



Cisco-Viptela SD-WAN Solution

Customer Version

EXPLORING
SUCCESS
TOGETHER





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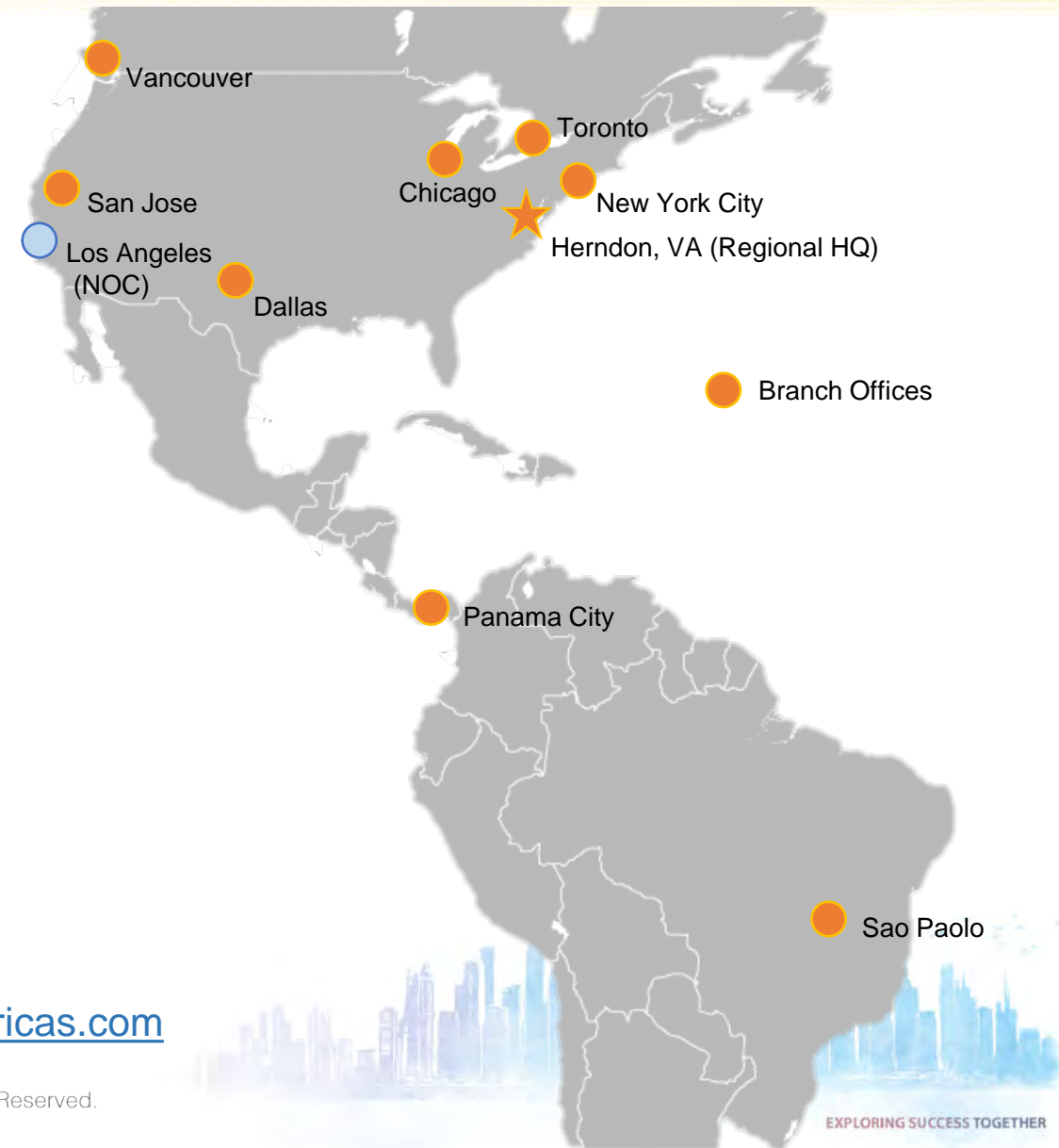
Who is China Telecom (Americas) Corporation (CTA)?

China Telecom (Americas) Corporation (CTA) provides customized, cost-effective and integrated network and communication solutions to its diverse base of customers. As a leading facility-resale carrier with unique access to providers in Asia and the Americas, we offer a wide range of services such as direct internet access, internet transit, data services, data center, ICT services, mobile voice, professional services and industry solutions.

CTA is headquartered in Herndon, Virginia, with offices in Chicago, Dallas, Los Angeles, New York, Panama City, San Jose, Sao Paulo and Toronto. Enterprises throughout the Americas trust CTA's one-stop, turnkey solutions to meet the challenges of today's complex business environment.

- Established in 2001
- Headquartered in Herndon, VA
- **250+** Employees in US, Canada & LATAM
- **7** Regional Sales & Support Offices
- **2** Network Operations Centers in LA & HK
- **22** Points of Presence (PoPs) in North America
- **12** Points of Presence (PoPs) in South America
- **100+** Customers in the Fortune 500
- **100+** Carrier Partnerships
- **21** Channel Master Partnerships

