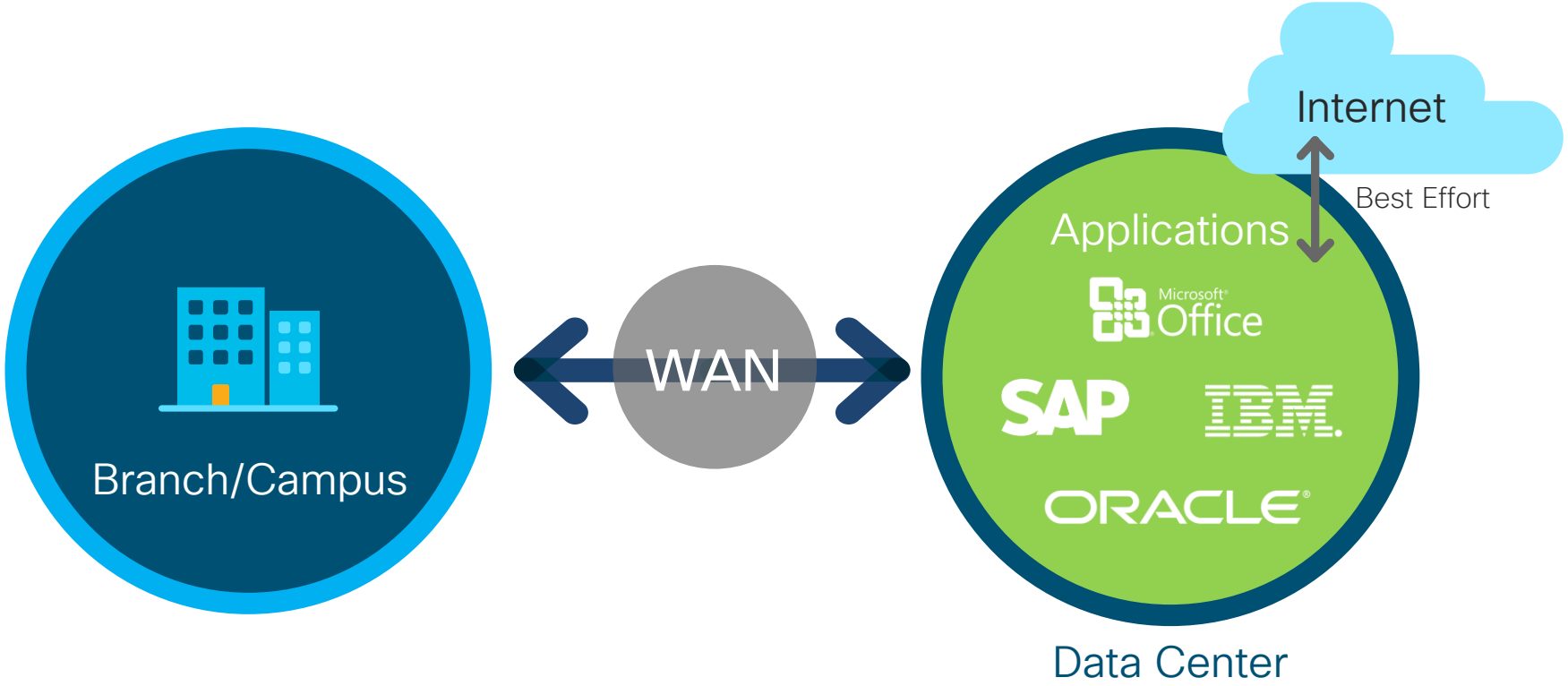
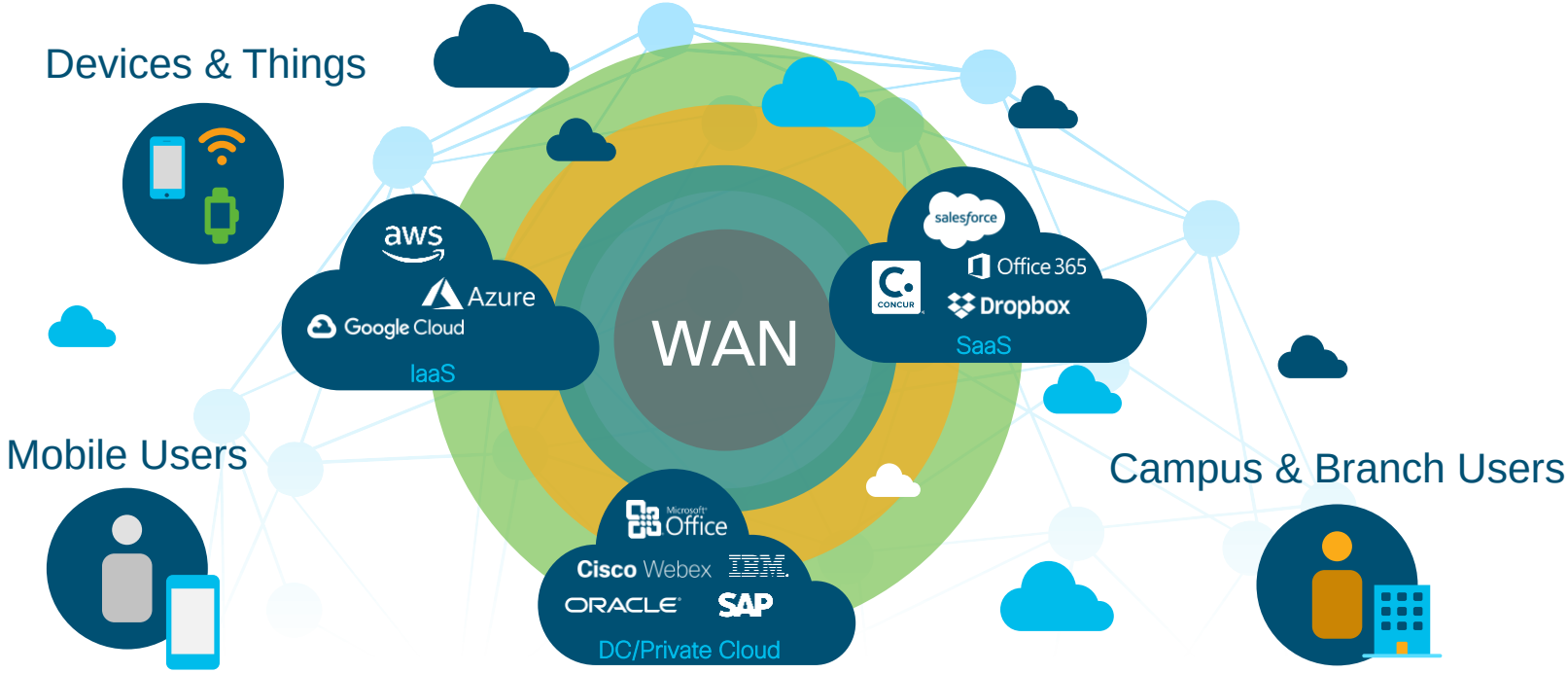
Setting the Stage

Connecting Users to Data Center was the Priority

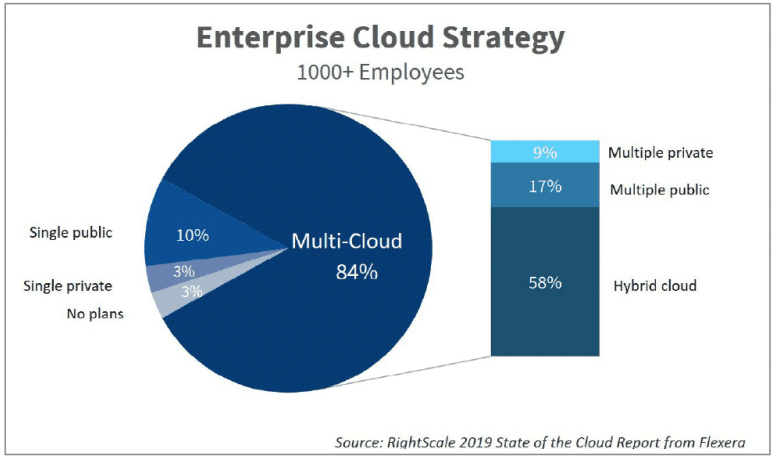


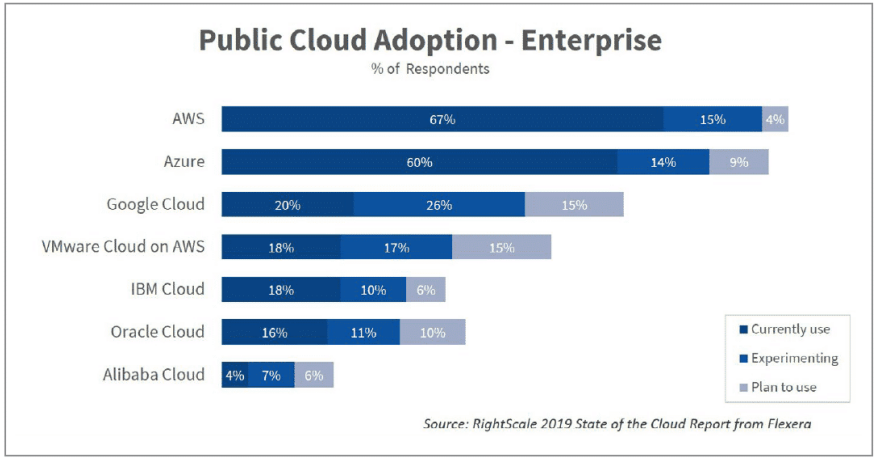
Then the Way We Worked Changed

Now...It's a Multicloud World



Enterprise Multi-Cloud Strategy





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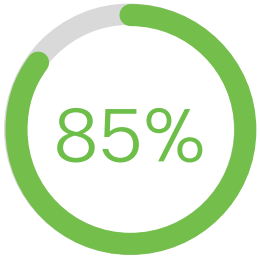
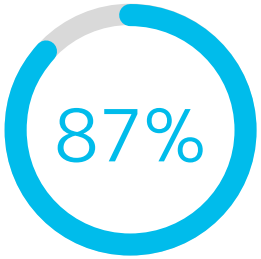
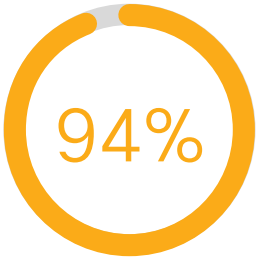
It’s a multicloud world



Evaluating or using public cloud



Taken steps towards a hybrid cloud strategy



Plan to use multiple clouds

Among cloud users

Source: IDC CloudView, April, 2017, n=8,293 worldwide respondents, weighted by country, company size and industry

SaaS Challenges

SaaS Adoption & Key Challenges

SaaS Adoption

SaaS adoption in enterprise is growing at higher than expected rate

SaaS adoption has grown by 29% in 2019

Security

Enterprise customers highlighted security as a top roadblock for SaaS adoption

30% of enterprise customers

Performance

Enterprise customers highlighted application performance & latency as second roadblock for SaaS adoption

25% of enterprise customers

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How are customers accessing SaaS today

No DIA

Users have to back-haul for internet access

Single DIA

SaaS applications can take the DIA path from branch

Dual DIA

Dual DIA paths for SaaS, providing additional bandwidth and availability

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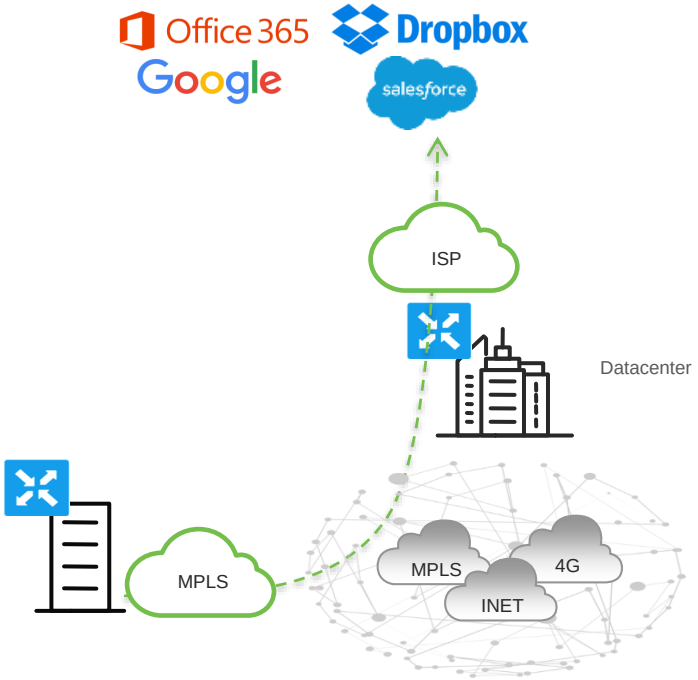
Optimize SaaS with No DIA



