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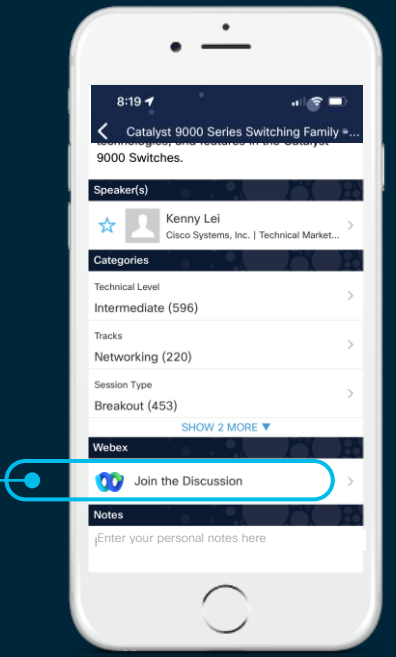


https://ciscolive.ciscoevents.com/ciscolivebot/#BRKENT-2001

The bridge to possible

SDWAN and Cloud Edge Transformation

Cloudify your WAN

Steve Wood – Principal TME – SDWAN | Cloud | Security
@swood0214

BRKENT-2001

About me...

IEEE 802.17
Resilient Packet Ring Working Group

Memory & ASIC & Hardware

SDCI

Mobility

SDWAN

Cloud

IWAN

Security

PELOTON

steve1465

Agenda

- The Network Cloud
- The WAN Disruption
- Cloud-first WAN Architecture
- Optimize SaaS access
- Integrate Cloud
- Lift-and-Shift to On-demand Aggregation
- Key Takeaways

"Invention requires two things: 1. The ability to try a lot of experiments and 2. Not having to live with the collateral damage of failed experiments."

Andy Jassy
CEO – Amazon Web Services

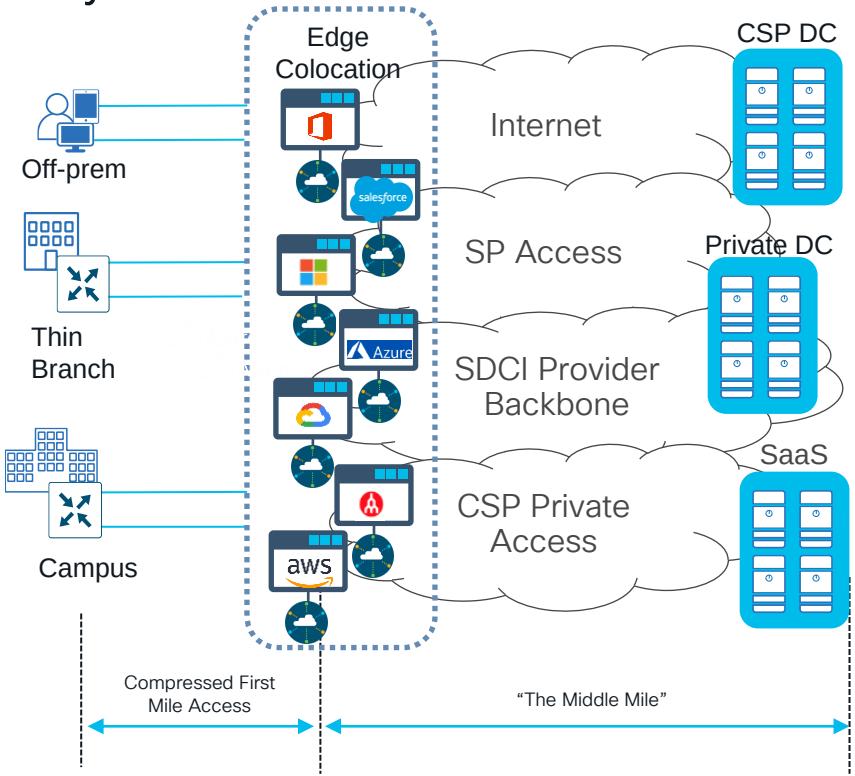
"Customers are opting for products they can use as opposed to sophisticated technical features"

Todd Nightingale
EVP/GM – Cisco Enterprise Networks & Cloud

The WAN Disruption

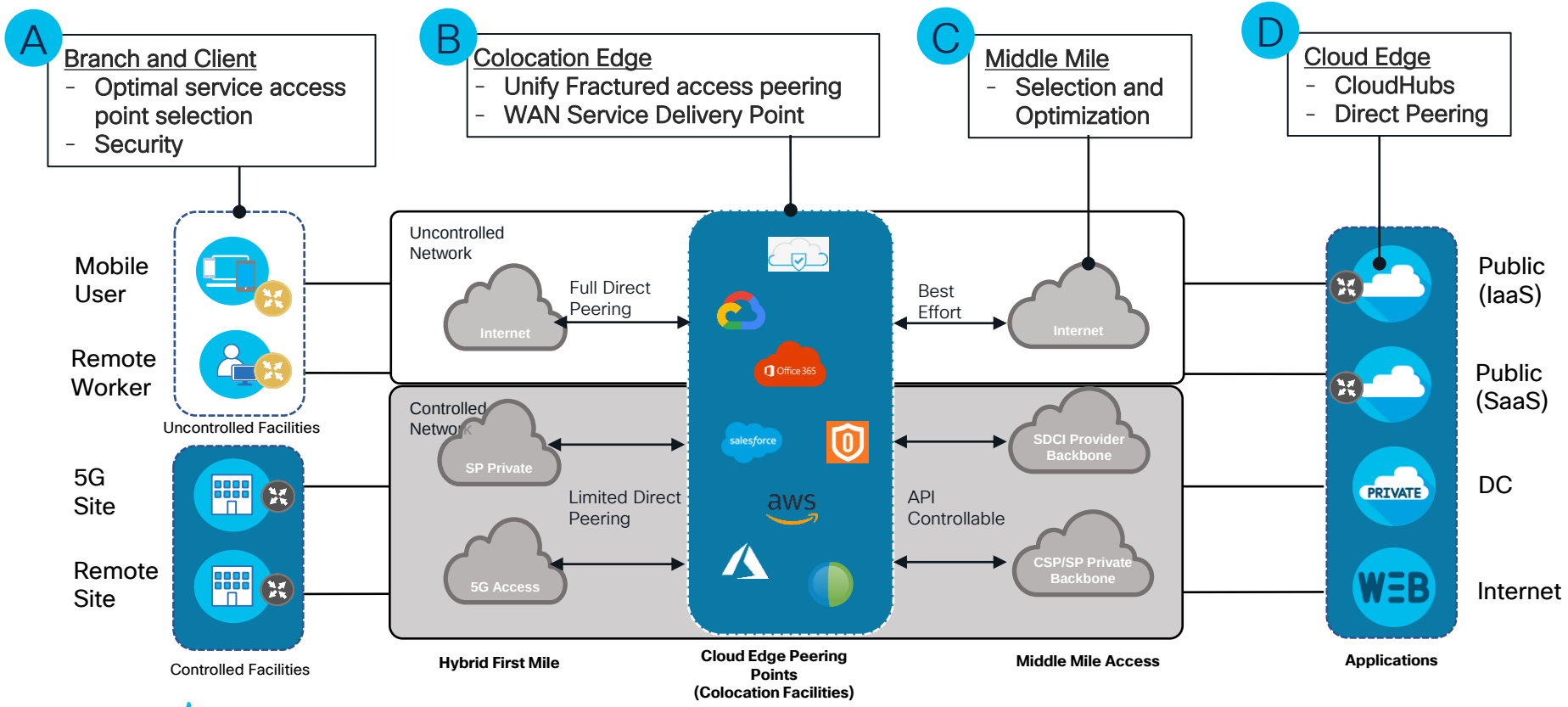
Custom Edge Peering, Programmability & Network IaaS

- The Internet is evolving from a network-of-networks to a network-of-datacenters
  - Multiple Provider Backbones
  - Large Private POP and Colo footprints
  - Short-term contracts, Service agility
- WAN disruption with programmable networks -> SDCI*
- Trending to single ISP first-mile access
- Enterprise WAN Core moving to ”aaS” consumption
- 3 major policy-enforcement points



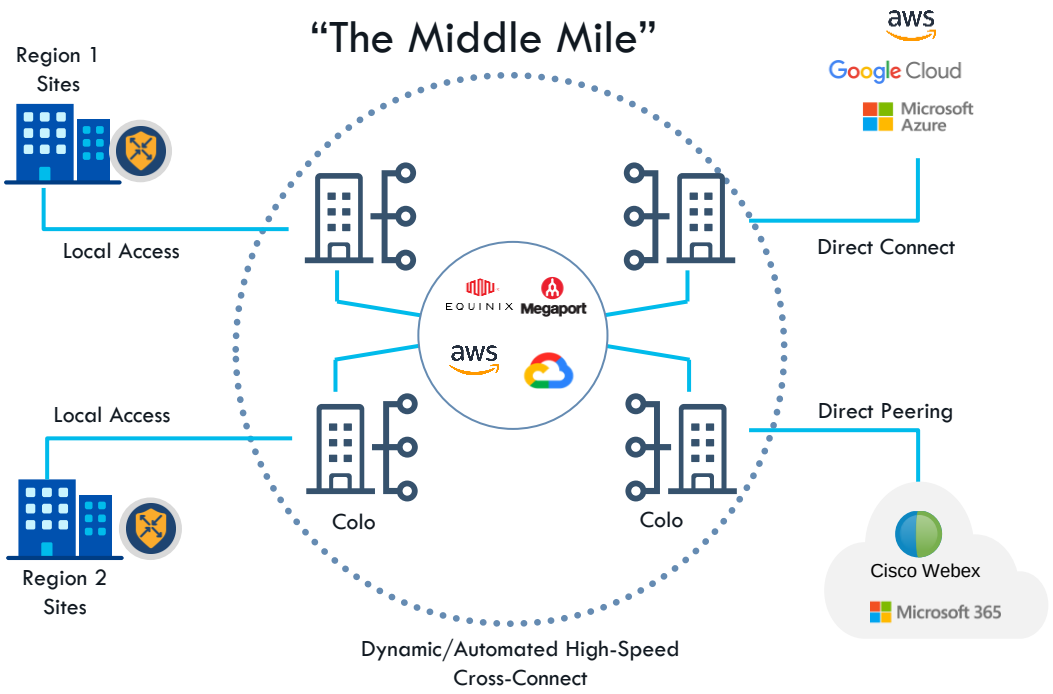
*SDCI – Software Defined Cloud Interconnect

