The bridge to possible

Managing Multiple Environments with a Single Policy

Securely Expand to Multi Cloud with One Centralized Solution

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Jim Mathers, Engineering Product Manager
Cisco Data Center and Provider Connectivity BE

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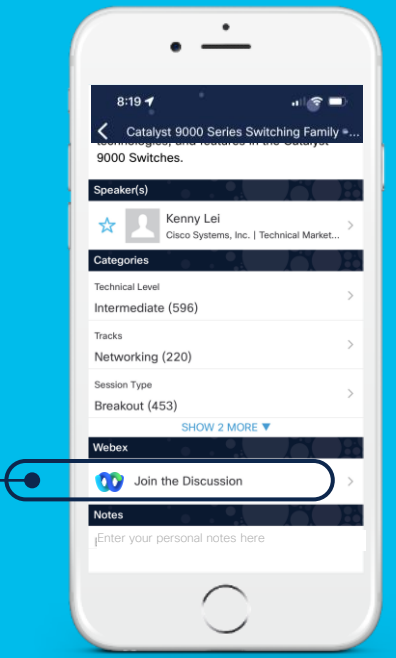


Agenda

- Introduction and Problem Statement
- ACI Primer
- ACI for Hybrid Cloud Deployments
- Multi Cloud Networking Solution Architecture
- Multi Cloud Networking Use Cases
- Conclusion