SD-WAN leverages best path for SaaS cloud from branch to DC

- Loss
- Jitter
- Delay

Sub-optimal to address performance issues from DC to SaaS cloud

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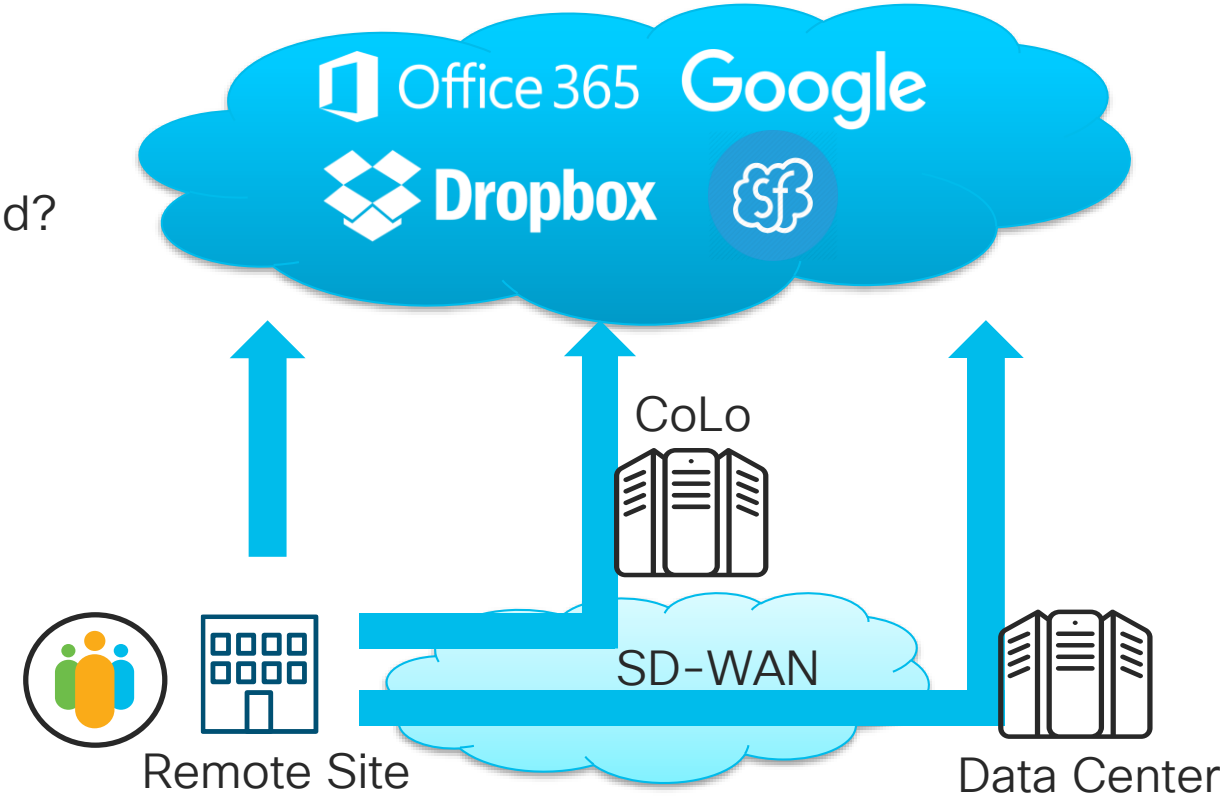
Cloud onRamp for SaaS

Evolutionary SaaS Cloud Adoption with SD-WAN

Problems:

- Which way is cloud?
- Performance?
- Security?



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Cloud onRamp for SaaS

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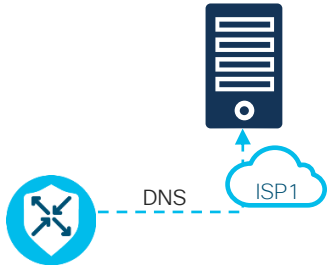
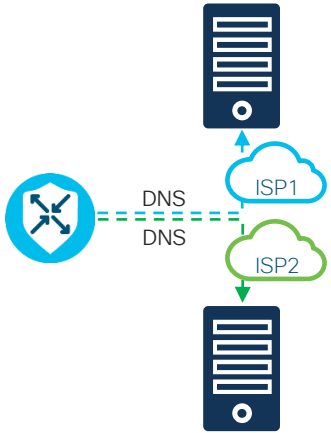
How does it work?

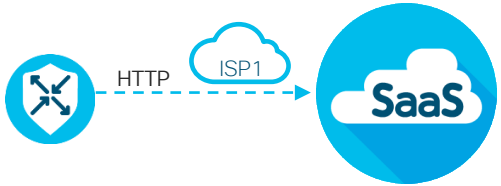
Configured WAN Edge router uses DNS address defined in VPN0 to send a DNS request for pre-configured SaaS application



HTTP ping packets are sent to probe (loss/latency) SaaS performance across all Internet egress points. A Quality of Experience score is then calculated



DNS requests are duplicated across all available Internet egress points or Gateway sites



	ISP	Score
✓	1	10
	2	8

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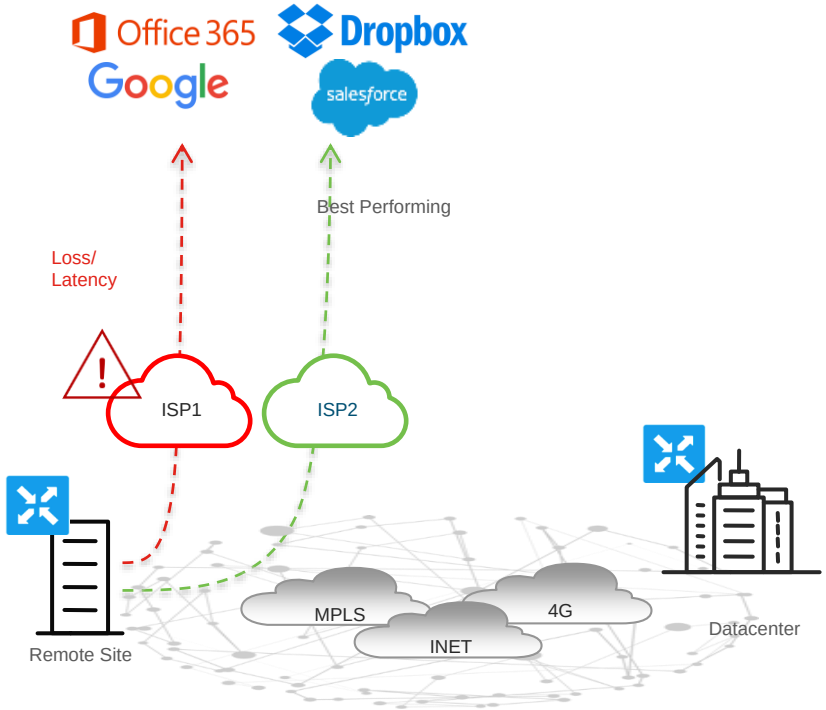
Optimize SaaS with Cloud onRamp

Dual DIA



- Monitors the SD-WAN Edge to SaaS performance on both the DIA paths
- Picks the best performing path based on the performance metrics (loss & delay)

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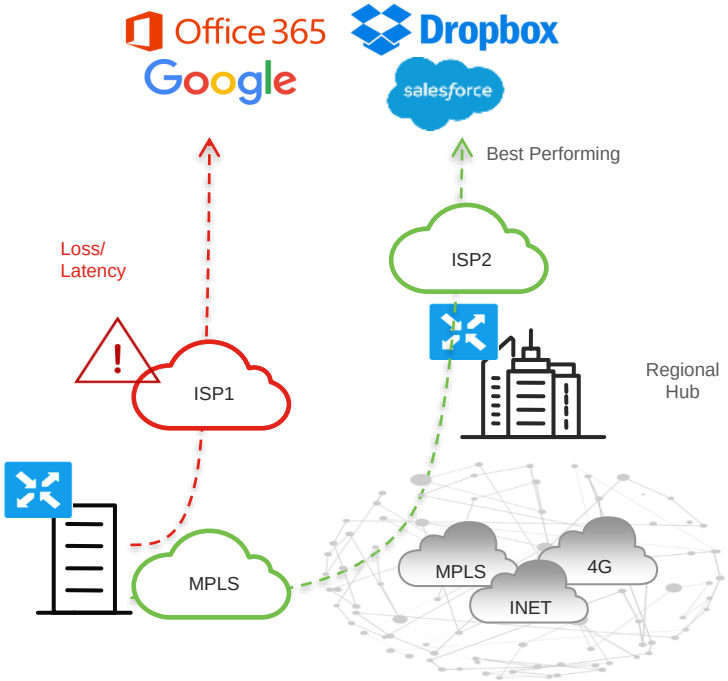
Optimize SaaS with Cloud onRamp

Single DIA



- One of the recommended designs, for SaaS deployments
- Continuously monitors the SD-WAN Edge to SaaS performance on both DIA path and the back-haul path
- Picks the best performing based on the performance metrics (loss & delay)

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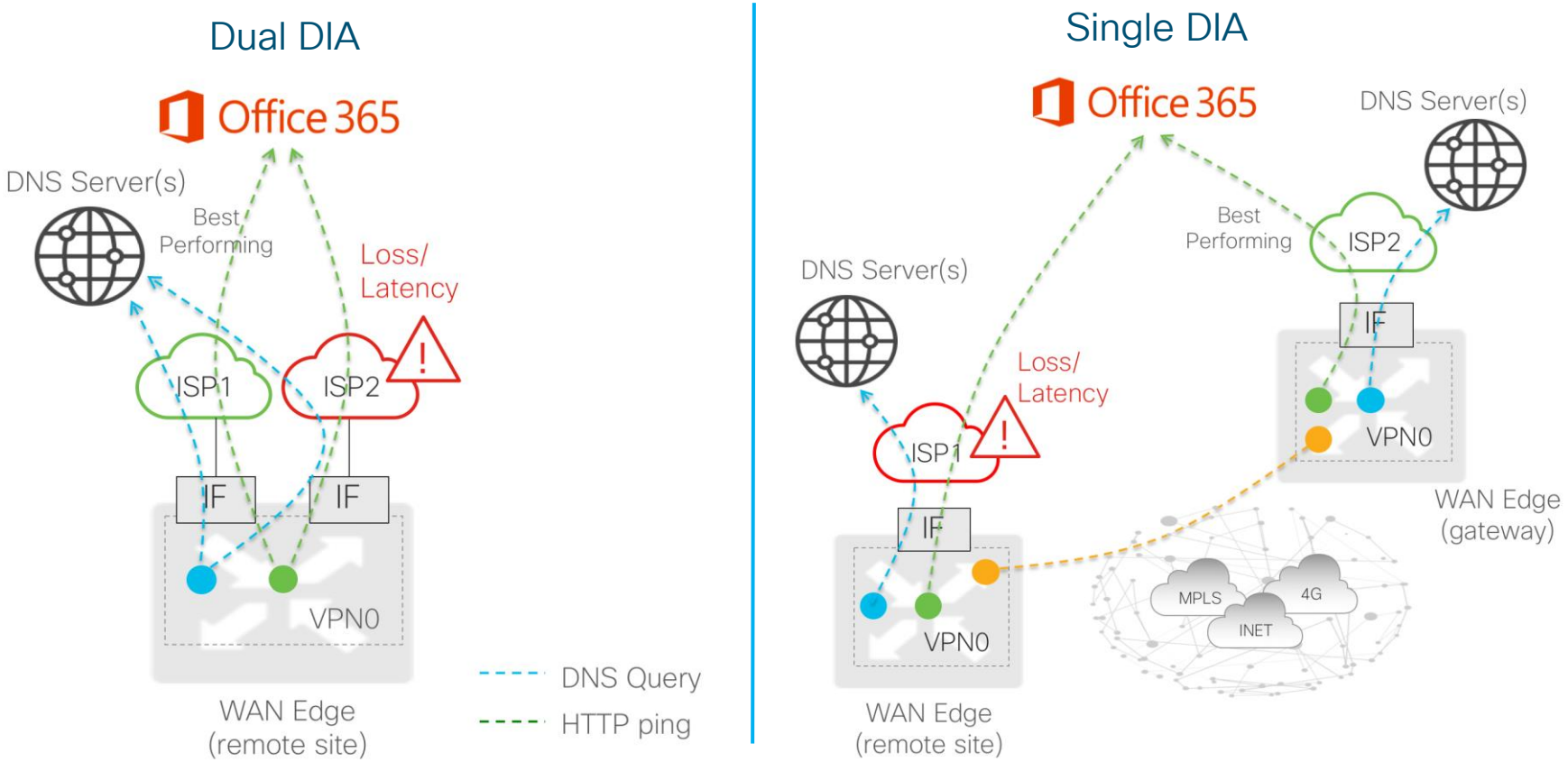
Quality Probing



