NetBrain

Address Your Top 8 Network Challenges with Day-2 Automation

By capturing, verifying, and enforcing network intents, up to 95% of all network service tickets, up to 50% of outages can be reduced or eliminated altogether

While there has been a great deal of focus on network automation as it pertains to initial deployment and device configuration, the biggest opportunity is found in automating Day-2 operations - which spans the entire infrastructure lifecycle. The typical large enterprise has thousands of network service tickets each month, ranging from the simple and mundane to the most complicated "headline-making" scenarios. This common device-by-device network management paradigm doesn't usually consider the application and service delivery business requirements or their end-user experiences.

Day-2 network automation enables scale for IT organizations by leveraging policies and best practices created by your most experienced subject matter experts across the organization that have been incorporated into network management over the lifespan of the infrastructure. Day-2 operations is also the perfect place to proactively enforce the network rules (or "intents") that have been designed to continuously exist as part of the enterprise architecture, such as those dealing with security zones, quality of service, failover, resiliency, and overall performance.

What's needed is a Day-2 vendor-agnostic intent-based automation solution for Network Operations that becomes part of the standard operational workflow. Not another tool, but a new strategy. One that focuses on IT business service delivery intended outcomes, accelerates service-related tasks, and proactively verifies the infrastructure's capacity to deliver IT services at levels the business requires and prevent new applications from negatively impacting the performance of existing applications.

NetBrain Next-Gen for Managing Operations by Network Intent

NetBrain's Intent-based network management looks at the network as the delivery mechanism for various application and business service intents. NetBrain differs drastically from all other device-based network management approaches by focusing on the needs of the applications and services in use. By realigning network operational plans to directly support business application service delivery, business leaders and IT professionals can focus on verifying their network's ability to meet the needs of the business as their core KPI.

NetBrain Next-Gen manages hybrid networks as a compilation of network intents which directly supports IT service delivery needs. Day-2 automated network operations allows you to manage your hybrid network by capturing, verifying, and enforcing network design intents and eases problem diagnosis to ensure those conditions are maintained. NetBrain's Automation Library offers more than 50 intents for modern enterprise network operations.

NetBrain Next-Gen Addresses Today's 8 Most Common Network Challenges

1. Enforcement of Security Policies & Zones

Network security is one of the most critical needs of a modern enterprise. In most situations, network security has been implemented by a litany of point and overlapping solutions, each designed to manage an application or feature access requirement. But how do you know when a new security solution interferes with the behavior of a previously installed one? How can you confirm that your business network is always protected? The key is to continuously verify the production network against the identified list of security intents including hundreds of security borders and zones enforced by firewall rules, access control, dynamic routing schemes, and edge access restrictions.

Challenges

The deployment of security hardware and software creates the illusion of "one and done" protection. Most IT leaders diminish the prevalence or ignore the reality of ad-hoc changes, which results in configuration drift for network components, including security services. The concept of proactive and on-going verification of the thousands of security rules (access control, allow/deny, intrusion), that must be compliant for complete protection, surfaces much less frequently.

Security Assurance

Networks are protected from malicious traffic by security products such as firewalls, but how can these devices be tested continuously to assure they allow certain types of traffic and deny other types? Rules for transporting various traffic types and the valid source and destination addresses must be verified continuously. NetBrain uses its Intent technology to assure that all devices that are paired or load-balanced have the same sets of rules.

NetBrain's Intent-based network automation platform makes security enforcement a standard part of your network operations. NetBrain continuously tests how well information is flowing whether verifying enterprise-wide or granular policies and controls focusing on users, data types, services, or individual devices.

Applications, services, and users live on different networks and subnets, so network and security architects add segmentation to different networks with policies to allow or deny application traffic. NetBrain enforces network intents automatically:

Security-related

- on core routing, distribution separation, and edge access
- by validating configuration, ACLs, topology, device state, and permit/deny conditions
- to assure that VLANs and micro-segmentation security zones and subnets are intact

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2. Monitoring Critical Link Failovers

Modern networks are designed to eliminate any single point of failure. Critical links are no exception and great effort is put forward to assure that there is redundant connectivity between key sites and services. The problem is that redundancy and failover processes are rarely tested 'live in production' to assure that they will function as needed in stress conditions. Many times, catastrophic failure is the first time that the network operations teams realizes that the failover links have been mis-configured or no longer functional for some other reason. It's because few operational best practices include on-going verification of standby components. It is assumed that resiliency capabilities will function as intended.

Few operational best practices include on-going verification of standby components.

Challenges

In the real world, a simple link failure can quickly result in a catastrophic outage – due to the drift in network design that has damaged the expected failover protection. If the backup link isn't properly configured, it can prevent communication altogether or perform far outside the needs of the critical link design. The backup link is your last line of defense from a blackout so it must be functional, even when not in use.