Addressing WAN Disruption – Key Control Points



Cloud First WAN Architecture

Building the Network Cloud



On-demand Connectivity

Reduce time from months to minutes for Multicloud connectivity

Connections worldwide

Programmability

Dynamic/Automated High-Speed Cross-Connects

Controller APIs for partner orchestration

Cloud Management

Automate the connections through single pane of glass

Performance & Control

Remove congestion risk by sending packets through a private backbone

Cisco Components for Cloud Transformation

Cisco Cloud Hub (CGW) - SDWAN

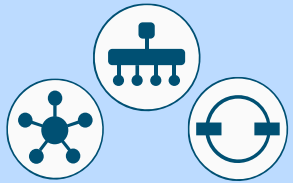
- Cisco SD-WAN and VPN endpoints at the Cloud Edge
- Deep cloud-native integrations
- Single Policy domain across WAN, cloud and VPCs
- Advanced Cloud Networking: backbone networking, multi-region access, Segmentation, Identity-based secure access

Cisco Interconnect Gateway (IGW) - SDWAN

- Colo-hosted Network Service
- On-demand SDWAN and VPN aggregation
- On-demand WAN Core Networking backbone
- On-demand Cloud Peering: Cloud Direct Connect, SaaS Optimization, Umbrella, Webex

Cloud Secure Internet Gateway - SASE

- Software defined perimeter & Zero-trust networking
- SASE Security: SWG, NGFW, CASB, DNS, ZTNA
- Delivered as a cloud service
- Chained into the application traffic path under Enterprise control

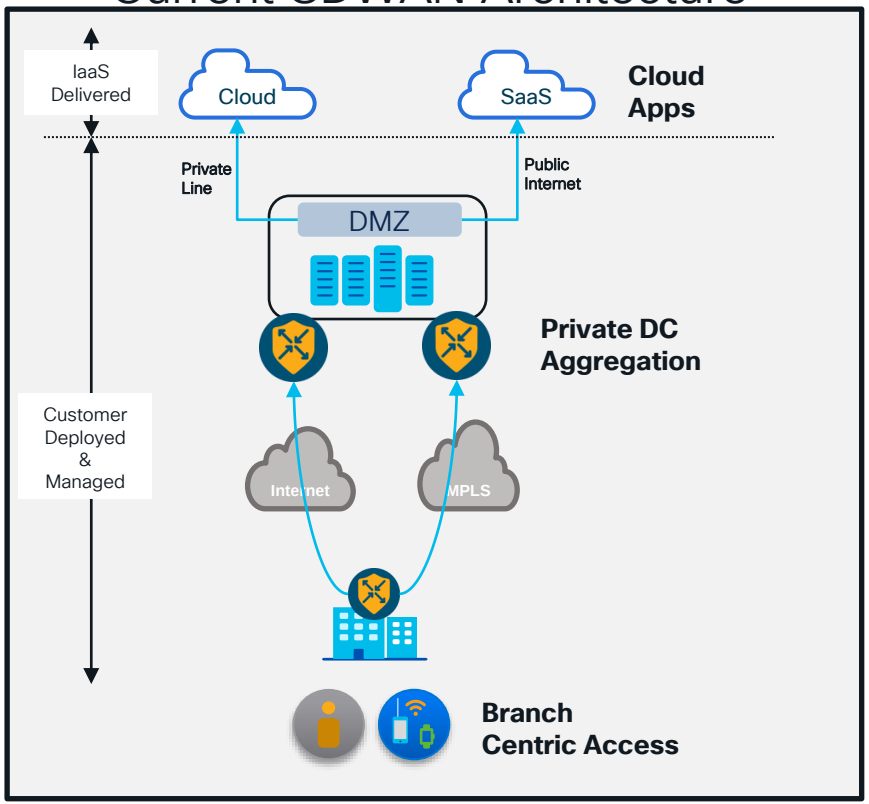


Cisco SDWAN & Multi-cloud Service Controller

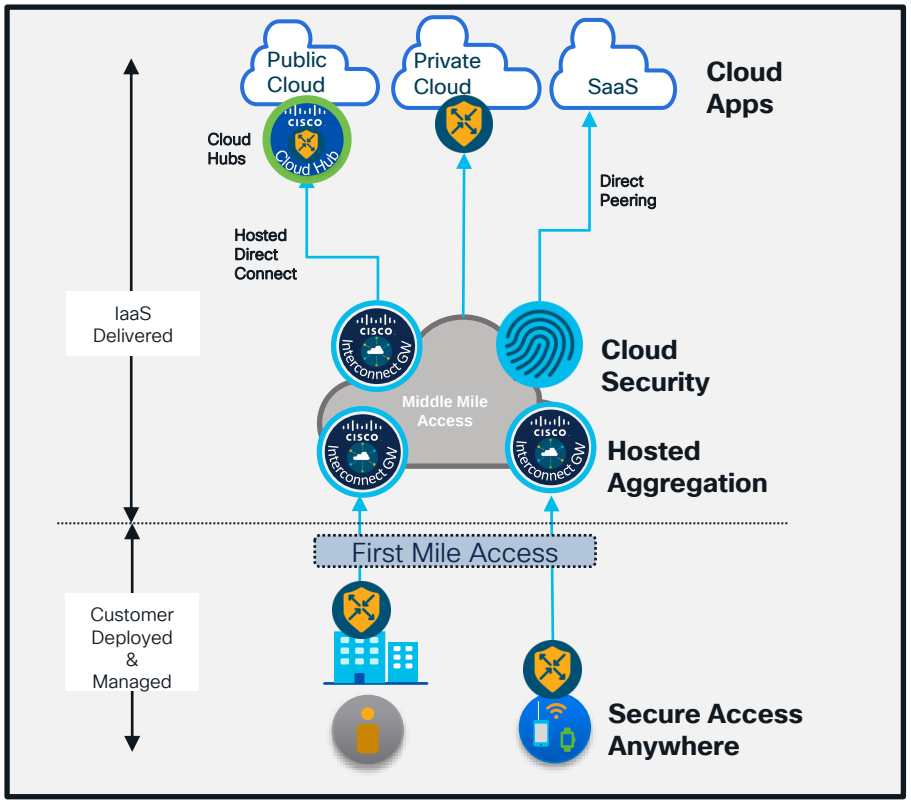
- API-based Orchestration
- Cloud and SDCI API support
- Rich Cloud DX support
- On-demand SDWAN Fabric
- Intent-based workflows
- Normalized Cloud Operations
- Visibility & Assurance

Cloud Transformation for WAN

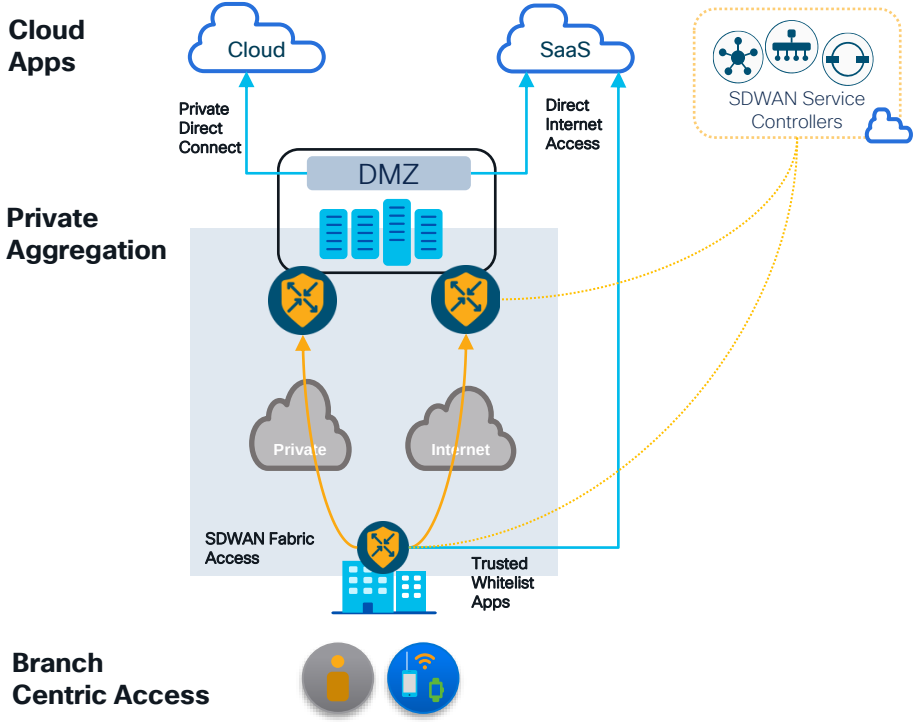
Current SDWAN Architecture



Cloud-first SDWAN Architecture



Starting the Journey



- Cisco SDWAN Access and Centralized Control
- Fabric overlay unifying access to all Enterprise sites
- DMZ proxy access to SaaS
- Direct connect to cloud
- Perhaps DIA whitelisting for trusted SaaS
- A solid starting point