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vQoE Scores

Dual DIA

App	Path	Score
O365	ISP1 (DIA)	10
O365	ISP2 (DIA)	8

Single DIA

App	Path	Score
O365	ISP1 (DIA)	9
O365	Via Gateway	4

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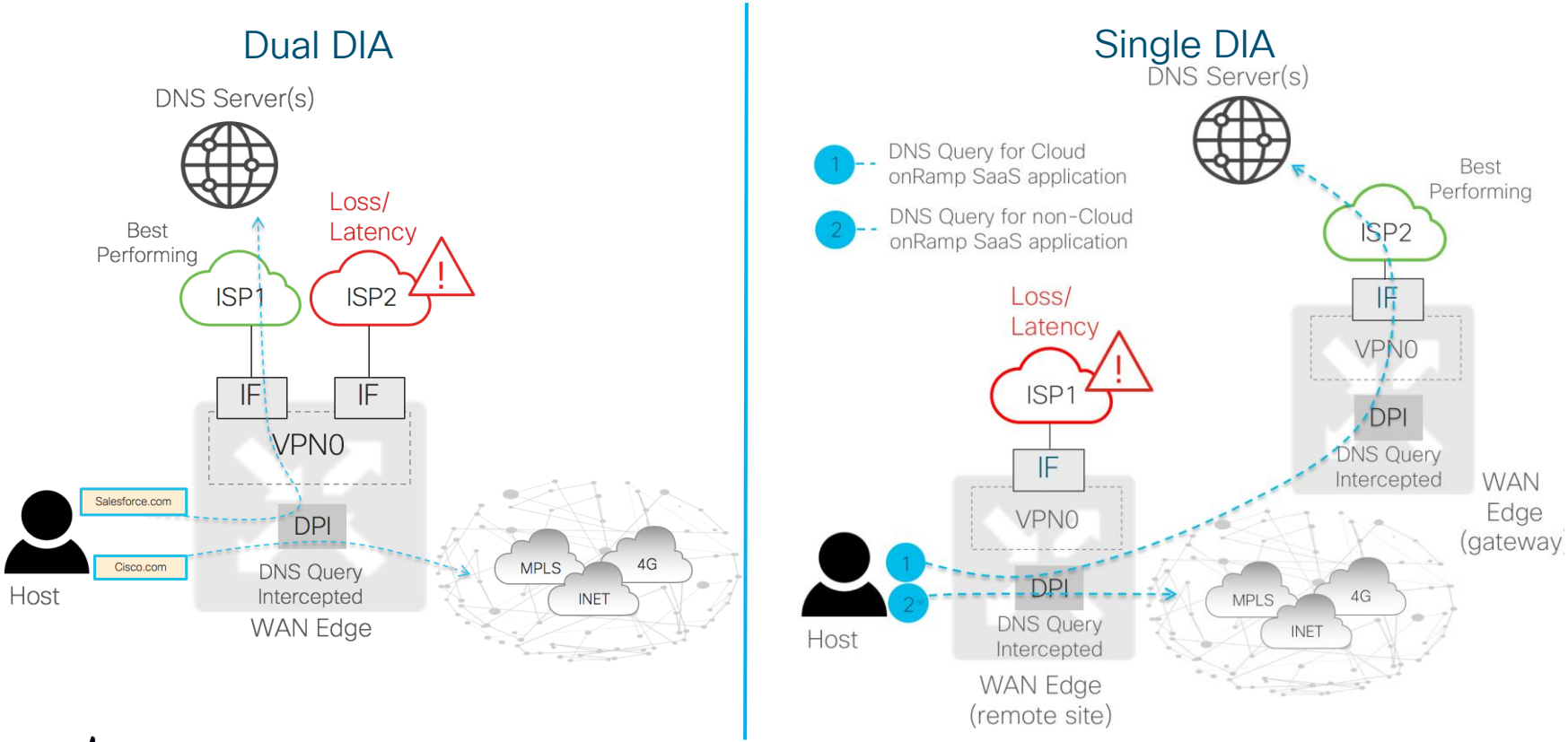
DNS Resolution



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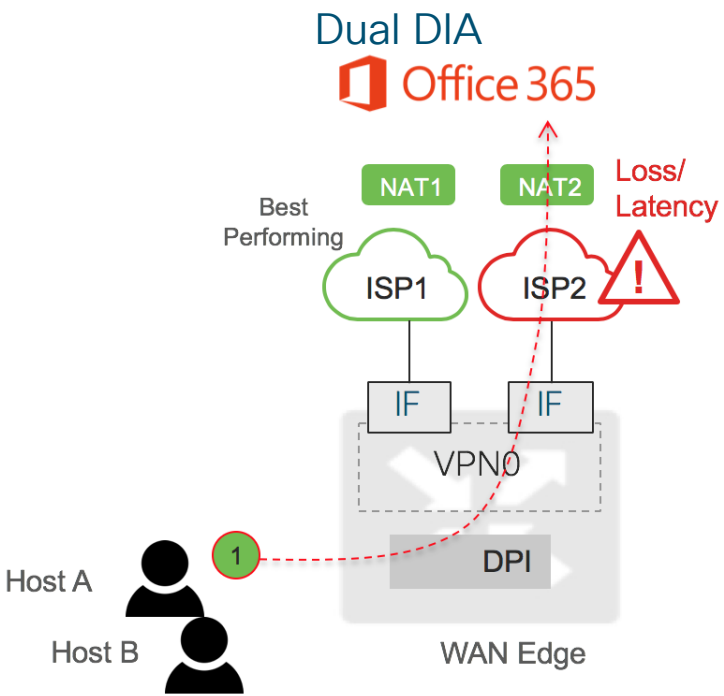
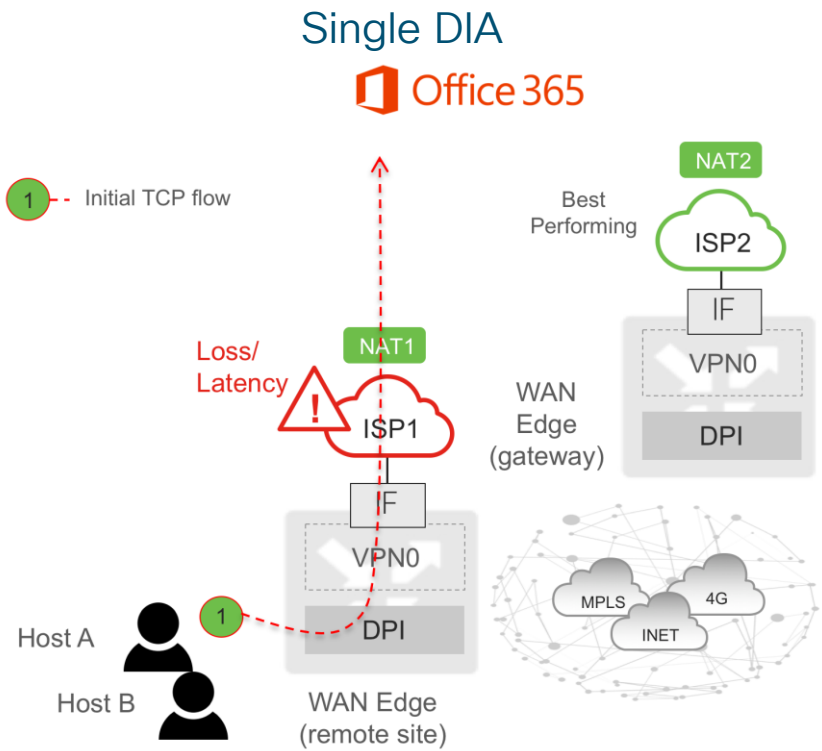
Path Selection – first flow





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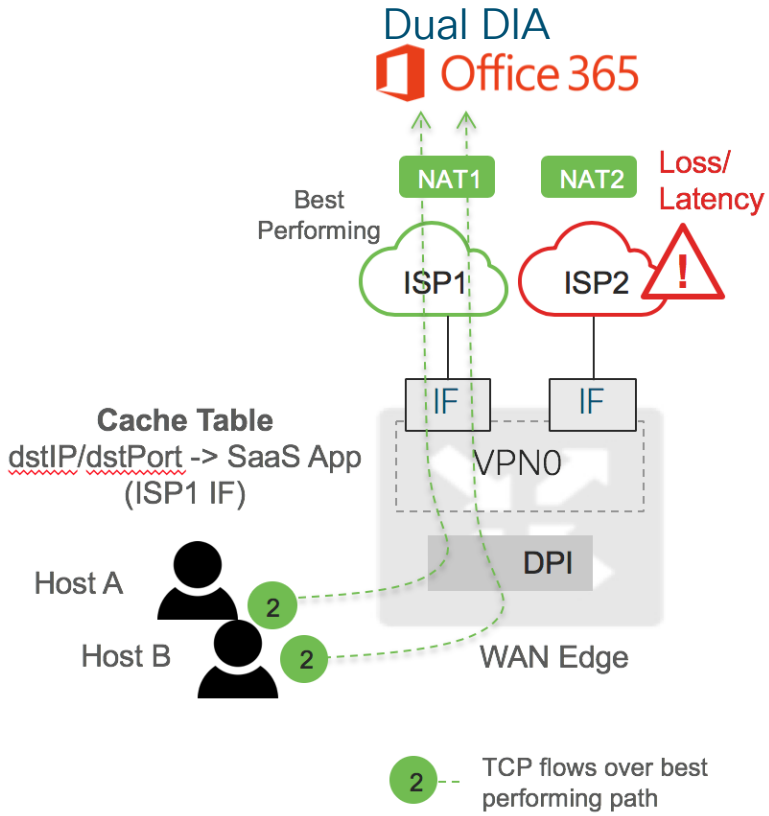
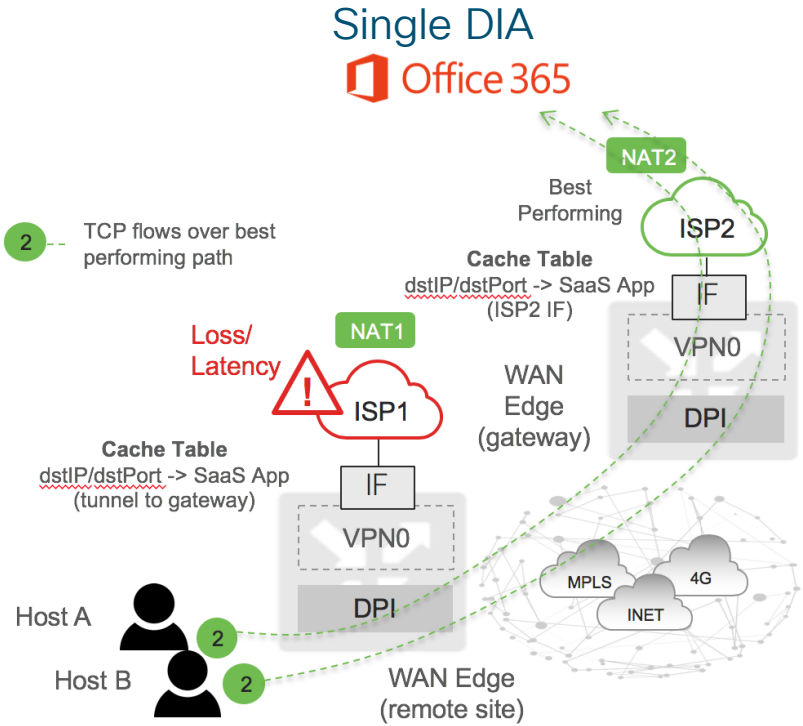
Path Selection – subsequent flow





