

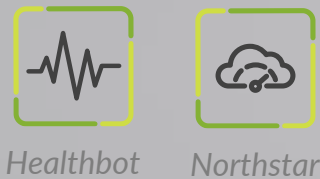


Automated WAN Solutions

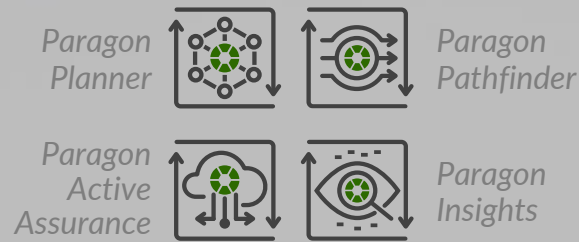
Juniper Paragon Automation 2.0

Vijendra Singh, Reseller at Juniper Networks

Juniper Paragon Evolution & Offerings



Standalone products
Industry best SDN Controller
Multi-vendor

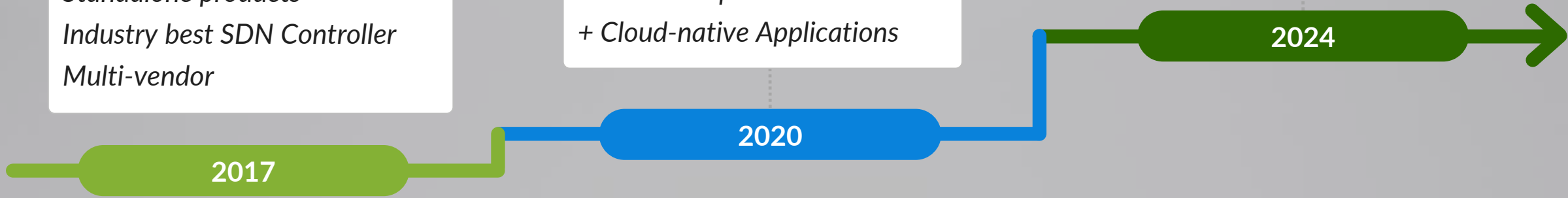


Paragon Applications (1.0)

- + Active Assurance
- + Closed loop
- + Cloud-native Applications



- + Use-case based
- + Easy button (UX/UI)
- + Intent-driven
- + AI/ML enabled
- + API First

