

FUNDAMENTALS FOR RELOADED MPLS-VPN CONNECTIVITY

Tony Sarathchandra – Director, Product Management

Dec 12th, 2017

LEGAL DISCLAIMER

This statement of direction sets forth Juniper Networks' current intention and is subject to change at any time without notice. No purchases are contingent upon Juniper Networks delivering any feature or functionality depicted in this presentation.

This presentation contains proprietary roadmap information and should not be discussed or shared without a signed non-disclosure agreement (NDA).

A woman with dark hair is looking down at a tablet she is holding. Overlaid on the image are several semi-transparent data visualizations: a bar chart in the top left, a world map with network connections in the middle left, and a pie chart in the bottom left. The background is a blurred bookshelf.

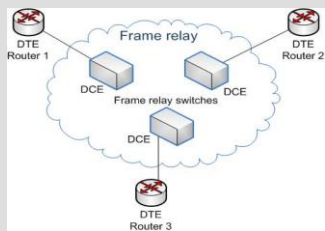
Agenda

- MPLS-VPN Service Evolution
- SD-WAN Solution Overview
- Demo (<10m)
- Q&A

Evolution of Business Connectivity Services

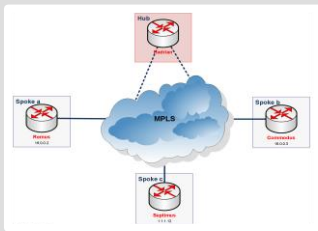
1990s

Leased Lines
& Frame
Relay



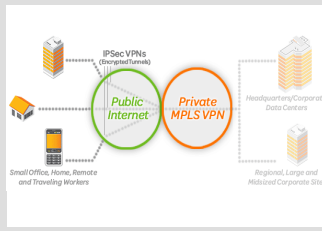
2000s

IP/MPLS VPN
with L2/L3
services



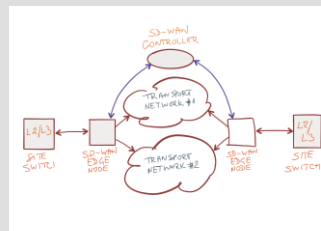
mid-2000

Hybrid WAN &
IPSec VPN



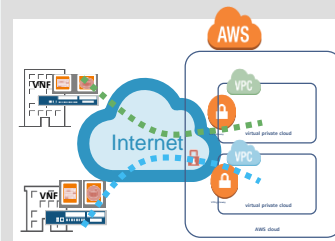
mid-2010

SD-WAN with
services



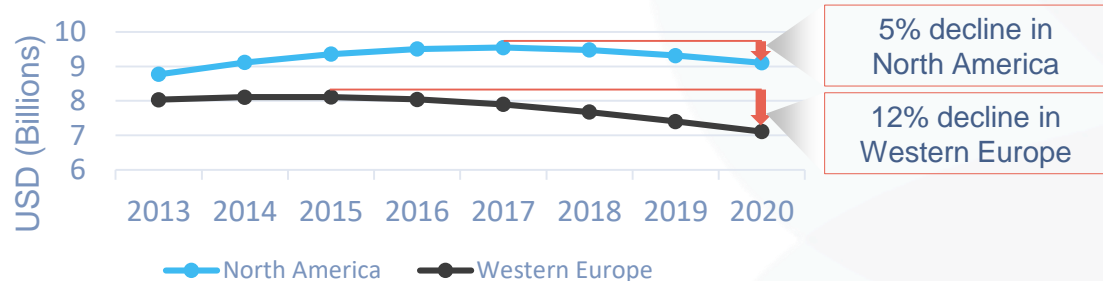
2020+

Cloud
Connect



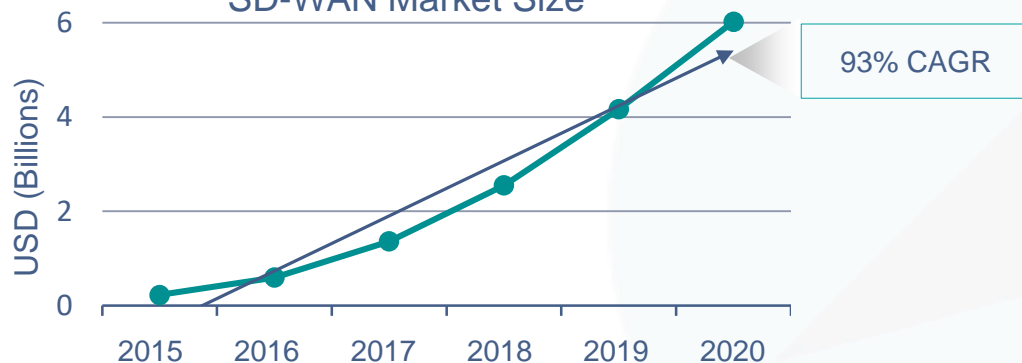
MPLS Challenges & SD-WAN Opportunities

MPLS Revenue (Developed Markets)



- Global Revenue growth for MPLS is declining
- Price erosion for MPLS means Europe starts to see negative growth rates for MPLS VPN revenues by 2016, with North America following suit by 2018

SD-WAN Market Size



- By 2020, SD-WAN market size is projected to grow to \$6B with a CAGR of 93%

Sources:
OVUM: "IP VPN Services Market Forecast"
IDC: "Cloud and Drive for WAN Efficiencies Power Move to SD-WAN"

What are Enterprise WAN Challenges?

- Top 3 WAN Challenges

38%
Security

33%
**SaaS / Cloud
Services**

32%
**Managing
Branch
Connectivity**

- **7%** Currently use SD-WAN
- **63%** Plan to adopt SD-WAN in next 18 months

Source: IDC WW SD-WAN Survey Special Report, July 2016

What do Enterprises want?

- The enterprise application mix is fast leaning towards cloud based applications
- WAN transformation is inevitable for enterprises seeking to optimize for these applications

SD-WAN Deployment Scenarios:

