GitOps Workshop

以 A/B 測試為例
(Blue-Green Deployment)

Weithenn Wang

IT Eng Sites Architect

Micron

Microsoft® MVP Most Valuable Professional

vmware vEXPERT 2023

AWX

About **Weithenn.org**

- Microsoft MVP 2012 – 2023
- VMware vExpert 2012 – 2023
- Taiwan VMUG (VMware User Group) Leader
- 微軟 S2D 軟體定義儲存技術實戰...等 19 本著作
- 擔任 Kubernetes Summit 2023、DevOpsDays Taipei 2023、COSCUP 2023、Cloud Summit Taiwan 2023、Cloud Summit Taiwan 2022、SRE Conference 2022、DevOpsDays Taipei 2021、Cloud & Edge Summit Taiwan 2021……等研討會講師

What is A/B Testing?

A/B Testing

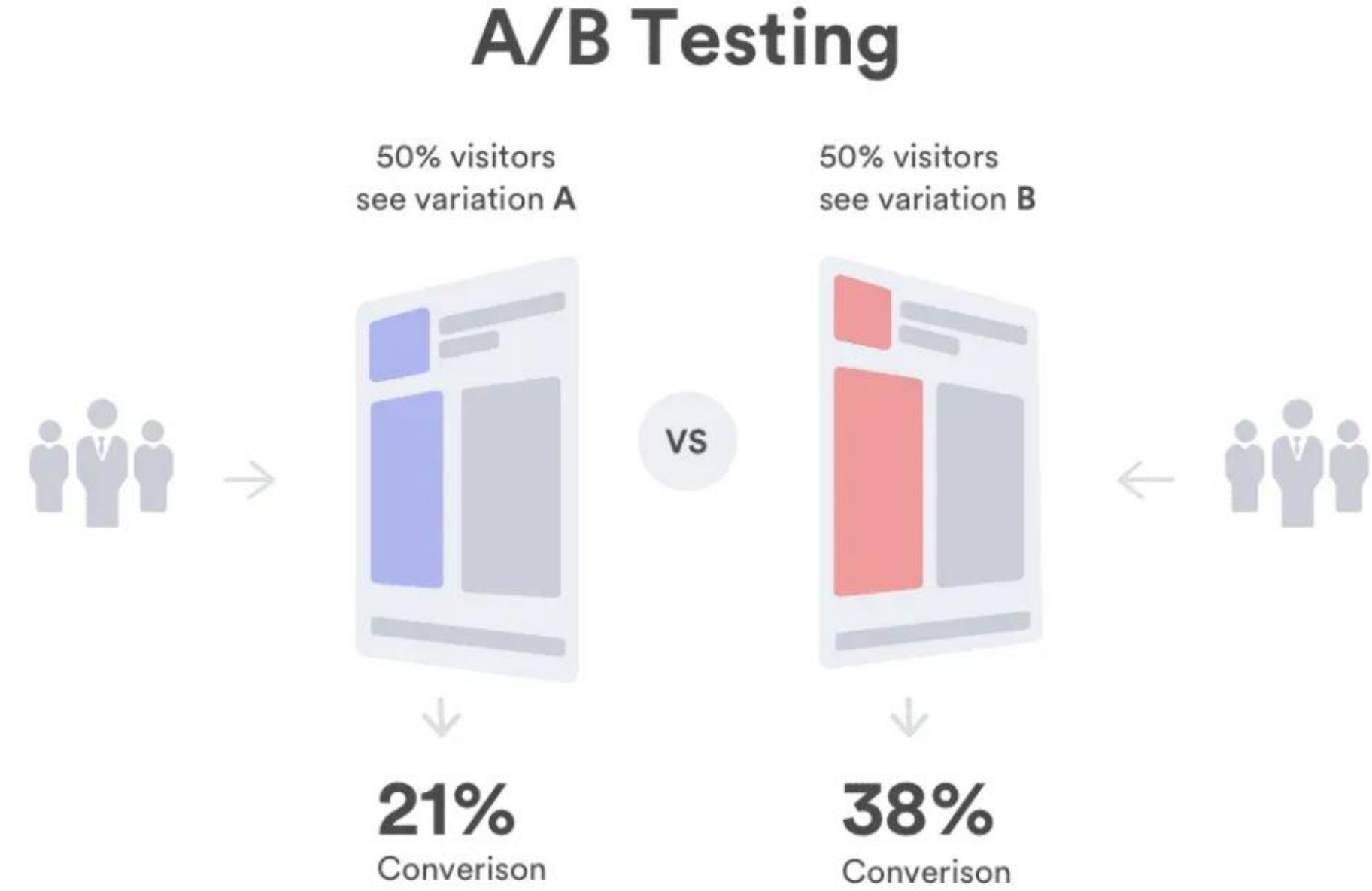


Image From: [A Samart Guide to A/B Testing | Orderhive (cin7.com)]

Blue/Green Deployment (Random Split Client)

What is GitOps?

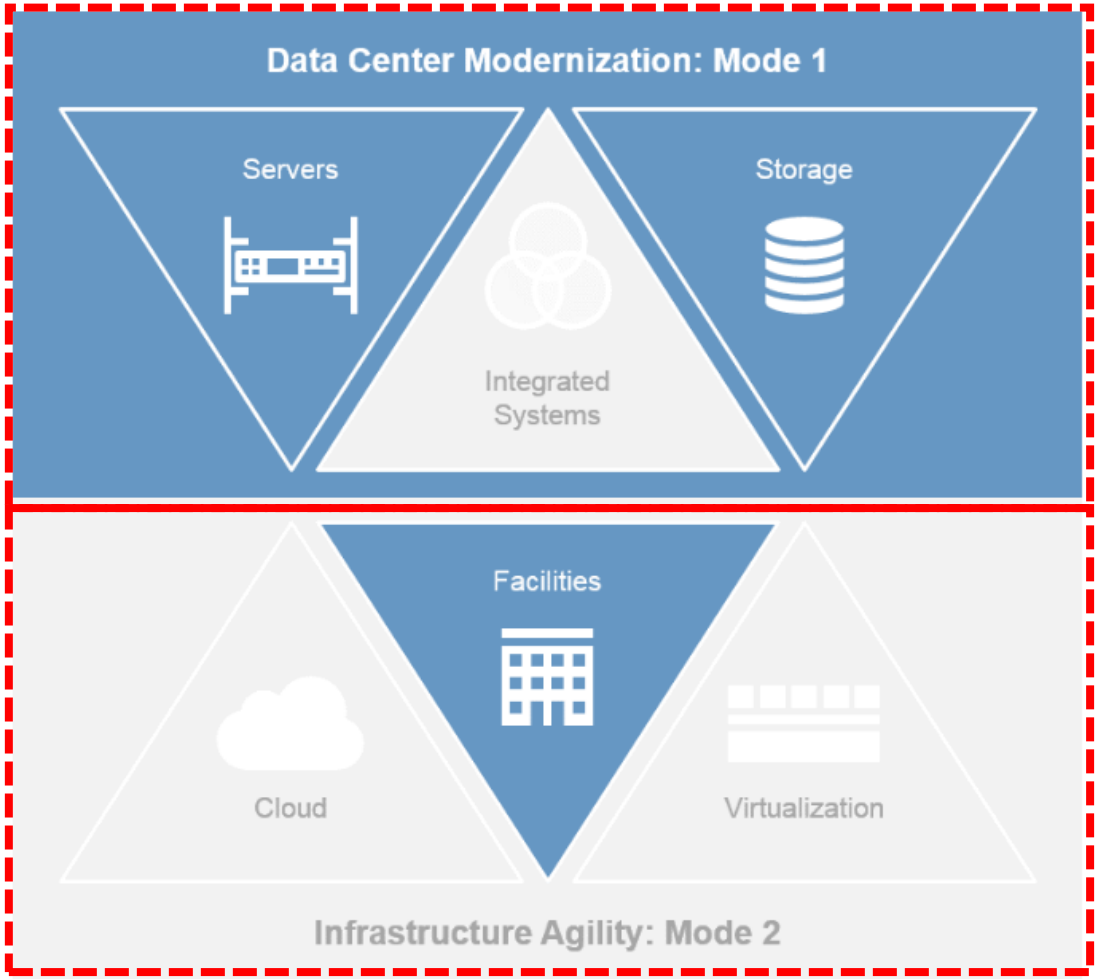
"**[GitOps]** works by using **Git** as a **single source of truth** for **declarative** infrastructure and applications."

-- Weaveworks, "Guide To GitOps"

IaC (Infrastructure as Code)

Bimodal IT – Mode 1 / Mode 2

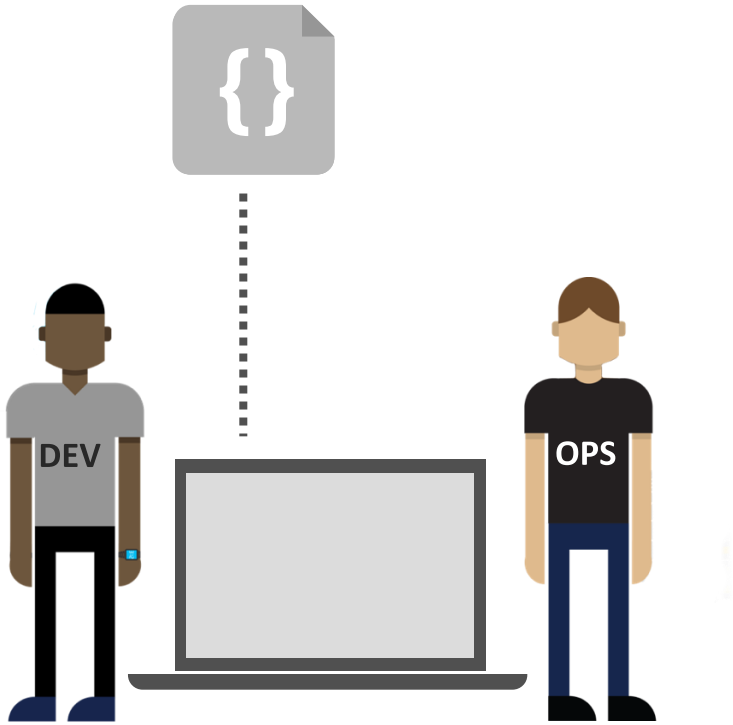
- Mode 1
  - Traditional Infrastructure
    - Reliability / Stability
  - Physical Server / Storage / Network
- Mode 2
  - Infrastructure Agility
  - Software Defined (SDC, SDS, SDN, SDDC)
  - VM / Container / Microservice
    - Agility / DevOps

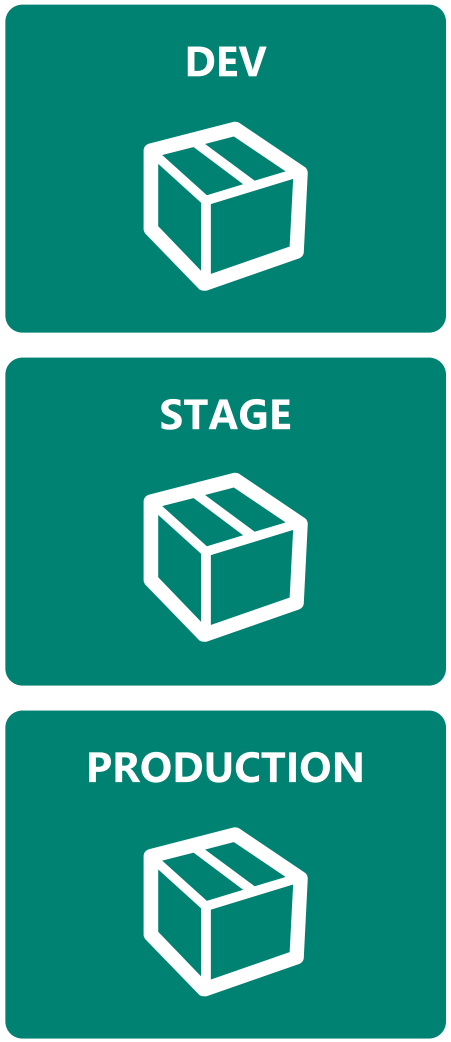


SOURCE: GARTNER (JULY 2015)

