Building the Internet for the Future with Sustainable Deployment Models

Swayam Sarangi, Engineering Product Manager
Vishakha Mysore Vedavyas, Engineering Product Manager
Osvaldo Pacheco, Technical Marketing Engineer

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Agenda

1. CSP market trends, challenges, and requirements
2. Cisco innovations and solutions
   - Silicon One and centralized architecture
   - Cisco 8608 Router
   - Crosswork Network Automation
3. Demo
4. Q & A

CSP market trends, challenges, and requirements

Trends and challenges

- Traffic levels continue to increase with demands for new content and applications
- Hybrid cloud (on-premises private, hosted private, public) creates dynamic traffic patterns that impact the core
- Colocation facilities constrained for power and space
- Networks have become highly complex to build, manage, and operate at scale

This environment makes it difficult for providers to meet their sustainability goals

Requirements

- Dynamic network with the ability to adapt to changing traffic patterns
- High performance and density core platform to address growing traffic load
- Power- and space-efficient systems
- Simplified network / service management and scalable operations

Cisco provides innovative solutions to address sustainability initiatives

Cisco innovations and solutions

Cisco Silicon One family

One architecture. Unmatched capabilities.

Unparalleled programmability, performance, flexibility, and efficiency

Higher bandwidth
More network bandwidth than other routing silicon

Larger scale
Ready for massive internet scale

Better performance
More packets per second than other networking silicon

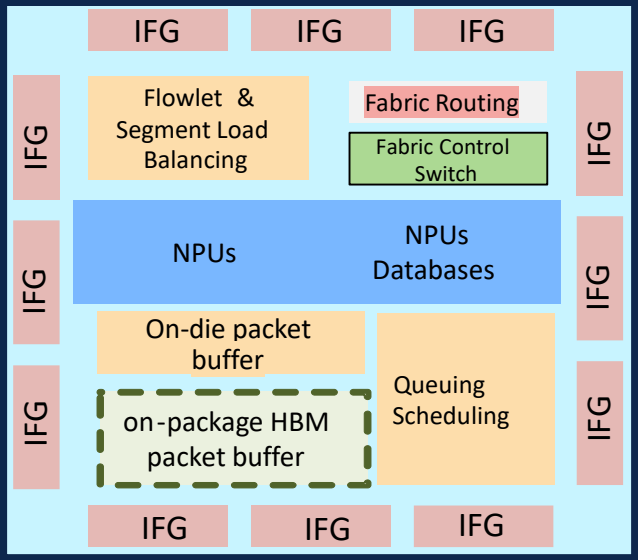
Endlessly programmable
Fully programmable for faster feature delivery and future-ready deployments

Lower power
Routing features, scale, and performance at better than switching power efficiency

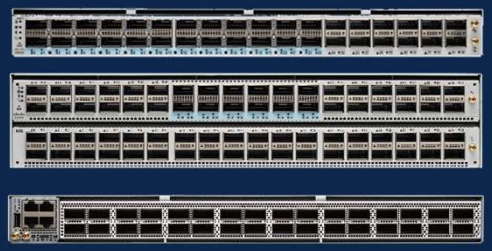
Deeper buffers
Switching devices with fully shared on-die buffers and routing devices with seamless extension to large buffers

Cisco Silicon One Q200

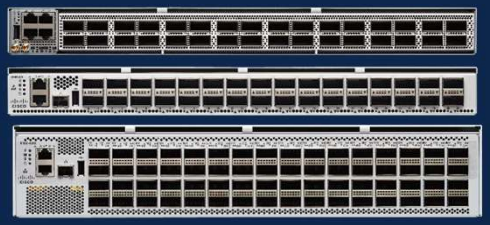
- 12.8T
- 256x 56G SerDes
- 7nm
- Large on-die
  - TCAM (double TCAM for larger LPM/HBM/ACLs)
  - SRAM
- Simplified network / service management and scalable operations



