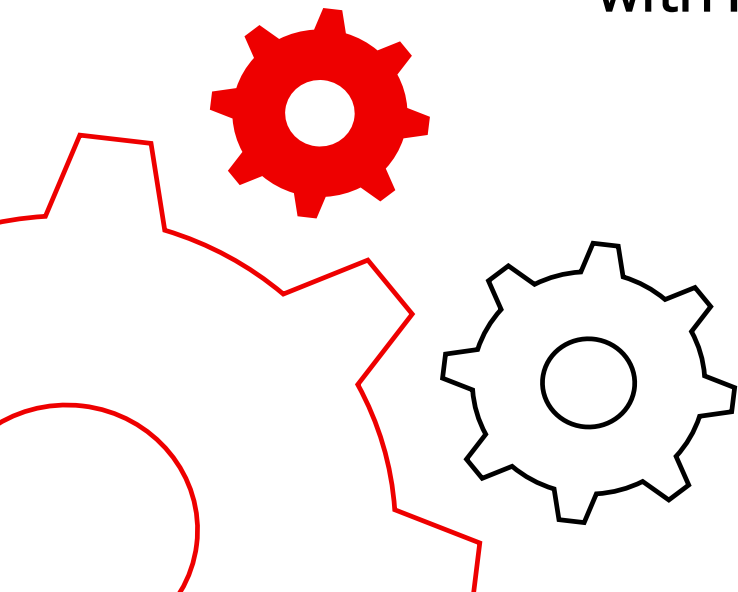




# NETWORK AUTO- MATION

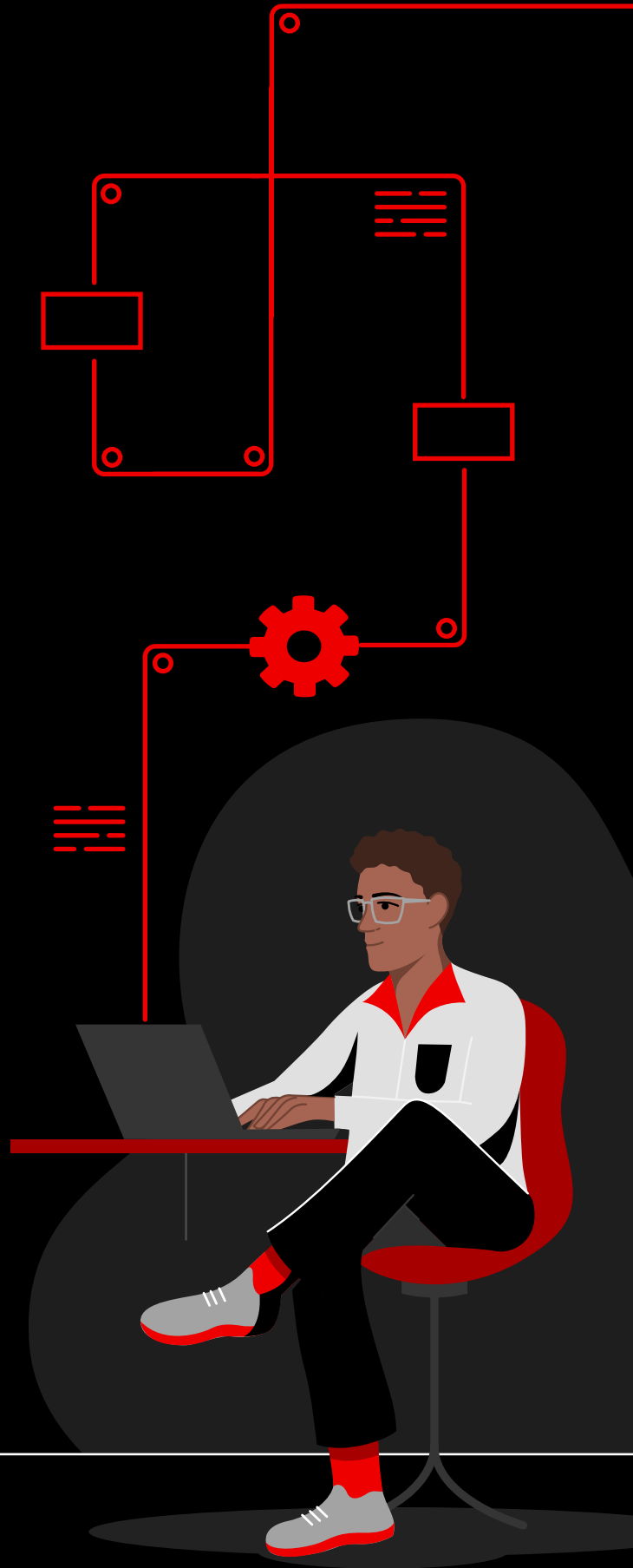
**for everyone**

with Red Hat and F5 Networks



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- 4 Adopt an open approach to network automation
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# Now is the time for network evolution

Even as network and IT infrastructure technologies have evolved rapidly over the past several years, network management has not changed at the same pace. Networks are often built, operated, and maintained using mostly manual processes. Network operators (NetOps) often log in to network components—including routers, switches, load balancers, and network firewalls, and web application firewalls (WAF)—change configurations by hand, then log out. These procedures are typically directed at implementing and maintaining the network policies defined by business processes and security operations (SecOps) teams.

Despite enormous advances in software-defined datacenter technology and new development techniques, this routine has been slow to change for many reasons:

- ▶ NetOps and SecOps teams often specialize in highly isolated domains and platforms.
- ▶ Disparate, cross-departmental teams cannot collaborate effectively.
- ▶ Existing paper-based operational practices are difficult to update and change.
- ▶ Reliance on network device command-line interfaces (CLIs) impedes automation.
- ▶ Existing monolithic, proprietary platforms lack automation capabilities.
- ▶ Increasing numbers of security threats overwhelm NetOps and SecOps teams.
- ▶ Organizational momentum makes it difficult to adapt to changing customer needs.
- ▶ Network vendors often focus on individual product capabilities, rather than overall operational improvements.