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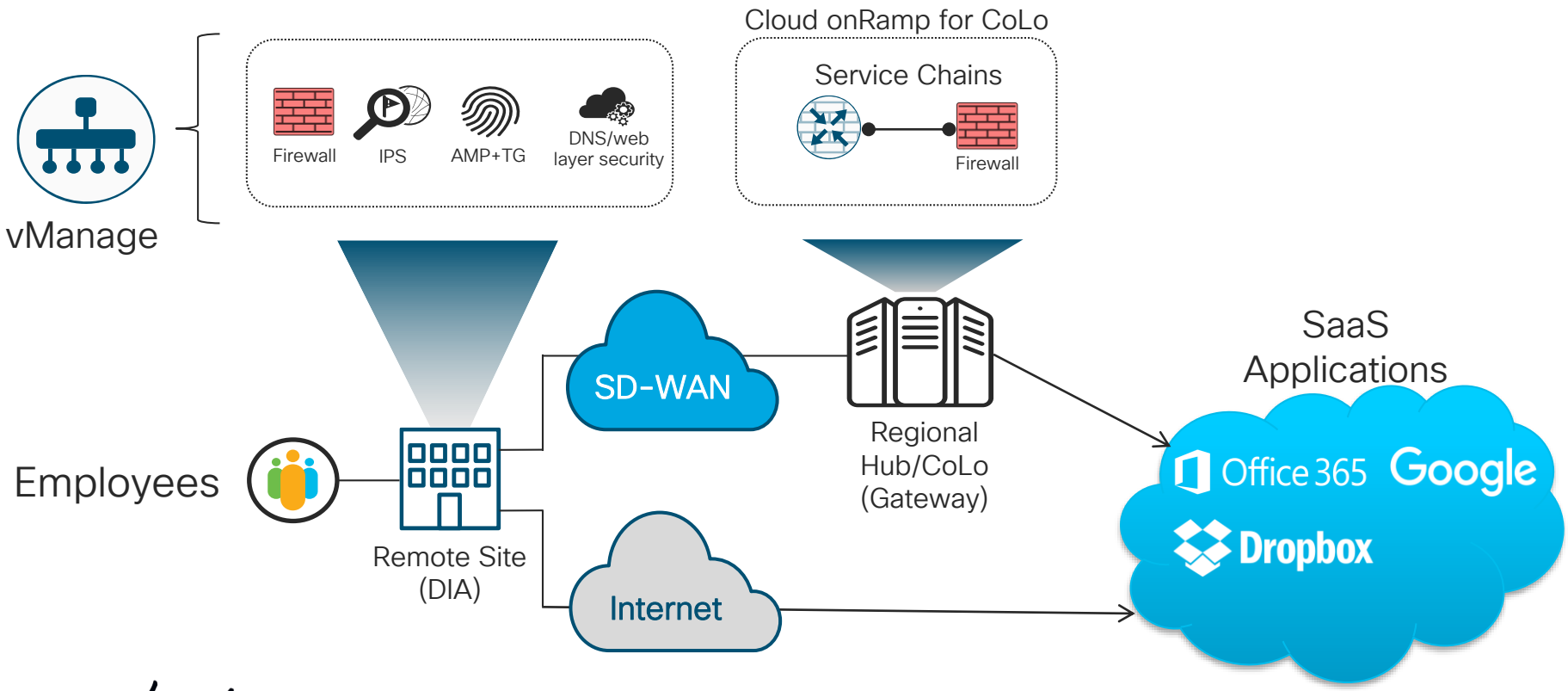
Securing Cloud onRamp for SaaS



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Cloud onRamp for SaaS

Configuration

Pre-requisites for Cloud onRamp for SaaS

- Enable Cloud onRamp for SaaS under vManage >Administration > Settings.
- Enable NAT under DIA interface of the SD-WAN Edge router using Feature Template.
- Configure DNS Server IP address under Transport VPN (VPN 0) of the SD-WAN Edge router using feature template.

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Configuring Cloud onRamp for SaaS in 3 steps

1. Select SaaS Applications and VPNs
2. Identify the DIA sites
3. Identify sites that will be used as Gateways (Optional)

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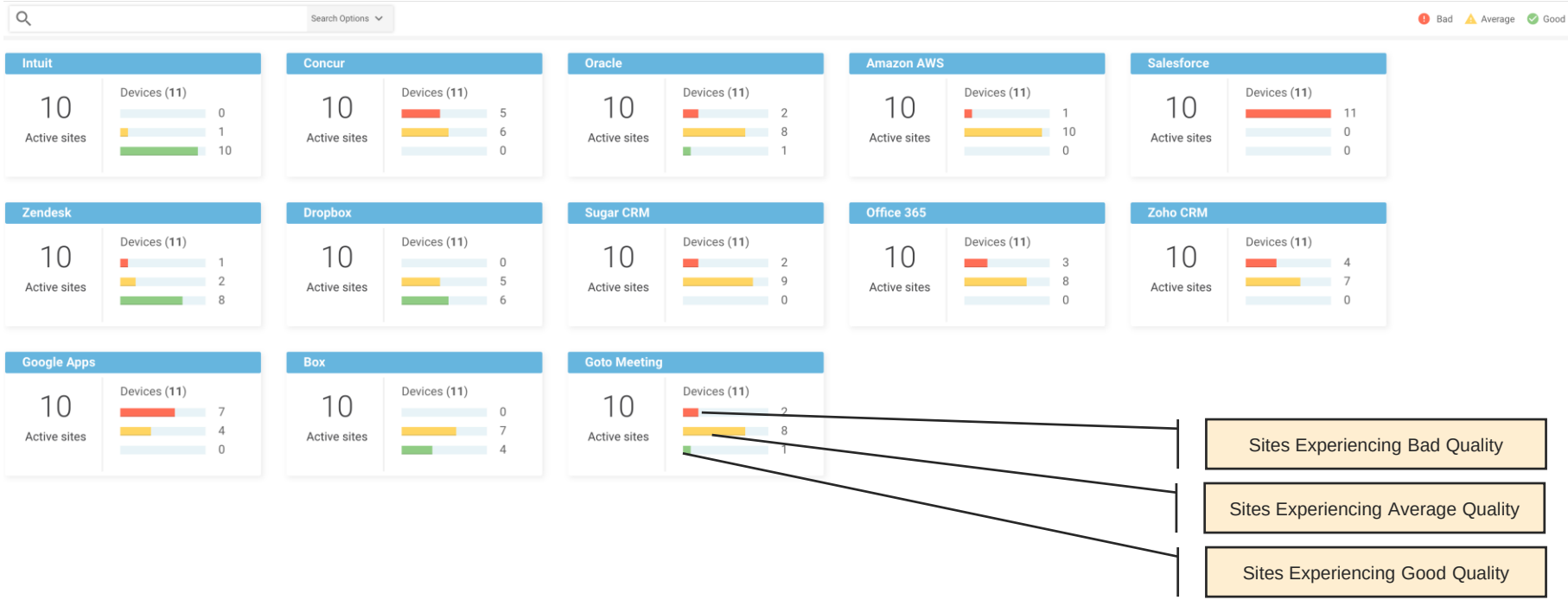
Monitor SaaS performance



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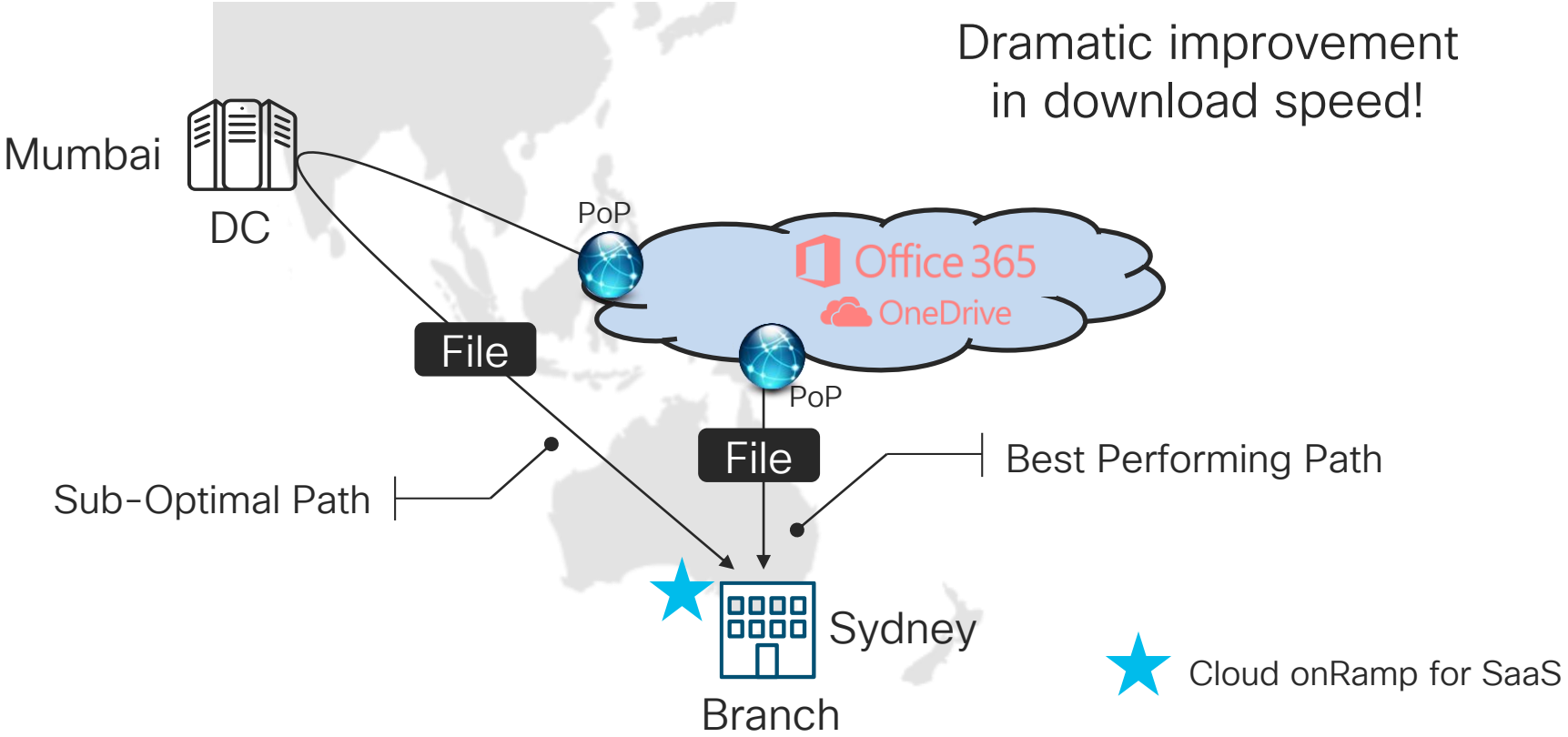
Cloud onRamp for SaaS Demo

