The Definitive Guide to Network Automation
Transforming NetOps from Operator-centric to Machine-centric

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Today’s businesses are digital-centric businesses. Their very livelihood is based on the ability for their digital infrastructure to deliver the required level of application services at the levels needed by the business. And when the network struggles in any way, so does the business. So it should be no surprise that as businesses grow, so does the need for their infrastructure to grow, which takes the form of both scale and complexity. And keeping it all running is a challenge for even the most mastery in the network operations space. Today’s NetOps is all about scale.

For decades, NetOps has always been considered a necessary overhead that accompanies the build-out of any organization’s digital infrastructure, and as the network topologies that create this infrastructure grew in size, so did the number of staff resources needed to support it. It was quite common to increase staffing in a linear fashion proportional to the infrastructure size. And all of the operational resources brought onboard needed to have the requisite training for the majority of technologies in production. But as infrastructure scope and complexity expanded, it is becoming impractical to simply hire more operational staff and train each of them on everything.

So, the challenge has always been one of capacity and knowledge, and only recently has the linear relationship between network size and headcount been identified as a strategic opportunity for improvement. Executive teams are finding their entire business has become a function of successfully keeping their infrastructure up and running. What they may not have realized is that their global enterprise is likely dealing with thousands of hybrid network operational service tasks or “tickets” per week. Each service ticket is associated with a specific operation, ranging from simple firmware updates to a more complicated remediation of a network outage or service degradation. What may be surprising to these same executives is that the vast majority of these tasks are so similar that more than three-quarters of all of them can be grouped into just a handful of common tasks that each get repeated over and over again. And it is this task similarity that provides the strategic opportunity to think differently about how NetOps is conducted and turn to a smarter approach.

Making the Strategic Choice

IT business leaders are hence faced with the challenge of becoming smarter in how they deal with the operational overhead derived from scale and scope of their network. And while they have heard for many years about the promise of automation throughout other parts of the organization, they do not have the background or understanding of how to incorporate automation into their network operations plan. And no wonder because the term “automation” has always had a connotation of big software development projects with big budgets, rigid specification requirements and hard to articulate ROI. Automation has always been perceived as unapproachable for anything except the biggest of problems. The executive leaders who oversee the digital infrastructure NetOps functions simply don’t know how to shift from people and labor intensive NetOps to machine-based automation. So, they remain status quo and drown every day in operational tedium.
Fortunately, NetBrain has demonstrated to thousands of customers worldwide that network automation can be easily applied to any operational portfolio, can be used for any size problem big or small, allows problems that are similar in nature to be machine-driven, and significantly reduce MTTR in the process. Network automation addresses the scale issue directly. By creating an infrastructure-aware, smart visual control platform that allows knowledge and experience to be captured by anyone which then becomes reusable by anyone, operational overhead decreases. No longer does the traditional operational overhead need to scale linearly as the network infrastructure itself does. Smarter not bigger.

Network automation squarely fits into the “Day-2” operational planning process, and allows operators to solve problems once, and then capture and then reuse their efforts, all without any programming of any type. NetBrain makes that resulting automation available to everyone in NetOps so they can resolve subsequent occurrences quickly and with the same confidence as the original authors of that re-usable knowledge. And it can even be used to proactively validate and enforce operational rules which must exist to ensure business applications function properly.

**Your Automation Maturity Journey**

Knowing where your organization currently fits in the network automation journey is important from a strategic planning perspective. As maturity progresses from one level to the next, the operational overhead associated with infrastructure scale decreases. Mean-Time-To-Repair (MTTR) can be used as a proxy for maturity as it forms the baseline case for a completely manual network operational plan. You’ll see that as network automation maturity increases, MTTR decreases. The net difference between the two curves is the very tangible value network automation and can be used to quantify the ROI.

