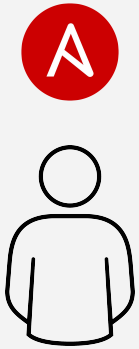
Red Hat
Ansible
Automation

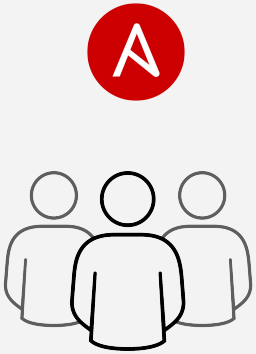
Automation for everyone

J.R. Morgan
Solutions Architect, Public Sector SIs

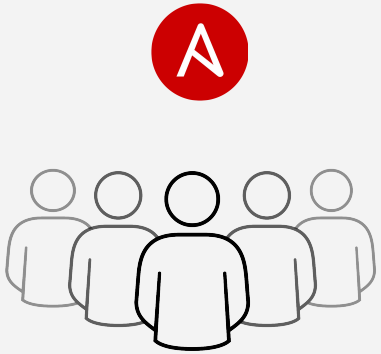
Red Hat



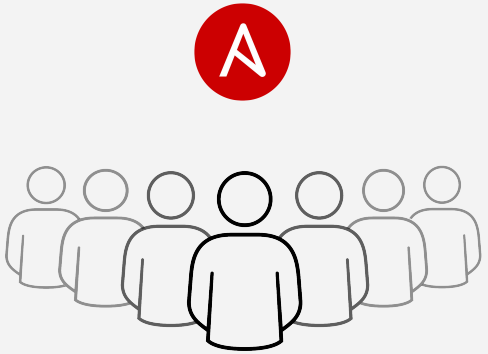
Automation happens when one person meets a problem they never want to solve again



ACCELERATE



INTEGRATE



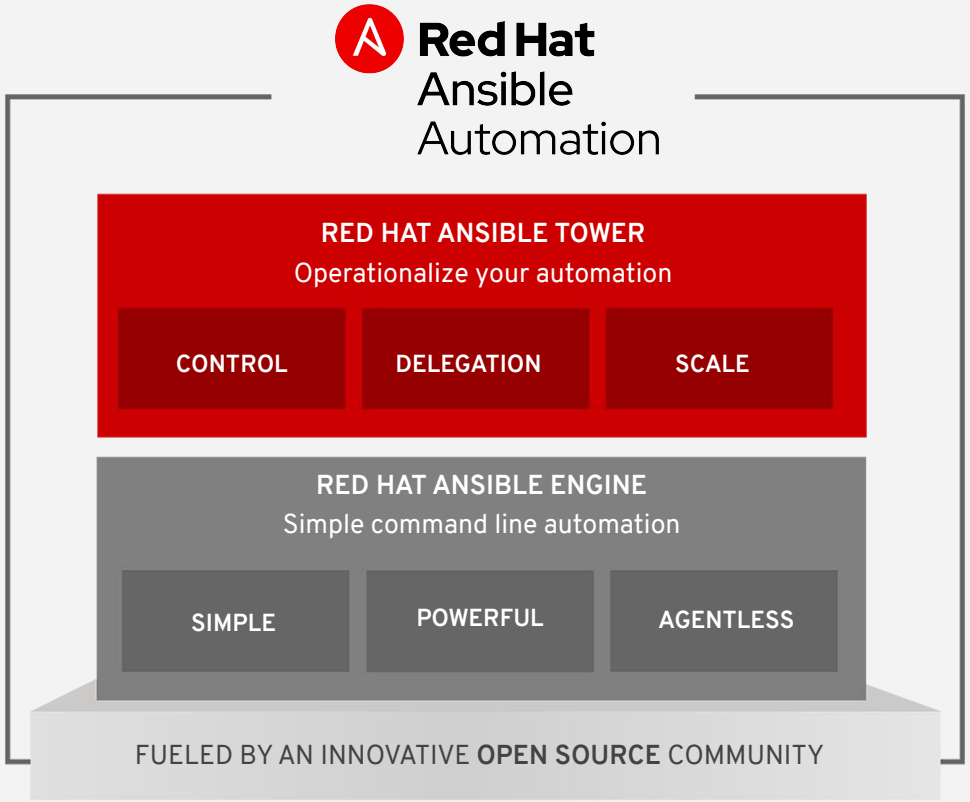
COLLABORATE

What is Ansible Automation?

Ansible Automation is the enterprise **framework** for automating across IT operations.

Ansible Engine runs Ansible Playbooks, the automation **language** that can perfectly describe an IT application infrastructure.

Ansible Tower allows you **scale** IT automation, manage complex deployments and speed productivity.



Why Ansible?

Simple

Human readable automation

No special coding skills needed

Tasks executed in order

Usable by every team

Get productive quickly

Powerful

App deployment

Configuration management

Workflow orchestration

Network automation

Orchestrate the app lifecycle

Agentless

Agentless architecture

Uses OpenSSH & WinRM

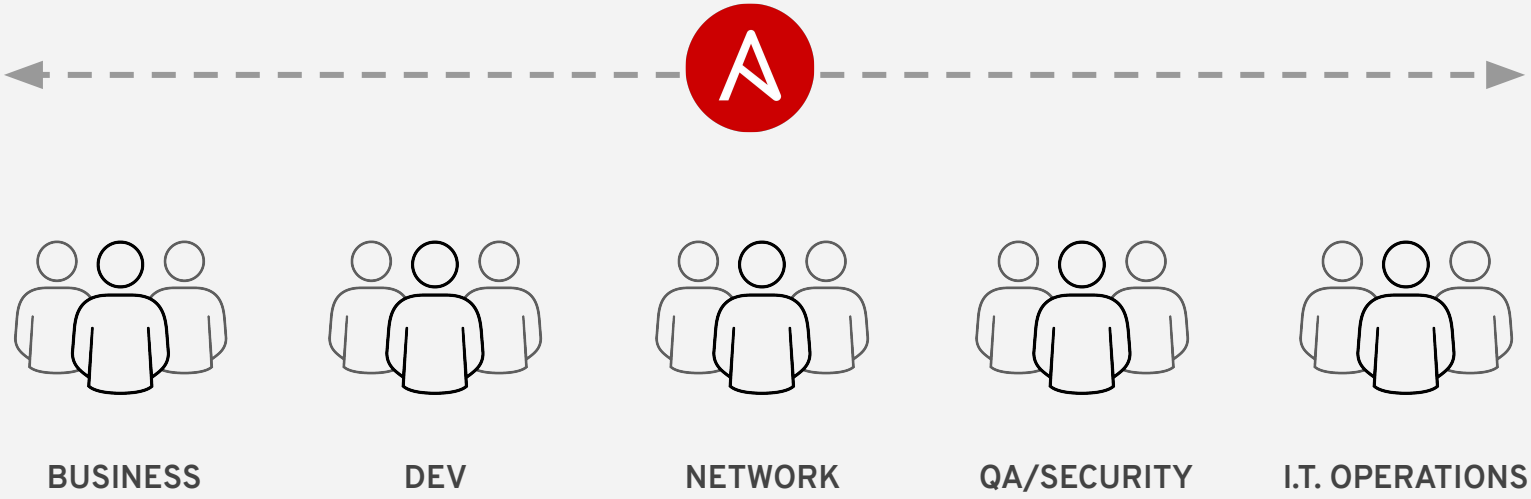
No agents to exploit or update

Get started immediately

More efficient & more secure

Red Hat

Ansible Automation works across teams



What can I do using Ansible?

Automate the deployment and management of your entire IT footprint.

Do this...

- Orchestration
- Configuration Management
- Application Deployment
- Provisioning
- Continuous Delivery
- Security and Compliance

On these...

- Firewalls
- Load Balancers
- Applications
- Containers
- Clouds
- Servers
- Infrastructure
- Storage
- Network Devices
- And more...

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Ansible automates technologies you use

Time to automate is measured in minutes

Cloud

AWS
Azure
Digital Ocean
Google
OpenStack
Rackspace
+more

Operating Systems

Rhel And Linux
Unix
Windows
+more

Virt & Container

Docker
VMware
RHV
OpenStack
OpenShift
+more

Storage

Netapp
Red Hat Storage
Infinidat
+more

Windows

ACLs
Files
Packages
IIS
Regedits
Shares
Services
Configs
Users
Domains
+more

Network

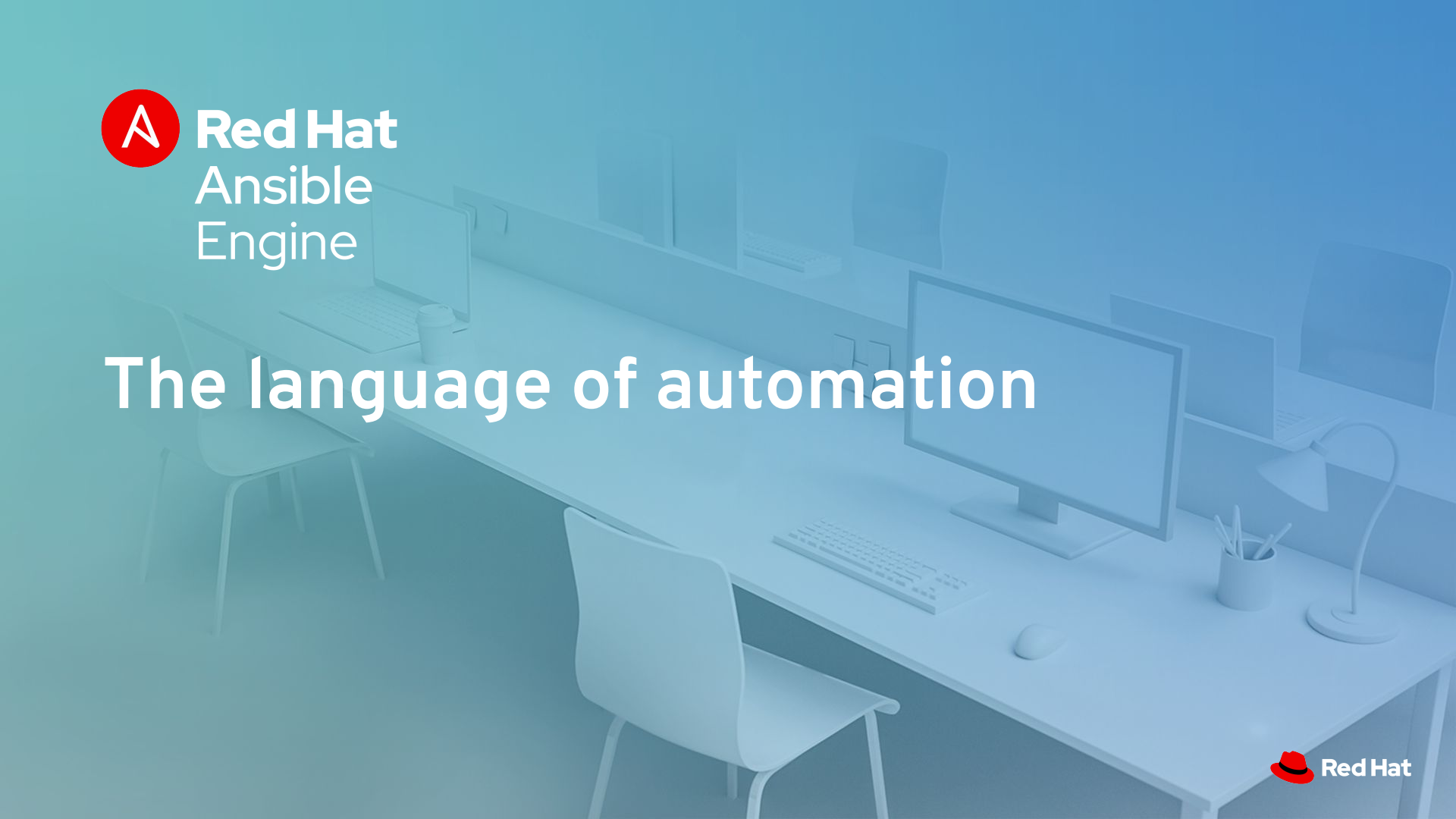
Arista
A10
Cumulus
Bigswitch
Cisco
Cumulus
Dell
F5
Juniper
Palo Alto
OpenSwitch
+more

Devops

Jira
GitHub
Vagrant
Jenkins
Bamboo
Atlassian
Subversion
Slack
Hipchat
+more

Monitoring

Dynatrace
Airbrake
BigPanda
Datadog
LogicMonitor
Nagios
New Relic
PagerDuty
Sensu
StackDriver
Zabbix
+more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Ansible
Engine
The language of automation
Red Hat

Red Hat Ansible Engine

Cross platform

Agentless support for all major OS variants, physical, virtual, cloud and network devices.

Human readable

Perfectly describe and document every aspect of your application environment.

Perfect description of application

Every change can be made by Playbooks, ensuring everyone is on the same page.

Version controlled

Playbooks are plain-text. Treat them like code in your existing version control.

Dynamic inventories

Capture all the servers 100% of the time, regardless of infrastructure, location, etc.

Orchestration plays well with others

Orchestration plays well with others: ServiceNow, Infoblox, AWS, Terraform, Cisco ACI and more

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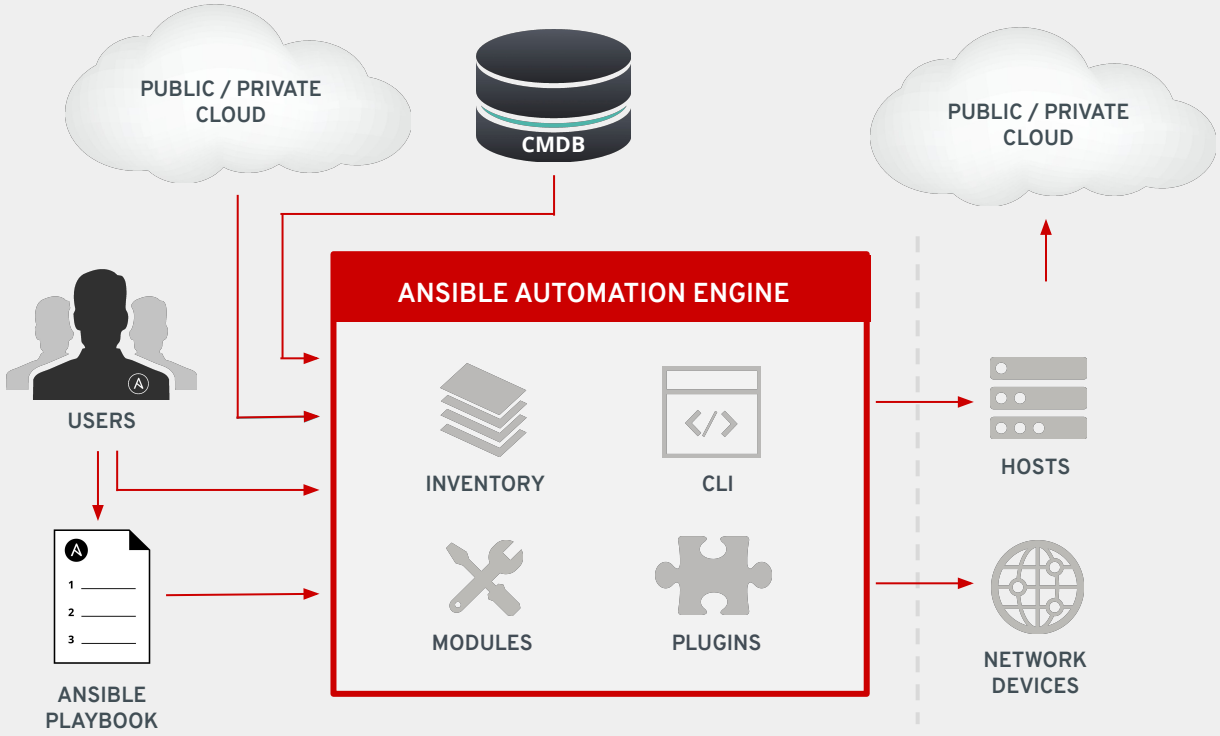
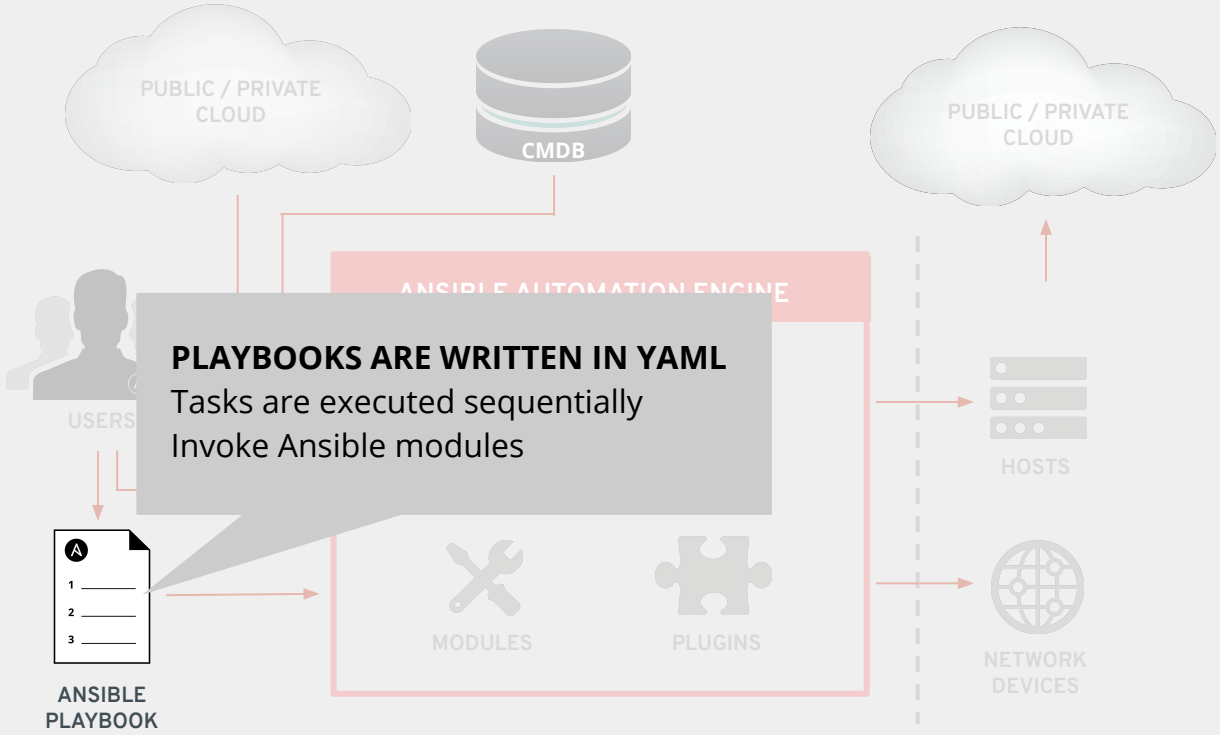
```
---
- name: install and start apache
  hosts: web
  become: yes
  vars:
     http_port: 80

  tasks:
    - name: httpd package is present
       yum:
          name: httpd
          state: latest

    - name: latest index.html file is present
      copy:
         src: files/index.html
         dest: /var/www/html/

    - name: httpd is started
      service:
         name: httpd
         state: started
```