Internet VPN Access

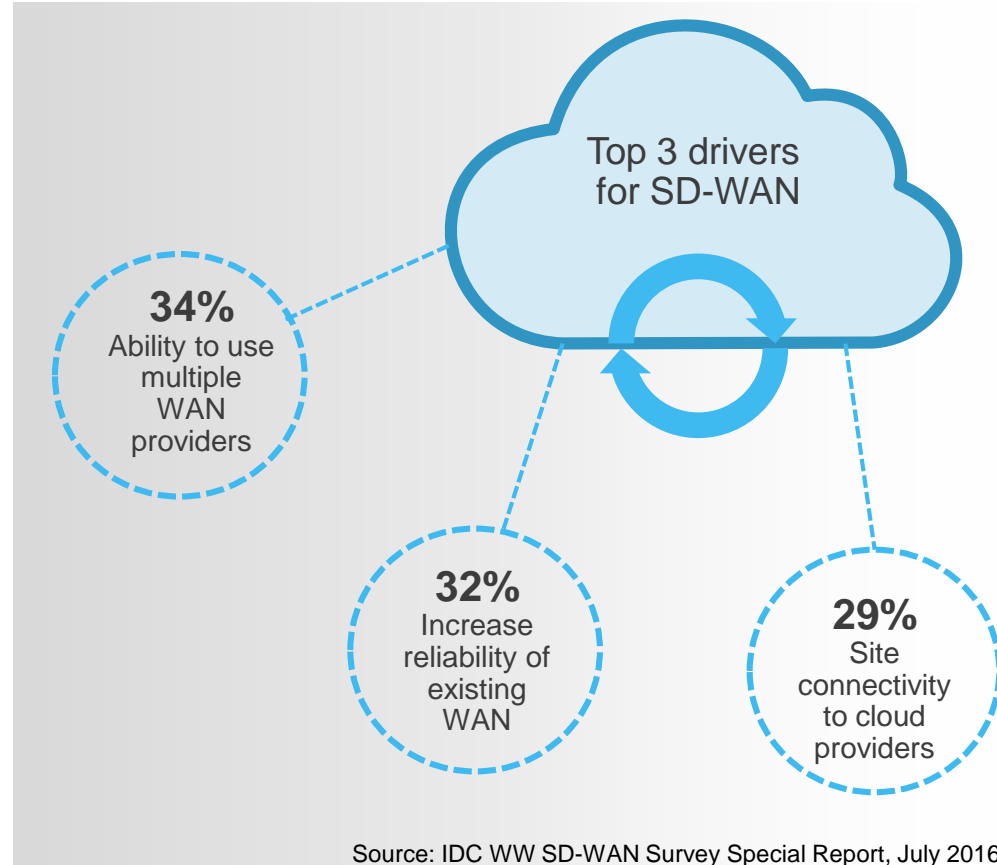
57%

Support for SaaS and public cloud

32%

Optimized SaaS/Cloud Offload

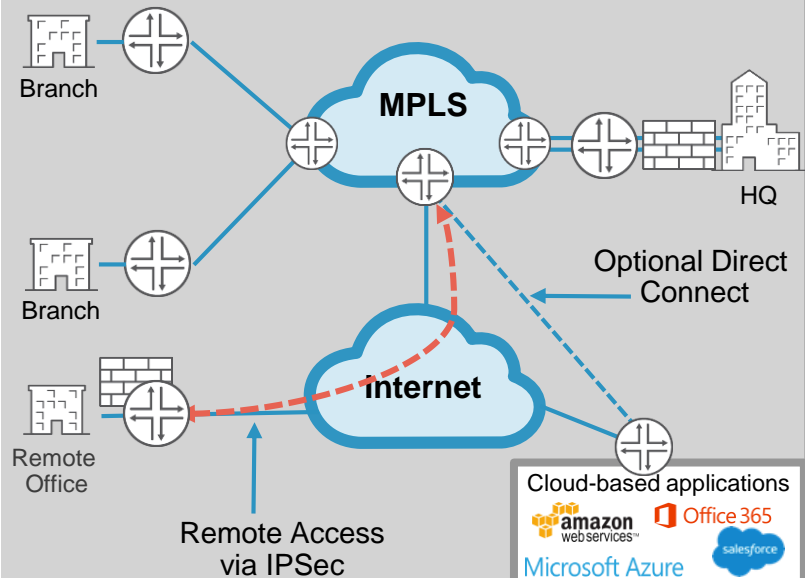
31%



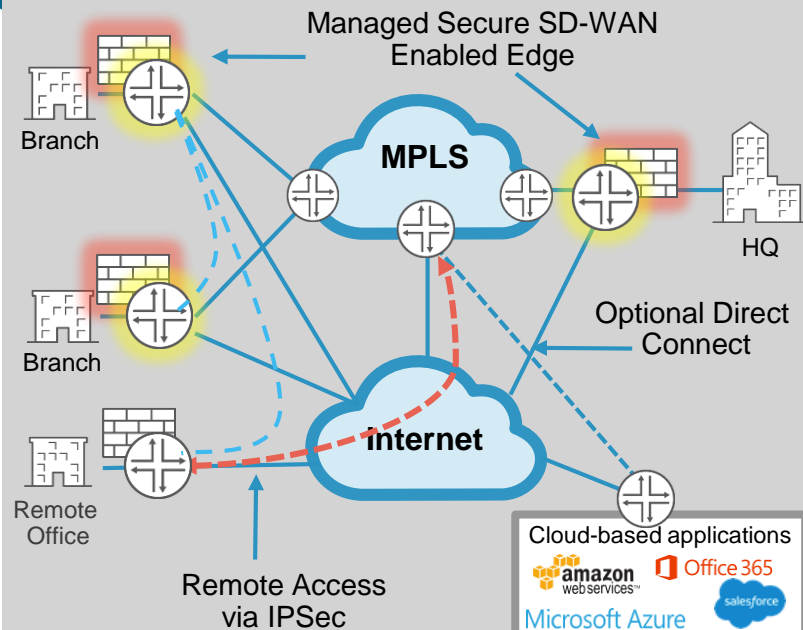
Source: IDC WW SD-WAN Survey Special Report, July 2016

IP/MPLS VPNs Evolution with SD-WAN

PMO with IP/MPLS VPN Services



FMO with SD-WAN Services



End to End SD-WAN with Transport Independence

Intelligent Branch

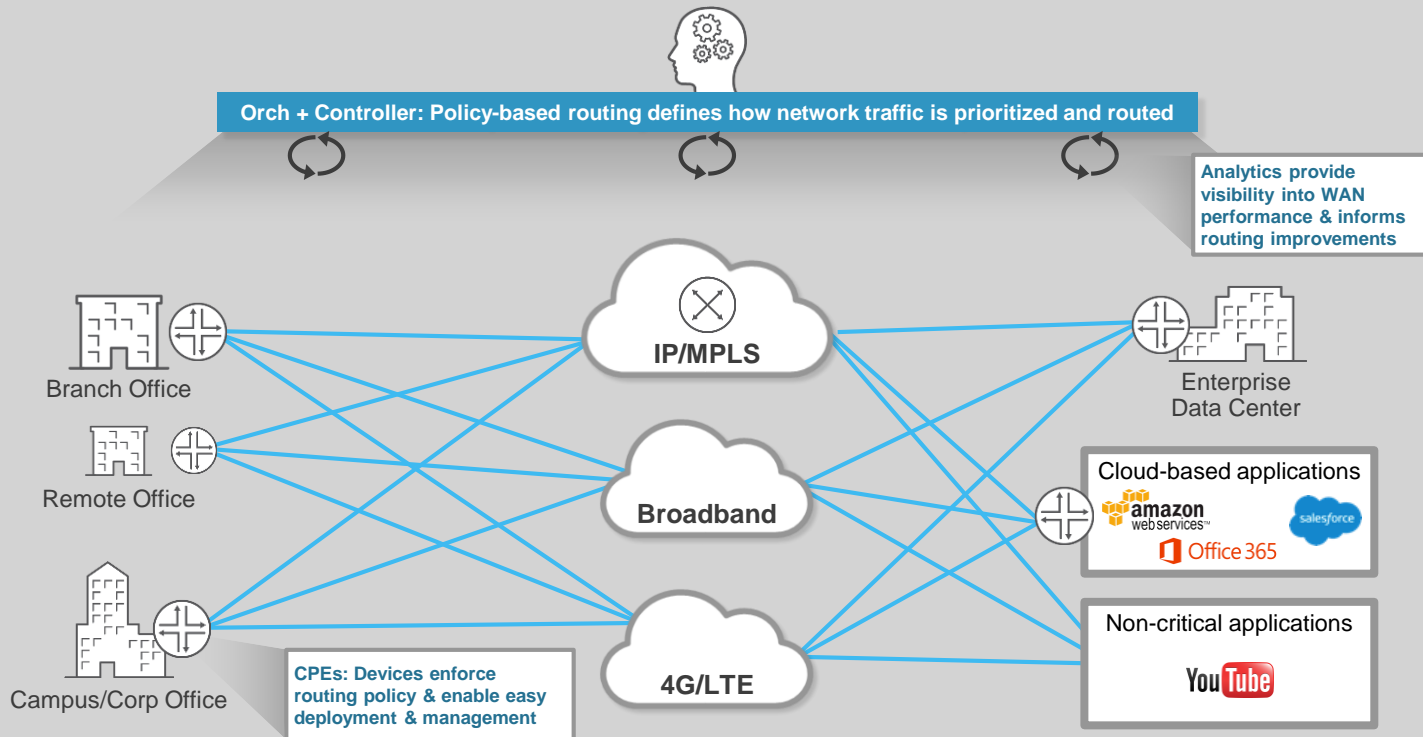
Analytics and Deep
Application Inspection