Image From: [Gartner - Data Center Modernization and Consolidation Key Initiative Overview]

IaC (Infrastructure as Code)





Habits

- Production first mindset
- Infrastructure as flexible resource

Value

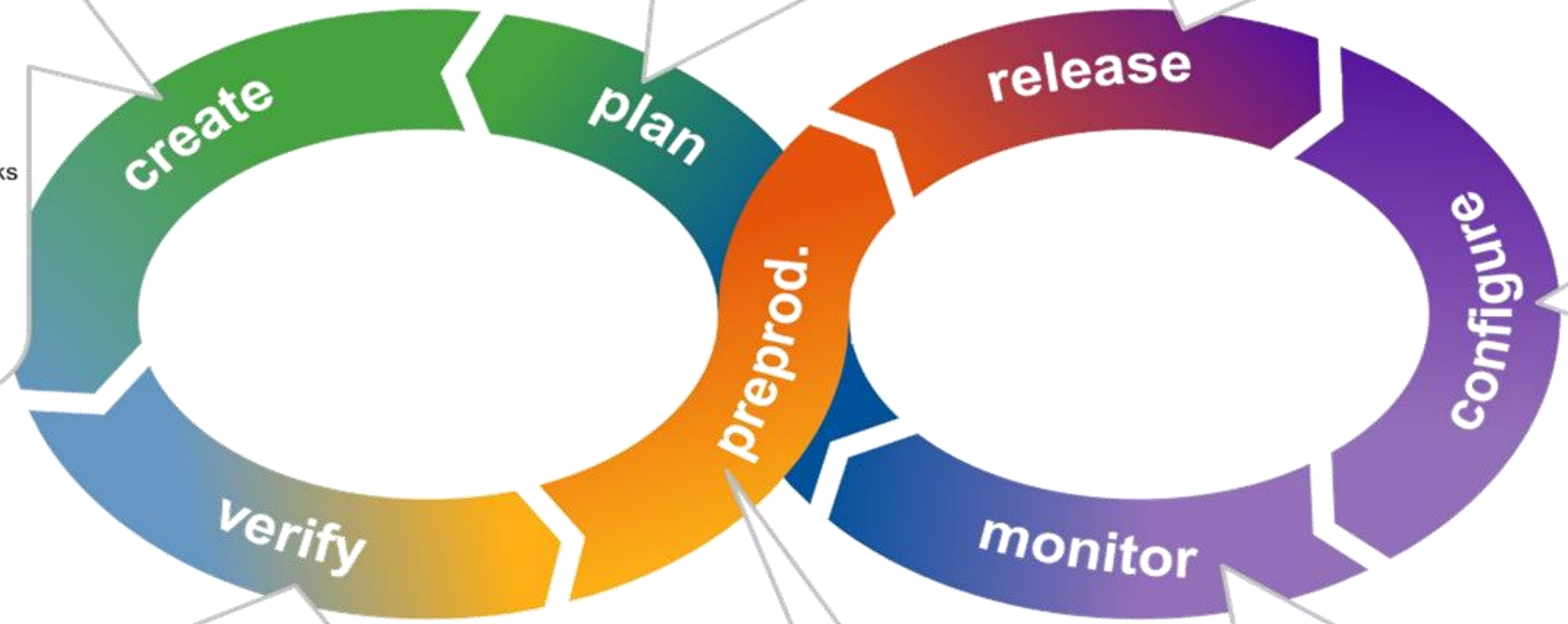
- Optimized Resources
- Accelerate Delivery

Measure

- Deployment Rate
- MTTR (Mean Time to Repair)

DevOps Toolchain

Example Vendors



Code:
- Apple
- Atlassian
- Codenvy
- GitHub
- IBM
- JetBrains
- Microsoft
- Parasoft
- Perforce
- Subversion

Build:
- Atlassian
- CircleCI
- IBM
- JetBrains
- Jenkins
- Microsoft
- OpenMake Software
- ThoughtWorks
- Travis CI

Configure:
- CFEngine
- Chef
- Puppet Labs
- Red Hat (Ansible)
- SaltStack

Define:
- Axure
- Blueprint
- eDev
- IBM
- iRise
- Jama
- Micro Focus (Borland)

Plan:
- AgileCraft
- Atlassian
- CA Technologies
- CollabNet
- Pivotal
- Targetprocess
- VersionOne

Release, Deploy & Coordination
- Atlassian
- Automic
- CA Technologies
- Chef
- Clarive
- CollabNet
- Electric Cloud
- IBM
- Inedo
- Microsoft
- MidVision
- OpenMake Software
- Orca
- Octopus Deploy
- Serena Software
- VMware
- XebiaLabs

Continuous Configuration Automation
- CFEngine
- Chef
- Inedo
- Puppet Labs
- Red Hat (Ansible)
- SaltStack

Test Automation:
- IBM
- Micro Focus
- Microsoft
- Sauce Labs
- ThoughtWorks
- Tricentis

Static Analysis:
- Cast
- Microsoft
- Optimyth Software
- Parasoft
- Semmie
- SonarSource

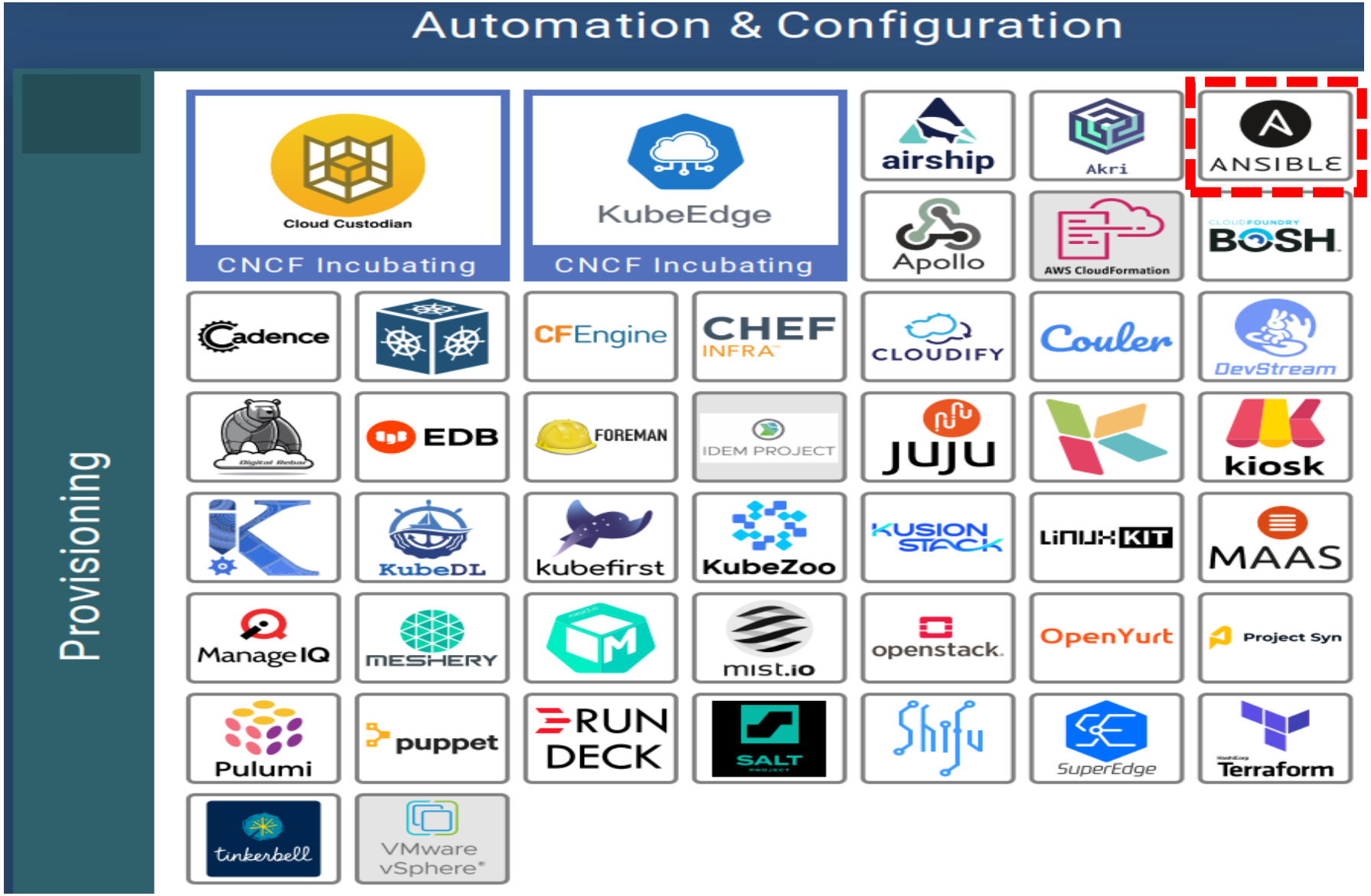
Test Lab:
- Delphix
- Microsoft
- Perfecto
- Quali
- Qualsys
- Skytap
- SauceLabs

Security:
- Micro Focus
- Trend Micro
- IBM
- Trustwave
- Veracode
- Whitehat Security Inc.

- Artifactory
- Atlassian
- Bitbucket
- Clarive
- Electric Cloud
- Inedo
- Sonatype

Infrastructure, APM & Analytics and Log Mgmt.
- Datadog
- Elastic
- Ganglia
- Nagios
- Prometheus
- Graphite
- AppDynamics
- BigPanda
- Cacti
- Dynatrace
- Caliper
- CA Technologies
- New Relic
- Splunk
- SignalFX
- Sumo Logic
- Wireshark
- Zabbix
- Zenoss

CNCF – Cloud Native Landscape



Reference: [CNCF Cloud Native Interactive Landscape]

Why Ansible AWX

Why Ansible AWX

AWX provides a web-based user interface, REST API, and task engine built on top of Ansible. It is one of the upstream projects for **Red Hat Ansible Automation Platform**.

- ✓ RBAC (Role-Based Access Control)
- ✓ Push Button – Easy to execute playbook
- ✓ RESTful API
- ✓ Webhook
- ✓ Workflow
- ✓ Enterprise Integrations
- ✓ Centralized Logging
- ✓ Ansible AWX is **Open Source Community Project**

Image From: RedHat people bhinson – Ansible automation technical deck

GitOps - Operations by Pull Request

GitOps Workflow

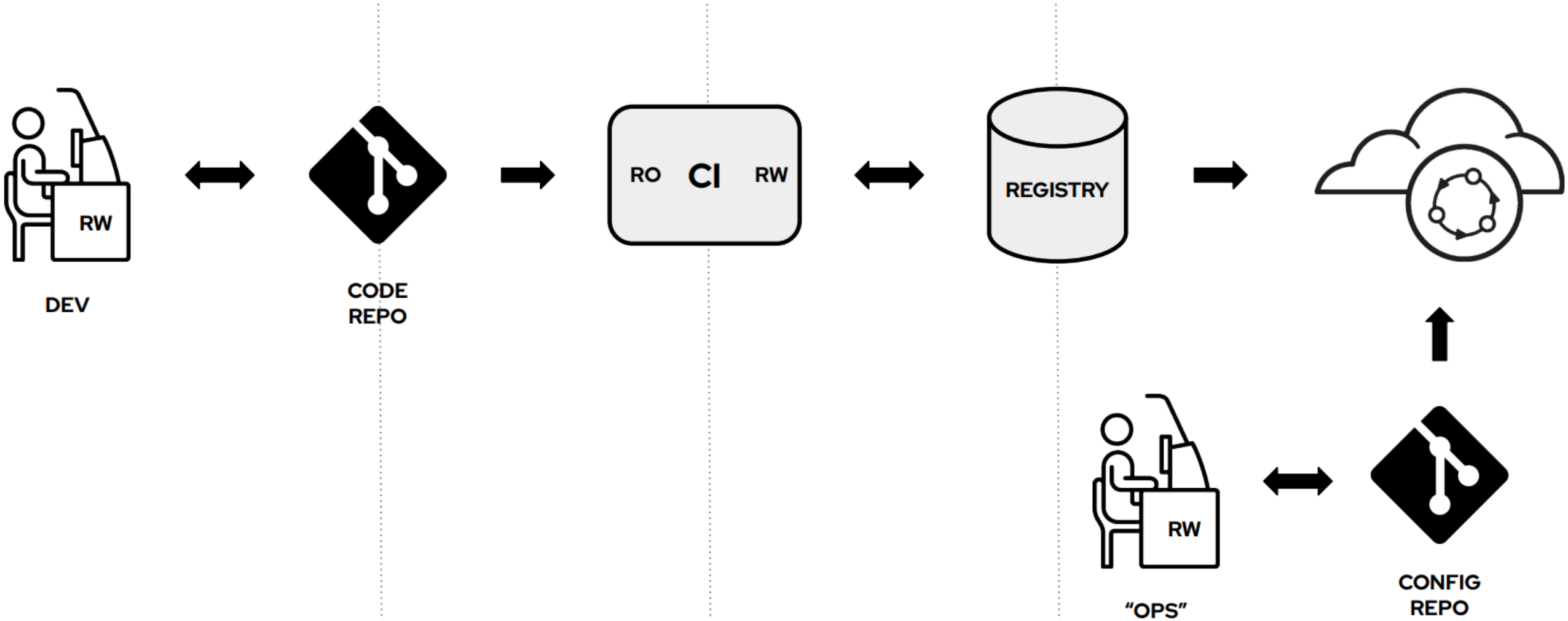


Image From: [Operations by Pull Request: An Ansible GitOps Story]

