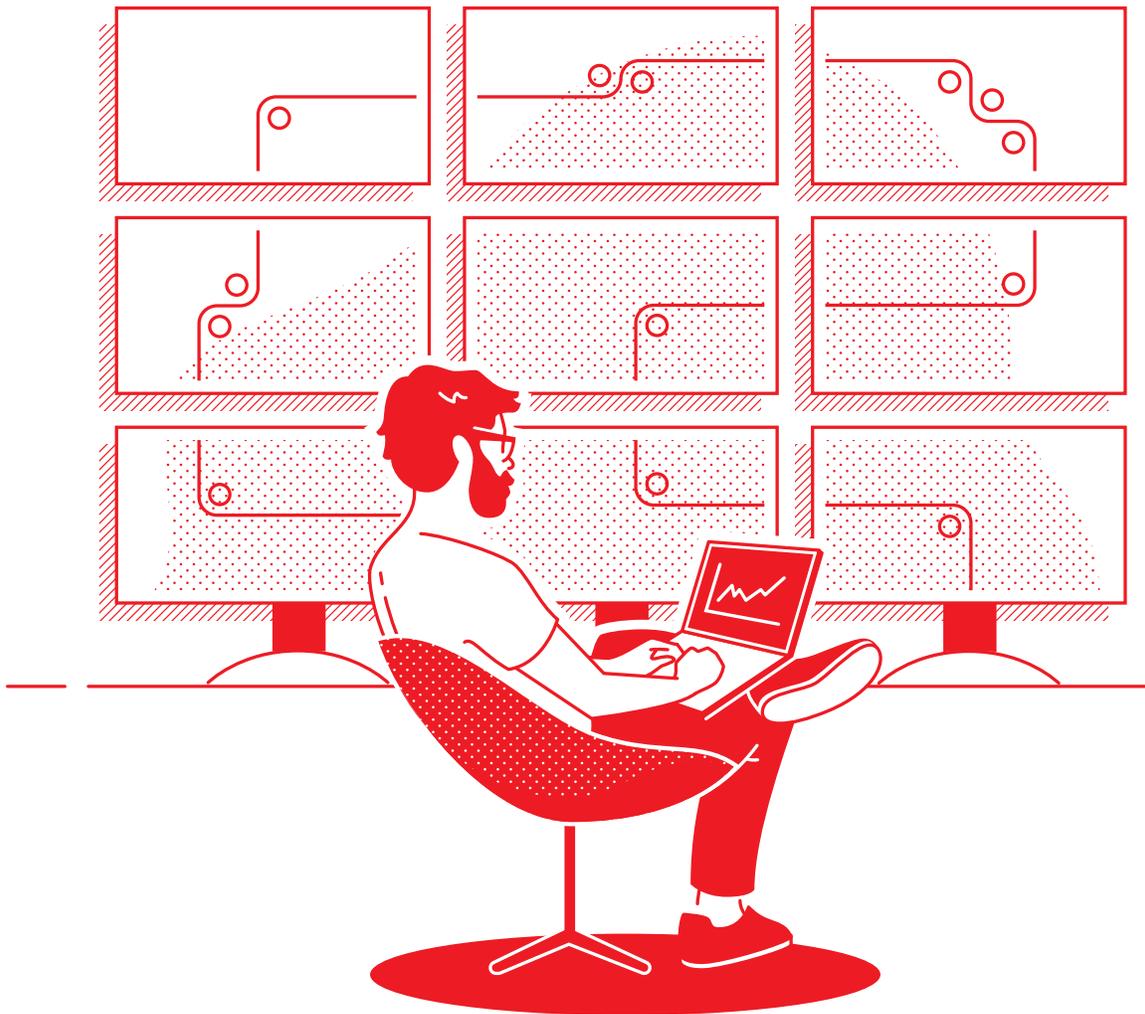# Network automation for everyone

Modernize your network with Red Hat Ansible Automation Platform

Red Hat

See what's inside

The current state of networking
Network management has evolved slowly

Even as underlying technologies have evolved, network management has remained largely the same for decades. Networks are typically built, operated, and maintained manually. Network operators (NetOps) log in to routers, switches, load balancers, and firewalls, change configurations by hand, then log out. These procedures are typically directed at implementing and maintaining the network policies defined by business processes.

