

How to use this deck

**Name:**

Lab Guide -

**Purpose:**

This deck is for teaching an Ansible Lab “Gitops with Event Driven Ansible” for Ansiblefest 2023

**Last updated:**

Sep 5th, 2023

**What this deck is for?**

Training, it goes hand-in-hand with self-paced exercises

**What is this deck is NOT for?**

Business level discussions

**Google Slides source link (Red Hat internal):**

https://docs.google.com/presentation/d/1wrJ90OEvkais6wcyinMq42uv1_VJJQlrxHy8UgC220/edit?usp=sharing

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Event-Driven Ansible Technical Workshop

Ansible Self-Guided Labs

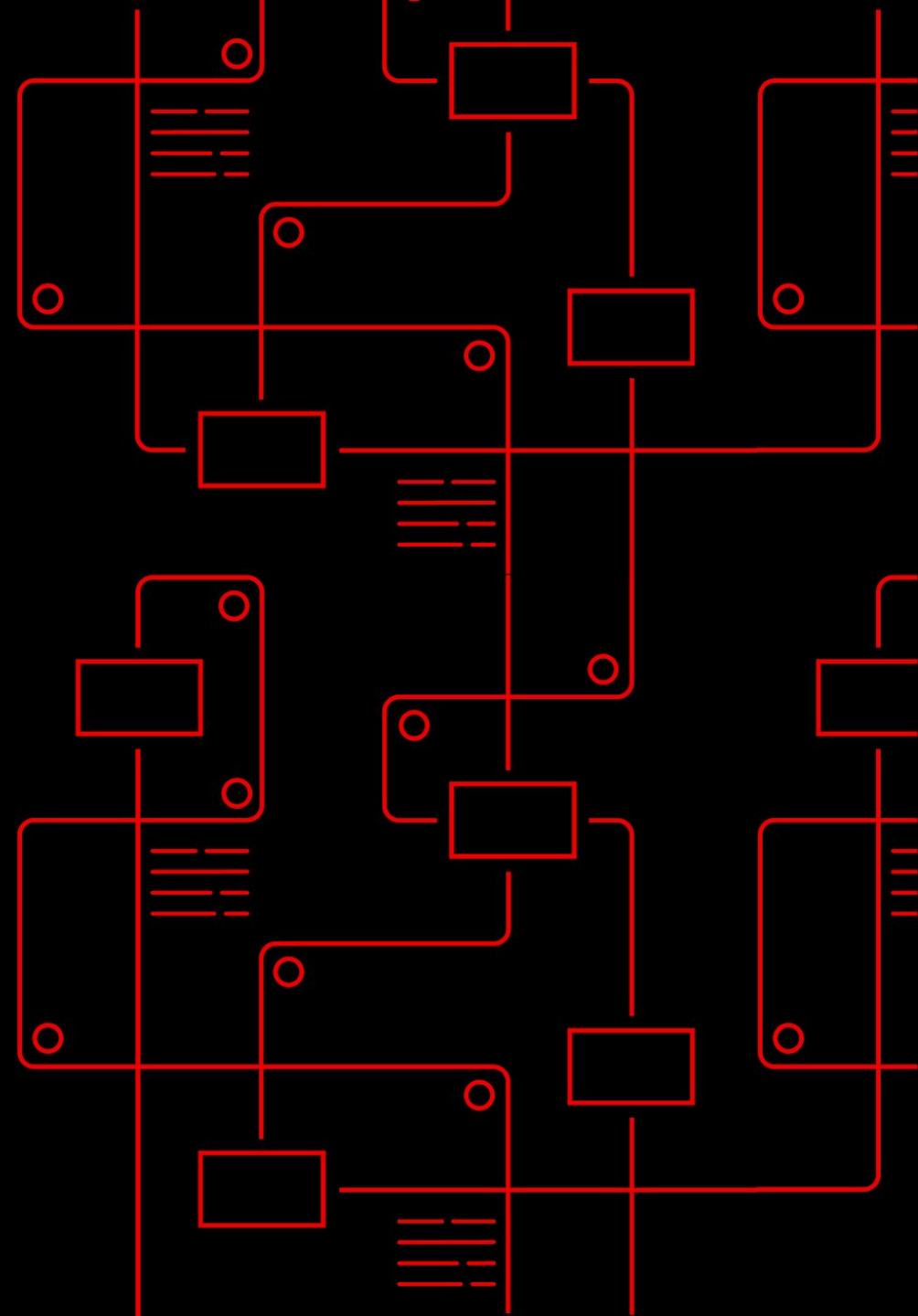
Event-Driven Ansible Technical Workshop

- 01 What is Event Driven Ansible?
- 02 How does it work?
- 03 Lab 1 - Getting Started with Event-Driven Ansible
- 04 Lab 2 - Getting Started with Event-Driven Ansible Controller
- 05 Next steps

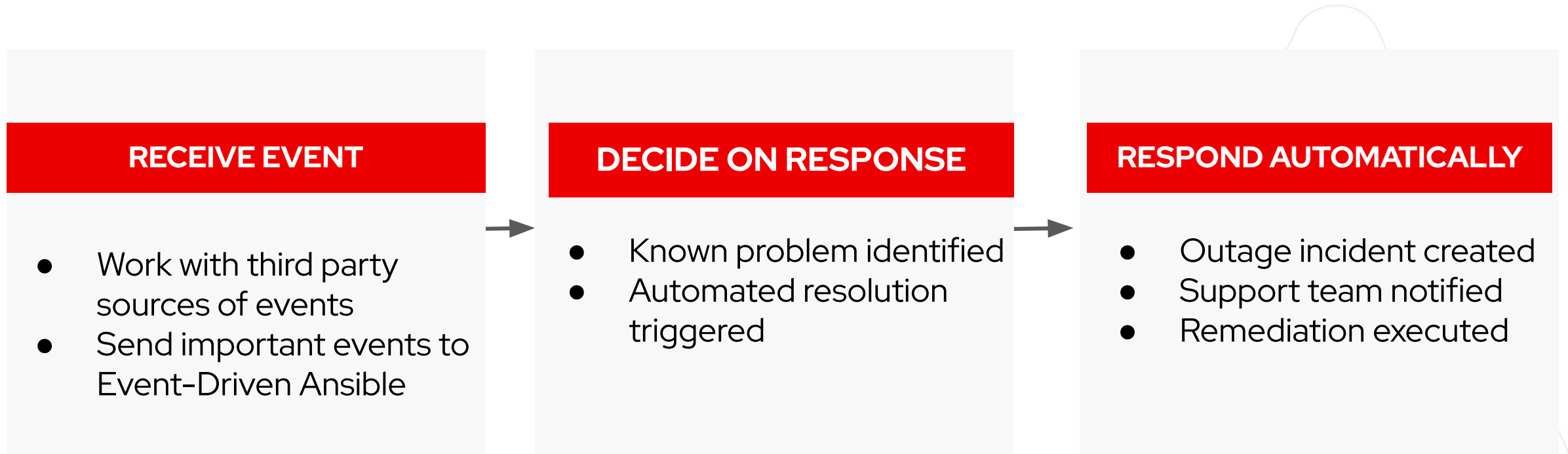


What is event-driven automation?

The ability to
connect intelligence, analytics and service requests
for an IT solution
to automated actions so that activities
can take place in a single motion.



A typical event-driven automation process

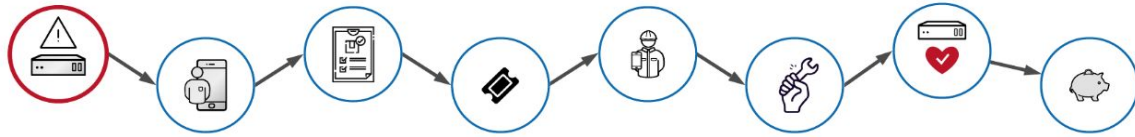


WORK ACROSS MULTI-VENDOR IT OPERATIONS

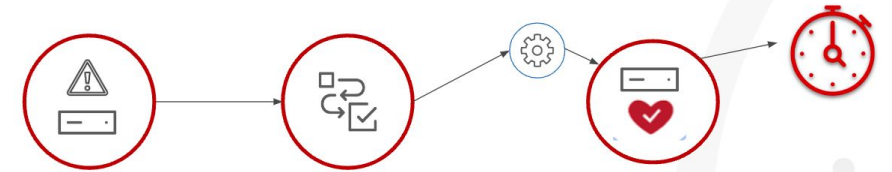
Work flexibly and well with multi-vendor monitoring and other solutions across the event driven architecture with appropriate approvals, controls and awareness

A brief history of IT Operations

The Old Way: Time, Toil and Churn



The new way: Event-Driven Automated Ops



Outage resolution:

Follow a people-intensive multi-step manual process including opening tickets and multiple handoffs.



Event-Driven outage resolution:

Receive event, matching to rule, respond and act automatically

Security risk resolution:

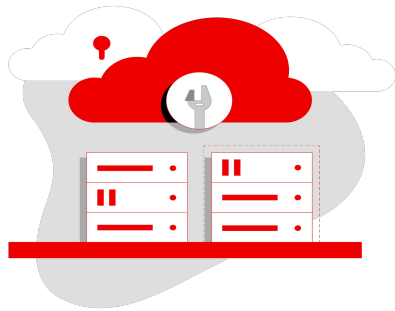
Monitor to identify risk, notify and open a ticket, manually apply a patch or manually initiate automation job.



Event-Driven security risk resolution:

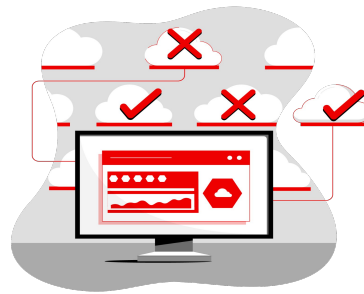
Receive risk event, match to rule, automatically apply patch to impacted inventory.

