Juniper Apstra Solutions

Focus : Juniper Apstra Platform

Contact : CRDC-platforms-plm-tme@juniper.net

JUNIPER NETWORKS | Driven by Experience™

Vijendra Pratap Singh

Reseller partner –Marconi Wireless
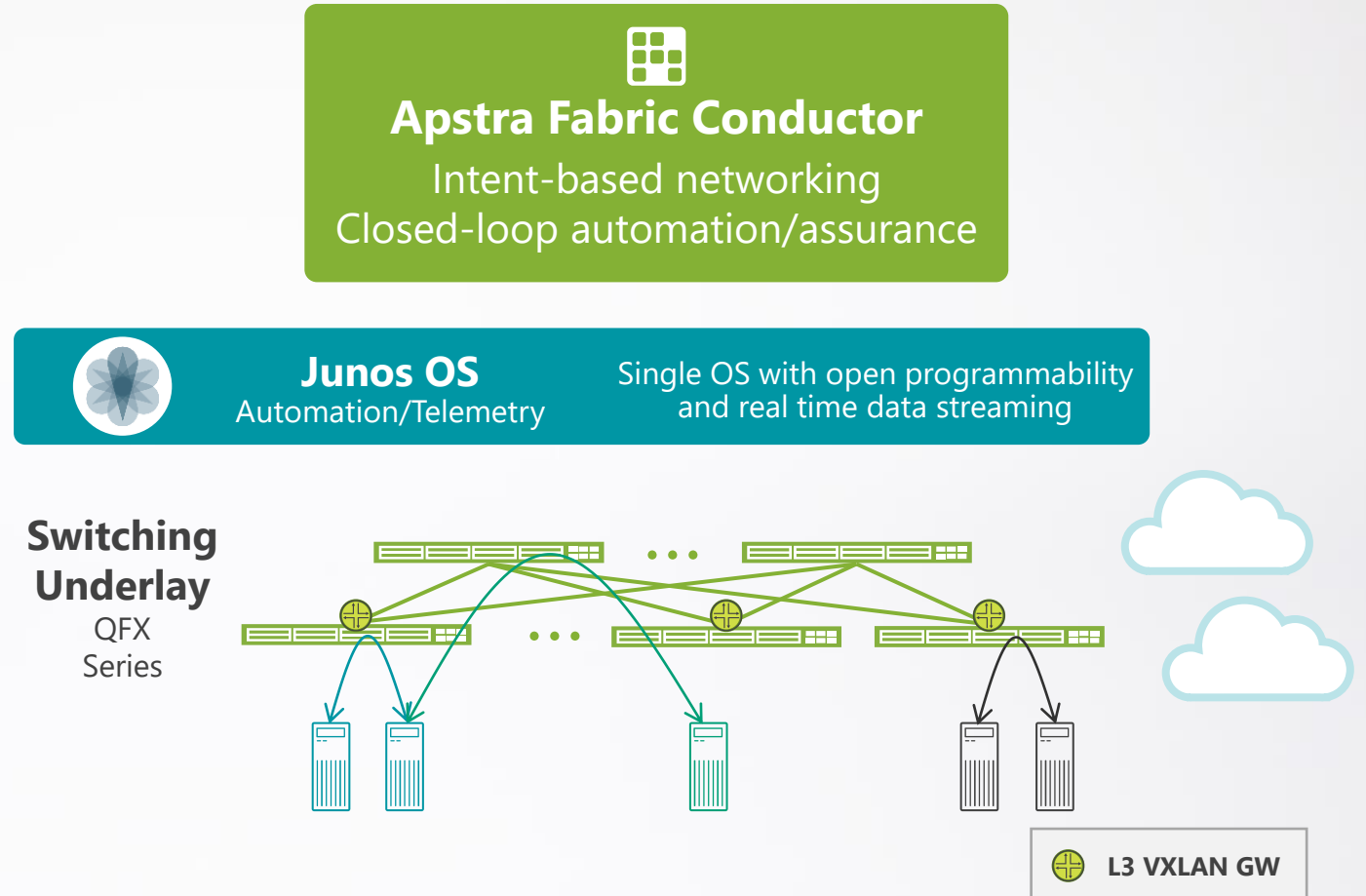
Vijendra Pratap Singh
Reseller partner - Marconi Wireless

Automated data center

Standard, automated fabrics

- Intent-based, assured operations with root cause identification

- Automated fabric management

- Self-service and DevOps extensions (infra as code)

- Open, programable infrastructure, rich telemetry

- Scalable EVPN-VXLAN for a range of environments

Apstra Fabric Conductor
Intent-based networking
Closed-loop automation/assurance

Junos OS
Automation/Telemetry
Single OS with open programmability and real time data streaming

Switching Underlay
QFX Series

L3 VXLAN GW

Vijendra Pratap Singh

Reseller partner –Marconi Wireless

Apstra for your business

Scale, performance and function

"Apstra's system gives us a single view into the entire media production network - regardless of our devices, switches, operating systems or vendors."

- Bloomberg

Ease of use and time savings

"We went from POC to production in 2 weeks."

– BeElastic

TCO savings

"In the previous solution there were 8 people managing the network, that number went down to 2."

- Global 500 Manufacturer

Self-driving network

"Our success depends on rapidly introducing new services, quickly scaling to new demand and delivering the assured experiences. Juniper and Apstra joining forces as one company helps T-Systems"

- T-Systems

Bloomberg

Beelastic

T··Systems·

YAHOO! JAPAN

Vijendra Pratap Singh

Reseller partner –Marconi Wireless

Custom Telemetry Collection

Define new data collection in minutes .. and use it in IBA!

1) Define a custom collector for new telemetry ingestion

```
class BgpRouteCollector(BaseTelemetryCollector):
    def __init__(self, *args, **kwargs):
        super(BgpRouteCollector, self).__init__(*args, **kwargs)
        self.error_msgs = []
        self.bgp_route_info = {}
        self.v6_nbr_key = None
        self.vrf_collector = None
```

Select | show route receive-protocol bgp

2) Get rid of the GraphDB complexity

```
match(
    node('system', name='system', system_type
    ='internal')
    .out('hosted_interfaces')
    .node('interface', if_type='port_channel', name
    ='system_interface')
    .in_('composed_of')
    .node('interface', name='target')
)
.having(
    match(
        node('interface', name='target')
        .out('composed_of')
        .node('interface', name='system_interface')
    ),
    names=['target'],
    at_least=1
)
.distinct(names=['target'])
```

Saved Query *

ESI	▼
ESI	
Interface with IPv4	
Interface with tag	
Internal systems	
Link	
Specific hostname	