Git-Centric Ansible Deployments

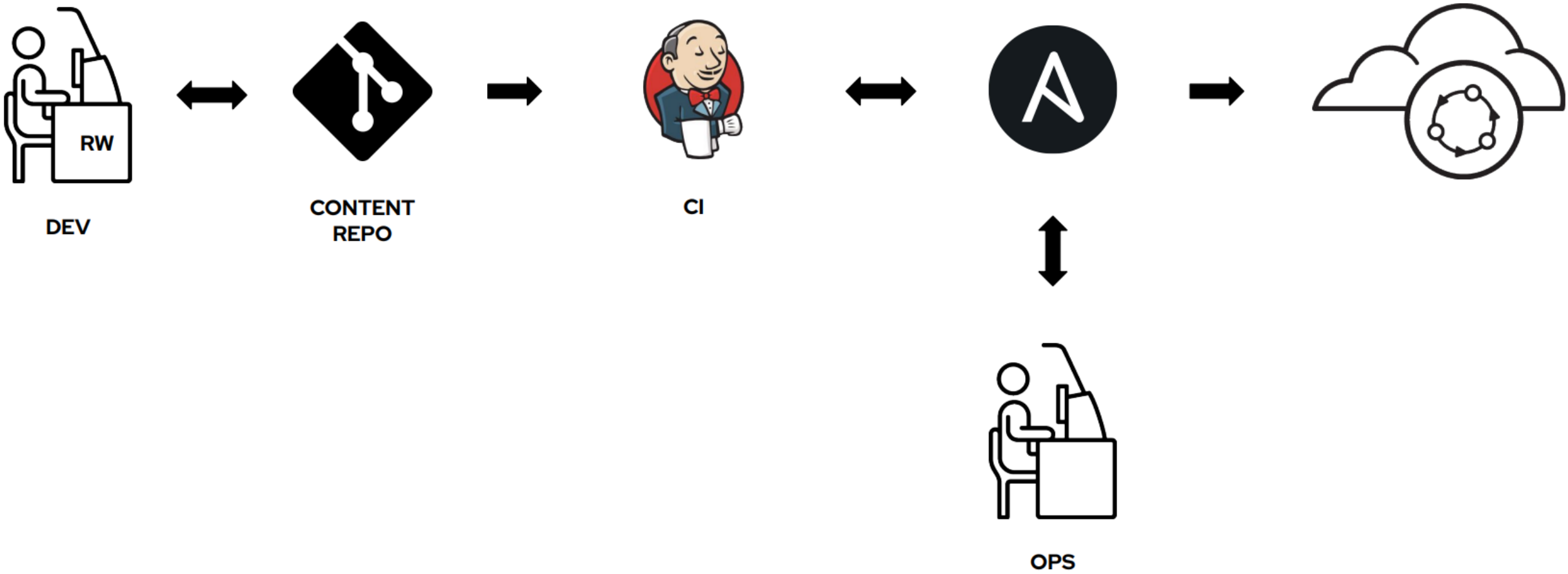


Image From: [Operations by Pull Request: An Ansible GitOps Story]

Git-Centric Ansible Deployments Today

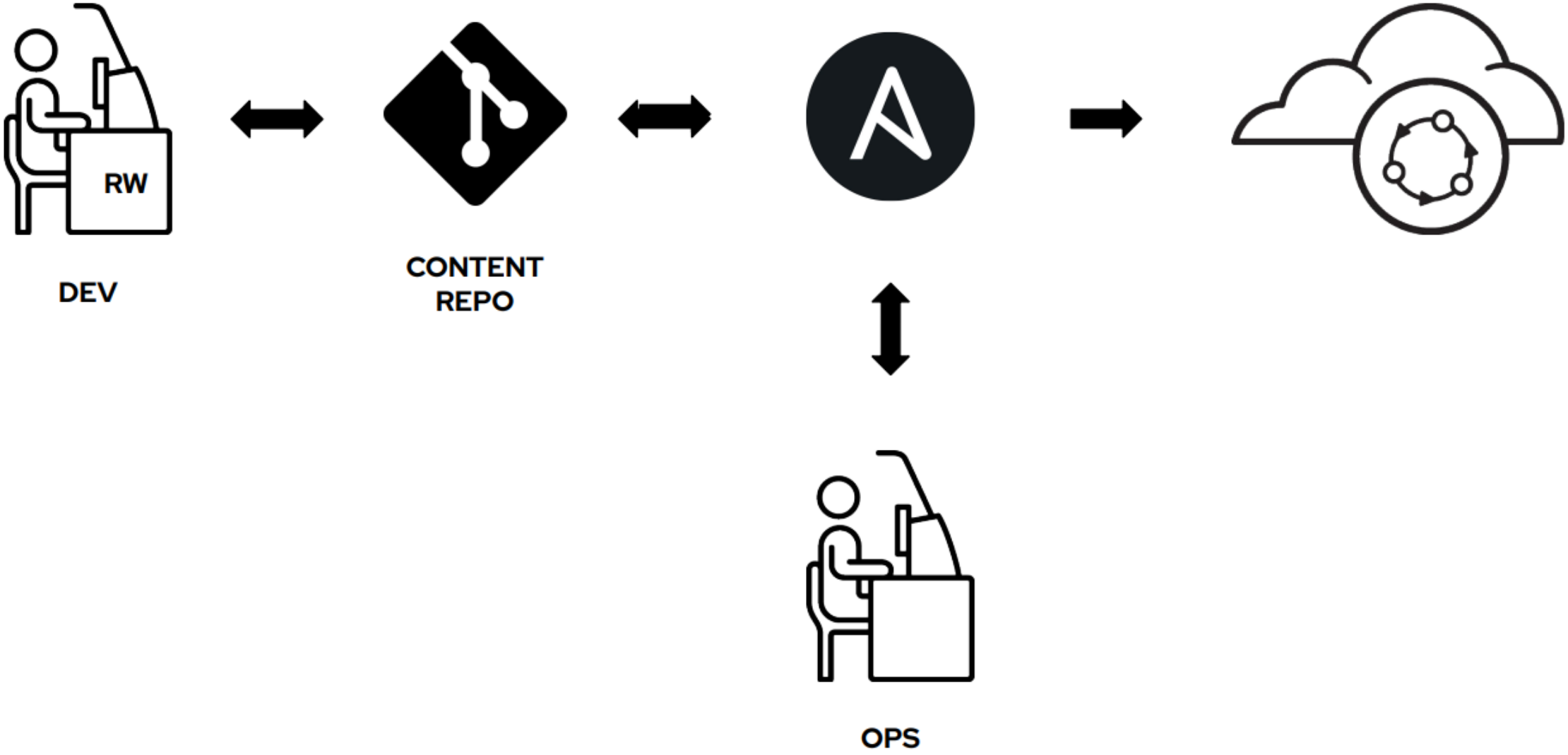


Image From: [Operations by Pull Request: An Ansible GitOps Story]

GitOps the Ansible Way

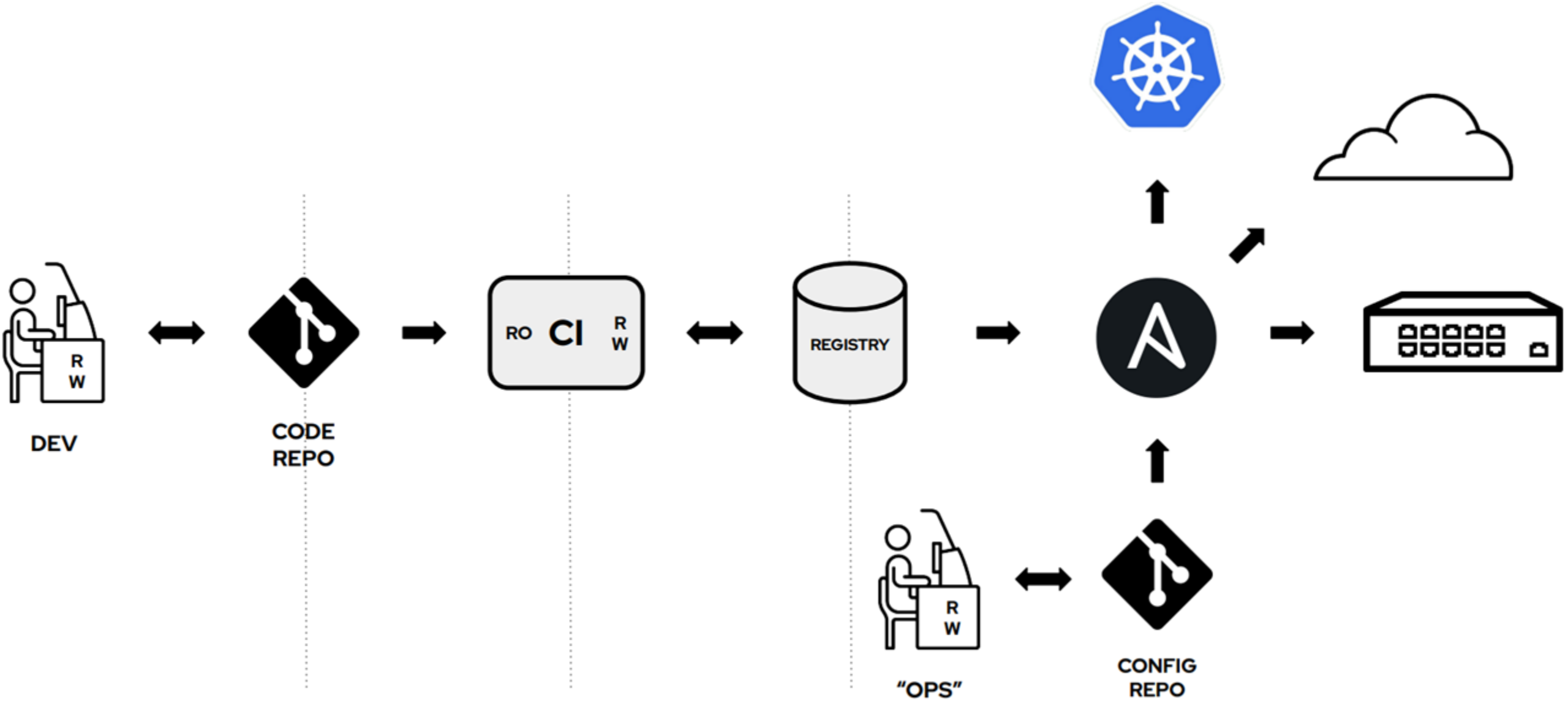


Image From: [Operations by Pull Request: An Ansible GitOps Story]

Hands-On Labs

- Change AWX Logo
- Playbook / Workflow
- API Trigger
- Integration GitHub webhook for GitOps
- Workflow Approval
- AI for Code