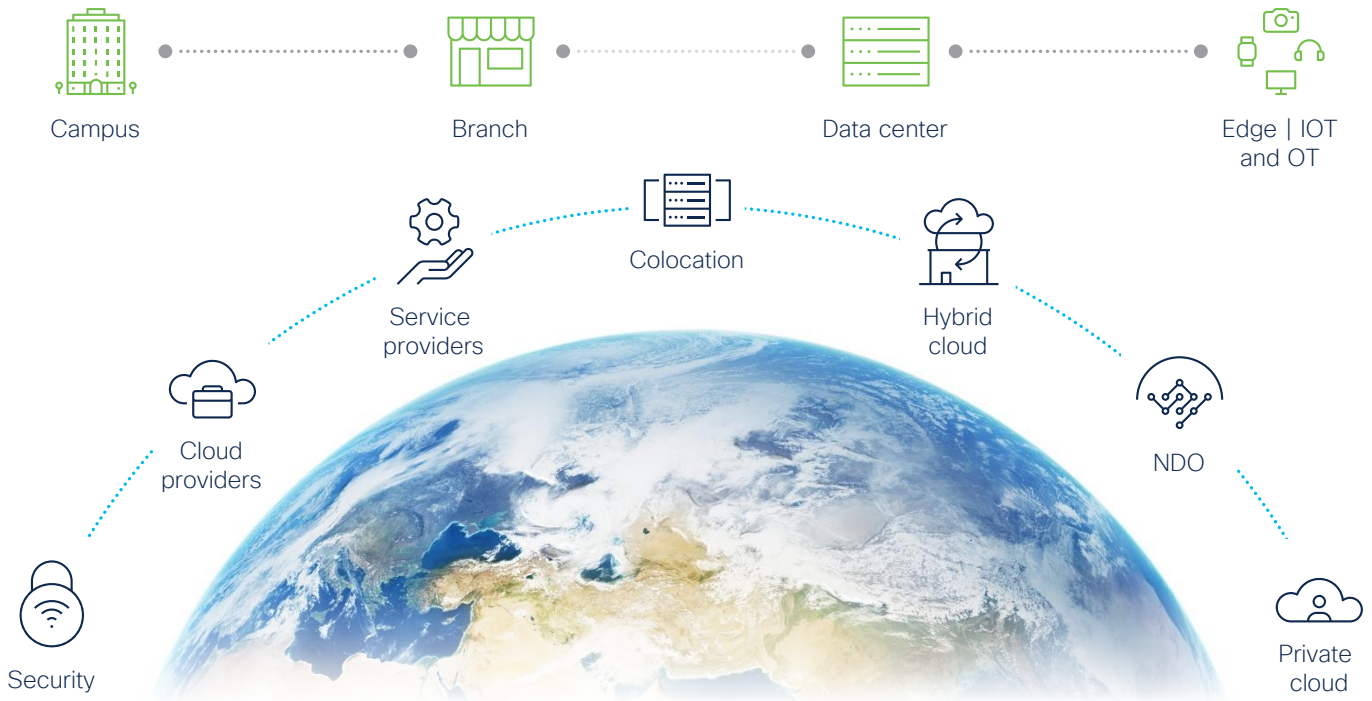
Complexity and Chaos

Complexity is the new normal for Multi Cloud networking

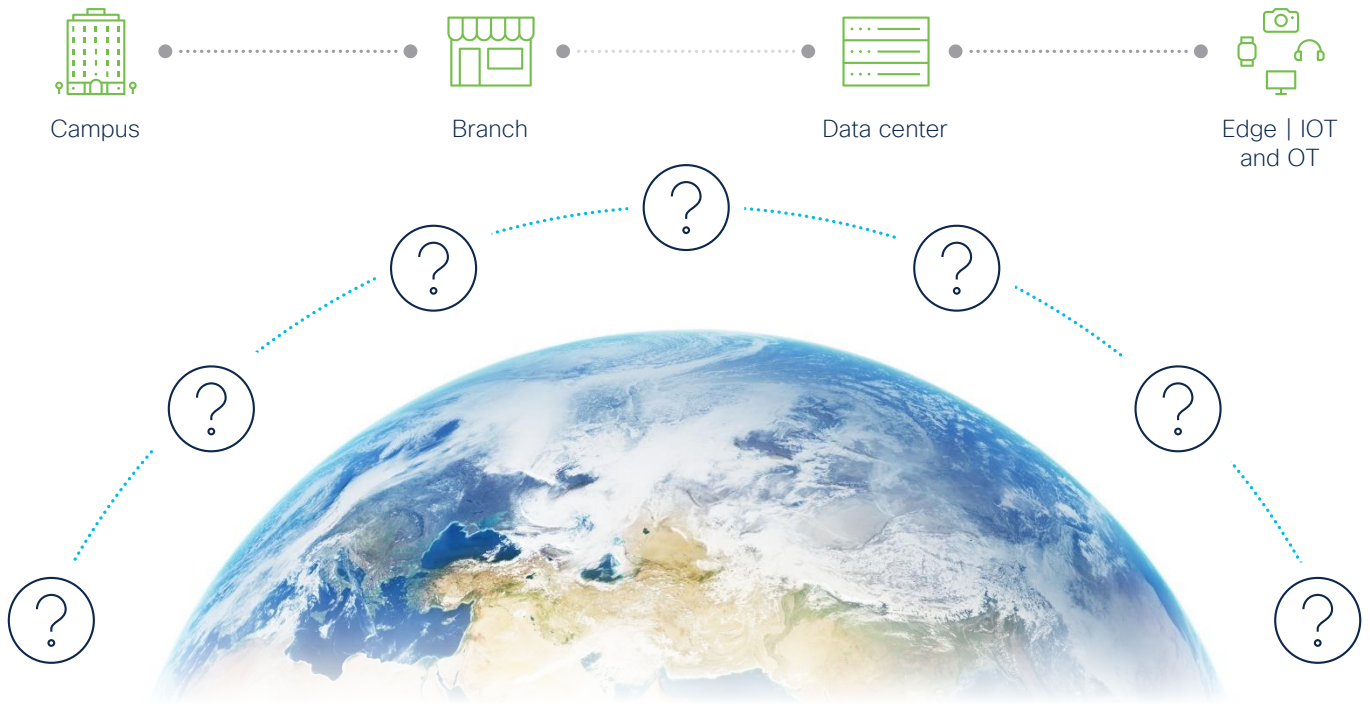
Tenant	Account	Subscription/ Resource Group	Account/Project
Site	Region	Region	Region
Pod	Availability Zone	Availability Zone	Zone
VRF	VPC	VNet	VPC
Bridge Domain/ Subnet	CIDR/Subnet	Subnet	Subnet
EPG	Security Groups	Application/Network Security Groups	Firewall
Contracts & Filters	Security Group Rules	Security Rules	Firewall Rules

How can we impose order from Chaos?

