



Cisco Secure Agile Exchange with Netrounds Automated Active Assurance

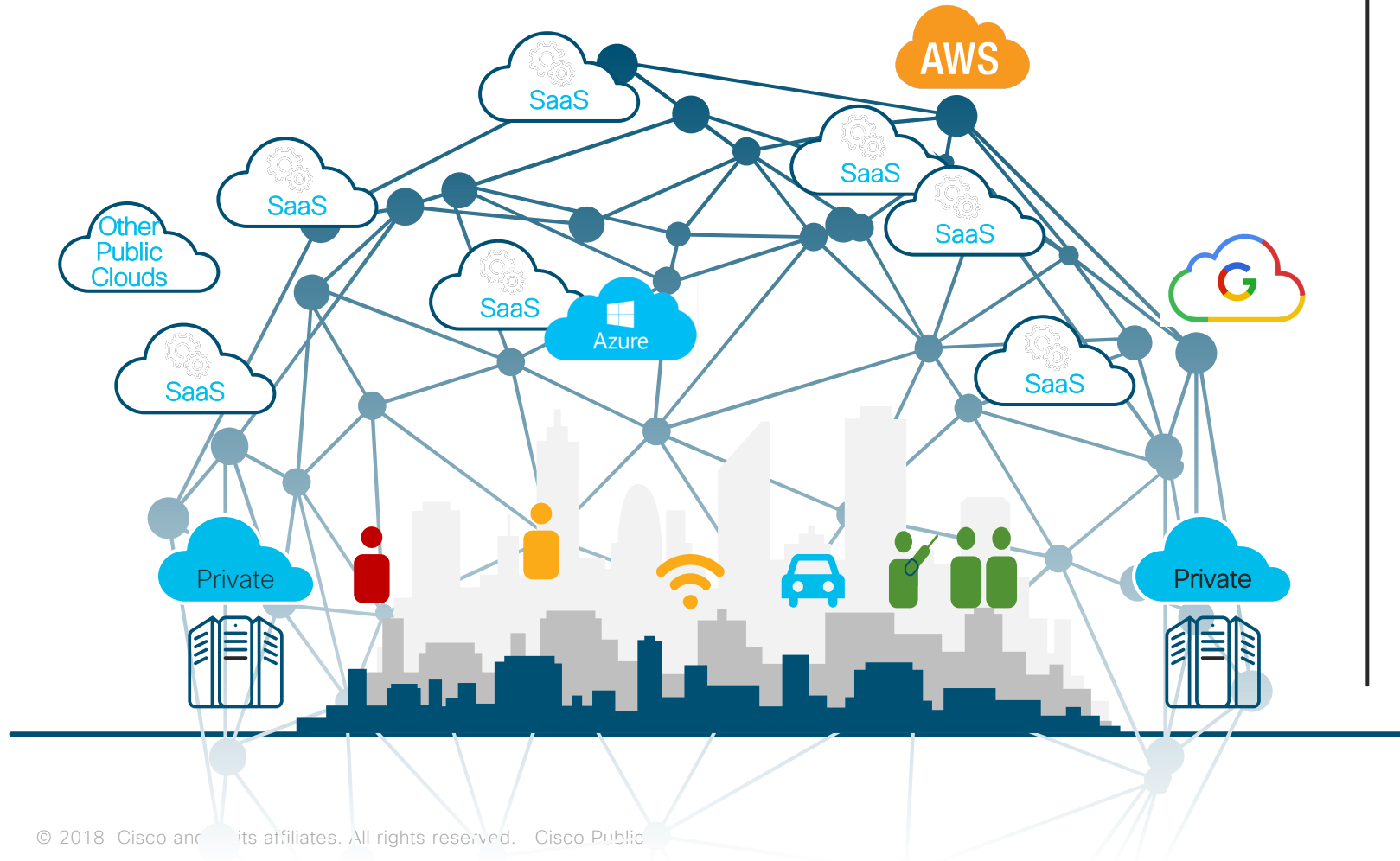
Sujay Murthy – Cisco NSO Application Team/SAE

Jonas Krogell – Netrounds Technical Product Manager

Agenda

- Cisco Secure Agile Exchange (SAE)
- SAE Component/Solution Stack
- SAE Demo
- Netrounds VNF Validation Solution
- Netrounds Active Assurance Tools

Challenges of multi-cloud access by disparate user groups

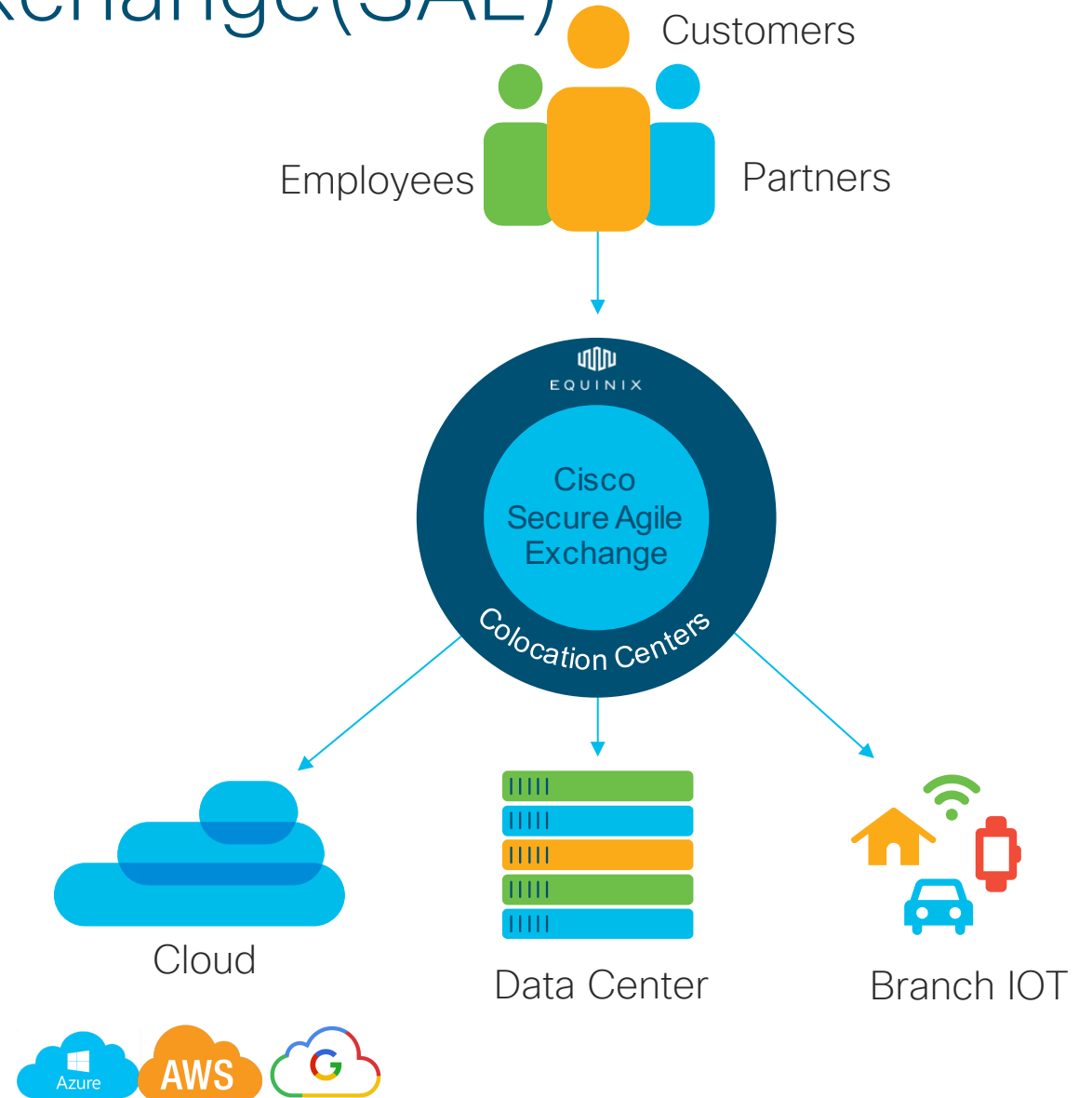


Business Challenges

- Efficient IaaS and SaaS access keeping app SLA intact
- Distributed internet access
- Operationally efficient

Introducing Secure Agile Exchange(SAE)

- Virtualized Secure Cloud On-Ramp
- Secure Access to Multicloud environments and services
- Automated Policy-Based insertion of network services (VNFs)
- Single-Point of analysis and auditing for consumer-application relationships
- Open and flexible architecture with 3rd party support.