Get your Super IBA powers with Apstra 4.2

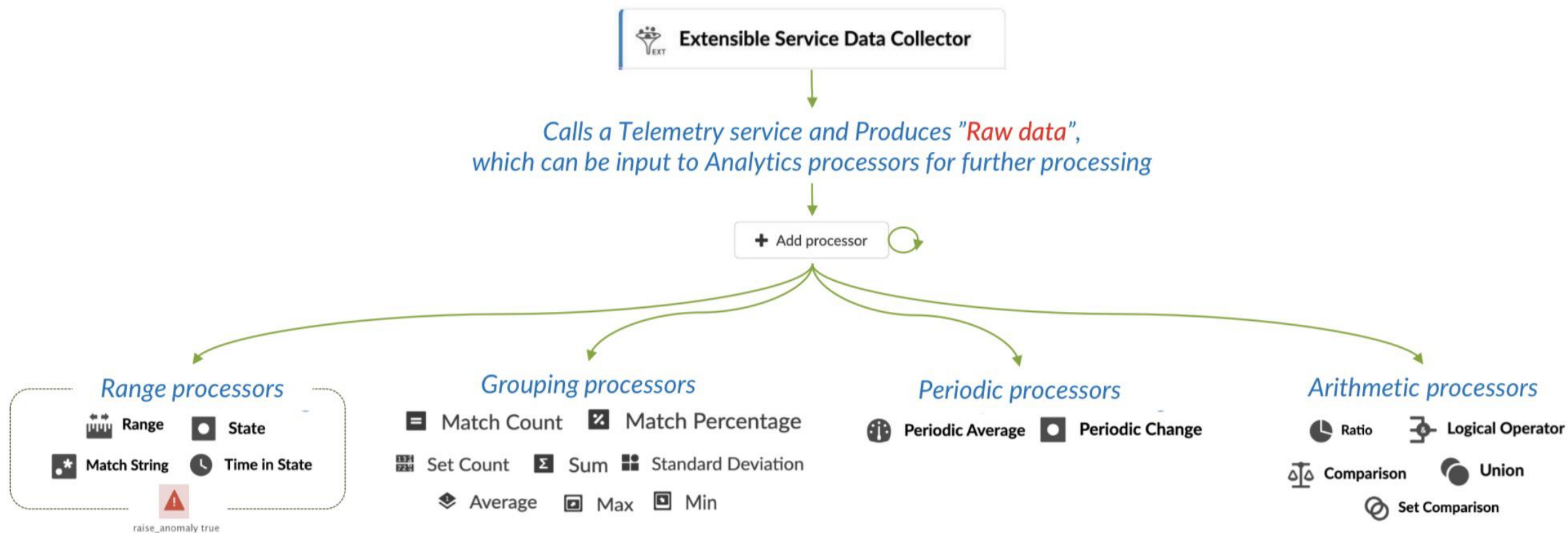*Any Juniper platform, Any Version, Any CLI command*

3) Leverage the IBA toolkit

- ▤ Match Count
- ♔ Range
- Σ Sum
- ▣ Min
- ▨ Match Percentage
- ▣ Max
- ▦ Set Count
- ◈ Average
- ▦ Standard Deviation

Vijendra Pratap Singh

Reseller partner –Marconi Wireless

Data Collection - Useful if you implement Analytics on top of it

Extensible Service Data Collector

Calls a Telemetry service and Produces "Raw data",
which can be input to Analytics processors for further processing

+ Add processor

Range processors
- Range
- State
- Match String
- Time in State
- ⚠ raise_anomaly true

Grouping processors
- Match Count
- Match Percentage
- Set Count
- Sum
- Standard Deviation
- Average
- Max
- Min

Periodic processors
- Periodic Average
- Periodic Change

Arithmetic processors
- Ratio
- Logical Operator
- Comparison
- Union
- Set Comparison

IBA lets you automate knowledge extraction by defining an Analytics Pipeline.
Extract insights out of "Raw data".

*: Not all in/out processors chaining are possible, depends on data-type and other factors. Enhancements planned for future releases.

Vijendra Pratap Singh

Recognition

Gartner

2020 Magic Quadrant **LEADER** Data Center and Cloud Networking
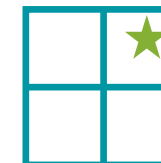
FORRESTER

"The vendor has a **strong portfolio of hardware and software**, with feature depth & excellent automation capabilities. **As a** result, the vendor can **meet the technical needs of nearly all use cases in this market**."

"Juniper Networks recognizes that customers need more than technology and products. **Customers that want to automate the entire network** with a consistent OS, from the data center to the business edge, **should look to Juniper Networks.**"

apstra

Intent-based Networking Systems

Gartner Cool vendor in enterprise networking

Best of VMworld winner

IBNS can reduce network infra. delivery times by 50%-90%.

IBNS can reduce the number and duration of outages by at least 50%. **Gartner**

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Learn it. Try it. (for free)

Apstra Academy

https://apstra.com/products/apstra-academy

YouTube Playlist

https://juniper.net/apstra-playlist

Juniper vLabs

https://vlabs.juniper.net
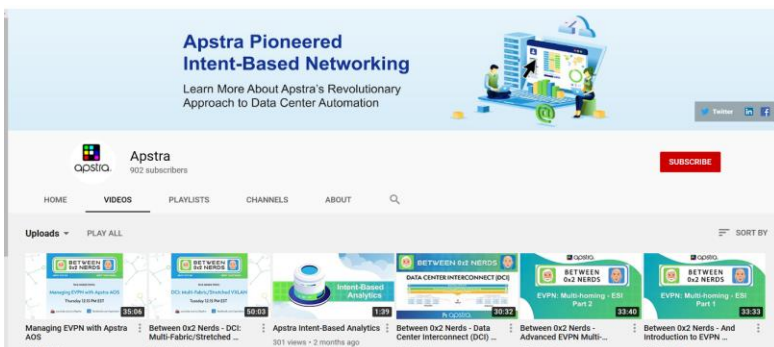
- Cloud-based lab environment
- Virtualized, pre-built network topologies
- Available on-demand – for free!