Hands-On Lab environment

AWX Portal

gitops1108-[1-45]
.eastasia.cloudapp.azure.com

Username	Password
gitops-admin	GitOpsABTesting@1108

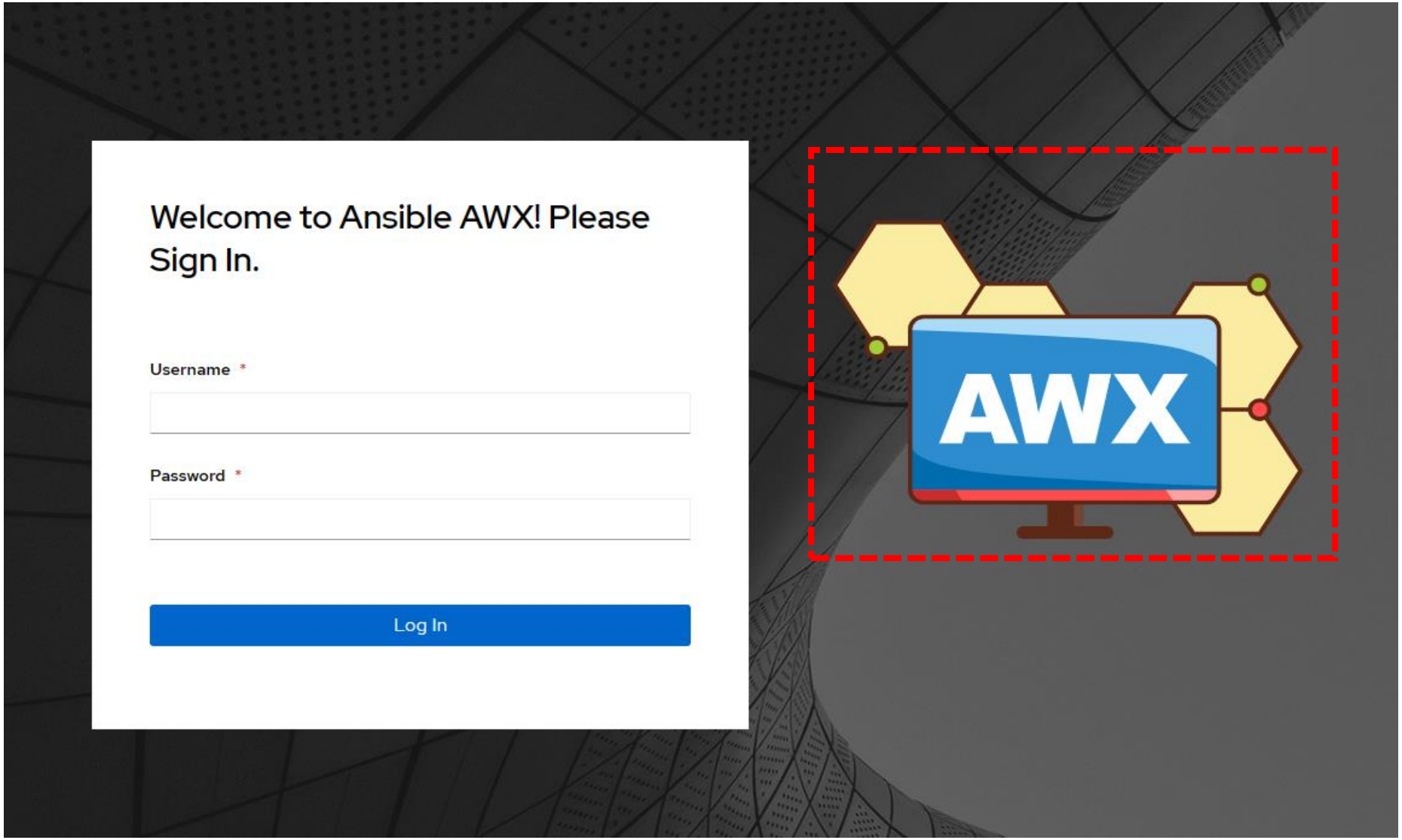
Azure VM (Standard_D4s_v4)

AlmaLinux 9.2 (4 vCPU / 16 GB vMemory / Premium SSD LRS)