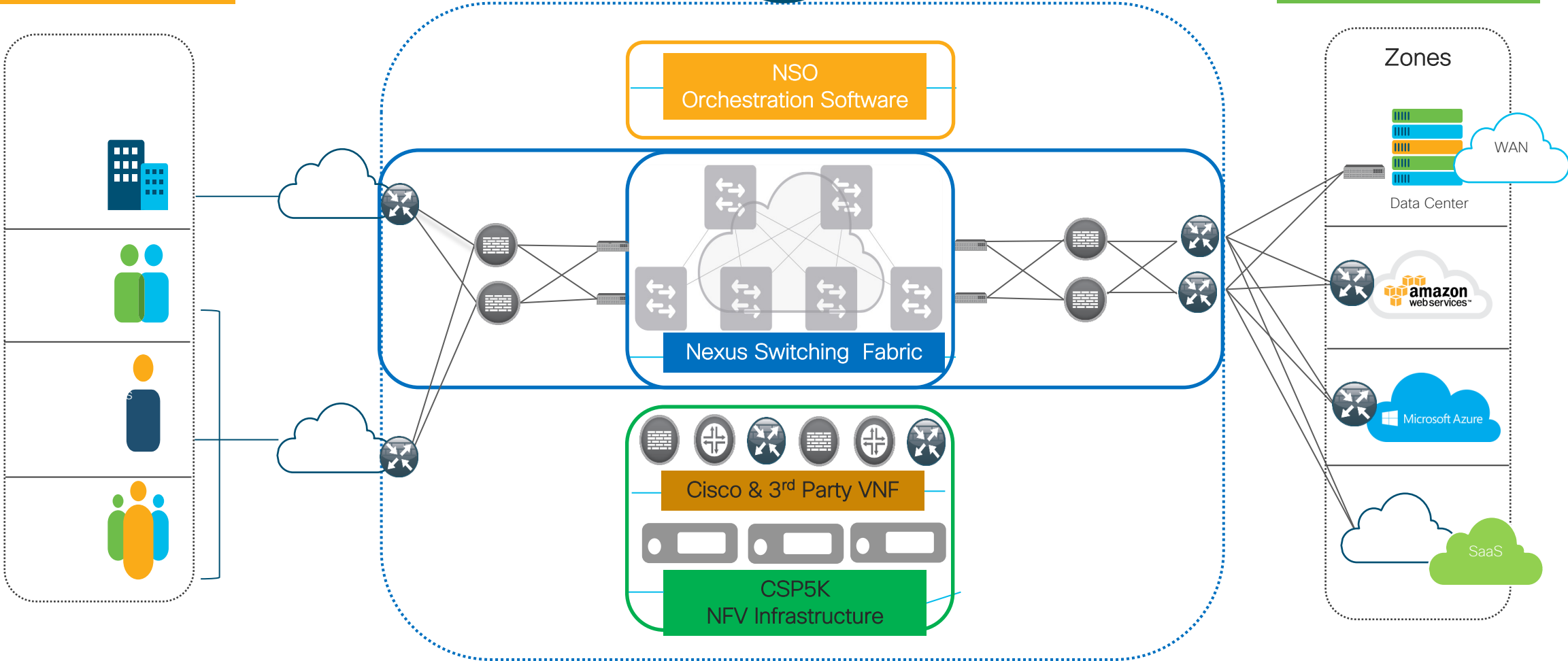


Secure Agile Exchange Stack



Consumer Zones

Provider Zones



SAE Component Stack

Nexus Fabric

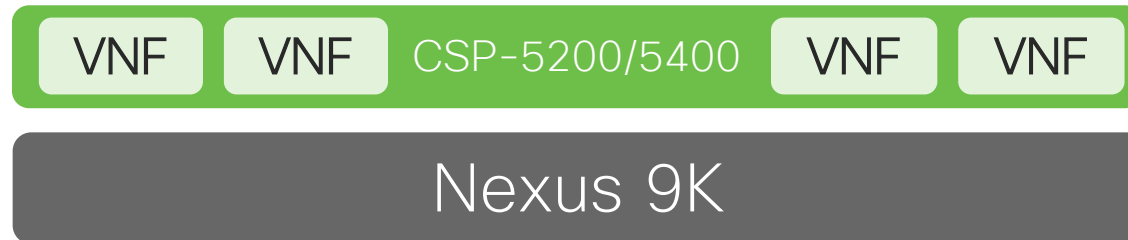
- Nexus Standalone (Spine/Leaf) or ACI
- Support for VLAN and/or VXLAN
- Multi-Tenancy with VRFs
- Full redundancy with port-channels and VPC



Nexus 9K

The diagram consists of a dark grey rounded rectangle containing the text 'Nexus 9K'. A red line extends from the right side of this rectangle, moves horizontally to the right, then turns 90 degrees upwards, ending in an arrowhead pointing towards the 'Nexus Fabric' section.

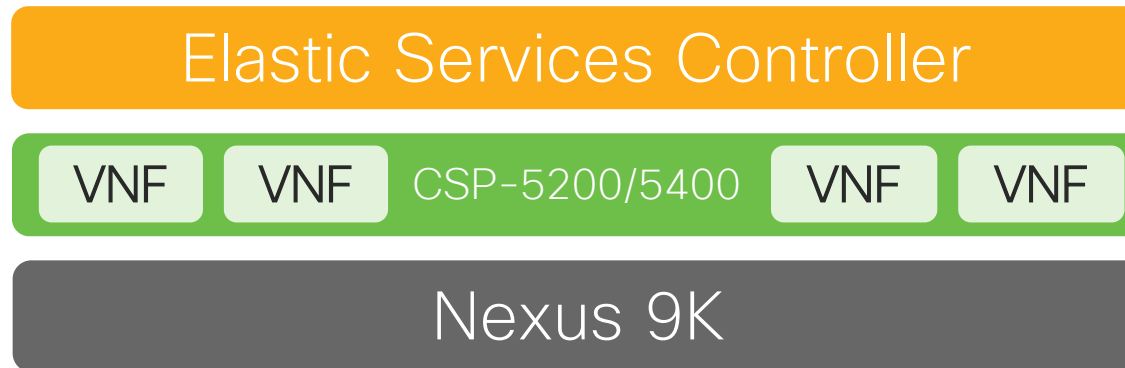
SAE Component Stack



NFV Infrastructure (NFVI)

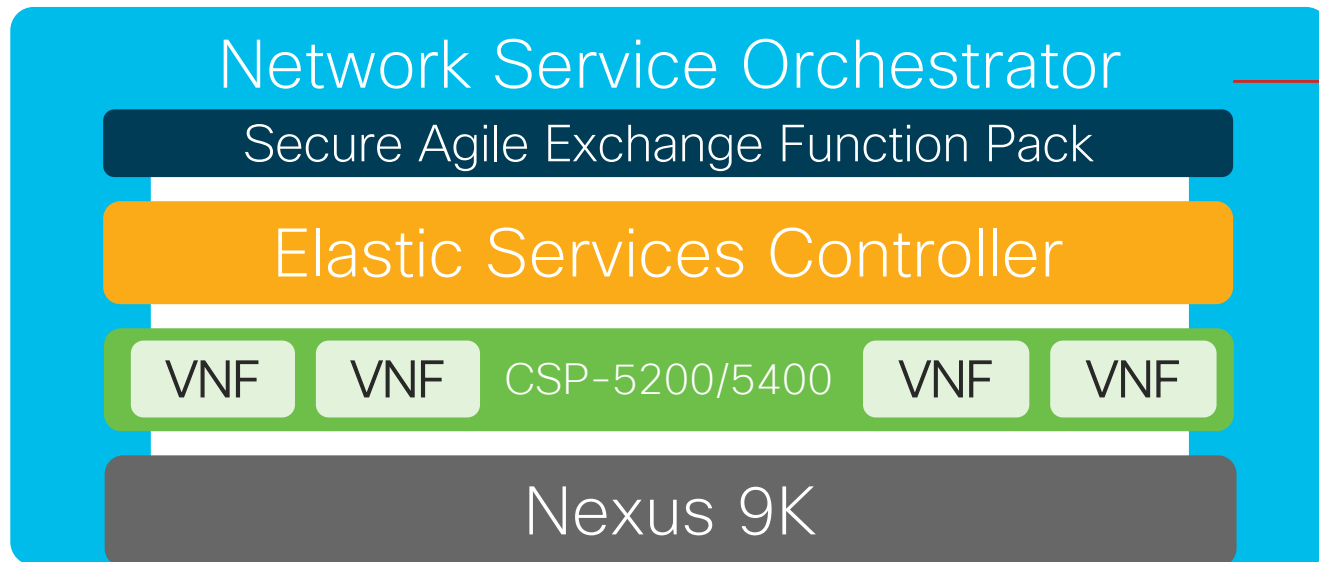
- Support for any KVM based NFVs (QCOW2)
- Multiple networking options, including OVS DPDK, SRIOV and port-channels
- Hosting Cisco VNFs like CSR, ASA v and FTDv and 3rd party VNFs like Palo Alto, Fortinet as firewall and load balancers like AVI, F5 etc.

SAE Component Stack



- VNF Lifecycle Manager (VNFM)
- Instantiate individual and/or groups of VNFs
 - Provision Day0 configurations and network objects
 - Monitor VNF health and perform recovery