Application-based
SLAs

Centralized Policy
Management

Secure and Managed
VPN

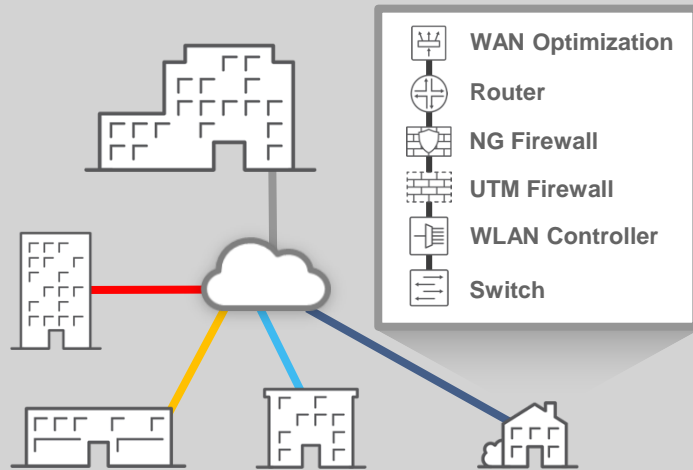
SD-WAN framework allows implementation of more intelligence/logic in software rather than in hardware, enabling increased flexibility and automation



Branch Consolidation & Evolution to SD-WAN

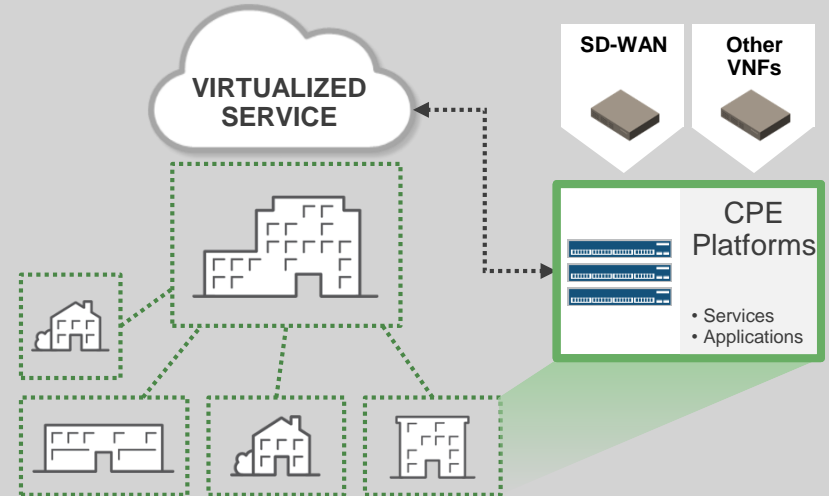
Bring Agility and Enhanced Customer Experience Utilizing Cloud Technology

Legacy Branch (PMO)



Expensive, complex all-in-one box or many vendor inline boxes and cumbersome refresh

Future Branch (FMO) with D-NFV



Simple, customizable and instantaneous refresh

Juniper SD-WAN Differentiation

Integrated NG Security



UTM, IPS, Sky ATP,
Unified Policy, SDSN

CPE Portfolio Breadth



Fixed and Virtualized
CPE appliances

On-prem or Cloud Multi-tenancy



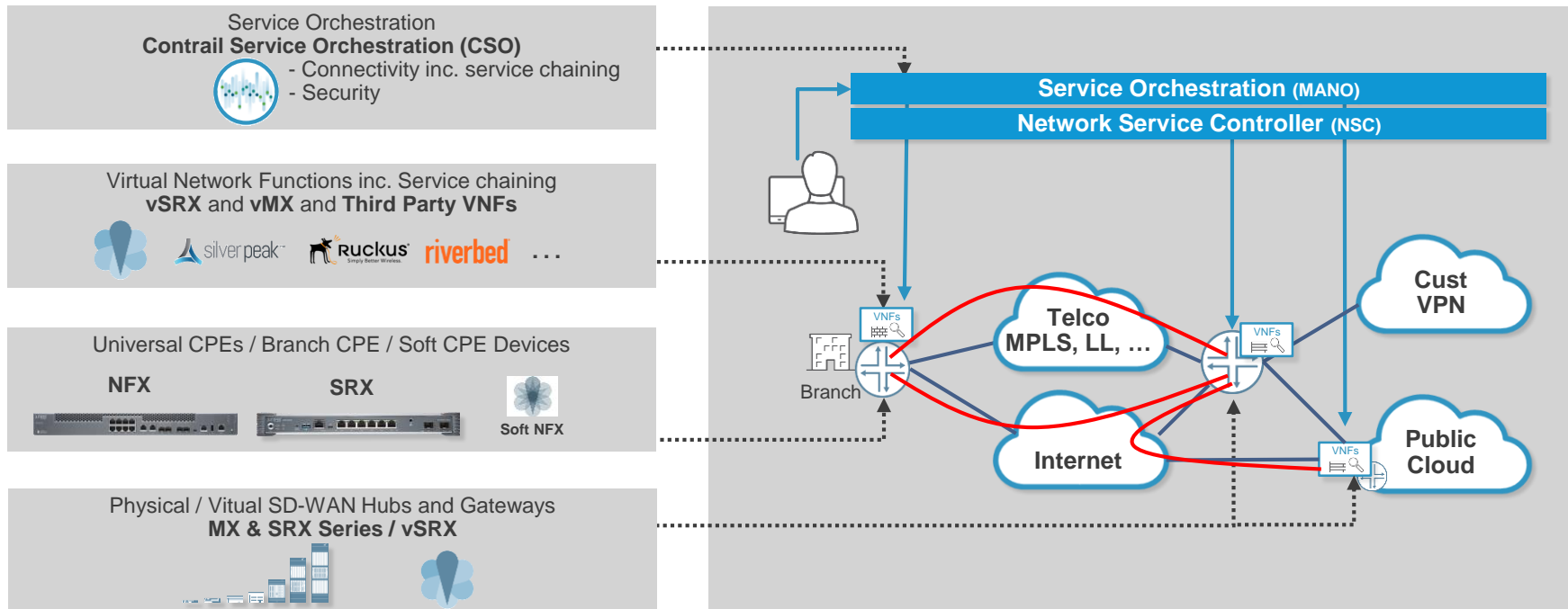
Management &
Orchestration, VNF
Orchestration

