SD-WAN: Start here

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BRKENT-2108

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Questions?

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How

1. Find this session in the Cisco Events mobile app
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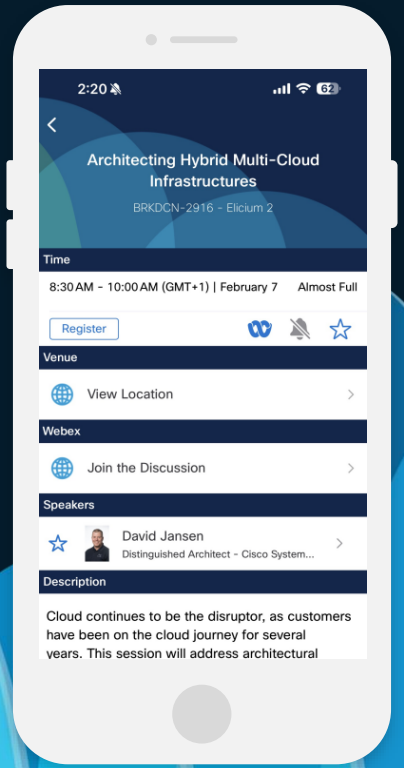


Agenda

- Why SD-WAN
  - Where are we coming from
- Solution Architecture
  - What is it, how does it all come together?
- Software Features
  - Let’s scratch the surface
- Learn More
  - Where to go and when

About me

Copenhagen, Denmark

Technical Marketing Engineer
SDWAN And Routing Business Unit

Before that:

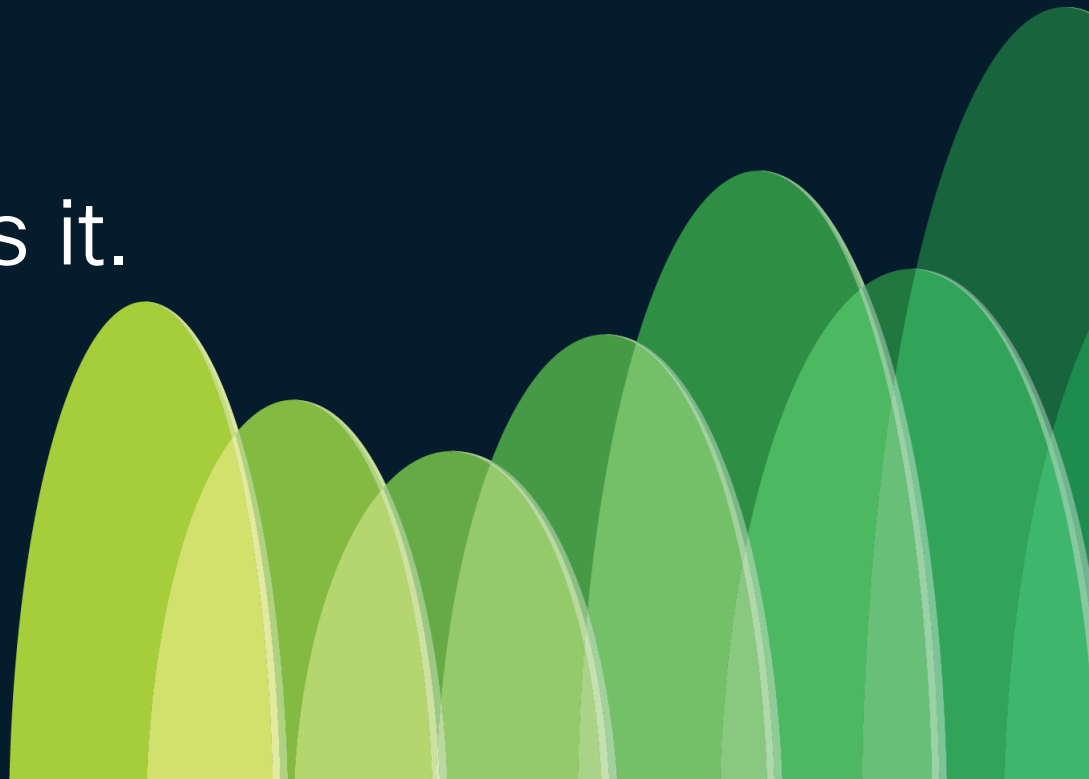
- Systems Architect
- Technical Solutions Architect
- Systems Engineer

Cisco since 2014

Cisco Live Speaker

IT and networking since 2003

SD-WAN – This is it.



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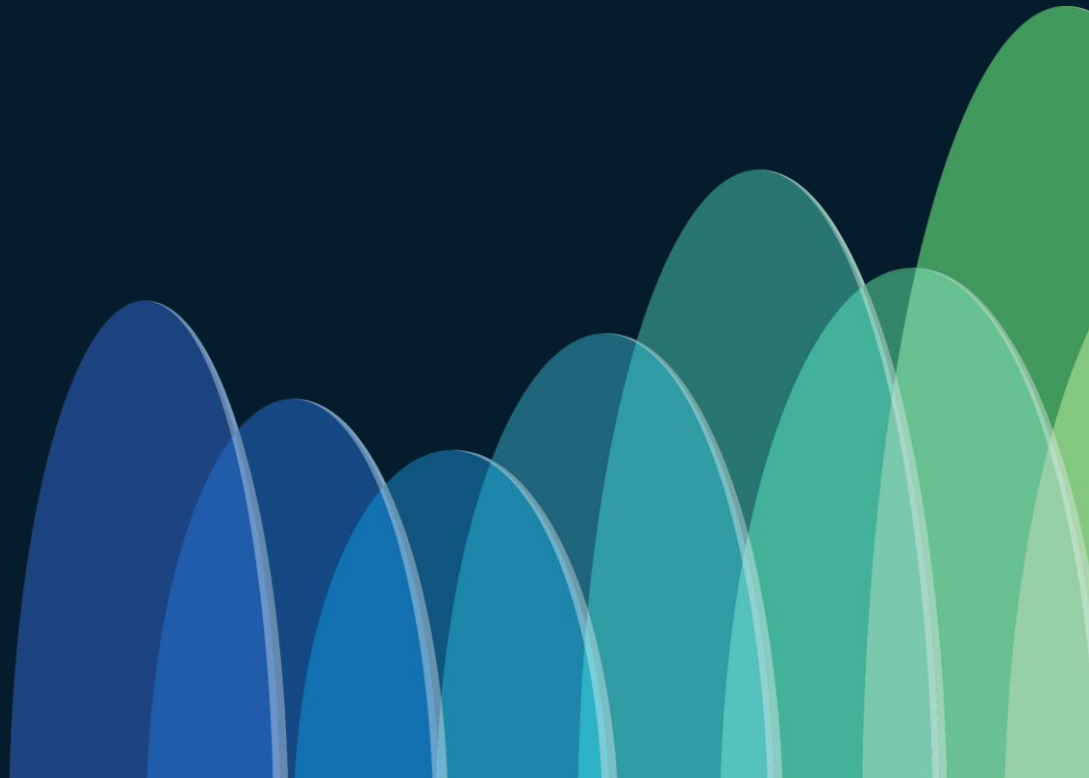
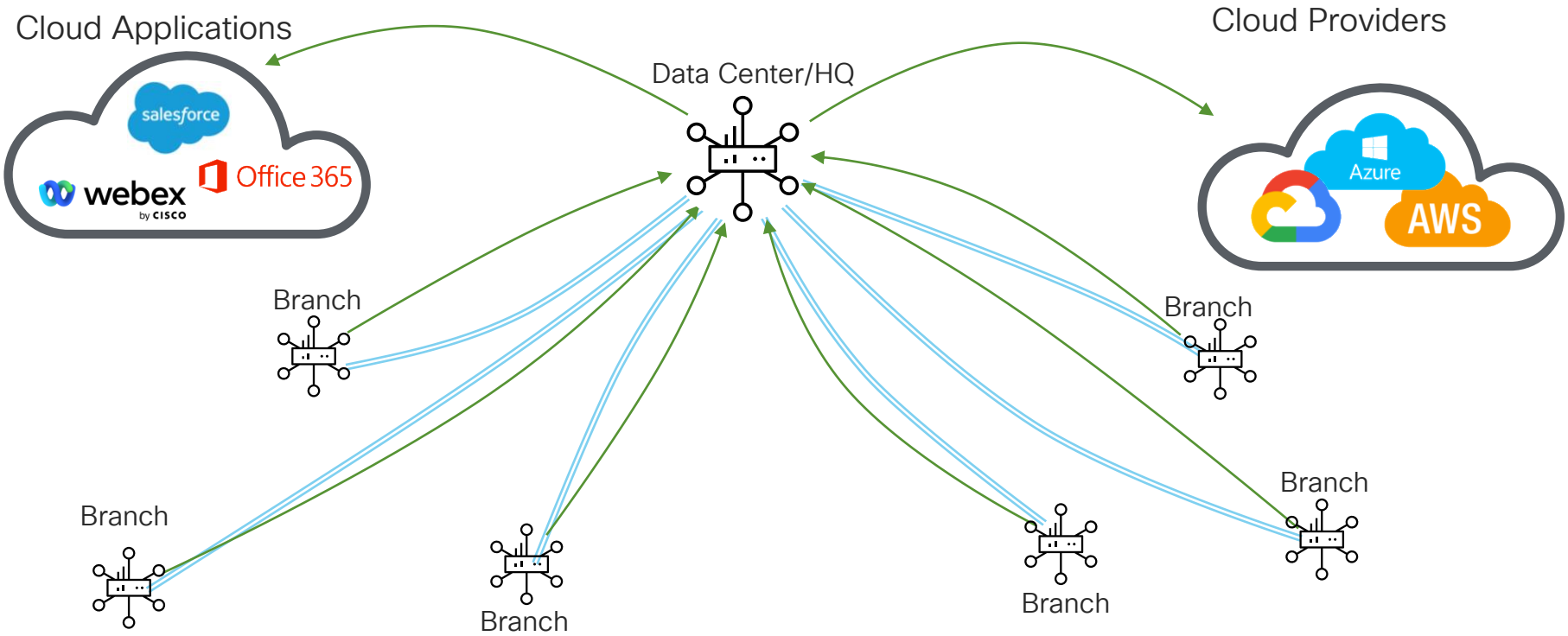
Why SD-WAN?

