Tech Talk: Monitoring SDN, NFV, Software-Defined Data Center and SD Wide-Area-Network Technologies

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Abe Dorr, Principal Software Engineer

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Agenda

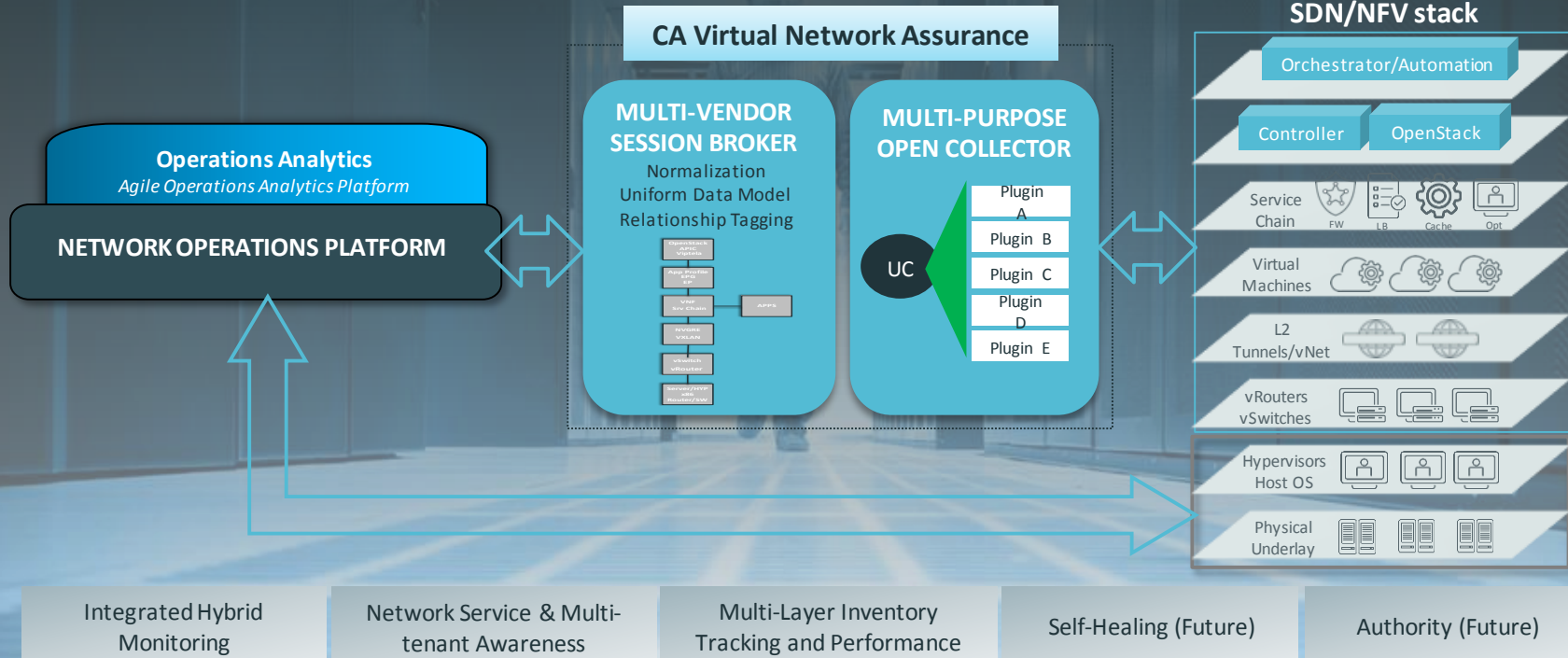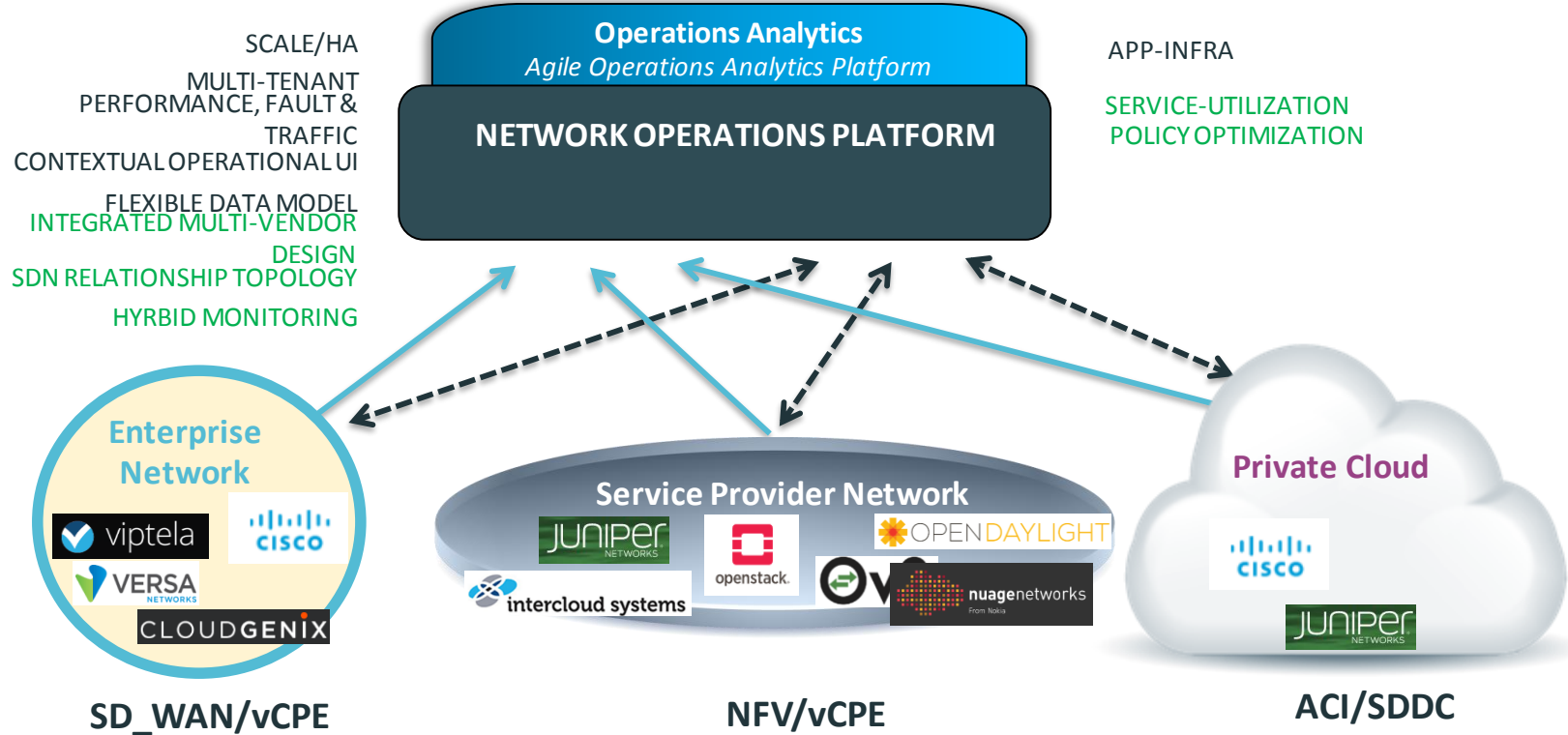|	
1	**OVERVIEW**
2	**OUR MISSION**
3	**CHALLENGES**
4	**VIRTUAL NETWORK ASSURANCE（VNA）**
5	**LOOKING AHEAD**

