



Network Mapping and the Digital Twin

In today's world, applications are everything and when the network they reside upon stops working, the possibility of key portions of any business grinding to a halt is a major concern, with potentially dire consequences. Thus, network operations professionals become the lifeblood of business and their ability to maintain those hybrid networks starts with their ability to visualize the entire network across locations, regardless of the mix of vendors and device form factors (physical, virtual, software-defined – at the edge and in the cloud). To ensure the business applications are delivered without disruptions, they must be able to see the relationships between devices, as well as the application paths traversing the network – all in real time. In the end, each application designer or architect requires a certain level of service from the production network, and it is the goal for network operations to deliver upon their design intentions 24x7.

NetBrain's Digital Twin of the Network Enables Dynamic Maps

The concept of building a comprehensive "Digital Twin", or robust virtual representation of the physical and logical topologies has risen in importance. Digital twins are important for process modeling, business continuity, and to maintain up-to-date documentation for increasingly complex technology infrastructures. And if the Digital Twin is faithful enough and truly bidirectional in nature, then any changes desired to the network intents can be made upon the Digital Twin which is ultimately reflected upon the devices themselves. This is the core of the NetBrain PDA System and its Digital twin- to enable intelligent and well-informed Day-2 operations across any hybrid network.

A Robust Data Model

The auto-discovery of the hybrid network that creates the Digital Twin in NetBrain extracts the plethora of rich data that exists within your network's infrastructure devices. Using a combination of automated SNMP, SSH/CLI, and API mechanisms and NetBrain's patented neighbor discovery algorithms, NetBrain understands even the largest environments, from public cloud to remote edge, with scalable efficiency.

NetBrain is constantly updating its underlying data model, providing real-time telemetry for the most accurate Digital Twin of your network. And NetBrain includes API connections to the most popular third-party network monitoring tools to take this to the next level, enriching the robust data model with even more contextual information that deepens your understanding of the network at-a-glance and allows you to take action. The net result is the NetBrain PDA System and its Digital Twin foundation has the ability to deliver robust hybrid network topology detail as an output, suitable for consumption by an number of other processes.

NetBrain's Digital Twin allows for dynamic visualization and by doing so, provides a highly intelligent control plane which allows collaborative real-time problem solving and maintains business continuity preventing disruption. The Digital Twin itself is live, so that changes made in the network are reflected in the digital twin, and vice versa.

Knowledge is Everything

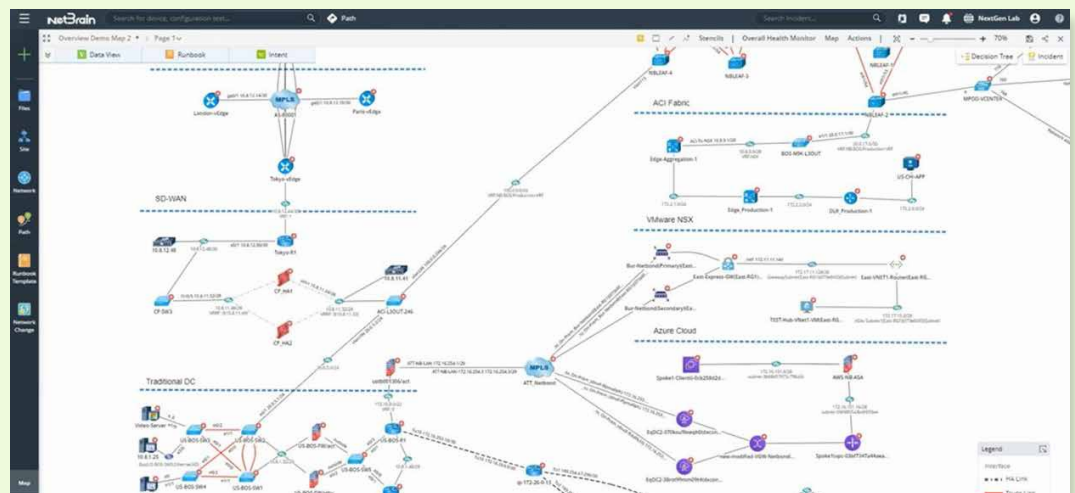
Every network operations team knows the essential nature of having up-to-date network mapping and documentation when solving network problems in today's business critical environments. And they know that legacy approaches mean that their documentation is usually out-of-date and may be significant inaccurate.