Optimize and Secure SaaS Access

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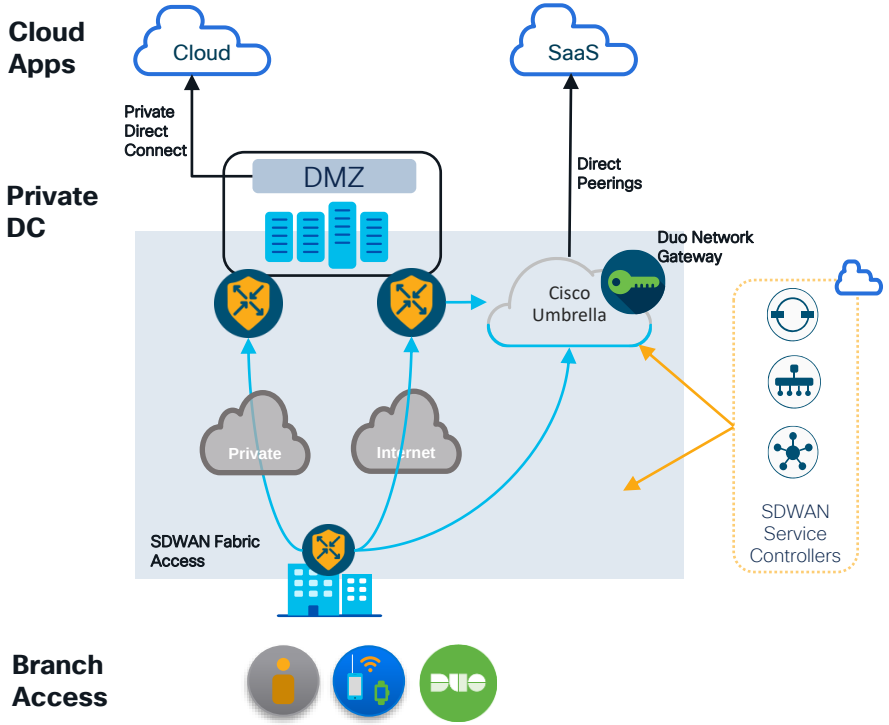
Optimized SaaS Access with Cloud Security



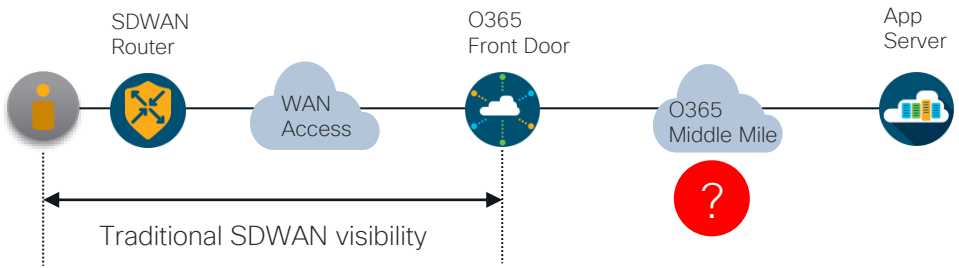
- Secure SaaS traffic with Umbrella
- Rapid, pre-provisioned onboarding
- Direct-peering for low latency cloud access
- Policy-based traffic steering for public services
- Umbrella colo/DC selection
- Scalable, automated attachment up to 1Gbps today

Microsoft 365 SaaS Optimization

Application Informed Network Routing

Problem

- Traditional SD-WAN only probes the app front-end detect the best path for the appropriate SaaS app.
- Probe measurement only covers part of the network part.
- It does not take service performance into account



Microsoft 365 SaaS Optimization

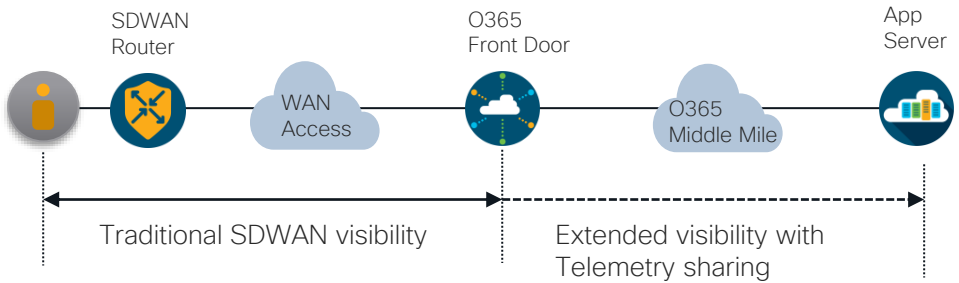
Application Informed Network Routing

Problem

- Traditional SD-WAN only probes the app front-end detect the best path for the appropriate SaaS app.
- Probe measurement only covers part of the network part.
- It does not take service performance into account

Solution

- Cloud onRamp for SaaS probing is augmented by O365 SaaS telemetry.
- Microsoft monitors performance of App service and computes a score



Microsoft 365 Performance Optimization

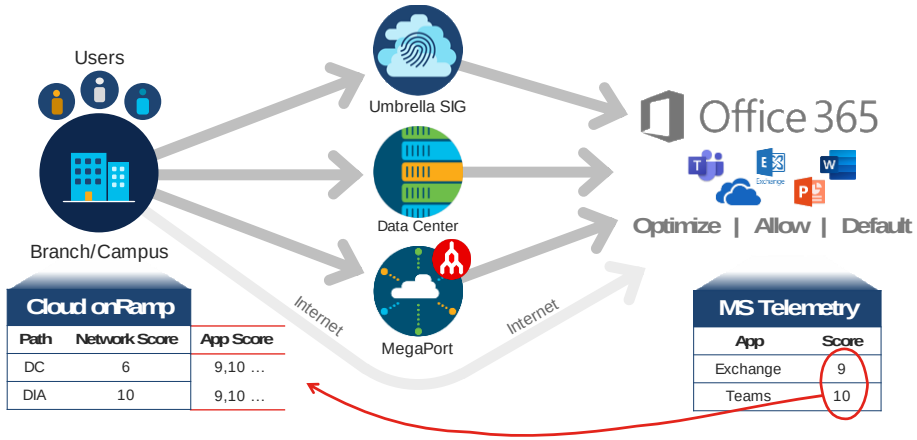
Application Informed Network Routing

Problem

- Traditional SD-WAN only probes the app front-end detect the best path for the appropriate SaaS app.
- Probe measurement only covers part of the network part.
- It does not take service performance into account

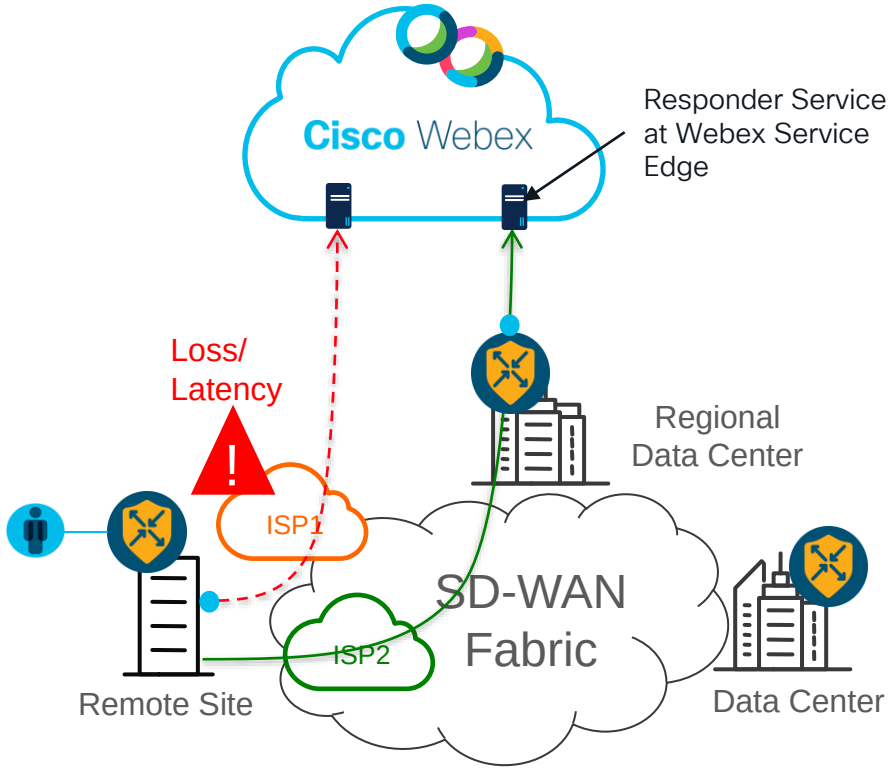
Solution

- Cloud onRamp for SaaS probing is augmented by O365 SaaS telemetry.
- Microsoft monitors performance of App service and computes a score
- Score is sent to SDWAN controller where it is used to augment probing data
- A combined path selection decision is made