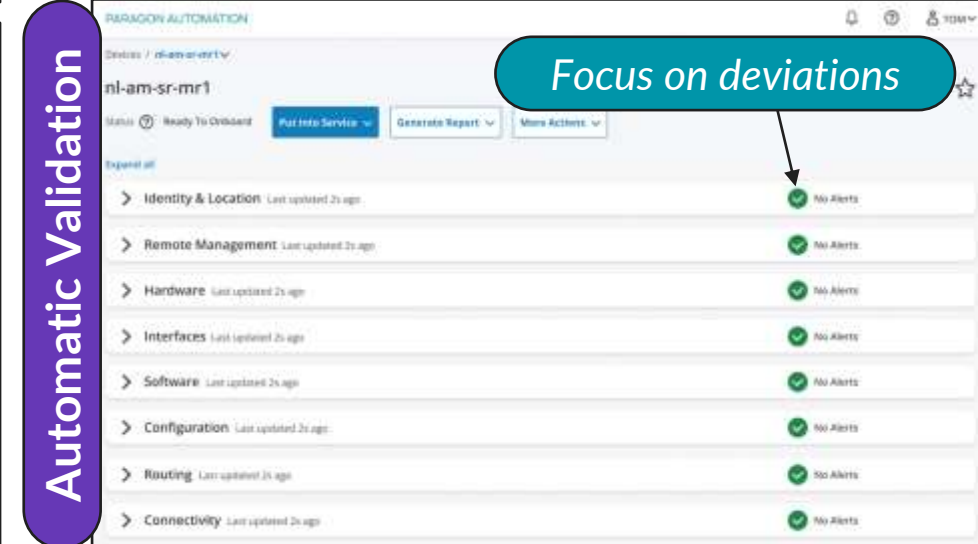
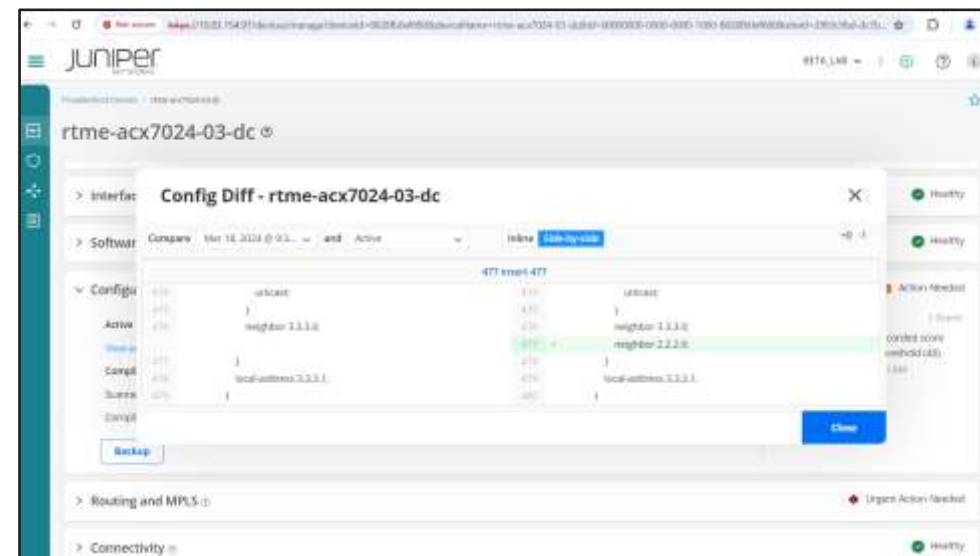
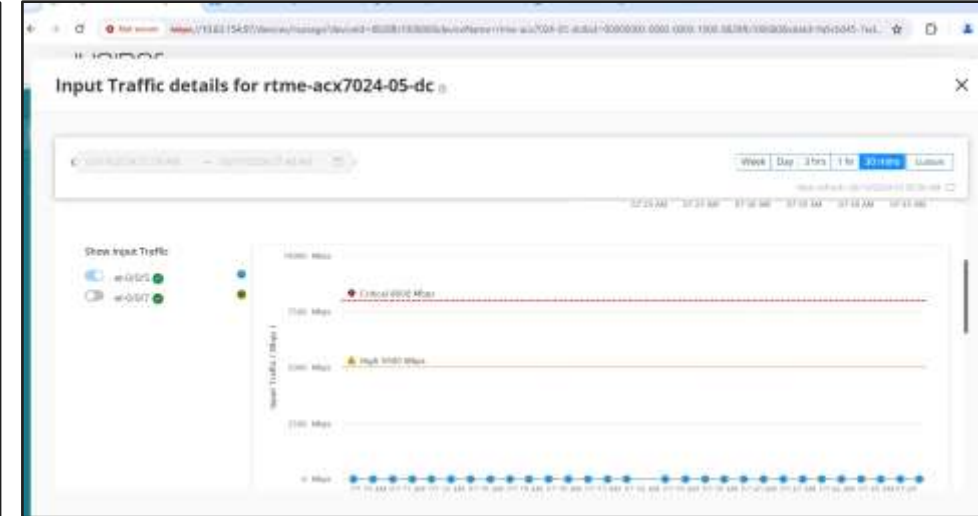
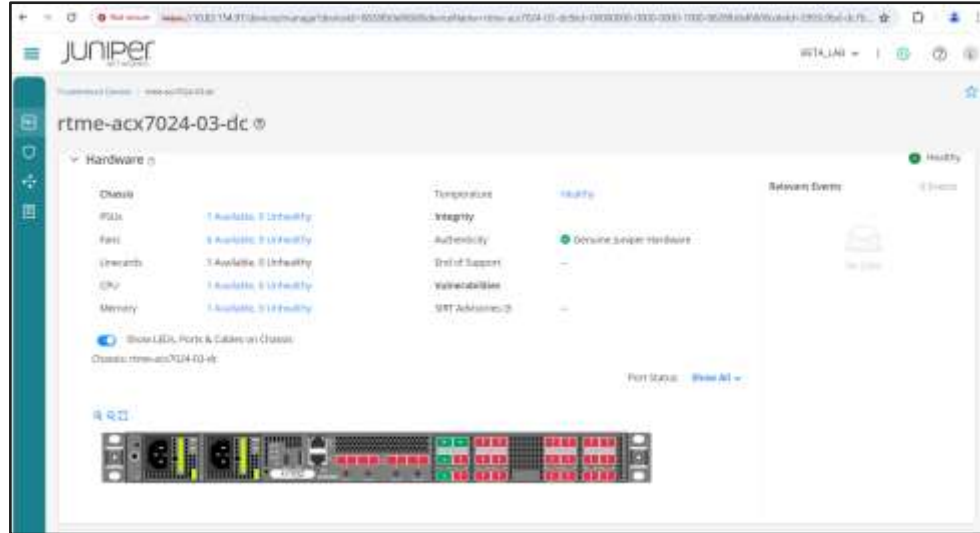


