

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



apstra®

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Reseller partner - Marconi Wireless

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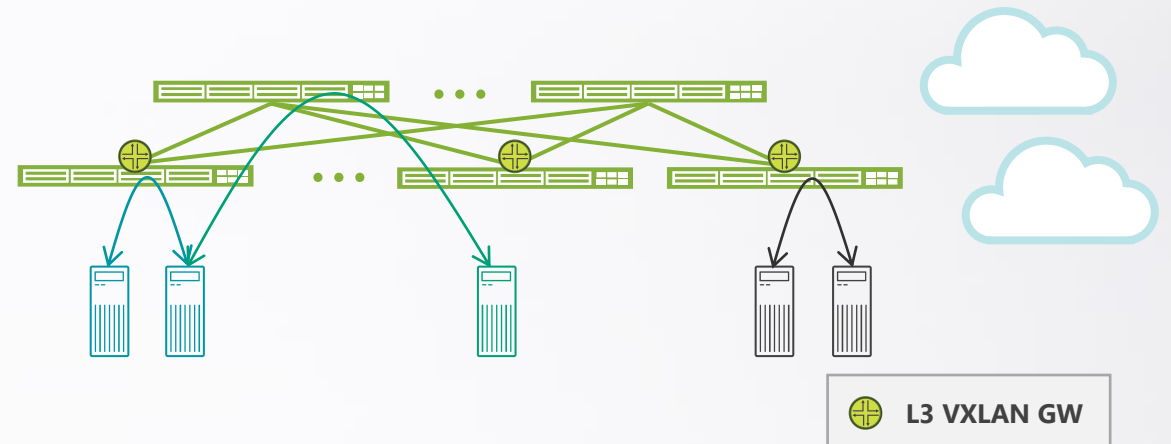
Automated data center

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



Switching Underlay
QFX Series



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Juniper Business Use Only

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

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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

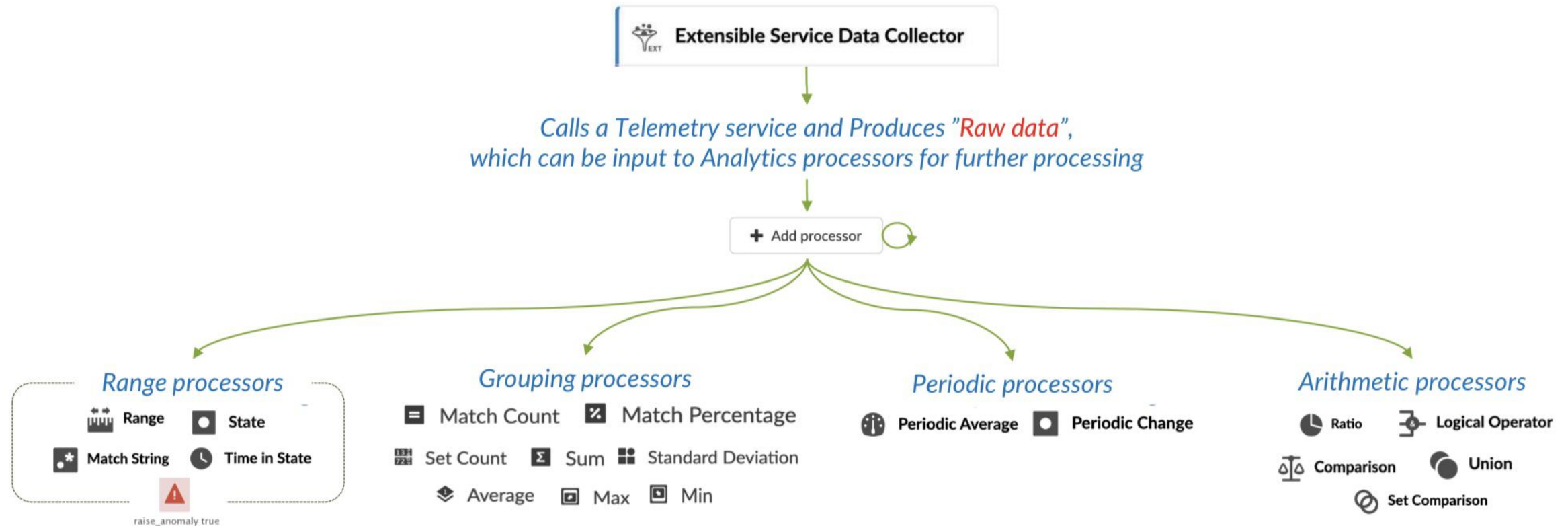
- Match Count
- Range
- Sum
- Min
- Match Percentage
- Max
- Set Count
- Average
- Standard Deviation

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



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.

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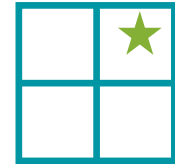
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Recognition

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.**"



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)