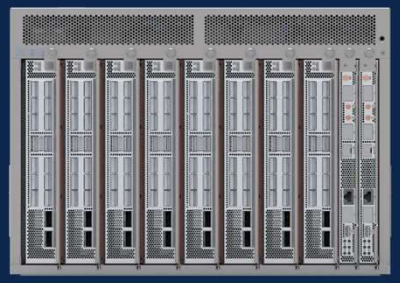
8000 Series product line



8200 SP/DC Fixed



8100 SP/DC Fixed

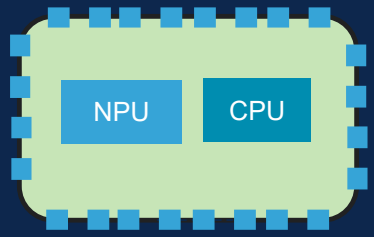


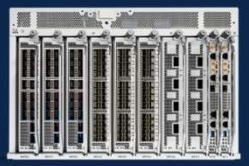
8600 Centralized Modular

8800 Distributed Modular

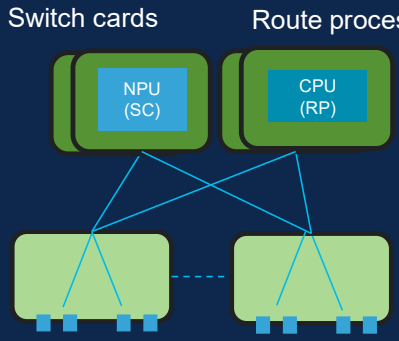
Cisco 8000 Series Router portfolio

Fixed

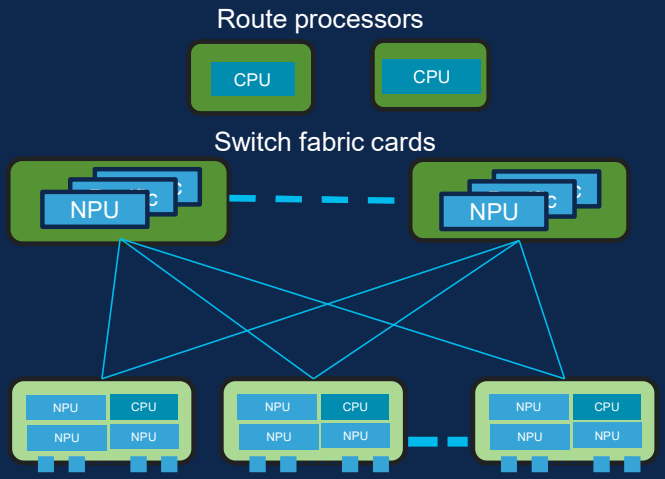




Centralized

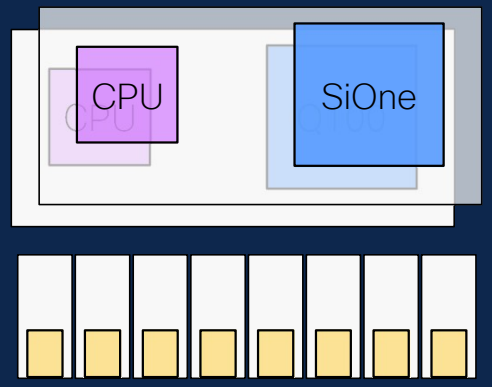


Distributed



Benefits of centralized architecture

- Single/Dual Silicon One ASIC meets bandwidth requirement for many roles
- Redundancy is required in many traditional SP environments
- Migration path to higher-speed ASICs
  - Port adapter investment protection
  - No re-cabling required for SC upgrade
- Addresses use case where CP & DP redundancy is needed

