

**Network automation is essential to cloud-centric operations. Organizations increasingly need comprehensive network automation applicable to multiple domains and use cases.**

# *Addressing the Need for Comprehensive Multivendor, Multidomain Network Automation*

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## ***Introduction***

As enterprises and service providers adopt cloud in pursuit of digital transformation, they increasingly recognize the value of network automation.

Indeed, the drivers for network automation include digital transformation — an imperative for organizations worldwide — and the growing embrace of cloud, not only as a destination for workloads but also as a set of technologies and as an operating model that requires extensive infrastructure automation.

As the world moves into the post-COVID next normal, the advance toward cloud and cloud-centric automation is accelerated by an emphasis on business resilience. Organizations want to leverage cloud and cloud-centric strategies to keep the digital lights on under all foreseeable (and some unforeseeable) circumstances.

In this context, not just any approach to network automation will suffice. After all, network automation covers a wide spectrum of technologies and offerings. Ideally, organizations should adopt a comprehensive approach to network automation that will bring cloud principles and cloud-centric operational agility to networking, which, in relation to automation, has traditionally lagged not just cloud services but also other forms of infrastructure, including servers and storage.

Several forms of network automation are available, and many organizations begin their network automation journey by starting with tools that address low-risk configuration automation scenarios. Some organizations advance from scripting and scripting tools to infrastructure automation tools, including open source offerings, and sometimes to vendor-specific products that address policy-based network automation.

## **AT A GLANCE**

### **WHAT'S IMPORTANT**

Despite multiple challenges that inhibit the effectiveness of current approaches, IDC research finds that organizations recognize comprehensive network automation as a critical need.

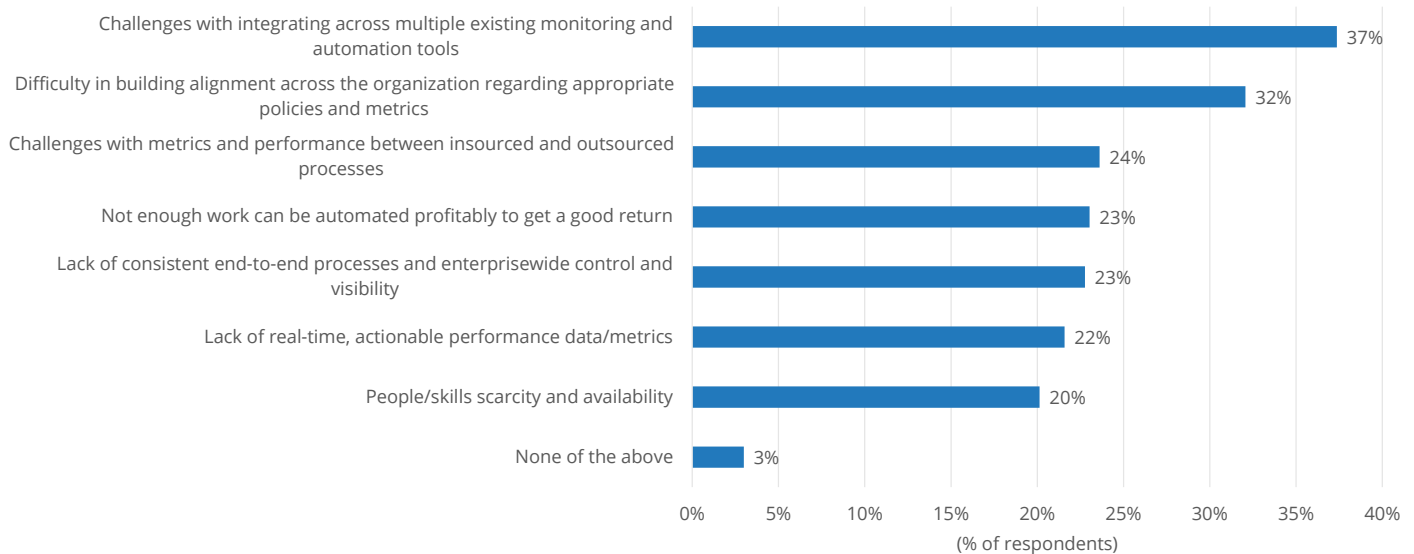
### **KEY TAKEAWAY**

A careful and thorough consideration of requirements, including a full assessment of key attributes and capabilities, will ensure that organizations select a network automation solution that addresses a broad range of use cases.