PUBLIC / PRIVATE CLOUD
CMDB
PUBLIC / PRIVATE CLOUD
ANSIBLE AUTOMATION ENGINE
USERS
INVENTORY
CLI
HOSTS
MODULES
PLUGINS
NETWORK DEVICES
ANSIBLE PLAYBOOK

Red Hat



PLAYBOOKS ARE WRITTEN IN YAML

Tasks are executed sequentially

Invoke Ansible modules

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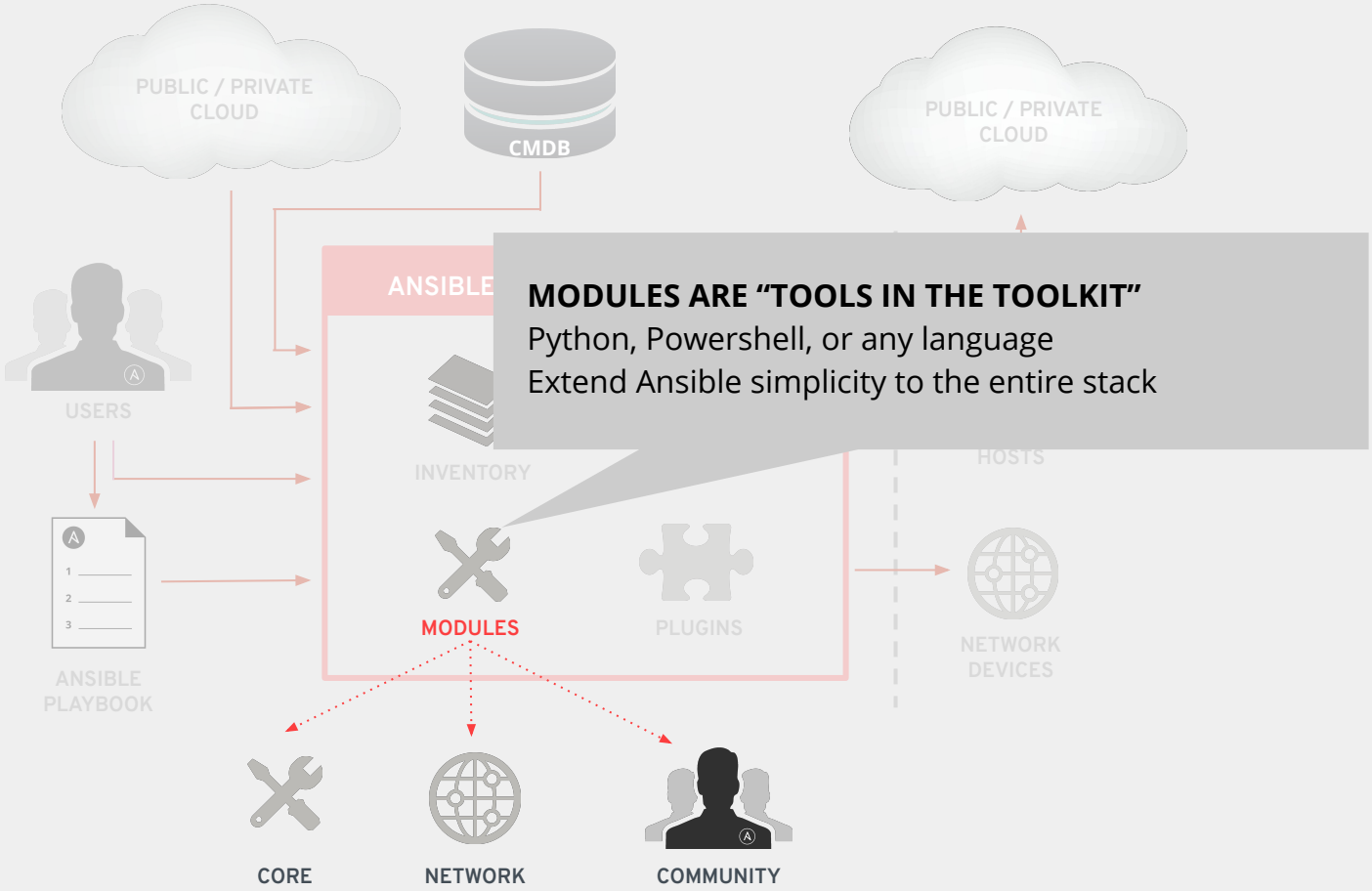

MODULES ARE "TOOLS IN THE TOOLKIT"

Python, Powershell, or any language

Extend Ansible simplicity to the entire stack

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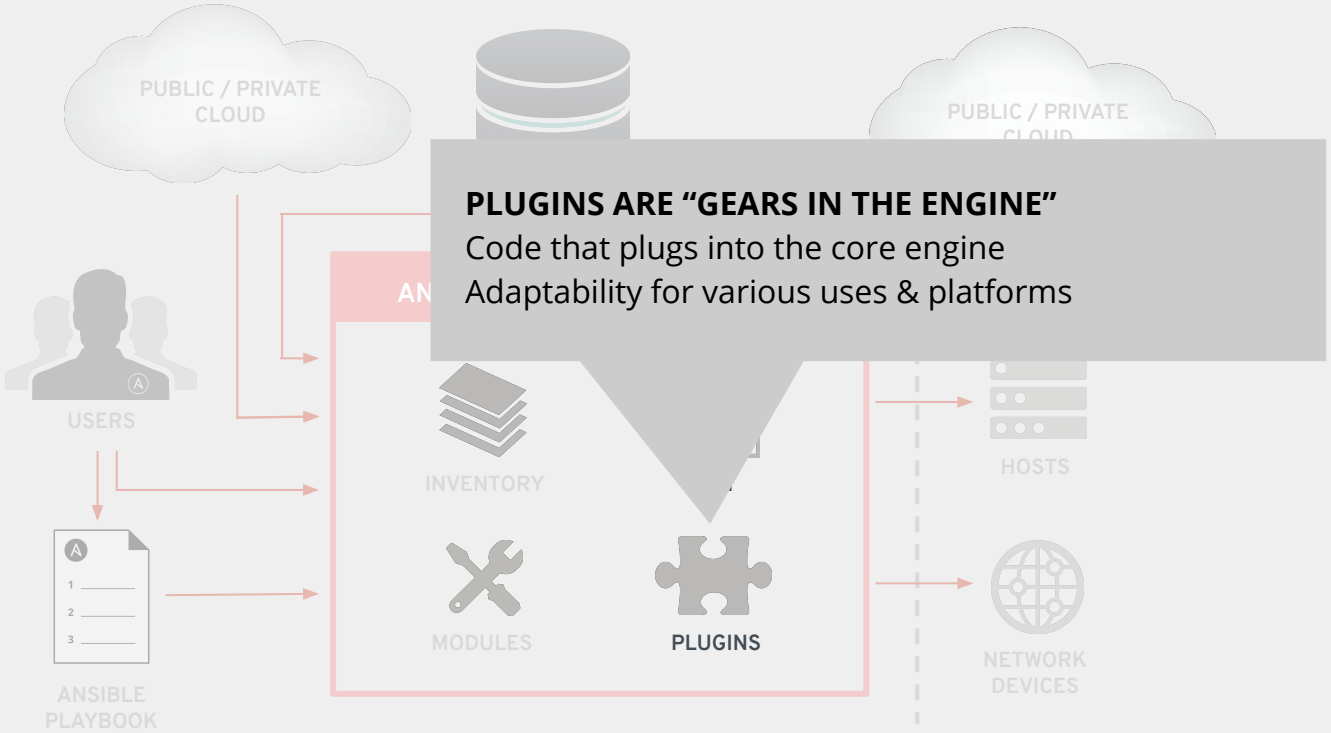
PUBLIC / PRIVATE CLOUD
PUBLIC / PRIVATE CLOUD
USERS
INVENTORY
HOSTS
MODULES
PLUGINS
NETWORK DEVICES
ANSIBLE PLAYBOOK
PLUGINS ARE “GEARS IN THE ENGINE”
Code that plugs into the core engine
Adaptability for various uses & platforms

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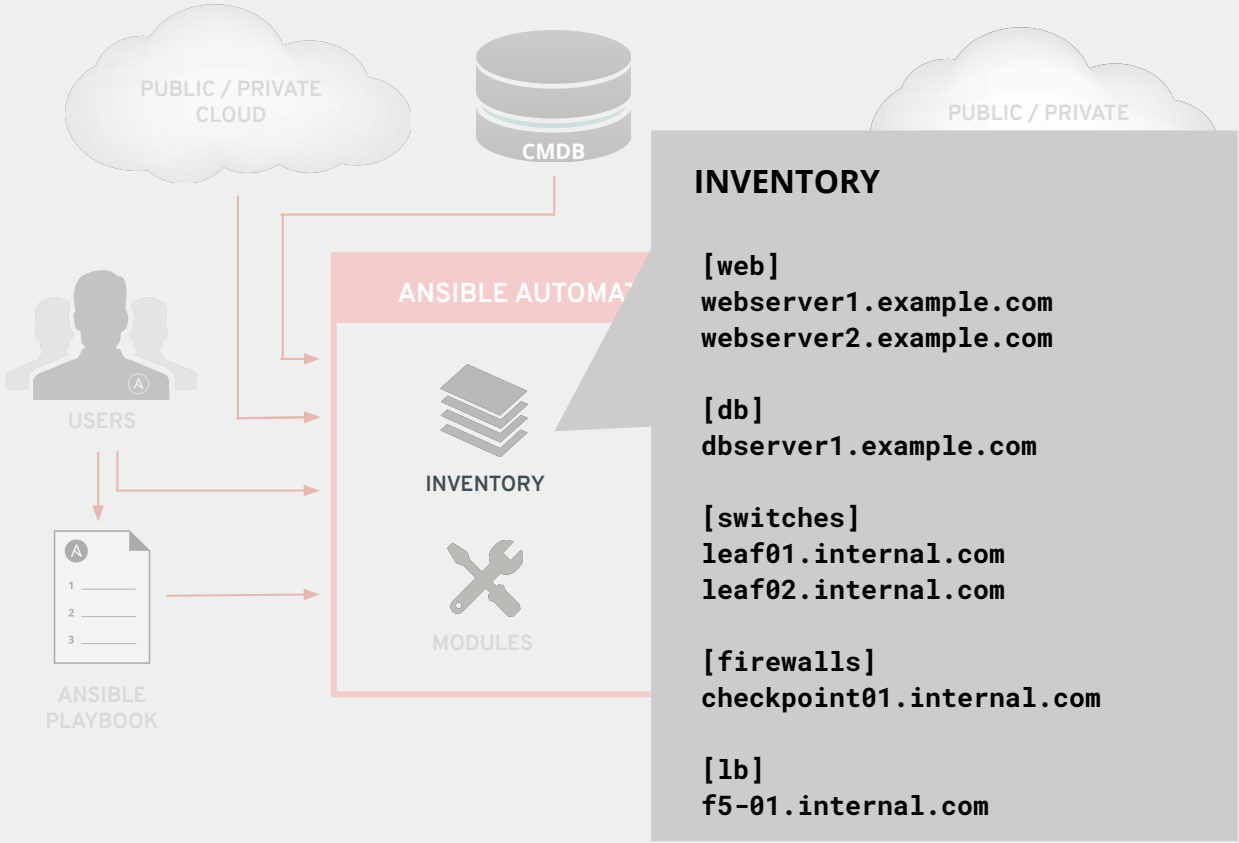
PUBLIC / PRIVATE
CLOUD
CMDB
PUBLIC / PRIVATE
ANSIBLE AUTOMAT
USERS
INVENTORY
MODULES
ANSIBLE
PLAYBOOK
INVENTORY
[web]
webserver1.example.com
webserver2.example.com
[db]
dbserver1.example.com
[switches]
leaf01.internal.com
leaf02.internal.com
[firewalls]
checkpoint01.internal.com
[lb]
f5-01.internal.com

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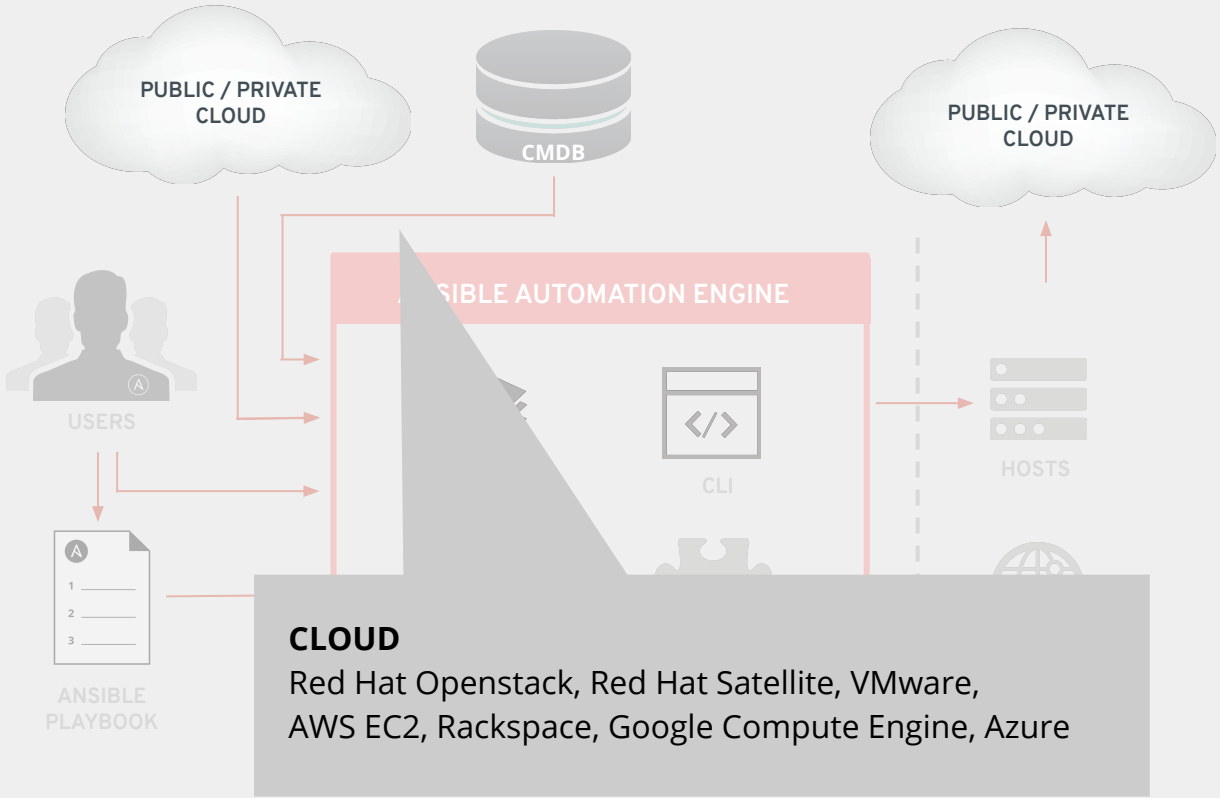
PUBLIC / PRIVATE CLOUD
CMDB
PUBLIC / PRIVATE CLOUD
SIBLE AUTOMATION ENGINE
USERS
CLI
HOSTS
ANSIBLE PLAYBOOK
CLOUD
Red Hat Openstack, Red Hat Satellite, VMware,
AWS EC2, Rackspace, Google Compute Engine, Azure