Suggested use cases for **getting started**



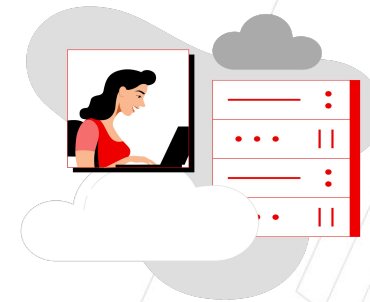
Service ticket enhancement

Automate fact gathering
Network administration
Edge device management



Remediation

Drift
Slow performance
Outages



User management

User authentication and access
Login issues
Group and role access

Event-Driven Ansible integrations and roadmap

CERTIFIED AND VALIDATED CONTENT

(Expected delivery Q2 and Q3 2023)

- Cisco NX-OS
- Cisco ThousandEyes
- CrowdStrike
- Cyberark
- Dynatrace*
- F5
- IBM Instana* and IBM Turbonomic*
- Palo Alto Networks
- Red Hat Insights
- Red Hat Openshift
- ServiceNow
- Zabbix
- AWS SQS
- Azure Service Bus
- GCP Pub/Sub
- Kafka (AMQ Streams)
- Prometheus/Alertmanager
- Webhooks
- watchdog (file system watcher)
- url_check (url status check)
- range (event generation plugin)
- file (loading facts from yaml)

*Collection includes both certified and validated content.

COMMUNITY CONTENT

- Arista

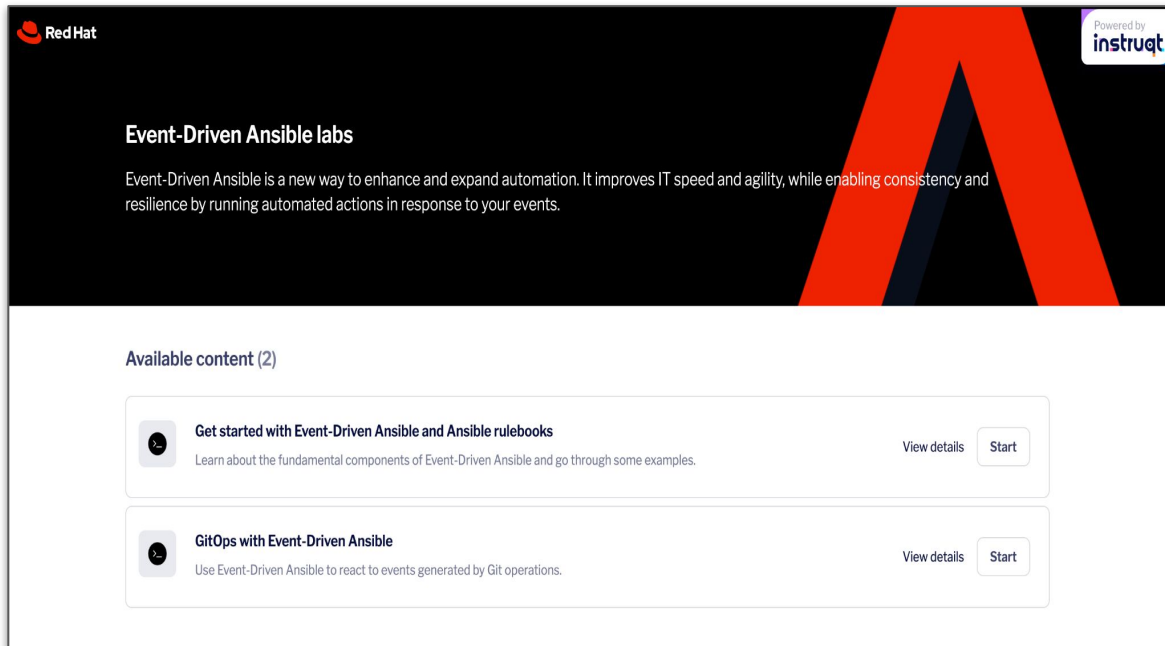
ROADMAP FOR INTEGRATIONS

- Additional ITSM solutions
- Additional observability / monitoring tools

[Blog: Event-Driven Ansible ecosystem partners](#)

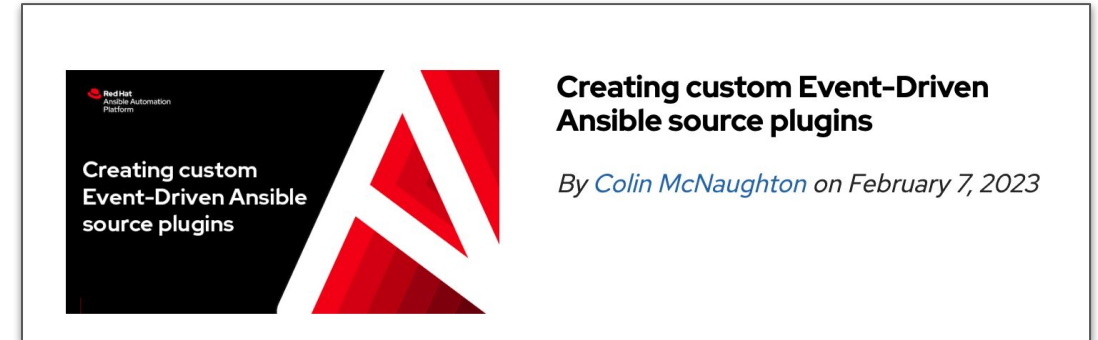
(as of May, 2023)

Three key technical learning resources



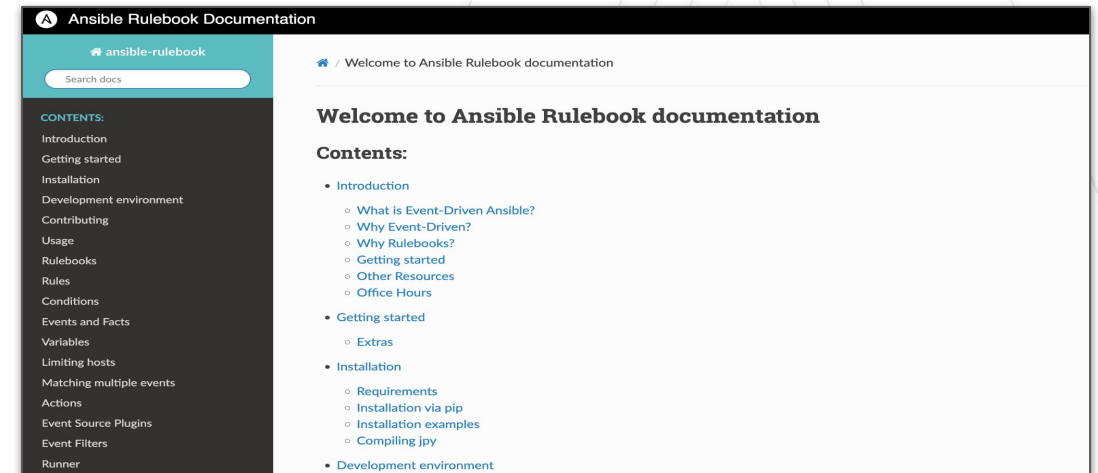
The screenshot shows the landing page for 'Event-Driven Ansible labs'. At the top left is the Red Hat logo, and at the top right is a 'Powered by instruct' badge. The main heading is 'Event-Driven Ansible labs'. Below it, a paragraph states: 'Event-Driven Ansible is a new way to enhance and expand automation. It improves IT speed and agility, while enabling consistency and resilience by running automated actions in response to your events.' Underneath, there is a section titled 'Available content (2)' which lists two lab cards. The first card is 'Get started with Event-Driven Ansible and Ansible rulebooks' with a sub-description 'Learn about the fundamental components of Event-Driven Ansible and go through some examples.' and buttons for 'View details' and 'Start'. The second card is 'GitOps with Event-Driven Ansible' with a sub-description 'Use Event-Driven Ansible to react to events generated by Git operations.' and buttons for 'View details' and 'Start'.

[Interactive labs](#)



The thumbnail features a large red and white stylized 'A' logo on the right. On the left, the text reads: 'Creating custom Event-Driven Ansible source plugins'. Above this text is the Red Hat Ansible Automation Platform logo. To the right of the 'A' logo, the article title 'Creating custom Event-Driven Ansible source plugins' is displayed in bold, followed by the author 'By Colin McNaughton on February 7, 2023'.

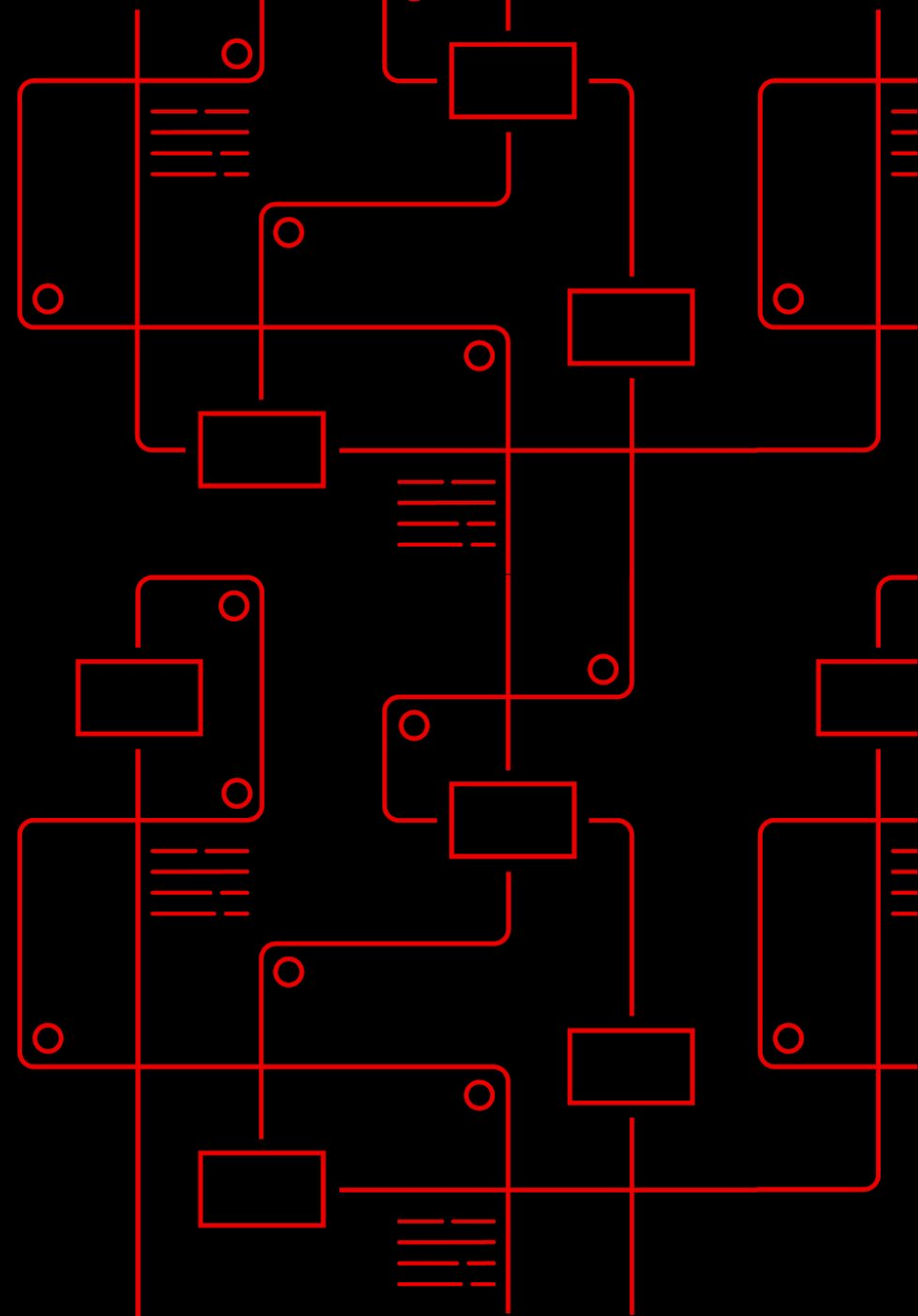
[Technical blogs](#)