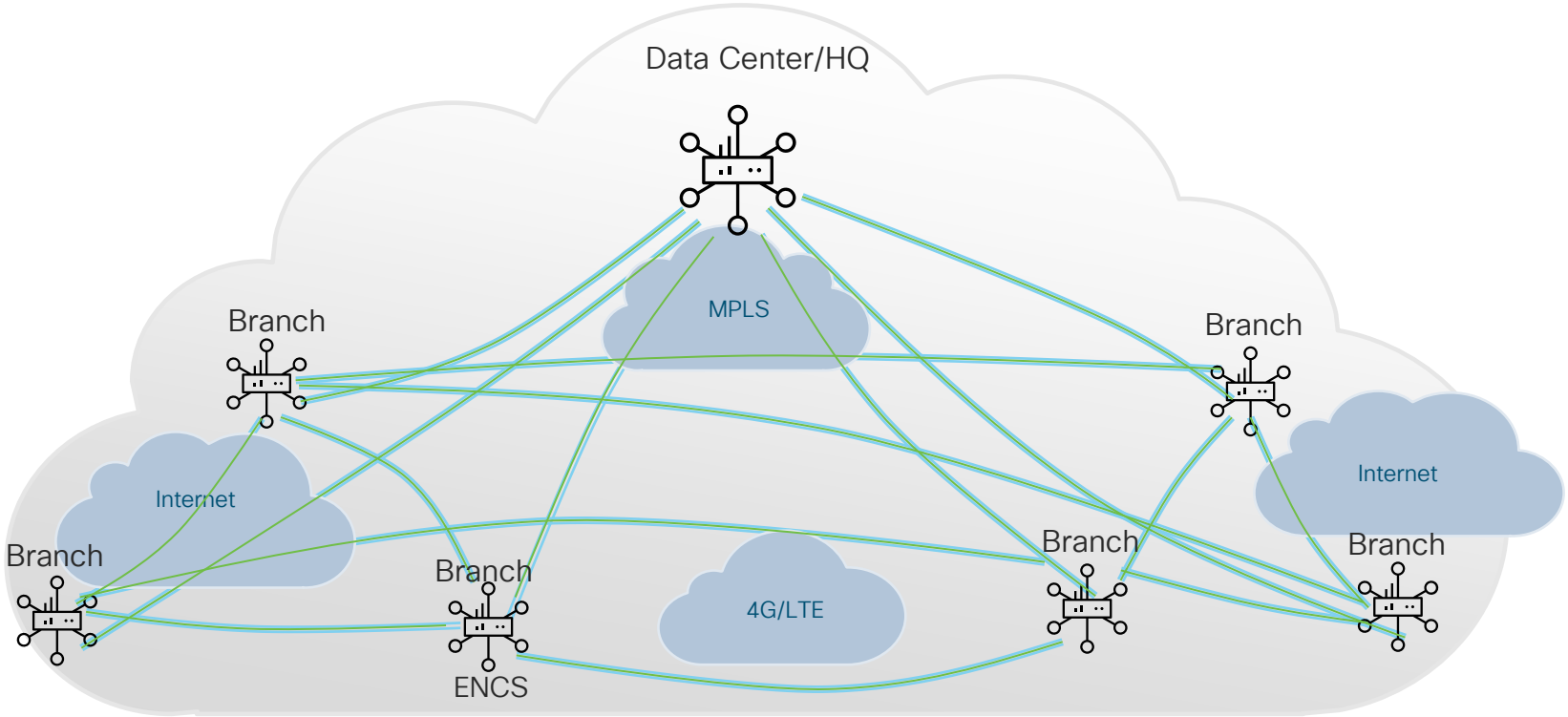


The Hardware Based WAN of Yesterday

Doesn't Keep up with the Needs of Today

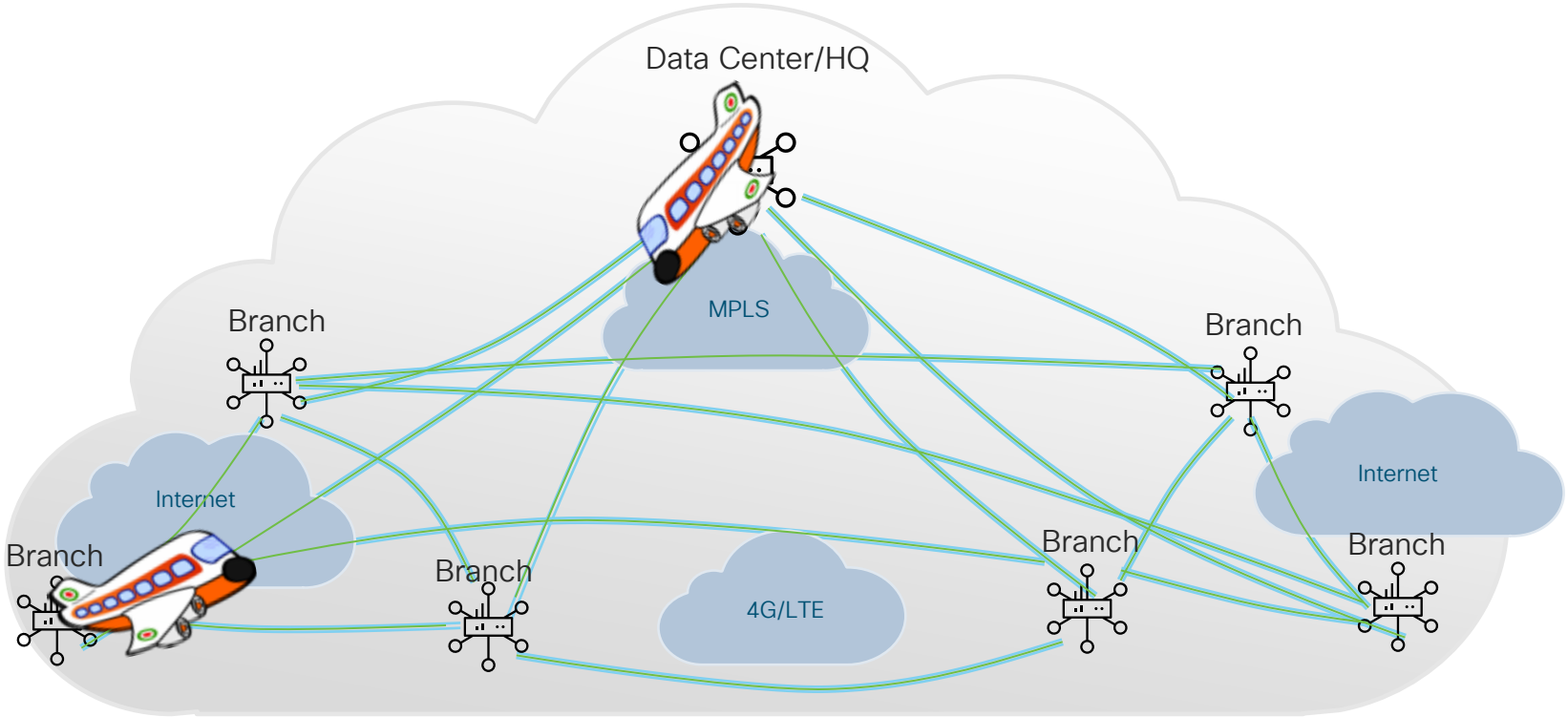


Cisco SD-WAN: Software Approach

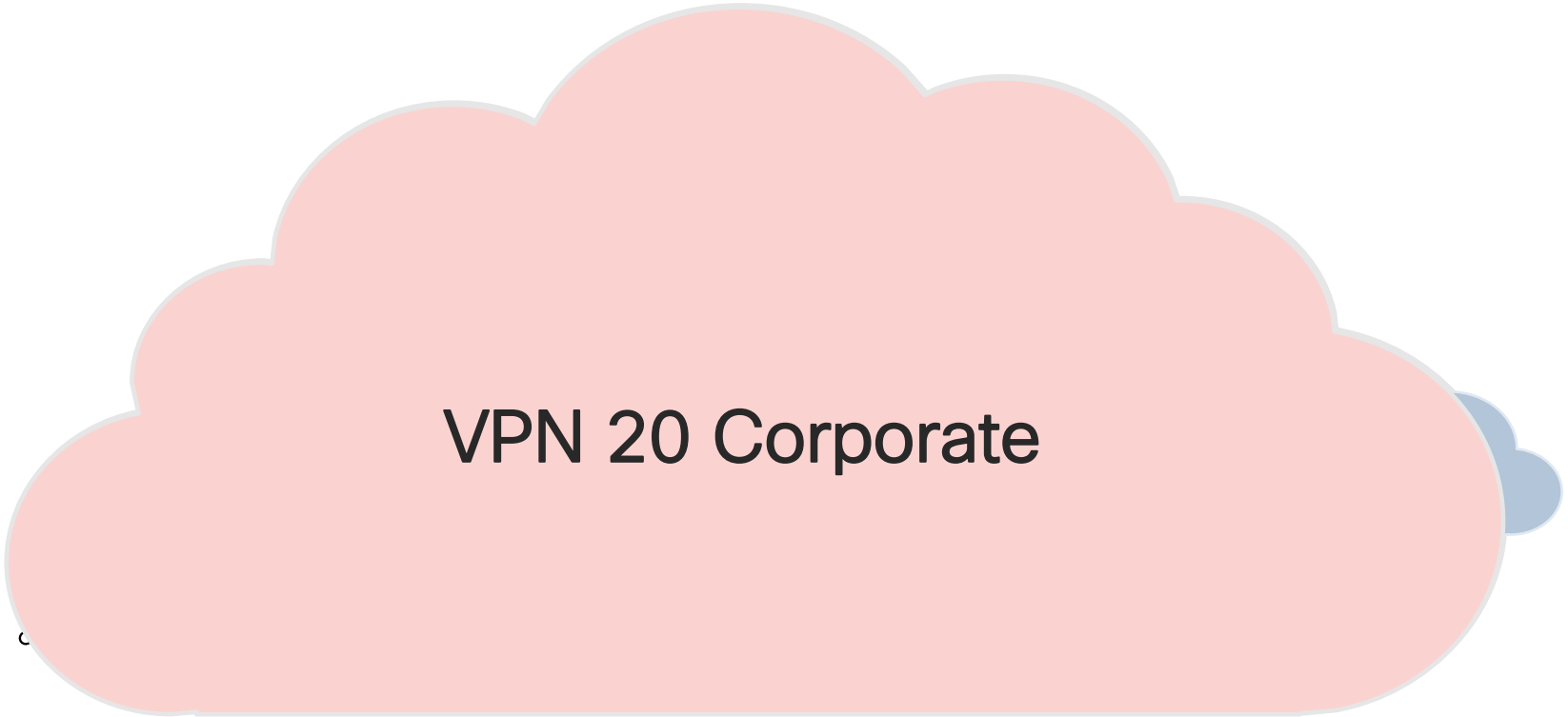


Cisco SD-WAN: Software Approach

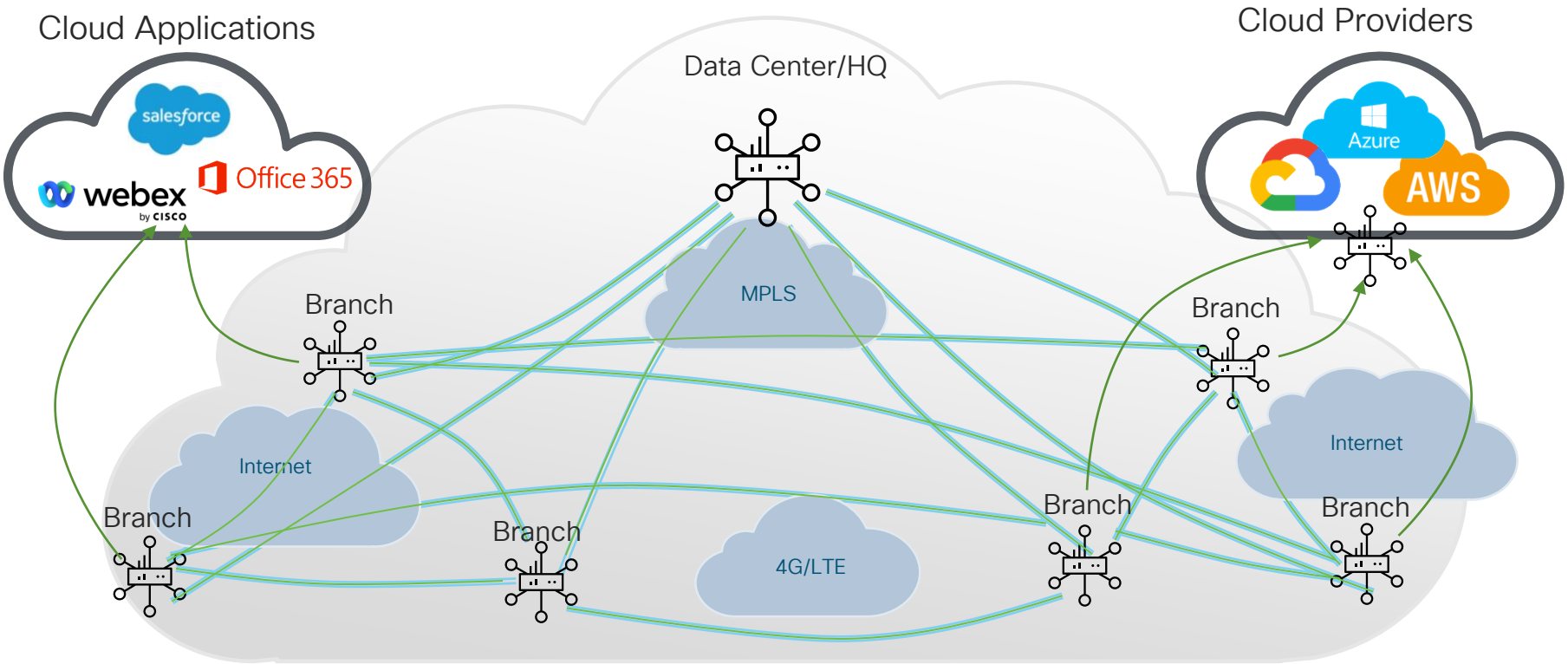
Cisco SD-WAN: Software Approach



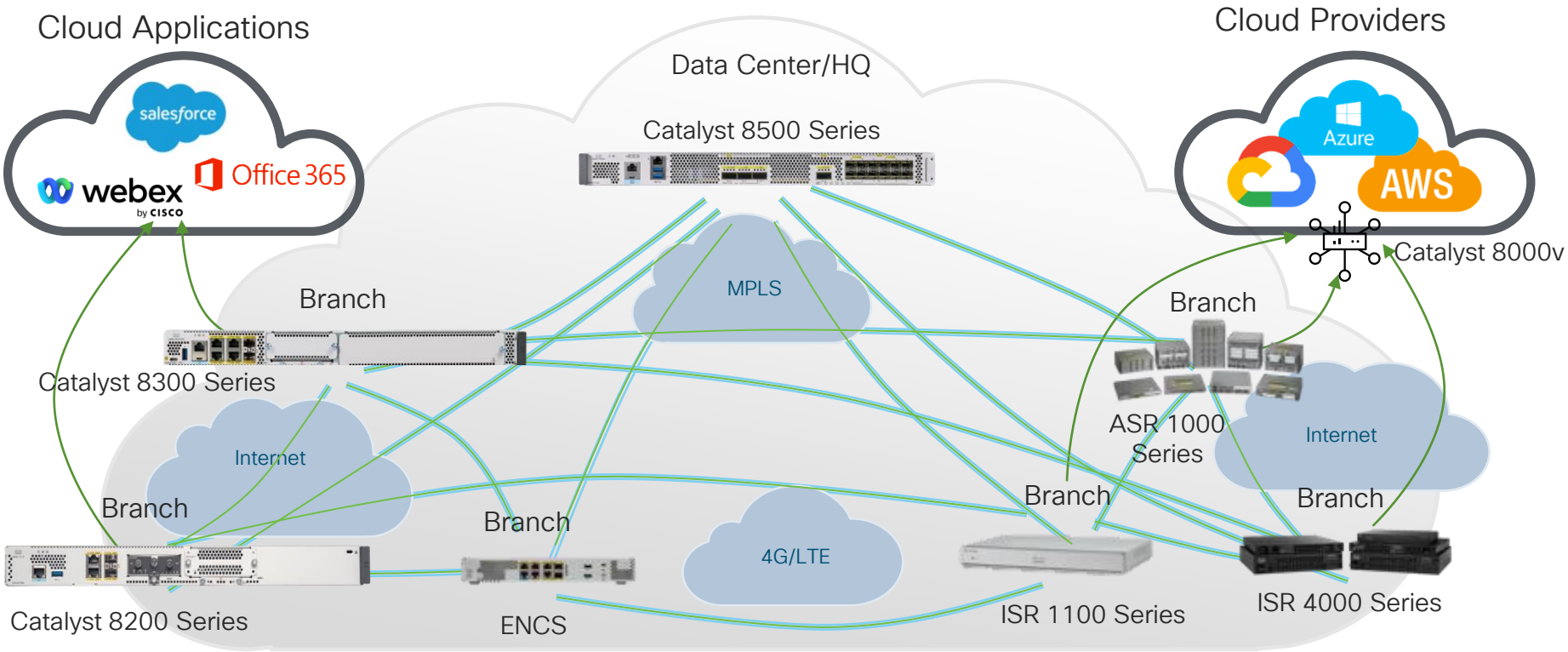
Cisco SD-WAN: Software Approach



Cisco SD-WAN: Software Approach

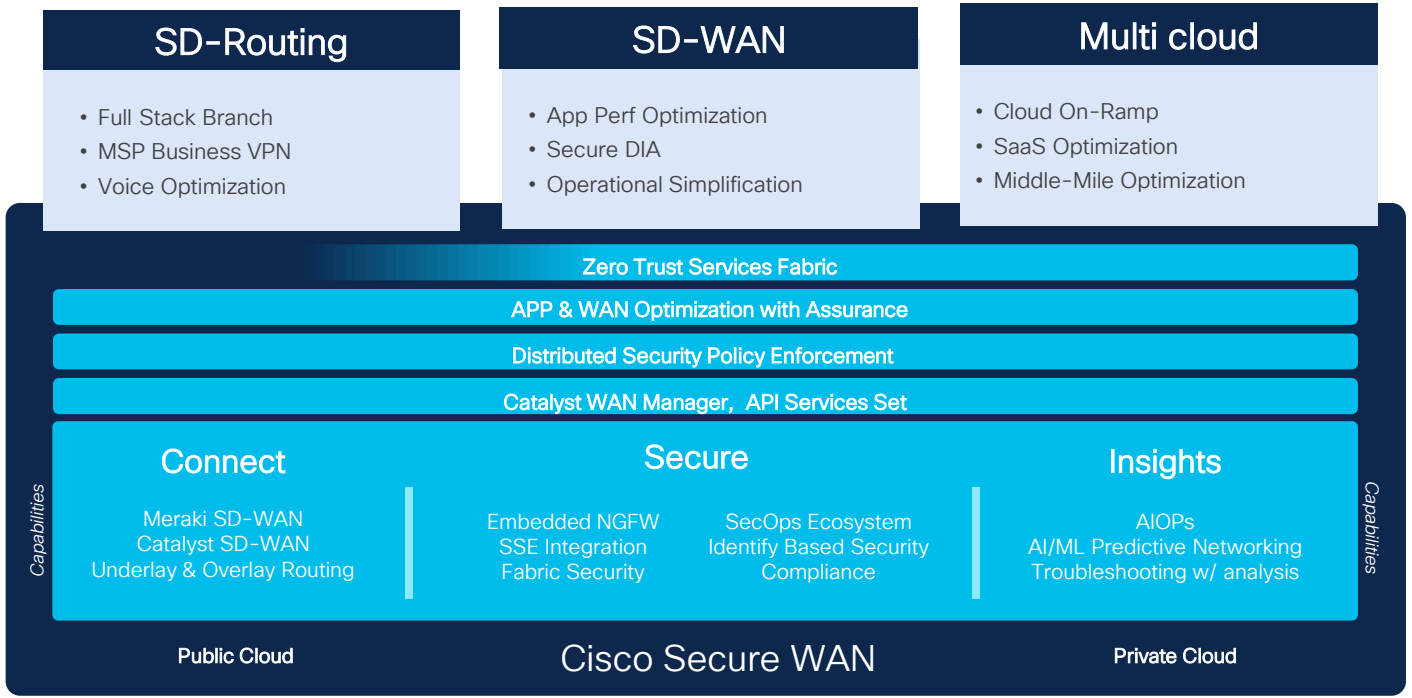


Cisco SD-WAN: Software Approach

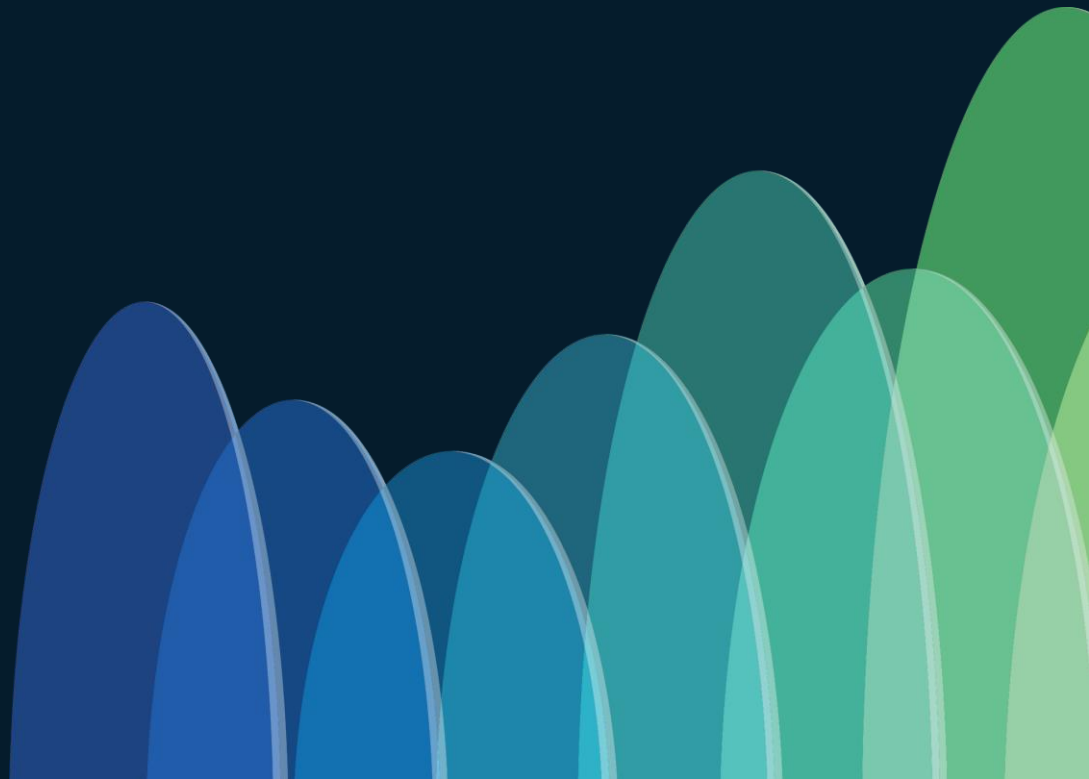


Cisco Secure WAN

Connecting users, places and things from everywhere to applications anywhere securely



Solution Architecture



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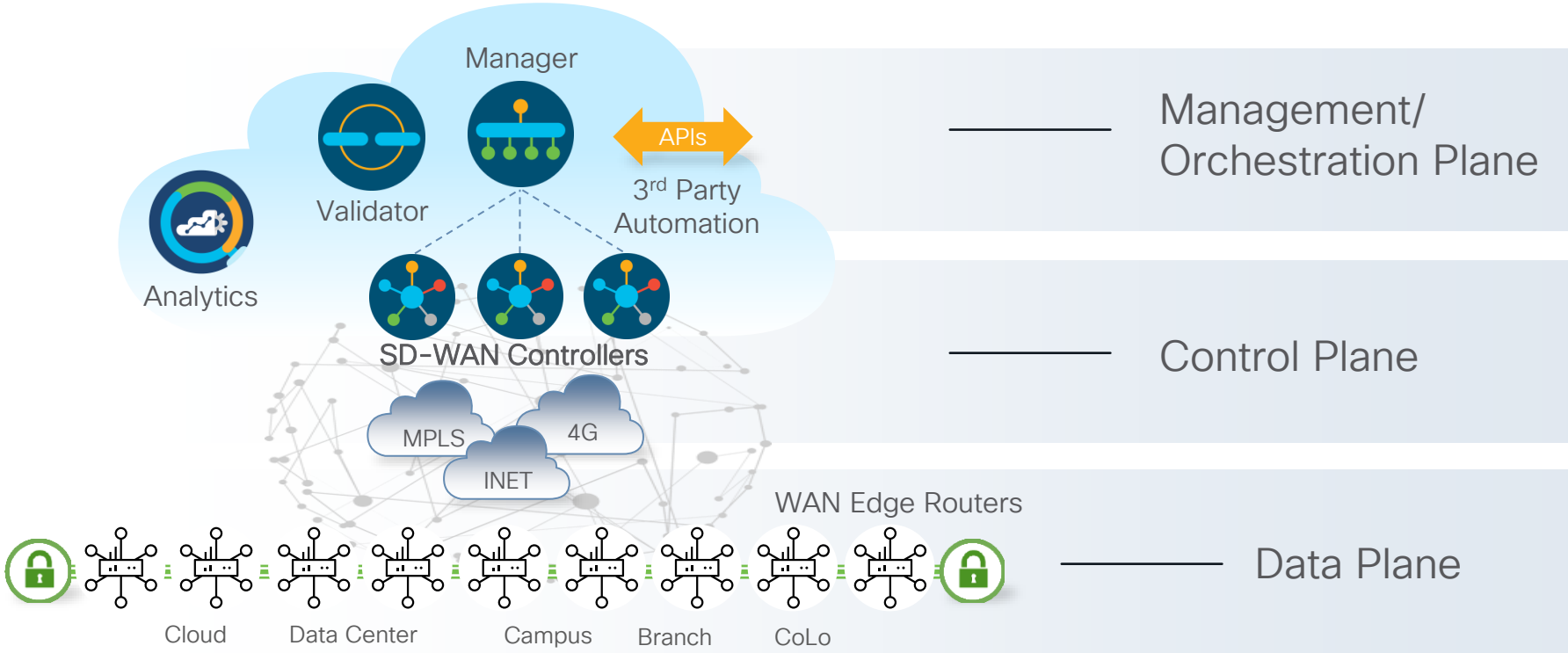
FYI

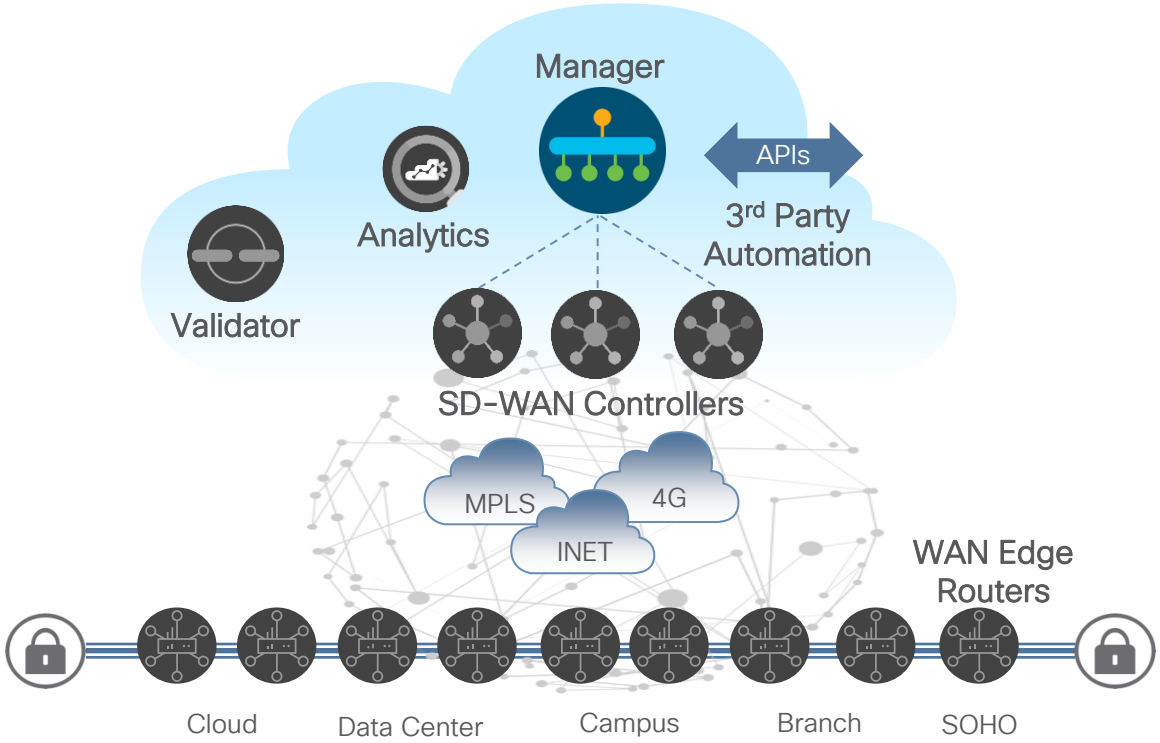
New Naming: Cisco Catalyst SD-WAN

Old Name	New Name (rebranding)	Documentation	Displayed on Screens	API/CLI – Documentation
Cisco SD-WAN	Cisco Catalyst SD-WAN	Cisco Catalyst SD-WAN	Cisco Catalyst SD-WAN	Cisco Catalyst SD-WAN
vManage	Cisco Catalyst SD-WAN Manager	SD-WAN Manager	Manager	vManage
vAnalytics	Cisco Catalyst SD-WAN Analytics	SD-WAN Analytics	Analytics	vAnalytics
vBond	Cisco Catalyst SD-WAN Validator	SD-WAN Validator	Validator	vBond
vSmart	Cisco Catalyst SD-WAN Controller	SD-WAN Controller	Controller	vSmart
Self Service Portal	Cisco Catalyst SD-WAN Portal	Cisco Catalyst SD-WAN Portal	Cisco Catalyst SD-WAN Portal	SD-WAN Portal
Cloud-Delivered Cisco SD-WAN	Cloud-Delivered Cisco Catalyst SD-WAN	Cloud-Delivered Cisco Catalyst SD-WAN	Cloud-Delivered Cisco Catalyst SD-WAN	NA

Cisco Catalyst SD-WAN Solution Overview



Cisco Catalyst SD-WAN Solution Elements

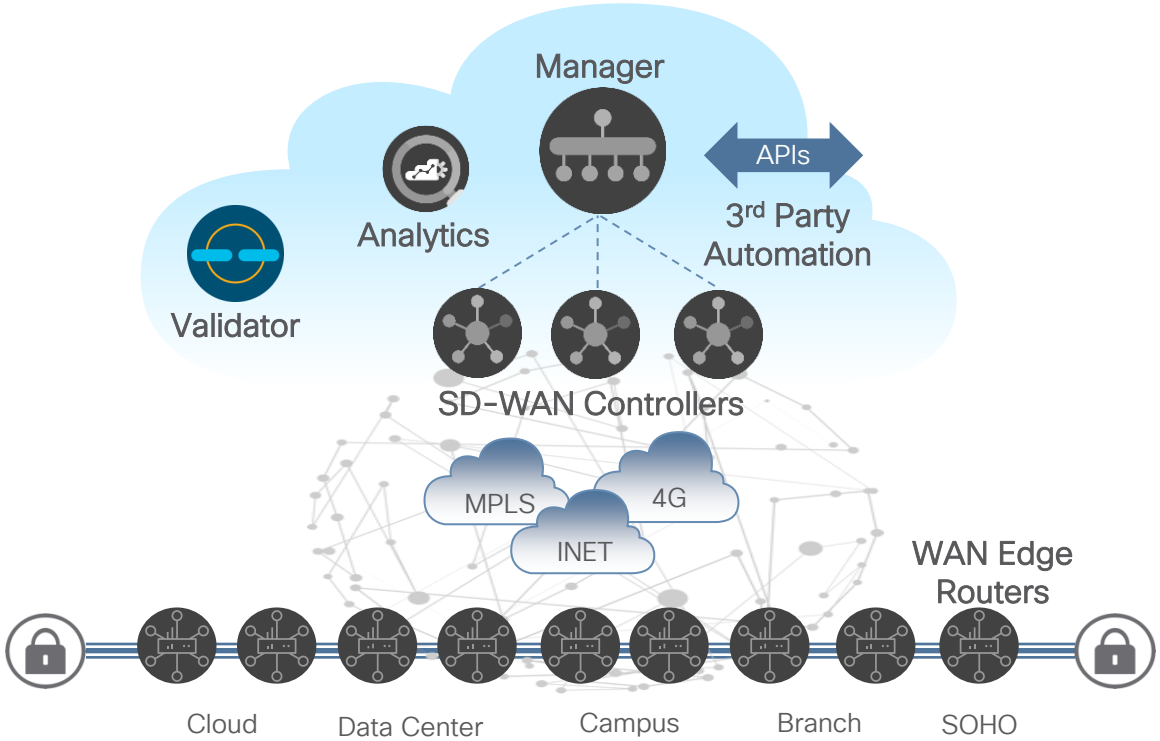


Management Plane

Cisco Catalyst SD-wan Manager

- Single pane of glass for Day0, Day1 and Day2 operations
- Multitenant with web scale
- Centralized provisioning
- Policies and Templates
- Troubleshooting and Monitoring
- Software upgrades
- GUI with RBAC
- Programmatic interfaces (REST, NETCONF)
- Highly resilient

Cisco Catalyst SD-WAN Solution Elements

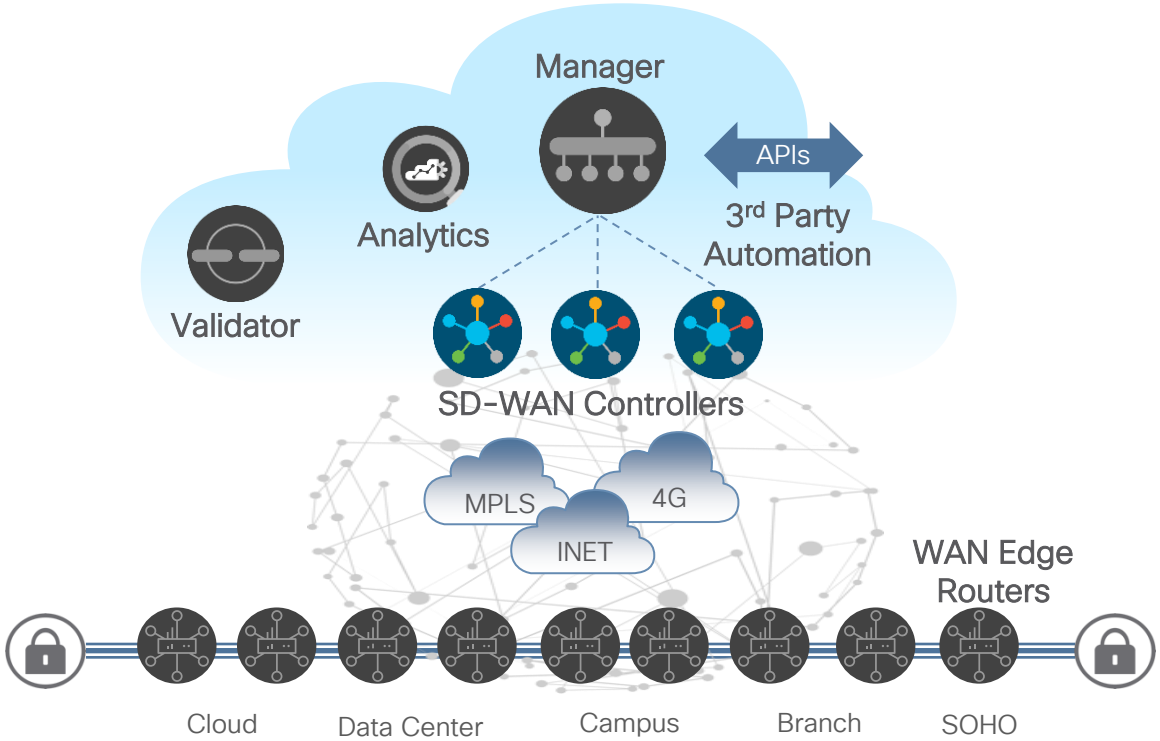


Orchestration Plane

Cisco Catalyst
SD-WAN Validator

- Orchestrates control and management plane
- First point of authentication (white-list model)
- Distributes list of Controllers/ Manager to all WAN Edge routers
- Facilitates NAT traversal
- Requires public IP Address [could sit behind 1:1 NAT]
- Highly resilient