The new normal is a hyper-distributed, extremely diverse IT landscape



And your world is constantly changing…



Trends: What our customers care about

Cybersecurity

50%

of cybersecurity leaders are speeding up the deployment of zero trust

Evolving priorities: TCO

50%

NetOps list automation and visibility as highest technology priorities**

Operational simplicity in an increasingly complex world

82%

organizations have adopted hybrid cloud*

Increasing pace of workload deployments

58%

are moving workloads between on and off-prem environments weekly*

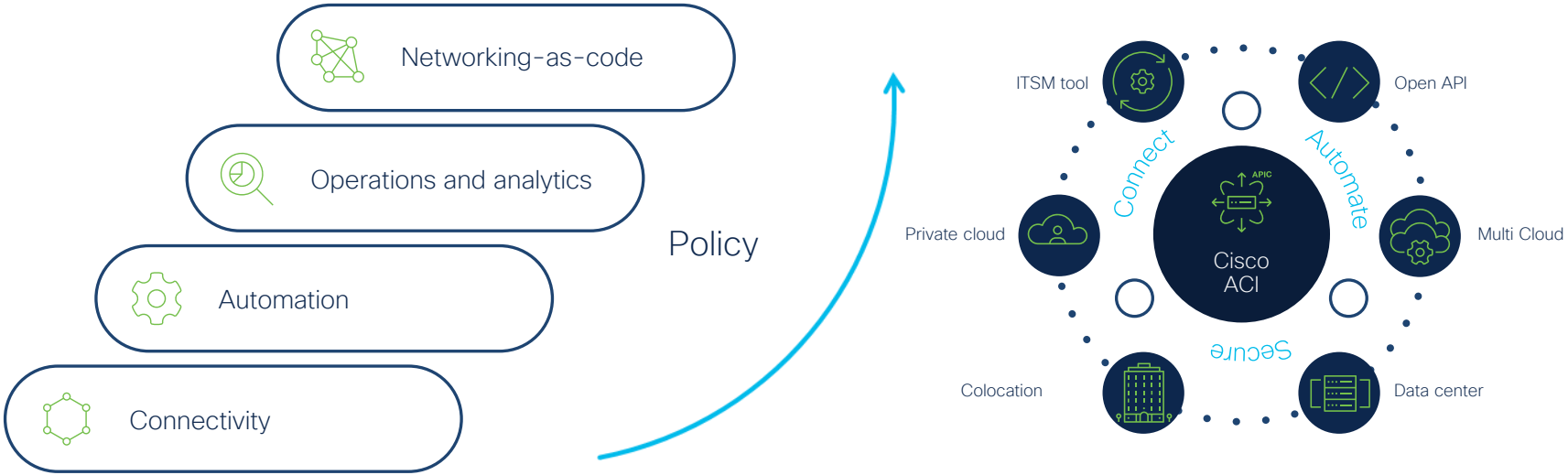
Sources

* Cisco: Hybrid Cloud Global Trends Report

** Cisco: Global Networking Trends Report

*** Gartner: Top 10 Strategic Technology Trends for 2023

Introducing Cisco Application Centric Infrastructure



Data center | Colocation | SDWAN | Edge | Multi Cloud

Application Centric Infrastructure building blocks

Built on the Nexus 9000

Centralized policy model, network automation

Cisco APIC

Single open API for entire system

Flexible – modular and fixed spine options

Non-blocking 40/100/400G/800G fabric, CLOS fabric

Integrated overlay | 40/100/400G/800G
Non-blocking fabric | Distributed gateway

Built-in distributed stateless firewall, multi-tenant security

Physical, virtual and container workloads

WAN interconnect

IP storage

Network service appliances

Industry leading

Price | Performance | Port density | Programmability | Power efficiency

Cisco ACI: Industry Leading SDN Solution

Automation out-of-the-box; Integrated Underlay and Overlay networks

Application-aware service-chaining

Workload Agnostic
(Bare Metal / Virtual Machine / Containers)

True administrative multi-tenancy

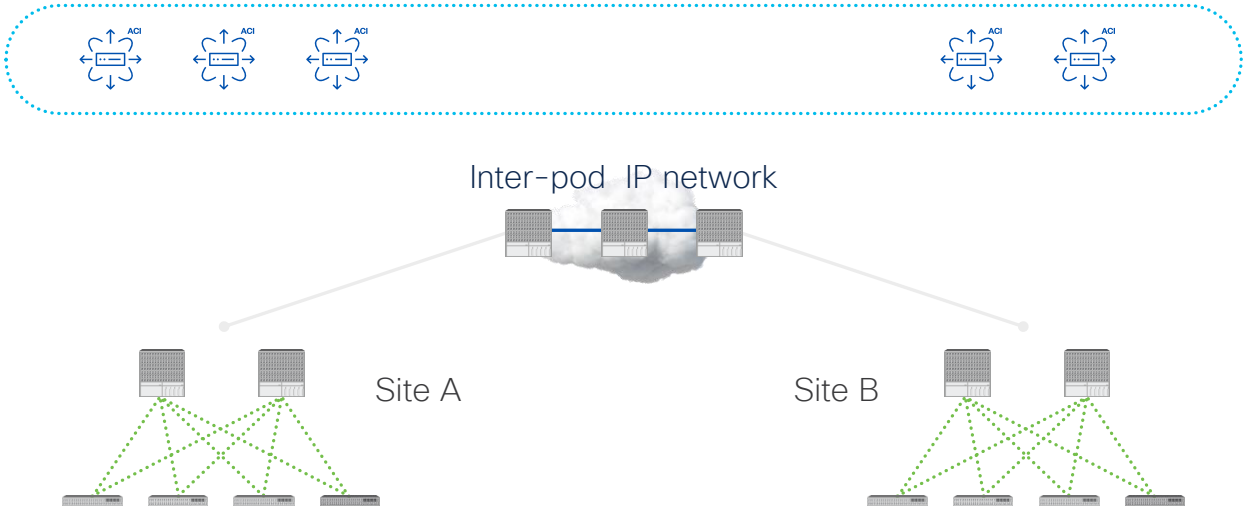
Hybrid cloud capability; public cloud-like networking constructs