Native IP/VPN Integration



Reduce CAPEX with
Existing PE
infrastructure

Juniper SD-WAN Solution Components



SD-WAN with Integrated Security

Secure SD-WAN Building Blocks

- **Application Awareness**

Deep Packet Inspection (DPI), App-ID and Meta-Data, 3000+ App Signatures

- **User Awareness**

Integration with Microsoft Active Directory/LDAP*

- **Overlays, IPSec/GRE**

Application and Subscriber-Aware

- **Performance Monitoring and Analytics**

RPM, IP monitoring, BFD, Ethernet OAM, J-Flow v5 v8 v9, TWAMP

- **Application Based Routing**

Stateful: Performance monitoring results, App-ID, User-ID*

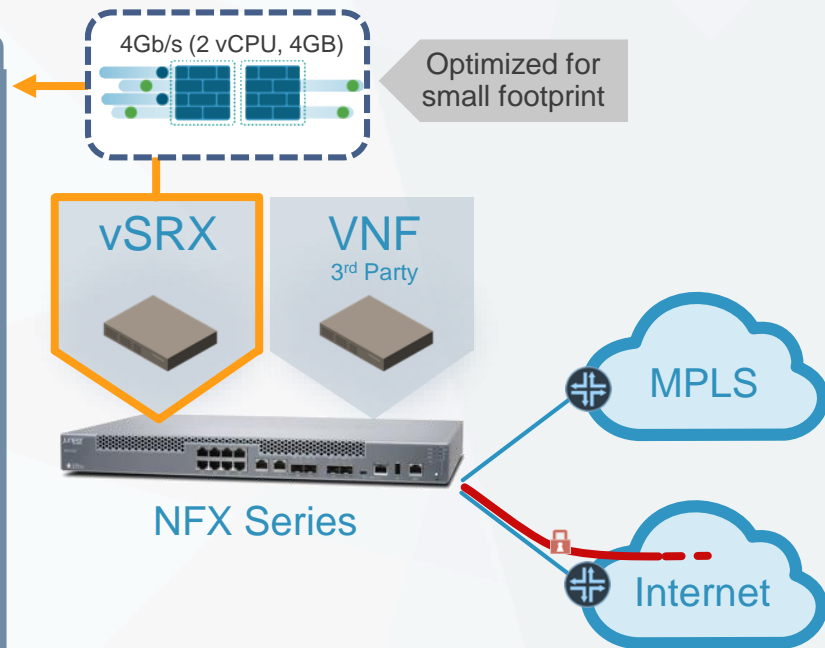
- **Full Routing Stack**

Routing Protocols (BGP, IS-IS, OSPF, RIP, Static)