Apstra DC Fabric Operations
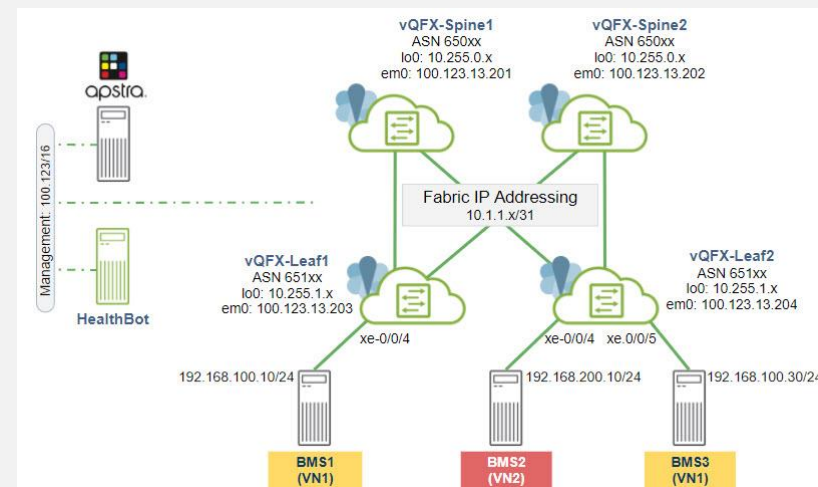
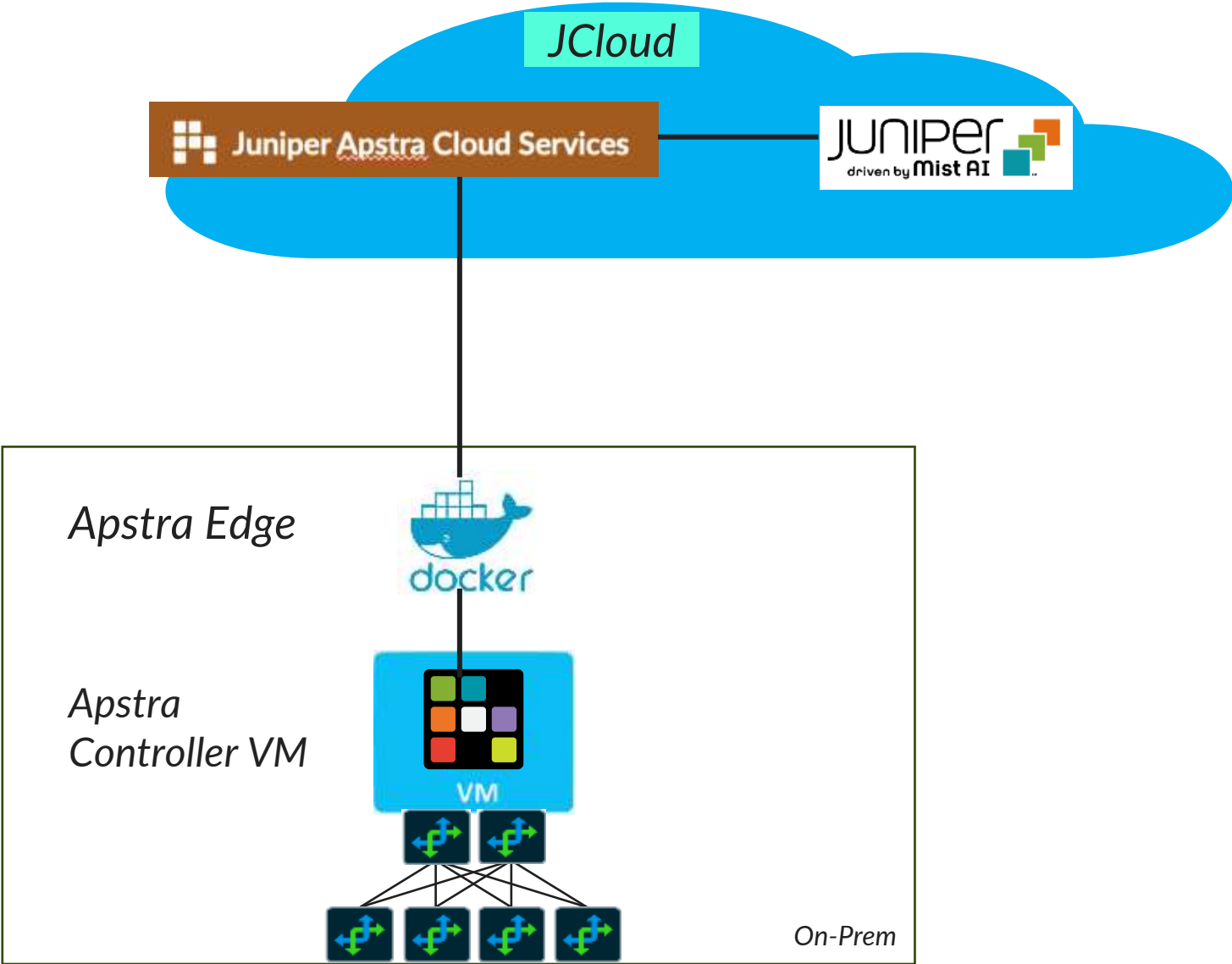Vijendra Pratap Singh

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Apstra Update

Vijendra Singh,Reseller at Juniper Networks

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Apstra on-Prem and Cloud Service

Juniper Apstra Cloud Services Overview

A new suite of SaaS features to enhance Apstra's operational capabilities.

- *Apstra continues to be an on-prem solution and will be continuously enhanced.*

- **Apstra Cloud Services will provide AIOps capabilities in conjunction with the IBN functionality in Apstra.**

- *Apstra Cloud Services is a SaaS service focused on delivering enhanced operational capabilities to solve complex Data Center problems*

- *Built on Mist Cloud and uses a similar visual theme, but it is **an entirely separate product suite.***

- *The initial capability of Apstra Cloud Services is **Marvis VNA for DC**.*

- *Future capabilities for the DC user will be added to Apstra Cloud Services*

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Apstra + Mist AI Ops with Marvis

Available NOW

Integration to Marvis

**DC Events in Marvis Virtual Network Assistant
+
Chatbot for Documentation**

Leverage the AIOps capabilities of the Marvis VNA for Data Centers

- *Displaying and analyzing data center events*
- *Providing the generative AI-based Marvis Conversational Interface (CI).*
- *Provides actionable recommendations to proactively respond to data centre events*
- *Single VNA for actions across domain including campus, branch and data center*
- *E2E visibility*
- *3rd party integration (Webhooks to ServiceNow … etc.)*

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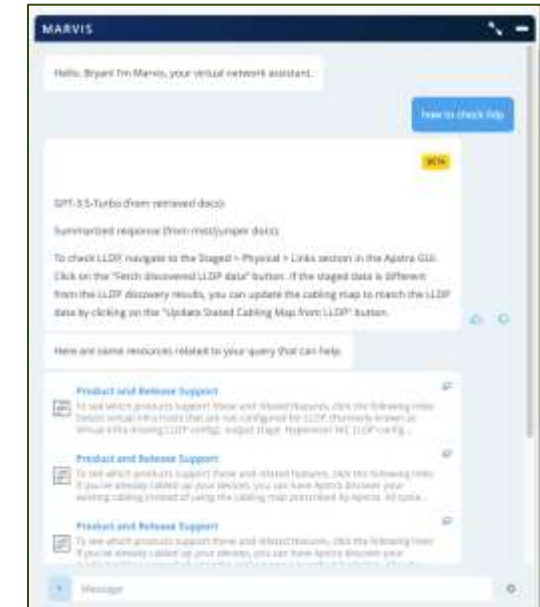
MEDIA & ENTERTAINMENT Customer

AIOps for Networking: Marvis + Apstra Better Together

THE CHALLENGE

- *Single operations team currently managing Mist for the campus*
- *Looking to simplify and consolidate operational tools and panes of glass*
- *Streamline incoming alerts from multiple systems and integrate alerts into ticketing systems*

THE SOLUTION

- **Marvis VNA** *for the data center is the industry's only AI-Native virtual network assistant for data center operations.*
- *It works in conjunction with* **Juniper Apstra Cloud Services** *to provide proactive and prescriptive data center actions.*