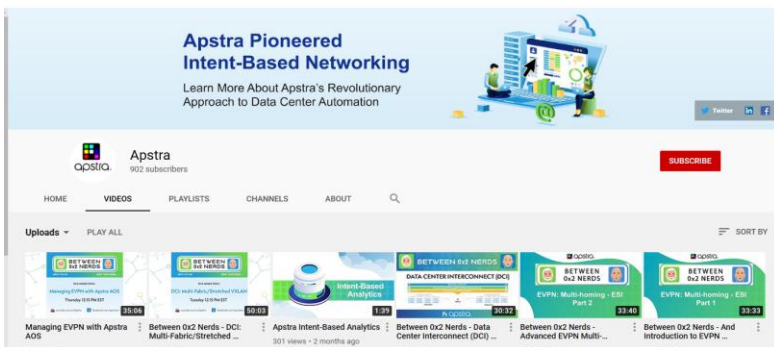
Apstra Academy

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



YouTube Playlist

<https://juniper.net/apstra-playlist>

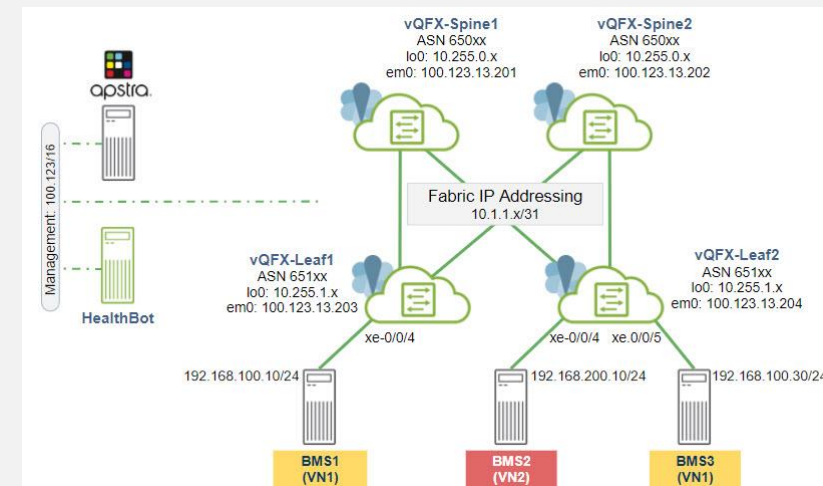


Juniper vLabs

<https://vlabs.juniper.net>

- Cloud-based lab environment
- Virtualized, pre-built network topologies
- Available on-demand – for free!

Apstra DC Fabric Operations



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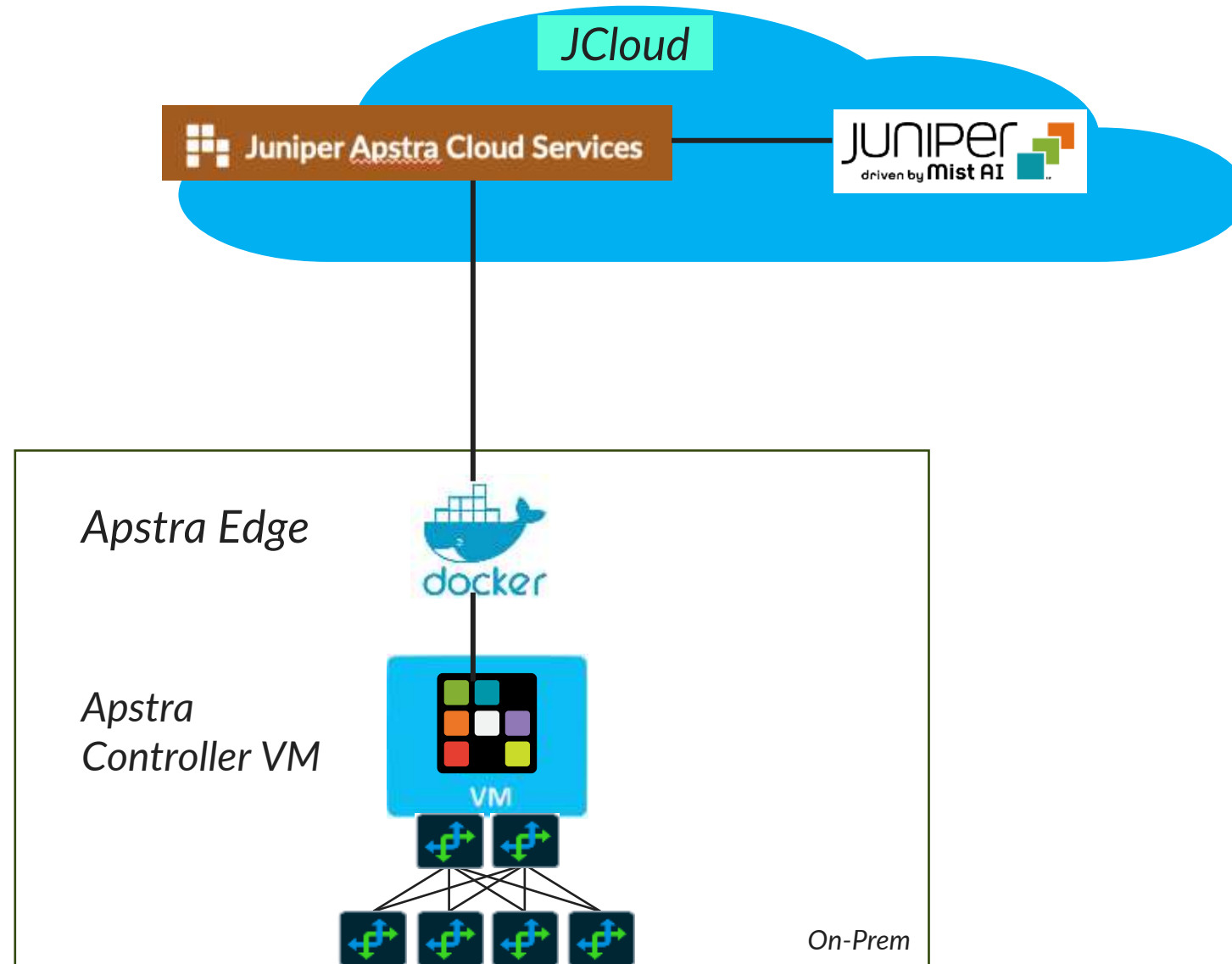
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Apstra Update