Cisco Catalyst SD-WAN Solution Elements

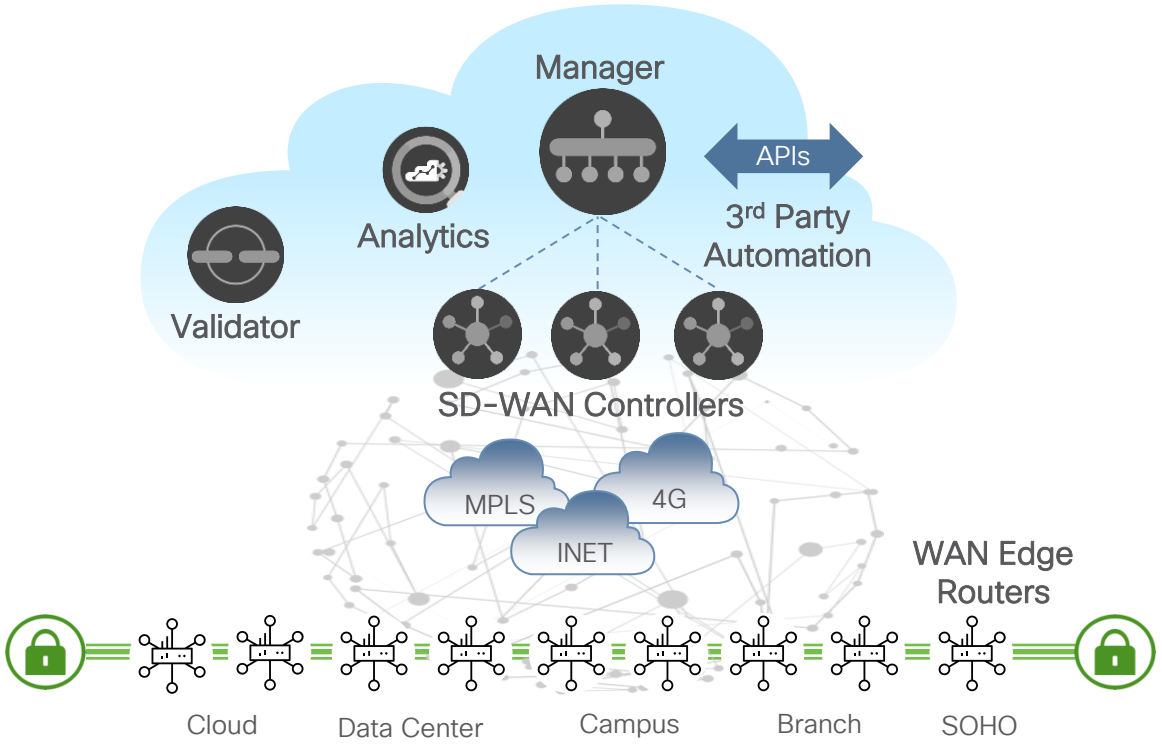


Control Plane

Cisco Catalyst SD-WAN Controller

- Facilitates fabric discovery
- Dissimilates control plane information between WAN Edge Routers
- Distributes data plane and app-aware routing policies to the WAN Edge routers
- Implements control plane policies, such as service chaining, multi-topology and multi-hop
- Dramatically reduces control plane complexity
- Highly resilient

Cisco Catalyst SD-WAN Solution Elements



Data Plane

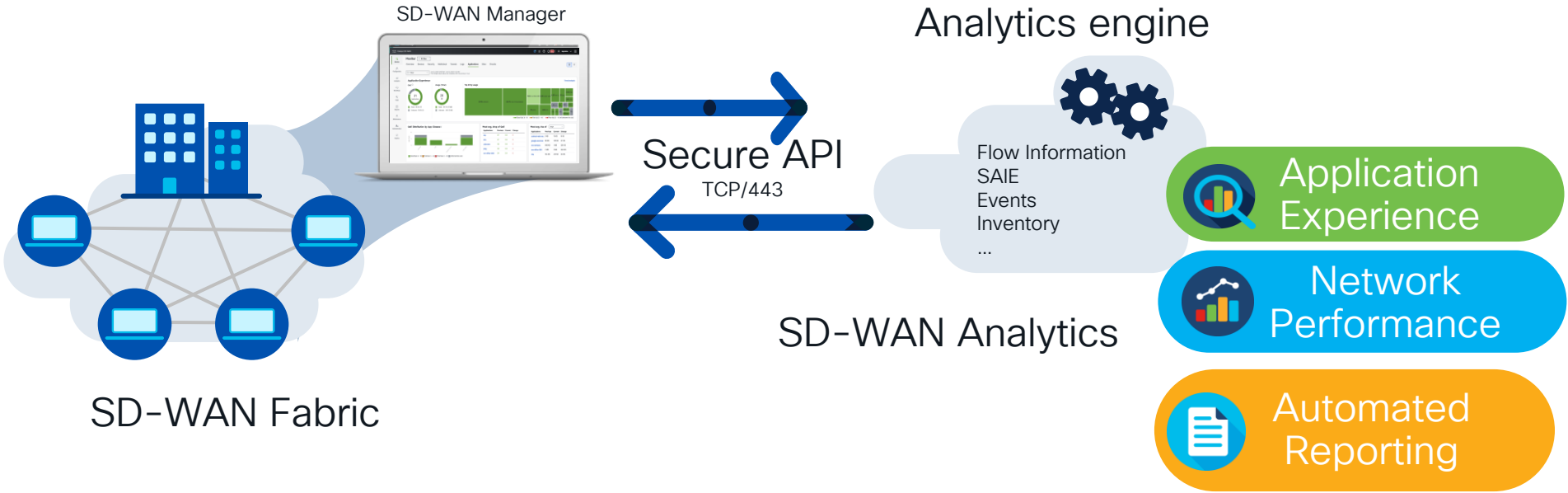
Physical/Virtual

Cisco SD-WAN
WAN Edge

- WAN edge router
- Provides secure data plane with remote WAN Edge routers
- Establishes secure control plane with vSmart controllers (OMP)
- Implements data plane and application aware routing policies
- Exports performance statistics
- Leverages traditional routing protocols like OSPF, BGP, and EIGRP
- Support Zero Touch Deployment
- Physical or Virtual form factor (100Mb, 1Gb, 10Gb,40Gb, 100Gb)

Analytics Architecture

Learn more watch
BRKENT-2469



On-Prem or Cloud-Hosted SD-WAN Manager

Cloud-Hosted Analytics

Cisco Catalyst SD-WAN Fabric Deployment Models

Customer/MSP Hosted

- Customer Private Cloud & Public Cloud
- MSP Private Cloud & Public Cloud

Cisco Hosted
(AWS & Azure)

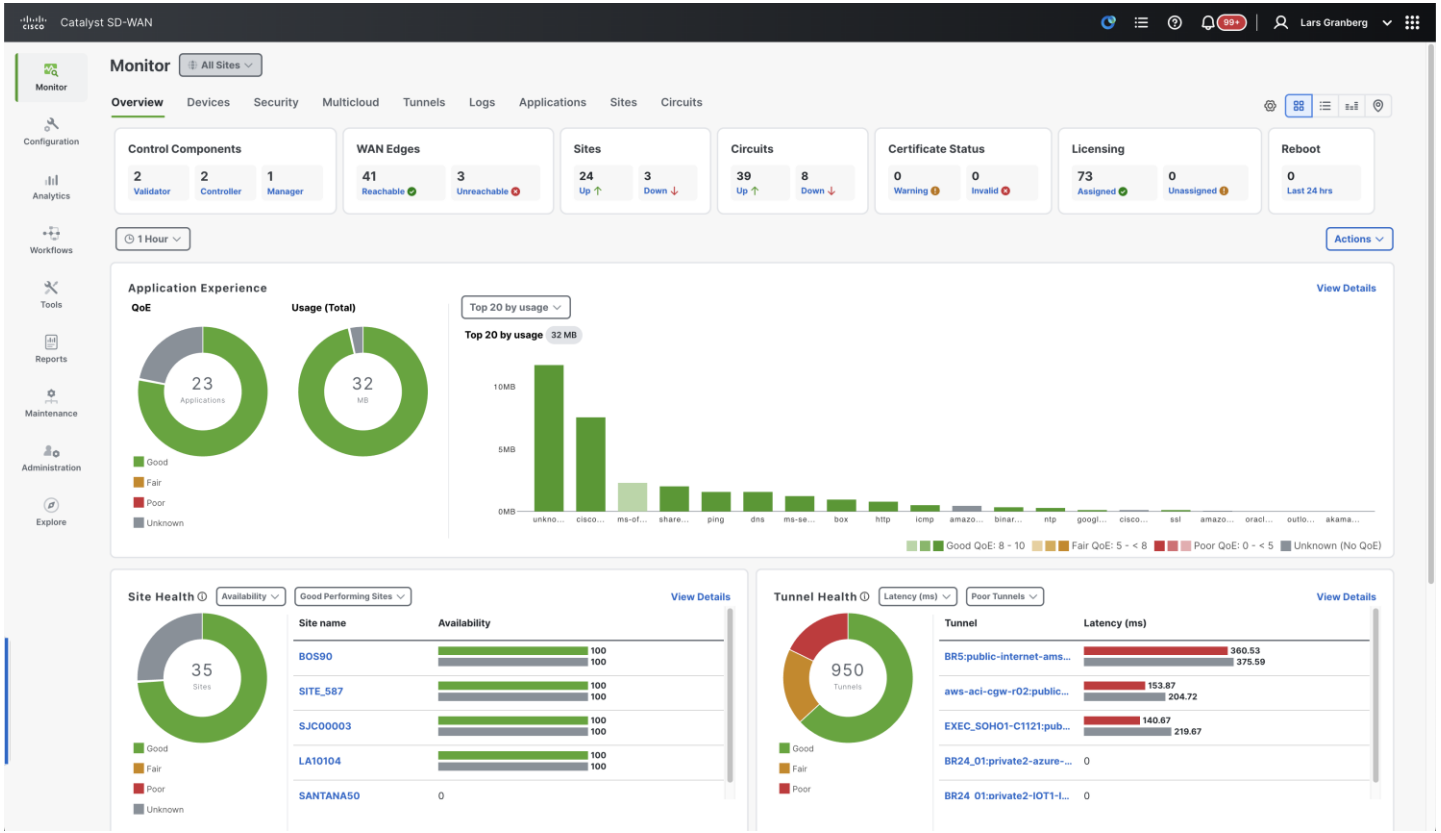
- Standard Environment (Shared and Dedicated)
- Certified Environment (PCI, SOC2, ISO, C5, etc.)
- Gov. Cloud (FedRAMP)

Cloud-delivered*

- Life Cycle Management of SD-WAN Fabric
- Agile and scalable service access
- Operational simplicity
- Rich analytics providing actionable insights

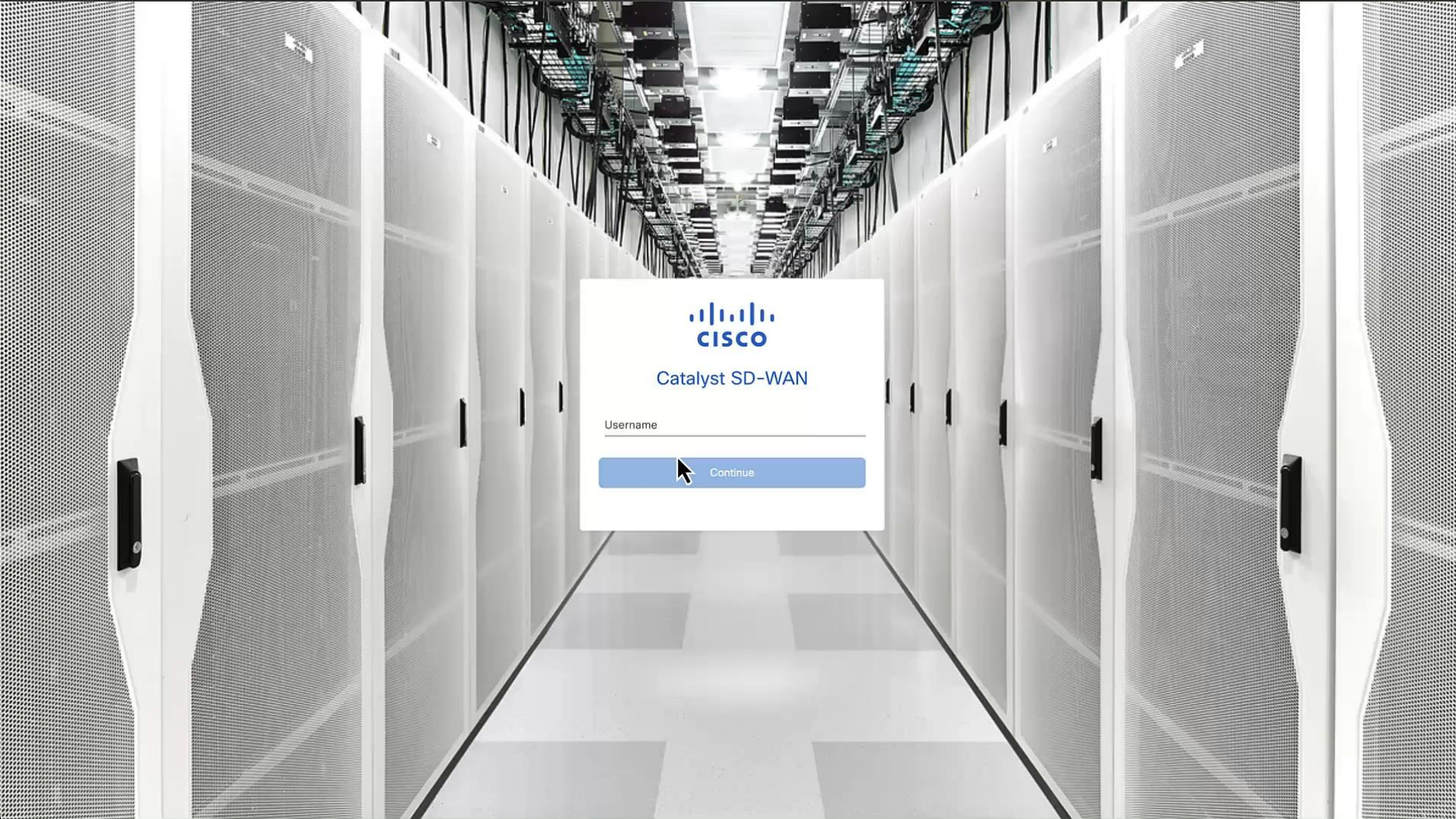
Flexible deployment models aligned to your business needs

SD-WAN Manager UI

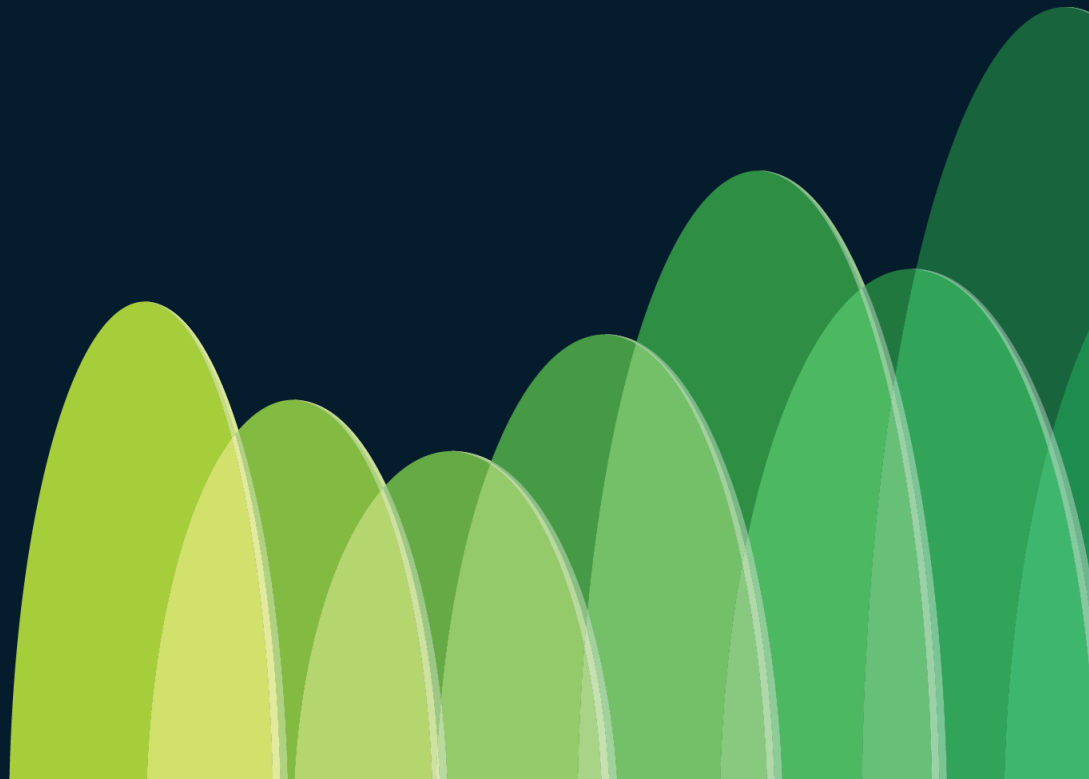


SD-WAN Manager 20.15.1

Demo


Catalyst SD-WAN
Username
Continue

SD-WAN Features



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Significance of TLOC Color

Color is an abstraction used to identify individual WAN transport

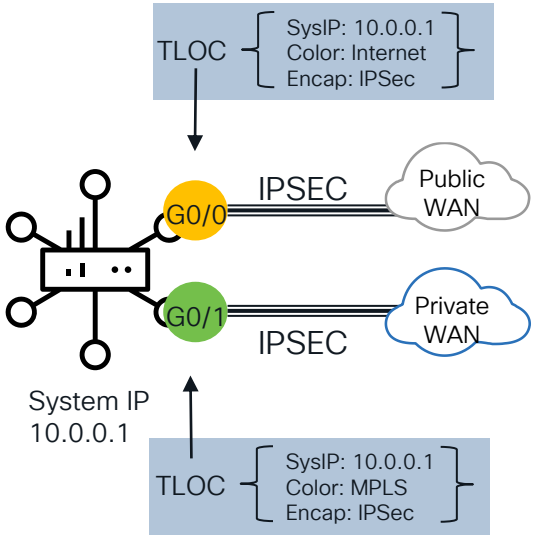
Colors are KEYWORDS not just LABELS

Policy is written based on these

TLOC maps to a physical WAN interfaces

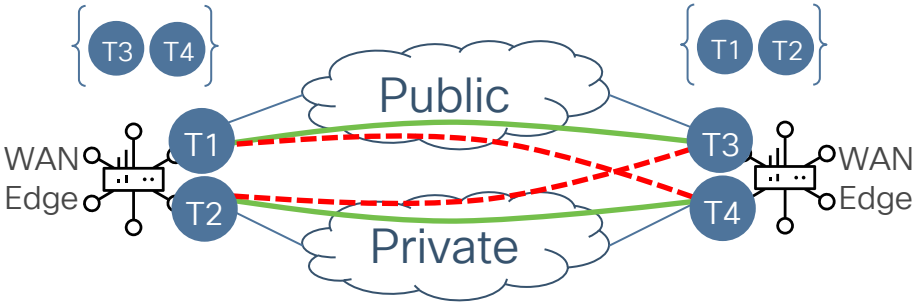
“Color” dictates the use of private-ip vs public-ip (dest) for Tunnel Establishment when there is NAT present

- Example:
  - If two ends have a private color: private IP address/port used for DTLS/TLS or IPSec
  - If endpoint has public color: Public IP is used for DTLS/TLS or IPSec

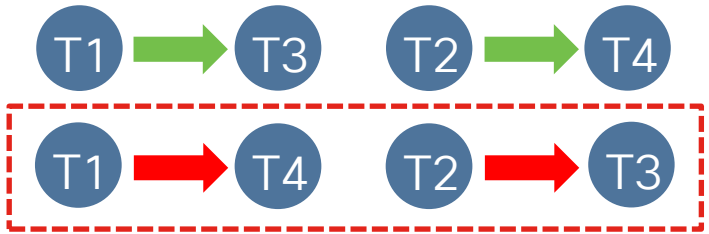


Private Colors	Public Colors
Metro-ethernet	3g
mpls	lte
private1	biz-internet
private2	public-internet
private3	blue
private4	green
private5	red
private6	gold
	silver
	bronze

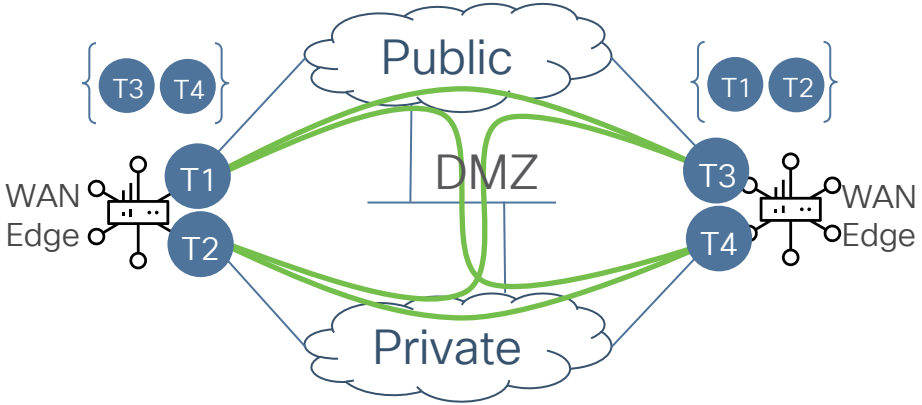
Transport Colors



T1, T3 – Public Color T2, T4 – Private Color

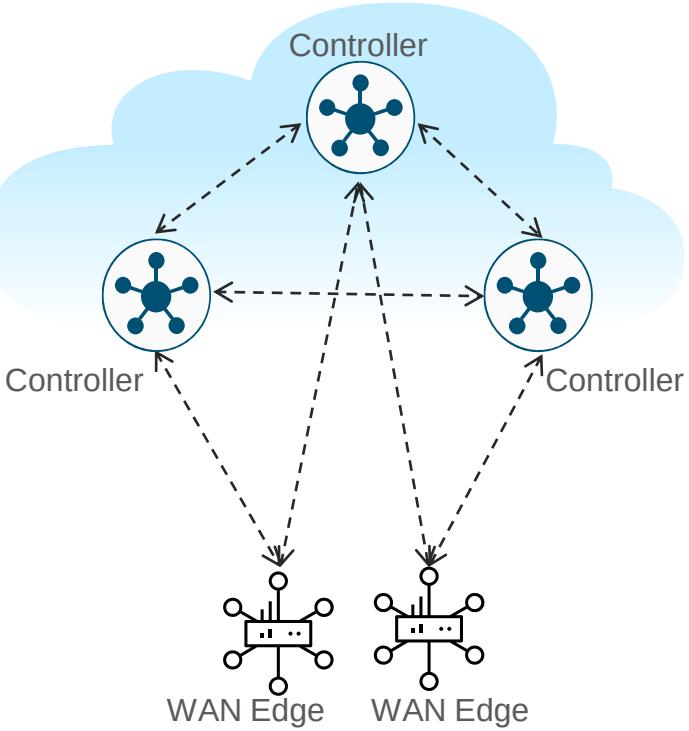


Color restrict will prevent attempt to establish IPSec tunnel to TLOCs with different color



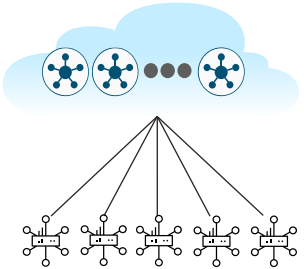
T1, T3 – Public Color T2, T4 – Private Color

Overlay Management Protocol (OMP)



- Overlay Management Protocol (OMP)
- TCP-based extensible control plane protocol
- Runs between WAN Edge routers and vSmart controllers and between the vSmart controllers
  - Inside authenticated TLS/DTLS connections
- Advertises control plane context and policies
- Dramatically lowers control plane complexity and raises overall solution scale

