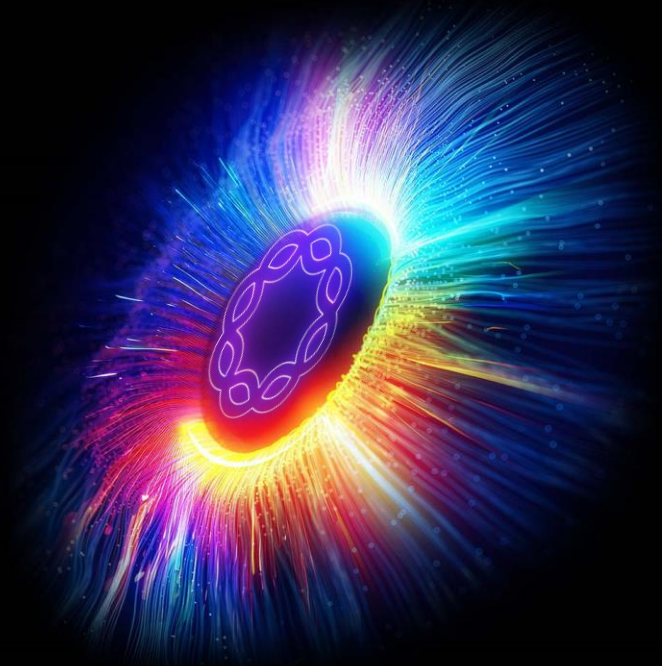


ribbon[®]
INSIGHTS



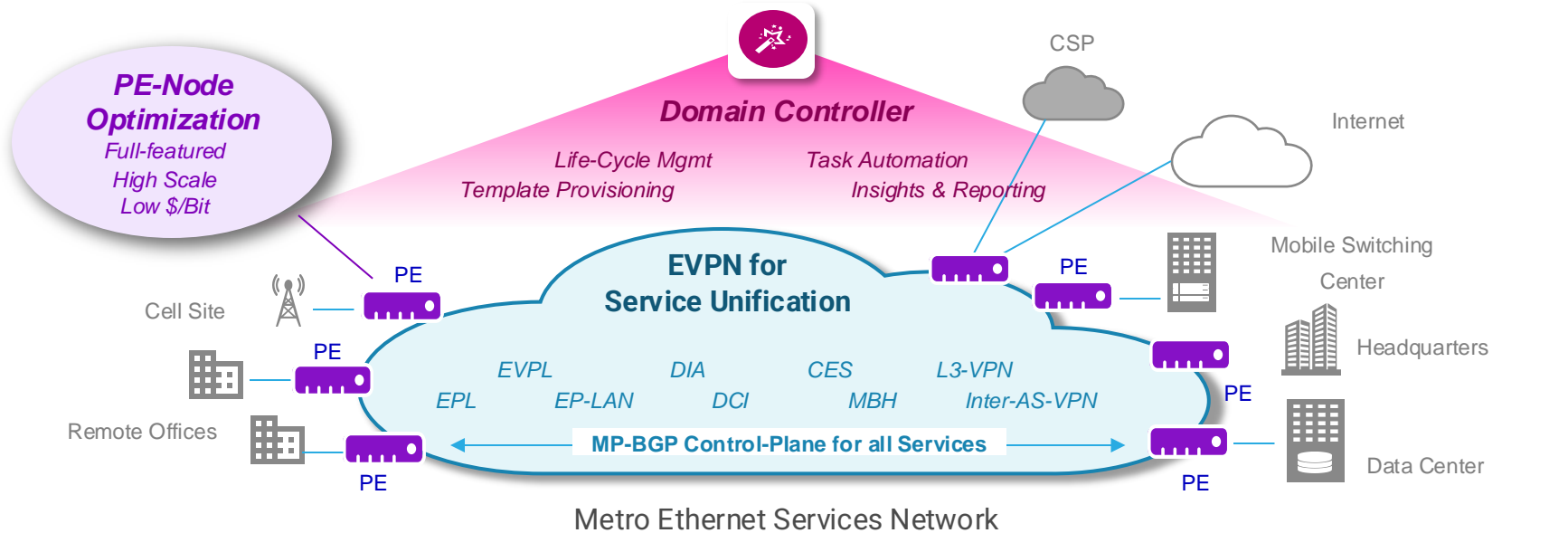
Modernizing Middle Mile

Glenn Yallaly

NASP Architect and Business Development

ribbon
INSIGHTS

Network Modernization for Metro Ethernet Services



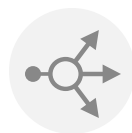
Service Flexibility



New Revenues



Higher Scale



End-End Resilience



Workflow Automation



SLA Assurance

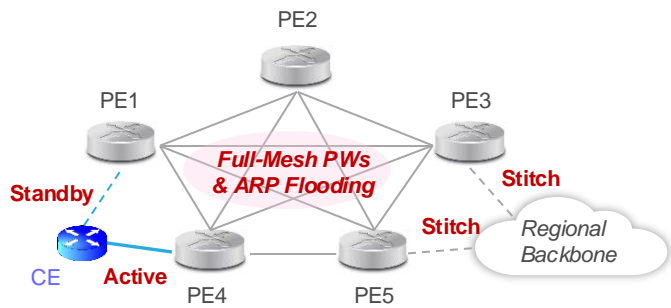
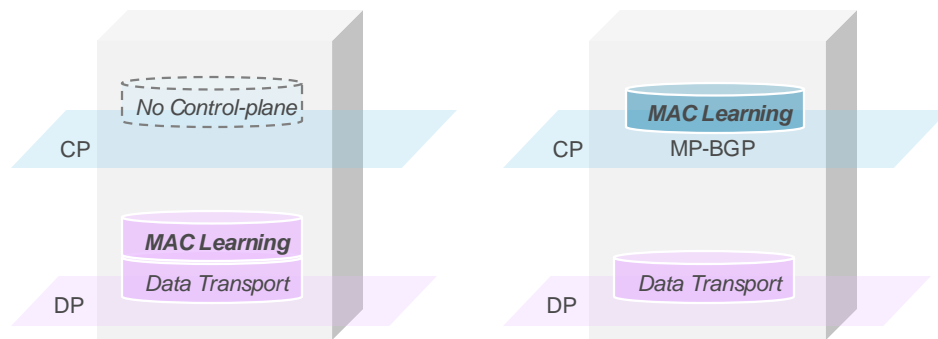


Optimize Cost/Bit

Major Benefits of Modern EVPN

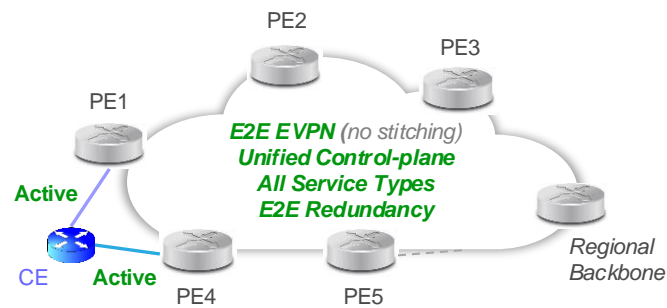
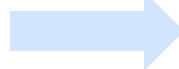
Middle-Mile Service Unification over EVPN

- Major operational simplification
- Foundation for automated provisioning
- Opens opportunity for new revenue streams
- Increases service and volume scalability
- Introduces end-end resiliency options
- Reduces convergence times
- Improves monitoring and SLA assurance



Previous Generation VPLS

Modernize
Ethernet Services



EVPN-based VPLS

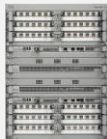
Modern Application of Merchant Silicon Routers

Custom Silicon Routers

Nokia
(7750 SR,
7730 SRX)



Cisco
(ASR 9000)



Juniper
(MX, PTX)



- At or Approaching EOS
- High Cost to Upgrade (CAPEX)
- High Annual Support (OPEX)
- High Facility Costs (Pwr/Space)
- Complex/Costly Redundancy