Network Observability

FRS

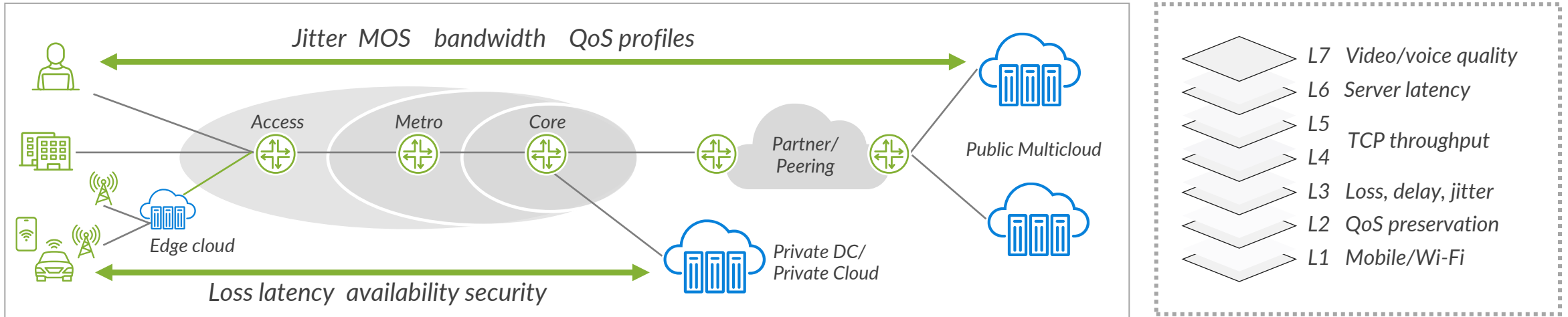
Observe various network KPIs based on Telemetry, Active Assurance, Topology.

- CPU and memory utilization, fans, and PSUs
- Available physical interfaces, operational status, input and output traffic
- Information on the SIRT advisories
- Location, version, and compliance
- Device connectivity health and data
- Routing protocols, and health information related to BGP, OSPF, IS-IS, RSVP, LSP, and LDP neighbors



Active Assurance

Active data-plane measurements



- ➔ Measure what matters, directly on the data plane.
- ➔ Generate synthetic traffic like an end-user.

You cannot improve what you do not measure



Service Orchestration

Intent-based service orchestration

ORCHESTRATE

FRS

Automate provisioning of network services based on service intent.

PROBLEM

- Operators need to differentiate on quality and make sure the network can guarantee service levels proposed to customers.
- Network services take weeks to roll out.
- Frequent CRUD operations results in stale configuration with no means to ensure config sanity.

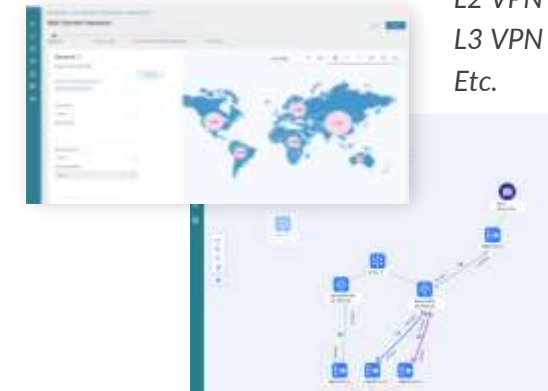
SOLUTION

- End-to-end service provisioning driven by quality intent.
- Low-cost, simplified, automated model-based provisioning.
- Multi-vendor device mapping support with YANG-based standard interface.
- Built-in service quality testing with Active Assurance.
- Ensure config sanity during CRUD operations.