Single API for 100s of switches and 1000s of ports

Cisco Cloud Network Controller

ACI is the on-prem anchor fabric in a hybrid cloud deployment model

Cisco ACI Multi Pod: On-Prem Availability Zones

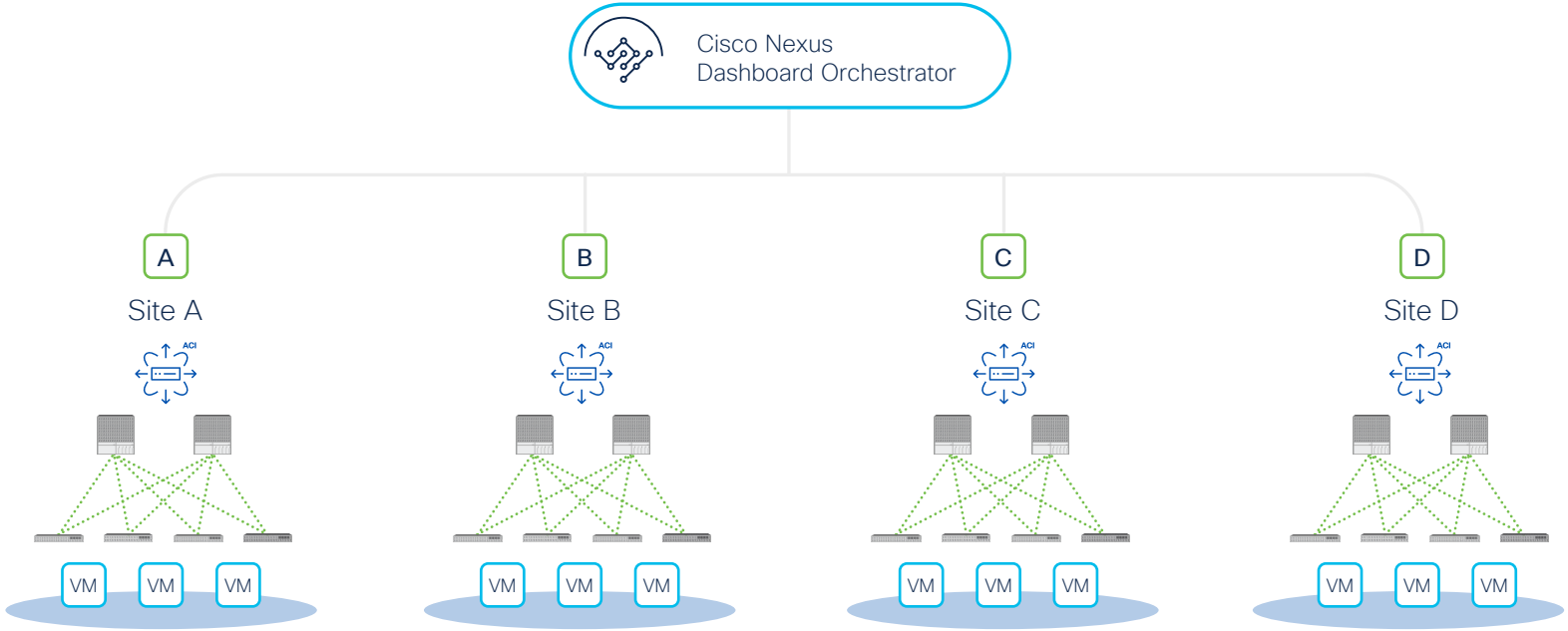


Active-Active Datacenters

Virtual Metro Clusters

Stretch VRF, EPG, BD

Cisco ACI Multi Site: On-Prem Regions



Active-Active Datacenters

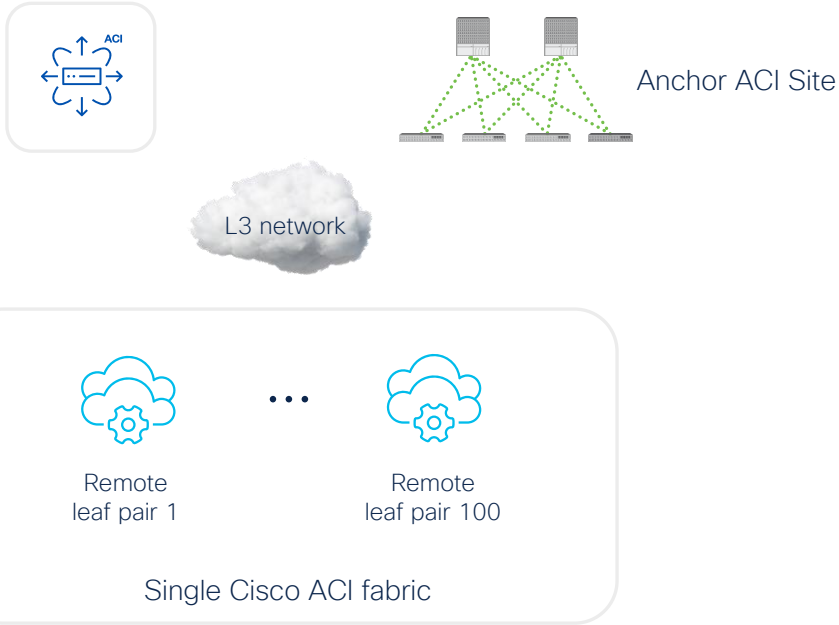
Disaster Recovery

Fault Domain Boundary

Stretch VRF, EPG, BD

Cisco ACI Remote Leaf: Hybrid Cloud colo extension

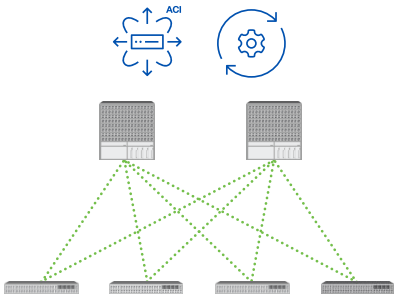
Colocation Facility Use Case



Extend ACI policy and segmentation framework to hybrid cloud edge

Cisco ACI: A platform built for automation

Simplicity from chaos: One API call to deliver a data center wide construct (like a VRF)



