

# RED HAT ANSIBLE AUTOMATION FOR TELECOMMUNICATIONS

Maximizing automation benefits for service providers

OVERVIEW

## 71%

of service providers believe that process automation is the most important enabler of long-term operational excellence.<sup>1</sup>

*“The work the Ansible team is doing... is something the entire industry should be paying attention to.”<sup>2</sup>*

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## INTRODUCTION

Modern telecommunications network and cloud architectures can significantly accelerate service delivery, increase flexibility, and boost productivity. However, manual configuration and management processes greatly diminish the benefits of these new technologies and negatively impact operation and delivery. Manual tasks monopolize resources and reduce network operation staff productivity. Errors can propagate through scaling efforts, and they are typically difficult to troubleshoot and repair. To avoid these issues and get the most from your infrastructure, you need a modern, vendor-agnostic, automated approach to network and IT management. Red Hat® Ansible® Automation can help.

## RED HAT ANSIBLE AUTOMATION BENEFITS

- **Accelerated automation efforts.** Simple, human-readable automation language is easily learned, even by those with no coding skills. The [module index](#) provides thousands of tasks—across dozens of vendors—that are easily plugged into playbooks.
- **Simplified network and IT technology.** Implementation details are abstracted, simplifying the view of a diverse, multivendor environment.
- **Increased control and governance.** Consistent configuration and management across multivendor environments strengthen compliance with regulations and policies. Shorter maintenance windows minimize update impacts.
- **Increased innovation.** Tedious, repetitive, and error-prone tasks are automated, accelerating delivery of new services and allowing teams to focus on the creation of new business and consumer and mobile services.

## RED HAT ANSIBLE AUTOMATION KEY FEATURES

Red Hat Ansible Automation consists of different components that collectively form a fully supported automation stack for IT and network automation and management:

- Red Hat Ansible Engine
- Red Hat Ansible Tower
- Red Hat Ansible Network Automation



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<sup>1</sup> Singhal, Prashant. “Digital transformation for 2020 and beyond: eight telco considerations.” EY. 2017. [https://www.ey.com/en\\_gl/tmt/digital-transformation-for-2020-and-beyond-eight-telco-considerations](https://www.ey.com/en_gl/tmt/digital-transformation-for-2020-and-beyond-eight-telco-considerations)

<sup>2</sup> Red Hat whitepaper, “Ansible in depth.” 2017. <https://www.ansible.com/hubfs/pdfs/Ansible-InDepth-WhitePaper.pdf>

