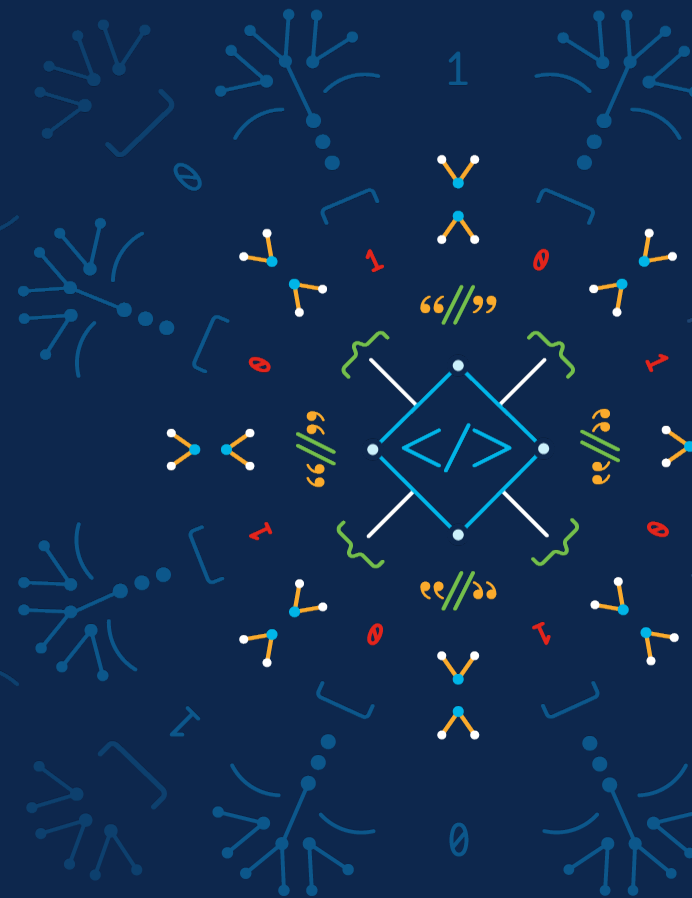


## Automated Extensible Service Assurance in Crosswork Network Controller

End to End Service Visibility

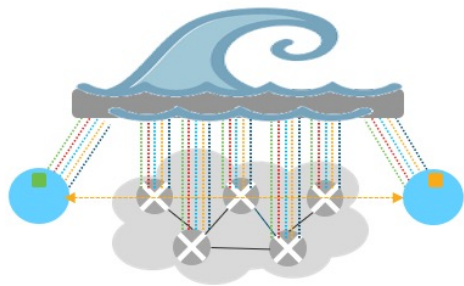
Krishnan Thirukonda, Sujay Murthy  
MIG A Crosswork TME  
11/30/2022



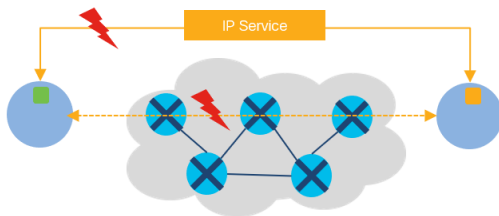
# Agenda

- 1 Service Health Overview
- 2 Heuristic Package & Customization
- 3 Brownfield VPN Services Support
- 4 Demo
- 5 Resources

# Automated Service Health Monitoring - Overview



Is service meeting SLA ?



Service is degrading!  
WHERE is the problem ?

## Challenges:

- Lack of end-to-end service visibility
- Decoupled Service Provisioning and monitoring
- Disconnect between customer service experience and network health

## Solution:

- Service Centric approach to health monitoring
- Dynamically tie Service Intent to infrastructure telemetry
- Codify networking troubleshooting "Know-How" to automate
- Based on the IETF Architecture Draft: **Service Assurance for Intent-based Networking Architecture**

## Outcome:

- Reduction in Time to Detect service issues and remediation
- Improved user experience and operator productivity

# Service Health Functionality

- Aggregate Health report at the VPN service level
- Monitor VPN service health at the sub-service level:
  - Device cpu, memory, service-endpoint interface and link,
  - xConnect and limited transport underlay.
- SLA metrics - Jitter, Loss, Delay, interface Oper state, etc.
  - Monitoring via Y. 1731 for L2VPN
  - Segment Routing –Performance Measurement ( SR-PM) based monitoring ( Future )
  - External Probing via Accedian ( Future )
- L3VPN – Connectivity metrics - BGP, BGP Neighbor, interface Oper state, etc.
- Rule based engine to monitor key service metrics and report service health
- Monitoring and Reporting specifications are defined in the Heuristic Package(HP)

# *Heuristic Package*

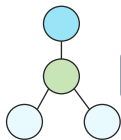
# What is the Heuristic Package ?



INTENT

Service Type and  
Device Config

Associate Heuristic  
Package



Assurance Graph

Rules

Subservices

Expressions

Metric

Rule Type: L2VPN

BGP Neighbor Health

...