Demonstration Setup



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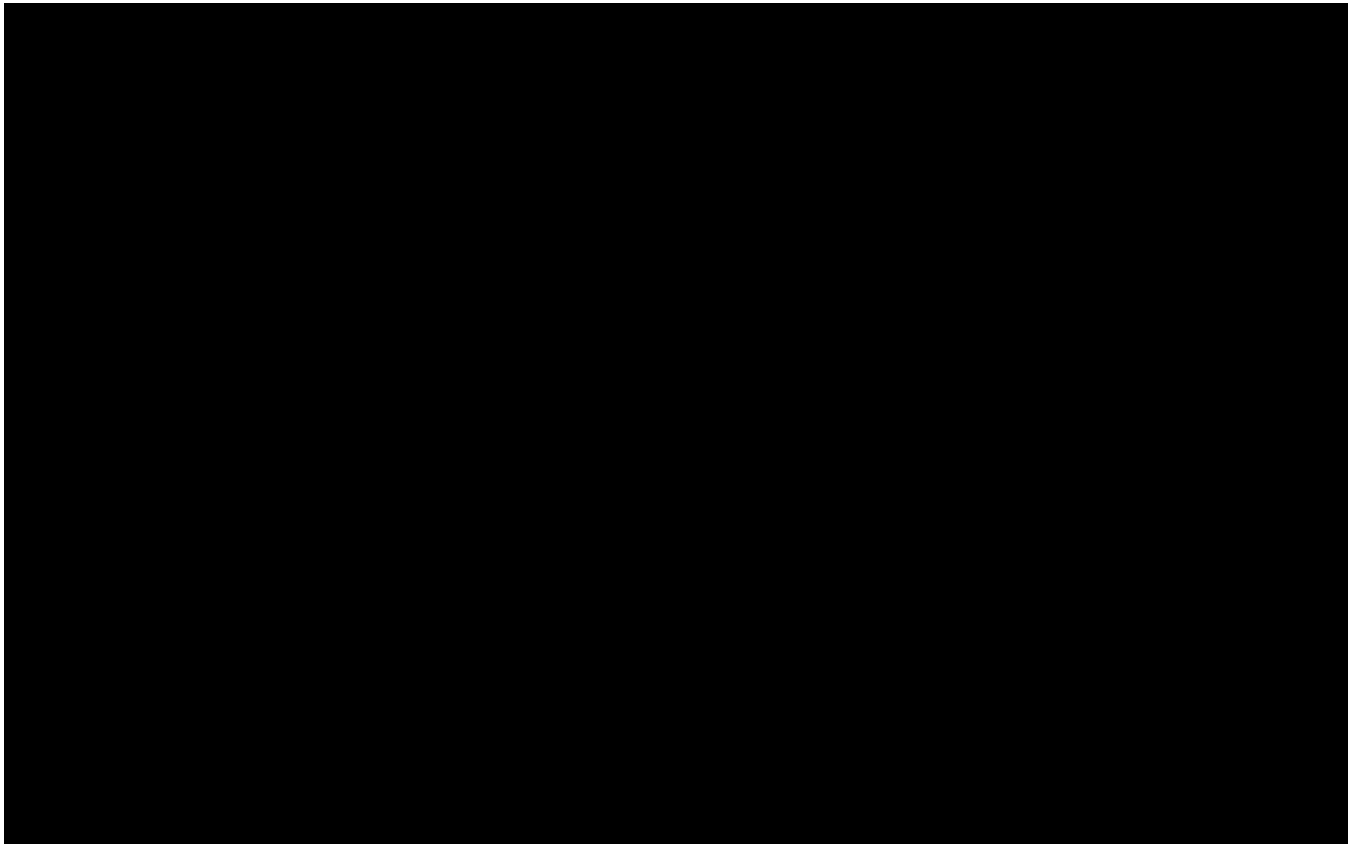
Demonstration



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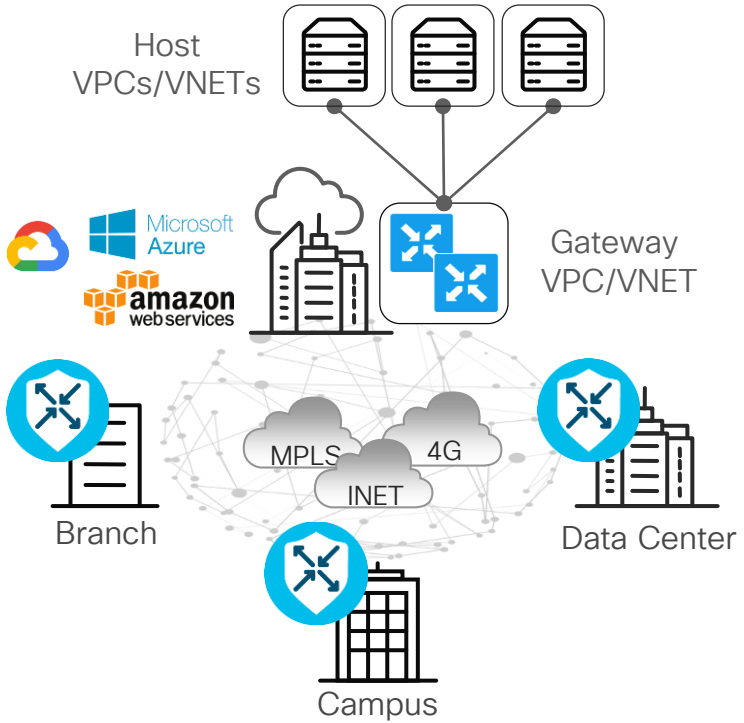
Cloud onRamp for IaaS

What is it?

- Extends full SD-WAN capabilities into the cloud
- Extends a common policy framework across SD-WAN fabric and cloud
- Managed via vManage just like any other router



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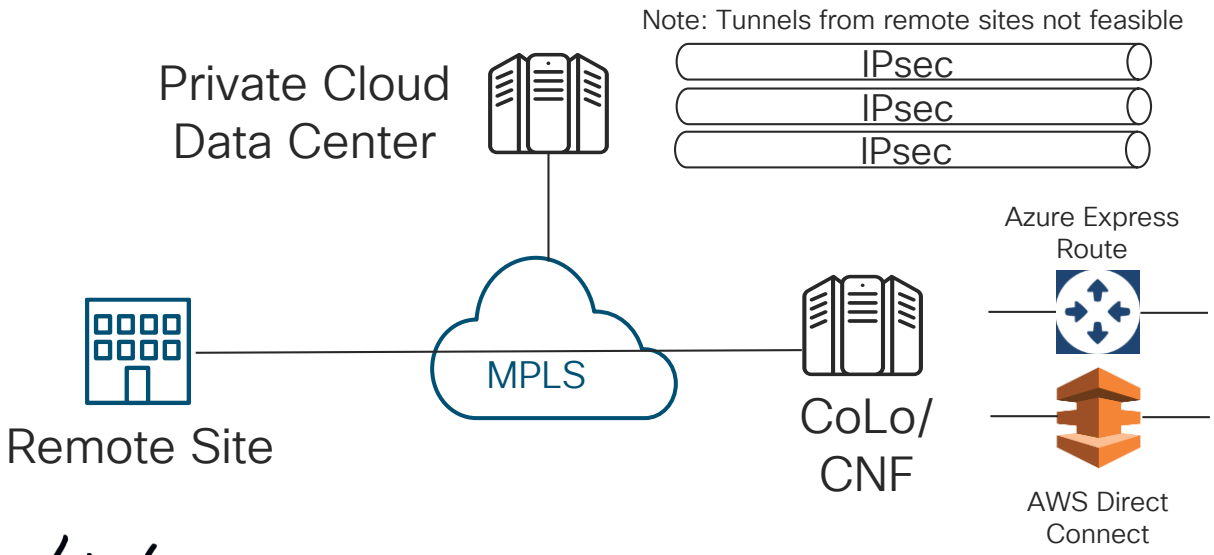
Traditional Cloud Data Center Access

- Dependent on MPLS for private cloud Data Centers
- No direct access to public cloud Data Centers
- No consistent segmentation and QoS policies



Public Cloud Data Centers

VPC VPC
VPC VPC

VNET VNET
VNET VNET

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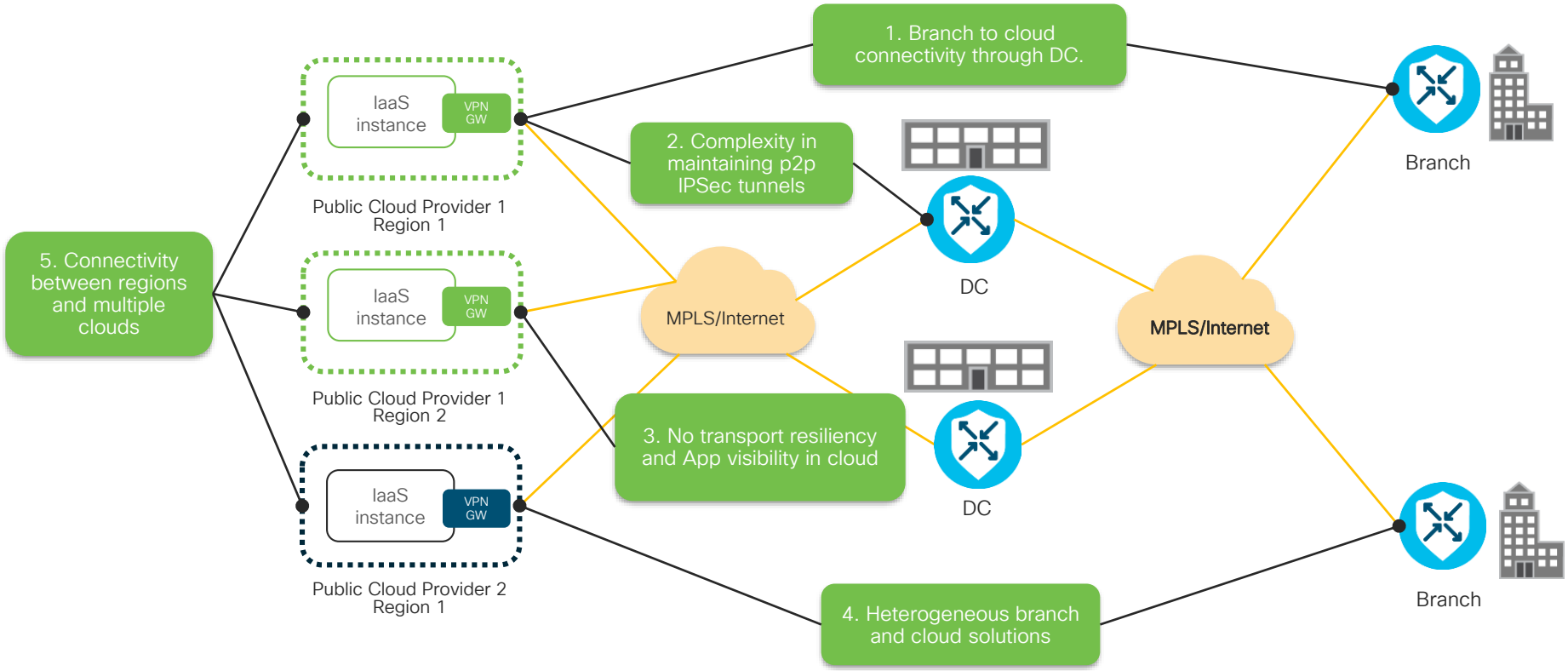
Challenges with Hybrid Cloud Today



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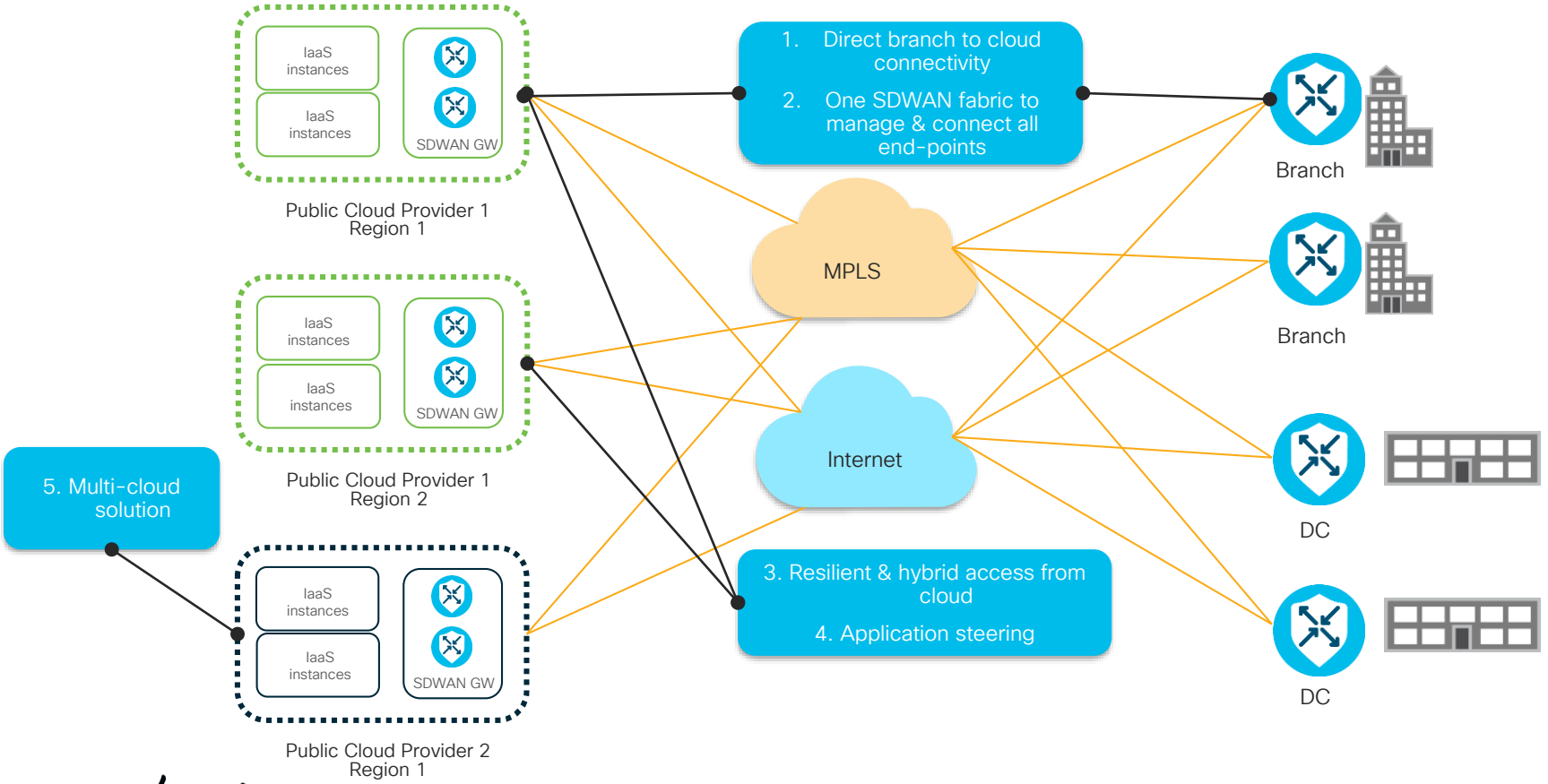
Cloud onRamp IaaS: Value Proposition