Those approaches, while offering practical value and utility in many contexts and use cases, often fall short of providing comprehensive network automation. In IDC's February 2021 *Future Enterprise Resiliency and Spending Survey, Wave 1*, respondents mentioned several significant barriers that prevented them from deriving full value from automation, including challenges integrating multiple automation tools; difficulty in achieving alignment across the organization regarding appropriate policies and metrics; challenges pertaining to metrics and performance between insourced and outsourced processes; lack of consistent end-to-end processes and enterprisewide control and visibility; lack of real-time, actionable performance data/metrics; and people/skills scarcity and availability (see Figure 1). What's more, many organizations have heterogeneous networking environments that are beyond the scope of vendor-specific approaches to network automation.

FIGURE 1: **Barriers to Deriving Value from Automation**

**Q What are the greatest barriers/concerns related to getting the full value out of your automation investments?**



*n* = 698

Base = respondents who indicated that enabling greater automation will be a selection criterion for organization's 2021 investments

Notes:

The survey is managed by IDC's Quantitative Research Group.

Data is weighted by country GDP (500+ employee size).

Multiple responses were allowed.

Source: IDC's Future Enterprise Resiliency and Spending Survey, Wave 1, February 2021

The monolithic architectures of many network service orchestrator (NSO) offerings present another problem. Monolithic architectures introduce both complexity and inefficiency. If a system module (e.g., for device discovery) experiences a failure, the entire software system must be restarted, resulting in a service disruption. Similarly, if operators want or need to upgrade a single function, they must upgrade the entire system because the components are not loosely coupled.

In addition, legacy NSO offerings frequently lack support for multitenancy and security controls and often lack active-active high-availability features, providing active-standby support instead. Legacy offerings that provide active-standby support rather than active-active support result in greater downtime, slower service recovery from failure, and inefficient use of computing and license resources.

These legacy offerings often operate in disconnected silos, with three or four products working in isolation from one another, failing to align properly in terms of capacity, capability, and performance. Consequently, steep learning curves and relatively high costs often accompany procurement and operation of disparate, disconnected products, with essential network telemetry and insights locked away in isolated islands of single-task automation. This results in slower operational processes, such as mean time to repair (MTTR).

Further, legacy architectures are often subject to performance bottlenecks, addressed suboptimally by additional procurement of software licenses, an approach that is inherently inefficient, expensive, and insufficiently scalable to meet the demands of next-generation services associated with 5G, edge computing, and IoT environments.

With those considerations in mind, IDC believes that a comprehensive approach to network automation should possess the following key attributes:

- » **Cloud-native architecture** based on containers and microservices. A cloud-native architecture provides the following benefits:
  - Secure multitenancy, including dedicated namespaces for each tenant, providing secure isolation and compliance as well as economies of scale for service providers
  - Highly efficient resource utilization, which reduces costs
  - Support for CI/CD pipelines, enabling application developers and DevOps teams to release new features with greater speed and agility (feature velocity)
  - Elastic scalability, which automatically accommodates variations in service demand, including peaks and valleys, scaling up and down as required
  - Hitless upgrades, which contribute to higher levels of availability and resiliency
  - Better support for AIOps, particularly through actionable insights that align network resources seamlessly with desired business outcomes
- » **Intelligent automation**, leveraging declarative policy, which is inherently simple to operate and manage through effective abstraction of underlying complexity. Network automation must make provisioning and deployment as simple as possible, but it should also inform and accelerate ongoing operations. At the same time, operational simplicity should not involve a compromise on features or functionality. Network automation must be as effective and rich as it is simple to manage and operate.
- » **Low-code automation**, which minimizes the amount of coding required to perform well-understood repetitive tasks at scale, including upgrades of IPv6, BNG routers, and network operating systems.
- » **Multidomain capabilities**, extending from the core (datacenter) to the cloud, across the enterprise campus, and across the WAN to the edge, as well as inclusive of service provider environments. Network automation should extend to all places in the network, ensuring that agility and rich digital experiences are supported everywhere.

