

## **NETWORK AUTOMATION FOR EVERYONE**

**MODERNIZE YOUR NETWORK  
WITH RED HAT ANSIBLE  
NETWORK AUTOMATION**

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# NETWORK AUTOMATION FOR EVERYONE

Your path to support modern, digital business

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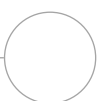
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# THE CURRENT STATE OF NETWORKING

## Network management has evolved slowly

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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 largely 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 only a few domains and platforms.
- » Network vendors focus on product sales, rather than operational improvements.
- » Disparate, cross-departmental teams cannot collaborate effectively to share ideas.
- » 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.

### IS YOUR NETWORK READY FOR THE FUTURE?

70% of NetOps and DevOps professionals use vendor or device-specific tools to manage network changes.<sup>1</sup> Established network vendors have not guided their customers toward operational improvements, and they often market ordinary products as highly innovative.<sup>2</sup> As a result, your network may not be as efficient or advanced as you may think.



**At least 70% of Gartner clients still use manual CLI-based changes as the primary mechanism for network configurations.**

GARTNER, LOOK BEYOND NETWORK VENDORS FOR NETWORK INNOVATION, JANUARY 2018<sup>2</sup>

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<sup>1</sup> F5 Networks and Red Hat, "NetOps Meets DevOps: The State of Network Automation," 2018. [red.ht/netops-report](http://red.ht/netops-report).

<sup>2</sup> Gartner, "Look Beyond Network Vendors for Network Innovation," Andrew Lerner, January 2018. G00349636. [gartner.com/doc/3847469/look-network-vendors-network-innovation](http://gartner.com/doc/3847469/look-network-vendors-network-innovation).

# 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 data transfer requirements. These hands-on processes make it difficult to:

- » Provide the high level of service users expect.
- » Deliver resources to applications 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 stronger and more 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.

### CHALLENGES TO NETWORK AUTOMATION

According to a survey of more than 400 IT NetOps and DevOps professionals, the top challenges to network automation are:<sup>3</sup>

- » A lack of skilled professionals to manage projects (48%).
- » Integration of tools across vendors and devices (44%).
- » Political or cultural resistance to change (40%).
- » Creating policies and governance (36%).
- » Restricted budget for new tools (32%).
- » Limited solution offerings from vendors (23%).

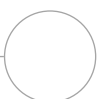


**Gartner believes organizations that automate 70% of their network configuration changes will reduce the number of unplanned network outages by more than half, compared with those that automate less than 30%.**

GARTNER, LOOK BEYOND NETWORK VENDORS FOR NETWORK INNOVATION, JANUARY 2018<sup>4</sup>

<sup>3</sup> F5 Networks and Red Hat, "NetOps Meets DevOps: The State of Network Automation," 2018. [red.ht/netops-report](http://red.ht/netops-report).

<sup>4</sup> Gartner, "Look Beyond Network Vendors for Network Innovation," Andrew Lerner, January 2018. G00349636. [gartner.com/doc/3847469/look-network-vendors-network-innovation](http://gartner.com/doc/3847469/look-network-vendors-network-innovation).



# 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 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 multicloud integrations. They can implement self-service and on-demand network activities. As a result, NetOps teams can become as agile and flexible as applications and infrastructure teams to support modern business demands.

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*By 2021, productized network automation tools will be used by 45% of organizations, which is an increase from fewer than 10% today.*

