Red Hat
Ansible Automation
Platform

Ansible Linux Automation Workshop

Introduction to Ansible for Red Hat Enterprise Linux Automation
for System Administrators and Operators

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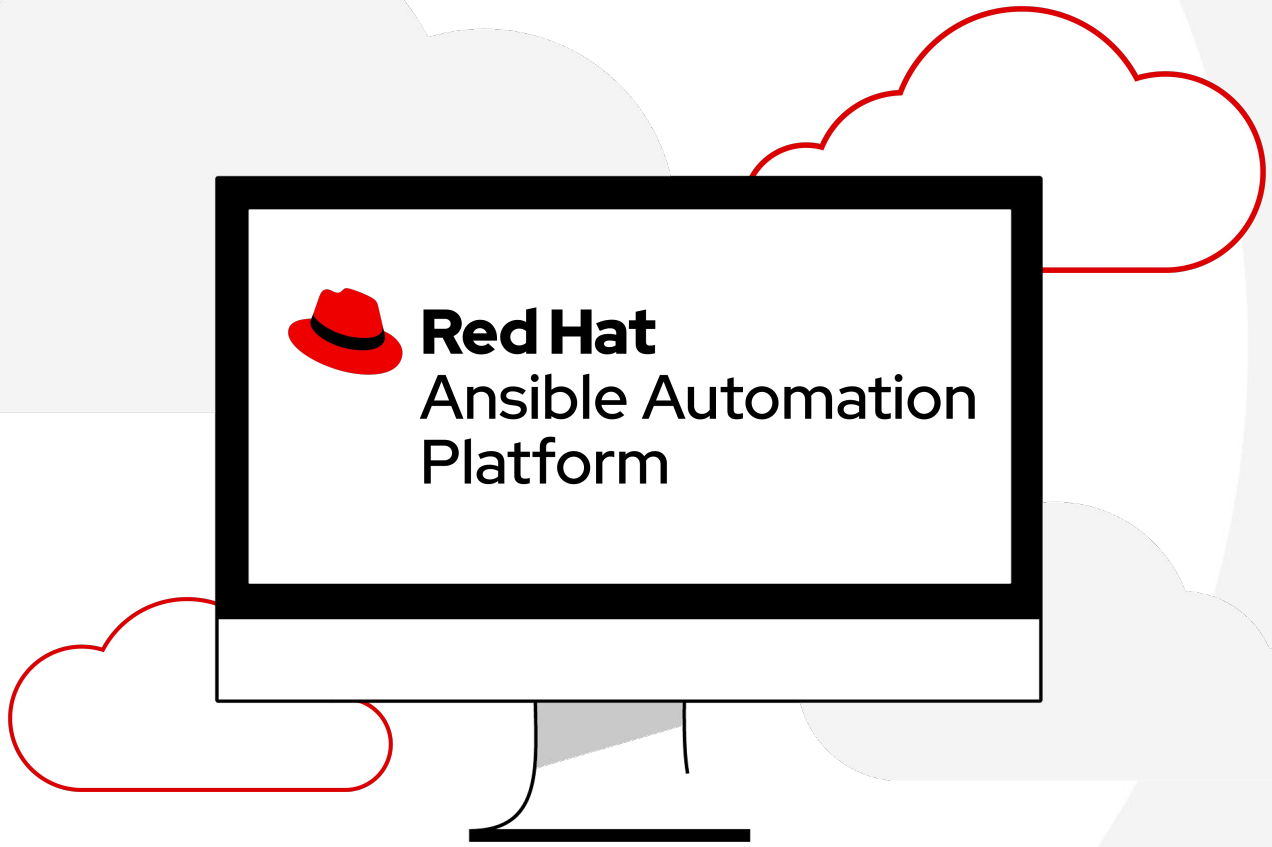

What you will learn

- Intro to Ansible Automation Platform
- How it Works
- Understanding modules, tasks, playbooks
- How to execute Ansible commands
- Using variables and templates
- Automation Controller - where it fits in
- Automation Controller basics
- Major Automation Controller features - RBAC, workflows

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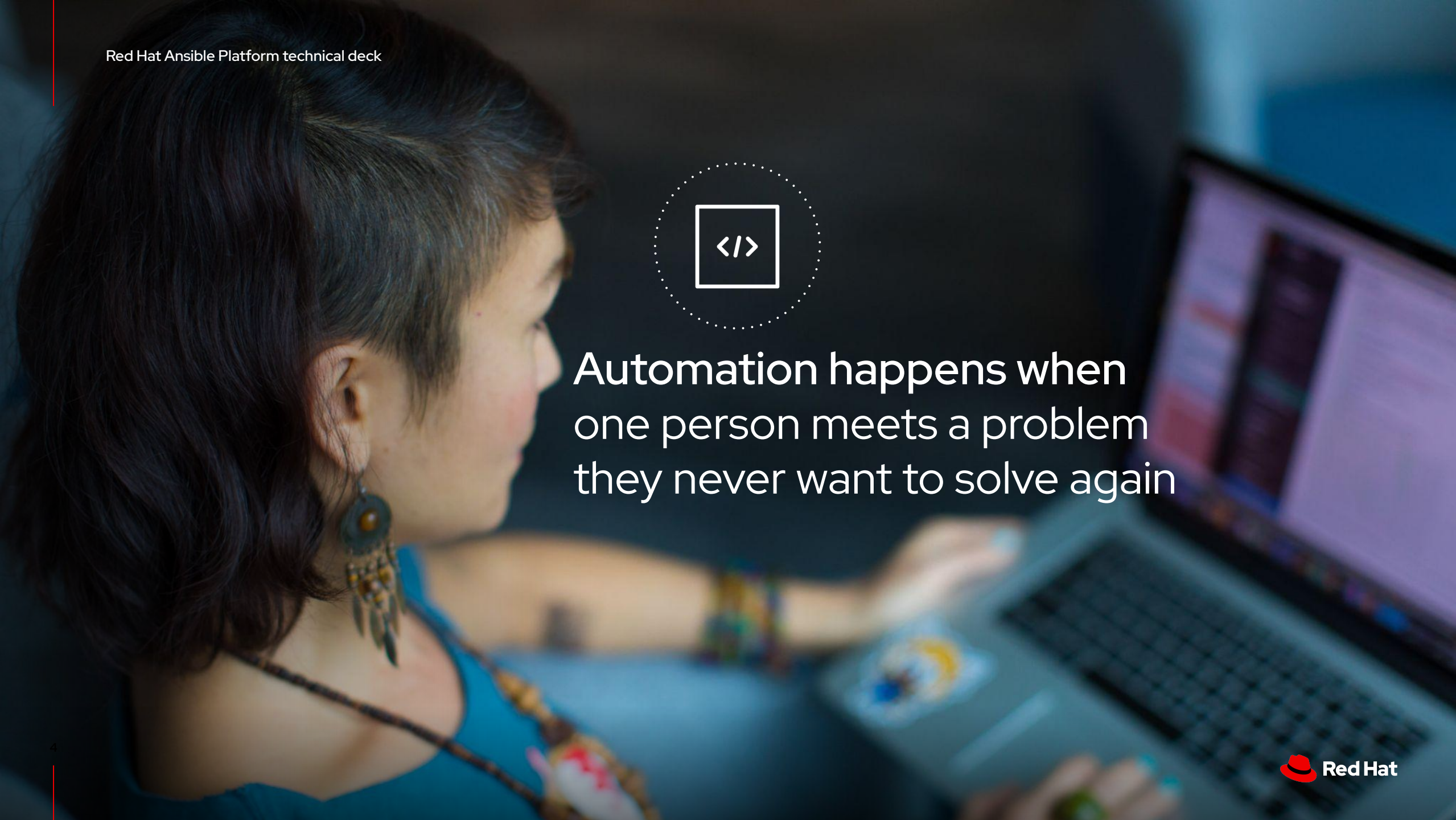
Introduction

Topics Covered:

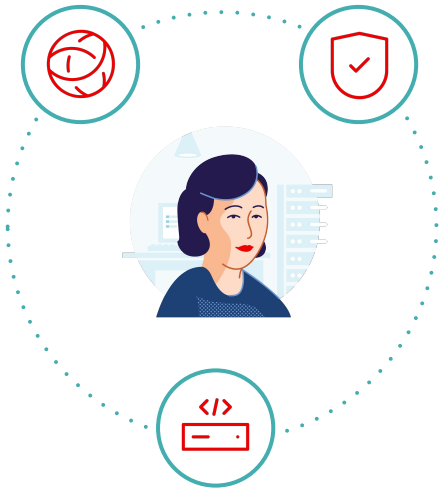
- Why the Ansible Automation Platform?
- What can it do?



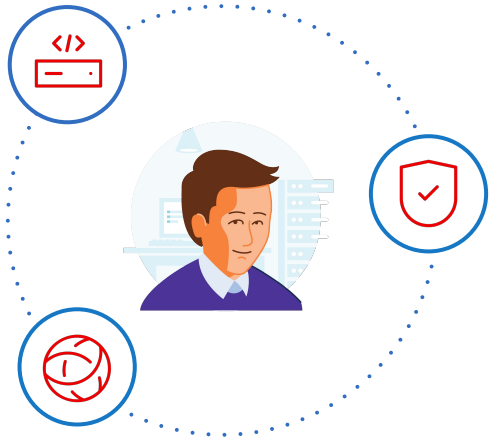
Automation happens when
one person meets a problem
they never want to solve again

Many organizations share the same challenge

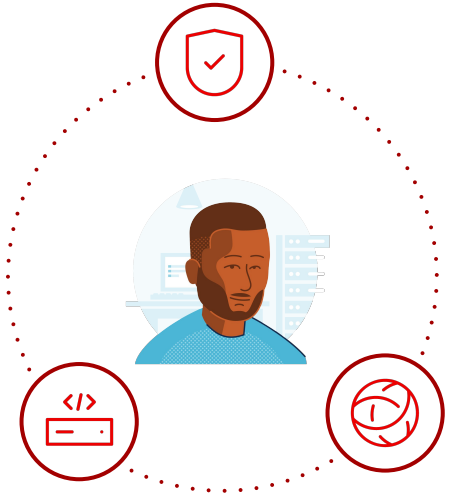
Too many unintegrated, domain-specific tools



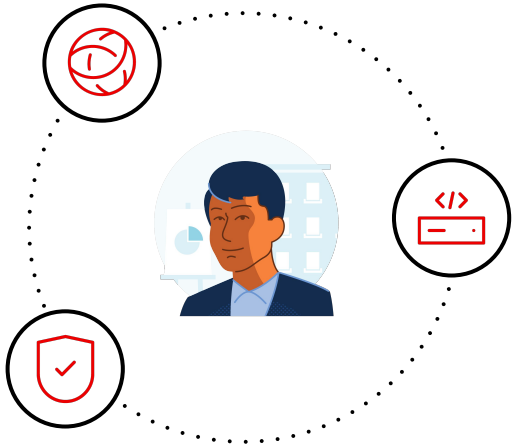
Network ops



SecOps

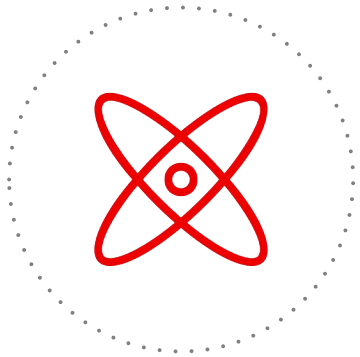


Devs/DevOps



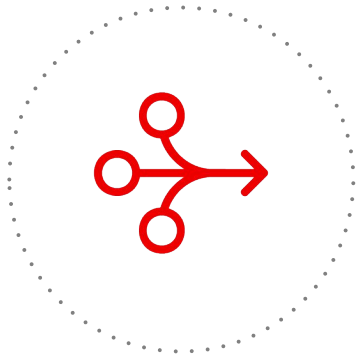
IT ops

Why the Ansible Automation Platform?



Powerful

Orchestrate complex processes at enterprise scale.



Simple

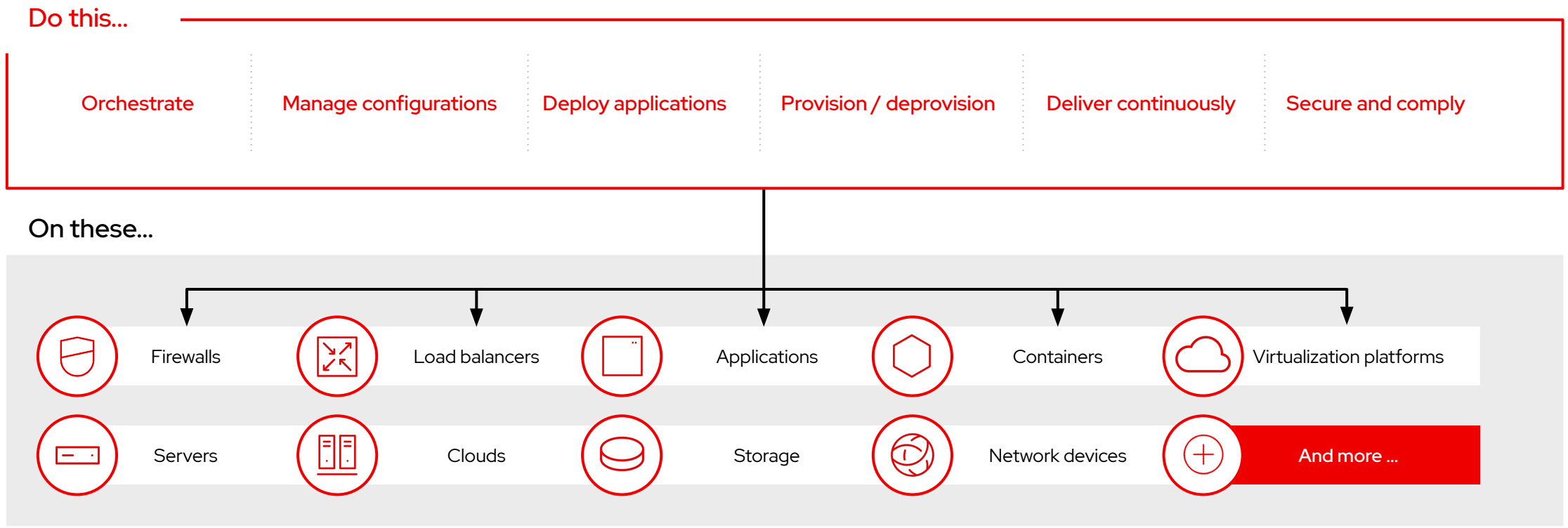
Simplify automation creation and management across multiple domains.

Agentless

Easily integrate with hybrid environments.

Automate the deployment and management of automation

Your entire IT footprint



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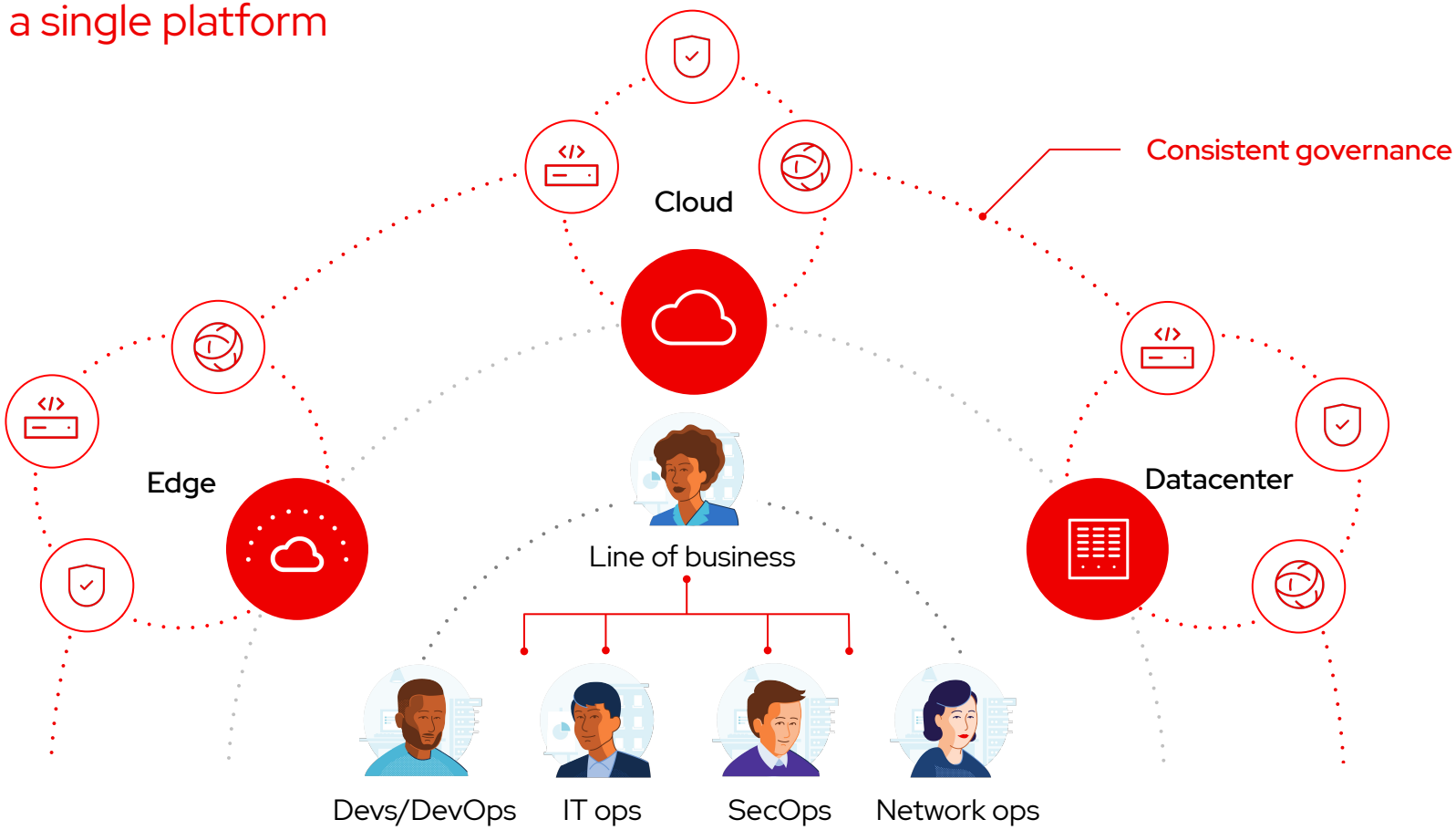
Break down silos

Different teams a single platform



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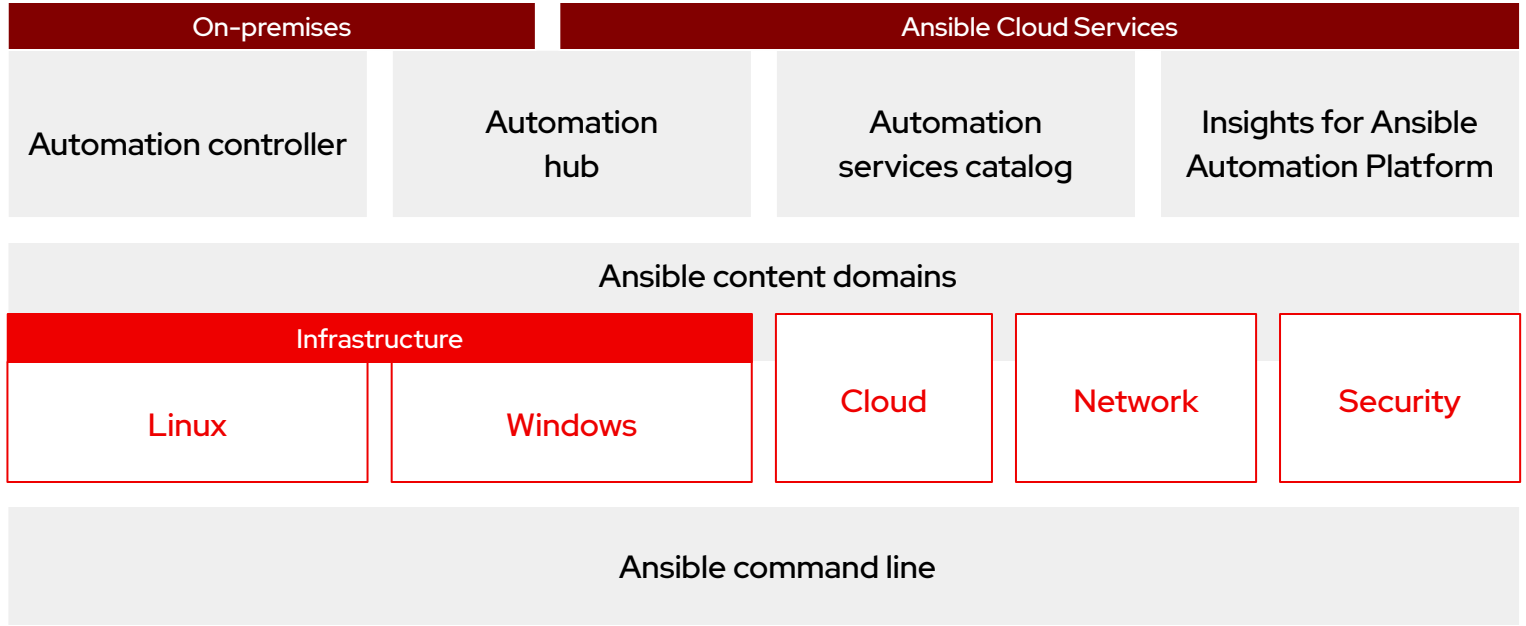
Red Hat Ansible Automation Platform

Content creators

Operators

Domain experts

Users



Fueled by an open source community

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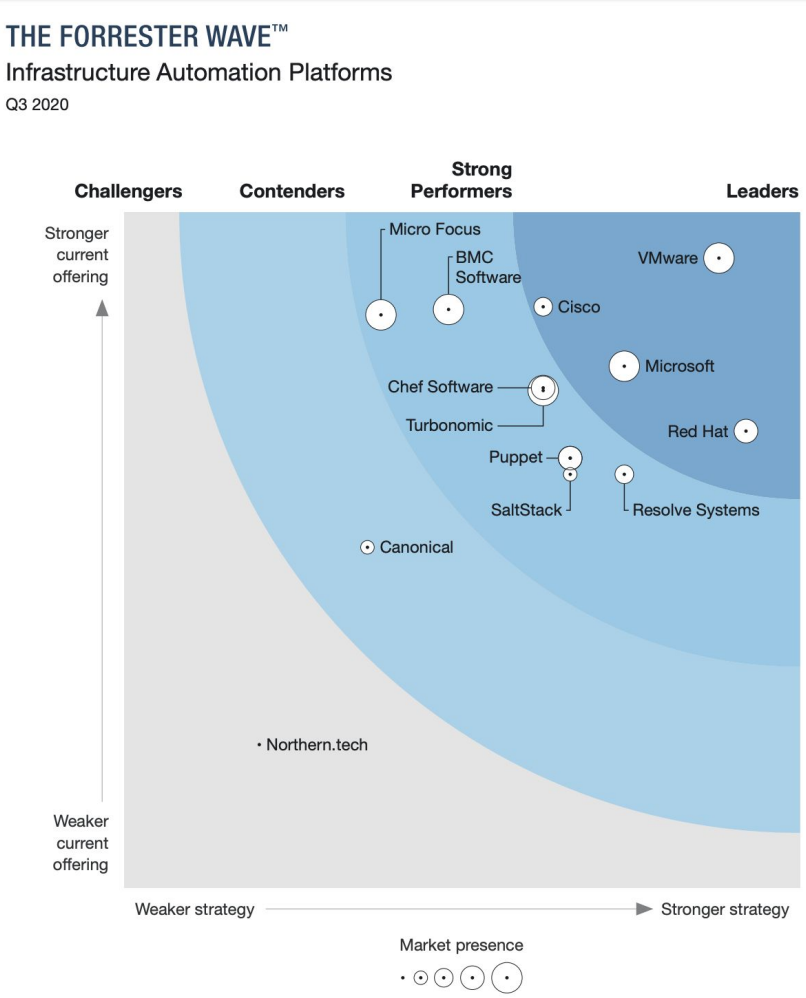

Red Hat named a Leader in The Forrester Wave™

Infrastructure Automation Platforms, Q3 2020

Received highest possible score in the criteria of:

- Deployment functionality
- Product Vision
- Partner Ecosystem
- Supporting products and services
- Community support
- Planned product enhancements

- "Ansible continues to grow quickly, particularly among enterprises that are automating networks. The solution excels at providing a variety of deployment options and acting as a service broker to a wide array of other automation tools."
- "Red Hat's solution is a good fit for customers that want a holistic automation platform that integrates with a wide array of other vendors' infrastructure."

Source:
Gardner, Chris, Glenn O'Donnell, Robert Perdonii, and Diane Lynch. "The Forrester Wave™: Infrastructure Automation Platforms, Q3 2020." *Forrester*, 10 Aug. 2020.