**64%** of surveyed IT decision-makers say IT operational efficiency is a benefit of their organization's digital transformation efforts.<sup>1</sup>

## Network automation can help you accelerate operations

IT organizations today are faced with rapidly shifting application and developer requirements. Traditional, manual approaches to network configuration and updates are too slow and error-prone to effectively support these needs. Hands-on processes make it difficult to:

- ▶ Provide a high level of service to users.
- ▶ Deliver resources to application development and IT operations teams on demand.
- ▶ Implement change control and configuration processes.
- ▶ Understand and manage inventory effectively.
- ▶ Maintain configuration standards across disparate network platforms.
- ▶ Build more proactive and self-sufficient NetOps and SecOps teams.

Programmable, software-based automation technologies can help your team better support your organization's digital initiatives. Even so, it can be challenging for NetOps teams to implement the same levels of automation as peer IT teams. Many NetOps teams apply automation only for specific tasks, and in limited capacity. This results in hybrid processes in which some tasks are automated, but others still require manual intervention. There are several causes for this:

- ▶ Device-specific tools are often tough to incorporate into automation tooling.
- ▶ Policy-driven network configuration requirements can impede integration of multivendor environments.
- ▶ Teams may perceive automation as a loss of control and increased security risk.
- ▶ Many NetOps professionals feel unprepared or lack the skills to take advantage of automation technologies for specific network integrations.

### The current state of network automation

Automation can transform NetOps, but many organizations have been slow to automate their networks.



