How to use this deck

Name:

Windows Automation workshop

Purpose:

These additional slides are used in conjunction with the windows automation workshop as provisioned from:
https://github.com/ansible/workshops

Last updated:

Jan 19, 2022

What this deck is for?

What this deck is not for?

Google Slides source link (Red Hat internal):

https://docs.google.com/presentation/d/1RO5CQiCoqLDES1NvTI_1fQrR-oWM1NuW-uB0JRvtJzE/edit#slide=id.g10efc4a0549_0_2429

Owner:

Ansible MBU, ansible-pmm-tmm@redhat.com

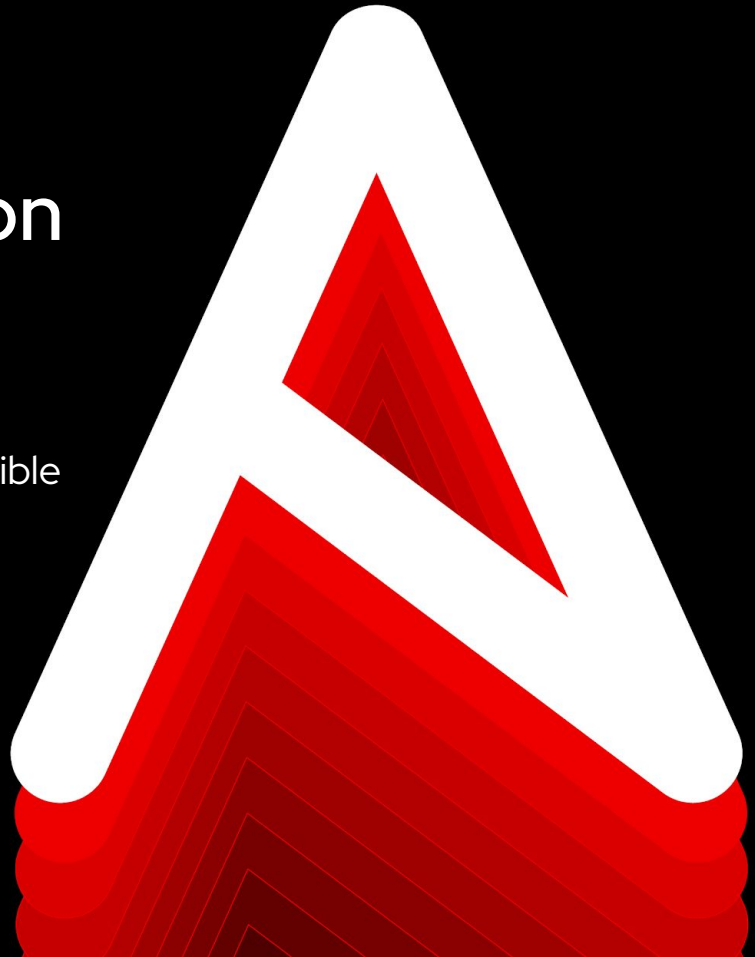
List of all official Ansible content:

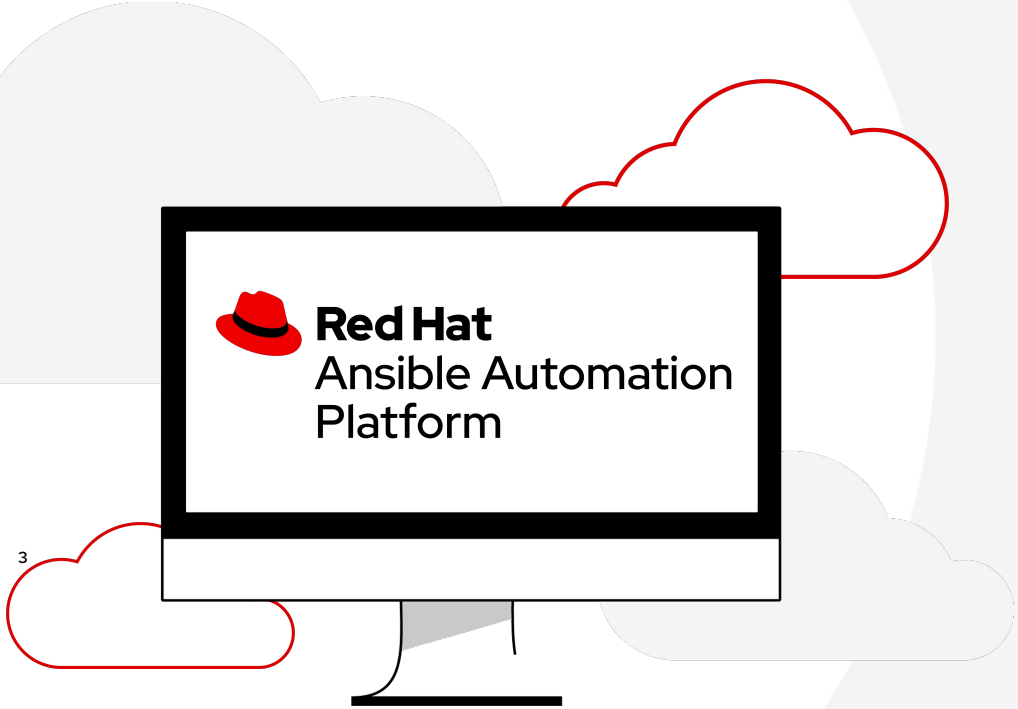
Red Hat Ansible Automation Platform One Stop:
https://redhat.highspot.com/items/5966647572ad8e20778bc270?lfrm=srp.10

Red Hat
Ansible Automation
Platform

Ansible Windows automation workshop

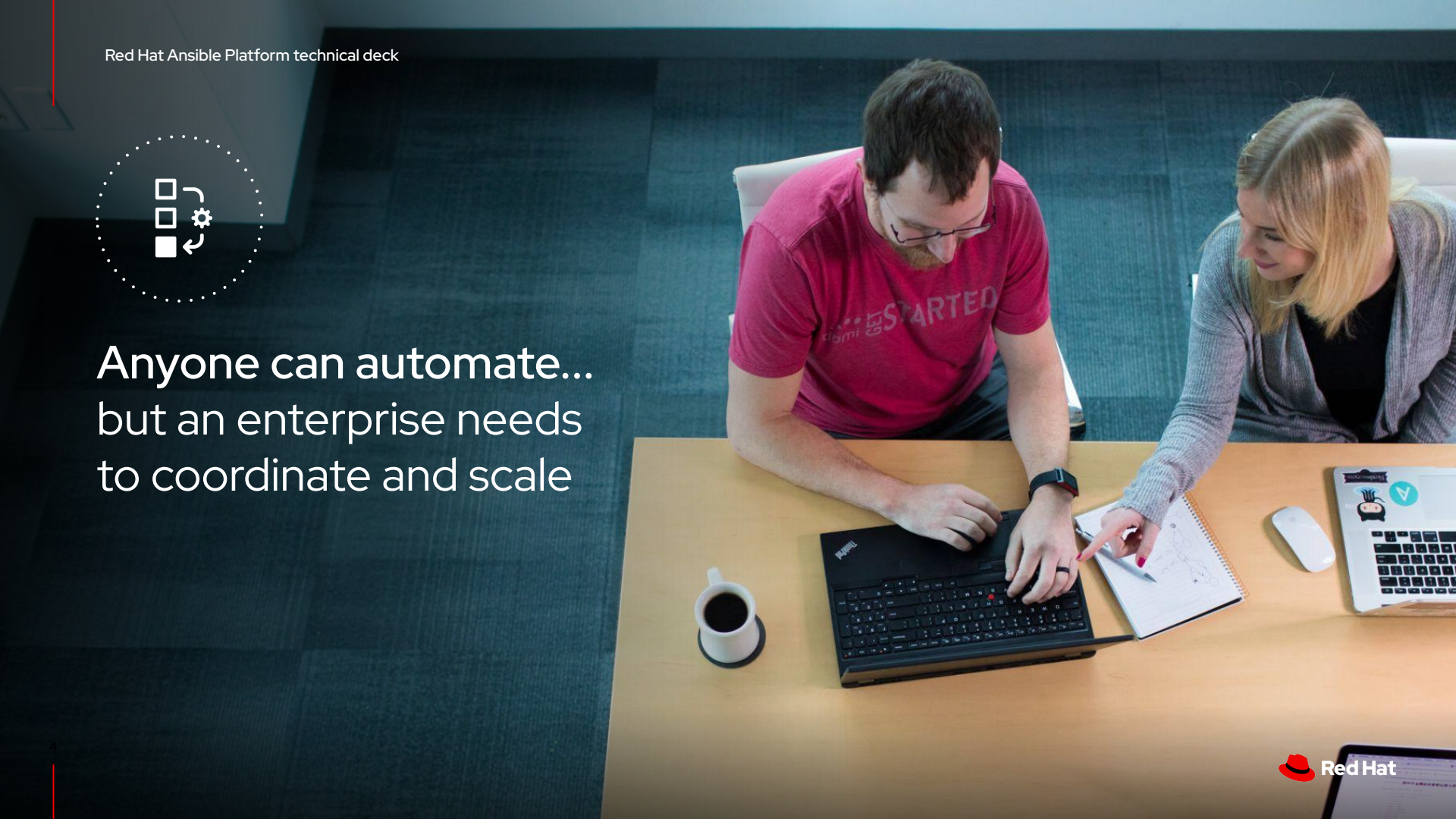
Introduction to automating Microsoft Windows with Ansible Automation Platform 2