Proven Benefits

- Accelerates time-to-revenue.
- Lowers OPEX by automating multiple config tasks.
- Provides network-level service visibility.
- Reduces failed service delivery rates.

Solution Snapshot

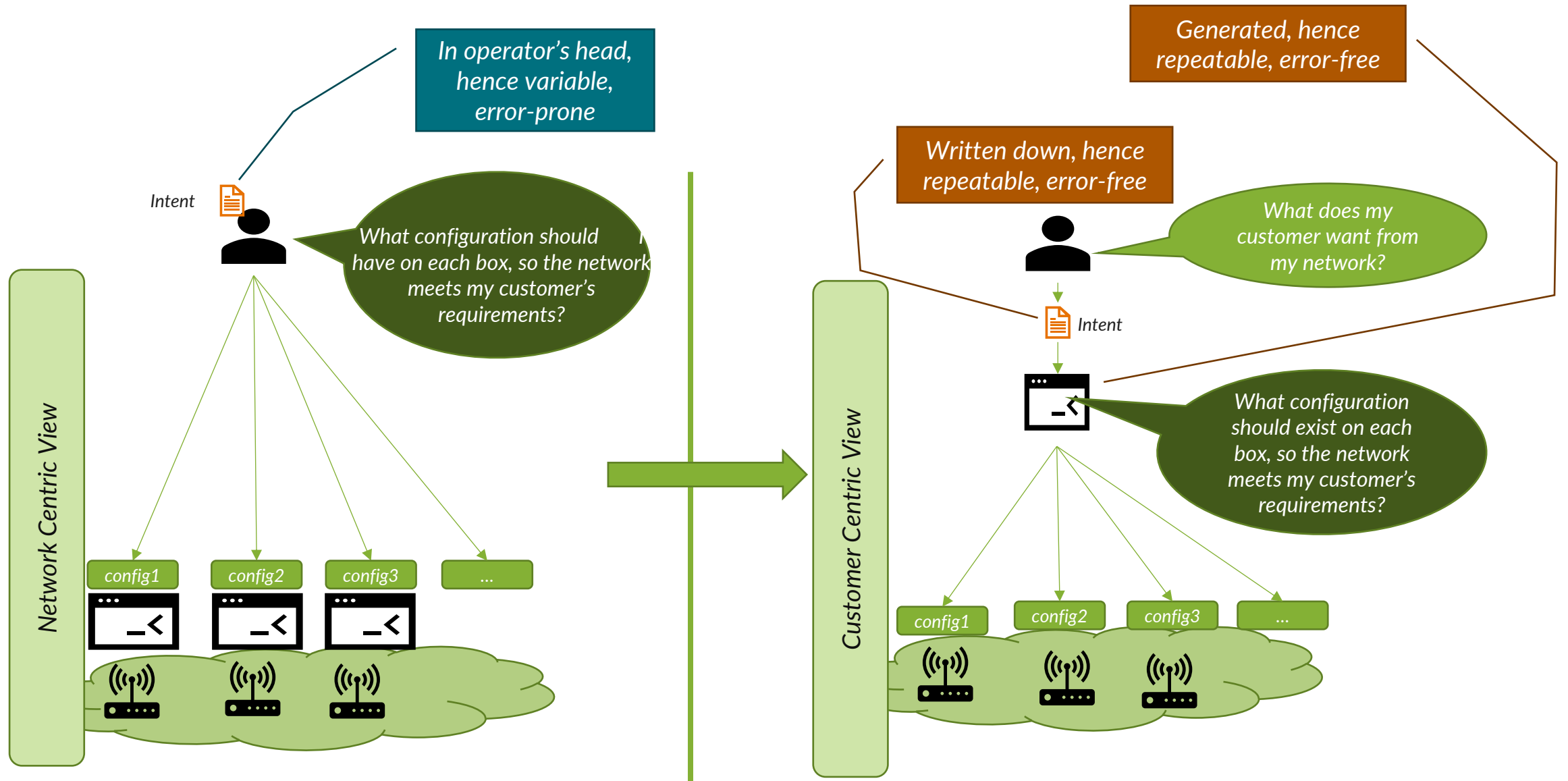


Built-in Service Models
L2 VPN
L3 VPN
Etc.