GARTNER, MARKET GUIDE FOR NETWORK AUTOMATION, MARCH 2018<sup>5</sup>

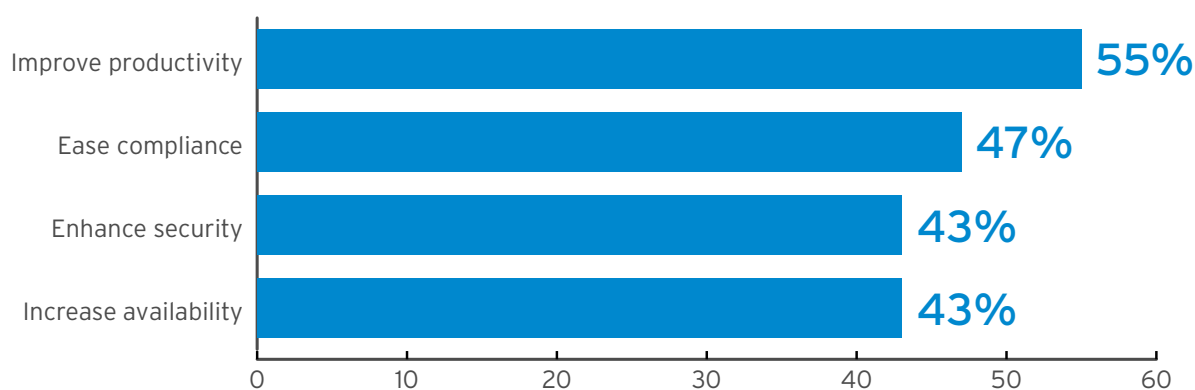


Figure 1. Organizational goals for network automation initiatives<sup>6</sup>

<sup>5</sup> Gartner, "Market Guide for Network Automation," March 2018. G00328743. [gartner.com/doc/3869769/market-guide-network-automation](https://www.gartner.com/doc/3869769/market-guide-network-automation).

<sup>6</sup> F5 Networks and Red Hat, "NetOps Meets DevOps: The State of Network Automation," 2018. [red.ht/netops-report](https://red.ht/netops-report).



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# WHY AUTOMATE YOUR NETWORK?

## Benefits for organizations of all sizes, across industries

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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 backup and restore functions.
- » Test and deploy changes automatically.
- » Automate repetitive and unpopular tasks.

### COMPLIANCE

Ensure continuous compliance with changing regulations.

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

### SECURITY

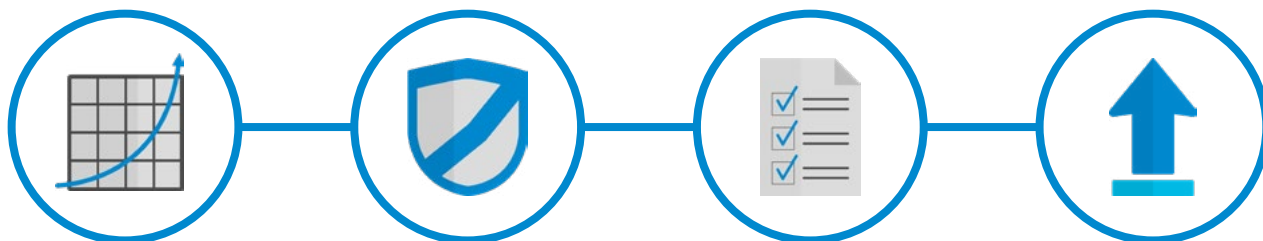
Identify vulnerabilities and implement fixes across your entire network.

- » Collect information about network devices.
- » Build an inventory of those devices.
- » Automatically mitigate issues.

### AVAILABILITY

Increase network availability with more effective testing and management.

- » Automate testing to better understand the impact of changes.
- » Reduce manual errors with automated change management.



# INTRODUCING ANSIBLE FOR NETWORK AUTOMATION

Run your network more efficiently with a common tool

Ansible® is a simple, powerful IT automation platform that helps you streamline and manage complex datacenter environments, from servers and networks to applications and DevOps. Ansible 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 language, Ansible makes everyday tasks repeatable and scalable, so you can run your network more efficiently. Choose to automate where you need it most. Ansible's flexible framework embraces incremental change, so you can start small and expand over time.

With Ansible, you can manage your network infrastructure throughout the entire production life cycle.