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Section 1
The Ansible Basics

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Exercise 1.1

Topics Covered:

- Understanding the Ansible Infrastructure
- Check the prerequisites

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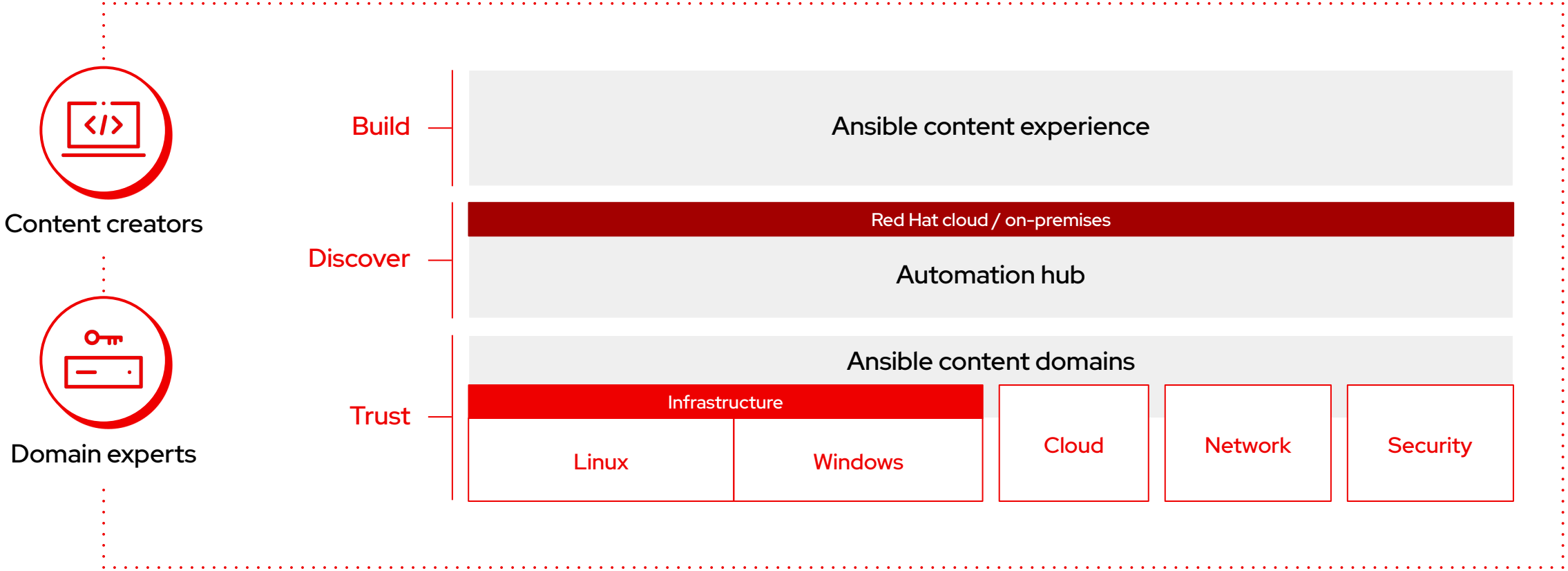
Create

The automation lifecycle



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Ansible playbooks

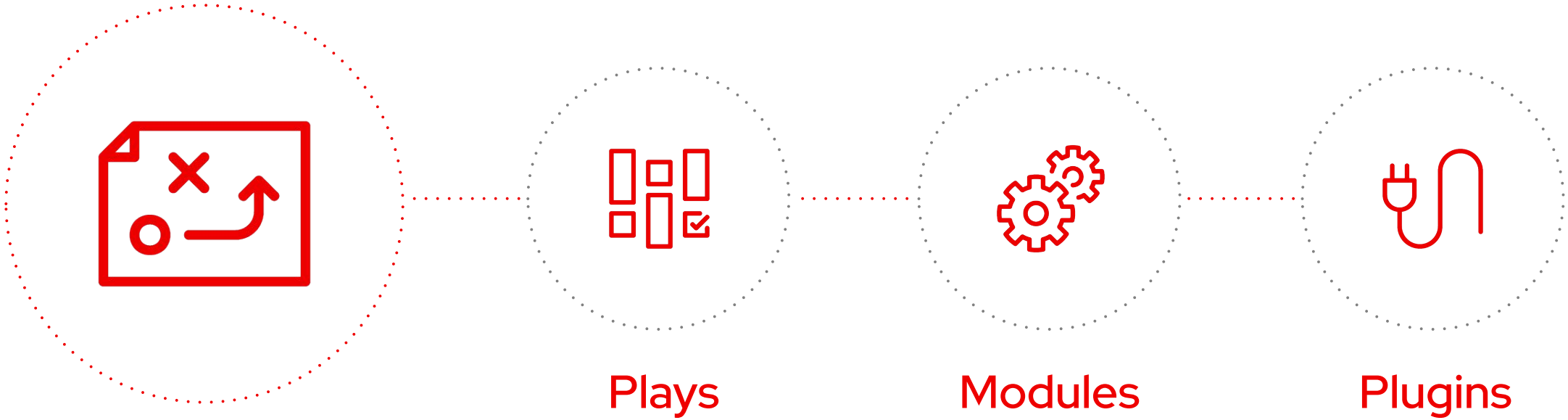
```
---
- name: install and start apache
  hosts: web
  become: yes

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

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

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

What makes up an Ansible playbook?



Ansible plays

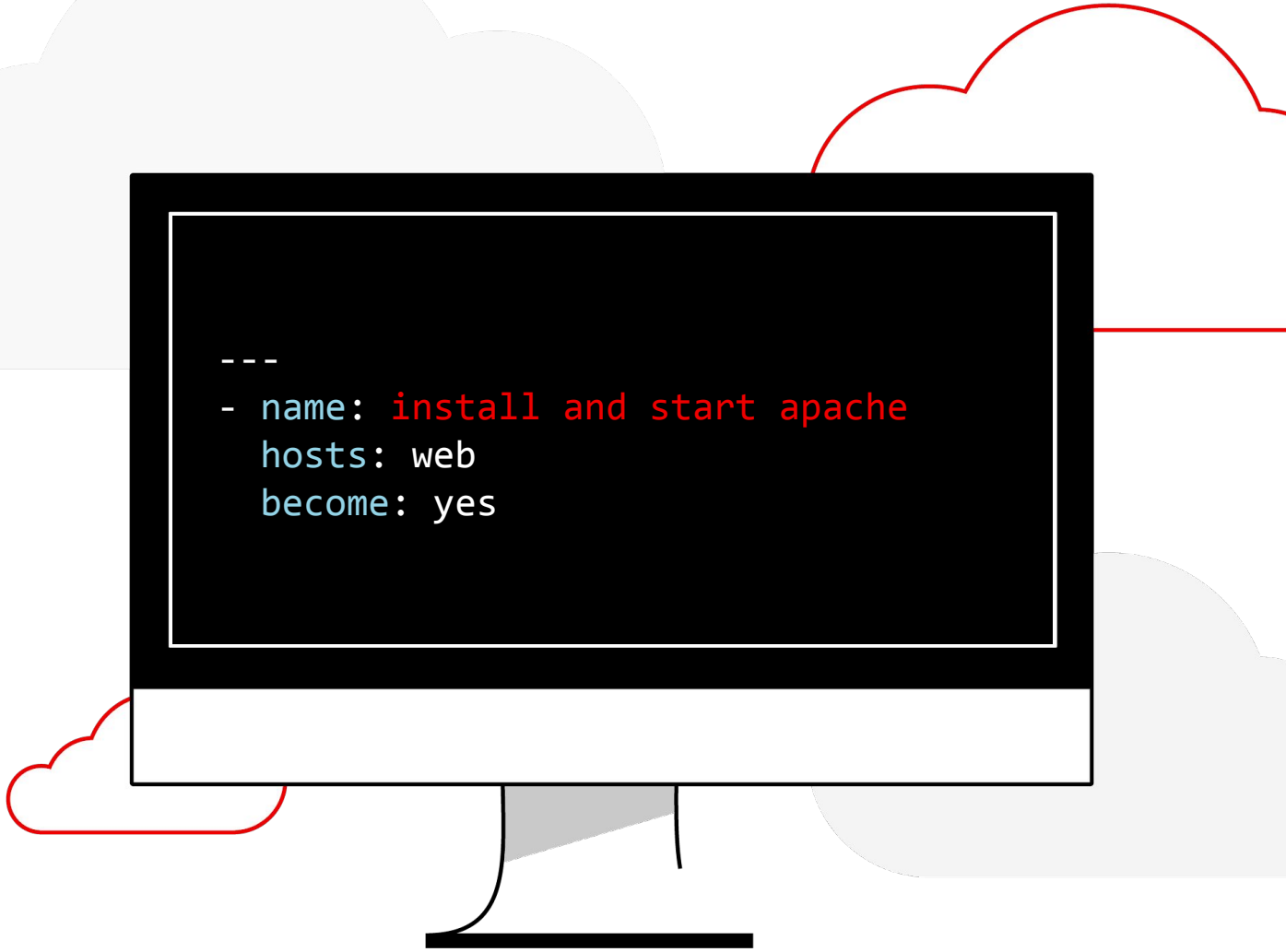
What am I automating?

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.



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Ansible modules

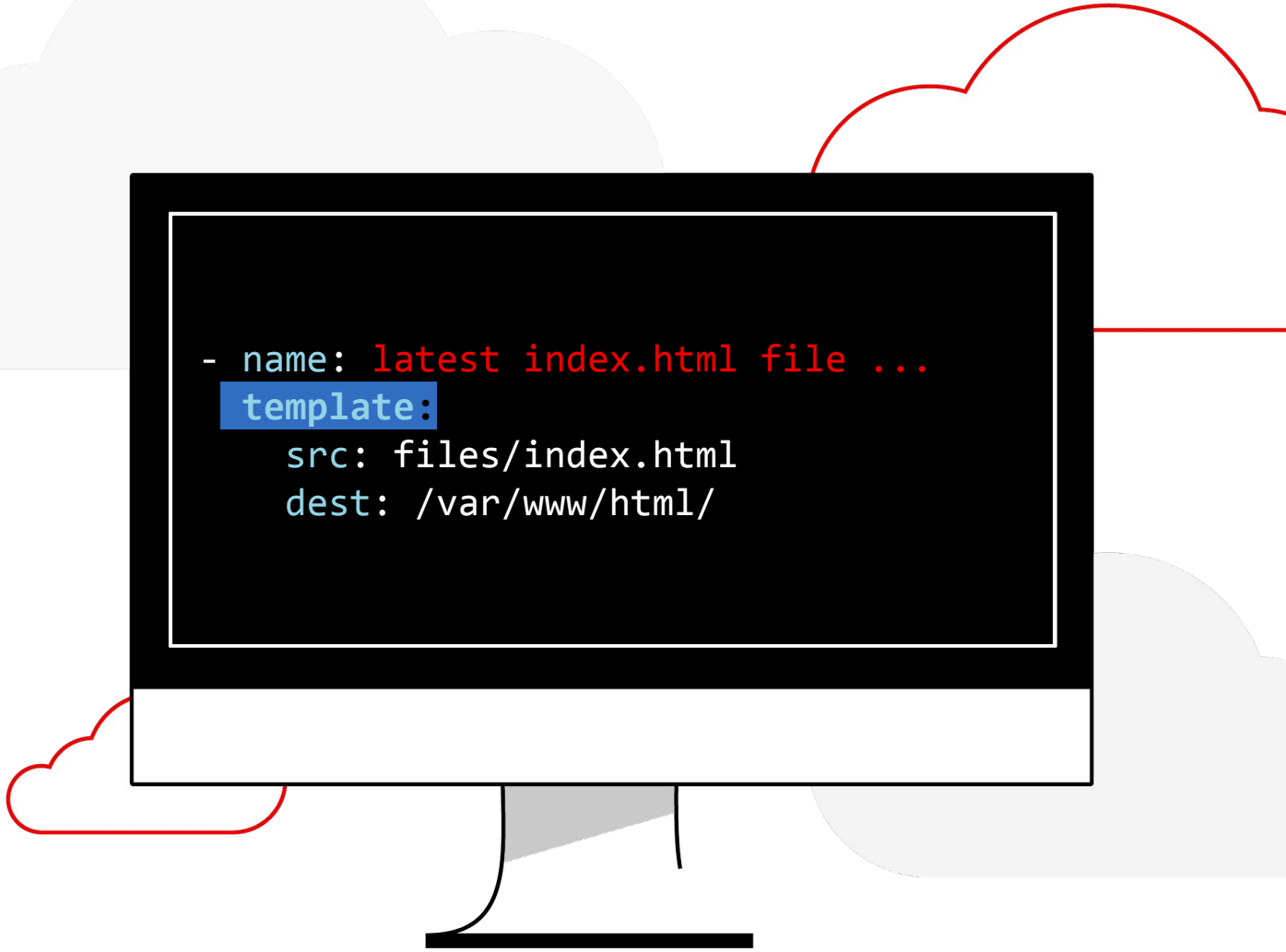
The “tools in the toolkit”

What are they?

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

Language

Usually Python, or Powershell for Windows setups. But can be of any language.

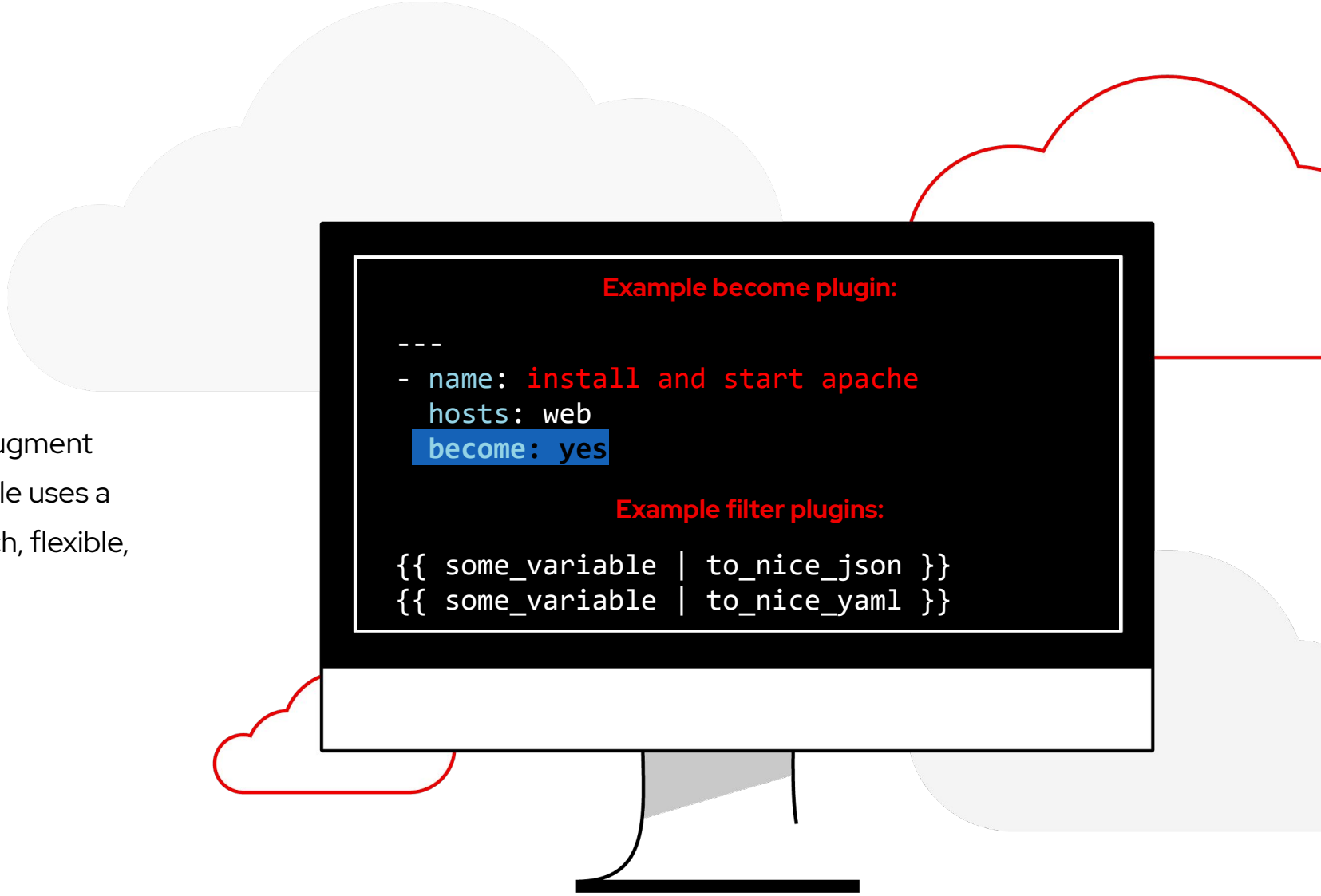


Ansible plugins

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.

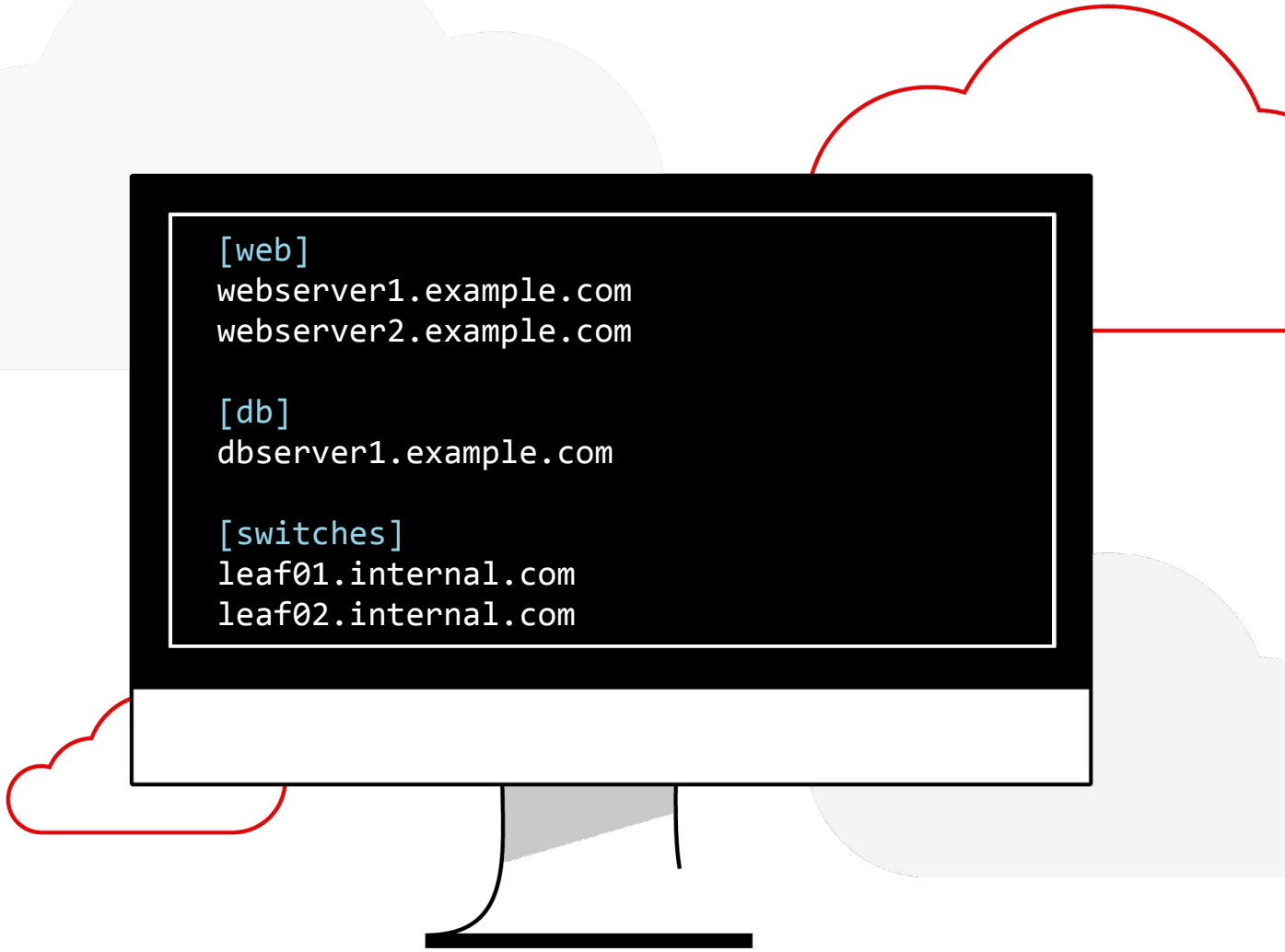


Ansible Inventory

The systems that a playbook runs against

What are they?

List of systems in your infrastructure that automation is executed against

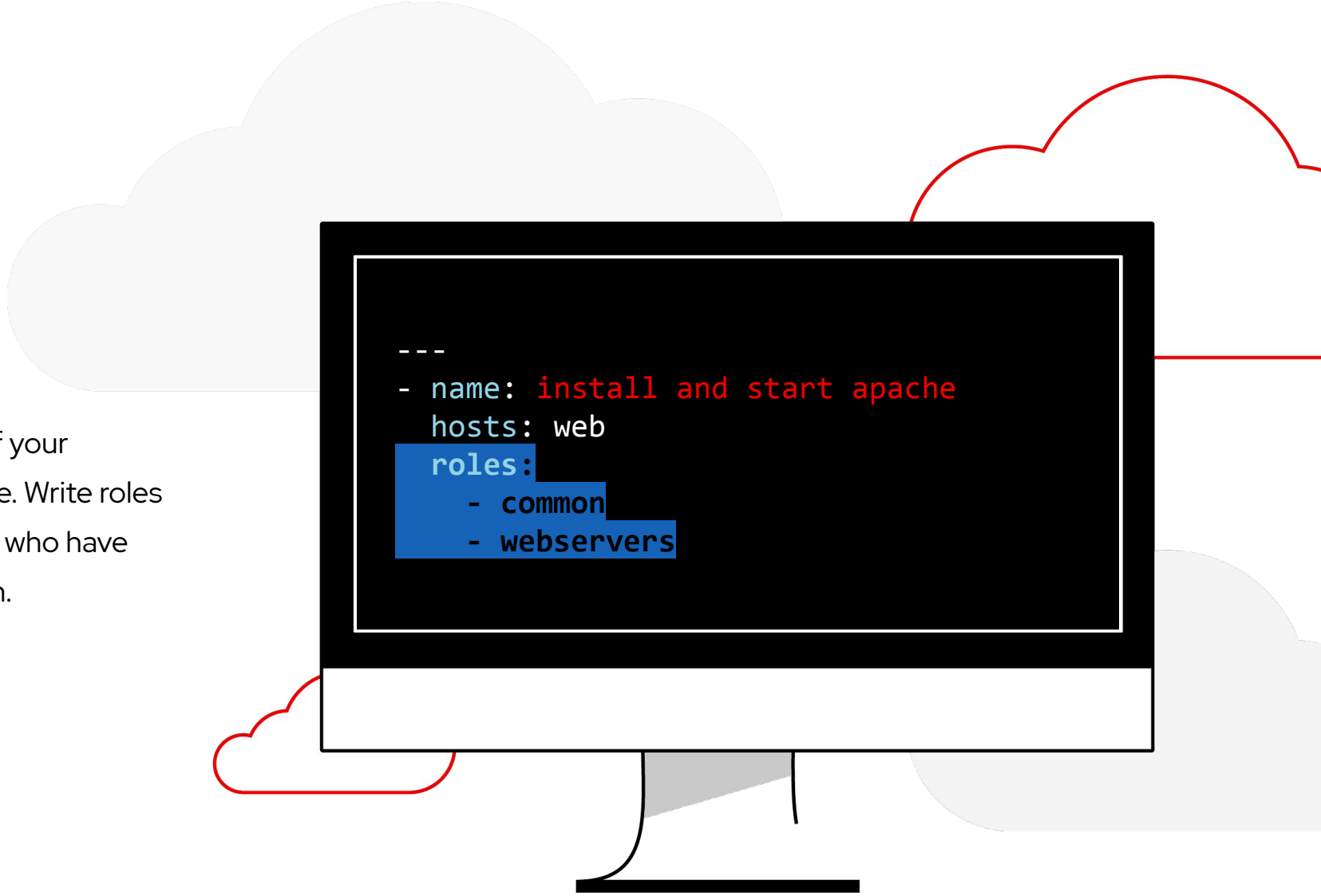


Ansible roles

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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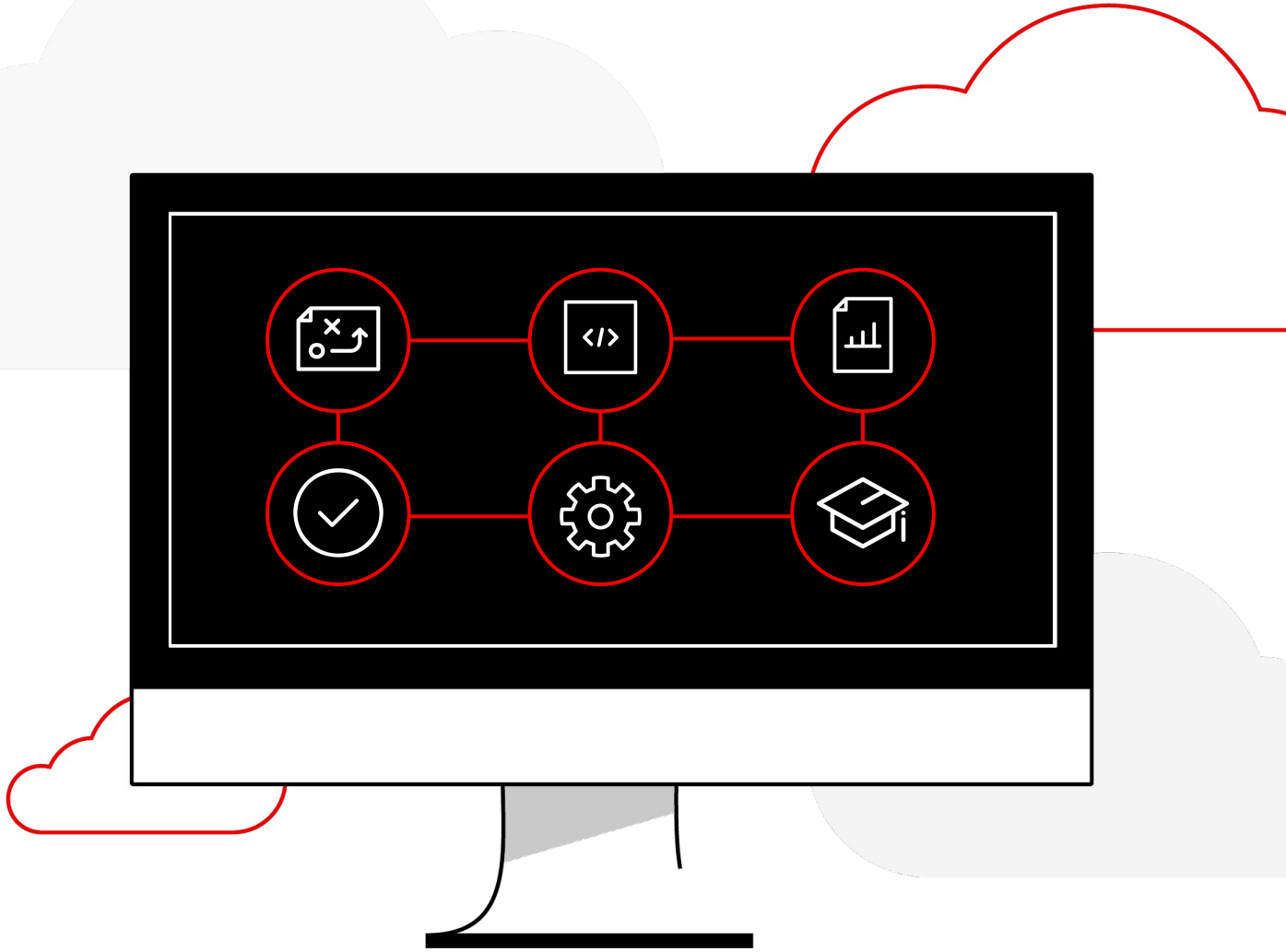
Collections

Simplified and consistent content delivery

What are they?

Collections are a data structure containing automation content:

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



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Collections

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

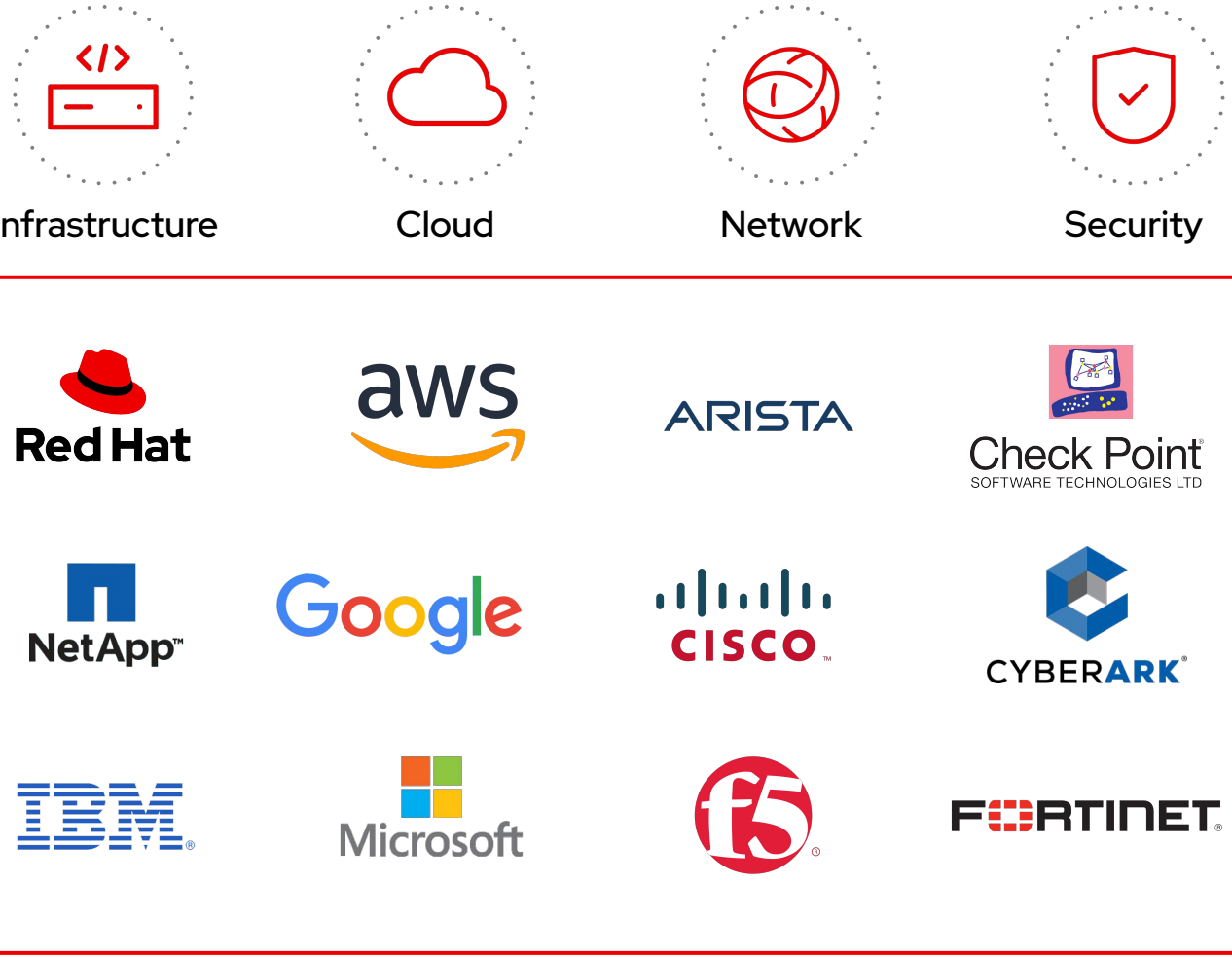
deploy-nginx.yml