The screenshot shows the 'Welcome to Ansible Rulebook documentation' page. The page has a dark sidebar on the left with a search bar and a 'CONTENTS' menu listing various topics like Introduction, Getting started, Installation, etc. The main content area has a heading 'Welcome to Ansible Rulebook documentation' and a 'Contents:' section with a list of links: Introduction (with sub-links for 'What is Event-Driven Ansible?', 'Why Event-Driven?', 'Why Rulebooks?', 'Getting started', 'Other Resources', 'Office Hours'), Getting started (with sub-link for 'Extras'), Installation (with sub-links for 'Requirements', 'Installation via pip', 'Installation examples', 'Compiling jpy'), and Development environment.

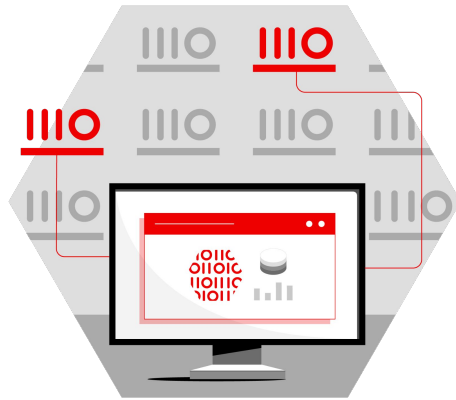
[Rulebook docs](#)

Ansible Rulebooks



Key building blocks in Event-Driven Ansible

Simple, powerful, agentless



Sources

All the sources of event data you want to use



Rules

What you will create using Event-Driven Ansible®



Actions

When a condition or event is met, the Ansible Rulebook executes

Ansible Rulebooks contain the source of the event, as well as the instructions on what steps to perform when a certain condition is met—and it is all very flexible.

Ansible Rulebooks

Simple declarative decisions through rules

- ▶ **Events are processed by a rules engine**
 - ▷ Rules trigger based on conditions and actions can be carried out by the rules engine
 - ▷ Rules are organized into Ansible Rulebooks
 - ▷ Ansible rules can apply to events occurring on specific hosts or groups
- ▶ **Conditional management of actions to events**
 - ▷ Simple YAML structure for logical conditions
 - ▷ Events can trigger different types of actions:
 - Run Ansible Playbooks
 - Run Modules
 - Post new events to the event handler
- ▶ **YAML-like format familiarity**
 - ▷ Current Ansible users quickly learn and use Rulebook writing

```
- name: Automatic Remediation of a web server
hosts: all
sources:
  - name: listen for alerts
    ansible.eda.alertmanager:
      host: 0.0.0.0
      port: 8000
rules:
  - name: restart web server
    condition: event.alert.labels.job == "fastapi" and
event.alert.status == "firing"
    action:
      run_playbook:
        name: ansible.eda.start_app
```

Anatomy of an Ansible Rulebook

Smart automation from conditional rules

Receive

Decide

Respond

Event Source

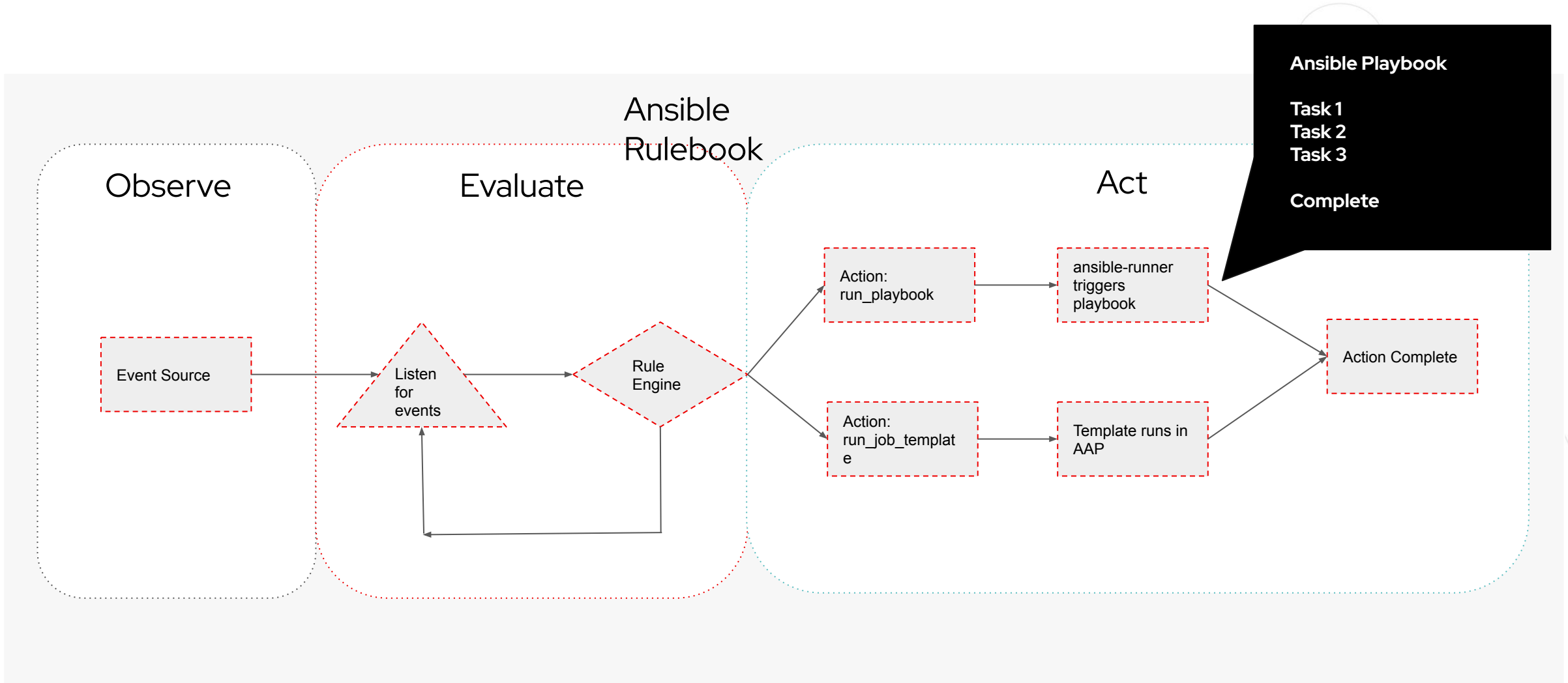
```
...
source:
- name: watchdog
  ansible.eda.watchdog:
    path: "{{src_path}}"
    recursive: true
    ignore_regexes: [".*\pytest.*", ".*__pycache__.*", ".*\.git.*"]
rules:
- name: Check for folder modification
  condition: event.type == "DirModifiedEvent"
  action:
    run_playbook:
      name: folder_permission_restore.yml
      post_events: true
- name: Check for file Modification
  condition: event.type == "FileModifiedEvent"
  action:
    run_playbook:
      name: file_permission_restore.yml
      post_events: true
```

- Event sources are processed through conditional rules
- Actions are triggered once rule conditions are met