So, let’s consider the five levels of network automation to help you understand where your organization currently fits, and give you some insight into the anticipated rewards of making a strategic commitment to move forward.
Level 0: Manual Processes for everything

Level 0 is purely manual. It is commonly based on using element management interfaces such as the CLI, to execute manual operational tasks and is entirely reliant on the operator or engineer’s individual skills and personal experience. There are no protections nor guidance and task execution is inconsistent from operator to operator and from day to day. All provisioning, configuration, and updating of network devices is done manually, and often under pressure without suitable checks and balances to assure desired results. Worse yet, in many cases the NetOps teams are in a virtual state of “firefighting” problems as they arise and the chance of making sometimes catastrophic errors is high. Many of the world’s most high-profile outages in recent years can be directly traced back to human error associated with manual network operations. Level 0 should be considered the baseline for most organizations today and it is the state of network operations that supports their business.

Level 1: Leveraging smarter tools Interactively

Level 1 or “Interactive” is the first step in the network automation journey. Think of this level as the guided level of network automation. Engineers and operators can still interact with the infrastructure components individually, but they do so using an intelligent platform that understands the underlying infrastructure in minute detail. Every device, platform and technology are fully enumerated, and the presented management interface provides the context for successful operational tasks. The platform knows the boundaries of what is possible and prevents operators or engineers from making changes that will result in unpredictable or unexpected results. It also allows engineers and operators to capture their own expertise into reusable automation routines or ‘runbooks’. Level 1 offers guardrails for any operator or engineer to make informed decisions based on network real-time status and allows experience and expertise to be shared.

The NetBrain visual console platform makes this all possible. As networks have gotten larger and more complex, the management interface needs to become more intelligent, especially as networks incorporate technologies like SDN, SD-WAN, and public cloud. NetBrain not only provides end-to-end visibility across hybrid networks, but also the ability to drill down into each segment and isolate network issues on a Dynamic Map that can be updated in real-time. And the context it brings enables the platform itself to guide the operator or engineer to help them make informed decisions and execute tasks with a high degree of confidence. This greatly accelerates problem identification and resolution.
With NetBrain, NetOps professionals leverage their own expertise to automatically record standardized procedures into a runbook as they detect, diagnose, and fix issues. Operators no longer need to log into the individual CLI for every network device in the affected segment and then try to piece together how the devices work together in their head.

Instead of having to deal with the same problems repeatedly, the task of NetOps is to dig deep into the root cause of network problems and then create re-usable automation routines to solve subsequent occurrences. From an Automation Maturity standpoint, it's not just a matter of intelligently fixing an error or executing operational tasks the first time. The maturity comes from being able to learn from that experience and then being able to re-use it again in the future.

**Level 2: Facilitating Collaboration amongst peers**

Level 2, the "Collaborative" stage, is where engineers and operators leverage their own knowledge and that of peers to solve similar problems. And since the NetBrain automation platform uses a no-code approach to creating automation routines, anyone can add to the organization's collective knowledge base to be shared with their peers. In essence, this level of maturity enables subject matter expertise to be available even when the subject matter expert is not.

Automatically capturing this information allows experienced engineers to codify and share their knowledge with less experienced colleagues, effectively leveraging knowledge, from experienced users to less experienced team members. The next time the same task is needed, commonly referred to as Day-2 operations, the runbook can be executed by responders without the same level of experience. Even complicated network issues no longer need to be handled exclusively by experts. Level 2 automation maturity allows network operation teams to increase their collective knowledge, and share resources more effectively. It allows operational teams to act as a unified resource, rather than a loose collection of discrete experts.

**Level 3: Automatic response to external events**

Level 3 or "Triggered" network automation maturity occurs when organizations use network automation in response to external events, before operators and engineers get involved. Triggered automation enables any set of actions to be performed in response to external events, such as when tickets are created by an ITSM system.
In practice, NetBrain is usually configured to automatically perform problem diagnosis, generate dynamic real-time maps of the vicinity of the issue and text the performance and needed device or path health-checks when an ITSM ticket is created. All of this information is then published and waiting for operational staff to begin working on the service ticket or other incident.