- » **Multivendor support**, capable of working with heterogeneous network infrastructure (overlays and underlays) from multiple vendors. This includes multivendor configuration management, compliance, service insertion and orchestration, and workflow-oriented automation.
- » **An integrated platform with centralized management**, facilitating consolidation of functionality and tooling, thus reducing costs while further simplifying operations for both network architects and operators.
- » **Support for the entire network life cycle**, spanning day 0, day 1, day 2, and day N. The goal is full-fledged closed-loop automation, supporting planning and design, provisioning and deployment, troubleshooting and remediation, and optimization and change management. Closed-loop automation continually validates the network in real time, identifies problems, and takes automated actions to remediate issues in compliance with operator intent to ensure continuous network uptime. Similarly, network automation should support the tenant life cycle, cluster life cycle, release life cycle, and maintenance life cycle. This ensures that automation can support the full range of tenant, cluster, release, and maintenance requirements.
- » **High degrees of scalability and performance**, capable of accommodating existing networks and services as well as next-generation 5G networks and MEC, which require low latency and high throughput.
- » **High availability and reliability**, which are table stakes for network infrastructure, including automated network infrastructure. Features such as geo-redundancy further bolster availability by providing proactive service continuity.
- » **Brownfield as well as greenfield support**, ensuring that automation can be applied incrementally and compatibly to all environments, preexisting and new.
- » **Deployability worldwide** across regions and available zones to support global business resilience at scale.
- » **Compliance validation and checks**, compliance logs, and audit trails for corporate governance, as well as compliance remediation capabilities.
- » **Flexible licensing and consumption models**, which align with cloud-centric capabilities such as on-demand functionality, elastic scale, and utility pricing.
- » **Integration with back-end systems**, including ticketing and OSS/BSS.

## Benefits

Many benefits derive from having a comprehensive, full life-cycle approach to network automation, including the following:

- » **Faster and better business outcomes.** The ability of network automation to support faster provisioning of applications and services results in earlier rollouts of revenue-generating products and services. Additionally, because network automation extends throughout the life cycle, it allows for faster remediation of any issues that arise, keeping revenue-generating services available and responsive to customer demand.
- » **Operational efficiencies, including doing more with less.** Extensive network automation and orchestration allow IT operations staff to be more productive and efficient, mitigating the need for many repetitive, manual tasks that incur time and resource costs but add minimal value. Instead, the network and its operators can leverage automation and orchestration to better support SLAs and other metrics associated with organizational business outcomes.

- » **Operational agility, including the ability to expedite processes and complete required tasks faster.** Beyond the mitigation of low-value repetitive tasks, thoroughgoing network automation and orchestration facilitate greater agility in every facet of network operations and management, enabling the network to keep pace with the automated agility of related infrastructure and teams.
- » **The ability to minimize errors that result from manual operations.** During provisioning and change management, network automation's validation and verification capabilities ensure that configuration errors are not made and propagated across devices and networks. This reduces costs, improves operational effectiveness, mitigates security vulnerabilities, and precludes potentially debilitating service outages.
- » **Improved customer experiences through enhanced digital engagement.** By ensuring that the network provides agile and effective support for applications and services throughout the entire life cycle, network automation and orchestration contribute to enhanced digital experiences, which are increasingly important as organizations shift toward digital business and application-oriented customer relations.
- » **Cost optimization through flexible consumption and deployment models.** The move to cloud-centric operating models and agile digital engagement often increases organization demand for more cloud-like consumption and deployment models. An approach to network automation and orchestration that is adaptable and elastically scalable can accommodate flexible deployment and consumption models, aligning well with service-oriented infrastructure adoption.
- » **Better alignment between application development and DevOps needs and ITOps and NetOps capabilities.** A well-designed network automation platform can help align the interests and processes of application developers and DevOps with the capabilities of ITOps and NetOps, resulting in less friction and improved outcomes.