CA's Solution to the SDN/NFV Assurance Challenges

CA Virtual Network Assurance is a flexible and scalable solution providing **extended** visibility into the multi-layered SDN/NFV stack and its physical network relationships for improved orchestration and agility.

CA Virtual Network Assurance

Operations Analytics
Agile Operations Analytics Platform

NETWORK OPERATIONS PLATFORM

MULTI-VENDOR SESSION BROKER
Normalization
Uniform Data Model
Relationship Tagging

OpenStack APIC Viptela
App Profile EPG EP
VNF Srv Chain
APPS
NVGRE VXLAN
vSwitch vRouter
Server/HTTP x86 Router/SW

MULTI-PURPOSE OPEN COLLECTOR
UC
Plugin A
Plugin B
Plugin C
Plugin D
Plugin E

SDN/NFV stack
Orchestrator/Automation
Controller
OpenStack
Service Chain — FW, LB, Cache, Opt
Virtual Machines
L2 Tunnels/vNet
vRouters vSwitches
Hypervisors Host OS
Physical Underlay

Integrated Hybrid Monitoring

Network Service & Multi-tenant Awareness

Multi-Layer Inventory Tracking and Performance

Self-Healing (Future)

Authority (Future)

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SDN Performance Monitoring – Pathway to the Cloud

Operations Analytics
Agile Operations Analytics Platform

NETWORK OPERATIONS PLATFORM

SCALE/HA

MULTI-TENANT
PERFORMANCE, FAULT &

TRAFFIC
CONTEXTUAL OPERATIONAL UI

FLEXIBLE DATA MODEL
INTEGRATED MULTI-VENDOR

DESIGN
SDN RELATIONSHIP TOPOLOGY

HYRBID MONITORING

APP-INFRA

SERVICE-UTILIZATION
POLICY OPTIMIZATION

Enterprise Network

viptela

CISCO

VERSA
NETWORKS

CLOUDGENIX

SD_WAN/vCPE

Service Provider Network

JUNIPER
NETWORKS

openstack

OPENDAYLIGHT

intercloud systems

OVS

nuagenetworks
From Nokia

NFV/vCPE

Private Cloud

CISCO

JUNIPER
NETWORKS

ACI/SDDC

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Our Mission

- Extend our monitoring solutions into the SDN space

- Based on an architecture that scales

- Give users data that is relevant and useful

Challenges that We Face

- Many SDN use cases

- Lack of standard APIs

- Monitoring APIs are still maturing

- Multiple technologies work together to accomplish SDN

- Abstractions add additional layers of complexity to the stack

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Complex Stack

CONTROLLERS/ORCHESTRATORS

LOGICAL NETWORKS/GROUPING

APPS/SERVICES

OVERLAY TUNNELS

NETWORK VIRTUALIZATION

PHYSICAL UNDERLAY

OpenStack
APIC
Viptela

App Profile
EPG

VNF
SFC

APPS

NVGRE
VXLAN

vSwitch
vRouter

Server/HYP
x86
Router/SW

Correlates condition of building blocks

Isolate overlay faults/events to underlay failure

Apply log analytics to validate and correlate automation events to network state/flow

Analytics -Health-score to network state/flow

Apply analytics to map performance and utilization to service models

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SDN Monitoring with CA Virtual Network Assurance