- Limited Support for DCO

Industry Trend

Operators' Expanding
Acceptance of BCM-based
Router Platforms



- *VPN PE Routers*
- *Metro Routers*
- *P Routers (LSRs)*
- *Border Routers*

Merchant Silicon Routers

BCM NPU (J2c, J2, J2c+, J3)

NPT 2300



Centralized, Modular

NPT 2400



Compact Fixed

- **Significantly Lower Cost**
- **High Forwarding Capacity**
- **Internet-Class Service Scale**
- **Advanced QoS Pipeline**
- **Highly Programmable**
- **Built to Leverage DCO**

NPT for Modernizing Metro Ethernet Services

PE and Hub Aggregation for Enterprise VPN and Ethernet DCI - 10G → 400G



NPT-2100

- 1-RU / 300mm (depth)
 - 800G Q2a NPU
 - 24 x SFP28 + 2 x QSFP28
 - 2 x 400G QSFP-DD ZR+
-
- PE Node for 10G/25G VPN
 - Service scale for large networks
 - Uplink at 100G and/or 400G DCO
 - Cost optimized PE @ ~ \$10/Gbps



NPT-2300

- 3-RU / 300mm (depth)
 - 2.4T J2C NPU
 - 7-slot Centralized/Modular
 - 10G → 100G/400G ZR+
-
- J2C in compact, modular chassis
 - Simple NPT 1300 upgrade path
 - Internet scale FIB/RIB, LSP, VPN
 - Cost-effective internet-scale router



NPT-2400

- 2-RU, 4.8T J2 NPU
 - 24 x 100G w/ 48x10G (BO)
 - 6 x 400G QSFP-DD ZR+
 - 8 x 100G QSFP-DD ZR+
-
- 100G/400G Eth Svcs Hub Router
 - Migration path for 10G access to 100G
 - DCO on 100G / 400G ports
 - Cost optimized Hhub @ ~ \$7/Gbps