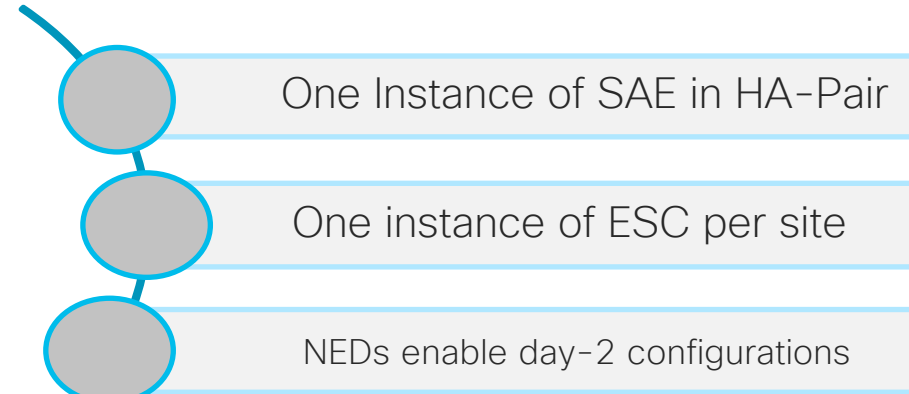
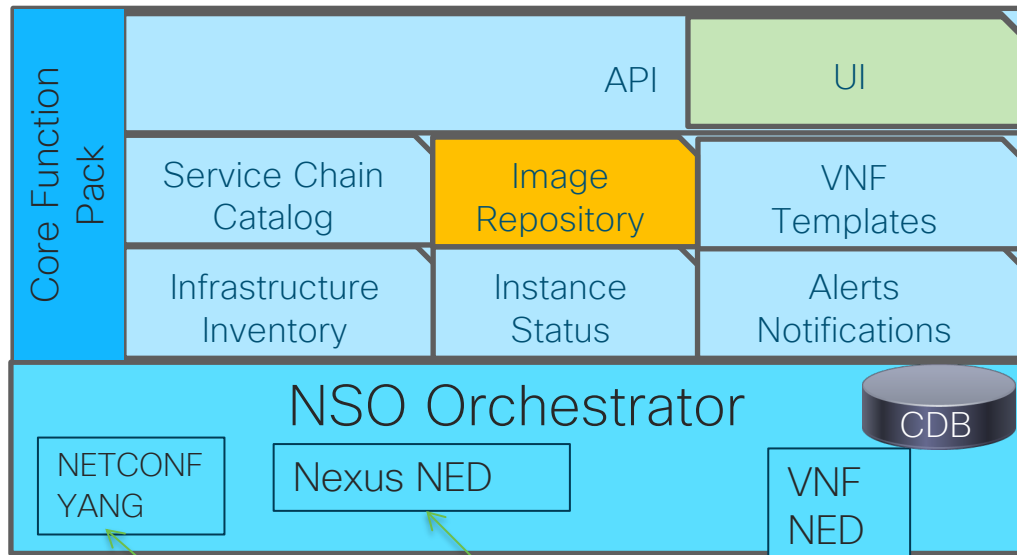
SAE Component Stack



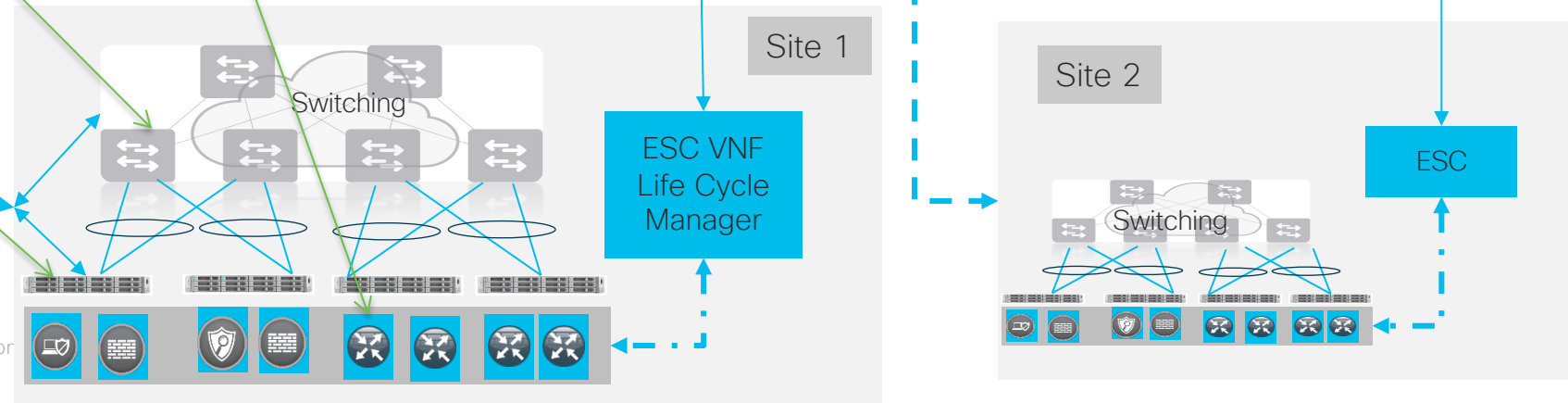
NSO and SAE Core Function Pack

- Model and deploy Service Chains (Day1,Day2)
- Manage Resource Pools (IP, VLAN, VXLAN, Compute, Endpoint Gateway)
- Manage Lifecycle of Service Chains (Create, Re-deploy, Update, Delete)
- Full northbound API support and extensibility (VRFs, Day 2 Policy, etc.)

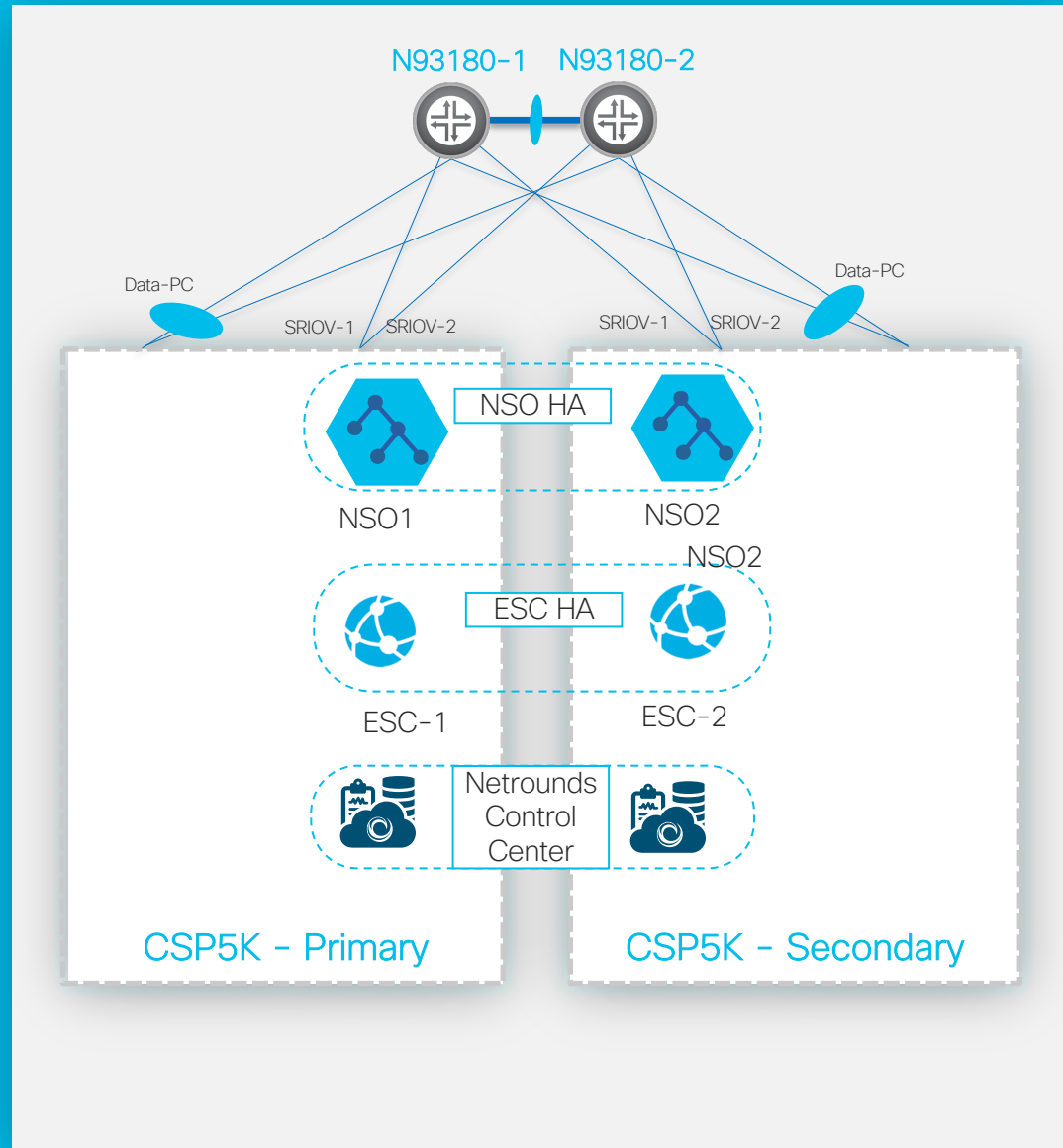
SAE Solution stack



To be released
 Roadmap



SAE Site- Infrastructure



- **Management Domain** will be a separate domain from the SAE Core (Data & Service Plane) for remote management .
- Dual Switches (N93180) in VPC Pair
- Dual CSP5K - (Min For Management Applications)
- NSO-HA SAE Service Orchestration
- ESC-HA (VNF Life Cycle Management)
- Netrounds Control Center for Service Assurance

SAE Deployment process

Discover/Assess

Security policies

Flows bandwidth

Design_(once)

Identify VNFs

Design Service chain

Site Setup

Size & Onboard

Topology Discovery

Instantiate (at a site)

Deploy Service chain

Apply IP/AS/VLAN

Validate (using Netrounds)