- Vendor agnostic model of the SDN space

- Relationships to help provide cohesive monitoring

- Northbound API implemented using a pub/sub architecture

- Plugins added to support new technologies

CA VNA Architecture
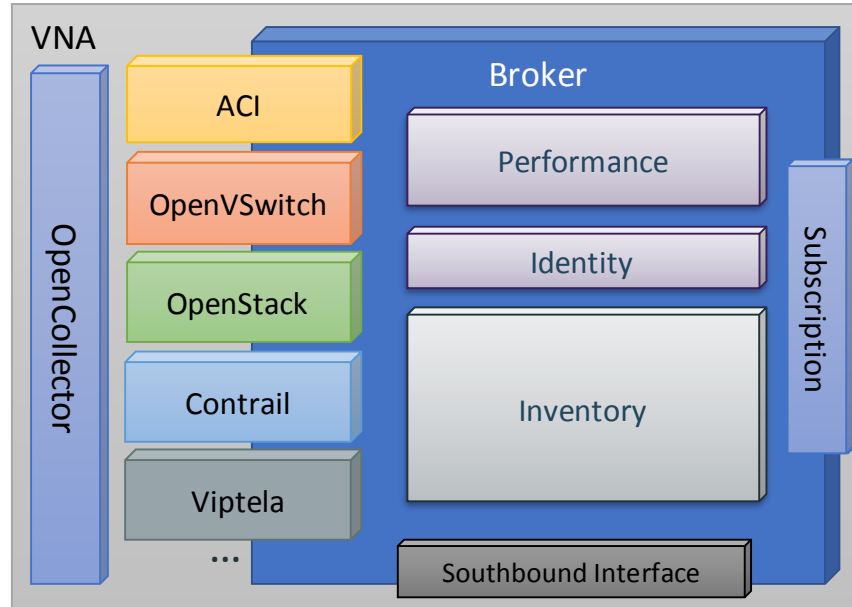
VNA

OpenCollector

ACI

OpenVSwitch

OpenStack

Contrail

Viptela

...