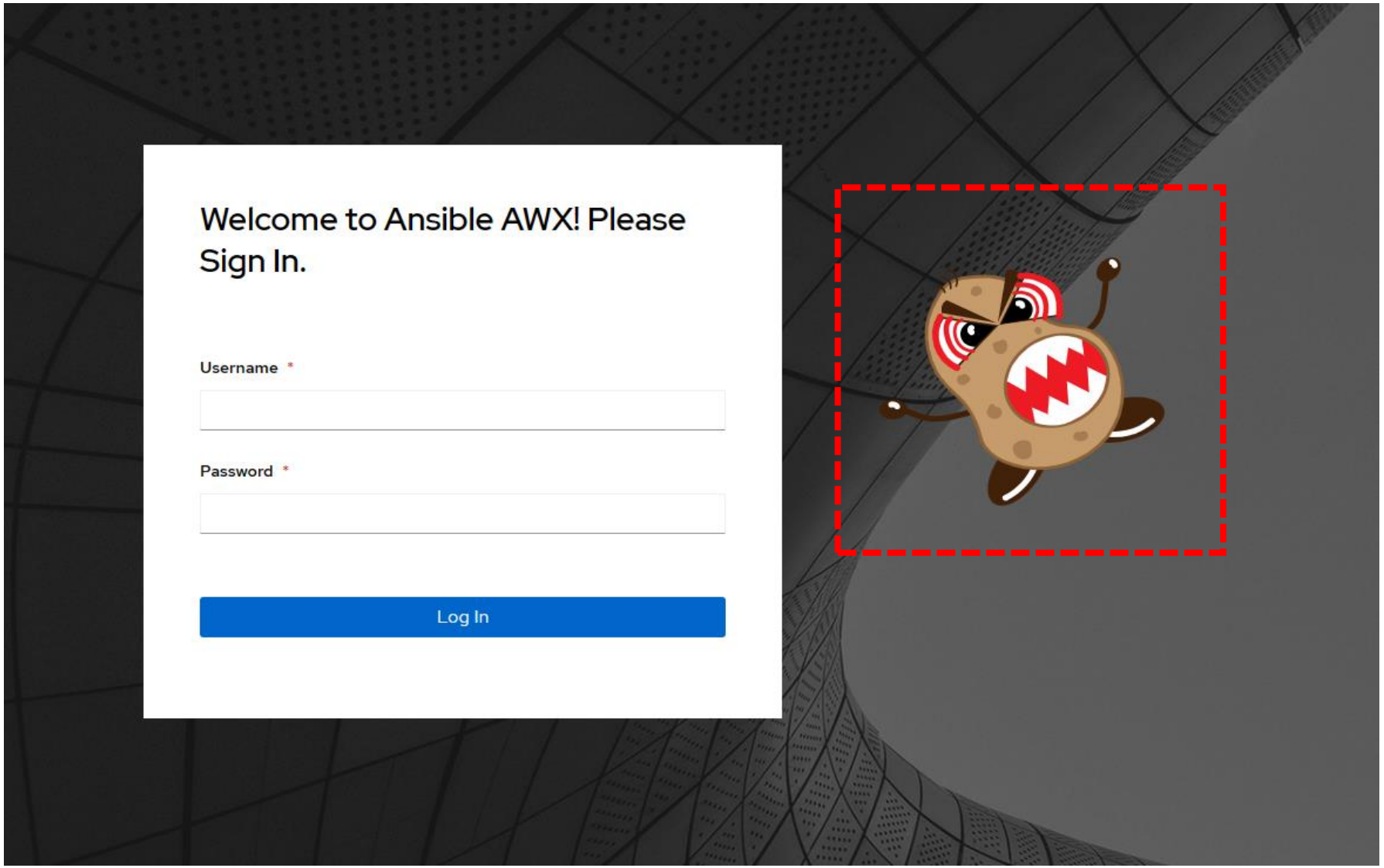
Hands-On Labs

Change AWX Logo

Change AWX Logo - Before



Change AWX Logo - Before



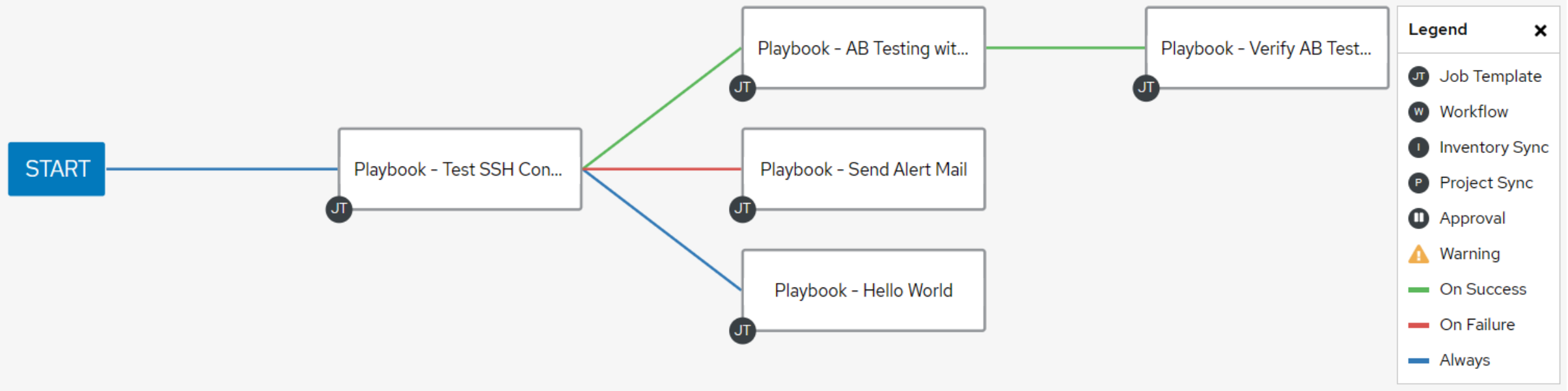
AWX Tutorial

Organization, Projects, Inventory, Credentials, Templates, and Workflow

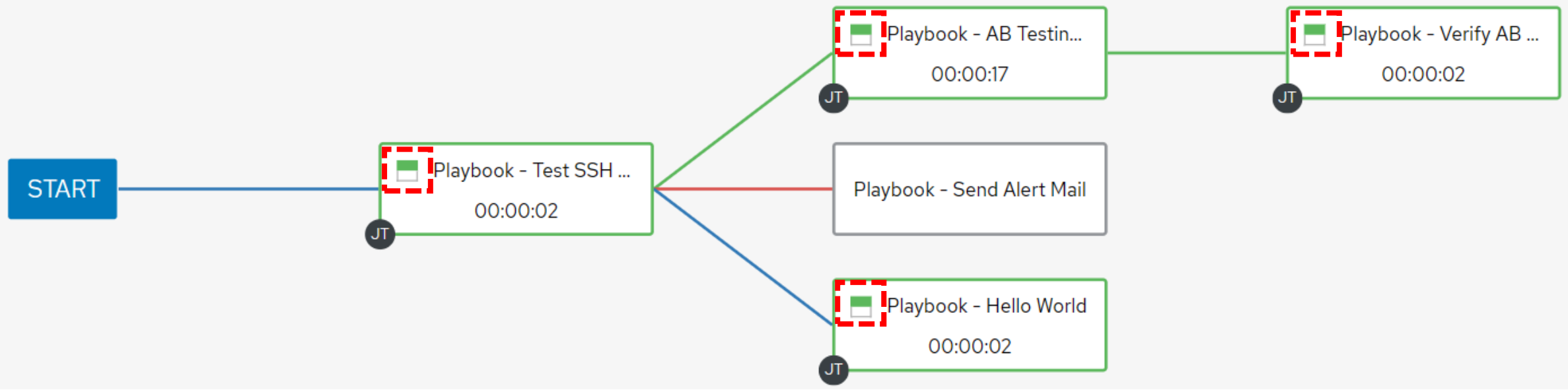
Hands-On Labs

Playbook / Workflow

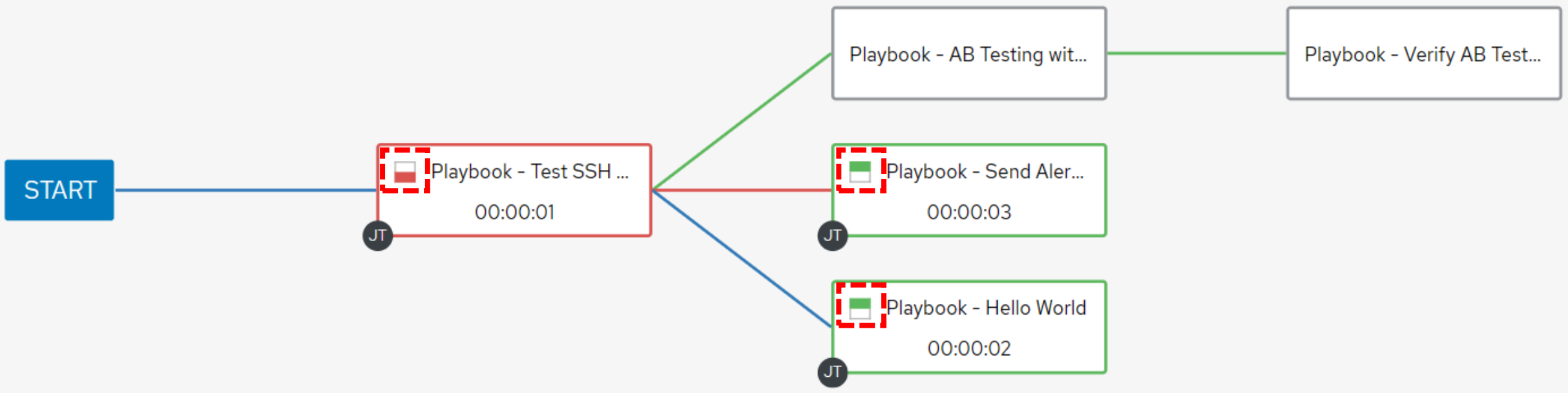
Playbook / Workflow



Playbook / Workflow – SSH Success



Playbook / Workflow – SSH Failed



Hands-On Labs

API Trigger

API Trigger – API Reference Guide

Versioning

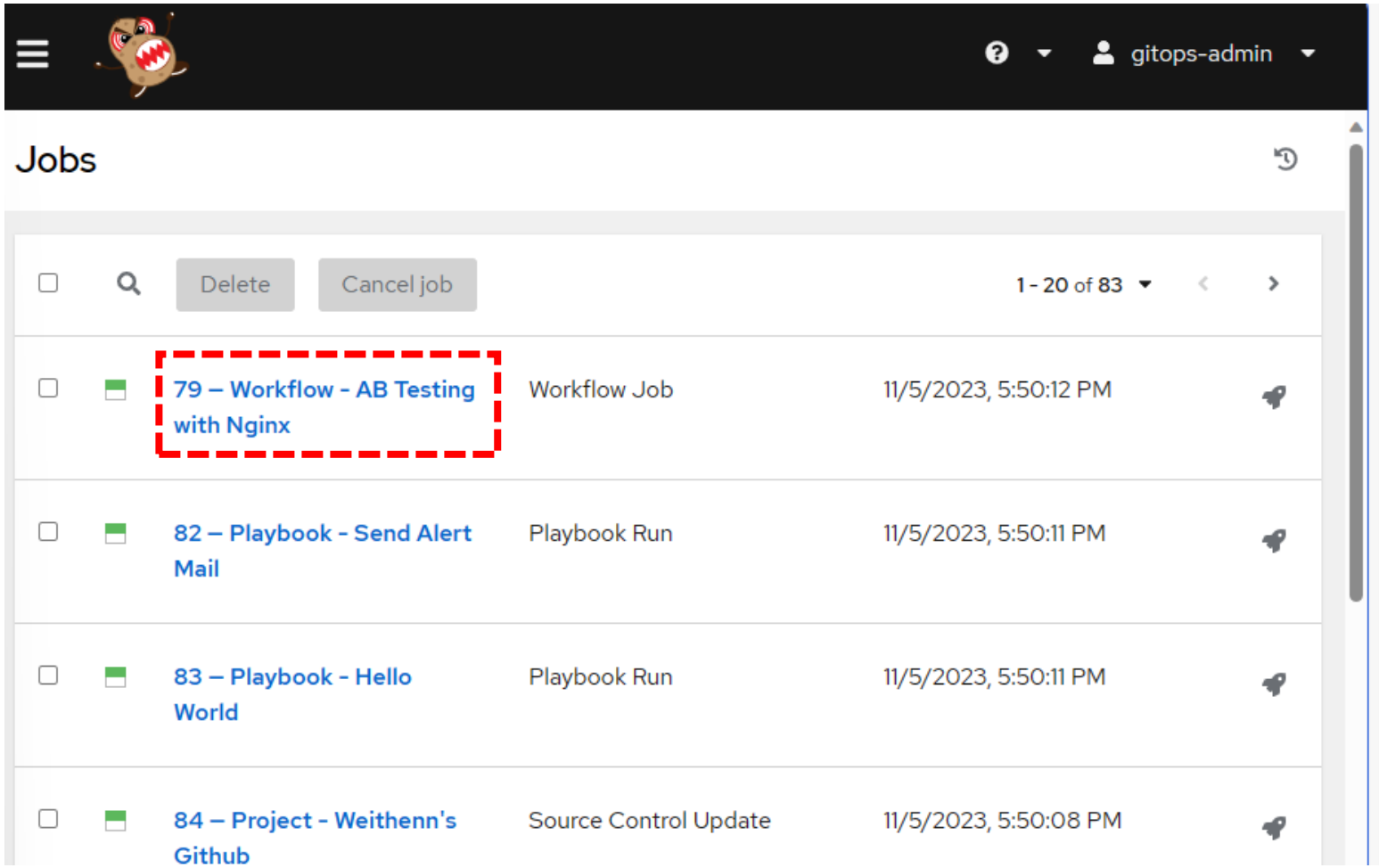
GET	/api/	List supported API versions
GET	/api/v2/	List top level resources

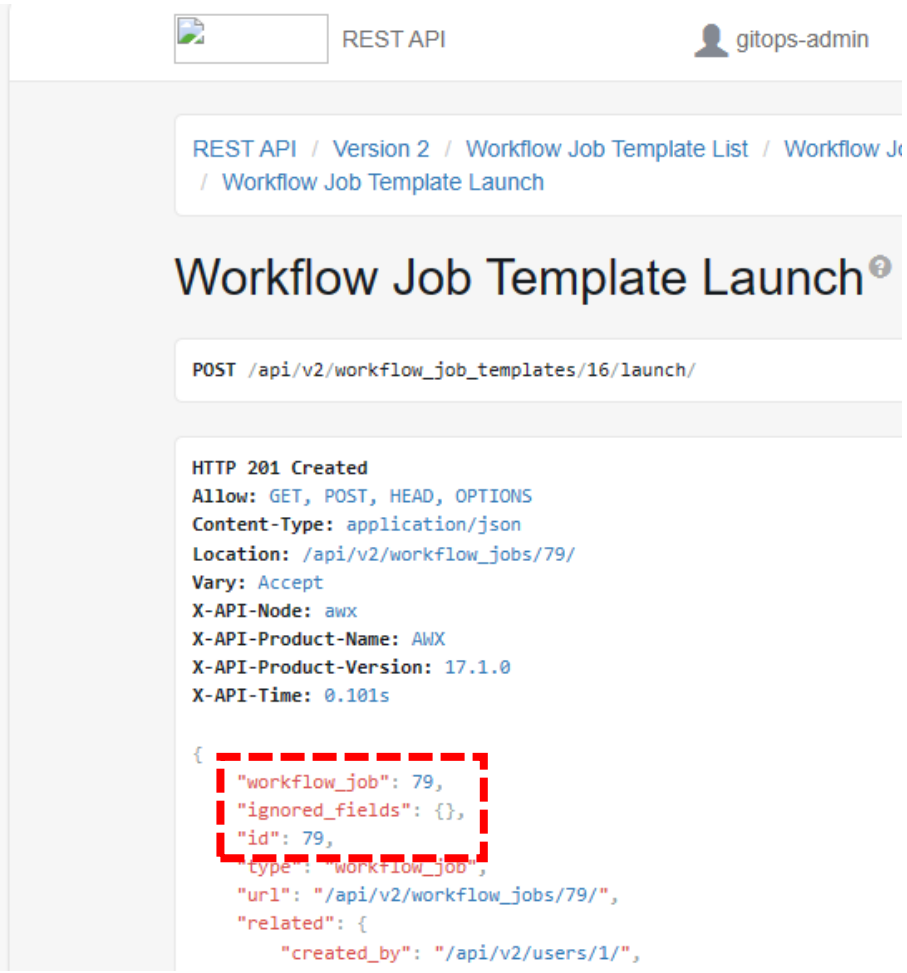
Authentication

GET	/api/o/	Token Handling using OAuth2
GET	/api/v2/applications/	List Applications
POST	/api/v2/applications/	Create an Application
GET	/api/v2/applications/{id}/	Retrieve an Application
PUT	/api/v2/applications/{id}/	Update an Application
PATCH	/api/v2/applications/{id}/	Update an Application
DELETE	/api/v2/applications/{id}/	Delete an Application
GET	/api/v2/applications/{id}/activity_stream/	List Activity Streams for an Application
GET	/api/v2/applications/{id}/tokens/	List Access Tokens for an Application
POST	/api/v2/applications/{id}/tokens/	Create an Access Token for an Application
GET	/api/v2/tokens/	List Access Tokens

Image From: [10. Tower API Reference Guide — Ansible Tower API Guide v3.8.6]

API Trigger


gitops-admin
Jobs
Delete
Cancel job
1 - 20 of 83
79 – Workflow - AB Testing with Nginx
Workflow Job
11/5/2023, 5:50:12 PM
82 – Playbook - Send Alert Mail
Playbook Run
11/5/2023, 5:50:11 PM
83 – Playbook - Hello World
Playbook Run
11/5/2023, 5:50:11 PM
84 – Project - Weithenn's Github
Source Control Update
11/5/2023, 5:50:08 PM


REST API
gitops-admin
REST API / Version 2 / Workflow Job Template List / Workflow Job Template Launch
Workflow Job Template Launch
POST /api/v2/workflow_job_templates/16/launch/
HTTP 201 Created
Allow: GET, POST, HEAD, OPTIONS
Content-Type: application/json
Location: /api/v2/workflow_jobs/79/
Vary: Accept
X-API-Node: awx
X-API-Product-Name: AWX
X-API-Product-Version: 17.1.0
X-API-Time: 0.101s
{
"workflow_job": 79,
"ignored_fields": {},
"id": 79,
"type": "workflow_job",
"url": "/api/v2/workflow_jobs/79/",
"related": {
"created_by": "/api/v2/users/1/",