NetBrain's Dynamic Map provides a real-time visual digital representation of the edge-to-cloud network, across all network devices, platforms, and firmware versions. And this digital representation can be consumed by any other application, such as ITSM ticketing systems that may need topology information as part of their ticket management processes. The Digital twin always provides up-to-date digital documentation for any purpose, to solve problems or respond to outages, to speed audit preparation, or to support compliance mandates. And since the Digital Twin is real-time, it understands A/B pathing and follows devices hop-by-hop in both directions to mimic the actual path of a packet moving along the network, revealing the dependencies of applications and workflows across their environment.

The PDA System creates and checks how information flows throughout the topology by establishing baselines and documenting paths and intents in their healthy states. In this way, it verifies the network's ability to deliver the intended service levels, assuring the health of the network and its hosted applications.

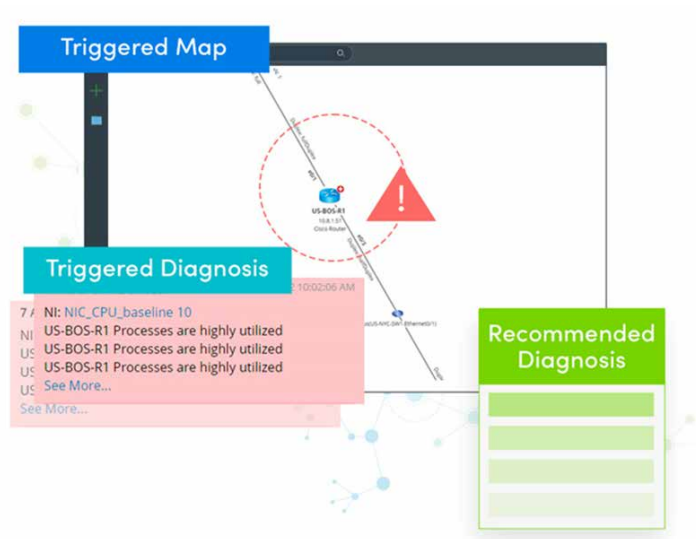
NetBrain's Dynamic Maps differ from traditional manual ways of doing network documentation in multiple ways:

- **Auto-discover every device on the network.** NetBrain continuously discovers, models, and visualizes the network from edge-to-cloud in a single, consolidated view. This is regardless of mix of infrastructure, delivery models, vendors, or number of locations. Everything in your hybrid network is accurately reflected in the NetBrain Digital Twin.
- **Displays network logical topologies, design pathways, baseline configurations, and changes made over time.** See and understand the logical relationships between network devices, their design intents, and compare changes over time. NetBrain's Dynamic Map provides the network's full history while being highly adaptable for the future.
- **Integrates with and leverages your software ecosystem.** Organizations rely on any number of data monitoring, network change and configuration, ITSM, and ITOM tools to ensure end-to-end network management. NetBrain integrates into all these solutions via API to provide a view of the end-to-end network that is enriched with contextual data.



Digital Twin, Dynamic Map and Traffic Path are the Foundation for Problem Diagnosis Automation

Part of the NetBrain PDA System, the Digital Twin becomes the perfect platform for network automation since it understands the detail of the underlying structure. And since the network itself is defined by the intentions of what it delivers, the Digital Twin becomes a lens into the real-time operation of the network. With this tight connection between the two, network automation can be applied to the digital twin which is then reflected in the network components themselves. The Digital Twin enables extreme focus on Day-2 operations and can accelerate remediation of network issues. In addition, network automation can be applied proactively to enforce that the designer's intentions are maintained. In doing so, IT teams can continually drive down the MTTR of network tickets, prevent outages from occurring in the first place, while continuously increasing the number of NetOps workflows that they can accommodate with existing resources.



Conclusion

Today, it is not enough to just visualize the network during Day-0 or Day-1 tasks. Every hybrid network requires significant Day-2 efforts to assure that business applications continue to perform as needed 24x7 by their business leaders and software design architects. NetBrain creates the industry's most robust Digital Twin of the entire network, from edge to cloud, and allows that digital model to be manipulated by intents and consumed by any number of management processes, including NetOps and ITSM ticketing workflows. And because the Digital Twin is created and maintained in real-time, it is always accurate, quickly identifying current network conditions needed for any Day-2 investigation.

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.