```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
```

90+

certified platforms



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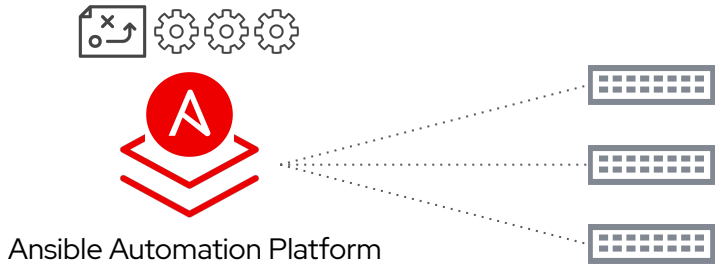
How Ansible Automation Works

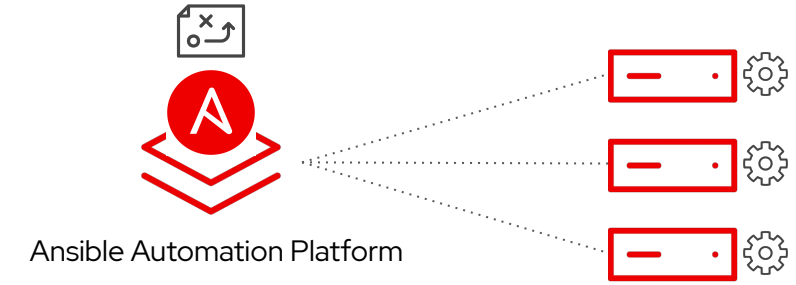
Module code is executed locally on the control node



Local Execution

Network Devices / API Endpoints

Module code is copied to the managed node, executed, then removed



Remote Execution

Linux / Windows Hosts

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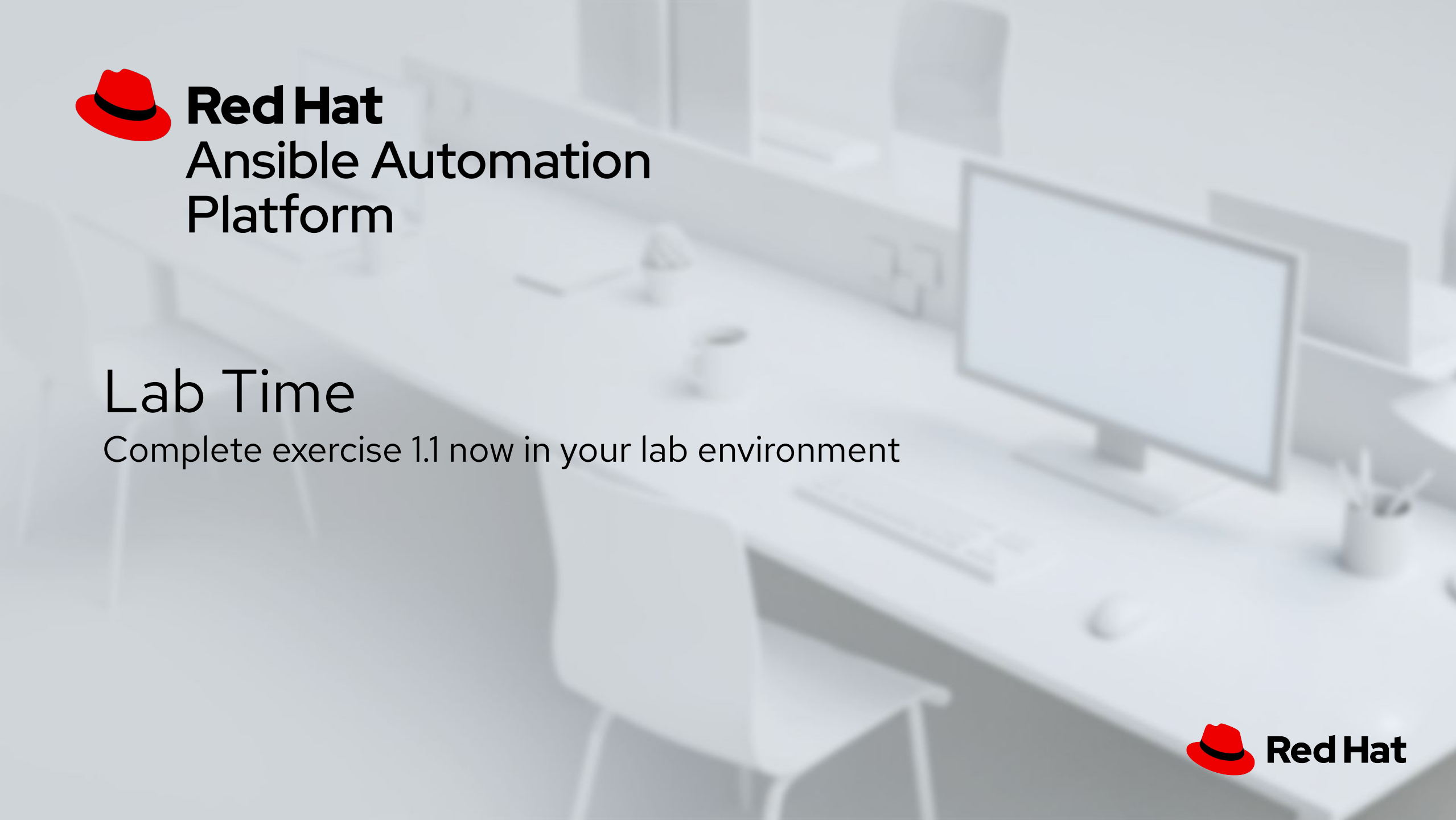
Verify Lab Access

- Follow the steps in to access environment
- Use the IP provided to you, the script only has example IP
- Which editor do you use on command line?
  If you don’t know, we have a short intro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Lab Time
Complete exercise 1.1 now in your lab environment
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Exercise 1.2

Topics Covered:

- Ansible inventories
- Accessing Ansible docs
- Modules and getting help

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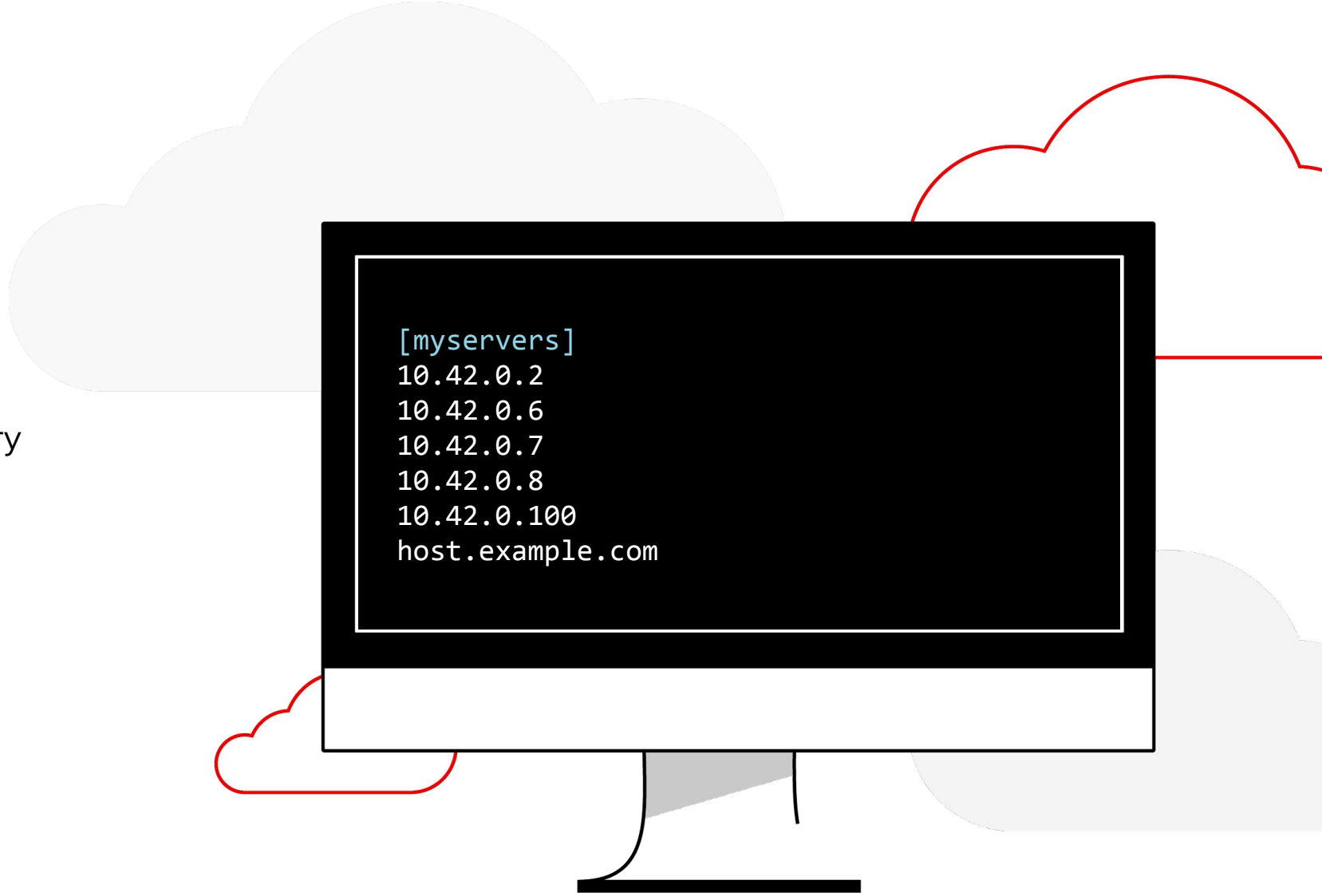
Inventory

- Ansible works against multiple systems in an inventory
- Inventory is usually file based
- Can have multiple groups
- Can have variables for each group or even host

Ansible Inventory

The Basics

An example of a static Ansible inventory including systems with IP addresses as well as fully qualified domain name (FQDN)



Ansible Inventory - The Basics

```
[app1srv]
appserver01 ansible_host=10.42.0.2
appserver02 ansible_host=10.42.0.3

[web]
node-[1:30] ansible_host=10.42.0.[31:60]

[web:vars]
apache_listen_port=8080
apache_root_path=/var/www/mywebdocs/

[all:vars]
ansible_user=kev
ansible_ssh_private_key_file=/home/kev/.ssh/id_rsa
```

Ansible Inventory - Variables

```
[app1srv]
appserver01 ansible_host=10.42.0.2
appserver02 ansible_host=10.42.0.3

[web]
node-[1:30] ansible_host=10.42.0.[31:60]

[web:vars]
apache_listen_port=8080
apache_root_path=/var/www/mywebdocs/

[all:vars]
ansible_user=ender
ansible_ssh_private_key_file=/home/ender/.ssh/id_rsa
```

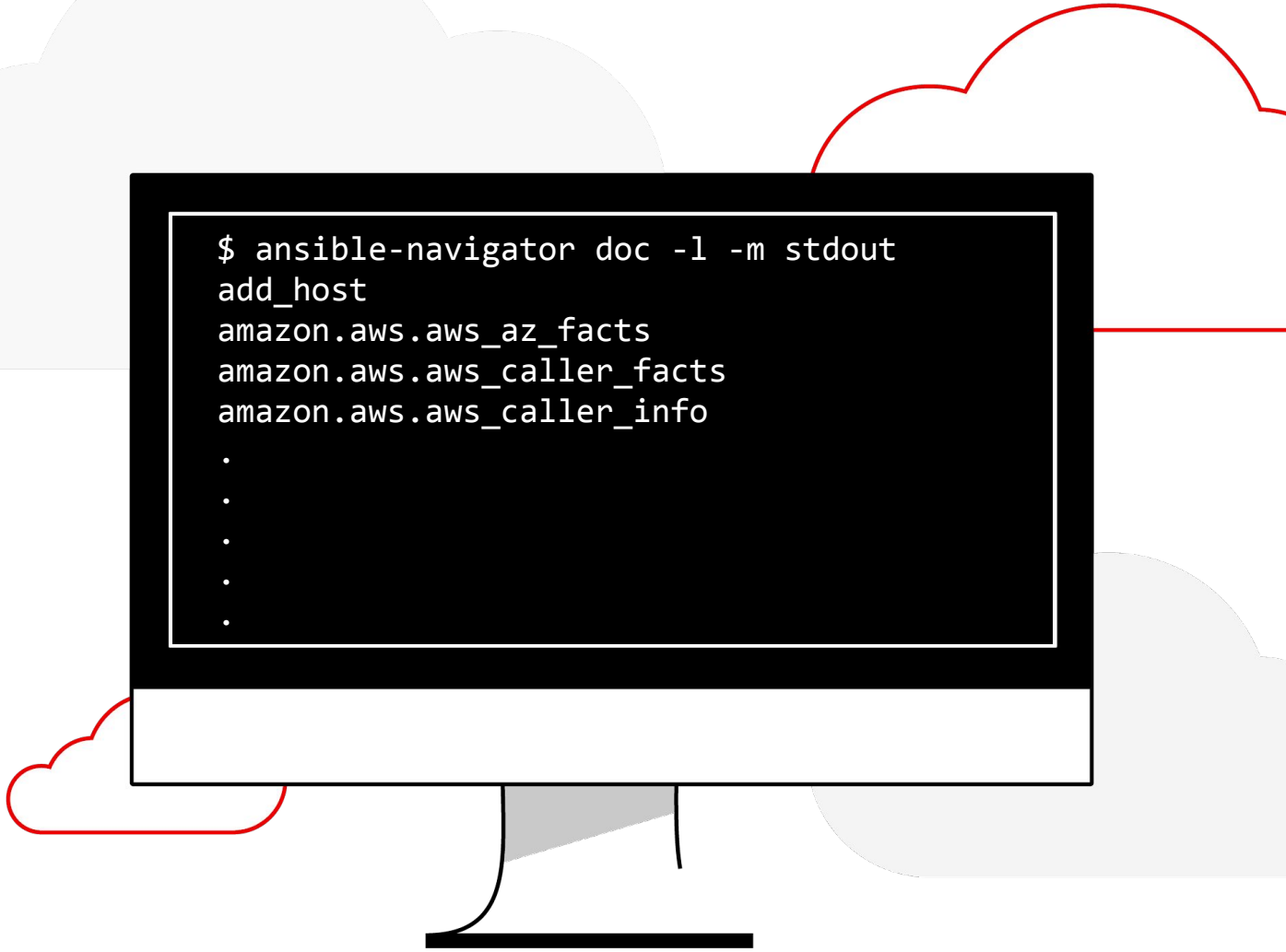
Ansible Inventory - Groups

```
[nashville]
bnaapp01
bnaapp02

[atlanta]
atlapp03
atlapp04

[south:children]
atlanta
nashville
hsvapp05
```

Accessing the Ansible docs

With the use of the latest command utility ansible-navigator, one can trigger access to all the modules available to them as well as details on specific modules.

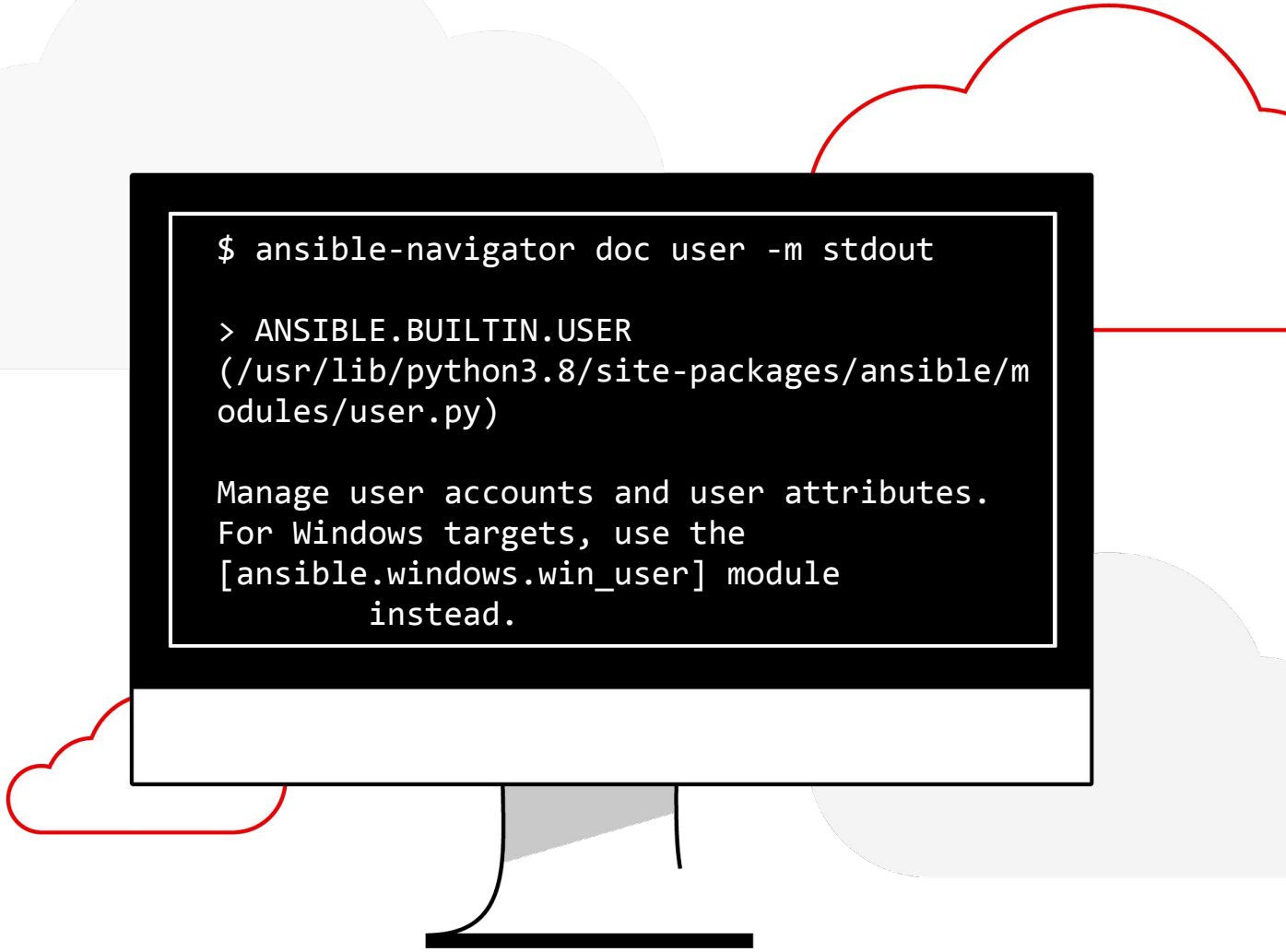
A formal introduction to ansible-navigator and how it can be used to run playbooks in the following exercise.

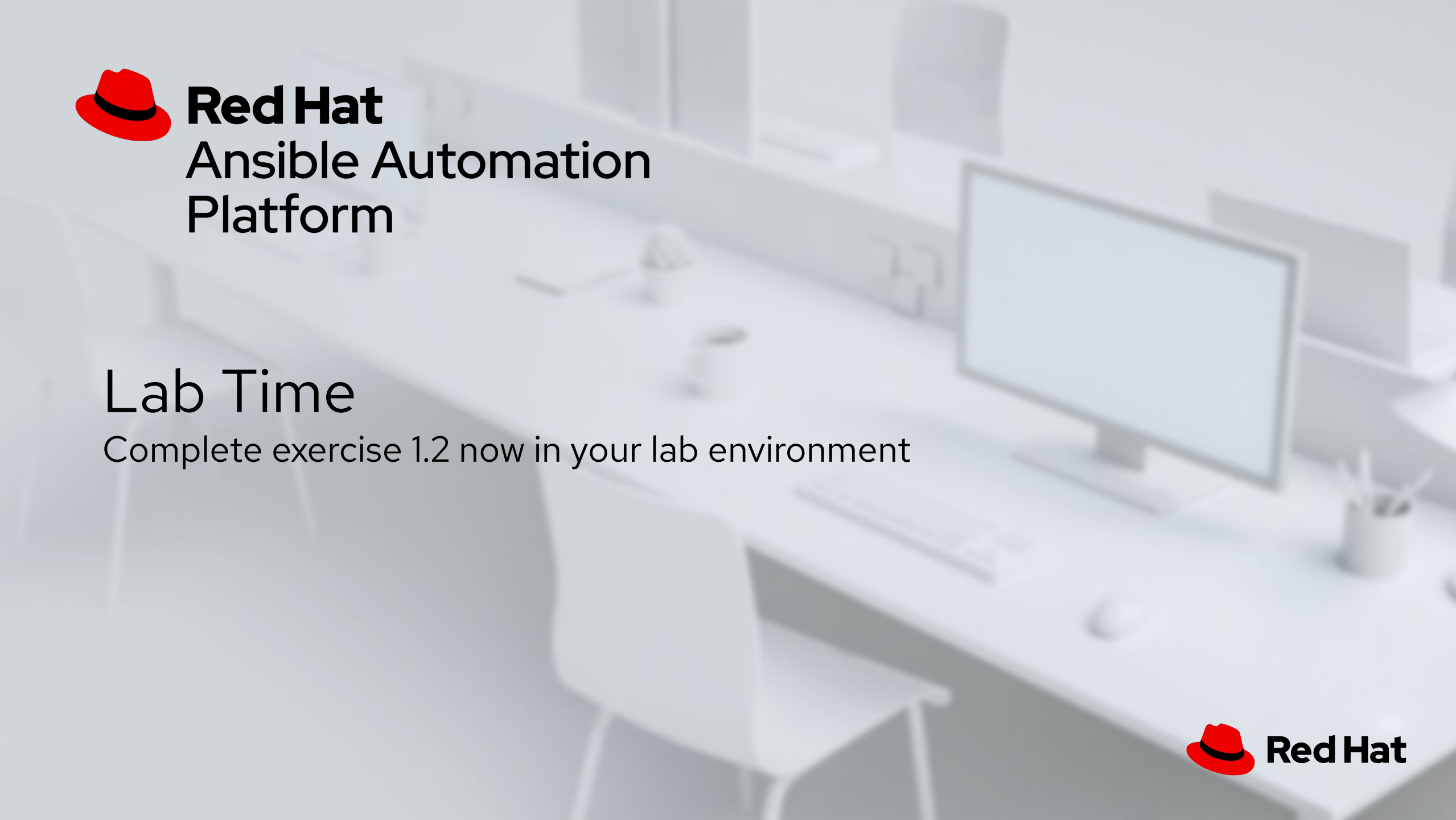


Accessing the Ansible docs

Aside from listing a full list of all the modules, you can use ansible-navigator to provide details about a specific module.

In this example, we are getting information about the user module.

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Exercise 1.3

Topics Covered:

- Playbooks basics
- Running a playbook

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A play

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

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

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

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

Ansible playbooks

A task

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

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

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

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

Ansible playbooks

A module

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

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

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

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

Running Playbooks

The most important colors of Ansible

A task executed as expected, no change was made.

A task executed as expected, making a change

A task failed to execute successfully

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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Running an Ansible Playbook

Using the latest ansible-navigator command

What is ansible-navigator?

ansible-navigator command line utility and text-based user interface (TUI) for running and developing Ansible automation content.

It replaces the previous command used to run playbooks “ansible-playbook”.

ansible-navigator

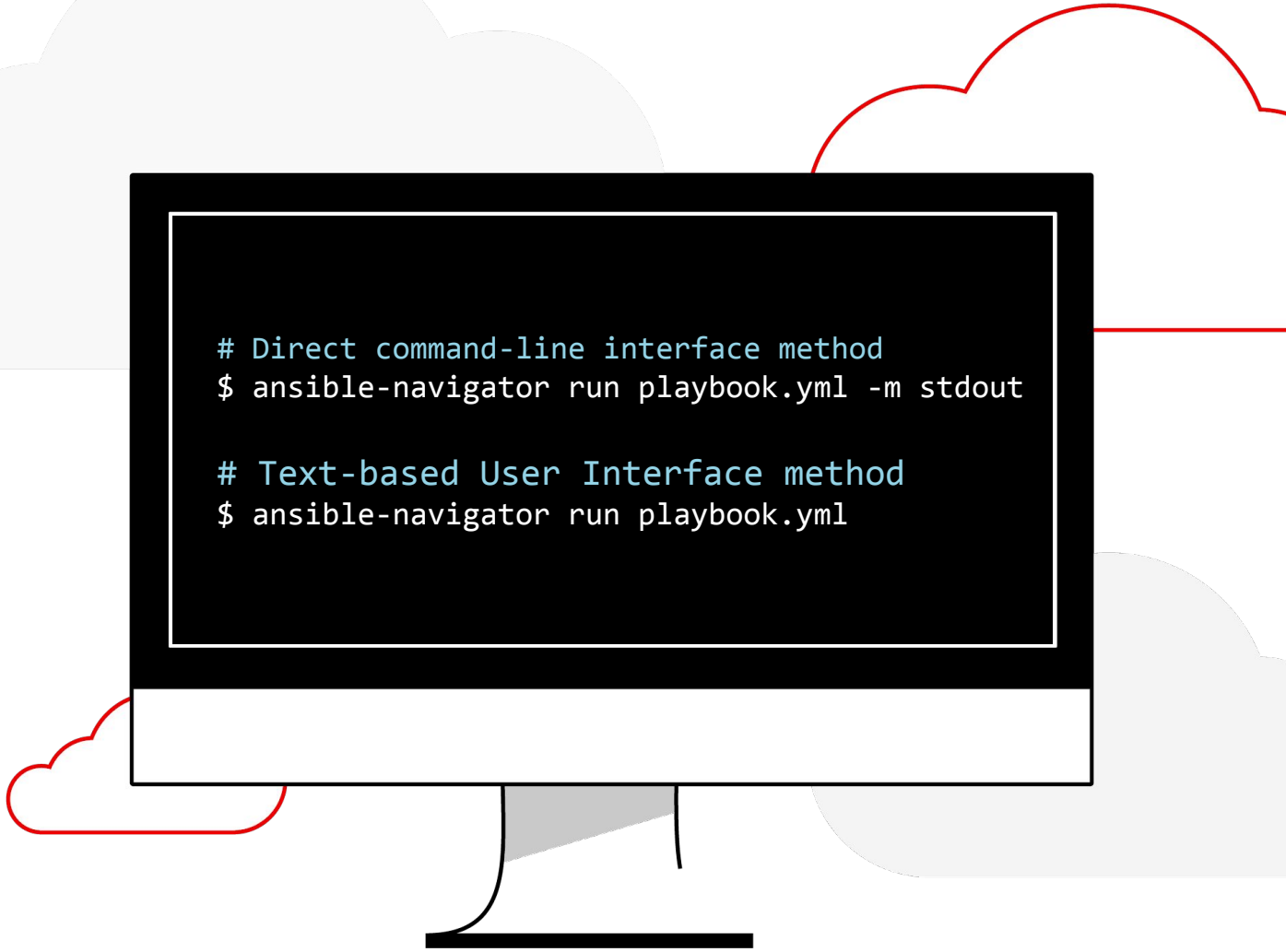
Bye ansible-playbook, Hello ansible-navigator

How do I use ansible-navigator?

As previously mentioned, it replaces the ansible-playbook command.

As such it brings two methods of running playbooks:

- Direct command-line interface
- Text-based User Interface (TUI)



ansible-navigator

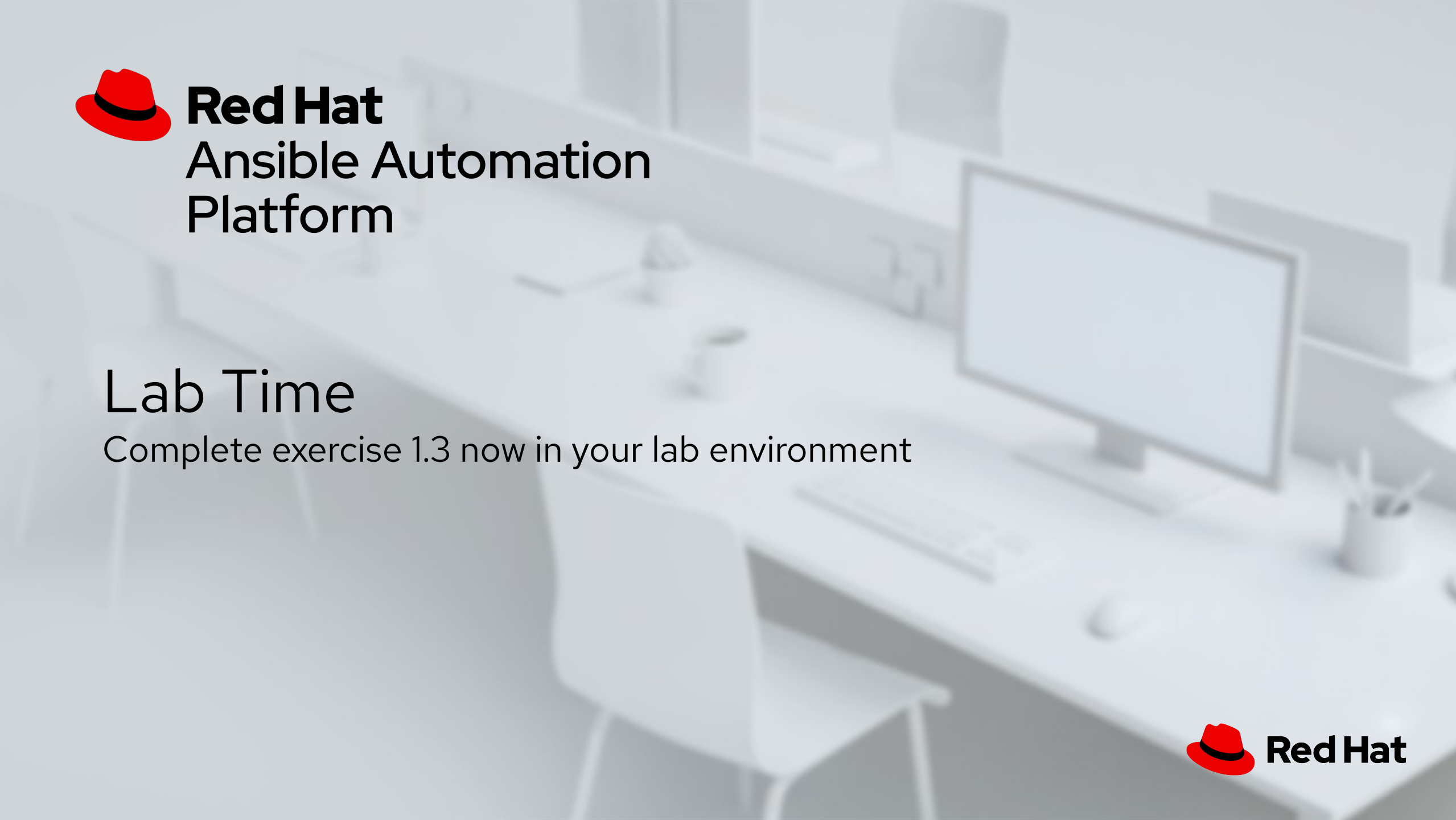
Mapping to previous Ansible commands

ansible command	ansible-navigator command
`ansible-config`	`ansible-navigator config`
`ansible-doc`	`ansible-navigator doc`
`ansible-inventory`	`ansible-navigator inventory`
`ansible-playbook`	`ansible-navigator run`

ansible-navigator

Common subcommands

Name	Description	CLI Example	Colon command within TUI
collections	Explore available collections	ansible-navigator collections --help	:collections
config	Explore the current ansible configuration	ansible-navigator config --help	:config
doc	Review documentation for a module or plugin	ansible-navigator doc --help	:doc
images	Explore execution environment images	ansible-navigator images --help	:images
inventory	Explore and inventory	ansible-navigator inventory --help	:inventory
replay	Explore a previous run using a playbook artifact	ansible-navigator replay --help	:replay
run	Run a playbook	ansible-navigator run --help	:run
welcome	Start at the welcome page	ansible-navigator welcome --help	:welcome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Complete exercise 1.3 now in your lab environment
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Exercise 1.4

Topics Covered:

- Working with variables
- What are facts?

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Ansible playbooks