Services

- L2-VPN VPLS/VPWS
- EVPN VPLS/VPWS
- L3VPN

Tunnels

- MPLS-LDP
- SR-MPLS; SR-TE (PCC)
- BGP-LU

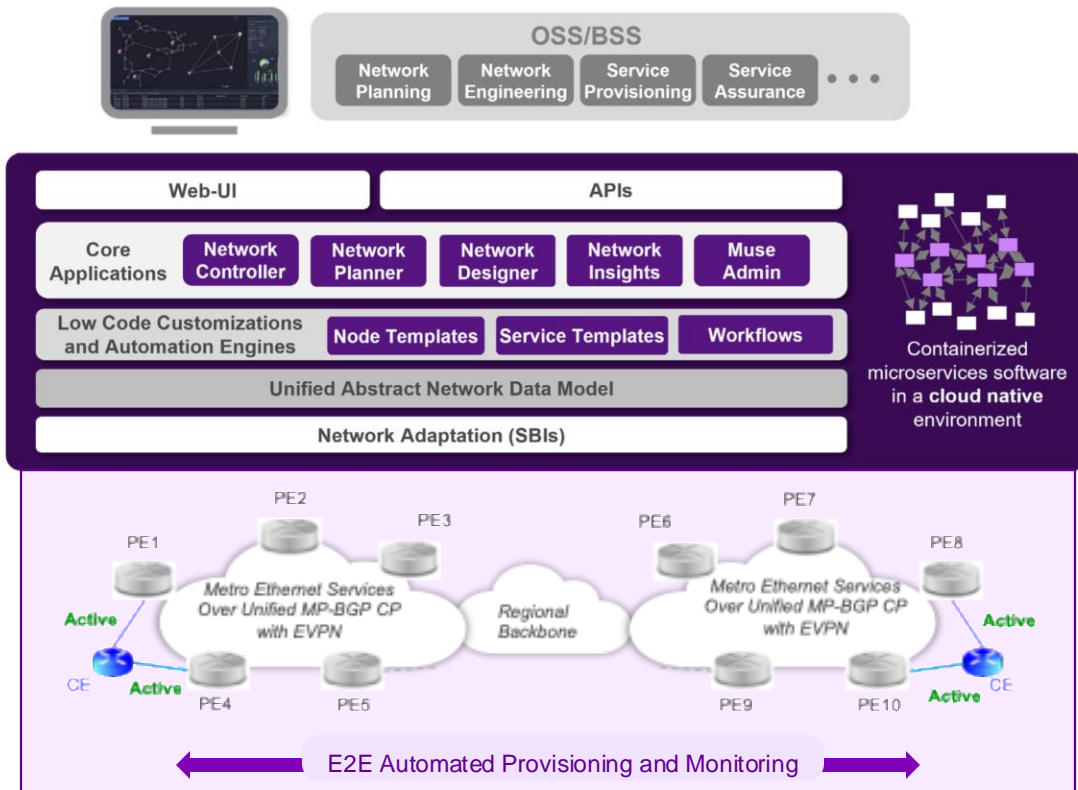
Programmability

- Provisioning: Netconf/YANG Models
- Path Computation: PCEP, BGP-LS
- Telemetry: OpenConfig Models over gRPC

OAM

- CFM (802.1ag)
- PM (Y.1731)
- SAT (2544, 1564)

Modern SDN Controller for Life-Cycle Management



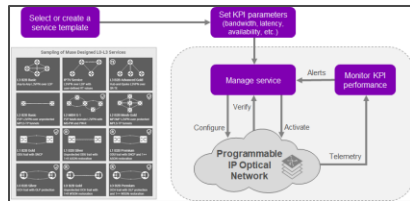
- Advanced Workflow Automation
- Intent-based Provisioning
- Multi-layer Topology & Device
- SDN TE Path Computation
- Insights and Analytics
- Closed-loop Automation
- Cloud-native Deployment
- Flexible North-bound Interfaces
- Flexible South-bound Interfaces

Muse Advanced Functions

Network Automation

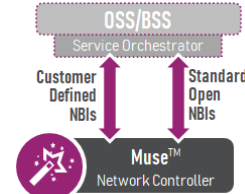


Workflow Engine

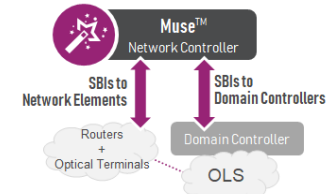


Service Provisioning

Multi-Vendor and OSS Integration

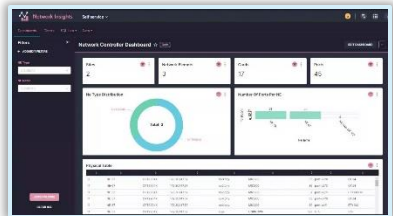


Flexible NBI



Flexible SBI

Advanced Analytics



Network Insights



Network Health

Cloud Native Architecture



Microservices Architecture



K8S Infrastructure