What you will learn

- Introduction to Ansible automation
- How Ansible works for Windows automation
- Understanding Ansible modules and playbooks
- Using Ansible Tower to scale automation to the enterprise
- Reusing automation with Ansible Roles



Anyone can automate...
but an enterprise needs to coordinate and scale

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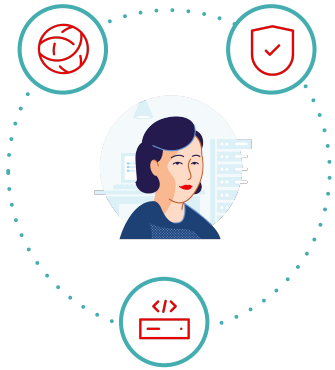
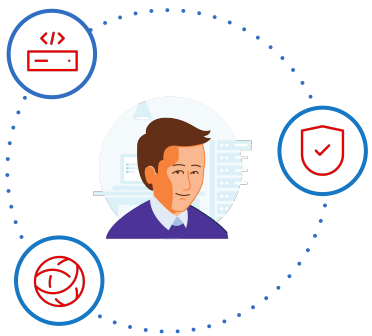
Many organizations share the same challenge

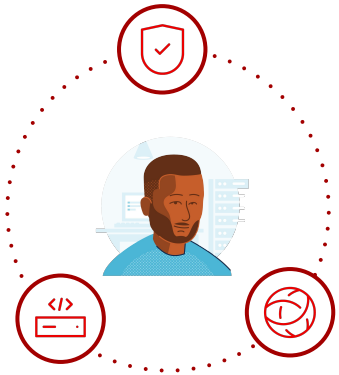
Too many unintegrated, domain-specific tools



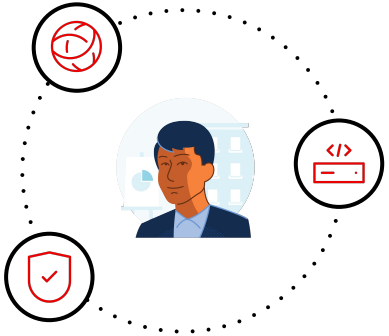
Network ops



SecOps



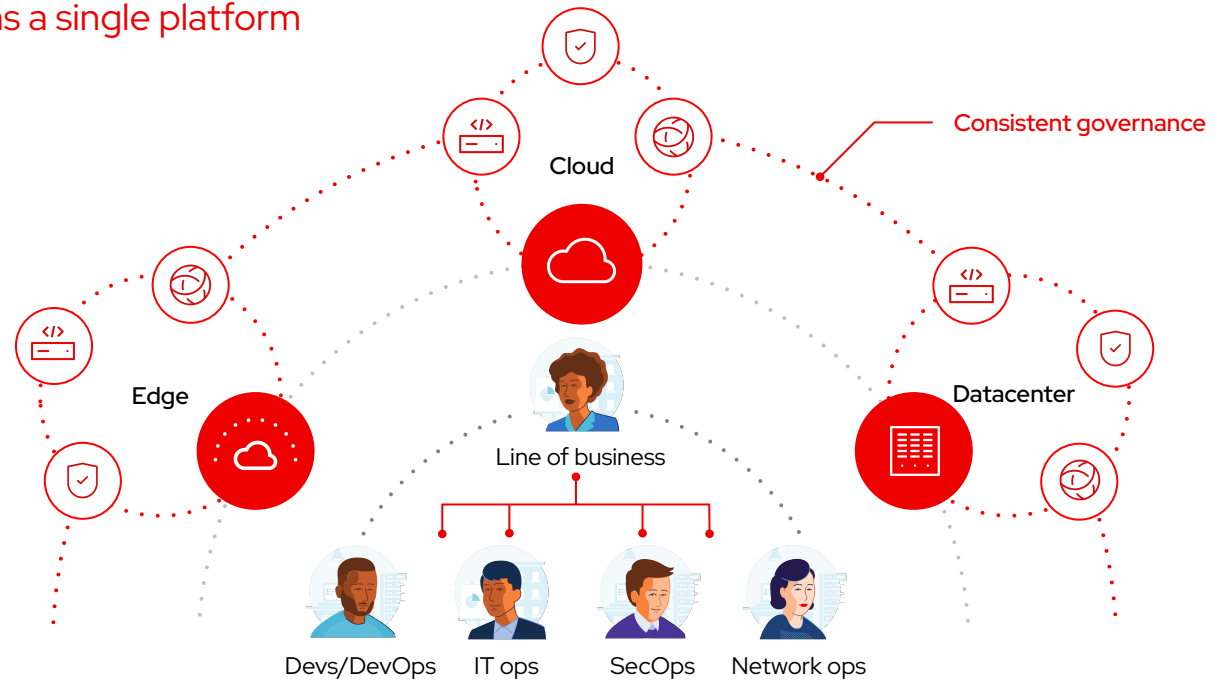
Devs/DevOps



IT ops

Break down silos

Different teams a single platform



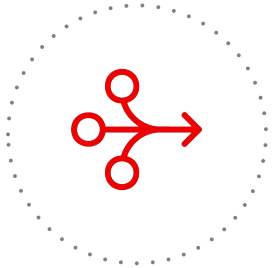
Red Hat

Why the Red Hat® Ansible® Automation Platform?

Why the Ansible Automation Platform?

Powerful

Orchestrate complex processes at enterprise scale.



Simple

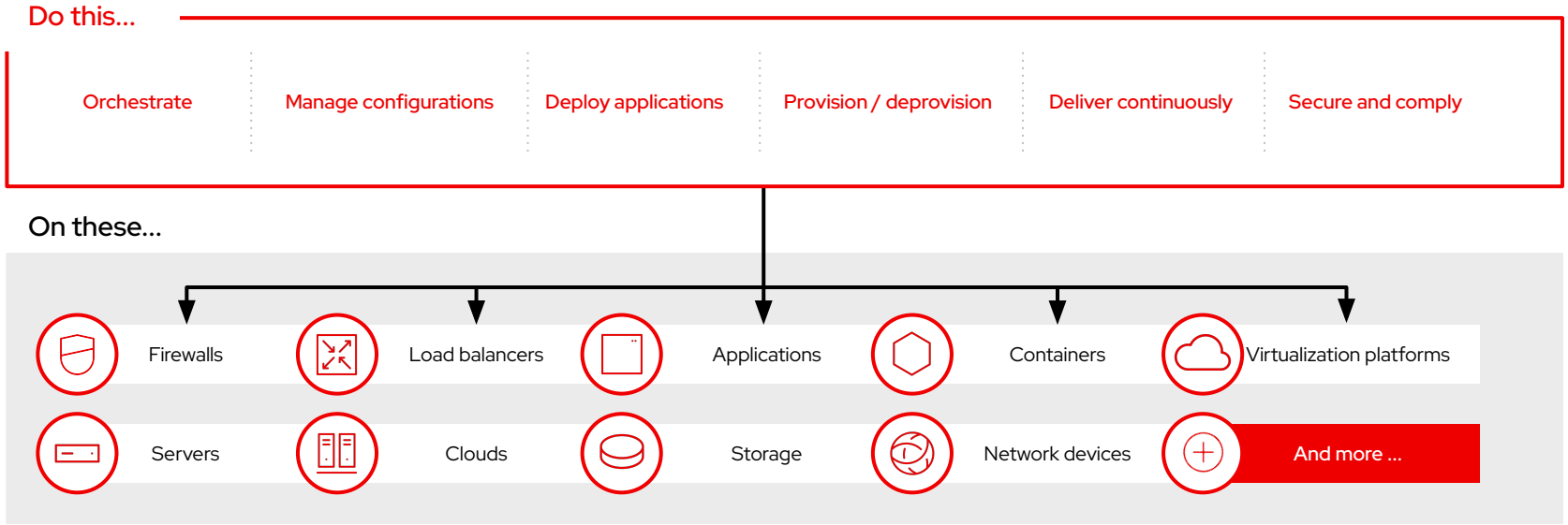
Simplify automation creation and management across multiple domains.

Agentless

Easily integrate with hybrid environments.

Automate the deployment and management of automation

Your entire IT footprint



Red Hat

100+

certified platforms

Infrastructure

Cloud

Network

Security

Red Hat

aws

ARISTA

Check Point
SOFTWARE TECHNOLOGIES LTD

NetApp

Google

CISCO

CYBERARK

IBM

Microsoft

f5

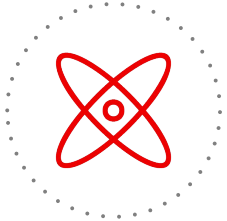
FORTINET

Red Hat

What makes a platform?

Red Hat Ansible Automation Platform

Combining the universal automation language with cloud services and certified content for automating, deploying, and operating applications, infrastructure and services securely at enterprise scale.

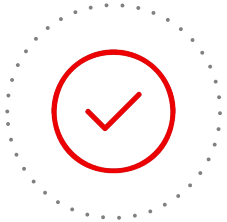


Ansible automation

Providing scalable, secure implementation for describing, building, and managing the deployment of enterprise IT applications across diverse enterprise architectures.

Cloud services

Cloud services that facilitate team collaboration and provide operational analytics for automating heterogeneous, hybrid environments.



Certified content

Extends native platform capabilities with certified, supported content designed to expand the automation domain and accelerate adoption for enterprise customers.