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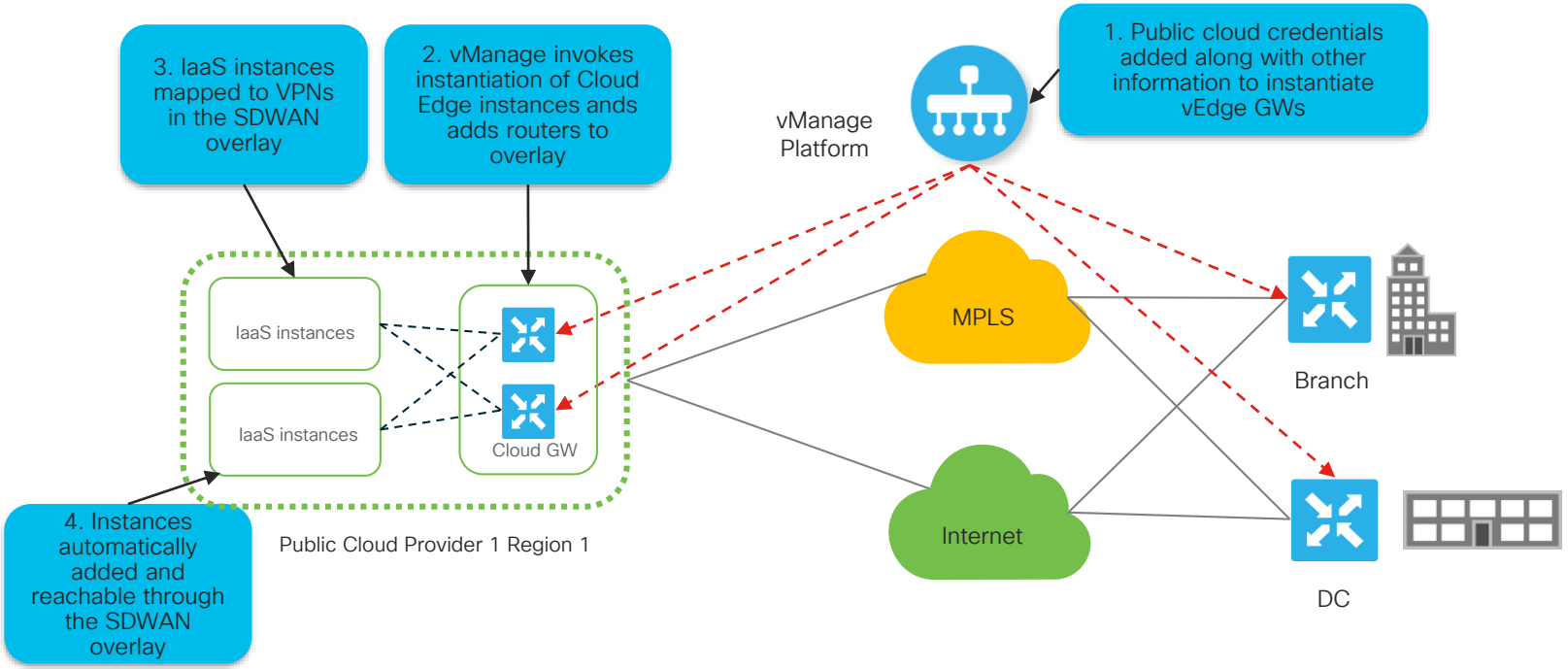
Cisco SDWAN Cloud onRamp for IaaS

Public Cloud (AWS & Azure) connectivity solution consumable through the vManage platform



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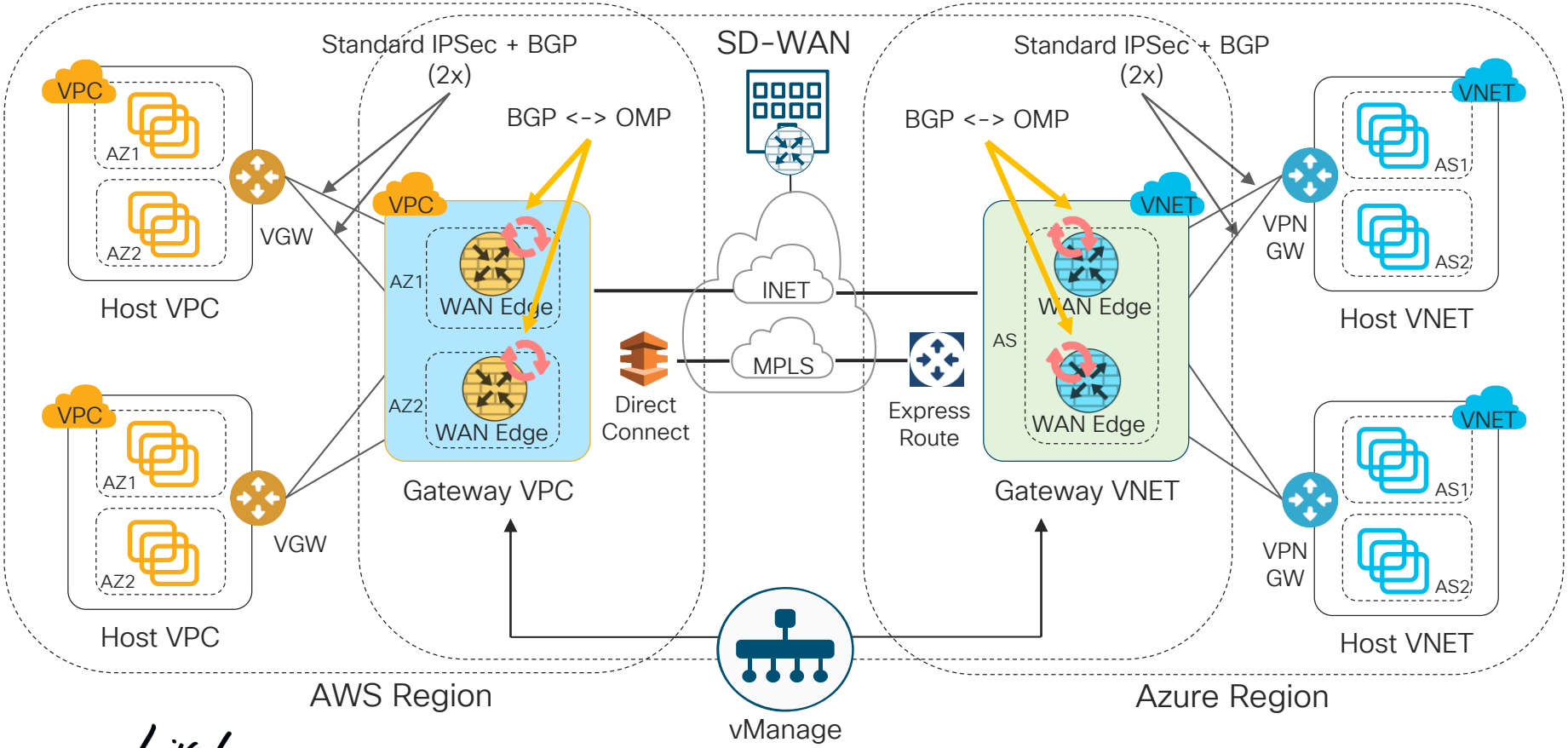
MultiCloud onRamp for IaaS – Explained



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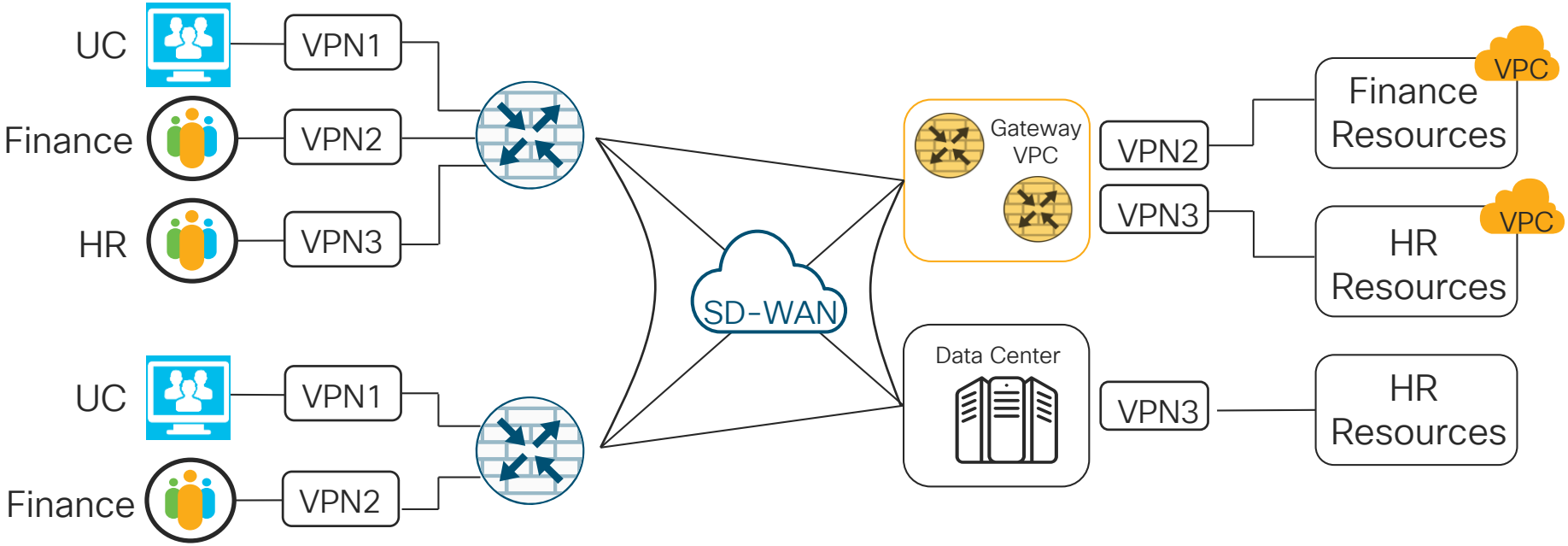
Segmentation and Optimal Topology

- End-to-end segmentation across public and private Data Centers
- Optimal application topology for best performance