51%

have automated network security functions.<sup>2</sup>



37%

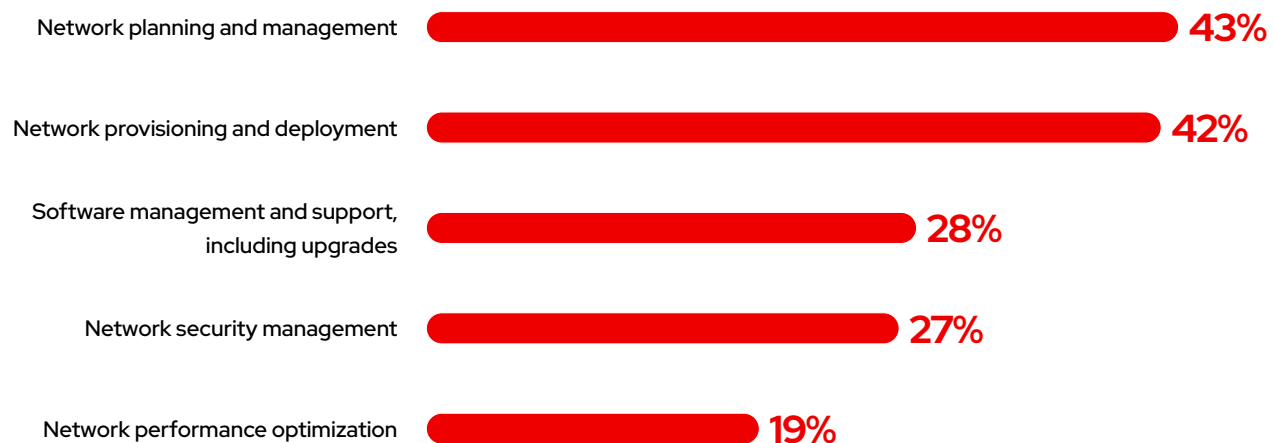
have automated network infrastructure functions.<sup>2</sup>

# Streamline processes with programmable logic

Network automation uses programmable logic to manage network resources and services. It allows NetOps teams to rapidly configure, scale, secure, and integrate network infrastructure (layers 1-3) and application services (layers 4-7). Telecommunications and public cloud service providers were among the first to adopt network automation to streamline their fast-growing web-scale networks, but all organizations can now benefit from network automation technologies. With network automation, NetOps teams can quickly respond to ever-changing workload requirements for flexible capacity, application security, load balancing, and hybrid cloud integrations. They can implement self-service and on-demand network activities while ensuring corporate security policies are satisfied. They can also improve change management, documentation, and logging to increase visibility and transparency. As a result, NetOps teams can become as agile and flexible as applications and infrastructure teams to support modern business demands.

## Network management team efficiencies resulting from automation<sup>3</sup>

Organizations experience increased efficiency across network management team responsibilities from deploying a comprehensive automation platform across IT domains.



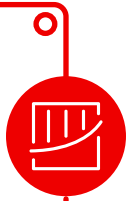
n = 15; Source: IDC Business Value In-Depth Interviews, January 2024

<sup>3</sup> IDC White Paper, sponsored by Red Hat. "The business value of Red Hat Ansible Automation Platform." Document #US51839824. March 2024.

## Why automate your network?

### Network automation delivers benefits for organizations of all sizes, across industries.

Reusable, scalable, enterprise automation gives you more control over and visibility into network resources. As a result, you can improve infrastructure availability, staff productivity, network security, and configuration compliance.



#### Productivity

Improve your team's ability to respond faster to increased demand for changes.

- ▶ Streamline essential routine activities.
- ▶ Test and deploy network changes automatically.
- ▶ Automate repetitive and unpopular tasks.
- ▶ Integrate automated network operations into IT change management systems and workflows.



#### Security

Identify vulnerabilities and implement fixes across your entire network.

- ▶ Collect information about network devices.
- ▶ Build and maintain an inventory of devices.
- ▶ Automatically mitigate simpler issues so staff can focus on more complex and sophisticated attack vectors.
- ▶ Adopt an event-driven approach and telemetry to automatically find and address security issues.



#### Compliance

Ensure continuous compliance with changing policies and regulations.

- ▶ Implement a centralized source of truth for GitOps processes.
- ▶ Automatically test changes before committing.
- ▶ Validate that changes were made appropriately.
- ▶ Automate auditing tasks and change logging.



#### Availability

Increase network availability with more effective testing and management.

- ▶ Gain visibility into the effects of changes.
- ▶ Ensure consistency across your entire network.
- ▶ Reduce errors with automated change management.
- ▶ Implement event-driven automated incident response processes.

