

# Introduction to Ansible

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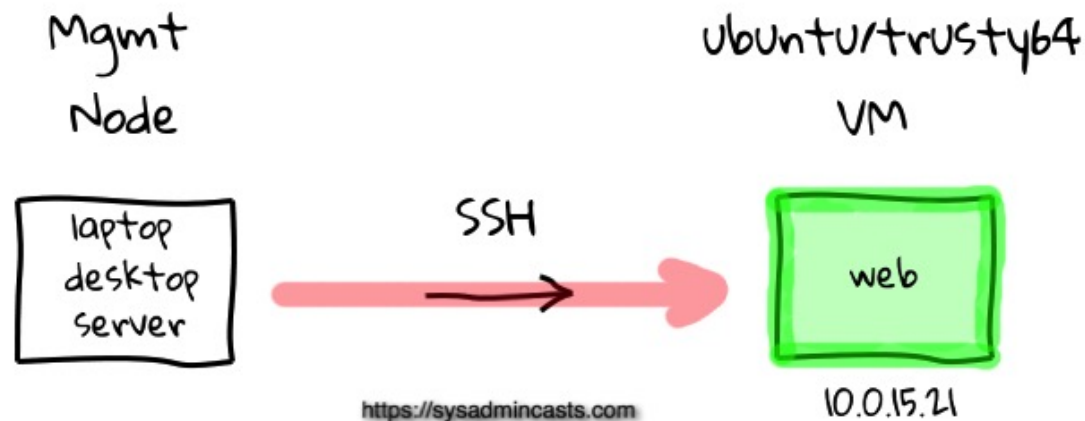
# Brief history

- A configuration management tool, deployment tool, and ad-hoc task execution tool all in one.
- Initially developed by Michael DeHaan.
- Inspired by Func (previously used by tumblr)
- Userbase includes NASA, Apple, Juniper et al.

**Why Ansible? Or any other  
tool for that matter?**

# Before Configuration management

- manual configuration.
- results in Flaky servers.

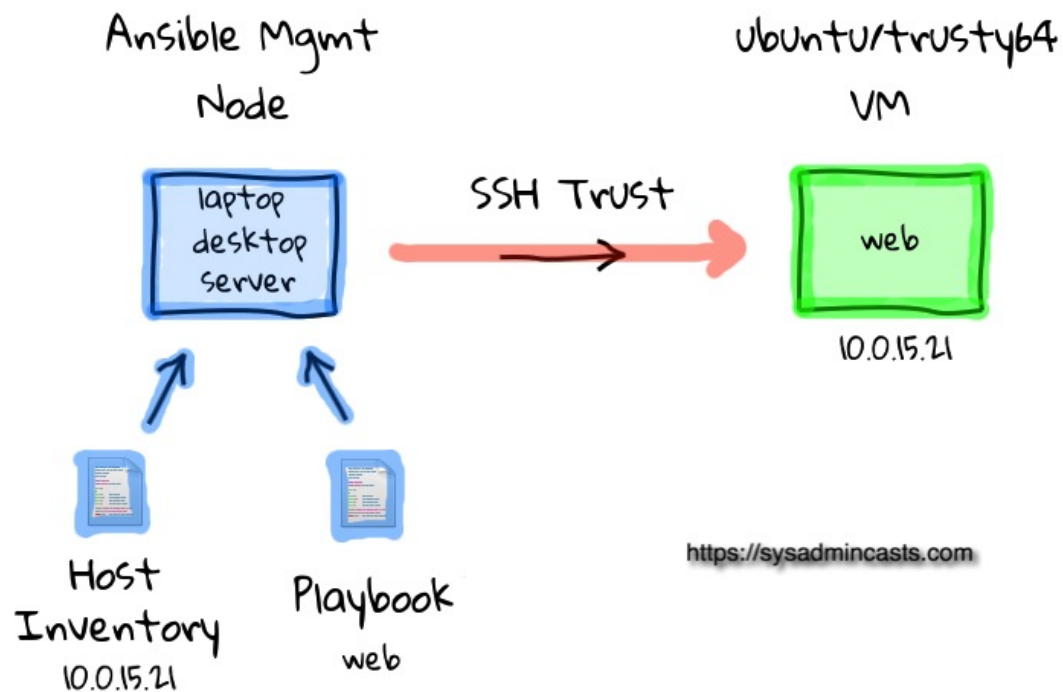


# Enter Ansible

- Follows a push approach.
- Agentless.
- Uses OpenSSH for transport.
- Easy to understand `yaml` styled configuration.
- Requires `python` installed on the managed node
- Runs tasks in a sequential manner.
- Immutable infrastructure.
- ***Idempotency!***

# Using Ansible

Brings server to a known/deterministic state.



# Inventory

- sample `/etc/ansible/hosts` file

```
[testdroplets]
ubu ansible_ssh_host=139.59.3.235
icinga ansible_ssh_host=139.59.24.40

[testansible]
host0.example.org ansible_host=192.168.33.10
host1.example.org ansible_host=192.168.33.11
host2.example.org ansible_host=192.168.33.12

[testansible:vars]
ansible_user=tasdik
```

- From `v2.0`, Ansible has deprecated the `ssh` above.