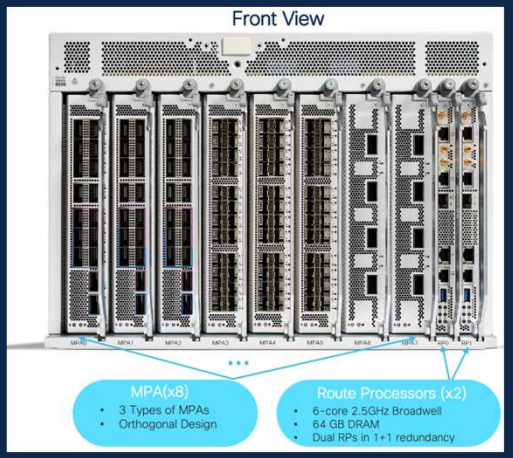


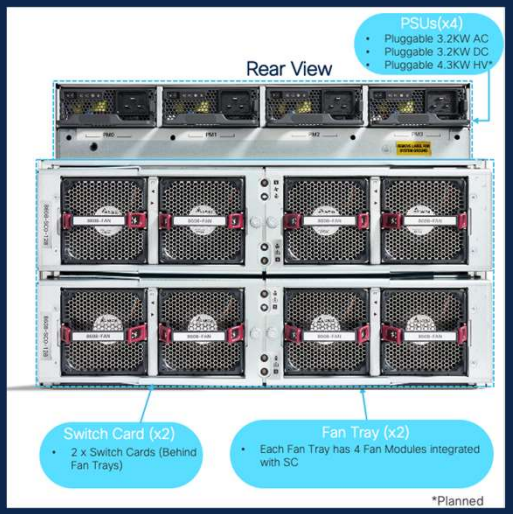
Cisco 8608 Router

8608 Series introduction

- Q200 based ASIC
- 12.8 Tbps in 7 RU , 8 x 1.6Tbps per slot
- 580mm in Chassis depth
- Redundant Control & Data Plane (Active / Standby RP & SC)
- 3 Types of MPAs
  - Combo MPA – 16x100G **or** 12x100G+1x400G **or** 8x100G+2x400G
  - 4x 400G MPA
  - 24x 10/25/50G MPA

- Hardware designed for compatibility with NextGen NPU based SCs
- MACsec support on all Ports
- Timing Support (Class B/C* compliant for PTP & Sync E, GNSS)
- RON ready, wide DCO support including ZR / ZRP / BZRP on all 400g Ports
- Feature parity with other Cisco 8000 Q200 fixed systems





* Roadmap

Modular port adapters (MPAs)

			
Type	Combo 100/400G MPA	10/25/50G MPA	400G MPA
PID	86-MPA-14H2FH-M	86-MPA-24Z-M	86-MPA-4FH-M
Port combination	16x 100G or 8x 100G + 2x 400G or 12x 100G + 1x 400G	24x 10/25/50G	4x 400G
Maximum throughput	1.6T	1.2T	1.6T
Optics	Native 40/100G optics support ZR / ZRP / BZRP on all 400G ports	Native 10/25/50G optics support	ZR / ZRP / BZRP on all 400G ports
MACsec & timing	MACsec on all ports, class B/C*		