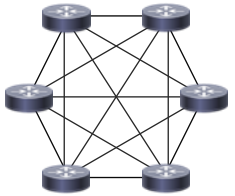
SD-WAN



O(n) Control Complexity

VS

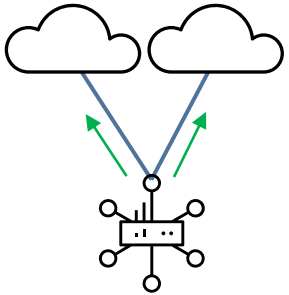
Traditional



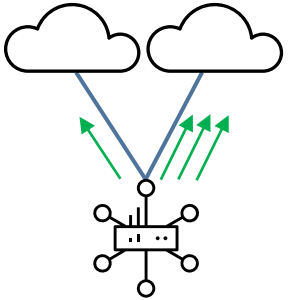
O(n^2) Control Complexity

Fabric Communication

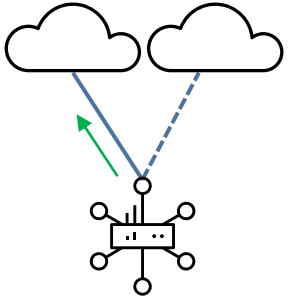
Per-Session Load-sharing
Active/Active



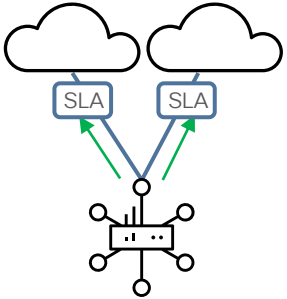
Per-Session Weighted
Active/Active



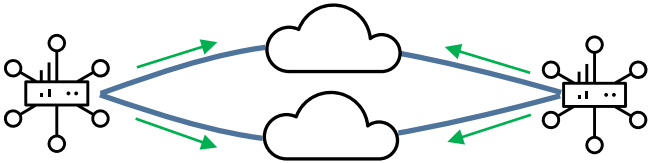
Application Pinning
Active/Standby



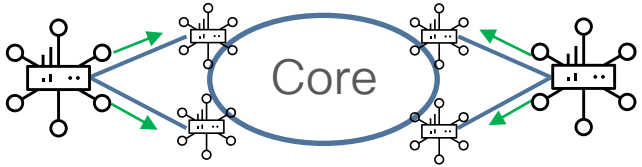
Application Aware Routing
SLA Compliant



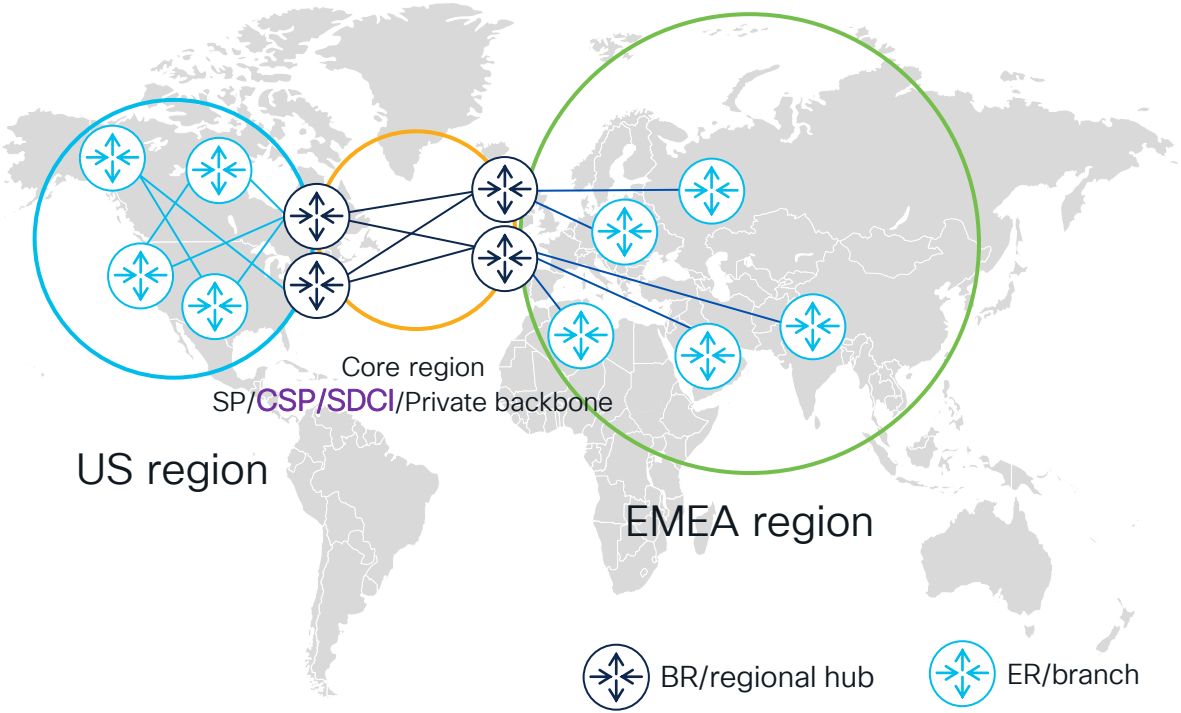
Single-hop Fabric



Multi-Region Fabric



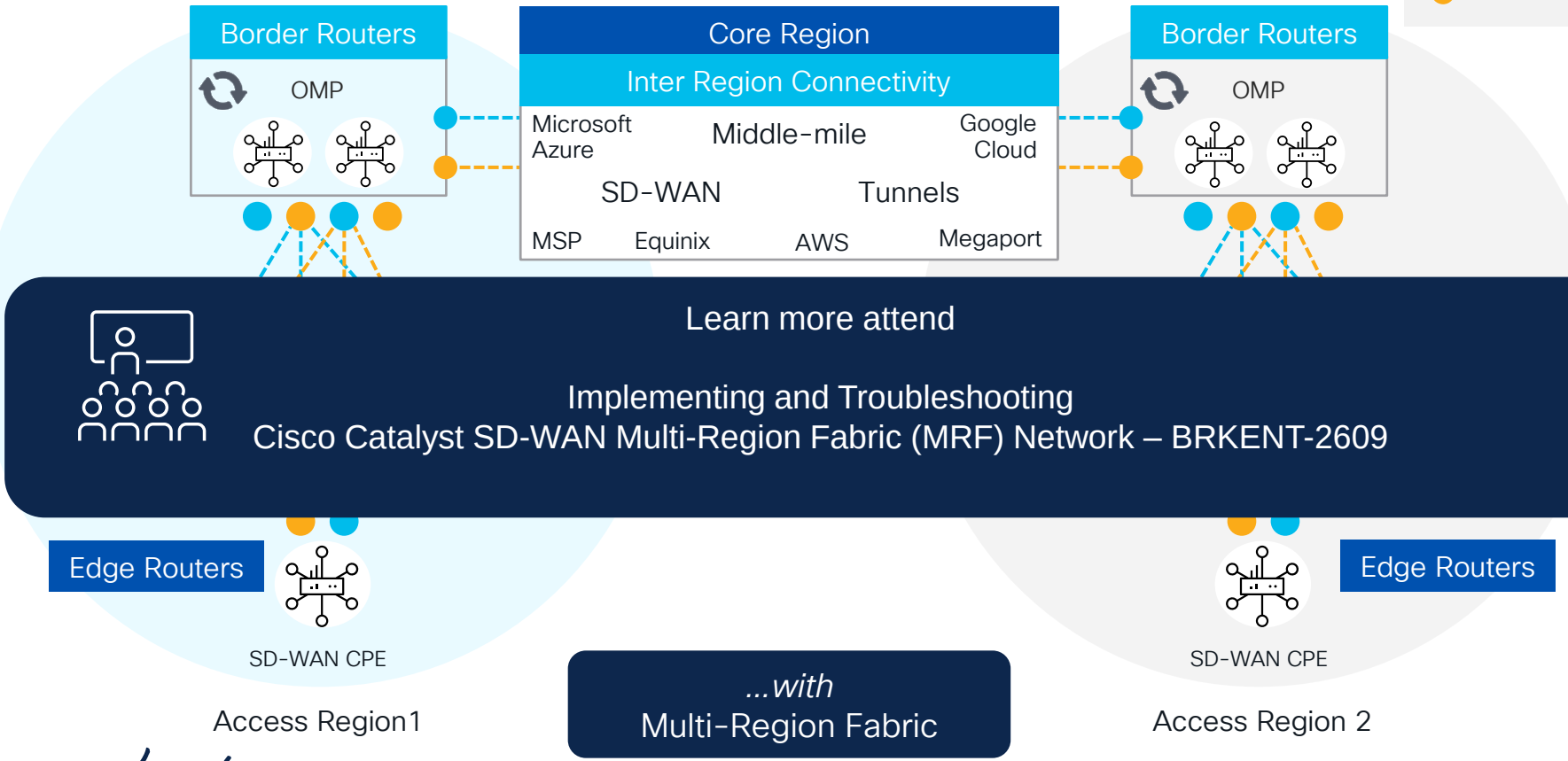
What is Multi Region Fabric (MRF)?



- Intuitive user-defined site grouping. E.g. based on geo
- Finer grouping using sub-regions
- Auto restrict overlay tunnels between regions
- Different topologies per region
- Mix access transports across regions
- Scale up control-plane per region(s)

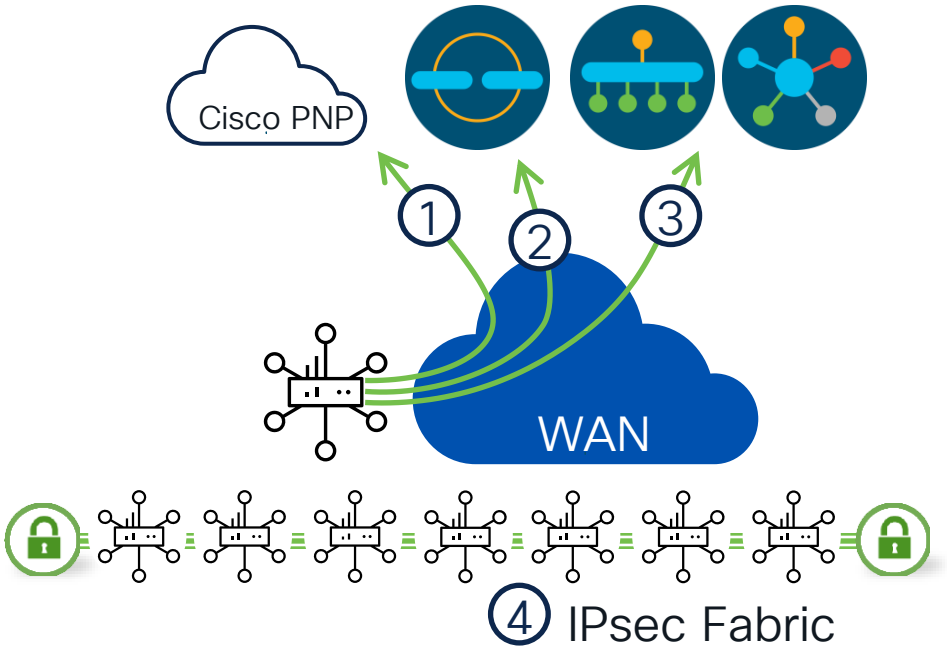
CSP = Cloud Service Provider (AWS, Azure, GCP)
SDCI = Software Defined Cloud Interconnect

The Network, with Multi-Region Fabric



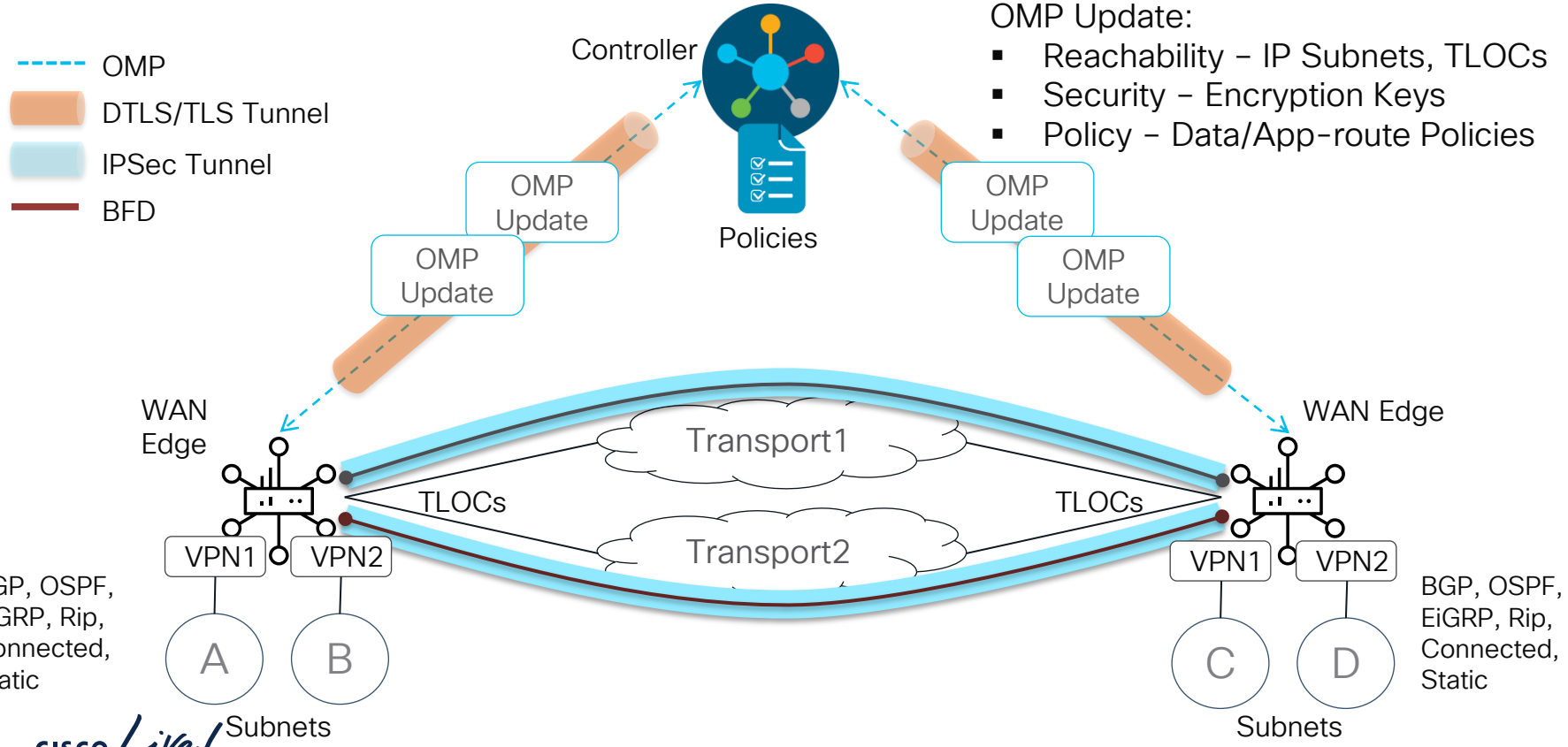
Lets bring it up

Automated, Zero-Touch Onboarding

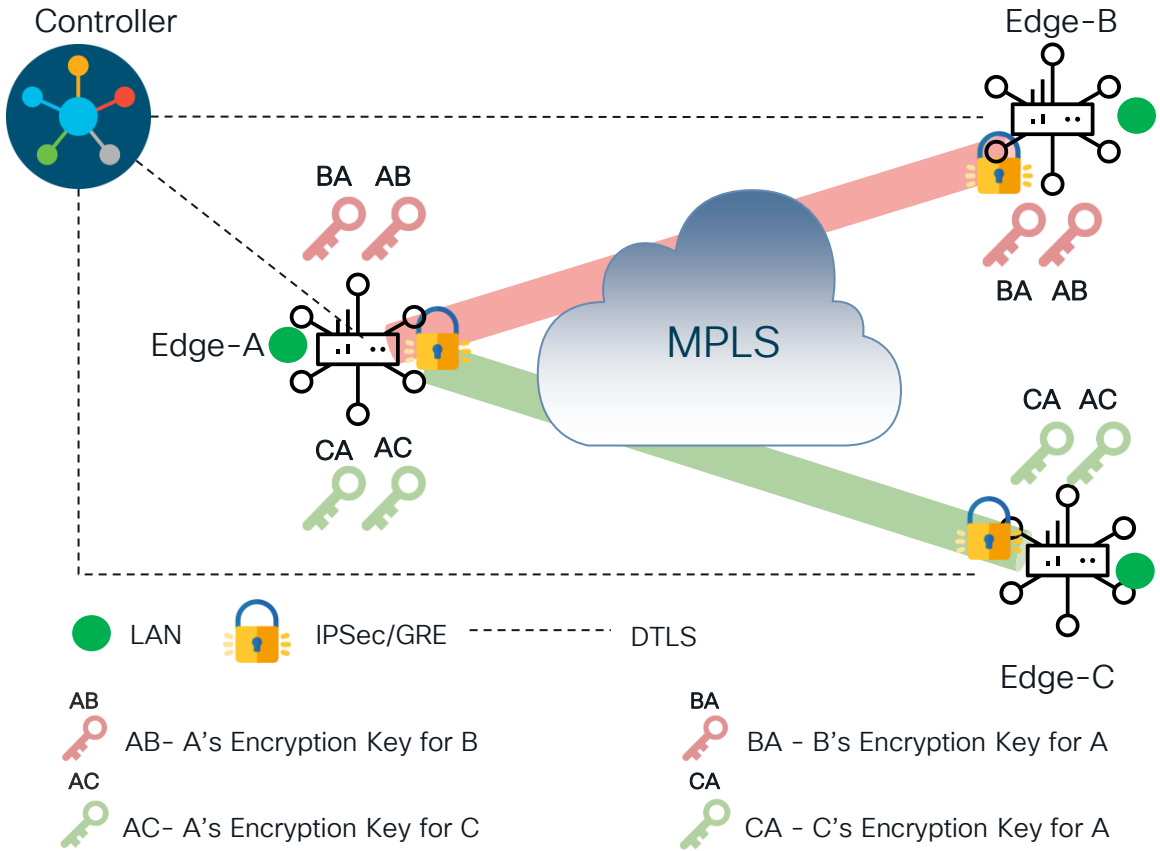


- SD-WAN appliance will onboard itself into the SD-WAN fabric automatically with no administrative intervention.
- Connect the SD-WAN appliance to a WAN transport that can provide a dynamic IP address, default-gateway and DNS information.
- If no DHCP service is available then bootstrap file is an option either on USB or Bootflash

Fabric Operation Walk-Through



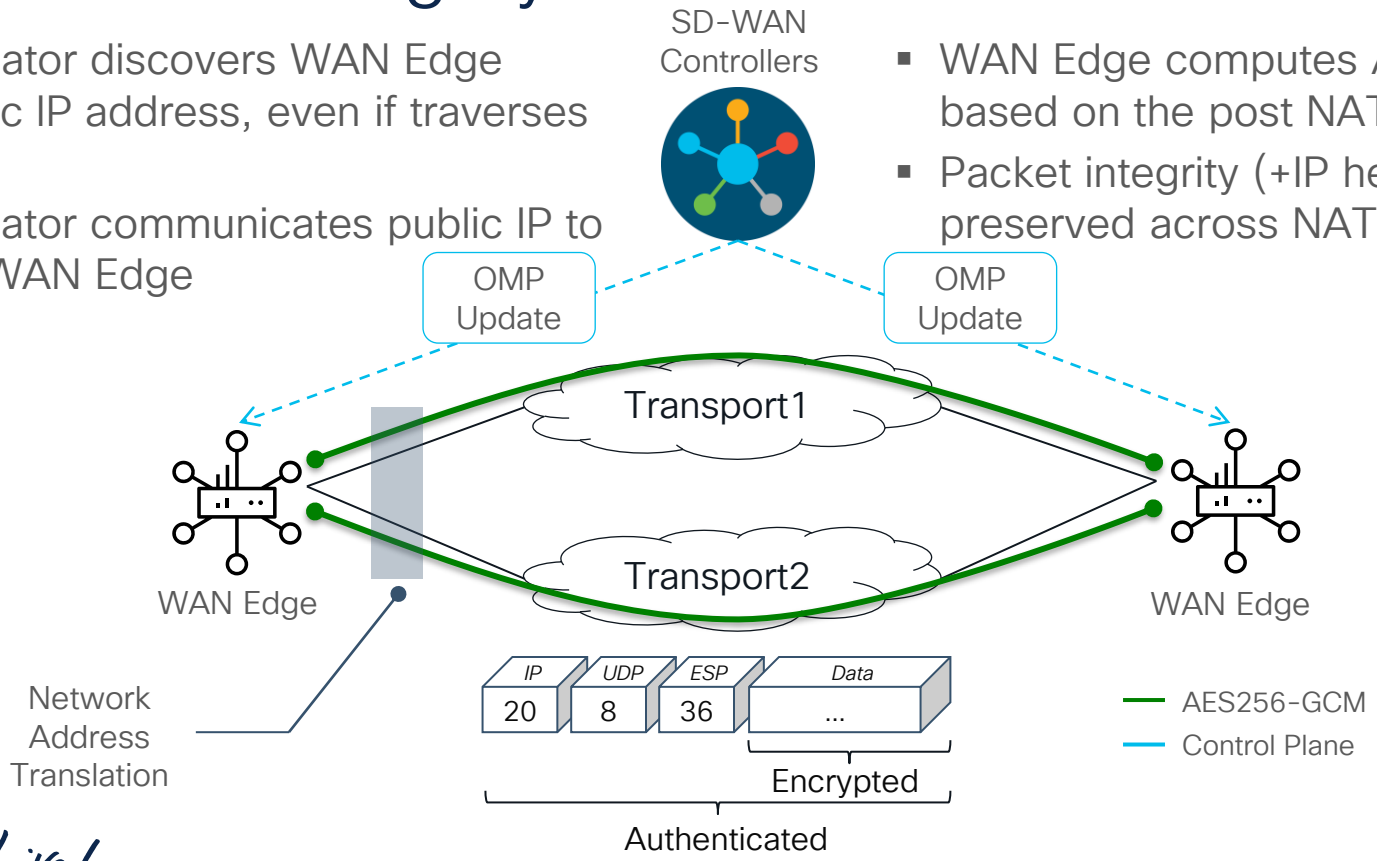
Data Plane Privacy (Pairwise)



- Each WAN edge will create separate session key for each transport and for each peer
- Session keys will be advertised through vSmart using OMP
- When Edge-A needs to send traffic to Edge-B, it will use session key "AB" (B will use key "BA")

Data Plane Integrity

- Validator discovers WAN Edge public IP address, even if traverses NAT
- Validator communicates public IP to the WAN Edge

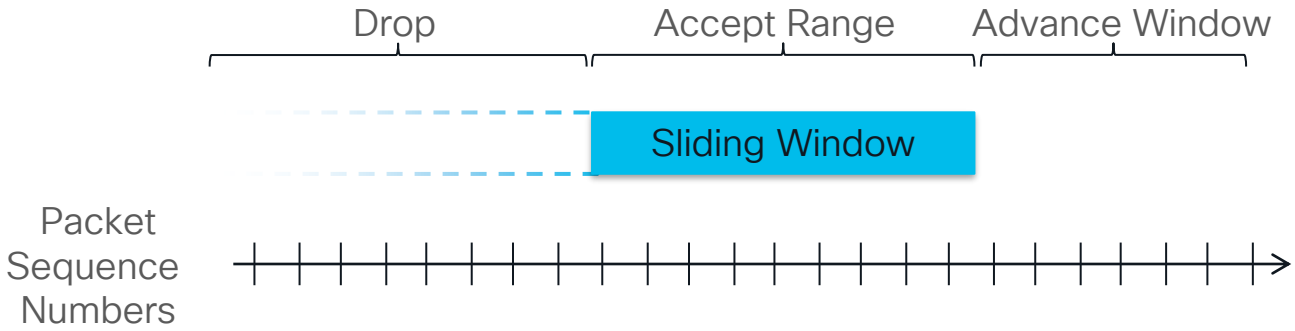


- WAN Edge computes AH value based on the post NAT public IP
- Packet integrity (+IP headers) is preserved across NAT