Automation

Event-Driven Ansible

Ansible Rulebooks can call playbooks to leverage and extend trusted playbooks

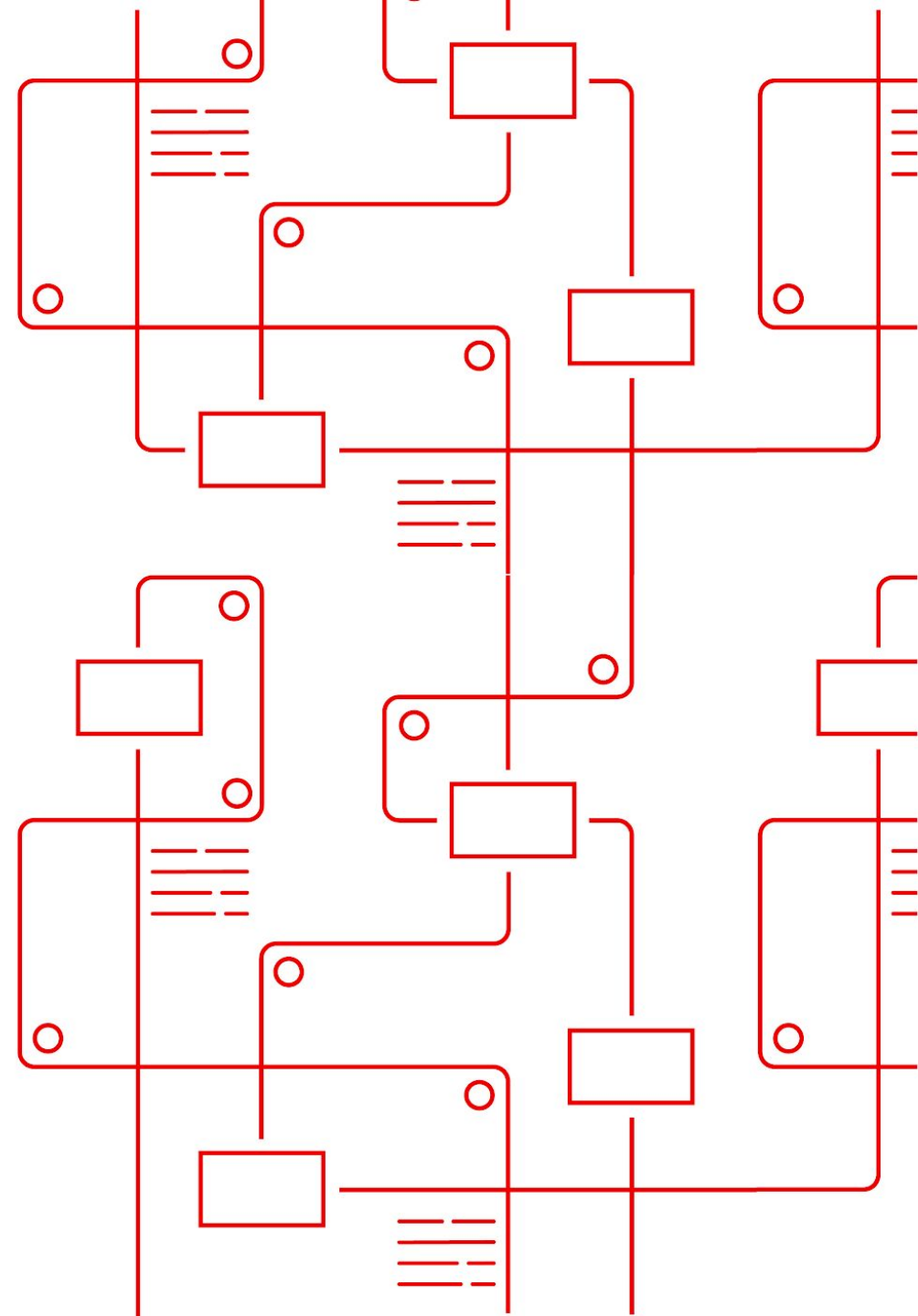


Lab Time

Lab 1 - Rulebooks: Getting started

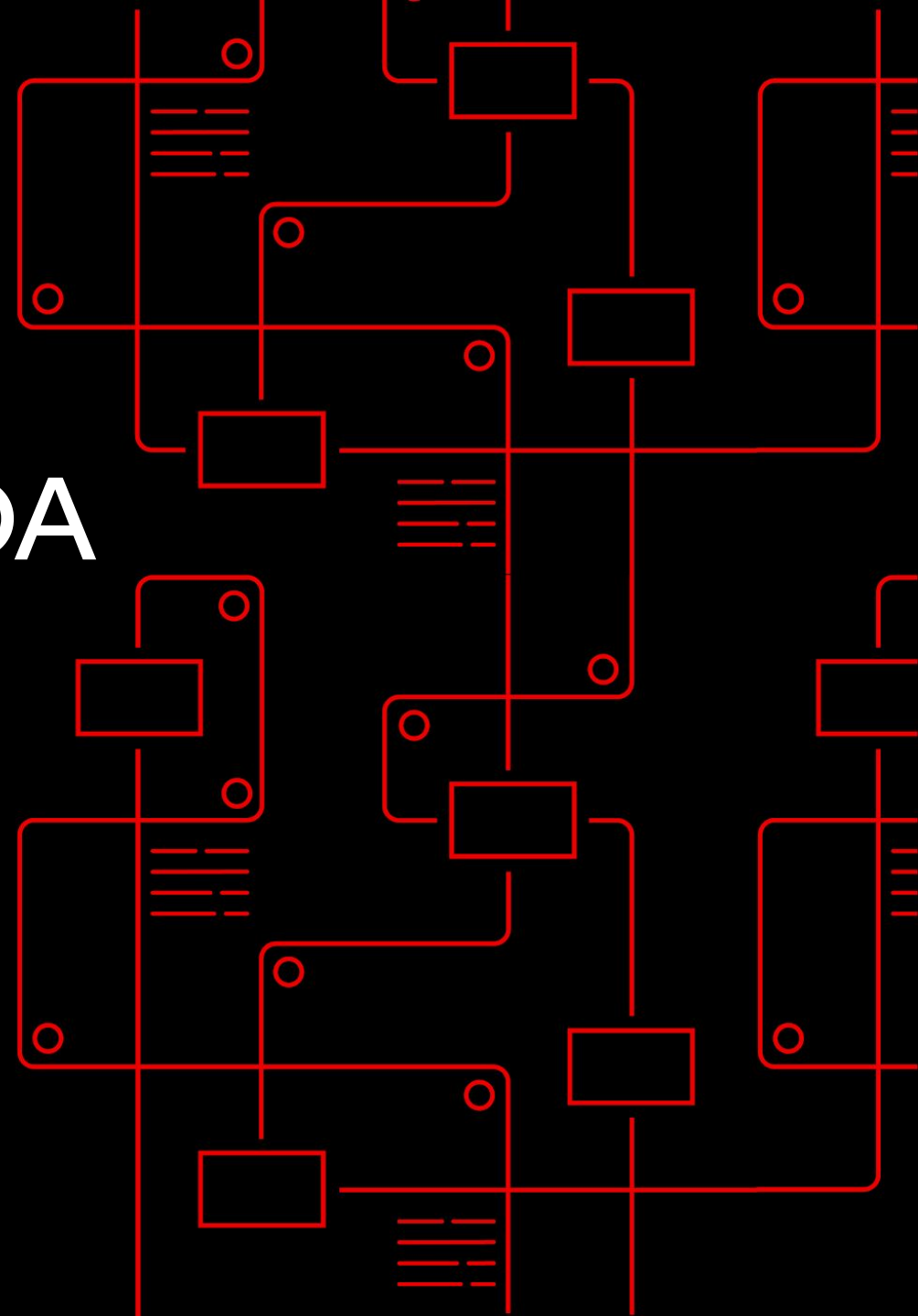


25 Minutes (click to start)



Getting Started with EDA Controller

- Projects
- Decision Environments
- Rulebook Activation



EDA Controller

Event-Driven Ansible Management

Red Hat
Ansible Automation Platform

admin

Dashboard

Views

- Rule Audit
- Rulebook Activations

Resources

- Projects
- Credentials
- Decision Environments

User Access

- Users
- Roles

Welcome to Ansible Automation Platform

Connect intelligence, analytics and service requests to enable more responsive and resilient automation.

Getting Started

Event-Driven Ansible is a highly scalable, flexible automation capability that works with event sources such as other software vendors' monitoring tools. In an automatic remediation use case, these vendor tools watch your IT solutions and identify "events," such as an outage.

To learn how to get started, view the documentation, [check out our instruct guides](#), or follow the steps below.

- Project**
Create a project.
- Decision Environment**
Create a decision environment.
- Rulebook Activation**
Create a rulebook activation.

Projects

Recently updated projects

[Go to Projects](#)

There are currently no projects

Create a project by clicking the button below.

[+ Create project](#)

Decision Environments

Recently updated environments

[Go to Decision Environments](#)

Name	Modified
Default Decision Environment	15/06/2023, 13:49:17

- ▶ **EDA Controller**
 - ▶ Manage EDA projects, Decision Environments and rulebook activation
 - ▶ Audit running rulebooks
 - ▶ View event history
 - ▶ Securely connected to **Automation Controller** via **Token**

Getting Started

Event-Driven Ansible Management

Getting Started

Event-Driven Ansible is a highly scalable, flexible automation capability that works with event sources such as other software vendors' monitoring tools. In an automatic remediation use case, these vendor tools watch your IT solutions and identify "events," such as an outage.

To learn how to get started, view the documentation, [check out our instruct guides](#), or follow the steps below.



Project

Create a project.



Decision Environment

Create a decision environment.



Rulebook Activation

Create a rulebook activation.

▶ **Project**

- ▶ Grab your Rulebooks and synchronize from source control

▶ **Decision Environment**

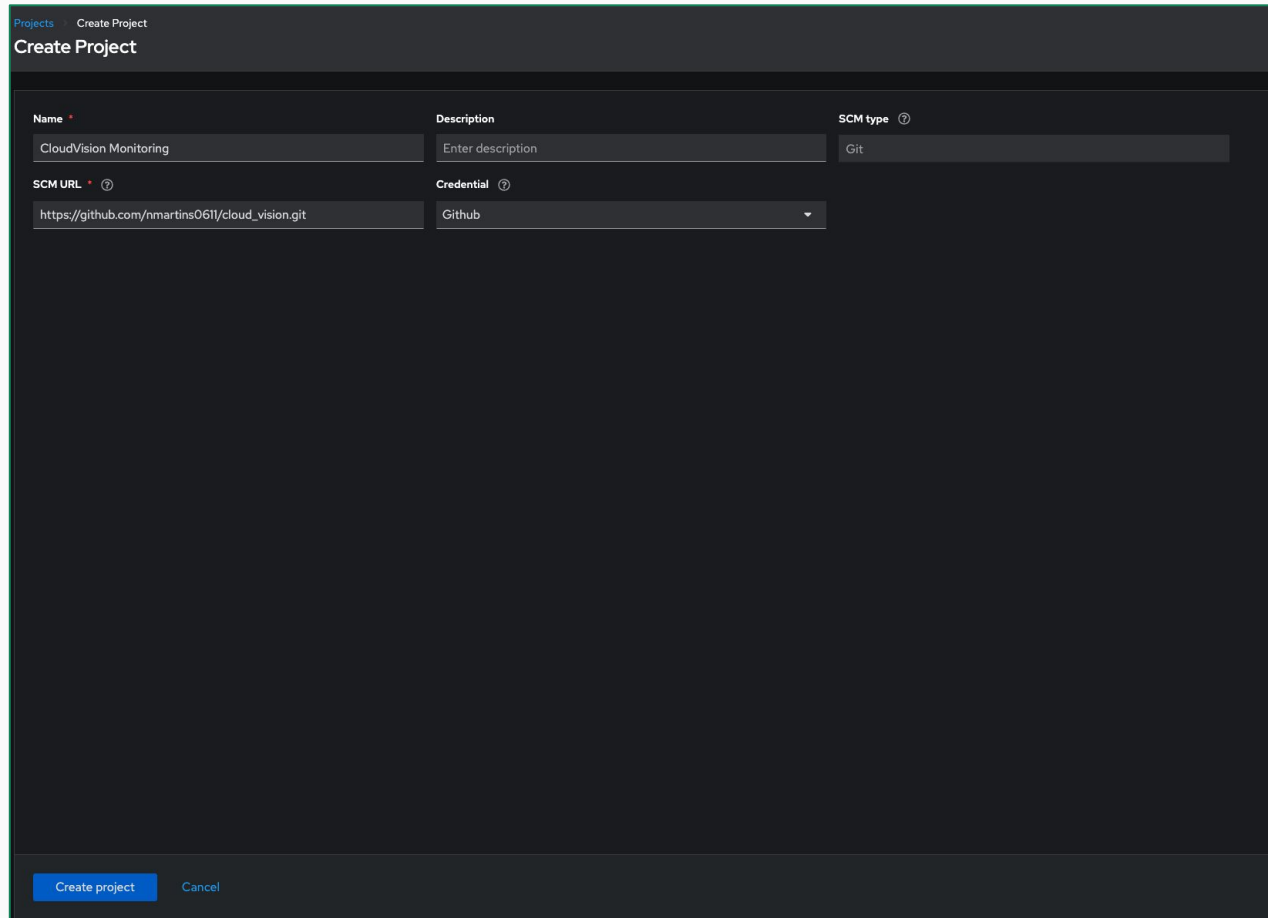
- ▶ Select the Container environment that contains ansible-rulebook and any additional Ansible content that is needed.