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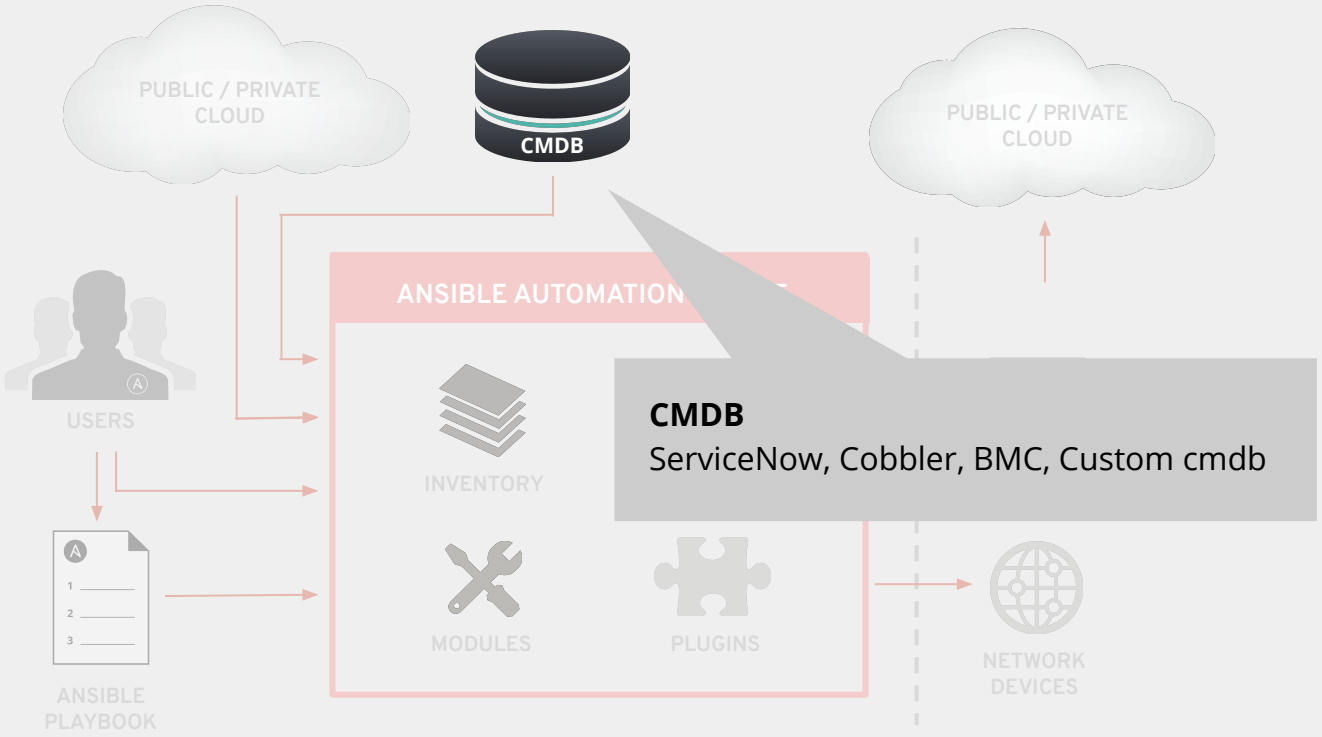
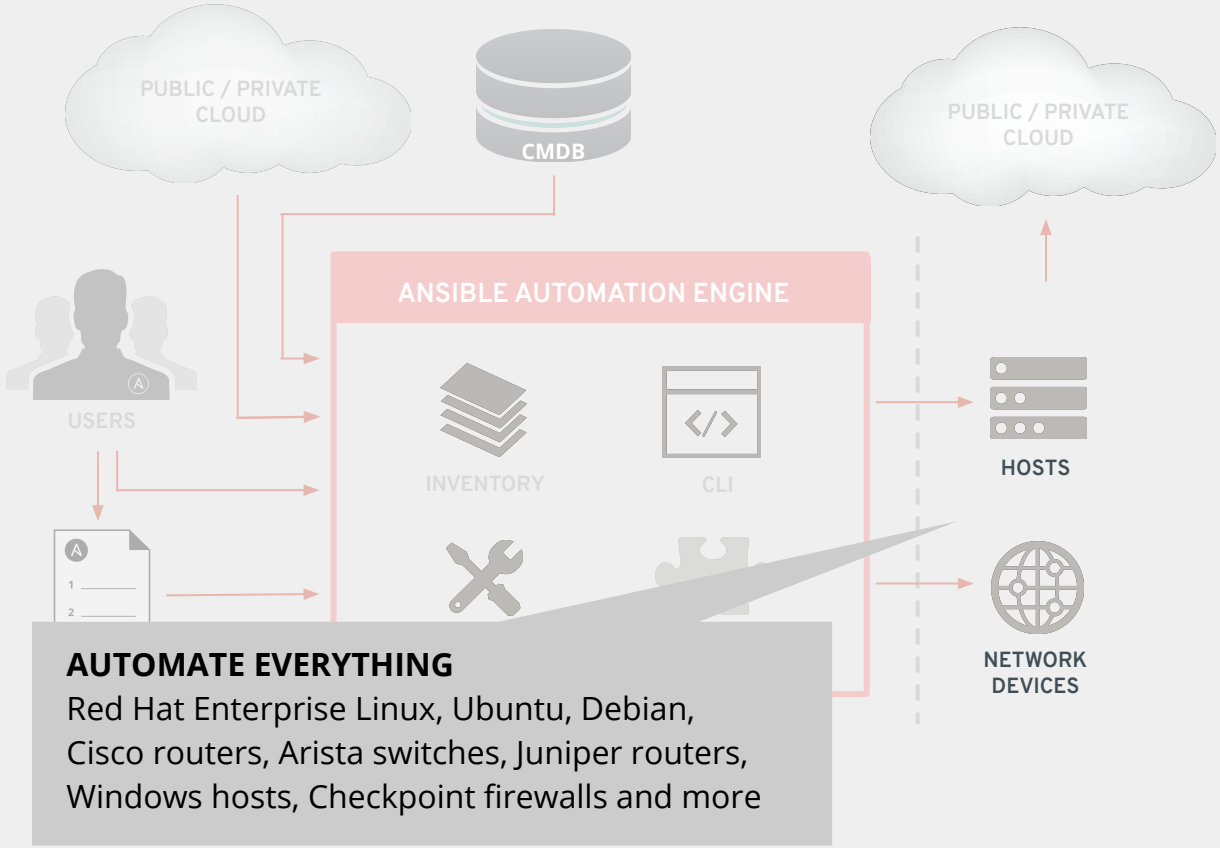

PUBLIC / PRIVATE CLOUD
CMDB
PUBLIC / PRIVATE CLOUD
ANSIBLE AUTOMATION
USERS
INVENTORY
CMDB
ServiceNow, Cobbler, BMC, Custom cmdb
MODULES
PLUGINS
NETWORK DEVICES
ANSIBLE PLAYBOOK

Red Hat


PUBLIC / PRIVATE CLOUD
CMDB
PUBLIC / PRIVATE CLOUD
ANSIBLE AUTOMATION ENGINE
USERS
INVENTORY
CLI
HOSTS
NETWORK DEVICES
AUTOMATE EVERYTHING
Red Hat Enterprise Linux, Ubuntu, Debian,
Cisco routers, Arista switches, Juniper routers,
Windows hosts, Checkpoint firewalls and more

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Playbook examples:

GITHUB
github.com/ansible/ansible-examples

LAMP + HAPROXY + NAGIOS
github.com/ansible/ansible-examples/tree/master/lamp_haproxy

WINDOWS
github.com/ansible/ansible-examples/tree/master/windows

SECURITY COMPLIANCE
github.com/ansible/ansible-lockdown

NETWORK AUTOMATION
ansible.com/linklight
github.com/network-automation


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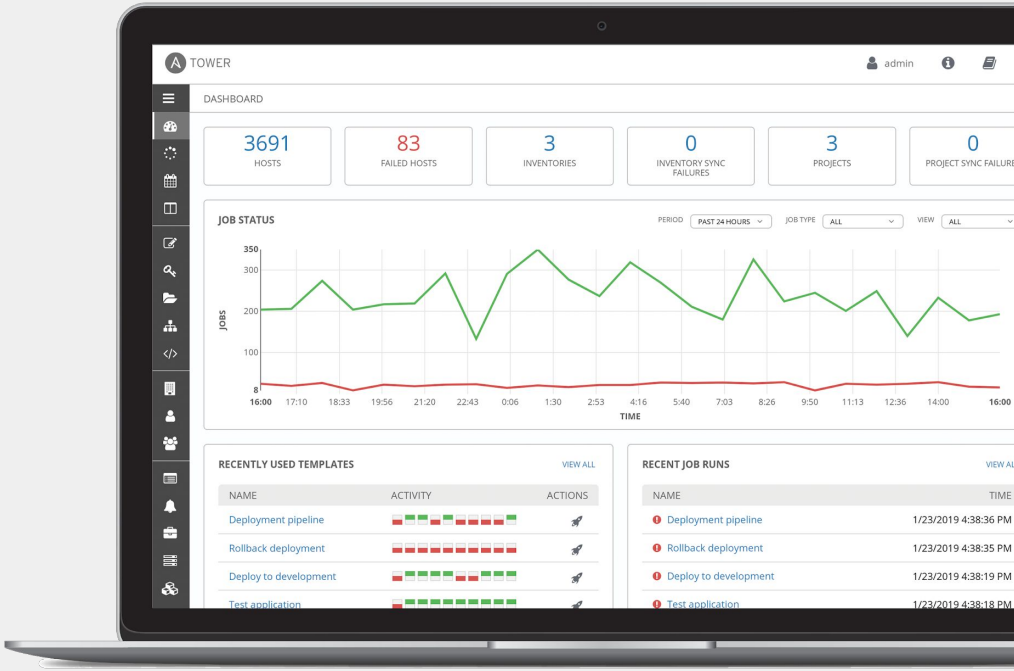
Ansible
Tower
Automation across the enterprise

What is Ansible Tower?

Ansible Tower is a UI and RESTful API allowing you to scale IT automation, manage complex deployments and speed productivity.

- Role-based access control
- Deploy entire applications with push-button deployment access
- All automations are centrally logged
- Powerful workflows match your IT processes



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Red Hat Ansible Tower

RBAC

Allow restricting playbook access to authorized users. One team can use playbooks in check mode (read-only) while others have full administrative abilities.

Push button

An intuitive user interface experience makes it easy for novice users to execute playbooks you allow them access to.

RESTful API

With an API first mentality every feature and function of Tower can be API driven. Allow seamless integration with other tools like ServiceNow and Infoblox.

Workflows

Ansible Tower's multi-playbook workflows chain any number of playbooks, regardless of whether they use different inventories, run as different users, run at once or utilize different credentials.

Enterprise integrations

Integrate with enterprise authentication like TACACS+, RADIUS, Azure AD. Setup token authentication with OAuth 2. Setup notifications with PagerDuty, Slack and Twilio.

Centralized logging

All automation activity is securely logged. Who ran it, how they customized it, what it did, where it happened - all securely stored and viewable later, or exported through Ansible Tower's API.

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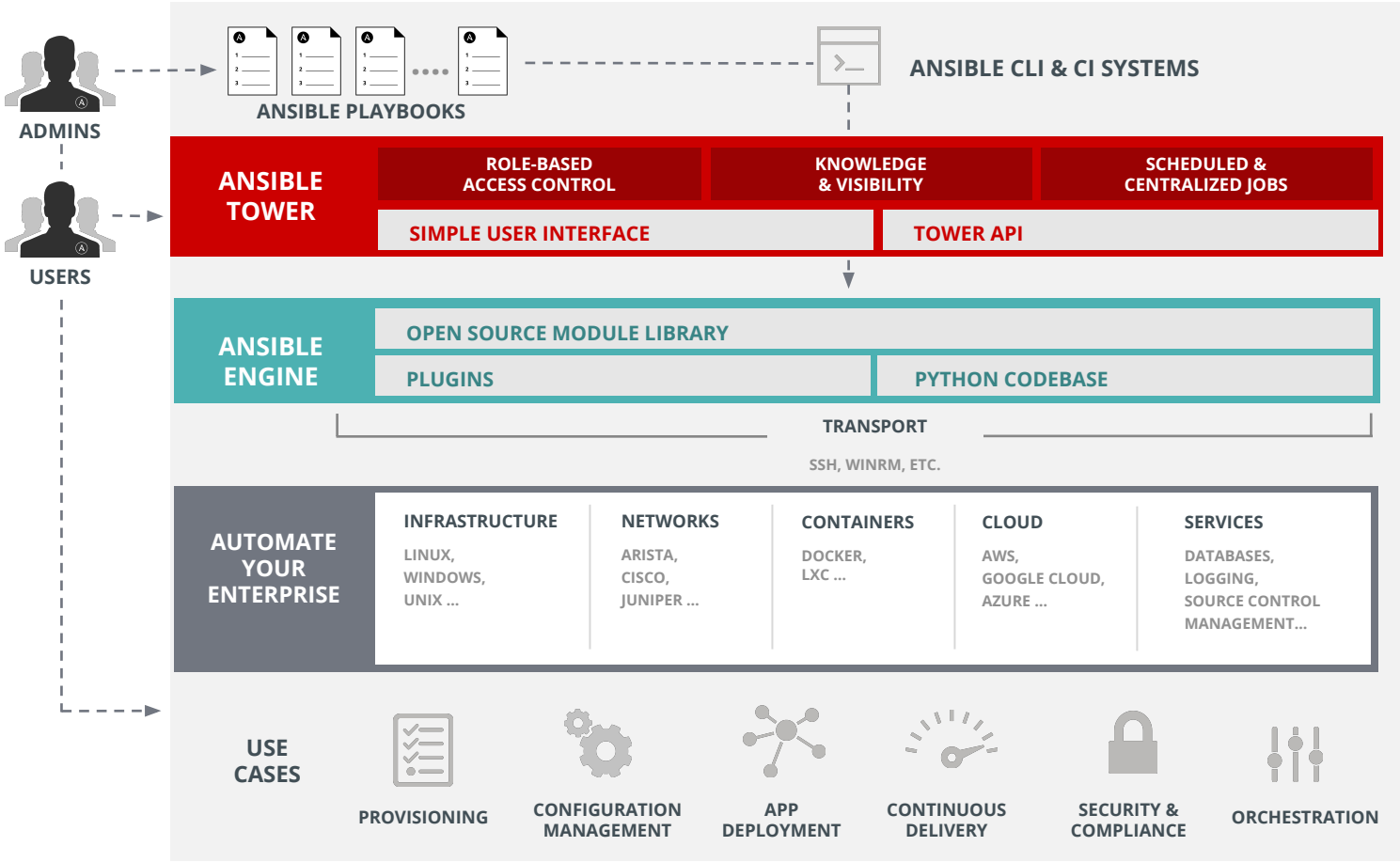
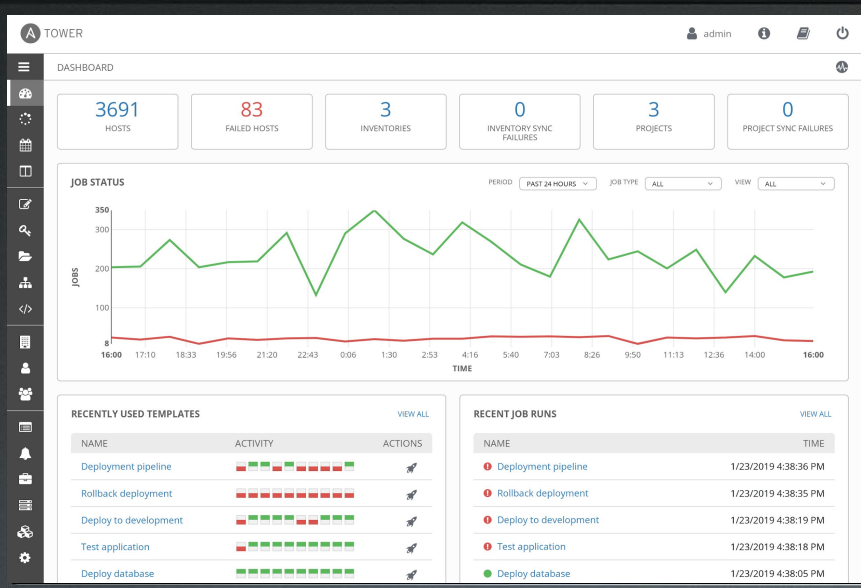