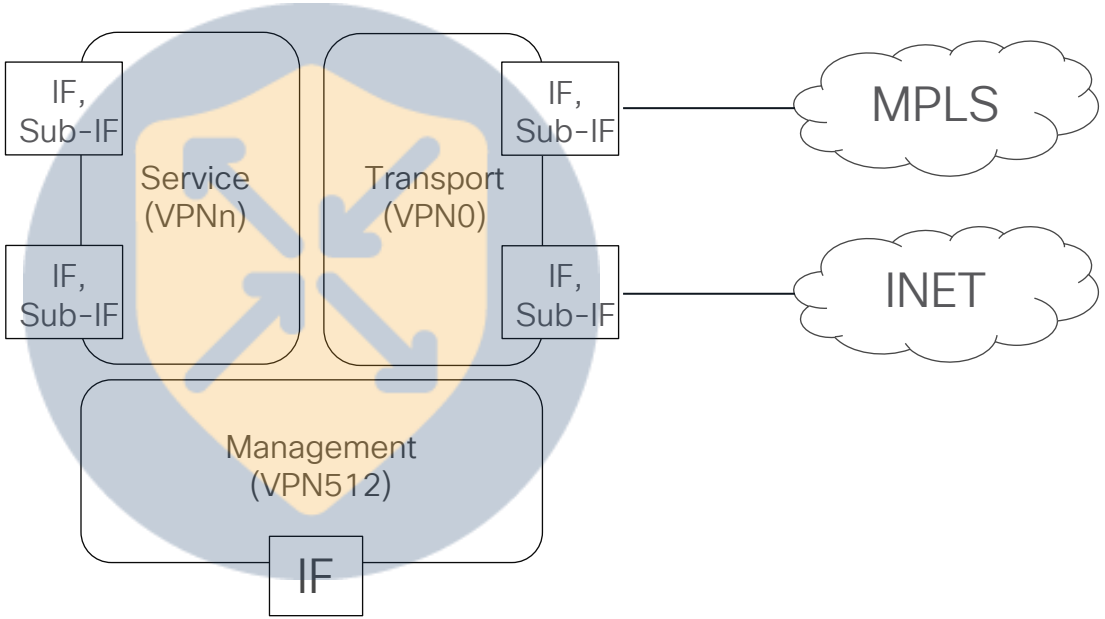
FYI

IPsec Anti-Replay Protection

- Encrypted packets are assigned sequence numbers. WAN Edge routers drop packets with duplicate sequence numbers
  - Replayed packet
- WAN Edge routers drop packets with sequence numbers lower than the minimal number of the sliding window
  - Maliciously injected packet
- Upon receipt of a packet with higher sequence number than received thus far, WAN Edge router will advance the sliding window
- Sliding window is CoS aware to prevent low priority traffic from “slowing down” high priority traffic



Cisco SD-WAN VPNs (VRFs)

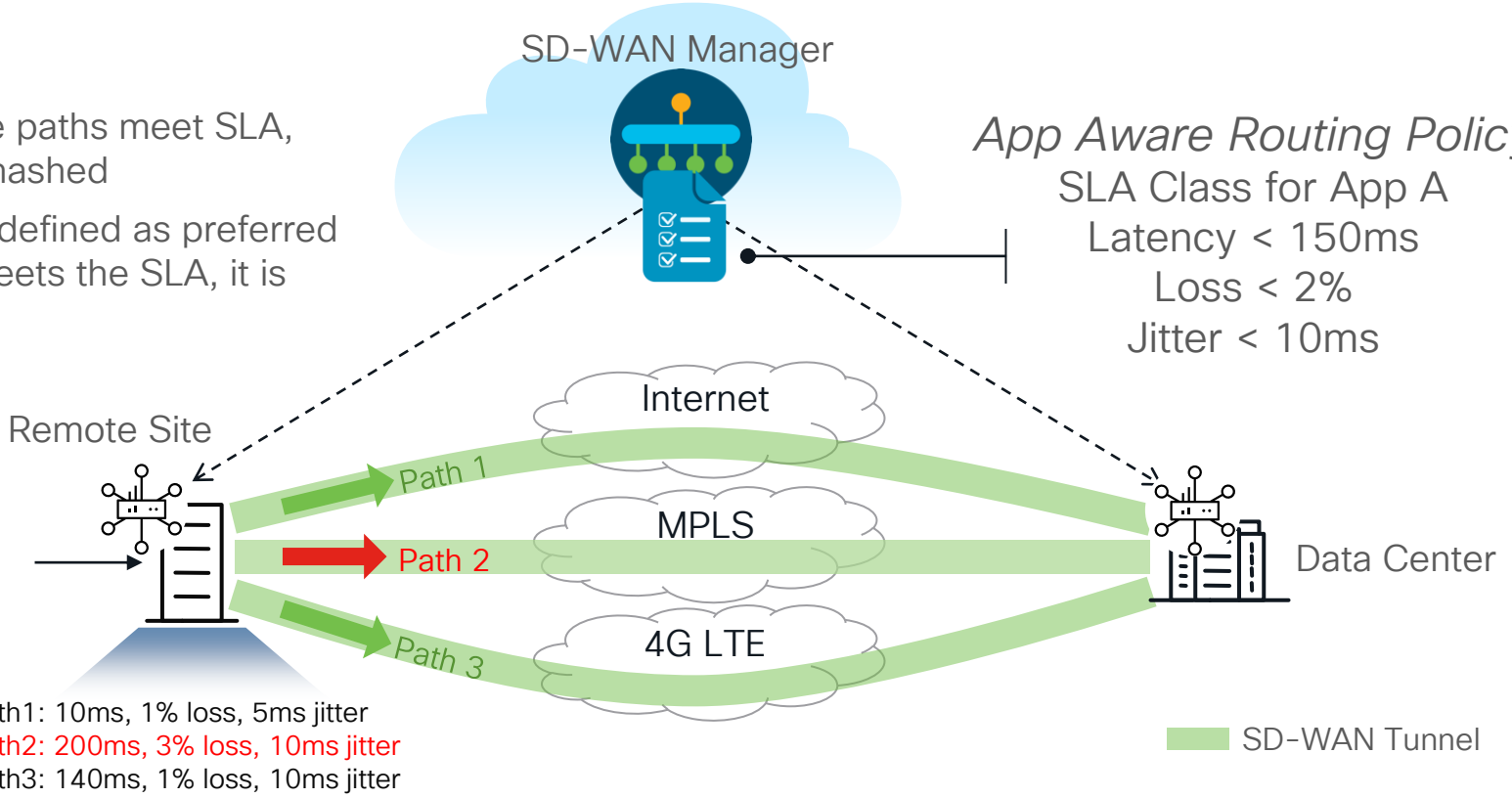


- VPNs are isolated from each other, with each VPN has its own forwarding table
- Reachability within VPN is advertised by OMP
- VPN0 is reserved for WAN uplinks (Transport)
- VPN512 is reserved for Management interfaces
- VPNn represents user-defined LAN segments (Service)

Application Aware Routing

Learn more about policy watch BRKENT-2043

- If multiple paths meet SLA, traffic is hashed
- If path is defined as preferred AND it meets the SLA, it is chosen



Key Building Blocks of AppQoE

Configuration Management System

SD-WAN Manager - Virtualized | Scalable | Network

DRE, LZW

Byte Level Caching & Compression

Protocol Agnostic

Forward Error Correction

Packet Duplication

110 110
1011 1011
010 010
110 110
1011 1011
010 010

TCP Optimization

BBR2 Congestion Algorithm

Window Scaling

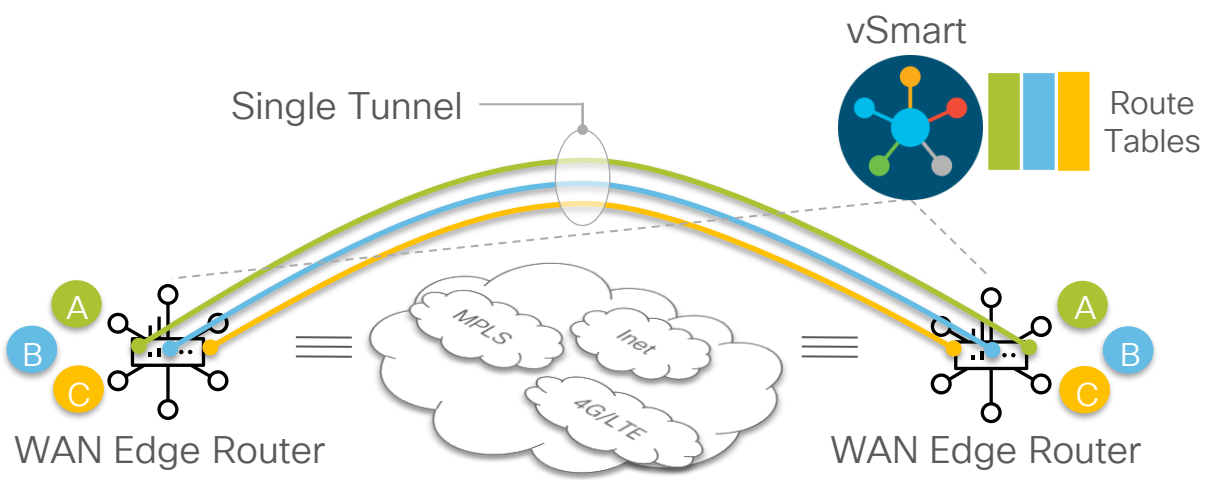
Large Initial Windows

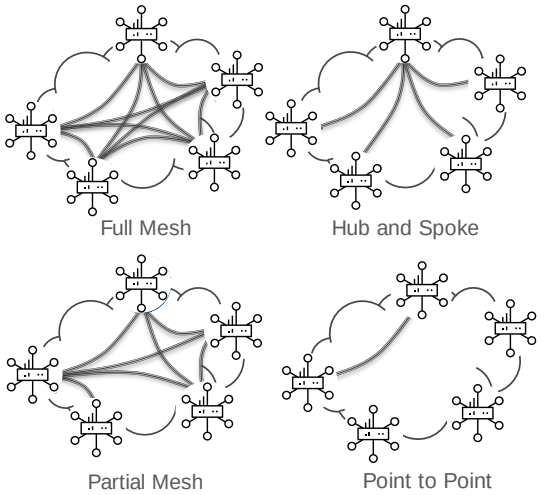
Selective Acknowledgement

BBR – Bottleneck Bandwidth and Round-trip propagation time

Security features

End-to-End Segmentation with Multi-Topology

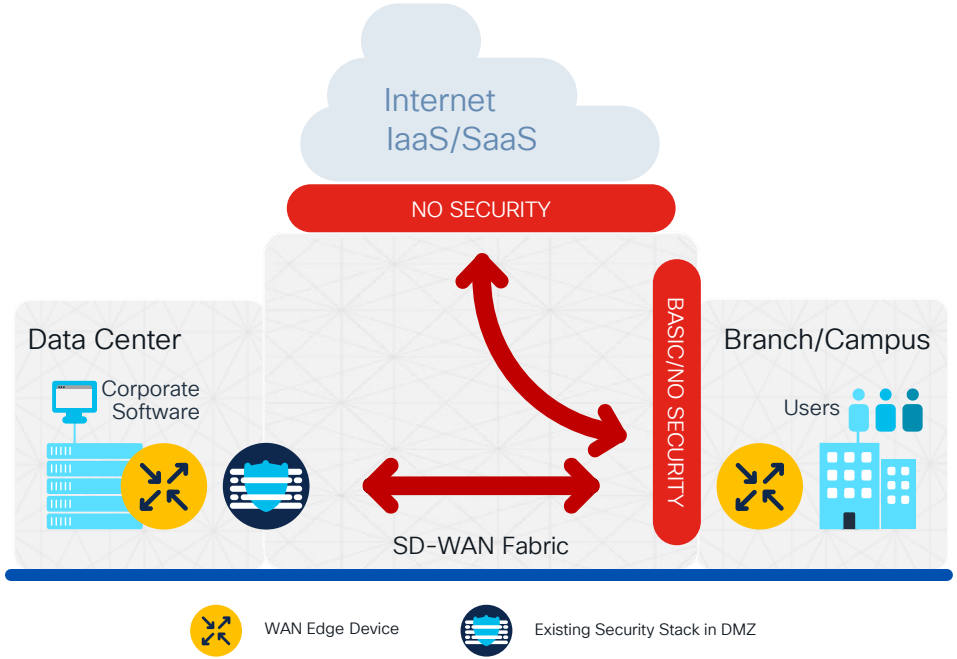




Segment connectivity across the SD-WAN fabric without reliance on underlay transport

WAN Edge routers maintain per-VPN routing table for complete control plane separation

How SD-WAN Exposes New Security Challenges



Internal & External Threats

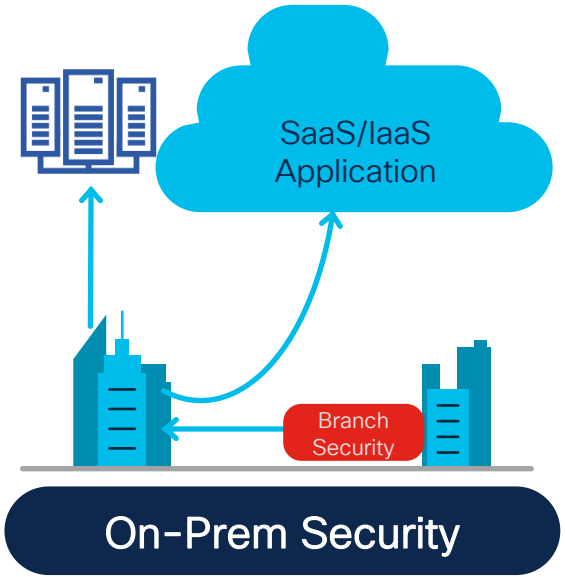
External

- Exposure to malware & phishing due to direct internet and cloud access
- Data breaches
- Guest access liability

Internal

- Untrusted access (malicious insider)
- Compliance (PCI, HIPPA, GDPR)
- Lateral movements (breach propagation)

Relevant Security Models. Driving towards SASE

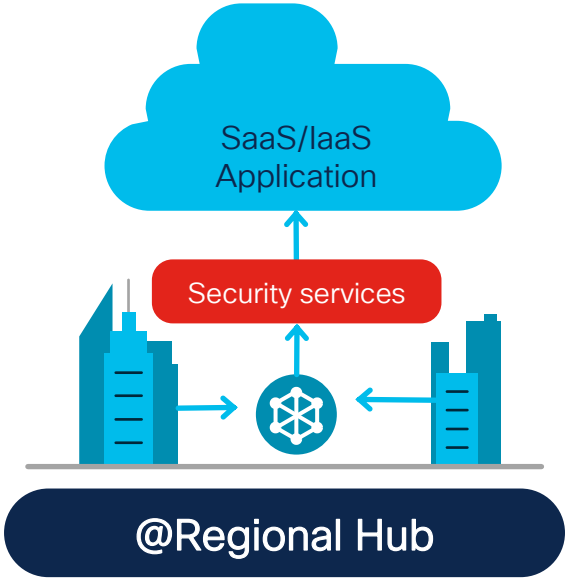


On-Prem Security

Thick branch with Routing and Security

Cloud Security/SSE

Thin branch with security in the cloud



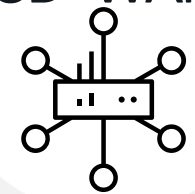
@Regional Hub

Security Services on a Regional Hub

Cisco Catalyst SD-WAN Security & SASE Solution

Consistent across on-prem and cloud

Cisco SD-WAN



< 8G Ram

Cisco Security

NextGeneration Firewall
Layer 3 to 7 apps classified with User Identity

Intrusion Protection System
Most widely deployed IPS engine in the world
Custom Applications

URL-Filtering
Web reputation score using 82+ web categories

Adv. Malware Protection
With File Reputation and Sandboxing (TG)

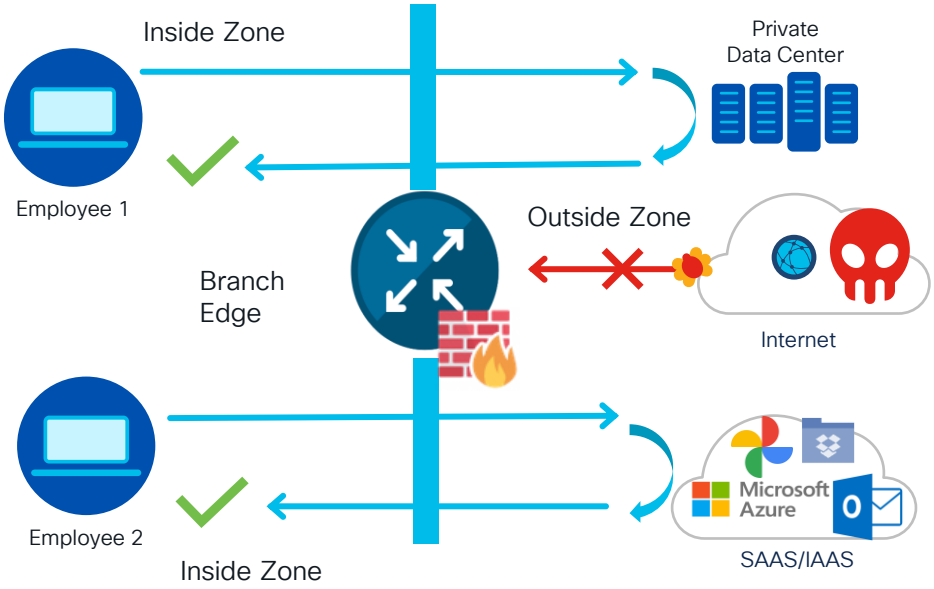
SSL Proxy
Detect Threats in Encrypted Traffic

Umbrella Cloud Security
DNS Security/Cloud FW with Cisco Umbrella

FYI

Catalyst Firewall

- Stateful Firewall (TCP,UDP,ICMP)
- App-aware using NBAR2 / SDAVC (Layer 3-7 visibility), Custom-app (NEW!)
- VPNs (VRFs) / Interfaces as Zones
- Self-Zones/Default-Zones
- Policy based on IPv4/IPv6, Ports, Protocols, FQDN, GEO, SGTs, User / User-group and Applications
- HSL logging/Unified Logging (multiple collectors)
- Session re-classification, Flood attack prevention
- ALG support (FTP, TFTP, SIP etc.)
- Object-groups/Rule-sets support for scalable configs
- FW Action: Pass | Drop | Inspect along with sending for Advanced Inspection



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FYI

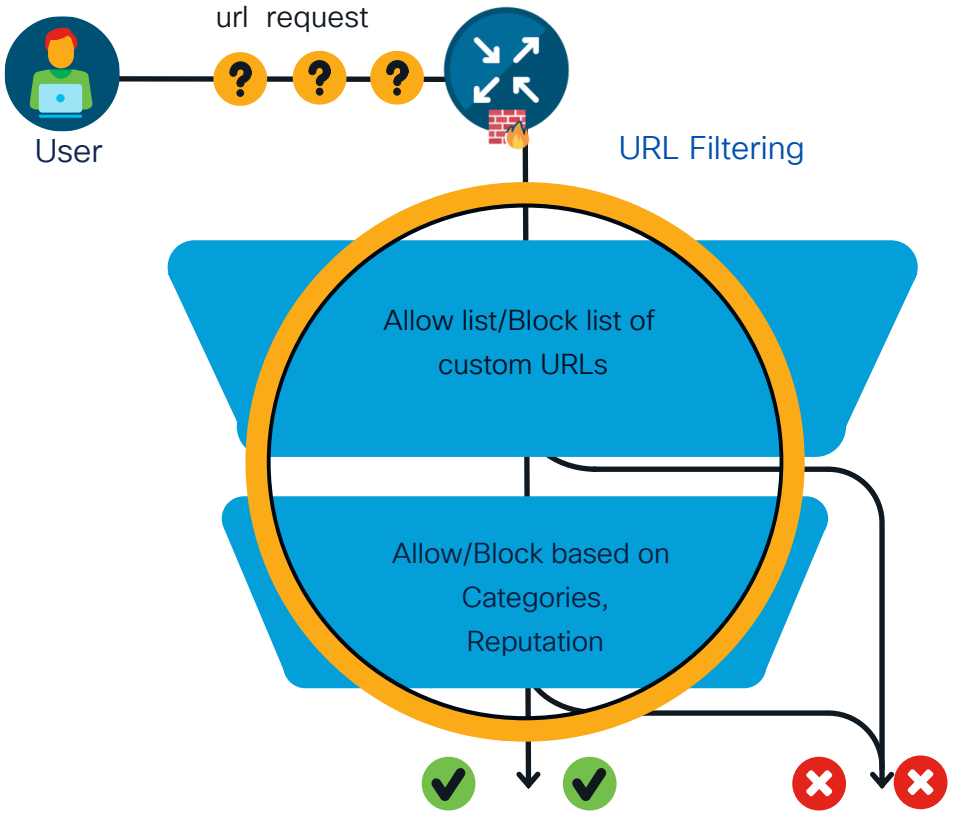
Intrusion Prevention/Detection System (IPS/IDS)

- Snort 3.0 – most widely deployed IPS engine in the world (better performance, ruleset coverage)
- IPS signatures (Talos) updated automatically by SDWAN manager or using local-server for air-gap networks Security-levels
  - Connectivity
  - Balanced
  - Security
- Custom IPS Signature
- IPS Signature Allow list
- Notifications and Syslog

FYI

URL-Filtering

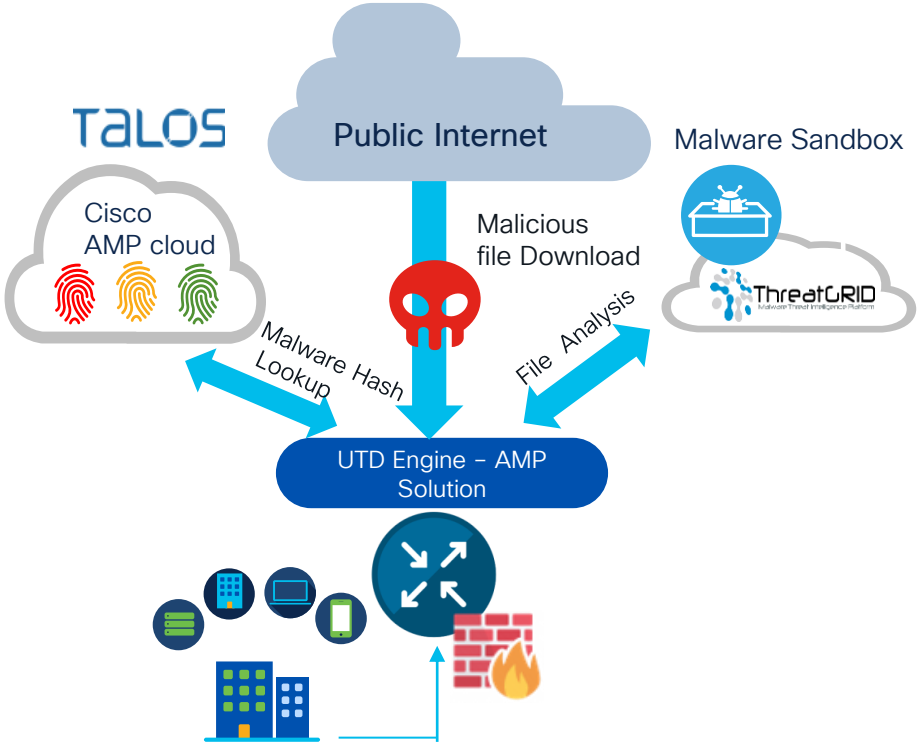
- Content filter of HTTP and HTTPs Traffic
- Utilizes Webroot Bright Cloud Web Classification and Web Reputation Service
- 82+ Web Categories and dynamic updates
- With URL-F feature enabled, order of process followed:
  - Allow lists of custom URLs
  - Block lists of custom URLs
  - Web Categories
  - Web Reputation Score
- Custom Regex based Allow and Block URL List
- Customizable End-user notifications – Block page or redirection
- Logging and Visibility