Broker

Performance

Identity

Inventory

Southbound Interface

Subscription

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CA VNA Deployment

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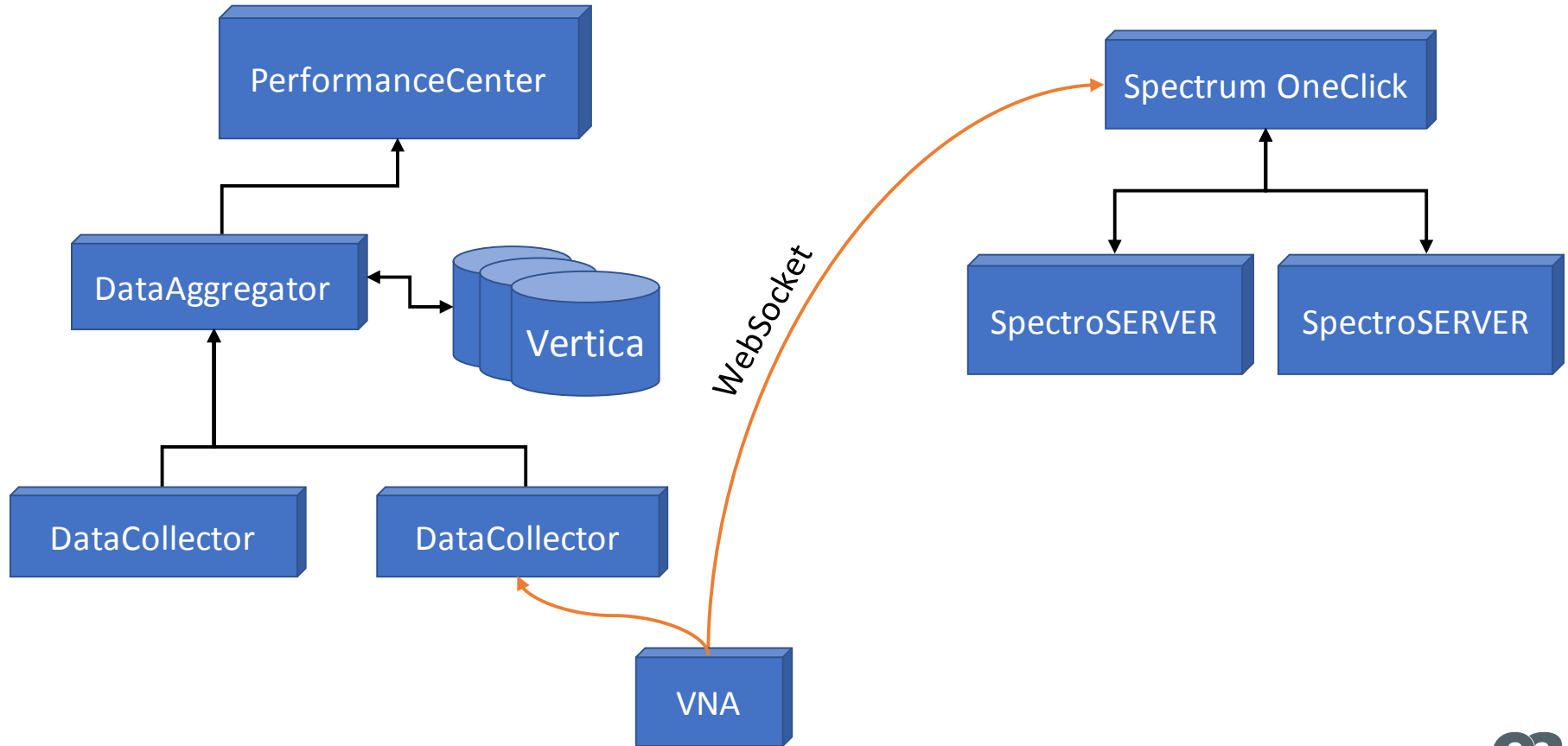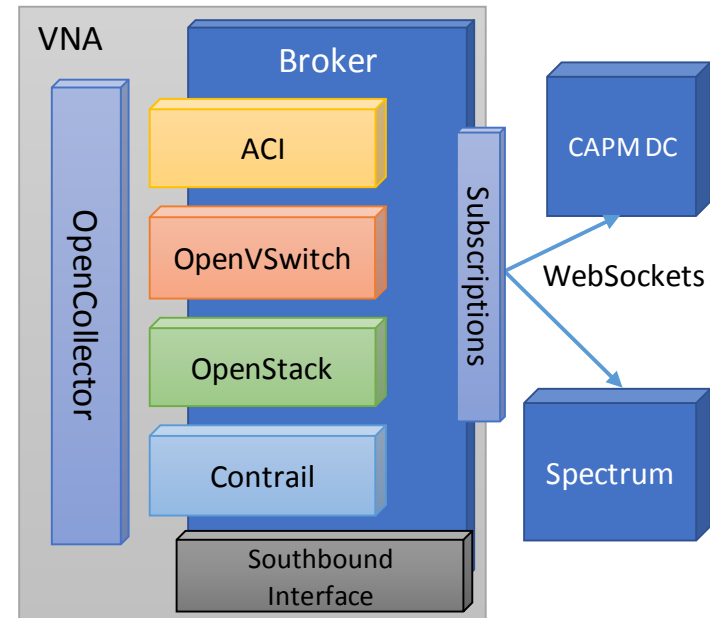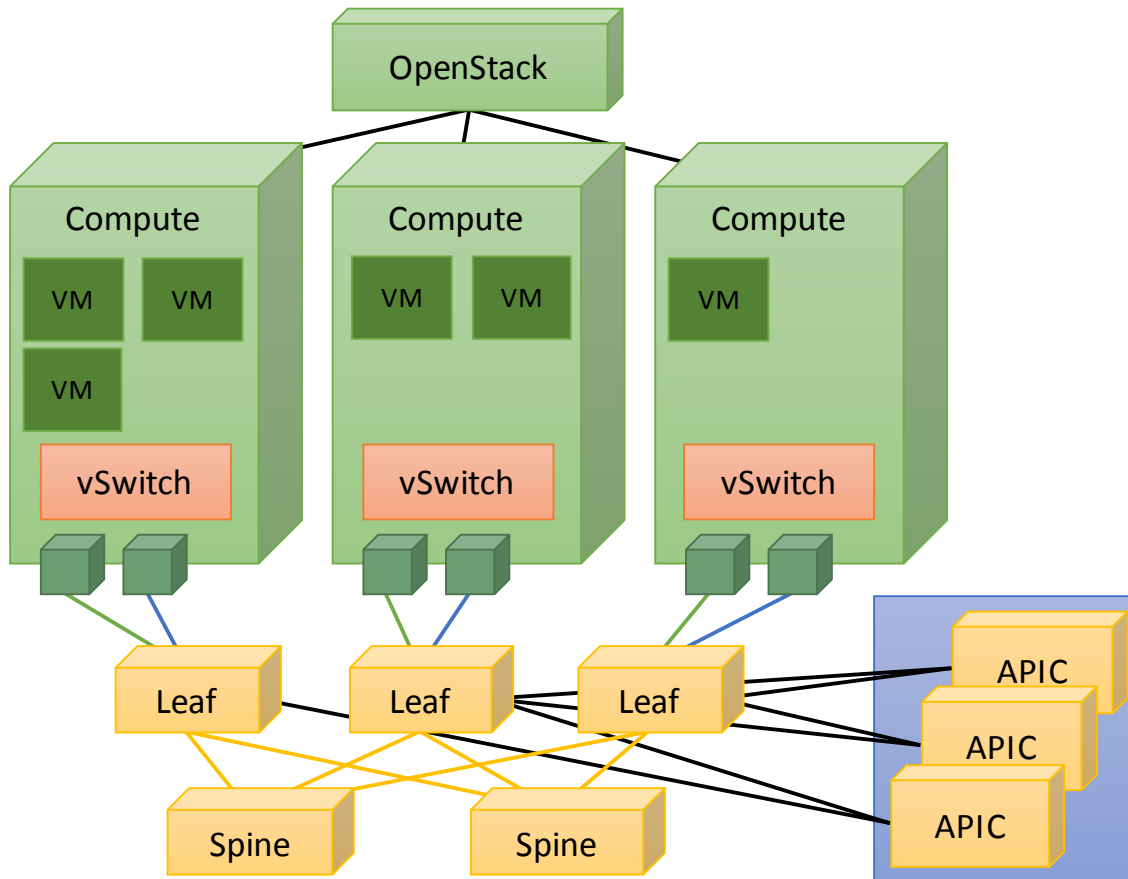