Despite enormous advances in software-defined datacenter technology and new development techniques, this routine has not changed for a number of reasons:

▶ NetOps teams often specialize in highly isolated domains and platforms.

▶ Network vendors often focus on individual product capabilities, rather than overall operational improvements.

▶ Disparate, cross-departmental teams cannot collaborate effectively.

▶ Legacy, 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.

▶ Organizational momentum makes it difficult to adapt to changing customer needs.

50% of network professionals prioritize network automation for addressing disruptions today.[1]

Is your organization ready for network automation?

While 77% of organizations cite network automation as a high priority,[2] most are in the early stages of automation maturity:

29%

are not automating at all.[3]

25%

are starting to automate beyond CLIs with basic scripting.[3]

13%

are using automation only in test, development or lab environments.[3]

21%

are using automation in some network places in production.[3]

12%

are automating in production in all network places.[3]

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1 Cisco. *"2021 Global Networking Trends Report,"* November 2020.

2 Enterprise Management Associates, sponsored by Red Hat. *"Research Summary: Enterprise Network Automation for 2020 and Beyond,"* September 2019.

3 Juniper Networks. *"The 2020 State of Network Automation,"* October 2020.
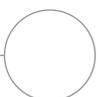
Traditional approaches cannot keep up

Network automation can help you accelerate operations

Traditional, manual approaches to network configuration and updates are too slow and error-prone to effectively support the needs of rapidly shifting application and developer requirements. These 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 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. Device-specific tools are often tough to incorporate into automation tooling. Policy-driven network configuration requirements can impede integration of multivendor environments. Finally, many NetOps professionals feel unprepared or lack the skills to take advantage of automation technologies for specific network integrations.

Common challenges to network automation

Network automation offers many benefits for organizations, but only 12% of enterprises report using automation in production across their entire network.[5] Top network automation challenges include:[5]

- Lack of time to learn on the job.

- Fear of making a mistake in production.

- Lack of knowledge necessary to access training.

- Overwhelming number of technology choices.

- Older networking equipment that is hard to automate.

53% of organizations use open source infrastructure automation software like Red Hat Ansible Automation Platform for network automation.[4]

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4   A commissioned study conducted by Forrester Consulting on behalf of Red Hat. "**Enterprise Open Source Automation Drives Innovation**," *July 2020.*

5   *Juniper Networks.* "**The 2020 State of Network Automation**," *October 2020.*
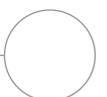
What is network automation?

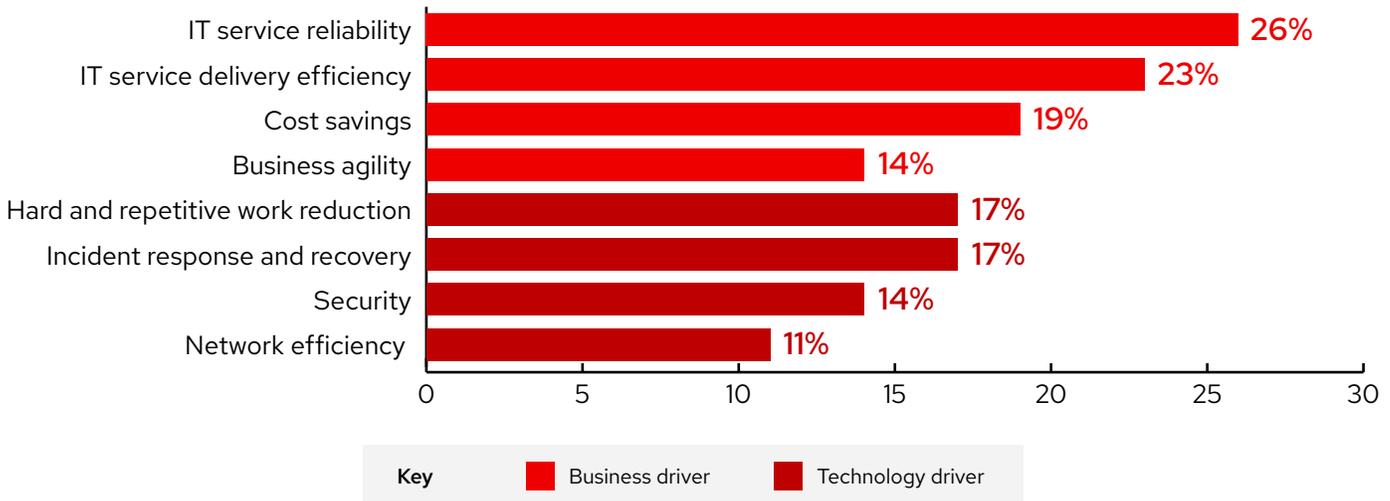## Streamline manual processes with programmable logic

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.

