Prepared for

NetBrain
DEMOCRATIZING NETWORK AUTOMATION

A Guide to Automating Network Operations

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Assessment Drives All Network Operations Processes

The typical network infrastructure professional's workday is fundamentally focused on assessing the network. Network teams continuously compare observed states to business requirements for critical applications and IT services during fault investigation, change validation, and security audits. Assessment is the initial step in network engineering and operations, ensuring alignment with business needs.

Traditionally, IT organizations considered network assessment a painfully manual and infrequent project focused on documenting IT device inventory. However, automation of network assessment can make it a powerful tool for for troubleshooting, change management, and outage prevention, fundamentally transforming the scope and scale of network operations.

This assessment process historically posed challenges, primarily due to multi-vendor networking. The emergence of public cloud and virtualized services added complexity to automating network operations.

The use of multiple infrastructure management tools exacerbates the problem. Fragmented management toolsets force engineers to specialize in individual approaches, resulting in work tailored to specific situations that is not integrated into the organization's collective knowledge.

Continuously automating network assessment transforms network operations by streamlining workflows and boosting the effectiveness of engineers.

Implementing an automation and observability platform across hybrid networks enables IT organizations to continuously assess the design and security compliance, then conduct ongoing troubleshooting diagnostics effortlessly. Skilled network engineers that automate key workflows and contribute their expertise to the organization's knowledge base contribute to operational simplification.

The Opportunity for Automated Network Assessment

A continuous network assessment solution can automate a wide variety of operational workflows. The repetitive tasks performed daily, termed Day-2 tasks (such as outage prevention, problem troubleshooting, and change management), are prime candidates for automation, particularly with a no-code approach.

Preventing Outages

Automation facilitates the assessment of network compliance, a critical aspect of network operations and outage prevention. Unauthorized changes, administrative errors, and network software bugs can lead to network performance issues and security vulnerabilities, impacting service delivery. With automation, IT organizations can establish expected behaviors for configurations, network designs, application requirements, and security policies. Continuous assessment proactively ensures that the delivered outcomes consistently meet these expectations, preventing service outages and degradations before being reported.

"We have 160 sites that have all been deployed at different times by different people," said a network engineer at a Fortune 500 food and agriculture company. "When we go over that to make sure we meet some kind of golden standard and compliance, we find that none of them are compliant right now. They are all 'artisanally' configured."

EMA research identified three key benefits of a continuous, automated network compliance assessment. First, 66% of organizations reported reduced security risk and 61% reported improved operational efficiency. Nearly half (46%) reported that such a solution helps with network outage prevention.[1]

[1] All research cited in this paper was originally published in the EMA report, "Enterprise Network Automation: Emerging from the Dark Ages and Reaching Toward NetDevOps" in March 2024.

Troubleshooting

Every step of the troubleshooting process can be difficult and time-consuming when conducted ad hoc. Highly skilled network engineers are already familiar with most of the problems that occur on a network and they've established processes for remediating them. However, without automation, administrators do not have the means to use these processes. Instead, they continually escalate issues to engineers, which lengthens remediation processes. Given that many network teams also lack accurate documentation and standards for network infrastructure, brute force, trial and error, and endless repetition dominate the current state of network troubleshooting.

Automating network assessment transforms these processes, allowing skilled network engineers to contribute their expertise to the organization's institutional library. The system can autonomously triage incidents as they arise, using this knowledge before involving any engineer. By automatically assessing the devices and pathways implicated in each report, engineers can swiftly pinpoint and resolve issues at their root. After resolution, the system conducts another assessment to confirm that the network is restored to expected production levels.

Change Management

For decades, change management played a pivotal role in operations. However, current solutions primarily focus on executing device-level changes, ensuring their completion and activating rollback and deployment procedures. What these solutions lack is insight into each device's role and its connection to IT service delivery.

An automated network assessment solution can integrate knowledge of network devices, topology, traffic flow, and expected behaviors, and it can assess the status of these variables before and after changes. This approach ensures compliance with network service delivery goals and prevents outages.

"We are constantly doing validations between intended state and running state to make sure they are in sync. If it goes off, we generate a config drift alert to address it," said a network automation engineer at a $3 billion SaaS provider.

Charting a Path to Network Automation

Effective Source of Truth

Any network assessment is built on a foundation of data. You cannot assess whether network intent and state are aligned if you lack operational data. EMA research found that 80% of enterprise network automation strategies have a network source of truth. In any automated network management process, personnel will refer to a source of truth to plan their automated actions. Unfortunately, only 20% of organizations that have created a network source of truth say that it is very effective due to issues with data accuracy and accessibility.

According to EMA research, an effective source of truth must include near-real time information about the network and its components. In other words, network engineers shouldn't have to log into a switch and run a show command to pull configuration information. That near-real time data should be easily accessible, either integrated with or embedded in the automation platform itself. A highly functional source of truth should also have full multi-vendor and multi-cloud support. Finally, this source of truth should be able to integrate with other IT systems to ensure that network state data becomes part of the source of truth. This integration ensures that events those external systems observe can be coordinated with the automation platform.