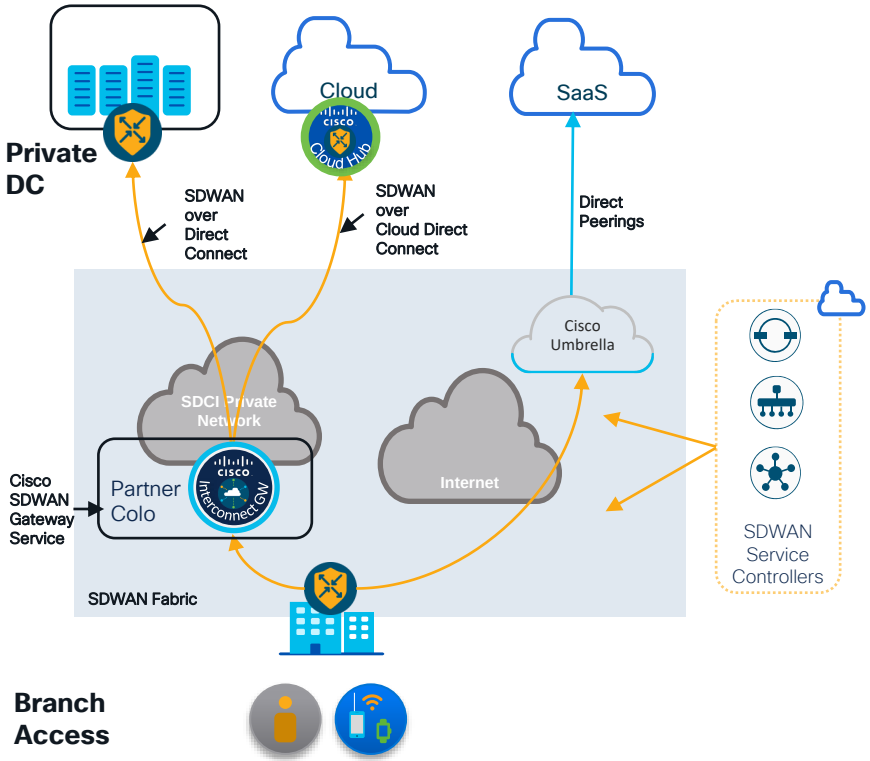
Webex Optimization

- Optimized Webex traffic goes via best performing path.
- HTTPS probing to dedicated Webex Responders across global Webex regions
- Calculates best performing path for each Webex region.
- Based on HTTPS probe results, Webex User traffic is sent via the best performing path.
- Cisco vManage queries Webex regions directly via API to periodically fetch Webex region App signatures. Publishes to all SDWAN edges.
- First Packet Match for Webex at remote site edges identifies Webex user traffic going to various regions.



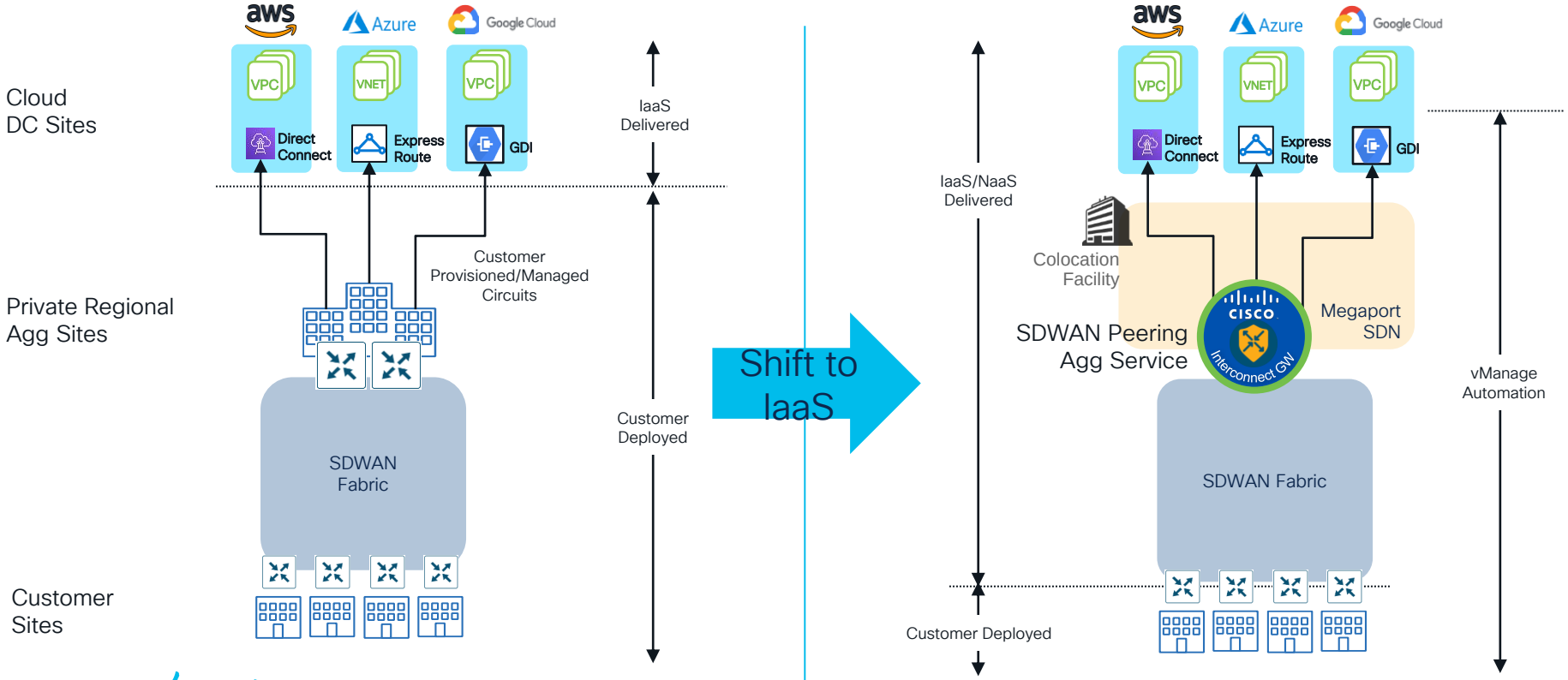
Lift & Shift your Aggregation to Cloud

Lift-and-Shift Branch Aggregation to Cloud



- Cisco SDWAN gateway service at Colocation facilities
- Hosted service. SDCI partners.
- On-demand Metro aggregation site
- On-demand Network and Cloud connections
- Fully automated from branch to workload

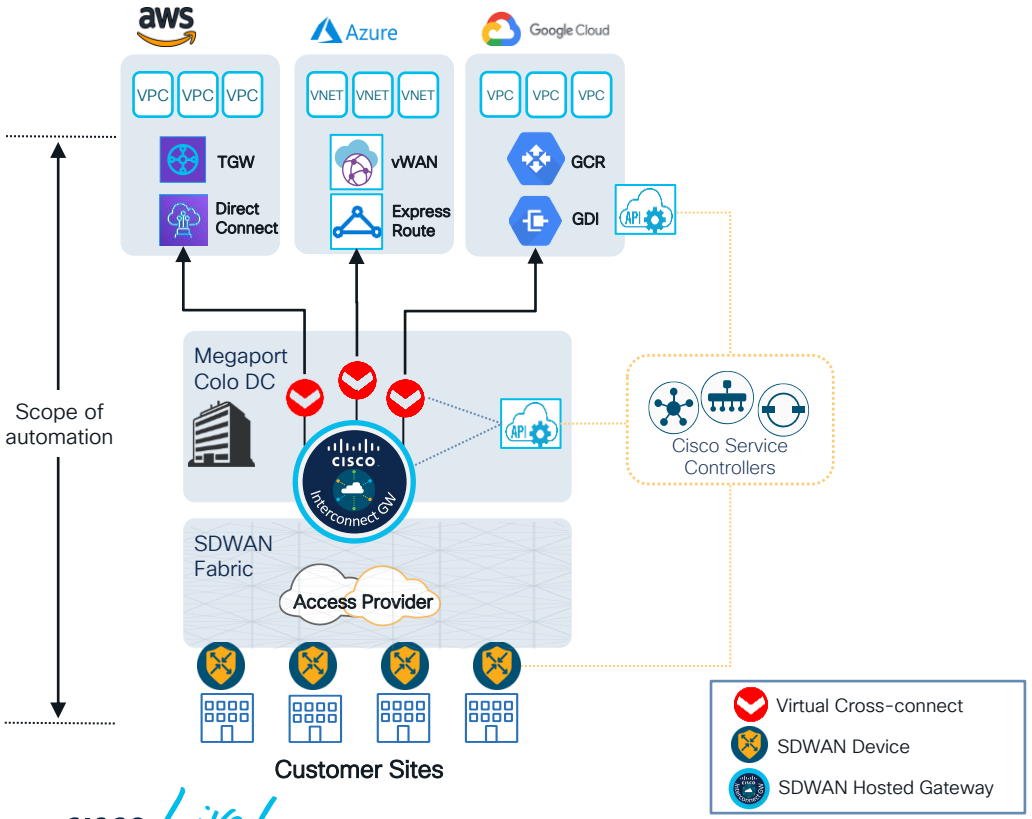
Use Case: Building your Network Cloud
SDWAN On-demand Aggregation and Cloud Interconnect



What is SDCI?

