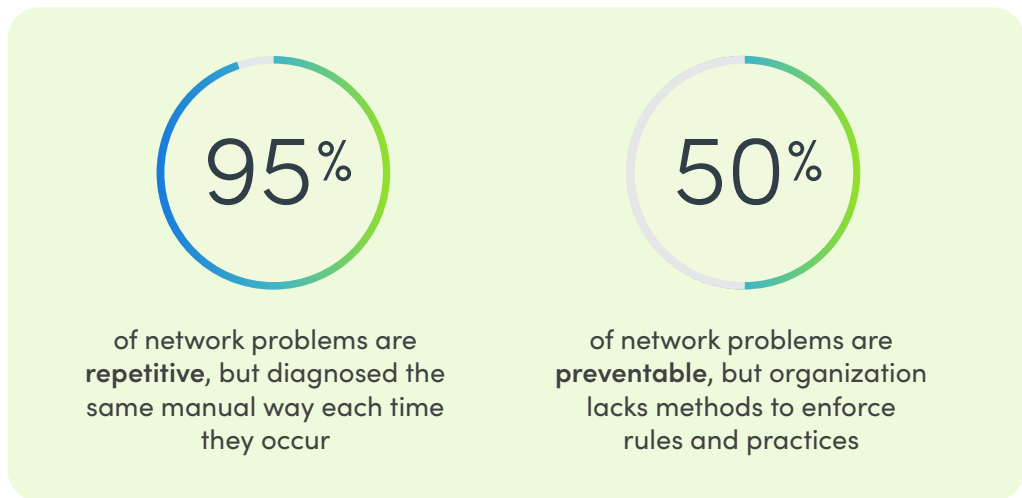


# NetBrain Problem Diagnosis Automation System

## Benefits:

- Reduce ticket duration and MTTR by half
- Automate 95% of all network service tickets
- Prevent network outages and increase uptime of in-production apps
- Improve compliance, knowledge sharing, collaboration, and morale
- Lower operational costs and allocate more resources to key strategic projects
- Safeguard company reputation

- **Automated problem diagnosis.** Accelerates the resolution of every network problem using no-code automation at scale for your hybrid network.
- **Prevent network outages.** Enables the proactive enforcement of network design intentions resulting in fewer outages and shorter outage durations.
- **Intelligent remediation.** Leverages intelligence from the live network and past resolutions to enable you to transform subject matter expertise into sharable automation.



Enterprise hybrid networks are complex in design and require tremendous amounts of operational and support resources to keep them operational at the levels required by the business. These complex structures consist of compilations of edge-to-cloud technologies and varying usage models. The result is most large enterprises find themselves dealing with thousands of operational tasks, or service tickets, every month which must be successfully completed to keep their businesses running.

## Platform Overview – NetBrain Problem Diagnosis Automation System

NetBrain PDAs is focused on Day-2 Operations across the entire network with a top-down approach, rather than a bottom-up approach like all other network management solutions do. A portfolio of patented network technologies describes and automates hybrid networks based on thousands of individual network design *intents* which govern every device in the network. NetBrain knows how every device is participating in the delivery of design intentions. NetBrain PDAs allows production networks to be managed by manipulating the design intentions which are based upon application requirements. Rather than continuing to operate networks at the complicated and problematic device level, operators can focus on design intentions which directly support their business applications and are typically very well understood. The NetBrain PDAs system takes care of all the translation of these design intentions into device configuration changes.

The NetBrain PDAs platform is built on a set of patented core technologies that change the entire paradigm for managing hybrid networks by using Network Intents:

### 1. Auto-Discovery and Digital Twin Data Model

Auto-discovers your entire network from edge to cloud and creates an exact digital twin using a mathematical model that understands the function as well as the relationships between devices. This is the foundation for NetBrain PDAs and used to deliver real-time topology information and render dynamic maps to users and external applications on-demand.

### 2. PATH Flow

The PDA System continues creates and checks how information flows throughout the topology. By establishing baselines and verifying the ability for the network to deliver that intended service level, the health of the network and its hosted applications is assured. This is essential to identify network changes that affect the performance of any application and service degradations and is usually described by users as problems like 'slow response' or 'choppy audio'.

### 3. Network Intents

The PDA System is different from all other solutions as it defines every topology based upon the thousands of network intents that each component delivers, rather than simply focusing on the existence of those components. By using the network intent paradigm, users no longer have the burden of understanding the device specific details throughout the network. These intents are also used to manipulate the delivered characteristics of the network, since changing the desired network intents in the digital twin automatically changes the actual devices involved in delivering that intent. And problem diagnosis is now conducted by comparing the original baseline intents of the network to the delivered performance at any point in time.



**4. No-Code**

Enables knowledge to be transformed into automation units using a no-code environment that anyone can use. Using this no-code approach, runbooks that solve various problems are created and stored, which are then offered in a decision-tree format as a guidebooks.