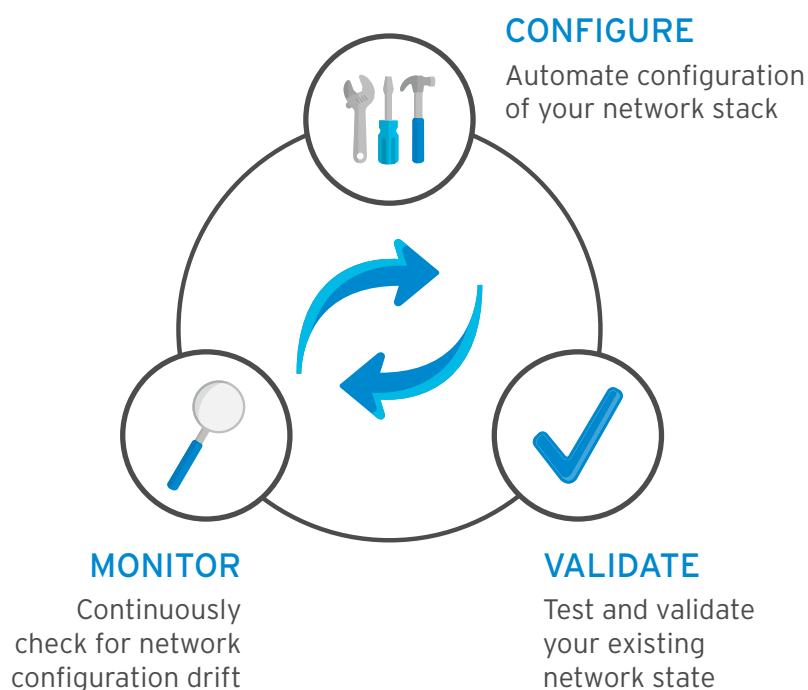


Figure 2. Manage the entire network infrastructure life cycle with Ansible.

## COMMON MYTHS ABOUT AUTOMATING WITH ANSIBLE

**You must know how to code to use Ansible.**

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

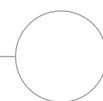
**You will automate your job away.**

- » 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 is only for servers.**

- » Ansible started as a tool for developers to automate manual tasks quickly and easily. Today, it can be used to automate all aspects of your datacenter, including IT processes, devices, and networks.

Read the blog post to learn more: [Five questions: Network automation](#)



# AUTOMATE YOUR NETWORK MORE EASILY

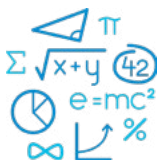
Ansible is simple, powerful, agentless, and proven

Based on open source standards and an agentless architecture, Ansible gives you a simple, powerful path to modern network operations, while still supporting your current processes and legacy infrastructure.



## SIMPLE

Ansible 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. No special programming skills are required, so NetOps engineers can start using Ansible immediately.



## POWERFUL

Using modules and plugins, Ansible can automate your entire datacenter. It transfers instructions over existing transport mechanisms and provides templating engines for large-scale automation. You can also use existing CLIs and platform-specific APIs directly within Ansible.



## 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.



## PROVEN

Ansible started as a tool for developers to automate manual tasks quickly and easily. Since then, the Ansible community has grown to 7,500 contributors in 2018.<sup>7</sup> Now, you can apply best practices from years of server automation to your network, reducing your risk.

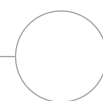
### WHAT IS A PLAYBOOK?

**Playbooks** are Ansible's configuration, deployment, and orchestration language. They consist of sets of instructions 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 module that performs a specific function like collecting useful information, backing up network files, managing network configurations, or validating connectivity. Playbooks can be shared and reused by multiple teams to create repeatable automation.

### WHAT IS A ROLE?

**Roles** are platform-agnostic playbooks that can be modified for multiple use cases. A role might contain instructions for backing up a configuration or collecting switch version numbers. These instructions can be applied to specific network platforms as needed. Roles are distributed separately from Ansible. Thousands of roles are available on [Ansible Galaxy](#).

<sup>7</sup> Github, "The State of the Octoverse," 2018. [octoverse.github.com/](https://octoverse.github.com/).





# RED HAT ANSIBLE NETWORK AUTOMATION

## Production-grade automation technology

Red Hat brings the community Ansible project to the enterprise, adding the features and functionality needed for team-based automation at scale. Red Hat® Ansible Network Automation includes an automation engine, management interface, and support offering. It provides control over how automation is deployed and used, as well as auditable knowledge about sources and outcomes.



### RED HAT ANSIBLE NETWORK AUTOMATION

Complete network automation platform



### RED HAT ANSIBLE ENGINE

Automation foundation



### RED HAT ANSIBLE TOWER

Integration, control, and scalability



#### SINGLE INTERFACE FOR YOUR ENTIRE NETWORK

Automate everything with support for 50 platforms and 700+ modules.