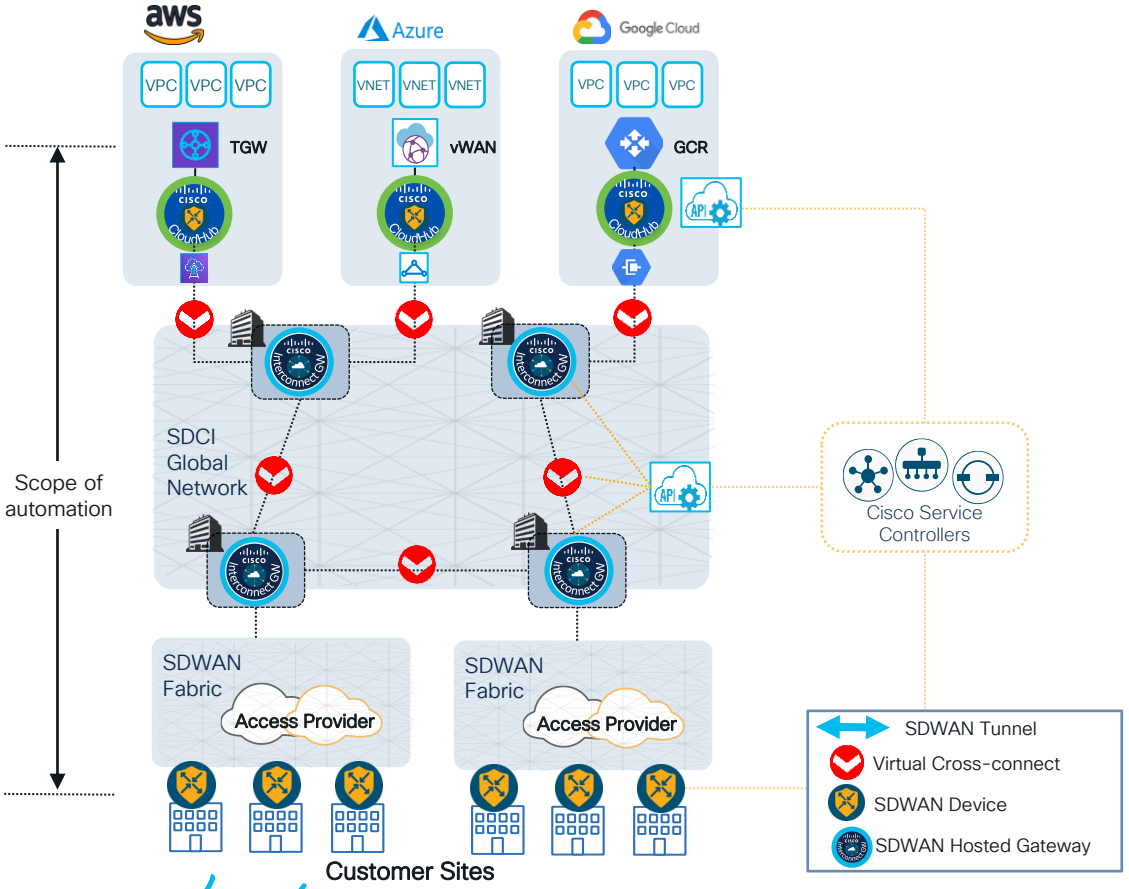
- **Software Defined Cloud Interconnect (SDCI)**
- SDCI offers programmable network interconnect for public and private cloud connections
- Global network across 100's of Metro access PoPs covering all major geographies.
- Software API layer to create and manage network connections via programmatic control.
- On-demand connections to cloud and other regional PoPs for site-to-site connectivity.
- Deploy your Middle Mile or WAN Core network on-demand:
  - Site Connections: Ingress Ports (Location, BW, Term)
  - Regional Interconnects: Layer 3 connections or Layer 2 circuits across the SDCI backbone.
  - Cloud Connections (Hosted or Private VIFs).
- Cisco vManage integrates these APIs to provide a full-stack SDWAN deployment building both the network underlay and overlay connections
- Cisco is building a hosted SDWAN service called the Interconnect Gateway with these SDCI providers

Use Case: Site-to-Cloud Direct Connect Service



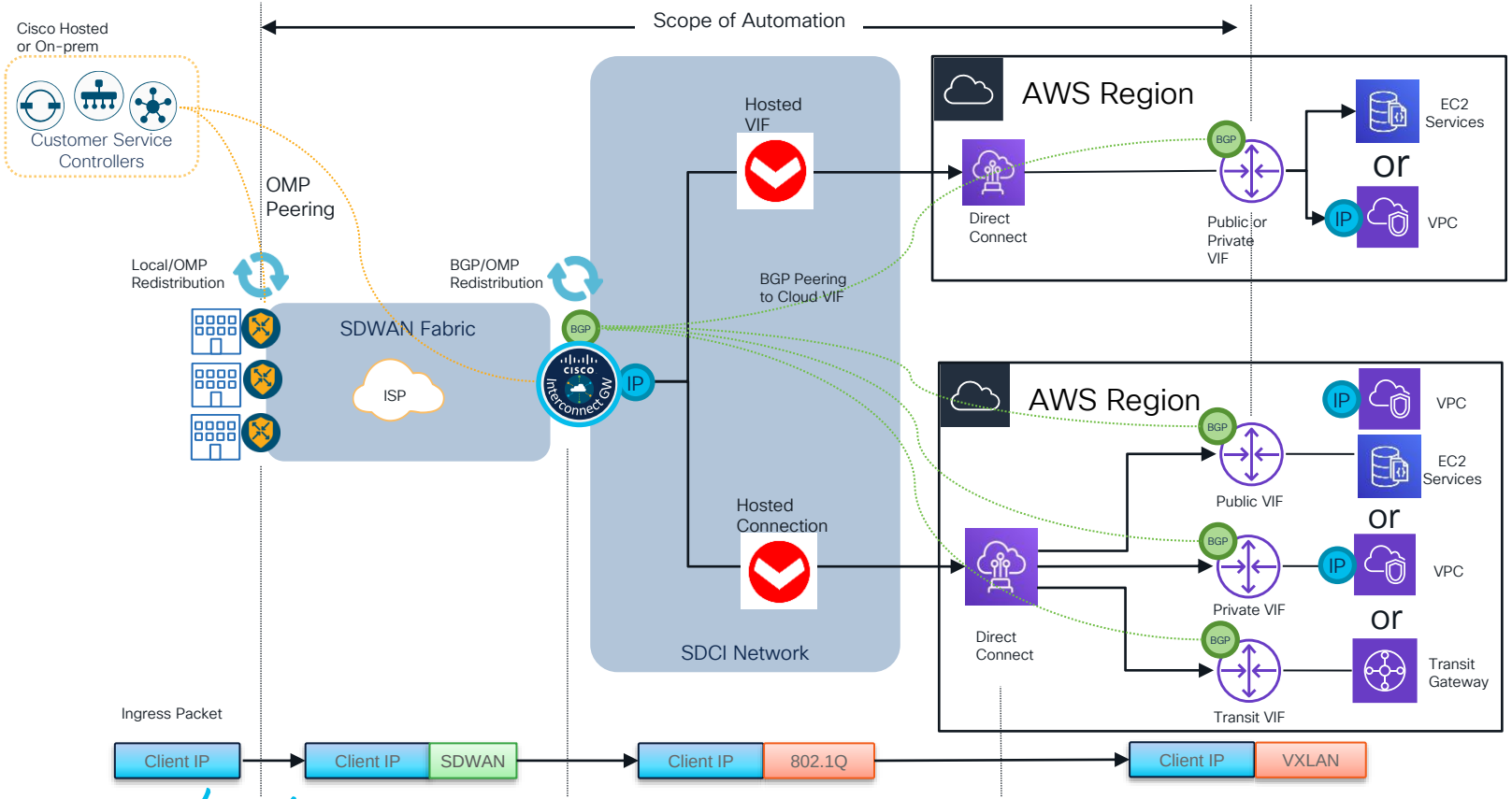
- Hosted SDWAN service at SDCI datacenters
- Regional Aggregation to Cloud and SaaS
- vManage integrated control for:
  - SDWAN Policy, Overlay and Devices
  - Site-to-cloud connectivity via programmable cross connects
  - On-demand cloud direct connects
- Provisioning of all Cloud direct connections in vManage
  - Hosted VIF (Public & Private)
  - Hosted Connections
- Full-stack network automation
- Single portal for service creation

Use Case: Global WAN Core On-demand



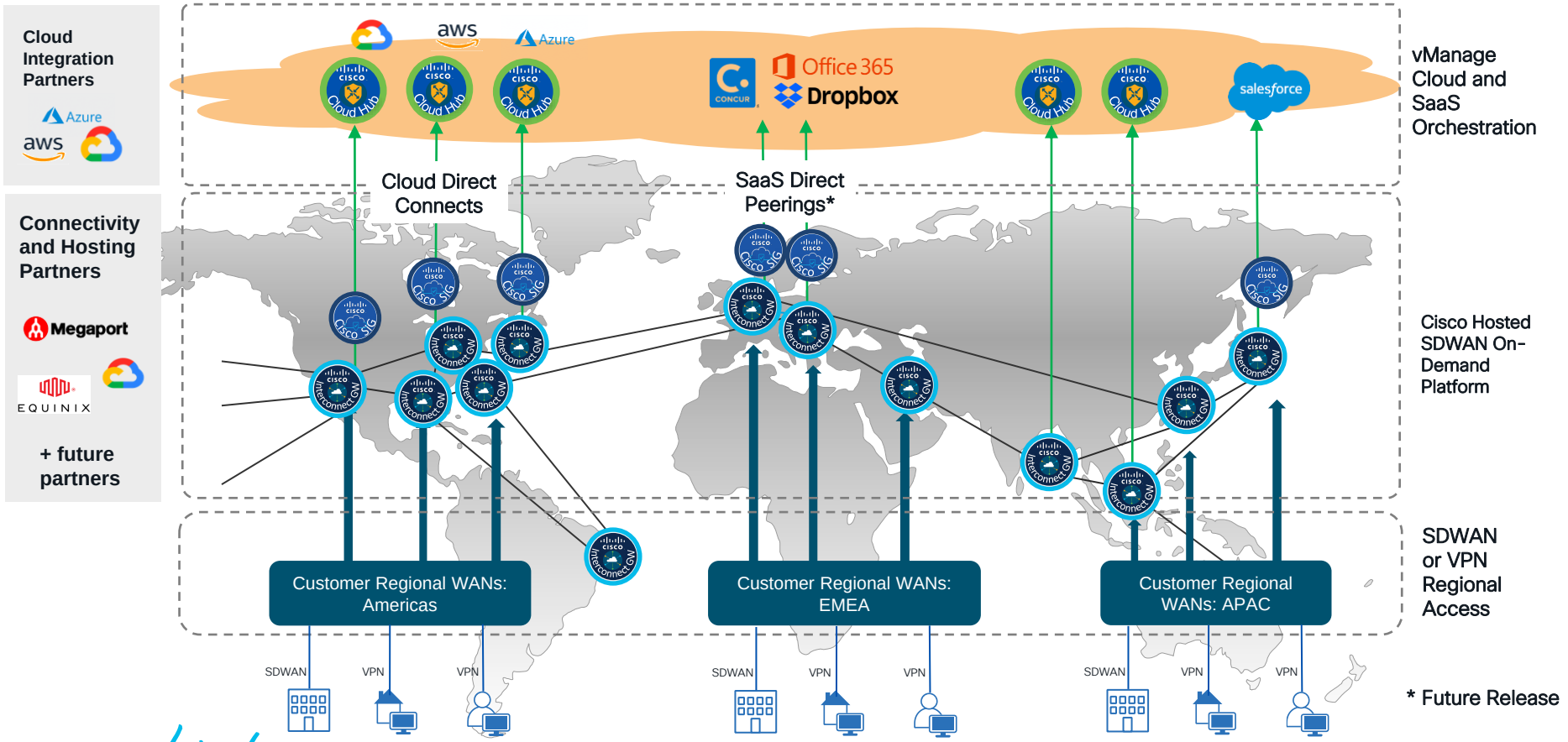
- SDWAN Site-to-site Interconnect
- vManage Cloud controllers for Service layer orchestration and overlay topology
  - Inter-region connection provisioning and abstraction via API
  - Hierarchical SDWAN core
- SDWAN overlay topology control over programmable cross-connects
- Full Segmentation, Traffic engineering policy control
- Programmable, Automated, On-demand WAN Core network-as-a-service
- Single portal for service creation