## ***How Anuta Networks Addresses the Need for Comprehensive Network Automation***

Anuta Networks addresses the network automation challenge with Anuta ATOM, a multivendor, multidomain offering for closed-loop automation.

Built on a cloud-native architectural foundation, Anuta ATOM is designed to provide assurance, telemetry, and orchestration. It supports more than 150 platforms from 45 vendors with the following capabilities:

- » Compliance and configuration management, ensuring that device and service configuration automation policies are compliant, consistent, and validated
- » Low-code workflow automation for stateless methods and procedures, addressing the need for simple yet integrated and comprehensive operations and functionality
- » Automated device onboarding to provide brownfield service discovery and zero-touch provisioning (ZTP), reducing the need for laborious and repetitive tasks
- » Monitoring and analytics, which ensure that operators have continuous views into relevant network metrics
- » Event correlation and alert routing, which accelerate troubleshooting and remediation
- » Closed-loop automation, providing for ongoing optimization and proactive remediation, with workflow-based change management

Anuta ATOM's agents can be flexibly deployed on premises or in the cloud, with out-of-the-box services and workflows for L2/L3 VPNs, ZTP, compliance, software upgrades, and CLA. Anuta ATOM also provides multidomain support for large enterprises, campus and edge environments, cores (datacenters and cloud), WANs, and service providers.

Anuta ATOM's multivendor and multidomain support is designed to help customers address a wide range of requirements across devices and places in the network, giving customers the opportunity to use Anuta's integrated functionality while pursuing tool consolidation, which has the potential to reduce complexity and cost. Along these lines, Anuta ATOM's visual, programmable workflows provide for operational simplicity across heterogeneous environments.

Anuta ATOM is designed for highly scalable automation, capable of elastic scaling of workflows and services. The platform is also built to accommodate next-generation 5G and IoT services, which require high throughput and low-latency provisioning.

### **Anuta ATOM Cloud**

Anuta ATOM Cloud is a version of ATOM that has been designed to deliver simple-to-consume but scalable network automation, affording customers the flexibility to scale elastically as they grow. The platform is regularly updated with new features and is intended to provide fast time to value and operational efficiencies as well as reduce IT support costs.

Key features of Anuta ATOM Cloud include the following:

- » Secure, compliant multitenant SaaS
- » Multitenant and siloed instances
- » VM, Docker container, or app agents that can be deployed on premises or in the cloud
- » Support spanning multiple availability zones in the Americas, EMEA, and APAC
- » 24 x 7 centralized support with automated alerting, reporting, and troubleshooting
- » Single sign-on (SSO)

### **Anuta ATOM Use Cases**

The Anuta ATOM platform has been deployed at a growing number of customer sites, including those of cloud-building enterprises and service providers. In those environments, the platform helps IT operators address a range of use cases spanning multidomain networks that frequently encompass multivendor infrastructure.

Among the use cases that Anuta ATOM addresses are the following:

- » **Stateful service orchestration.** In practice, service orchestration covers a range of automated multidomain stateful use cases. It is applicable to L2/L3 EVPNs and to application delivery at Layer 4 through Layer 7, and it can also involve 5G slicing and cable distributed access architecture (DAA).
- » **Low-code automation.** Use cases extend across software upgrades and other standardized methods of procedure (MOPs) as well as to network migrations and a variety of stateful and stateless tasks with pre- and post-implementation checks and validations. Automation of stateless services can include software upgrades, configuration migrations, and ZTP.



