Testing Ansible Content With Molecule

29 Feb 2024

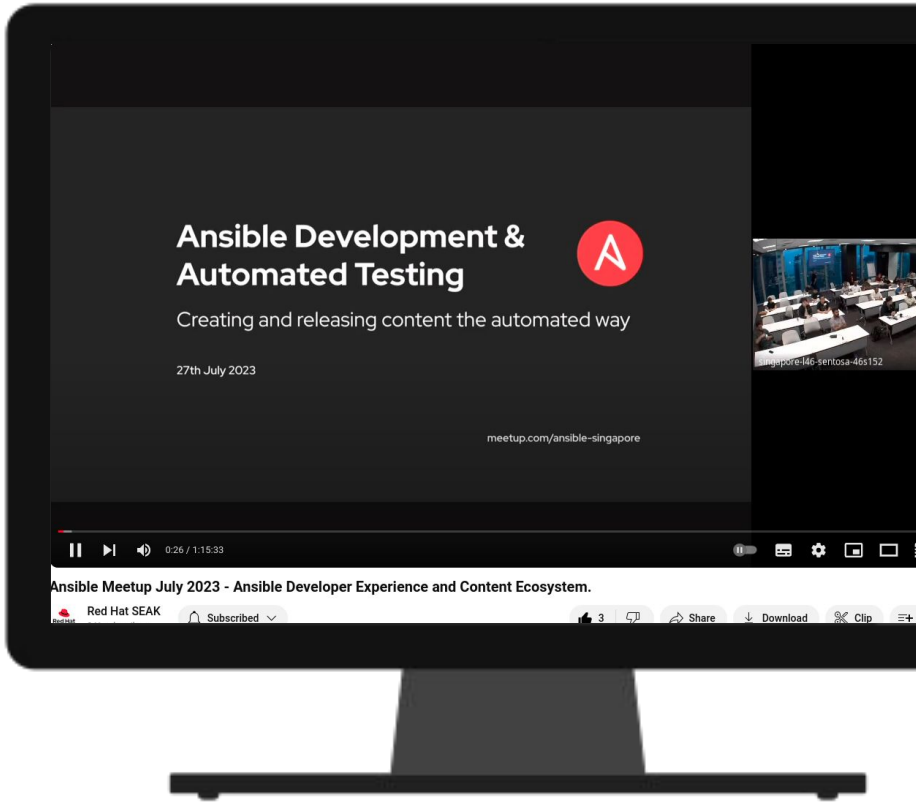
meetup.com/ansible-singapore

What we'll discuss today

- The importance of testing the automation code
- Options available to test Ansible content
- What is Molecule and how it helps?
- How to test with Ansible Molecule?
- Typical scenarios

Let’s continue….

In July 2023, We learned about…



youtube.com/watch?v=72PB_XDz9KI

Why Ansible?

- Simple, Powerful and Agentless
- Getting contribution from larger and active community
- Ansible Automation Platform - Enterprise-hardened platform

Why Should I test my Ansible content?

- Running the automation **confidently**
- **Risk mitigation** - by testing in all possible scenarios

Typical automation **developers**:

- SysAdmins, NetOps, SecOps etc - they don't see themselves as **'developers'**

Do you have a practice of testing Ansible content?

The importance of testing your Ansible content

- To ensure the code (playbook, modules, plugins) is clean to use in the environment.
- To ensure best practices are followed while developing.
- To ensure the functionality is not broken due to the code changes.
- To ensure the collaboration is happening in the right way.

Treat Ansible content like a software code

test it, scan it, clean it!