Vijendra Singh, Reseller at Juniper Networks

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*

Apstra + Mist AI Ops with Marvis

Available NOW

Integration to Marvis



ACTIONS: 15

- Layer 1 & 2
- Connectivity
- Devices
- Virtual Infra
- Security
- Traffic Capacity

1 BGP Mismatch
2 LAG Imbalance
2 MLAG Imbalance
1 Stack Mapping
4 Distribution Mapping
1 Loop in Learning State
1 Loop in Learning State
1 Security/Access Control

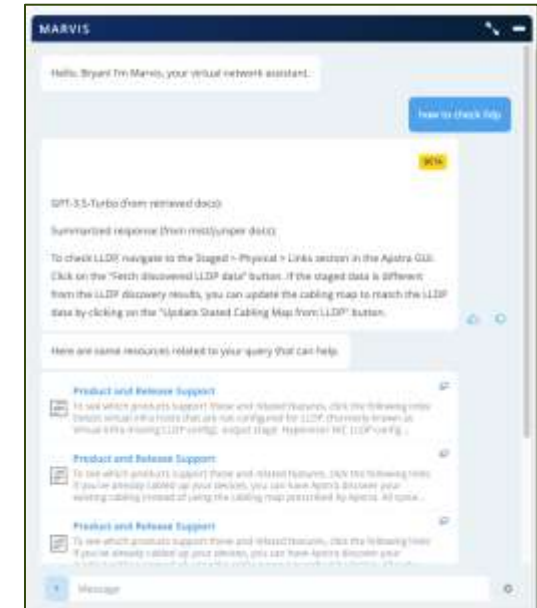
0 Other Actions

MARVIS chatbot interface showing a conversation about logical devices.

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.)*



MEDIA & ENTERTAINMENT Customer

AI Ops 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.
- **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 RESULTS

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

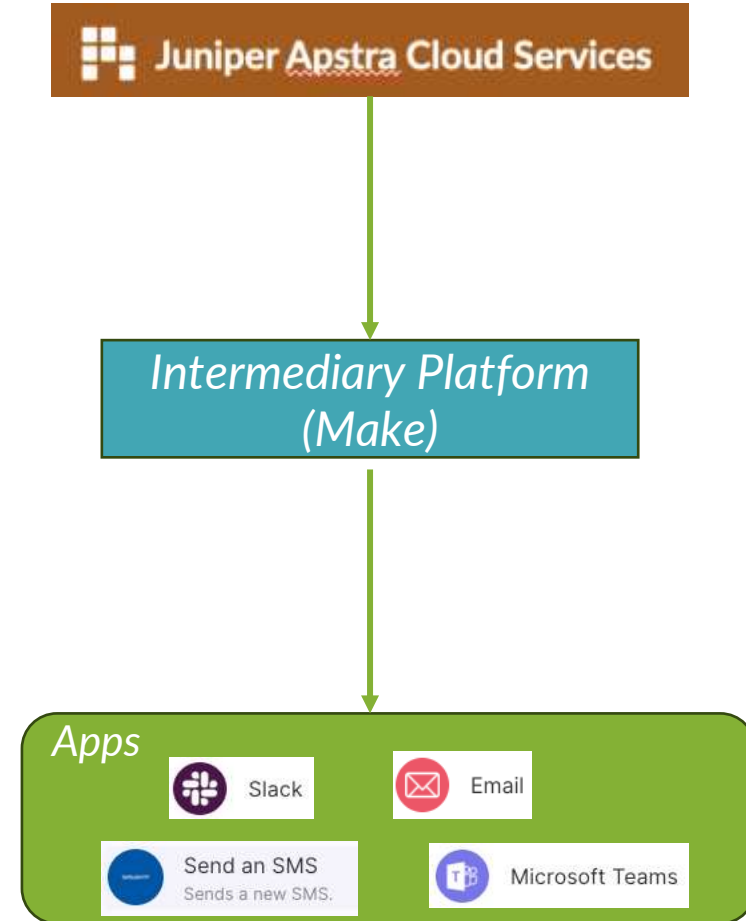
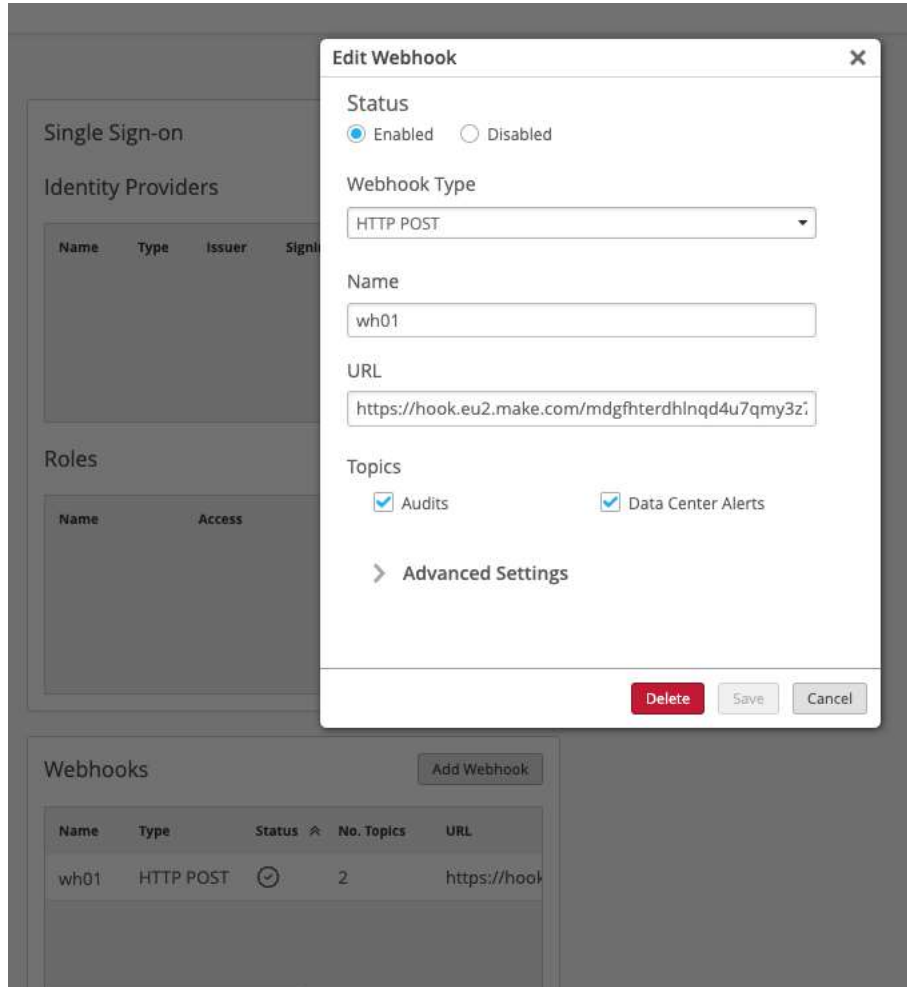
DC Alert Notification Service