Day 0

Out of the box automation

- Hardware
- Fabric
- Underlay

ACI fabric is deployed based on Cisco best practices

Avoid 100s of micro decisions required to design traditional fabrics

Day 1

ITOPS Ticketing queue

ServiceNow ticket – create VRF

Ansible / Terraform / Python

APIC API

Hundreds of switches and 1000s of ports

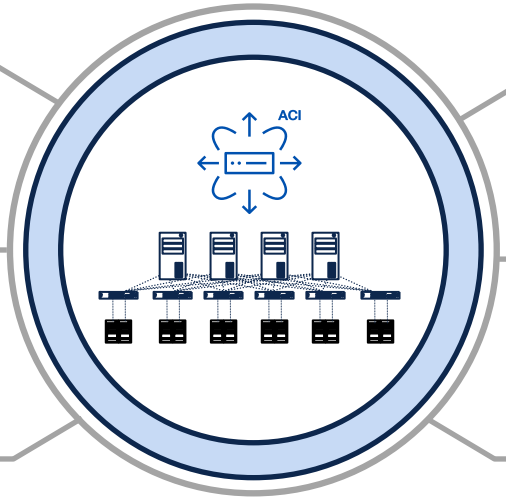
IT operations lifecycle: Provision, automate and operate

Cisco ACI: Summary of hybrid cloud features

Cloud-like deployments
ACI Policy model closely resembles public Cloud

Single Point of Administration
For Security Policy across private and public Cloud

API-driven Deployment Model
For on-prem anchor fabric



Data Center Interconnect
Standards-based prescriptive DCI design & provisioning

Unified Policy Models
Security and policy models between private and public Cloud

Cisco Cloud Network Controller
A Multi Cloud networking solution to automate connectivity and segmentation

Multi Cloud Networking

cisco Live!

Business Drivers

Agility

Rapid response to business demands

Improved customer satisfaction and retention

Flexibility

Choice of infrastructure best suited to application needs

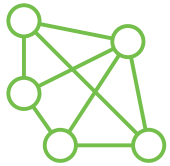
Availability and mobility

TCO

Flexible consumption model

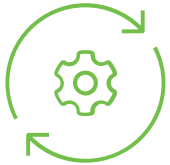
Scalable infrastructure

Challenges in Hybrid Cloud Networking



Network connectivity

Operations and visibility



Services integration

Segmentation and security

Cisco Hybrid Cloud Networking Architecture

Automated connectivity and routing

Consistent security and segmentation

Single Control Plane across On Premises data center and Cloud

Automate insertion of L4-7 services

Visibility and Troubleshooting

Solution Building Blocks

Cisco Cloud Network Controller

Catalyst 8000v

or

Cloud native router

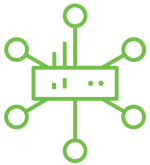
Nexus Dashboard

Flexible Deployment Models

Cloud only

Hybrid with on-premises ACI

Hybrid with on-premises NDFC



Connect to external networks

SD-WAN router

Branch router

Data center edge router

Benefits

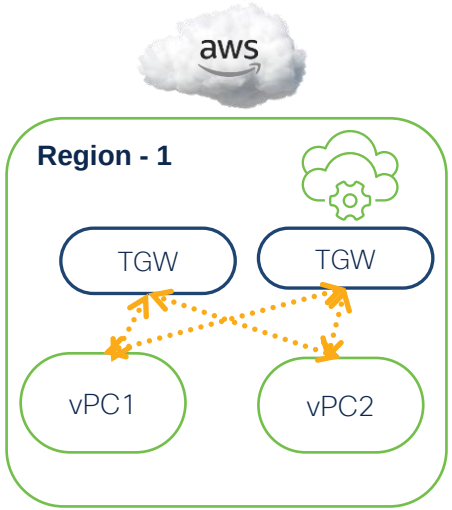
Innovate with next-generation applications

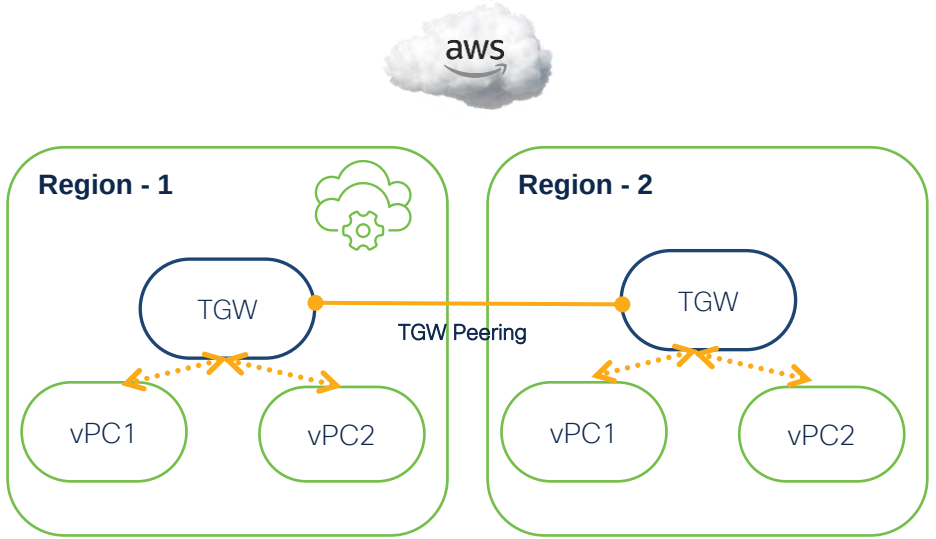
Best-of-breed on-premises or cloud infrastructure

