

# Ansible 101 - Getting Started on your Ansible Journey

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*All views and opinions in this talk are my own and do not reflect those of my employer.*

# About Me

- Service Delivery Engineer at Dell Technologies
- RHCSA / RHCE
- Homelab and self-hosting ❤️
- PC and Board games 🎲
- Let's talk about:
  - Ansible (*obviously*) 😊
  - Linux
  - Infrastructure as Code
  - Proxmox
  - K8s
  - ...



# What is Ansible?

- Open source configuration management tool written in Python.
- Agentless.
- Human readable (YAML).
- Use-cases:
  - Application deployment.
  - Prevent configuration drift.
  - (De)provisioning.
  - Audit server configuration and compliance.
- Ansible Core vs Ansible PyPi packages.

ANSIBLE

# Key Terminology

# Control Node & Managed Nodes

## Control Node:

- A control node is the device where Ansible is installed and ran from.
- Could be your laptop, an on-premise or cloud server.
- Has the Ansible CLI tools installed.
- Execution Environments.

## Managed Nodes:

- Managed nodes are the target devices that Ansible will manage.
- Managed nodes are defined in an inventory.
- *Generally*, Managed nodes require Python and openssh-server.

# Inventory

- Defines the Managed Nodes to run against.
- INI or YAML formatted.
- Can be created dynamically via a script or inventory plugin.
- Managed Nodes can be grouped into host groups.
- Managed Nodes and host groups can have variables assigned.
- Command: ***ansible-inventory***

```
[all]

server1.example.com

server2.example.com
```

```
[all:vars]
    ~~~~~
ansible_user = ubuntu
```

```
---

all:
  vars:
    ~~~~~
    ansible_user: ubuntu
  hosts:
    server1.example.com:
    server2.example.com:
```

# Playbooks

- Define one or more plays.
- Plays contain tasks that Ansible will run against Managed Nodes in the inventory.
- Tasks use modules to perform actions.
- Command: ***ansible-playbook***

```
---  
- name: Playbook | Install Nginx  
  hosts: all  
  tasks:  
    - name: Install Nginx  
      ansible.builtin.package:  
        name: nginx  
        state: present
```

# Modules & Plugins

## Modules:

- The building blocks for doing anything in Ansible.
- Each task in a playbook uses a module.
- Modules *should* be declared using the Fully Qualified Collection Name (FQCN).
- Examples:
  - `ansible.builtin.file`
  - `ansible.builtin.template`
  - `ansible.builtin.package`
- Idempotency.
- Command: ***ansible-doc***

## Plugins:

- Extend Ansible's core functionality.
- Popular plugin types:
  - Inventory
  - Callback
  - Lookup
- Command: **`ansible-doc -t filter -l`**



# Roles

- Contain tasks, files, variables, templates and handlers for running repeatable actions.
- Shared and re-used across playbooks.
- Publish on [galaxy.ansible.com](https://galaxy.ansible.com).
- Commands:
  - ***ansible-galaxy role list***
  - ***ansible-galaxy role install <role>***

```
.└─ run
    ├── defaults
    │   └─ main.yml
    ├── files
    ├── handlers
    │   └─ main.yml
    ├── meta
    │   ├── argument_specs.yml
    │   └─ main.yml
    ├── README.md
    ├── tasks
    │   └─ main.yml
    ├── templates
    ├── tests
    │   └─ inventory
    └─ vars
        └─ main.yml
```

# Collections

- Contain playbooks, roles, modules and plugins.
- Popular collections:
  - community.general
  - Ansible.windows
- Publish on [galaxy.ansible.com](https://galaxy.ansible.com).
- Commands:
  - ***ansible-galaxy collection list***
  - ***ansible-galaxy collection install <collection>***
  - ***ansible-creator init collection dbrennand.playground***

```
.
├── CHANGELOG.rst
├── changelogs
│   └── config.yaml
├── docs
│   └── docsite
├── extensions
│   ├── eda
│   └── molecule
├── galaxy.yml
├── LICENSE
├── meta
│   └── runtime.yml
├── plugins
│   ├── action
│   ├── cache
│   ├── filter
│   ├── inventory
│   ├── lookup
│   ├── module_utils
│   ├── modules
│   ├── plugin_utils
│   ├── sub_plugins
│   └── test
├── README.md
├── requirements.txt
├── roles
│   └── run
└── test-requirements.txt
```

# Ad-Hoc Commands

- Useful for quickly running one of tasks on Managed Nodes.
- Command: ***ansible <hostgroup> -i <inventory> -m <module> -a <args> -u <user> [args]***