Email

The screenshot shows the Juniper Apstra Alerts Configuration page for Email notifications. The page is titled "Alerts: Configuration" and includes a search filter. The configuration is for a "Default" alert type, which applies to "All other sites". The "Applies to Scope" section has "Entire Org" selected. The "Email Recipients Settings" section has "To organization admins" checked and "To site admins" unchecked. Below this is a text input field for "To additional email recipients". The "Alert Types" section is a table with columns for "Alerts", "Enable Alert", and "Send Email Notification".

Alerts	Enable Alert	Send Email Notification
▼ Datacenter	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
▼ Connectivity	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
● BGP Flapping	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
● BGP Mismatch	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
● EVPN Host Flapping	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
● LAG Imabalance	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
● MLAG Imbalance	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

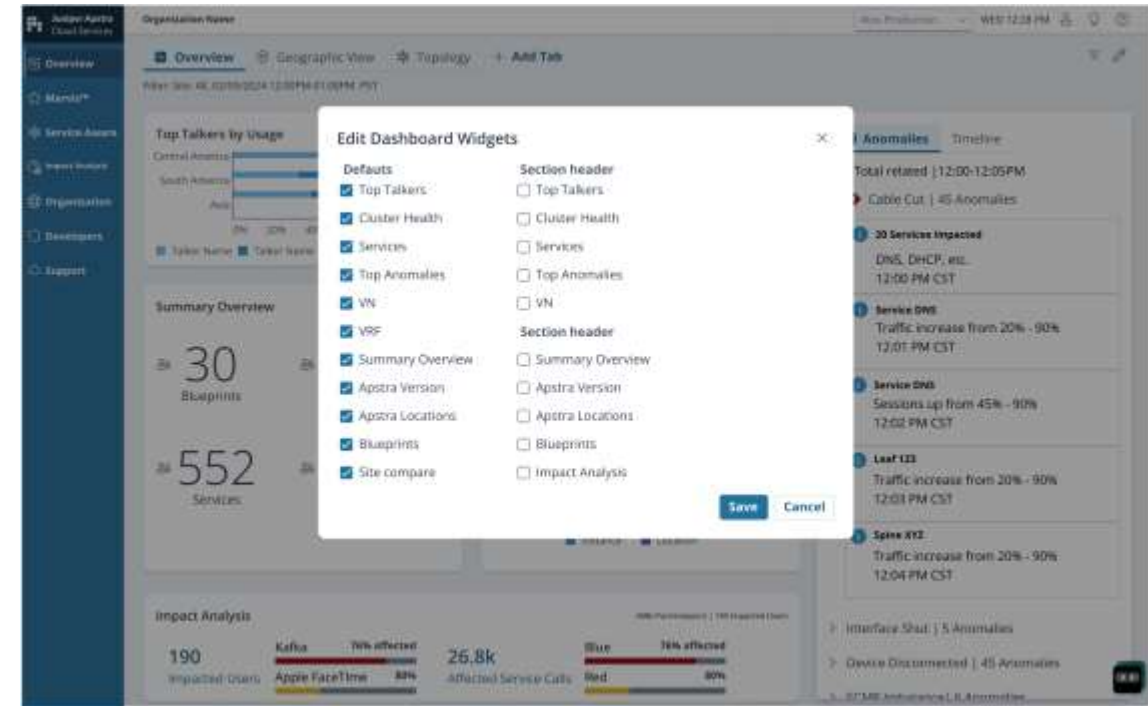
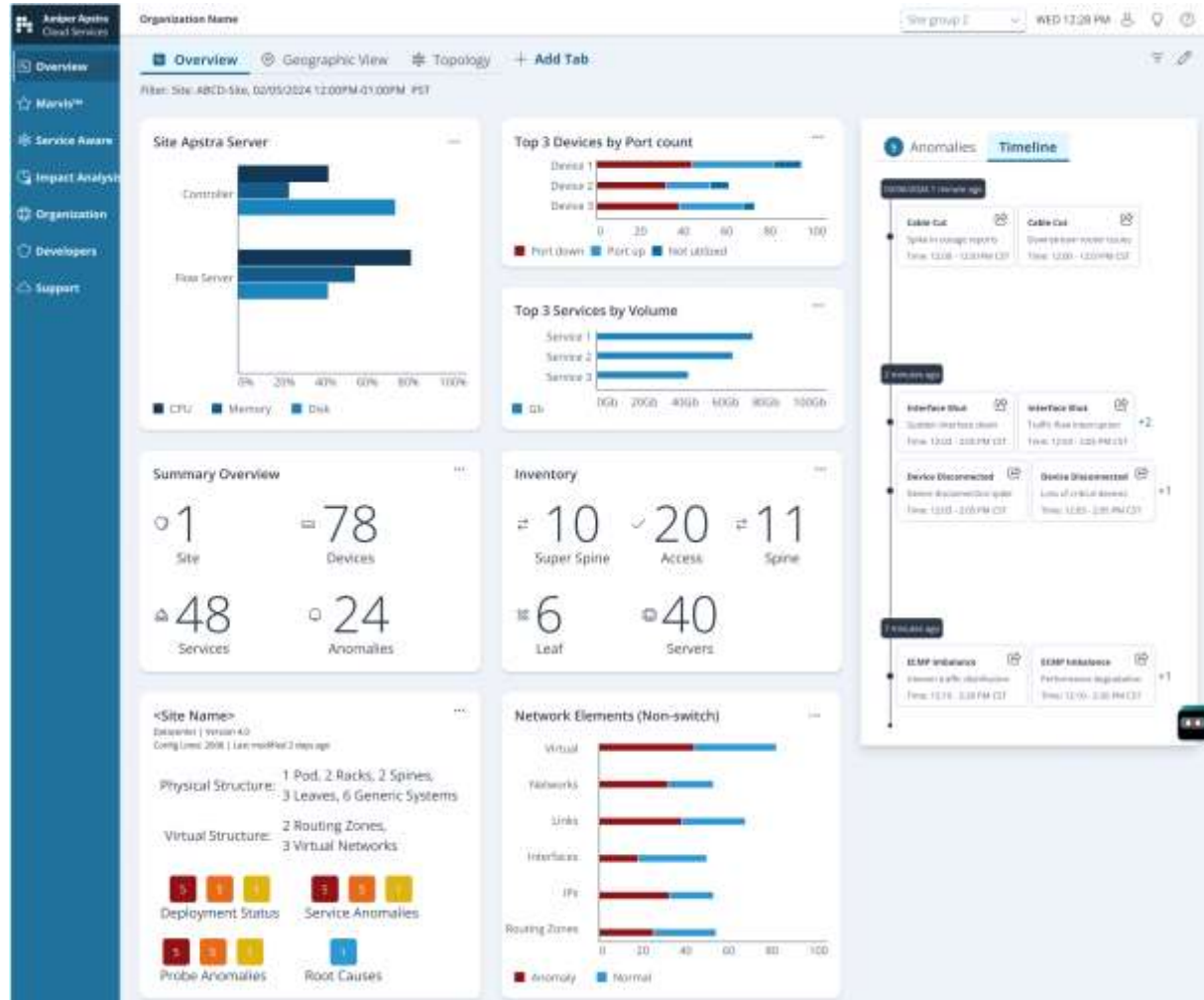
Cloud Service Audit/Alert Notification Service *Webhooks*