THE RESULTS

- **Proactive actions by Marvis** *save time and money and increase network uptime by accelerating problem resolution*
- **End-to-end visibility** *with VNA dashboard across campus, branch, and data center*

THE OUTCOME

- **Comprehensive visibility of data center network health, regardless of which switching vendors are being deployed**
- **AI-driven insights lead to faster root cause identification and issue resolution**

"The speed and ease with which Apstra edge was deployed were incredible. The customer was onboarded and ready to go in less than 2 hours"
Yaseen Kadlemakki, Director Software Engineering

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DC Alert Notification Service
Email

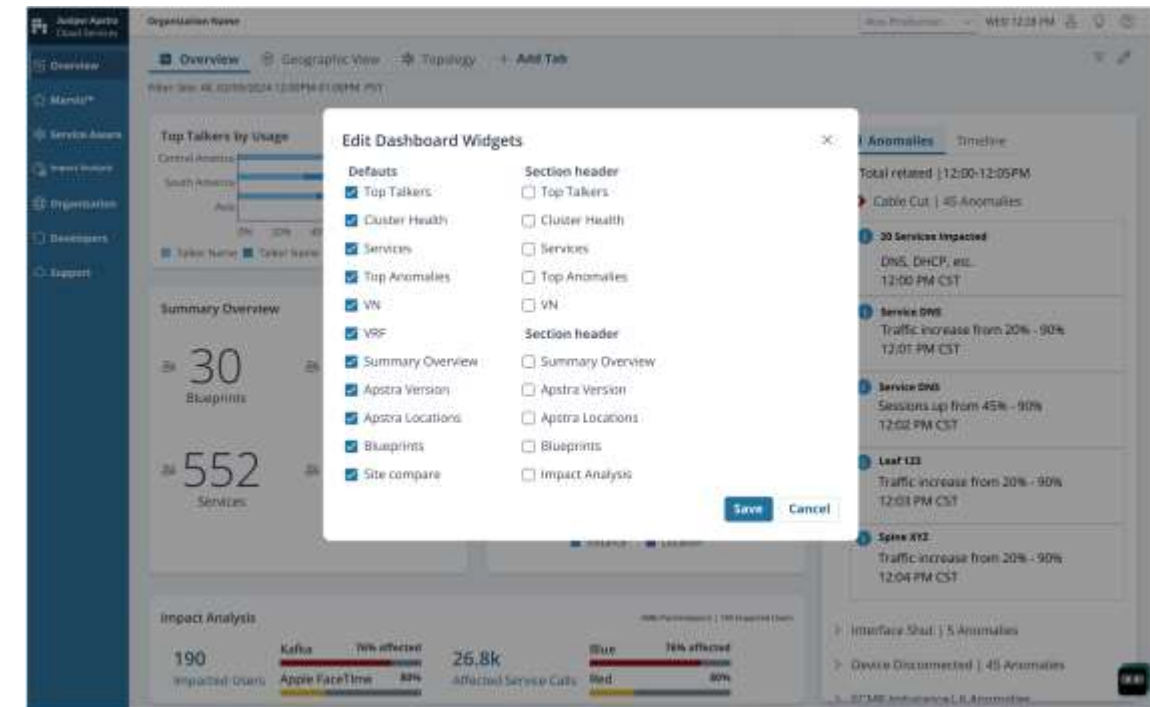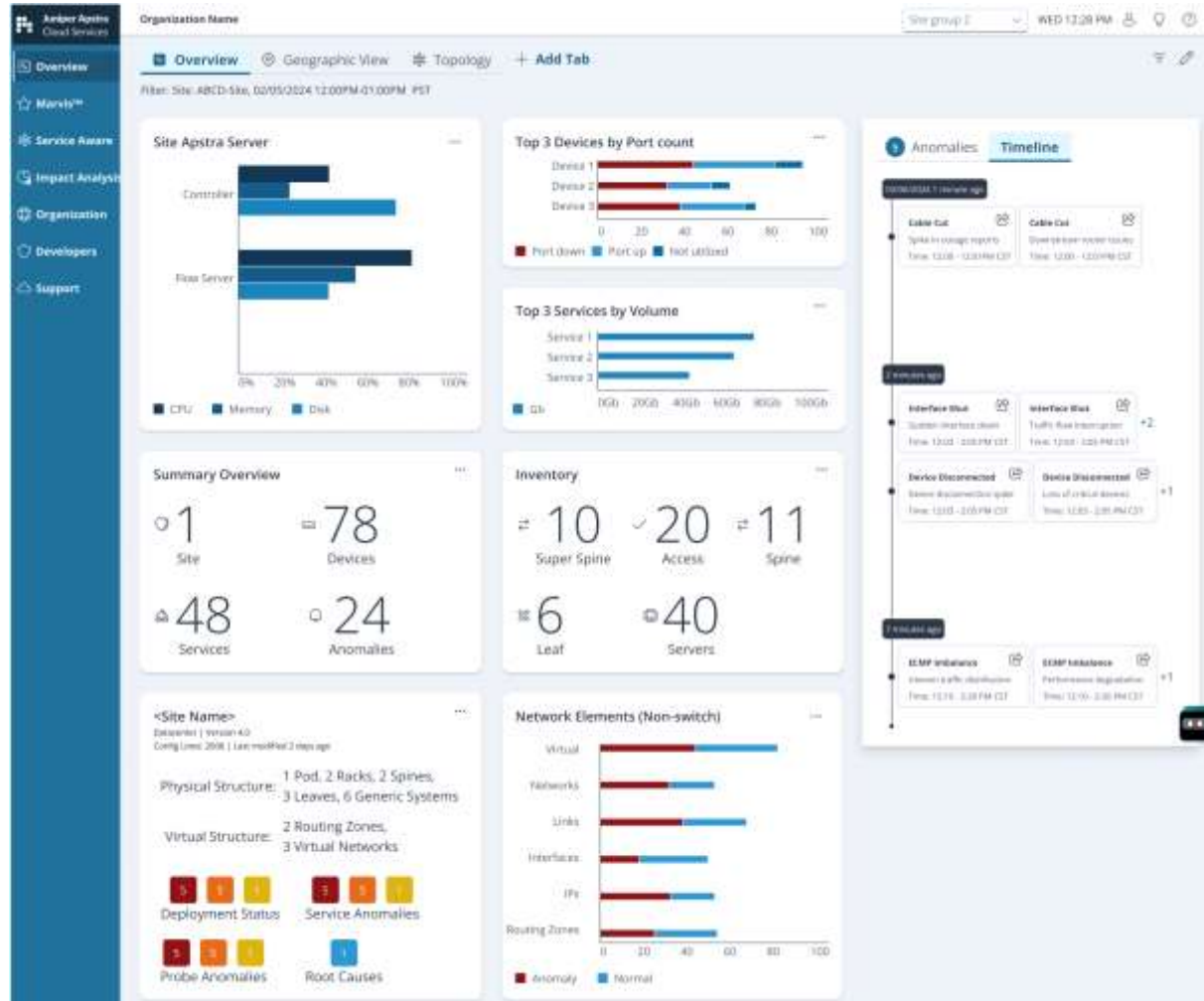# Cloud Service Audit/Alert Notification Service
Webhooks
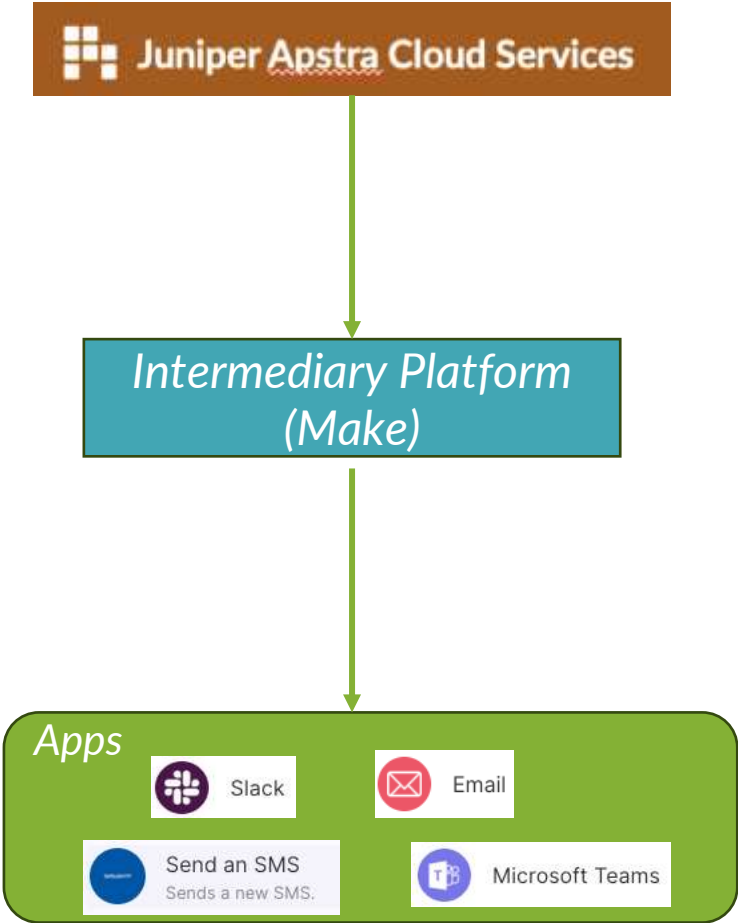
Dashboards