```
---
- name: variable playbook test
  hosts: localhost

  vars:
    var_one: awesome
    var_two: ansible is
    var_three: "{{ var_two }} {{ var_one }}"

  tasks:
    - name: print out var_three
      debug:
        msg: "{{ var_three }}"
```

Ansible playbooks

```
---
- name: variable playbook test
  hosts: localhost

  vars:
    var_one: awesome
    var_two: ansible is
    var_three: "{{ var_two }} {{ var_one }}"

  tasks:
    - name: print out var_three
      debug:
        msg: "{{ var_three }}"
```

ansible is awesome

Ansible Facts

- Just like variables, really...
- ... but: coming from the host itself!
- Check them out with the setup module

Red Hat

Ansible playbooks

```
---
- name: facts playbook
  hosts: localhost

  tasks:
    - name: Collect all facts of host
      setup:
        gather_subset:
          - 'all'
```

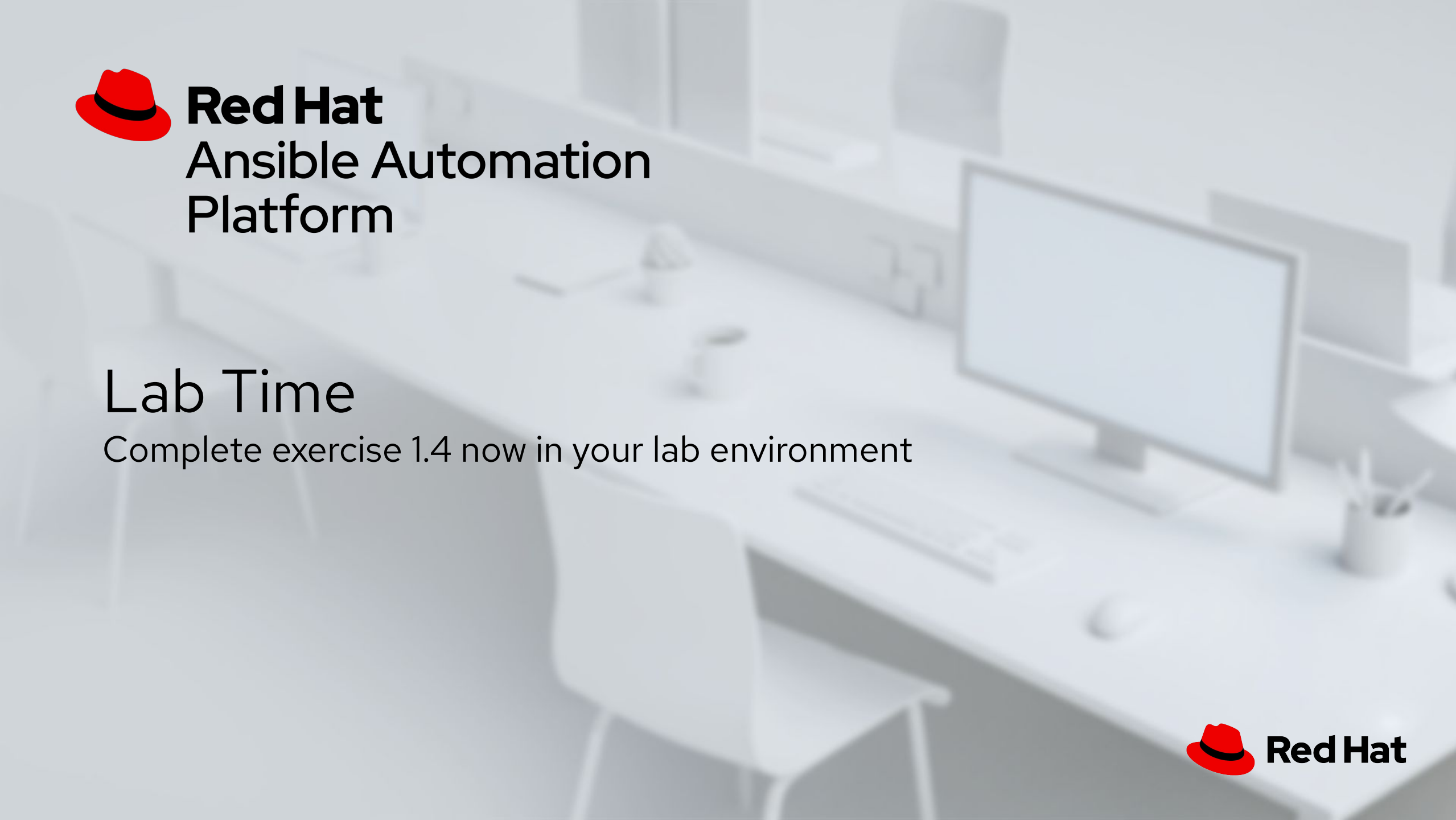
```
$ ansible-navigator run playbook.yml
```

Ansible Navigator TUI

```
PLAY NAME            OK  CHANGED    UNREACHABLE     FAILED   SKIPPED    IGNORED    IN PROGRESS     TASK COUNT  PROGRESS
0|facts playbook     2       0                0          0         0            0               2   COMPLETE

RESULT     HOST              NUMBER     CHANGED      TASK                          TASK ACTION        DURATION
0|OK       localhost              0       False      Gathering Facts               gather_facts            1s
1|OK       localhost              1       False      Collect all facts of host     setup                   1s

PLAY [facts playbook:1]
*********************************************************************************************************
TASK [Collect all facts of host]
*********************************************************************************************************
OK: [localhost]
.
.
12 |  ansible_facts:
 13|    ansible_all_ipv4_addresses:
 14|    - 10.0.2.100
 15|    ansible_all_ipv6_addresses:
 16|    - fe80::1caa:f0ff:fe15:23c4
```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Exercise 1.5

Topics Covered:

- Conditionals
- Handlers
- Loops

Conditionals via VARS

Example of using a variable labeled *my_mood* and using it as a conditional on a particular task.

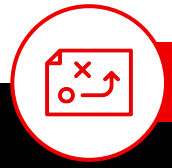
Red Hat

Ansible Conditionals

```yaml
---
- name: variable playbook test
  hosts: localhost

  vars:
    my_mood: happy

  tasks:
    - name: task, based on my_mood var
      debug:
        msg: "Yay! I am {{ my_mood }}!"
      when: my_mood == "happy"
```

Alternatively

```yaml
    - name: task, based on my_mood var
      debug:
        msg: "Ask at your own risk. I'm {{ my_mood }}!"
      when: my_mood == "grumpy"
```



Ansible Conditionals w/ Facts

```
---
- name: variable playbook test
  hosts: localhost

  tasks:
  - name: Install apache
    apt:
      name: apache2
      state: latest
    when: ansible_distribution == 'Debian' or
          ansible_distribution == 'Ubuntu'

  - name: Install httpd
    yum:
      name: httpd
      state: latest
    when: ansible_distribution == 'RedHat'
```

Using Previous Task State

```
---
- name: variable playbook test
  hosts: localhost

  tasks:
  - name: Ensure httpd package is present
    yum:
      name: httpd
      state: latest
    register: http_results

  - name: Restart httpd
    service:
      name: httpd
      state: restart
    when: httpd_results.changed
```

Ansible Handler Tasks

```
---
- name: variable playbook test
  hosts: localhost

  tasks:
  - name: Ensure httpd package is present
    yum:
      name: httpd
      state: latest
  notify: restart_httpd

  handlers:
  - name: restart_httpd
    service:
      name: httpd
      state: restart
```

Ansible Handler Tasks

```
tasks:
- name: Ensure httpd package is present
  yum:
    name: httpd
    state: latest
  notify: restart_httpd

- name: Standardized index.html file
  copy:
    content: "This is my index.html file for {{ ansible_host }}"
    dest: /var/www/html/index.html
  notify: restart_httpd
```

If **either** task notifies a **changed** result, the handler will be notified **ONCE**.

```
TASK [Ensure httpd package is present] ***********************************************
ok: [web2]
ok: [web1]

TASK [Standardized index.html file] **************************************************
changed: [web2]
changed: [web1]

NOTIFIED: [restart_httpd] ************************************************************
changed: [web2]
changed: [web1]
```

unchanged

changed

handler runs once

Ansible Handler Tasks

```
tasks:
- name: Ensure httpd package is present
  yum:
    name: httpd
    state: latest
  notify: restart_httpd

- name: Standardized index.html file
  copy:
    content: "This is my index.html file for {{ ansible_host }}"
    dest: /var/www/html/index.html
  notify: restart_httpd
```

If **both** of these tasks notifies of a **changed** result, the handler will be notified **ONCE**.

```
TASK [Ensure httpd package is present] ***************************************
changed: [web2]
changed: [web1]

TASK [Standardized index.html file] ******************************************
changed: [web2]
changed: [web1]

NOTIFIED: [restart_httpd] ****************************************************
changed: [web2]
changed: [web1]
```

changed

changed

handler runs once

Ansible Handler Tasks

```
tasks:
- name: Ensure httpd package is present
  yum:
    name: httpd
    state: latest
  notify: restart_httpd

- name: Standardized index.html file
  copy:
    content: "This is my index.html file for {{ ansible_host }}"
    dest: /var/www/html/index.html
  notify: restart_httpd
```

If **neither** task notifies a **changed** result, the handler ***does not run.***

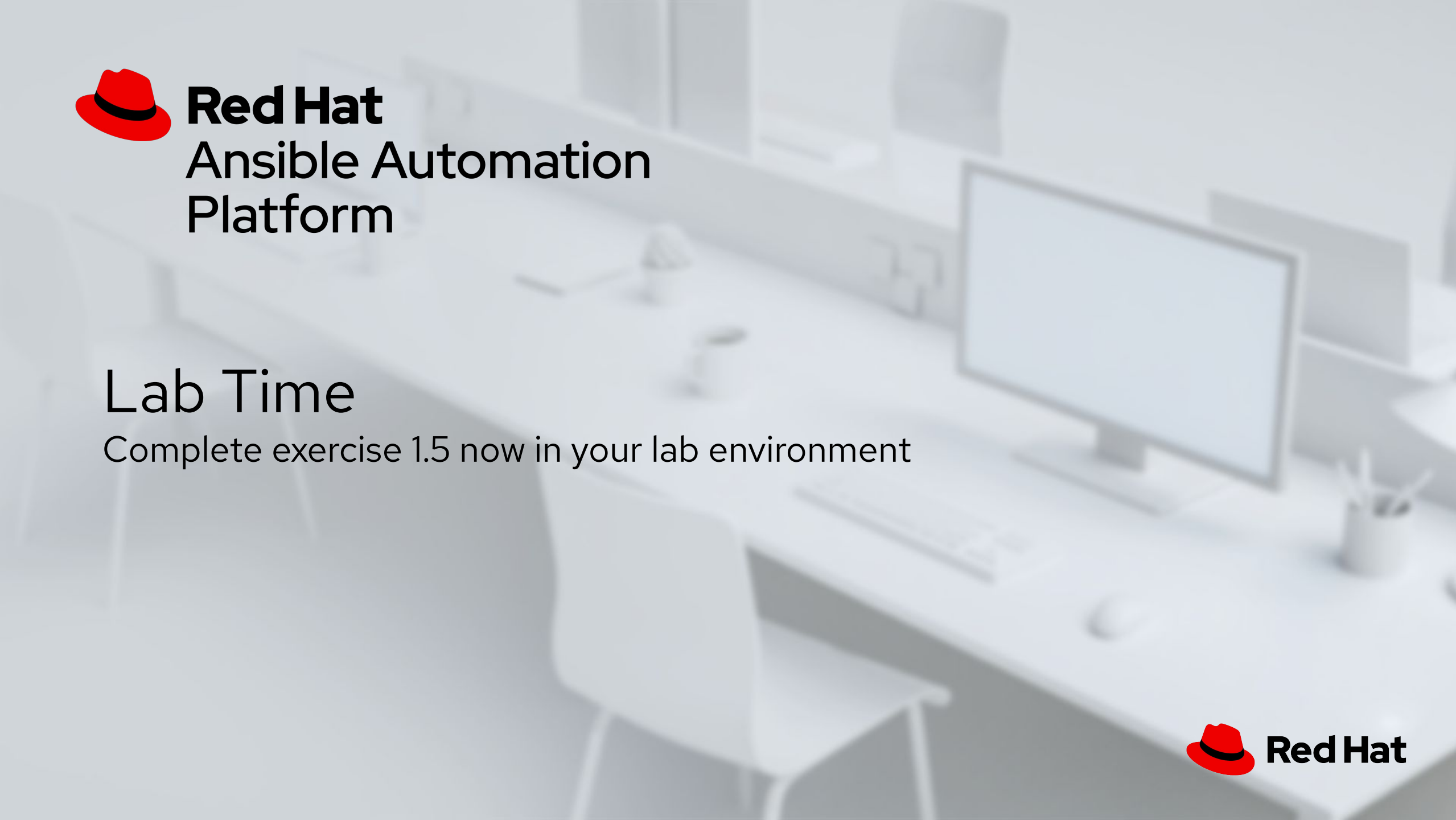
```
TASK [Ensure httpd package is present] ***************************************
ok: [web2]
ok: [web1]

TASK [Standardized index.html file] ******************************************
ok: [web2]
ok: [web1]

PLAY RECAP *******************************************************************
web2       : ok=2   changed=0   unreachable=0   failed=0   skipped=0   rescued=0 ignored=0
web1       : ok=2   changed=0   unreachable=0   failed=0   skipped=0   rescued=0 ignored=0
```

unchanged

unchanged

```yaml
---
- name: Ensure users
  hosts: node1
  become: yes

  tasks:
    - name: Ensure user is present
      user:
        name: dev_user
        state: present

    - name: Ensure user is present
      user:
        name: qa_user
        state: present

    - name: Ensure user is present
      user:
        name: prod_user
        state: present
```

```yaml
---
- name: Ensure users
  hosts: node1
  become: yes

  tasks:
    - name: Ensure user is present
      user:
        name: "{{item}}"
        state: present
      loop:
        - dev_user
        - qa_user
        - prod_user
```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Exercise 1.6

Topics Covered:

- Templates

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```
- name: Ensure apache is installed and started
  hosts: web
  become: yes
  vars:
    http_port: 80
    http_docroot: /var/www/mysite.com

  tasks:
    - name: Verify correct config file is present
      template:
        src: templates/httpd.conf.j2
        dest: /etc/httpd/conf/httpd.conf
```

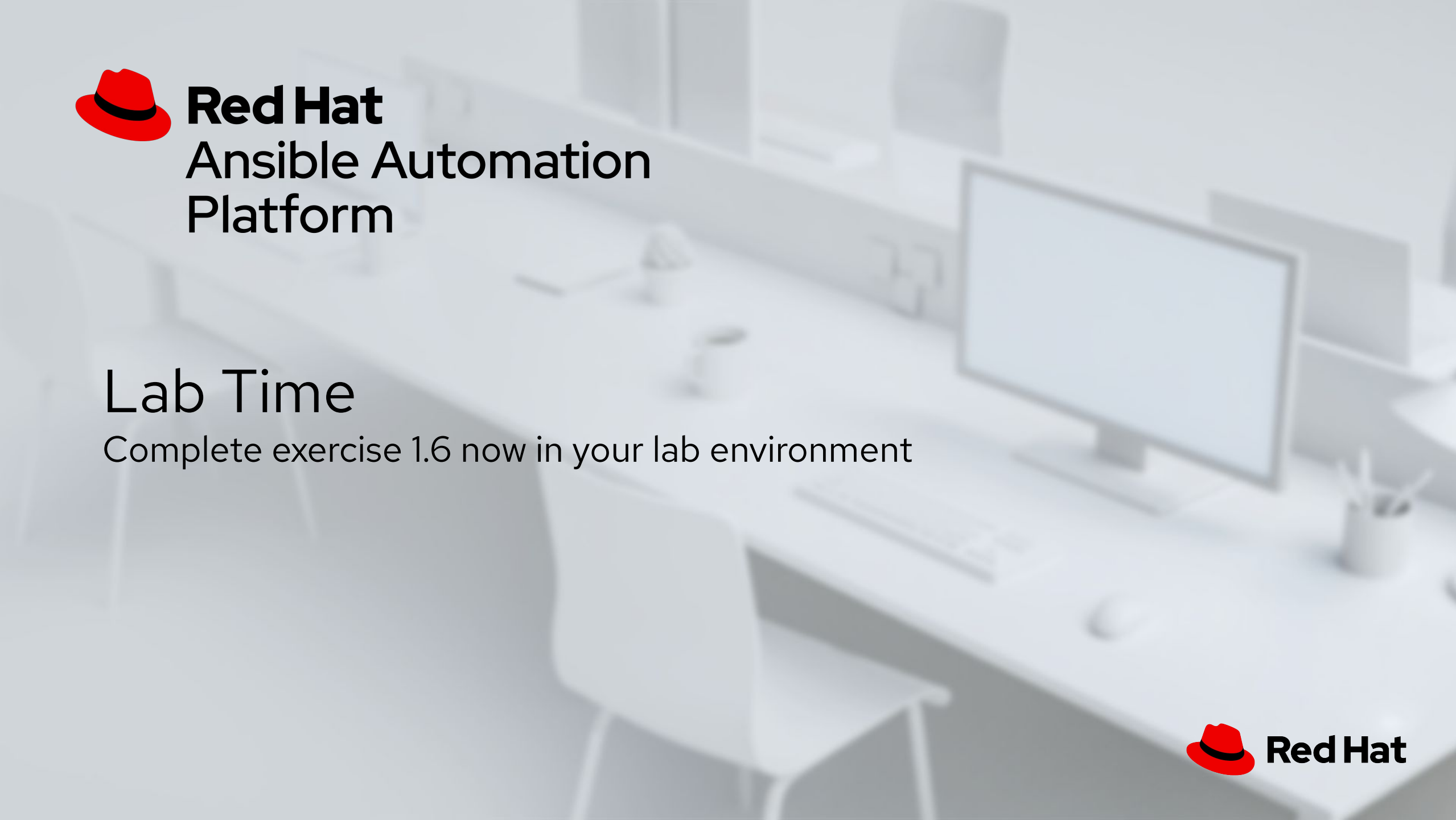
```
- name: Ensure apache is installed and started
  hosts: web
  become: yes
  vars:
    http_port: 80
    http_docroot: /var/www/mysite.com

  tasks:
    - name: Verify correct config file is present
      template:
        src: templates/httpd.conf.j2
        dest: /etc/httpd/conf/httpd.conf
```

```
## Excerpt from httpd.conf.j2

# Change this to Listen on specific IP addresses as shown below to
# prevent Apache from glomming onto all bound IP addresses.
#
# Listen 80   ## original line
Listen {{ http_port }}

# DocumentRoot: The directory out of which you will serve your
# documents.
# DocumentRoot "/var/www/html"
DocumentRoot {{ http_docroot }}
```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Exercise 1.7

Topics Covered:

- What are roles?
- How they look like
- Galaxy

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Role Structure

- Defaults: default variables with lowest precedence (e.g. port)
- Handlers: contains all handlers
- Meta: role metadata including dependencies to other roles
- Tasks: plays or tasks
  Tip: It's common to include tasks in main.yml with "when" (e.g. OS == xyz)
- Templates: templates to deploy
- Tests: place for playbook tests
- Vars: variables (e.g. override port)

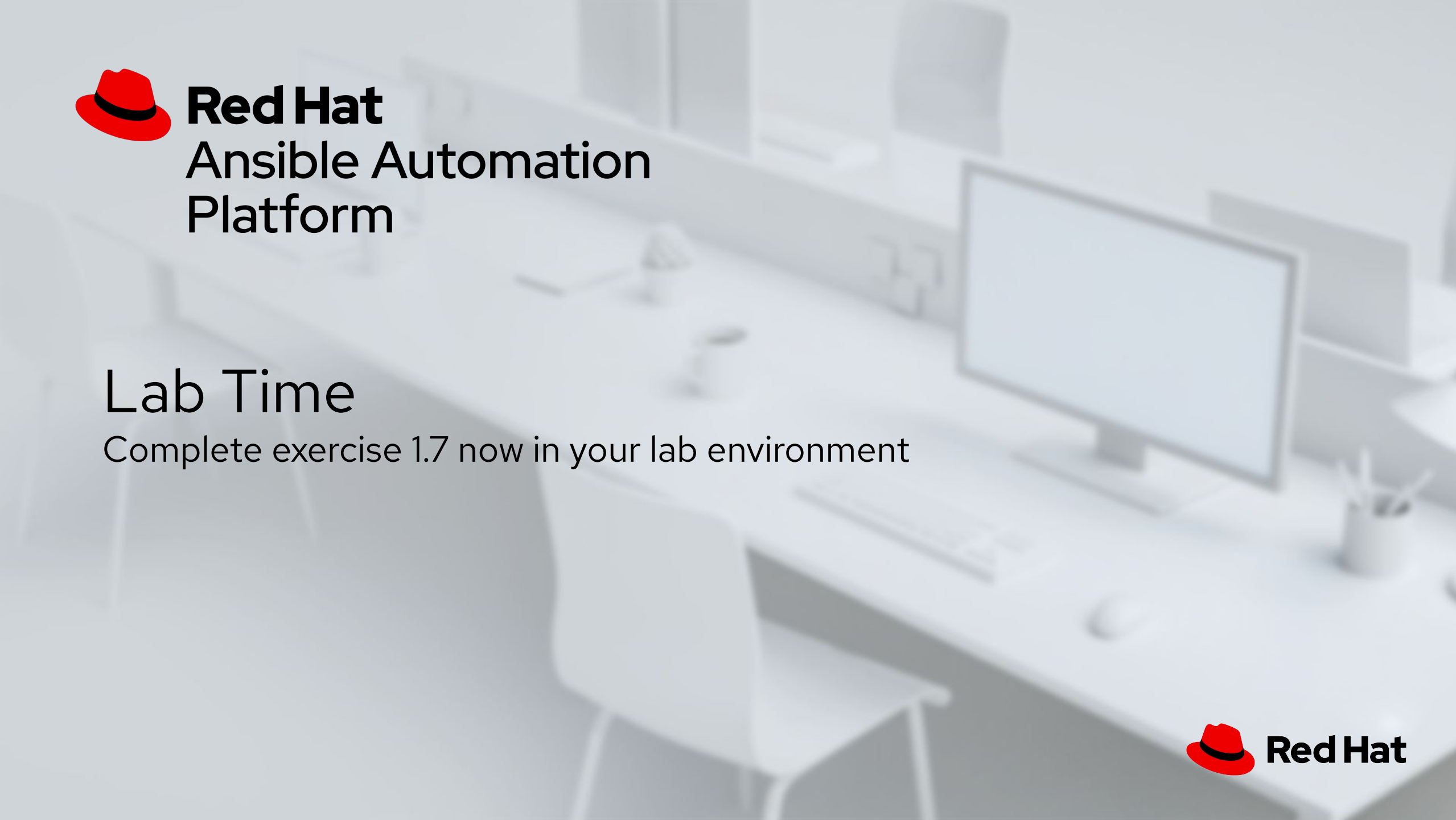
```
user/
├── defaults
│   └── main.yml
├── handlers
│   └── main.yml
├── meta
│   └── main.yml
├── README.md
├── tasks
│   └── main.yml
├── templates
├── tests
│   ├── inventory
│   └── test.yml
└── vars
    └── main.yml
```

Ansible Galaxy

Sharing Content

Community

Roles, and more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Exercise 1.8

Topics Covered:

- A bonus lab – try it on your own, and when time permits

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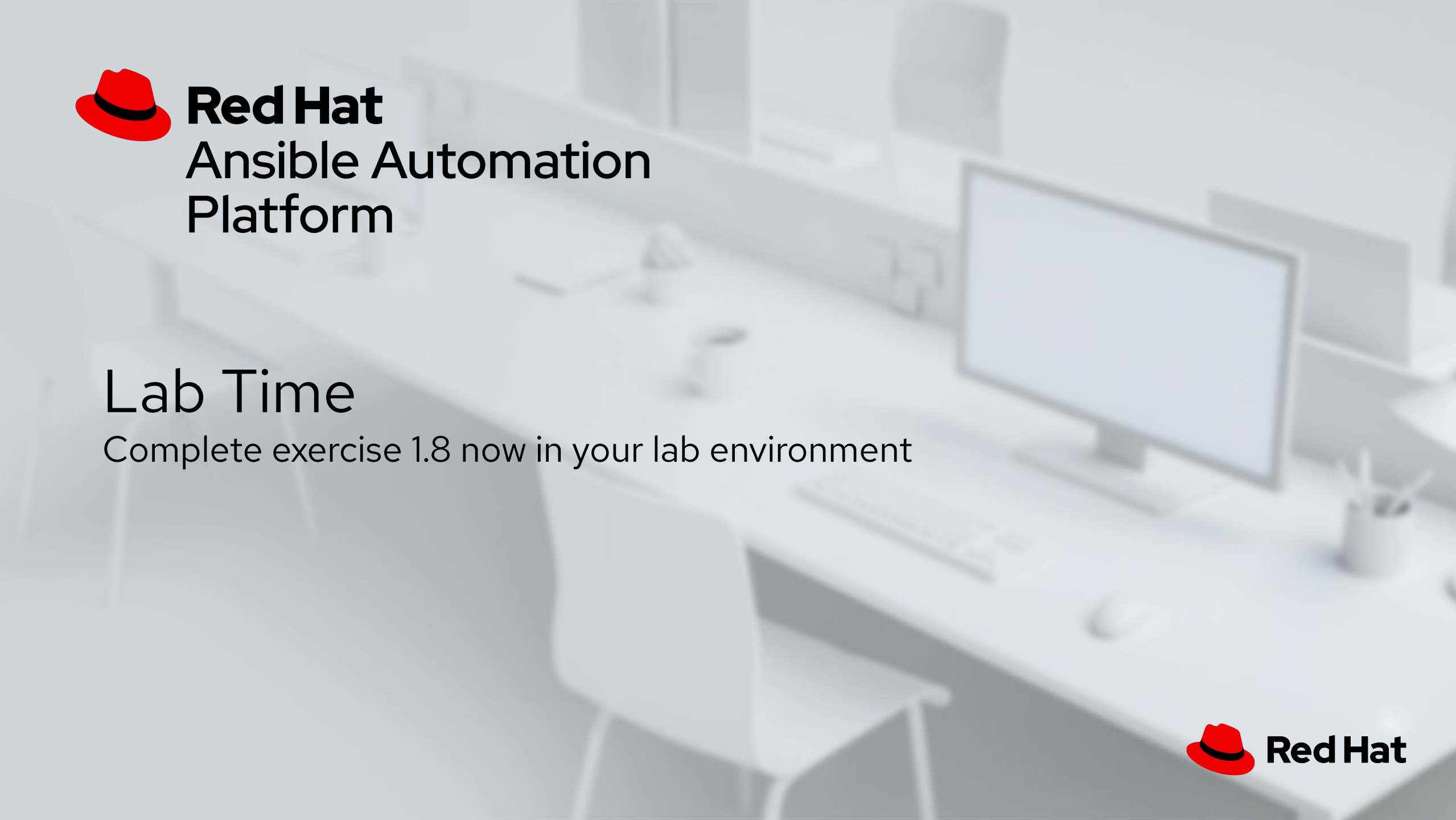
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Section 2
Automation Controller