▶ **Rulebook Activation**

- ▶ Select your Ansible Rulebook from the project and configure how it runs.

Projects

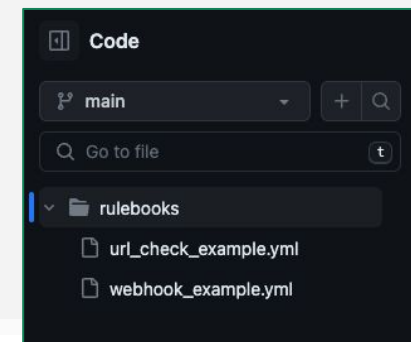
Single source of truth for your Rulebooks



The screenshot shows the 'Create Project' dialog box in a dark theme. At the top, it says 'Projects Create Project' and 'Create Project'. The dialog has four input fields: 'Name' with the value 'CloudVision Monitoring', 'Description' with the placeholder 'Enter description', 'SCM type' with the value 'Git', and 'SCM URL' with the value 'https://github.com/nmartins061/cloud_vision.git'. Below these is a 'Credential' dropdown menu with 'Github' selected. At the bottom, there are two buttons: 'Create project' (highlighted in blue) and 'Cancel'.

▶ Projects

- ▶ Similar to Automation controller, we create projects on EDA Controller and synchronize from a source of truth.
- ▶ Projects will contain all the resources you need such as Ansible Rulebooks.
- ▶ **Note:**
 - Rulebooks need to be kept in a rulebook subfolder in your project repository.



Decision Environments

Container based execution of Event-Driven Ansible

The image shows two screenshots of a web interface. The top screenshot is the 'Create Decision Environment' form, which has a dark theme. It includes fields for 'Name' (with a sub-label 'Enter name'), 'Description' (with a sub-label 'Enter description'), and 'Image' (with a sub-label 'Enter image name'). There is also a 'Credential' dropdown menu with the text 'Select credential'. At the bottom of this form are two buttons: 'Create decision environment' and 'Cancel'. The bottom screenshot shows a 'Decision Environments' list view. It has a title 'Decision Environments' and a subtitle 'Decision environments contain an ansible-rulebook image that dictates where the rulebooks will run.' Below this is a search bar with a filter icon, the text 'Name starts with', and a right arrow. To the right of the search bar is a blue button with a plus sign and the text '+ Create decision environment'. Below the search bar is a list item for 'Default Decision Enviro...' with a three-dot menu icon and a checkbox. Underneath the list item, the text 'Decision Environment' is shown, followed by the 'Image' field containing the value 'registry.redhat.io/ansible-automation-platfor...'. At the bottom of this list view are two buttons: 'Create decision environment' and 'Cancel'.

▶ Decision Environments

- ▶ Provides a container environment similar to an Execution Environment.
- ▶ Contains an Ansible rulebook to run rulebooks
- ▶ Contains any additional Ansible content needed

Configure Rulebook Activation

Event-Driven Ansible Management

Rulebook Activations Create Rulebook Activation

Create Rulebook Activation

Name * URL_Check

Description Enter description

Project eda_samples

Rulebook * Select project rulebook

Decision environment * Default Decision Environment

Restart policy Always

Variables

1

Rulebook activation enabled?

Enabled

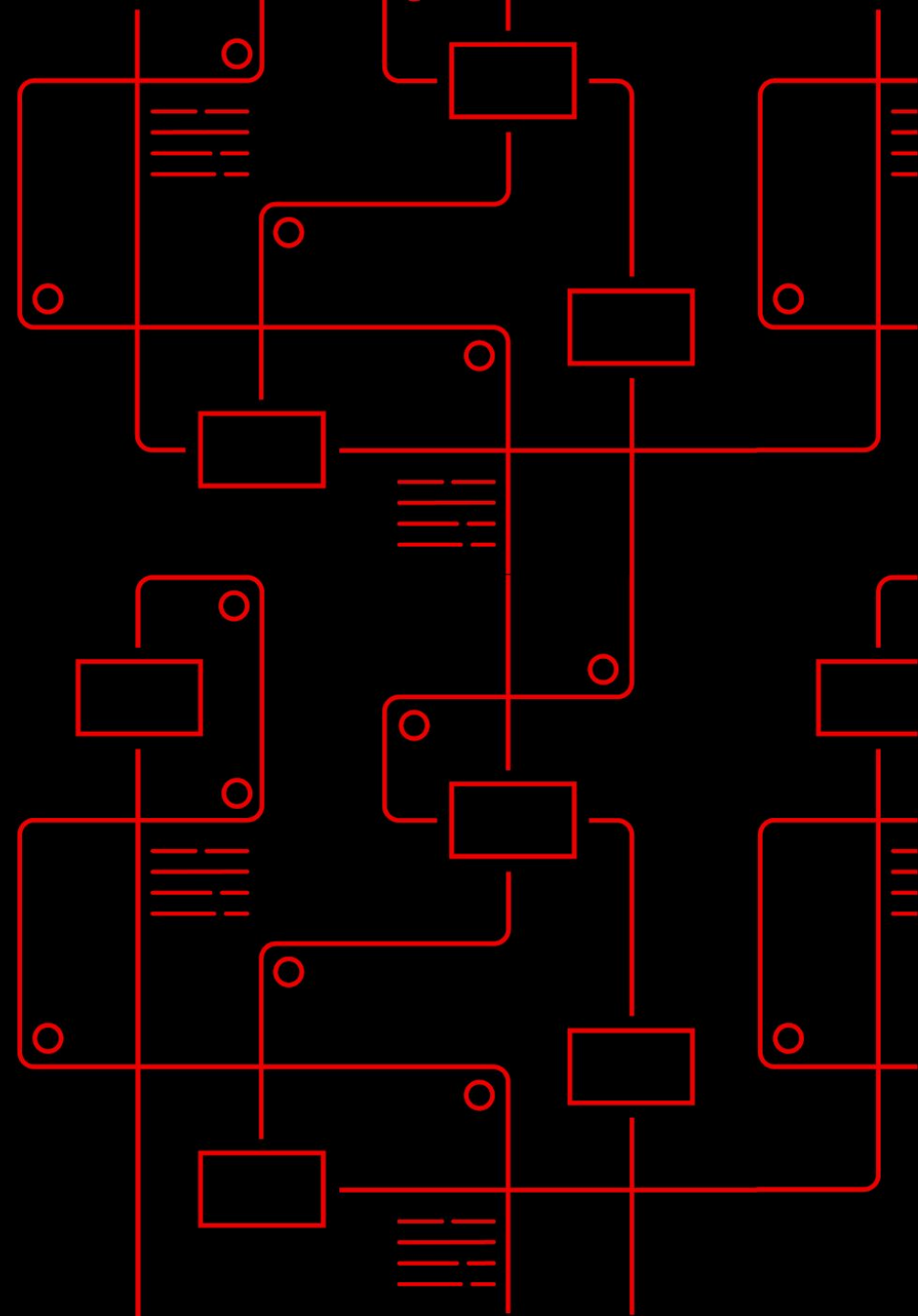
Create rulebook activation Cancel

▶ Rulebook Configuration

- ▶ Rulebooks from our Projects can be configured via Rulebook Activation. Restart Policies, Decision Environments, Variables and enablement are configured here.
- ▶ Additional Variables can be supplied to the rulebooks
- ▶ Restart Policy allows us to restart rulebooks if needed.
 - Always
 - Never
 - On Failure

Rulebook and Event Auditing

- Gather information around Events and Actions
- Observe Rulebook activation
- View status of Event-Driven Ansible Rulebooks



Rulebook Activation

Activated Automation

The screenshot shows the 'Dev_test' Rulebook Activation details page. It includes a breadcrumb 'Rulebook Activations > Dev_test' and tabs for 'Details' and 'History'. The details are as follows:

Name	Decision environment	Rulebook
Dev_test	ansible-rulebook	hello_controller.yml
Restart policy	Project	Activation status
Always	eda-project2	Running
Project git hash	Restarted count	Created
a6bd882ded2b413b9346edaa9e6faf7b30ebfb13	0	22/06/2023, 19:39:04

Rulebook [?]
hello_controller.yml
Activation status
Starting
Created
22/06/2023, 19:39:04

Rulebook Activated

Waiting for Events

Rulebook [?]
hello_controller.yml
Activation status
Running
Created
22/06/2023, 19:39:04

▶ Rulebook Activation

- ▶ Once Rulebooks are activated and running they are listening for events.
- ▶ Event data and Event History can be viewed from the Rulebook Activation window.
- ▶ Further inspection of the Rulebook events and actions can be done via **Rule Audit**