**5. Interactive Automation**

Provides users with a network-aware intelligent management console including real-time visibility and the associated control plane. The console allows operators and engineers to interactively make changes to the network by redefining intended network behaviors and allows them to utilize the remedial solutions and other efforts previously captured by subject-matter experts which have been stored in the Automation Library.

**6. Preventive Automation**

Enumerates any network as a series of application or network designer goals and provides the framework for problem diagnosis based upon deviations from the intended outcomes. This also enables continuous compliance validation to create a service request when intent drift occurs.

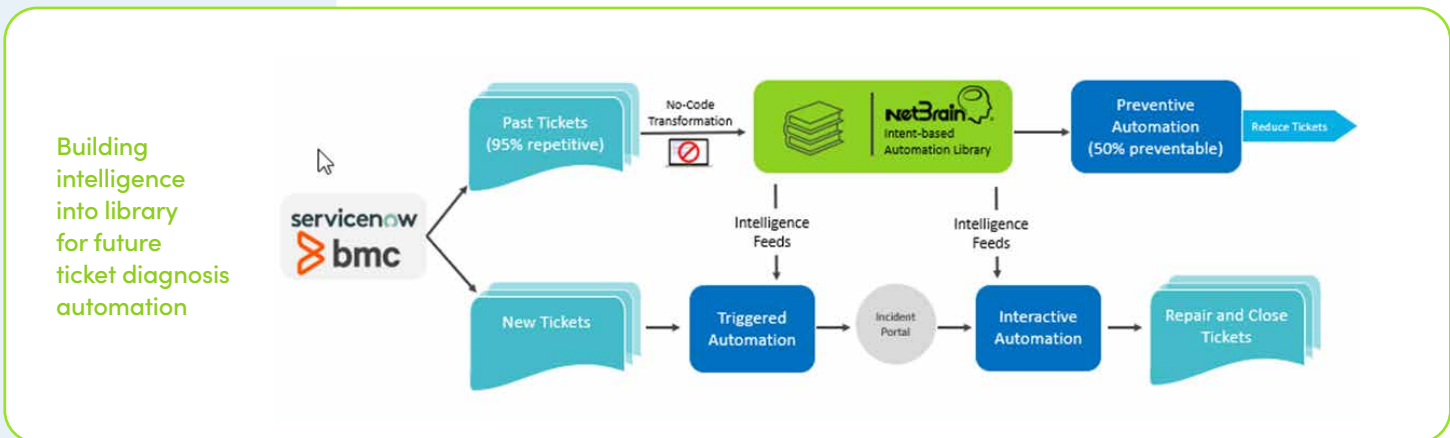
**7. Triggered automation**

Enables the NetBrain system to respond to incidents and external events automatically, creating desired mapping, and executing health-checks and other diagnosis steps programmatically. These results are then packaged and returned to the calling system.

**Building Intent-Based Problem Diagnosis Automation without Code**

NetBrain’s PDAs builds diagnosis intelligence without the need for programming by:

- Interpreting the live network topology and design intents which were auto discovered
- Problem ticket resolution history and stores the experience as an executable runbook



NetBrain PDAs Intent-Based Automation applies the IBN paradigm to the full network infrastructure lifecycle. NetBrain's proactive operations approach continually validates and verifies that the network is providing the exact level of delivered service needed by every business application, based upon the agreed performance intent or baselines established when applications were initially installed.

As new applications come online and their network requirements are captured in the NetBrain PDAs, NetBrain enforces all those intents to assure that previously deployed applications continue to work as needed by the business.

### Network Intent and Network Intent Cluster

Network intents (NI) are the outcomes the network infrastructure is expected to deliver. Network intents define and enforce network design constraints, quality of service, performance expectations, security policies, and application path preferences. Intents range from the purely technical (e.g., packet size) to domain-specific (e.g., access policy) to business-driven (e.g., throughput levels for a VoIP or customer-facing network application).

NetBrain PDAs leverages the wealth of experience learned from SMEs solving all previous problems to accelerate the handling of subsequent problems of the same type and in many cases can prevent them from happening again. It codifies that SME knowledge from past incidents making it into executable runbooks, shares it in the Automation Library and makes it available across the entire organization to improve the diagnostic and remedial capabilities of every operator or engineer, regardless of their own personal experience, eliminating most escalations and the delays associated with those escalation processes.

Network Intent Cluster (NIC) expands the scope of Network Intent from one network design at a time to one type of network design with similar diagnosis logic. The concept of similar is essential since relatively few types of 'similar' network problems occur, and each can be solved in a similar fashion, if a solution only understand how to address the concept of similar. The NetBrain PDA System does just that with Network Intent Clusters. It allows users to replicate one network intent across entire network and allows hundreds or thousands of similar problems to be resolved with a single diagnostic or remedial effort.

### Use Network Intent to Troubleshoot Paths

NetBrain PDAs Path-based Troubleshooting Flow is where Path NI verifies whether the current config impacts the path and interacts with the topology itself to check if the data status is correct. When a network is healthy, NetBrain PDAs creates intent baselines by calculating critical application flows from live network data to programmatically define path-related baseline data and diagnosis logic. The Path-based Diagnosis functions automate checks on path changes, failover and routing changes, performance health and configuration.

