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JUNIPER AND ANUTA AUTOMATE WORKFLOWS FOR NETWORK TRANSFORMATION

Roll out services faster, enable feedback loops, and assure services with a low-code automation framework

Challenges
New technologies such as 5G, Wi-Fi 6, IoT, and edge computing have significantly increased network complexity. Operators are facing a massive challenge in managing, monitoring, and troubleshooting devices and services, leading to noncompliant and unstable networks.

Solution
The joint Juniper/Anuta automation solution gives organizations the unique ability to rapidly design and provision network services, gain visibility into applications and services, and ensure SLA compliance as well as service assurance for multivendor infrastructures.

Benefits
- *Faster service rollout, greater productivity, and elevated customer experience*
- *Lower downtime, meantime to repair, and OpEx costs*
- *Secure and policy-compliant networks*

With the evolution of new technologies, rapid multivendor adoption, and rising use case intricacies, automating sophisticated modern networks can be complex. Further complicating the situation, task-based automation, accomplished with heavy scripting tools and pointed solutions, has outlived its utility. Network operators require automation solutions that can readily translate business intent into service performance across the entire service delivery life cycle: plan, design, implement, operate, and optimize.

To meet this challenge, Juniper Networks has partnered with Anuta Networks to enhance its Juniper® Paragon Automation Portfolio, which includes Juniper Paragon Active Assurance, Juniper Paragon Pathfinder, Juniper Paragon Planner, Juniper Paragon Insights, along with the Junos® telemetry interface (JTI).

The joint Anuta/Juniper solution provides a modular, extensible, scalable, and cloud-native software platform that enables network operators to rapidly design and provision network services, collect real-time telemetry, display deep network analytics, ensure compliance, and provide service assurance for multivendor physical and virtual infrastructure. It allows network operators to efficiently achieve their business objectives with a comprehensive solution that simplifies the planning, design, deployment, operation, and optimization of their networks and services. As a result, teams are able to deliver services faster, eliminate human error, introduce standardization, automate methods of procedure (MOPs) such as router software upgrades, and optimize customer experience with exceptionally high availability.

The Challenge

Network Workflow Automation and Service Orchestration

Conventional automation solutions typically consist of siloed pointed solutions that require heavy scripting. As a result, organizations often struggle to automate stateless and complex MOPs such as software upgrades, network troubleshooting, and network migrations.

It is equally challenging to develop and manage customized stateful network services that require complex life-cycle management, service discovery, and multitenancy capabilities. In response, organizations have embraced task-based automation where few specific tasks within a procedure are automated. Task-based automation cannot scale to satisfy today's rapidly growing multivendor networks and rising use case complexity, leading to an increase in manual processes, human errors, and nonstandard and noncompliant configurations across the network.

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End-To-End Visibility

Real-time network monitoring is essential to immediately detect and remediate performance issues. Yet many organizations have multiple specialized monitoring solutions catering to a multivendor environment. These typically consist of devices with varied capabilities and create multiple challenges.

If the data is collected and stored by many different tools, you end up with multiple data lakes. Correlating that data across multiple vendor solutions to determine the root cause of an issue becomes a tedious, time-consuming process. Integrating and managing multiple tools to comprehend dispersed information and automatically initiate corrective actions is equally challenging.

Automated Remediation

To ensure business continuity and service-level agreement (SLA) adherence, enterprises and service providers must respond swiftly to critical network issues and failures. Without a framework for continuous monitoring and automated remediation, operators lose precious time when analyzing and debugging the network. Network administrators need a platform that enables them to write essential performance and compliance policies, monitor their multivendor multidomain networks, and automatically remediate any policy violations.

In short, a comprehensive network automation solution is critical to ensure service delivery, availability, and performance within a multidomain network infrastructure.

The Joint Juniper-Anuta Network Automation Solution

The Paragon Automation Portfolio is a modular collection of cloud-native software applications, specifically designed to deliver closed-loop automation that simplifies network operations by eliminating repetitive manual tasks, processes, and workflows that are prone to human error. By increasing network reliability, the Paragon Automation Portfolio ensures that customers receive an assured service experience throughout the life of their service.

The Anuta Networks ATOM platform is a comprehensive low-code workflow automation framework that allows network operators to automate processes for deploying, managing, and monitoring network devices and services. ATOM orchestrates the complete life cycle of network services across the plan, design, deploy, operate, and optimize steps, delivering a simple and intuitive workflow builder framework that enables network operators to drag, drop, and automate both simple and complex procedures.