Hands-On Labs

Integration GitHub webhook for GitOps

GitHub – Add webhook for you Repo

Payload URL

- ✓ Copy the contents of **Webhook URL**

Content type

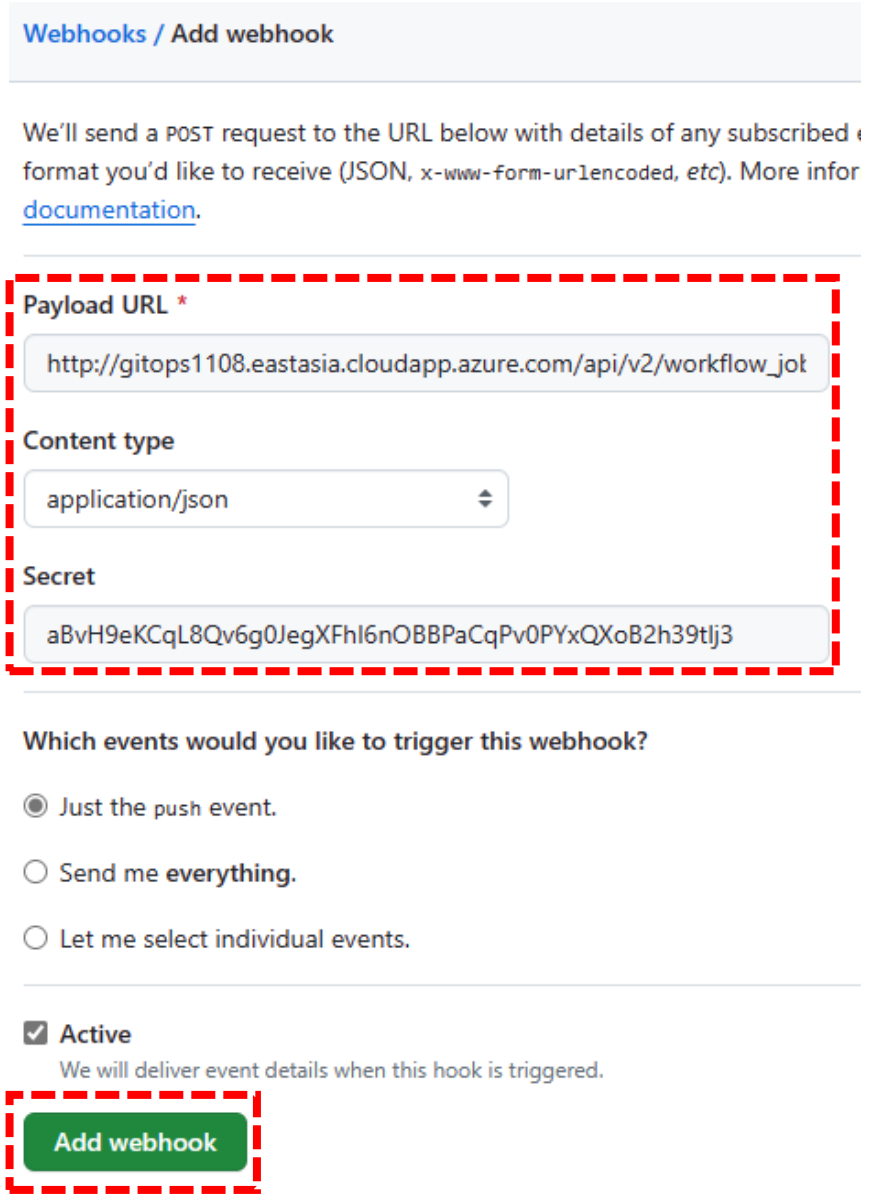
- ✓ Set to **application/json**

Secret

- ✓ Copy the contents of **Webhook Key**

貼上 Webhook URL & Key

- ✓ 使用講者 GitHub Repo 實作的朋友，請貼到 HackMD 共同筆記，以便協助建立 Webhook



Generating a new Webhook Key

Templates › Workflow - AB Testing with Nginx

Details

Back to Templates | Details | Access | Notifications | Schedules | Visualizer

Name	Workflow - AB Testing with Nginx
Activity	
Organization	MWC GitOps Workshop
Job Type	Workflow Job Template
Webhook Service	Github
Webhook URL	http://gitops1108.eastasia.cloudapp.azure.com/api/v2/workflow_job_templates/16/github/
Webhook Key	aBvH9eKCqL8Qv6g0JegXFhI6nOBBPaCqPv0PYxQXoB2h39tlj3
Webhook Credentials	GitHub PAT

Webhooks / Add webhook

We'll send a `POST` request to the URL below with details of any subscribed e
format you'd like to receive (JSON, `x-www-form-urlencoded`, *etc*). More infor
documentation.

Payload URL *

http://gitops1108.eastasia.cloudapp.azure.com/api/v2/workflow_jot

Content type

application/json

Secret

aBvH9eKCqL8Qv6g0JegXFhI6nOBBPaCqPv0PYxQXoB2h39tlj3

Which events would you like to trigger this webhook?

- (•) Just the `push` event.
- ( ) Send me **everything.**
- ( ) Let me select individual events.

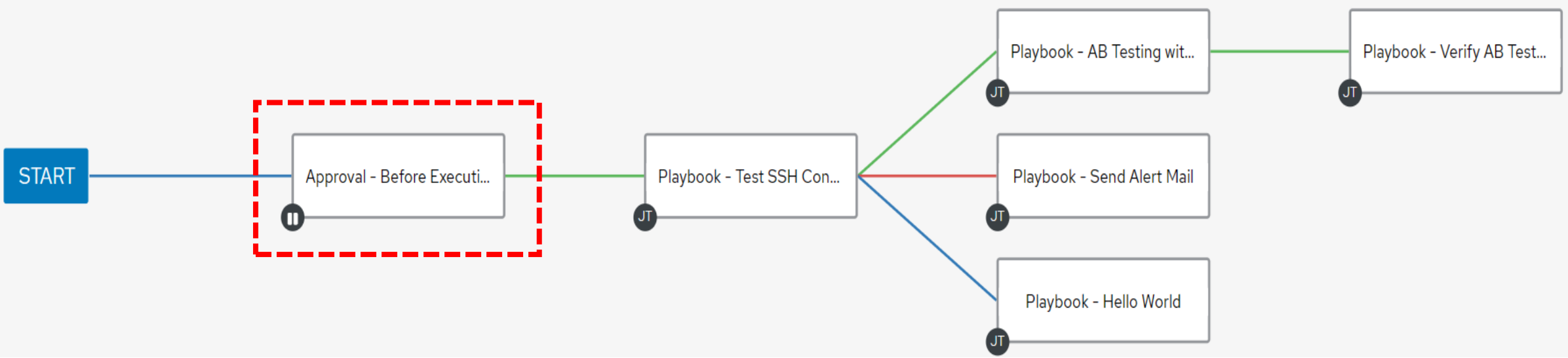
☑ **Active**
We will deliver event details when this hook is triggered.

