

Developer Days
Automation

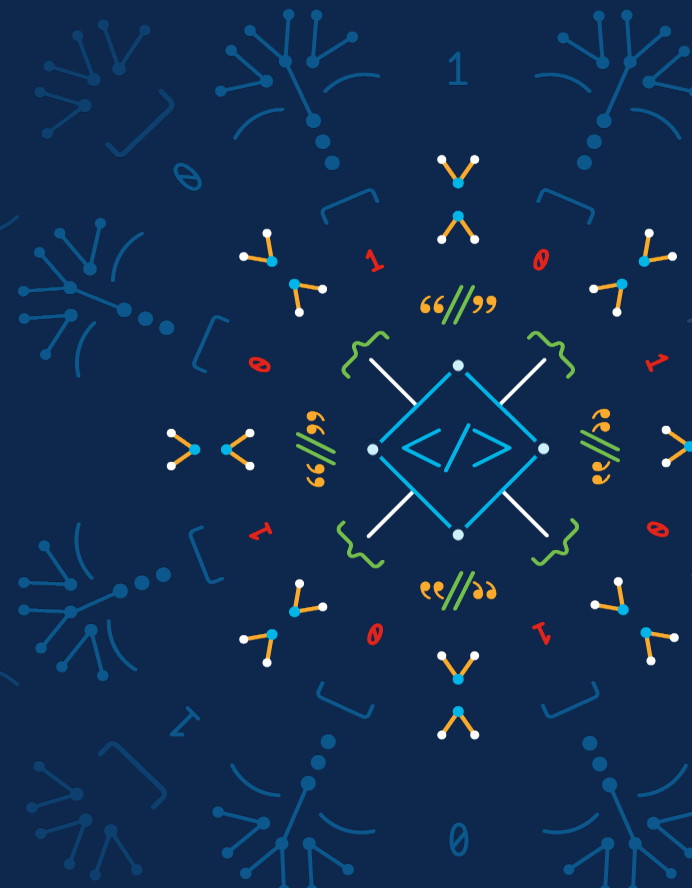


The bridge to possible

CNC Multi-Vendor

Non-Cisco Device Integration

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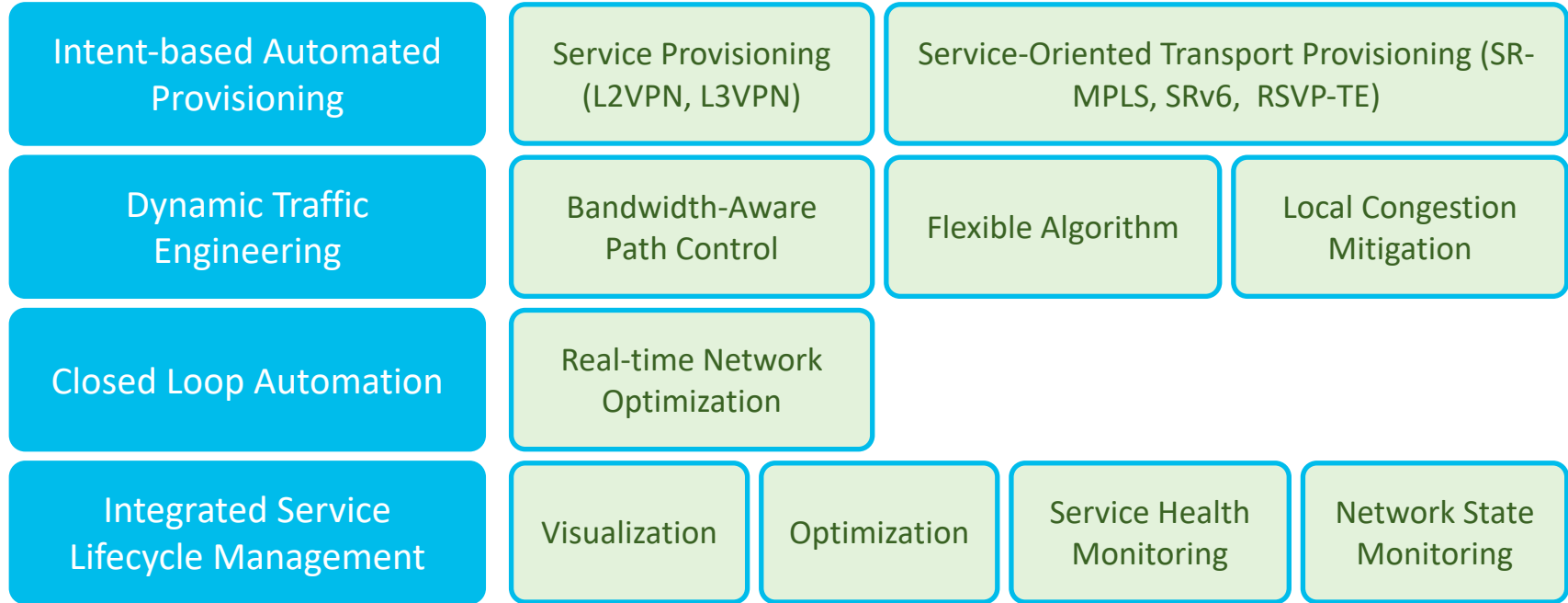