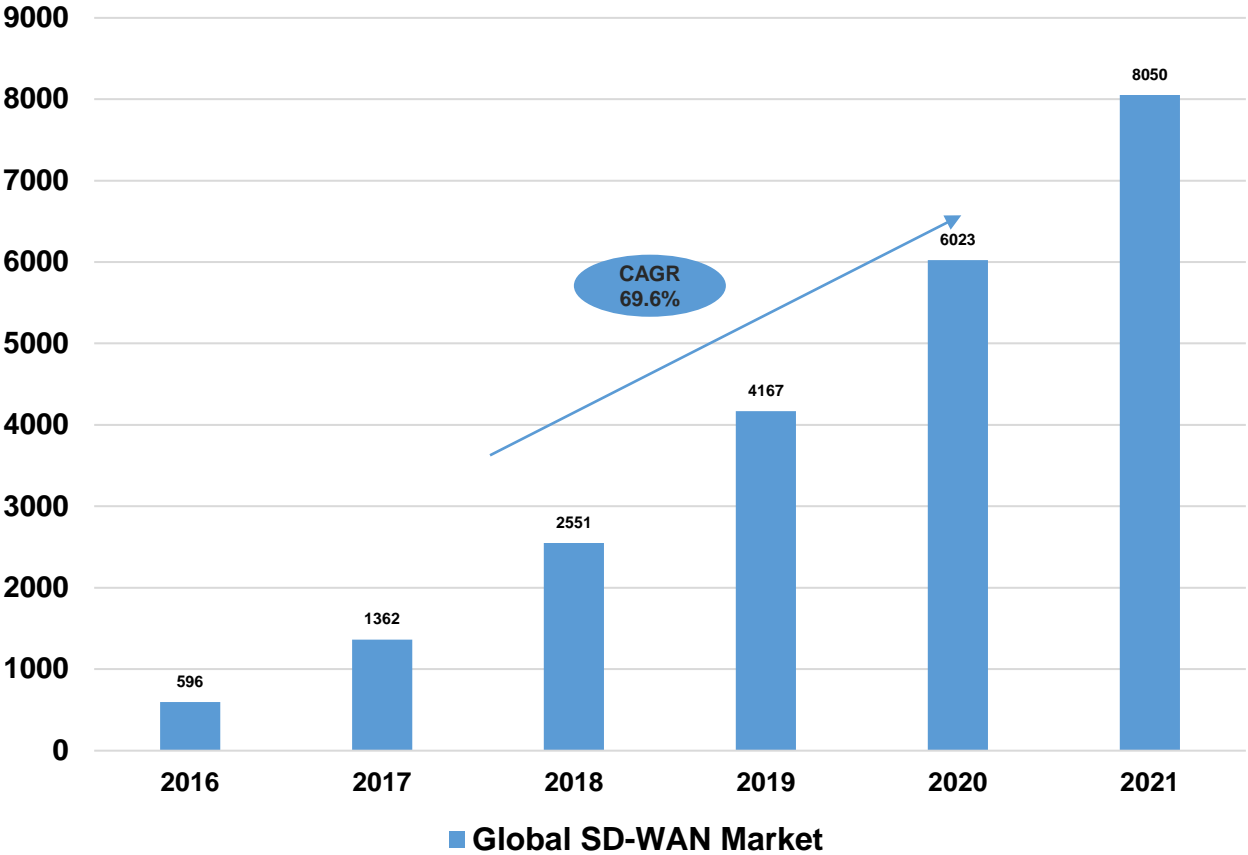
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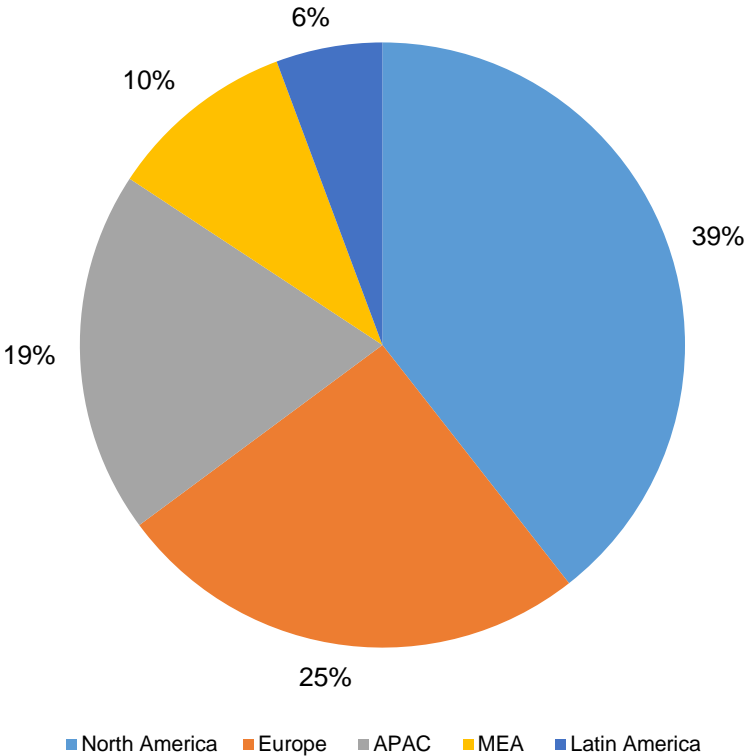
SD-WAN Market Trend



2016-2021 Revenue(\$M) with CAGR

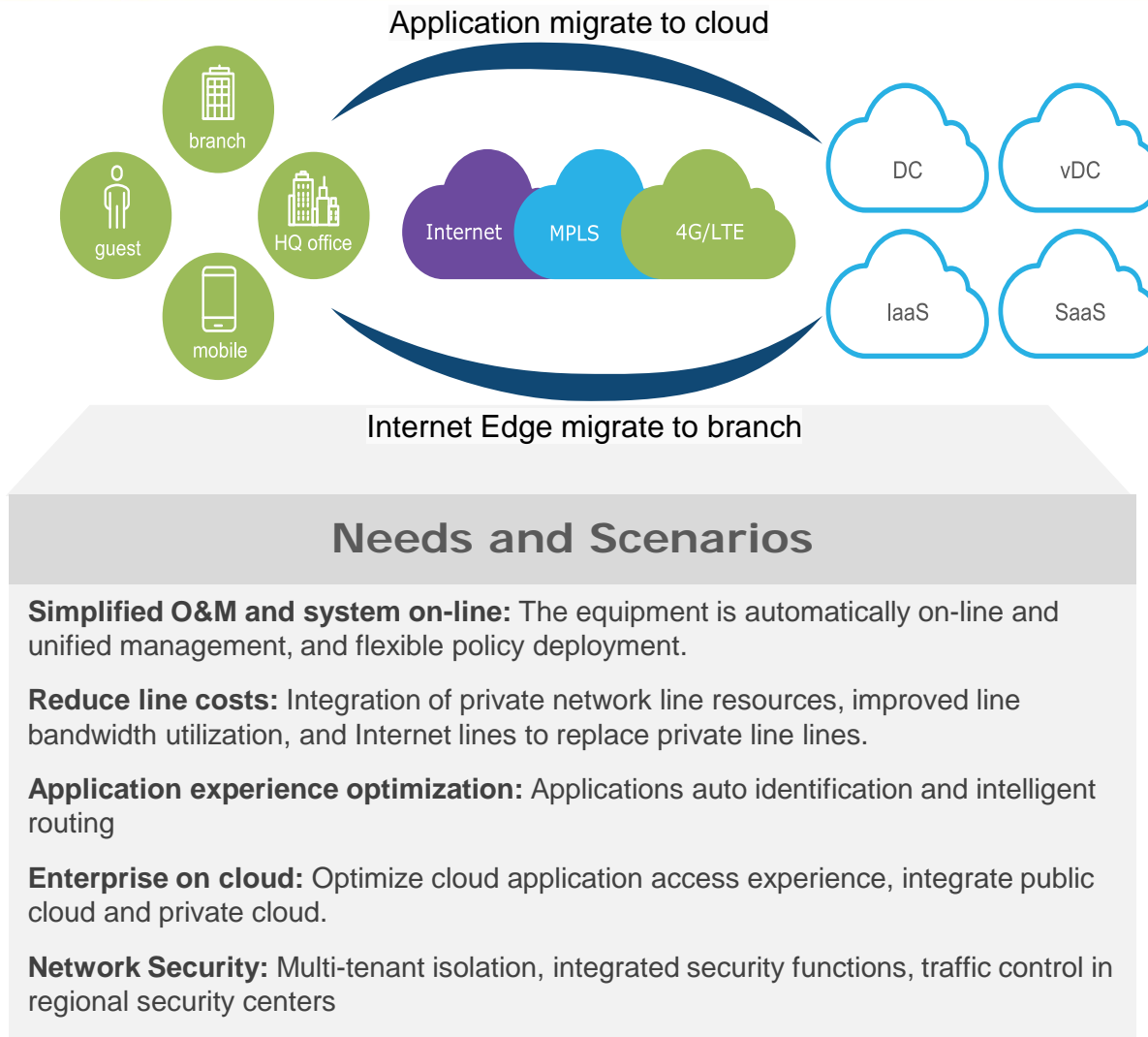


2016 Global SD-WAN Market by Region



Source: IDC Worldwide SD-WAN Forecast: 2017-2021
SD-WAN Global Market Forecast 2021