Anuta ATOM complements other Paragon Automation Portfolio products such as Juniper Paragon Insights, which provides network health monitoring and diagnostic capabilities for consistent and coherent operational intelligence across network deployments. Juniper Paragon Pathfinder, the industry's first WAN software-defined networking (SDN) controller for traffic optimization, provides the capability to provision and manage network service paths by automating control of segment routing,
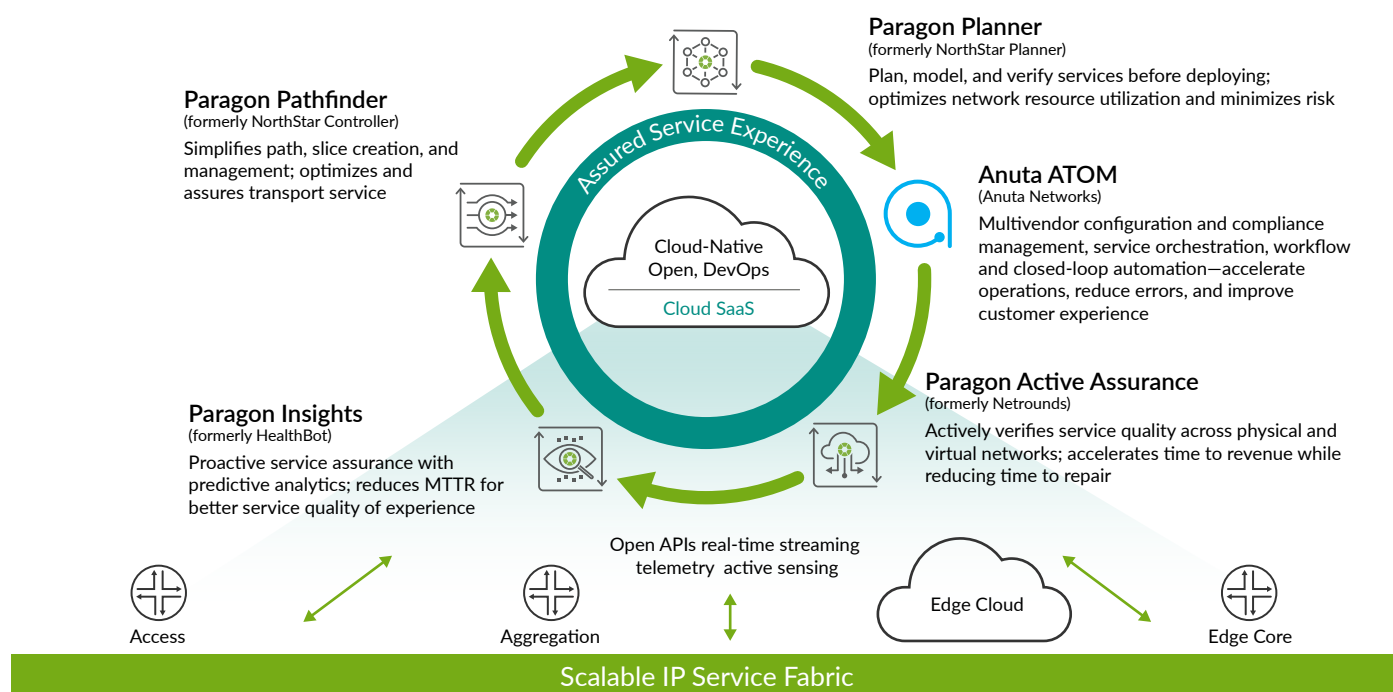

Paragon Planner
(formerly NorthStar Planner)
Plan, model, and verify services before deploying; optimizes network resource utilization and minimizes risk

Paragon Pathfinder
(formerly NorthStar Controller)
Simplifies path, slice creation, and management; optimizes and assures transport service

Anuta ATOM
(Anuta Networks)
Multivendor configuration and compliance management, service orchestration, workflow and closed-loop automation—accelerate operations, reduce errors, and improve customer experience

Paragon Active Assurance
(formerly Netrounds)
Actively verifies service quality across physical and virtual networks; accelerates time to revenue while reducing time to repair

Paragon Insights
(formerly HealthBot)
Proactive service assurance with predictive analytics; reduces MTTR for better service quality of experience

Assured Service Experience

Cloud-Native Open, DevOps

Cloud SaaS

Open APIs real-time streaming telemetry active sensing

Access

Aggregation

Edge Cloud

Edge Core

Scalable IP Service Fabric

Figure 1: Anuta Networks and Juniper Networks joint solution

MPLS, and network slicing flows. Anuta ATOM also complements Juniper Paragon Planner, a network planning and simulation tool that provides in-depth network views, health audits, and scenario planning without impacting the live network.