ADMINS
USERS
ANSIBLE PLAYBOOKS
ANSIBLE CLI & CI SYSTEMS
ANSIBLE TOWER
ROLE-BASED ACCESS CONTROL
KNOWLEDGE & VISIBILITY
SCHEDULED & CENTRALIZED JOBS
SIMPLE USER INTERFACE
TOWER API
ANSIBLE ENGINE
OPEN SOURCE MODULE LIBRARY
PLUGINS
PYTHON CODEBASE
TRANSPORT
SSH, WINRM, ETC.
AUTOMATE YOUR ENTERPRISE
INFRASTRUCTURE
LINUX, WINDOWS, UNIX ...
NETWORKS
ARISTA, CISCO, JUNIPER ...
CONTAINERS
DOCKER, LXC ...
CLOUD
AWS, GOOGLE CLOUD, AZURE ...
SERVICES
DATABASES, LOGGING, SOURCE CONTROL MANAGEMENT...
USE CASES
PROVISIONING
CONFIGURATION MANAGEMENT
APP DEPLOYMENT
CONTINUOUS DELIVERY
SECURITY & COMPLIANCE
ORCHESTRATION

Red Hat Ansible Tower

FEATURE OVERVIEW:

Control



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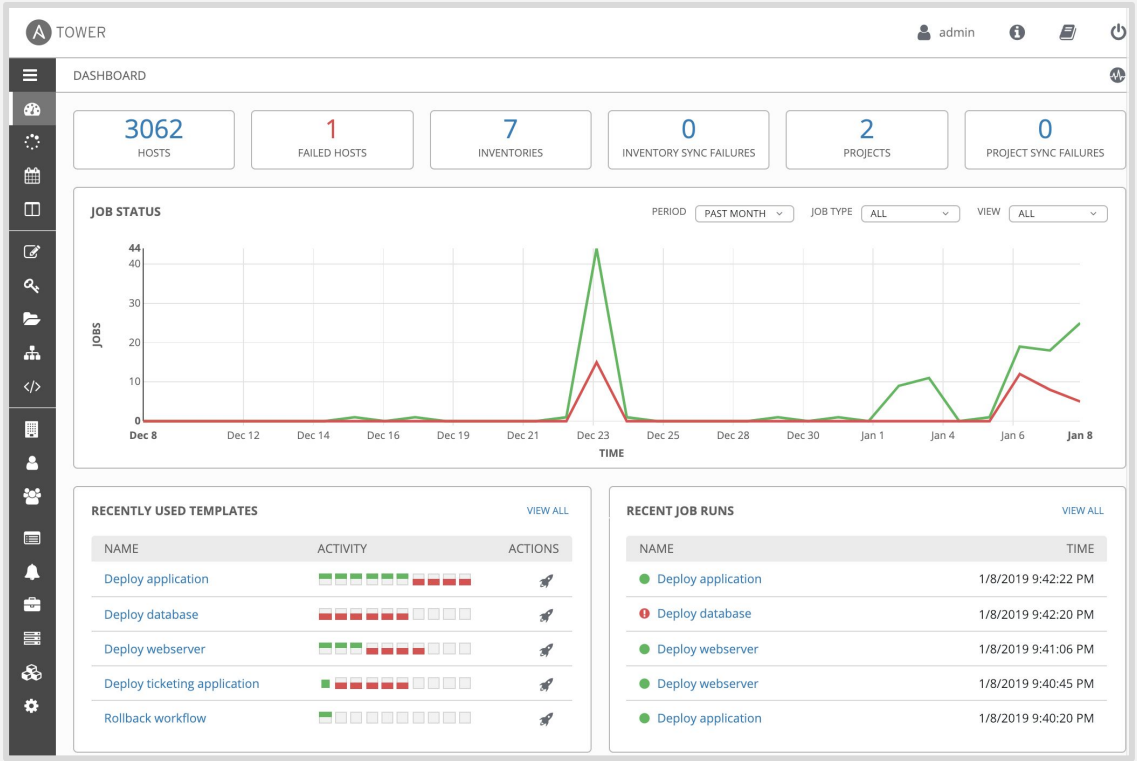
ANSIBLE TOWER FEATURES: YOUR ANSIBLE DASHBOARD



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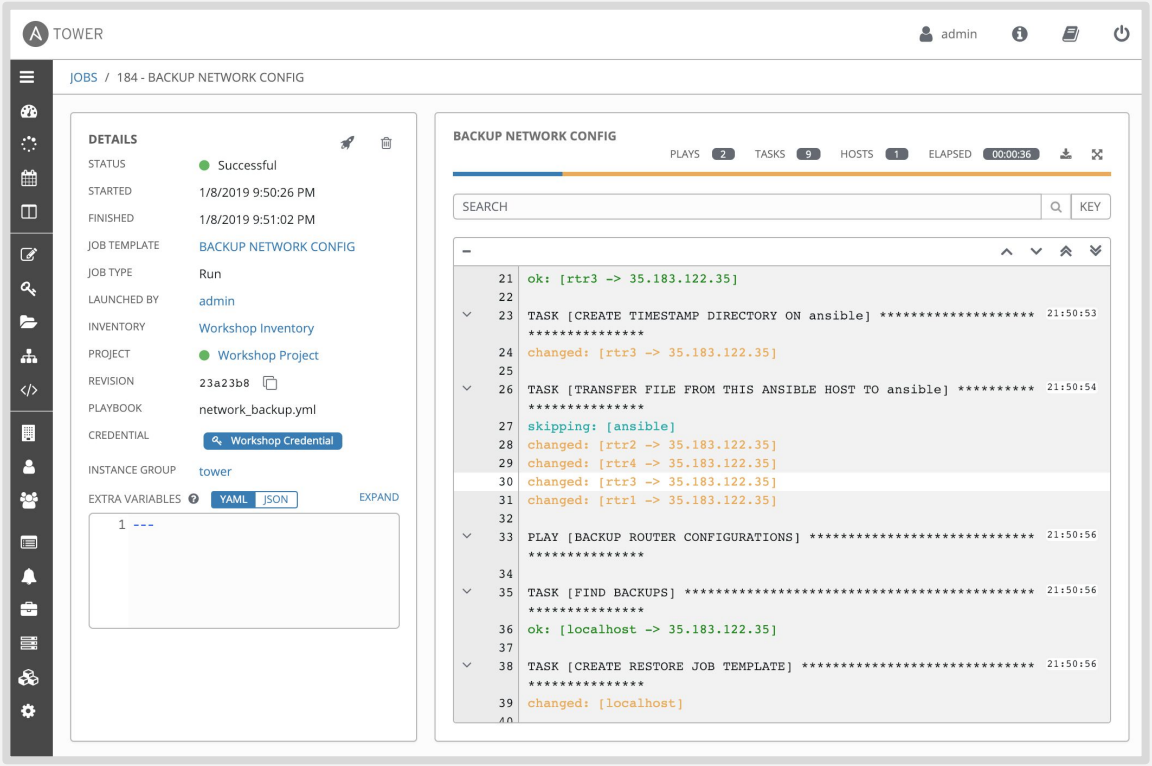
ANSIBLE TOWER FEATURES: JOB STATUS UPDATE



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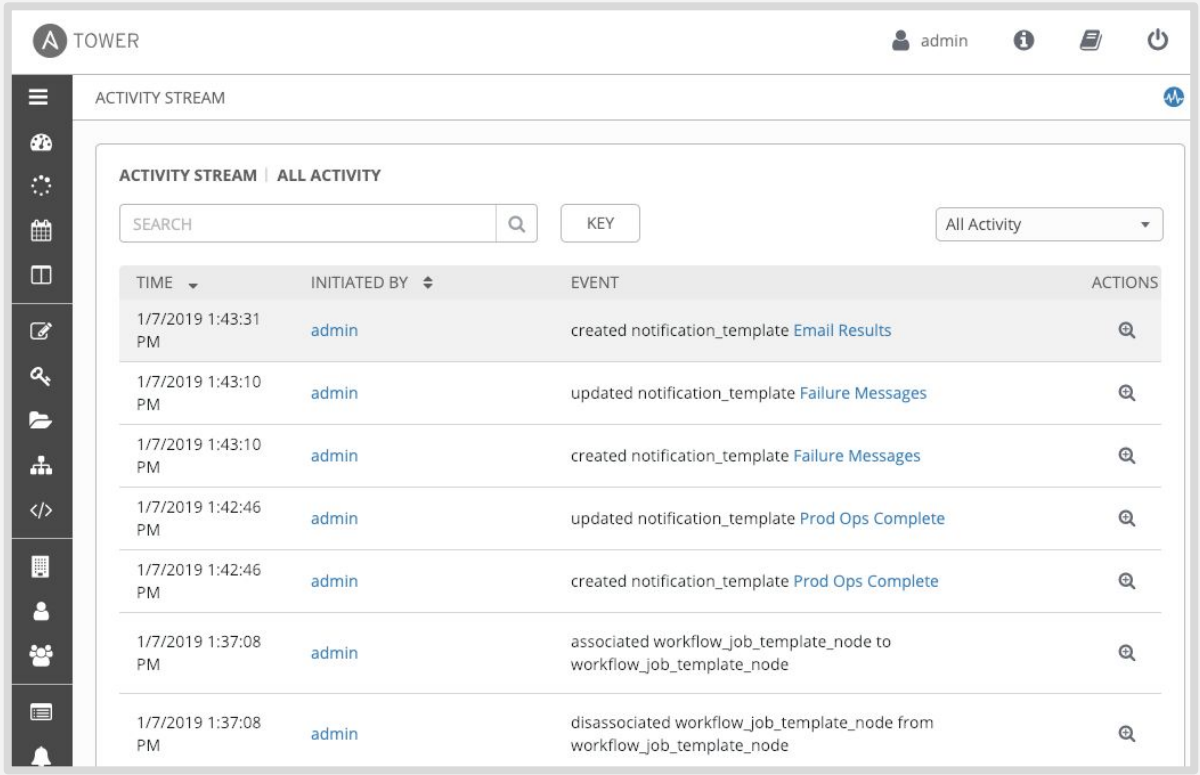
ANSIBLE TOWER FEATURES: ACTIVITY STREAM



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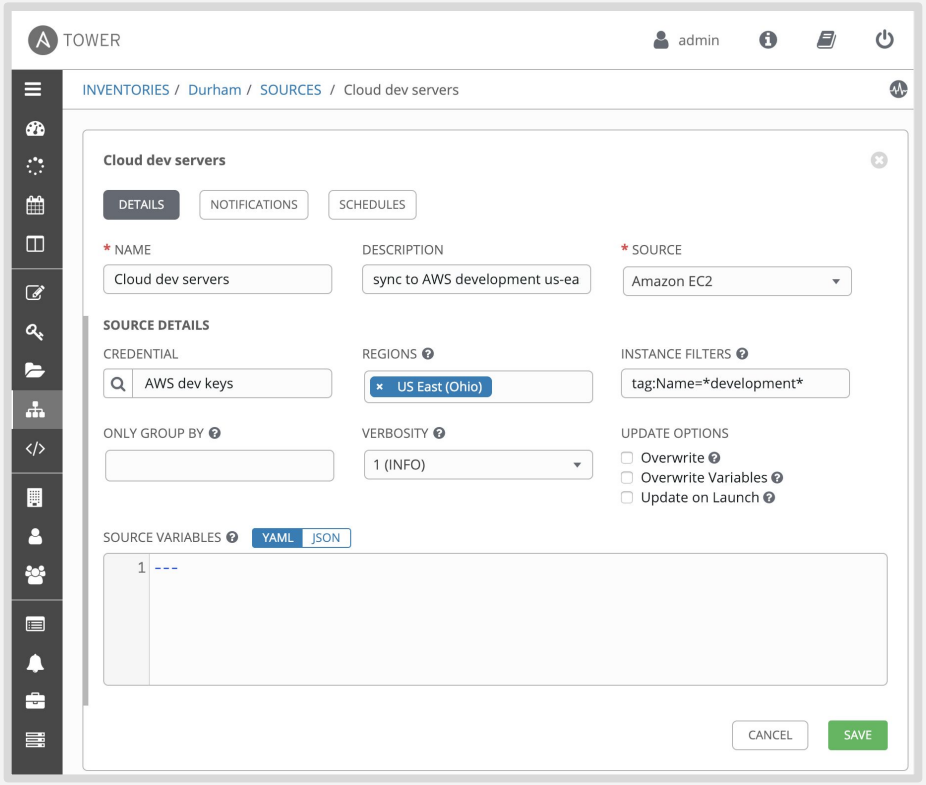
ANSIBLE TOWER FEATURES: MANAGE AND TRACK YOUR INVENTORY



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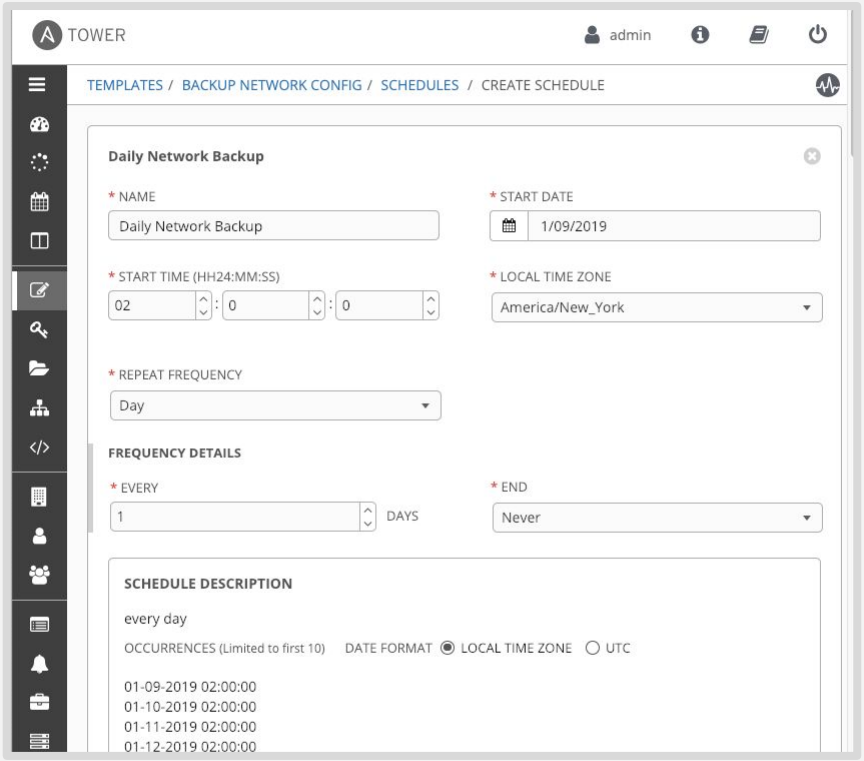
ANSIBLE TOWER FEATURES: SCHEDULE JOBS



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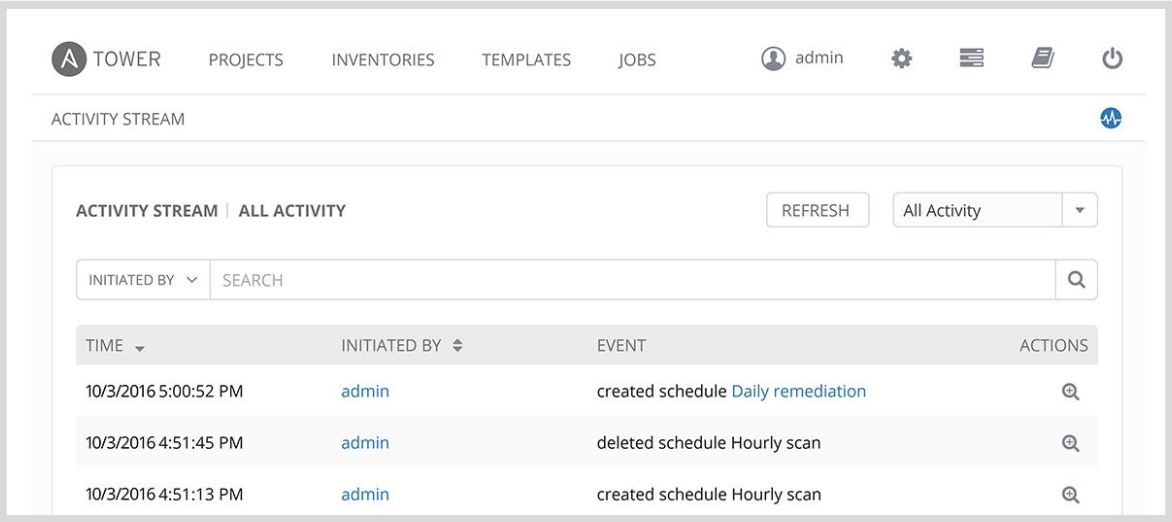
ANSIBLE TOWER FEATURES: EXTERNAL LOGGING