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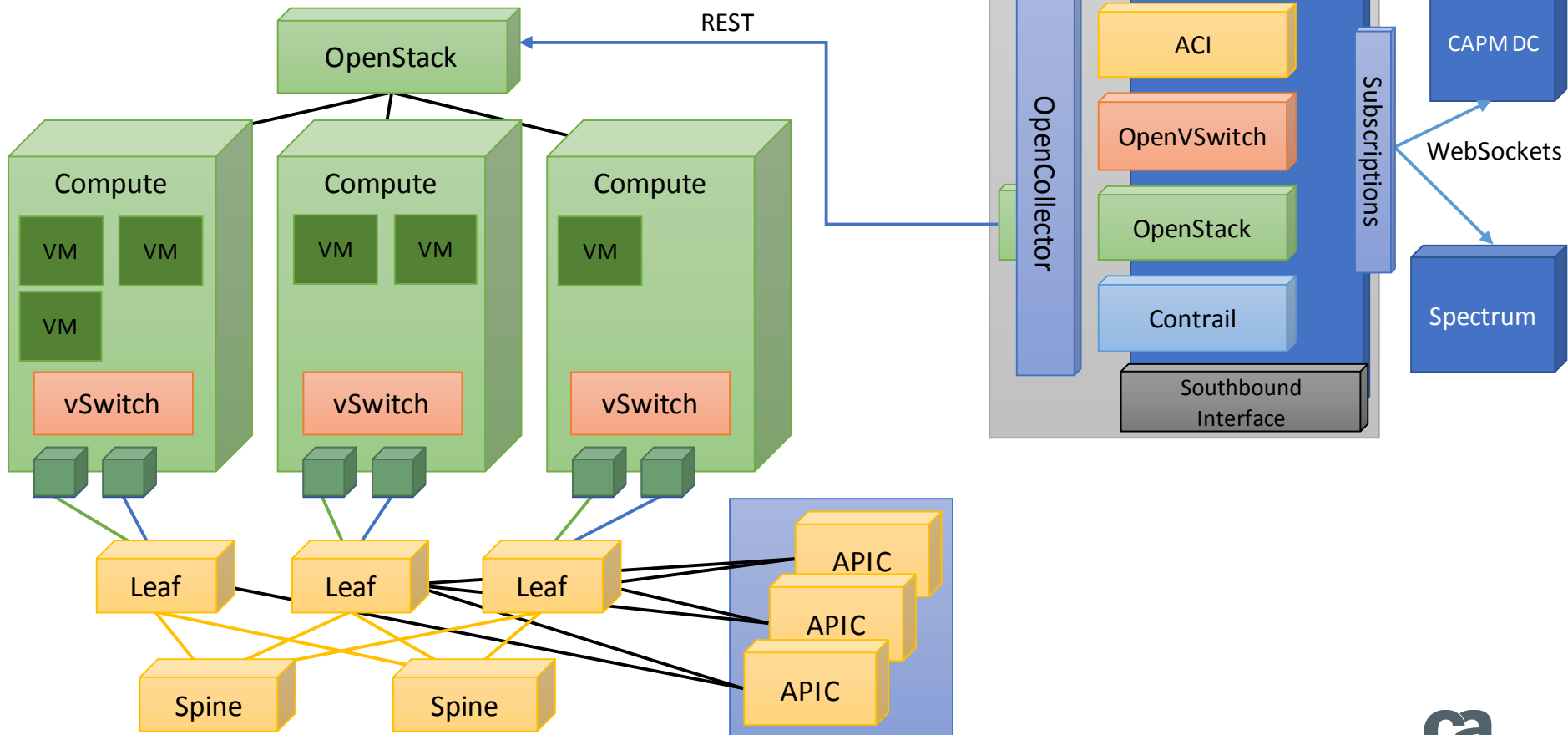
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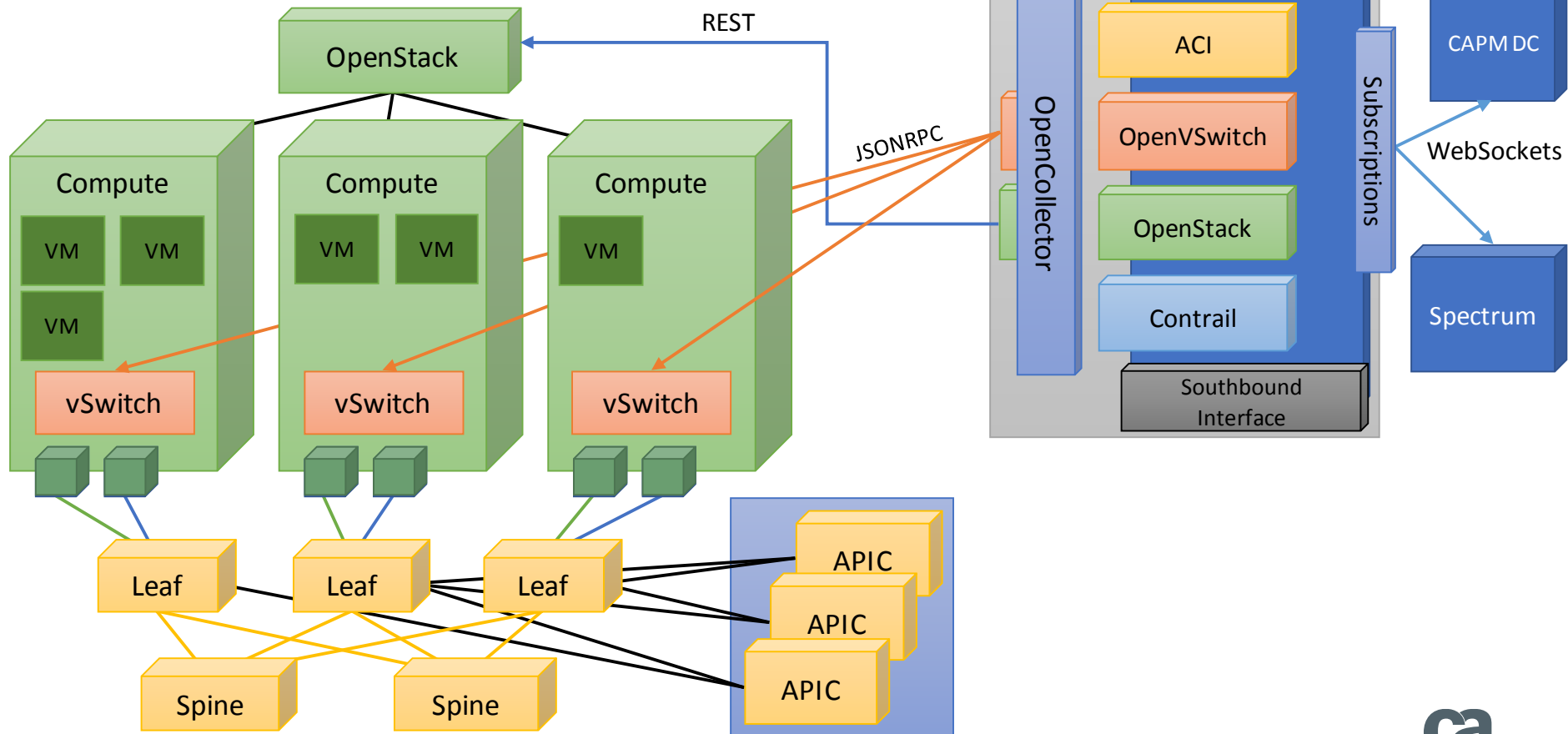
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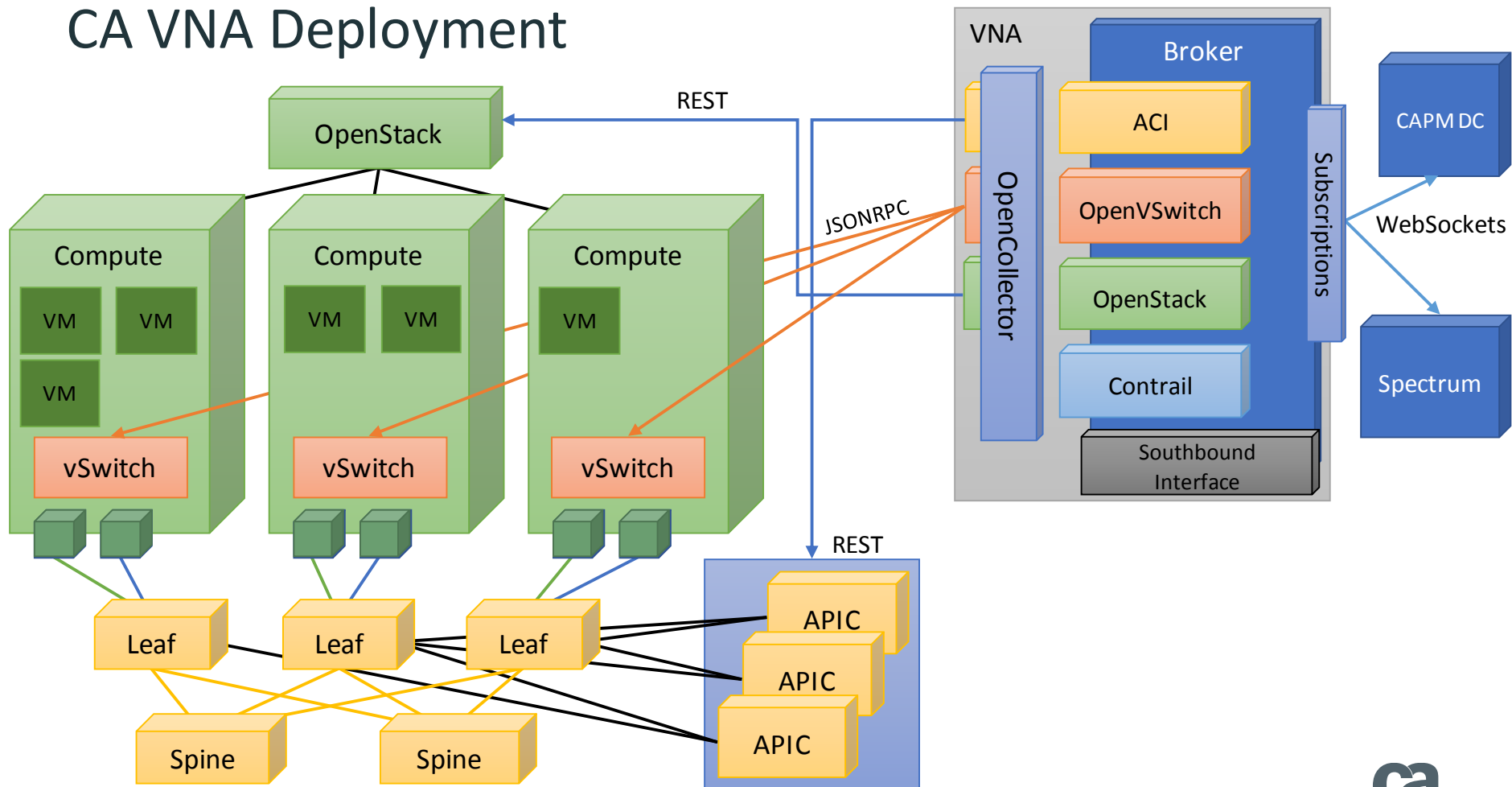
CA VNA Deployment