Rulebook Output

Viewing ansible-rulebook output and history

```
Rulebook Activations  Dev_test  History  25 - Dev_test
25 - Dev_test

Details

Name                Activation status  Start date
25 - Dev_test        running           22/06/2023, 19:39:04

Output

2023-06-22 17:39:08,718 - ansible_rulebook.app - INFO - Starting worker mode
2023-06-22 17:39:08,718 - ansible_rulebook.websocket - INFO - websocket ws://eda-daphne:8001/api/eda/ws/ansible-rulebook connecting
2023-06-22 17:39:08,752 - ansible_rulebook.websocket - INFO - websocket ws://eda-daphne:8001/api/eda/ws/ansible-rulebook connected
2023-06-22 17:39:08,818 - ansible_rulebook.job_template_runner - INFO - Attempting to connect to Controller
https://controller.apps.aap-dt.ocp4.testing.ansible.com
2023-06-22 17:39:09,013 - ansible_rulebook.app - INFO - AAP Version 4.4.0
2023-06-22 17:39:09,013 - ansible_rulebook.app - INFO - Starting sources
2023-06-22 17:39:09,013 - ansible_rulebook.app - INFO - Starting rules
2023-06-22 17:39:09,013 - ansible_rulebook.engine - INFO - run_ruleset
2023-06-22 17:39:09,015 - drools.ruleset - INFO - Using jar: /opt/app-root/lib/python3.9/site-packages/drools/jars/drools-ansible-
rulebook-integration-runtime-1.0.2-SNAPSHOT.jar
2023-06-22 17:39:10 053 [main] INFO org.drools.ansible.rulebook.integration.api.rulesengine.AbstractRulesEvaluator - Start automatic
pseudo clock with a tick every 100 milliseconds
2023-06-22 17:39:10,060 - ansible_rulebook.engine - INFO - ruleset define: {"name": "Hello Controller", "hosts": ["all"], "sources":
[{"EventSource": {"name": "ansible.eda.range", "source_name": "ansible.eda.range", "source_args": {"limit": 5, "source_filters":
[]}}, "rules": [{"Rule": {"name": "Run job template", "condition": {"AllCondition": [{"EqualsExpression": {"lhs": {"Event": "i"},
"rhs": {"Integer": 1}}]}, "actions": [{"Action": {"action": "run_job_template", "action_args": {"name": "hello", "organization":
"Default", "job_args": {"extra_vars": {"hello": "Fred"}}, "retries": 1, "delay": 10}}], "enabled": true}}]}]}
2023-06-22 17:39:10,078 - ansible_rulebook.engine - INFO - load source
2023-06-22 17:39:10,847 - ansible_rulebook.engine - INFO - load source filters
2023-06-22 17:39:10,847 - ansible_rulebook.engine - INFO - loading eda.builtin.insert_meta_info
2023-06-22 17:39:11,568 - ansible_rulebook.engine - INFO - Calling main in ansible.eda.range
2023-06-22 17:39:11,569 - ansible_rulebook.websocket - INFO - websocket ws://eda-daphne:8001/api/eda/ws/ansible-rulebook connecting
2023-06-22 17:39:11,572 - ansible_rulebook.engine - INFO - Waiting for all ruleset tasks to end
2023-06-22 17:39:11 573 [drools-async-evaluator-thread] INFO org.drools.ansible.rulebook.integration.api.io.RuleExecutorChannel -
Async channel connected
2023-06-22 17:39:11,608 - ansible_rulebook.rule_set_runner - INFO - Waiting for actions on events from Hello Controller
2023-06-22 17:39:11,608 - ansible_rulebook.rule_set_runner - INFO - Waiting for events, ruleset: Hello Controller
2023-06-22 17:39:11 668 [main] INFO org.drools.ansible.rulebook.integration.api.rulesengine.RegisterOnlyAgendaFilter - Activation of
effective rule "Run job template" with facts: {m={meta={received_at=2023-06-22T17:39:11.570384Z, source={name=ansible.eda.range,
type=ansible.eda.range, uuid=666eee67-c9ab-4218-a9e0-5e7abb2ec86b}, i=1}}
2023-06-22 17:39:11,678 - ansible_rulebook.rule_generator - INFO - calling Run job template
2023-06-22 17:39:11,681 - ansible_rulebook.rule_set_runner - INFO - call_action run_job_template
2023-06-22 17:39:11,682 - ansible_rulebook.rule_set_runner - INFO - substitute_variables [{"name": 'hello', 'organization':
'Default', 'job_args': {'extra_vars': {'hello': 'Fred'}}, 'retries': 1, 'delay': 10}] [{"event": {'meta': {'received_at': '2023-06-
22T17:39:11.570384Z', 'source': {'name': 'ansible.eda.range', 'type': 'ansible.eda.range', 'uuid': '666eee67-c9ab-4218-a9e0-
5e7abb2ec86b'}, 'i': 1}}]}
2023-06-22 17:39:11,682 - ansible_rulebook.rule_set_runner - INFO - action args: {'name': 'hello', 'organization': 'Default',
'job_args': {'extra_vars': {'hello': 'Fred'}}, 'retries': 1, 'delay': 10}
2023-06-22 17:39:11,682 - ansible_rulebook.builtin - INFO - running job template: hello, organization: Default
2023-06-22 17:39:11,682 - ansible_rulebook.builtin - INFO - ruleset: Hello Controller, rule Run job template
2023-06-22 17:39:11,688 - ansible_rulebook.engine - INFO - Broadcast shutdown to all source plugins
2023-06-22 17:39:11,689 - ansible_rulebook.engine - INFO - Broadcast to queues: [<Queue at 0x7f4069f386d0 maxsize=1 _getters[1]
```

▶ Rulebook Activation

- ▶ Once Rulebooks are activated It is possible to view the history output of that rulebook.
- ▶ This provides you with the ability to view the verbose output of ansible-rulebook for your specific rulebook.

Rule Audit

An Overview of events and actions

Rule Audit
Rule audit allows auditing of rules which have been triggered by incoming events.

Name	Status	Rulebook activation	Last fired date
Run job template	✔ Successful		22/06/2023, 19:39:11

[Rule Audit](#) > [Run job template](#)

Run job template

Details Events Actions

Rule name	Status	Rulebook activation ⓘ
Run job template	✔ Successful	Dev_test
Created	Fired date	
22/06/2023, 19:39:32	22/06/2023, 19:39:11	

▶ Audit Rulebook Activation

- ▶ Rule Audit allows you to view data around the events and actions that have taken place.
- ▶ Events will list the events that have matched within the rulebook.
- ▶ Actions provide a list of actions which have taken place

Event Audit

Event information and auditing

Rule Audit · Run job template

Run job template

Details **Events** Actions

▼ Name starts with →

Name	Source type	Timestamp
ansible.eda.range	ansible.eda.range	22/06/2023, 19:39:11

Event details

Name	Source type	Timestamp
ansible.eda.range	ansible.eda.range	22/06/2023, 19:39:11

Event log

```
{"id":1}
```

Close

▶ Event list

- ▶ The Event list in Rule Audit provides a list of events that have been matched with your Rulebook conditions.
- ▶ The events are listed and provide the event source type where they were observed.
- ▶ These events can be selected to get the event information.

Action Audit

Action information and data

Rule Audit > Run job template

Run job template

Details Events **Actions**

🔍 Name starts with →

Name	Status	Last fired date
run_job_template		

▶ Actions

- ▶ Rule Audit provides the ability to access the Action history.
- ▶ If the action is to run_job_template in Automation Controller, the action will link back to the Job Status on Automation Controller.

Jobs > 188 - hello

Details

◀ Back to Jobs Details Output

Job ID	188	Status	Successful	Started	22/06/2023, 19:39:12
Finished	22/06/2023, 19:39:23	Job Template	hello	Job Type	Playbook Run
Launched By	admin	Inventory	managed nodes	Project	Demo Project
Revision	347e44fea036c94d5f60e544de006453ee5c71ad	Playbook	hello_world.yml	Verbosity	0 (Normal)
Execution Environment	Default execution environment	Controller Node	controller-task-5c89b6bd-7fdfb	Container Group	default
Job Slice	0/1	Forks	0	Timeout	No timeout specified
Credentials	SSH: managed nodes				
Created	22/06/2023, 19:39:12 by admin	Last Modified	22/06/2023, 19:39:12		

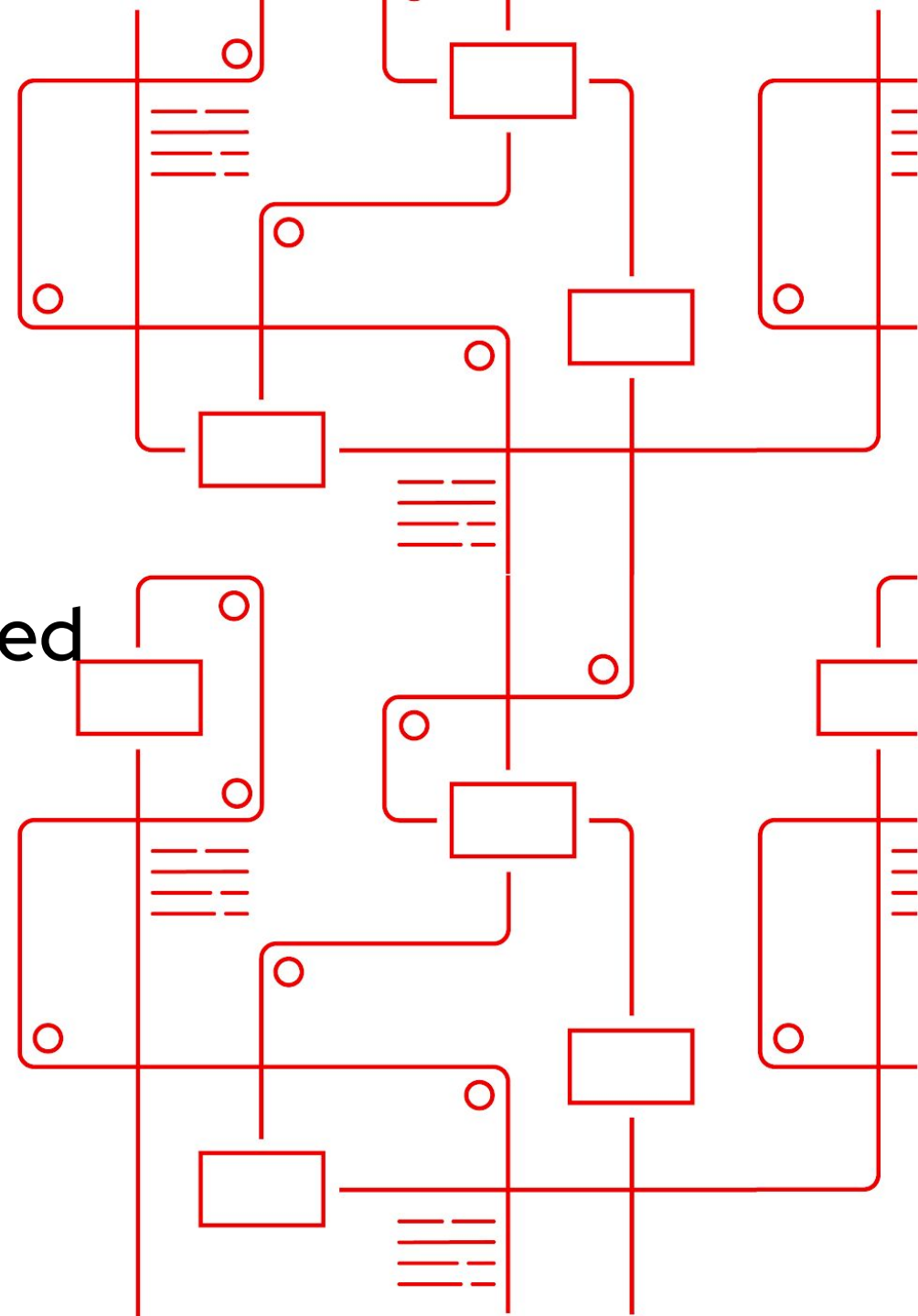
Variables [YAML](#) [JSON](#)