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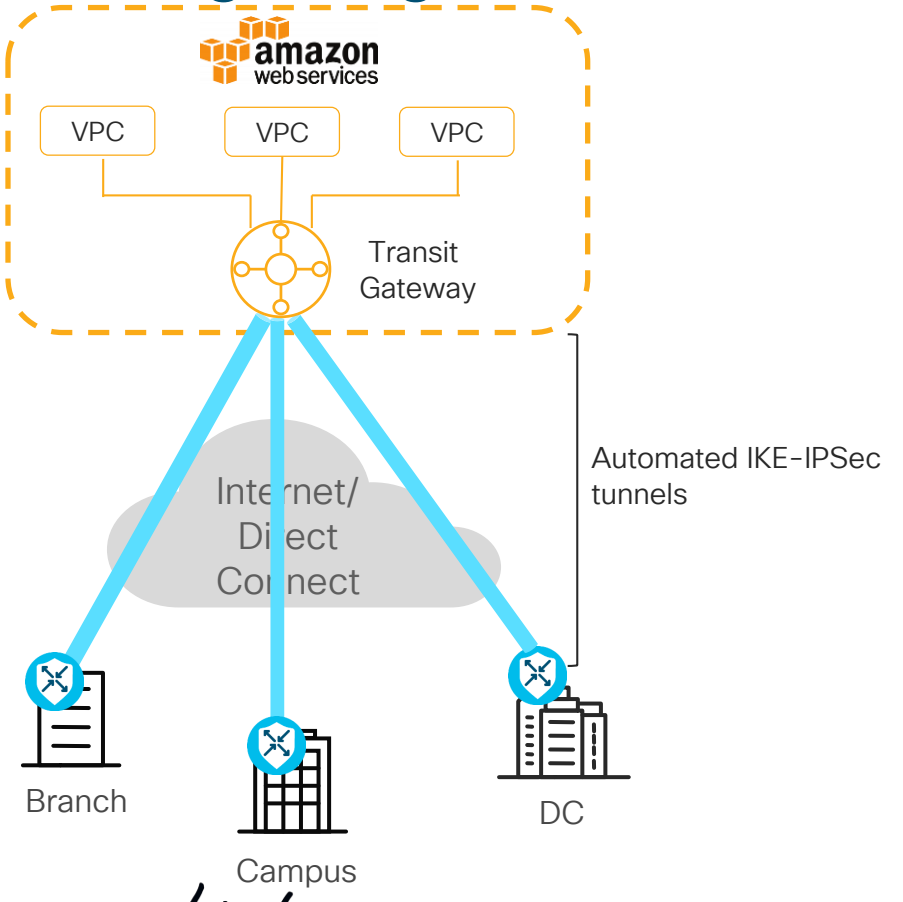
Multicloud Designs

Integrating with AWS Transit Gateway



Pros:

- Automated provisioning through vManage (CoR-IaaS)*
- Lower costs while comparing to Transit VPC design
- More BW available per site (~1.25 Gbps per tunnel)
- HA Support for IKE-IPSec tunnels

Cons:

- Potential sub-optimal path from Branch to TGW due to lack of dynamic path selection based on performance
- End-to-end WAN segmentation not preserved
- Operation overhead: Need to monitor individual tunnels from all the branches to TGW

*Coming soon

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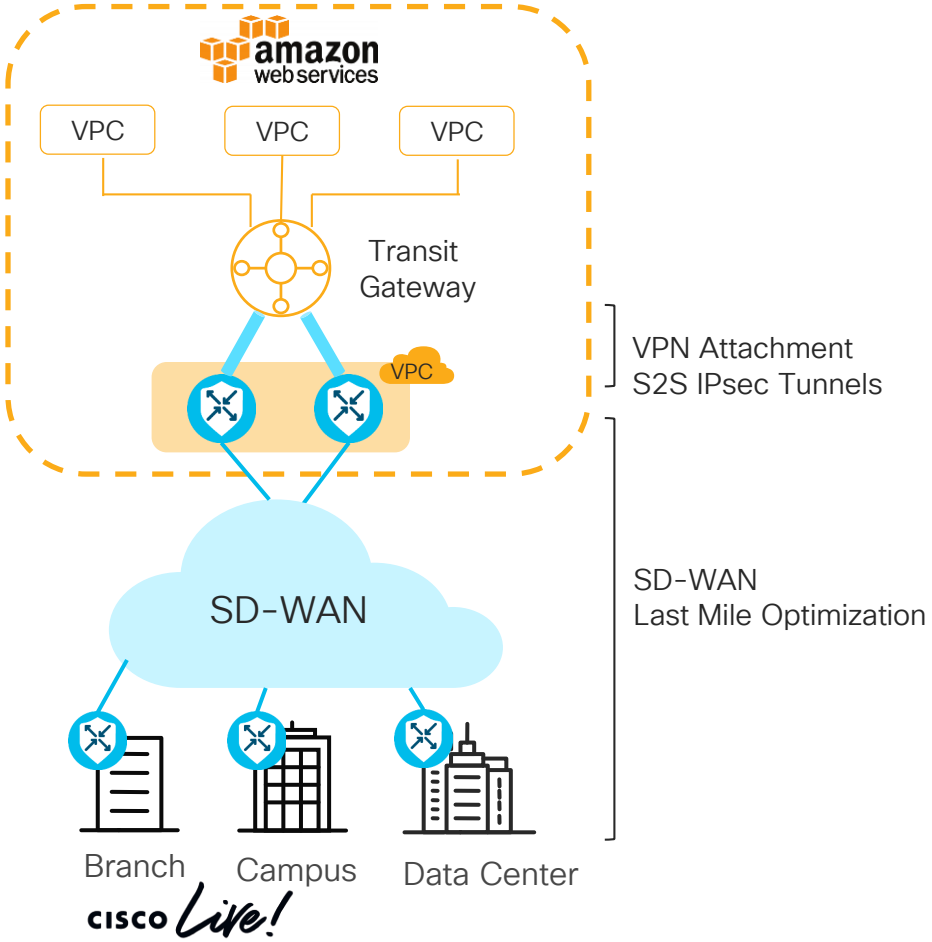
Integrating with AWS Transit Gateway



Pros:

- Extend SD-WAN upto TGW
  - vManage automation*
  - Apply uniform business intent via SD-WAN policies all the way into cloud
  - Extend existing network segmentation into the cloud
- Optimized routing and path selection
- Lower operational overhead
- DPI and flow visibility, up to the cloud
- Leverage SD-WAN for HA architecture

Cons:

- Higher cost, requiring a pair of redundant SD-WAN Edge routers in each AWS region
- S2S VPN tunnel limits to ~1.25 Gbps
  - Mitigate via multiple VPN tunnels and leverage ECMP

*Coming soon

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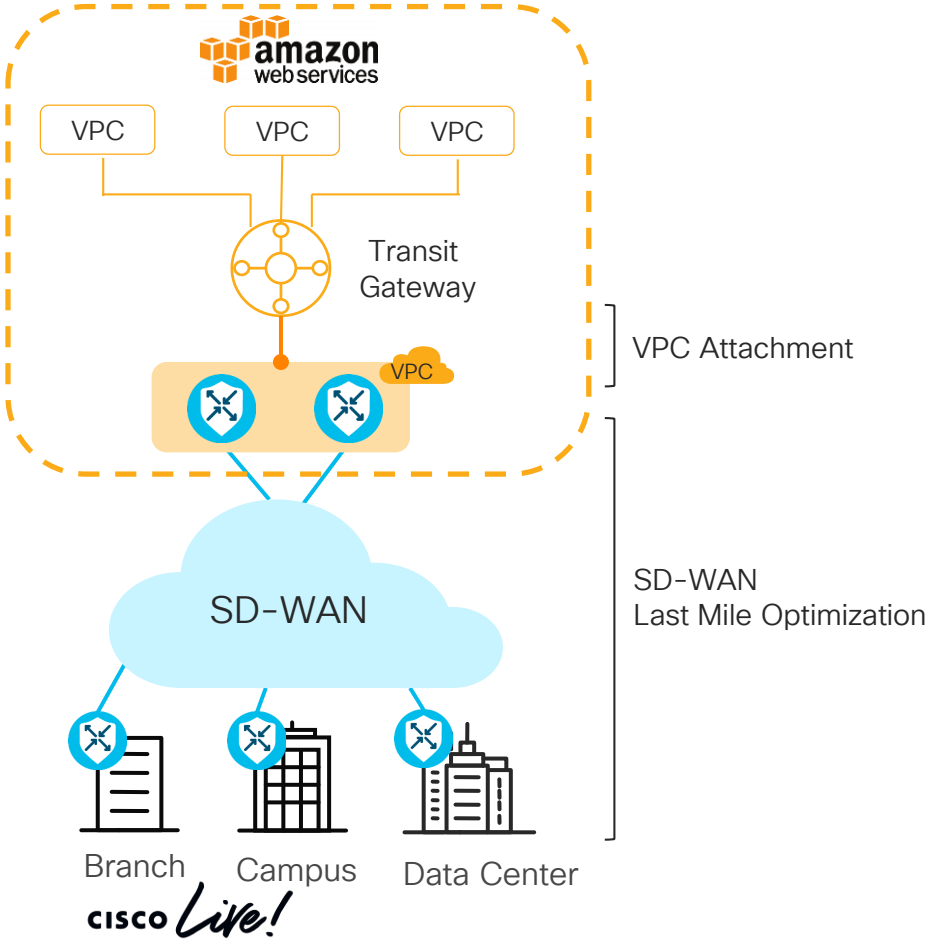
Integrating with AWS Transit Gateway



Pros:

- Higher single connection bandwidth
  - Terminating SD-WAN VPC to AWS Transit Gateway as a VPC attachment eliminates 1.25 Gbps limitation
- Saves the cost associated with AWS S2S VPN connections

Cons:

- Loss of dynamic routing support via BGP
  - Routes in AWS Transit Gateway will need to be statically defined.
- Addition/Removal of SD-WAN router (scaling out or failover scenarios) implies need for changes within TGW routing table
- Connection between the SD-WAN VPC and AWS Transit Gateway is unencrypted

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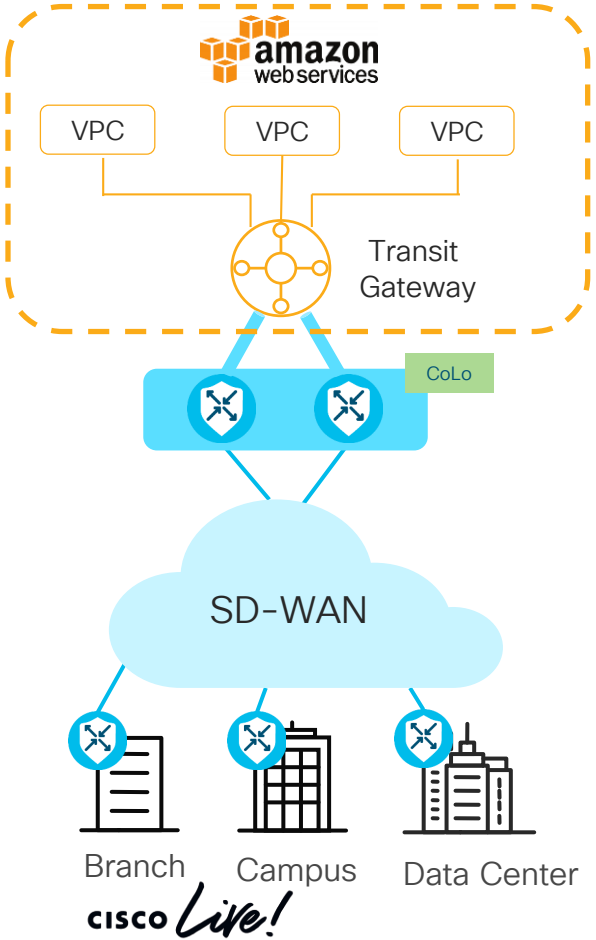
Integrating with AWS Transit Gateway



- High-speed connectivity to the cloud via DC
- S2S IPsec Tunnels

SD-WAN
Last Mile Optimization

Pros:

- Regionalized CoLo design benefits
  - Service Chain
  - Scale as you grow
  - High speed path to cloud
- Optimized routing and path selection to the CoLo
- Leverage SD-WAN for HA architecture

Cons:

- CoLo management overhead
- S2S VPN tunnel limits to ~1.25 Gbps
  - Mitigate via multiple VPN tunnels and leverage ECMP