# Run your network more efficiently

A foundation for building and operating automation at scale, **Red Hat® Ansible® Automation Platform** lets you create and orchestrate complete IT workflows that support your business goals. Multiple domain teams can use the platform, allowing you to build, scale, and deploy automation across your entire organization.

Ansible Automation Platform can orchestrate all aspects of your IT environment, from servers and networks to applications, security, and DevOps. It provides support for standalone and software-defined network infrastructure devices across multivendor virtual, physical, and cloud environments so you can automate your entire network using a single platform.

Using a common language, Ansible Automation Platform makes everyday tasks repeatable and scalable so you can run your network more efficiently. Choose to automate where you need it most. The platform's flexible framework embraces incremental change, so you can start small and expand over time.

## Simple

Ansible Automation Platform uses human-readable automation via YAML-based playbooks and roles. Tasks are executed in order and can be combined to orchestrate even the most complex processes. Users can create simple, effective automation sequences using a visual user interface. No special programming skills are required, so NetOps engineers can start using the platform immediately.

## Common myths about using Ansible Automation Platform

- ▶ **You must know how to code to use it.**  
You don't need to learn a programming language to use Ansible Automation Platform. You can automate your systems using simple, human-readable commands, existing networking CLIs, and open application programming interfaces (APIs).
- ▶ **You will automate your job away.**  
Automating tasks frees you to spend more time on the high-value, strategic, and innovative projects that matter for your company and you as a professional.
- ▶ **Network automation is risky.**  
Automation isn't all-or-nothing. Start small and expand your efforts over time. For example, begin with read-only use cases, then gradually implement additional scoped changes, before extending to network operations.
- ▶ **It is only for servers.**  
Ansible Automation Platform can be used to automate all aspects of your IT environment, including Linux®, Windows, security, cloud, storage, and network technologies.

**Watch this video playlist** to learn more.

## Powerful

Using modules and plugins, Ansible Automation Platform can orchestrate your entire IT environment. It transfers instructions over existing transport mechanisms and provides templating engines for large-scale automation. Access to **certified, supported content** from network partners helps you create robust, enterprise workflows. You can also use existing CLIs and APIs directly within the platform. Ansible Automation Platform serves as an abstraction layer, so you can implement network configurations as code and design workflows using a common set of states and commands across devices—the platform takes care of translating your commands for each endpoint via resource modules.

## Agentless

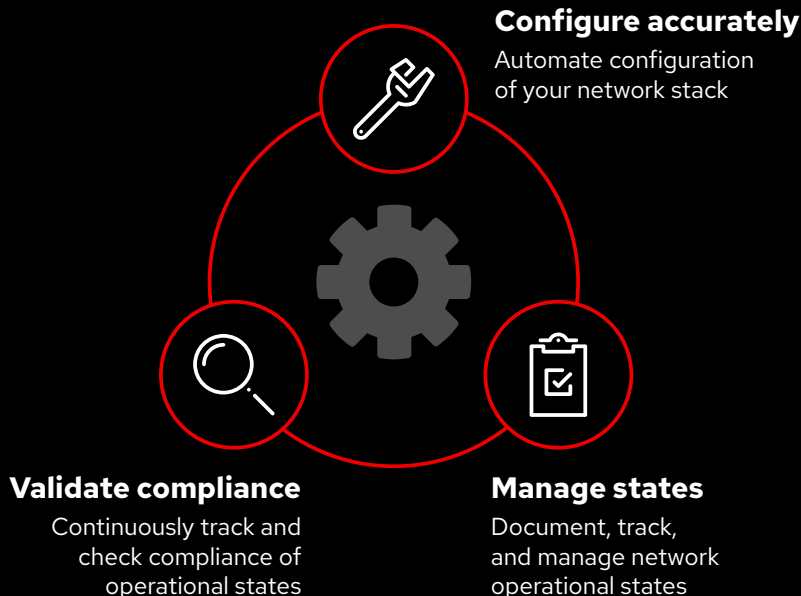
There is no need to install agents on networking devices, helping you avoid interoperability issues. A low attack surface improves network security. Connection plugins for network devices make it easy to deploy existing automation onto new device APIs.