"By 2023, 60% of datacenter networking configuration activities will be automated, up from 30% in early 2020."

Gartner
Market Guide for Network Automation and Orchestration Tools, September 2020[7]

Top business and technology drivers for network automation[6]

Driver	Percentage
IT service reliability	26%
IT service delivery efficiency	23%
Cost savings	19%
Business agility	14%
Hard and repetitive work reduction	17%
Incident response and recovery	17%
Security	14%
Network efficiency	11%

Key — ■ Business driver ■ Technology driver

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6   *Juniper Networks.* "**The 2020 State of Network Automation,**" *October 2020.*

7   *Gartner.* "**Market Guide for Network Automation and Orchestration Tools**," *14 September 2020. Document ID G00720710.*
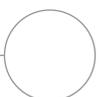
Why automate your network?

Benefits for organizations of all sizes, across industries

Reusable, scalable, software-defined 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.

Compliance

Ensure continuous compliance with changing policies and regulations.

- ▶ View all configurations from a single platform.
- ▶ Automatically test changes before committing.
- ▶ Validate that changes were made appropriately.

Security

Identify vulnerabilities and implement fixes across your entire network.

- ▶ Collect information about network devices.
- ▶ Build and maintain an inventory of network devices.
- ▶ Automatically mitigate issues.

Availability

Increase network availability with more effective testing and management.

- ▶ Automate testing to examine the impact of changes.
- ▶ Reduce errors with automated change management.
- ▶ Scale network capacity to meet changing needs.
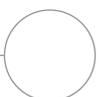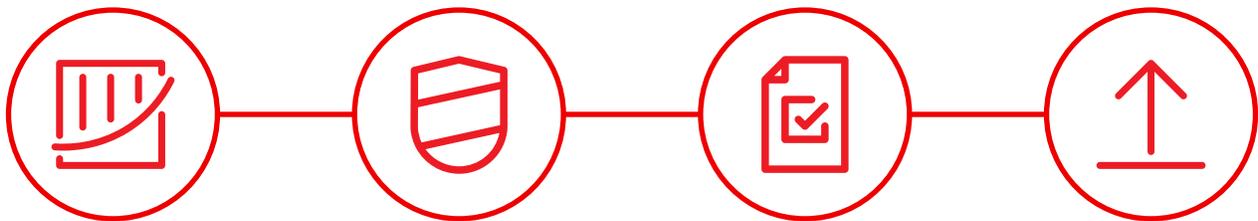
Run your network more efficiently

Red Hat Ansible Automation Platform provides a common foundation for IT automation

Red Hat® Ansible® Automation Platform is simple, powerful IT automation that helps you streamline and manage complex datacenter environments, from servers and networks to applications and DevOps. It provides support for legacy and open network infrastructure devices across multivendor virtual and physical environments so you can automate your entire network using a single tool.

Using a common, human readable 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. Ansible Automation Platform's flexible framework embraces incremental change, so you can start small and expand over time.