Session Overview

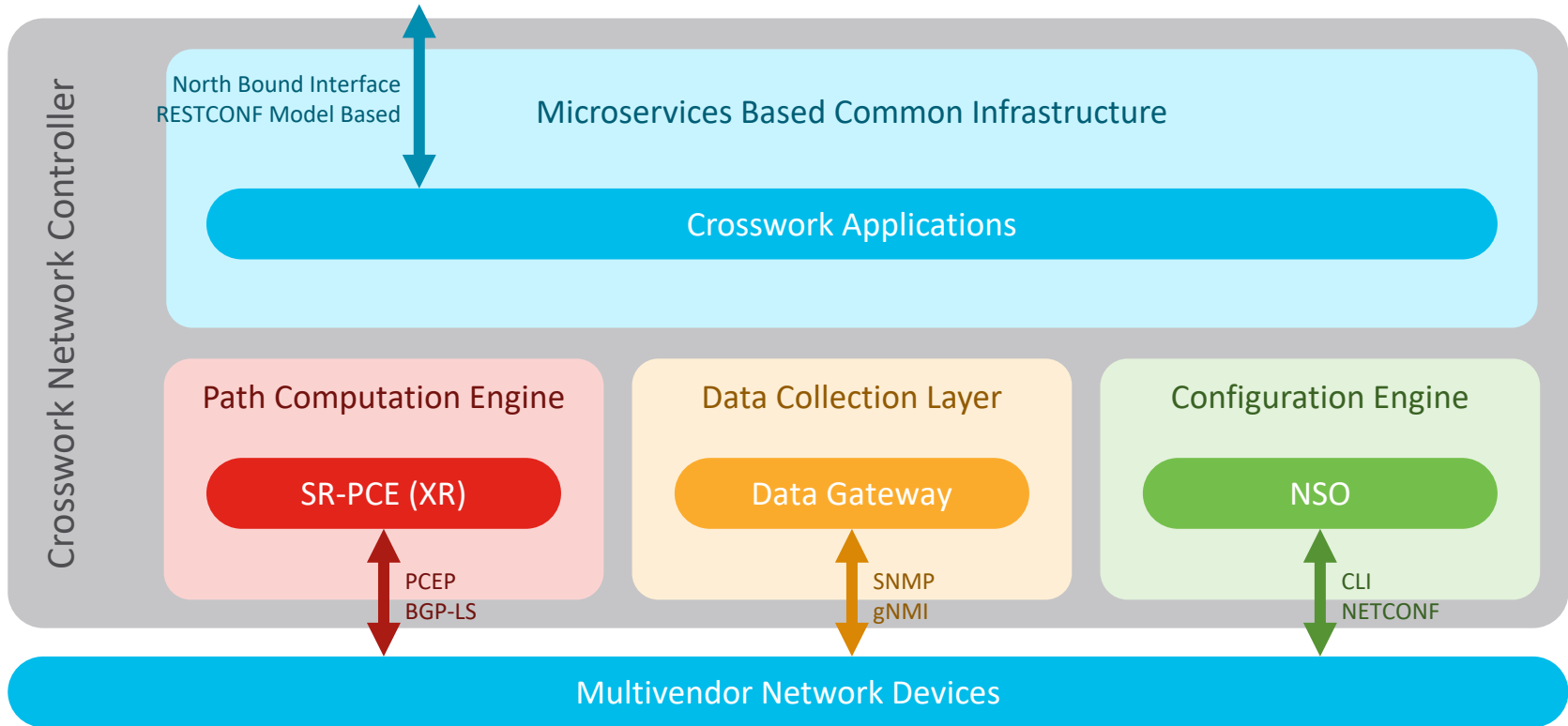
- CNC overview
- Customization and extension areas
- NSO steps to add new vendor
 - Python and templates to create configs for Juniper vMX
- CNC Demo
 - Creating and viewing VPNs and SR-TE with Cisco and Juniper