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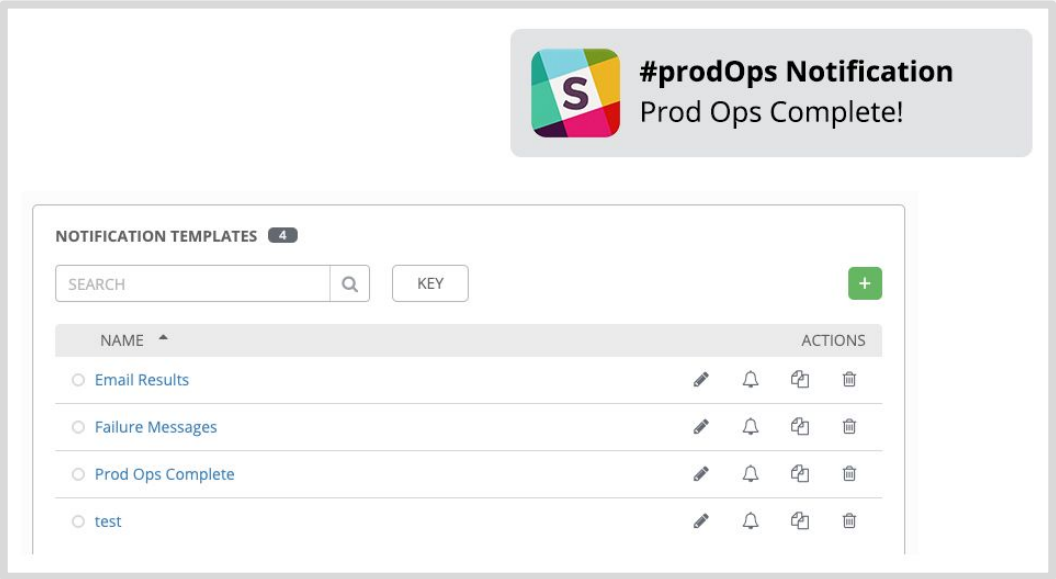
ANSIBLE TOWER FEATURES: INTEGRATED NOTIFICATIONS



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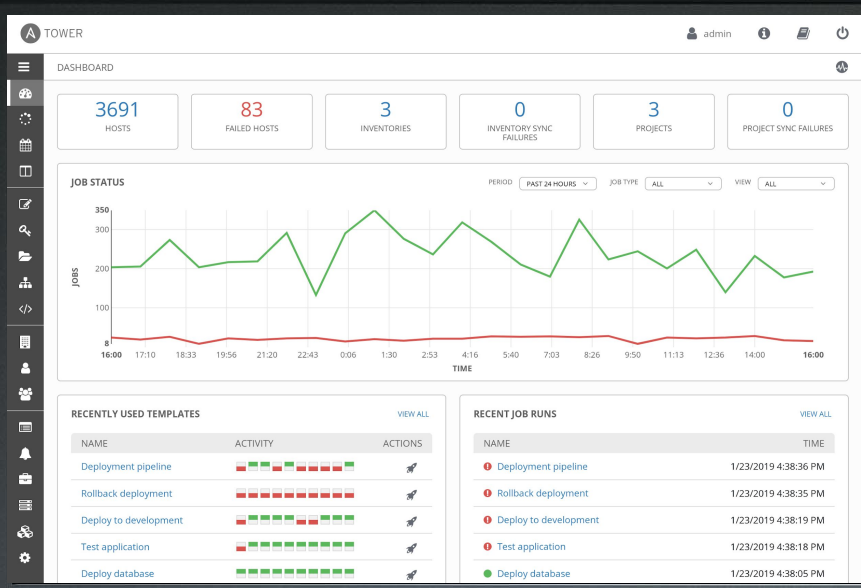
Red Hat Ansible Tower

Provision + STIG + Multicloud

Demo Overview



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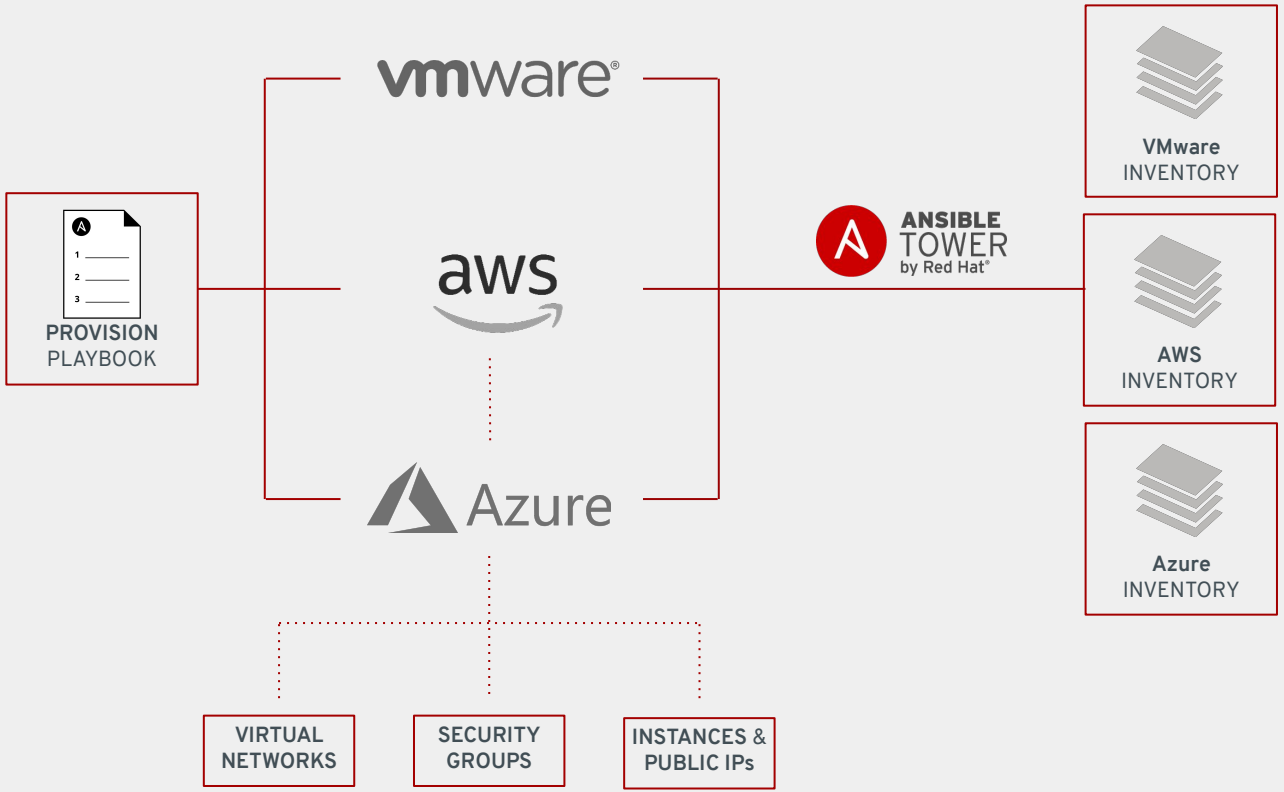
ANSIBLE TOWER: PROVISIONING



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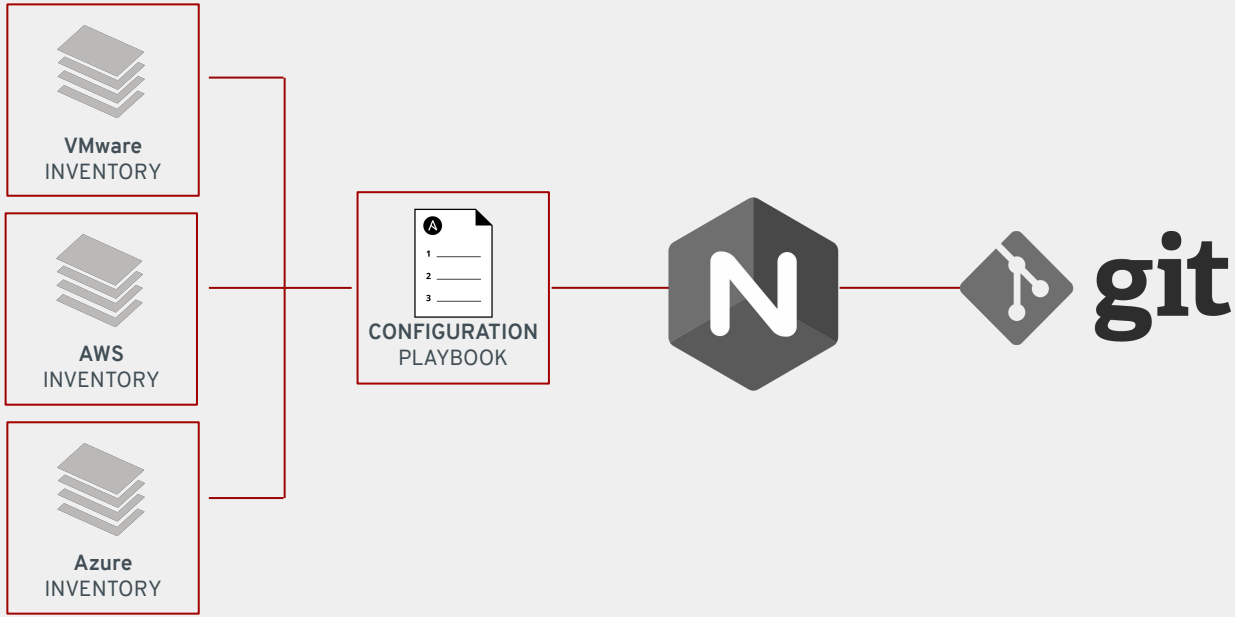
ANSIBLE TOWER: CONFIG MANAGEMENT + APPLICATION DEPLOYMENT



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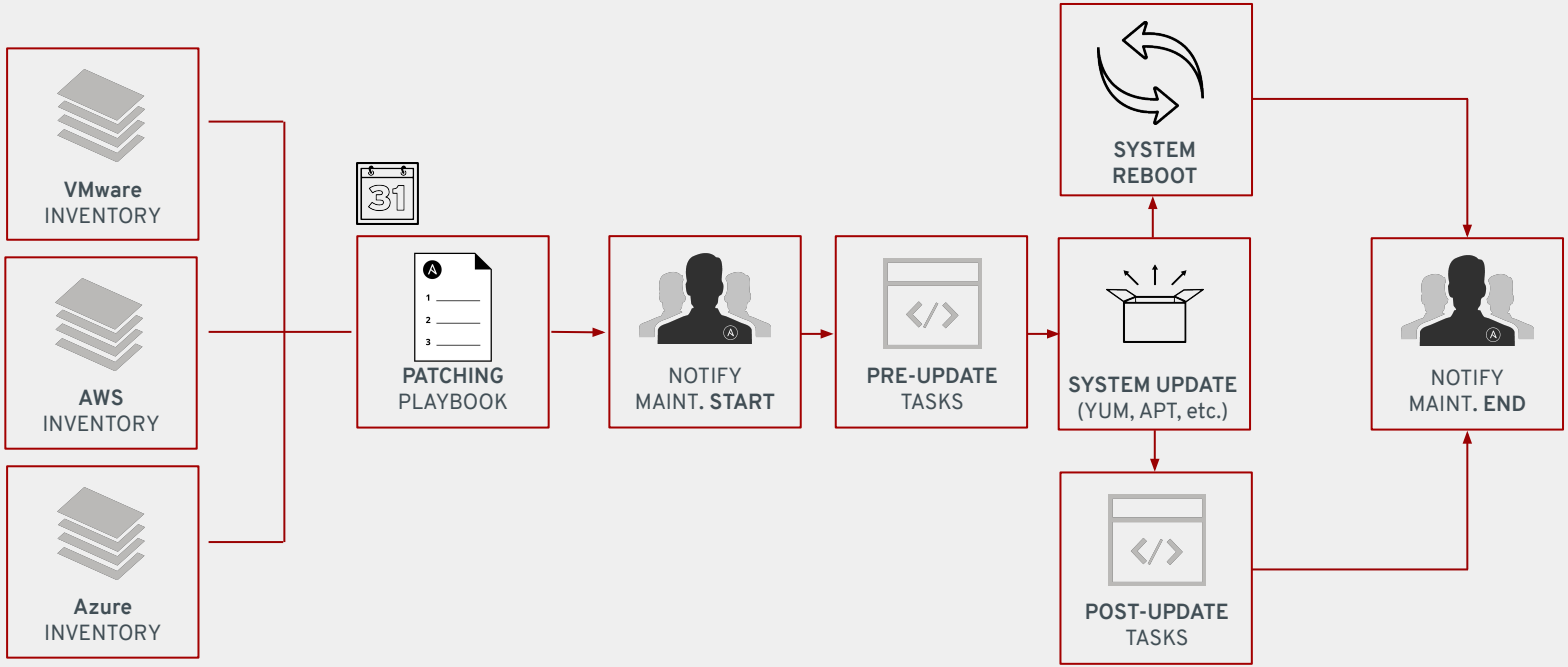
ANSIBLE TOWER: PATCHING + REMEDIATION



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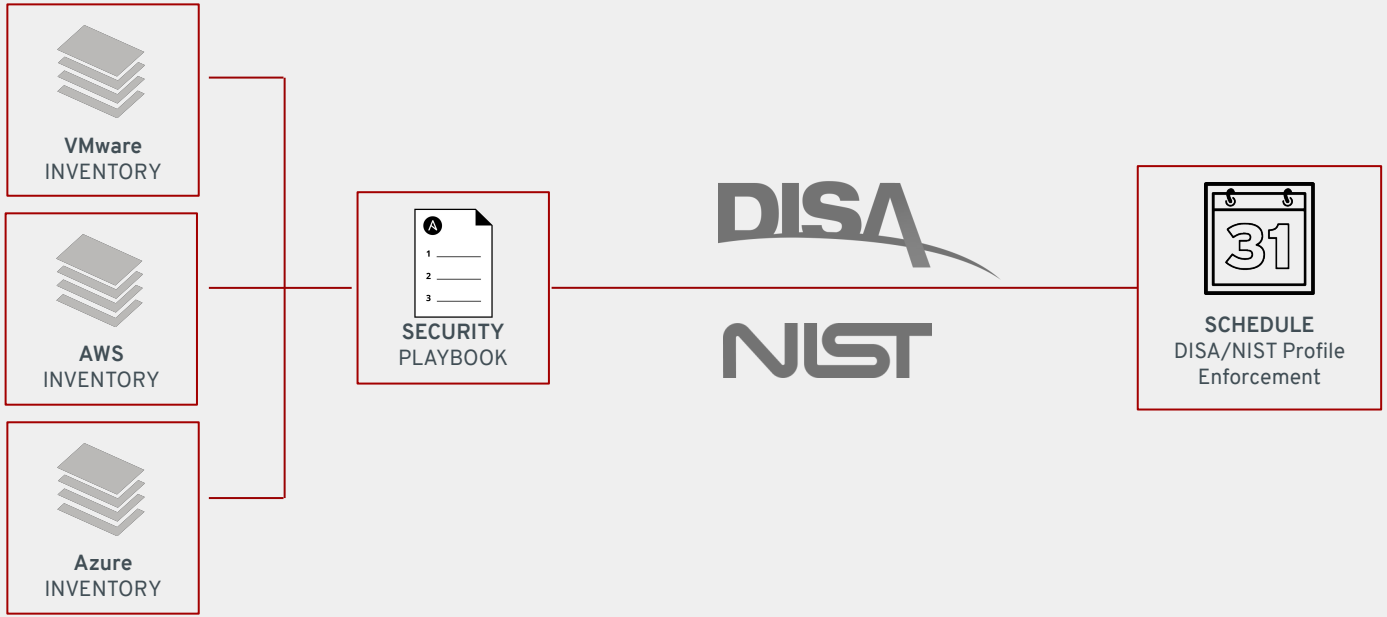
ANSIBLE TOWER: PATCHING + REMEDIATION

- **Compliments**, rather than replaces, Red Hat Satellite
  - No content lifecycle management
  - No distribution + synchronization of content
- Ansible helps:
  - Notify system owners of patching maintenance
  - Execute pre- or post-update automation ensuring safe svc shutdown/startup
  - Automate reboots when required by updates (e.g. kernel)
  - Apply + enforce system security profiles (e.g. NIST, STIG)

ANSIBLE TOWER: SECURITY



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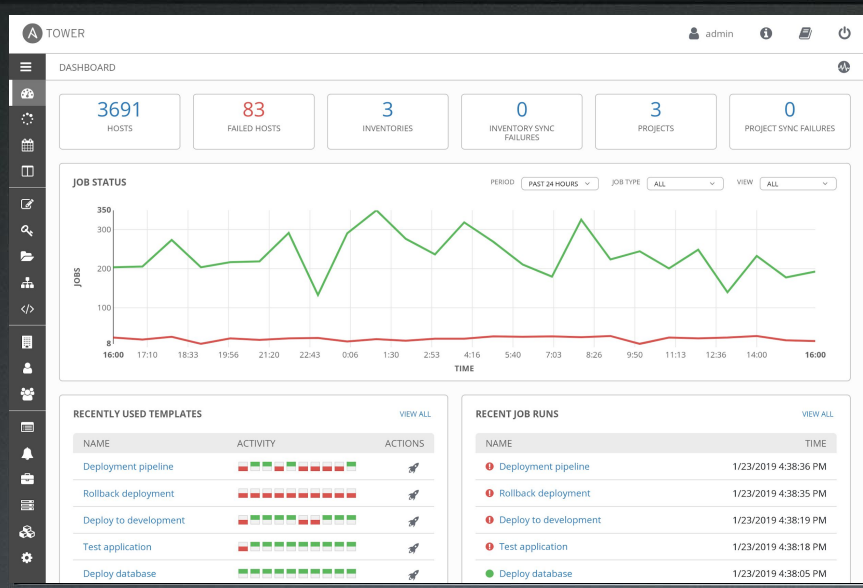
Red Hat Ansible Tower