Q3

## Configurable dashboards for insights into inventory and resources across all Apstra instances

Service Awareness
Adding service data to the Apstra network knowledge graph
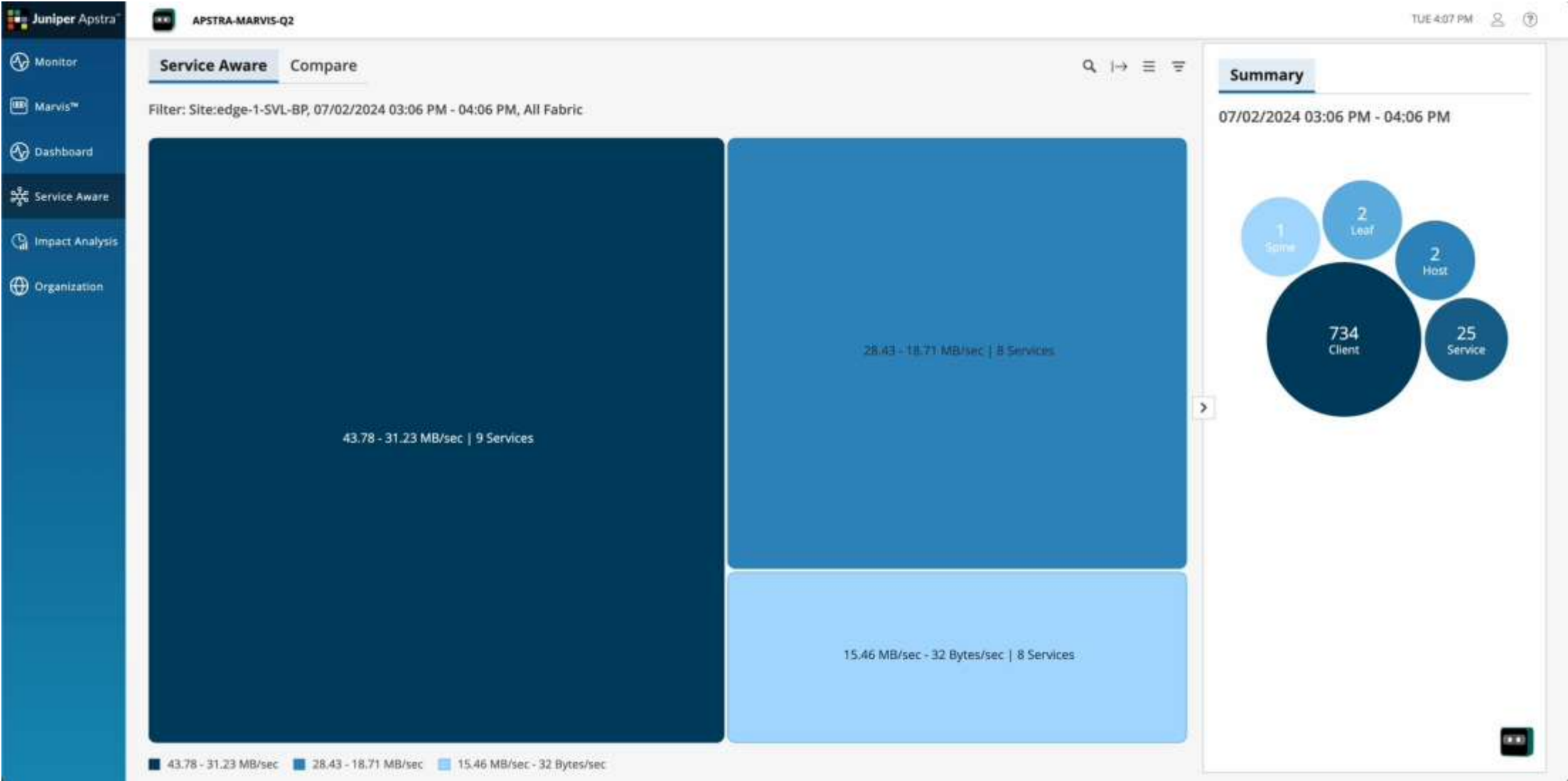
Which switch ports are hosting a Kafka service? What is using all the bandwidth in VRF Blue?

