Testing Infrastructure with Molecule

Automated Testing of Ansible Infrastructure as Code

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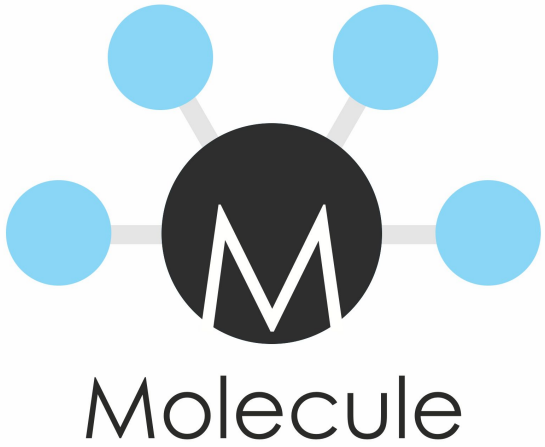

Molecule provides support for testing with multiple instances, operating systems and distributions, virtualization providers, test frameworks and testing scenarios.

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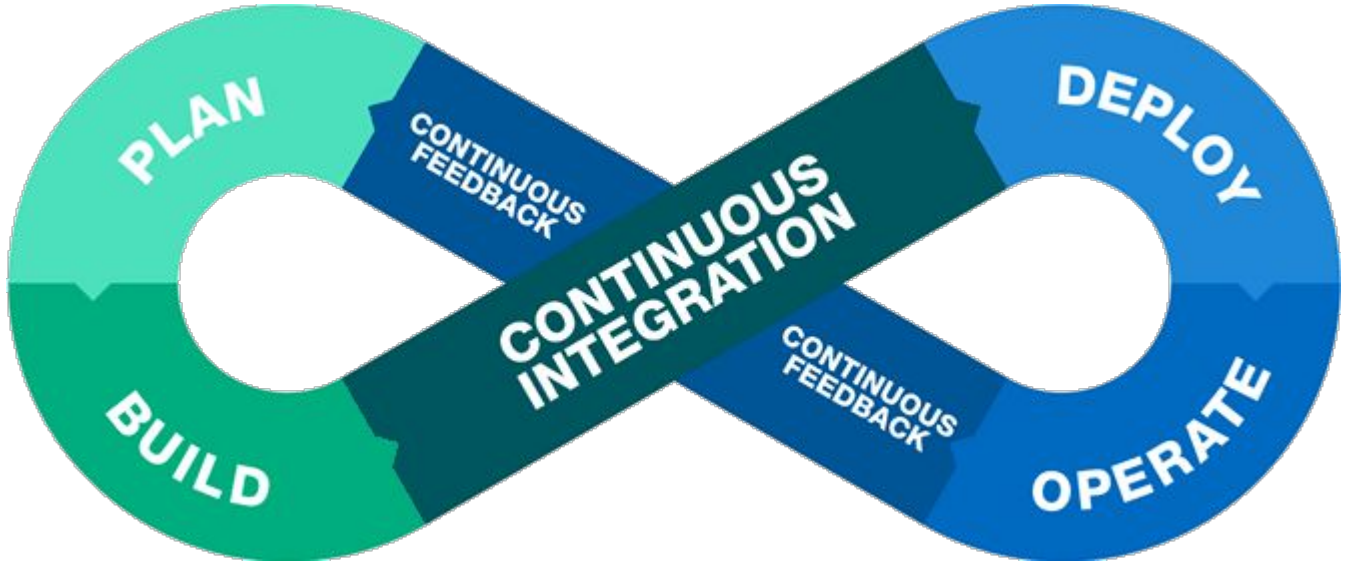
The DevOps Story:

Development, operations... and everything in between.



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What you need to know

- Ansible (good)
- Python (great)

- Docker (amazing) AND/OR
- Vagrant (good) AND/OR
- Your own virtual infrastructure (this works too!)