#### NETWORK-SPECIFIC ROLES

Simplify network operations with predefined, preinstalled automation.



#### ROLE-BASED ACCESS CONTROL (RBAC)

Specify access by people, processes, and devices from Ansible Tower.



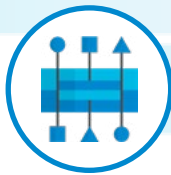
#### DYNAMIC INVENTORY CAPABILITIES

Connect to any data source in your network to build an inventory.



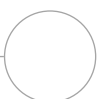
#### WORKFLOWS AND SCHEDULING

Organize tasks and schedule playbooks to run at a specific time.



#### RESTFUL API

Send and receive messages and instructions from other tools.



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# NETWORK AUTOMATION, THE RED HAT WAY

An open approach that delivers enterprise results

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## COMMUNITY PROJECT TO COMMERCIAL-GRADE PRODUCT

Red Hat Ansible Network Automation is a fully supported product based on the community Ansible project, 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 Network Automation includes network-specific [modules](#) and [roles](#) that let you automate devices and platforms from a large number of vendors.

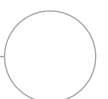
## EXPERTISE AND KNOWLEDGE FOR YOUR STAFF

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 KNOWLEDGE AND SKILLS

[Red Hat Training](#) offers several courses to help you get started with Red Hat Ansible Automation quickly and successfully:

- » [Ansible for network automation \(DO457\)](#) is designed 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.
- » [Ansible essentials: Simplicity in automation technical overview \(DO007\)](#) is a series of on-demand, online videos that introduces you to Ansible automation and configuration management, provisioning, deploying, and managing compute infrastructure across cloud, virtual, and physical environments with Ansible.
- » [Ansible workshops](#) are free, one-day, hands-on technical sessions that provide a comprehensive overview of Red Hat Ansible Automation.



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# COMMON USES FOR NETWORK AUTOMATION

Start small and build over time

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Red Hat Ansible Network Automation can help you automate many aspects of your network. Most teams begin with one of the following use cases.



## **PULL DATA TO UNDERSTAND WHAT YOU HAVE.**

Most networks contain many different platforms and devices. Ansible can query, store, and report on network data like software versions and interface information.



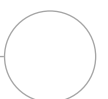
## **BACK UP NETWORK CONFIGURATIONS.**

Storing backups of configurations is a critical activity for NetOps. Ansible makes it easy to pull a whole configuration, or just parts of the configuration, from a network device.



## **VALIDATE NETWORK CONFIGURATIONS.**

Configuration drift happens, especially when manual processes are involved. Ansible makes it easy to compare running configurations to desired configurations.



# EXPERIENCE BENEFITS ACROSS YOUR BUSINESS

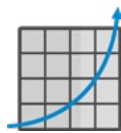
Proven success through network automation



**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.



Streamlined IT management to reduce downtime and errors



Improved productivity through automation and reusable code



Enhanced system and data security with role-based access

“

*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



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.



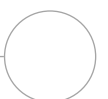
Expected to save 3,000 hours per year in manual tasks



Streamlined common tasks with self-service capabilities



Improved collaboration with playbooks and sync meetings



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# GET STARTED WITH NETWORK AUTOMATION

Red Hat can help you define your path to efficiency

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Network automation is critical for supporting the increasing application and workload needs of modern, digital business. Red Hat Ansible Network Automation 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 reevaluate 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's a strategy, a journey, and a culture.

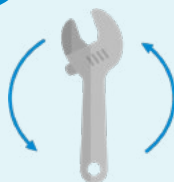
## IT'S EASY TO GET STARTED.

1



Create playbooks that read or check information only.

2

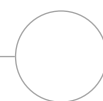


Build simple jobs to replace tedious and unpopular tasks.

3



Apply your team's current knowledge to automation.



A network diagram background with a dark blue color scheme. It features a grid of interconnected nodes (circles) and lines (edges). The nodes vary in size, with some being significantly larger than others. The lines are thin and light blue. The overall layout is framed by a thick, bright blue border at the top and bottom, which has a stepped, geometric appearance. The text is centered in the middle of the image.

**PLAN YOUR PATH TO  
NETWORK AUTOMATION:**

*[ansible.com/for/networks](https://ansible.com/for/networks)*