## What is a playbook?

**Playbooks** provide instructions for configuring, deploying, and orchestrating IT assets through Ansible Automation Platform. They consist of sets of commands called plays that define automation across an inventory of hosts. Each play includes 1 or more tasks that target 1, many, or all hosts in the inventory. Each task calls a module that performs a specific function like collecting information, managing configurations, or validating connectivity. Playbooks can be shared and reused by multiple teams to create repeatable automation.

## Automate complete networking lifecycles

With Ansible Automation Platform, you can manage your network infrastructure throughout the entire production lifecycle.



## What is a Content Collection?

A **Collection** is a standardized distribution format for Ansible content that can include playbook examples, roles, modules, and plugins and more. You can install fully supported, **certified Content Collections**, as well as validated Content Collections that provide tested, opinionated reference content, from **Ansible automation hub**, available with your Ansible Automation Platform subscription.



## Deploy production-grade automation technology at scale

Ansible Automation Platform delivers the features and functionality needed for team-based automation at scale. It includes a CLI-based automation engine; a graphical management interface; access to advanced analytics, content management, and catalog services; and enterprise-grade support. The platform provides control over how automation is deployed and used, as well as auditable knowledge about sources and outcomes.



### Automation fabric

Ansible Automation Platform delivers a scalable, security-focused fabric for describing, building, and managing automation across diverse enterprise IT environments.



### Cloud services

Ansible Automation Platform provides operational analytics through a cloud-based interface that helps you understand your current automation levels and encourages collaboration and sharing between and across your teams.



### Certified content

Ansible Automation Platform offers certified, supported automation content to extend platform capabilities, expand automation across domains, and ease adoption.



### Key features and benefits

- ▶ **Single interface for your entire network.** Orchestrate your network from core to edge with integrations and support for hundreds of components.
- ▶ **Certified Content Collections.** Access **validated automation content** that is supported by Red Hat and certified partners.
- ▶ **Role-based access control (RBAC).** Specify access by people, processes, and devices from the built-in automation controller.
- ▶ **Dynamic inventory capabilities.** Connect to any data source in your network to build an inventory.
- ▶ **Workflows and scheduling.** Organize tasks and schedule playbooks to run at a specific time.
- ▶ **Restful API.** Send and receive messages and instructions from other tools.
- ▶ **Event-driven capabilities.** Respond in a consistent way to changes in network conditions, without manual intervention, using **Event-Driven Ansible**.
- ▶ **Generative AI for content creation.** Create, adopt, and maintain automation content more efficiently with **Red Hat Ansible Lightspeed with IBM® watsonx Code Assistant**.

# Adopt an open approach to network automation

Today's IT environments are complex, often containing a multitude of different technologies and products from a variety of vendors. And networking is not immune to this trend. Networking technologies must be integrated throughout the IT stack to ensure reliable, controlled, and security-focused connections. Vendor collaboration through strategic partnerships and open ecosystems is critical for building complete, reliable IT solutions and networks that meet unique customer needs.

Red Hat's **open business model** focuses on collaboration and partnership to bring vendors, customers, and communities together. Our global ecosystem brings together industry-leading partners and trusted open source communities to create innovative, integrated solutions that deliver real business outcomes. And Ansible Automation Platform provides a unified foundation for end-to-end automation and orchestration of ecosystem-based networking and IT solutions.

## Community project to commercial-grade product

Ansible Automation Platform is a fully supported product that incorporates several open source projects, giving you the innovation and longevity of the community with less risk. Our open development model frees your staff from needing to manage, update, and test community releases, saving you time and money. As more people are involved with the code, there are more opportunities to find and resolve issues before they affect users.

## Complete support for your organization

We offer holistic, end-to-end support—from operating systems and observability platforms to dozens of certified vendor integrations—encompassing all your IT and network security and compliance needs. Every Red Hat subscription provides access to technical experts and support services to help you successfully build, deploy, and manage your solutions. Our approach is open and collaborative, providing you direct connections to Red Hat engineers, the latest product knowledge, and best practices. Security patches and product updates are regularly provided by the Red Hat Global Support Services team.