With Ansible Automation Platform, you can manage your network infrastructure throughout the entire production life cycle.
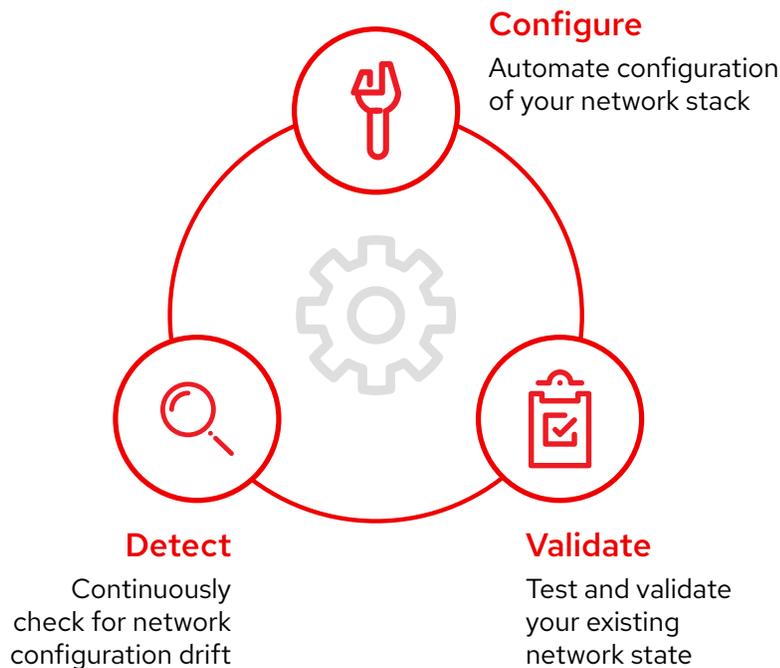
Common myths about using Red Hat Ansible Automation Platform

You must know how to code to use Ansible Automation Platform.

▶ There is no need to learn a programming language to get started with Ansible Automation Platform. You can automate your systems using simple, human-readable commands, existing networking CLIs, and open application programming interfaces (APIs).
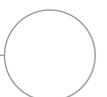
You will automate your job away.

▶ Automating tedious, time consuming 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.

Ansible Automation Platform 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 on-demand video playlist to learn more: **red.ht/AnsibleVideos**.

Configure
Automate configuration of your network stack

Detect
Continuously check for network configuration drift

Validate
Test and validate your existing network state

Figure 1. Manage the entire network infrastructure life cycle with Red Hat Ansible Automation Platform.

Automate your network more easily

Adopt a simple, powerful, and agentless automation foundation

Based on open source standards and an agentless architecture, Red Hat Ansible Automation Platform gives you a simple, powerful path to modern network operations, while still supporting your current processes and legacy infrastructure. At the core of this platform is a simple, powerful, and agentless automation engine.

Simple

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

Powerful

Using modules and plugins, Ansible Automation Platform can automate your entire datacenter. It transfers instructions over existing transport mechanisms and provides templating engines for large-scale automation. Access to certified, supported content from network hardware partners helps you create robust, enterprise automation workflows. You can also use existing CLIs and platform-specific APIs directly within Ansible Automation Platform.

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 one or more tasks that target one, many, or all hosts in the inventory. Each task calls an Ansible Automation Platform module that performs a specific function like collecting device information, managing network configurations, or validating connectivity. Playbooks can be shared and reused by multiple teams to create repeatable automation.

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 community-supported Collections from **Ansible Galaxy** and fully supported, **certified Collections** from **Ansible Automation Hub**.
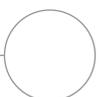
Deploy production-grade automation technology at scale

Red Hat 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. Ansible Automation Platform provides control over how automation is deployed and used, as well as auditable knowledge about sources and outcomes.

Automation fabric

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

Cloud services

Red Hat Ansible Automation Platform provides operational analytics through a cloud-based interface that encourages collaboration between and across your teams.

Certified content

Red Hat 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.** Automate everything with support for more than 80 platforms.

► **Certified Content Collections.** Access **trusted, 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 Red Hat Ansible Tower.

► **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.
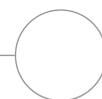
Network automation, the Red Hat way

Take advantage of an open approach that delivers enterprise results

Community project to commercial-grade product

Red Hat Ansible Automation Platform is a fully supported product that incorporates several open source projects, giving you all of the innovation and longevity of the community, but with less risk. Red Hat's open development model frees your staff from needing to manage, update, and test community releases in-house, 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

Red Hat offers holistic end-to-end support—from operating system to automation software to dozens of 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 access to Red Hat engineers, the latest product knowledge, and best practices. Security patches and product updates are provided by the Red Hat Global Support Services team.

Choice and flexibility for your network

Red Hat fosters a large ecosystem of certified partners and third-party products, so you can deploy the tools, clouds, software, and hardware you need knowing they will work reliably with Red Hat products. Additionally, Red Hat 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.

Expertise and knowledge for your staff

Red Hat also 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 understand and apply best practices to improve operations and productivity.