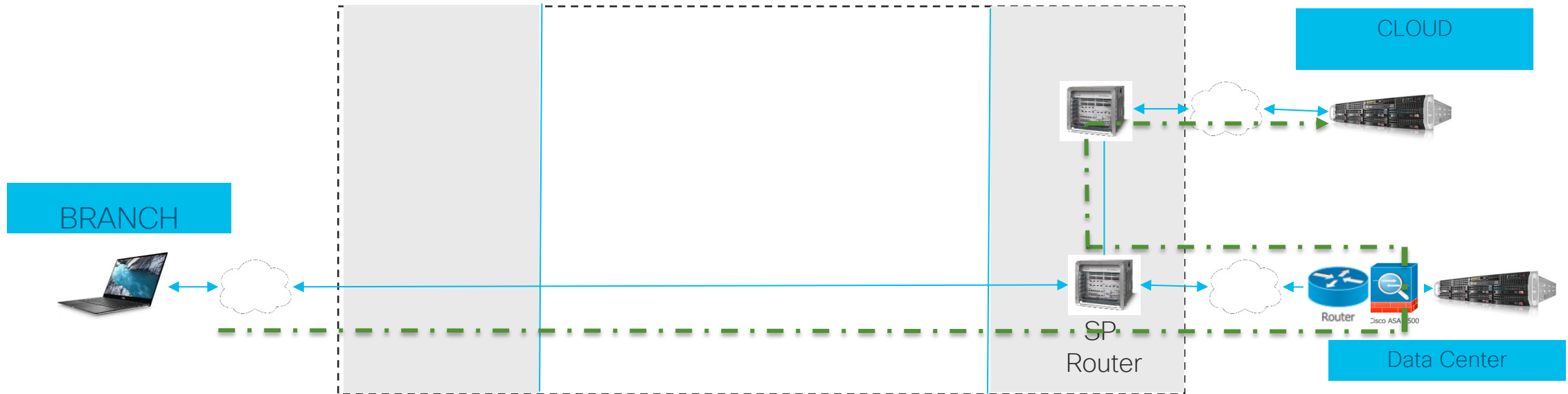
Test Service chain

Monitor Service chain

Access to app hosted in Cloud

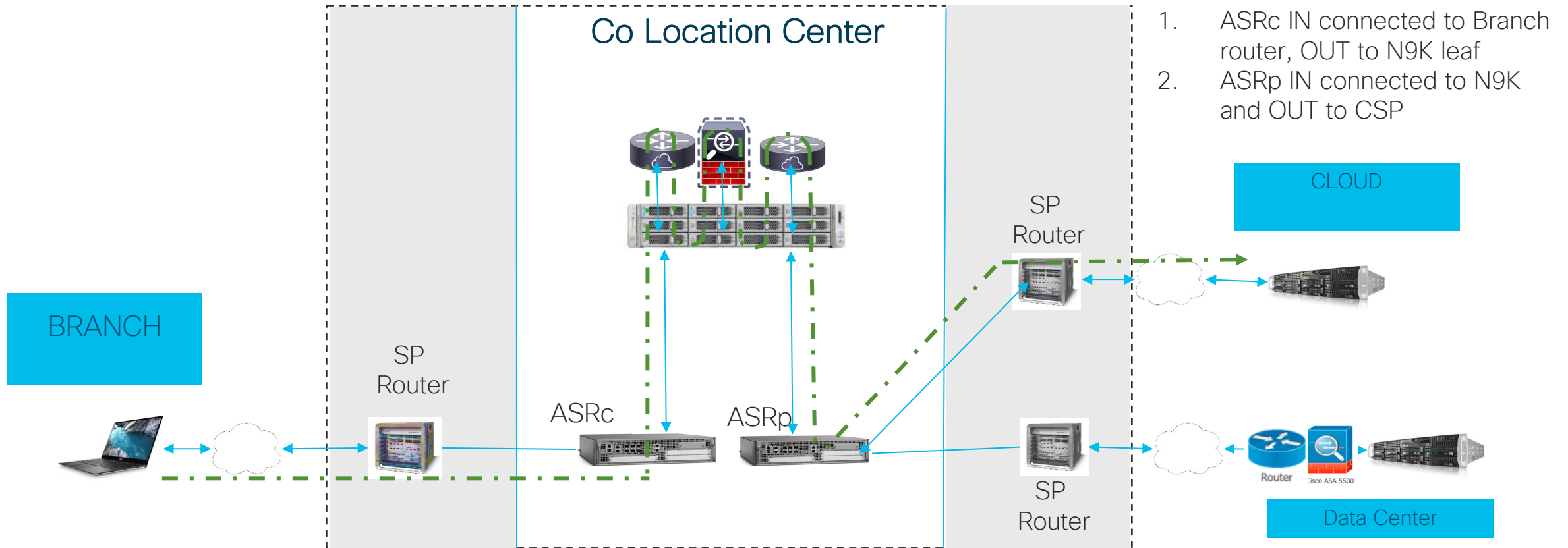
Effects, when traffic back-hauled to DC to apply security policies

- Hair pinning/tram boning of traffic
- Adds latency
- Increases BW requirements
- Increase transport costs



Traffic delivered to cloud App over internet or Hybrid Cloud Connect (Direct Connect/Express Route)

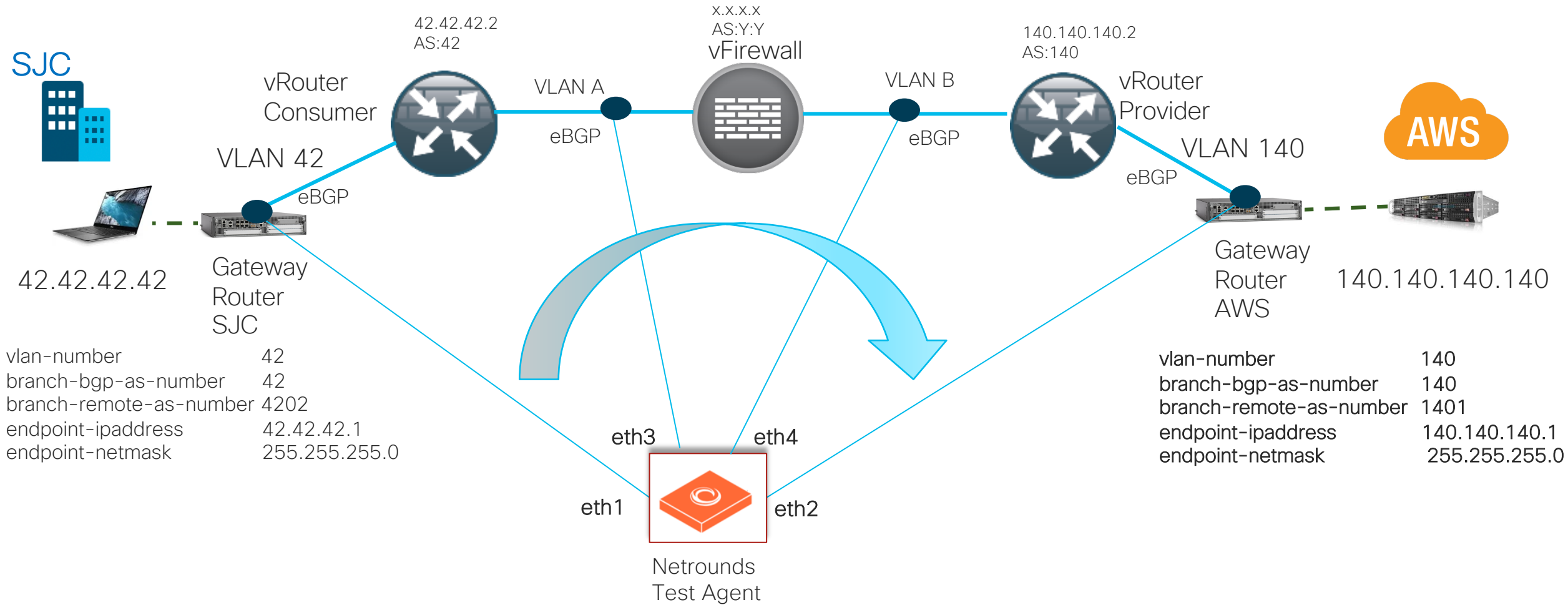
SAE: Centralized secure policy application to traffic flows