## Expertise and knowledge for your staff

Red Hat provides optional expert services and training to help you on your path to network automation. **Red Hat Consulting** works with your team to analyze your challenges and help you overcome them with comprehensive, cost-effective solutions. **Red Hat Training and Certification** provides hands-on training and practical certification that can help your staff learn and apply best practices to improve operations and productivity.

## Build your skills

Red Hat offers training courses and resources to help you start automating faster:

- ▶ **Ansible Basics** (DO007) provides an introduction to using Ansible Automation Platform.
- ▶ **Ansible for network automation** (DO457) teaches you how to automate network management.
- ▶ Free, **self-paced labs** offer a preconfigured environment for learning and experimenting.
- ▶ The **Red Hat Developer program** provides resources and information specifically for developers.
- ▶ **Ansible Automates** are free, 1-day, virtual events that demonstrate Red Hat's IT automation solutions.
- ▶ Free, 60-day **trial subscriptions** let you try Ansible Automation Platform in your own environment.

## Choice and flexibility for your network

Red Hat fosters a **large ecosystem** of certified partners and third-party products, so you can deploy your preferred tools, clouds, software, and hardware you need knowing they will work reliably with Red Hat products. Additionally, Ansible Automation Platform includes network-specific Content Collections with certified modules, plugins, and roles that let you automate devices and platforms from a large number of vendors.

Because Ansible Automation Platform works across **networks**, platforms, and tools, you can orchestrate complete workflows that incorporate the components and technologies you use today as well as those you plan to adopt in the future. Using certified integrations, you can combine network switches, controllers, management systems, routers, firewalls, load balancers, IP address management tools, and more into automated processes and workflows.



Switches



Enterprise  
firewalls



Routers



Load  
balancers



Controllers



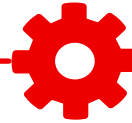
IP address  
management



Ansible Automation Platform

## Strategic partnership spotlight

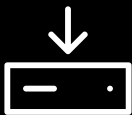
# F5 Networks



Together, Red Hat and F5 Networks help you deliver high-performance applications at speed and scale with automated, protected, and optimized workflows across complex hybrid cloud environments. Our solutions provide defense at both the application and network levels, allowing you to build agile, security-focused infrastructure.

F5 BIG-IP application services help you keep your applications up and running with the availability, performance, and protection you need to meet business demands. F5 provides **Certified Content Collections** for both physical and virtual editions of BIG-IP, allowing you to automate networks of any size more simply. You can automate and orchestrate nearly all Day 0 to Day 2 tasks over a wide range of use cases. A dedicated staff builds and regularly maintains these integrations, ensuring that they are always up to date and reliable for production use.

F5 and Red Hat give you the tools you need to automate tasks across networks, scale installations and deployments to the size you need for your business, and protect your infrastructure against attack.



### Automate installation and deployment tasks

Create F5 BIG-IP deployment and configuration templates in an Ansible Automation Platform playbook and reuse them across devices and endpoints. A library of repeatable automation assets can help you speed application installation, increase configuration consistency and reliability, and save IT staff time and effort.



### Respond faster to incidents and events

Implement event-driven automation to rapidly respond to network- and IT-related events and reduce tedious manual tasks. For example, you could **automate compliance** by checking and maintaining patch levels, and remediating and preventing drift. On the security side, firewall changes could prompt automatic remediation.



### Protect your network against outside attacks

Integrate security throughout your infrastructure using automation. Ensure systems are configured correctly, perform automatic checks, and monitor to catch issues as they arise. Built-in security features and integrations with common security tools lets you apply security consistently across your network and environment.

# Common use cases and customer successes

## Start small and build over time

Ansible Automation Platform can help you automate many aspects of your network. Most teams begin with 1 of these use cases.

### Back up and restore network configurations

Storing backups of configurations is a critical activity for NetOps. Ansible Automation Platform makes it easy to pull an entire configuration, or just parts of the configuration, from 1 or more network devices. You can then restore these configurations to network devices as needed.

### Collect facts

Read-only tasks like fact collection can help you gain visibility into your network inventory. Ansible Automation Platform makes it easy to collect information from your network devices and create reports for compliance and standardized, agnostic network management.