Build your skills and knowledge

Red Hat offers training courses and resources to help you get started with Ansible Automation Platform quickly and successfully:

- Ansible for network automation (DO457) is a training course for network administrators or infrastructure automation engineers who want to use network automation to centrally manage the switches, routers, and other devices in the organization's network infrastructure.

- The Red Hat Developer program offers self-paced, browser-based labs that teach you how to use Ansible Automation Platform.

- Ansible Automates are free, one-day, virtual or in-person events held around the world to provide an introduction to Red Hat's solutions for IT automation.

- Free, 60-day trial subscriptions let you try Ansible Automation Platform in your own environment.
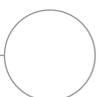
Common uses for network automation
Start small and build over time

Red Hat Ansible Automation Platform can help you automate many aspects of your network. Most teams begin with one of the following 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 one 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 an infrastructure-as-code approach with structured configuration data, you can manage your network in the same way you manage your Linux hosts.

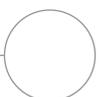### Integrate your existing network tools and devices

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.

"Ansible [Automation Platform] continues to grow quickly, particularly among enterprises that are automating networks. The solution excels at providing a variety of deployment options and acting as a service broker to a wide array of other automation tools. A robust community ecosystem contributes to Ansible [Automation Platform's] success."

The Forrester Wave™: Infrastructure Automation Platforms, Q3 2020[8]

8 Forrester. *"*The Forrester Wave™: Infrastructure Automation Platforms, Q3 2020*," 10 August 2020.*

Microsoft

Digitally transform through automation and cloud technologies

Challenge

Microsoft is a leading platform and productivity company for the mobile-first, cloud-first world. The company wanted to digitally transform its customer, partner, and employee experience to accelerate growth. With drastic increases in network complexity and volume and the number of connected devices, Microsoft decided to automate and digitize its processes using the technologies showcased throughout this e-book.

Solution

Microsoft deployed Red Hat Ansible Automation Platform to automate its network in a consistent, repeatable way. Through automation, Microsoft's network developers can now focus on impactful features that support customer demands. Ansible Tower has also helped Microsoft increase network scalability and consistency, while accelerating network issue ticket resolution.

"Automation plays a huge role in our digital transformation."

Ludovic Hauduc
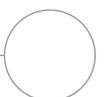Corporate Vice President, Core Platform Services, Microsoft

Implemented repeatable, shareable automation

Increased network scalability and consistency

Accelerated network issue resolution

Customer success highlights

Surescripts and Swisscom

Experience benefits through network automation

surescripts®
The Nation's E-Prescription Network

swisscom

Surescripts, a leading health information network in the United States, needed to improve its software development infrastructure and datacenter networking to help its DevOps team meet business demands. The company uses Red Hat Ansible Tower to support its new microservices-based code infrastructure and launch new applications faster.

To stay competitive in the challenging network infrastructure market, **Swisscom** needed a tool for enterprise-wide IT and network automation. The service provider used Red Hat Ansible Tower to automate management of approximately 15,000 components, including servers, firewalls, network devices, and storage devices.

Streamlined IT management to reduce downtime and errors

Expected to save 3,000 hours per year in manual tasks

Improved productivity through automation and reusable code

Streamlined common tasks with self-service capabilities

Enhanced system and data security with role-based access

Improved collaboration with playbooks and sync meetings

"In the past, we had a few outages caused by staff running commands with unexpected results. Now, by routing everything through Red Hat Ansible Tower, we have much higher quality and availability assurance."

Michael Perzel
Senior Devops Engineer, Surescripts
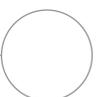
Get started with network automation
Red Hat can help you define your path to efficiency

Network automation is critical for supporting the increasing application and workload needs of modern, digital business. Red Hat Ansible Automation Platform gives you a path to modern network operations, while still supporting current processes and legacy 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.
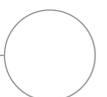
It's easy to get started.

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.

Ready to automate your networks?

Network automation can help your organization streamline operations, respond faster, and support modern business demands. Red Hat Ansible Automation Platform gives you everything you need to automate your networks—and your organization—at scale.

Plan your path to network automation:
ansible.com/for/networks

Learn more about Red Hat Ansible Automation Platform:
redhat.com/ansible

Watch automation videos, demonstrations, and webinars:
youtube.com/AnsibleAutomation

Red Hat