Customer's Motivation



Traditional Network vs. SD-WAN



Traditional Networking Products

Access (e.g.: E1, IPLC, DIA)

CTA affiliate Backbone
(MPLS PE, IPsec Gateway)

CPE (Cisco ISR)

CTA affiliate Management &
Orchestration Tools



Flexible SD-WAN

Access+ WAN Backbone
Vendor & Transport
Agnostic

SD-WAN Devices

CTA affiliate Management &
Orchestration Tools
+
SD-WAN Controller

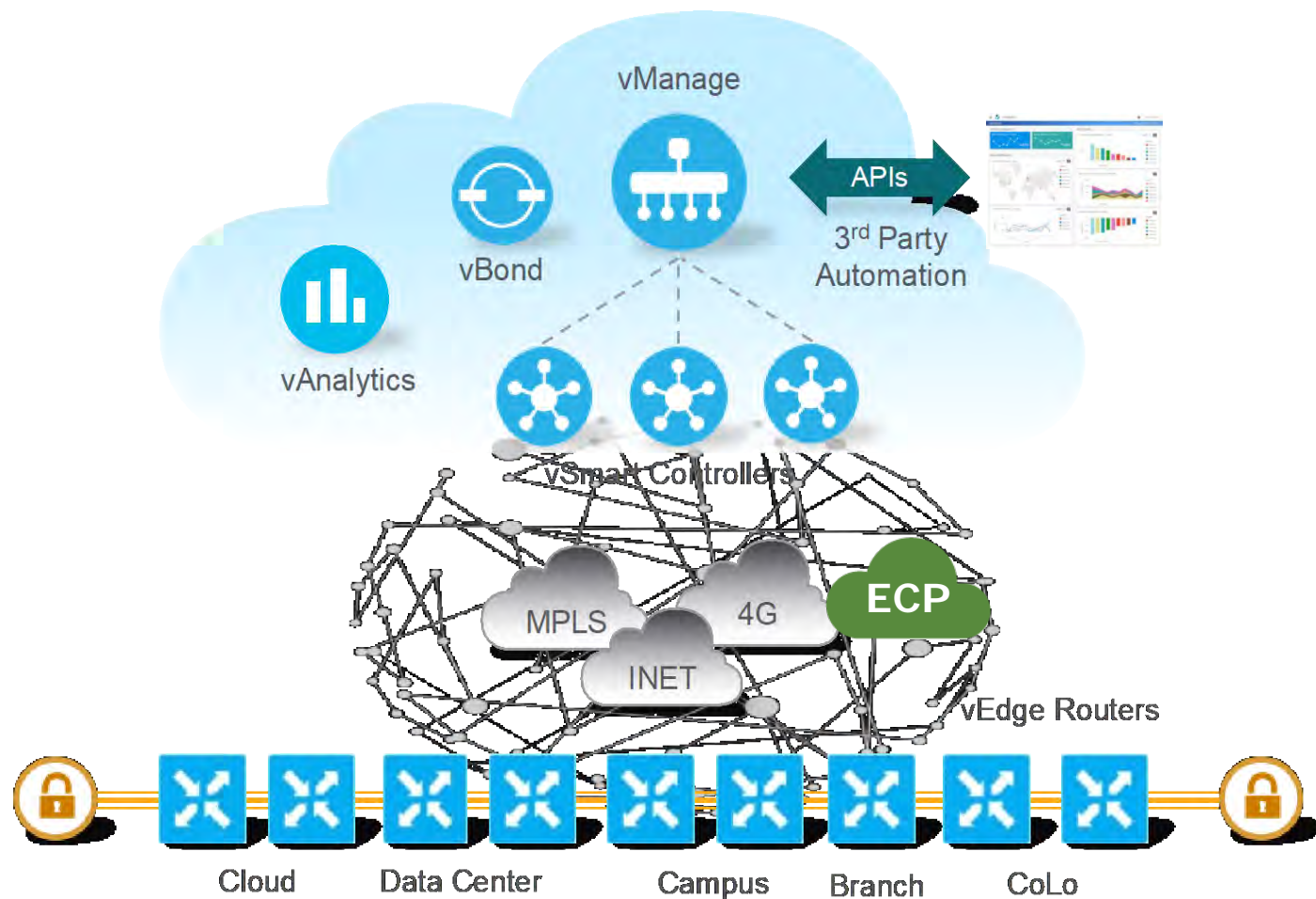
Unified

Network
Routing
Configuration

Product
Application
Management



CTA Affiliate and Cisco-Viptela SD-WAN Structure and Components



Orchestration = vBond

- Unified orchestration for control and management
- First certification and registration point
- Forward vSmart / vManage list to all vEdge



Management = vManage (Multi-tenant or Dedicated)

- SD-WAN network configuration and management center
- Policy template centralized management
- GUI interface, easy to use
- Rest API interface



Control Platform = vSmart (Containers or VMs)

- Control platform with vEdge
- Distribute data and policy information between vEdge
- Implement control platform strategies

Data Platform = vEdge/cEdge (Physical or Virtual)

- SD-WAN data platform routers.
- Perform data transfer strategies
- Connect with existing network through routing protocol



Control Platform Architecture



CTA Affiliate and Cisco-Viptela SD-WAN controller is dedicated to global management and includes three components:

- vBond: SD-WAN device registration
- vSmart: Routing and policy management
- vManage: unified GUI interface for configuration orchestration

CTA Affiliate SD-WAN Controller Distribution:

- China: Beijing
- Asia Pacific: Hong Kong
- Europe: Frankfurt
- Americas: Los Angeles

Controller Design Mechanism:

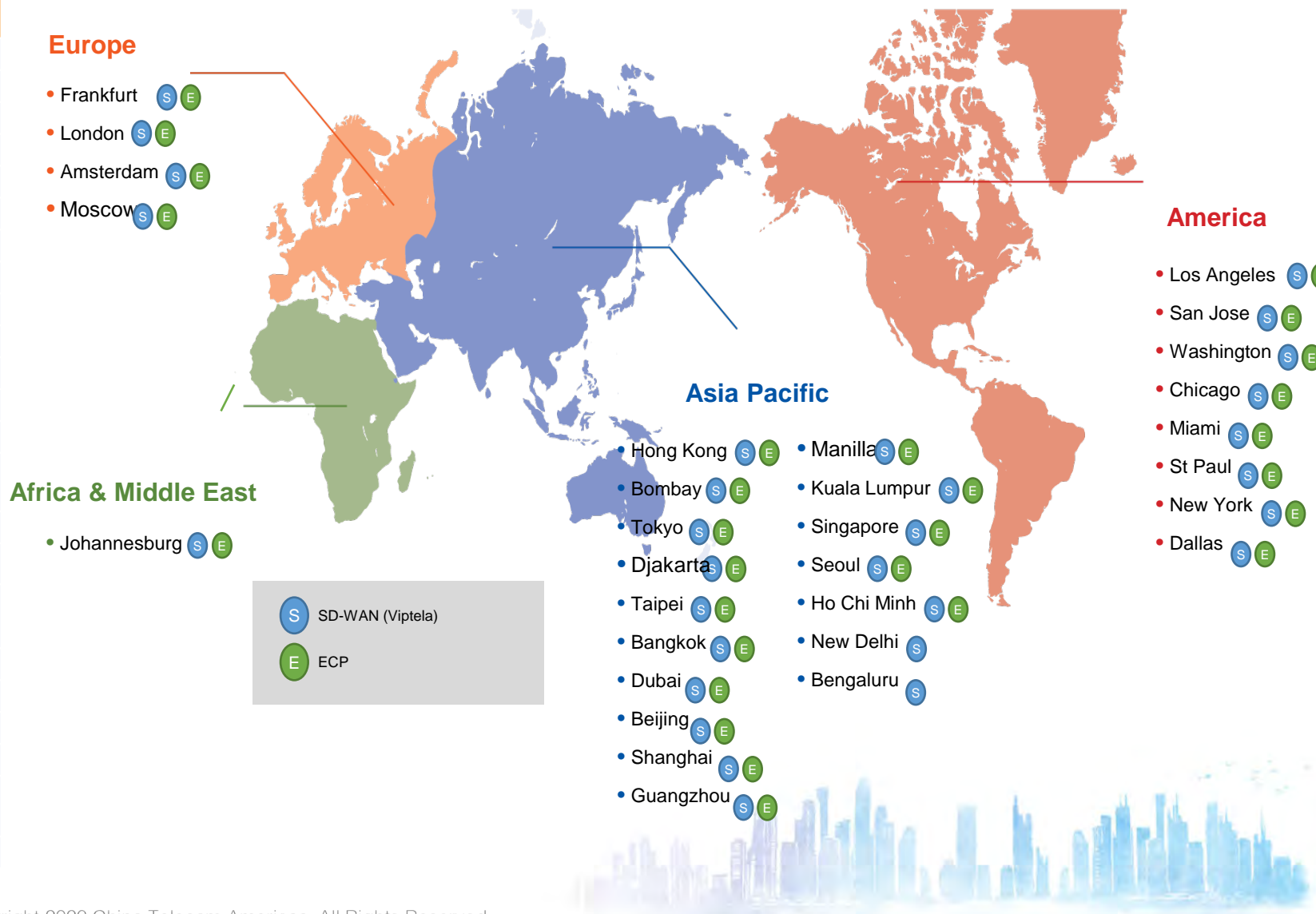
- All controller are connected by CTA Affiliate's MPLS VPN network.