Typical Service Connection Detail: AWS DX



NOTE:
Only one VIF type supported per DX connection

Cisco Global SDWAN On-Demand



Cisco SDWAN On-Demand Service Locations
Megaport PoPs

For Your Reference

235 Onramps

37 New YoY

	Total Onramps
Microsoft Azure	53
AWS	47
Google Cloud	37
Oracle Cloud	22
IBM Cloud	19
Cloudflare	15
Salesforce	10
Rackspace	9
Alibaba Cloud	9
Nutanix	5
SAP	6
OVHcloud	3

22 Regions

72 Datacenters

Supported Cloud Regions

aws

- Asia Pacific (Sydney)
- Asia Pacific (Hong Kong)
- Asia Pacific (Singapore)
- Asia Pacific (Tokyo)
- Asia Pacific (Osaka)
- EU (London)
- EU (Ireland)
- EU (Frankfurt)
- EU (Madrid)
- EU (Paris)
- EU (Stockholm)
- AWS GovCloud (West)
- US East (Ohio)
- US East (N.Virginia)
- US West (N.California)
- US West (Oregon)
- Canada (Central)

Microsoft Azure

- Australia East
- Australia South East
- East Asia
- Southeast Asia
- Japan East
- Japan West
- UK South
- France South
- Germany North
- Germany Central
- West Europe (Amsterdam)
- North Europe (Ireland)
- Switzerland North
- Switzerland West
- Spain (Madrid)
- Norway East
- Norway West
- UAE North
- US Gov Arizona
- US Gov Virginia
- US Gov San Antonio
- US DoD East (Virginia)
- US DoD Central (Chicago)
- North Central US
- South Central US
- West Central US
- East US
- East US2
- West US
- West US2
- Canada East
- Canada Central

Google Cloud

- Asia Northeast1 (Japan)
- Asia Northeast2 (Osaka)
- Asia Southeast1 (Singapore)
- Australia South East1 (Sydney)
- Australia West East2 (Perth)
- Asia East1 (Taiwan)
- Europe West1 (Belgium)
- Europe West2 (UK)
- Europe West3 (Germany)
- Europe West4 (Netherlands)
- Europe West6 (Zurich)
- North America-Northeast1 (Montréal)
- US Central1 (Iowa)
- US East1 (South Carolina)
- US East4 (Virginia)
- US West1 (Oregon)
- US West2 (Los Angeles)

Supported PoPs

Asia Pacific

- Auckland
- Hong Kong
- Osaka
- Perth
- Singapore
- Sydney
- Tokyo

North America

- Ashburn
- Atlanta
- Bay Area
- Chicago
- Dallas
- Denver
- Los Angeles
- New York
- Phoenix
- Seattle
- Toronto

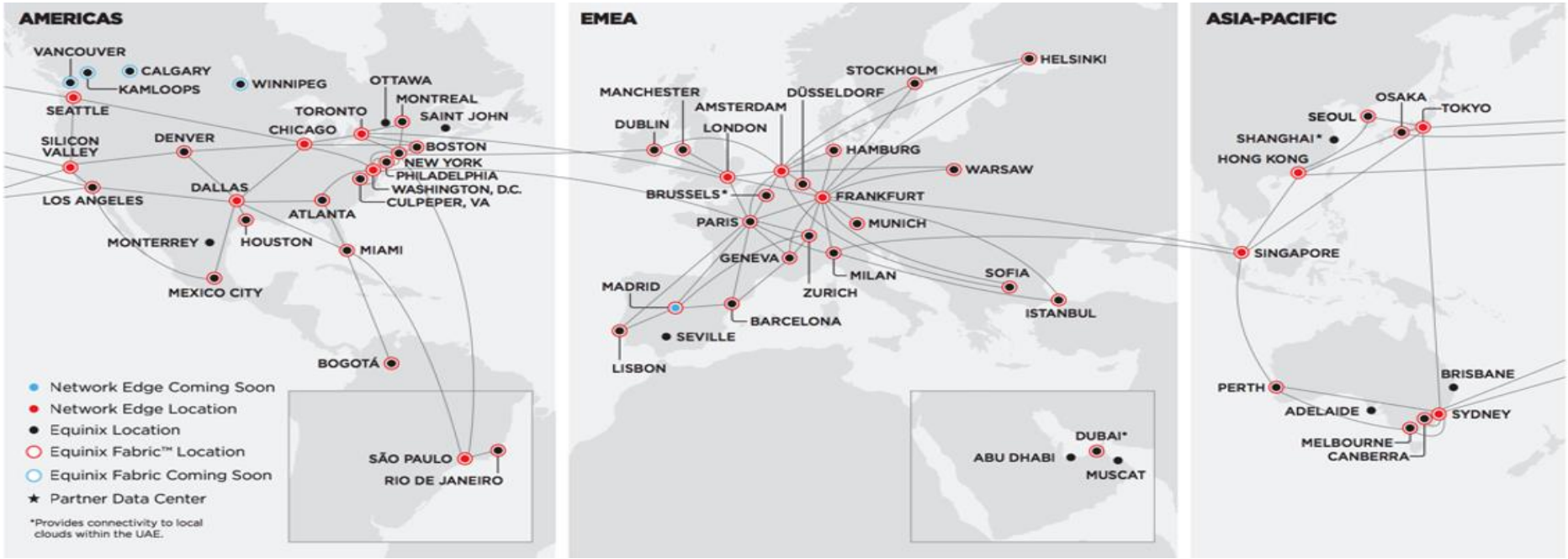
Europe

- Amsterdam
- Frankfurt
- London

Cisco SDWAN On-Demand Service Locations
Equinix Locations

For Your Reference

AMER: Ashburn, Silicon Valley, Chicago, Dallas, Seattle, Toronto, Sao Paulo
EMEA: Amsterdam, London, Frankfurt, Madrid
AP: Singapore, Sydney, Tokyo, Hong Kong
Upcoming Locations: Helsinki, Los Angeles, Montreal, Miami, Paris, Dublin, Melbourne and New York