FEATURE OVERVIEW:

Delegation



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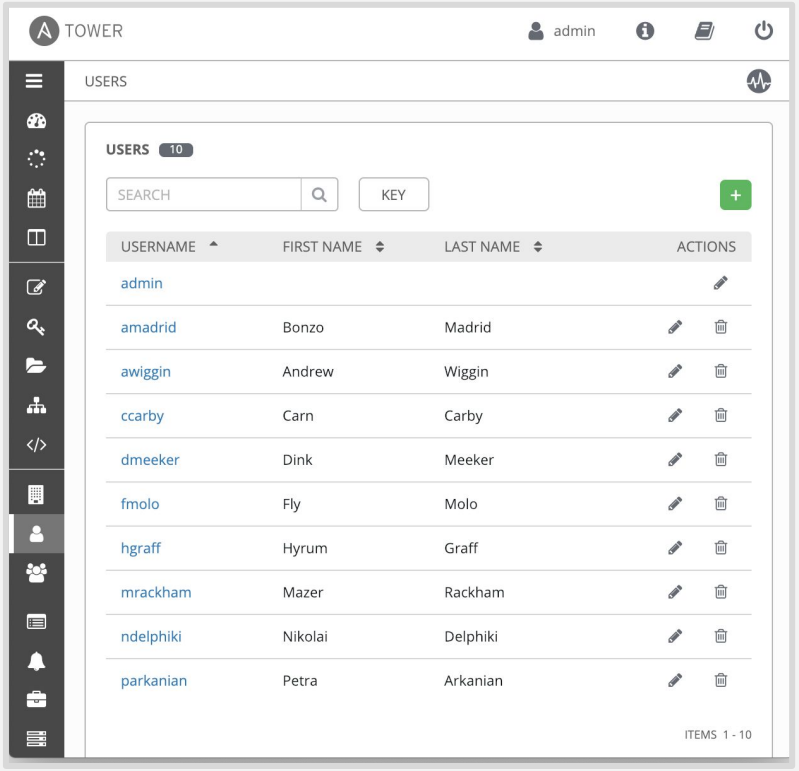
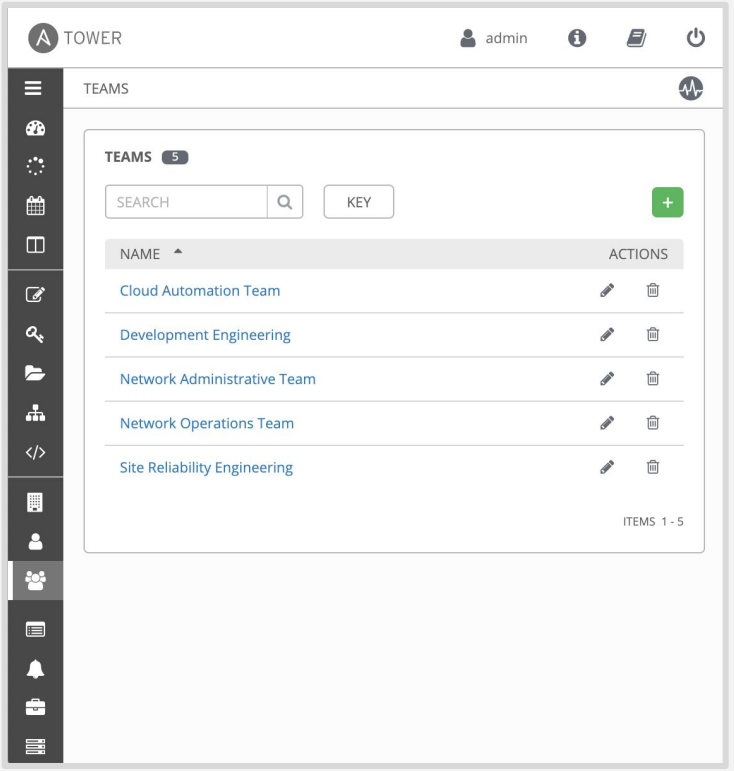
ANSIBLE TOWER FEATURES: ROLE BASED ACCESS CONTROL

USERS



TEAMS



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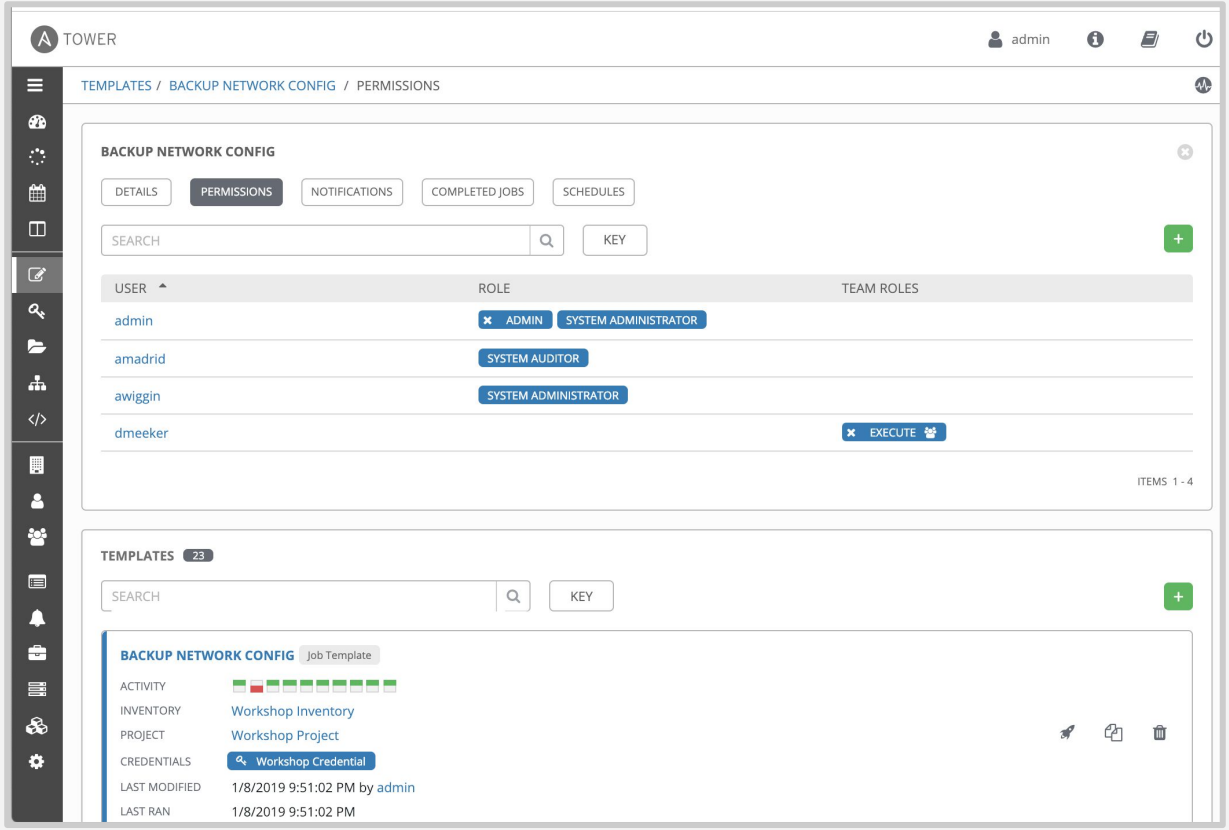
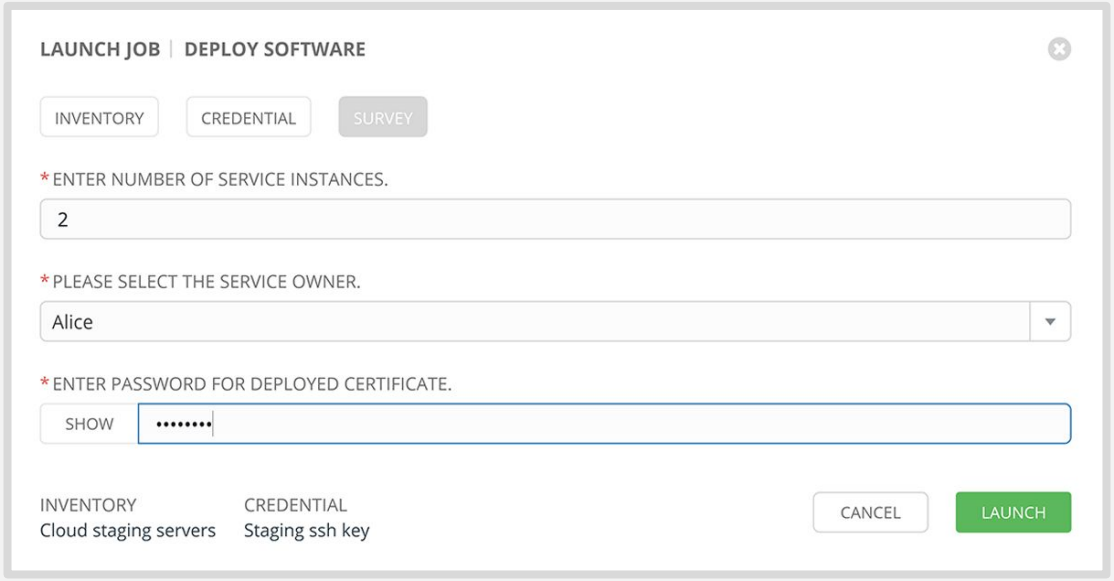
ANSIBLE TOWER FEATURES: ROLE BASED ACCESS CONTROL



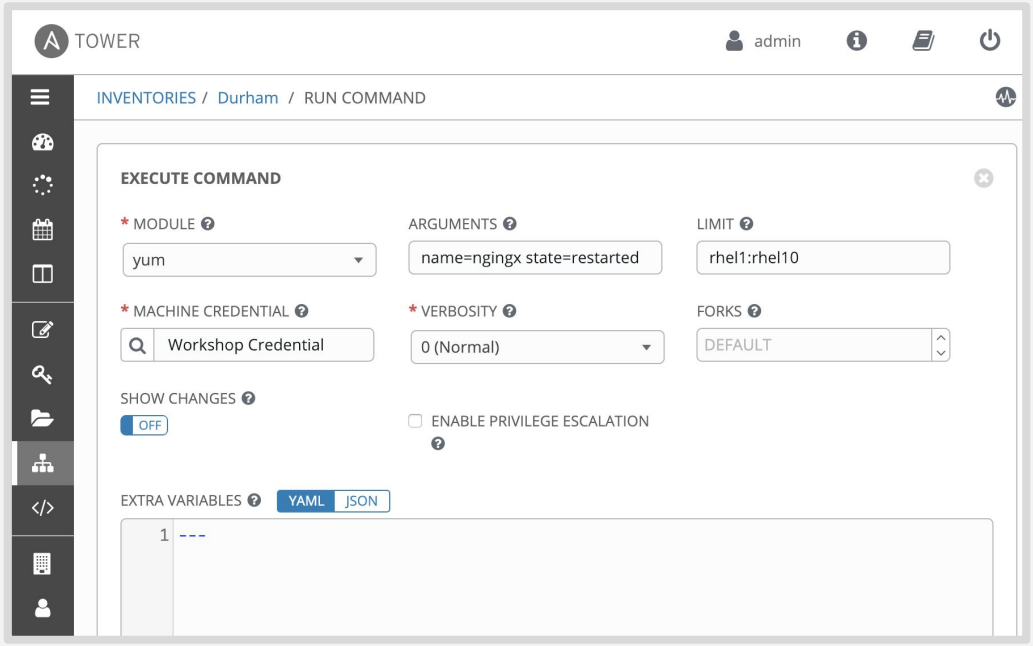
Red Hat

ANSIBLE TOWER FEATURES: SELF-SERVICE I.T.



Red Hat

ANSIBLE TOWER FEATURES: REMOTE COMMAND EXECUTION

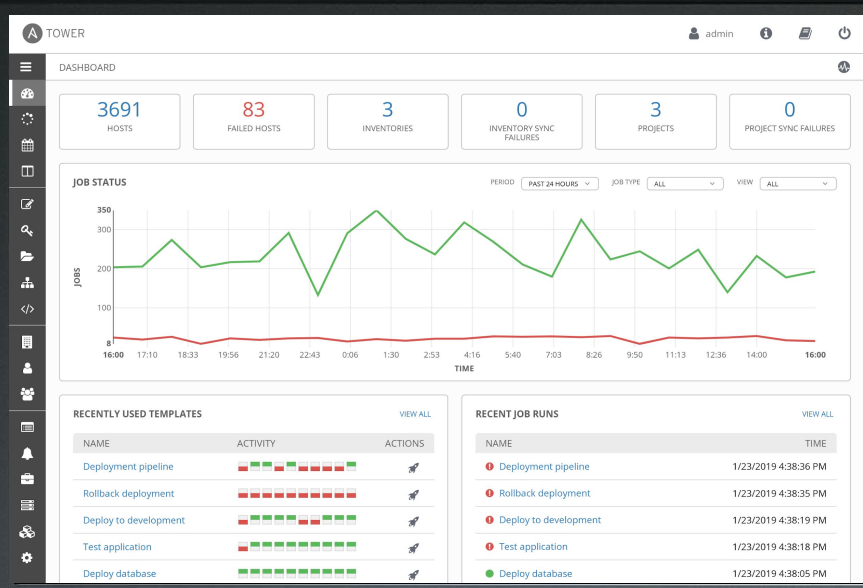


Red Hat

Red Hat Ansible Tower

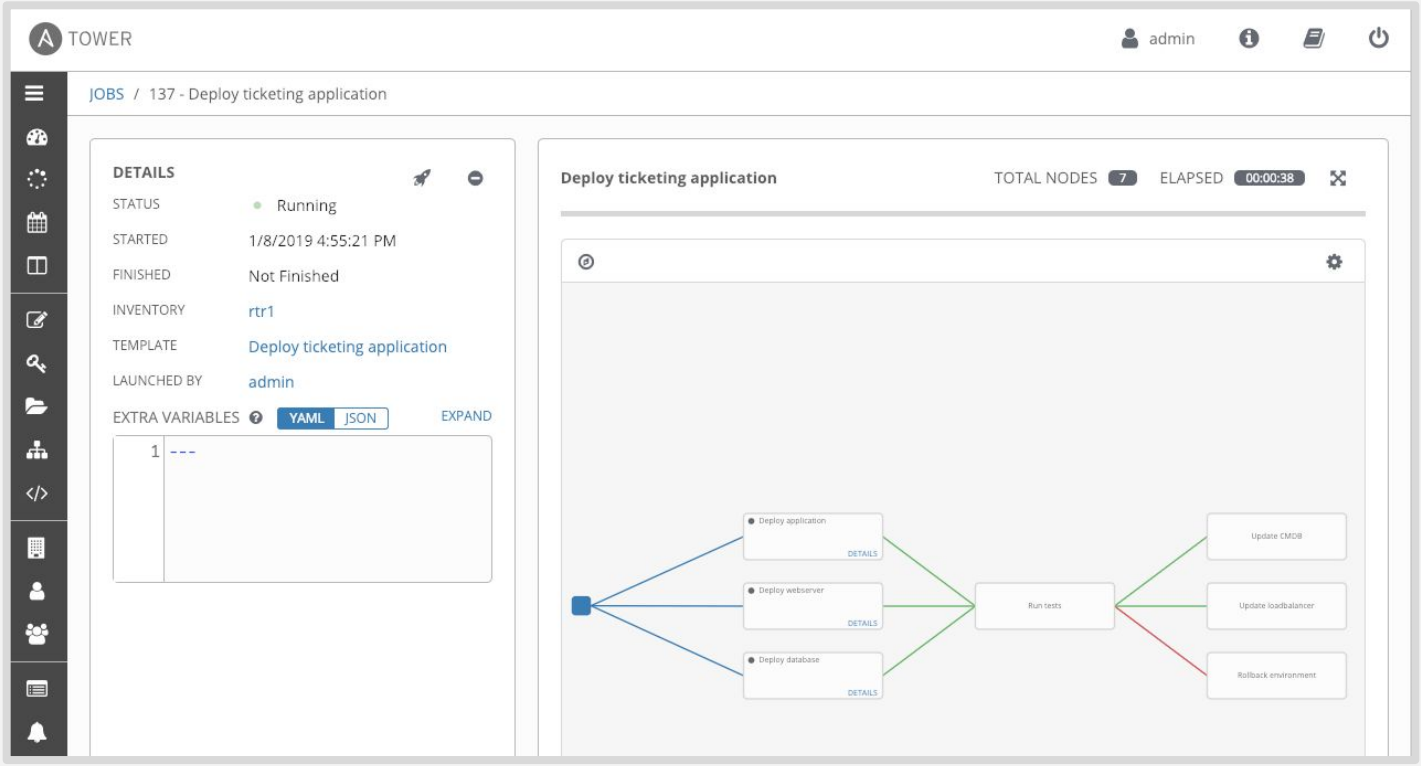
FEATURE OVERVIEW:

Scale



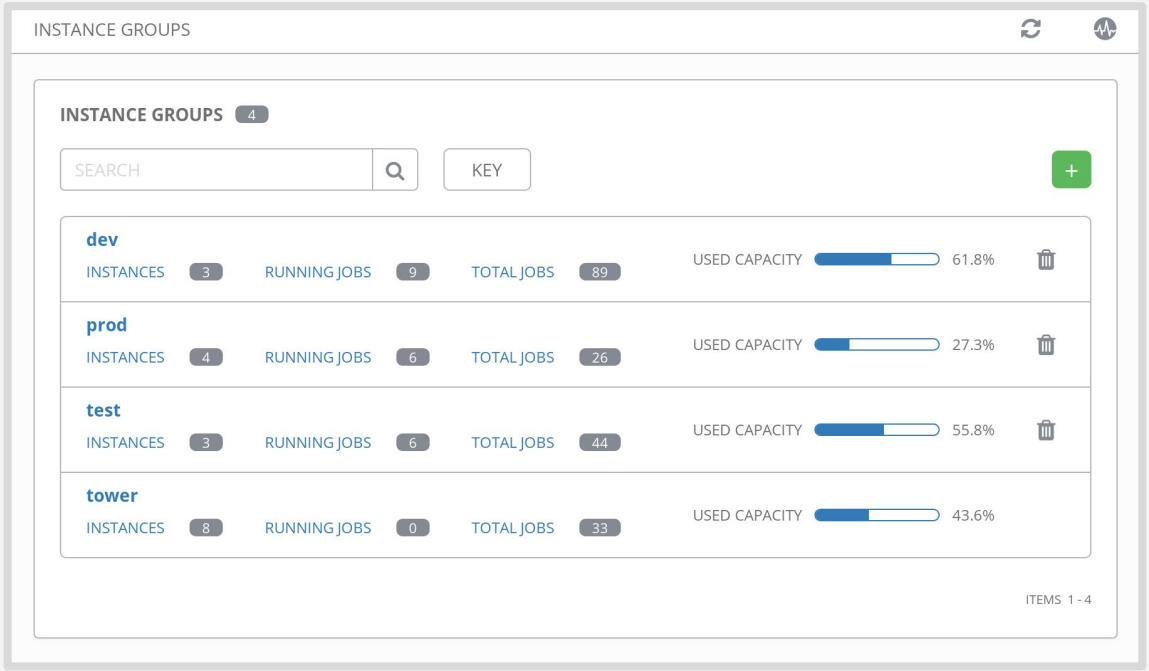
Red Hat

ANSIBLE TOWER FEATURES: CREATE AUTOMATION WORKFLOWS

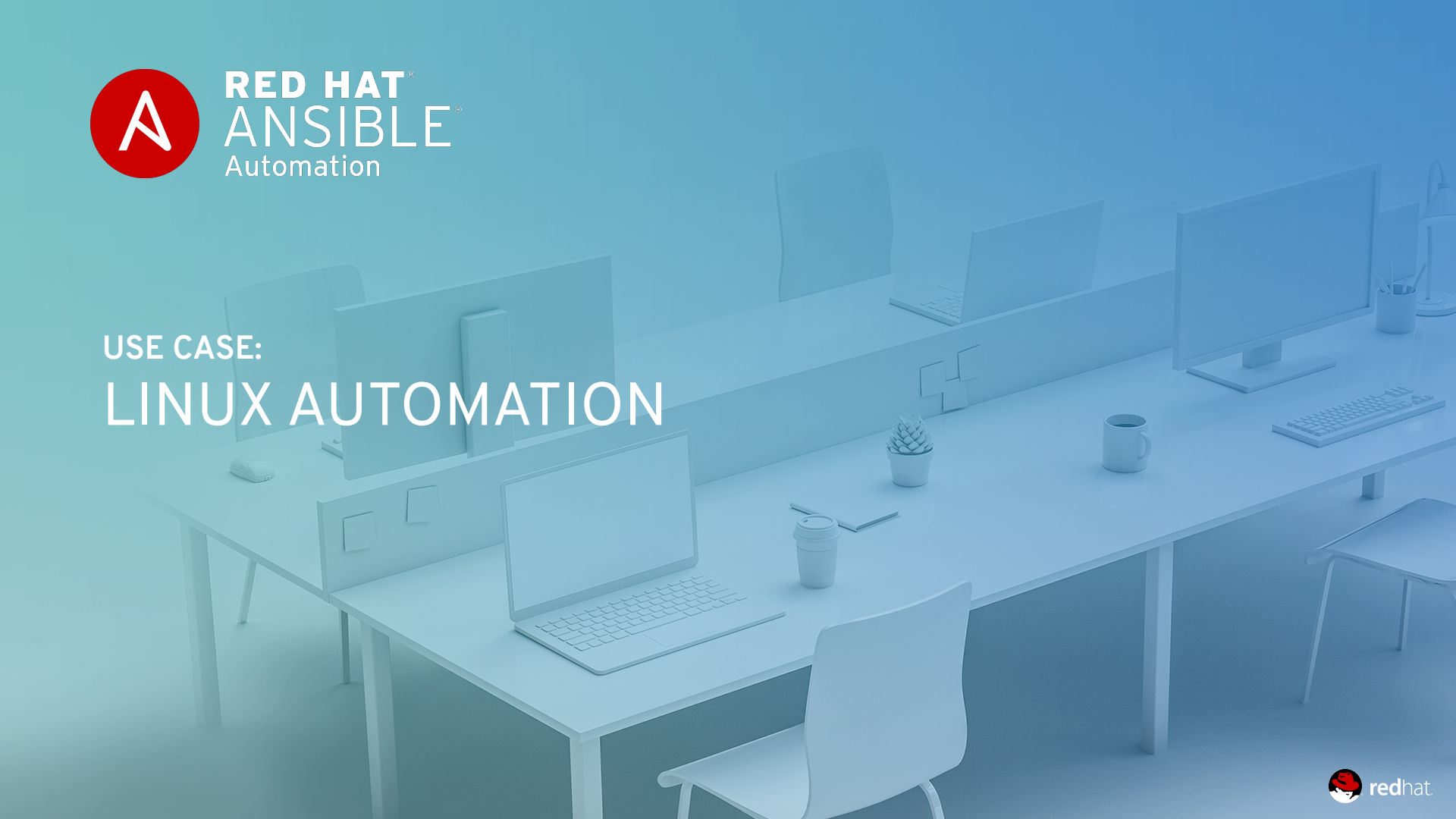


Red Hat

ANSIBLE TOWER FEATURES: SCALE OUT CLUSTERING



Red Hat


RED HAT
ANSIBLE
Automation
USE CASE:
LINUX AUTOMATION
redhat.

LINUX AUTOMATION

150+

Linux Modules

AUTOMATE EVERYTHING LINUX

Red Hat Enterprise Linux, BSD,
Debian, Ubuntu and many more!

ONLY REQUIREMENTS:
Python 2 (2.6 or later)
or Python 3 (3.5 or later)

ansible.com/get-started

Red Hat

AUTOMATION FOR EVERYONE: **SYSTEM ADMINISTRATORS**

```
---
- name: upgrade rhel packages
  hosts: rhel

  tasks:
    - name: upgrade all packages
      yum:
        name: '*'
        state: latest
```

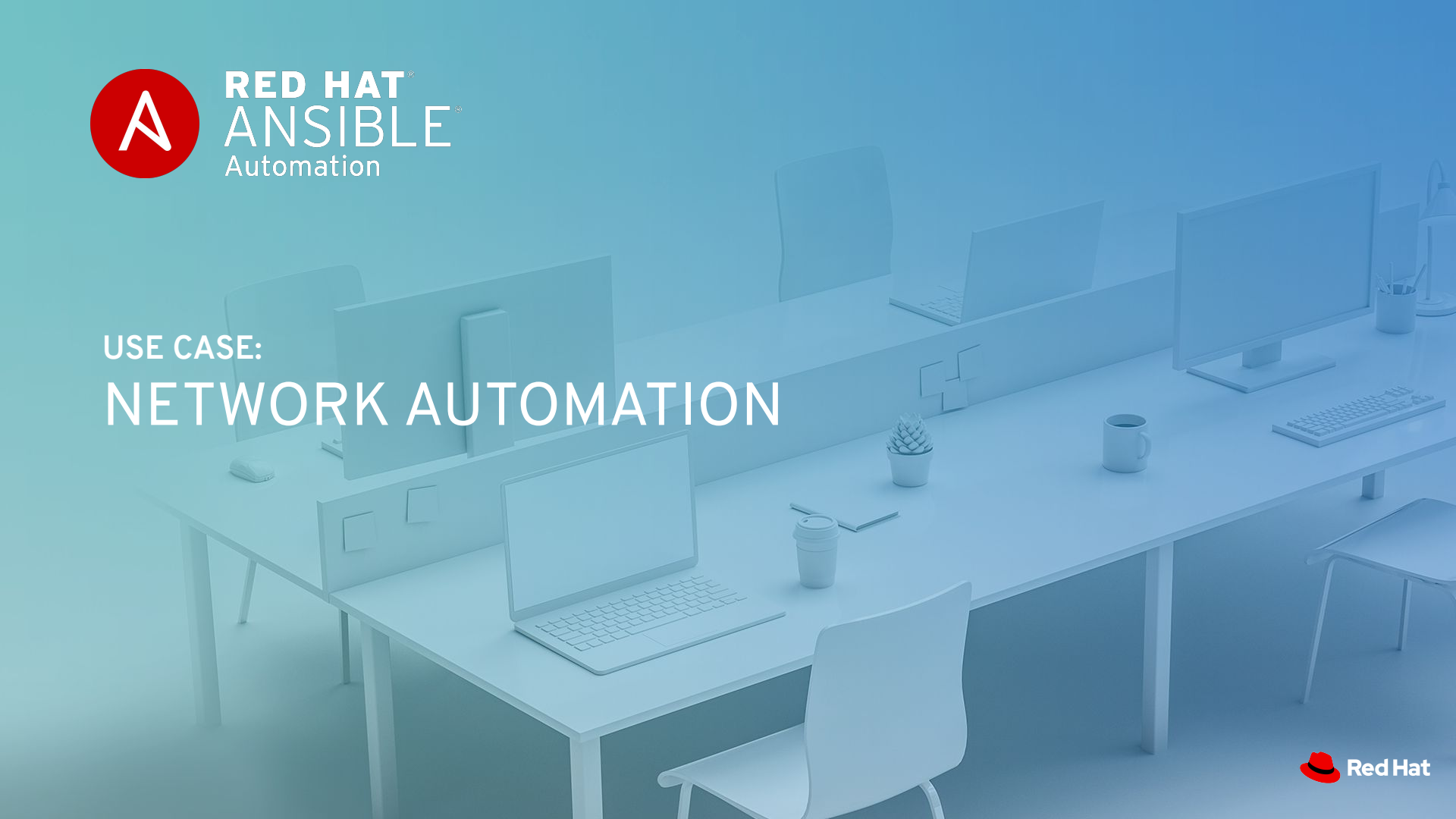
Red Hat

AUTOMATION FOR EVERYONE: **SYSTEM ADMINISTRATORS**

```
---
- name: reboot rhel hosts
  hosts: rhel

  tasks:
    - name: reboot the machine
      reboot:
```

AUTOMATION FOR EVERYONE: **SYSTEM ADMINISTRATORS**

```
---
- name: check services on rhel hosts
  hosts: rhel
  become: yes

  tasks:
   - name: ensure nginx is started
     service:
       name: nginx
       state: started
```



USE CASE:

NETWORK AUTOMATION

Red Hat

ANSIBLE NETWORK AUTOMATION

50
Network Platforms

700+
Network Modules

12*
Galaxy Network Roles

ansible.com/for/networks
galaxy.ansible.com/ansible-network

**Roles developed and maintained by Ansible Network Engineering*

Red Hat

WHY AUTOMATE YOUR NETWORK?

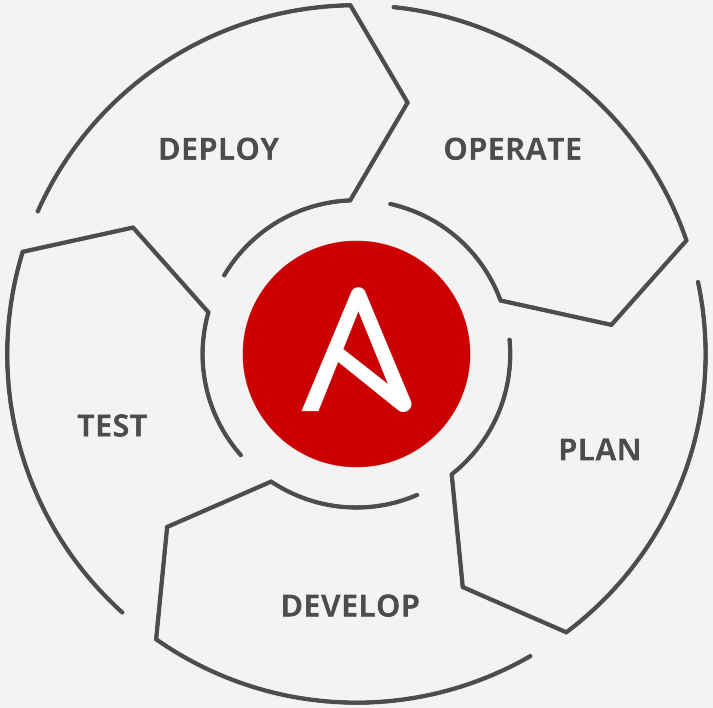
PLAN AND PROTOTYPE VIRTUALLY
Use tasks as reusable building blocks

USE YOUR CURRENT DEVELOPMENT PRACTICES
Agile, DevOps, Waterfall

GO BEYOND THE “PING” TEST
Integrate with formal testing platforms

BE CONFIDENT DURING DEPLOYMENT
Validate changes were successful

ENSURE AN ON-GOING STEADY-STATE



Red Hat

AUTOMATION FOR EVERYONE: **NETWORK ENGINEERS**

```
---
- hosts: cisco
  gather_facts: false
  connection: network_cli

  tasks:
    - name: show command for cisco
      cli_command:
        command: show ip int br
      register: result

    - name: display result to terminal window
      debug:
        var: result.stdout_lines
```

AUTOMATION FOR EVERYONE: **PLAYBOOK RESULTS**

```
[student3@ansible network_setup]$ ansible-playbook example.yml

PLAY [cisco] ***********************************************************************************************************************************************************

TASK [show command for cisco] ******************************************************************************************************************************************
ok: [rtr2]
ok: [rtr1]

TASK [display result to terminal window] ********************************************************************************************************************************
ok: [rtr1] => {
    "result.stdout_lines": [
        "Interface              IP-Address      OK? Method Status                Protocol",
        "GigabitEthernet1       172.16.22.120   YES DHCP   up                    up      ",
        "VirtualPortGroup0      192.168.35.101  YES TFTP   up                    up"
    ]
}
ok: [rtr2] => {
    "result.stdout_lines": [
        "Interface              IP-Address      OK? Method Status                Protocol",
        "GigabitEthernet1       172.17.1.107    YES DHCP   up                    up      ",
        "VirtualPortGroup0      192.168.35.101  YES TFTP   up                    up"
    ]
}

PLAY RECAP *************************************************************************************************************************************************************
rtr1                       : ok=2    changed=0    unreachable=0    failed=0    skipped=0
rtr2                       : ok=2    changed=0    unreachable=0    failed=0    skipped=0

[student3@ansible network_setup]$
```

