FUNDAMENTALS FOR RELOADED MPLS-VPN CONNECTIVITY

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Dec 12th, 2017
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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

VNF
Internet
VPN gateway
AWS cloud
virtual private cloud
virtual private cloud
VPN gateway
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

Top 3 drivers for SD-WAN:

- 34% Ability to use multiple WAN providers
- 32% Increase reliability of existing WAN
- 29% Site connectivity to cloud providers

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

- Branch
- Branch
- Remote Office

Remote Access via IPSec

Optional Direct Connect

MPLS

HQ

Internet

Cloud-based applications

Microsoft Azure

FMO with SD-WAN Services

- Branch
- Branch
- Remote Office

Remote Access via IPSec

Managed Secure SD-WAN Enabled Edge

Optional Direct Connect

MPLS

HQ

Internet

Cloud-based applications

Microsoft Azure
End to End SD-WAN with Transport Independence

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

Intelligent Branch

Analytics and Deep Application Inspection

Application-based SLAs

Centralized Policy Management

Secure and Managed VPN

Orch + Controller: Policy-based routing defines how network traffic is prioritized and routed

Analytics provide visibility into WAN performance & informs routing improvements

CPEs: Devices enforce routing policy & enable easy deployment & management

Cloud-based applications

Non-critical applications
Branch Consolidation & Evolution to SD-WAN

Bring Agility and Enhanced Customer Experience Utilizing Cloud Technology

Legacy Branch (PMO)

- WAN Optimization
- Router
- NG Firewall
- UTM Firewall
- WLAN Controller
- Switch

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

Future Branch (FMO) with D-NFV

- VIRTUALIZED SERVICE
- SD-WAN
- Other VNFs
- CPE Platforms
  - Services
  - Applications

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

- Service Orchestration
  - Contrail Service Orchestration (CSO)
    - Connectivity inc. service chaining
    - Security

- Virtual Network Functions inc. Service chaining
  - vSRX and vMX and Third Party VNFs
  - SilverPeak
  - Ruckus
  - Riverbed
  - ... (indicated by three dots)

- Universal CPEs / Branch CPE / Soft CPE Devices
  - NFX
  - SRX
  - Soft NFX

- Physical / Virtual SD-WAN Hubs and Gateways
  - MX & SRX Series / vSRX

- Service Orchestration (MANO)
  - Network Service Controller (NSC)
  - Internet
  - Branch
  - Public Cloud
  - Telco MPLS, LL, ...
  - Cust VPN
  - VNFs

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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

Optimized for small footprint

NFX Series

vSRX VNF

3rd Party

MPLS Internet

4Gb/s (2 vCPU, 4GB) Optimized for small footprint
SD-WAN CPE Product Portfolio

Flexibility and Scale

- SRX300
- SRX320
- SRX340
- SRX345

Performance

- Custom PFE
  - 0.5-2.0 Gbps router
  - Crypto acceleration
  - Integrated Appliance
  - No virtualization
  - VDSL, LTE

- Whitebox CPE/Server
  - 4 Gbps router
  - (2vCPUs), up to 20Gbps Router (10vCPUs)

- ATOM 4C/8C
  - 2-4 VNFs
  - Crypto acceleration
  - Expansion slot / LTE Server

- Xeon D 6C / Pentium D 4C
  - 2-8 VNFs
  - AES-NI acceleration
  - 1GE/10GE Server + HW PFE

- Xeon Multi-socket
  - High Performance
  - 1/10GE and higher
  - Crypto acceleration
  - Expansion slots
  - Server

CSO/NSC Automation, SD WAN & Security

Open VNF Platform

- NFX250 S2
- NFX250 S1
- NFX250 LS1
- NFX350

- NFX250 S2
- NFX250 S1
- NFX350

- NFX250 S2
- NFX250 S1
- NFX350

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- NFX250 S1
- NFX350

- NFX250 S2
- NFX250 S1
- NFX350

- NFX250 S2
- NFX250 S1
- NFX350
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
Integrated Intuitive Policy Management – New Intent based policy model for SD-WAN
Integrated Intuitive Policy Management –
New Intent based policy model for NGFW
SD-WAN Roadmap

Cloud CPE Distributed 2.0
Cloud CPE Distributed 2.1
CSO 3.0 Secure SD-WAN
CSO 3.1 Secure SD-WAN
CSO 3.2 Secure SD-WAN
CSO 3.3 Secure SD-WAN
CSO 4.0* Secure SD-WAN
CSO 4.1* Secure SD-WAN

Q4 2016
Q1 2017
Q2 2017
Q3 2017
Q4 2017
Q1 2018
Q2 2018
Q3 2018

Available Now!

SD-WAN with integrated NG Security Services
THANK YOU
REFERENCES & ADDITIONAL INFO

• SD-WAN for Service Providers – Cloud CPE

• SD-WAN for Enterprise – Cloud Enabled Branch
  • https://www.juniper.net/us/en/solutions/cloud-enabled-enterprise/branch/

• Contrail Service Orchestration

• NFX250 Network Services Platform

• SRX/vSRX Gateways