Integrate your SDWAN Fabric to Cloud

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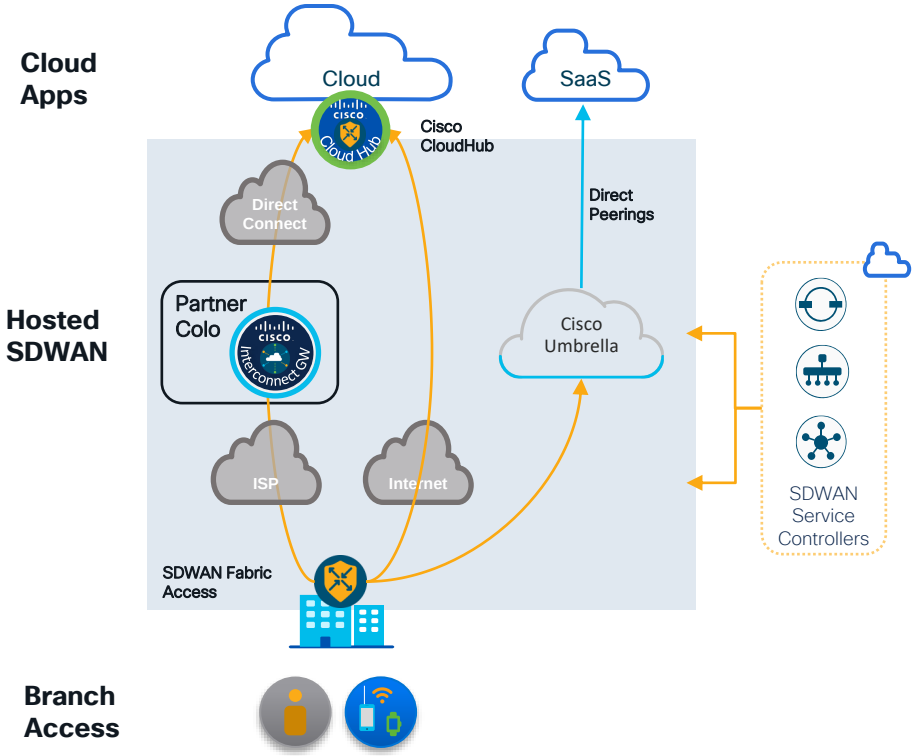
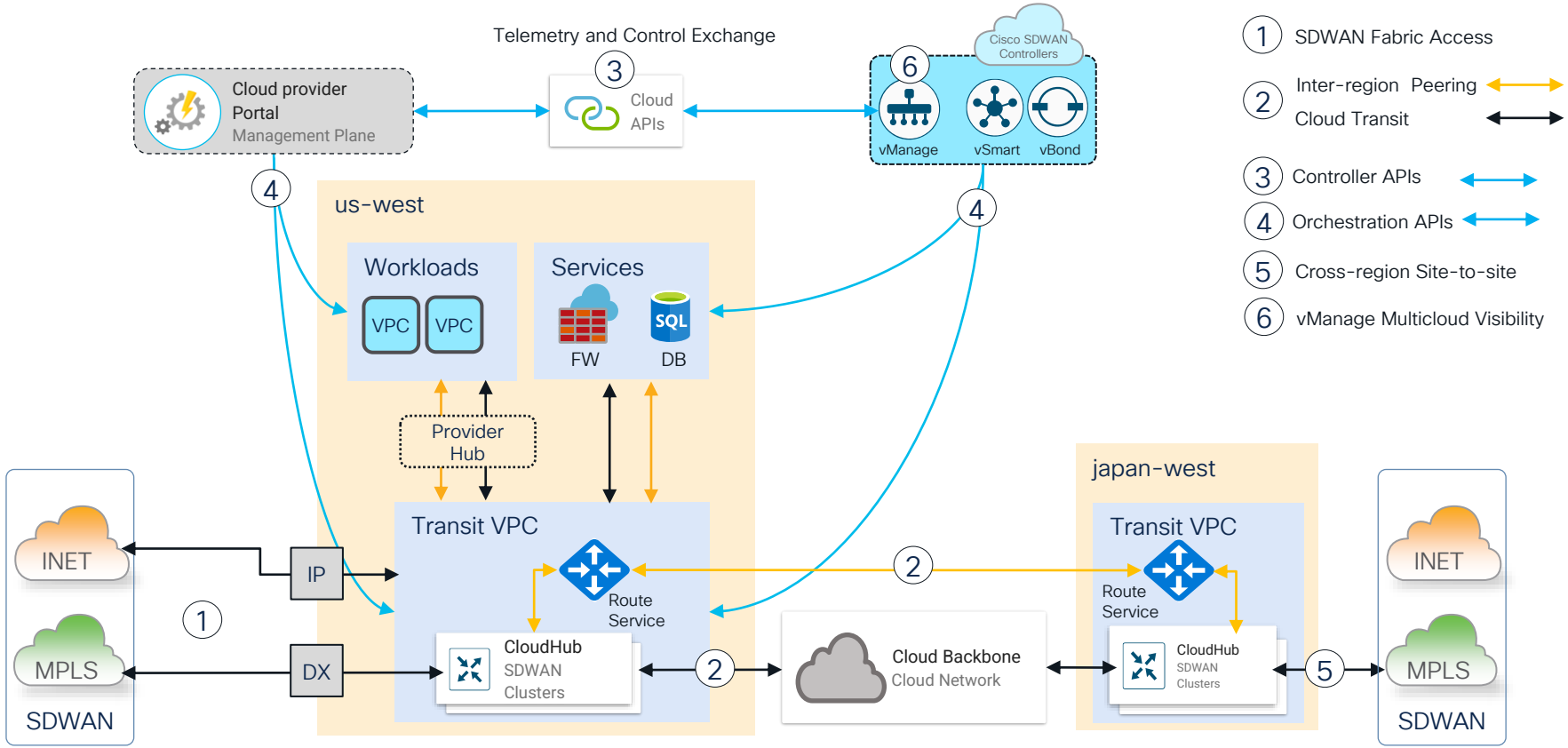
Attach Cloud DCs Directly with SDWAN Cloudhub



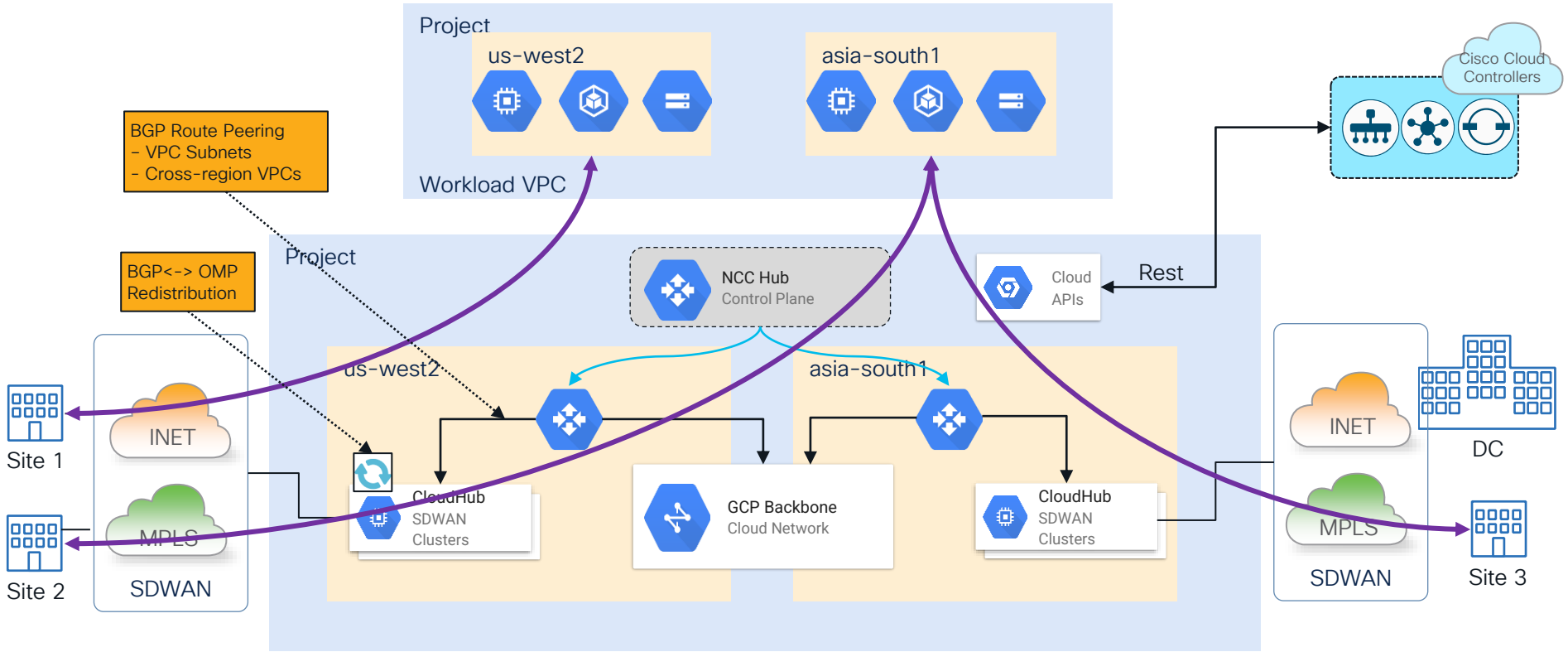
- Extend SDWAN directly to Public Cloud edge
- Common service abstraction across cloud providers: AWS, GCP, Azure…
- Integrated with Cloud VPC and backbone networking
- Control flow traffic & performance. Unify operations.
  - DC resiliency, route preference, backup
  - Automated workload connectivity
  - Load balancing
  - Segmentation on-demand
  - Application SLA
  - Single cloud-networking abstraction
- Fully automated. On-demand.