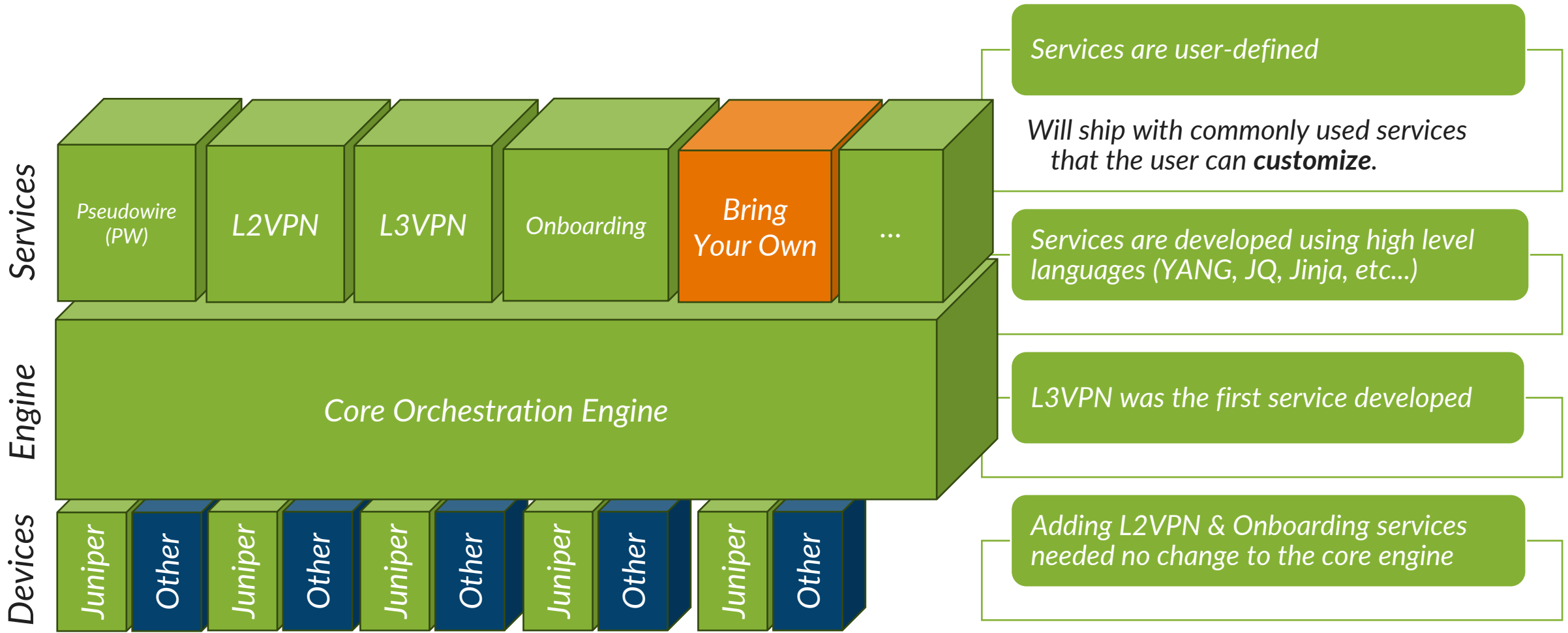
Why Paragon?

- Enables YANG model-driven service provisioning within minutes.
- Provides the complete service lifecycle automation for multi-vendor infrastructure along w/ service compliance.
- One vendor for automated service activation and testing, with active testing and monitoring built-in.