Dashboards



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



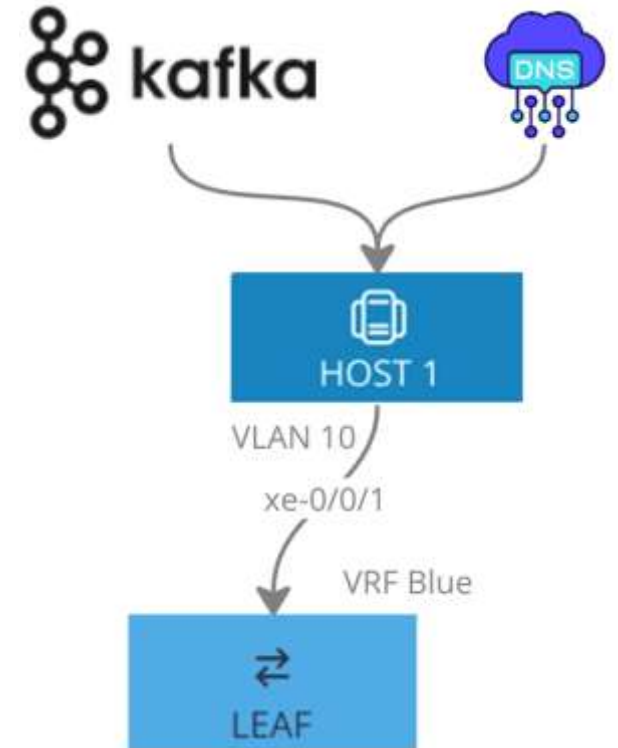
Service Awareness

Adding service data to the Apstra network knowledge graph

Q3

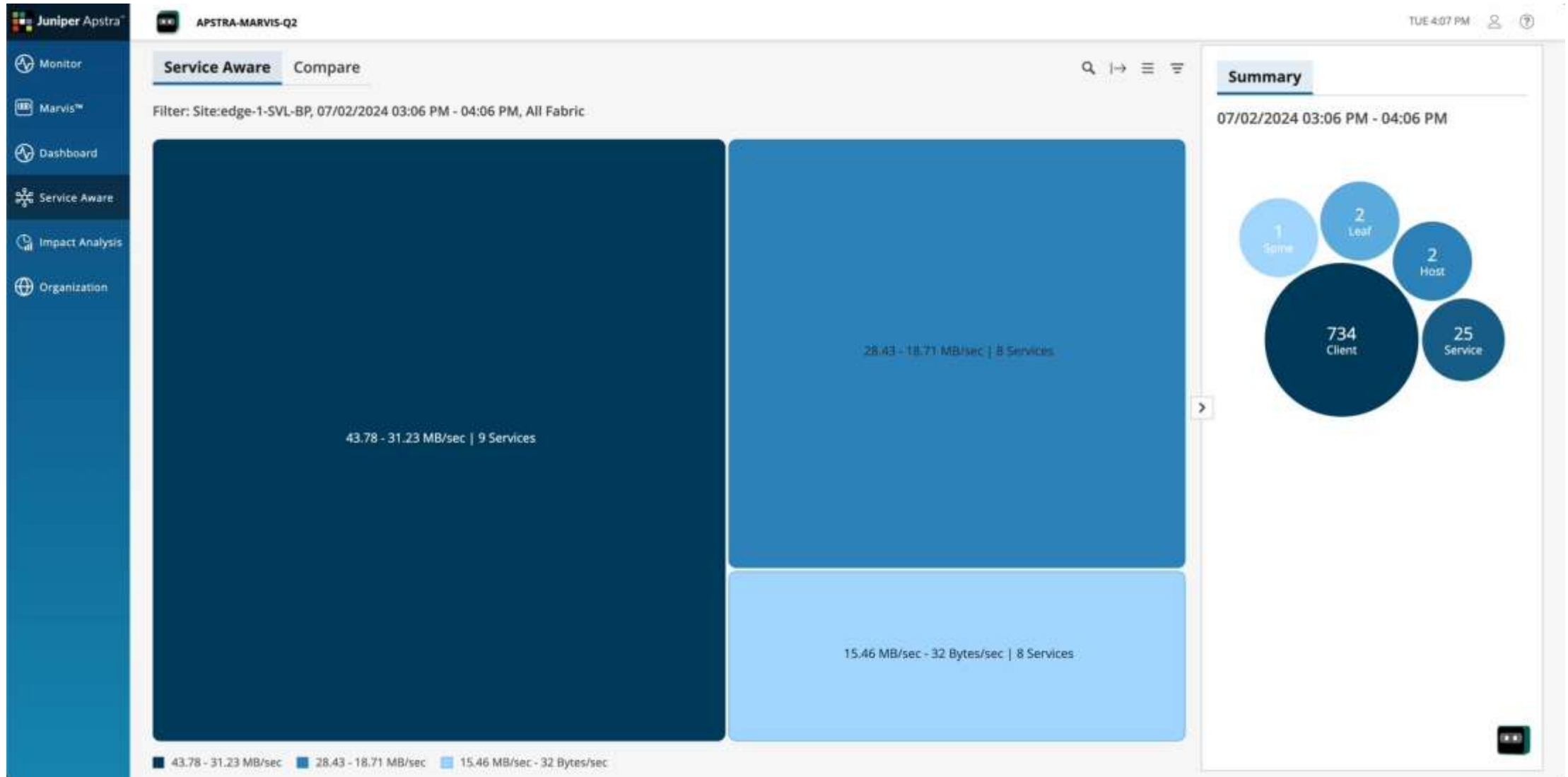
Which switch ports are hosting a Kafka service? What is using all the bandwidth in VRF Blue?

- 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



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."

Impact Analysis



The screenshot displays the Juniper Service Aware Impact Analysis interface. The main area shows a network topology diagram with nodes categorized as CLIENT, SERVICES, HOST, LEAF, and SPINE. A timeline at the bottom shows events for 02/05/2024, including 'Service3 Added' and 'Change A description'. A right-hand panel lists 'Changes' such as 'DNS Service added' with associated traffic increases and times. Further right, an 'Anomalies' panel shows '4 Total related' anomalies, including '5 Services Impacted' and 'Link Status Mismatch'.