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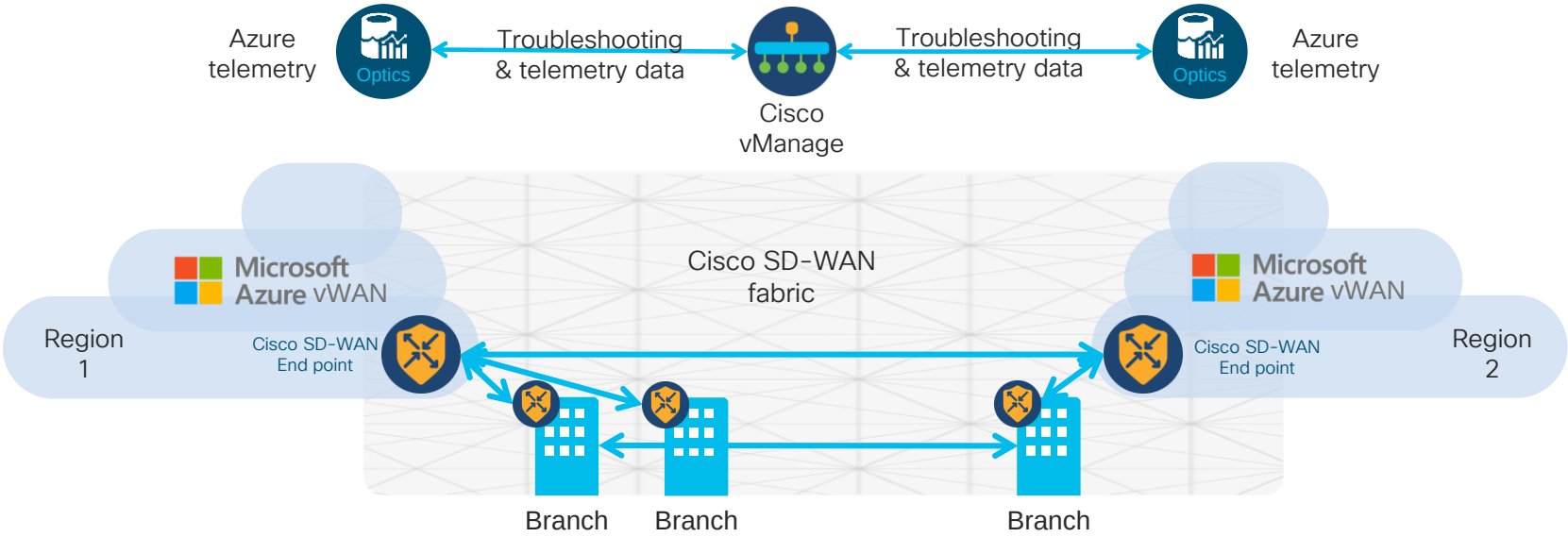
Cisco SD-WAN integration with Microsoft vWAN

Deep integration between CSR SD-WAN and Azure Virtual WAN



CSR SD-WAN Endpoint in vWAN Hub	Auto Peering with vWAN Hub	Policy synced with vWAN and vManage

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Cloud onRamp for IaaS Demo

Firefox File Edit View History Bookmarks Tools Window Help

Mon 17:18

SD-WAN - Cisco Comm | My Items - At Your Serv | Cisco vManage | EXP DMZ Lab - ENG Ro | cEdge TCPOPT - SDWA | yang/Cisco-IOS-XE-pla | Cisco vManage | Cisco vManage

https://173.37.56.169/#/app/dashboard

Cisco vManage

npitaev

Dashboard

Main Dashboard

VPN Dashboard

Security

Monitor

Configuration

Tools

Maintenance

Administration

vAnalytics

Reporting

DASHBOARD | MAIN DASHBOARD

2 vSmart - 2

11 WAN Edge - 11

2 vBond - 2

1 vManage - 1

Reboot 2
Last 24 hrs

Warning 0
Invalid 0

Control Status (Total 10)

Control Up	8
Partial	2
Control Down	0

Site Health (Total 8)

Full WAN Connectivity	0 sites
Partial WAN Connectivity	7 sites
No WAN Connectivity	1 sites

Transport Interface Distribution

< 10 Mbps	33
10 Mbps - 100 Mbps	0
100 Mbps - 500 Mbps	0
> 500 Mbps	0

View Percent Utilization

WAN Edge Inventory

Total	39
Authorized	39
Deployed	11
Staging	3

WAN Edge Health (Total 11)

5 Normal

6 Warning

0 Error

Transport Health

Type: By Loss

100 %

50 %

0

Top Applications

95.37 MB
976.56 KB
9.77 KB
100 B
1 B

Usage

http ms... dns win... icmp rtp https ms... ssl go...

Application

Application-Aware Routing

Type: By Loss

Tunnel Endpoints	Avg. Latency (ms)	Avg. Loss (%)	Avg. Jitter (ms)
BR4-vEdgeCloud:mpls-BR5-CSR1k-AMP:mpls	0	0.014	0
DC2-vEdge2k:biz-internet-DC1-vEdge1k-R1:...	0.569	0.003	0
DC1-vEdge1k-R1:biz-internet-BR1-ISR4331:b...	0	0.002	0
DC1-vEdge1k-R1:biz-internet-BR4-vEdgeClo...	0	0.002	0
DC1-vEdge1k-R2:biz-internet-DC2-vEdge2k:...	1	0.002	0

Cloud onRamp for IaaS
TGW Branch VPN Automation Demo

Cisco SD-WAN

Cloud onRamp for IaaS
TGW Sd-WAN GW Automation Demo


Cisco SD-WAN
cisco
Cisco vManage
Username
Password
Log In

Cisco onRamp for SaaS – Summary

DNS resolution

Performance visibility

Path selection

An innovative way to identify the best path to SaaS applications

Cloud onRamp for IaaS – Summary

Direct branch to IaaS cloud connectivity, if desired

Consistent policy management for branch & cloud

Resilient and scalable access to cloud

Multicloud ready

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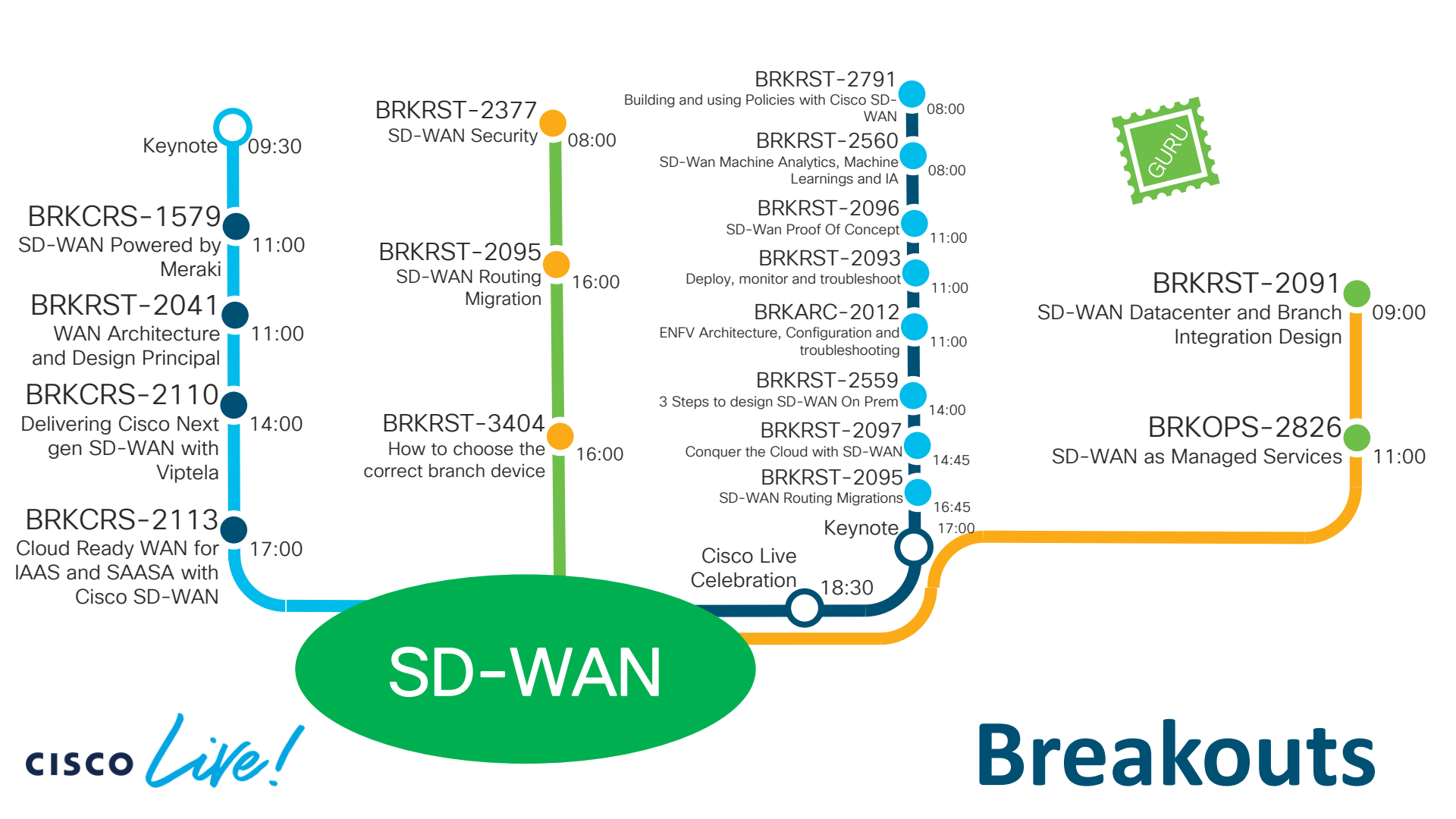
Keynote 09:30
BRKCRS-1579
SD-WAN Powered by Meraki
11:00
BRKRST-2041
WAN Architecture and Design Principal
11:00
BRKCRS-2110
Delivering Cisco Next gen SD-WAN with Viptela
14:00
BRKCRS-2113
Cloud Ready WAN for IAAS and SAASA with Cisco SD-WAN
17:00
BRKRST-2377
SD-WAN Security
08:00
BRKRST-2095
SD-WAN Routing Migration
16:00
BRKRST-3404
How to choose the correct branch device
16:00
BRKRST-2791
Building and using Policies with Cisco SD-WAN
08:00
BRKRST-2560
SD-Wan Machine Analytics, Machine Learnings and IA
08:00
BRKRST-2096
SD-Wan Proof Of Concept
11:00
BRKRST-2093
Deploy, monitor and troubleshoot
11:00
BRKARC-2012
ENFV Architecture, Configuration and troubleshooting
11:00
BRKRST-2559
3 Steps to design SD-WAN On Prem
14:00
BRKRST-2097
Conquer the Cloud with SD-WAN
14:45
BRKRST-2095
SD-WAN Routing Migrations
16:45
Keynote
17:00
Cisco Live Celebration
18:30
GURU
BRKRST-2091
SD-WAN Datacenter and Branch Integration Design
09:00
BRKOPS-2826
SD-WAN as Managed Services
11:00
SD-WAN
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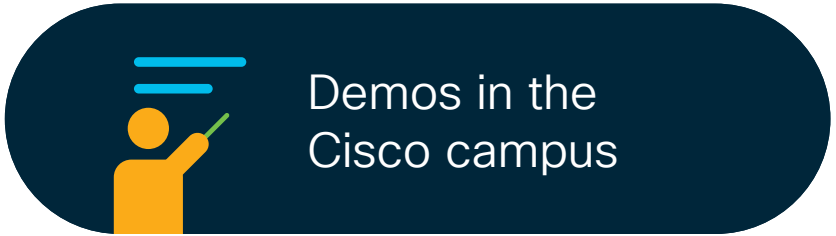

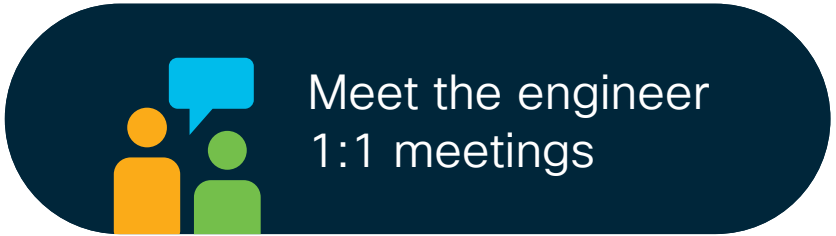

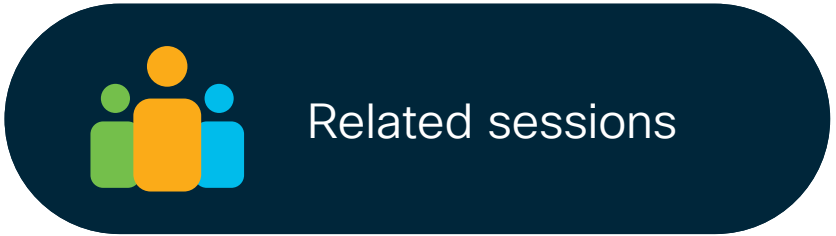

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Thank you

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