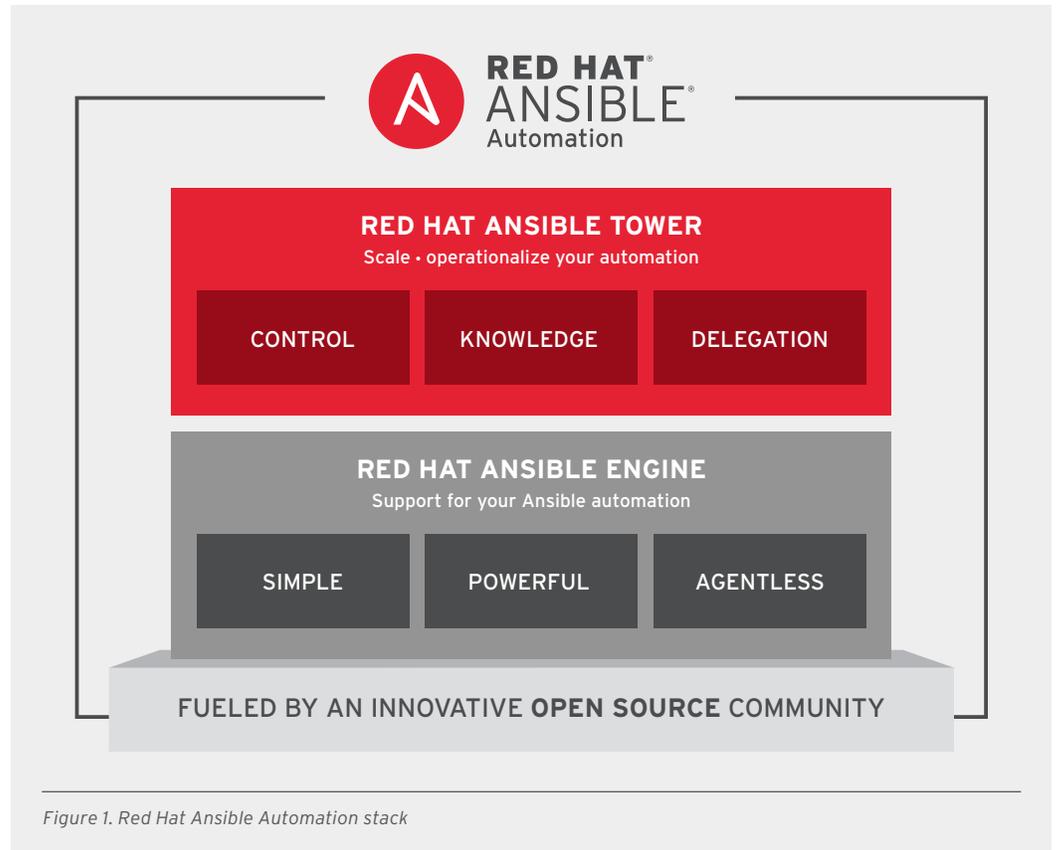


Figure 1. Red Hat Ansible Automation stack

Red Hat Ansible Engine is designed to support all functionality from the command line. This includes roles, playbooks, and modules, enabling automation of routine IT activities and rapid deployment of IT services, applications, and environments. Ansible interprets your playbooks and executes them in an order that you prescribe.

Red Hat Ansible Tower helps scale IT automation, manage complex deployments, and speed productivity. Centralize and control your IT infrastructure with a visual dashboard, role-based access control (RBAC), job scheduling, integrated notifications, auditing, and graphical inventory management. It is easy to embed Ansible Tower into existing tools and processes via Ansible Tower's representational state transfer application programming interface (REST API). Ansible Tower manages the Ansible functionality used by thousands of organizations worldwide to automate IT tasks, such as configuration management, provisioning, workflow orchestration, application deployment, and life-cycle management with a simplified representation of all components and automation activity.

Ansible’s extremely low learning curve for administrators, developers, and IT managers makes it easy to adopt across the entire enterprise—from networks, servers, security, and compliance to cloud, infrastructure, DevOps, and continuous integration/continuous delivery (CI/CD)—all of which can benefit from the power of Ansible Automation. Ansible installs within minutes and is agent-less, which means no changes are needed to your servers or network equipment to use Ansible Automation. Red Hat Ansible Tower functionality adds additional security, scale, and scope.