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Exercise 2.1

Topics Covered:

- Introduction to Automation Controller

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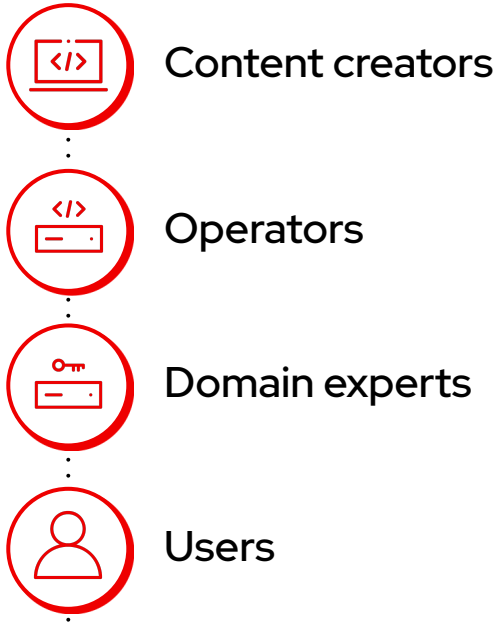
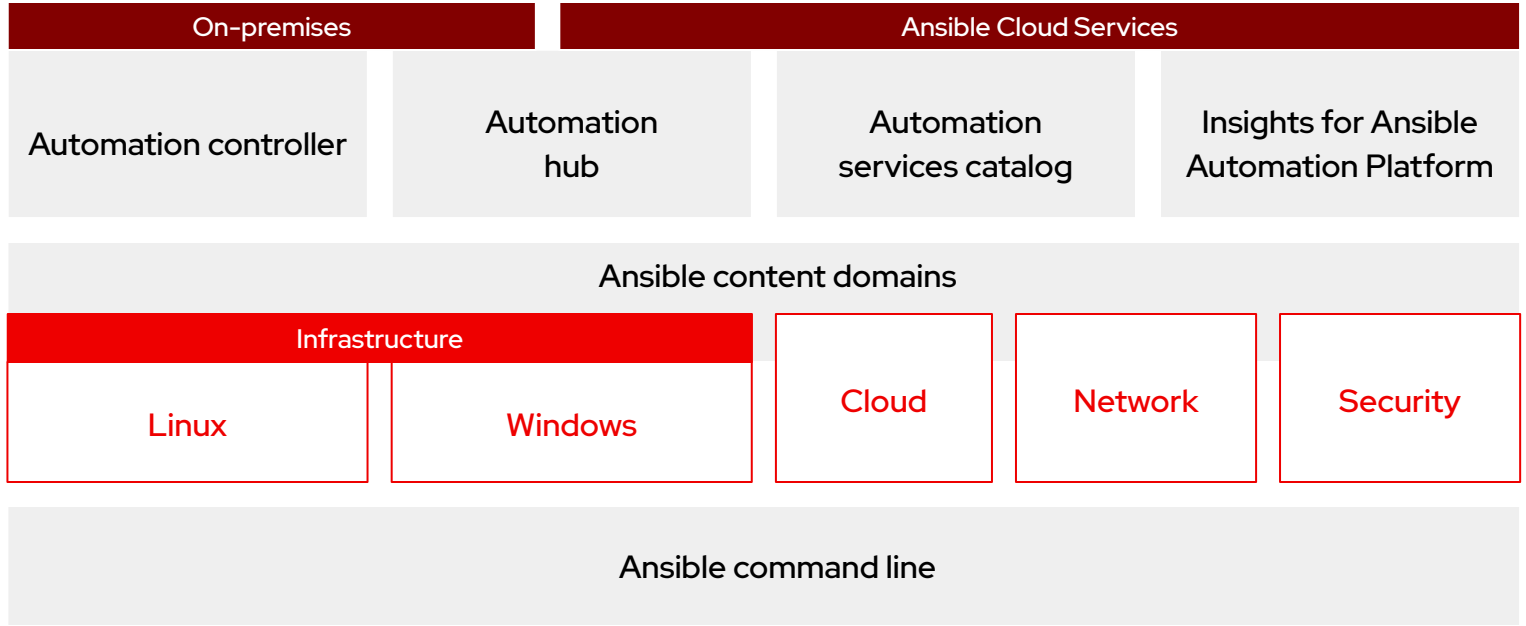
Red Hat Ansible Automation Platform





Fueled by an open source community

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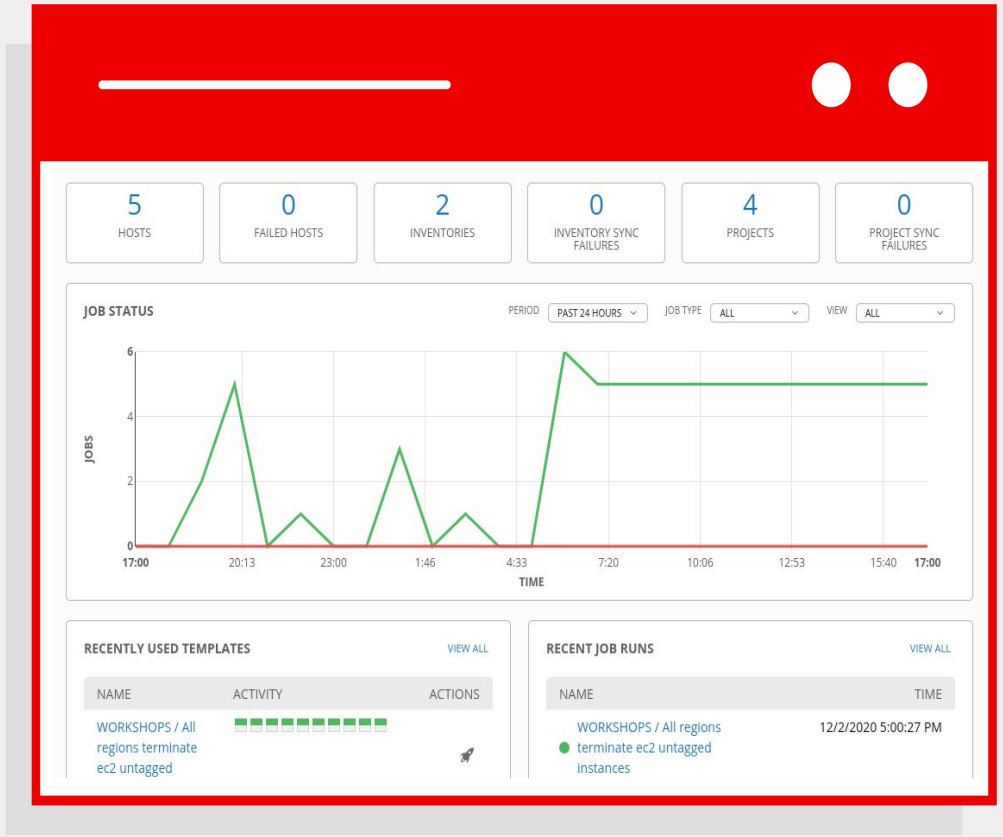
What is Ansible Automation Controller?

Ansible Automation Controller 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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Ansible Automation Controller

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.

RBAC

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

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.

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.

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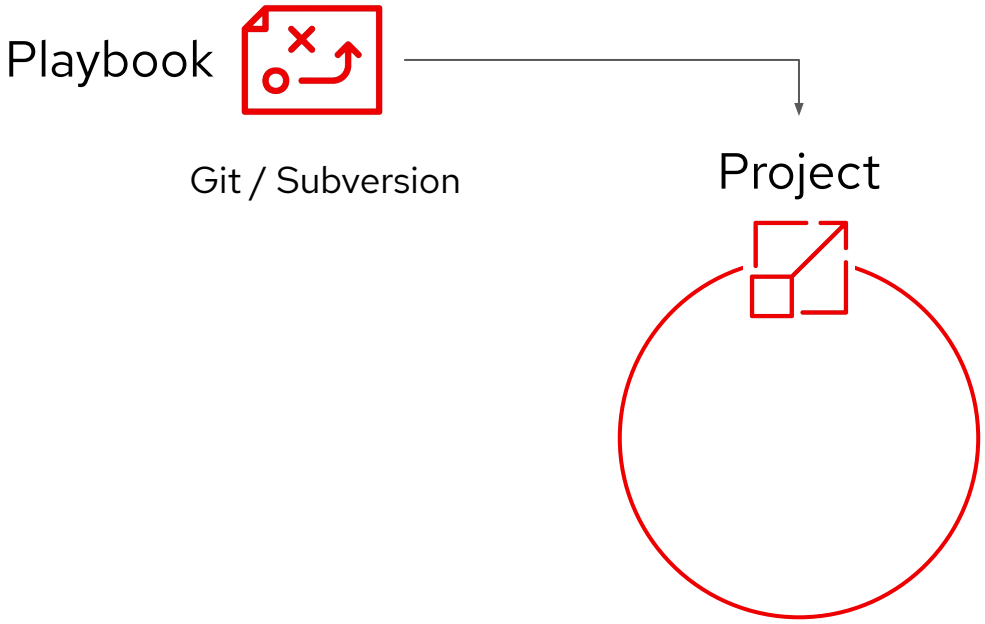
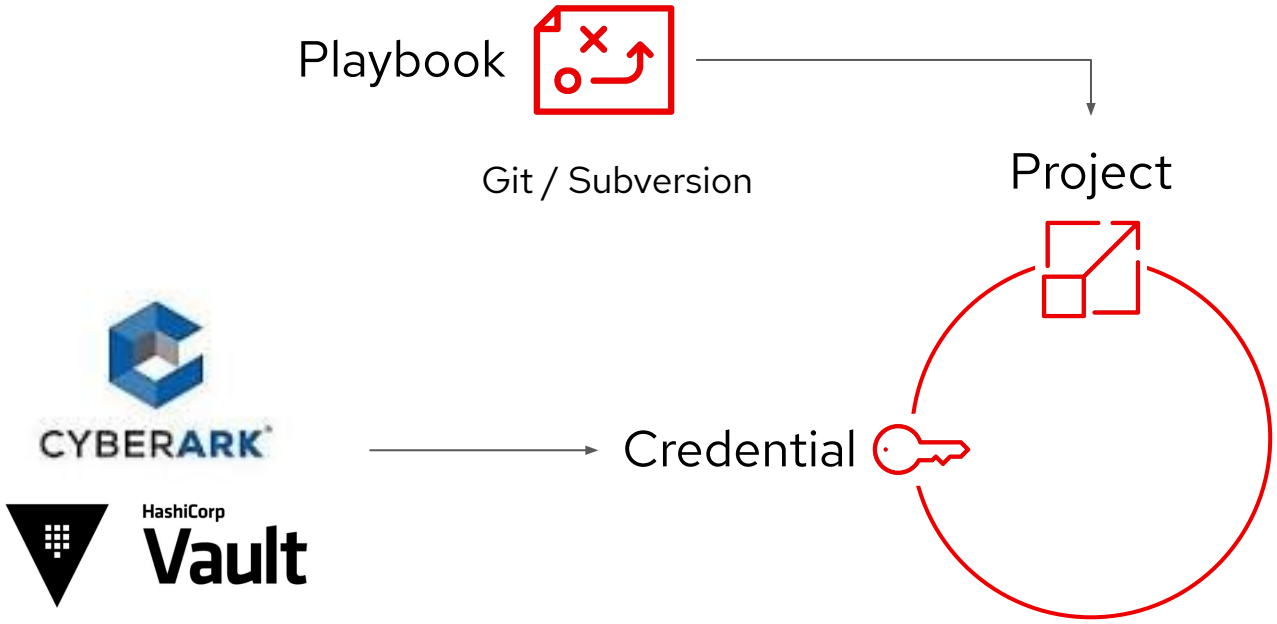
Anatomy of an Automation Job



Anatomy of an Automation Job



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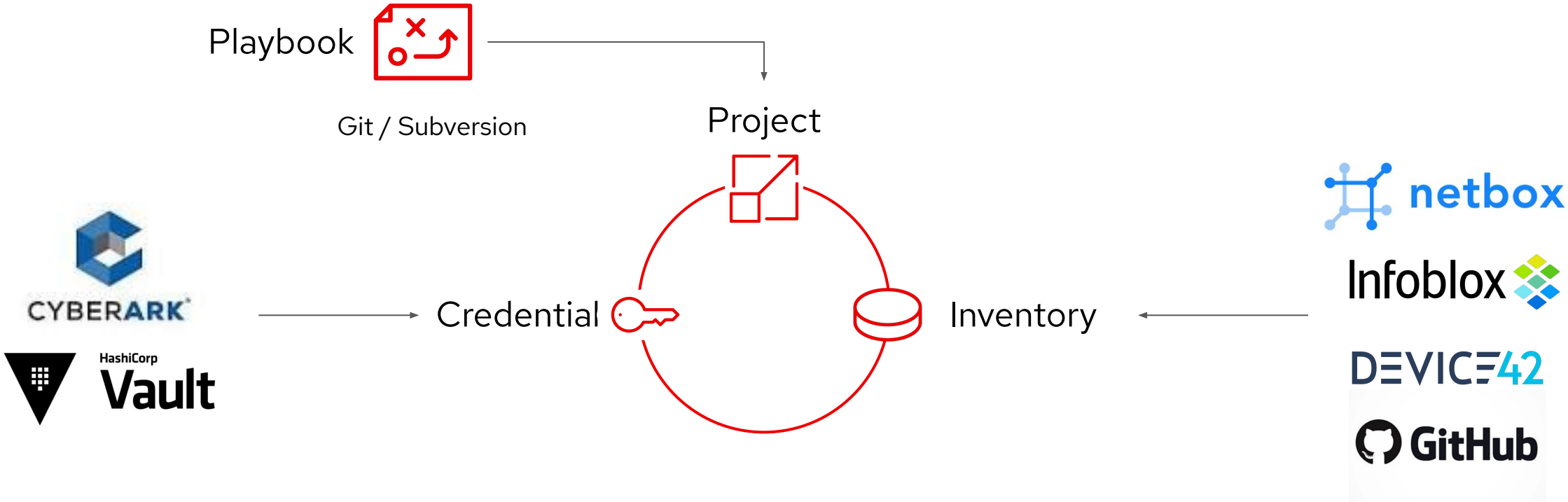
Anatomy of an Automation Job



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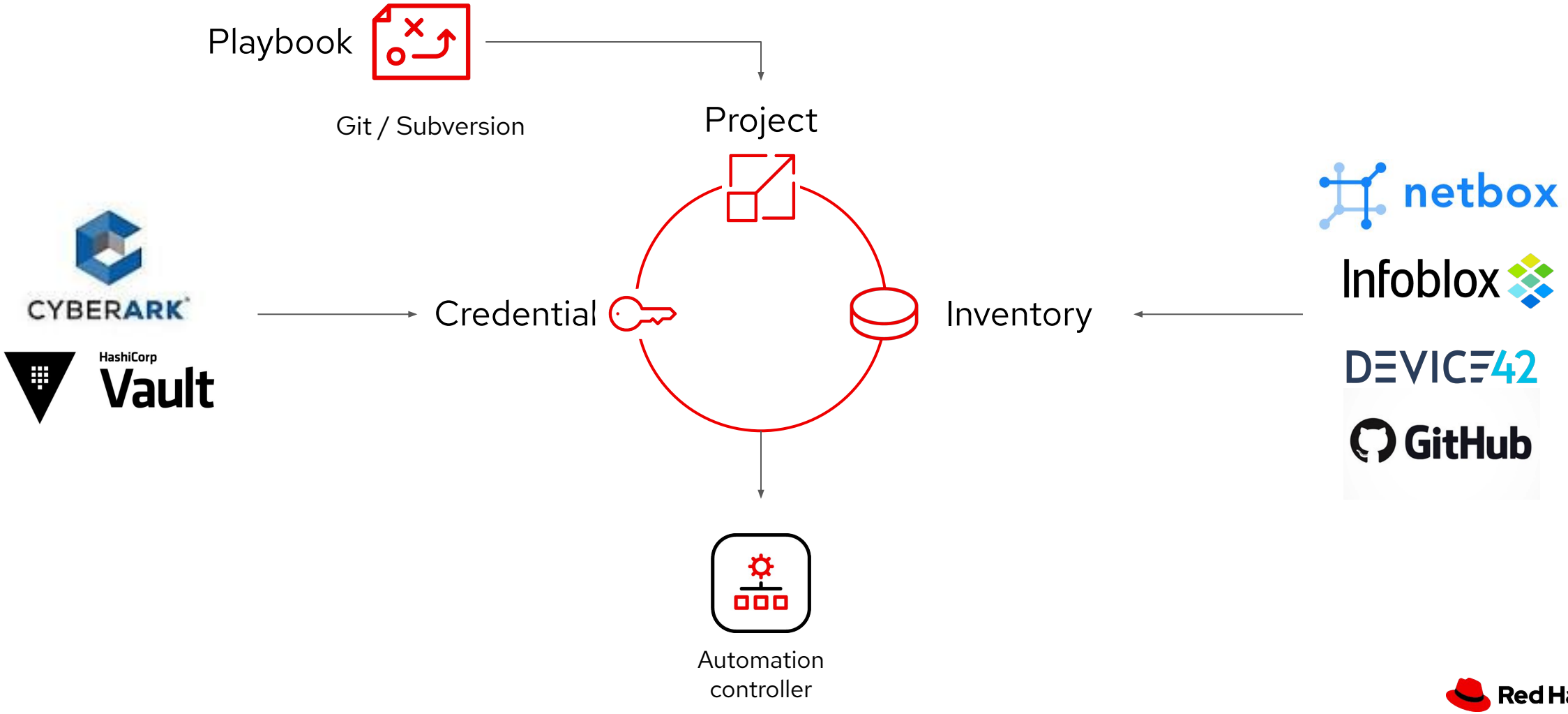
Anatomy of an Automation Job



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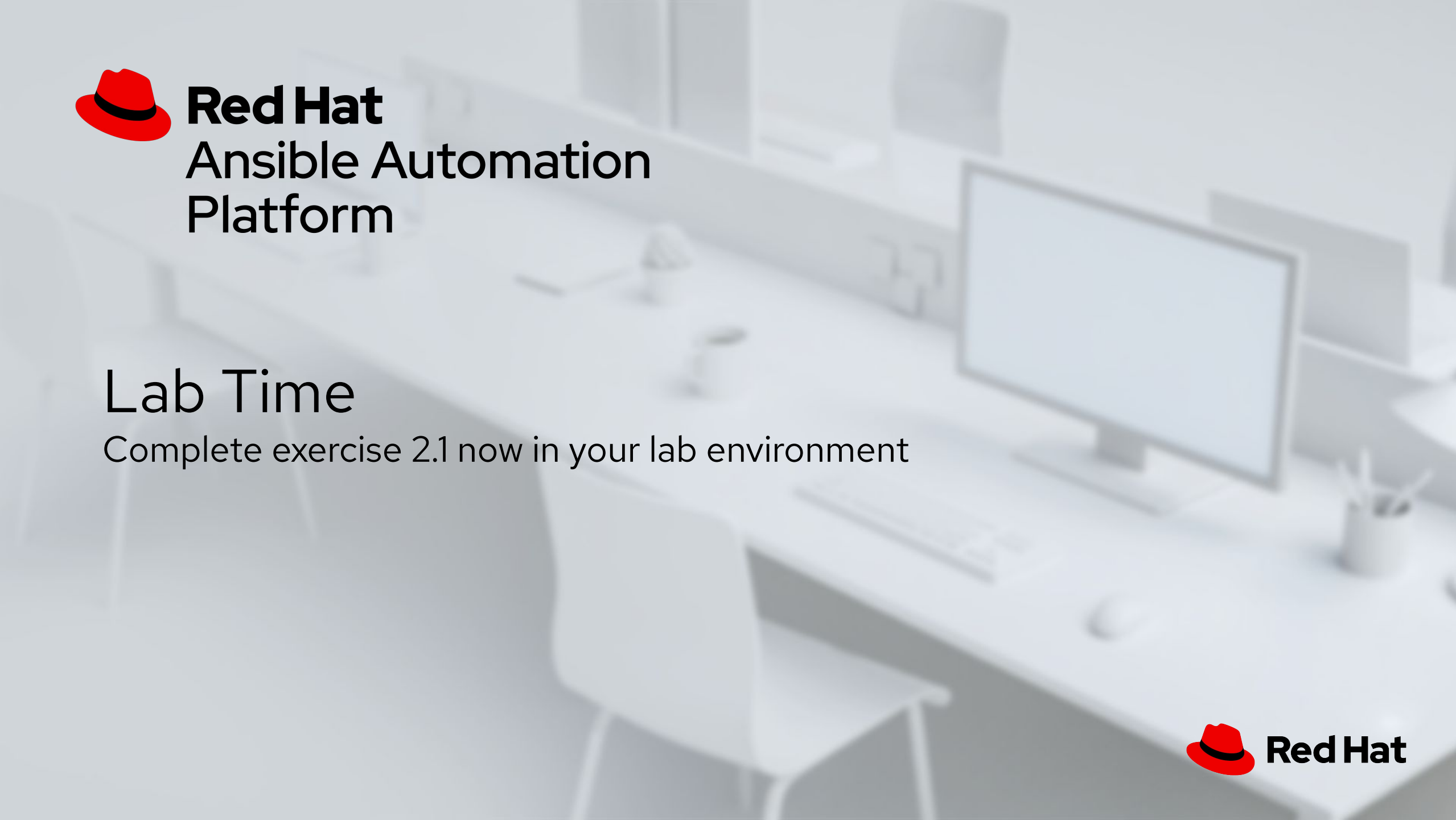
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Exercise 2.2

Topics Covered:

- Inventories
- Credentials

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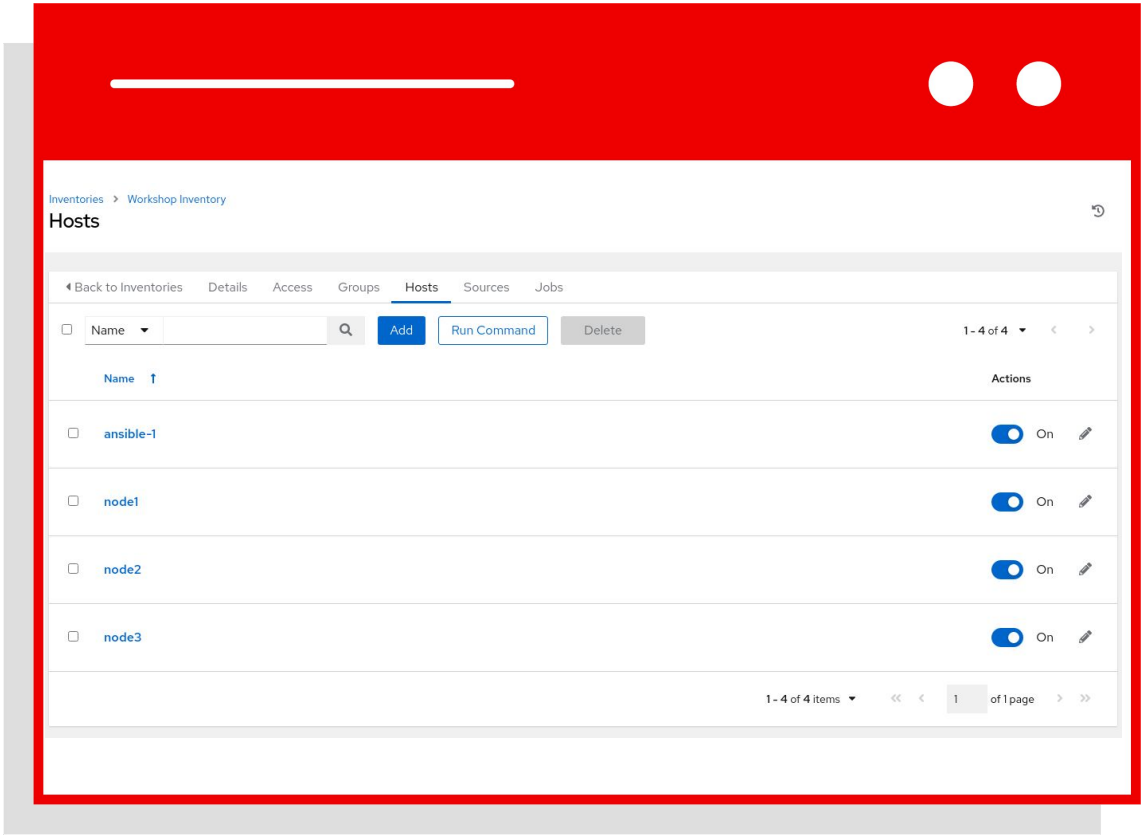
Inventory

Inventory is a collection of hosts (nodes) with associated data and groupings that Automation Controller can connect to and manage.

- Hosts (nodes)
- Groups
- Inventory-specific data (variables)
- Static or dynamic sources



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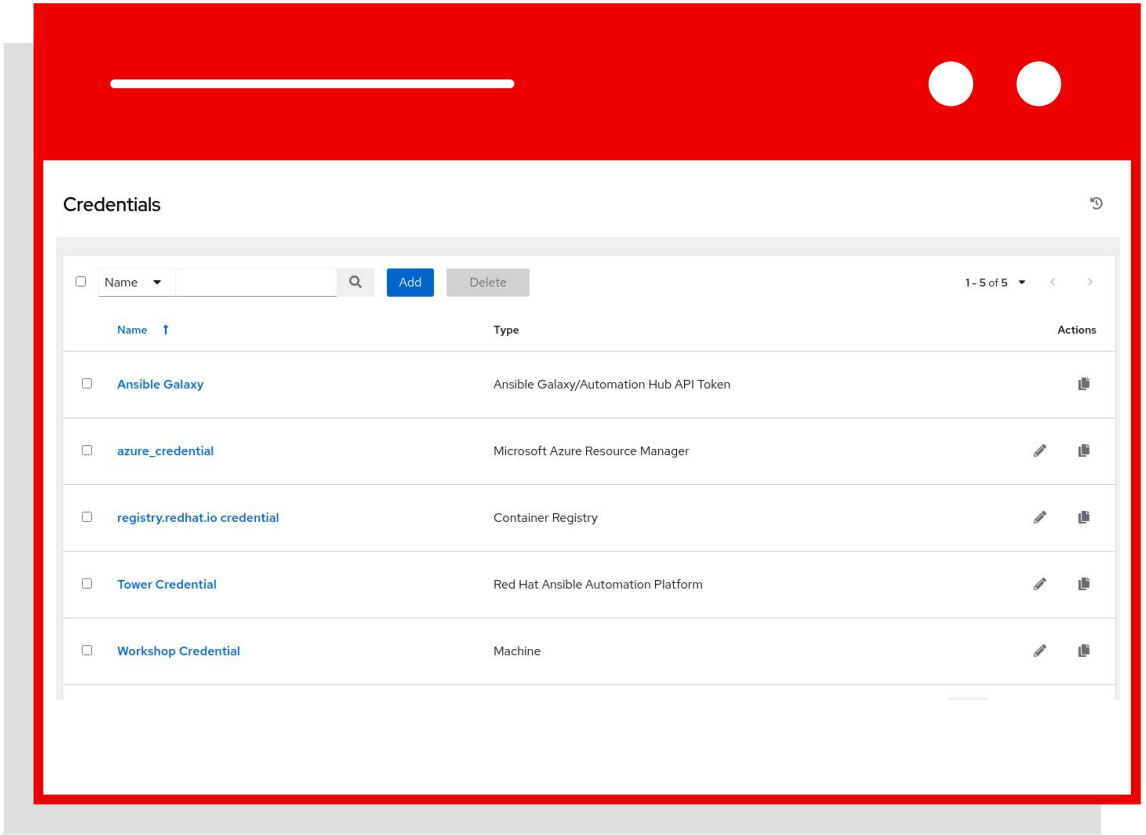
Credentials

Credentials are utilized by Automation Controller for authentication with various external resources:

- Connecting to remote machines to run jobs
- Syncing with inventory sources
- Importing project content from version control systems
- Connecting to and managing network devices

Centralized management of various credentials allows end users to leverage a secret without ever exposing that secret to them.