Ansible testing tools and methods

- ansible-test

```
ansible-test sanity --test pep8
ansible-test sanity --test validate-modules
```

https://docs.ansible.com/ansible/latest/dev_guide/testing_units_modules.html#introduction

Ansible testing tools and methods

- ansible-test
- ansible-playbook --syntax-check

```
$ ansible-playbook -i inventory --syntax-check webserver.yml
playbook: webserver.yml
$
```

https://docs.ansible.com/ansible/latest/dev_guide/testing_units_modules.html#introduction

Ansible testing tools and methods

- ansible-test
- ansible-playbook --syntax-check
- ansible-playbook --check

```
$ ansible-playbook foo.yml --check
```

Ansible testing tools and methods

- ansible-test
- ansible-playbook --syntax-check
- ansible-playbook --check
- ansible-lint

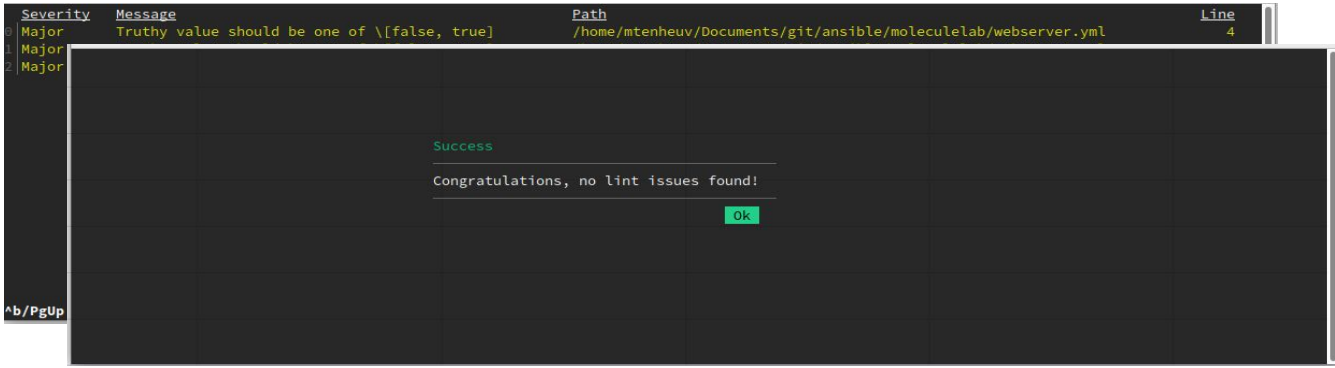
```
$ ansible-lint --offline -p webserver.yml

Passed: 0 failure(s), 0 warning(s) on 1 files. Last profile that met the
validation criteria was 'production'.
```

https://docs.ansible.com/ansible/latest/dev_guide/testing_units_modules.html#introduction

Ansible testing tools and methods

- ansible-test
- ansible-playbook --syntax-check
- ansible-playbook --check
- ansible-lint
- ansible-navigator



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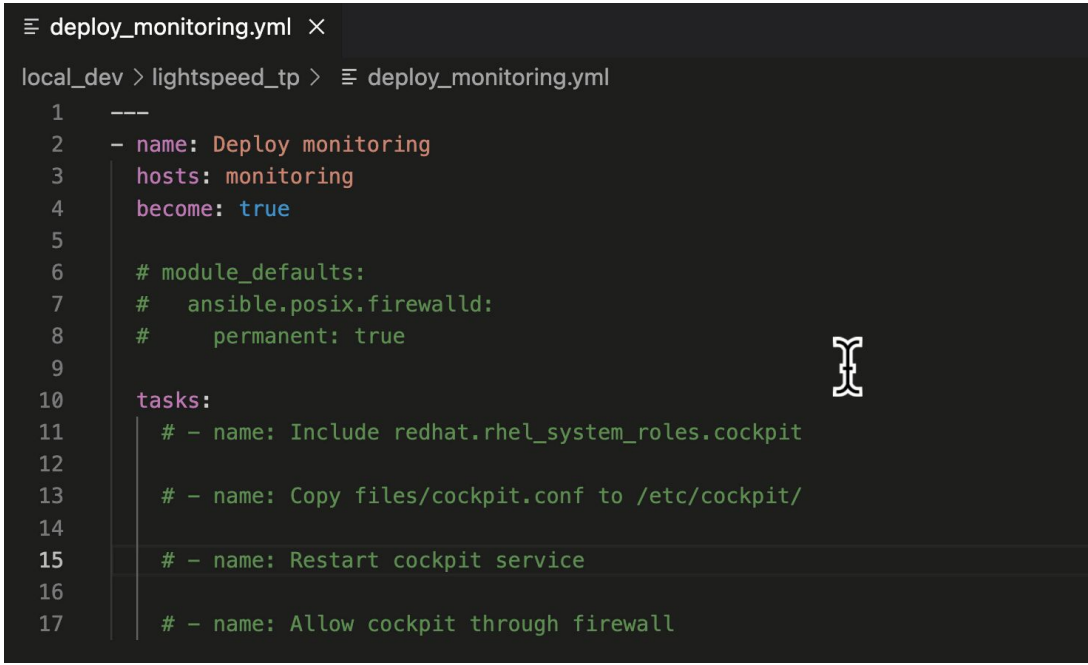
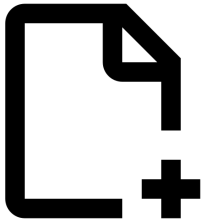
Ansible testing tools and methods