1 {}

Artifacts [YAML](#) [JSON](#)

1 {}

[Relaunch](#) [Delete](#)



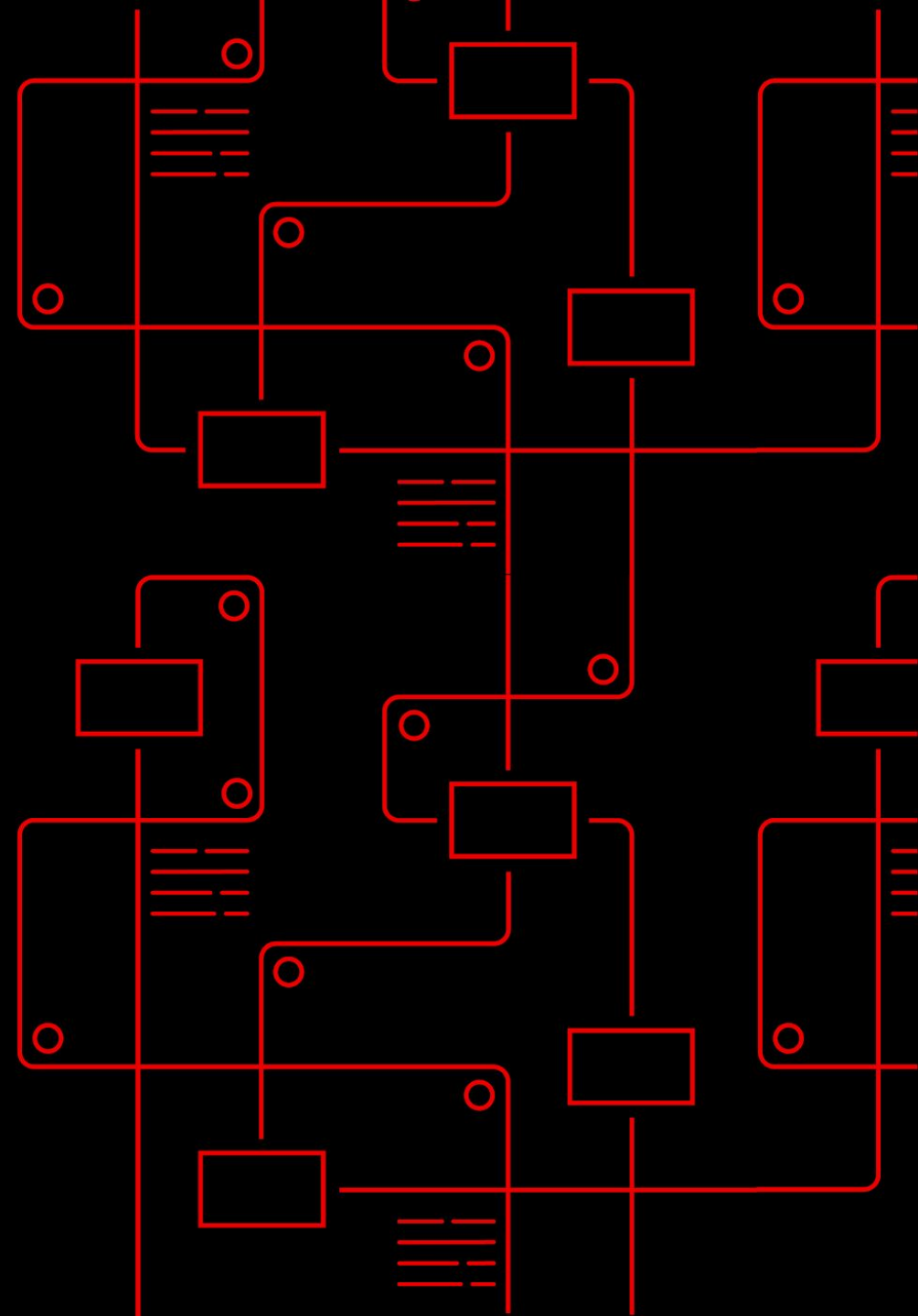
Lab Time

Lab 2 - EDA Controller: Getting started



[40 Minutes](#) (click to start)

Next steps



Learning resources

Continue your automation journey with Red Hat Ansible for public cloud automation



Ansible Automation Labs

red.ht/ansible_labs

E-book:

An IT executive's guide to automation

red.ht/automate_guide

Ansible Basics:

Automation Technical Overview

red.ht/automation_basics

Thank you

Red Hat is the world's leading provider of enterprise open source software solutions. Award-winning support, training, and consulting services make Red Hat a trusted adviser to the Fortune 500.



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[youtube.com/c/AnsibleAutomation](https://www.youtube.com/c/AnsibleAutomation)