FYI

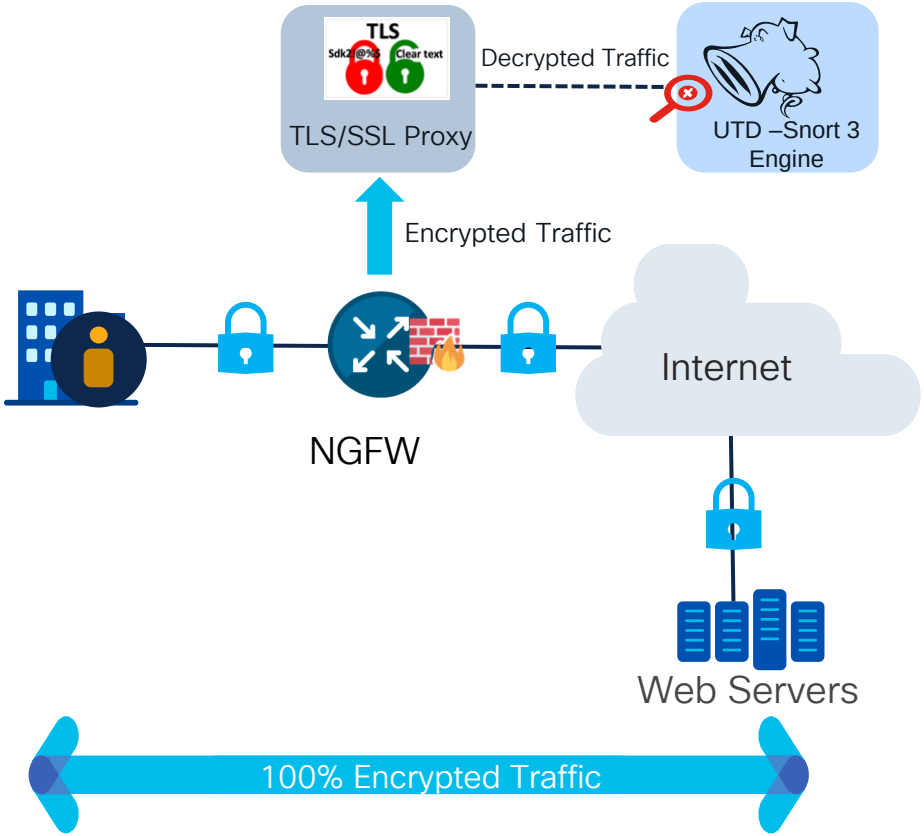
Advanced Malware Protection

- Integration with AMP Cloud
  - File Reputation
  - File Retrospection
- Integration with Threat Grid
  - File Analysis(sandboxing)
  - File Retrospection
- Customize log level



TLS/SSL Decryption

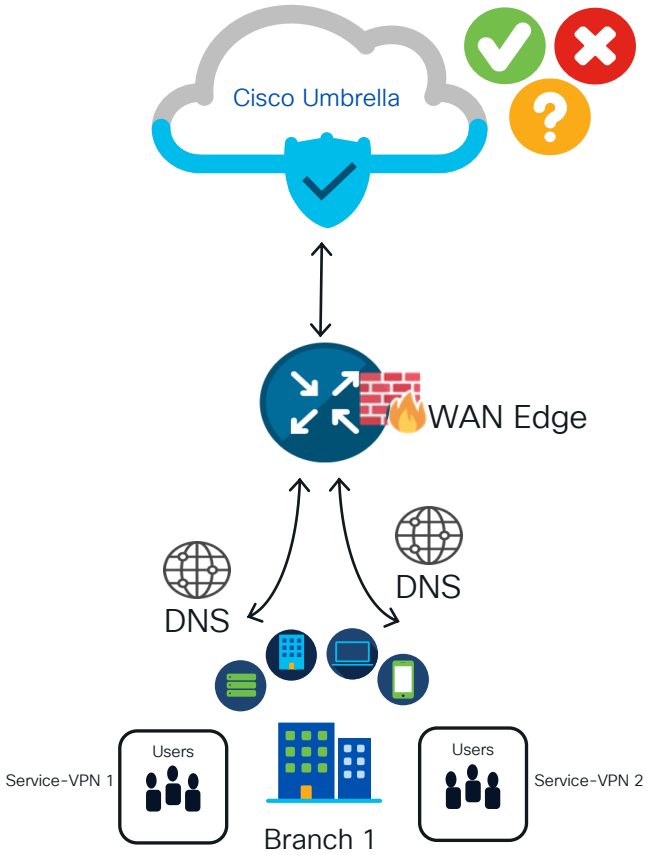
- TLS Proxy act as a Man in The Middle (MiTM)
- Proxy runs a Certificate authority
- Proxy generates Server certificates dynamically
- Catalyst Manager can act as a Certificate Authority to automate Proxy certificates
- Policy based decryption
- URL Reputation/Categories can be excluded



FYI

DNS Security

- Cloud-only DNS based inspection
- Automatic API Key registration
- VPN-aware policies
- Global points of presence (POP) and anycast IP for fastest response and high availability
- Block malware, phishing, and non-compliance domain requests
- Supports DNS-crypt
- Local Domain-bypass option



Learn more attend BRKSEC-2438

Cisco Secure Access

Go beyond core Secure Service Edge (SSE) to better connect and protect your business

Core SSE

- Secure Web Gateway (SWG)
- Cloud Access Security Broker (CASB) and DLP
- Zero Trust Network Access (ZTA)
- Firewall as a Service (FWaaS) and IPS

Cisco delivers the core and more in a single subscription...

- DNS Security
- Multimode DLP
- Advanced Malware protection
- Sandbox
- Talos Threat Intelligence
- VPN as a Service
- Digital Experience Monitoring*
- Remote Browser Isolation*

Add-on solutions

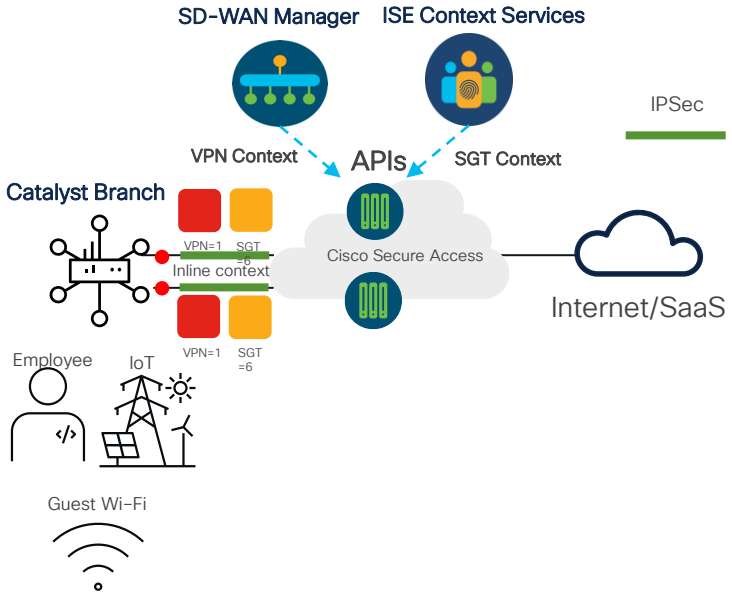
- SD-WAN
- XDR
- DUO MFA/ SSO
- CSPM

Cisco Catalyst WAN – Secure Access – Today

Use Case	Secure Internet/SAAS Access from Catalyst Branch
Catalyst Edge	• Automated connectivity with Auto/manual Region selection • Controller-Based Automation Framework • Robust Reliability with 8Active/8 Backup Tunnels • Application Assurance and Tracking • Advanced traffic steering and monitoring • SD-Routing Support

Catalyst SD-WAN-Cisco Secure Access Context Sharing

Context-aware security is key for implementing and achieving a true zero-trust framework for an enterprise.



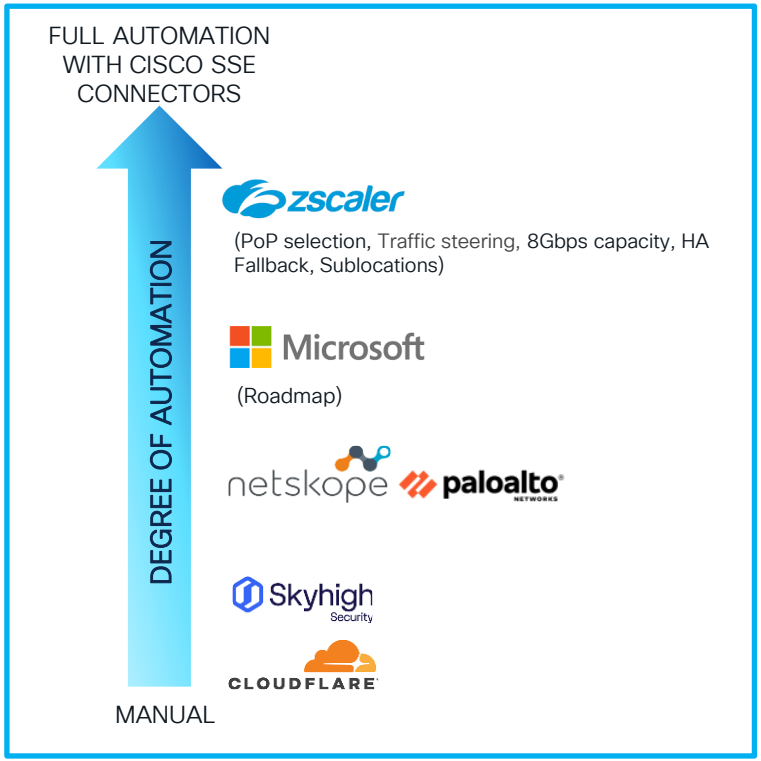
- Catalyst SD-WAN will share enterprise context with Cisco Secure Access
- Part of the efforts to share end-end context across the enterprise with Cisco-on-Cisco solutions
- Competitive differentiator for Cisco
- Both Macro(VPN-ID) and Micro (SGT) segmentation support
- Granular but simplified security policy control on Cisco Secure Access for catalyst branches accessing internet/SAAS apps

Employee, Guest and IOT segments behind a Catalyst Branch securely accessing Internet/SAAS with differentiated policy enforcement by Cisco Secure Access.

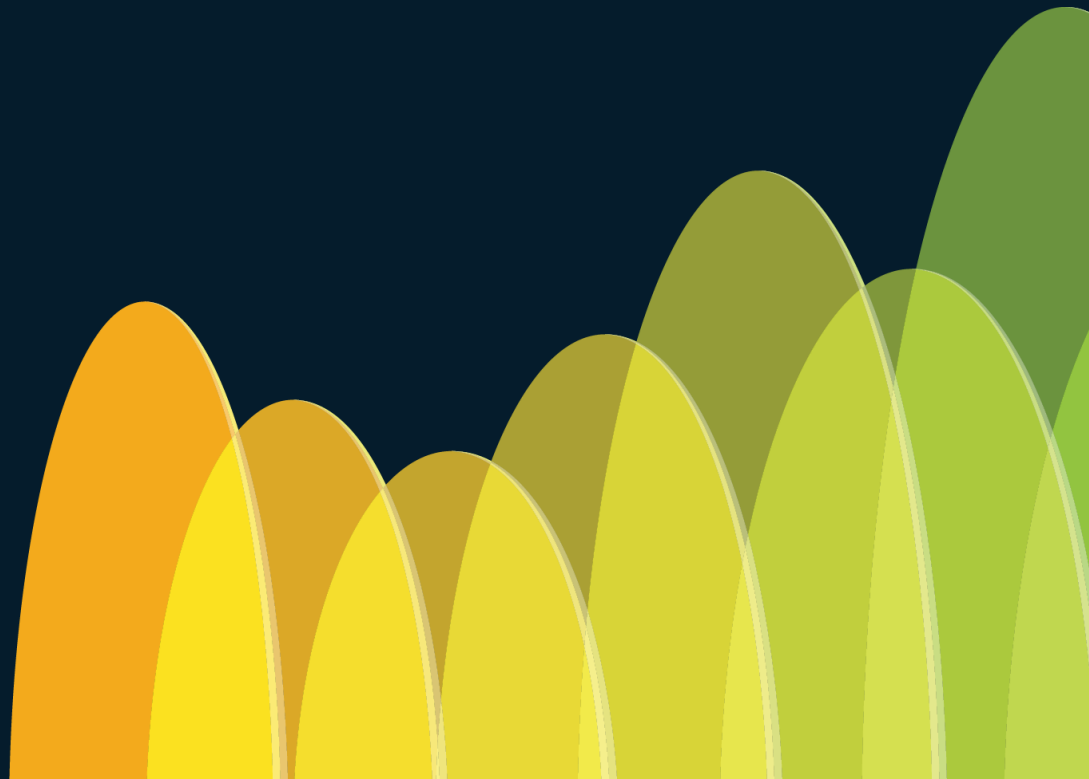
Multi-Vendor SSE Integrations

900+ customers love the flexibility and interoperability that Cisco SD-WAN offers

- Dashboard & API based automation
- IPSec / GRE tunnel automation and PoP selection
- Resiliency with fallback and application health check
- Granular traffic redirection
- Segmentation



Cloud OnRamp for SaaS



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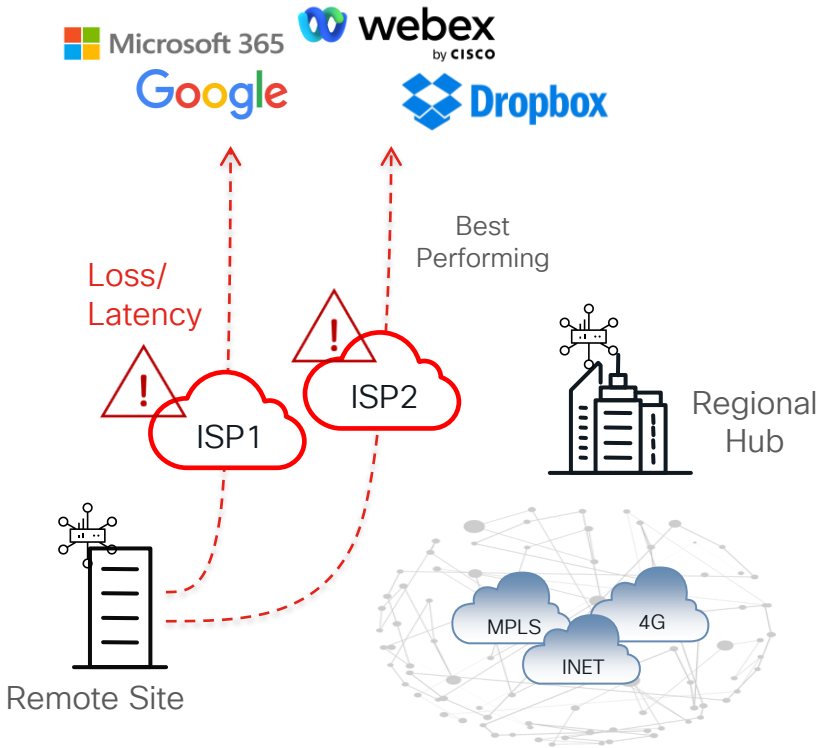
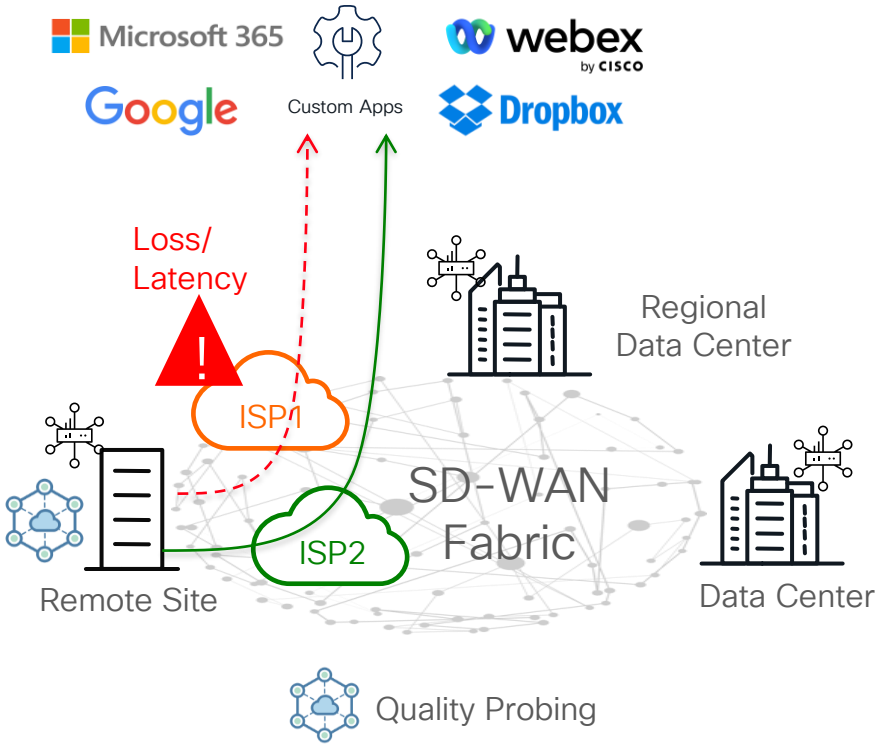
SaaS Optimization Challenges

- Internet circuits performance is unreliable.
- How to get performance visibility for each available path?
- When specific path is having performance issues, How to automatically steer traffic ?

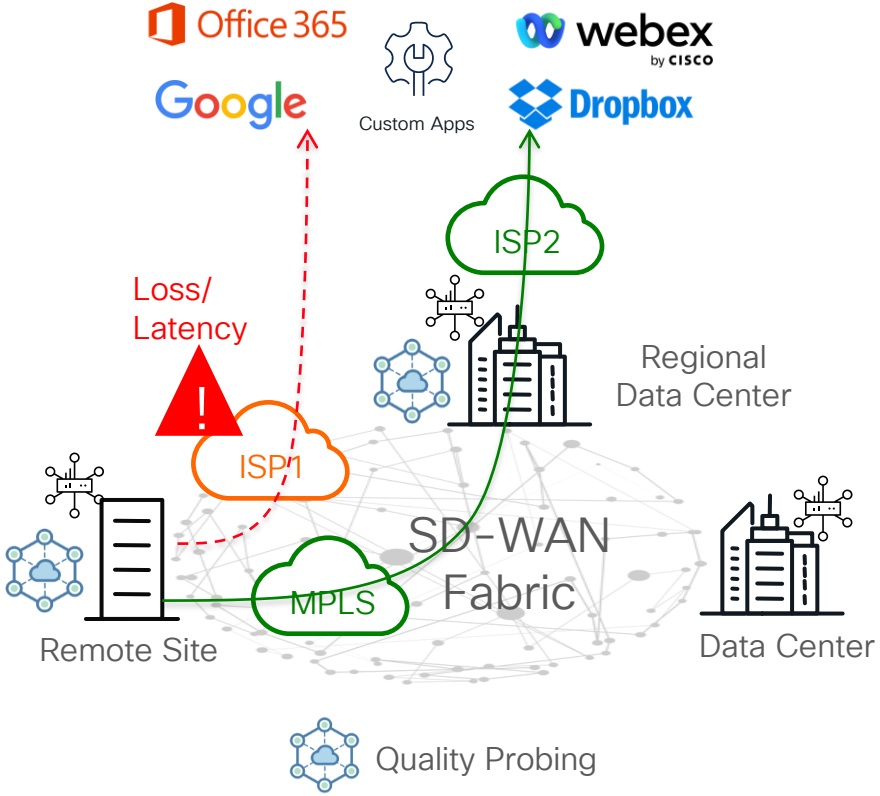


Cloud onRamp for SaaS – Internet DIA



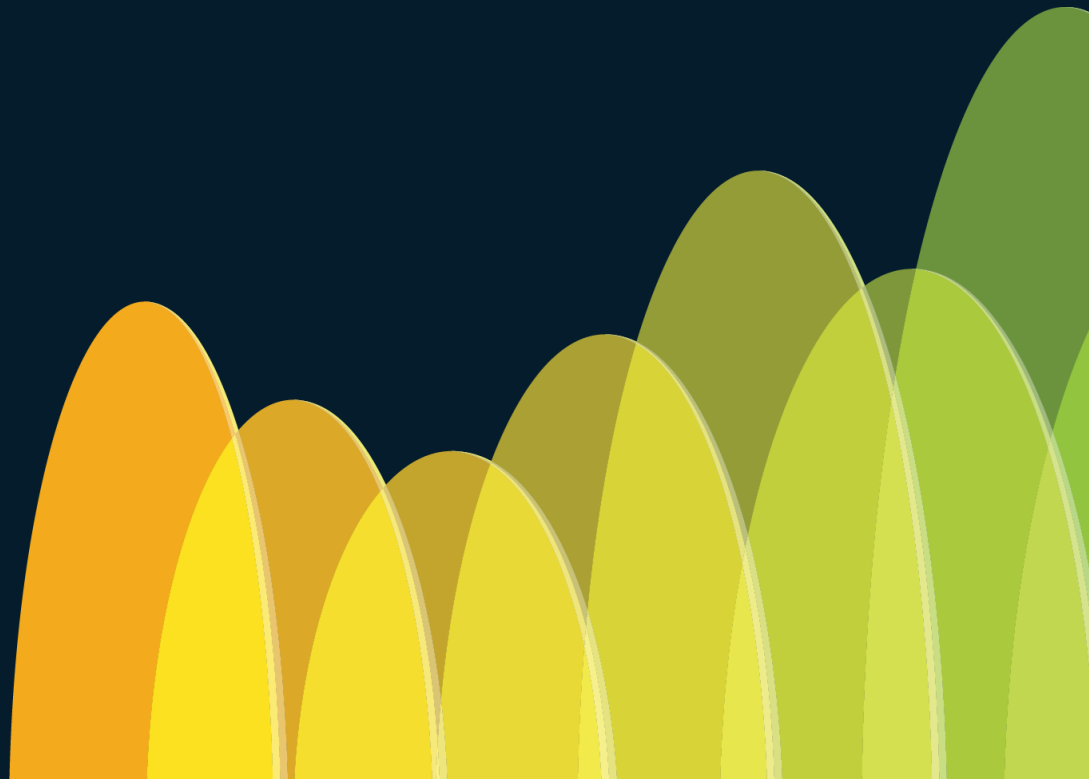
- WAN Edge router at the remote site performs quality probing for selected SaaS applications across each local DIA exit
  - Simulates client connection using HTTP ping
- Results of quality probing are quantified as vQoE score (combination of loss and latency)
- Local DIA exit with better vQoE score is chosen to carry the traffic for the selected SaaS application
  - Initial application flow may choose sub-optimal path until DPI identification is complete and cache table is populated

Cloud onRamp for SaaS – Regional Gateway



- Wan Edge routers at the remote site and regional hub perform quality probing for selected SaaS applications across their local Internet exits
  - Simulate client connection using HTTP ping
- Results of quality probing are quantified as vQoE score (combination of loss and latency)
  - HTTP ping for local DIA and App-Route+HTTP ping for regional Internet exit
- Internet exit with better vQoE score is chosen to carry the traffic for the selected SaaS application
  - Initial application flow may choose sub-optimal path until DPI identification is complete and cache table is populated

Cloud OnRamp for MultiCloud



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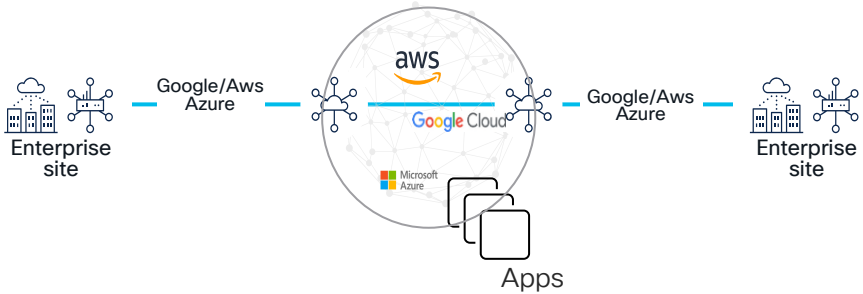
Cisco SD-WAN Cloud Hub- Use Cases