Resiliency, Failover Verification

NetBrain prevents this configuration drift from sabotaging your business continuity plan by:

- Capturing network intent embedded inside current failover design
- Monitoring the design intents continuously
- Warning when detecting configuration drifts

3. Diagnosing Slow Applications

When users are reporting that their applications are responding slowly, everyone automatically points to the network as the source of the problem. But, since there are so many pieces involved in application delivery, the IT organization struggles to identify the actual part of the network that may be amiss. In many cases, the performance issue resolves itself long before you can identify and execute corrective action.

What network operation teams need is real-time way to diagnose the network in the context of the applications it serves. That application performance context forms the basis for managing by network intent. Network intents allow application designers to set specific network requirements that must exist for each application to perform as designed. When these conditions vary from the design requirements, application performance is reported as 'slow'. By capturing the network intents associated with every application and then automating network diagnosis for these intents, you can quickly identify and correct problems.

Challenges

It's easy to spot network conditions which are binary, traffic is flowing or it's not, but most companies have significant difficulty investigating 'slow' issues and, as a result, waste too much time testing everything they can in hopes of pinpointing the actual cause. This is because of a lack of contextual visibility and adherence to network designs. As networks grow, it becomes more difficult to determine root causes of network-related application performance issues.

Prevent Reports of Slow Applications

NetBrain's network intents technology coupled with its ability to execute traffic based real-time path tracing allows you to locate and visualize the network problem area including the actual routes that application traffic flows. And, its intent-based automation performs the extensive set of diagnostics to determine the root cause of application performance issues. Using its Path Intent capability, NetBrain allows you to document healthy network path baselines for comparison at any point in the future. Any deviations from the known good baselines will be overlayed onto the healthy application path intents for easy problem identification. NetBrain's Next-Gen provides:

- Detailed understanding of traffic paths, forward and backward
- Baseline the route performance including the effects of traffic shaping and filtering
- The ability to monitor changes between current network conditions and baseline intents

According to Enterprise Management Associates, "Only **30%** are fully satisfied with their troubleshooting tool's support of problem isolation, and only **28%** are fully satisfied with root cause analysis support."

Source: EMA Network Management Megatrends 2022: Navigating Multi-Cloud, IoT, and NetDevOps During a Labor Shortage

4. Maintaining a Network-wide QoS Policy

Ubiquitous real-time communications applications including voice, video and multicasting require high-performance and high-quality network links to prevent poor experiences. These applications are dependent on proper Quality-of-Service (QoS) configuration across the hybrid network. Continuous adherence to your network-wide QoS policy is critical to delivering high-performance real-time communication experiences.

Challenges

Historically, network quality of service was not well understood. As voice and video became part of the standard set of IT supported services, organizations saw mixed results when implementing QoS without the rigid set of control needed to assure QoS policies remained in effect. QoS problems are less apparent because traffic still flows. Troubleshooting is made difficult because the same level of performance must be maintained across different networks.

Today, these applications compete with hundreds of other applications across different types of network technologies including the home-based edge. Therefore, it's common for the quality of these services to suffer due to lack of complete adherence to QoS policies due to configuration drift, human error, and lack of big picture understanding of the impacts on other applications on shared networks.

Monitor and Resolve Real-time Communication Quality

NetBrain enables you to continuously verify the adherence to design intents, including QoS policies, needed to maintain optimal real-time communications performance by:

- Capturing QoS policy as part of the network intent
- Verifying network intents to detect QoS policy compliance or drift
- Detect variations between the current network and the design intent before incidents are created

According to Gartner®, A quick win would be "Creating an automated network performance baseline, such as an automated test that verifies and records whether latency to specific services/ applications is within a threshold."

Source: Market Guide for Network Automation Tools - Published 22 February 2022

5. Managing Cloud-Based Services

Today's critical applications are no longer the traditional, monolithic server-based applications. Some applications live on cloud-based infrastructure, while others consist of a compilation of distributed but interconnected services that are delivered by in-house infrastructure and by the public cloud.

The dominant public cloud service providers include Amazon, Google, and Microsoft, and most software-as-a-service (SaaS) offerings span more than one cloud provider. Cloud-based services are typically sold by some measure of consumption or in a transactional fashion making costing cloud-based service very straight-forward and elastic.

The problem is business is not just about a contract's penalty terms; it's about the continued necessity to understand service delivery and verification of the required service levels. With or without the use of cloud services, the age-old mantra still rings true, "business stops when infrastructure stops." The discussion of SLA penalty terms has very little material effect on the need for those delivered services to keep the business running, support customer retention goals, valuation, and reputation, etc.

Challenges

Many IT organizations have limited their responsibility and accountability for cloud-based services, since they largely have no visibility or control of these external infrastructures. In recent years, that has become a major point of contention as business leaders have make it clear that the selection by IT leadership to rely upon cloud provided services does not reduce or eliminate their accountability for business IT operations.

A significant issue with moving to the cloud is understanding how to view and measure performance of those services, and how to incorporate those services into the same model as traditional resources. Existing operational challenges include maintaining design compliance and verifying service delivery across these services.