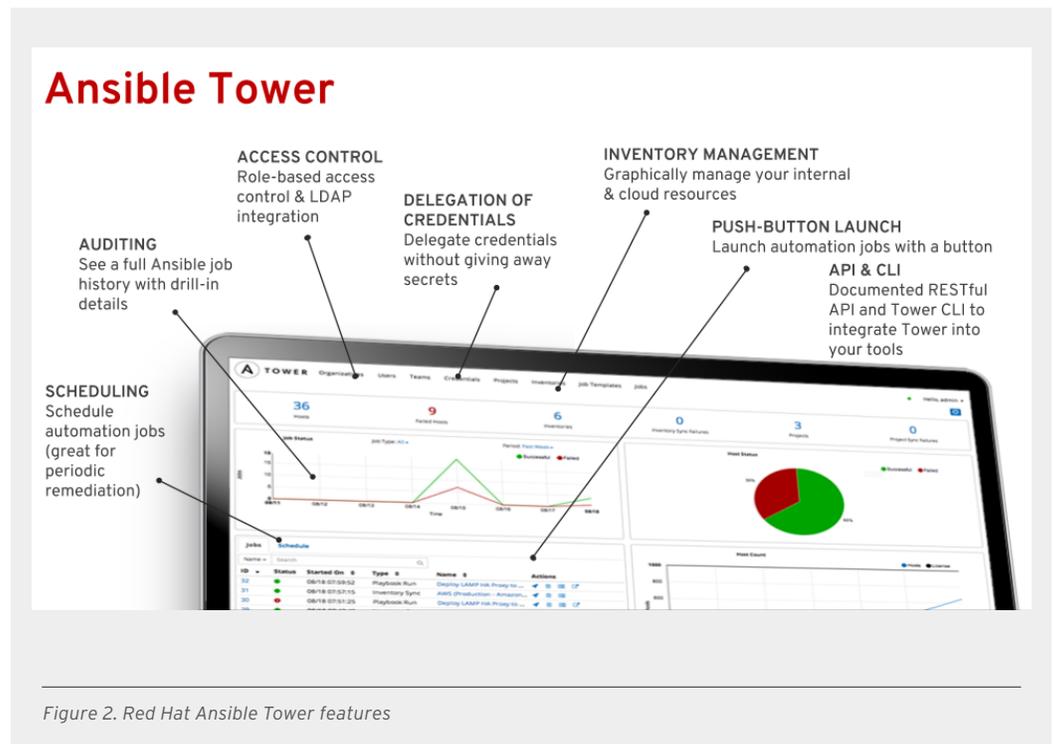


Figure 2. Red Hat Ansible Tower features

Red Hat Ansible Automation is ideal for managing networks with components from multiple vendors and different operating systems and configuration methods. It abstracts device-specific implementation details from network management, allowing you to focus on network configuration values. In a typical configuration process, Ansible attaches to and reads information from each network device, including devices present, device capabilities, and operating systems in use. Ansible uses this information to intelligently and conditionally configure each device. It then validates the network configuration by comparing information read from each network device with expected values. Finally, the tool logs inconsistencies as configuration issues requiring remediation.

With other automation approaches, users typically have to combine many different tools to cover the basics of managing IT operating systems and software configurations. Ansible seamlessly integrates with and augments other tools without disturbing existing infrastructure. The common language used for IT infrastructure bridges the gap between separate organizations, accelerates and standardizes requests between organizations, and reduces friction between teams.

With Ansible, you adopt an approach to automation in which everyone can participate—allowing you to not only automate processes, but entire teams, technologies, and ultimately entire organizations.

## **PLAYBOOKS AND MODULES**

Playbooks are Ansible’s configuration, deployment, and orchestration language. Playbooks are written in YAML format, with minimal syntax, to provide simplistic descriptions of configurations and processes. Ansible Playbooks consist of a series of plays that define automation across a set of hosts, known as the inventory. Each play consists of multiple tasks that can target one, many, or all of the hosts in the inventory.

Each task is a call to a module, which is a piece of Ansible code that performs a specific function. Tasks can be simple, such as grabbing version information about machines in your network or backing up network configurations. Tasks can also be complex, such as generating and managing entire network configurations.

Before executing a module, Ansible verifies that the task that is specified actually needs to be performed. For example, if an Ansible task to add a network time protocol (NTP) server is defined, configuration is only performed if the NTP server is not already configured. This desired state configuration, sometimes referred to as idempotency, ensures that configuration can be applied repeatedly without side effects and that configuration runs quickly and efficiently when it has already been applied.

Ansible includes thousands of modules in the module index, ranging from tasks for host operating systems, such as Red Hat Enterprise Linux® and Microsoft Windows, to tasks for maintaining infrastructure on every major cloud provider. You can also write your own modules as needed to perform other required tasks, including controlling system resources and executing system commands. By using Ansible, automation no longer needs to be performed by a separate team, with separate tools and processes. Many IT and network automation challenges, such as the orchestration of complex, multitier workflows and cleanly unifying network configuration under a single banner, are solved with Ansible.

## **VENDOR INTEGRATION**

Ansible integrates with numerous devices across multivendor routing (router configuration), switching, software-defined networking (SDN), datacenter, and security platforms. The following table lists examples of Red Hat Ansible Automation integrations.