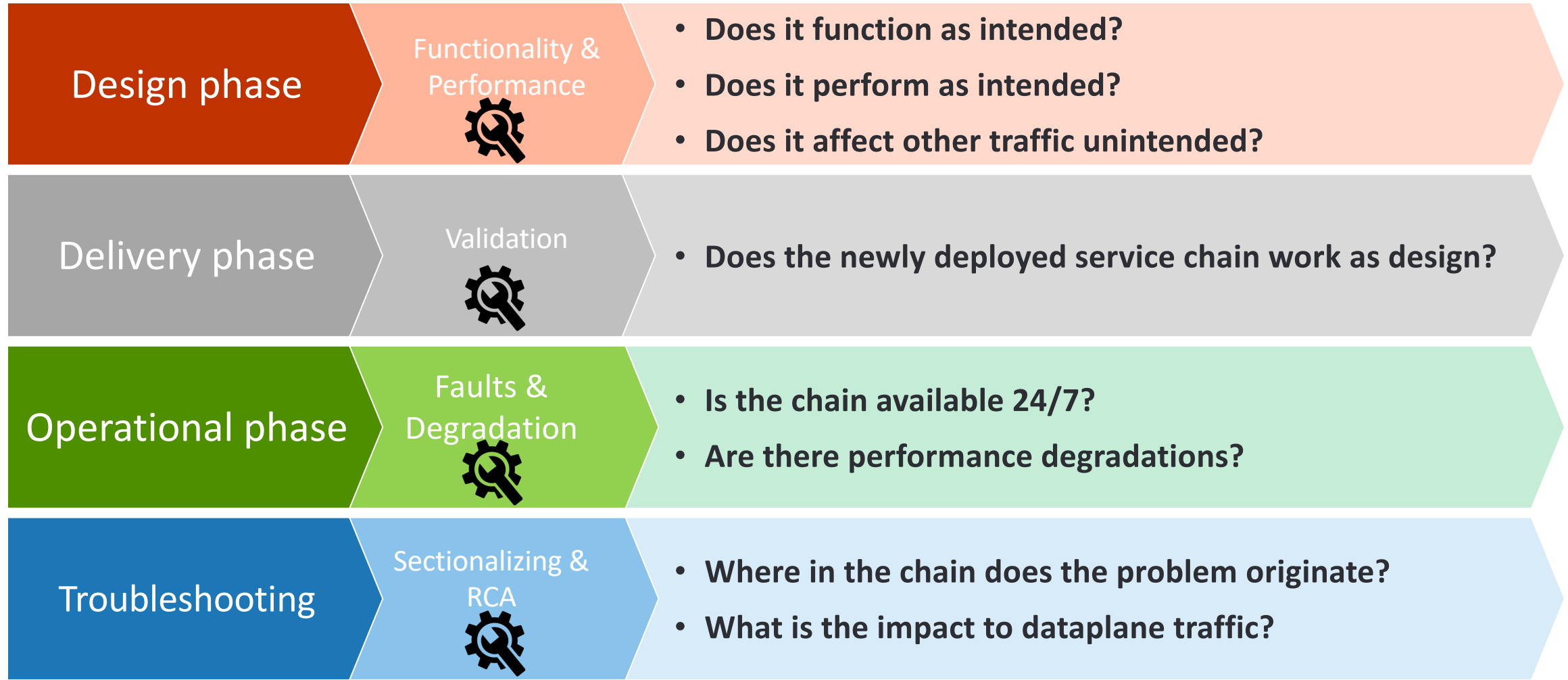
SAE Demo

Traffic flow through Service Chain

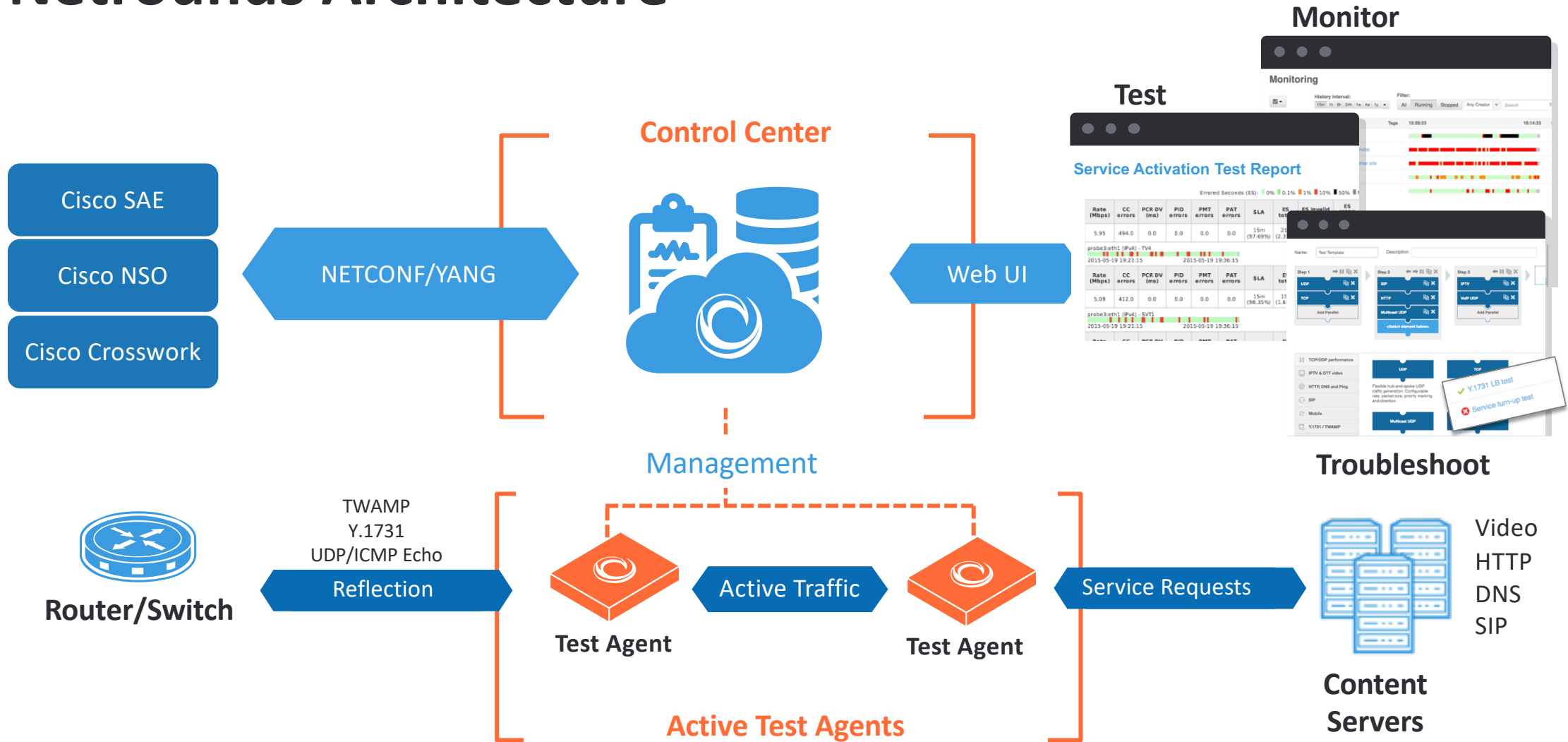


Netrounds for Service Chain NetDevOps

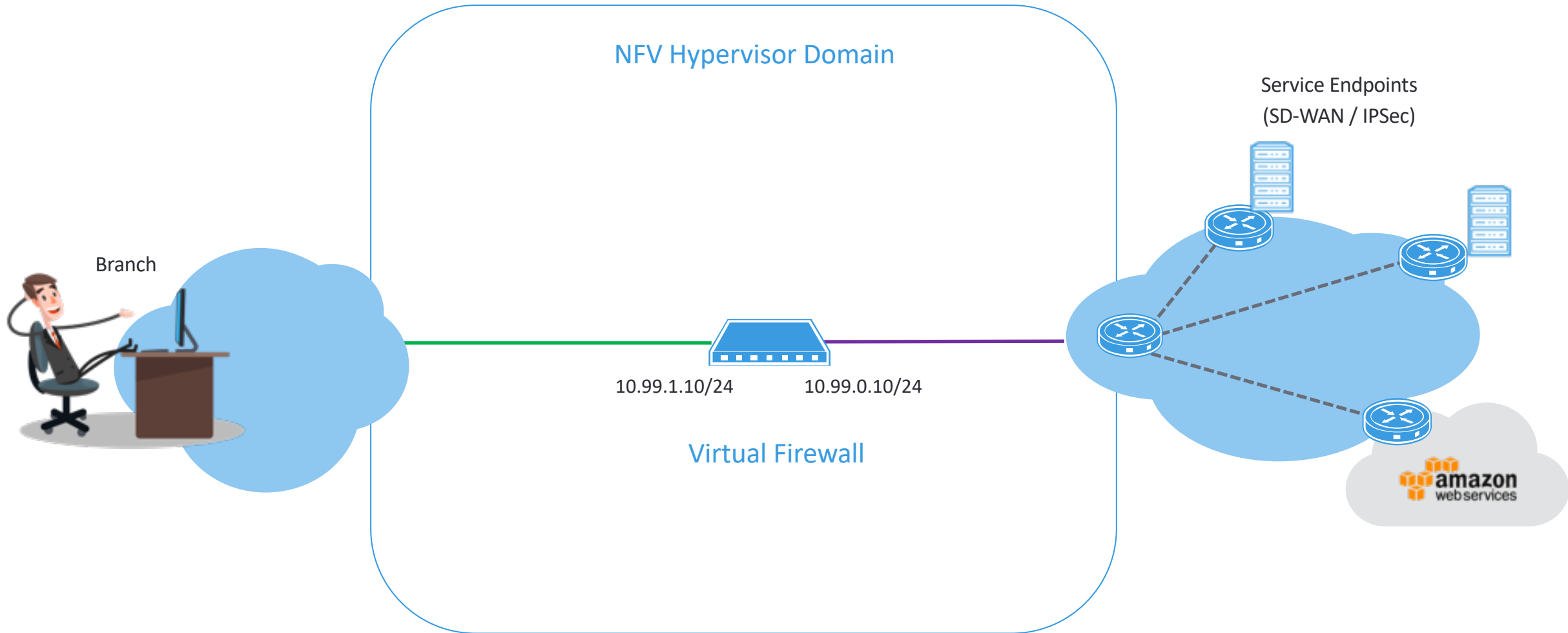