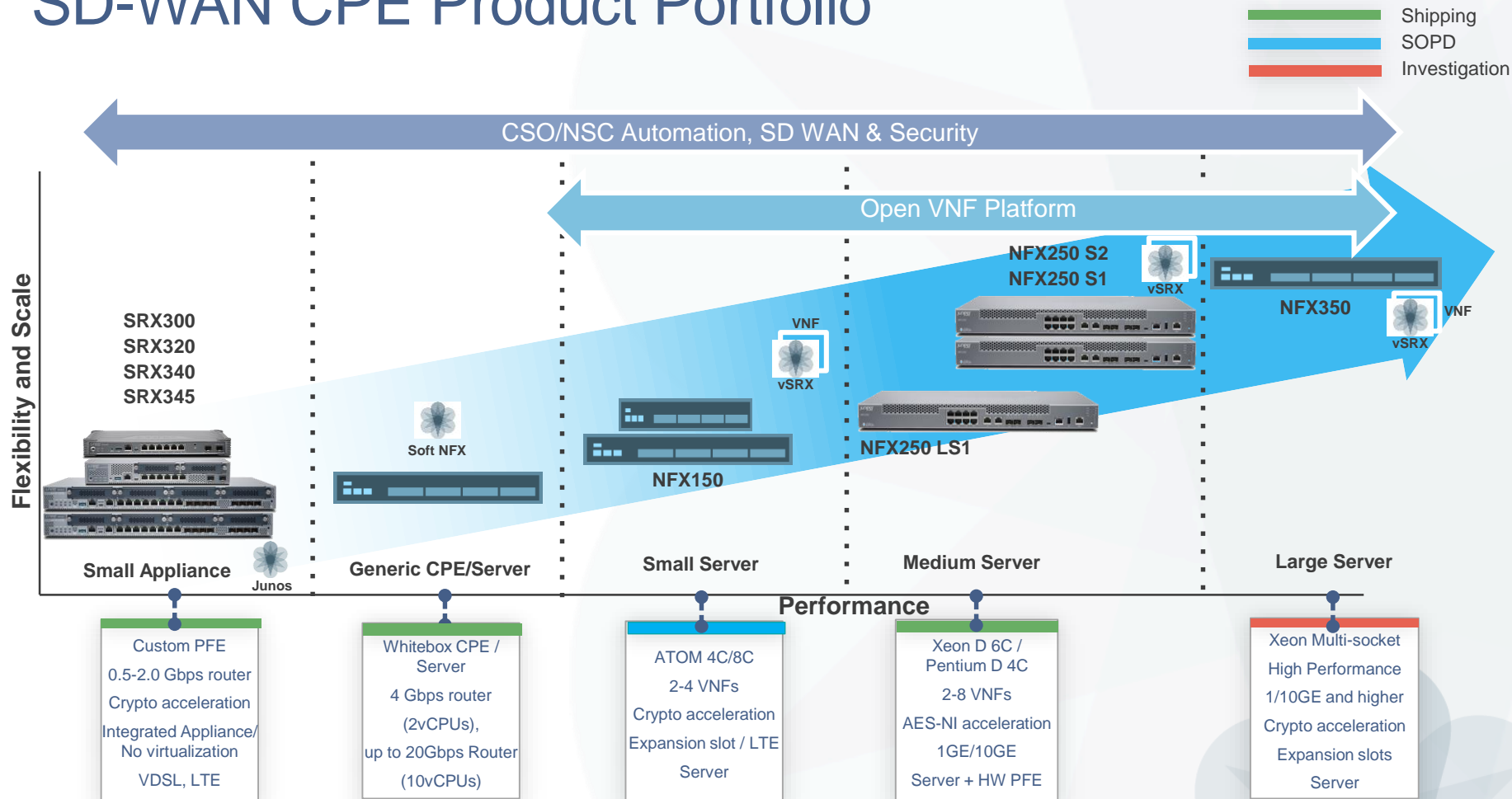
- **Full Security Stack**

Firewall, IDP, UTM, ATP, Anti-virus, Anti-spam, Web/Content Filtering

* Roadmap

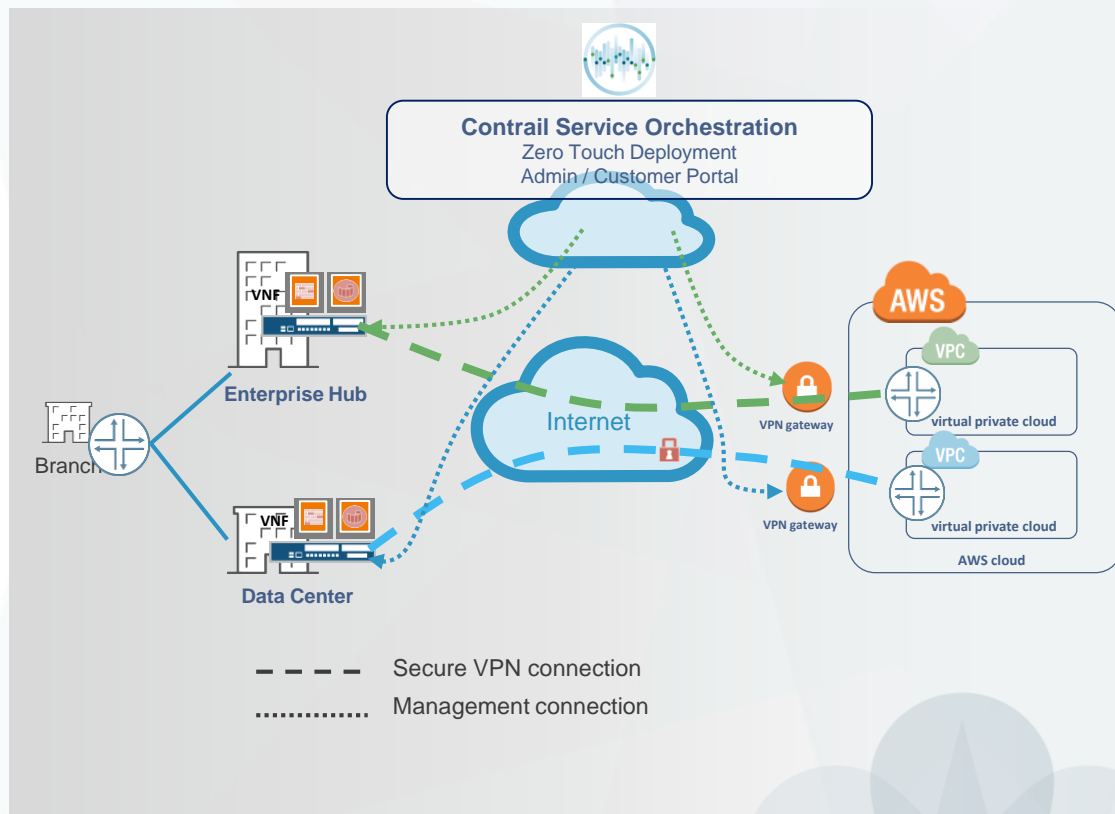


SD-WAN CPE Product Portfolio



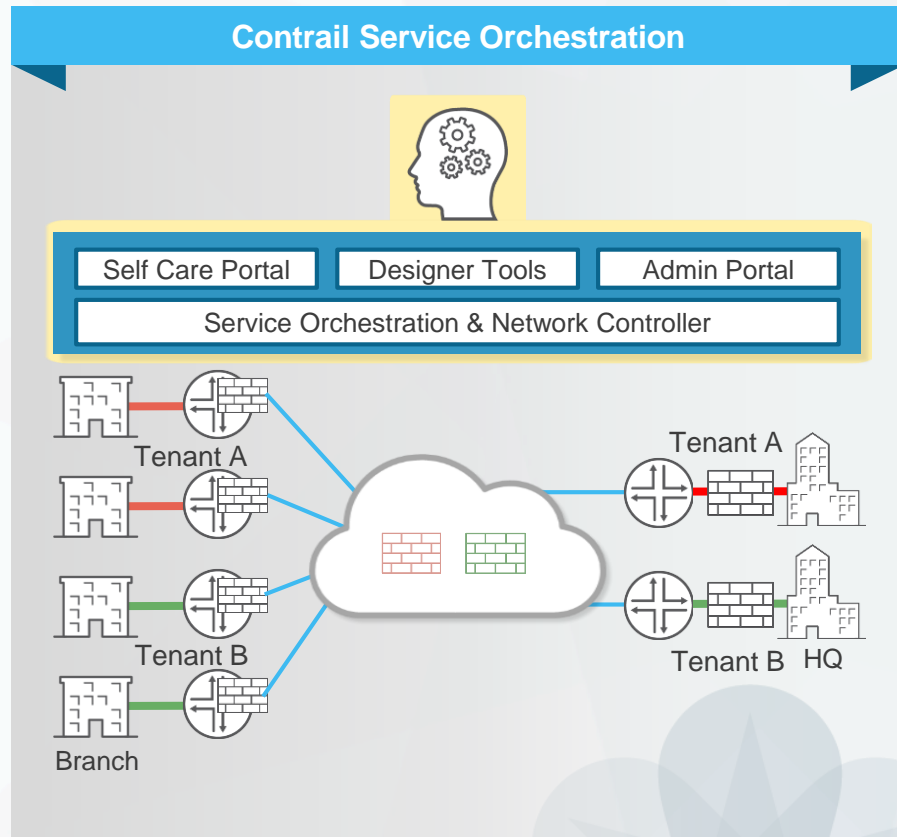
SD-WAN with Public Cloud Connectivity (AWS)

- Universal SD-WAN Connectivity
 - Fully automated SD-WAN connectivity to vSRX in customer VPC
 - Additional direct connect support in future
- Automated Provisioning
 - vSRX auto provisioned in AWS via CSO
 - Bring-up from defaults
 - Fully security service management
 - Customer access to Self Care Portal for self provisioning of VPC credentials