Intent Based



Model Driven Architecture



Assurance KPIs L3VPN & L2VPN

L3VPN - Detail	Frequency
IFD - validate that all interfaces state(s) are as expected	60s
IFD - validate that the interface does not flap	60s
IFD - input errors	60s
IFD - output errors	60s
IFD - input traffic monitoring	60s
IFD - output traffic monitoring	60s
IFL - validate that all interfaces state(s) are as expected	60s
BGP - validate that all neighbour state(s) are as expected	60s
OSPF - validate that all ospf neighbour state(s) are as expected	60s
OSPF - detect that no ospf (extensive) flaps are occurring	60s
OSPF - validate that the expected number of OSPF nodes and adjacencies are visible, expected number should be "learned" based on the number of nodes and adjacencies over a learning period for a device that has been on-boarded for more than the learning period or from data from other similar devices in the same network for newly on-boarded devices. (if available) validate that there are no statistics that are unexpected (e.g., frame discards, frame errors, TLV discards & unknown TLVs)	60s
BFD - validate that all session state(s) are as expected	180s
L3VPN BGP - Network health status i.e. Links and neighbors sessions of service	65s
L3VPN OSPF - Network health status i.e. Links and neighbors sessions of service	65s
L3VPN Static - Network health status i.e. Links and neighbors sessions of service	65s

L2VPN - Detail	Frequency
IFD - validate that all interfaces state(s) are as expected	60s
IFD - validate that the interface does not flap	60s
IFD - input errors	60s
IFD - output errors	60s
IFD - input traffic monitoring	60s
IFD - output traffic monitoring	60s
IFL - validate that all interfaces state(s) are as expected	60s
LFM OAM - validate that no alarms related to links	180s
LLDP - validate that all neighbor state(s) are as expected	60s
Validate that all expected I2circuit connections are up	180s
Validate that all expected PWs are up	180s
L2Ckt - Network health status i.e. links, lfm, lldp and pw of a service/vpn	185s

L2 Circuit Overview

The screenshot displays the Juniper Networks configuration interface for an L2 Circuit. The page title is "Add L2 Circuit" and the current step is "Summary". The network diagram shows a path from a source IP of et-0/0/1:0 through PE-2, a Cloud, PE-1, to a destination IP of et-0/0/30:0. The configuration summary on the right lists the following details:

- connection:
- encapsulation:
 - dot1q:
 - c_vlan_id: 520
 - l2_access_type: "dot1q"
- service:
 - svc_input_bandwidth:
 - input_bandwidth [1]:
 - 0:
 - cbs: 10000
 - cir: 500000
 - type: "bw-per-port"
 - svc_output_bandwidth:
 - output_bandwidth [1]:
 - 0:
 - cbs: 10000
 - cir: 500000

Service Instances Inventory

The screenshot shows the Juniper EPIC interface for Service Instances. The main view displays a summary of instance counts and a table of instances. A details popup is open for the 'Acme_VPN' instance.

Service Instances Summary:

- Blocked: 5
- Active: 300 (▲ + 2% in last 7 days)
- Scheduled: 600
- In progress: 300