## Real-time Problem Diagnosis Automation for ITSM Systems

NetBrain PDAs integrates directly with ITSM solutions such as those from ServiceNow and BMC Remedy and provides automated collaborative troubleshooting, drill-down analysis and dynamic mapping. By working collaboratively and at the program level with ITSM system, network service tickets can begin to be addressed the moment a ticket is created, an essential requirement when dealing with large volumes of service tickets and problems that are transient in nature. These connectors are available out of the box in the NetBrain PDA System.



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## Get More from ITSM with an Automation Framework

NetBrain PDAs offers two key types of automation which can be used by network operators and engineers to diagnose and remediate every service ticket.

1.

Triggered Automation Framework defines interactions between NetBrain PDAs and the ITSM solution along with the data from each incident, based upon a set of signatures, to provide the operator with the needed topology views, performance tests and recommended pre-built automation to resolve the problem. Triggered automation is important since many problems are transient in nature and a problem may change over the duration of a service cycle. In all cases, the first part of handling every service ticket involves the tedium of establishing the network topology detail, gathering documentation, conducting initial diagnostics and health-checks and testing various design goals. This diagnosis may account for more than three-quarters of the time it takes to resolve every ticket, resulting in longer outages or service degradations, and increasing the number of operators and engineers needed to support every network infrastructure. The Triggered Automation completes its diagnosis work and packages up all of the results, including the rendered real-time maps and diagnostic results and inserts that detail back into the ITSM system natively.

2.

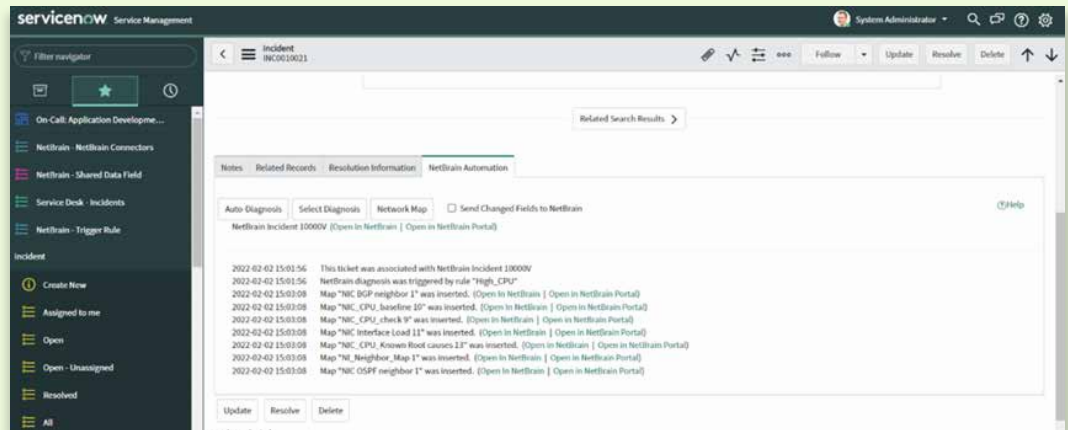
Interactive Automation leverages the NetBrain PDA System's digital twin to enable the operator or engineer assigned to handle every ticket to make the most informed choices when addressing any problem. After the triggered automation is complete, the operator simply accesses the ticket detail inside the ITSM to find the wealth of diagnosis detail NetBrain conducted. Equipped with this level of real-time detail and initial diagnostics, the operator accesses the management control plane using the NetBrain visual console. And since the visual console is deeply aware of every detail about the network now residing in its digital twin, the operator simply interacts with the digital twin at the intent level. This prevents the vast majority of human error, since the operator no longer needs to interact with any piece of equipment directly. The PDA System prevents errors from occurring since it knows what the underlying equipment can and should be doing. In addition, the operator can now draw from the collective experience of subject-matter-experts who have likely solved each problem previously by accessing the PDAs Automation Library. The library ships with dozens of problem resolution already defined and grows over time through NetBrain's library subscription services or through the organization's own SME efforts. The library dramatically increased number and types of problem resolutions that any user can draw from regardless of their own personal experience level. Lastly, the PDA System's guidebook technology provides a decision-tree style access to these library automation routines which results in recommendations to solve specific ticket issues.



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### Extend the Value of ServiceNow

NetBrain PDAs even supports multi-tenancy by mapping the related ServiceNow data (Scope) to NetBrain tenants and domains.



### Amazon, Google and Azure Cloud Support

NetBrain PDAs discovers all the major commercial public cloud resources, maps the edge-to-cloud network, displays cloud monitoring data from metrics and logs, provides path analysis, checks routing functions like Cloud VPN, and supports automated troubleshooting across the hybrid network. The PDAs data model treats the public clouds as any other topology, just as it does for software defined LAN and WAN, and virtualized networks. PDAs treats all of it natively, allowing a true end-to-end management view, all based on network intentions, rather than devices.

### 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.