With the information provided by NetBrain as part of the ticket, the fix for many issues can be addressed automatically with runbooks developed over time by the engineers with the most experience with that issue. By automating the response to IT tickets to include a Dynamic Map at the time of incident and basic diagnostics that remediate the issue, escalations are dramatically reduced since all the info needed, including the fix, is available to tier 1 engineers.

Level 3 Triggered automation maturity shifts the operational paradigm from human-centric to automation-centric.

Level 4: Preventing problems before they occur

Level 4, the “Preventative” level, delivers enforcement of in-production conditions, running tasks continuously in the background. Engineers create tasks based on goals around bandwidth, ACLs, security, etc. Preventive network automation assures that as you introduce new applications, all requirements of the existing application are preserved.

At this level, when the system detects common network faults, automation kicks in to analyze and identify, and ultimately fix, the issue to restore network operations automatically. Automated runbooks can also be created for compliance purposes, offering standardized reporting processes that meet internal and external audit requirements.

Preventive network automation enables organizations to prevent issues before they affect production business services. NetBrain’s preventive automation becomes a single source of truth to establish the network operating conditions required for each application across the global enterprise, and those conditions can then be automatically assured to exist continuously. Level 4 network automation maturity is a strategic approach to reducing the sheer volume of service tasks.
Network Automation Maturity Enables Business

Most organizations know their average MTTR, so this can be used as the baseline in their automation journey allowing them to easily measure concrete savings as they progress in their own maturity. For instance, the four hours that you spend manually executing a service ticket with CLI, may be reduced to two hours through automation, saving 50%. And with organizations reporting 5,000 service tickets per month, this yields a monthly aggregate savings of about 10,000 hours (or approximately 60 operators.) At prevailing engineer hourly rates, that’s almost $1 million per month!

The knowledge contained within the NetBrain system grows over time as more subject matter experts contribute their experience, becoming a tireless and virtually unlimited partner to the support team. As the NetOps team gains knowledge, or new networking technologies are introduced to the network, troubleshooting methods change and NetBrain captures these changes automatically, allowing the number of runbooks and guidebooks to grow to support changes in the network.

Capturing the knowledge of your best engineers also makes your NetOps team stronger and more impactful to the business. NetBrain facilitates sharing knowledge and improving the ability of every engineer to address a wider range of network issues without the need for each engineer to have extensive training on every device and scenario. And when people leave the company, NetBrain’s network automation platform retains that knowledge and makes it easy to empower new employees.

Automation Maturity Powers Strategic Growth

As network automation matures, operational efficiency climbs. Organizations that deploy NetBrain find their staff are more satisfied with their roles, and their value becomes problem solving rather than simply repeating mundane task over and over again. This allows them time to hone their advanced skills and learn new technologies that are personally rewarding from a career development point of view. These new skills include deploying and supporting public cloud networks, establishing highly flexible software-defined networking, data center interconnect and performance management, or exploring and adopting new digital transformation technologies.

With service tasks and tickets numbering into the hundreds or thousands per month, it’s clear that as enterprises advance their network automation maturity, everything becomes easier. Everything becomes more defendable. Advanced network automation maturity reduces costs and increases employee satisfaction while ensuring that a highly functional and easily supportable network infrastructure is always available for every application installed across the enterprise, improving the entire bottom line of the company.
About NetBrain Technologies

Founded in 2004, NetBrain is the market leader for NetOps automation, providing network operators and engineers with dynamic visibility across their hybrid networks and low-code/no-code automation for key tasks across IT workflows. Today, more than 2,500 of the world’s largest enterprises and managed service providers use NetBrain to automate network problem diagnosis, generate real-time documentation, accelerate troubleshooting, and enforce enterprise architectural rules.

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Would you like to learn more about how you can use NetBrain to automate your NetOps processes? Book a Meeting with one of our solutions consultants for a custom-tailored demo.