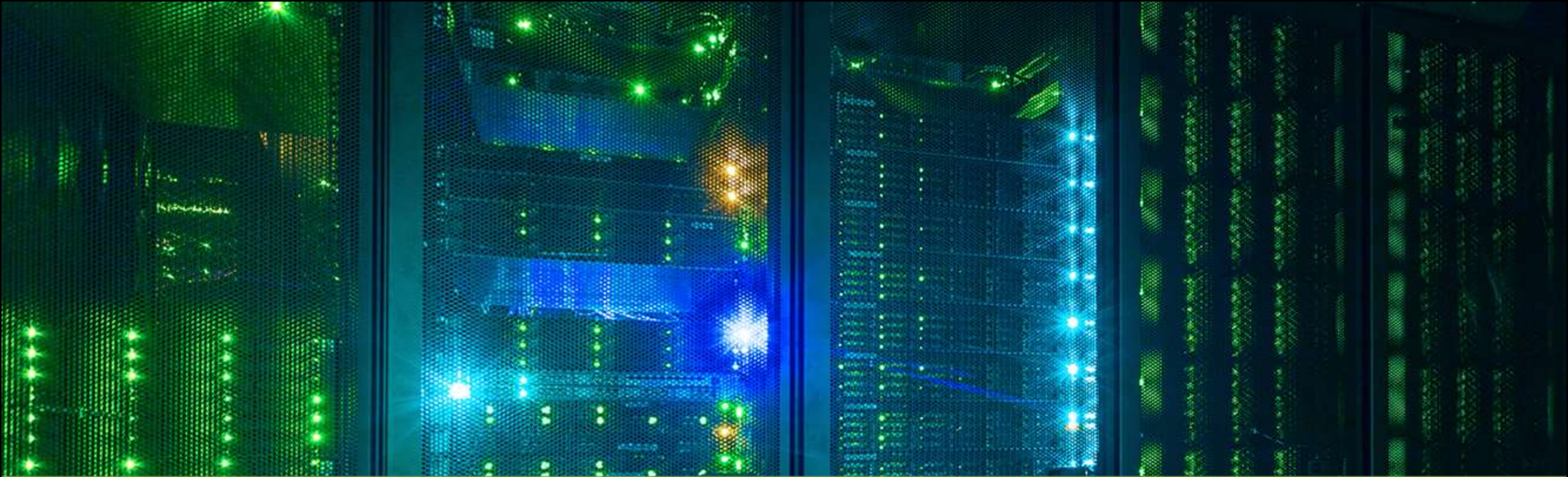
Service Instances Table:

Name	Current State	Customer	Service Design	Devices	Last Modified By	Last Modified Date	Start Date
Acme_VPN	Active	Acme	Connect2sites	Device123	Admin	-	Feb 6, 2018, 2:40 AM
Warephase	Deprovisioned	Warephase	Connect3sites	site_codehow	Admin	Feb 6, 2018, 2:40 AM	Feb 6, 2018, 2:40 AM
Acme_India	Draft	Acme	Connect_branch	site_labdrill.com	Admin	Feb 6, 2018, 2:40 AM	Feb 6, 2018, 2:40 AM
Codehow	Provisioning	Codehow	Connect_datacenter	site_grooverstreet	Admin	-	Feb 6, 2018, 2:40 AM
Labdrill	Scheduled Provisi...	Ladrill	Custom123	site_zotware.com	Admin	Feb 6, 2018, 2:40 AM	Feb 6, 2018, 2:40 AM
Grooverstreet	Deprovisioned	Grooverstreet	ACX_Config	Device234	Admin	Feb 6, 2018, 2:40 AM	Feb 6, 2018, 2:40 AM
Zotware	Deprovisioning	Zotware	Custom222	12345	Admin	-	Feb 6, 2018, 2:40 AM
Zencorp	Active	Zencorp	Custom222	site_codehow.	Admin	Feb 6, 2018, 2:40 AM	Feb 6, 2018, 2:40 AM
Iselectrics	Active	Iselectrics	Custom222	site_konmatfix	Admin	Feb 6, 2018, 2:40 AM	Feb 6, 2018, 2:40 AM
Konmatfix	Scheduled Deprovisi...	Konmatfix	Custom222	site_iselectrics.	Admin	-	Feb 6, 2018, 2:40 AM
Acme_Asia	Scheduled Deprovisi...		Custom222	Text	Admin	Feb 6, 2018, 2:40 AM	Feb 6, 2018, 2:40 AM

Details For Acme_VPN:

- State: Active
- Customer: Acme
- Service Type: EVPN
- Service Design: Connect2sites
- Last Modified By: Admin
- Last Modified Date: Feb 6, 2018, 2:40 AM
- Start Date: Feb 6, 2018, 2:40 AM
- CE Sites: USA_West, USA_East, Asia_East, USA_West, Europe_West
- PE Sites: USA_West, USA_East, Asia_East, USA_West, Europe_West
- Devices:

Name	Status	Model	Site
Device1	Disconnected	Ex-4300-48T	USA_West
Device2	Disconnected	Ex-4300-48T	USA_East
Device3	Connected	Ex-4300-48T	Asia_East
Device4	Connected	Ex-4300-48T	USA_West
Device5	Disconnected	Ex-4300-48T	Europe_West



Thank you

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