Crosswork Network Controller (CNC)

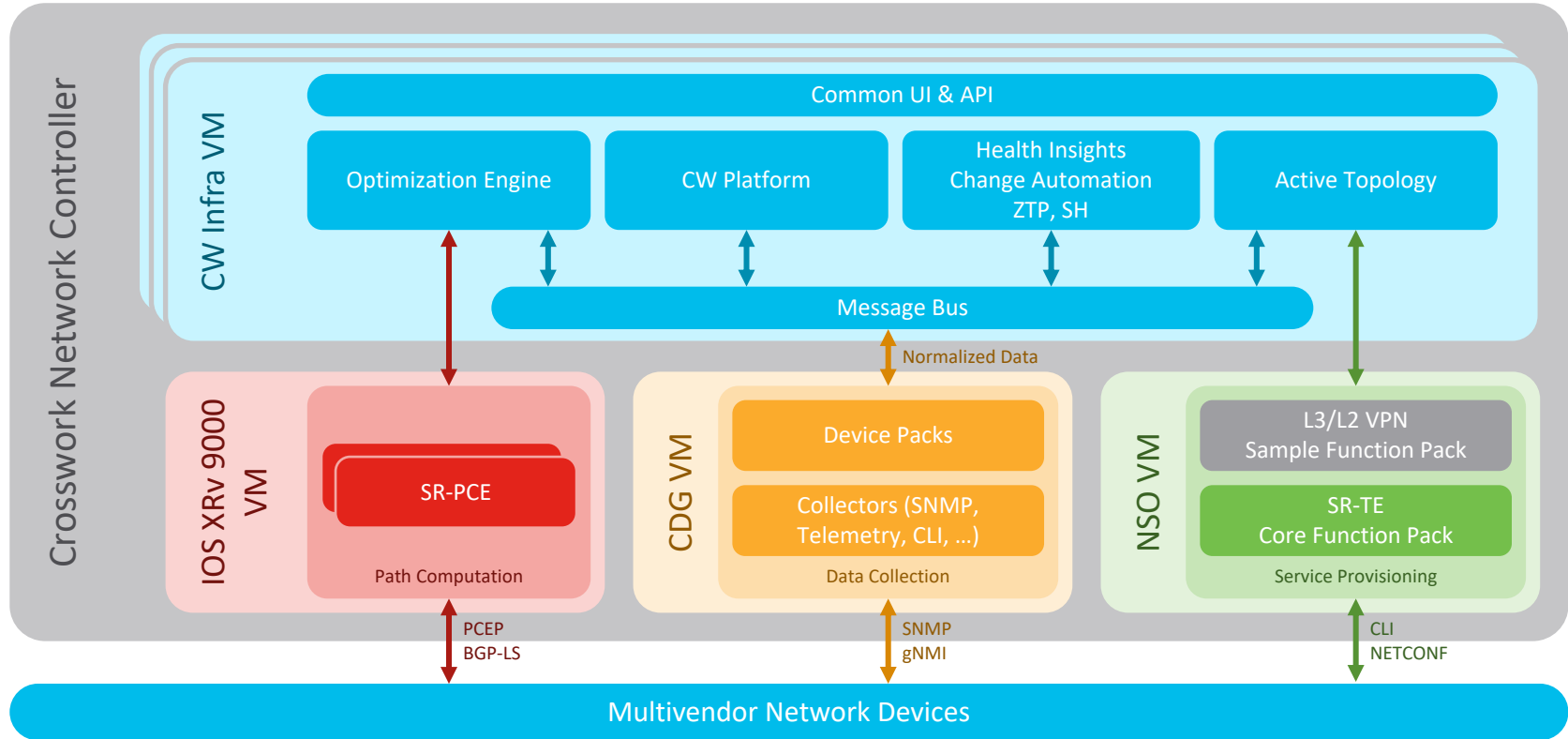
Automation solution for deploying and operating IP transport networks



Crosswork Network Controller – Architecture



Crosswork Network Controller – Architecture



CNC Core Functions

VPN Provisioning
Traffic Engineering
Telemetry Collection
Visualization

Configuration functionality

- TSDN CFP for SR-TE
- Example FP for L2/L3 VPN
- Example FP for RSVP-TE

Validated against recent combinations of IOS-XR/XE & specific hardware platforms

- Includes device collection / telemetry using SNMP
- SR-PCE validation on
 - XR versions for PCE
 - XR/XE versions for PCC

Support matrix published with release documentation.