Network automation professionals identified to EMA their top feature requirements for a network source of truth. First, they want data quality management reflective of network intent to ensure the accuracy and trustworthiness of the network state. Next, they want an accurate network model that includes traditional, cloud-based, virtual, and software-defined devices, which will ensure that network managers can understand not just individual configuration and policies standards, but also how the various components in a network combine to deliver business services. Next, they need a security policy enforcement function that can assure that secured boundaries, access controls, and design considerations are always in compliance with architected goals. Finally, they need deep and rich auto-discovery to ensure that the chosen source of truth is always based on the live production network.

Low-Code and No-Code Automation

For a network automation and assessment tool to make a significant impact, it needs to be user-friendly for all team members. It should capture the expertise of advanced engineers and turn it into workflows that less skilled personnel or the automation platform itself can execute.

With a robust no-code network automation platform, every network engineer can effectively become a network automation engineer, expanding automation beyond largescale software development projects. A user-friendly interface allows operational ideas to be quickly transformed into executable automation.

EMA research found that 64% of network automation leaders prefer low-code or no-code solutions to empower all personnel to interact with their automation solutions.

Critical Features

Finally, IT organizations prioritize the following features when looking for network automation platforms.

Continuous security policy assessment is a top priority for 32% of organizations. This capability ensures that ongoing network operations do not accidentally introduce security vulnerabilities, that vendor security bulletins are implemented, and that configurations do not drift and create vulnerabilities. Enforcement of long lists of security-related goals must be easily implemented across the entire hybrid network.

Next, 27% of network operations leaders say design and configuration compliance assessment is critical. These features can automatically detect changes and verify that they comply with intended goals.

Network change validation and assurance was the third most important (26%) automation feature. This capability will allow network teams to automatically analyze an environment before and after any change is made by looking at the entire service delivery plan to see how individual changes could and did affect applications and services. This service-level change assessment approach prevents outages and incidents.

Finally, 25% said incident management is a top priority. This includes automation of troubleshooting, diagnostics, and collaborative remediation. It can help network teams assess current conditions as well as the root cause of a problem, automate diagnostic steps, and store the incident resolution workflow to address future occurrences of similar problems.

Introducing Continuous Network Assessment from NetBrain Technologies

NetBrain is a leading provider of no-code network automation and observability. Its Next-Gen platform applies no-code network automation to all core IT workflows, including outage prevention, troubleshooting, and change, while offering full-stack observability of the network's processes, problems, and workflows in support of the business and its applications. It includes a Continuous Network Assessment (CNA) capability for hybrid, multi-vendor, and multi-cloud networks.

NetBrain CNA enables network engineers to define automated assessments without the need for code to continuously assess any hybrid network for configuration drifts and unexpected changes, network design compliance, capacity and performance issues, security controls, policy compliance, and network vulnerabilities. These assessments are stored in an extensible library of customizable automations that are accessible to every engineer during problem solving. They can also execute automatically in response to external events to continuously assure complete network health.

NetBrain's Summary Dashboard engine, part of its Next-Gen platform, provides customizable observability of ongoing operational processes, reported incidents and problems, and the work-in-progress associated with troubleshooting, change, and outage prevention. Through its no-code approach, every incident becomes a collaborative dashboard and can be reused continuously any time a similar situation occurs. The dashboard technology will also establish real-time insight into network status, health, cloud delivery, capacity conditions, and any other kind of network health or operational status assessment that is desired – all without requiring code. Every network engineer becomes a network automation engineer, leveraging the power of automation to be applied to every task of any size or complexity. The collective knowledge of problem-solving experts becomes institutional knowledge that grows over time and makes future network problem-solving easier.

By leveraging this institutional knowledge library, technicians and engineers at all skill levels become more empowered, leading to a reduction in escalations.

About NetBrain Technologies

Founded in 2004, NetBrain Technologies, Inc. provides the industry's most advanced no-code network automation and observability platform, enabling network engineers to automate and collaborate on troubleshooting, continuously assess their hybrid network for errant conditions, and protect change operations from inadvertent consequences that would otherwise result in unplanned downtime. NetBrain is in use by more than one-third of the Fortune 500 and is headquartered in Burlington, Massachusetts, with locations in Munich, Germany; Toronto, Canada; Hyderabad, India; and Beijing, China. For more information, please visit **www.netbrain.com**.

About Enterprise Management Associates, Inc.

Founded in 1996, Enterprise Management Associates (EMA) is a leading IT analyst research firm that specializes in going "beyond the surface" to provide deep insight across the full spectrum of IT management technologies. EMA analysts leverage a unique combination of practical experience, insight into industry best practices, and in-depth knowledge of current and planned vendor solutions to help its clients achieve their goals. Learn more about EMA research, analysis, and consulting services at **www.enterprisemanagement.com**. You can also follow EMA on **X** or **LinkedIn**.

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