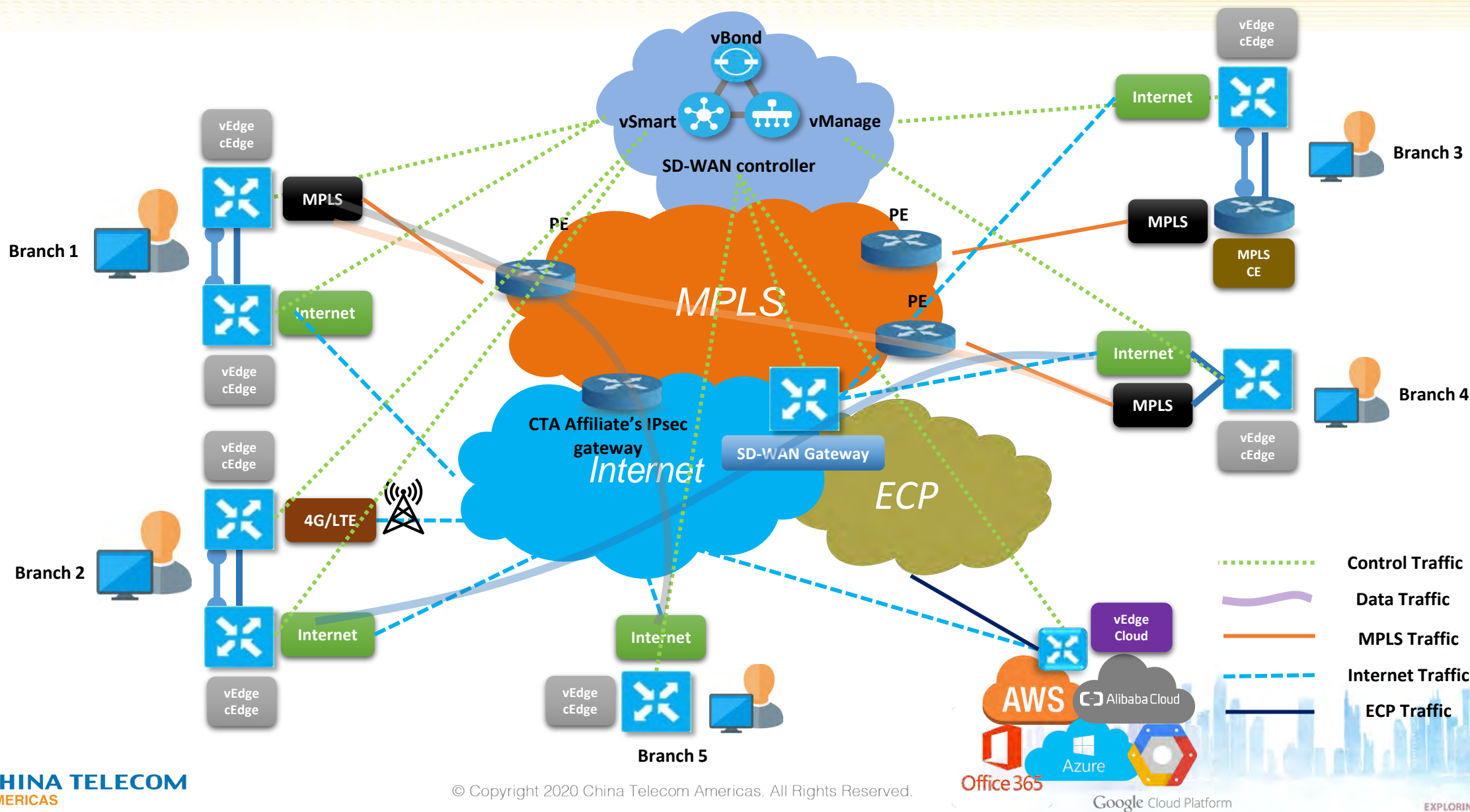
Data Platform Gateway Distribution



Region	City	Region	City
Mainland China	Beijing_pop1	Asia Pacific	Hong Kong
	Beijing_pop2		Singapore
	Beijing_pop3		Tokyo
	Shanghai_pop1		Jakarta
	Shanghai_pop2		Seoul
	Guangzhou_pop1		Bombay
	Guangzhou_pop2		Taipei, China
	Shenzhen		Bangkok
	Suzhou		Manila
	Hangzhou		Kuala Lumpur
	Wuhan		Ho Chi Minh
	Tianjin		New Delhi
	Jinan		Bangalore
	Fuzhou	US	Los Angeles
Europe	Shijiazhuang		Washington
	Shenyang		San Jose
	Chengdu		New York
	Frankfurt		Miami
	Amsterdam		Dallas
	Moscow		Chicago
	London	Brazil	Sao Paulo
Middle East Area	Dubai		
	Johannesburg		



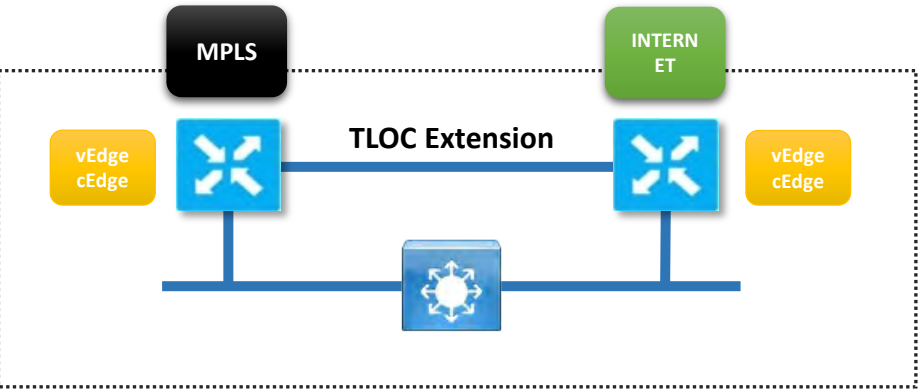
Topology Overview



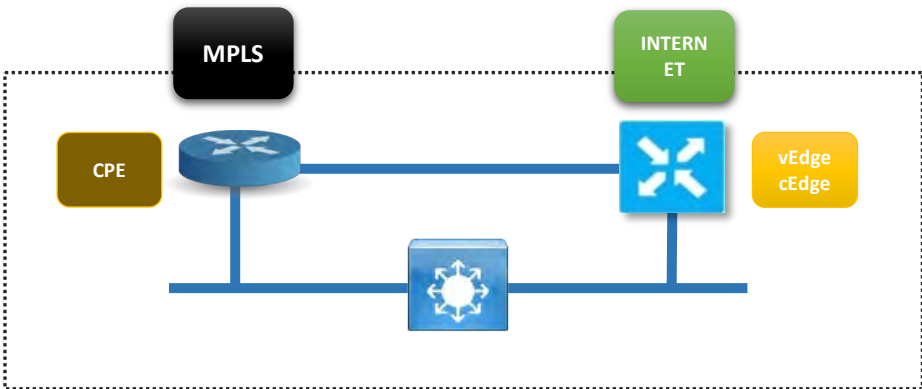
Client Branch Architecture



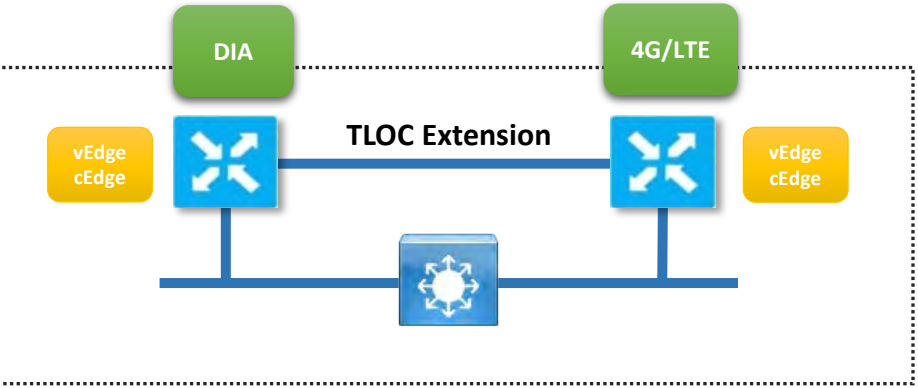
- SD-WAN network over MPLS and Internet



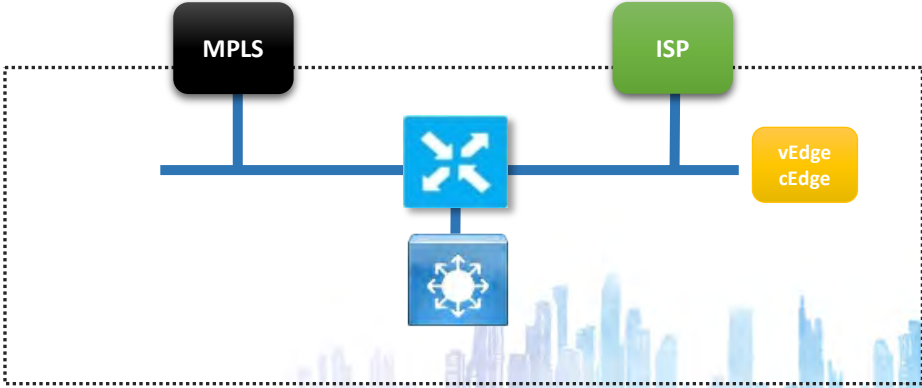
- Hybrid network with traditional MPLS and SD-WAN