*Roadmap

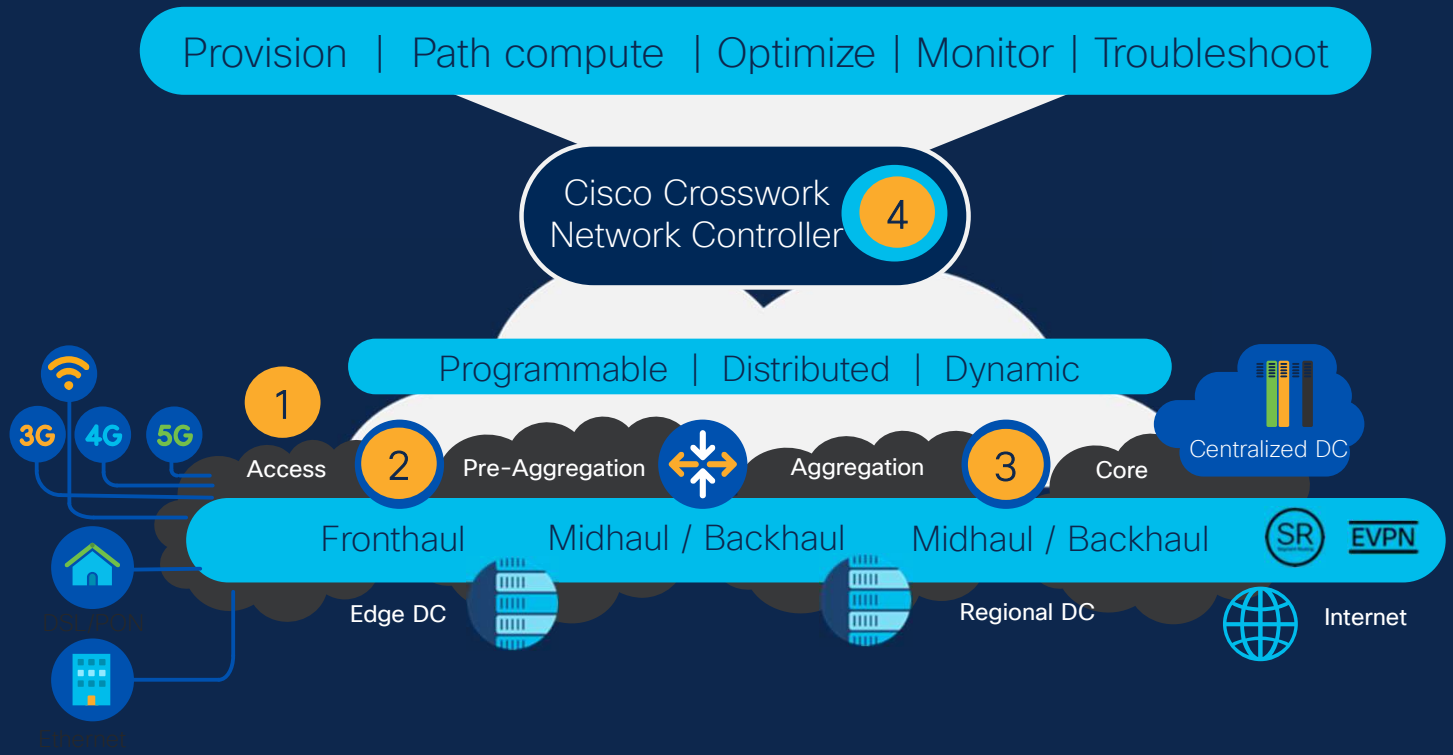
Key takeaways

- Efficiency
  - Power/Space/Cooling/Cost
- Flexibility
  - 10/25/40/50/100/400G interfaces
- Reliability
  - Redundant control and data planes
- Leverage the 8608 router to build sustainable networks