- » **Configuration management.** Typical scenarios involve ZTP, configuration versioning and archiving, and configuration restoration and return merchandise authorization (RMA). Configuration management can apply to standardized bulk updates for CLIs, NETCOMF, and multivendor API-based network devices and appliances (physical and virtual).
- » **Compliance management.** This involves automation of tasks relating to standardization, audits, and reporting as well as compliance checks and remediation. It also encompasses service, CLI, and YANG compliance.
- » **Closed-loop automation, with emphasis on day 2 troubleshooting and remediation.** This applies to routing metrics and remediation, interface health and remediation, and network health telemetry and statistics, which can inform change management and ongoing optimizations.

### Challenges

A major challenge in the market today involves the degree to which enterprises and other organizations struggle to clearly understand the depth and breadth of their network automation requirements. Many organizations either don't know where to begin their network automation journey or fail to achieve an optimal fit between their network automation tools or platforms and their complete set of needs. Some of these organizations find themselves constrained by investments in tools that address discrete or partial requirements without solving foundational network automation issues. Similarly, organizations that opt for network automation are often bewildered by the array of tools available, some of which are general and some of which are specific to certain functions, tasks, places in the network, vendor infrastructure, or use cases.

In other cases, enterprise IT operations teams, including traditional network operators, remain culturally reluctant to adopt comprehensive network automation platforms because they are concerned about having to learn new skills or adopt new workflow-based processes.

For Anuta Networks, these challenges manifest in both cultural inertia within customers organizations and competition from incumbent suppliers that offer either vendor-specific approaches to network automation or tools that compete indirectly or directly with Anuta ATOM. That said, the benefits of comprehensive network automation, across mixed environments and all places in the network, are now clear and compelling and well understood in the context of both business outcomes and operational efficiencies.

### Conclusion

For any organization pursuing strategies relating to digital transformation or cloud, substantive network automation has become not just desirable but also absolutely necessary. As the connective tissue and nervous system supporting increasingly valuable applications and digital engagement, the network cannot remain a technology laggard. Instead, it must be as agile as other forms of infrastructure, not to mention the processes and workflows that are salient to digital outcomes.

If Anuta ATOM can continue to address the requirements and deliver the array of business and operational benefits discussed in this document, Anuta Networks and its network automation platform will be well placed to help both service providers and enterprise customers successfully meet their digital transformation and cloud objectives through a comprehensive and cloud-native approach to full life-cycle network automation.

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## About the Analyst



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Brad Casemore is IDC's Research Vice President, Datacenter Networks. He covers networking products and related technologies and platforms typically deployed in the datacenter. Mr. Casemore also works closely with IDC's Enterprise Networking, Server, Storage, Cloud, and Security programs to assess the impact of emerging IT and converged and hyperconverged infrastructure. He researches technology areas such as Ethernet switching in the datacenter, application delivery controllers (ADCs), SD-WAN, WAN optimization, network virtualization, network programmability, and software-defined networks (SDNs).

## MESSAGE FROM THE SPONSOR

### About Anuta Networks

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

Anuta ATOM enables networking teams to rapidly design and provision services, collect real-time telemetry, display deep network analytics, ensure compliance, and provide service assurance for multi-vendor, multi-domain networks. With ATOM, networking teams can deliver services faster, eliminate human errors, avoid security violations, reduce OpEx and meet SLAs with exception high availability.

Anuta ATOM can be deployed on-prem or on-cloud to start small and achieve massive scale. Anuta ATOM uniquely offers many out-of-box services and low-code workflows, zero-touch provisioning, software upgrades, network slice provisioning, and integrations with over 45 vendors and more than 150 platforms, both physical and virtual.

For more, please visit: <https://anutanetworks.com>.



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