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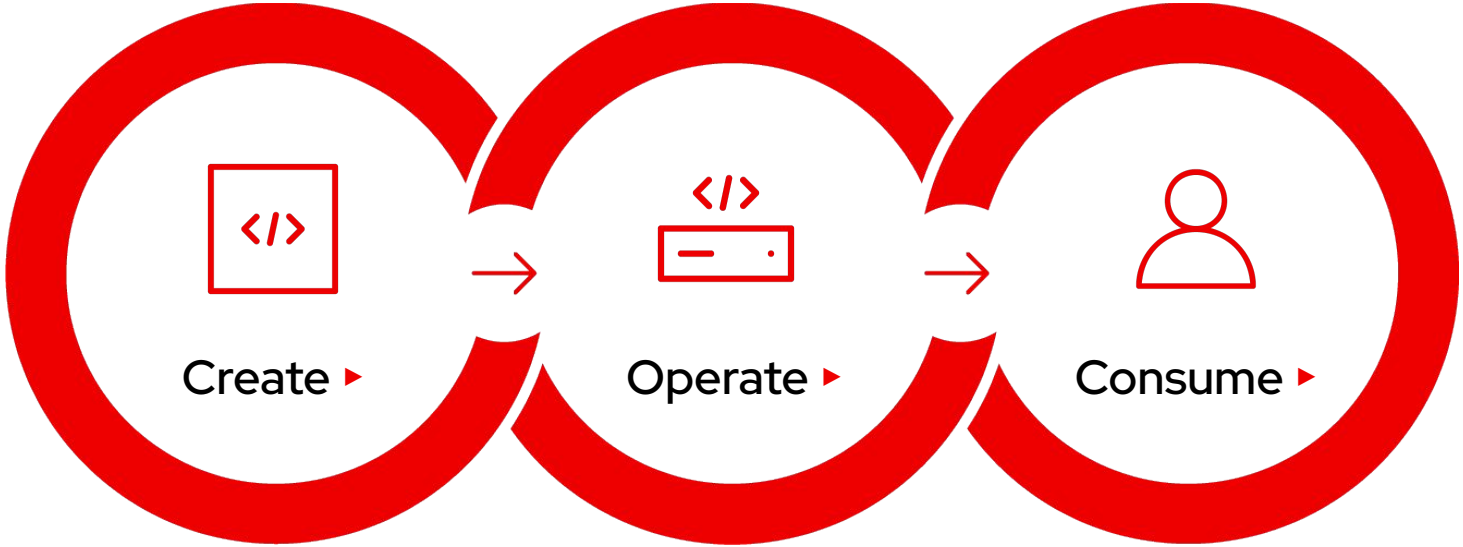
Ansible Automation Platform

Holistic automation for your enterprise



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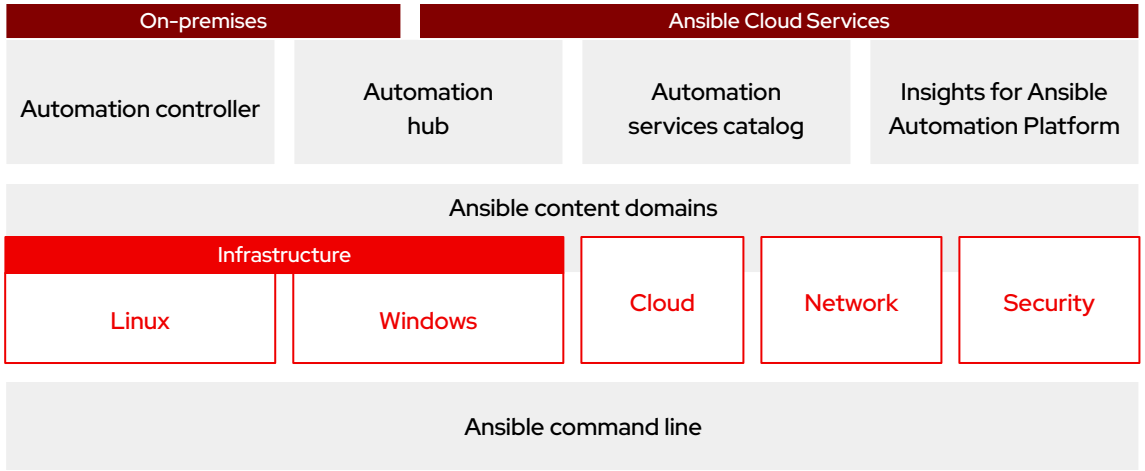
Ansible Automation Platform

Content creators

Operators

Domain experts

Users



Fueled by an open source community

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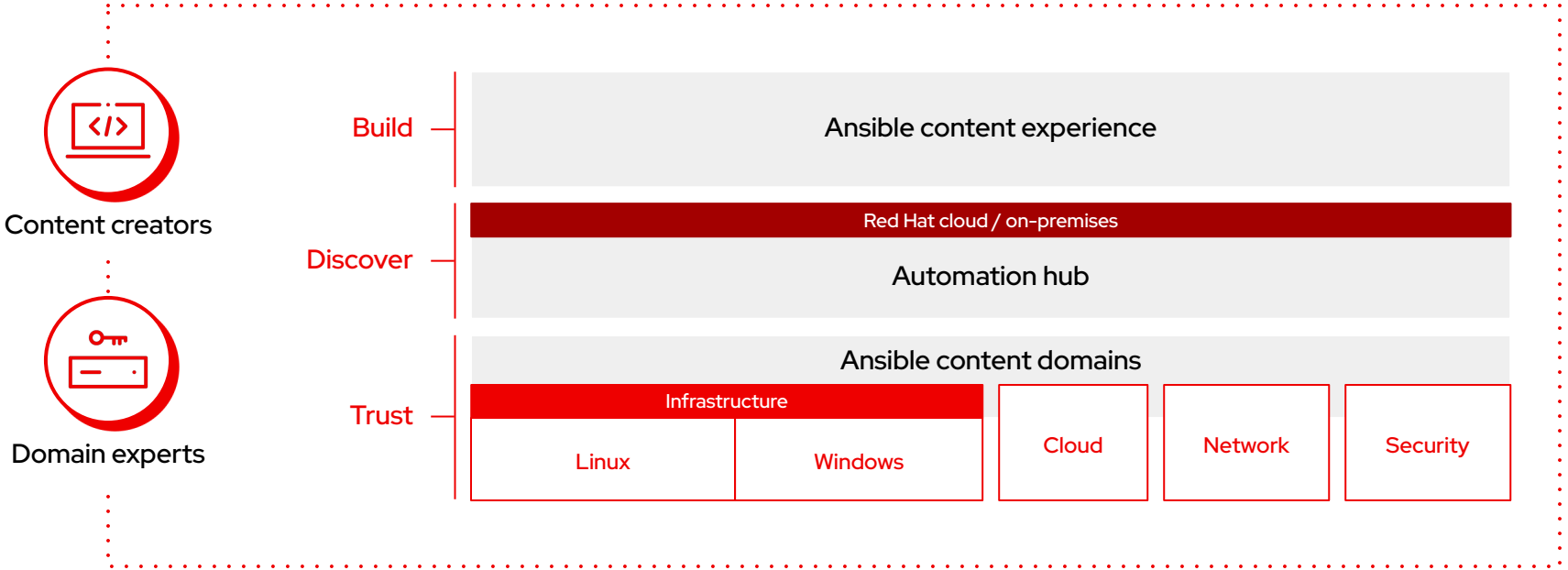
Create

Create

The automation lifecycle



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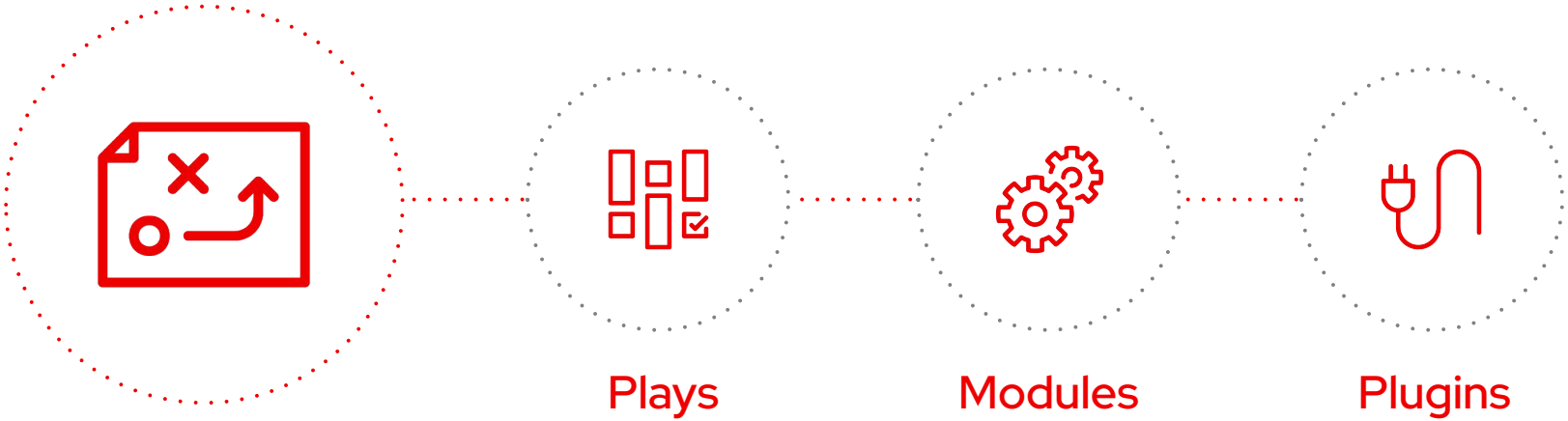
Ansible playbooks

```
---
- name: start IIS/stop firewall
  hosts: windows-web
  become: yes

  tasks:
    - name: IIS is running
      win_service:
        name: W3Svc
        state: running

    - name: firewall service is stopped/disabled
      win_service:
        name: MpsSvc
        state: stopped
        start_mode: disabled
```

What makes up an Ansible playbook?