- SD-WAN network over DIA or 4G



- Hybrid migration network with MPLS and SD-WAN

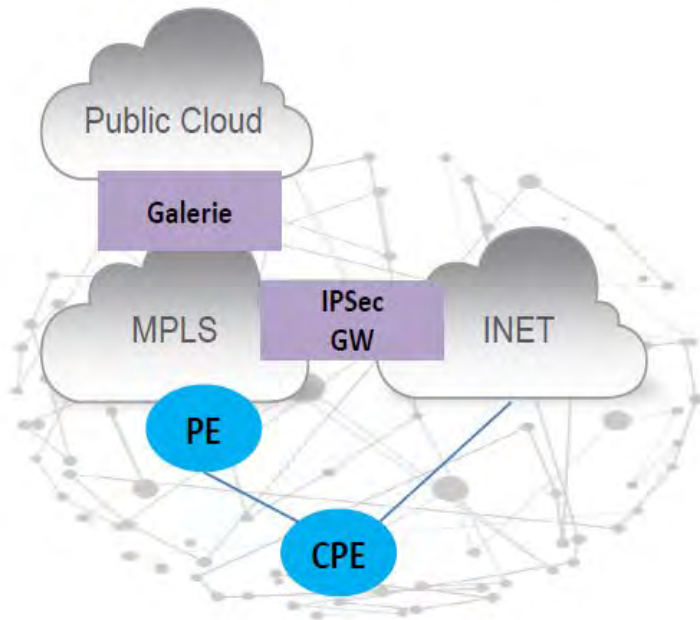


CTA Affiliate Cisco-Viptela SD-WAN over MPLS network



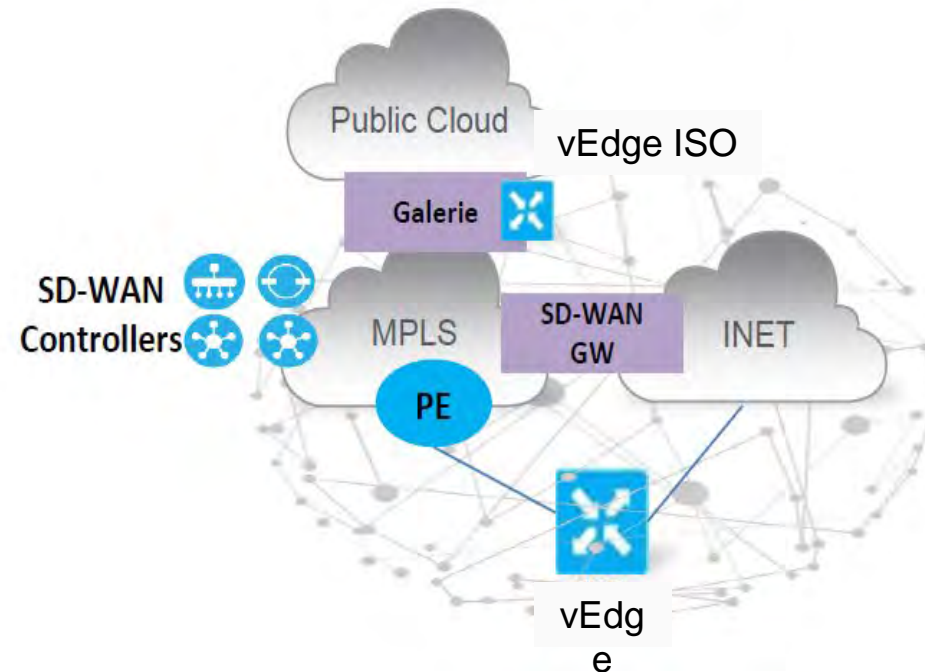
SD-WAN establish an overlay virtual network on top of the traditional underly MPLS network

Traditional MPLS



- Data and control flow are on the same level.
- All traffic runs in the underlayer of the hybrid WAN, and each individual component needs to be configured

SD-WAN Network



- SD-WAN controller has all CPE functions
- Separate control flow and data flow
- QoS, application level management

Equipment: cEdge, vEdge and More



SD-WAN

Branch

Aggregation

Cloud

cEdge
(IOS XE)



ISR 1000(100M)



ISR 4000
(100M-2.5G)



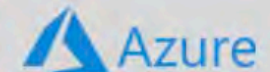
ASR 1000(10G)



CSR 1000v(2.5G)



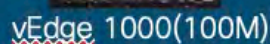
Google Cloud



vEdge
(Viptela OS)



vEdge 100(50M)



vEdge 1000(100M)



ISR1100-4G/6G/LTE
(100M/250M)

新



vEdge 2000(1G)



vEdge 5000(2.5G)



vEdgeCloud(1G)

NFV Platform



ENCS 5000(250M-500M)