## Examples:

- `ansible all -i inventory.yml -m command -a 'whoami'`
- `ansible all -i inventory.yml -m command -a 'df -hT'`

# Ansible Configuration File

- Configure Ansible's behaviour.
- INI formatted.
- Can be located at:  
/etc/ansible/ansible.cfg,  
~/.ansible.cfg or ./ansible.cfg
- Example uses:
  - *inventory*
  - *become\_method*
  - *become\_user*
  - *roles\_path*

```
[defaults]
inventory = inventory/inventory.yml
roles_path = ./roles:/home/daniel/.ansible/roles

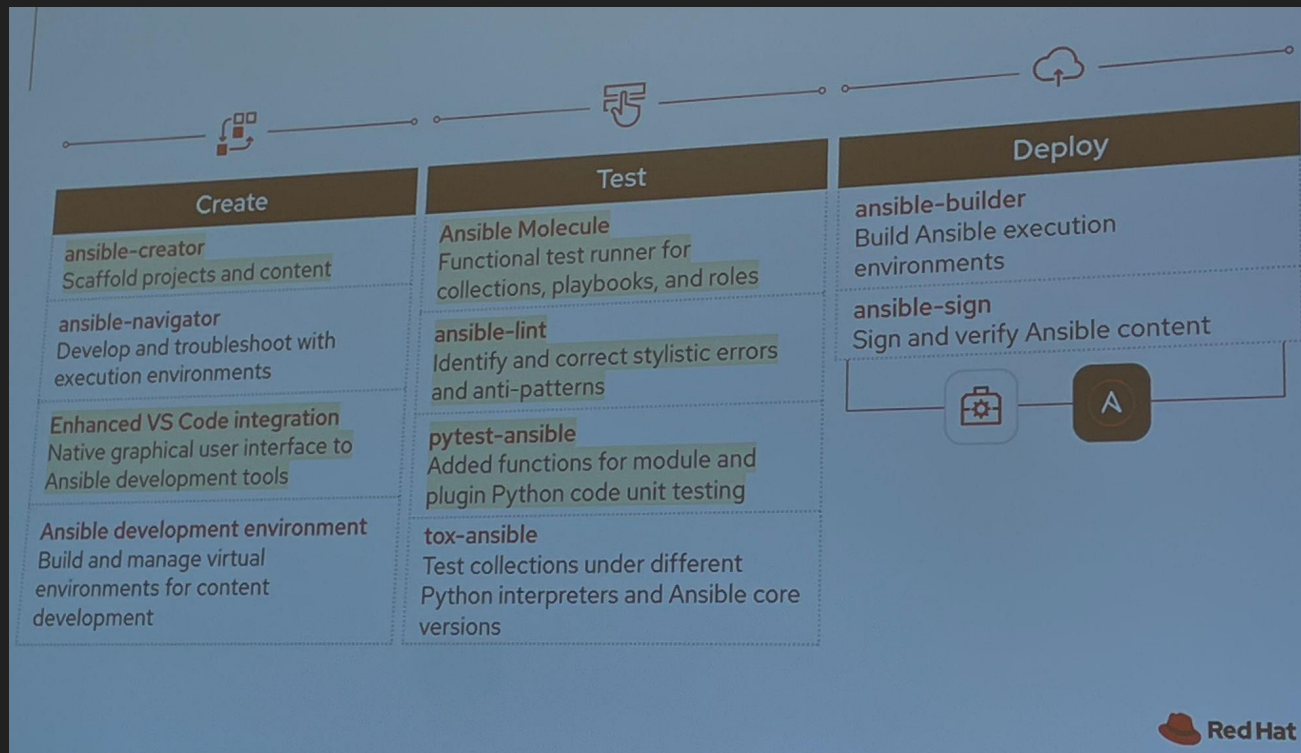
[privilege_escalation]
become_method = sudo
become_user = daniel
```

# Ansible Vault

- Used for encrypting secrets.
- Encrypt strings and files.
- Commands:
  - **ansible-vault encrypt\_string -n <name> '<secret>'**
  - **ansible-vault encrypt vars/my\_vars.yml**

```
super_secret_password: !vault |
    $ANSIBLE_VAULT;1.1;AES256
    32323561383738626235303836323964623561383737376330383736383832373738663764316532
    6266326361343061633862393833313134333333343239350a636134663162373431376333666565
    38656333656334636533663065643639653638393131316334663835356333396537313365343533
    3361346434363365310a336330353464313737323462346465366536356130353231383466656566
    3633
```

# Ansible Development Tools (ADT)



PyPi package. Installs packages used for developing Ansible content.