- ansible-test
- ansible-playbook --syntax-check
- ansible-playbook --check
- ansible-lint
- ansible-navigator
- Ansible Lightspeed?



Is that enough?

The pain of creating testing environment



Create

Maintain

Destroy

Testing Ansible content with Molecule

Consistent, repeatable testing for Ansible content

TDD: Test Ansible content during development

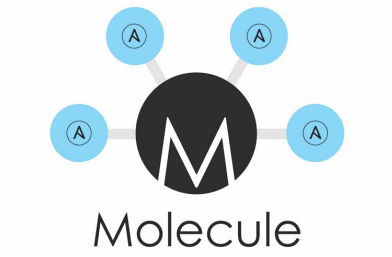
Helps provide a quick 'inner loop'

CI: Continuous integration

Run as part of a pipeline

Diverse test environments: Test across different OSs / providers

For roles that support multiple platforms



https://ansible.readthedocs.io/projects/molecule/

Testing Ansible content with Molecule

- Can be used as command line
- Can be run inside a container - Molecule is built into a image by the **Ansible Creator Execution Environment** project.

https://ansible.readthedocs.io/projects/molecule/

Testing Ansible content with Molecule

- Molecule project is designed to aid in the development and testing of Ansible roles.
- Molecule provides support for testing with multiple instances, operating systems and distributions, virtualization providers, test frameworks and testing scenarios.
- Molecule encourages an approach that results in consistently developed roles that are well-written, easily understood and maintained.

Molecule is not new, what is changed?

- **Red Hat Support**!*
- Use the Ansible syntax - provision your molecule test instances with Ansible based custom driver (instead of Python based provisioning)
- Easier for users to extend molecule for their use cases
- Better suited for **Ansible Content Collections**
- Re-homed from the role file tree to the collection file tree

* Ansible Molecule 6 is available as a developer preview within the Red Hat Ansible Automation Platform

https://www.redhat.com/en/technologies/management/ansible/development-tools

Molecule based development and testing

- Using ansible-galaxy command in the backend
- Molecule directory will be injected inside the role

```
$ pip install molecule
$ pip install molecule-podman

$  molecule init role iamgini.web --driver-name=podman
INFO     Initializing new role web...
Using /home/gmadappa/.ansible.cfg as config file
- Role web was created successfully
localhost | CHANGED => {"backup": "","changed": true,"msg": "line added"}
localhost | CHANGED => {"backup": "","changed": true,"msg": "line replaced"}
INFO     Initialized role in
/home/gmadappa/ansible/ansible-real-life/ansible-molecule-demo/web
successfully.
```

```
$  tree web/
web/
├── defaults
│   └── main.yml
├── files
├── handlers
│   └── main.yml
├── meta
│   └── main.yml
├── molecule
│   └── default
│       ├── converge.yml
│       ├── molecule.yml
│       └── verify.yml
├── README.md
├── tasks
│   └── main.yml
├── templates
├── tests
│   ├── inventory
│   └── test.yml
└── vars
    └── main.yml

11 directories, 11 files
```

https://ansible.readthedocs.io/projects/molecule/, https://www.iamgini.com/molecule

