

AHEAD

The Automotive Network Automation Guide

Adopting Enterprise Network
Automation at Scale

Introduction

The automotive industry has always been a pioneer in automation, with industrial robotics now powering most carmaker assembly lines. Many automotive companies have also adopted robotic process automation (RPA) or software robotics for things like inventory management and order processing.

But the most competitive automotive manufacturers are implementing advanced enterprise networking technologies that enable them to deploy and manage high-performance, data-driven systems. This requires managing modern infrastructure across sprawling enterprise networks at many different data centers, production facilities, dealerships, and even within individual cars themselves.





Network automation is the key to supporting a large-scale network architecture for industrial edge AI, autonomous vehicles, and other advanced technologies. IT teams can no longer manually maintain enterprise networks as more data and devices continue to come online, so network automation will be crucial for automotive companies that want to leverage emerging digital technologies to improve their operations.

In this guide, we'll discuss the benefits of network automation for automotive companies and four common challenges they often face when adopting it. We'll also cover strategies for overcoming these challenges to scale network automation in the automotive industry.

Network Automation in the Automotive Industry

In the automotive industry, manufacturers are constantly optimizing different aspects of their manufacturing and assembly processes. The latest trend is using AI for predictive maintenance and real-time analytics to optimize manufacturing across the entire production process.

For example, many automotive manufacturers are converting to smart factories, which enables faster turnaround times, greater production volumes, and higher quality outputs. Smart factories rely on edge AI systems that can collect and analyze large volumes of data from machines and processes to provide useful insights.

These edge AI systems — and many other data-driven software solutions — require modern enterprise network solutions that can connect and share data across many edge devices, production facilities, data centers, and cloud environments. By automating repetitive network tasks like device provisioning, configurations, and more, IT teams can leverage network automation to build and manage robust networks that can handle the demands of AI and other advanced systems.

The Common Challenges of Network Automation

Although there are benefits to adopting network automation, after some quick-wins many organizations often struggle to scale their efforts. Standardizing and maintaining consistency across sprawling enterprise networks is difficult due to their complex and dynamic nature. It's also challenging to adopt the right network automation tools and applications that align with business objectives.

Here are four common challenges most organizations face when adopting network automation, and strategies for overcoming them.

01

Lack of a defined architecture

Since enterprise networks have historically consisted of independent, multi-functional systems working together in complex ways, it's often difficult to model or simulate their overall functionality. Automating actions across these disparate and unpredictable systems usually leads to unreliable results.

Defining architectural and operational standards can provide confidence that automating cross-system processes will be reliable. This involves developing and applying standards to critical functions across all networks within the [enterprise network](#) — while still allowing each network to maintain flexibility to meet specific requirements.

Even when organizations define network standards, it's challenging to maintain them as their infrastructure evolves. One method for maintaining network standards is automated configuration management, which can help you detect when configurations differ from your defined standards. There are also many other tools that can automatically evaluate your configurations and operating code against your pre-defined network standards.

Key Takeaway

It's important to define and enforce network architectural and operational standards before automating anything. Automated configuration management tools are a great starting point for adopting network automation and infrastructure as code.

02

Incomplete understanding of current processes

Besides complex network architectures, modern enterprise infrastructure is often governed by complicated processes. These processes include configuring, managing, testing, deploying, and operating physical and virtual network resources. A lack of understanding of your current network processes means automation could amplify existing inefficiencies.

If you fully map out your internal processes, you may discover extraneous steps, ad hoc communication, and bottlenecks that would limit the results your organization sees from automation. Understanding these details first will allow you to re-define the process in a more optimal way before automating it.

Key Takeaway

Before automating any processes, it's important to fully map them out so that they can be translated into more efficient automated workflows.

This approach could also reveal other optimization opportunities within your organization.

A Single Source of Network Truth with Nautobot

Centralizing and managing the data that forms the intent of your network is crucial for adopting automation at scale. That's why AHEAD recommends Network to Code's Nautobot to lay the foundation for your enterprise network automation initiatives.

Nautobot is a network source of truth platform that can aggregate network data and build a model of your network. This helps your network team take a data-driven approach to automating enterprise workflows and network processes.

In addition, Nautobot is a network automation platform, allowing you to use existing Nautobot Apps (or build your own) atop the source of truth to solve common network automation challenges. This enables your team to immediately produce value from your network data.

Want to learn more? [AHEAD can help you leverage Nautobot](#) to streamline network automation.

03

Unclear goals and roadmap for delivering value

Many organizations start adopting network automation without a clear understanding of how it will impact the business. If you don't define clear goals, your automation initiatives may lack direction and fail to provide real value to the organization. Setting specific and measurable goals for the short, medium, and long term that align with business objectives will help deliver a positive impact.

After setting goals, you can then construct a roadmap that lays out the specific steps necessary to achieve them. By focusing on [smaller, incremental steps](#) — with each contributing a little bit of value — you'll build momentum for reaching your larger goals. A detailed roadmap also helps leadership understand how long it will take for a network automation initiative to deliver real value to the organization.

Key Takeaway

Demonstrate the value that your network automation efforts will deliver through measurable goals and a detailed roadmap. This will help leadership understand the potential impact and make them more likely to support future network automation projects.



How AI is Bridging Gaps to Effectively Scale Network Automation

Companies of all sizes struggle with scaling their network automation programs. As AI continues to advance and make inroads into the network automation space, it's helping organizations solve some of their scalability challenges, for example:

01

Script-writing and use cases that involve declaratives to develop a network automation configuration

02

Tools for engineers to generate examples quickly, which can connect the dots with tools they may already own and break down internal barriers to change

03

Using generative AI platforms such as ChatGPT to jumpstart automation efforts as a springboard for developing larger applications

AHEAD can help your organization tap into the power of AI to add value to your network automation initiatives.

04

The need for cross-functional leadership and internal training

When beginning a new network engineering project, choosing a leader that understands the business needs and how network automation can deliver value will ensure your efforts address real use cases and minimize the risk to business operations. A cross-functional leader can bridge the gap between the technical teams implementing network automation and the business teams that ultimately benefit from it.

In addition, many organizations may lack the blend of networking and development skills required for adopting network automation and infrastructure as code. Leaders can develop this talent internally by providing education and training related to automation, version control, configuration management, orchestration, and more. Allowing team members to take on simple use cases is another great way to build real world network automation skills.

Key Takeaway

A good leader that can bridge the gap between technical and business teams is crucial for overcoming many enterprise automation challenges. It's also important to provide training and resources for team members to build the necessary network automation skills.

Enterprise Network Automation with AHEAD

Although network automation can be challenging to adopt, the potential business value is worth the effort. By adopting automation at scale, automotive manufacturers can build predictable, flexible, and stable networks to leverage new technologies like industrial edge AI and optimize their production processes.

AHEAD is a leading provider of enterprise technology solutions that can help you develop a network automation strategy to overcome the most common adoption challenges. Our experience with the roadblocks many clients face has allowed us to develop a repeatable framework for [enterprise automation](#).

More specifically, AHEAD can help you build enterprise-wide standards, then develop a roadmap to progressively implement those standards. Our team of automation experts collaborates with your organization to identify key network automation opportunities, select the right tools, and design tailored solutions that align with your unique business goals.

Contact AHEAD to learn more about adopting network automation at scale.





AHEAD builds and manages digital platforms that power the most successful organizations in the world. Our consultative approach, unmatched engineering, and innovative solutions combine to accelerate the impact of technology for every client we serve.

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