Add webhook

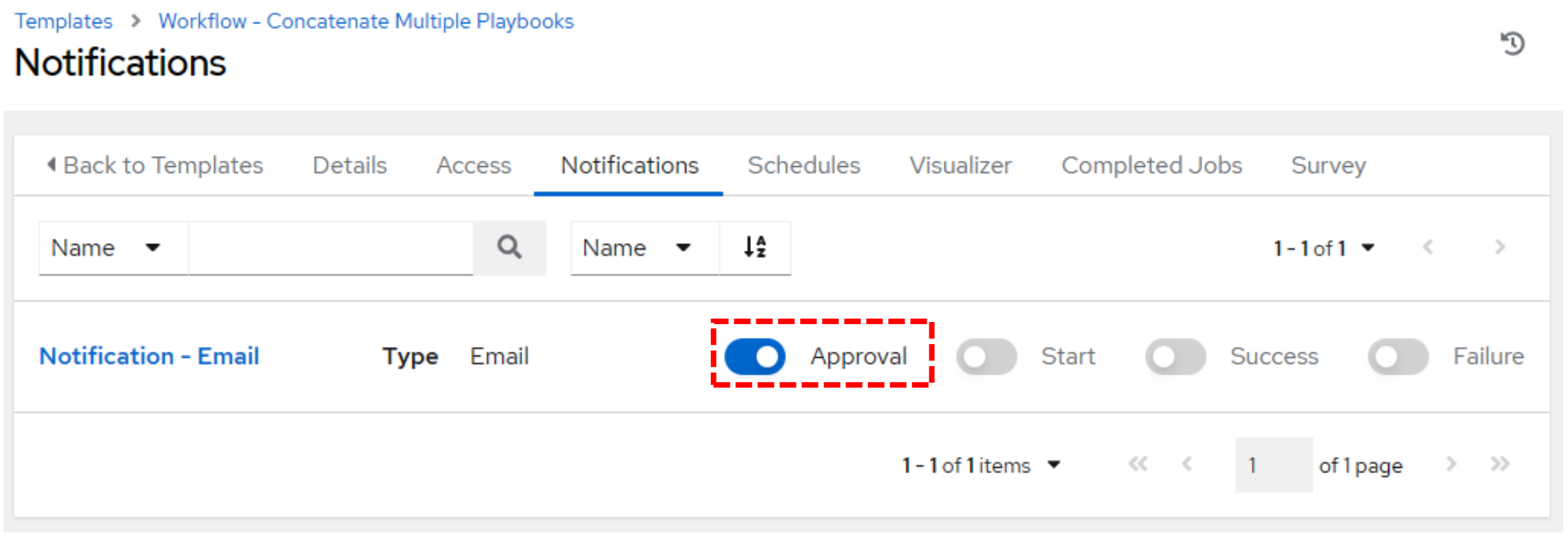
Hands-On Labs

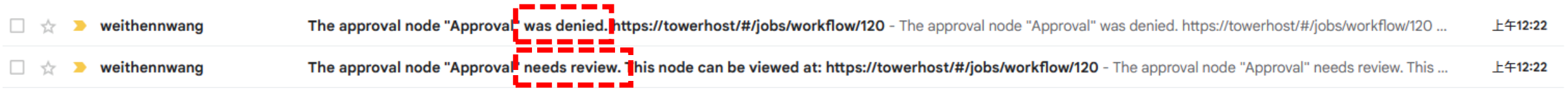
Workflow Approval

Add Approval

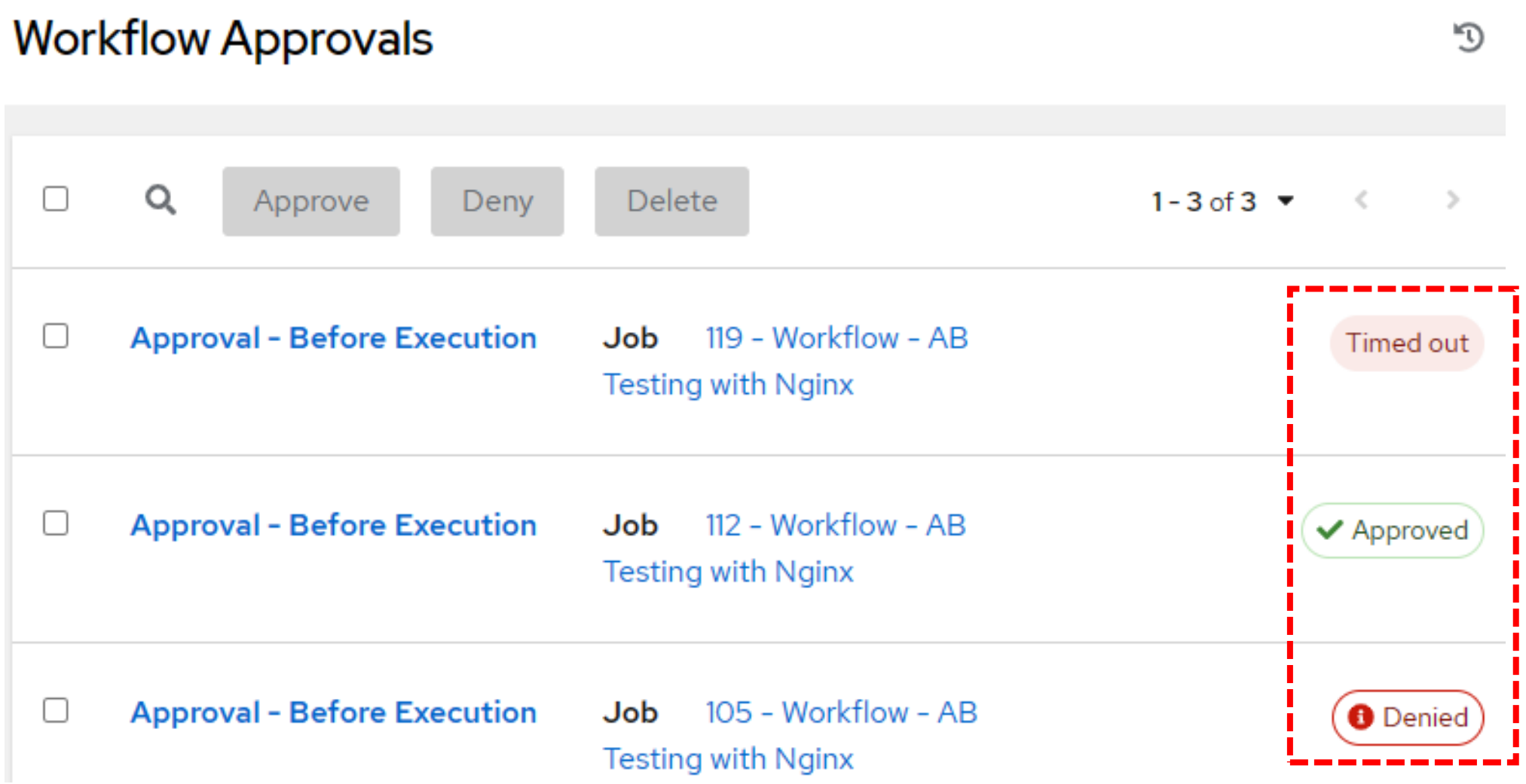


Add notifications for Approval





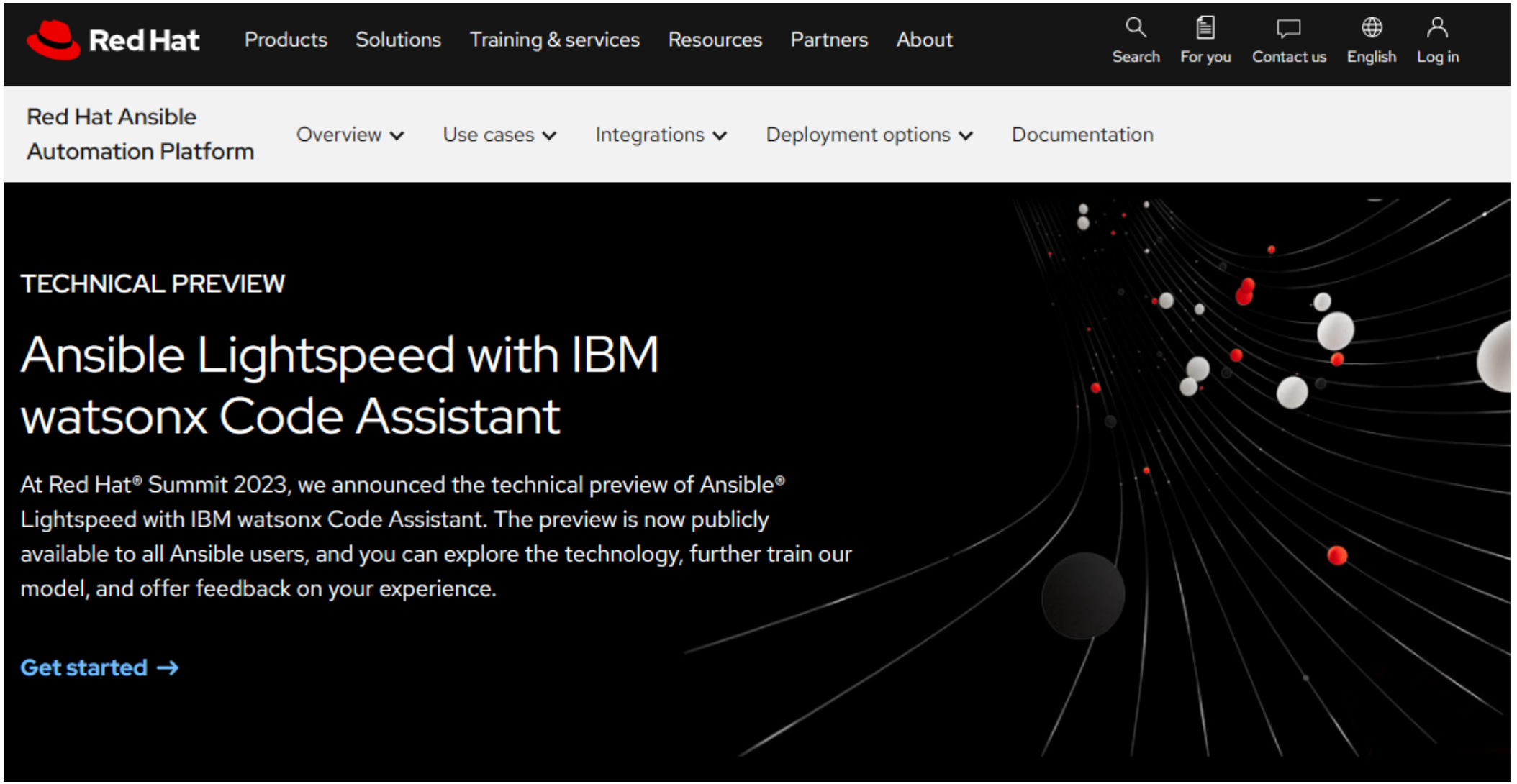
Approval – Timed out / Approved / Denied