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Populating the CA VNA Inventory
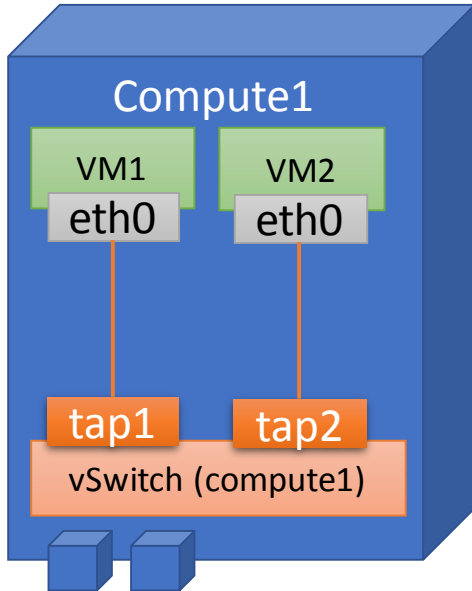
A Compute Node	Example Data	VNA Data Model

Compute1

VM1 — eth0

VM2 — eth0

tap1   tap2

vSwitch (compute1)

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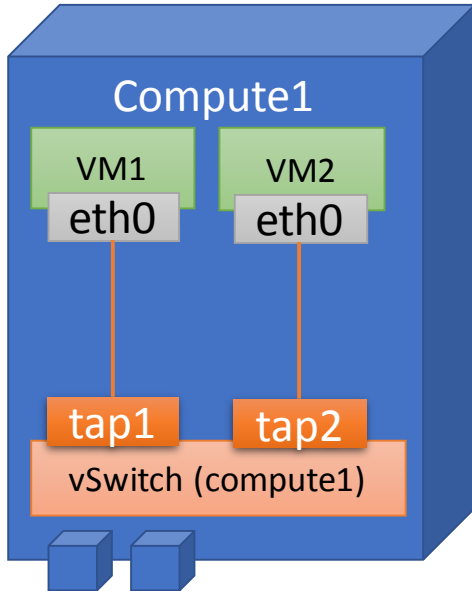
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  [{ name: compute1, etc. }]