Crosswork Network Automation

Differentiated services management and operations

Crosswork Network Controller (CNC)
SDN Transport Automation



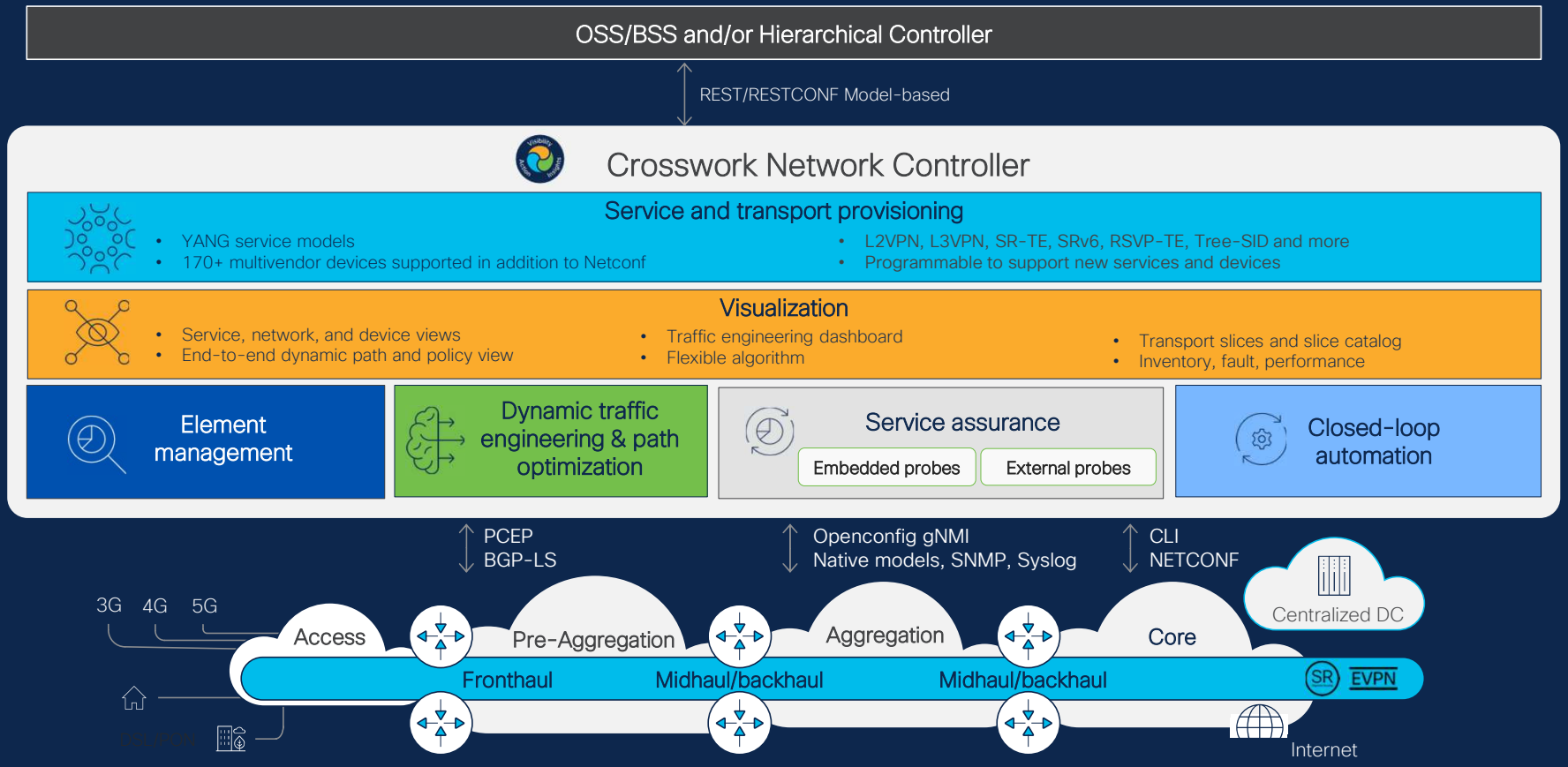
Challenges

1. Cumbersome service provisioning
2. Bandwidth swings, overcapacity, and congestion
3. Maintaining SLAs
4. Siloed tools, fragmented visibility

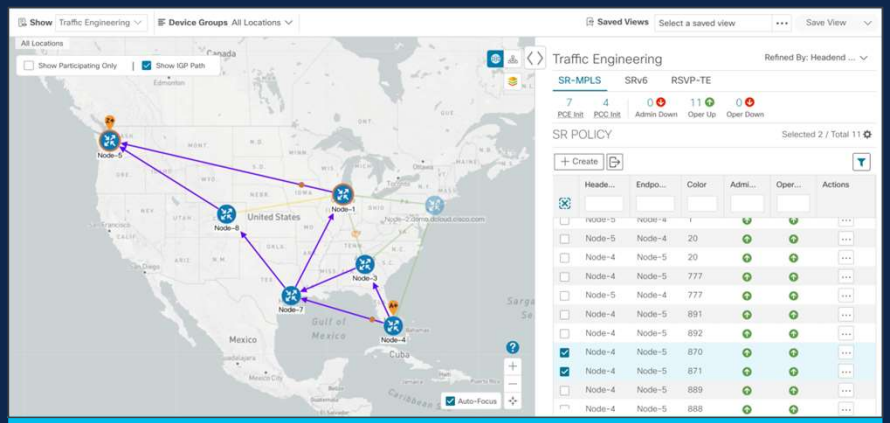
Outcomes

- Intent-based automated provisioning
- Dynamic traffic engineering
- Closed loop automation
- Integrated service lifecycle management