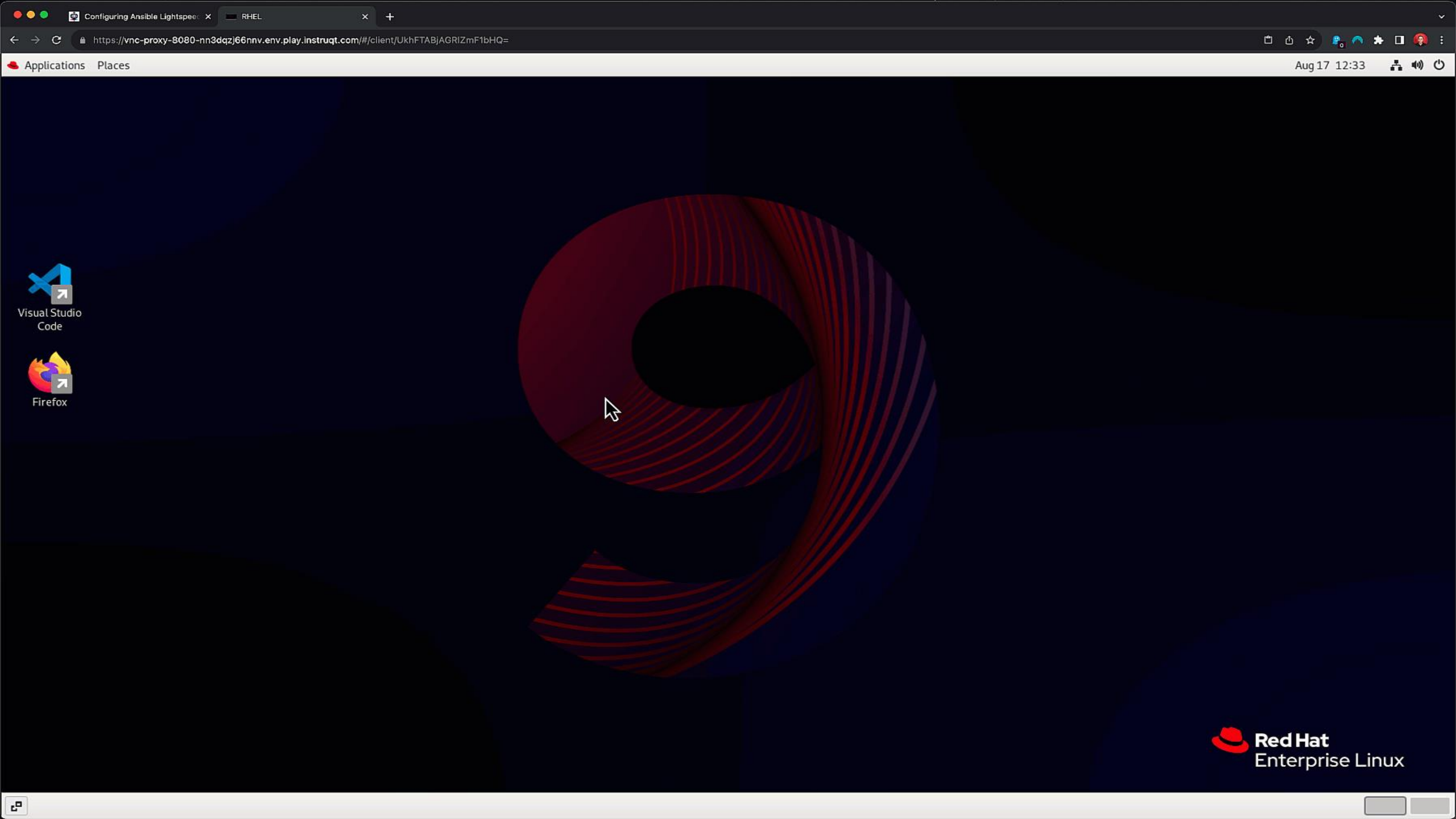


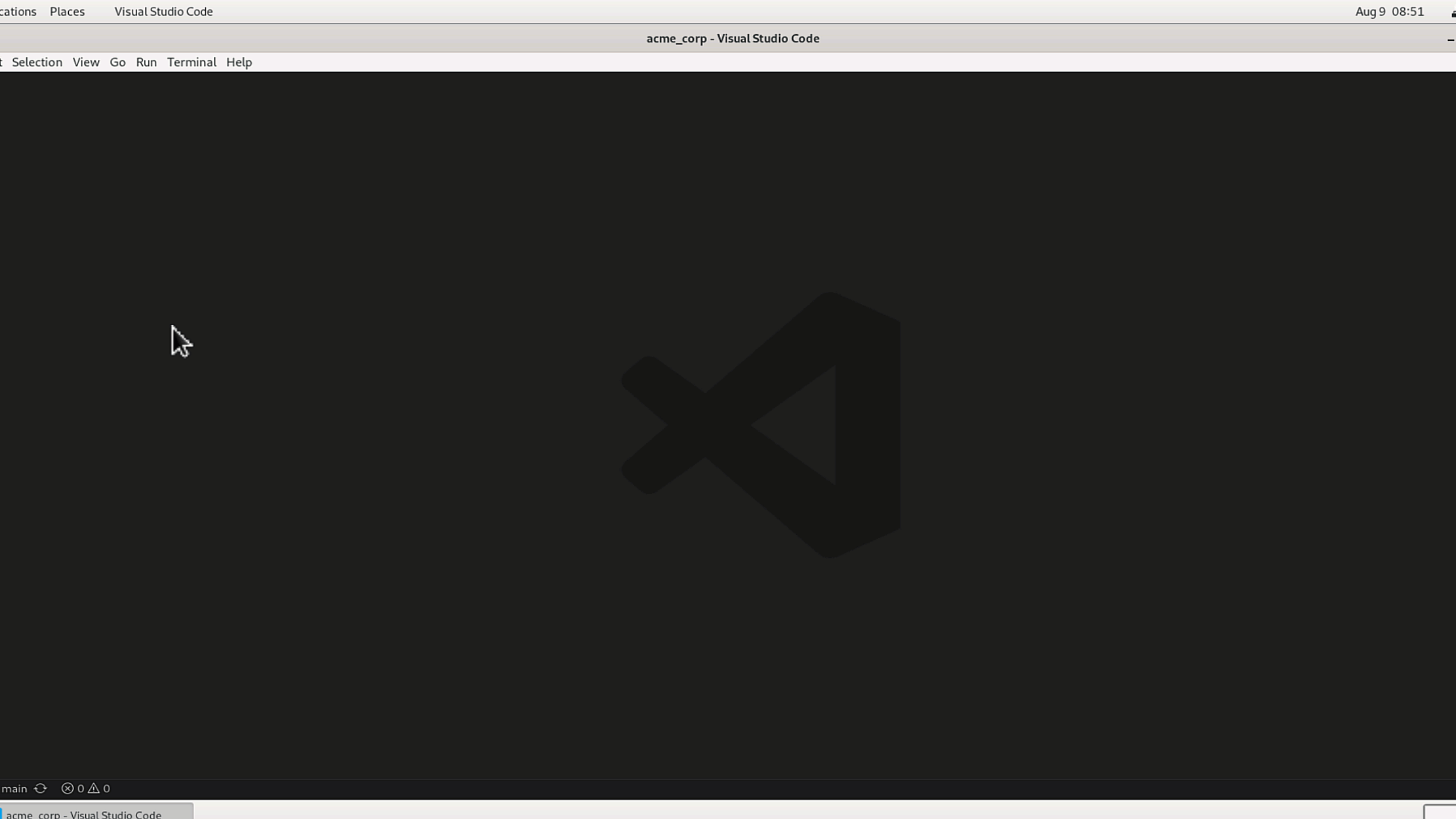
Hands-On Labs

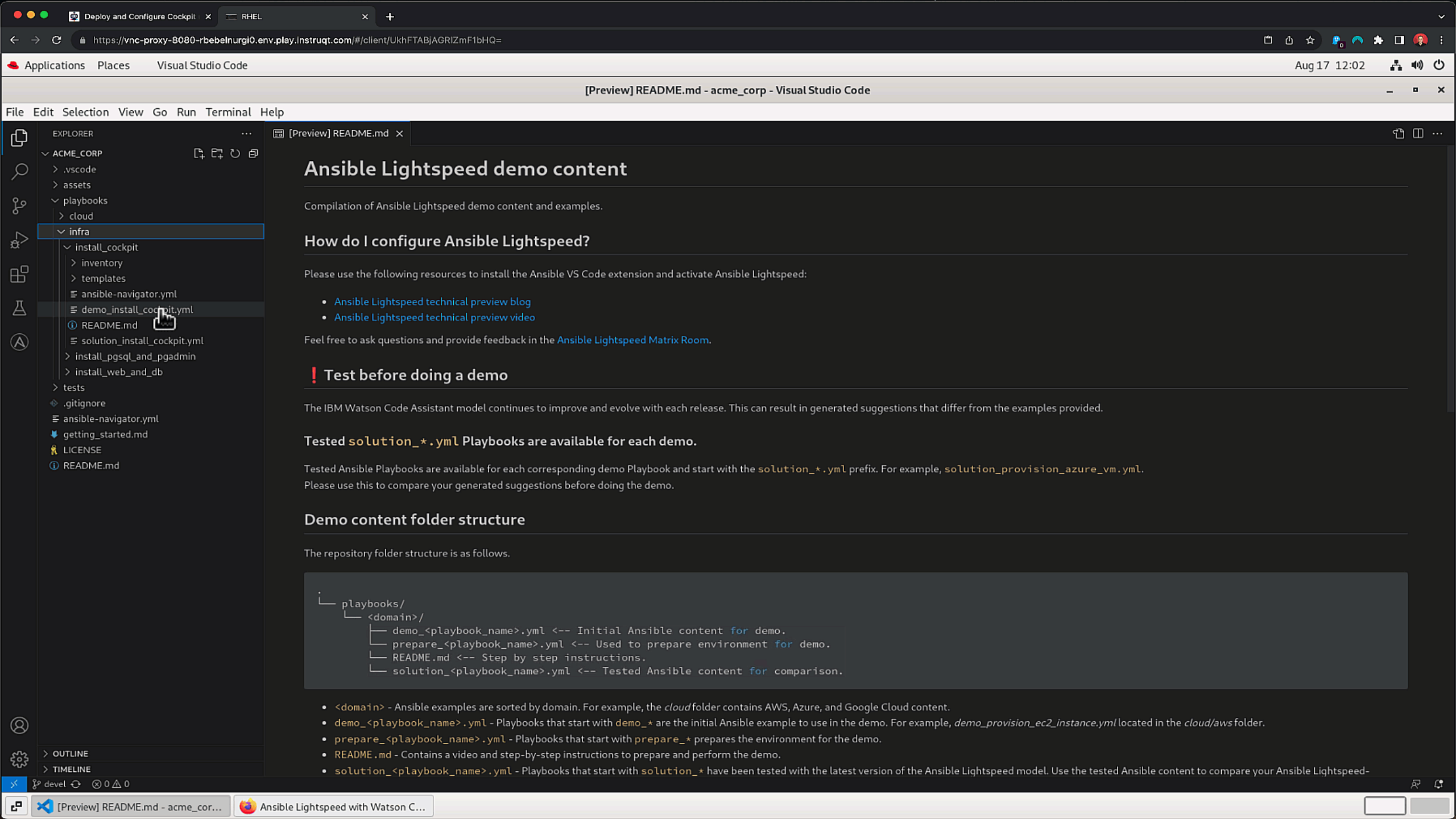
AI for Code (Ansible Lightspeed)

Ansible Lightspeed with IBM watsonx Code Assistant




Configuring Ansible Lightspeed
RHEL
https://vnc-proxy-8080-nn3dqzj66nnv.env.play.instruqt.com/#/client/UkhFTABjAGRlZmF1bHQ=
Applications
Places
Aug 17 12:33
Visual Studio Code
Firefox
Red Hat Enterprise Linux


cations Places Visual Studio Code
Aug 9 08:51
acme_corp - Visual Studio Code
t Selection View Go Run Terminal Help
main
0 0
acme_corp - Visual Studio Code


Deploy and Configure Cockpit
RHEL
https://vnc-proxy-8080-rbebelnurgi0.env.play.instruqt.com/#/client/UkhFTABjAGRIZmF1bHQ=
Applications Places Visual Studio Code
Aug 17 12:02
[Preview] README.md - acme_corp - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
ACME_CORP
.vscode
assets
playbooks
cloud
infra
install_cockpit
inventory
templates
ansible-navigator.yml
demo_install_cockpit.yml
README.md
solution_install_cockpit.yml
install_pgsql_and_pgadmin
install_web_and_db
tests
.gitignore
ansible-navigator.yml
getting_started.md
LICENSE
README.md
OUTLINE
TIMELINE
[Preview] README.md
Ansible Lightspeed demo content
Compilation of Ansible Lightspeed demo content and examples.
How do I configure Ansible Lightspeed?
Please use the following resources to install the Ansible VS Code extension and activate Ansible Lightspeed:
Ansible Lightspeed technical preview blog
Ansible Lightspeed technical preview video
Feel free to ask questions and provide feedback in the Ansible Lightspeed Matrix Room.
❗ Test before doing a demo
The IBM Watson Code Assistant model continues to improve and evolve with each release. This can result in generated suggestions that differ from the examples provided.
Tested solution_*.yml Playbooks are available for each demo.
Tested Ansible Playbooks are available for each corresponding demo Playbook and start with the solution_*.yml prefix. For example, solution_provision_azure_vm.yml.
Please use this to compare your generated suggestions before doing the demo.
Demo content folder structure
The repository folder structure is as follows.
.
└── playbooks/
└── <domain>/
├── demo_<playbook_name>.yml <-- Initial Ansible content for demo.
├── prepare_<playbook_name>.yml <-- Used to prepare environment for demo.
└── README.md <-- Step by step instructions.
└── solution_<playbook_name>.yml <-- Tested Ansible content for comparison.
<domain> - Ansible examples are sorted by domain. For example, the cloud folder contains AWS, Azure, and Google Cloud content.
demo_<playbook_name>.yml - Playbooks that start with demo_* are the initial Ansible example to use in the demo. For example, demo_provision_ec2_instance.yml located in the cloud/aws folder.
prepare_<playbook_name>.yml - Playbooks that start with prepare_* prepares the environment for the demo.
README.md - Contains a video and step-by-step instructions to prepare and perform the demo.
solution_<playbook_name>.yml - Playbooks that start with solution_* have been tested with the latest version of the Ansible Lightspeed model. Use the tested Ansible content to compare your Ansible Lightspeed-
devel
[Preview] README.md - acme_cor...
Ansible Lightspeed with Watson C...

Resources & More

Free Online Interactive-labs

Red Hat Interactive-labs

Getting Started

JUMP TO SECTION

- Getting Started
- Network and Edge
- Event-Driven Ansible
- Hybrid Cloud

Apply Ansible Automation Platform components, tools, and best practices to support your IT goals—from content creation to task infrastructure management.

Get started with ansible-navigator

Install ansible-navigator and take a closer look at the command line.

30 mins

Sign Ansible Content Collections with private automation hub

Learn how to sign Ansible Content Collections using a private automation hub and install collections with ansible-galaxy CLI.

30 mins

Get started with automation controller

Explore the automation controller interface and complete some basic tasks.

55 mins

DevOps & CI/CD with automation controller

Integrate a CI/CD pipeline into automation controller to see how Red Hat Ansible Automation Platform supports DevOps practices.

60 mins

Install Red Hat Ansible Automation Platform on Red Hat OpenShift

Learn to install automation controller and private automation hub with the Red Hat Ansible Automation Platform operators.

60 mins

Get started with ansible-builder

Install ansible-builder v3 and learn how to create custom execution environments..

45 mins

Image From: [Learn Red Hat Ansible Automation Platform | Interactive labs]

Resources & More

- Performing A/B Testing with NGINX and NGINX Plus - NGINX
- GitOps - Operations by Pull Request (weave.works)
- What is GitOps? (redhat.com)
- What is multi-cloud GitOps? (redhat.com)
- Tower API Reference Guide — Ansible Tower API Guide v3.8.6
- Learn Red Hat Ansible Automation Platform | Interactive labs

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November 15-16, 2023

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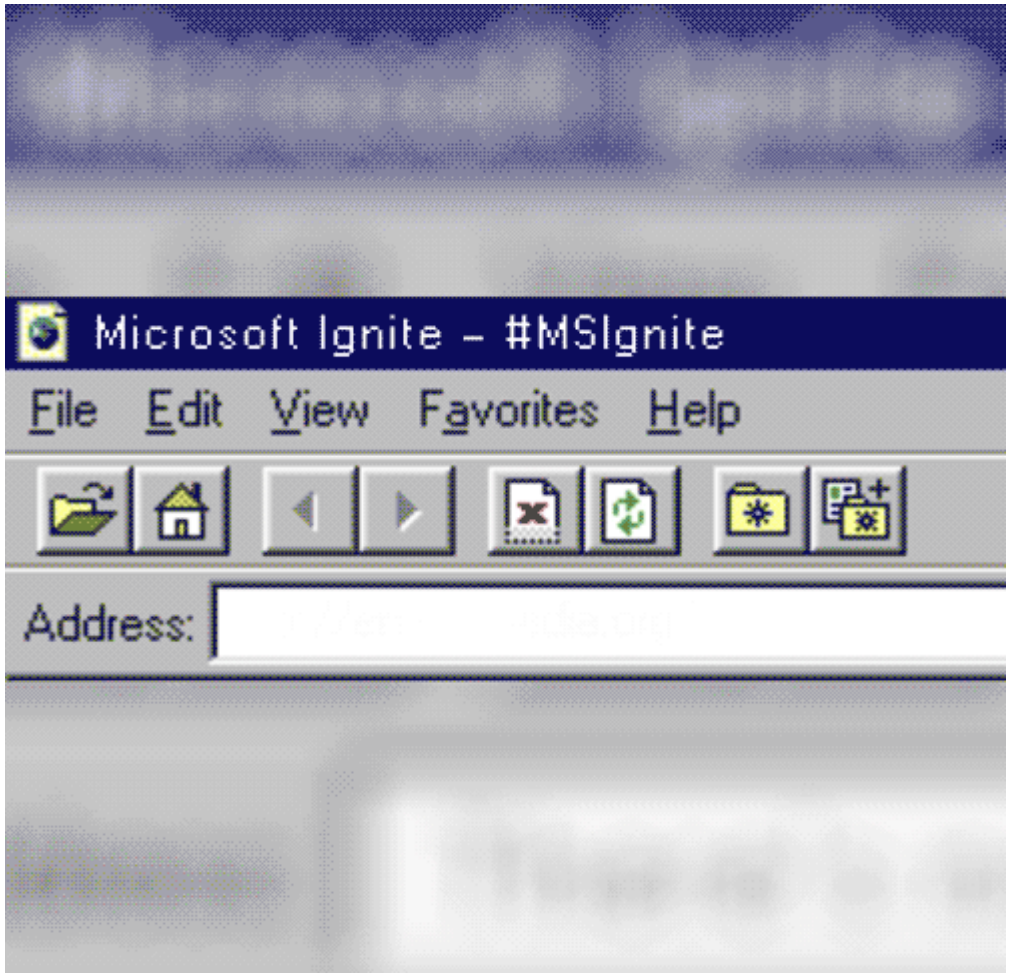

THANK YOU
ALL