Ansible plays

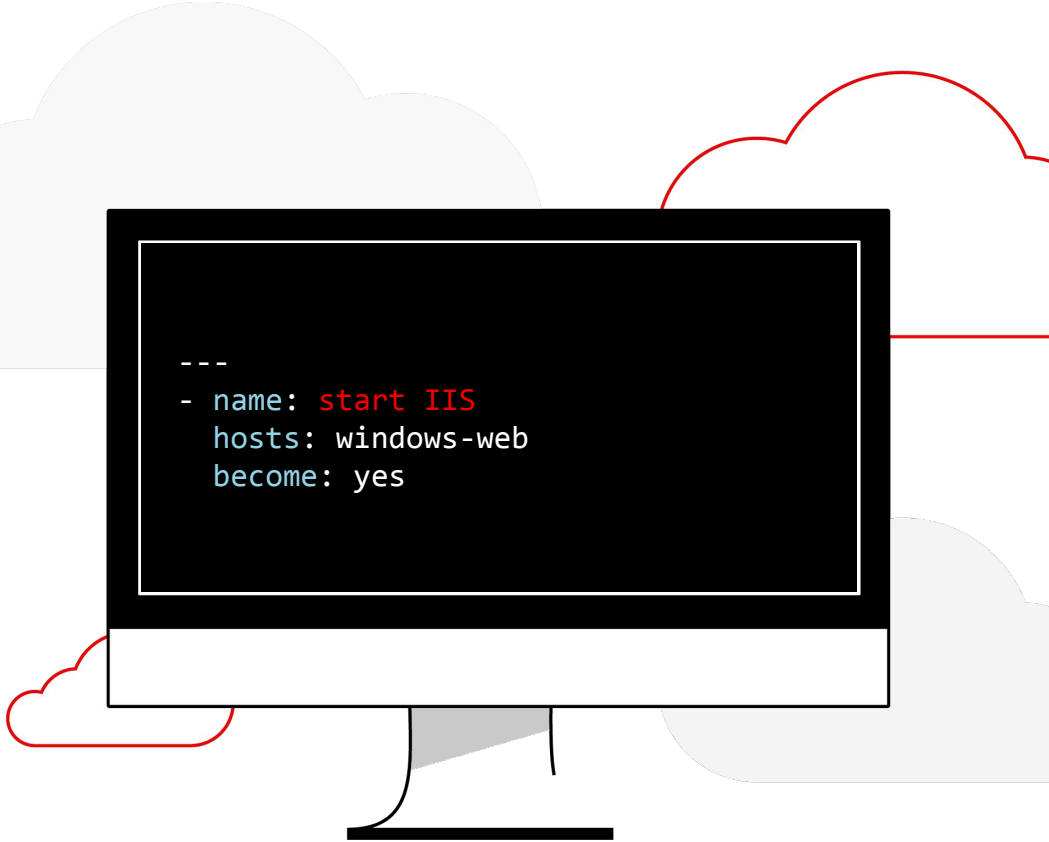
What am I automating?

What are they?

Top level specification for a group of tasks. Will tell that play which hosts it will execute on and control behavior such as fact gathering or privilege level.

Building blocks for playbooks

Multiple plays can exist within an Ansible playbook that execute on different hosts.



Ansible modules

The “tools in the toolkit”

What are they?

Parametrized components with internal logic, representing a single step to be done. The modules “do” things in Ansible.

Language

Powershell for Windows, python for linux. Can be of any language.

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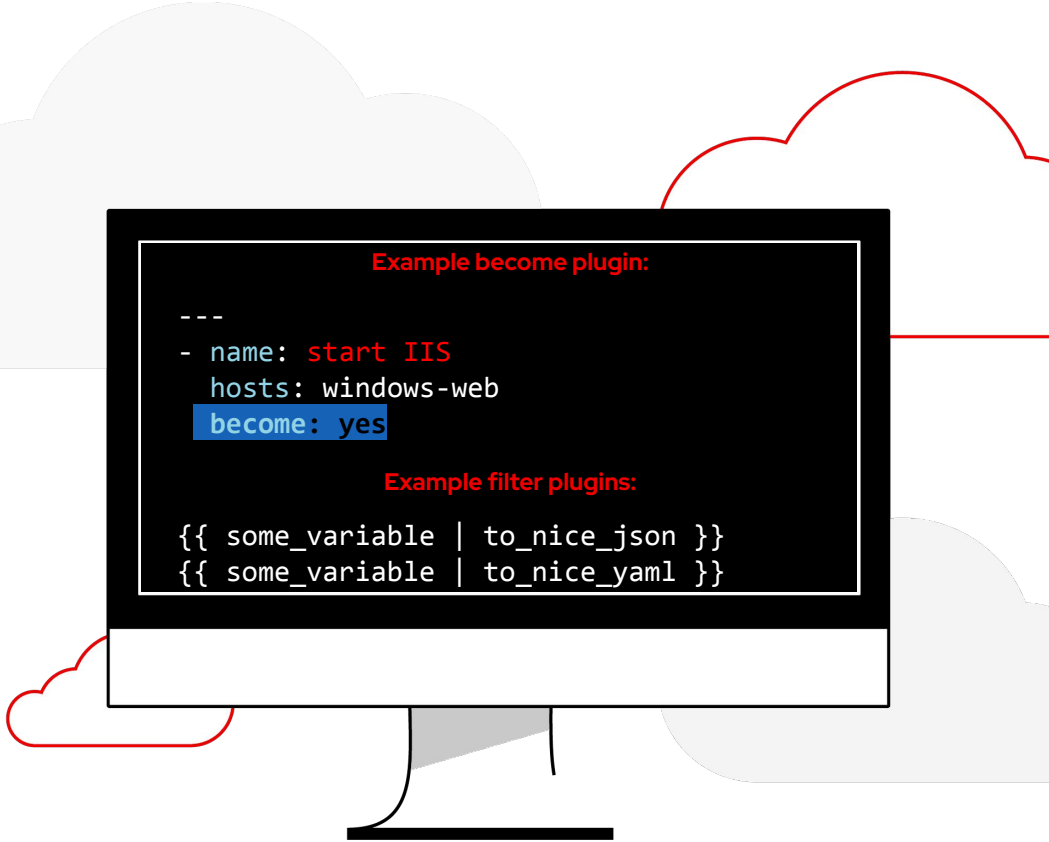
Ansible plugins

The “extra bits”

What are they?

Plugins are pieces of code that augment Ansible’s core functionality. Ansible uses a plugin architecture to enable a rich, flexible, and expandable feature set.

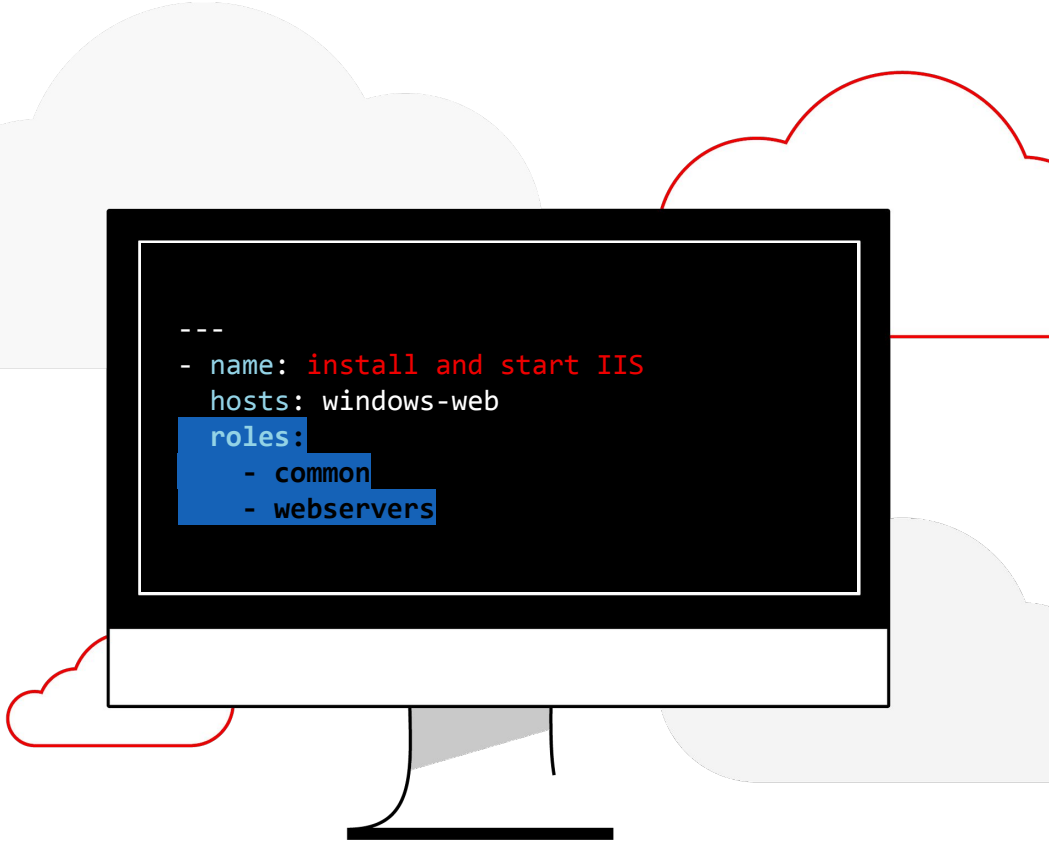


Ansible roles

Reusable automation actions

What are they?