CNC: Integrated service and device management



Real-time network optimization



SR policy SLA objectives and constraints

Objective	Latency/IGP/TE metric minimization
Constraints	Affinities, disjoint paths, bandwidth

✔ Preserved service intent

Challenges

- Manual re-optimization based on network changes is not scalable and poses risk to target SLAs

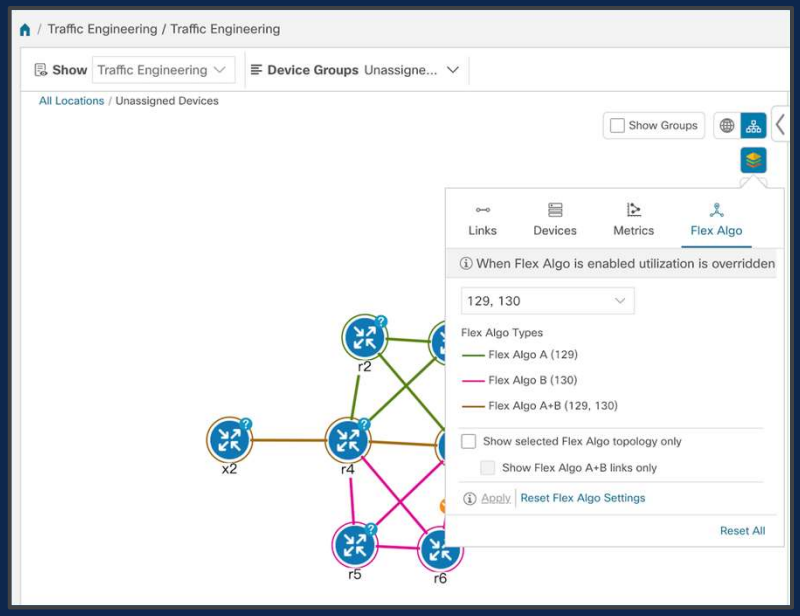
Solution

- Define policy intent once
- Automatically detect topology changes
- Real-time re-computation of paths in violation of “optimization metric” aka intent
- Optimized path is automatically provisioned

Outcomes

- Preserved service policy intent and associated SLAs
- Enhanced operational agility with real-time action
- Optimal utilization of network capacity

Fine-grain policy control with FlexAlgo



Flexible path control

Challenges

- Inability to scale with end-to-end, fine-grain control over the myriad 5G services with distinct policy requirements

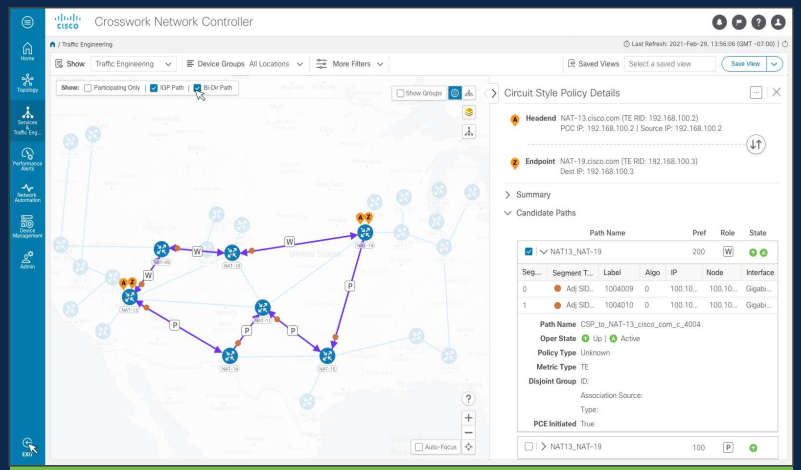
Solution

- Customized IGP shortest path computation
- Flexibility to define and assign new SR segments (prefix SIDs)
- Establish traffic-engineered path from anywhere to anywhere automatically computed by the IGP