= Cisco SD-WAN virtual router hosted at Cloud Service Provider POP

= Cisco SD-WAN router on-premises

Enterprise Site to Cloud

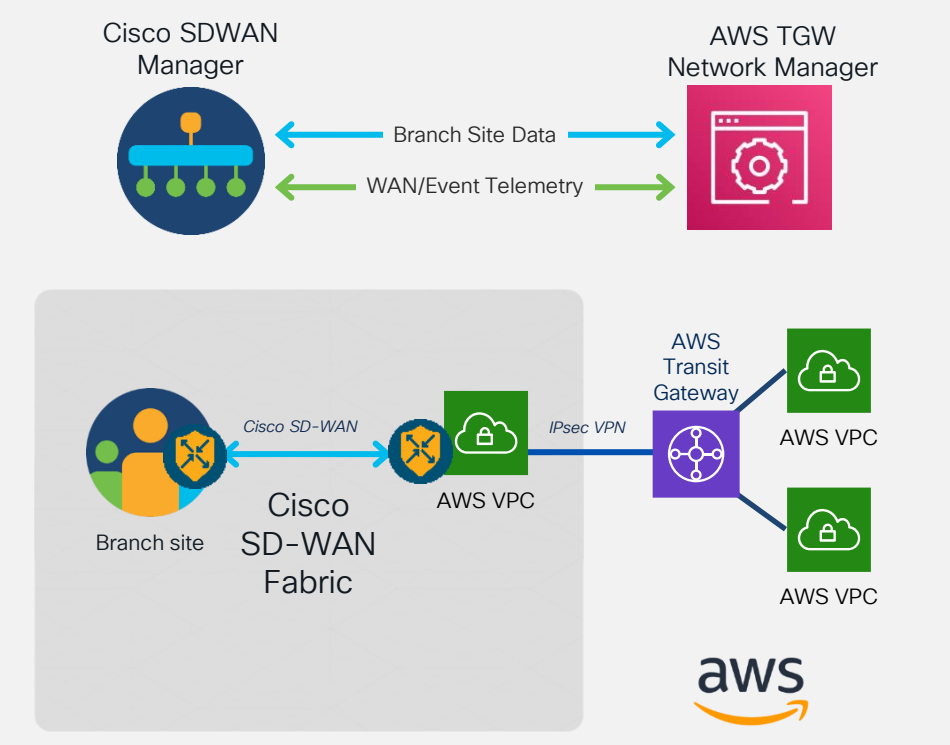
Enterprise Site to Enterprise Site



Cloud to Cloud/Inter-Cloud

Cisco SD-WAN simplifying connectivity with fabric extension to cloud providers, it is building a programable site-to-cloud, Region to Region, site-to-site and cloud to cloud connectivity using cloud providers Native contracts and backbone

Extending SD-WAN into Public Cloud (AWS as example)



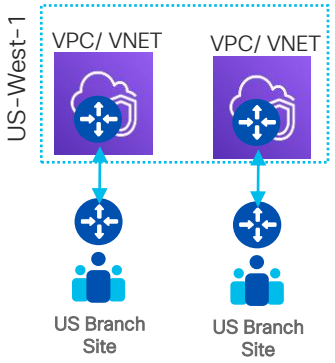
Benefits

- Automated provisioning of SD-WAN Transit VPC and TGW, route exchange for site to cloud and site to site traffic over AWS backbone
- Full Visibility into inter-regional transit traffic and telemetry with TGW Network Manager
- Consistent Policy and Segmentation across branch and cloud for enterprise class security

High Level Design Options

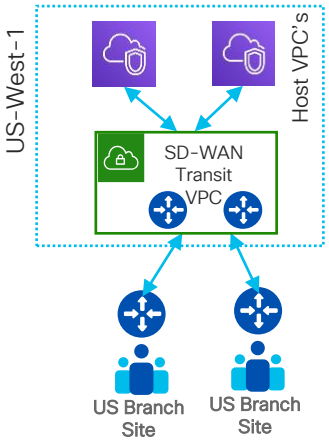
CSP-generic, AWS used as example

Cloud Gateway



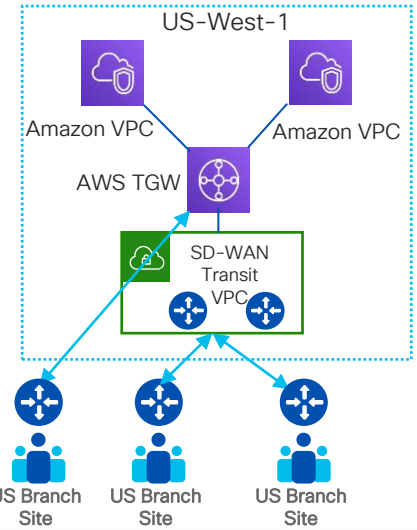
- SD-WAN Router in every VPC/VNET.
- Not scalable, but okay for one VPC.
- No built-in automation in Cloud onRamp, custom automation possible

Cloud OnRamp for IaaS



- Transit VPC with SD-WAN routers.
- IPSec to host VPCs / VNETS via VGW
- Cloud networks learnt via BGP, redistributed into OMP.
- AWS and Azure automation on vManage known as Cloud OnRamp for IaaS

Cloud OnRamp for Multicloud



- AWS TGW or Azure vWAN is used
- IPSec to AWS TGW, BGP on top of IPSec
- Cloud networks learnt via BGP, redistributed into OMP.
- AWS (17.3), Azure (17.4) and Google Cloud (17.5) automation on vManage known as Cloud onRamp for Multicloud
- Branch Connect - Traditional IPsec to AWS TGW (17.5)
- Cloud WAN coming in 2022

FYI

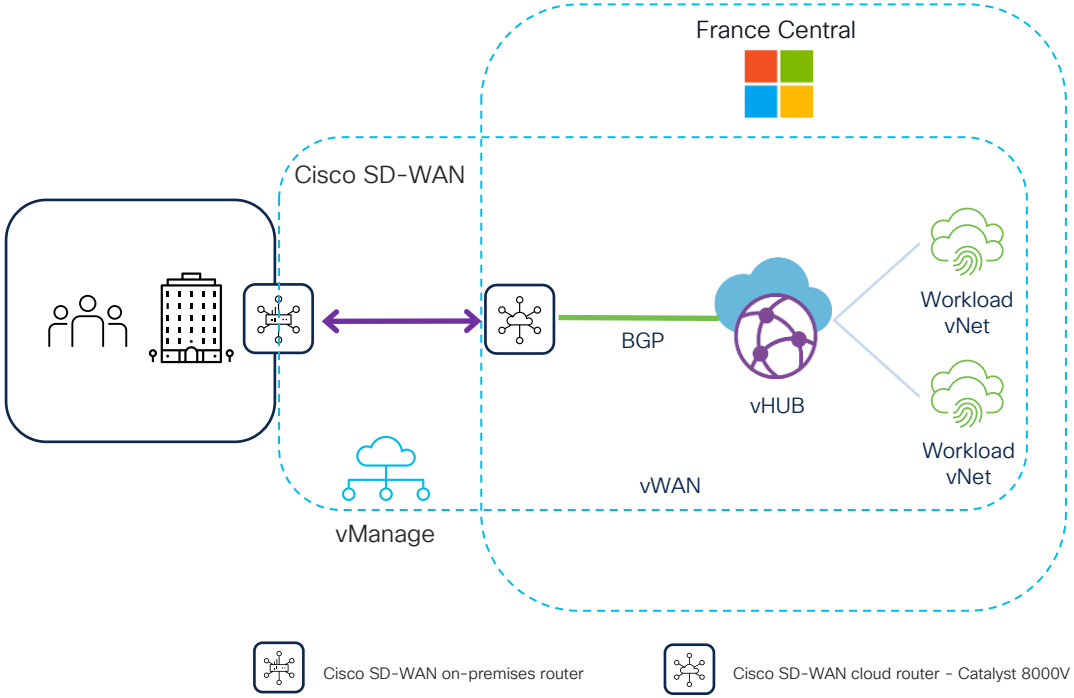
Automation (CSP-generic)

Different Automation options

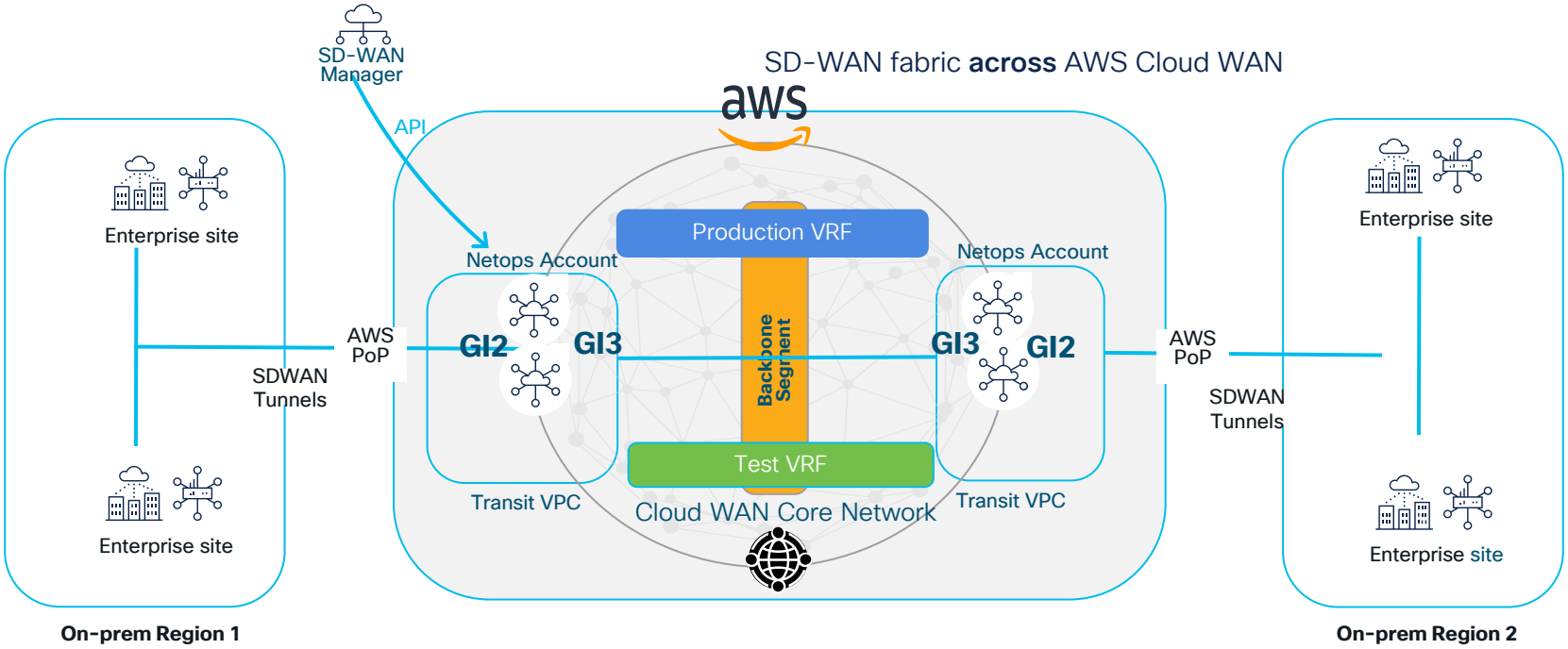
- Cloud OnRamp (CoR) for Multicloud Automation built in vManage
- Custom Automation with 3rd party tools like Terraform and Ansible

	Pros	Cons
Cloud OnRamp Automation	• Single UI in vManage for the whole workflow • Discovers host VPCs/VNETS and connects public-cloud with SD-WAN within minutes	• Not possible to add own customization for design changes i.e., virtual firewall • No built-in auto scale capabilities (yet)
Custom Automation	• Will do exactly what customer wants • Can be changed in case of any design changes	• Takes time and money to develop and test (customer, Cisco CX or Partner)

Cisco SD-WAN Cloud OnRamp for Multicloud with Microsoft Azure



Site-to-Site with Cloud WAN

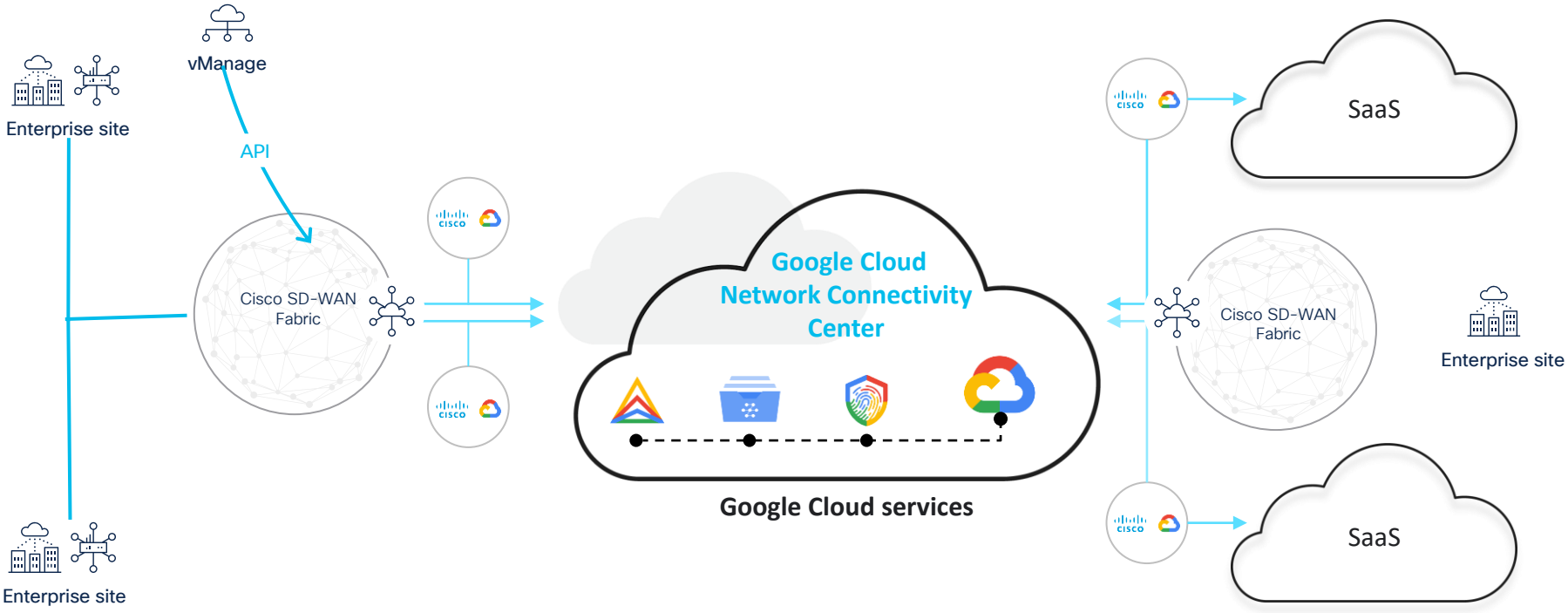


On-demand

High performance

Global connectivity

Cisco SD-WAN Cloud Hub and Google Cloud Network Connectivity Center



Cisco SD-WAN Cloud Hub with Google Cloud

= Cisco SD-WAN router on-premises

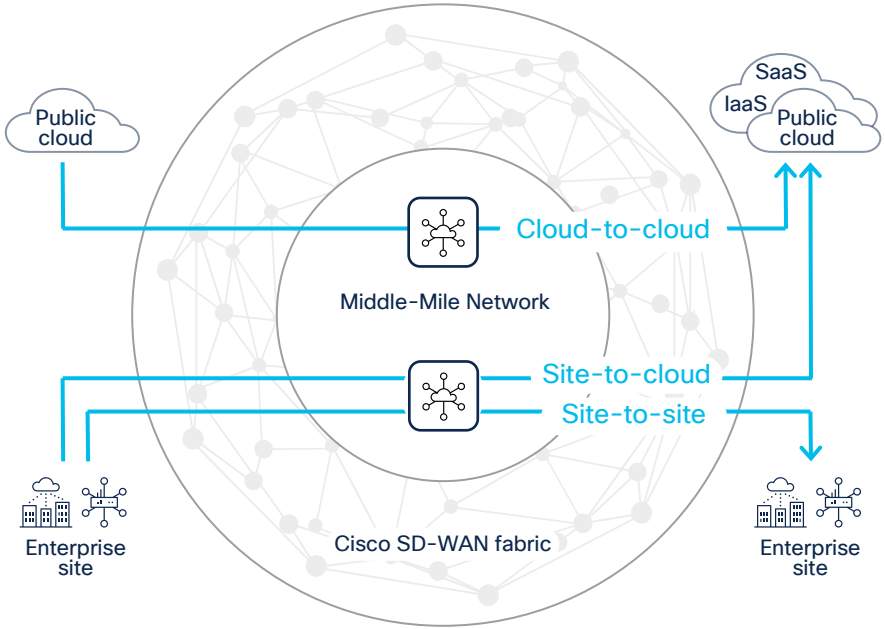
= Cisco SD-WAN cloud router at Google Cloud PoP

Cisco SD-WAN Middle-Mile Optimization

Megaport EQUINIX aws Cloud WAN Google Cloud NCC Microsoft Azure

= Cisco SD-WAN virtual router

= Cisco SD-WAN router on-premises



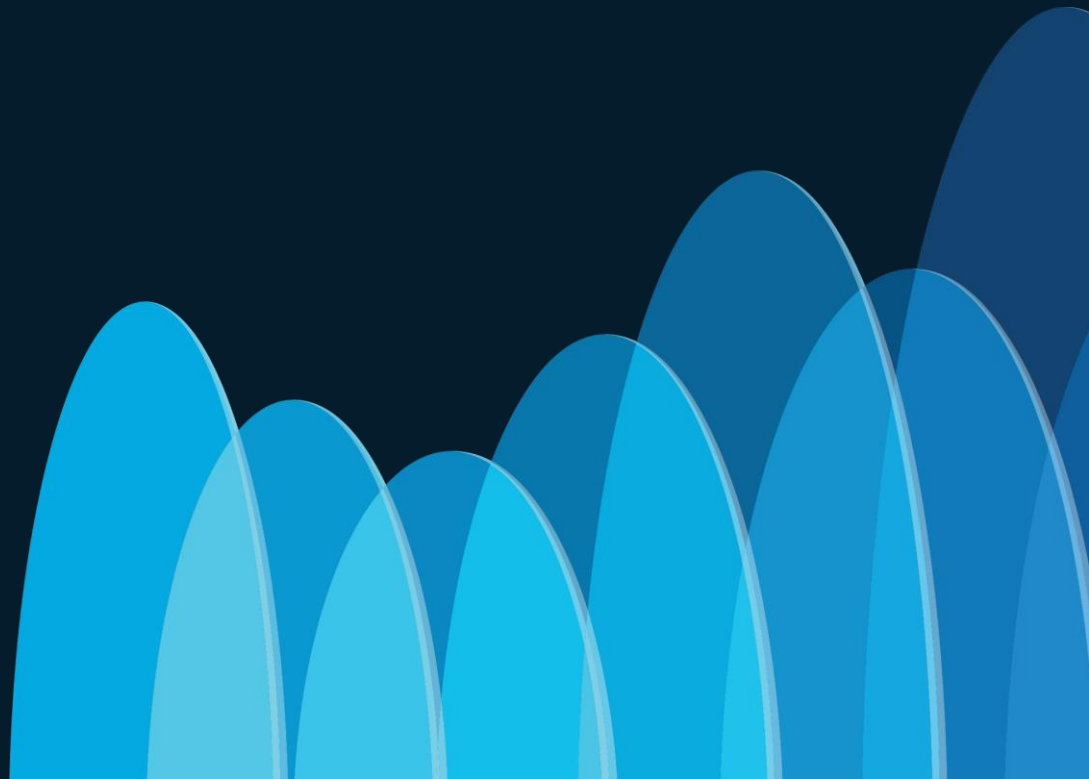
Flexibility
All or selective traffic sent based on type or app

Reliability
Reliable, high-speed connectivity between sites

Security
End-to-end encryption over middle mile global backbone

On-demand
Automated connectivity via vManage central dashboard

MultiCloud Defence



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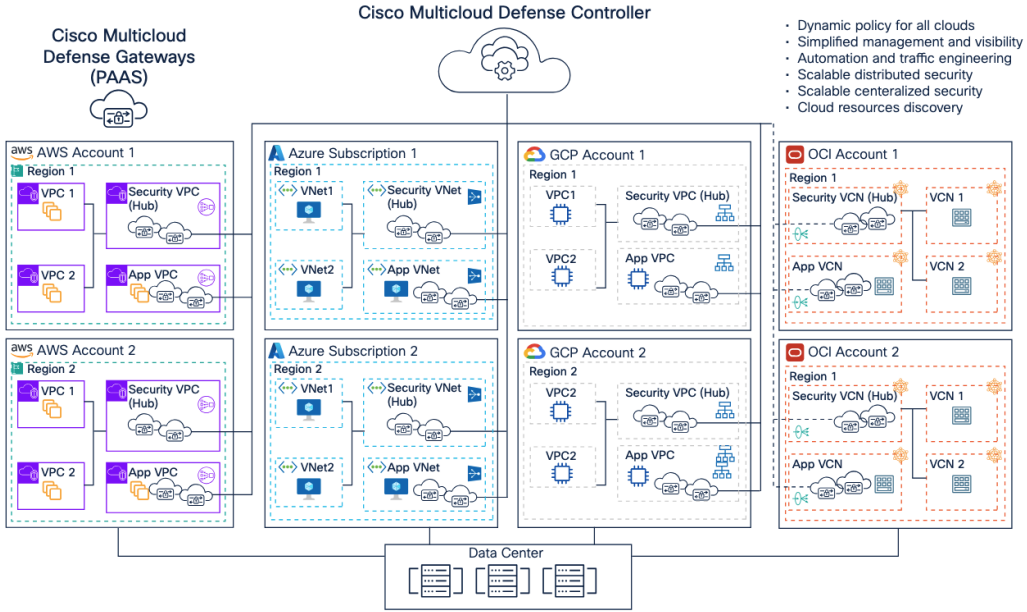
What is Multicloud Defense (MCD)?

Learn more attend
BRKENT-2283

- Runs in your Cloud Account. Not as a Cisco Secure Access cloud service.