CNC Optional Packages

Service Health

(pre-release with CNC3.0)

- Service Assurance for L2/L3VPN Example

Change Automation

- Maintenance automation

Health Insights

- KPI monitoring

ZTP

Zero touch provisioning

CNC – designed to be easily extensible



Service model extensions to extend the example VPN functionality (includes NBI extensions from L2NM / L3NM IETF drafts shipped)



Use of pre-existing VPN service model functionality and integrating with CNC (brownfield NSO package)



Adding new device types (multi-vendor)



Extending Service Health functionality

A good understanding of the network is essential



Routing technologies, platforms, services and operations



Lab validation of deploying the combination of hardware / software / features and integration with automation



Cisco professional services (CX) provides support and training

NSO Implementation & Demo

Adding new device type to CNC (multi-vendor)

Device

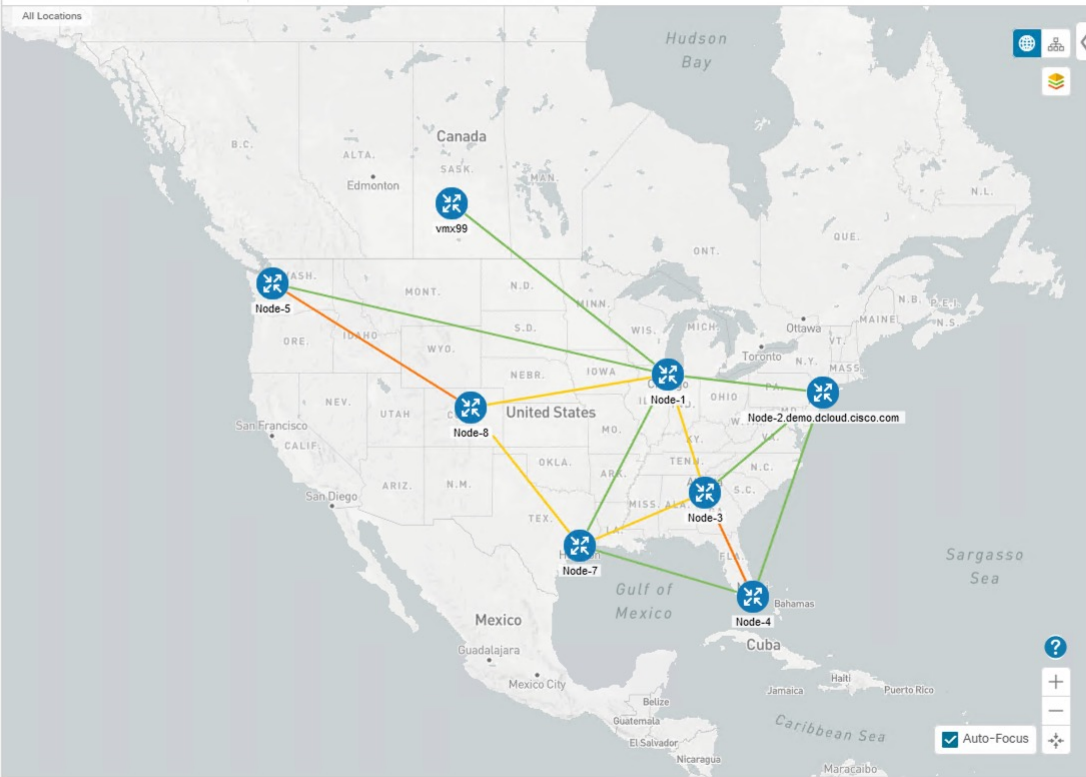
- Test and finalize actual device configurations
 - Network expertise is a must for this
 - Needs lab verification
 - Network engineering team signoff