Optimal resource use

Hybrid Cloud Networking Use Cases

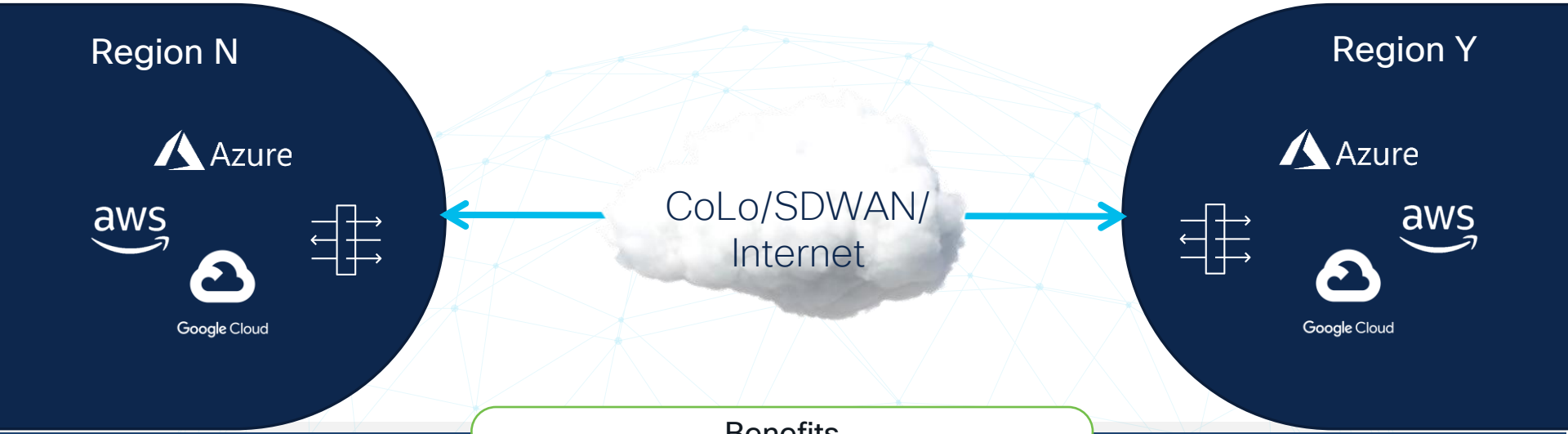
Intra Cloud Connectivity Automation





Automate Network Connectivity For Intra-Region and Inter-Region Traffic

Inter Cloud Connectivity



Benefits

Extend segments across clouds

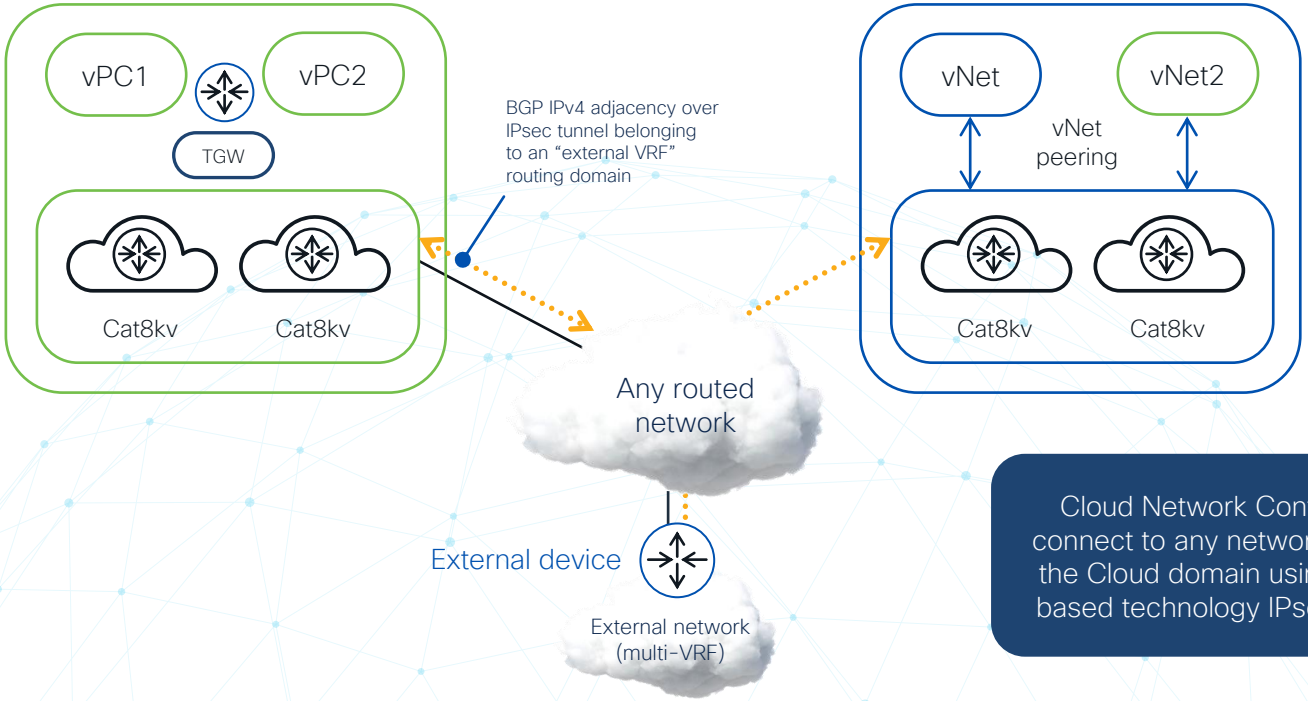
Automate service redirect

On Prem to cloud Connectivity

Benefits

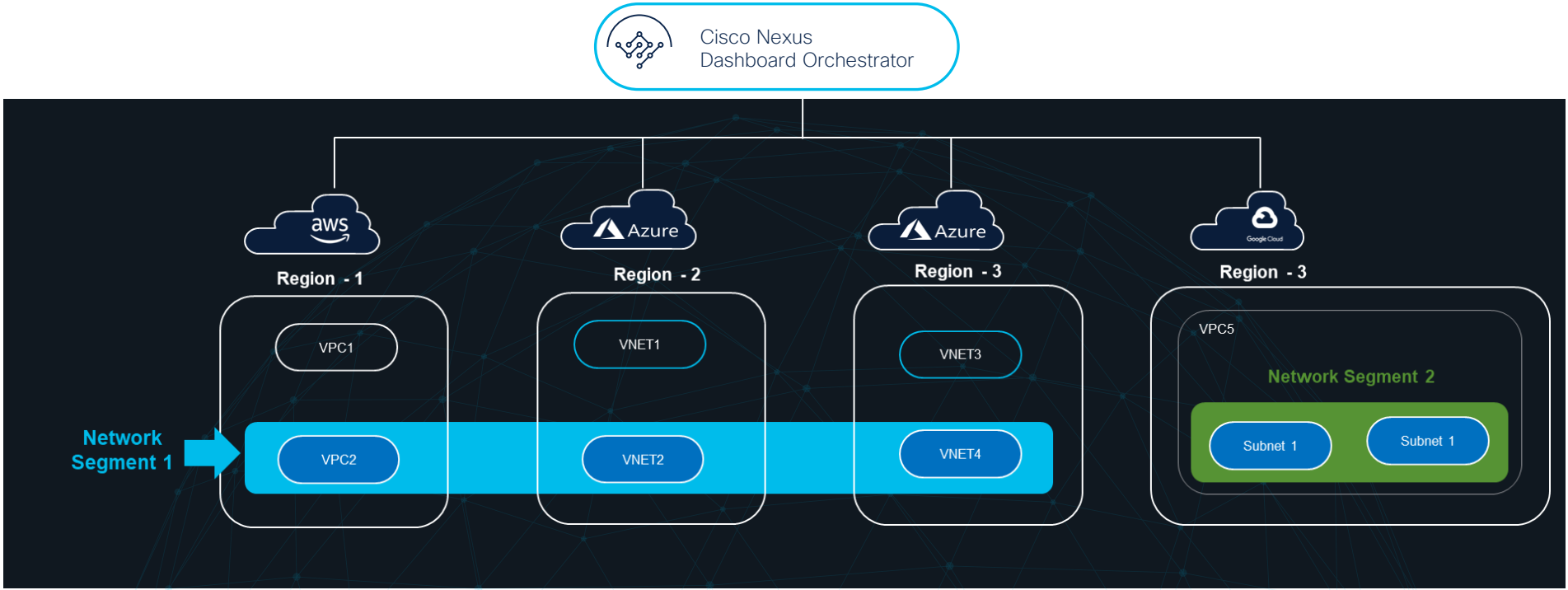