Organization Name
Impact Analysis
Filter: All, 01/31/2024 T 12:00AM-01/31/2024 T 01:00PM
Time Range: 02/05/2024 T 11:30 AM - 02/05/2024 T 12:30 PM

Network Topology Summary:

- 100 CLIENT (Issues: 0)
- 48 SERVICES (Issues: 0)
- 10 CLIENT (Issues: 0)
- 21 SERVICES (Issues: 0)
- 76 SERVICES (Issues: 0)
- 48 SERVICES (Issues: 0)
- 82 CLIENT (Issues: 0)
- 50 SERVICES (Issues: 0)
- 11 HOST (Issues: 0)
- 300 HOST (Issues: 0)
- 300 HOST (Issues: 0)
- LEAF (Issues: 23)
- LEAF (Issues: 23)
- LEAF (Issues: 23)
- SPINE (Issues: 0)
- SPINE (Issues: 0)
- SPINE (Issues: 0)

Changes Log:

- DNS Service added
Traffic increase from 20% - 90%
Time: 12:00 - 1:00 PM CST
- DNS Service added
Traffic increase from 20% - 90%
Time: 12:00 - 1:00 PM CST
- DNS Service added
Traffic increase from 20% - 90%
Time: 12:00 - 1:00 PM CST
- DNS Service added
Traffic increase from 20% - 90%
Time: 12:00 - 1:00 PM CST
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Traffic increase from 20% - 90%
Time: 12:00 - 1:00 PM CST