NSO

- Verify NED exists and supports required configuration
- Create new (or update *-multi-vendors) package
- Add NED-to-class entry in dynamic-device-mapping
- Implement python class
 - Templates (optional)

Verify

- Visualization
 - No changes
- Data Collection
 - Verify CNC can detect the device
 - SYSTEM and IF-MIB/IP-MIB is required
- Test and verify



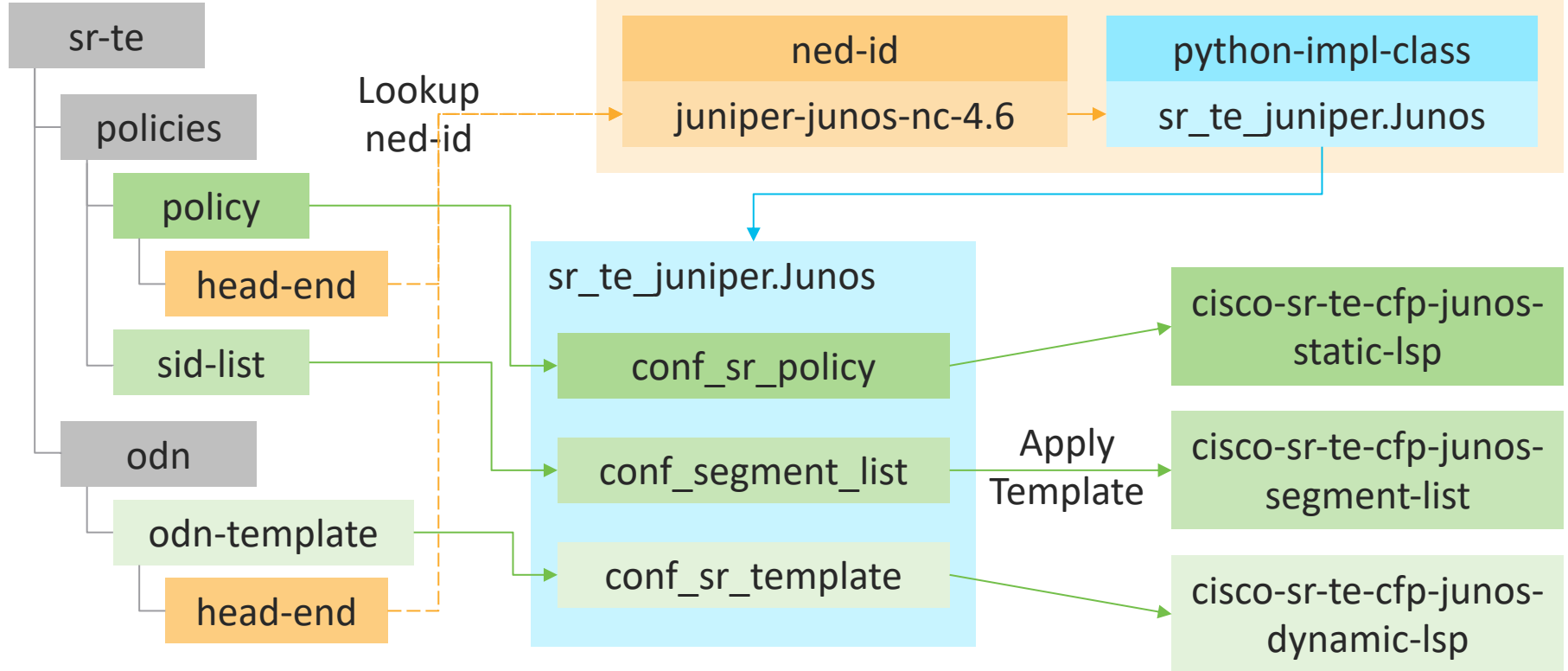
Topology

IP Domain: 8 Router
 Reachability: 8 Reachable, 0 Unreachable, 0 Unknown, 0 Degraded