ANSIBLE AUTOMATES TECHNOLOGIES YOU USE OVER 1,200 INTEGRATIONS					
CLOUD	VIRT & CONTAINER	WINDOWS	NETWORK	CHAT	MONITORING
AWS	Atomic	ACLs	Arista	Email	Airbrake
Azure	CloudStack	Files	A10	HipChat	BigPanda
CenturyLink	OpenStack	Packages	Cumulus	IRC	Datadog
Digital Ocean	OpenShift	IIS	Bigswitch	Jabber	LogicMonitor
Google	Red Hat Virtualization	Regedits	Cisco	Rocketchat	Monit
OpenStack	VMware	Shares	Dell	Sendgrid	Nagios
Rackspace	<b>+more</b>	Services	F5	Slack	New Relic
		Configs	Juniper	Twilio	PagerDuty
		Users	Palo Alto	<b>+more</b>	Sensu
		Domains	OpenSwitch		StackDriver
		<b>+more</b>	<b>+more</b>		Zabbix
					<b>+more</b>

*Figure 3. Red Hat Ansible Automation vendor integration examples*

### SERVICE PROVIDER AUTOMATION USE CASES

Red Hat Ansible Automation provides efficiencies for network infrastructure and operations and business processes, addressing key use cases for service providers:

- Network automation:
  - SDN, network functions virtualization (NFV), and 5G
  - Deployment of virtualized network functions (VNF) services
  - Network migration and testing
- Security and compliance:
  - Validation and auditing for compliance on multivendor equipment
  - Automated remediation and patching of system vulnerabilities (Wannacry, Spectre, Meltdown)
- Cloud infrastructure automation:
  - Application deployment
  - As-needed task execution performs tasks that do not fit into workloads, such as batch server rebooting.

### SUMMARY

Automation is critical for success in the digital world, especially as both customer demand and IT complexity grow. Red Hat Ansible Automation provides network and infrastructure automation to decrease risk through consistent and compliant configuration deployment and environment

management. Red Hat Ansible Automation is simple, powerful, agentless automation technology that seamlessly unites and streamlines configuration management, provisioning, orchestration, and application deployment across your entire IT environment—from networks, servers, security, and compliance, to cloud, infrastructure, and CI/CD.

Red Hat offers holistic end-to-end support, from operating system (Red Hat Enterprise Linux) to automation software (Red Hat Ansible Automation) to dozens of vendor integrations (including AWS, Cisco, Juniper, and VMware), encompassing all of your IT and networking needs. With a Red Hat Ansible Automation subscription, you can focus your resources on innovation and let Red Hat handle your business-critical automation.

### LEARN MORE

Download the Forrester total economic impact study of Red Hat Ansible Tower: <https://www.redhat.com/en/resources/ansible-automation-forrester-total-economic-impact-study>.

Get hands-on experience with Red Hat Ansible Automation, using the Ansible Tower trial: <https://www.ansible.com/tower-trial>.

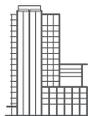
Review Ansible network modules: [https://docs.ansible.com/ansible/latest/modules/list\\_of\\_network\\_modules.html](https://docs.ansible.com/ansible/latest/modules/list_of_network_modules.html).

Review Ansible implementations: [github.com/network-automation](https://github.com/network-automation). For example:

Ansible networking inventory report playbook for exporting hostname, platform, mgmt0 IP address, and code version to an HTML file: [https://github.com/network-automation/ansible\\_inventory\\_report](https://github.com/network-automation/ansible_inventory_report).

Checking the operational status of a network: [https://github.com/network-automation/net\\_check](https://github.com/network-automation/net_check).

For questions or additional information, contact your Red Hat representative.



### ABOUT RED HAT

Red Hat is the world's leading provider of open source software solutions, using a community-powered approach to provide reliable and high-performing cloud, Linux, middleware, storage, and virtualization technologies. Red Hat also offers award-winning support, training, and consulting services. As a connective hub in a global network of enterprises, partners, and open source communities, Red Hat helps create relevant, innovative technologies that liberate resources for growth and prepare customers for the future of IT.



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