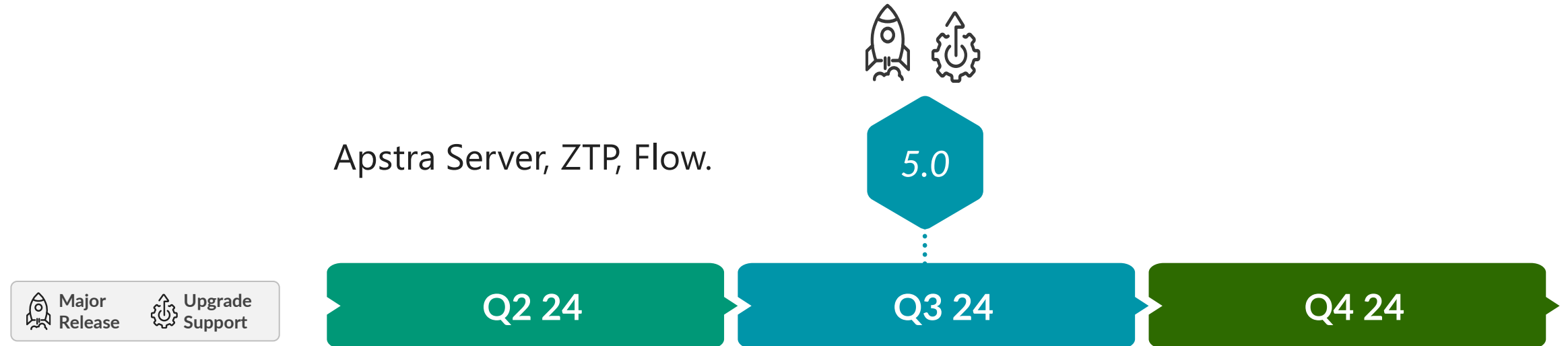
Anomalies Panel:

- 4 Total related | 10:15 AM - 10:30 AM
- 1 Anomalies | 5 Impacted
- 5 Services Impacted
complex-main (TCP/5000)
complex-main (TCP/5000)
service-1
service-2
service-3
Time: 07/12/2024 10:18 AM
- Cold Leaf link
Time: 07/12/2024 10:08 AM
- 1 Anomalies | 5 Impacted
- 5 Services Impacted
complex-main (TCP/5000)
complex-main (TCP/5000)
service-1
View More
Time: 07/12/2024 10:17 AM
- Device Cold Anomalous
Time: 07/12/2024 10:08 AM
- Link Status Mismatch
2 Anomalies | 5 Impacted

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).

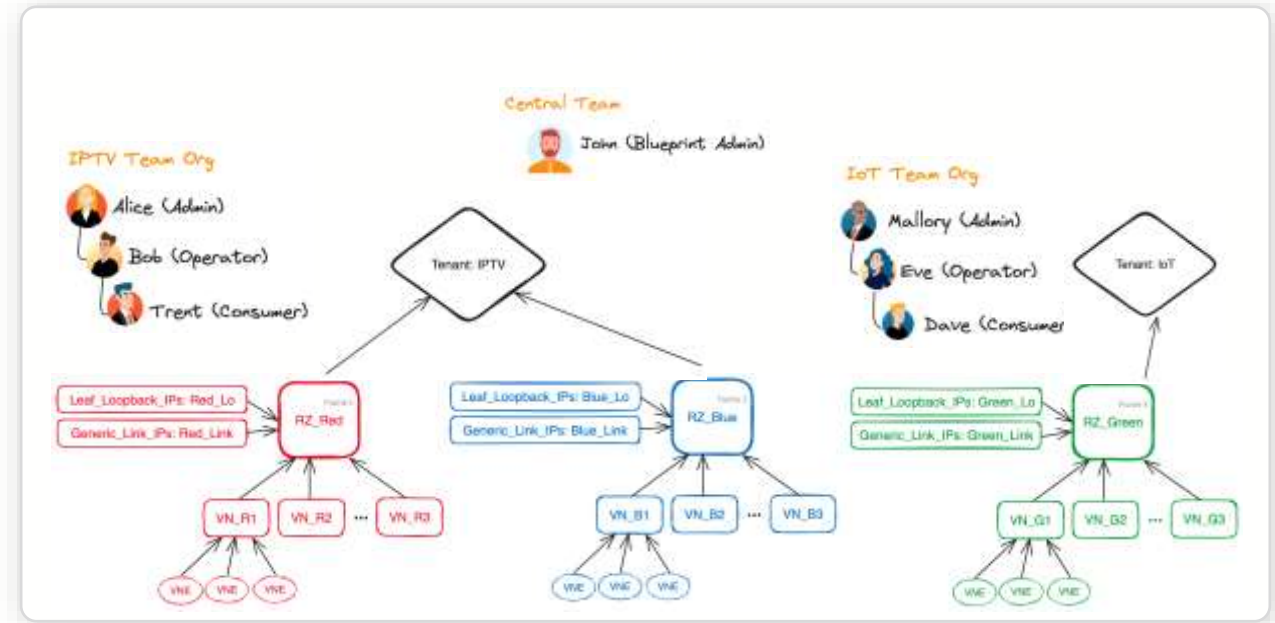


Tenant Aware RBAC

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).