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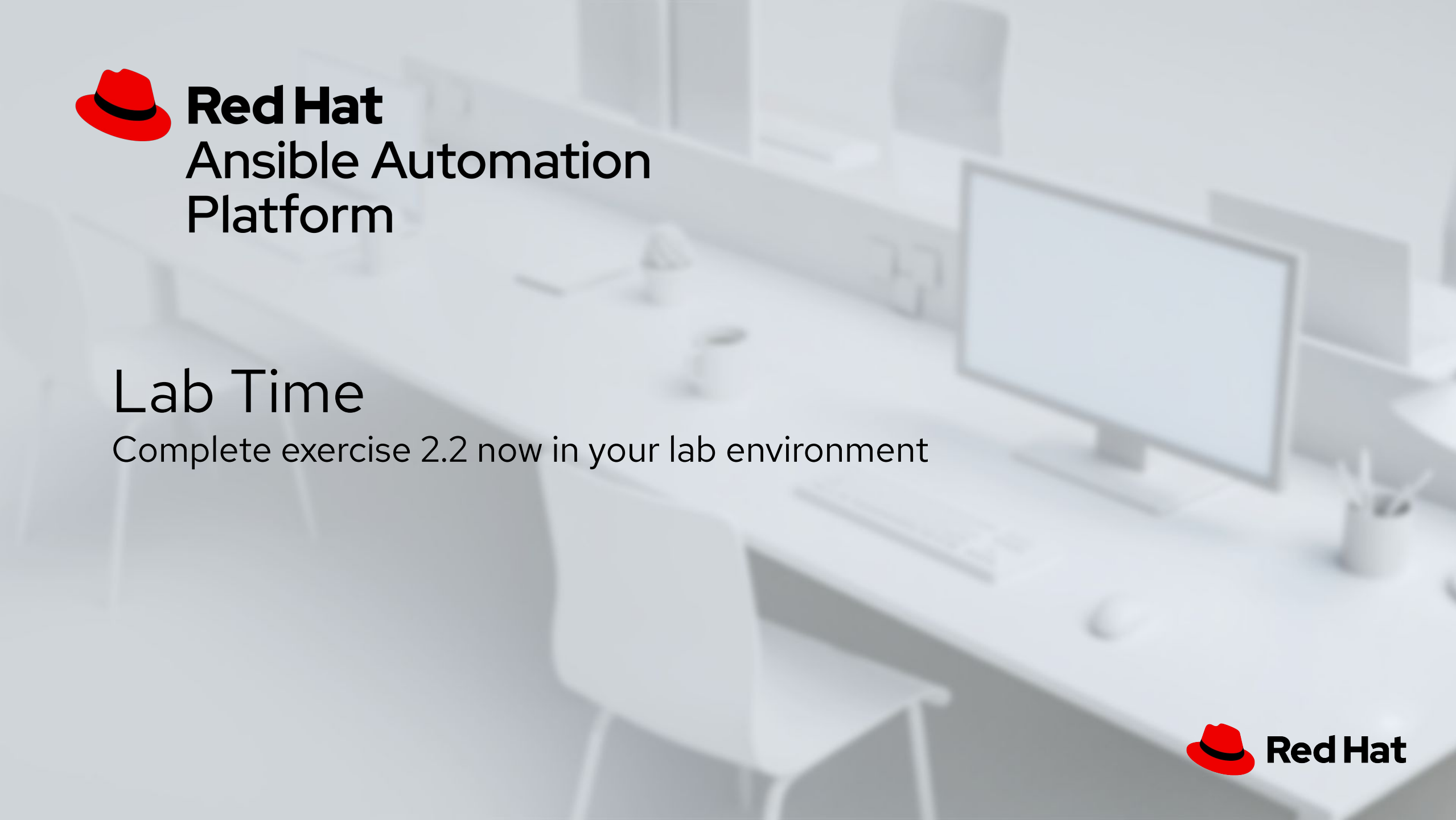
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Exercise 2.3

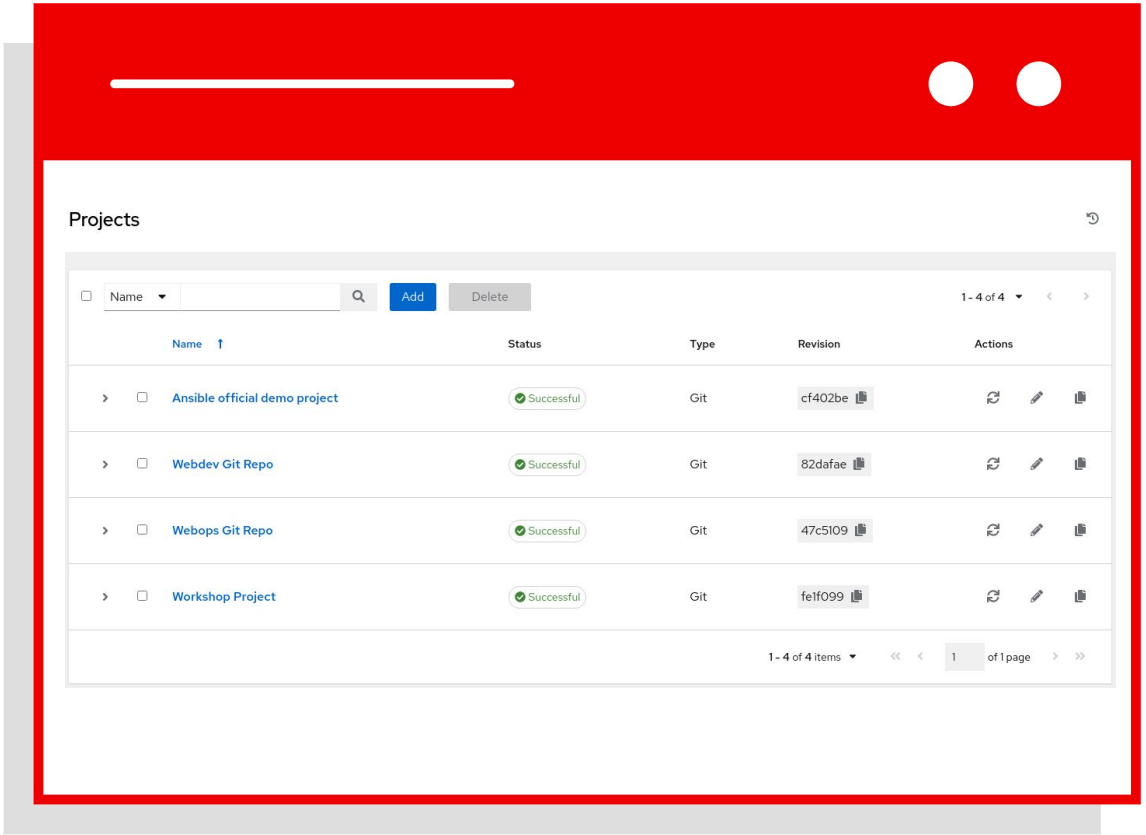
Topics Covered:

- Projects
- Job Templates

Project

A project is a logical collection of Ansible Playbooks, represented in Ansible Automation Controller.

You can manage Ansible Playbooks and playbook directories by placing them in a source code management system supported by Ansible Tower, including Git, Subversion, and Mercurial.



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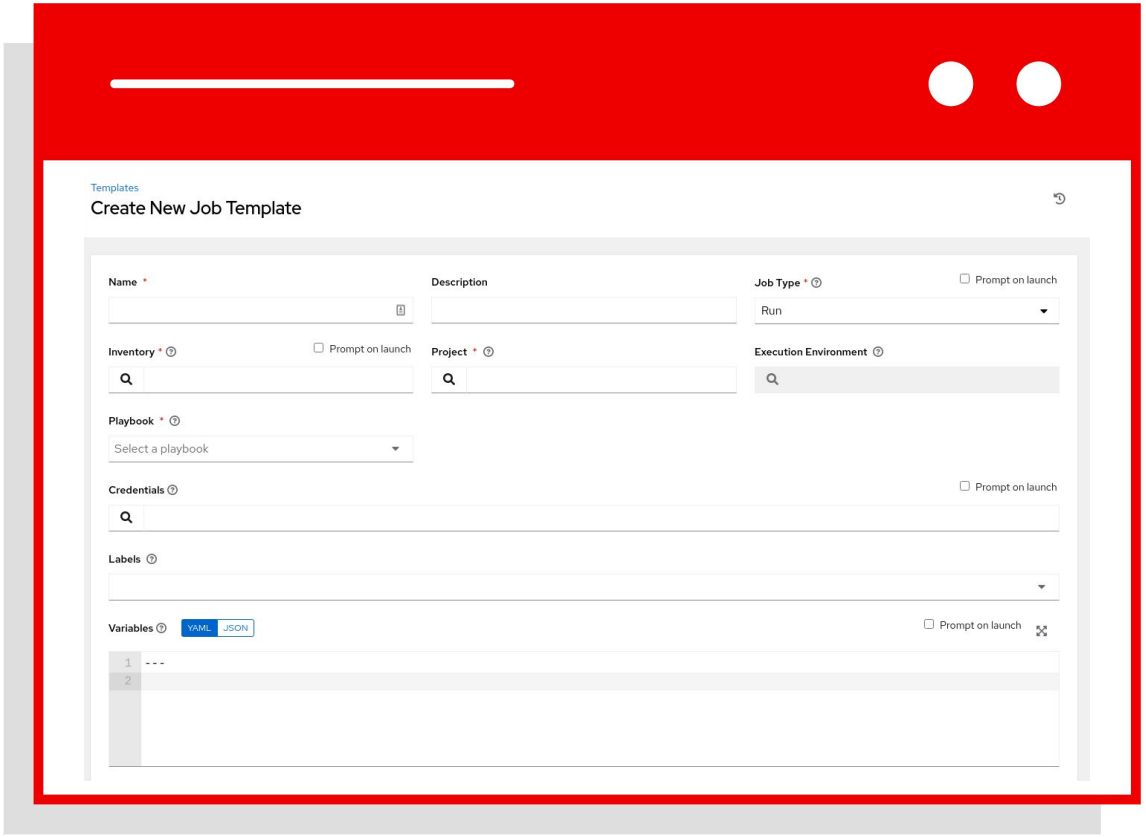
Job Templates

Everything in Ansible Tower revolves around the concept of a **Job Template**. Job Templates allow Ansible Playbooks to be controlled, delegated and scaled for an organization.

Job templates also encourage the reuse of Ansible Playbook content and collaboration between teams.

A **Job Template** requires:

- An **Inventory** to run the job against
- A **Credential** to login to devices.
- A **Project** which contains Ansible Playbooks



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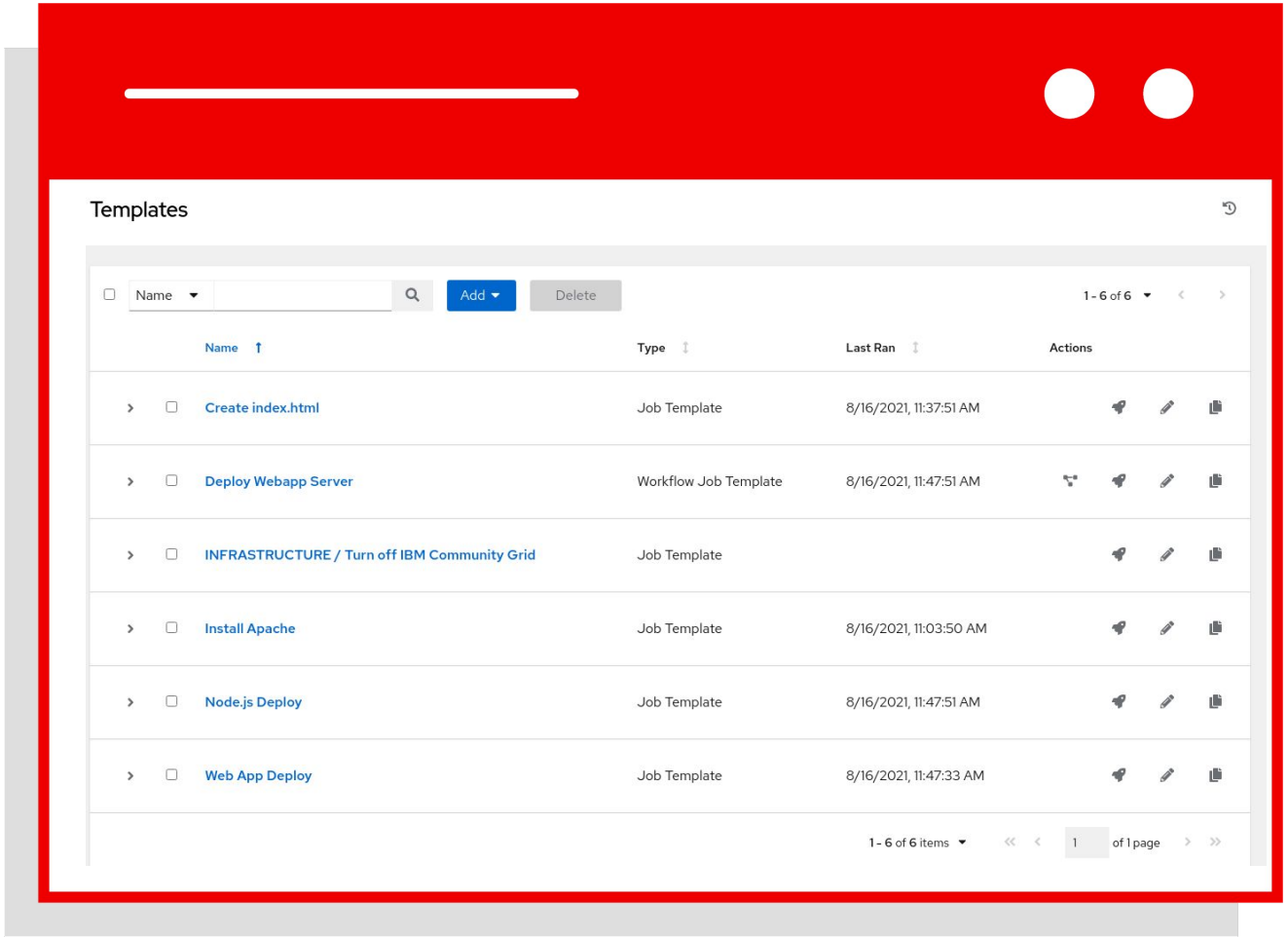
Expanding on Job Templates

Job Templates can be found and created by clicking the **Templates** button under the *Resources* section on the left menu.



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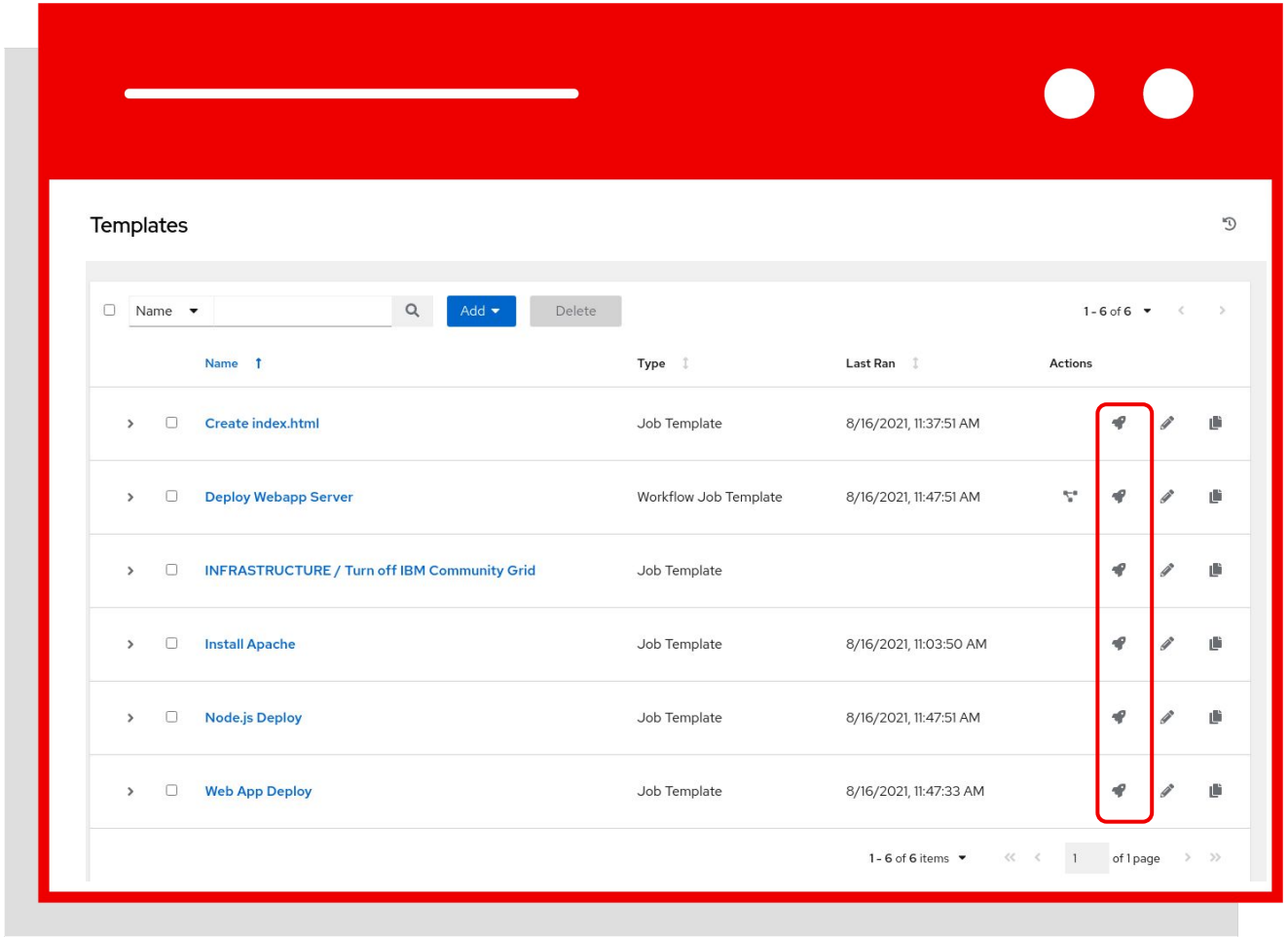
Executing an existing Job Template

Job Templates can be launched by clicking the **rocketship button** for the corresponding Job Template



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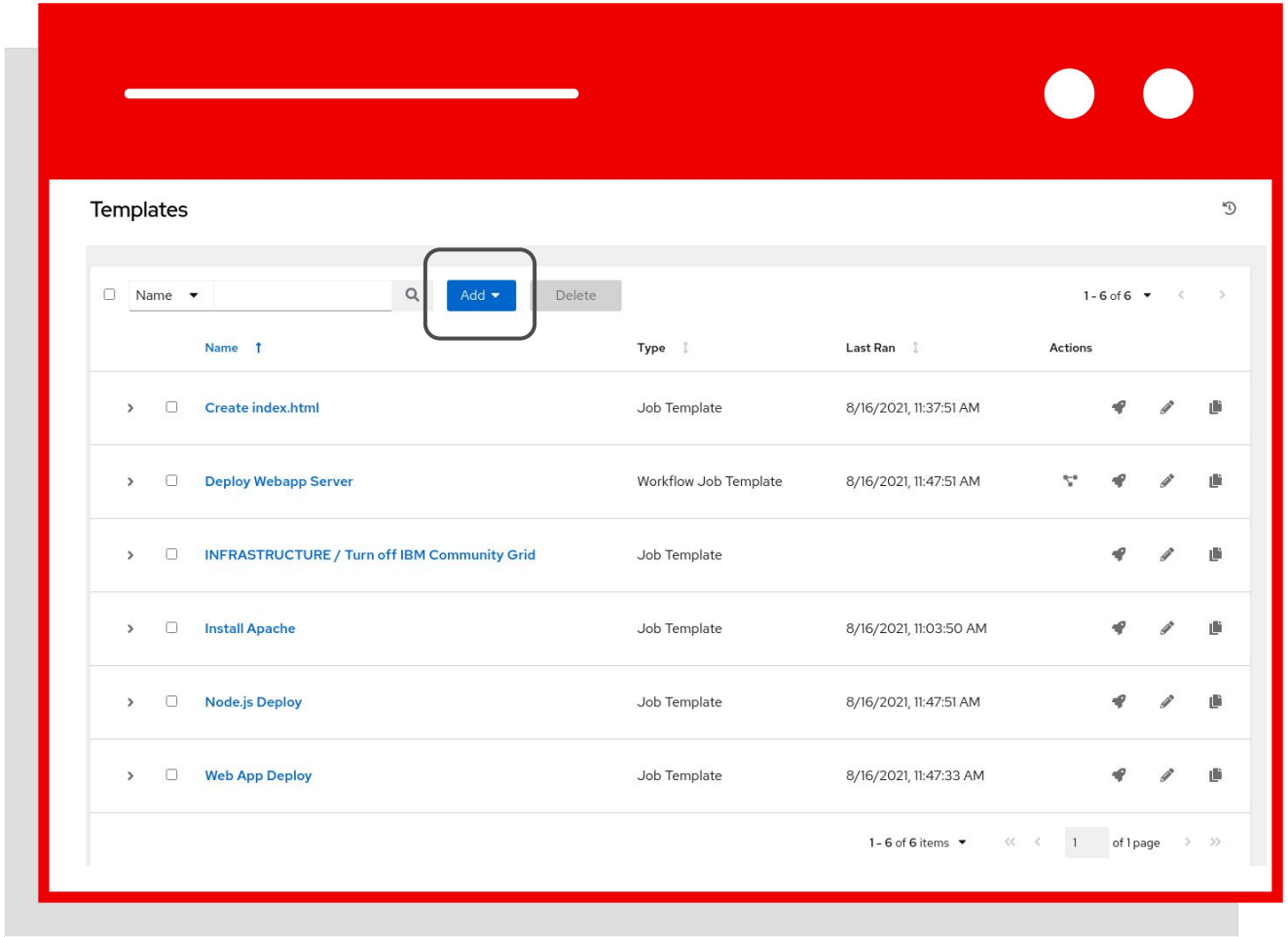
Creating a new Job Template (1/2)

New Job Templates can be created by clicking the **Add button**



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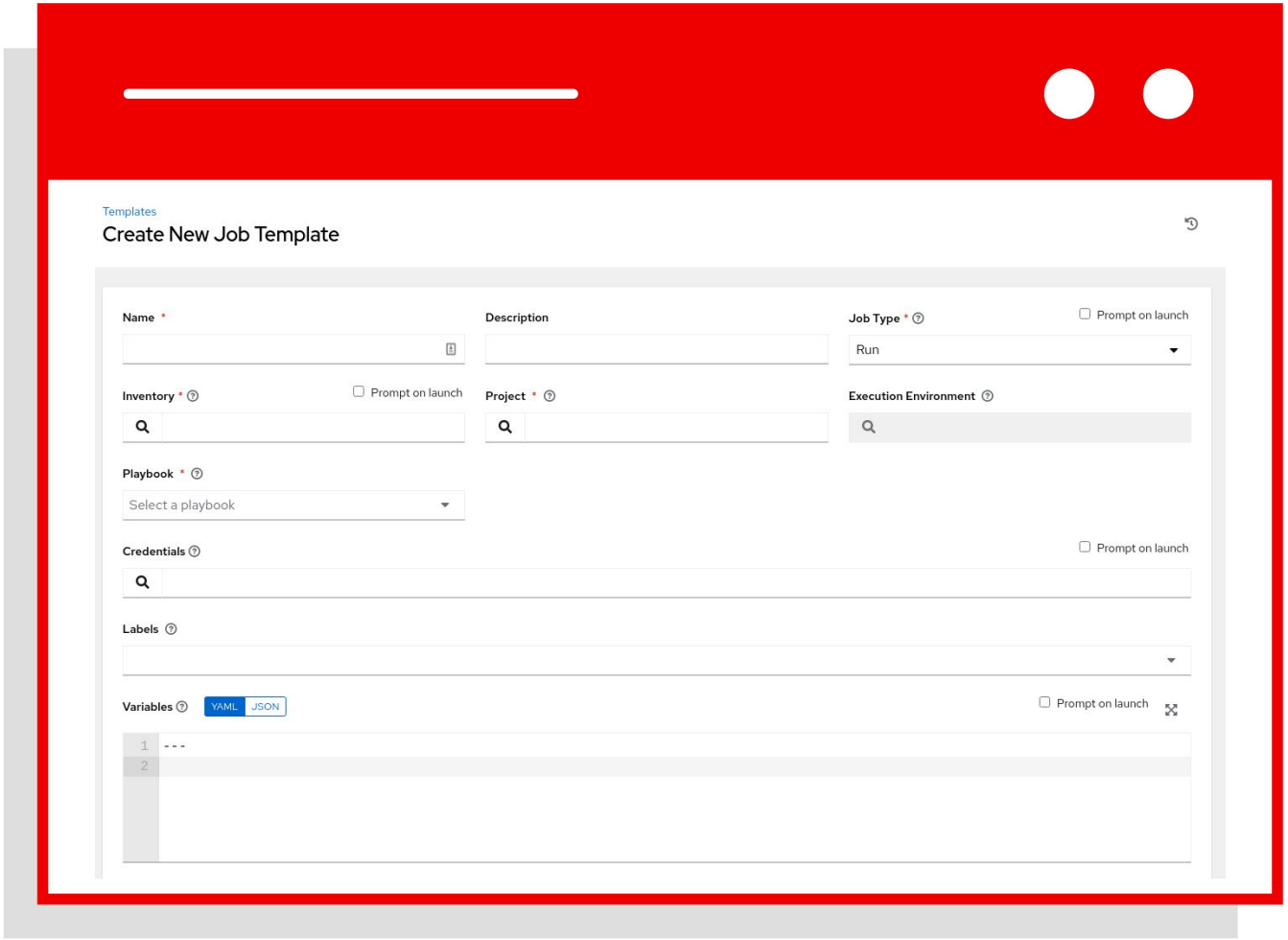
Creating a new Job Template (2/2)

This **New Job Template** window is where the inventory, project and credential are assigned. The red asterisk * means the field is required .