Outcomes

- Enhanced TE control with SID list customization
- Operational flexibility and control to meet SLA intent
- Custom-fit 5G network slices to specific applications

Segment Routing circuit style



Circuit style policy details—
co-routed bidirectional

Challenges

- Deliver bandwidth guaranteed services with path protection over Segment Routing
- Leverage a Segment Routing infrastructure to carry any kind of services including OTN, TDM, CEM

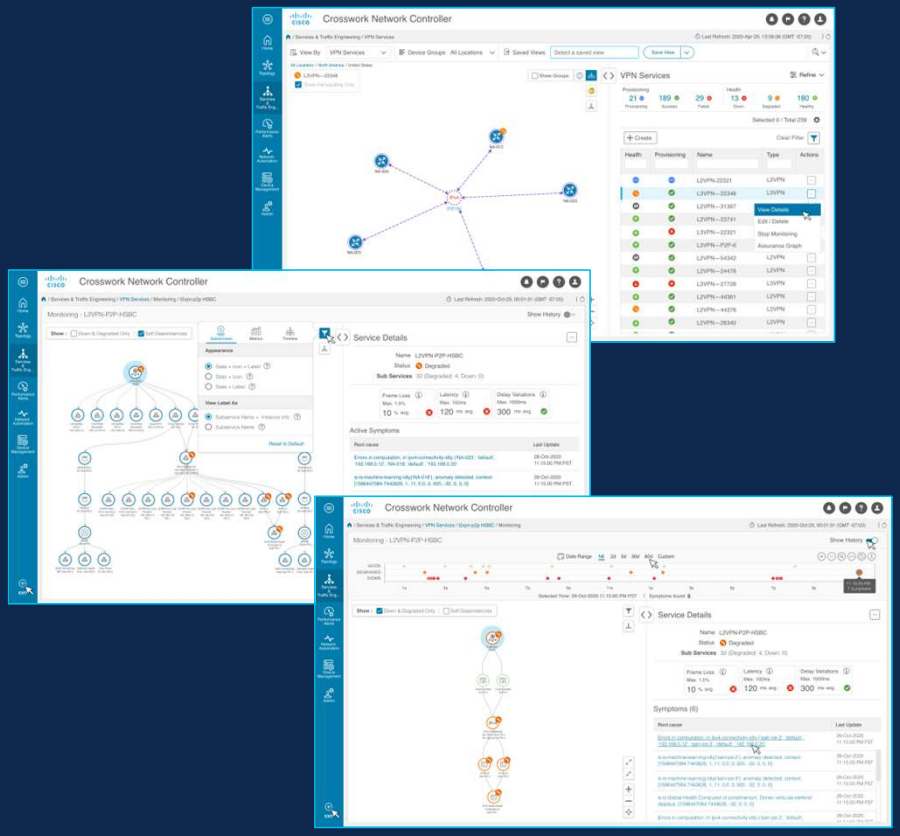
Solution

- Pre-book some bandwidth in the network to be used by these circuit style policies
- Use the SDN controller for bandwidth bookkeeping and path computation
- Use the SDN controller to compute bi-directional, co-routed paths with path protection (under 50ms)

Outcome

- One unified Segment Routing infrastructure can be used to carry any kind of services, including the most demanding ones

Service health monitoring



Challenges

- Decoupled service provisioning and monitoring
- Disconnect between customer service experience and network health

Solution

- End-to-end service health monitoring
- Proactive causality models
- Linkage between service and underlying components

Outcomes

- Reduction in time-to-detect service issues and remediation
- Improved user experience and operator productivity

Key takeaways

- Ready solution for network automation
- Offers integrated network/service and operations management under a single pane of glass
- Leverage Crosswork Network Controller to build sustainable networks

Crosswork Network Controller Demo

Q & A


CISCO
The bridge to possible