The Paragon Automation Portfolio works with Anuta Network ATOM to enable numerous advanced use cases, giving organizations the unique ability to:

- Automatically onboard multivendor greenfield and brownfield devices and services

- Provision, manage, and orchestrate network services such as L2/L3 VPN, Ethernet VPNs (EVPNs), etc.

- Leverage active and passive monitoring of end-to-end networks to:

  – Verify the network's ability to support a service before it gets deployed

  – Enforce uniform configurations and compliance policies for the entire network

  – Verify that a service is performing as committed, post deployment and beyond

  – Monitor devices, network connections, links, and services for user-defined key performance indicators (KPIs) to assess the health of the entire network at all times

- Provision and manage traffic-engineered paths for segment routing, MPLS, and network slicing

- Access advanced machine learning (ML) analytics that provide anomaly and outlier detection and predictive analytics

- Leverage closed-loop automation workflows to automatically troubleshoot and remediate network faults

Features and Benefits

As network operators look to overcome the challenge of growing complexity, the joint Juniper-Anuta network automation solution will provide them with the following capabilities and benefits:

- Simplified design, deployment, and management of network infrastructure and services, which increases efficiency, shortens delivery times, and improves the overall service experience

- Service assurance with automated health monitoring, ML-powered analytics, and automated workflows for closed loop, autonomous automation

- Institutionalized automation with DevOps and continuous integration/continuous delivery (CI/CD) practices, which provide the ability to standardize and automate MOPS while offering the flexibility for customization, enhancement, and differentiation

- Capacity planning enabling offline scenario planning and network analysis before implementing changes in the network, which can be used for unexpected situations

- Improved network security and performance with automated device onboarding, configuration, and compliance auditing and remediation

Feature	Description
Data collection	The Paragon Insights data collector gathers device, network, and service data using multiple data collection options such as the Junos telemetry interface (JTI), SNMP, system logging, and standards-based OpenConfig telemetry, to name just a few. As a result, Paragon Insights can aggregate large volumes of time-sensitive telemetry data, providing a multidimensional view across networks and services, translating real-time analytics into actionable insights.
Playbooks	Paragon Insights playbooks define how collected data will be analyzed. Playbooks can be applied to data collected from specific devices or device systems, as well as to network device groups and services. Within the playbooks, network operators can leverage machine learning. For example, Paragon Insights playbooks can leverage ML algorithms to provide anomaly detection and predictive analytics. The playbooks can also assign data analysis outcomes to triggers, such as green, yellow, or red, which can be used to drive specific intent-based actions.
ML-powered analytics	Paragon Insights leverages machine learning to provide anomaly detection and prediction, track data, provide event correlation, and simplify and streamline root cause analysis.
Low-code workflow automation	Anuta ATOM provides an intuitive graphical interface to design, develop, and execute complex or straightforward network operations and procedures. The powerful interface allows network administrators to describe business intent along with KPIs and take corrective actions on violations.
Service orchestration	ATOM service orchestration capabilities enable network operators to create and manage network services such as L2VPN, L3VPN, Ethernet VPN (EVPN), and so on, with the service modeled and customized using the IETF YANG framework. ATOM provides brownfield discovery and complete life-cycle management of network services, and it supports OpenConfig and IETF models for L2/L3 VPN services. Service models support atomic transactions and can be invoked by the low-code workflow for a complete stateful and stateless automation.