BGP Next Hop health

`bgp_session_state == "ESTABLISHED"`

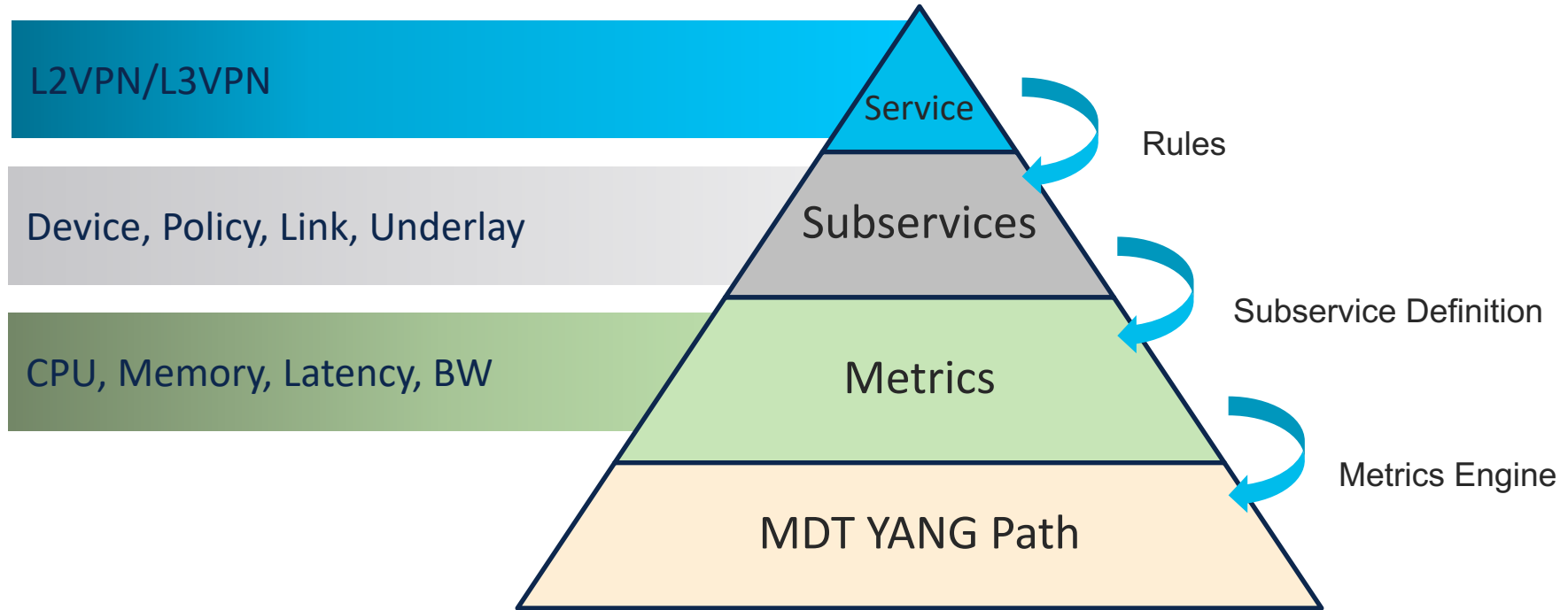
`metric.bgp.session.state`

Service  
Intent +  
Device  
Configs  
Payload

Rules

Assurance  
Model

# From NSO to YANG Path via Heuristic Package



# From Heuristic Package to Assurance Graph



INTENT

Service Type and  
Device Config



RULES



Assurance  
Graph

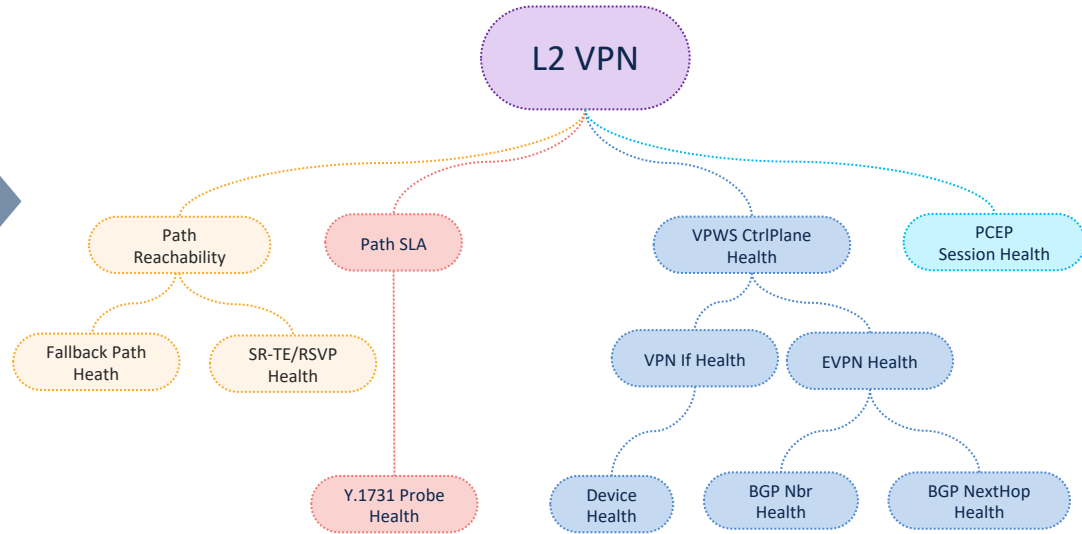
NSO Service and  
Device Configuration

Services

Subservices

Expressions

Metric





# CNC Demo of Service Health

- 1 View CNC and NSO Service
- 2 Service Health Augmentation
- 3 Enable Service Health Monitoring
- 4 Steps to update Heuristic

# Key Takeaways

- ✓ Crosswork Service Health adds automated assurance capability to VPN services.
- ✓ Highly extensible to meet various needs of service.
- ✓ Helps you view health of services after provisioning in single dashboard.

# References

- CNC Custom Heuristics Packages

<https://github.com/kthir/cnc41-sh-demo-pkg>

- Crosswork Network Controller Product Documentation

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

- CNC/CAT SDK Customization:

- Please reach out to [cnc-request@cisco.com](mailto:cnc-request@cisco.com) for more details.



The bridge to possible