- Visibility *where services attach* and access the network

- Understanding of *"service to resource" mapping*

- How *services communication and usage* they consume
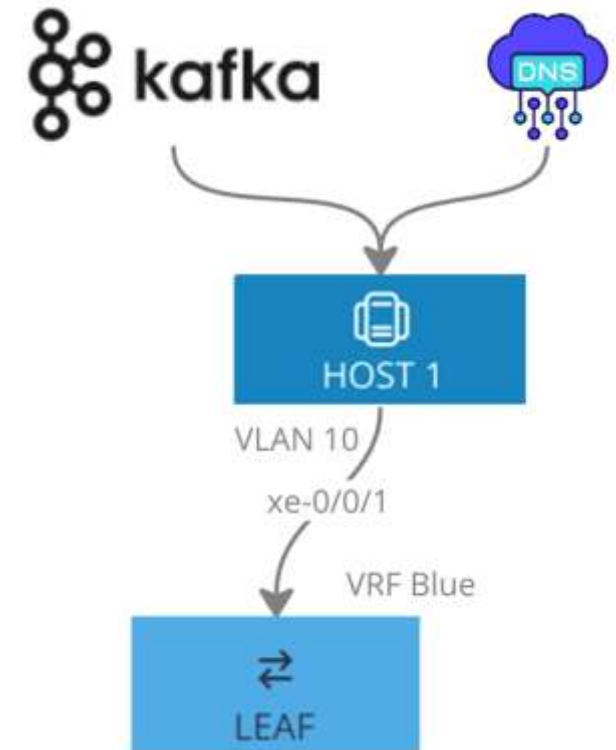
Visibility into what your apps are doing and how it all fits together

Service Awareness

Impact Analysis
## *Reduce alert fatigue and take the guesswork out of troubleshooting*

Q3

Is it a bottleneck in the network? A storage issue? Is something else going on in the fabric?

- Gives you a **clear picture of issues and impacts** on your applications

- *Machine Learning to analyze issues and map conditions and impacts*

- *Distinguish which anomalies were a side effect or unrelated*

- **Compare states** between different times

- Get back up and **running quickly**

"Aha! This optical is the reason my e-commerce app is running slow."
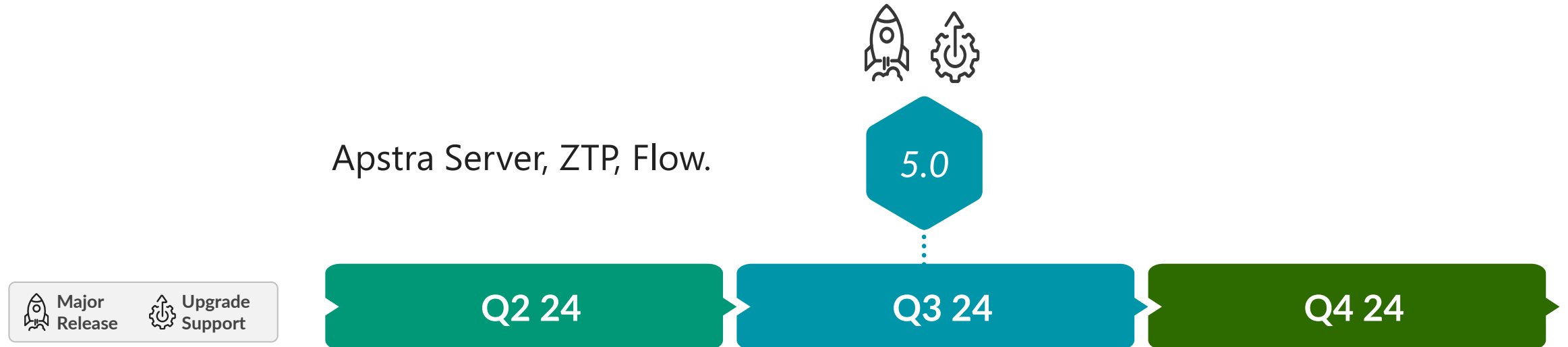
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Impact Analysis
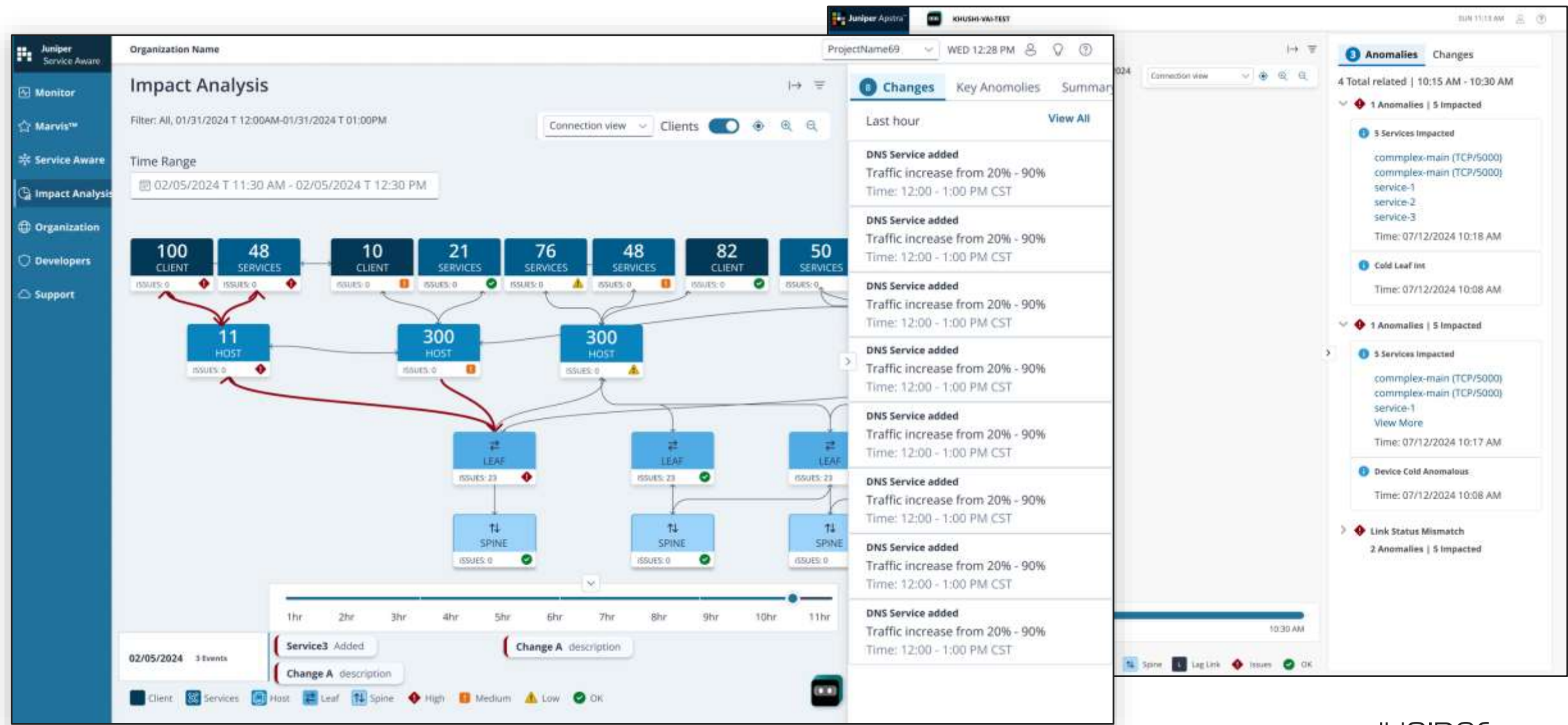
Apstra 5.0.0 Features

Juniper Apstra On-Prem

- **Apstra Server (design, build, deploy, operate, troubleshoot).**
- **Apstra ZTP (device bootstrap and onboarding).**
- **Apstra Flow (flow collection, visibility, and analytics).**

Apstra Server, ZTP, Flow.