Managing Cloud Services

IT leaders can no longer think of the cloud as a black box. Just because the infrastructure is delivered as a service, the responsibility to keep IT in support of the business remains. NetBrain can help you close the cloud performance and visibility gap by discovering, verifying, and visualizing the underlying cloud infrastructure and capturing the network intents for how information flows across hybrid networks to help you more quickly troubleshoot any issue by:

- Decoding cloud infrastructure configuration and capturing expected performance using network intents
- Verifying and enforcing the network intents in place
- Automating incident diagnosis

IT leaders can no longer think of the cloud as a black box. Just because the infrastructure is delivered as a service.

6. Optimizing Corporate Internet Connectivity

Today's connected businesses rely on the Internet as their network backbone to communicate with partners and customers day in and day out. Enterprise or production networks may have several inter-connections to the Internet, announcing and receiving publicly facing routes. Internet access policies must be adjusted from time to time to accommodate certain events such as partial Internet failure or application slowness. In today's connected world, the Internet is the backbone of every IT organization's enterprise architecture, connecting customers, partners, and suppliers.

Challenges

Without reliable Internet that meets a multitude of application performance needs, your business cannot survive. Your business operates on a set of distinct application requirements to deliver high-performance experiences. And Internet performance can vary widely based on a litany of external factors, most out of your own control.

Optimization

Applications need various types of services, so NetBrain's Network Intents capture and articulate your Internet access in terms of the applications it supports. By understanding these application and service needs, NetBrain network intents can be verified and enforced as needed. NetBrain builds this understanding into your standard operating best practices by:

- Codifying Internet access policies and performance expectations with Network Intent
- Monitoring the KPI off Internet trunk, and failover and load-balancing in place
- Alerting when certain thresholds or metrics are met, proactively resolving issues

According to Enterprise Management Associates, "A large majority of network operations teams are trying to gain better visibility into public cloud providers. People who work in network engineering, DevOps, and IT architectures were **43%** likely to cite Internet connectivity/ hybrid WAN."

Source: EMA Network Management Megatrends 2022: Navigating Multi-Cloud, IoT, and NetDevOps During a Labor Shortage

7. Audit Network Designs, Best Practices and Rules

Your network design compliance is only as good as the next network update. Most enterprises surprisingly don't have accurate documentation of what's in their networks, how they're connected and how information is intended to flow. Understanding your network and the purpose every device serves in delivering applications is fundamental to maintaining operational compliance. In addition, adhering to security policies and regulatory compliances (e.g., HIPAA, PCI-DSS, NIST) can take up a significant amount of time. What's more, the inability to proactively monitor and enforce security rules, puts you at greater risk of threats and security breaches which in some cases go undetected for days or weeks. Auditing and enforcing best practice and design architecture rules is the key to enforcing network security, maintaining compliance, and maximizing uptime.

Challenges

While the concept of design and best-practice compliance is intuitive, the means to achieve it at scale is daunting. In most cases, audit and compliance processes are executed infrequently, or in direct response to audits. In worse case scenarios, this rule enforcement is addressed immediately "after" a catastrophic incident occurs.

Achieving Design Compliance and Best Practice Audit

NetBrain enforces design compliance and security policy adherence by:

- Explicitly encoding best practice rules with Intent
- Proactively monitoring rule violation
- Mitigating security and performance risks

8. Sharing Network Knowledge and Experience

Enterprise networks are getting more complex with the addition of new underlay, overlay, security and cloud technologies. In addition, the in-house expertise needed to manage these complex infrastructures grows organically over time, but largely resides with your subject matter experts and is not made available to others. Infrastructure understanding in terms of applications is critical to long-term support success.

Challenges

The challenge of "operational readiness" exists well after deploying, provisioning, and configuring new technologies. People change, attrition happens, and the knowledge they possess rarely gets saved or documented or transferred to the next employee. Companies must re-build this knowledge set each time their infrastructure or organization undergoes change. Hence, network operations teams end up spending unnecessary time solving the same problems over and over which is very ineffective and reduces scalability.

Knowledge Sharing

NetBrain enables you to transform complex hybrid networks into network intents that can systematically be verified and diagnosed by anyone. Capture and share the knowledge and expertise needed to keep your network infrastructures up and running with the least amount of effort by:

- Transforming topology and application knowledge into executable intent-based diagnosis practices
- Enabling the replication of these network intents across the network to solve similar problems
- Accessing the intent-based knowledge base on demand

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Summary

NetBrain empowers network operations teams manage their networks by their design intents that directly support their business applications. It's no longer necessary to focus on the mix of hardware vendors, only what purpose they serve in the greater network. In this way, we help NetOps better align with business needs. Networks should be redefined as the tens of thousands of network intents that they deliver, rather than the static set of the thousand devices which comprise it on a network diagram. The number of intents those devices support may be 10 or 100-fold the number of devices. And by capturing, verifying and enforcing network intents, IT and the business can be perfectly aligned.

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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