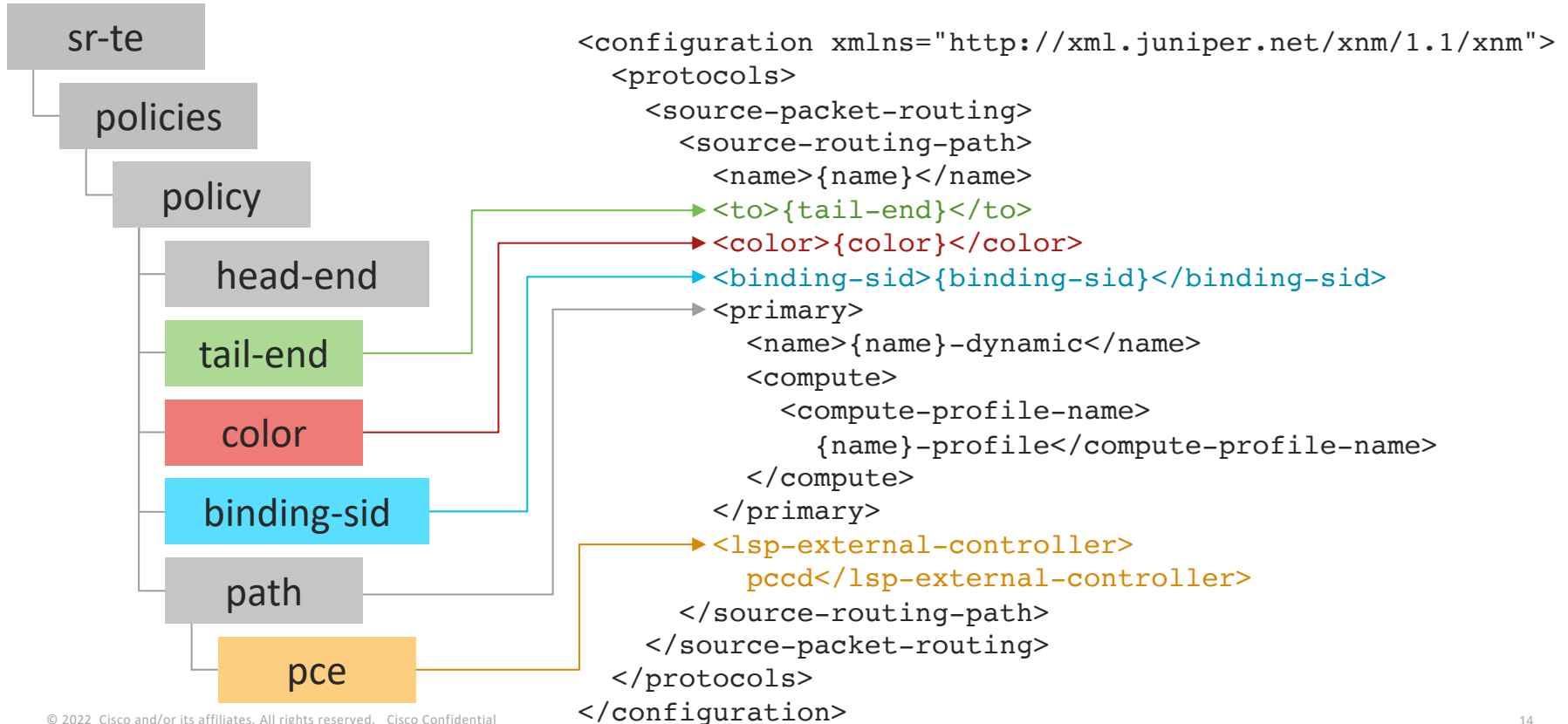
Devices Total 8 ⚙️

Host Name	IP Address	Reachability	Device ...	Product Type
Node-1	198.19.1.1	🟢 Reachable	🔌 Router	CISCO-XRv9000
Node-2 demo....	198.19.1.2	🟢 Reachable	🔌 Router	CiscoC8000V
Node-3	198.19.1.3	🟢 Reachable	🔌 Router	CISCO-XRv9000
Node-4	198.19.1.4	🟢 Reachable	🔌 Router	CISCO-XRv9000
Node-5	198.19.1.5	🟢 Reachable	🔌 Router	CISCO-XRv9000
Node-7	198.19.1.7	🟢 Reachable	🔌 Router	CISCO-XRv9000
Node-8	198.19.1.8	🟢 Reachable	🔌 Router	CISCO-XRv9000
vmx99	198.19.1.99	🟢 Reachable	🔌 Router	jnxProductNameVMX

