NetBrain

How the City and County of Denver Created an Intelligent Network Automation Program for Rapid Compliance

Quick Facts

City and County of Denver

Employees: 15,000

Networked Sites: 200

NetBrain Use Cases:
Visualization,
Automation,
Compliance

> " ...[NetBrain is] the driver, the engine for our automation efforts... "
>
> **Dan Burke**
> Network Architect

About City and County of Denver

Known as "The Mile High City," Denver, Colorado, functions administratively as a consolidated city and county serving a population of 715,522 throughout 154.7 square miles with 15,000 employees. The City and County of Denver's network operations team is responsible for around 200 municipal sites spread across the city and county. In 2019, Denver turned to NetBrain to automate several urgent network operations tasks necessary for improving network security. We spoke with Dan Burke and Joe DiCola, network architects for the City and County of Denver, about what NetBrain has meant for their automation initiatives.

The Challenge

In 2019, the City and County of Denver concluded an audit that highlighted the need to enable dynamic ARP inspection for thousands of network devices in a two-month timeframe. Burke and DiCola understood that manually turning this on for many of their devices was not feasible in their timeframe without hiring and quickly ramping up many new team members. Additionally, the city and county needed to set and enforce standards on all networked devices and intelligently manage their Cisco Smart Licensing environment.

The Solution

Burke and DiCola quickly realized that they would need to create a customized dynamic ARP inspection process for each device that only requires the gateway for an IP subnet. This still means having to go through and look at thousands of switches to figure out every port connected to other devices on the network. Done manually for each device, this would require a burdensome amount of labor and be highly error-prone to the complexity of access levels across IP gateway lists.

Enter NetBrain. According to (Burke), "NetBrain has all of this information inside it. It already knows where everything connects." From there, the City and County of Denver was able to quickly create an automation in NetBrain that performed this audit work automatically, bolstering its capabilities through NetBrain's seamless integration with Python. As a result, the City and County of Denver completed their audit requirements with weeks left on the timeline. NetBrain has become the database for the City and County of Denver's network. This allows the City and County of Denver to easily set and enforce network standards. DiCola reports that by building a parser to audit device configuration and leveraging NetBrain automations alongside Python and Ansible integration, they can achieve compliance above 98%.

> " Being able to get to 98% compliance is impressive. We've been able to do that leveraging automation and by giving (employees) some time back using these automated processes. "

Joe DiCola
Network Architect, City and County of Denver

This has been a lifesaver for their Network Operations team. The City and County of Denver's use of Cisco Smart Licensing require regular reporting on devices. This is another area where NetBrain automation is making a difference. Not only does NetBrain allow them to do this quickly and efficiently within their small team, but it also provides granular segmentation of audited devices, which helps with exception handling, management of unknown equipment, and transitioning traditionally licensed equipment into Smart Licensing.

The Results

By meeting the audit requirements for dynamic ARP inspection through automation, not only was the City and County of Denver able to meet their audit deadline with time to spare, but they also saved over $75,000 by not having to hire contractors to do this work manually. Beyond this immediate cost savings, the City and County of Denver also reported:

- Saved 150-200 hours of manual labor by automating network standards enforcement
- Achieved 98-99% standards compliance on firmware versions
- Automated inventory and segmentation of Cisco Smart License devices
- Dramatically reduced the ongoing audit and compliance monitoring efforts, for one VRF from 100 hours to 10 minutes.

What the Future Holds

As "the source of truth" and an "invaluable tool," Burke and DiCola feel as though they're only getting started with NetBrain, believing it to be well-positioned to be the network automation platform for the City and County of Denver. They have many plans to extend the use of NetBrain throughout their network infrastructure, streamlining network upgrades while leveraging NetBrain's rich network data visualization capabilities to support their wireless and IP telephony infrastructure. Further integrating NetBrain into CMDB and IT Operations software tools ecosystem is also a priority. NetBrain is also expected to help break down silos between networks that were once managed separately, providing automated discovery and visualization for a unified end-to-end network. As Burke puts it, NetBrain is "...the driver, the engine for our automation efforts because not only does NetBrain have an extremely detailed well-maintained, well-updated database about all of this information in our network that we can use while we're deploying all of these large-scale changes, but it also has the flexibility to allow us to create custom (automations), custom parsers, even custom API adapters... and integrate it in whatever way we can imagine and that's the beauty of automation, in general, is that it's limited only to the limits of your imagination."

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