Group your tasks and variables of your automation in a reusable structure. Write roles once, and share them with others who have similar challenges in front of them.



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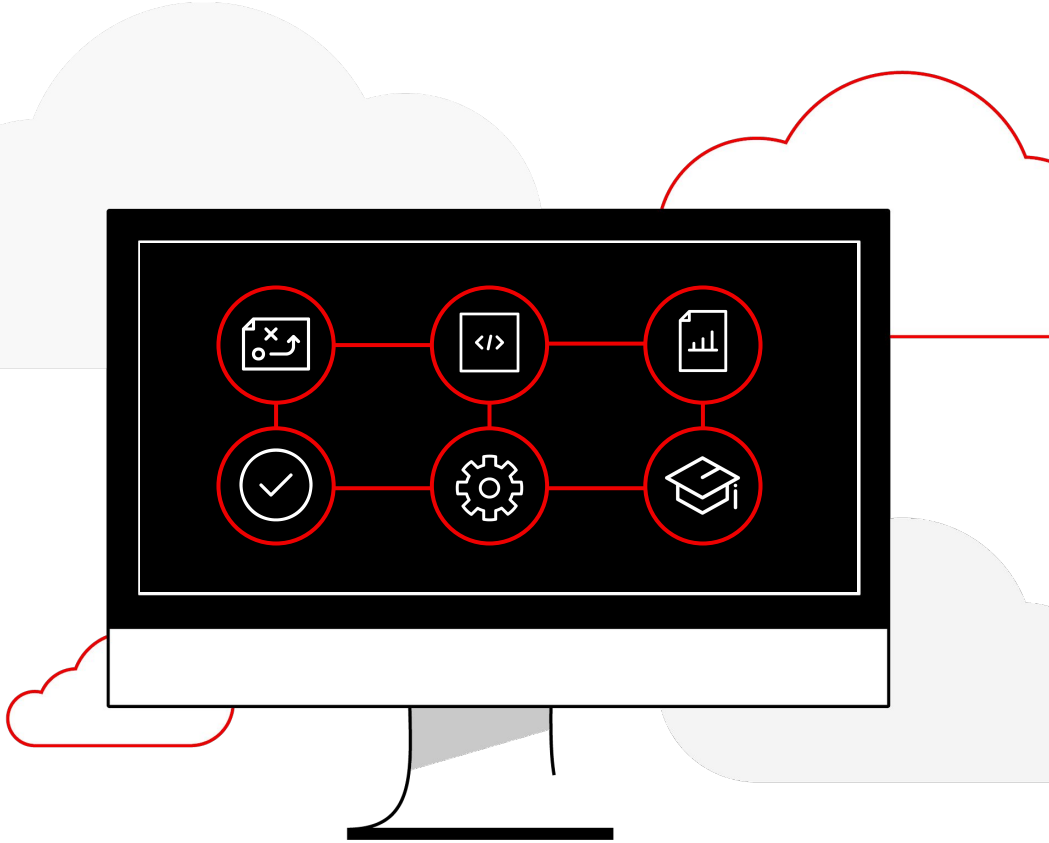
Collections

Simplified and consistent content delivery

What are they?

Collections are a data structure containing automation content:

- Modules
- Playbooks
- Roles
- Plugins
- Docs
- Tests



Collections

```
nginx_core
├── MANIFEST.json
├── playbooks
│   ├── deploy-nginx.yml
│   └── ...
├── plugins
├── README.md
└── roles
    ├── nginx
    │   ├── defaults
    │   ├── files
    │   │   └── ...
    │   ├── tasks
    │   └── templates
    │       └── ...
    ├── nginx_app_protect
    └── nginx_config
```

deploy-nginx.yml

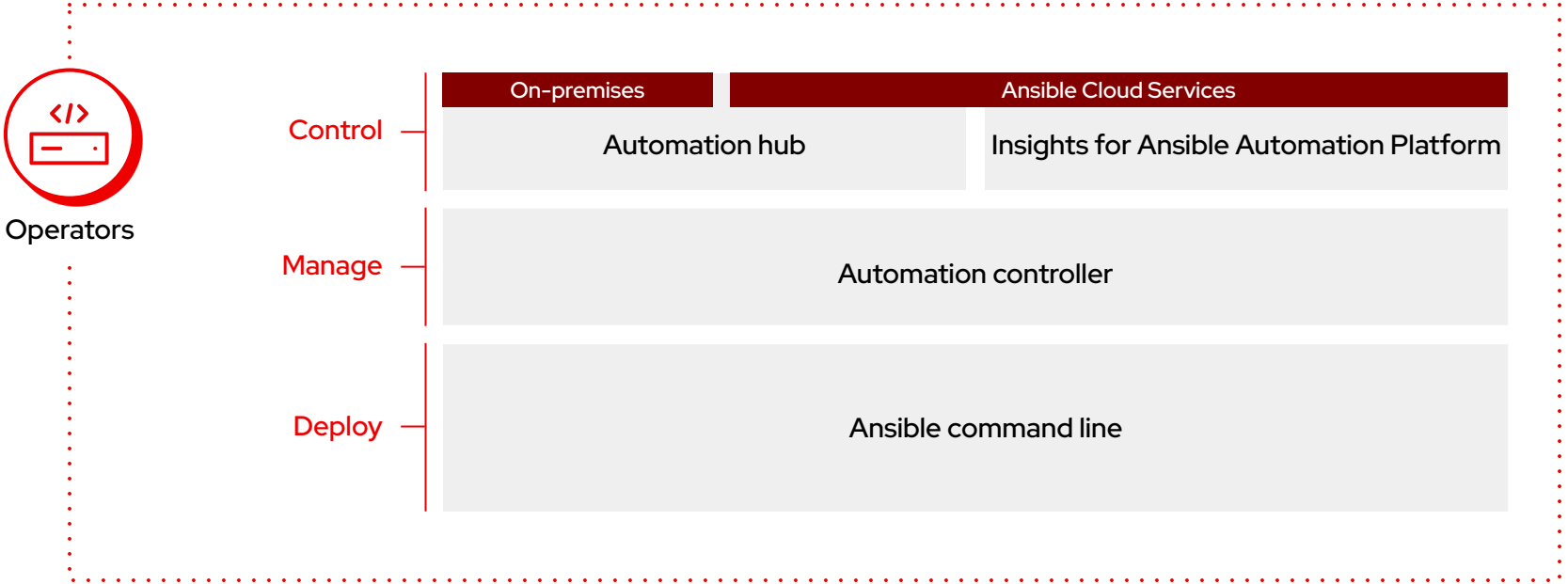
```yaml
---
- name: Install NGINX Plus
  hosts: all
  tasks:
    - name: Install NGINX
      include_role:
        name: nginxinc.nginx
      vars:
        nginx_type: plus

    - name: Install NGINX App Protect
      include_role:
        name: nginxinc.nginx_app_protect
      vars:
        nginx_app_protect_setup_license: false
        nginx_app_protect_remove_license: false
        nginx_app_protect_install_signatures: false
```

Automation Controller

Operate

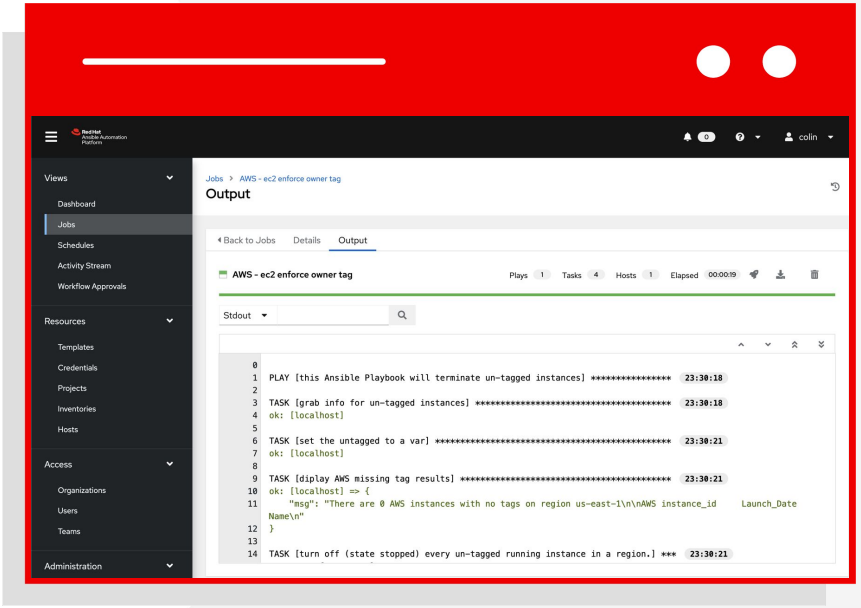
The automation lifecycle



A playbook run

Where it all starts

- A playbook is interpreted and run against one or multiple hosts - task by task. The order of the tasks defines the execution.
- In each task, the module does the actual work.