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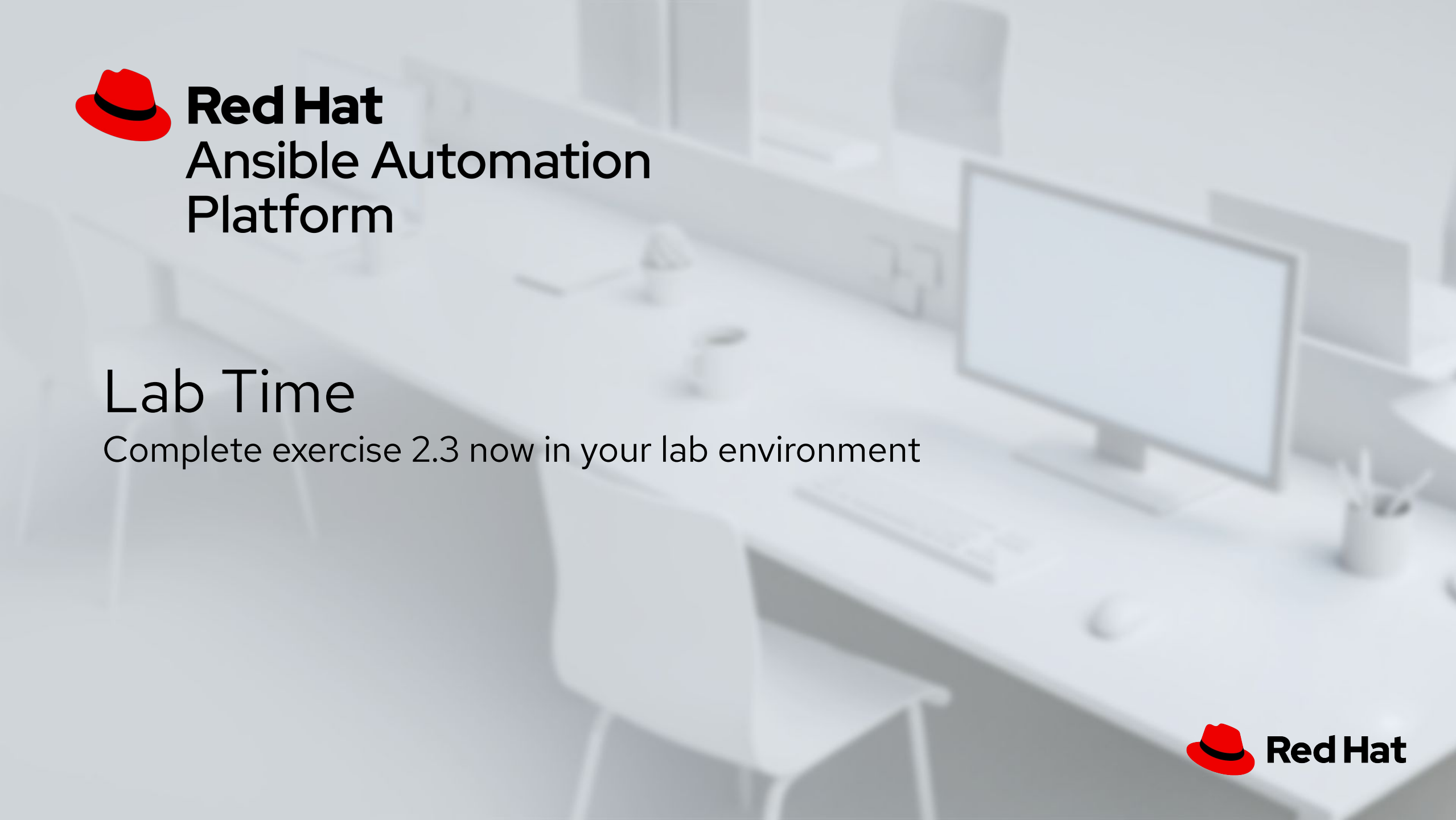
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Exercise 2.4

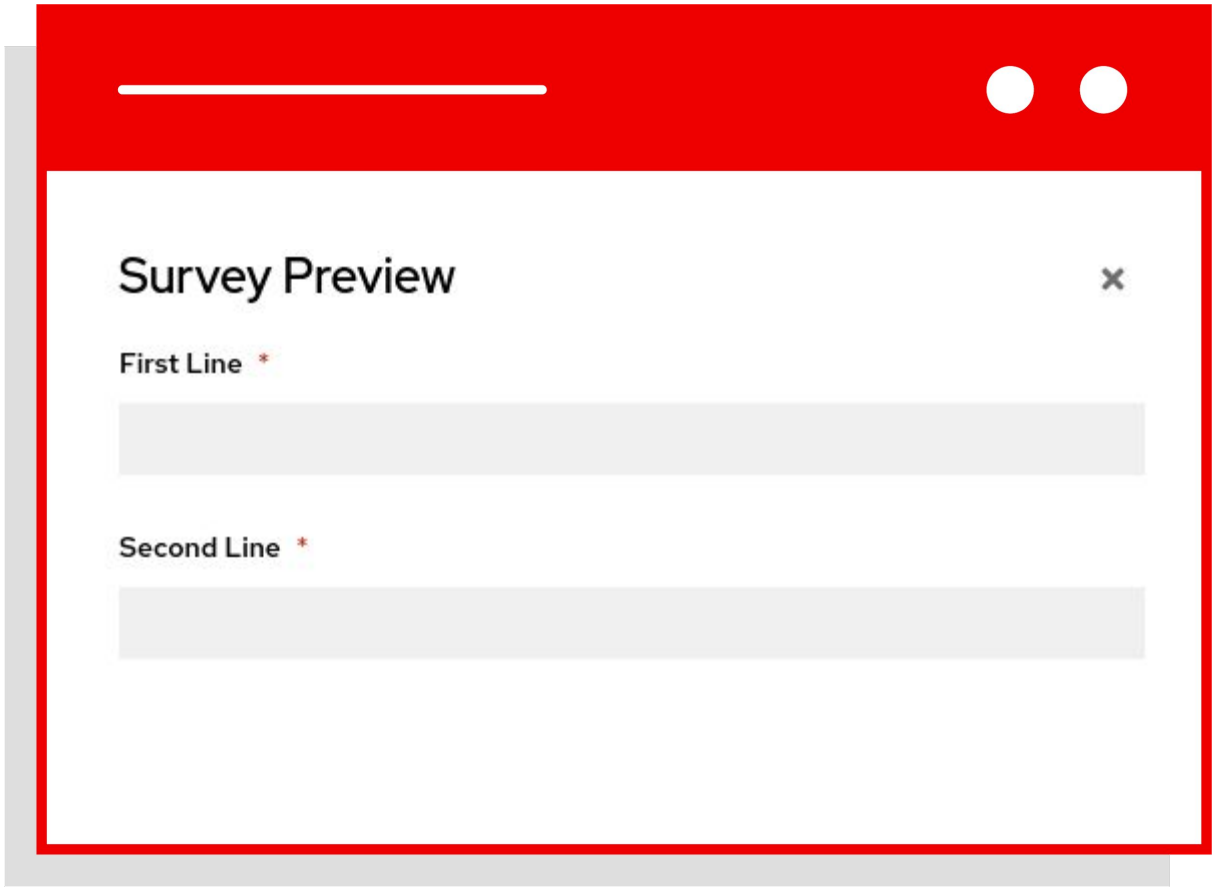
Topics Covered:

- Surveys

Surveys

Controller surveys allow you to configure how a job runs via a series of questions, making it simple to customize your jobs in a user-friendly way.

An Ansible Controller survey is a simple question-and-answer form that allows users to customize their job runs. Combine that with Controller's role-based access control, and you can build simple, easy self-service for your users.



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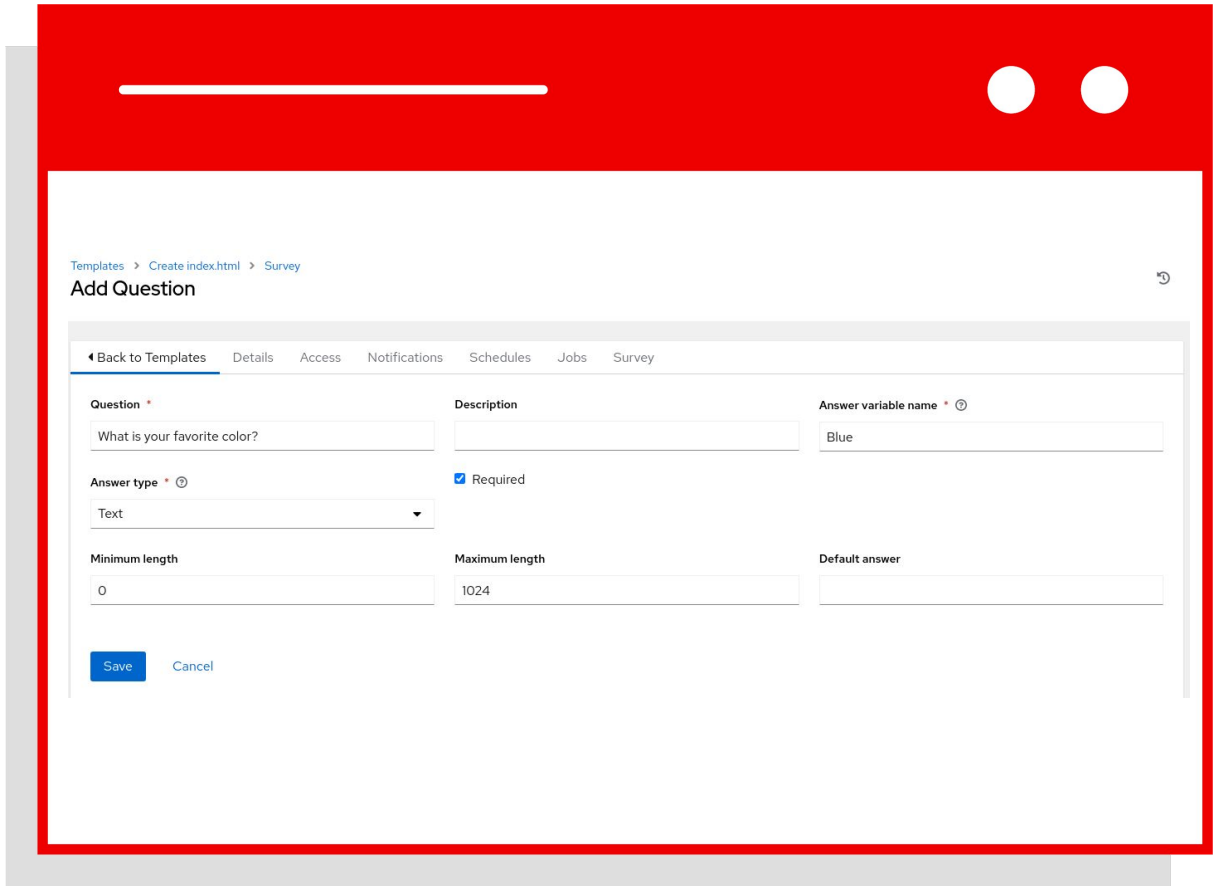
Creating a Survey (1/2)

Once a Job Template is saved, the Survey menu will have an **Add**

Button

Click the button to open the Add Survey window.



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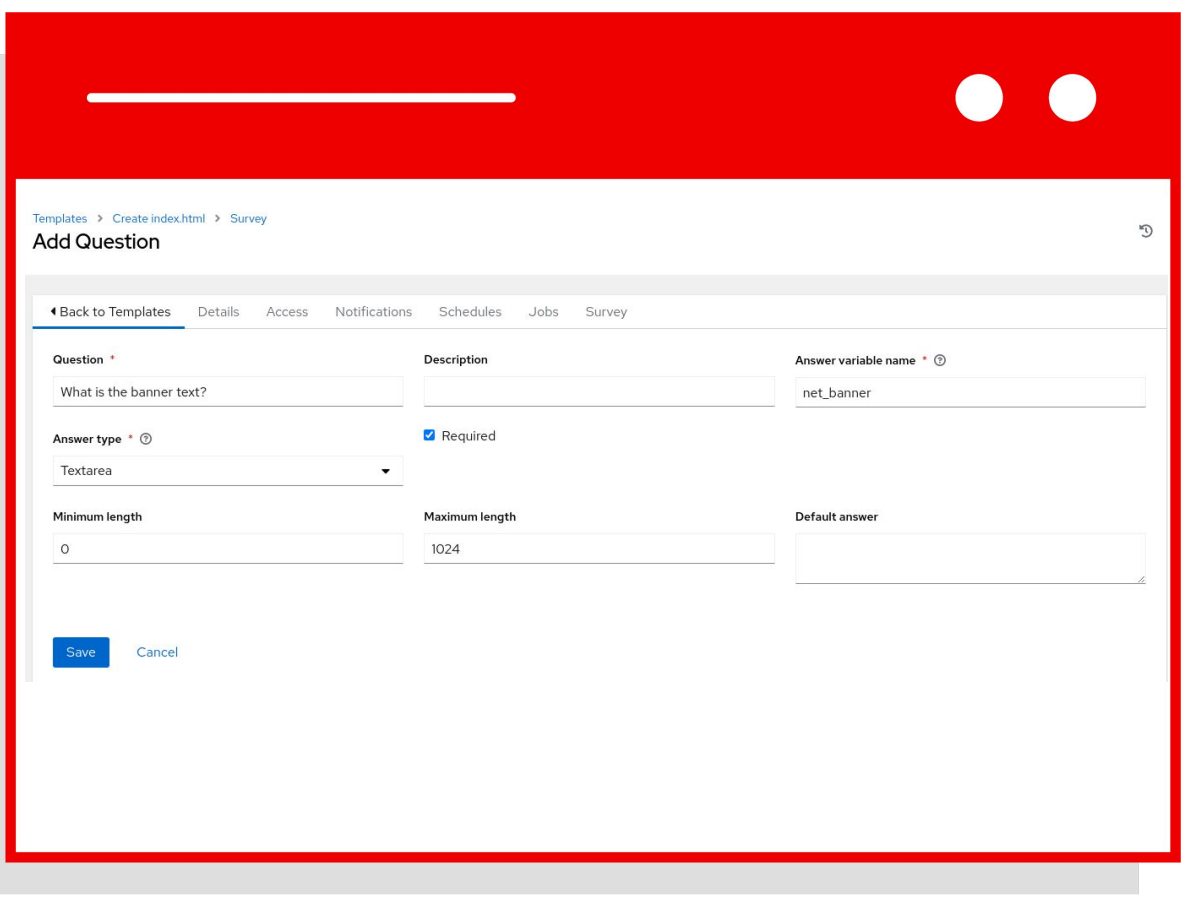
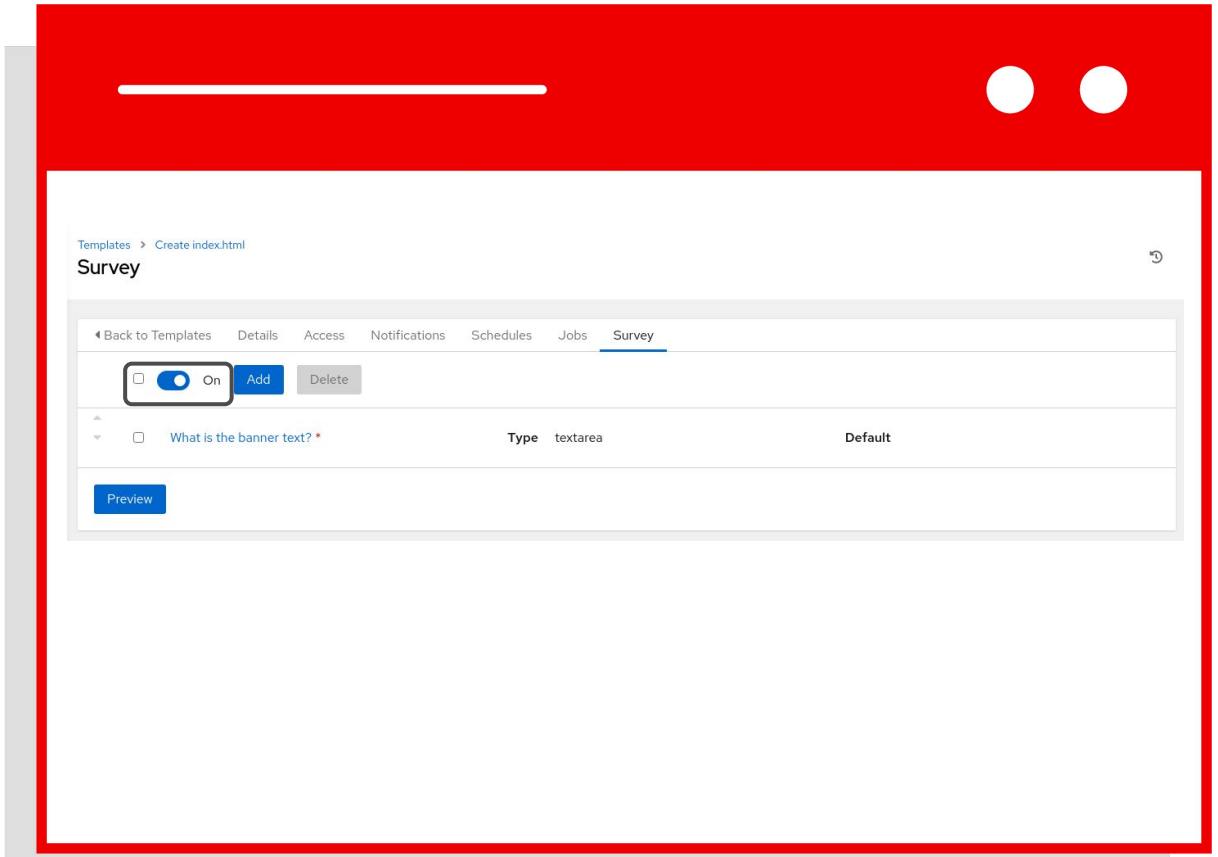
Creating a Survey (2/2)

The Add Survey window allows the Job Template to prompt users for one or more questions. The answers provided become variables for use in the Ansible Playbook.





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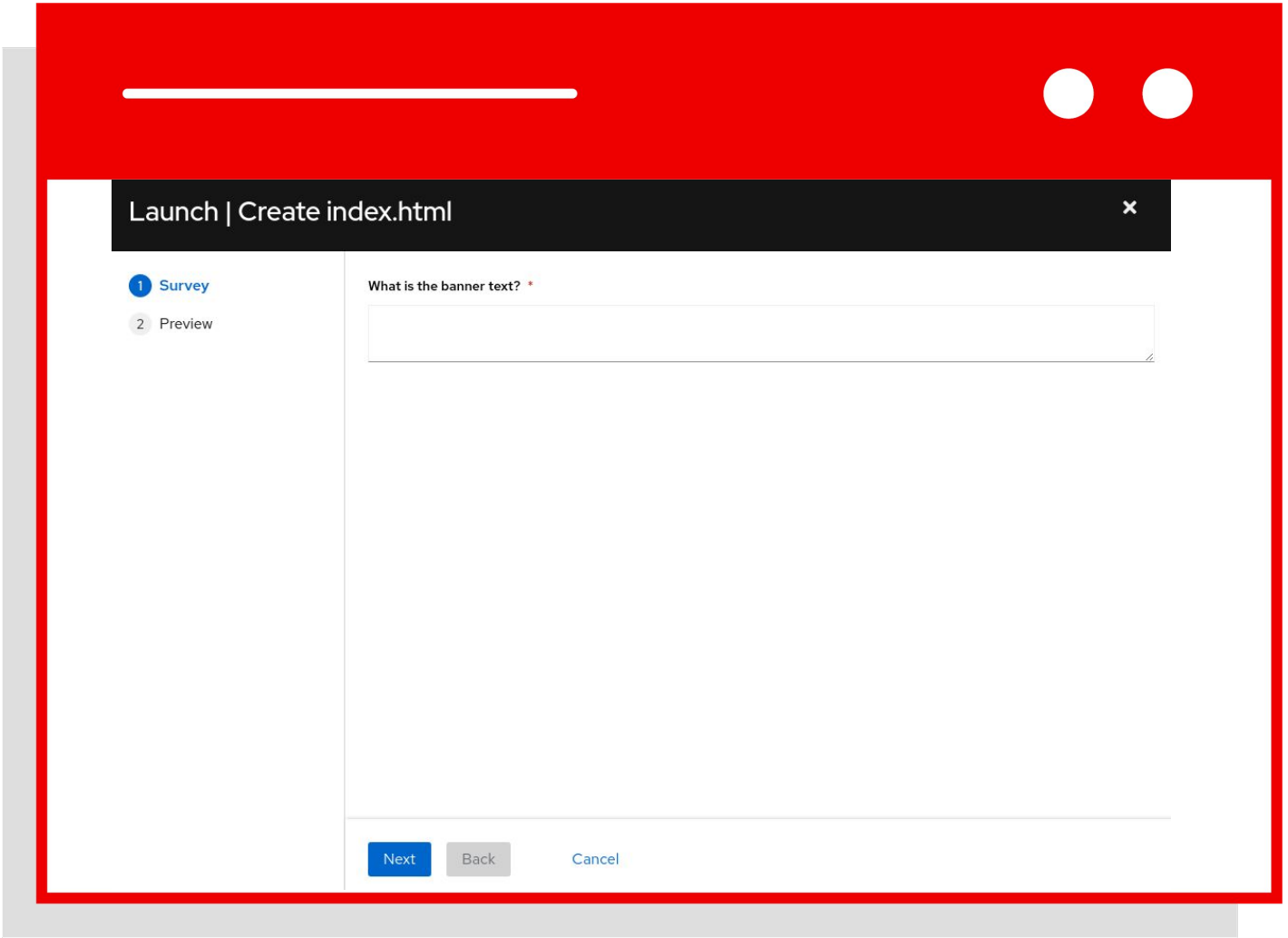
Using a Survey

When launching a job, the user will now be prompted with the Survey. The user can be required to fill out the Survey before the Job Template will execute.



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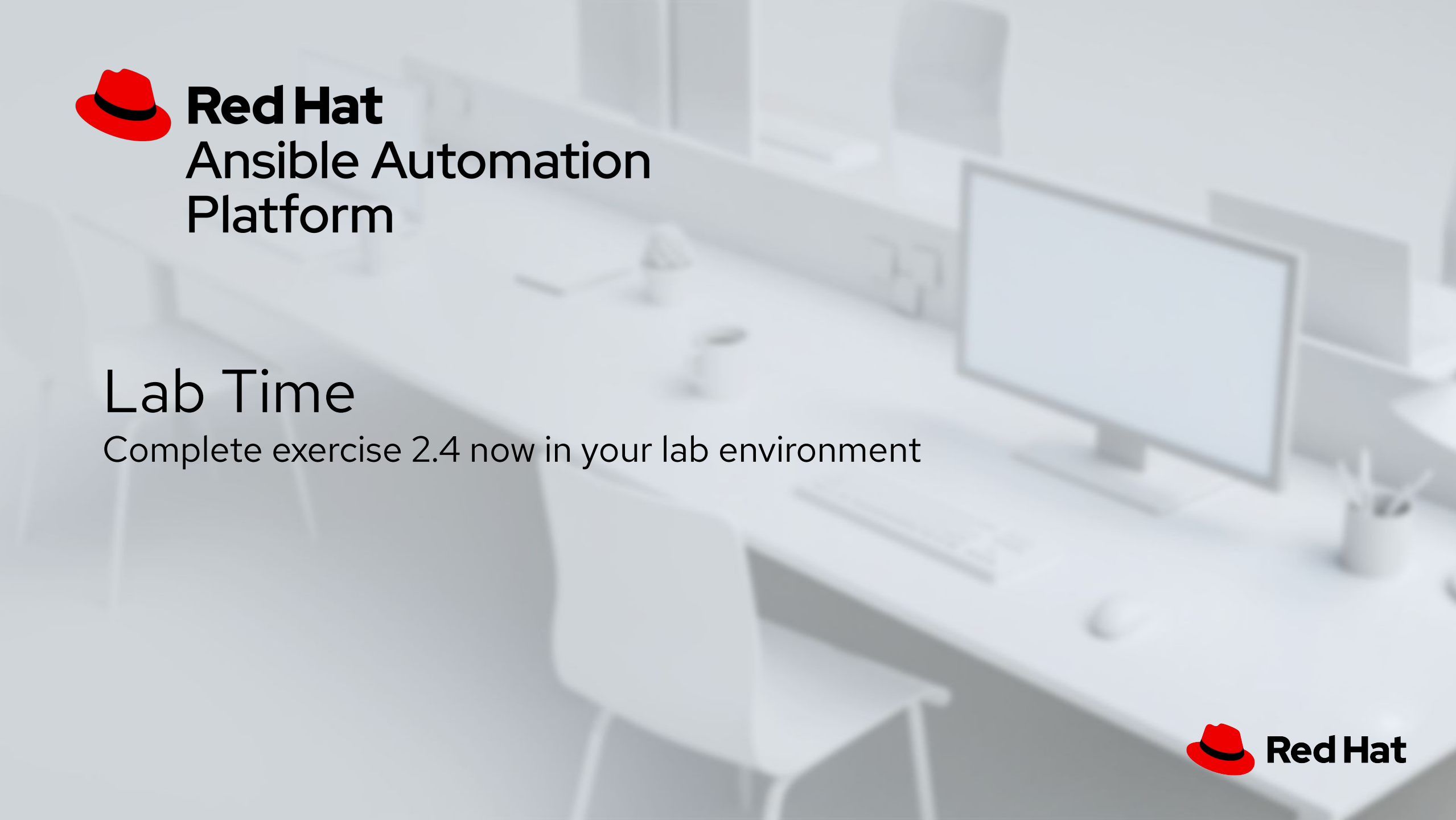
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Exercise 2.5

Topics Covered:

- Role based access control

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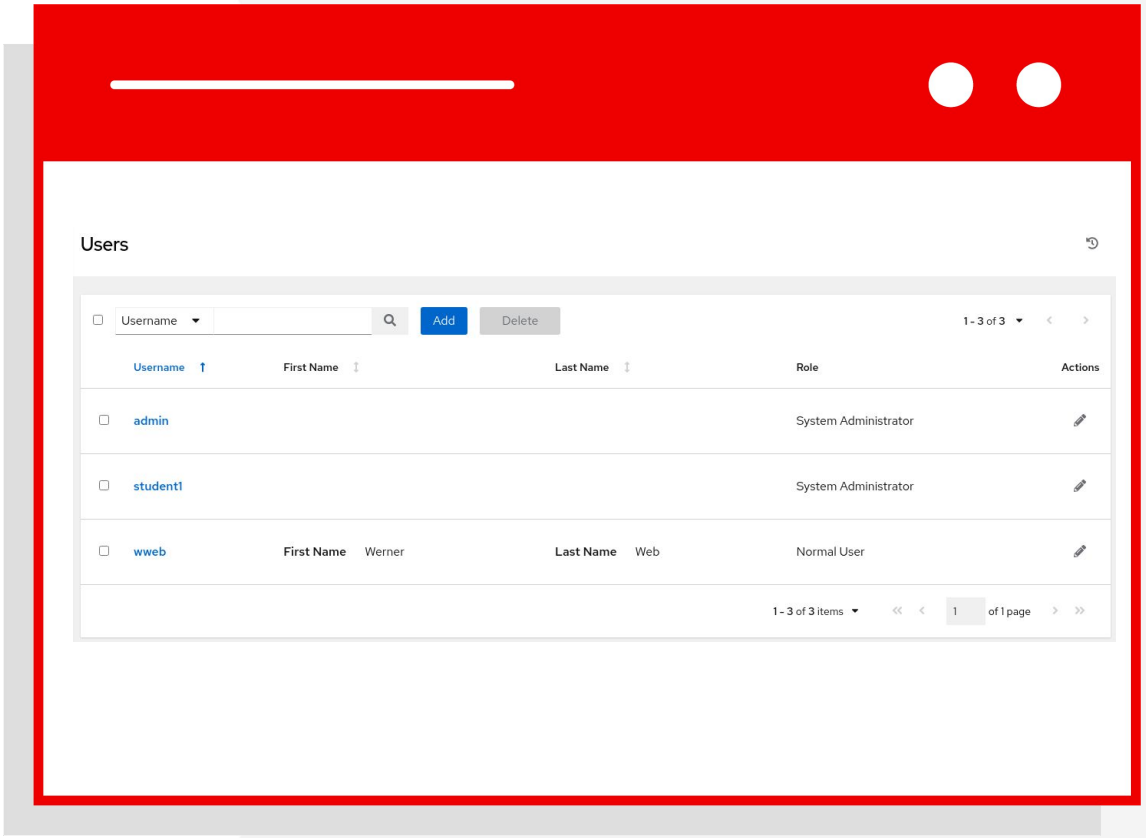
Role-based access control

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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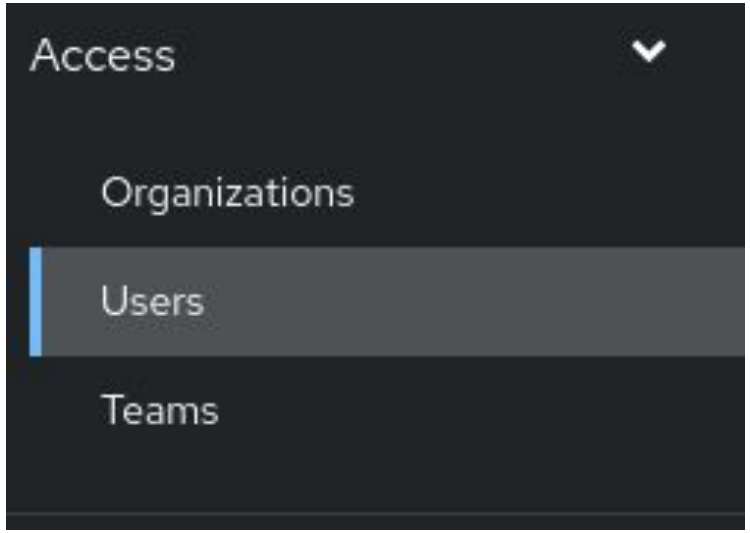
User Management

- An **organization** is a logical collection of users, teams, projects, inventories and more. All entities belong to an organization.

- A **user** is an account to access Ansible Automation Controller and its services given the permissions granted to it.

- **Teams** provide a means to implement role-based access control schemes and delegate responsibilities across organizations.