Netrounds in Service Chain NetDevOps



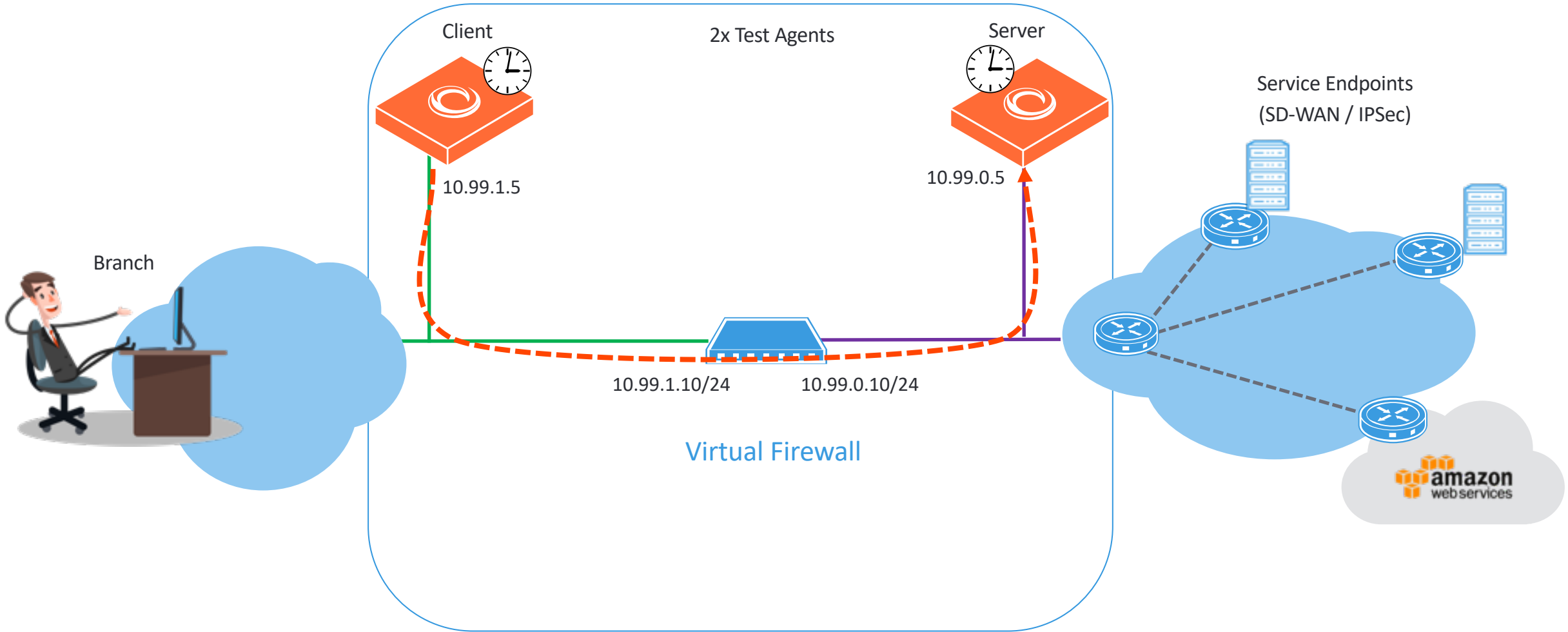
Netrounds Architecture



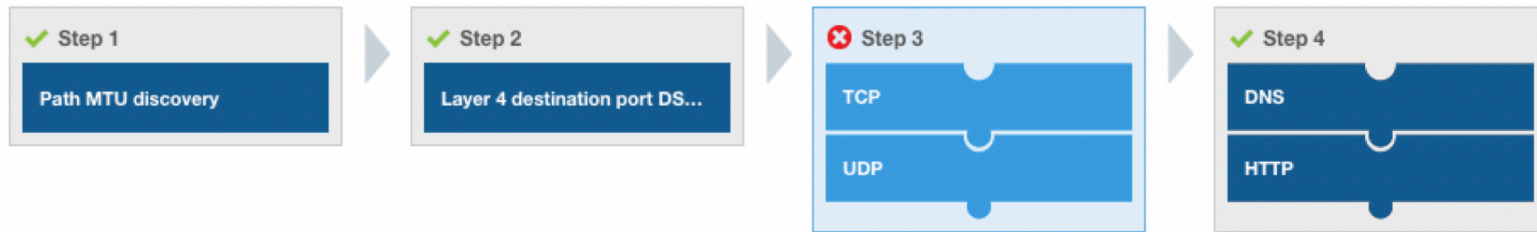
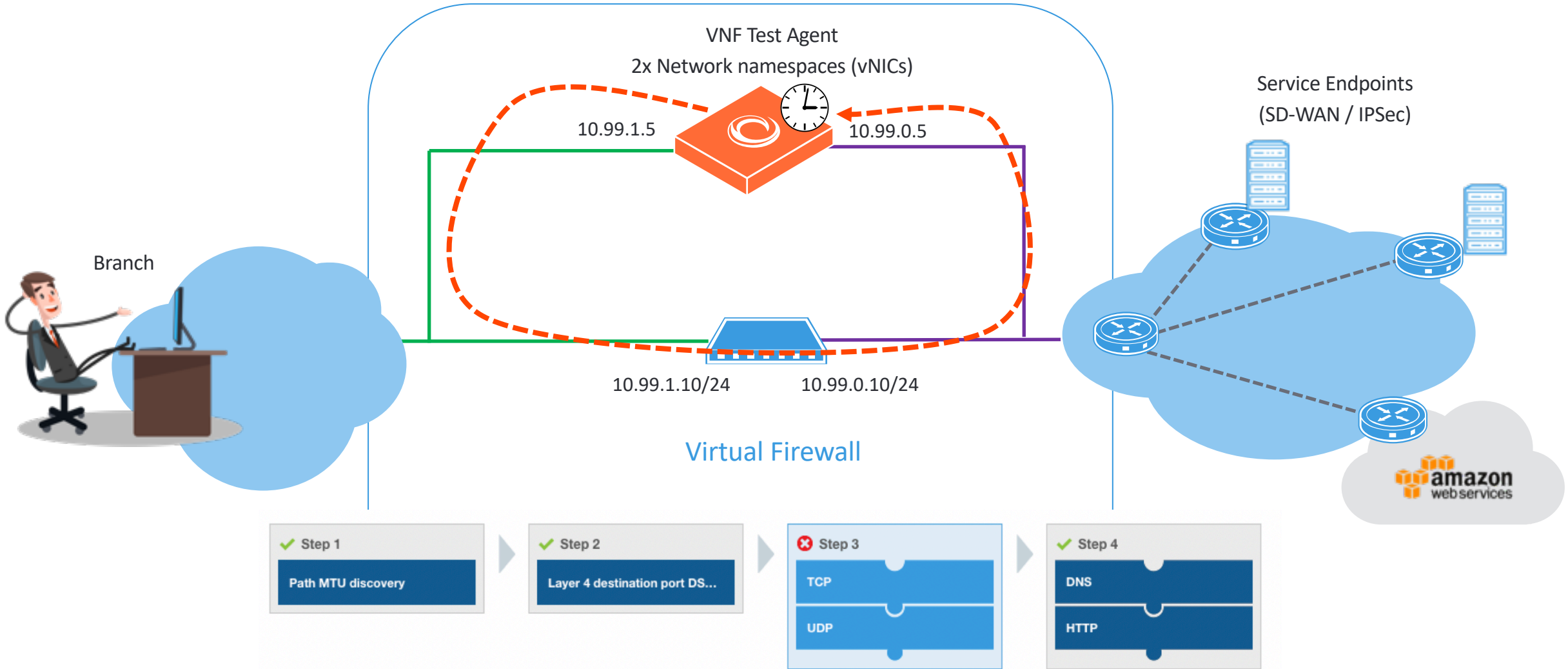
Virtual Network Function Scenario