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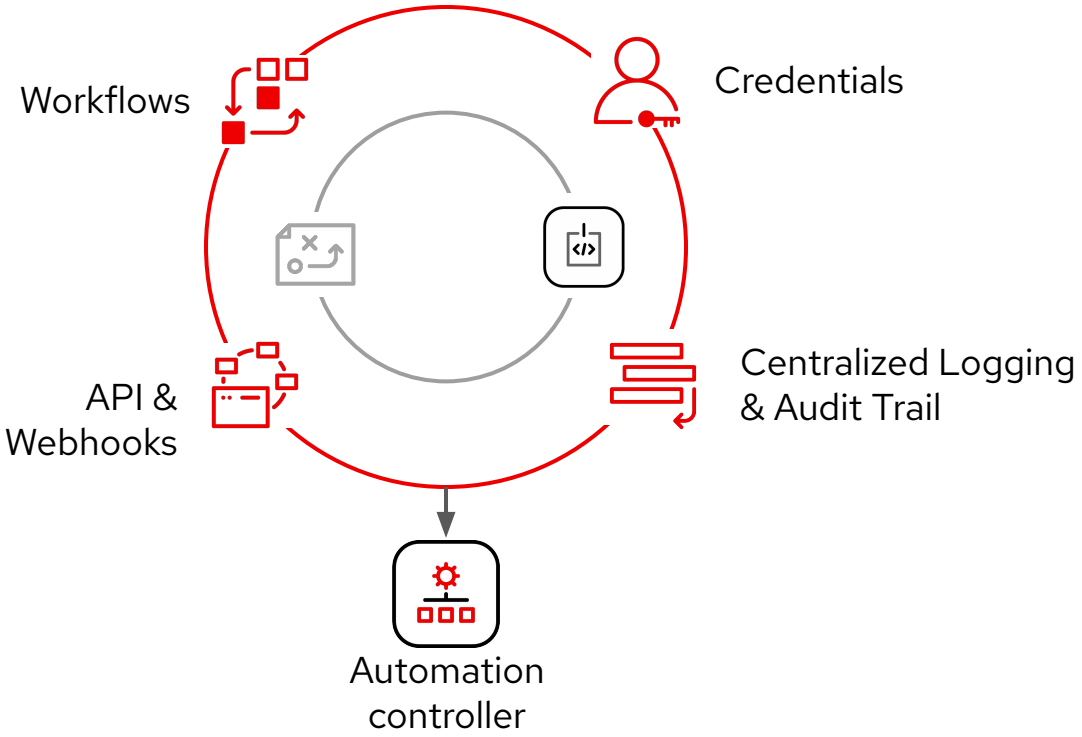
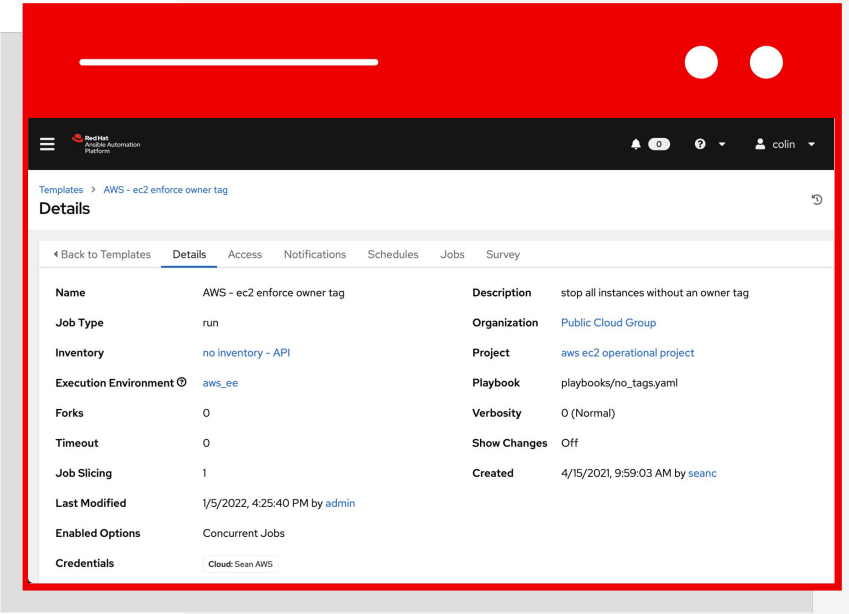
Anatomy of Automation Operation



Execution of content

Running at the core

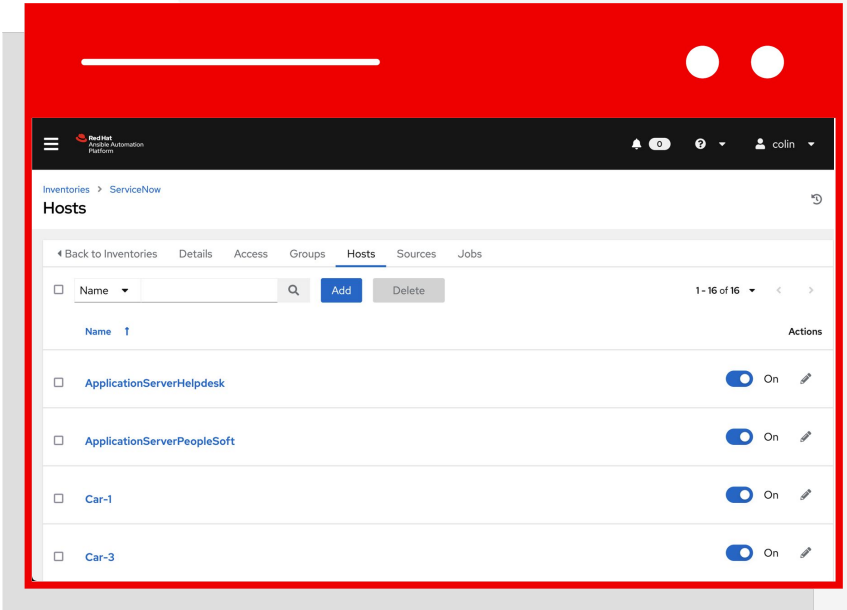
- The central execution of automation content is managed and done either via central cluster..
- Can also sync git repositories, takes care of execution environments, collections, credentials, inventory and logging.
- Full audit trail of the execution, including what version of content was executed, what variable values were provided, etc.



Inventories and credentials

How to talk to others

- An inventory is a collection of hosts (nodes) with associated data and groupings that the automation platform can connect to and manage:
  - Nodes
  - Groups
  - Can be static or dynamic
  - Smart inventories possible
- And what usernames and passwords do you use during connection? That is kept in the credentials.



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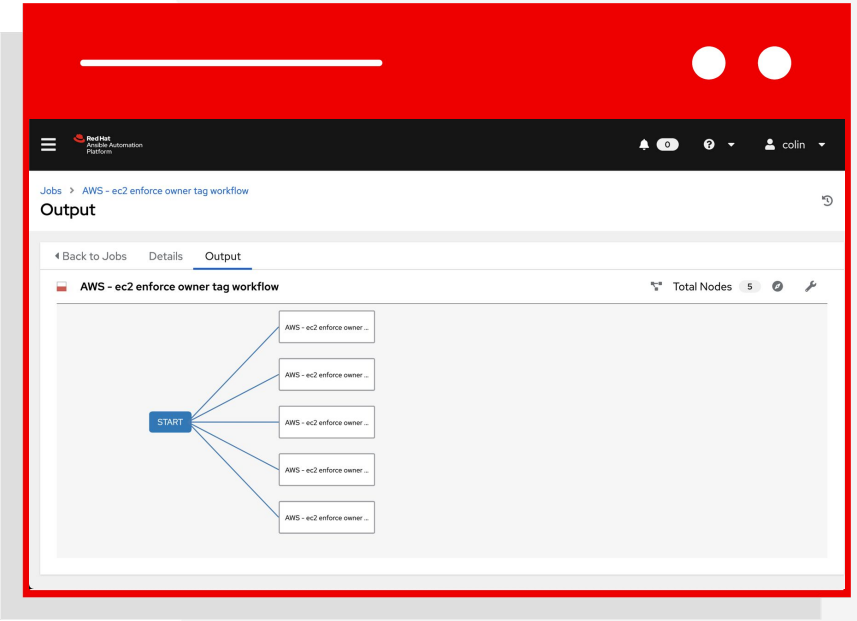
Workflows

Combine automation to create something bigger

- Workflows enable the creation of powerful holistic automation, chaining together multiple pieces of automation and events.
- Simple logic inside these workflows can trigger automation depending on the success or failure of previous steps.