Molecule key concepts

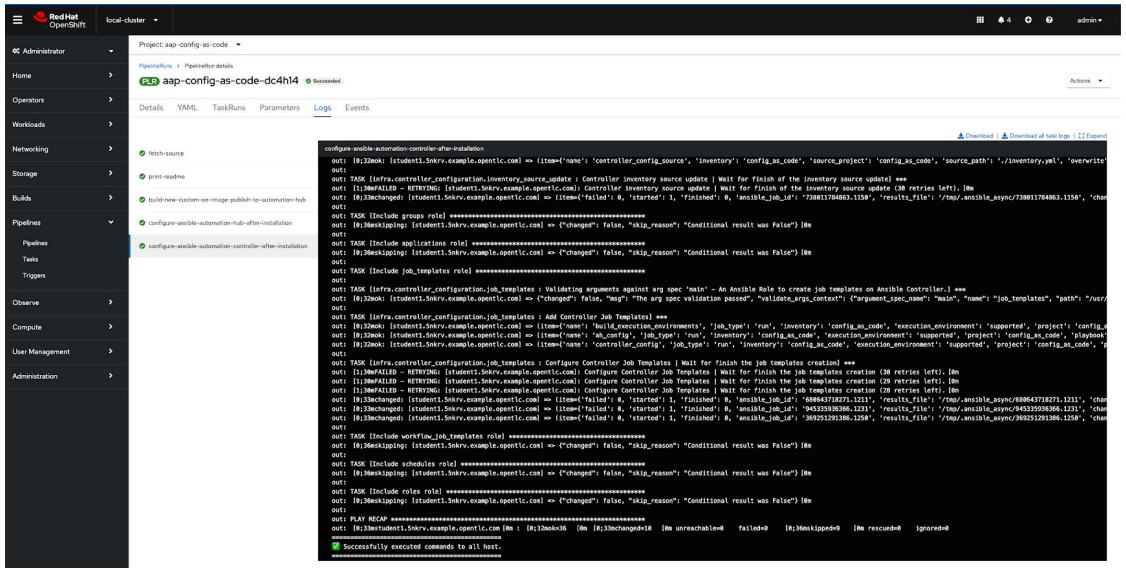
- Use a molecule **scenario** to define a customizable and modular sequence of test steps
- Use **molecule init scenario** to initialize the scenario while developing your collection
- Define an **ephemeral test environment** based on a selected **driver** (on **cloud**, **podman**, **OpenShift** …) or custom driver
- **Create/cleanup/destroy/re-create** the ephemeral test environment
- Test **roles** or **collection playbook**s by developing your own **functional** tests
- Include playbook **idempotence** test and **syntax check**