### Create a structured source of truth

Knowing the configurations of your network devices is essential for efficient NetOps. Ansible Automation Platform can help you create an off-device source of truth that treats network configurations as structured variables for infrastructure as code management approaches. Modules let you transform the configurations of devices from a variety of network vendors into structured data.

### Manage network configurations

Configuration drift happens, especially when manual processes are involved. Ansible Automation Platform simplifies policy enforcement, drift monitoring and correction, and configuration maintenance. Using a network as code approach with structured configuration data, you can manage your network in the same way you manage your Linux hosts.

### Integrate your existing network tools and devices

All NetOps teams need to make the most of their network investments. Ansible Automation Platform integrates with your existing network devices and management tools, as well as other vendor-specific automation tools, to help you automate the network you have today.

## Experience real business outcomes via network automation

Many organizations are already gaining benefits by automating with Ansible Automation Platform.



To stay competitive, **Swisscom** needed a tool for enterprise-wide IT and network automation. The service provider used Ansible Automation Platform to automate the management and scalability of approximately 20,000 components, including servers, firewalls, storage devices, and network devices like F5 BIG-IP load balancers.



Saved around 3,000 hours per year in manual tasks



Streamlined common tasks with self-service capabilities



Improved collaboration with playbooks and sync meetings

## Alstom

**Alstom**, a global leader in smart and sustainable mobility, wanted to upgrade the way its railway devices communicated with trains and back-office systems. Alstom standardized on Red Hat Enterprise Linux and adopted Ansible Automation Platform to automate edge device lifecycles and deliver updates to fielded devices in real time or on demand.



Created a data-driven IoT<sup>4</sup> hardware and software platform



Streamlined complete edge device lifecycles



Improved security hardening for distributed edge devices

**“We are seeing synergy effects where different teams can all use Red Hat Ansible Automation Platform because it can manage the different products.”<sup>5</sup>**

**Giancarlo Morena**  
Product Manager, Swisscom

<sup>4</sup> Internet of Things

<sup>5</sup> Red Hat case study, “Swisscom gains efficiency by standardizing and expanding automation,” December 2023.

# ProRail

Dutch rail operator **ProRail** sought to make its IT network and infrastructure more efficient to prepare for growing traffic and demands. By expanding its use of Ansible Automation Platform with help from Red Hat Consulting, the company has adopted standardized processes for network switch modification, created an automation community of practice (CoP) for cross-team collaboration, and established a foundation for ongoing innovation.



Saved time from 60 minutes to 20 minutes



Established a cross-functional automation CoP



Improved talent acquisition with innovative technology



**ANZ New Zealand**, the country's largest financial services group, decided to transition to a cloud-first approach focused on automation and site reliability engineering to streamline network operation tasks. The organization worked with Red Hat to increase productivity and time to market through the adoption of agile practices and automation, ultimately reducing the time required for end-to-end domain name service (DNS) provisioning by 99.4%.



Improved time to market and customer service



Automated time-consuming manual tasks



Enhanced efficiency and collaboration

**“Previously, our network operations staff had to log onto each switch to make the change, which took 2 or 3 minutes each. Ansible Automation Platform can change each switch in just a few seconds.”<sup>6</sup>**

**Coert Busio**  
IT4IT and IT4OT Manager, ProRail

# Get started with network automation



## Red Hat can help you define your path to efficiency

Network automation is critical for supporting the increasing application and workload needs of modern, digital business. Ansible Automation Platform gives you a path to modern network operations, while still supporting current processes and existing infrastructure.

While automating your network may seem like a daunting task, you can start small and make incremental changes at your own pace. Focus on solving the contained, tactical problems your team faces every day. Learn from these efforts and re-evaluate your approach as needed. As you move forward, be sure to develop success criteria and specific goals for your organization. A phased approach will keep people and processes from becoming alienated. Remember, automation is more than a tool. It is a strategy, a journey, and a culture.

It's easy to get started.



1 Create playbooks that read or check information only.



2 Build simple jobs to replace tedious and unpopular tasks.



3 Apply your team's current knowledge to automation.