Hypervisor: compute1

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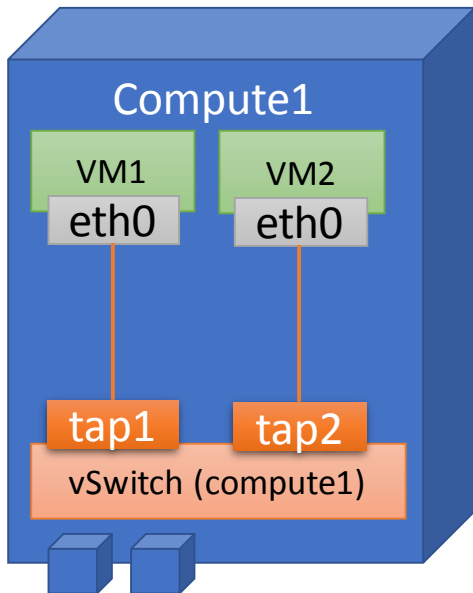
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Hypervisor: compute1

Virtual Machine: VM1

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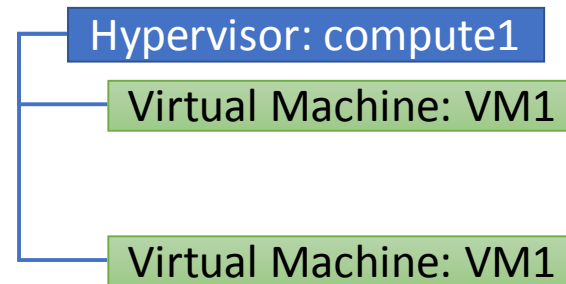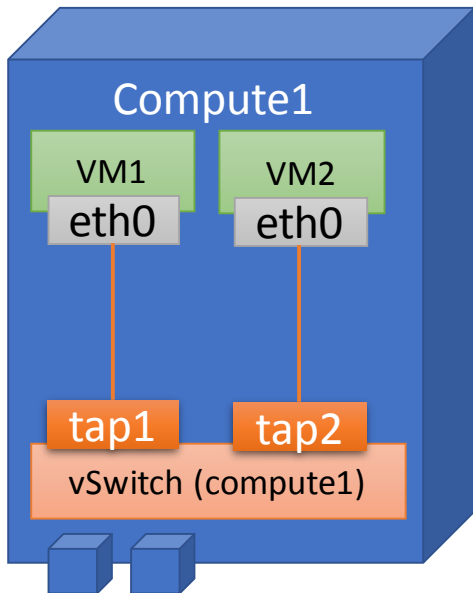
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OpenStack: Interfaces
[{ name: eth0, host: VM1, ip: 1.1.1.2, etc. },
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VNA Data Model
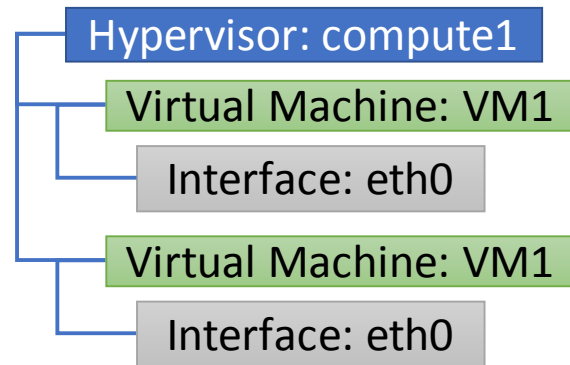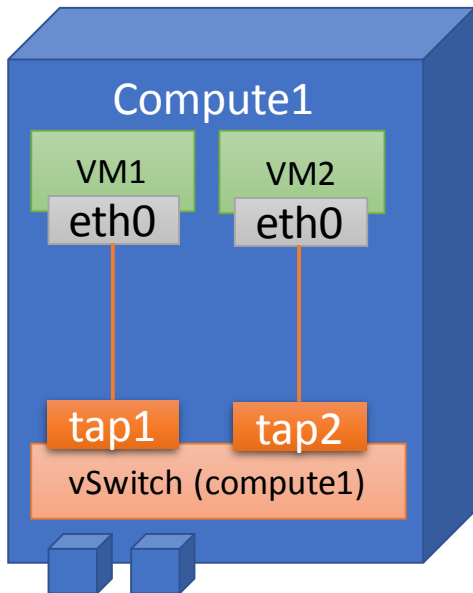
Hypervisor: compute1
Virtual Machine: VM1
Interface: eth0
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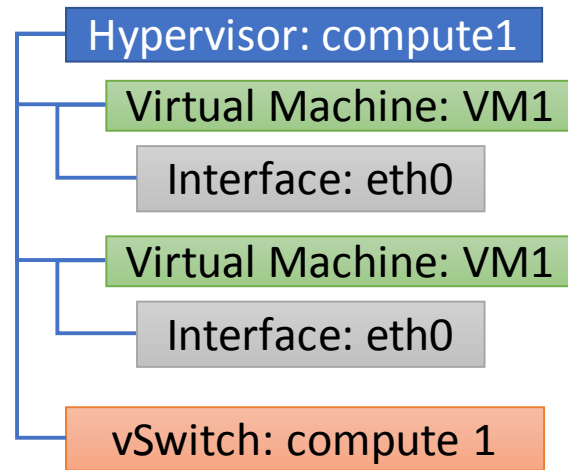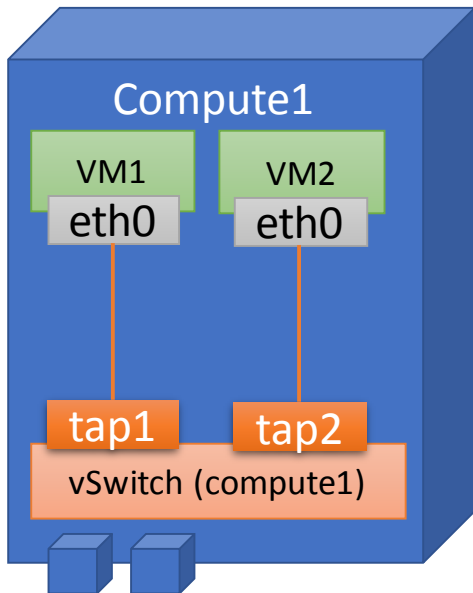
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Virtual Machine: VM1