CSP 5000

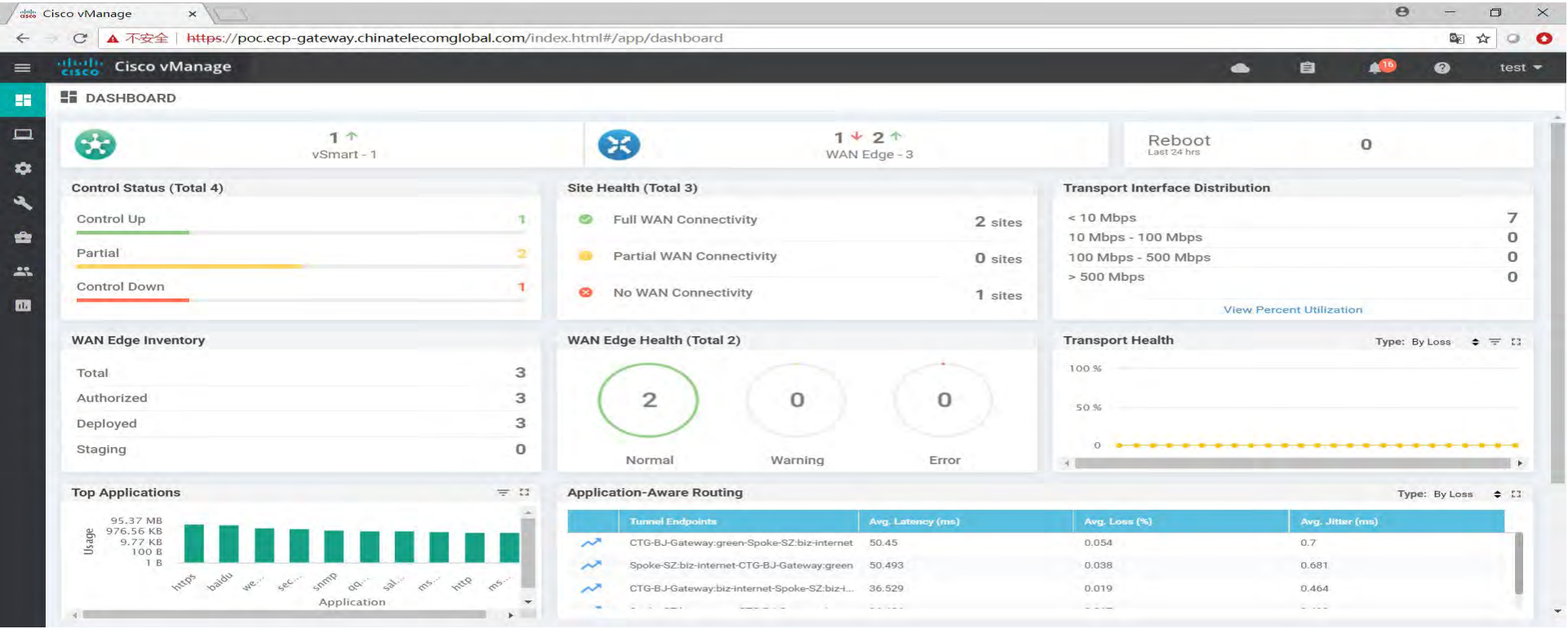
Product Feature



- **Intelligent Network**
 - **Define VPNs according to actual applications or departments.**
- **Experience Enhancement**
 - **Periodically circuit performance and quality checks by BFD.**
 - **Forward error correction (FEC) and multiplexing**
- **Enterprise on Cloud**
 - **Auto deployment and configuration over Cloud**
- **Automatization Operation & Management on Portal**



Customer Portal



REST



NETCONF



Syslog



SNMP



Flow Export

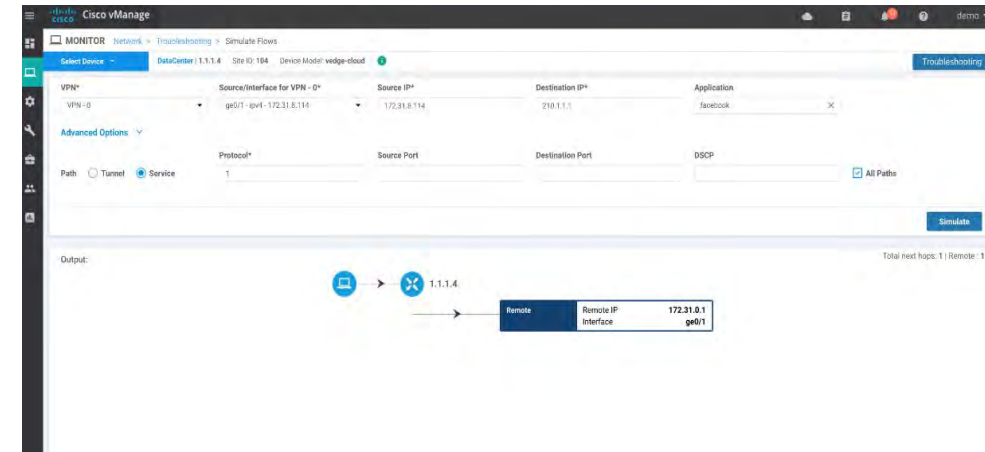
Automatization Operation & Management



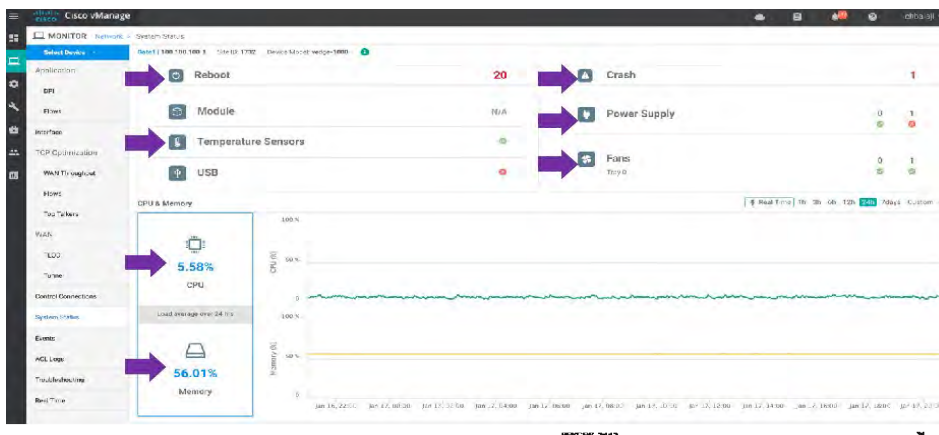
1 Configuration: Routing policy centralized management and deployment

Name	Description	Type	Device Model	Feature Templates	Devices Attached	Updated By	Last Updated	Template Status
vm1	showrun	CLI	vEdge Cloud	0	1	admin	07 Nov 2017 4:23:01 PM PST	Out of Sync - 1
enable_dpl	enable/dpl in dev...	CLI	vEdge Cloud	0	0	admin	07 Nov 2017 3:06:15 PM PST	
full	full	CLI	vEdge Cloud	0	0	admin	20 Nov 2017 4:53:09 PM PST	
full1	full1	CLI	vEdge Cloud	0	0	admin	20 Nov 2017 5:21:56 PM PST	
testb	testb	CLI	vEdge Cloud	0	0	admin	29 Nov 2017 8:57:16 PM PST	
vSmart_Template	vSmart Template	CLI	vSmart	9	0	admin	08 Jan 2018 10:37:19 AM PST	
test	test	Feature	vEdge Cloud	10	0	admin	05 Jan 2018 2:14:00 PM PST	
Template for Security	test	Feature	vEdge 2000	10	0	admin	03 Jan 2018 2:15:13 PM PST	In Sync
test_vedge_praveen	test	Feature	vEdge Cloud	9	0	admin	05 Jan 2018 2:24:35 PM PST	In Sync
test2	test	Feature	vEdge 1000	10	0	admin	17 Jan 2018 12:01:03 PM PST	In Sync

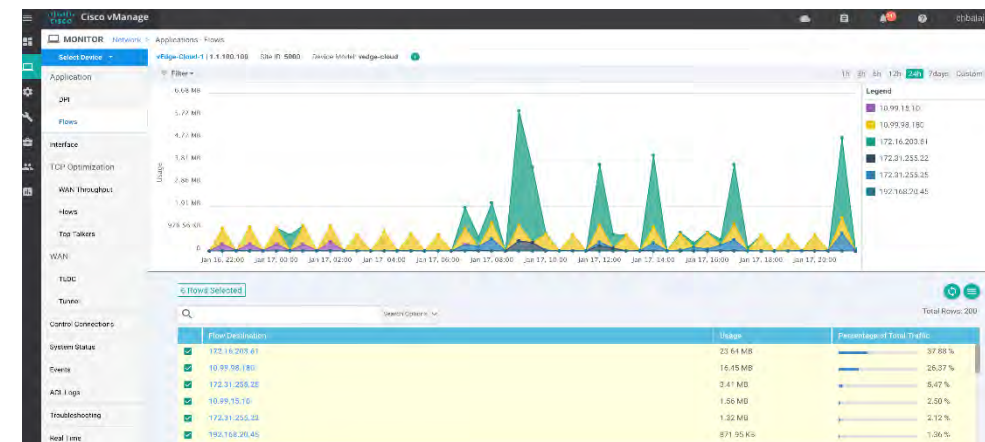
2 Troubleshooting: Traffic flow simulation