Demo

# Learning Resources

- [Ansible Documentation.](#)
- [Ansible Forum.](#)
- [Awesome Ansible.](#)
- [The Tao of Ansible.](#)
- [Jeff Geerling's Ansible 101 YouTube series.](#)
- [Jeff Geerling's Ansible for DevOps book.](#)
- [Ansible Visual Studio Code extension.](#)
- [YAML Visual Studio Code extension.](#)
- [Ansible Development Tools.](#)



# Questions

Demo resources are available on  
GitHub:



# Socials

- <https://dbren.uk>
- <https://www.linkedin.com/in/dbrenuk>
- <https://twitter.com/dbrenuk>
- [contact@danielbrennand.com](mailto:contact@danielbrennand.com)

```
PLAY [Playbook | Ansible 101 | Create group and user] *****

TASK [Gathering Facts] *****
ok: [ubuntu1@orb]
ok: [ubuntu2@orb]

TASK [Ensure group exists] *****
changed: [ubuntu1@orb]
changed: [ubuntu2@orb]

TASK [Ensure user exists] *****
changed: [ubuntu2@orb]
changed: [ubuntu1@orb]

PLAY RECAP *****
ubuntu1@orb      : ok=3    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
ubuntu2@orb      : ok=3    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

```
demos/ansible/meetup-june-5 on ʘ meetup-may is 📦 v0.1.0 via 🐍 v3.13.1 (meetup-june-5)
> ansible all -i inventory/inventory.yml -b -m command -a 'getent passwd bob'
ubuntu1@orb | CHANGED | rc=0 >>
bob:x:1002:1002:Created using Ansible:/home/bob:/bin/bash
ubuntu2@orb | CHANGED | rc=0 >>
bob:x:1002:1002:Created using Ansible:/home/bob:/bin/bash

demos/ansible/meetup-june-5 on ʘ meetup-may is 📦 v0.1.0 via 🐍 v3.13.1 (meetup-june-5)
> ansible all -i inventory/inventory.yml -b -m command -a 'getent group builder'
ubuntu1@orb | CHANGED | rc=0 >>
builder:x:1002:
ubuntu2@orb | CHANGED | rc=0 >>
builder:x:1002:
```



TASK [geerlingguy.apache : Check whether certificates defined in vhosts exist.] \*\*\*\*\*  
skipping: [ubuntu1@orb]

TASK [geerlingguy.apache : Add apache vhosts configuration.] \*\*\*\*\*  
changed: [ubuntu1@orb]

TASK [geerlingguy.apache : Add vhost symlink in sites-enabled.] \*\*\*\*\*  
changed: [ubuntu1@orb]

TASK [geerlingguy.apache : Remove default vhost in sites-enabled.] \*\*\*\*\*  
skipping: [ubuntu1@orb]

TASK [geerlingguy.apache : Ensure Apache has selected state and enabled on boot.] \*\*\*\*\*  
ok: [ubuntu1@orb]

TASK [Place index.html in /var/www/html/] \*\*\*\*\*  
changed: [ubuntu1@orb]

RUNNING HANDLER [geerlingguy.apache : restart apache] \*\*\*\*\*  
changed: [ubuntu1@orb]

TASK [Visit apache] \*\*\*\*\*  
ok: [ubuntu1@orb] => {  
 "msg": "Visit http://ubuntu1.orb.local"  
}

PLAY RECAP \*\*\*\*\*  
ubuntu1@orb : ok=18 changed=6 unreachable=0 failed=0 skipped=5 rescued=0 ignored=0



Not Secure

ubuntu1.orb.local

# Hi Ansible Meetup from Apache on ubuntu1!

```
demos/ansible/meetup-june-5 on  meetup-may is  v0.1.0 via  v3.13.1 (meetup-june-5) took 10s
```

```
> ansible-playbook vault-playbook.yml --ask-vault-pass
```

```
Vault password:
```

```
PLAY [Playbook | Ansible 101 | Ansible Vault Example] *****
```

```
TASK [Gathering Facts] *****
```

```
ok: [localhost]
```

```
TASK [Show super secret password] *****
```

```
ok: [localhost] => {
```

```
  "msg": "Here is my super secret password AnsibleRocks!\n"
```

```
}
```

```
PLAY RECAP *****
```

```
localhost                : ok=2    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```