5.0

| Major Release · Upgrade Support | Q2 24 | Q3 24 | Q4 24 |

Tenant Aware RBAC

WHY

Elevate security and safeguard your network with new granular controls to limit access to routing zones and authorized objects.

- *Introduced an* **RZ-aware access control** *to allow granular permissions enforcements → Tie back the role-based permissions (RBAC) to the Routing Zones (Notion of Tenant).*

- *Supports* **strict Tenancy definition** *(objects fully isolated) and more flexible ones (shared-tenant concept).*

- *Can be used on top of the Routing-Zone Constraint which deals with restricting the VRFs a given Server can access/attach to (orthogonal).*
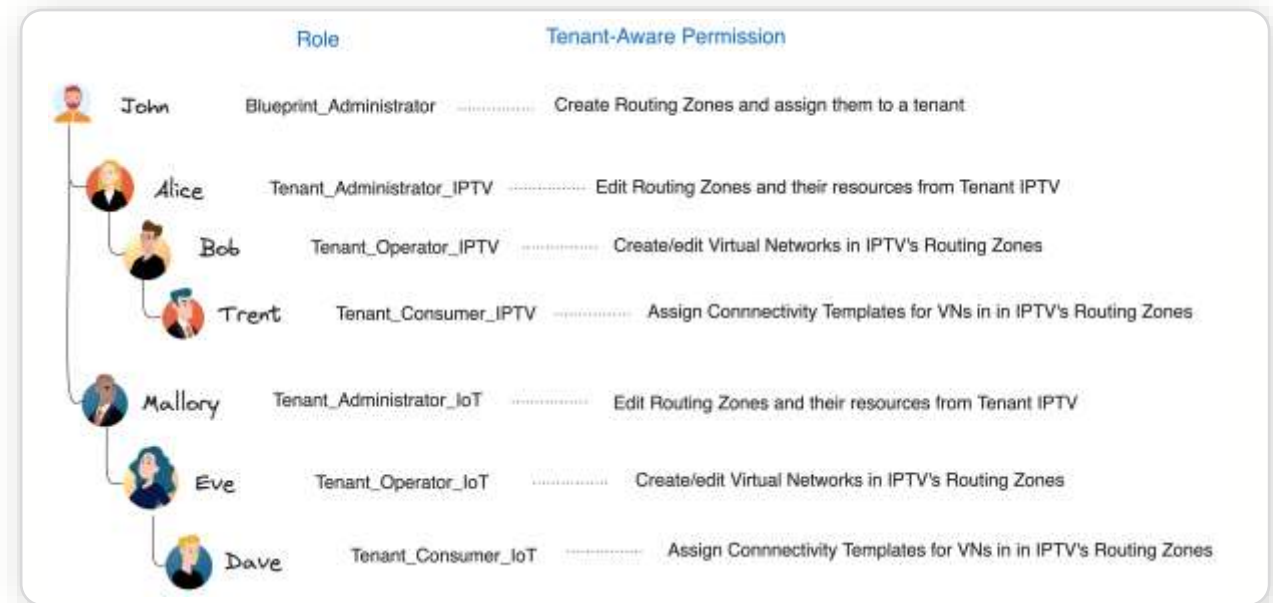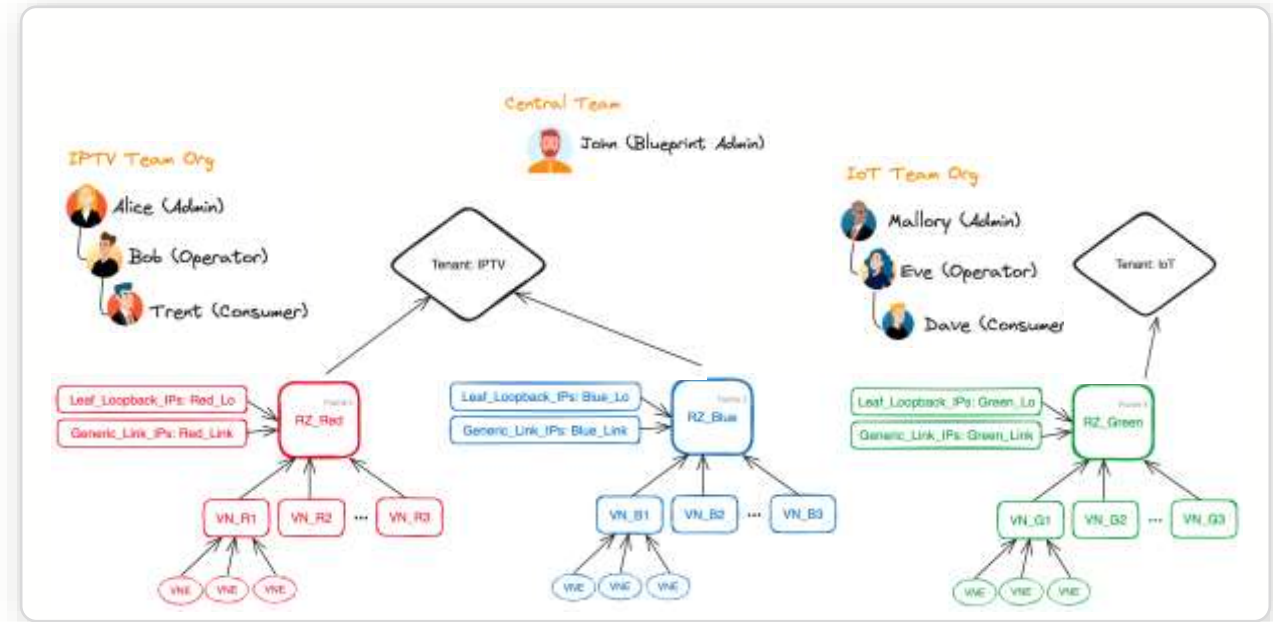
Apstra Python SDK

WHY

To provide a simple and reliable programmatic interface that abstracts low-level API workflows

- *Productization of in-product documentation of the Apstra-SDK.*

- *Provide auto-completion and auto-documentation at the IDE level so users can easily navigate the structure of the client library and find the function they want to use.*