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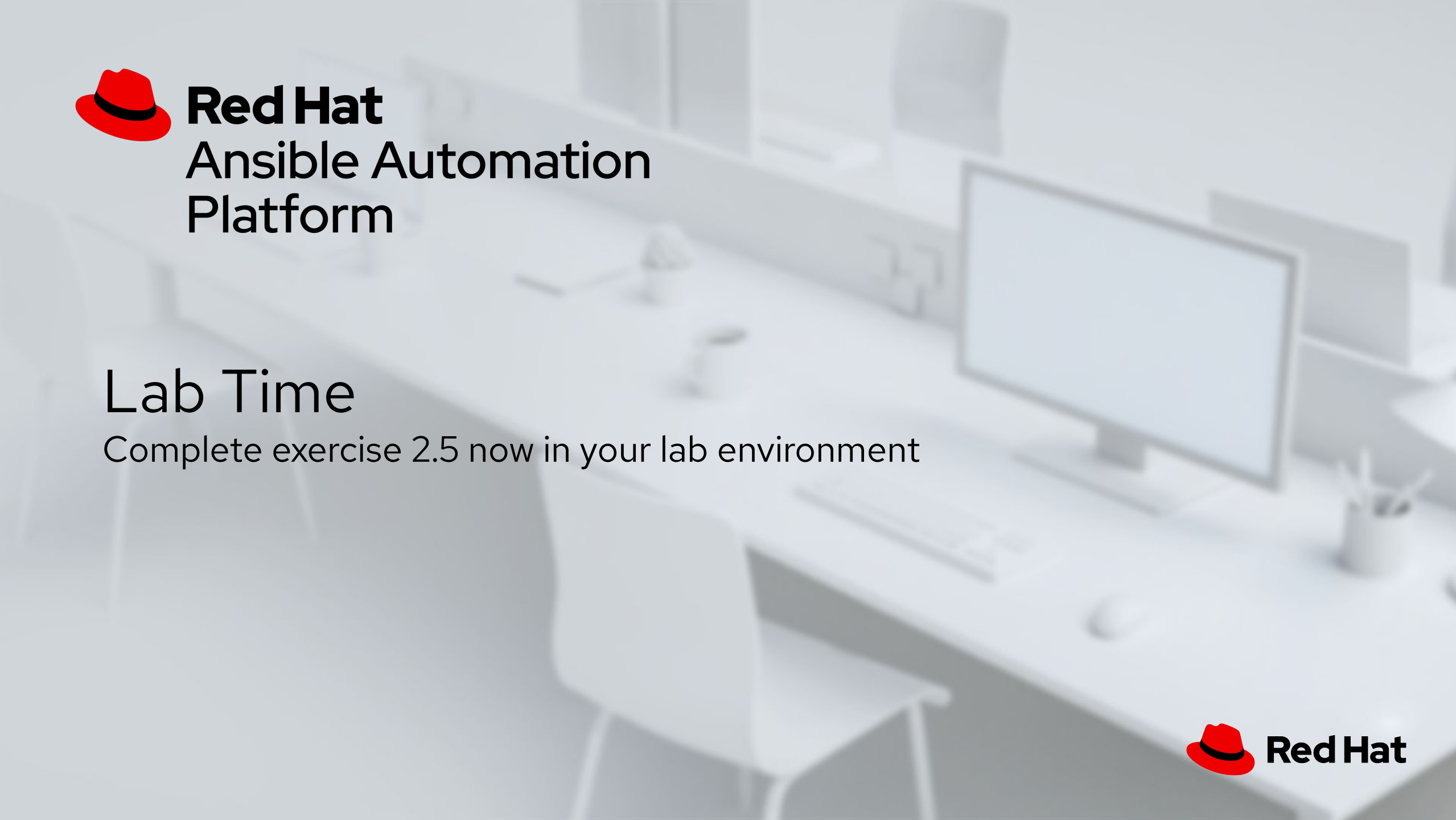
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Exercise 2.6

Topics Covered:

- Workflows

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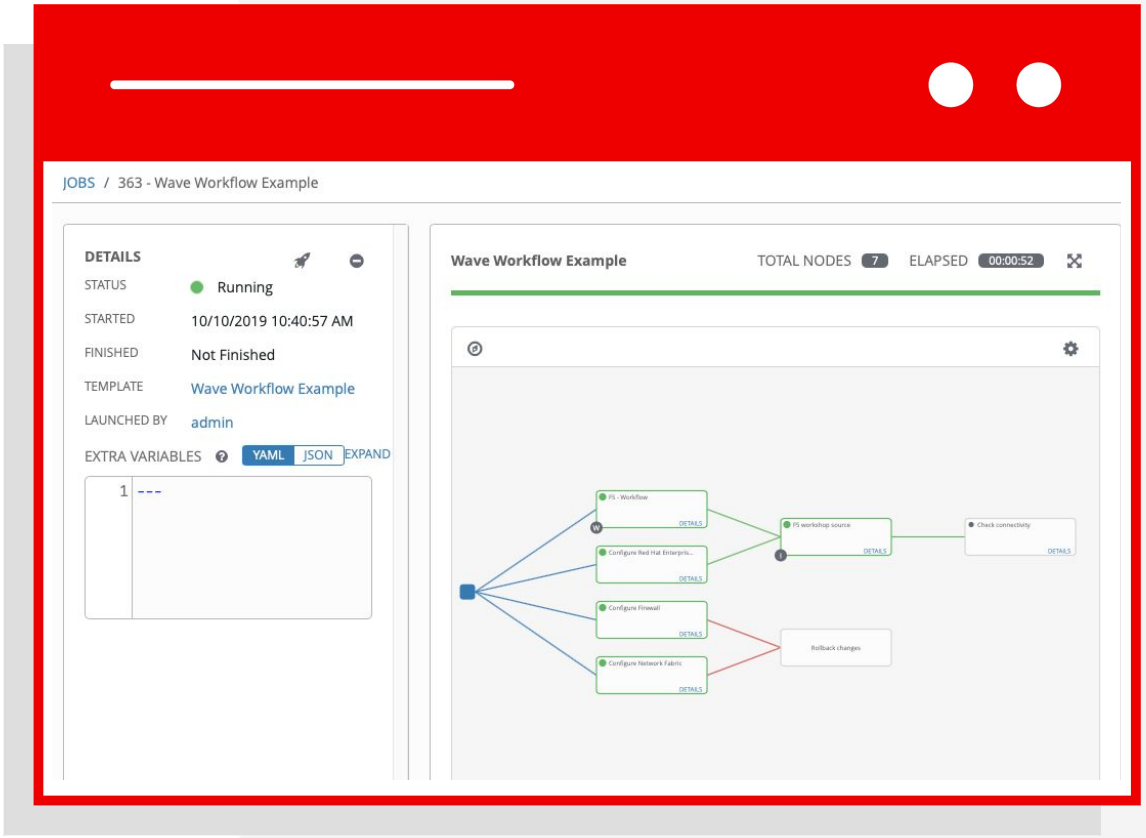
Workflows

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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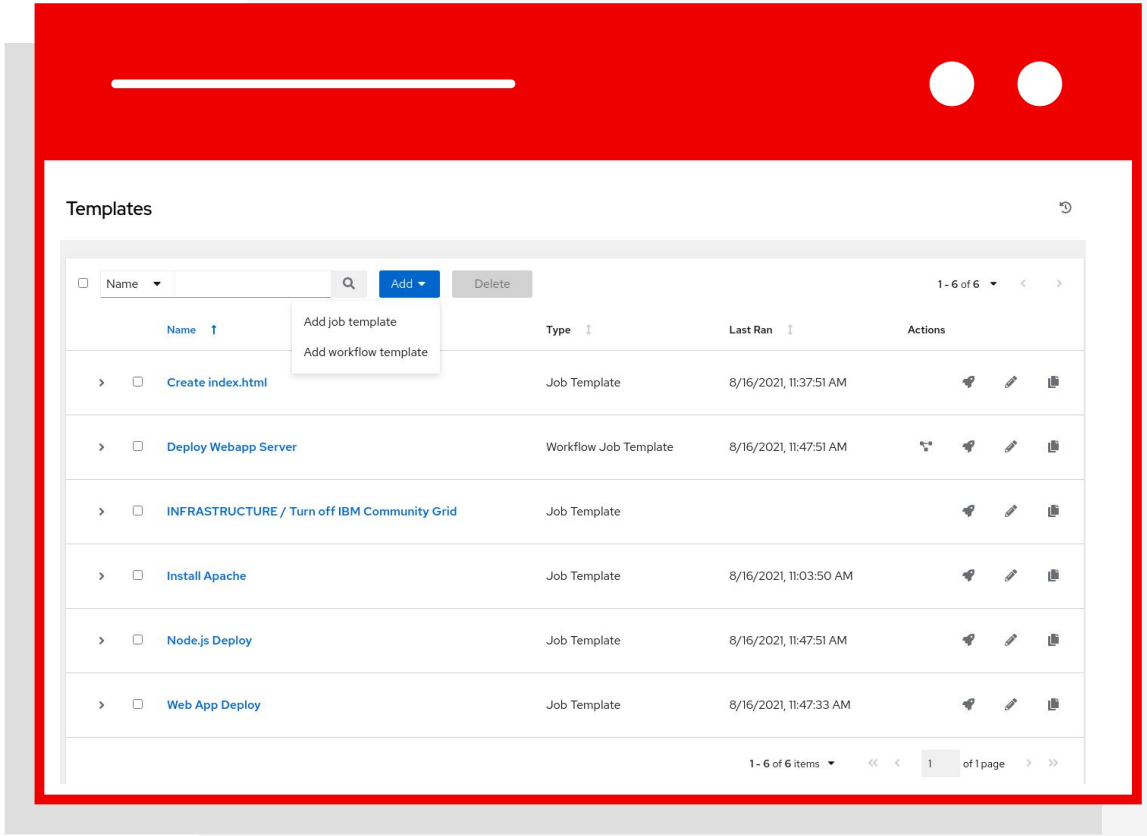
Adding a New Template

- To add a new **Workflow** click on the **Add** button.

  This time select the **Add workflow template**



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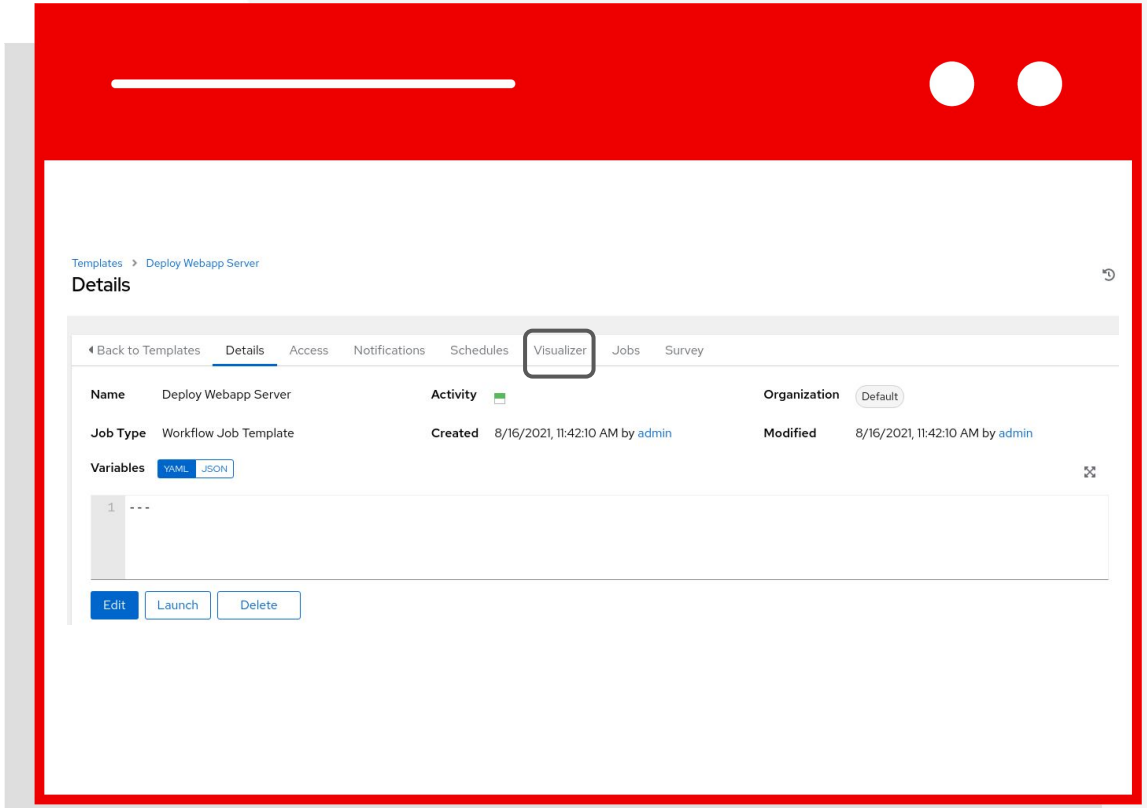
Creating the Workflow

- Fill out the required parameters and click **Save.**
  As soon as the Workflow Template is saved the Workflow Visualizer will open.



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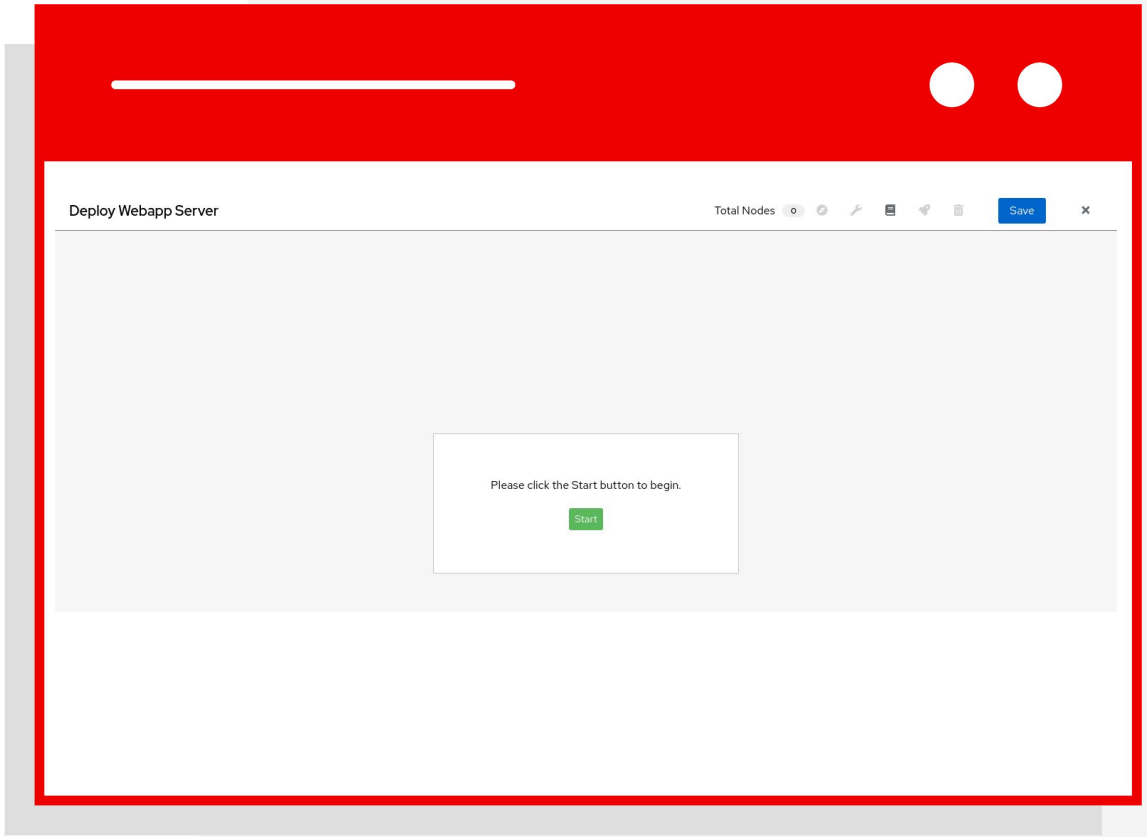
Workflow Visualizer

- The Workflow Visualizer will start as a blank canvas.
- Click the green Start button to start building the workflow.



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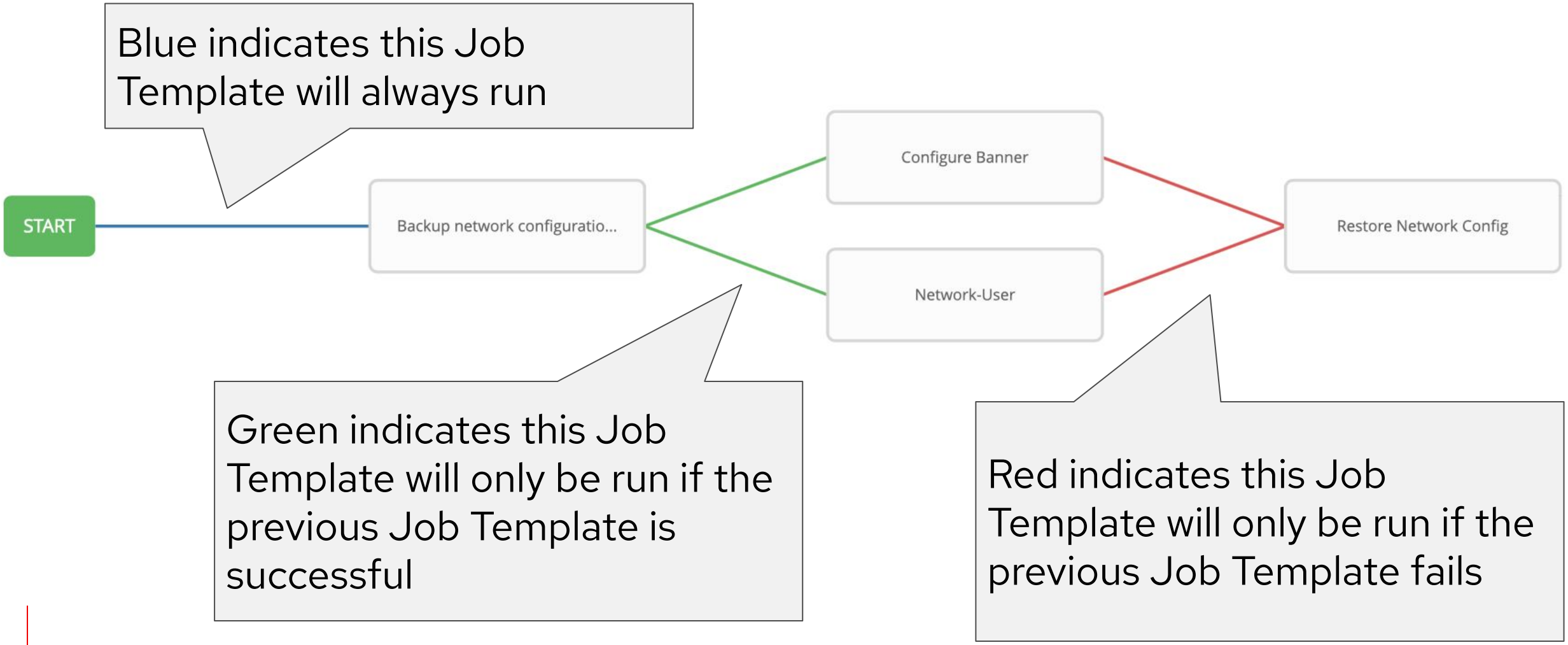
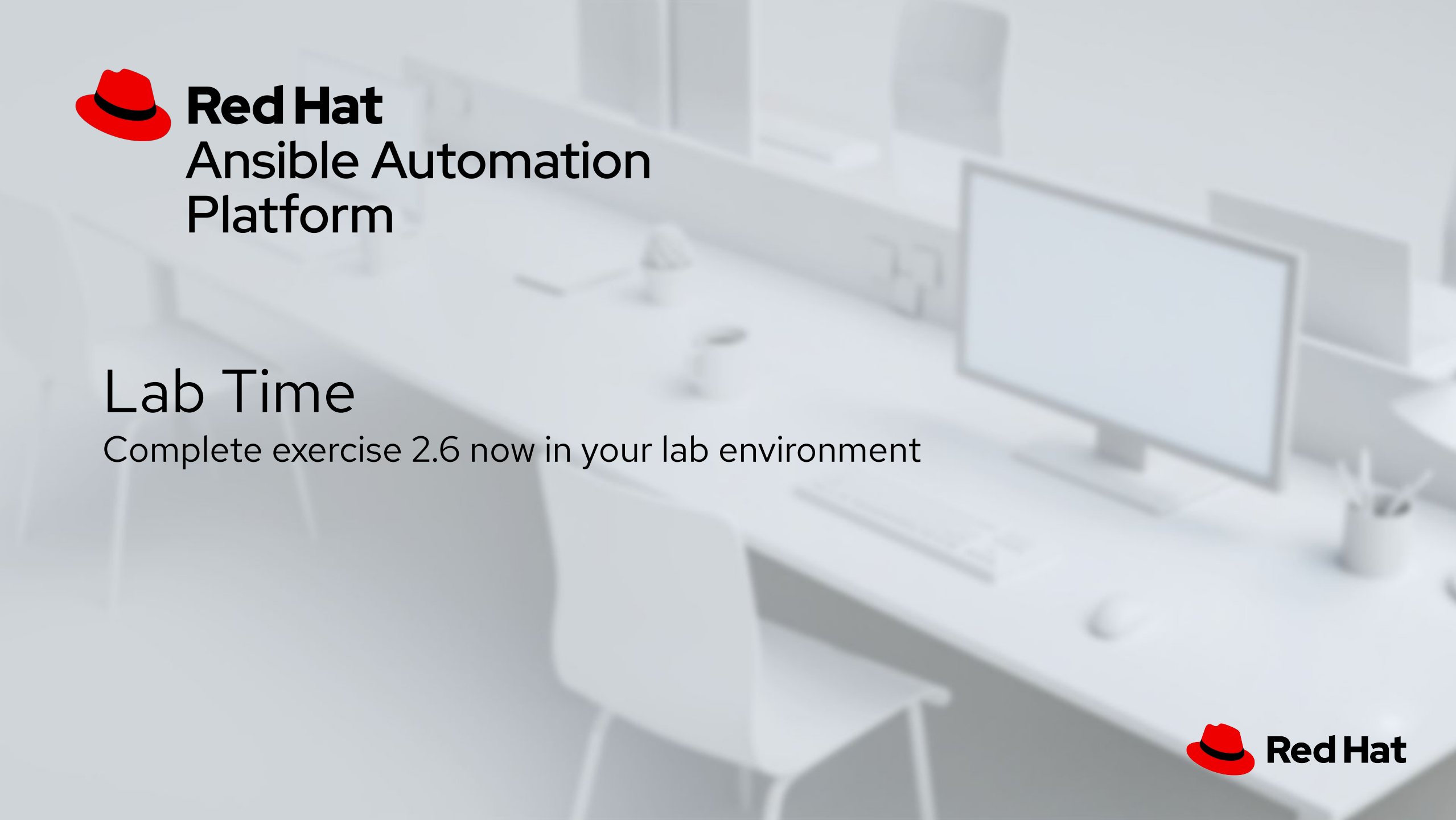
Visualizing a Workflow

Workflows can branch out, or converge in.

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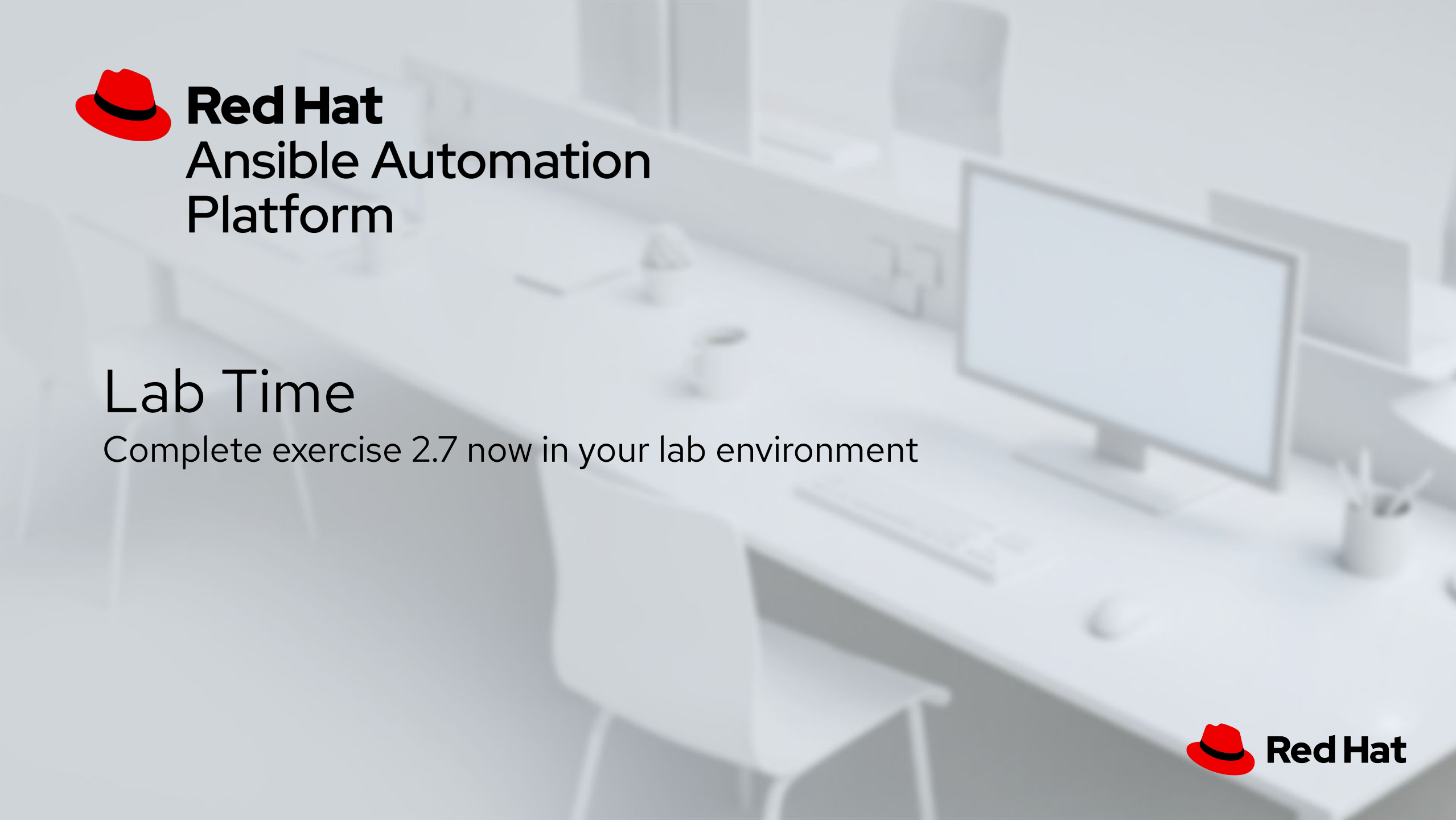
Exercise 2.7

Topics Covered:

- Wrap-up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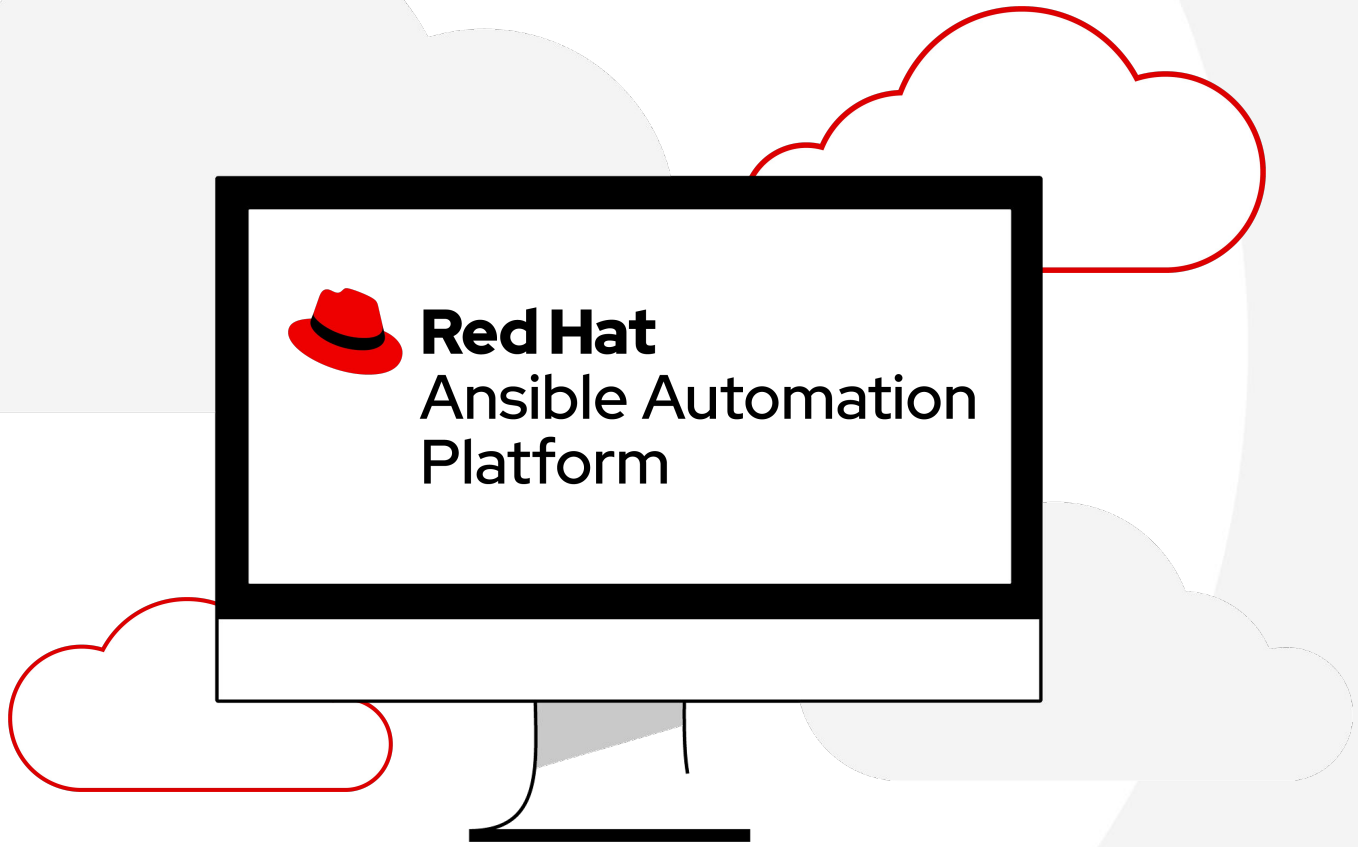

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