| Feature	Description
Calculation, provisioning, and management of IP/MPLS and short reach paths	Paragon Pathfinder calculates, provisions, and manages IP/MPLS and segment routing (SR) paths based on user-defined constraints such as bandwidth and latency. It includes the ability to provision fully redundant paths through a network, dynamically manage large traffic loads, manage traffic flows to and through network peering sites, and automatically load-balance traffic across peer sites to mitigate congestion and reroute traffic when end-user SLAs are at risk.
Out-of-the box workflows and adaptors	ATOM provides numerous out-of-the-box workflow templates for most common network operations and troubleshooting activities. These templates are highly customizable and can be easily modified to suit your needs. Templates cover a wide range of use cases, from simple L2/L3 provisioning to complicated OS upgrades.
Reusable libraries	ATOM workflow automation provides an extensible and modular low-code framework, enabling administrators to break down complicated workflows into smaller, simpler subroutines or libraries. The libraries are independent low-code blocks that can be imported into any workflows.
Analytics and closed-loop automation	Anuta ATOM collects essential network and device information from multivendor infrastructure to develop deep analytics and reports. Network administrators can define KPI metrics and corrective actions to automate SLA compliance.
Configuration and compliance management	Anuta ATOM offers a robust framework to easily define complex network and security policies. It enforces around-the-clock compliance by automatically detecting violations and taking corrective actions. The platform regularly archives and preserves device configurations. Anuta ATOM detects any unauthorized changes made on devices and enforces reconciliation procedures automatically.
Scalable cloud-native platform	Anuta ATOM is containerized and can be deployed on premises or in public, private, hybrid, or multiclouds, including AWS, Azure, and Google Cloud Platform (GCP). The modular architecture reduces ATOM's footprint by allowing administrators to install components relevant to their use cases. The microservices architecture provides resiliency and high availability for the platform.
Extensible platform	The joint Juniper-Anuta solution is open and extensible. The products within the portfolio leverage REST APIs for integration with operations support systems (OSS), business support systems (BSS), and ticketing systems, as well as compatibility with other tools and applications such as YANG models for ease of configuration, standards-based Path Computation Element Protocol (PCEP) for provisioning, and multiple different telemetry and data collection interfaces. Anuta ATOM and the Junos operating system both have software development kits (SDKs) supporting the ongoing DevOps movement.
Multivendor support	The joint Juniper-Anuta solution provides multivendor support for routers, switches, firewalls, load balancers, IT service management (ITSM) solutions such as ServiceNow and Jira, OSS/BSS, and ticketing billing solutions, among others.
Role-based access control (RBAC) and multitenancy	The Anuta ATOM Platform supports role-based access control and multitenancy, which allows the customization of privileges to various functions in ATOM.
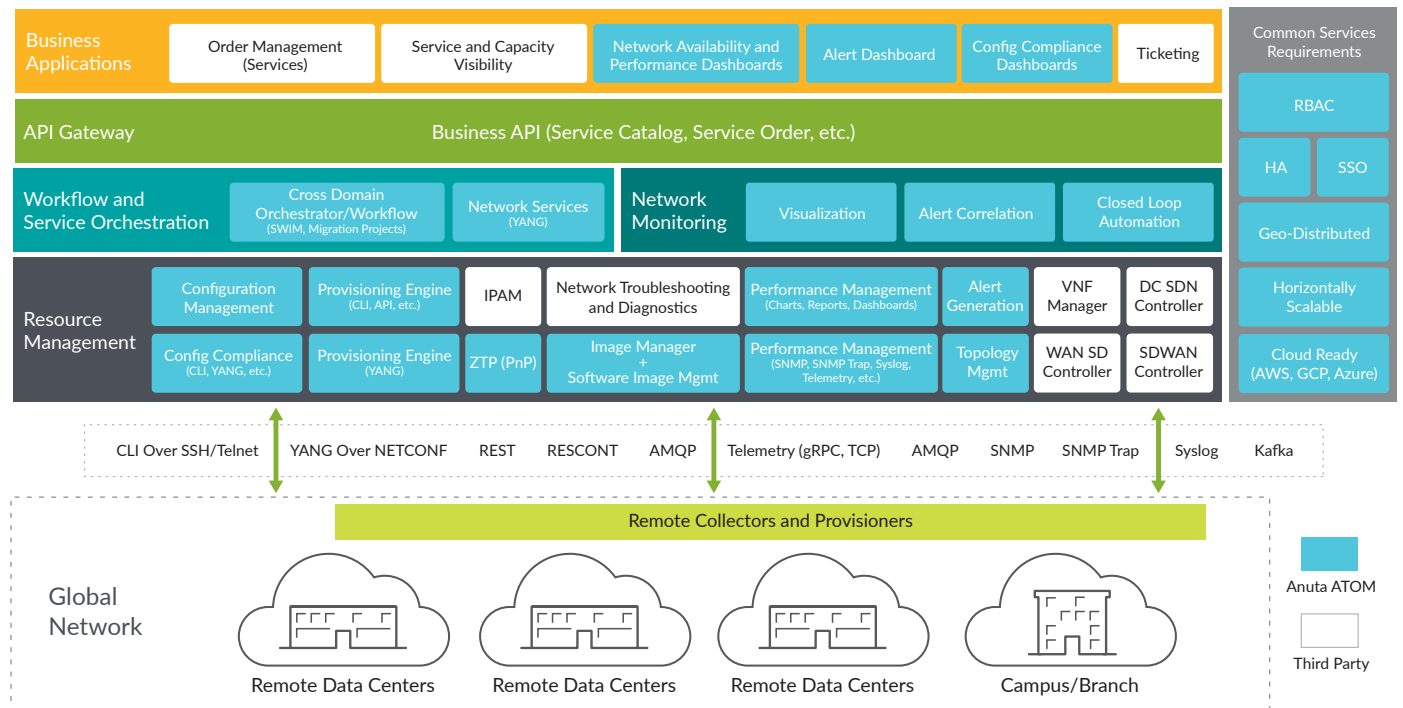
Figure 2: Network automation ecosystem with Anuta ATOM