Simplified connectivity for hybrid cloud	Enable high bandwidth underlay	Utilize cloud native routing

External Network Connectivity



Cloud Network Controller can connect to any network outside of the Cloud domain using standard based technology IPsec and BGP

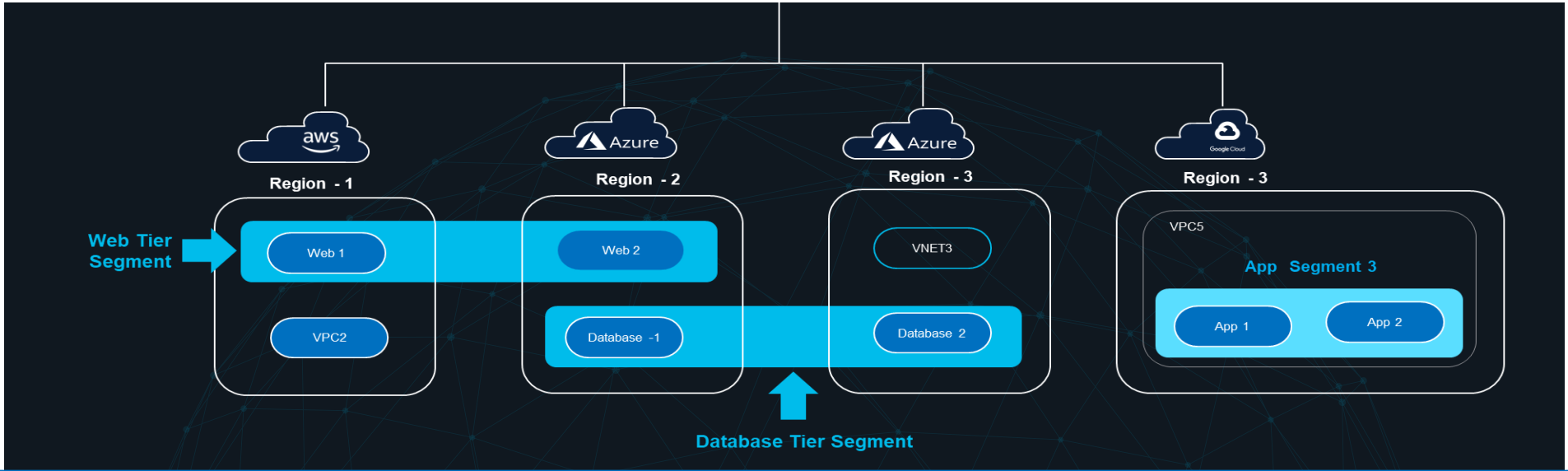
Network Segmentation



1. Segment Virtual Networks within and across VPCs and Clouds
2. Common routing domain across clouds
3. Automated route propagation within a routing domain