- *Type-Checking: Rigorous input checks on function calls, catching incorrect payloads - including type and value mismatches or missing elements - early on, before they reach the server.*

```python
## Import AOS SDK
from aos.sdk.client import Client

## Connect to Apstra server
client = Client("https://10.28.160.3/api", verify_certificates=False)
client.login("admin", "admin")

## Iterate over blueprints list and get blueprint's ID by its label
for bp in client.blueprints.list():
    if bp['label'] == "Paris_DC":
        My_Blueprint = client.blueprints[bp['id']]

## Print count of blueprint's anomalies grouped by their service type
print(My_Blueprint.anomalies_services_count())
```

```json
[
    {
        "type": "bgp",
        "role": "spine_leaf",
        "count": 4,
        "max": 4
    },
    {
        "type": "cabling",
        "role": "spine_leaf",
        "count": 2,
        "max": 2
    },
    {
        "type": "route",
        "role": "unknown",
        "count": 9,
        "max": 13
    },
    {
        "type": "all",
        "role": "all",
        "count": 15
    }
]
```
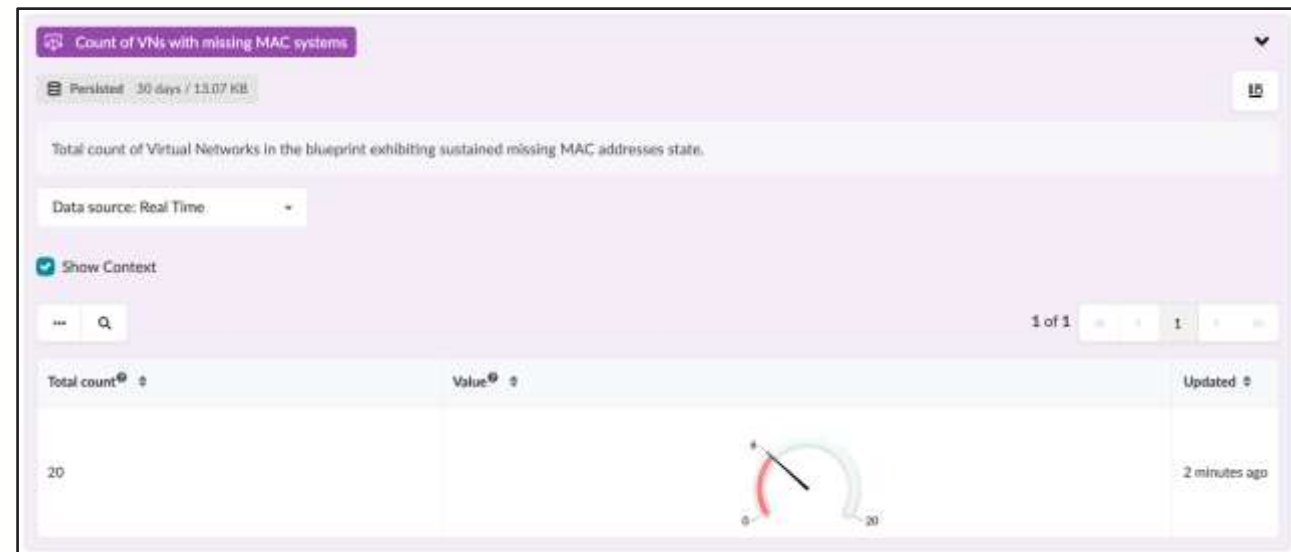
MAC Monitor Probe

WHY

To ensure your DC network is operating correctly by validating EVPN control plane.

- *A new **pre-defined dashboard** to show the health of Layer-2 service for all Virtual Networks in the blueprint across all vendors.*

- ***Continuous consistency checks** the MAC Address table of every leaf to verify that remotely learned entries comply with network intent.*

- *If there are any control-plane issues with the MAC to EVPN Route Type-2 propagation, you are **alerted with the context (MAC, VLAN, and Device).***

Template and Rack Relationships

WHY?

An intuitive element to enhance comprehension of the Apstra objects and to help validate and reduce errors during the design phase.

- Visual Relationship Mapping: *Directly within the templates and racks design view, users can now easily see and understand the connections between templates and racks, simplifying the conceptualization of network designs.*

- Principles Demonstration: *This feature serves as a practical demonstration of Apstra's design principles allowing users to grasp complex configurations visually.*

- Accelerated Learning: *This visualization makes the design principles more intuitive, aiding users in quickly familiarizing themselves with Apstra's functionalities, and promoting a smoother and faster onboarding process.*

5.0 Dev Environment
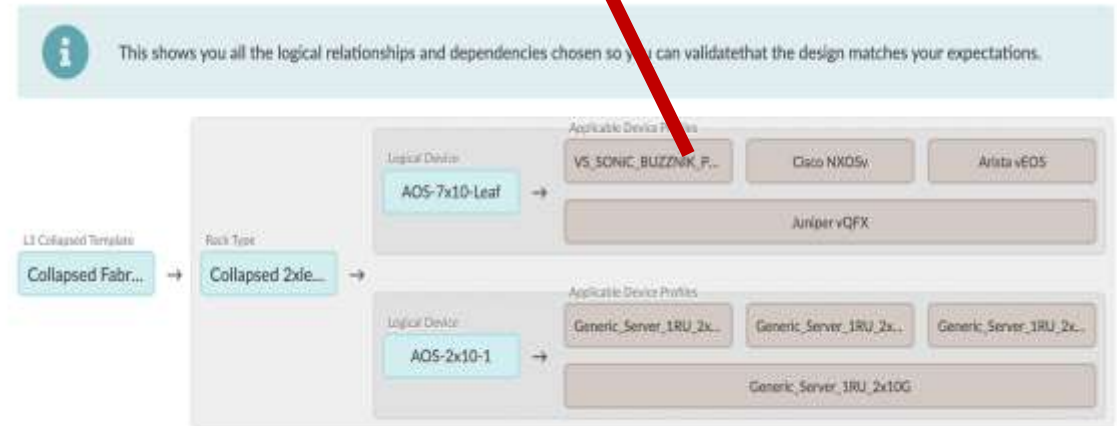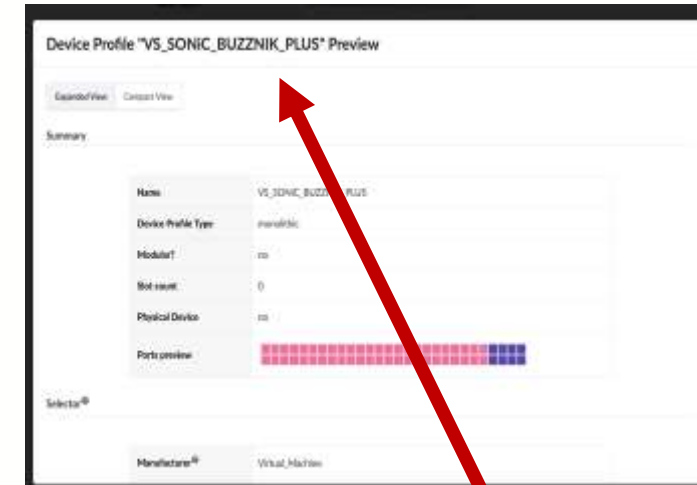
Supported Upgrade Paths to Apstra 5.0.0

From	To	Upgrade Methodology
4.2.0	5.0.0	VM to VM only
4.2.1	5.0.0	VM to VM only
4.2.1.x	5.0.0	VM to VM only
4.2.2	5.0.0	VM to VM only
4.2.2.x	5.0.0	VM to VM only

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Thank you

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