3 Monitoring: Equipment operating status



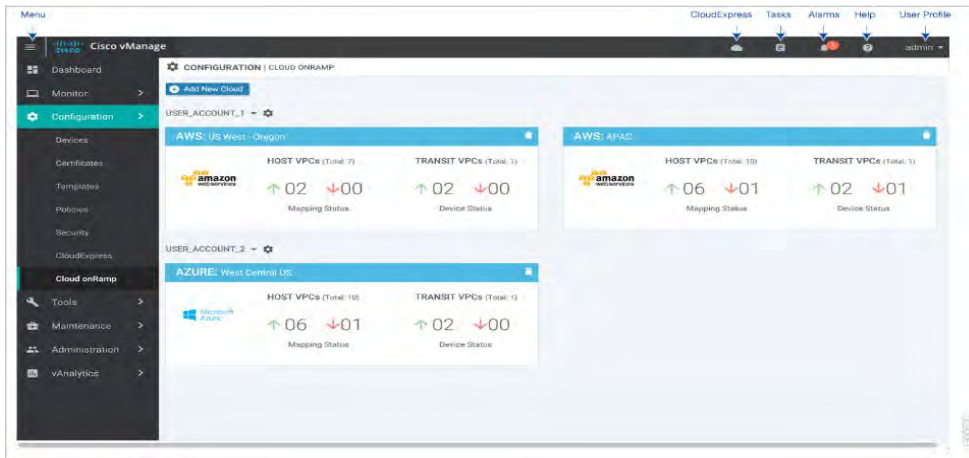
4 Monitoring: Traffic and application analysis



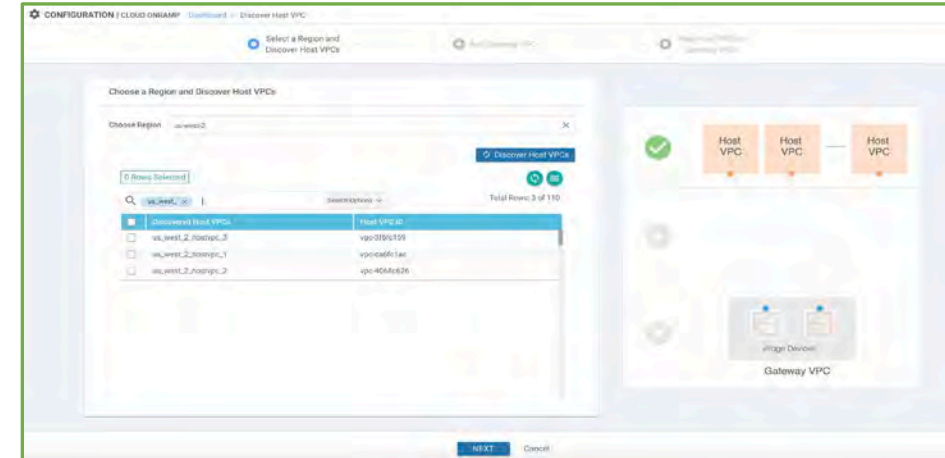
Multi-Cloud Management



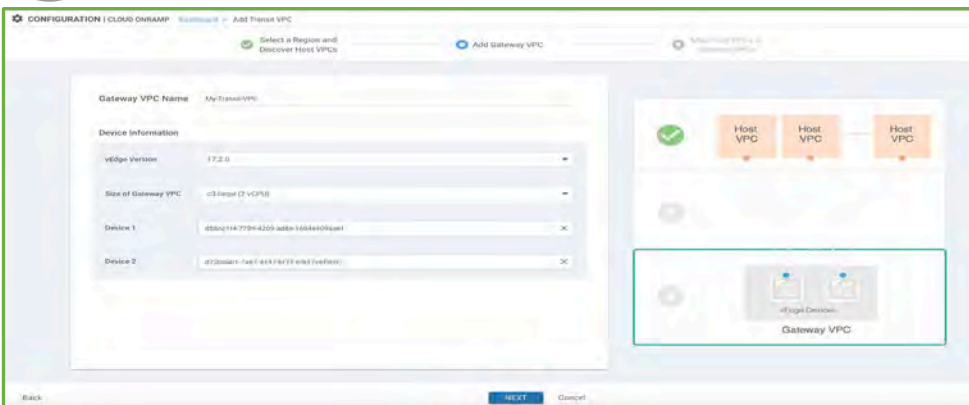
1 Public cloud platform Dashboard



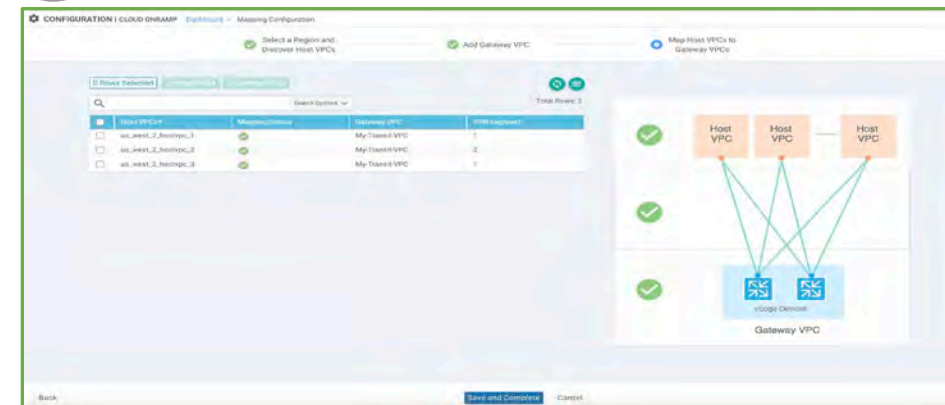
2 Region and VPC information selection



3 Activate vEdge Cloud in public cloud



4 vEdge Cloud auto connect to VPC GW



CTA Affiliate and Cisco-Viptela SD-WAN Advantage



- The platform gateway is built on CTA affiliate's core backbone network with rich underlying link resources, SLA reliability and availability SLA guarantee up to 99.9%
- Provide a flexible one-stop SD-WAN solution, including cloud access, cloud management, managed services, local lines, 4G / LTE, monitoring, etc.
- Licensed carrier, providing SD-WAN solutions based on CTA affiliate's core backbone network and ensure SD-WAN quality when cross national border.
- Simple and flexible price model
- Interconnect with customer existing traditional network, CTA's affiliate provides smooth SD-WAN evolution solution
- Free POC test service
- Self-managed mode or fully-managed mode
- 24x7 global post-sale service



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