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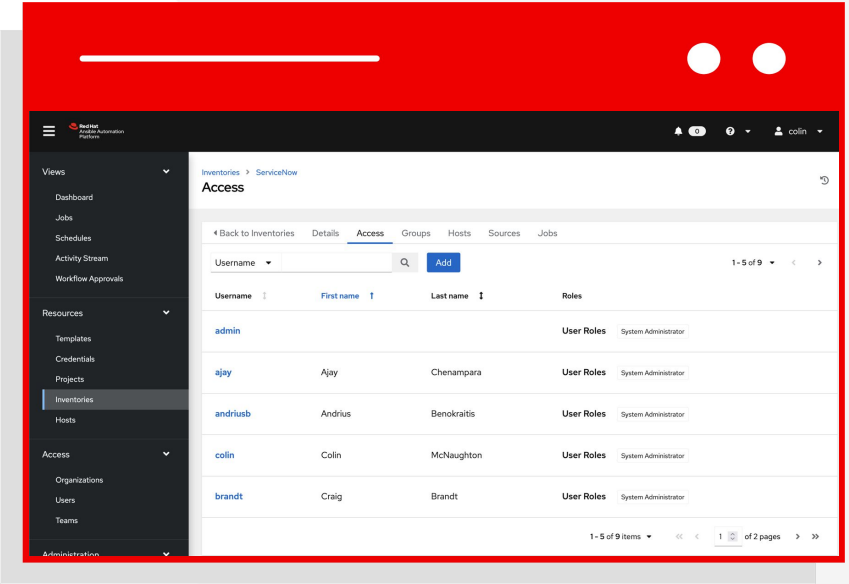
Role-based access control

How to manage access

- Role-based access control system:
  Users can be grouped in teams, and roles can be assigned to the teams.
- Rights to edit or use can be assigned across all objects.
- All backed by enterprise authentication if needed.



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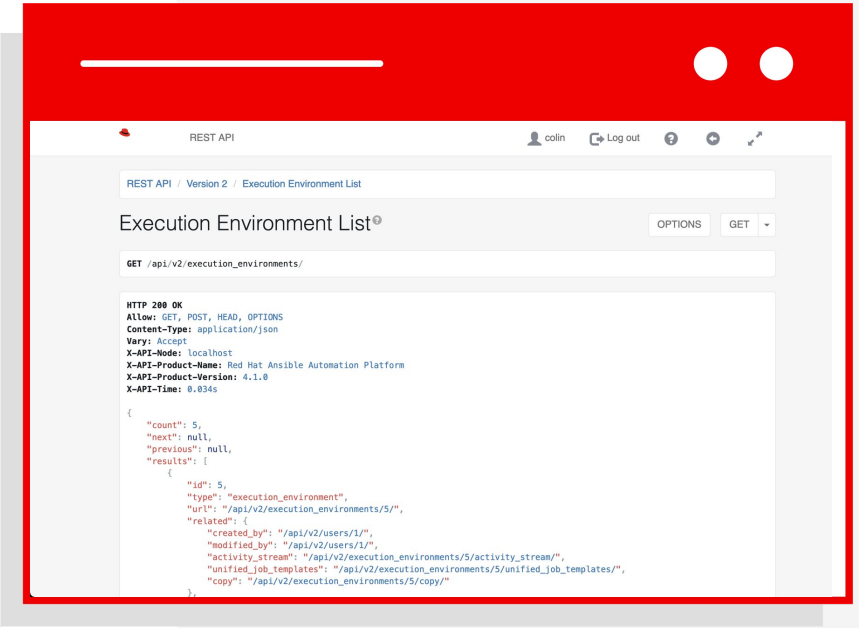
API

Integration of automation into larger workflows

- The API provides programmatic access to the automation via a defined interface.
- Underneath it is still powered by the same bits and pieces which are at the core: workflows, inventories, etc.
- It offers simple integration into other tools like ITSM, SOAR, etc.



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Lab Time

Exercise 1 - Configure Automation Controller

This lab is all about exploring the environment and configuring Automation Controller to import project code from source control

Approximate time: 15 mins

Ad-hoc command execution

Ad-hoc Commands

An ad-hoc command is a single Ansible task to perform quickly, but don’t want to save for later.

Ad-hoc Commands: Common Options

- **-m MODULE_NAME, --module-name=MODULE_NAME**
  Module name to execute the ad-hoc command
- **-a MODULE_ARGS, --args=MODULE_ARGS**
  Module arguments for the ad-hoc command
- **-b, --become**
  Run ad-hoc command with elevated rights such as sudo, the default method
- **-e EXTRA_VARS, --extra-vars=EXTRA_VARS**
  Set additional variables as key=value or YAML/JSON
- **--version**
  Display the version of Ansible
- **--help**
  Display the MAN page for the Ansible tool

Ad-hoc Commands

```
# check all my inventory hosts are ready to be
# managed by Ansible
$ ansible all -m win_ping

# collect and display the discovered facts
# for the localhost
$ ansible localhost -m setup

# run the uptime command on all hosts in the
# web group
$ ansible web -m command -a "uptime"
```

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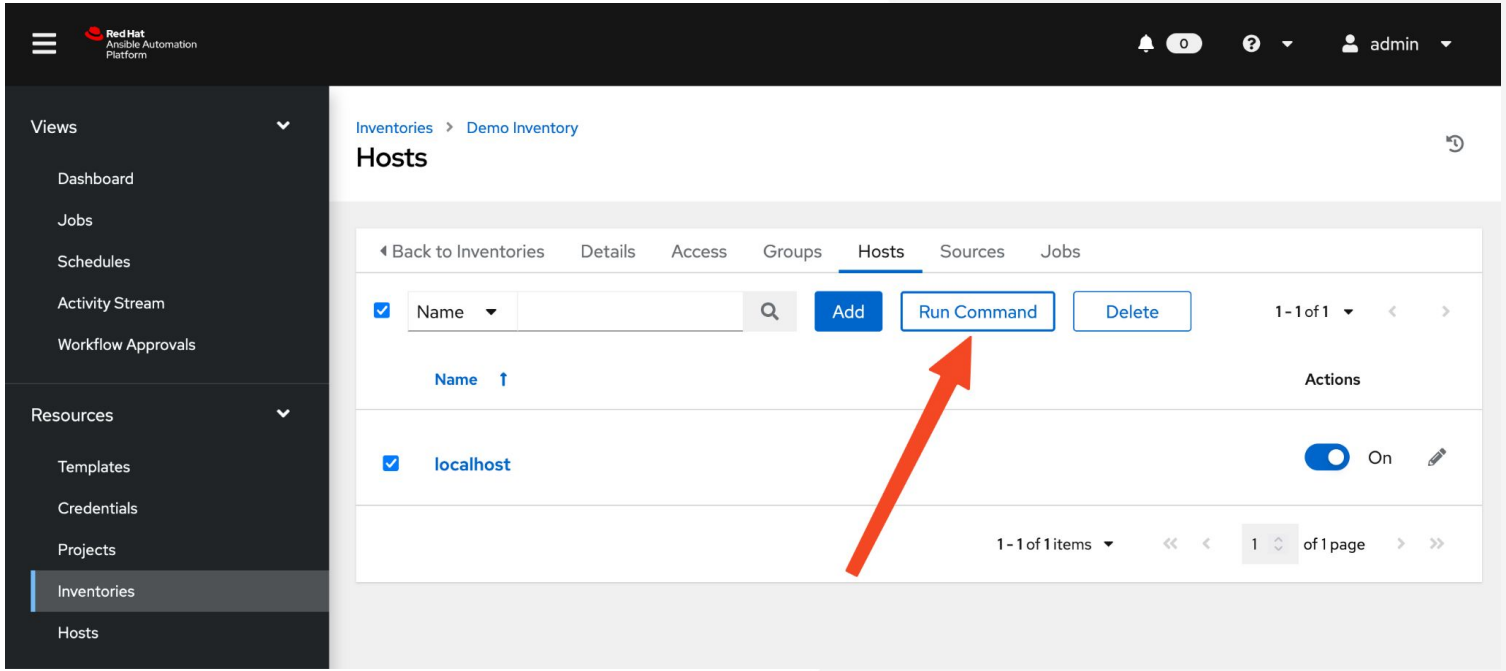
Ad-hoc Commands from Automation Controller



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Lab Time

Exercise 2 - Ad-hoc commands

This lab guides you through executing ad-hoc commands from Automation Controller

Approximate time: 15 mins

Playbooks

Variables

Ansible can work with metadata from various sources and manage their context in the form of variables.

- Command line parameters
- Plays and tasks
- Files
- Inventory
- Discovered facts
- Roles

Discovered facts

Facts are bits of information derived from examining a host systems that are stored as variables for later use in a play.

```
$ ansible localhost -m setup
localhost | success >> {
  "ansible_facts": {
      "ansible_default_ipv4": {
          "address": "192.168.1.37",
          "alias": "wlan0",
          "gateway": "192.168.1.1",
          "interface": "wlan0",
          "macaddress": "c4:85:08:3b:a9:16",
          "mtu": 1500,
          "netmask": "255.255.255.0",
          "network": "192.168.1.0",
          "type": "ether"
      },
```

Variable Precedence

The order in which the same variable from different sources will override each other.

1. command line values (eg "-u user")
2. role defaults [1]
3. inventory file or script group vars [2]
4. **inventory group_vars/all** [3]
5. playbook group_vars/all [3]
6. **inventory group_vars/*** [3]
7. playbook group_vars/* [3]
8. inventory file or script host vars [2]
9. **inventory host_vars/*** [3]
10. playbook host_vars/* [3]
11. host facts / cached set_facts [4]
12. play vars
13. play vars_prompt
14. play vars_files
15. role vars (defined in role/vars/main.yml)
16. block vars (only for tasks in block)
17. task vars (only for the task)
18. include_vars
19. set_facts / registered vars
20. role (and include_role) params
21. include params
22. extra vars (**always win precedence**)

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Tasks

Tasks are the application of a module to perform a specific unit of work.