Application Segmentation

Cisco Nexus
Dashboard Orchestrator



Create application segments that span across clouds

Define and enforce policy for application segments within and across clouds

Automate routing and security policies for application segments within and across clouds

Hybrid Cloud L4-7 Services

Capabilities

- Insert FW and load-balancer within and across clouds
- Automated routing redirect when needed
- Vendor agnostic
- Open API for broader ecosystem integration

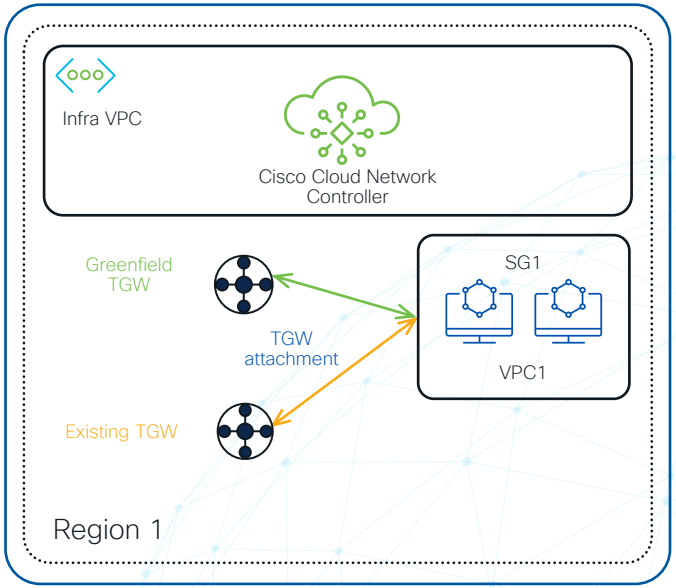
Benefits

Promote agility and on-demand security

Easy model and enforce the traffic flows

Scale up and down effortlessly

Brownfield VPC Onboarding



- Create TGW or VPC peering
- Copy of Route Tables from existing TGW
- Retain existing TGW
- BGP Configuration by Catalyst 8000v

Benefits

Seamless Migration | Simplified Operations | Co-existence

Hybrid Cloud Networking Summary

Automate Connectivity

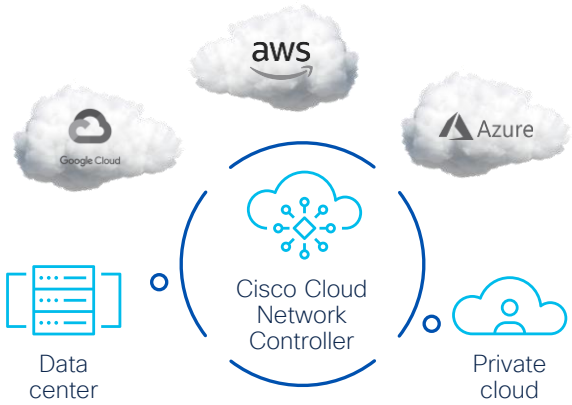
- Intra-cloud: TGW, VNET peering
- Inter-cloud: C8Kv automation
- Connectivity: IPSEC, Direct Connect, Express Route

Visibility

- View and connect to brownfield VPC networks
- Inventory and topology view

L4-L7 services

- Automate service insertion and service chaining (Load Balancers, Firewalls, etc.)



Segmentation

- Extend segments from On Premises to Cloud
- Extend segments from Cloud to Cloud
- Security group rule management

Support on Public and Private Clouds

- AWS, Azure, Google Cloud

Open APIs

- Enable automation using Terraform and Ansible

Customer Testimonial: Skanska

Skanska Construction Stretches Its Data Center Network to the Cloud with Cisco Cloud ACI

Skanska is one of the world's leading construction and project development companies, focused on selected home markets in the Nordic region, Europe, and the United States. Skanska deployed Cisco ACI in 2018 to improve data center automation, security, and resiliency, and is now in the process of stretching network management and policies to the cloud.

Challenges

- Align data center and cloud environments
- Improve network segmentation and security
- Accelerate IT operations

Solution

- Cisco® Application Centric Infrastructure (ACI)
- Cisco Cloud Network Controller (Formerly Cisco Cloud ACI™)
- Cisco Nexus® 9000 Series switches

Results

- Established hybrid cloud operating model
- Improved data center automation, security, and resiliency
- Increased operational agility and workload portability

"Instead of learning the ins and outs of Azure and recreating our security policies with a different syntax, we'll just extend our existing policies. It will save us a ton of time, improve the security and consistency of our network operations, and give us much more flexibility for where to place our workloads."

-Johan Stengård, Solution Architect for IT Networks, Skanska Construction

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