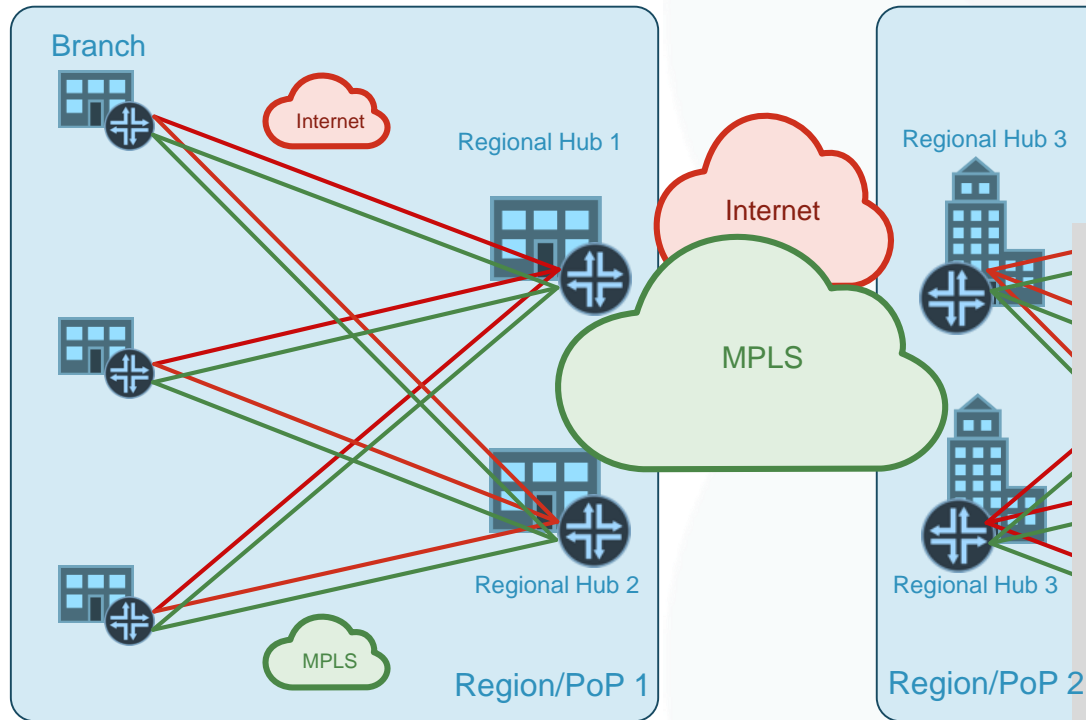
SD-WAN with Full Multi-Tenancy

- Multi-tenant Management with full Role Based Access Controls (RBAC)
 - Complete management separation between tenants
- Multi-tenant Control plane with Network Services Controller (BGP)
 - Full routing separation between tenants
- SD-WAN endpoints support multiple network segments per tenant
 - i.e. Tenant A can have overlapping network X & Y
- Each tenant supports multiple differing service sets
 - i.e. Tenant A: SD-WAN + Security, Tenant B: SD-WAN + WanOpt
- Deployable as on-premises or hosted (AWS)



Regional Hub Sites with Hub/Spoke Interworking

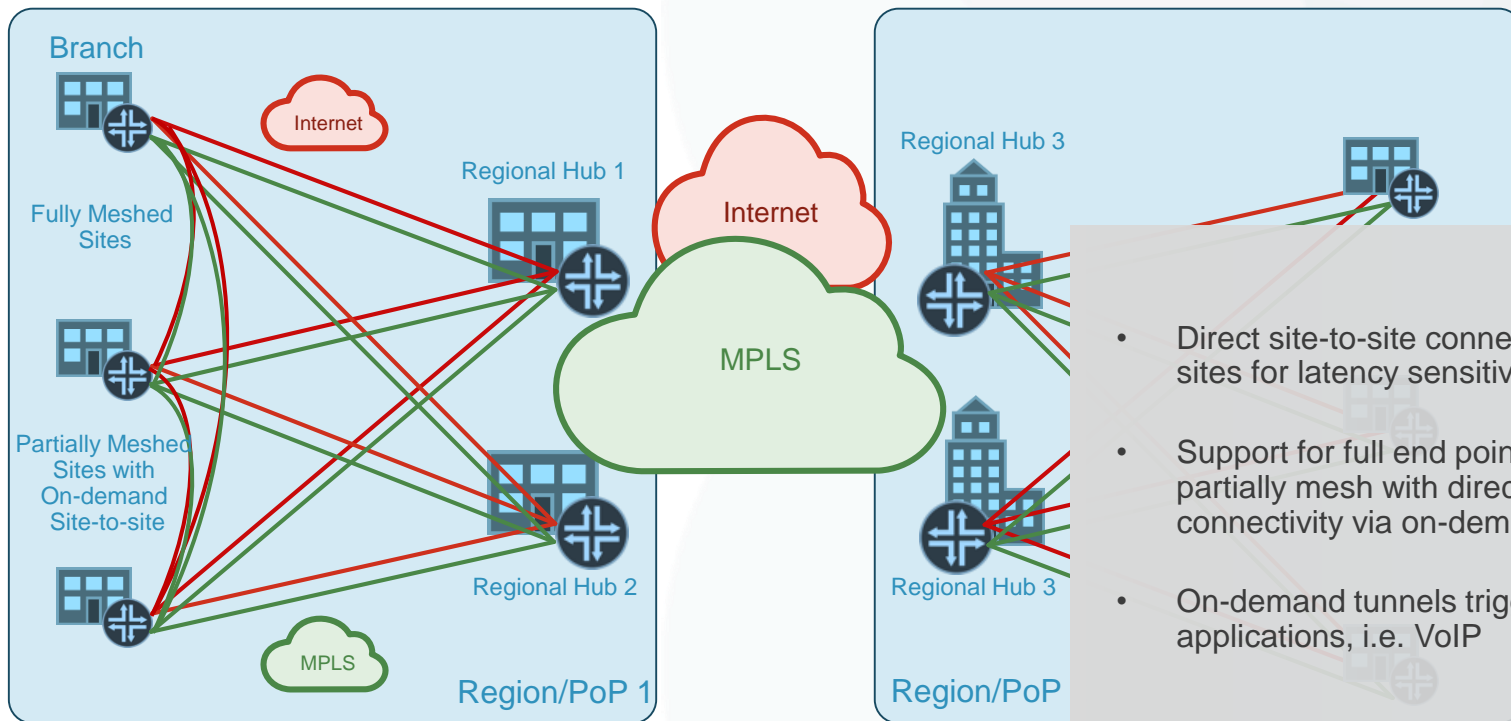
SD-WAN with MPLS as Transit



- Traditional multi-homed hub/spoke design
- Support for active/backup dual hubs with BGP based failover
- Support for multiple transport types with Internet/MPLS/LTE or any transport combination
- Mapping of traffic/CoS to underlay transit MPLS network for inter-PoP site connectivity via native PE integration