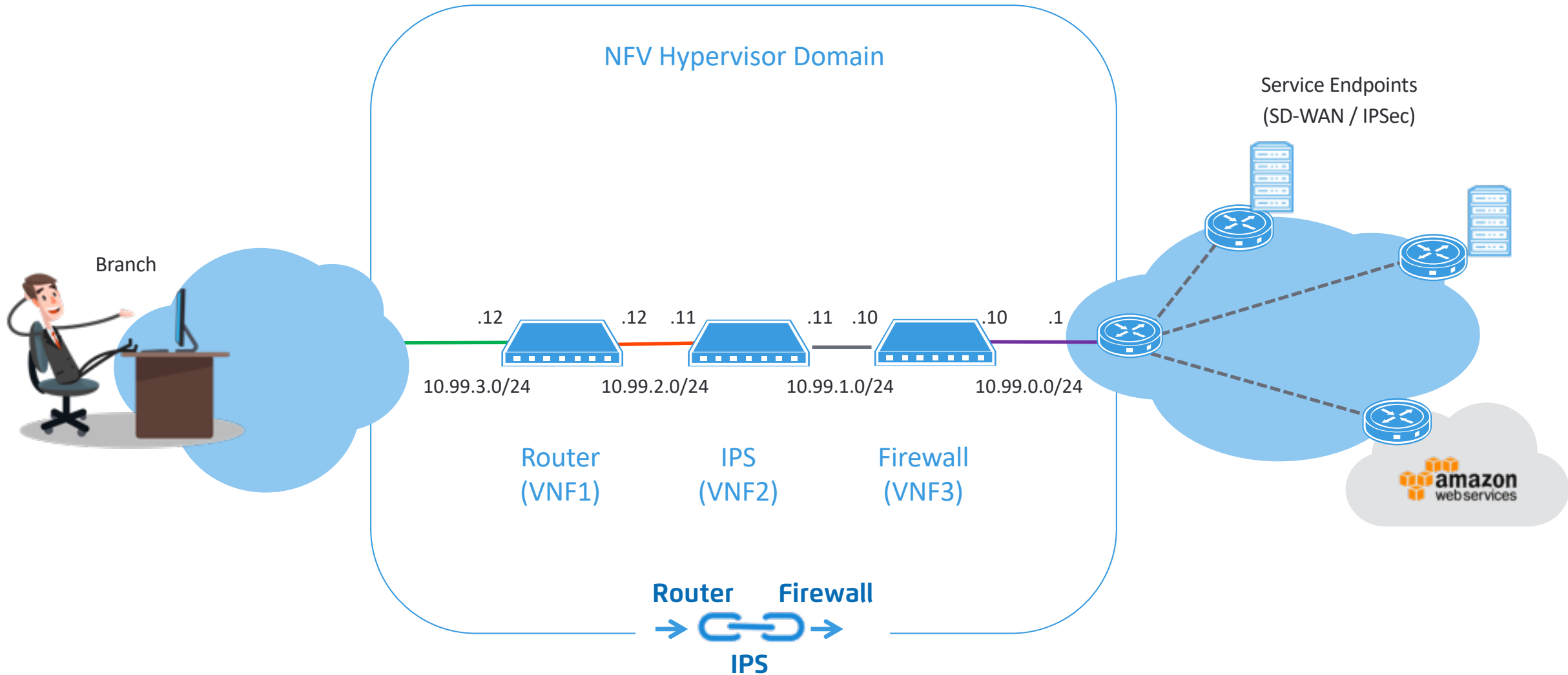
Classic Approach



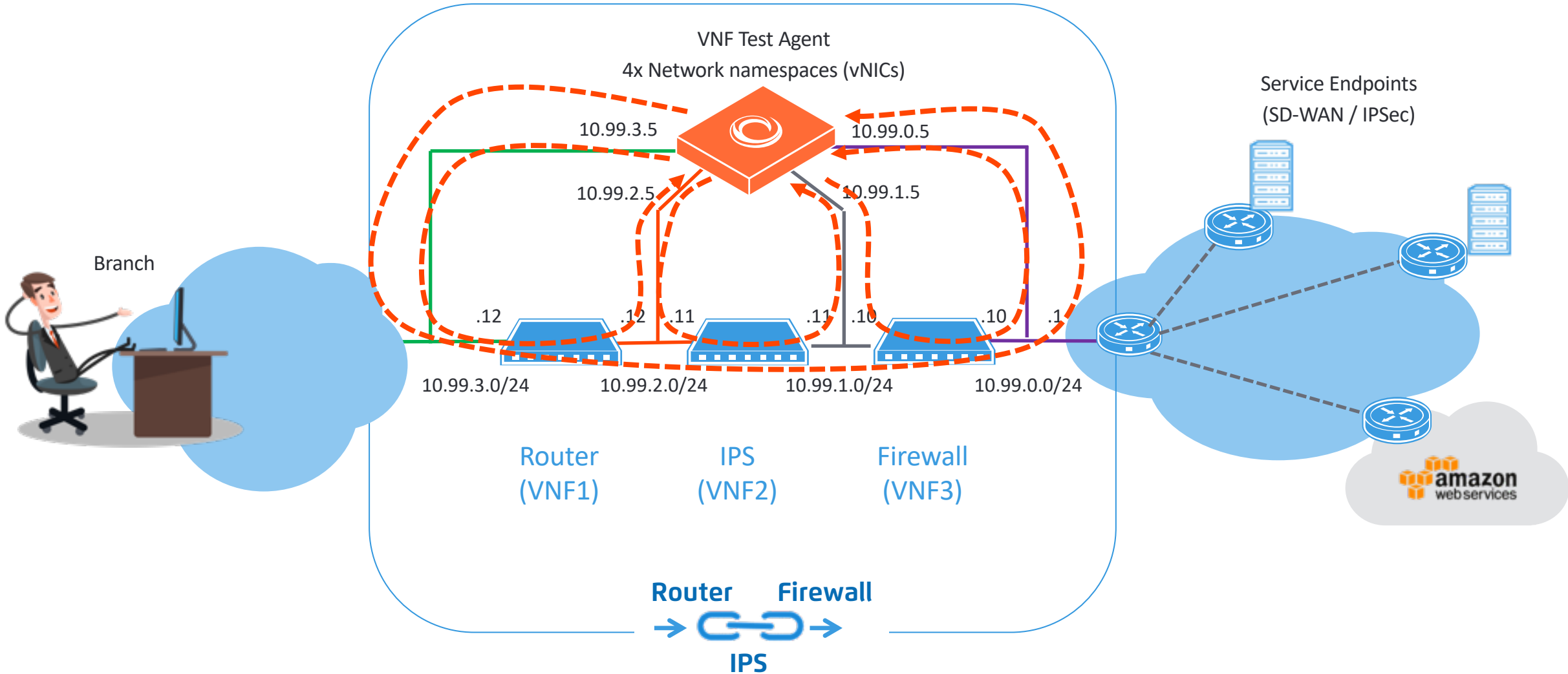
VNF Data Plane Assurance



VNF Service Chain Scenario



Sectionalizing the Service Chain



Dashboard

Service Chain Monitor per VNF (VMware ESX)

Time interval:

15m 1h 6h 24h 1w 4w 1y

Edit Clone Stop Report Export

Service Chain Monitor per VNF (VMware ESX) - VNF1+2+3

sweden-esx-ta-1:eth2 (IPv4) (server) -> sweden-esx-ta-1:eth1 (IPv4) (client)

2019-01-24 10:16:14 - 2019-01-24 10:31:14 (10 second resolution)

Graph Table

Follow graph



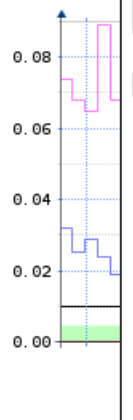
Service Chain Monitor per VNF (VMware ESX) - VNF3

sweden-esx-ta-1:eth2 (IPv4) (server) -> sweden-esx-ta-1:eth3 (IPv4) (client)

2019-01-24 10:16:40 - 2019-01-24 10:31:40 (10 second resolution)

Graph Table

Follow graph



Service Chain Monitor per VNF (VMware ESX) - VNF2

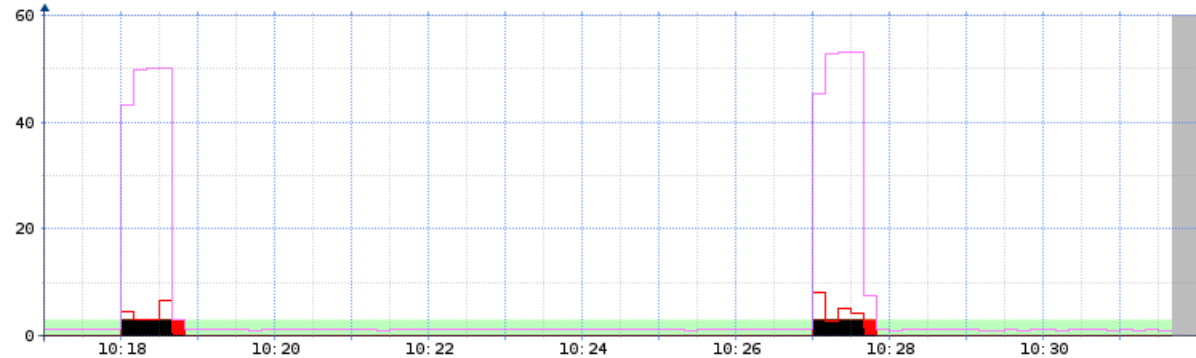
sweden-esx-ta-1:eth3 (IPv4) (server) -> sweden-esx-ta-1:eth4 (IPv4) (client)

2019-01-24 10:16:59 - 2019-01-24 10:31:59 (10 second resolution)

Graph Table

Follow graph

15m 1h 6h 24h 1w 4w 1y

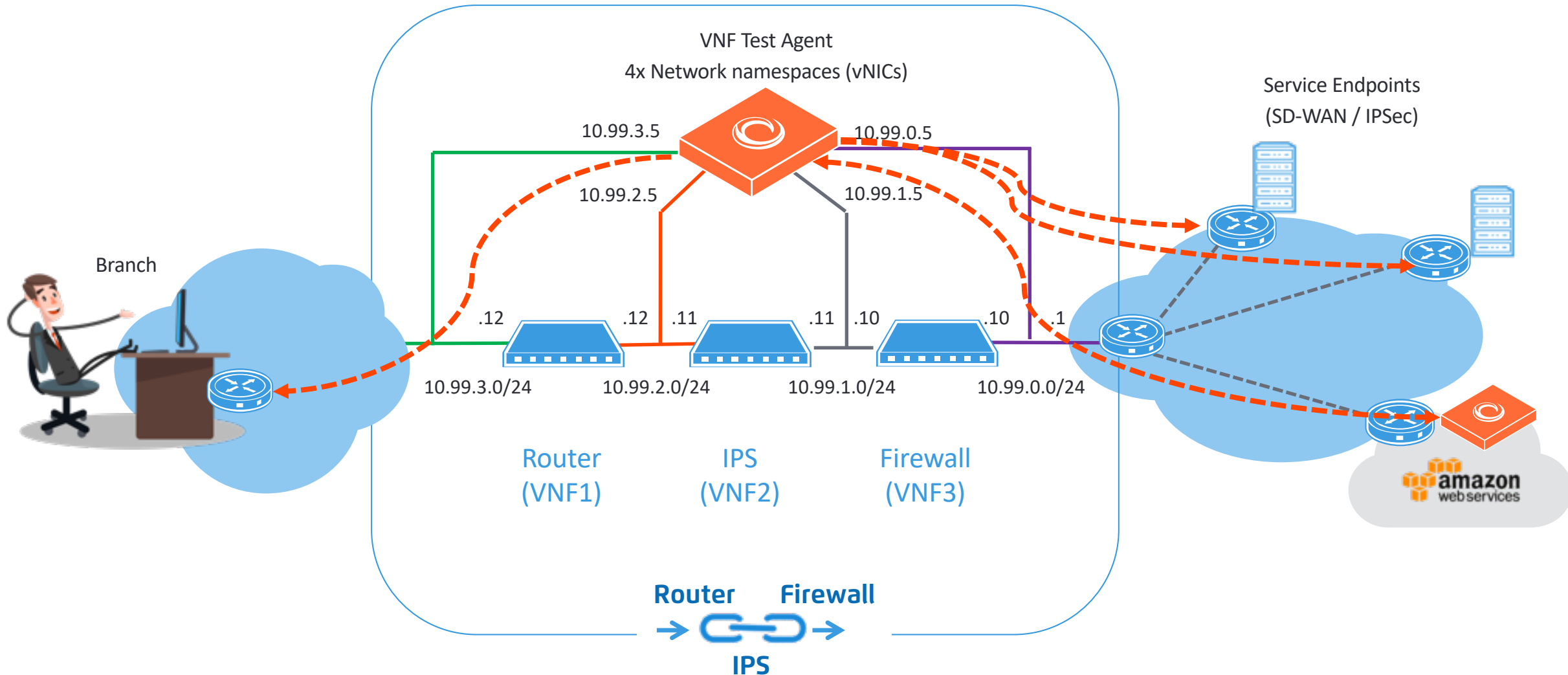


- ES bar
- Rate (Mbit/s)
- Loss (%)
- Misordered (packets/s)
- Min delay (ms)
- Average delay (ms)
- Max delay (ms)
- Jitter (ms)