Solution Components

Anuta ATOM

Anuta ATOM is a microservices-based scalable software platform that provides closed-loop automation and service orchestration by leveraging low-code workflow for provisioning, management, monitoring, and assurance of multivendor networks and services.

The ATOM platform is open and extensible, and it supports REST APIs for integration with network ecosystems such as IP Address Management (IPAM), OSS/BSS, and ticketing systems. ATOM workflow automation provides an intuitive and graphical low-code framework, enabling administrators to break down complicated MOPs into smaller, simpler subroutines or libraries. The platform is containerized and can be deployed on premises or in public, private, hybrid, or multiclouds, including AWS, Azure, and GCP.

Paragon Insights

Juniper Paragon Insights is Juniper's network health and diagnostic solution, providing consistent and coherent operational intelligence across network deployments. Integrated with JTI and standards-based OpenConfig telemetry, Paragon Insights aggregates large volumes of time series telemetry data and provides a multidimensional view across the network and applications, translating real-time analytics into actionable insights. To learn more, visit the Paragon Insights product page.

Paragon Pathfinder

Juniper Paragon Pathfinder simplifies, optimizes, and automates the provisioning, management, and monitoring of segment routing and IP/MPLS flows across large networks. Network operators use Paragon Pathfinder to optimize network infrastructure through proactive monitoring, planning, and explicit routing of large traffic loads, dynamically based on user-defined constraints. To learn more, visit the Paragon Pathfinder product page.

Paragon Planner

Juniper Paragon Planner is a network planning solution that provides concise, in-depth views of a routed network in an intuitive graphical format, helping network managers optimize time, bandwidth, and network resources. The planner can forecast the impact of network growth or realignment, while planning tools help you dynamically create explicit routing paths using a global view based on user-defined constraints. To learn more, visit the Paragon Planner product page.

Paragon Active Assurance

Juniper Paragon Active Assurance is a programmable, active test and service assurance platform for physical, hybrid, and virtual networks. Paragon Active Assurance uses active and synthetic traffic to verify application and service paths at the time of delivery and throughout the life of the service. To learn more, visit the Paragon Active Assurance product page.

Summary—End-to-End Monitoring, Service Orchestration, MOP Automation, Compliance Enforcement, and Closed-Loop Automation

The Anuta ATOM platform, working with Juniper Paragon Active Assurance, Paragon Insights, Paragon Pathfinder, and Paragon Planner, provides a perfect solution for end-to-end monitoring, service orchestration, and MOP automation. This joint solution enables network operators to design, develop, and manage a variety of network services, allowing them to define various complex configuration and compliance policies and ensuring constant enforcement of all policies across the network. It also lets network operators efficiently achieve their business objectives with a comprehensive solution that simplifies the planning, design, deployment, operation, and optimization of their networks and services.

Next Steps

To ease solution procurement, Anuta's automation products are available through Juniper Networks.

To learn more about Juniper and Anuta's joint solution, please visit Juniper's Solutions Partner Page at www.juniper.net/us/en/dm/anuta-networks-partnership/.

About Anuta Networks

Anuta Networks is a leading provider of web-scale on-premises and cloud network orchestration and assurance software for branch, campus, data center, and service provider networks. Headquartered in Silicon Valley, Anuta Networks is a Gartner Cool Vendor and Best of VMworld award winner three years in a row.

About Juniper Networks

Juniper Networks brings simplicity to networking with products, solutions and services that connect the world. Through engineering innovation, we remove the constraints and complexities of networking in the cloud era to solve the toughest challenges our customers and partners face daily. At Juniper Networks, we believe that the network is a resource for sharing knowledge and human advancement that changes the world. We are committed to imagining groundbreaking ways to deliver automated, scalable and secure networks to move at the speed of business.

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