Role	Tenant-Aware Permission
John (Blueprint Administrator)	Blueprint_Administrator Create Routing Zones and assign them to a tenant
Alice (Tenant Administrator IPTV)	Tenant_Administrator_IPTV Edit Routing Zones and their resources from Tenant IPTV
Bob (Tenant Operator IPTV)	Tenant_Operator_IPTV Create/edit Virtual Networks in IPTV's Routing Zones
Trent (Tenant Consumer IPTV)	Tenant_Consumer_IPTV Assign Connectivity Templates for VNs in in IPTV's Routing Zones
Mallory (Tenant Administrator IoT)	Tenant_Administrator_IoT Edit Routing Zones and their resources from Tenant IoT
Eve (Tenant Operator IoT)	Tenant_Operator_IoT Create/edit Virtual Networks in IoT's Routing Zones
Dave (Tenant Consumer IoT)	Tenant_Consumer_IoT Assign Connectivity Templates for VNs in in IoT's Routing Zones

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.***

```
## 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())
```

```
[
  {
    "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

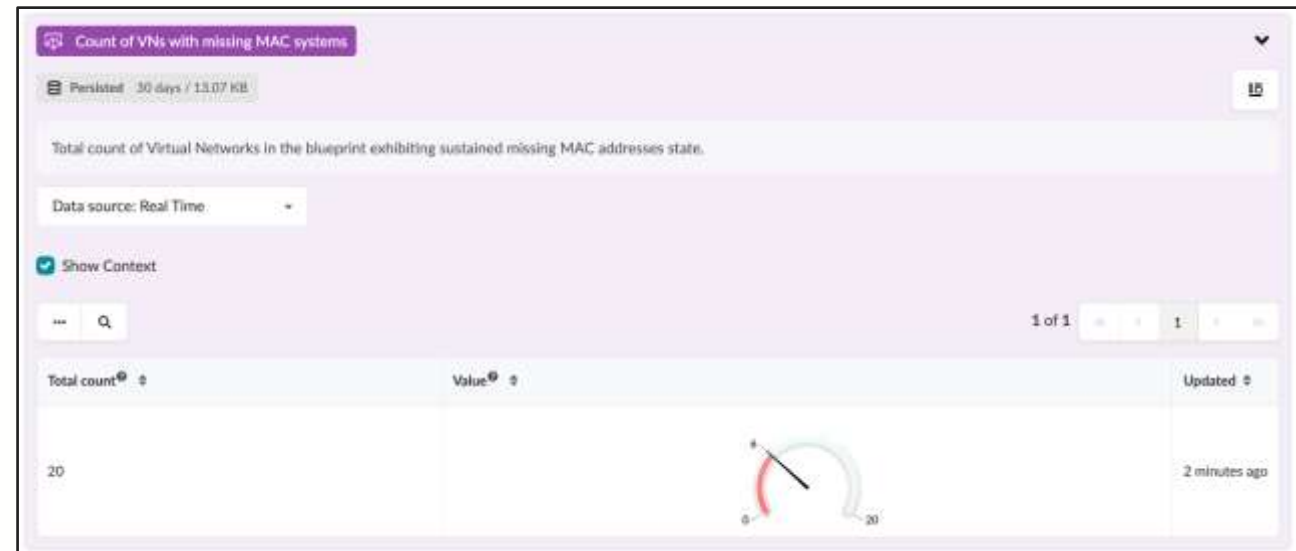
To ensure your DC network is operating correctly by validating EVPN control plane.

- 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)**.

Missing MAC Addresses count per System, per VNI.

1-25 of 42

System ID	Vni	Missing Mac Count	Updated
5254001F7975 leaf1 Leaf	30000 blue_vxlan_31_v4_1	0 (view)	a few seconds ago
5254001F7975 leaf1 Leaf	30001 red_vxlan_32_v4_1	1 (view)	a few seconds ago
5254001F7975 leaf1 Leaf	30005 blue_vxlan_36_v4_one_ep	0 (view)	a few seconds ago
5254001F7975 leaf1 Leaf	30006 blue_vxlan_37_v4_one_ep_mlag	0 (view)	a few seconds ago
5254001F7975 leaf1 Leaf	30012 blue_vxlan_43_v6_1	2 (view)	a few seconds ago



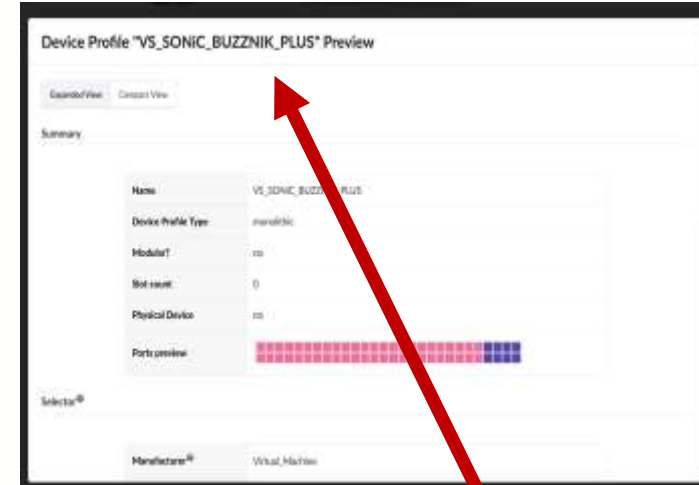
Template and Rack Relationships

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



 This shows you all the logical relationships and dependencies chosen so you can validate that the design matches your expectations.



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

A server room with blue and green lighting. The server racks are filled with equipment. The floor is dark with blue and green lights. The text "Thank you" is centered in white.

Thank you

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