Red Hat

AUTOMATION FOR EVERYONE: **NETWORK ENGINEERS**

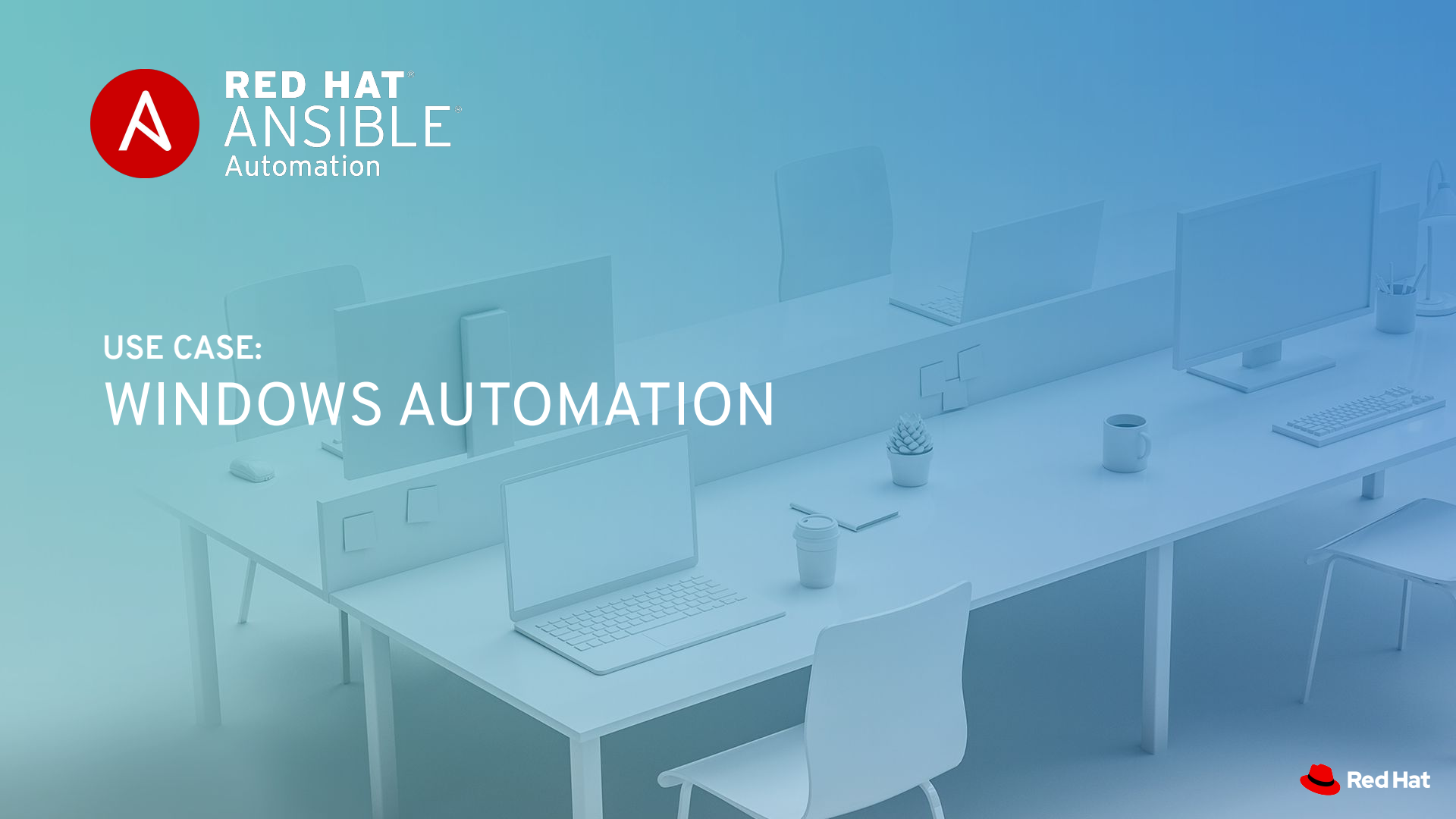
```
---
- hosts: juniper
  gather_facts: false
  connection: network_cli

  tasks:
    - name: show command for juniper
      cli_command:
        command: show interfaces terse em1
      register: result

    - name: display result to terminal window
      debug:
        var: result.stdout_lines
```

Red Hat

AUTOMATION FOR EVERYONE: **PLAYBOOK RESULTS**

```
[student3@ansible network_setup]$ ansible-playbook junos-example.yml

PLAY [juniper] *****************************************************************************************************************************

TASK [show command for juniper] ************************************************************************************************************
ok: [rtr3]
ok: [rtr4]

TASK [display result to terminal window] ***************************************************************************************************
ok: [rtr3] => {
    "result.stdout_lines": [
        "Interface               Admin Link Proto    Local                 Remote",
        "em1                     up    up",
        "em1.0                   up    up   inet     10.0.0.4/8      ",
        "                                           128.0.0.1/2     ",
        "                                           128.0.0.4/2     ",
        "                                  inet6    fe80::5254:ff:fe12:bdfe/64",
        "                                           fec0::a:0:0:4/64",
        "                                  tnp      0x4"
    ]
}
ok: [rtr4] => {
    "result.stdout_lines": [
        "Interface               Admin Link Proto    Local                 Remote",
        "em1                     up    up",
        "em1.0                   up    up   inet     10.0.0.4/8      ",
        "                                           128.0.0.1/2     ",
        "                                           128.0.0.4/2     ",
        "                                  inet6    fe80::5254:ff:fe12:bdfe/64",
        "                                           fec0::a:0:0:4/64",
        "                                  tnp      0x4"
    ]
}

PLAY RECAP *********************************************************************************************************************************
rtr3                       : ok=2    changed=0    unreachable=0    failed=0    skipped=0
rtr4                       : ok=2    changed=0    unreachable=0    failed=0    skipped=0

[student3@ansible network_setup]$
```

Red Hat


RED HAT
ANSIBLE
Automation
USE CASE:
WINDOWS AUTOMATION
Red Hat

WINDOWS AUTOMATION

90+
Windows Modules

1,300+
Powershell DSC resources

ansible.com/windows

Red Hat

AUTOMATION FOR EVERYONE: **WINDOWS ADMINS**

```
---
- name: windows playbook
  hosts: new_servers

  tasks:
  - name: ensure local admin account exists
    win_user:
      name: localadmin
      password: '{{ local_admin_password }}'
      groups: Administrators
```

Red Hat

AUTOMATION FOR EVERYONE: **WINDOWS ADMINS**

```
---
- name: windows playbook
  hosts: windows_machines

  tasks:
  - name: ensure common tools are installed
    win_chocolatey:
      name: '{{ item }}'
    loop: ['sysinternals', 'googlechrome']
```

Red Hat

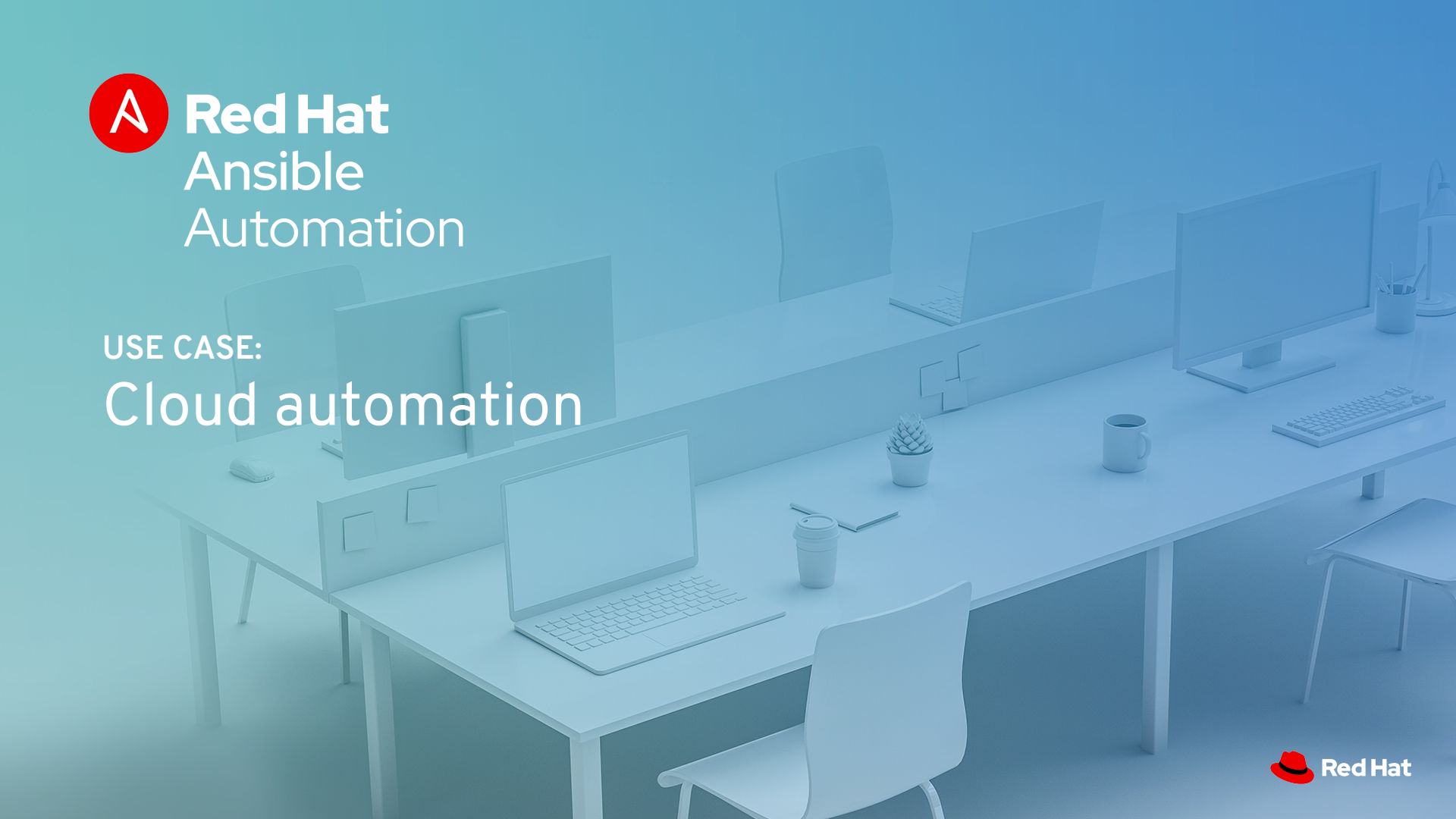
AUTOMATION FOR EVERYONE: **WINDOWS ADMINS**

```
---
- name: update and reboot
  hosts: windows_servers
  tasks:
  - name: ensure common OS updates are current
    win_updates:
    register: update_result

  - name: reboot and wait for host if updates change require it
    win_reboot:
    when: update_result.reboot_required
```

AUTOMATION FOR EVERYONE: **WINDOWS ADMINS**

```
---
- name: update domain and reboot
  hosts: windows_servers
  tasks:
  - name: ensure domain membership
    win_domain_membership:
      dns_domain_name: contoso.corp
      domain_admin_user: '{{ domain_admin_username }}'
      domain_admin_password: '{{ domain_admin_password }}'
      state: domain
    register: domain_result

  - name: reboot and wait for host if domain change require it
    win_reboot:
    when: domain_result.reboot_required
```

Red Hat


Red Hat
Ansible
Automation
USE CASE:
Cloud automation
Red Hat

CLOUD AUTOMATION

800+
Cloud
Modules

30+
Cloud Platforms

ansible.com/cloud

Red Hat

PLAYBOOK EXAMPLE: **AWS**

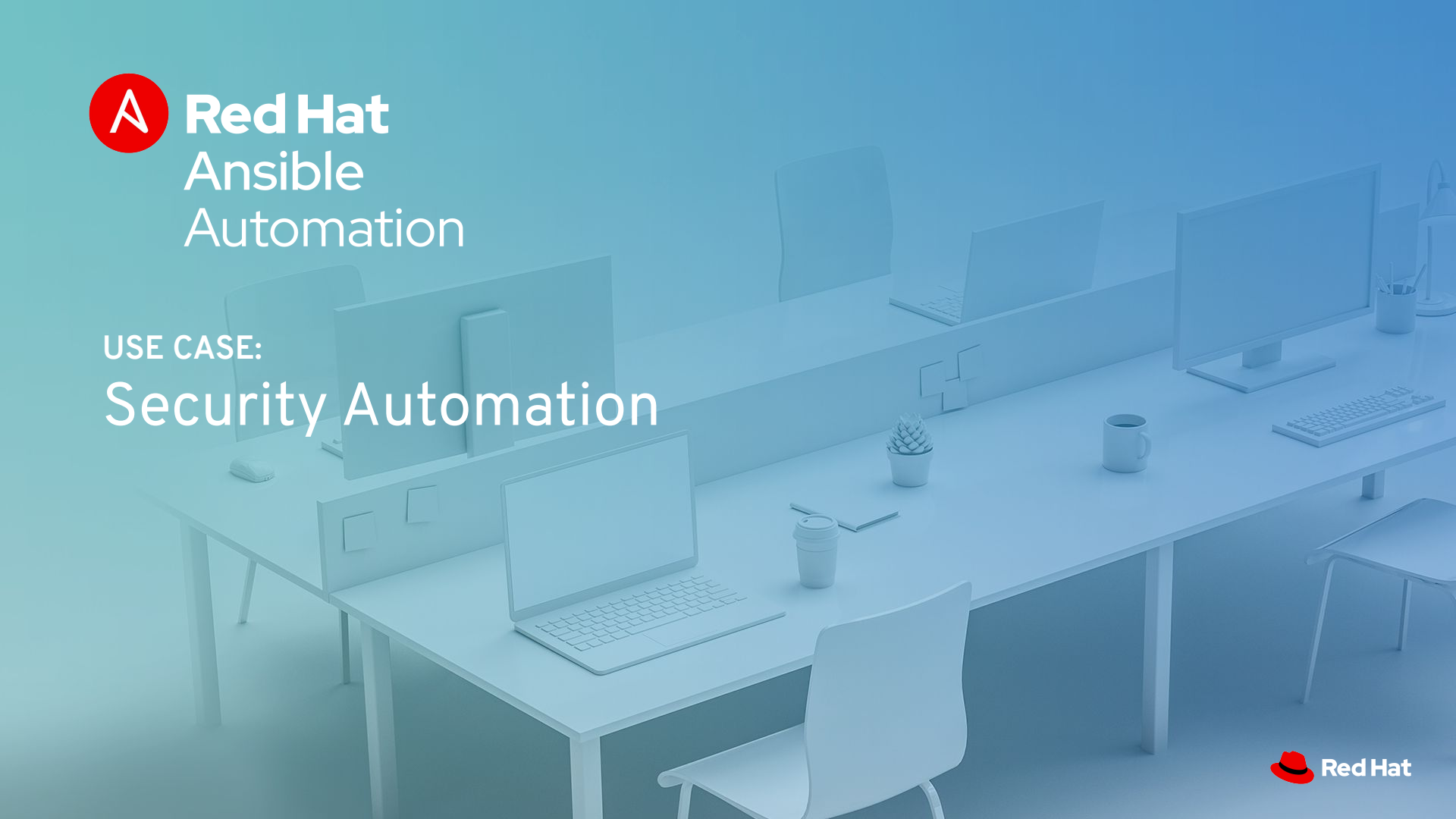
```
---
- name: aws playbook
  hosts: localhost
  connection: local

  tasks:
    - name: create AWS VPC ansible-vpc
      ec2_vpc_net:
        name: "ansible-vpc"
        cidr_block: "192.168.0.0/24"
        tags:
          demo: the demo vpc
      register: create_vpc
```

PLAYBOOK EXAMPLE: **AZURE**

```
---
- name: azure playbook
  hosts: localhost
  connection: local

  tasks:
    - name: create virtual network
      azure_rm_virtualnetwork:
        resource_group: myResourceGroup
        name: myVnet
        address_prefixes: "10.0.0.0/16"
```

PLAYBOOK EXAMPLE: **RED HAT OPENSTACK**

```
---
- name: openstack playbook
  hosts: localhost
  connection: local

  tasks:
    - name: launch an instance
      os_server:
        name: vm1
        cloud: mordred
        region_name: ams01
        image: Red Hat Enterprise Linux 7.4
        flavor_ram: 4096
```



Red Hat
Ansible
Automation

USE CASE:

Security Automation

Red Hat

What is it?

Ansible Security Automation is a supported set of Ansible modules, roles and playbooks designed to unify the security response to cyberattacks in a new way - by orchestrating the activity of multiple classes of security solutions that wouldn't normally integrate with each other.

What does it do?

Through Ansible Security Automation, IT organizations can address multiple popular use cases:

- For **detection and triage of suspicious activities**, for example, Ansible can automatically enable logging or increase the log verbosity across enterprise firewalls and IDS to enrich the alerts received by a SIEM for an easier triage.
- For **threat hunting,** for example, Ansible can automatically create new IDS rules to investigate the origin of a firewall rule violation, and whitelist those IP addresses recognized as non threats.
- For **incident response,** for example, Ansible can automatically validate a threat by verifying an IDS rule, trigger a remediation from the SIEM solution, and create new enterprise firewall rules to blacklist the source of an attack.

At launch, Red Hat's Ansible security automation platform provides support for:

- **Check Point** – Next Generation Firewall (NGFW);
- **Splunk** – Splunk Security Enterprise (SE);
- **Snort**

Who is it for?

Ansible Security Automation extends the Ansible agentless, modular and easy to use enterprise automation platform to support the following industry constituencies:

- **End-user organizations' security teams** in charge of Security Operations Centres (SOCs)
- **Managed security service providers (MSSPs)** responsible for the governance of thousands of enterprise security solutions across their whole customer base
- **Security ISVs** offering security orchestration and automation (SOAR) solutions currently using custom-made automation frameworks

AUTOMATION FOR EVERYONE: SECURITY OPERATIONS

```
---
- name: checkpoint playbook
  hosts: checkpoint
  connection: httpapi

  tasks:
    - name: create access rule
      checkpoint_access_rule:
        layer: Network
        name: "Drop attacker"
        position: top
        source: attacker
        destination: Any
        action: Drop
```

Red Hat

AUTOMATION FOR EVERYONE: SECURITY OPERATIONS

```
---
- name: checkpoint playbook
  hosts: checkpoint
  connection: httpapi

  tasks:
    - name: delete access rule
      checkpoint_access_rule:
        layer: Network
        name: "Drop attacker"
        state: absent
```

Red Hat

NEXT STEPS

GET STARTED

ansible.com/get-started

ansible.com/tower-trial

JOIN THE COMMUNITY

ansible.com/community

WORKSHOPS & TRAINING

ansible.com/workshops

Red Hat Training

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