Regional Hub Sites with Full & Partial Mesh Interworking

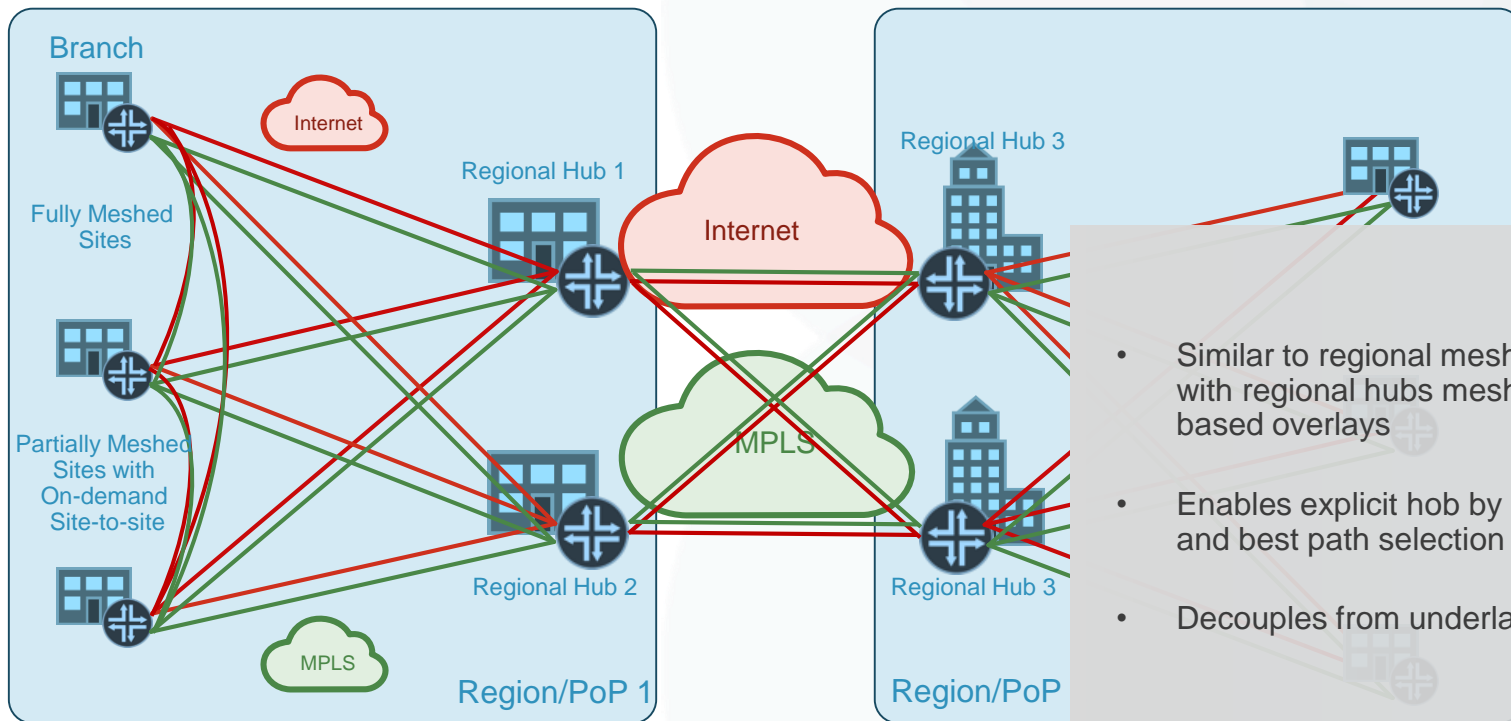
SD-WAN with MPLS as Transit



- Direct site-to-site connectivity bypassing hub sites for latency sensitive traffic
- Support for full end points to fully mesh or partially mesh with direct site-to-site connectivity via on-demand tunnel setup
- On-demand tunnels triggered by specific applications, i.e. VoIP

Regional Hub Sites E2E Full Mesh Overlay

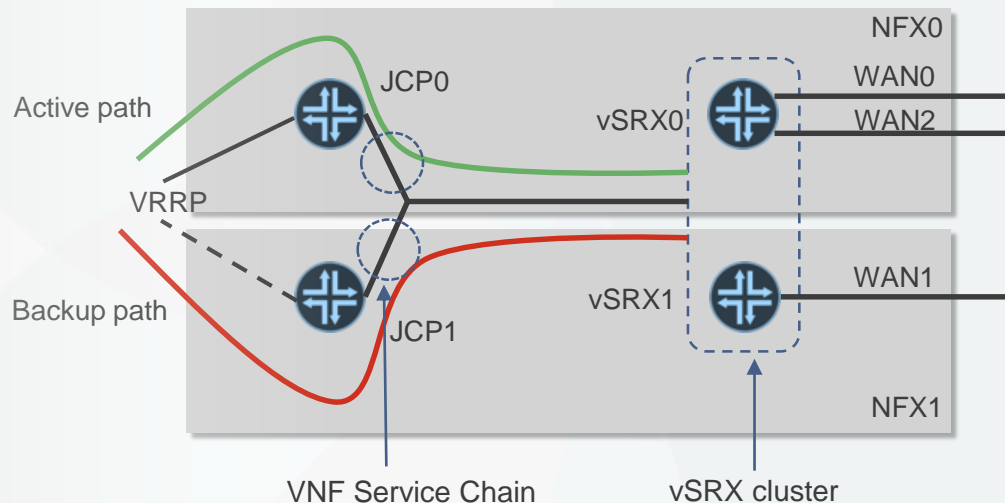
SD-WAN with E2E Overlay



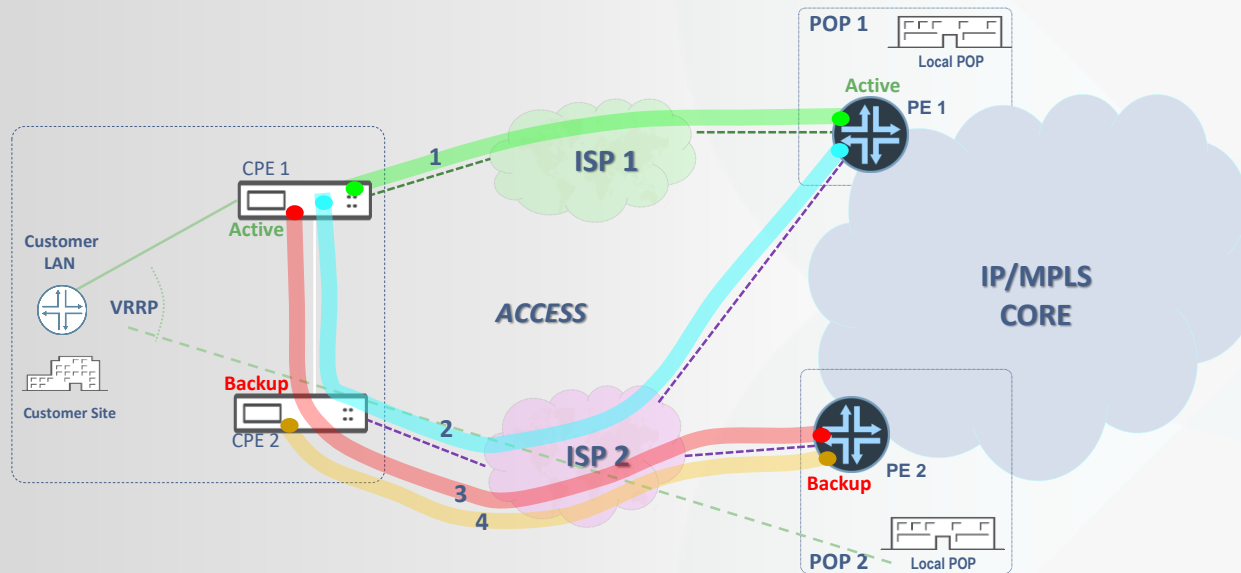
- Similar to regional mesh topology prior but with regional hubs meshed with SD-WAN based overlays
- Enables explicit hop by hop SLA monitoring and best path selection
- Decouples from underlay network entirely

Highly Available Dual-NFX CPE Support

- Dual NFXs with active/active WAN links across both devices at the branch
- GW vSRX operates in cluster mode with internal synchronization of routing/fib information
- Near hitless failover in case of a NFX or WAN link failure for local LAN traffic