VNF1

See config

Validating the Local and Remote Network



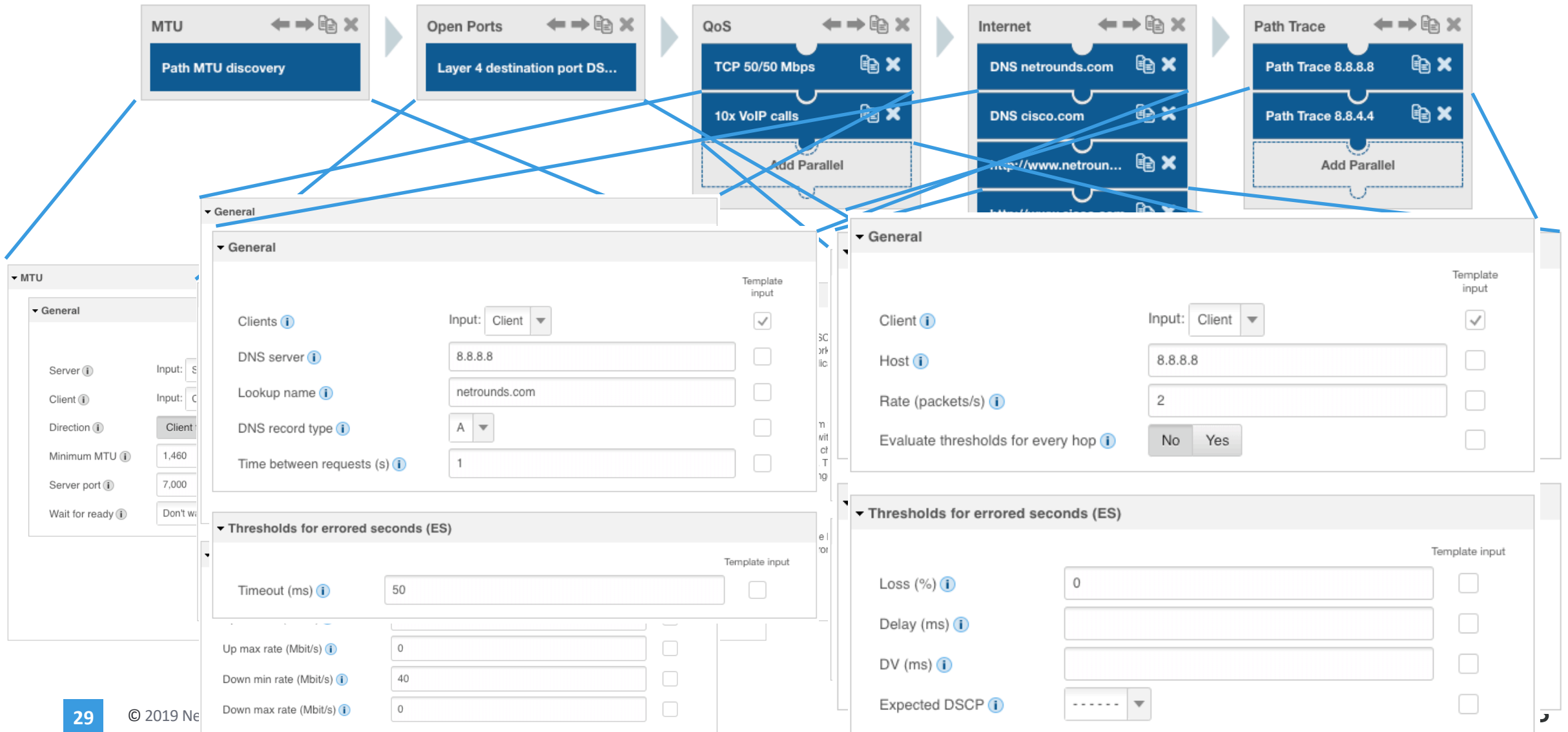
Our Toolbox – Tailored for Hardcore Networking

WI-FI	MOBILE	NETWORK PERFORMANCE	IPTV & OTT VIDEO	VOICE	INTERNET PERFORMANCE	REMOTE PACKET INSPECTION
SWITCHER	SWITCHER	UDP	IPTV	SIP	DNS	PACKET CAPTURE
LOGGER	LOGGER	Y.1564/MEF 48 UNI/ MULTICAST P2P/ HUB-AND-SPOKE/ FULL-MESH	ETSI TR 101 290 MULTI-CHANNEL IGMP JOIN/LEAVE INLINE	REGISTER CONNECT DISCONNECT CALL STATISTICS MOS	RESPONSE TIME EXPECTED RESPONSE WIDE RECORD TYPE SUPPORT	LIVE FEED PCAP FILES WIRESHARK COMPATIBLE
SCAN		STATEFUL TCP RFC 6349 MULTI-SESSION TCP QOS POLICY PROFILING	HTTP/OTT STREAMING APPLE HLS PLAYBACK RATE DOWNLOAD RATE BUFFER	VOIP UDP G.711/G.723/G.729/ GSM-EFR MOS	HTTP TCP CONNECT TIME TO FIRST BYTE PAGE LOAD DOWNLOAD RATE	
		REFLECTOR Y.1731 – LB/DM/SLM 802.1AG – LOOPBACK RFC 5357 – TWAMP FULL/ LIGHT			SPEEDTEST BROWSER-BASED TEST RATE LATENCY JITTER	
					PING ICMP UDP PATHTRACE	

Important Netrounds Tools for VNF Test/Monitors

- MTU Discovery
- TCP throughput
- Delay / delay variation / packet loss measurements
- TCP/UDP ports and DSCP mappings
- Synthetic Voice Calls
- Path trace
- Access Internet services (HTTP/DNS etc)
- Gateway latency/jitter/packetloss (TWAMP / UDP echo)

Example VNF Validation Template



Example VNF Template in Action

VNF Validation AWS VNF1

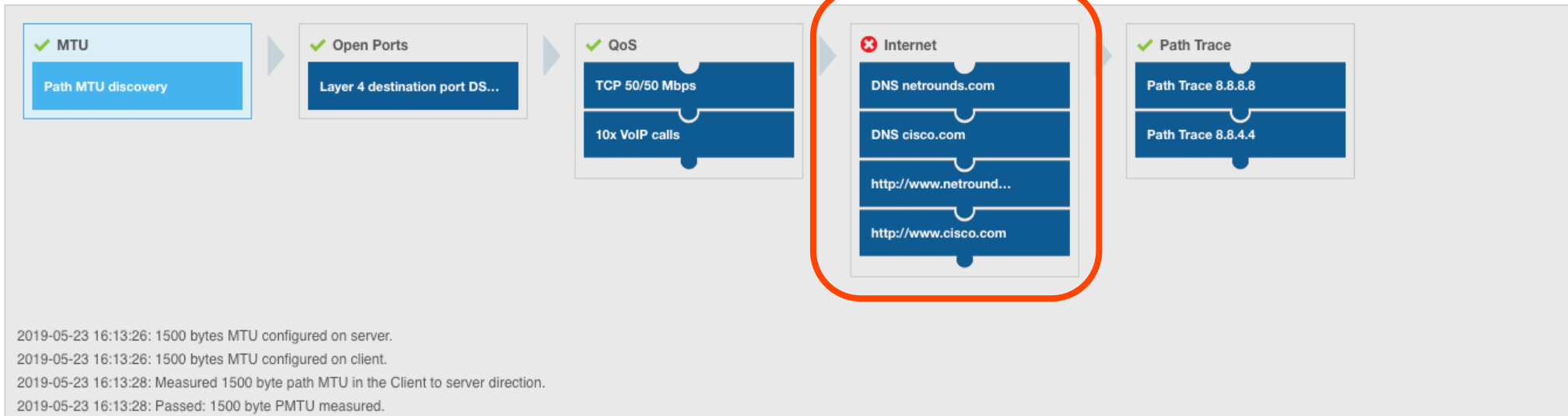
[\[Click here to add a description\]](#)

Rerun ▼ Delete Report Export

✖ Step 1 🔗

VNF validator v2

▶ ▶ ▶



Example VNF Template in Action

VNF Validation AWS VNF1

[\[Click here to add a description\]](#)

Rerun ▼ Delete Report Export

Step 1 🔗

VNF validator v2

▶ ▶ ▶



Summary

- Secure Agile Exchange enables a multi-cloud journey for customers.
- Capitalize on the transformation in consumption model.
- Ability to offer new services and business models.
- Programmable, customizable and extensible to fit into existing OSS/BSS stack.
- Built in Active Service Assurance using Netrounds for each VNF in Service Chain.

Resources

TDM & BDM

SAE Hub:

<https://salesconnect.cisco.com/#/program/PAGE-9966>

Presentations:

Title: Secure Agile Exchange (SAE) - Business Decision Maker (BDM) Presentation

SalesConnect Link:

<https://salesconnect.cisco.com/open.html?c=1529c321-7eec-4a42-9ab1-14d73bc54c6e>

Title: Secure Agile Exchange (SAE) - Technical Decision Maker (TDM) Presentation

SalesConnect Link:

<https://salesconnect.cisco.com/open.html?c=a178dcc4-6a16-4e38-810b-37211c9852e4>

Solution Guide:

<https://bit.ly/2RsDZKN>

Netrounds Resources:

<https://portal.netrounds.com>

Email - cisco@netrounds.com





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