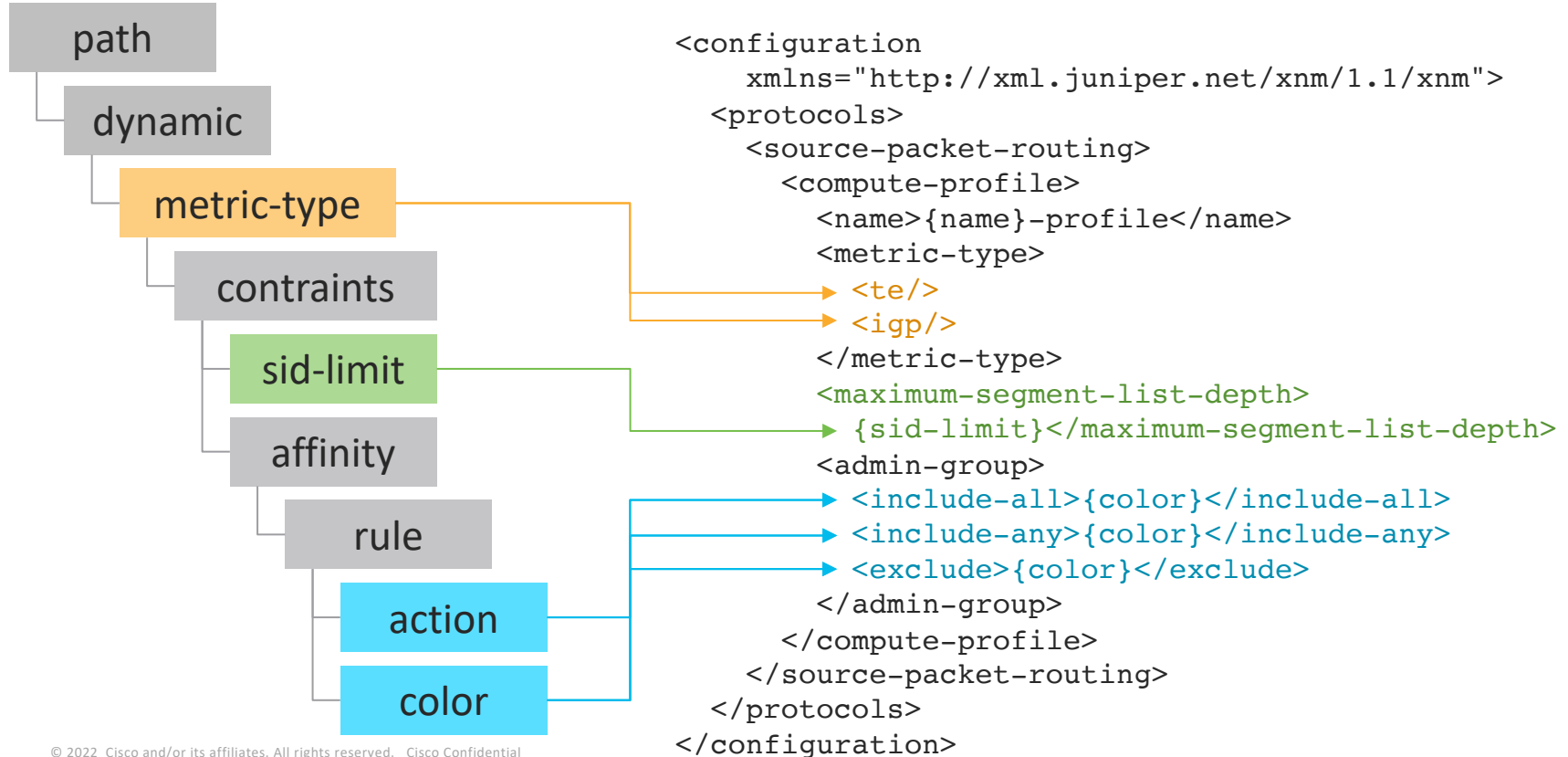
NSO sr-te-juniper



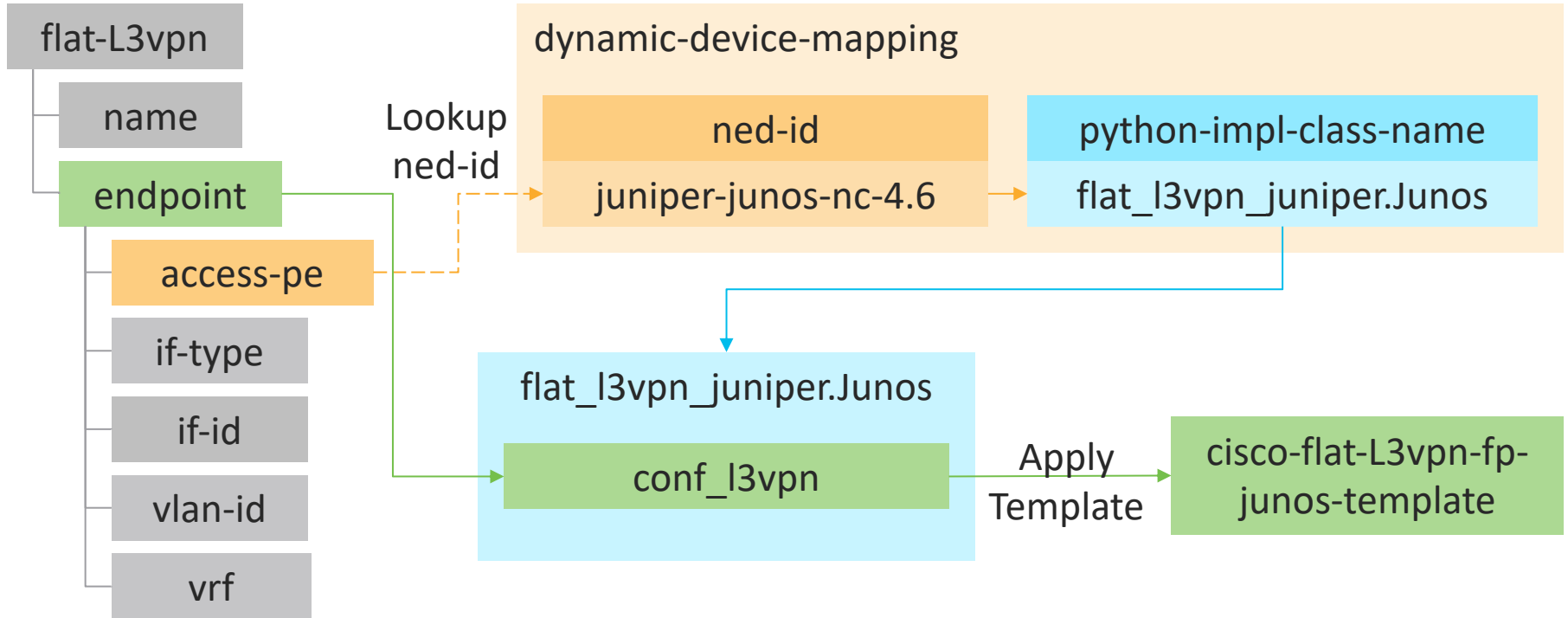
Template junos-static-lsp | source-routing-path



Template junos-static-lsp | compute-profile



NSO flat-l3vpn-juniper



dynamic-device-mapping

ned-id

python-impl-class-name

juniper-junos-nc-4.6

flat_l3vpn_juniper.Junos

Lookup
ned-id

flat_l3vpn_juniper.Junos

conf_l3vpn

Apply
Template

cisco-flat-L3vpn-fp-
junos-template

The background features a faint, light blue network diagram on a dark blue background. The diagram consists of various nodes and connecting lines, representing a complex network topology. Some nodes are circular, while others are more abstract shapes. Lines connect these nodes, forming a web-like structure. The overall aesthetic is technical and modern.

CNC Demo

Provisioning VPN & SR-TE on
Cisco & Juniper

Key Takeaways

- CNC uses standards-based interfaces and can support multi-vendor
- Use well known NSO multi-vendor implementation patterns
- Multi-vendor devices interop testing should include CNC

References

- NSO Packages

<https://developer.cisco.com/codeexchange/github/repo/maddn/tsdn-juniper>

- Crosswork Network Controller Product Documentation

<https://www.cisco.com/c/en/us/support/cloud-systems-management/crosswork-network-controller/model.html>

- T-SDN Function Pack User Guide

https://www.cisco.com/c/dam/en/us/td/docs/cloud-systems-management/crosswork-network-automation/NSO_Reference_Docs/Cisco_NS0_Transport_SDN_Function_Pack_Bundle_User_Guide_3_0_0.pdf

- Crosswork API

<https://developer.cisco.com/docs/crosswork/>



The bridge to possible