Molecule typical run

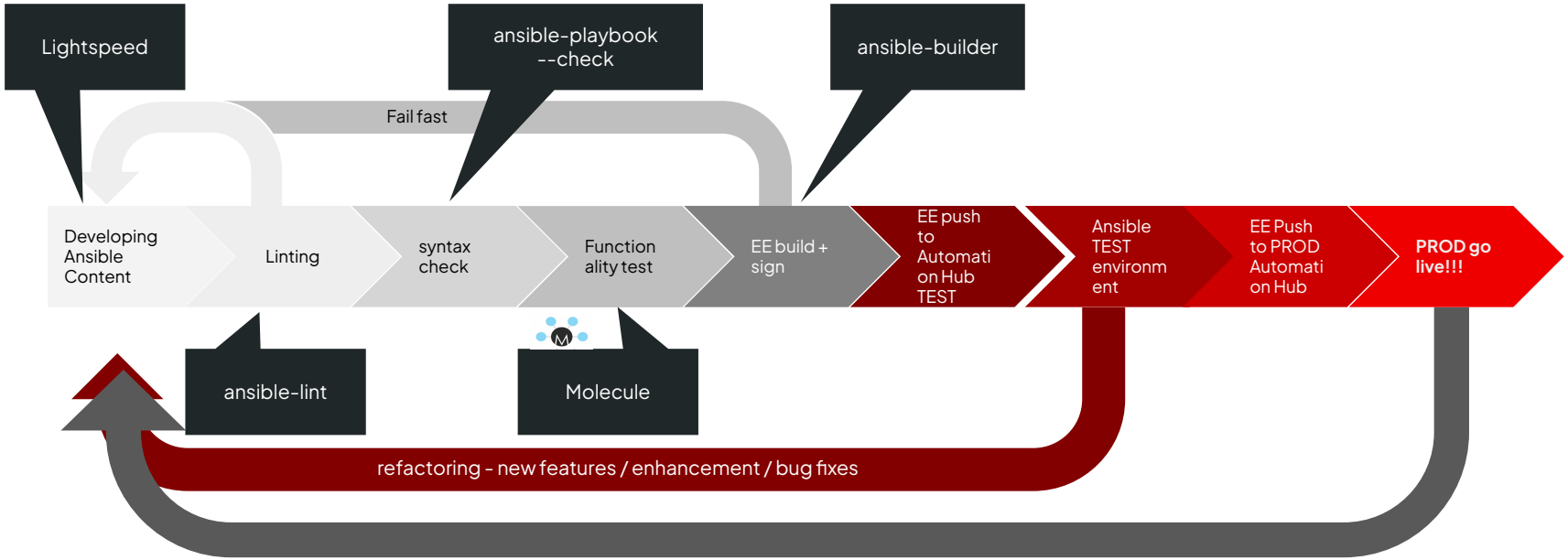
- This is a typical sequence that can be expanded or modified based on the needs
- Each step can be executed individually (*molecule <<step name>>*)
- Steps are defined as individual files in yml format (“as a code”)
- A main molecule.yml configuration file, defines sequence of steps, driver to be used …

Ansible testing in Pipeline

- Testing and sanity checks in automated pipelines
- Standard CI tools
  - OpenShift Pipelines
  - GitHub Actions
  - Jenkins
  - GitLab CI/CD
  - Tekton
- Customizations



Automating the Automation Testing



Let us see them in Action

Demo

Photo by Christina Morillo from Pexels

Questions & Feedback

Photo by Andrea Piacquadio from Pexels

References

Devspaces demo with Molecule content

https://github.com/iamgini/ansible-molecule-demo

Molecule documentation that includes the podman scenario

https://ansible.readthedocs.io/projects/molecule/examples/podman

Ansible Collections Overview

https://github.com/ansible-collections/overview

Migrating Roles to Roles in Collections on Galaxy

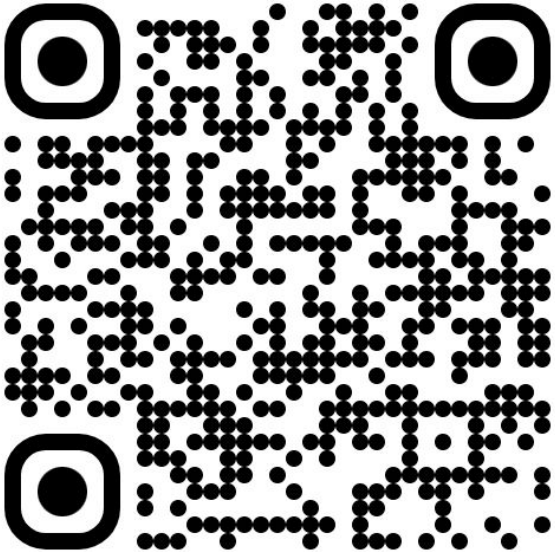
https://docs.ansible.com/ansible/latest/dev_guide/migrating_roles.html

Sample repo for deployment YAML

https://github.com/iamgini/ansible-real-life/tree/main/ansible-molecule-demo

Join us – Ansible Singapore

Ansible Singapore
(Telegram Group)



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