Gateway High Availability with Dual Hub/PoP Support

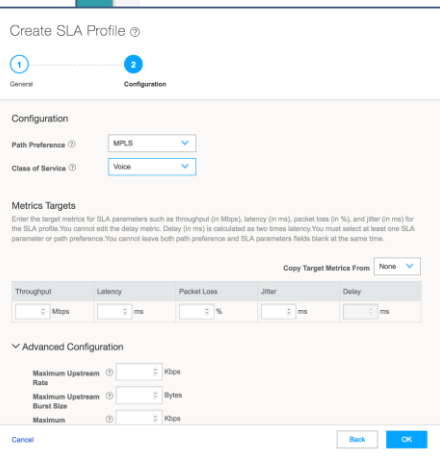
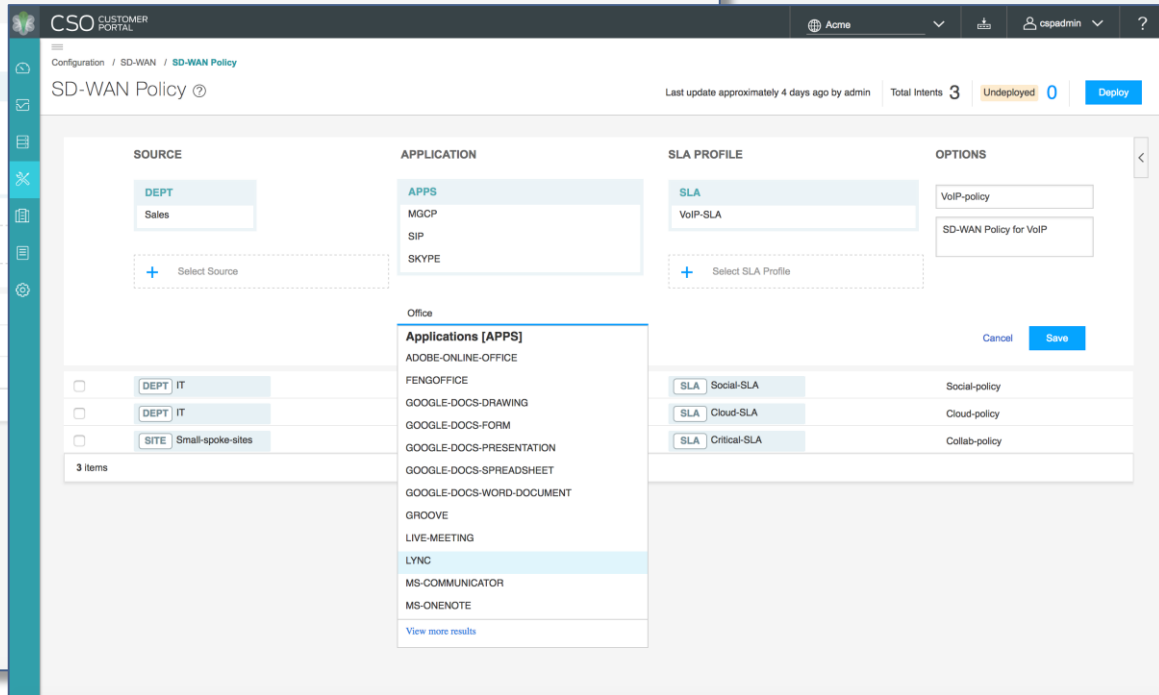
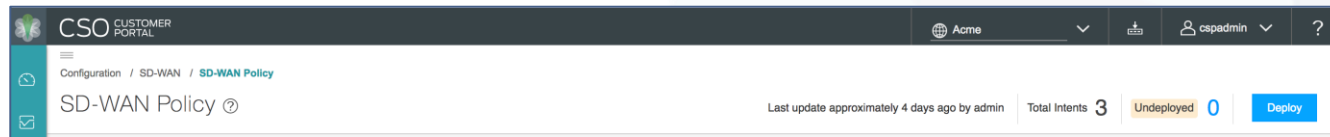


- Support for active/backup dual hubs with BGP based failover
- Backup SD-WAN Gateway(PE2) in case of primary gateway/PoP failure
- Dual NFXs with active/active WAN links across both devices
- Near hitless failover in case of a NFX or WAN link failure for local LAN traffic

SD-WAN {
1 WAN_0 - All Active
2 WAN_1 - All Active

NO SD-WAN {
3 ISP 1 and/or PE 1 Fails
4 ISP 1 and/or PE 1 and/or CPE 1 Fails

Integrated Intuitive Policy Management – New Intent based policy model for SD-WAN



Integrated Intuitive Policy Management – New Intent based policy model for NGFW

The image displays two screenshots of the Juniper Networks Administration Portal, illustrating the Firewall Policy configuration interface.

Left Screenshot (High-level View):

- Page Header:** ADMINISTRATION PORTAL, Configuration / Firewall Policy / Policy, Last update 7 minutes ago by orange_admin, Total Rules 2, Undeployed 0, Deploy.
- Source Section:** DEPARTMENT OrangeFinance, + Select Source.
- Destination Section:** DEPARTMENT OrangeRandD, + Select Destination.
- Rules List:**
 - 1. LAGR OrangeFinance (red minus icon) LAGR OrangeHR (+ icon)
 - 2. ADDR Orngaddress1 (red minus icon) ADDR Orngaddress2
- Footer:** 2 items

Right Screenshot (Detailed View):

- Page Header:** ADMINISTRATION PORTAL, Last update 2 hours ago by airtel, Total Rules 3, Undeployed 3, Deploy.
- Source Section:** Addresses [ADDR] (server-lab, servers, servers-critical-resources, Mumbai-resources, server-finance-ldr), SITES [SITE] (airtelBLR, Mumbai, Delhi), SITE GROUPS [STGP] (Mumbai_SG), DEPARTMENT [DEPT] (Engineering, Marketing, HR), View More Results.
- Destination Section:** + Select Destination.
- Options Section:** Scheduling (toggle), Logging (toggle), Rule name, Description.
- Rules List:**
 - 1. APPS LINKEDIN (red minus icon) Market_block
 - 2. STGP Mumbai_SG (red X icon) SITE Mumbai (red minus icon) Server_Lab_Deny
 - 3. STGP Mumbai_SG (red minus icon) STGP Mumbai_SG (red minus icon) ADDR HR-Server (red minus icon) test
- Footer:** 0 of 3 Selected

SD-WAN Roadmap



Available
Now!

SD-WAN with integrated NG Security Services



DEMO



THANK YOU



Q&A

REFERENCES & ADDITIONAL INFO

- SD-WAN for Service Providers – Cloud CPE
 - <https://www.juniper.net/us/en/solutions/sd-wan/>
- SD-WAN for Enterprise – Cloud Enabled Branch
 - <https://www.juniper.net/us/en/solutions/cloud-enabled-enterprise/branch/>
- Contrail Service Orchestration
 - <https://www.juniper.net/us/en/products-services/sdn/contrail/contrail-service-orchestration/>
- NFX250 Network Services Platform
 - <https://www.juniper.net/us/en/products-services/sdn/nfx250/>
- SRX/vSRX Gateways
 - <https://www.juniper.net/us/en/products-services/security/srx-series/>