- **win_file**: A directory should exist
- **win_package**: A package should be installed
- **win_service**: A service should be running
- **win_template**: Render a configuration file from a template
- **win_get_url**: Fetch an archive file from a URL
- **win_copy**: Copy a file from your repository or a remote source

Tasks

```
tasks:
- name: Ensure IIS Server is present
  win_feature:
    name: Web-Server
    state: present

- name: Ensure latest index.html file is present
  win_copy:
    src: files/index.html
    dest: c:\www\

- name: Restart IIS
  win_service:
    name: IIS Admin Service
    state: restarted
```

Handler Tasks

Handlers are special tasks that run at the end of a play if notified by another task when a change occurs.

> *If a package gets installed or updated, notify a service restart task that it needs to run.*

Handler Tasks

```
tasks:
- name: Ensure IIS Server is present
  win_feature:
    name: Web-Server
    state: present
  notify: Restart IIS

- name: Ensure latest index.html file is present
  win_copy:
    src: files/index.html
    dest: c:\www\

handlers:
- name: Restart IIS
  win_service:
    name: IIS Admin Service
    state: restarted
```

Plays and playbooks

Plays are ordered sets of tasks to execute against host selections from your inventory. A playbook is a file containing one or more plays.

Plays and playbooks

```
---
- name: Ensure IIS is installed and started
  hosts: web
  become: yes
  vars:
    service_name: IIS Admin Service

  tasks:
  - name: Ensure IIS Server is present
    win_feature:
      name: Web-Server
      state: present

  - name: Ensure latest index.html file is present
    win_copy:
      src: files/index.html
      dest: c:\www\

  - name: Ensure IIS is started
    win_service:
      name: "{{ service_name }}"
      state: started
```

Meaningful names

```
---
- name: Ensure IIS is installed and started
  hosts: web
  become: yes
  vars:
    service_name: IIS Admin Service

  tasks:
  - name: Ensure IIS Server is present
    win_feature:
      name: Web-Server
      state: present

  - name: Ensure latest index.html file is present
    win_copy:
      src: files/index.html
      dest: c:\www\

  - name: Ensure IIS is started
    win_service:
      name: "{{ service_name }}"
      state: started
```

Host selector

```
---
- name: Ensure IIS is installed and started
  hosts: web
  become: yes
  vars:
    service_name: IIS Admin Service

  tasks:
  - name: Ensure IIS Server is present
    win_feature:
      name: Web-Server
      state: present

  - name: Ensure latest index.html file is present
    win_copy:
      src: files/index.html
      dest: c:\www\

  - name: Ensure IIS is started
    win_service:
      name: "{{ service_name }}"
      state: started
```

Privilege escalation

```
---
- name: Ensure IIS is installed and started
  hosts: web
  become: yes
  vars:
    service_name: IIS Admin Service

  tasks:
  - name: Ensure IIS Server is present
    win_feature:
      name: Web-Server
      state: present

  - name: Ensure latest index.html file is present
    win_copy:
      src: files/index.html
      dest: c:\www\

  - name: Ensure IIS is started
    win_service:
      name: "{{ service_name }}"
      state: started
```

Plays variables

```
---
- name: Ensure IIS is installed and started
  hosts: web
  become: yes
  vars:
    service_name: IIS Admin Service

  tasks:
  - name: Ensure IIS Server is present
    win_feature:
      name: Web-Server
      state: present

  - name: Ensure latest index.html file is present
    win_copy:
      src: files/index.html
      dest: c:\www\

  - name: Ensure IIS is started
    win_service:
      name: "{{ service_name }}"
      state: started
```

Tasks

```
---
- name: Ensure IIS is installed and started
  hosts: web
  become: yes
  vars:
    service_name: IIS Admin Service

  tasks:
  - name: Ensure IIS Server is present
    win_feature:
      name: Web-Server
      state: present

  - name: Ensure latest index.html file is present
    win_copy:
      src: files/index.html
      dest: c:\www\

  - name: Ensure IIS is started
    win_service:
      name: "{{ service_name }}"
      state: started
```

Lab Time

Exercise 3 - Intro to playbooks

In this lab you'll author your first playbook

Exercise 4 - Configure a job template

This lab guides you through creating a job template from an existing project

Approximate time: 25 mins

Advanced playbooks

Doing more with playbooks

Here are some more essential playbook features that you can apply:

- Templates
- Loops
- Conditionals
- Tags
- Blocks

Doing more with playbooks: **Templates**

Ansible embeds the Jinja2 templating engine that can be used to dynamically:

- Set and modify play variables
- Conditional logic
- Generate files such as configurations from variables

Doing more with playbooks: **Loops**

Loops can do one task on multiple things, such as create a lot of users, install a lot of packages, or repeat a polling step until a certain result is reached.

```
- name: Ensure IIS Server is present
  win_feature:
    name: "{{ item }}"
    state: present
  loop:
  - Web-Server
  - NET-Framework-Core
```

Doing more with playbooks: **Conditionals**

Ansible supports the conditional execution of a task based on the run-time evaluation of variable, fact, or previous task result.

```
- name: Ensure IIS Server is present
  win_feature:
    name: Web-Server
    state: present
  when: ansible_os_family == "Windows"
```

Doing more with playbooks: **Tags**

Tags are useful to be able to run a subset of a playbook on-demand.

```
- name: Ensure IIS Server is present
  win_feature:
    name: "{{ item }}"
    state: present
  with_items:
  - Web-Server
  - NET-Framework-Core
  tags:
    - packages

- name: Copy web.config template to Server
  win_template:
    src: templates/web.config.j2
    dest: C:\inetpub\wwwroot\web.config
  tags:
    - configuration
```

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Doing more with playbooks: **Blocks**

Blocks cut down on repetitive task directives, allow for logical grouping of tasks and even in play error handling.

```
- block:
  - name: Ensure IIS Server is present
    win_feature:
      name: "{{ item }}"
      state: present
    with_items:
    - Web-Server

  - name: Copy web.config template to Server
    win_template:
      src: templates/web.config.j2
      dest: C:\inetpub\wwwroot\web.config

  when: ansible_os_family == "Windows"
```

Lab Time

Exercise 5 - More advanced playbook

This lab expands on the existing playbook

Approximate time: 15 mins

Sharing automation

Roles

Roles are a packages of closely related Ansible content that can be shared more easily than plays alone.

- Improves readability and maintainability of complex plays
- Eases sharing, reuse and standardization of automation processes
- Enables Ansible content to exist independently of playbooks, projects -- even organizations
- Provides functional conveniences such as file path resolution and default values

Roles

Project with Embedded Roles Example

```
site.yml
roles/
  common/
    files/
    templates/
    tasks/
    handlers/
    vars/
    defaults/
    meta/
```

```
  iis/
    files/
    templates/
    tasks/
    handlers/
    vars/
    defaults/
    meta/
```

Roles

Project with Embedded Roles Example

```
# site.yml
---
- name: Execute common and iis role
  hosts: web
  roles:
    - common
    - iis
```

Roles

http://galaxy.ansible.com

Ansible Galaxy is a hub for finding, reusing and sharing Ansible content.

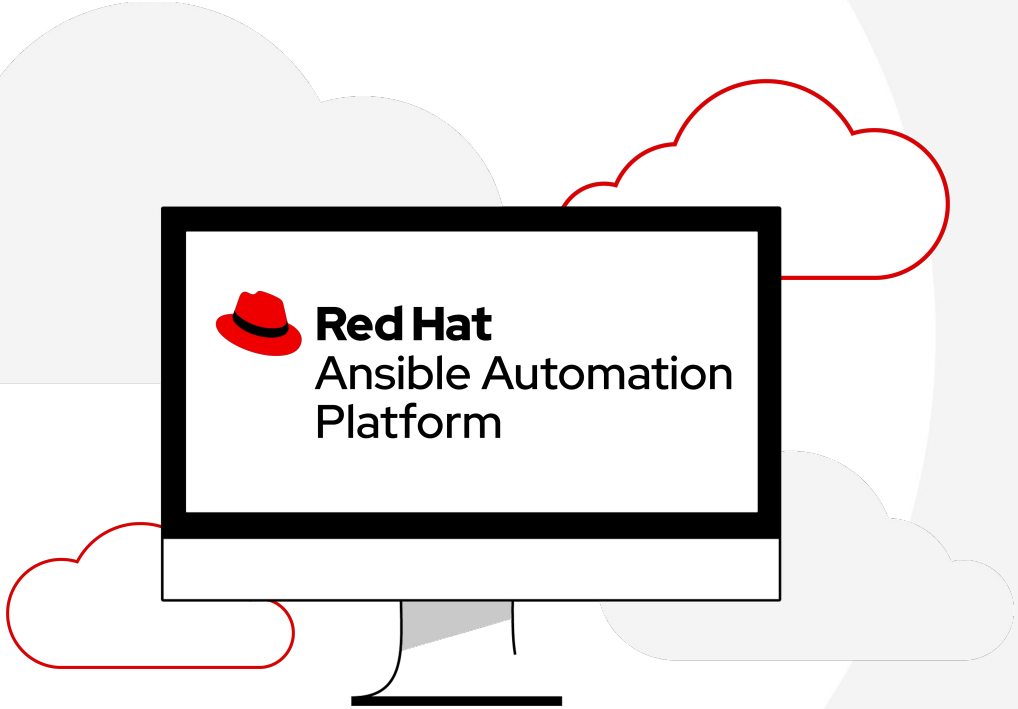
Jump-start your automation project with content contributed and reviewed by the Ansible community.

Lab Time

Exercise 6 - Ansible roles

In this lab you will convert your existing automation into roles that can be reused as a part of larger automated workflows

Approximate time: 15 mins



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