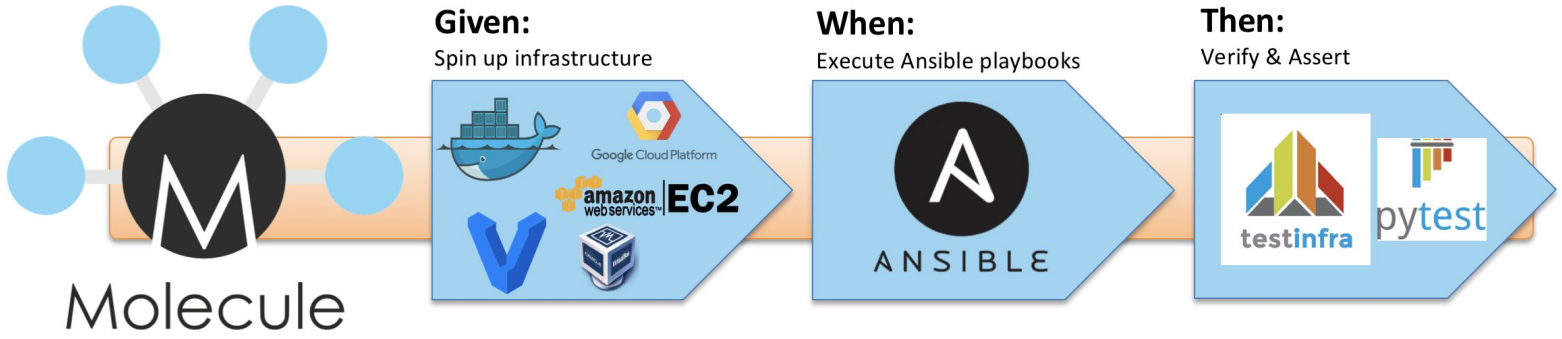
Under the Hood

--> **Test matrix**

└── default

- ├── **lint**
- ├── cleanup
- ├── destroy
- ├── dependency
- ├── syntax
- ├── **create**
- ├── prepare
- ├── **converge**
- ├── idempotence
- ├── side_effect
- ├── **verify**
- ├── cleanup
- └── **destroy**

- **Lint**: Check your code for best practices, conventions (yes/no vs. true/false), don't use command/shell modules, please be idempotent, etc. (**ansible-lint**)
- **Create**: Deploys container/vm to target infra
- **Converge**: Execute the role against the resource
- **Verify**: Validate and assert states (**TestInfra**)
- **Destroy**: Clean up leftover stuff after testing



Source:

IJonas Hecht https://blog.codecentric.de/en/2018/12/test-driven-infrastructure-ansible-molecule/

Molecule Usage https://molecule.readthedocs.io/en/latest/usage.html

Configuring Your Testing Environment

- **Configuration is Central.**
  - Utilizing molecule.yml we can define a multitude of items.
  - For instance, configuring two platforms to test against for a single playbook.
  - Other options include drivers, provisioners and verifiers.
- **Multiple Machines Configured At Once**
  - By configuring platforms we're more easily able to test against multiple platforms at once.
- **Test Runners**
  - Verifier has two options to test with including testinfra and ansible.
    - Testinfra tests are written utilizing Python
    - Ansible tests are written using standard YAML.

molecule > default > molecule.yml > ...

```yaml
---
dependency:
  name: galaxy
driver:
  name: podman
platforms:
  - name: centos7
    image: centos:7
    pre_build_image: true
    privileged: true
  - name: centos8
    image: centos:latest
    privileged: true
provisioner:
  name: ansible
verifier:
  name: testinfra
```

Assertions

- Provide the backbone to the tests, ensuring that functionally the playbooks do what they're supposed to do.
- Many expressive ways to write example tests.
  - For instance, the **host.package** class provides ***is_installed*** to test whether the package is present or not.
- Referencing documentation provides best source for constructing your tests.
  - https://testinfra.readthedocs.io/en/latest/

```
@pytest.mark.parametrize('pkg', [
    'httpd',
    'firewalld'
])
def test_pkg(host, pkg):
    package = host.package(pkg)
    assert package.is_installed
```

Quick Demo Time / Q&A

- Scenario #1
  - Playbook
    - A playbook needs to install packages httpd, firewalld.
    - A configuration file needs to be created in /tmp called demo.txt.
  - Molecule
    - We need to validate packages and files are created.
- Scenario #2
  - Playbook
    - We have an existing role that has been created.
      - Role installs nginx, wget.
  - Molecule
    - We need to apply molecule to this role to facilitate testing.

Thanks!

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- TestInfra Documentation
  - Testinfra test your infrastructure — testinfra 5.3.2.dev0+gcd485d4.d20200903 documentation
- Molecule Tricks
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