CloudHub Architecture- Any Cloud



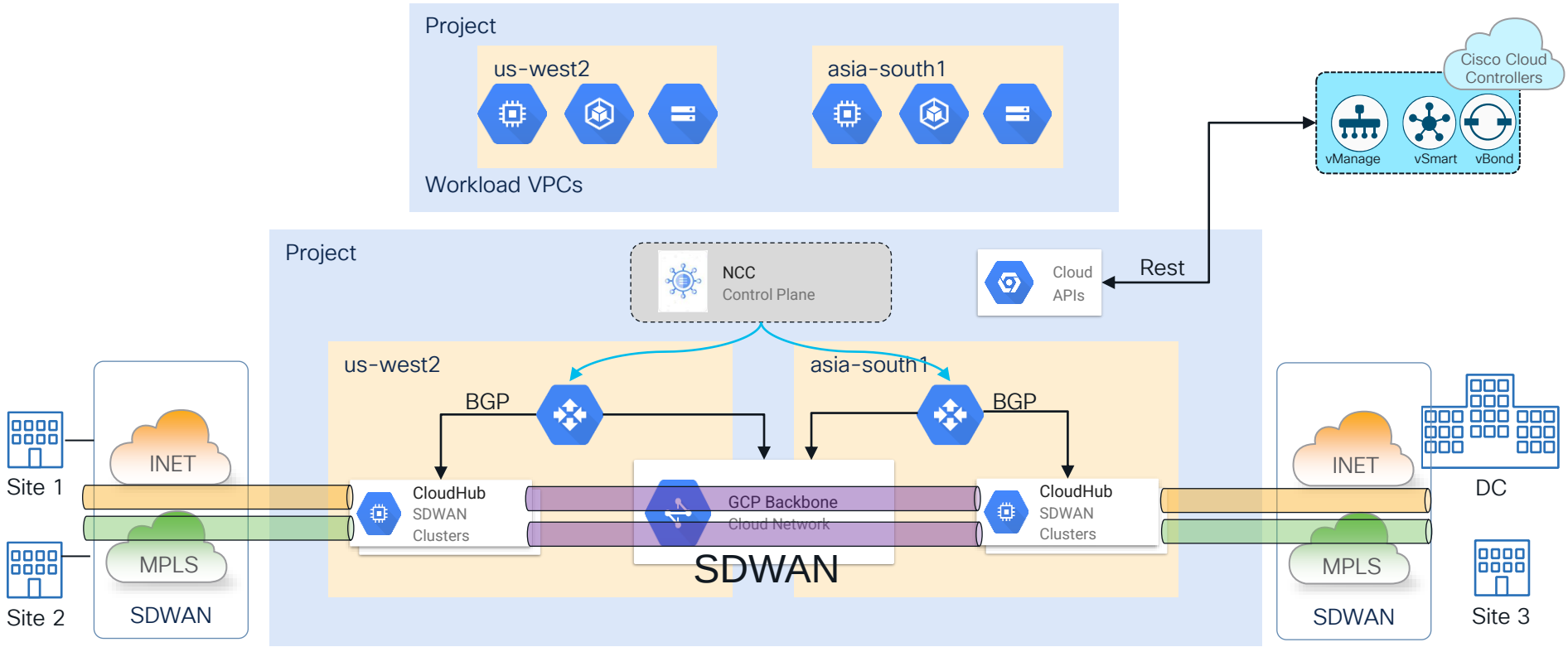
Cloud Hub Use Case - GCP

Site to Cloud Connectivity



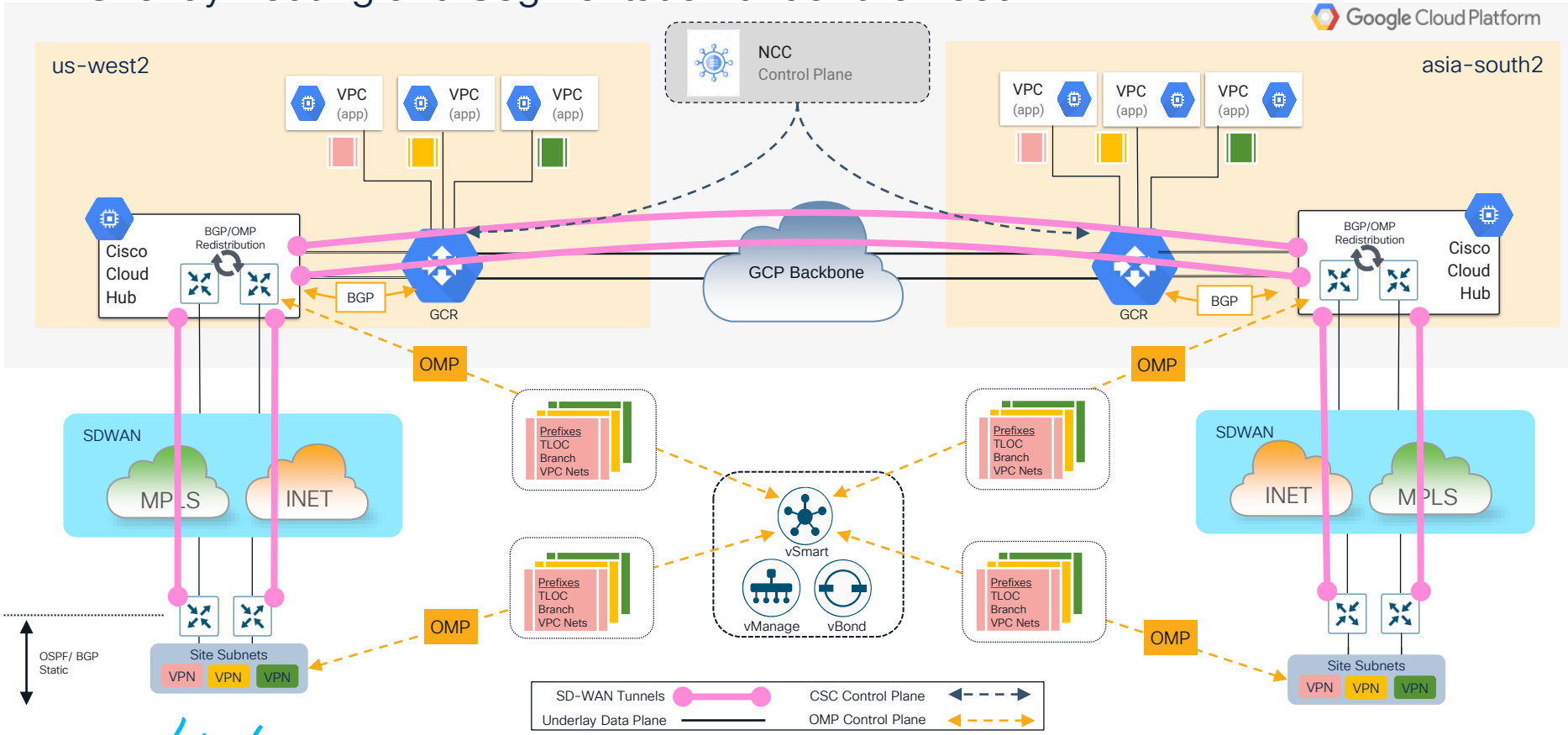
CloudHub Use Case – GCP Backbone Transit

Site to Site Connectivity with SDWAN Core

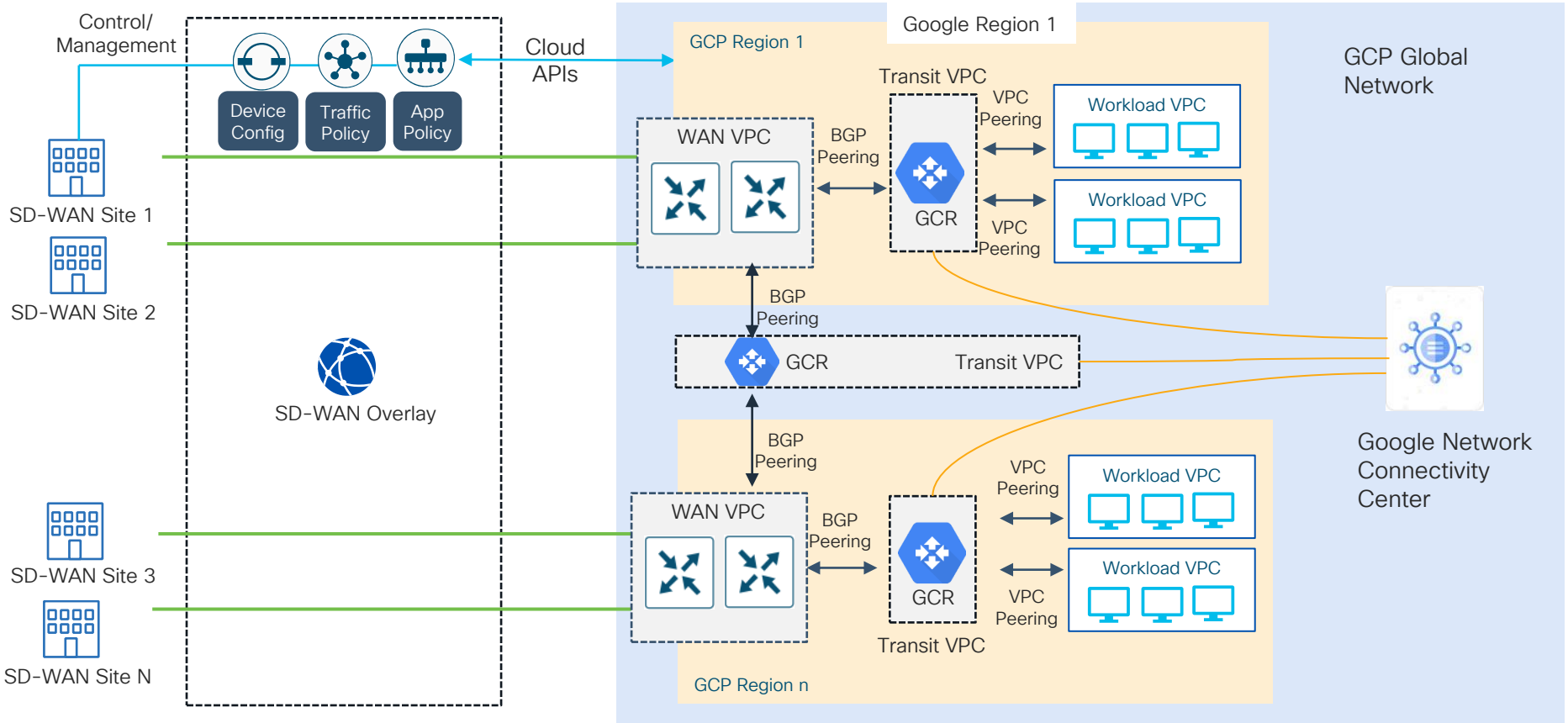


CloudHub Use Case – Google Cloud

Overlay Routing and Segmentation under the hood



Cloud OnRamp Automation Design for GCP



36

Key Takeaways

Key Takeaways

1. WAN service delivery is changing. Enterprise Networks need to change to take full advantage of Network cloud.
2. SDWAN is becoming the unified, secure access method to help you transform to cloud-first networking
3. API programmable networks and services enable Cloud and SDWAN connections, on-demand in minutes
4. Cisco Cloud and SDWAN automation is leading the transformation to the “Network Cloud”
5. Visit the Cisco Live WoS demo to see it all in action.

Thank you

Technical Session Surveys

- Attendees who fill out a minimum of four session surveys and the overall event survey will get Cisco Live branded socks!
- Attendees will also earn 100 points in the Cisco Live Game for every survey completed.
- These points help you get on the leaderboard and increase your chances of winning daily and grand prizes.

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