- Use cases:
  - Ingress Security (IPS/IDS/WAF)
  - Egress Security
  - East/West Segmentation
  - Data Loss Prevention (DLP)
  - Multicloud Networking



Multicloud Defense Gateways

Ingress Gateway

- Reverse Proxy
- TLS decrypt
- WAF – L7 DoS
- IDS / IPS
- Antivirus
- Geo IP
- Malicious IP

Egress Gateway

Egress

- URL filtering
- Forward proxy
- TLS decrypt
- FQDN filtering*
- FQDN-based firewall policy
- DLP
- IDS / IPS
- Antivirus

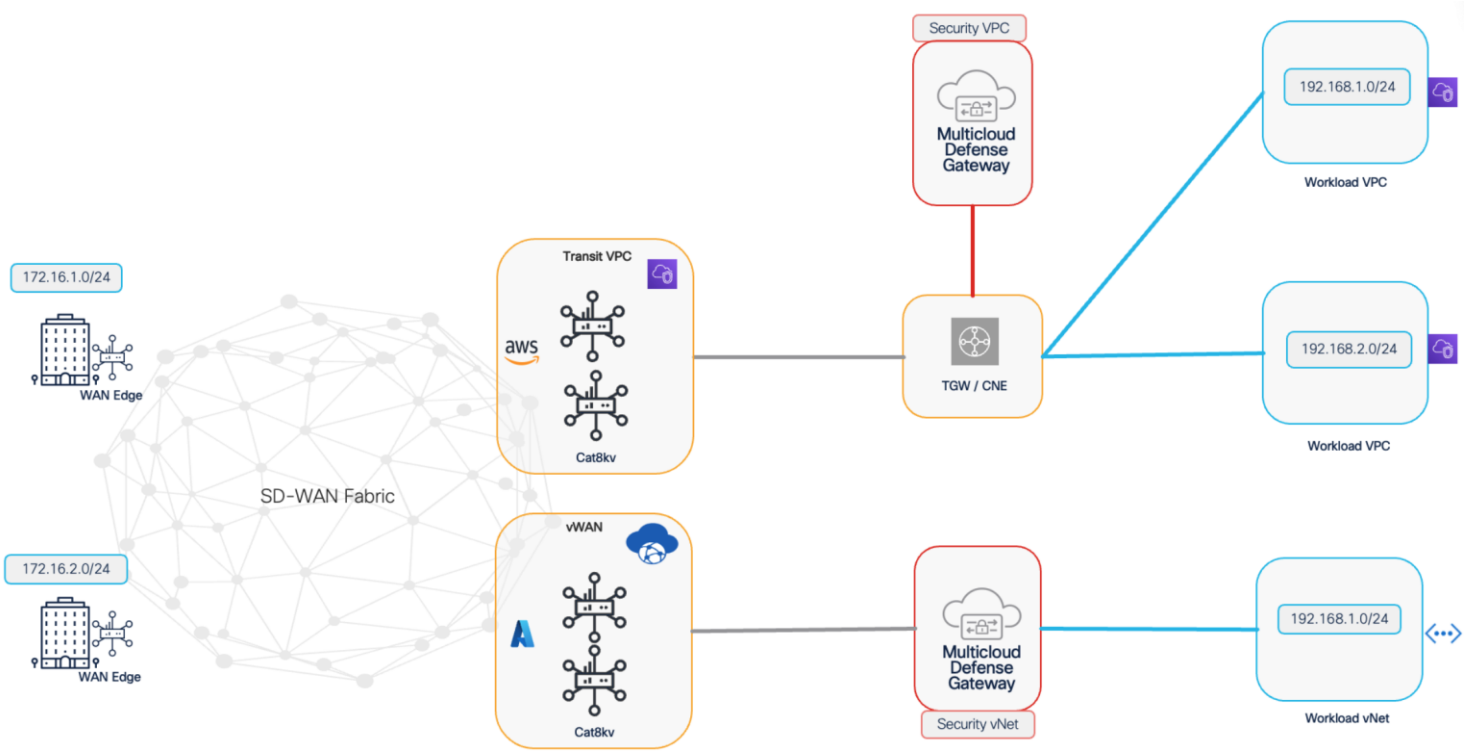
East/West

- FQDN filtering
- IPS / IDS
- Antivirus
- Segmentation
- FQDN-based firewall policy
- TLS decrypt

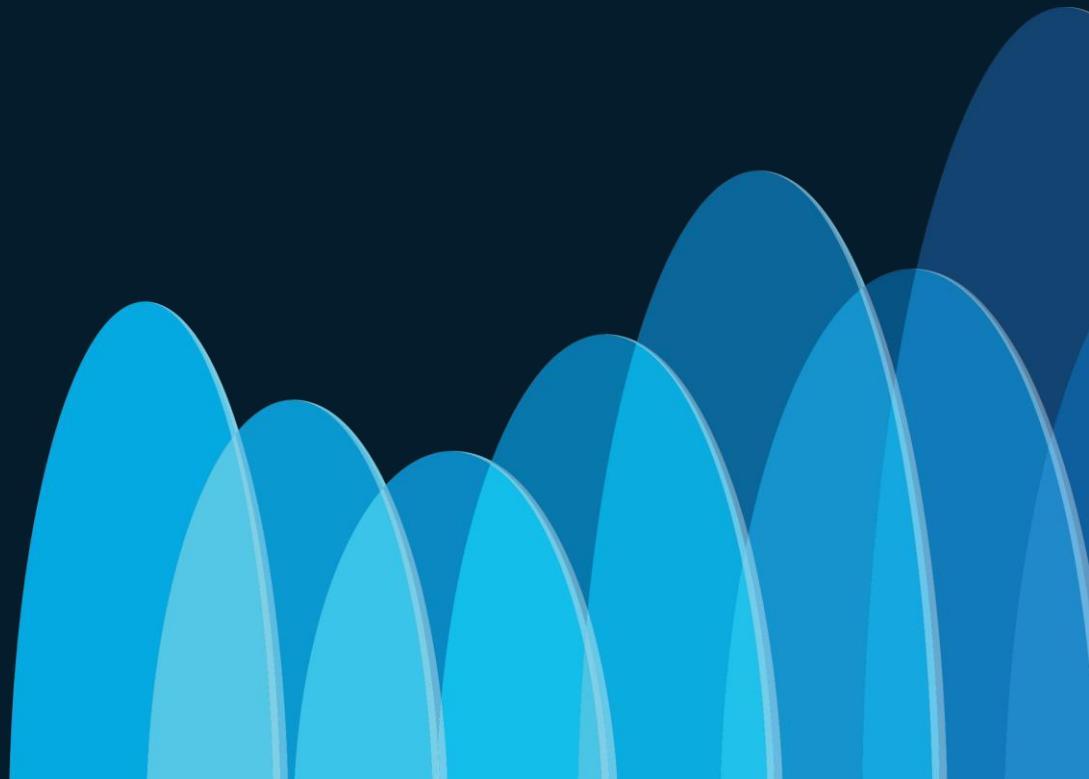
– Flexible Single Pass Architecture, Available in AWS, Azure, GCP and OCI

* No TLS decryption is needed
Forwarding mode is available on Multicloud Defense Gateway

Centralized MCD deployment model



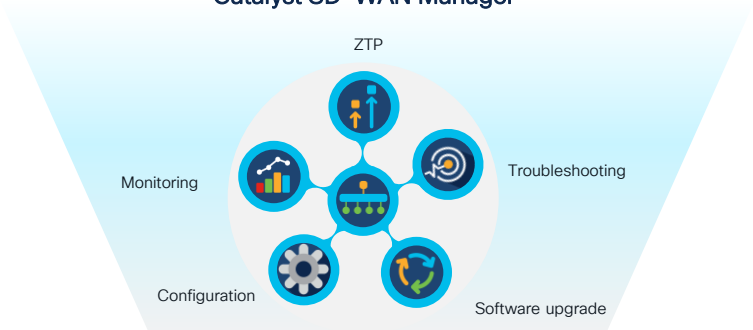
SD-Routing

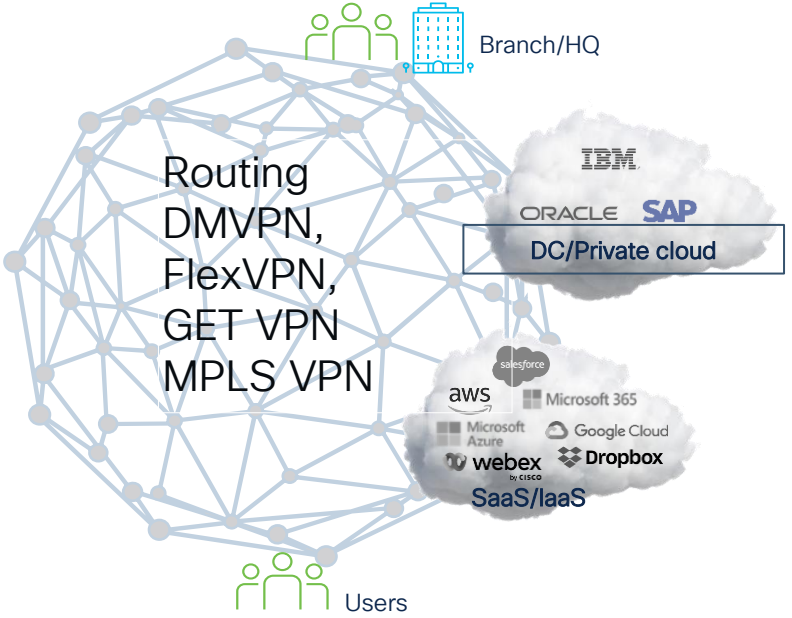


SD-Routing

Transform the platform experience

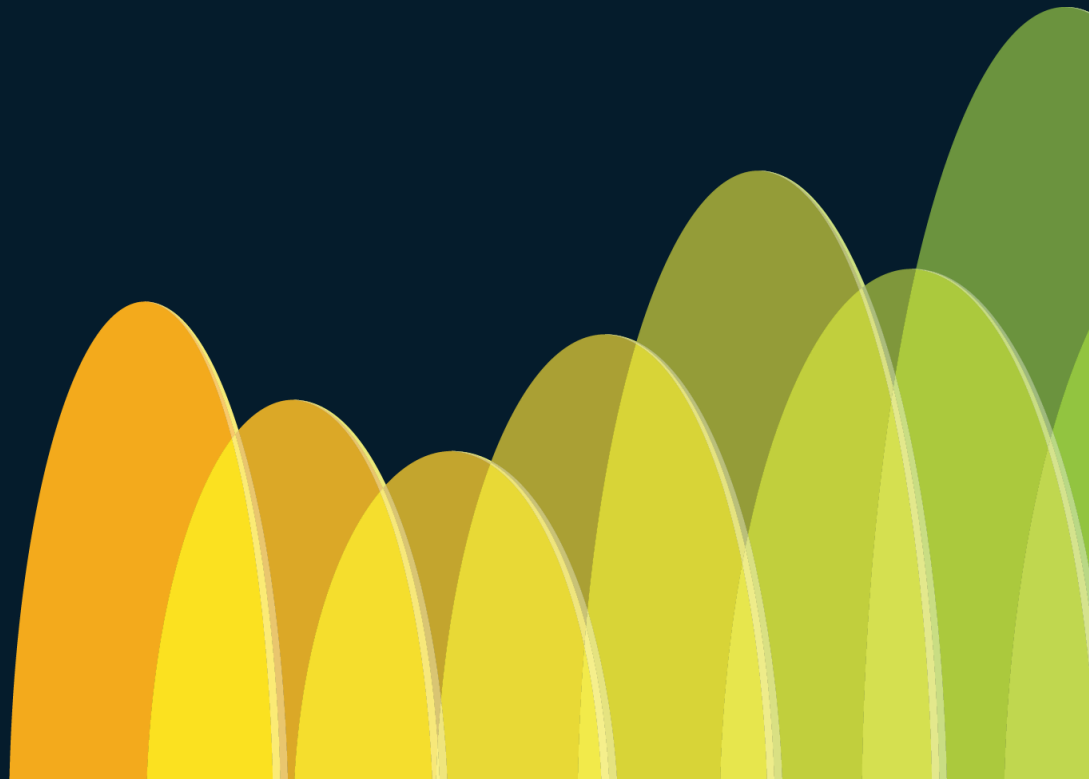
Catalyst SD-WAN Manager





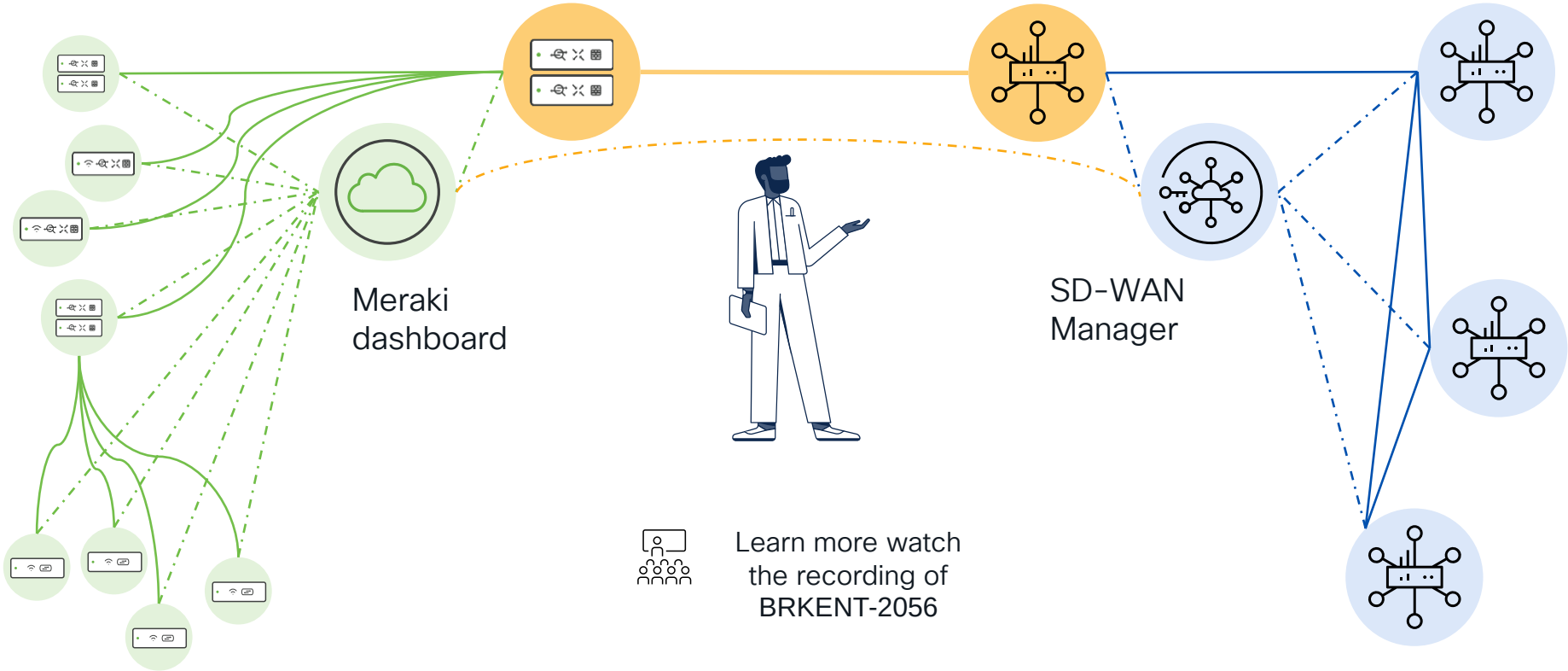
Simplicity and Agility | OpEx Reduction | Future-Ready WAN | Multi-layered Security

What about Meraki SD-WAN?



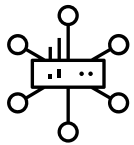
Cisco SD-WAN

Joining fabrics is now a simplified experience



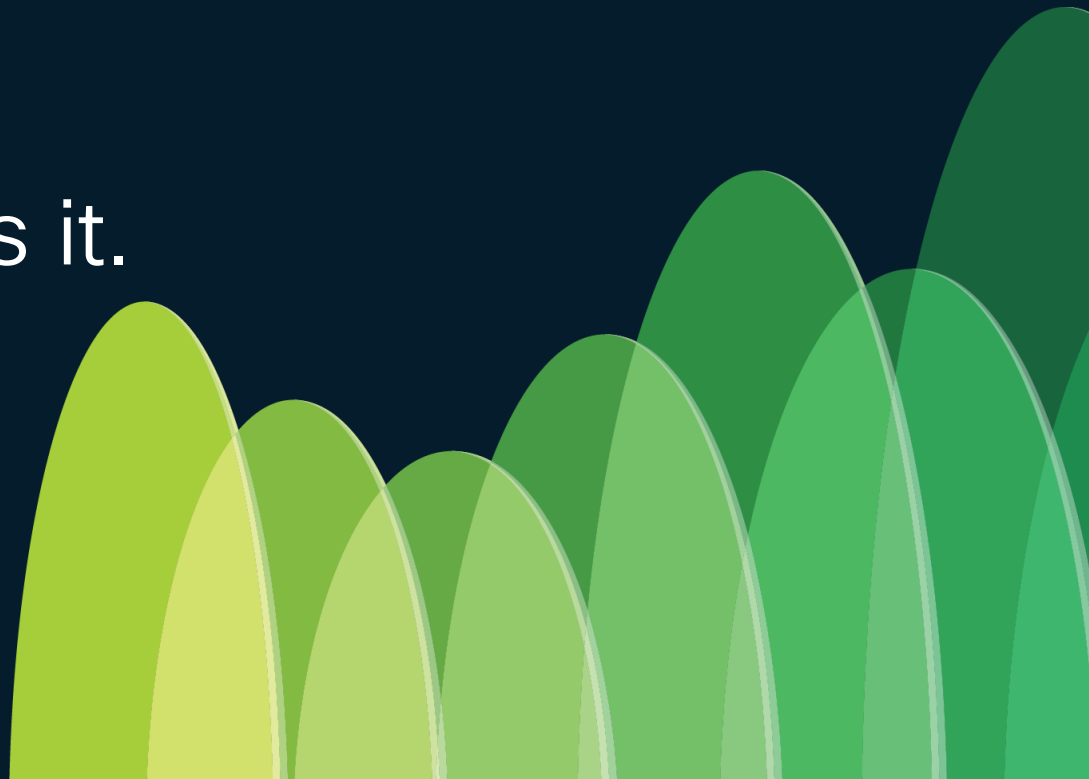
Key Takeaways

Cisco SD-WAN



- Single pane of glass Automation
- Optimized for Cloud access
- Pervasive Security
- Predictable and actionable insights

SD-WAN – This is it.



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Networking

SD-WAN

Learn how to confidently deploy and operate Cisco's SD-WAN solution in a new or existir network. These sessions provide a journey t the foundation to latest Cisco SD-WAN innovations focusing on design, innovations integrations with Cloud, SASE, and Assurance/Analytics.

START

Monday, February 10 | 2:00 p.m.
BRKENT-2108
Cisco SD-WAN: Start Here

Tuesday, February 11 | 2:30 p.m.
BRKENT-1313
Making SD-WAN Easy: Operational Simplification and User Experience

Wednesday, February 12 | 8:00 a.m.
BRKENT-2156
Chatting with your SD-WAN Network - Power of AI & LLMs to Simplify SD-WAN Network Operations

Wednesday, February 12 | 2:30 p.m.
BRKENT-2166
End to End Segmentation with Cisco Catalyst SD-WAN and ISE

Thursday, February 13 | 8:30 a.m.
BRKENT-2283
7 Steps: Master the Art of Unifying Multicloud Secure Connectivity and Design - Cisco SD-WAN + Multicloud Defense

Thursday, February 13 | 10:45 a.m.
BRKTRS-3241
7 Ways to Fail with Cisco Catalyst SD-WAN... and How to Prevent That

Thursday, February 13 | 1:15 p.m.
BRKENT-3115
Empowering Your Network with SD-WAN OMP: Path Optimization and Policy Insights Use Cases

Friday, February 14 | 11:00 a.m.
BRKENT-3797
Advanced SD-WAN Policies Troubleshooting

Networking

SD-WAN Advanced Design & Troubleshooting

You have deployed SD-WAN, take it to the next step and learn from the experts.

START

Tuesday, February 11 | 11:45 a.m.
BRKENT-2195
Unlocking the Power of Cisco Catalyst SD-WAN: Enhanced Network Operations

Tuesday, February 11 | 2:30 p.m.
BRKENT-1313
Making SD-WAN Easy: Operational Simplification and User Experience

Tuesday, February 11 | 4:00 p.m.
BRKTRS-2572
Best Practices for Troubleshooting Cisco Catalyst 8000 Edge Platforms

Wednesday, February 12 | 1:00 p.m.
BRKENT-2609
Solving Global WAN Challenges with Multi-Region Fabric

Wednesday, February 12 | 5:00 p.m.
BRKTRS-2595
Expedite your Troubleshooting with SD-WAN Manager Tools

Wednesday, February 12 | 5:30 p.m.
BRKENT-2660
Customer Case Studies: Lessons Learned from the Cisco SD-WAN Design Council

Wednesday, February 12 | 5:30 p.m.
BRKTRS-3050
Cisco SD-WAN, Hidden Complexity Revealed: How Cisco TAC Addresses Really Tricky Problems

Thursday, February 13 | 10:45 a.m.
BRKTRS-3241
7 Ways to Fail with Cisco Catalyst SD-WAN... and How to Prevent That

Thursday, February 13 | 1:15 p.m.
BRKENT-3115
Empowering Your Network with SD-WAN OMP: Path Optimization and Policy Insights Use Cases

Friday, February 14 | 11:00 a.m.
BRKENT-3797
Advanced SD-WAN Policies Troubleshooting

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Fill Out Your Session Surveys

Participants who fill out a minimum of 4 session surveys and the overall event survey will get a unique Cisco Live t-shirt.

(from 11:30 on Thursday, while supplies last)

All surveys can be taken in the Cisco Events mobile app or by logging in to the Session Catalog and clicking the ‘Participant Dashboard’

Content Catalog

Continue your education

- Visit the Cisco Showcase for related demos
- Book your one-on-one Meet the Engineer meeting
- Attend the interactive education with DevNet, Capture the Flag, and Walk-in Labs
- Visit the On-Demand Library for more sessions at ciscolive.com/on-demand. Sessions from this event will be available from March 3.

Contact me at: lagranbe@cisco.com or webex

Cisco Secure WAN Edge

Scan the QR code to learn more smart, secure, and simple networking with Cisco Catalyst SD-WAN

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Thank you
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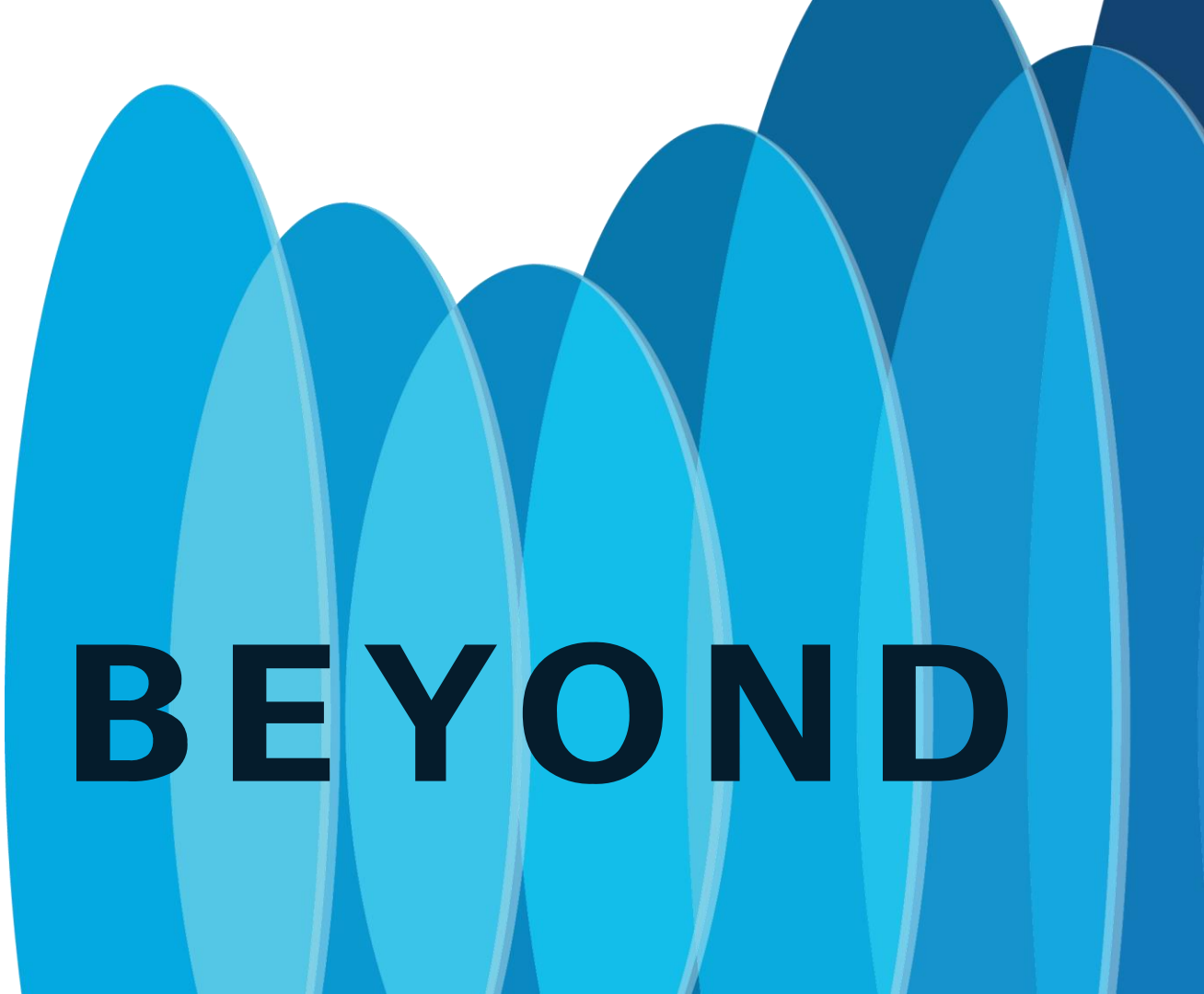

GO BEYOND