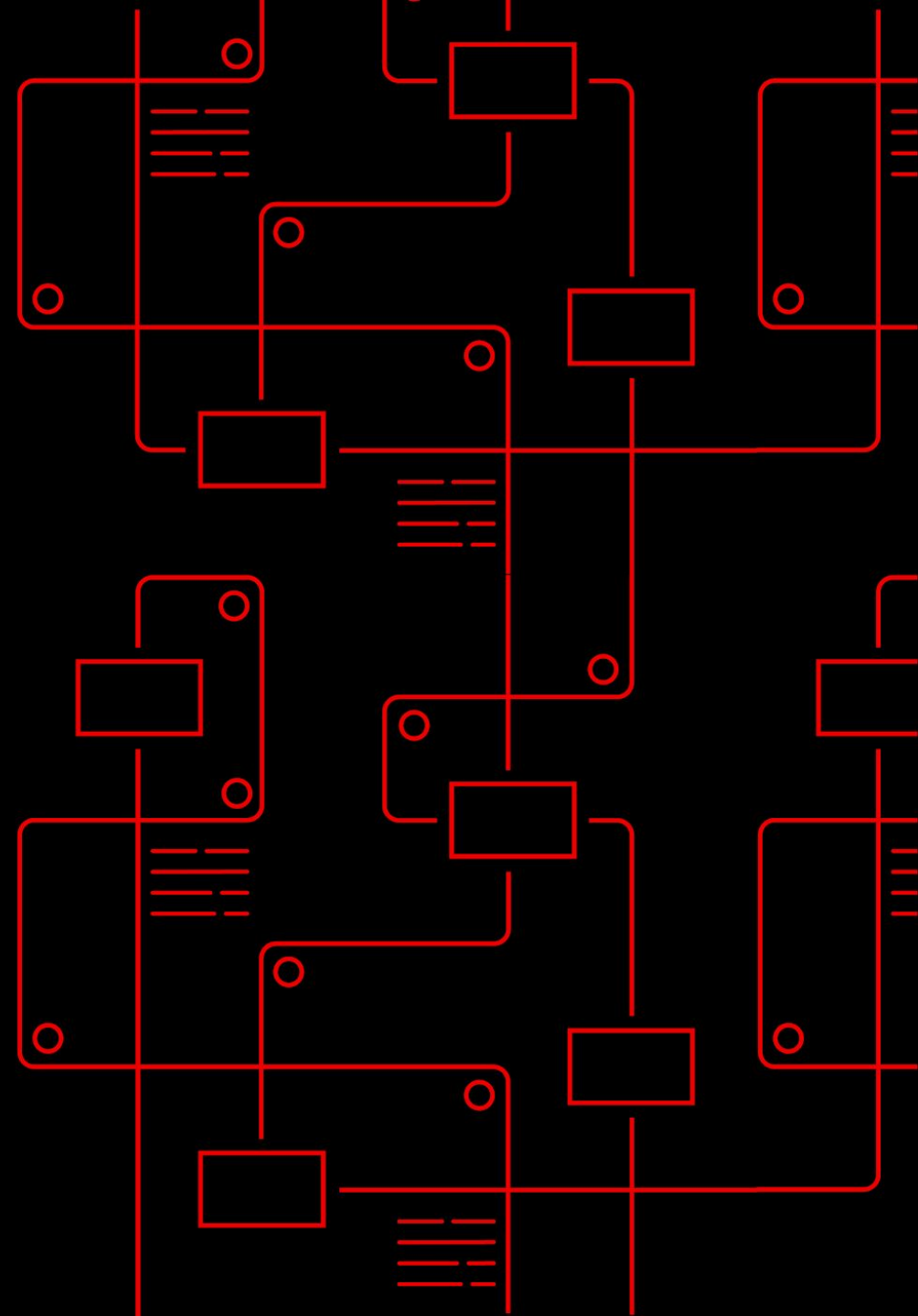


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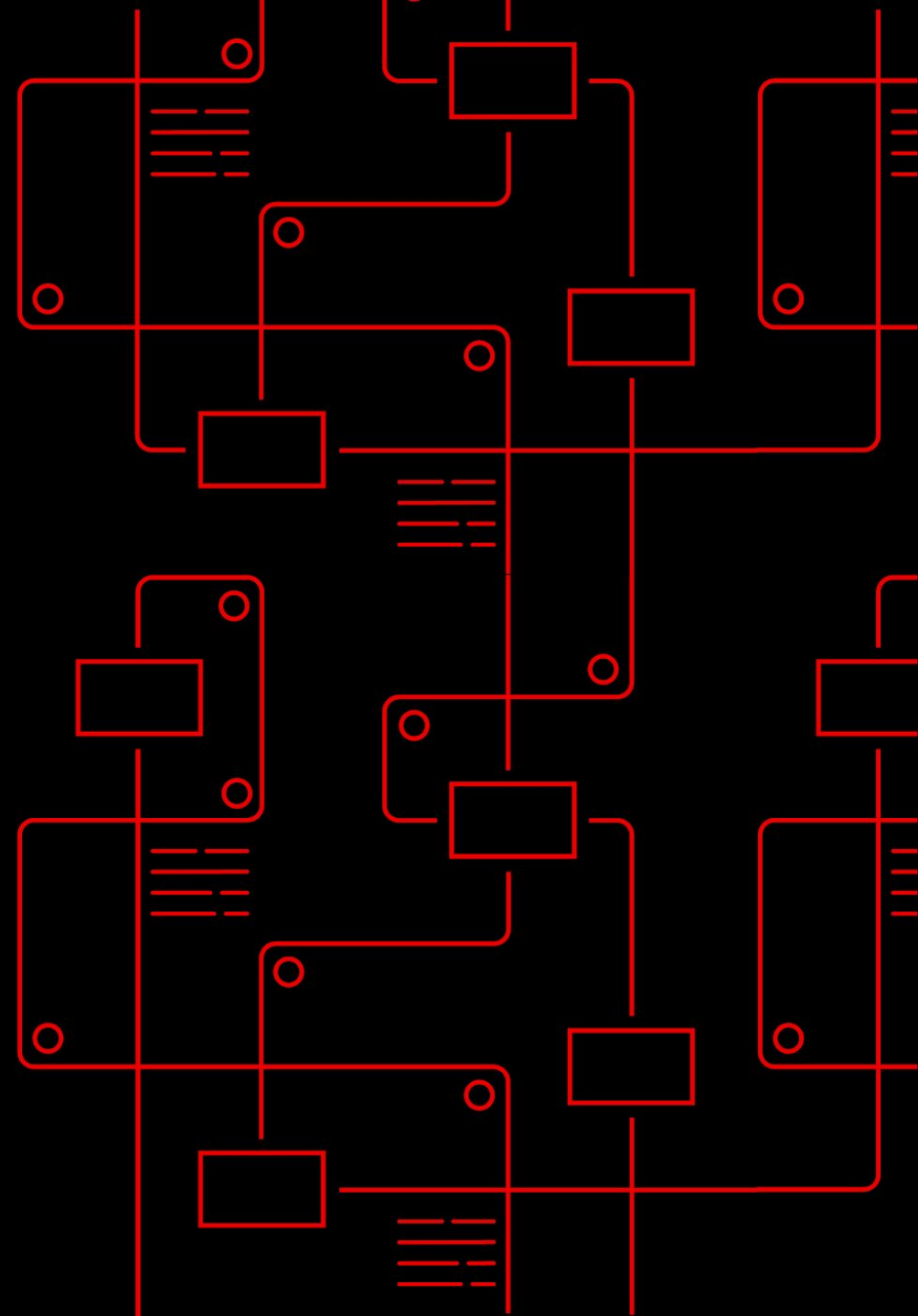


twitter.com/ansible

Supplemental lab: Event-Driven Ansible and gitops



Event driven gitops



So what is **GitOps**?

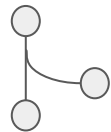
GitOps it is an operational framework that takes DevOps best practices for application development and applies them to infrastructure automation.

In other words?

Treat infrastructure as code as you would application code.

GitOps workflow

1. Create Pull Request



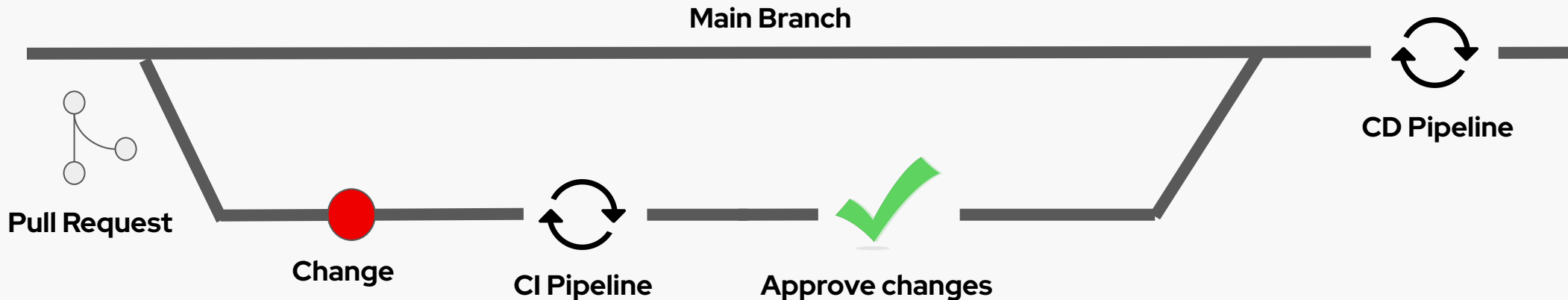
2. Run CI Pipeline



3. Approve changes



4. Run CD Pipeline



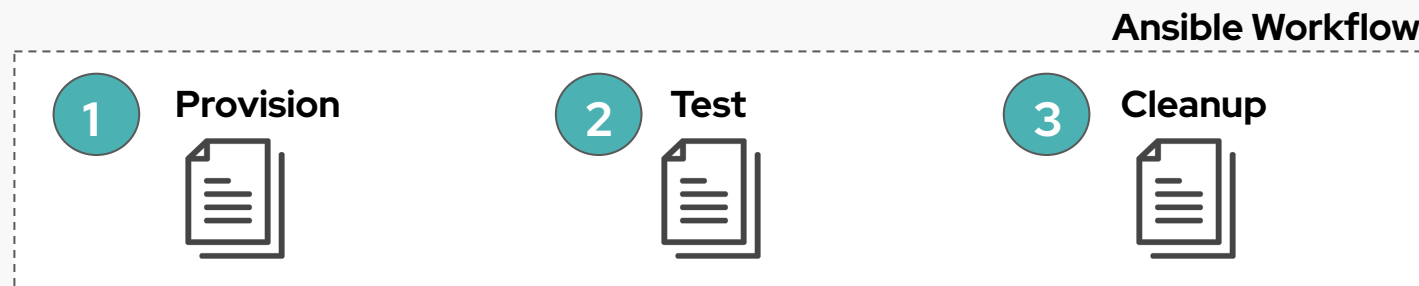
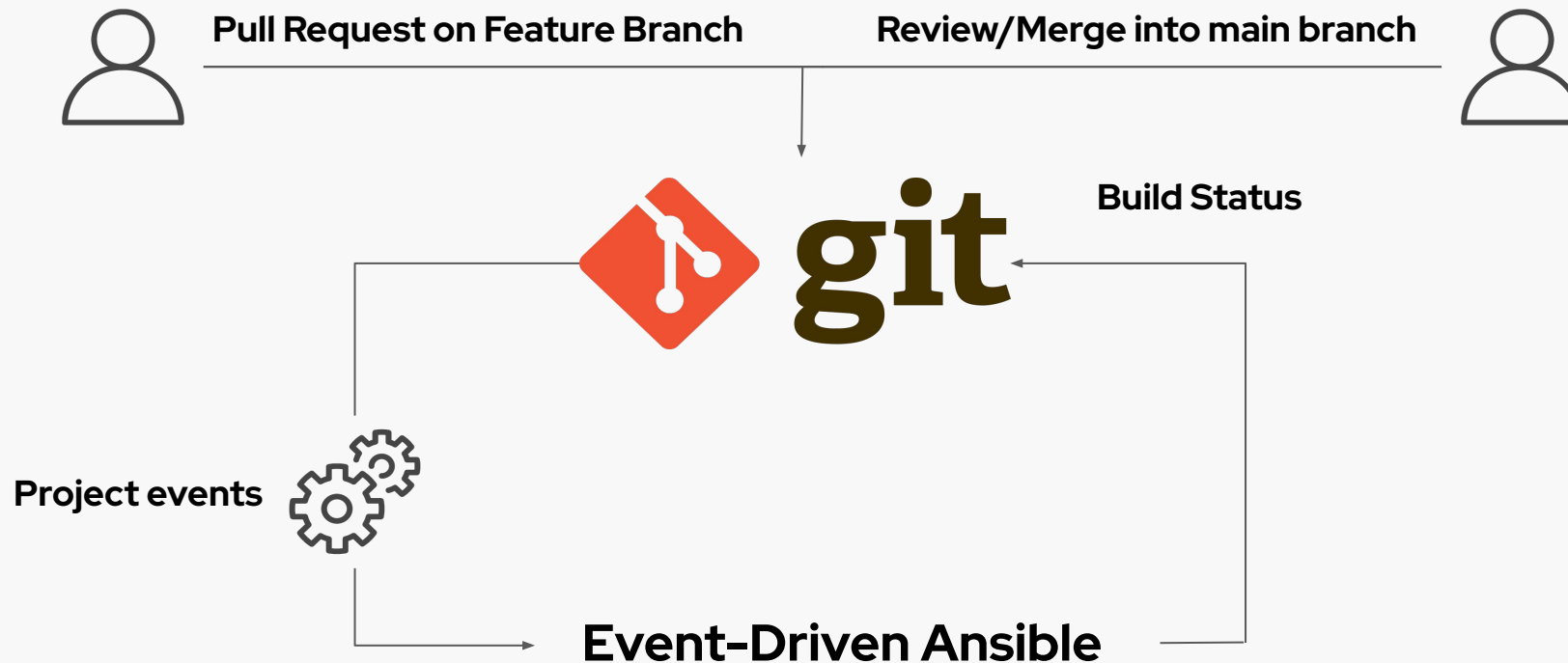
The benefits of **GitOps**

1. Increased productivity
2. Enhanced developer experience
3. Improved stability
4. Higher reliability
5. Consistency and standardization

Plan



Event Driven Ansible GitOps workflow



Lab Time

Lab 2 - Gitops with Event Driven Ansible



30 Minutes