Interface: eth0

Virtual Machine: VM1

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vSwitch: compute 1

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vSwitch: compute 1

Interface: tap1

Interface: tap2

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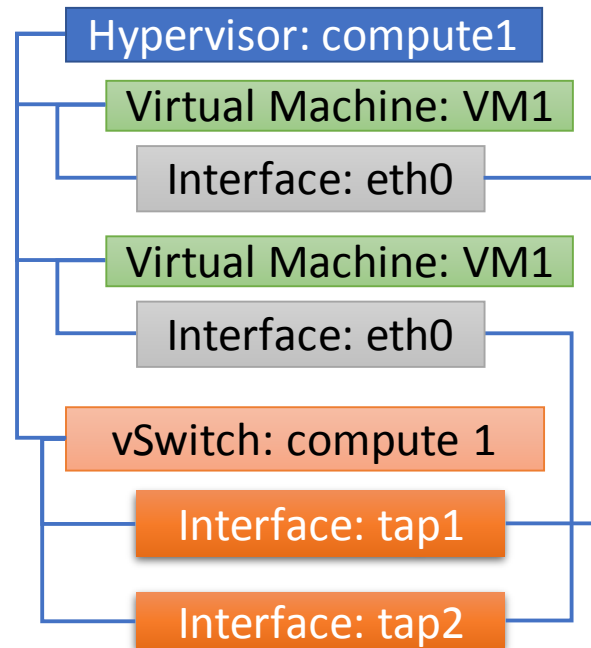
Visualizing CA VNA Data

CA VNA Groups

Key Features:
- Out of the box groups

SFC & NFV

Key Features:
- Ability to visualize the complete stack (logical to physical)
- Configurable thresholds that control visual alarms
- Tooltips provide metric data to facilitate better troubleshooting

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SDN in the Data Center (Cisco ACI)

Key Features:
- Easily navigable hierarchy
- Visualize the complete stack (logical to physical)
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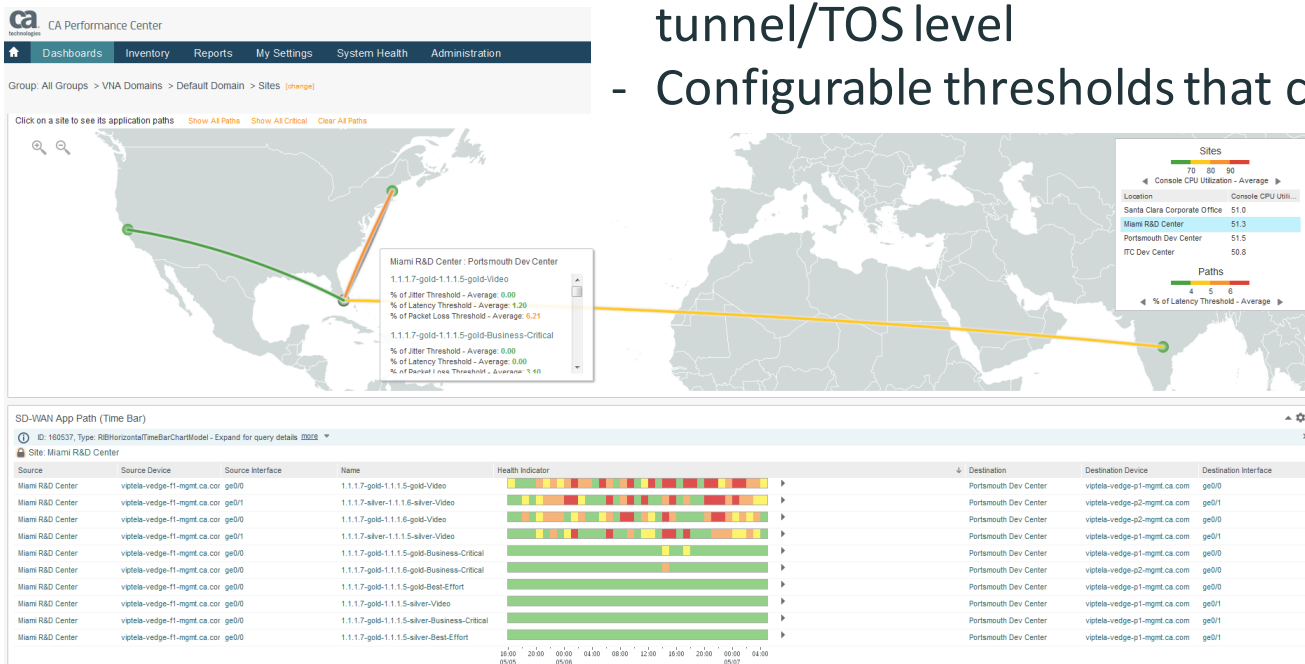
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SD-WAN

Key Features:
- Geographic map
- Interactive dashboards
- Insight into site performance
- Insight into latency, jitter and packet loss at a tunnel/TOS level
- Configurable thresholds that control visual alarms

Looking Ahead…

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What Questions Do You Have?

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THANK YOU!

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