# Inventory

- holds a *list* of Ansible-managed servers
- by default, hosts picked up from `/etc/ansible/hosts`
- can also be specified by giving `-i <path>` option on the command line.

```
[testdroplets]  
ubuntu1404
```

- `[testdroplets]` would be the groupname inside which `ubuntu1404` is a host.



- A host can co-exist in two groups at the same time.

```
[webservers]
foo.example.com

[dbservers]
foo.example.com
```

- Ansible will look for additional variables definitions in group and host variable files which will be searched in directories `group_vars` and `host_vars`, below the directory where the main inventory file is located.
- `group_vars/linux`  
`host_vars/host0.example.org`

# Ad-hoc commands

- would be something that you might type in to do something really quick, but don't want to save for later.
- Ansible has a great deal of modules

## General syntax

```
$ ansible <HOST_GROUP> -m <MODULE_NAME> \  
-a "OPT_ARGS" -u <USERNAME>
```

- basically used for things which you don't want to write a playbook for!

## Show us one

```
$ ansible testdroplets -l ubu \  
-u root \  
-m shell -a "free m"
```

- using `-l ubu` to limit the command to only the server with hostname `ubu` inside the `testdroplets` group (or in ansible terms, a "pattern")
- specifying `root` as the remote user to ssh into on the remote machine with `-u`.
- `-m shell` means use module "shell".
- as shell module takes additional params i.e the command to be run, passing it through `-a` switch.

# **Ansible playbooks**

## Playbook's you said?

- just a series of ansible commands (tasks), like the ones we used with the ansible CLI tool. These tasks are targeted at a specific set of hosts/groups.
- expressed in **YAML** format
- Each playbook is composed of one or more 'plays' in a list.
- The goal of a play is to map a group of hosts to some well defined roles, represented by things ansible calls tasks.
- At a basic level, a task is nothing more than a call to an ansible module

---

```
- hosts: nginx
  remote_user: root
  vars:
    message: "Welcome to the Aril Meetup!"
  tasks:
    - name: nginx | Install
      apt: pkg=nginx state=installed update_cache=true
    - name: nginx | remove default index.html
      file:
        path: /var/www/html/index.nginx-debian.html
        state: absent
    - name: nginx | copy template site
      template:
        src: files/index.html.j2
        dest: /var/www/html/index.nginx-debian.html
      notify:
        - restart nginx
  handlers:
    - name: restart nginx
      service: name=nginx state=restarted
```

- You can have multiple **plays** in your **playbook**.

```
--  
- hosts: web  
  tasks:  
    name: foo  
    task: ...  
  
- hosts: db  
  tasks:  
    name: foo  
    task: ...
```

- **hosts** : a list of one or more groups or host patterns, separated by colons
- **remote\_user** : just the name of the user account

- tasks items can be broken down over multiple lines to improve the structure

```
...  
- tasks:  
    name: foo  
    apt: pkg=nginx state=installed  
...
```

- can be written using `YAML`'s dict to pass `key=value`

```
...  
- tasks:  
    name: foo  
    apt:  
        pkg:nginx  
        state:installed  
...
```



# Tasks

Are executed in order, one at a time, against all machines matched by the host pattern, before moving on to the next task.

**But wouldn't this become messy  
for complex tasks?**

**YES!**

**How?**

# **Ansible Roles**

# What do they do?

- as we add more & more functionality to our playbook, it becomes unreadable at some point.
- allow you to create very minimal playbooks that then look to a directory structure to determine the actual configuration steps they need to perform.
- enforces modularity so that we can reuse commonly used tasks(roles) again.

# Organising your roles

```
roles/  
  common/  
    files/  
    templates/  
    tasks/  
    handlers/  
    vars/  
    defaults/  
    meta/
```

In a playbook, it would look like this:

```
---  
- hosts: webservers  
  roles:  
    - common
```

- **files** : contains regular files/scripts that need to be transferred to the hosts you are configuring for this role.
- **handlers** : All handlers that were in your playbook previously can now be added here.
- **meta** : can contain files that establish role dependencies. You can list roles that must be applied before the current role can work correctly.
- **templates** : place all files that use variables to substitute information during creation here.
- **tasks** : contains all of the tasks in a playbook.
- **vars** : Variables for the roles can be specified in this directory and used in your configuration files.

# what goes inside these?

Within all of the directories but the `files` and `templates`, if a file called `main.yml` exists, its contents will be automatically added to the playbook that calls the role

```
roles
├── basic_server_hardening
│   ├── defaults
│   │   └── main.yml
│   ├── handlers
│   │   └── main.yml
│   └── tasks
│       └── main.yml
├── create_new_user
│   ├── defaults
│   │   └── main.yml
│   └── tasks
│       └── main.yml
└── vimserver
    ├── defaults
    │   └── main.yml
    ├── files
    │   └── vimrc_server
    └── tasks
        └── main.yml
```



“ If Ansible modules are the tools in your workshop, playbooks are your instruction manuals, and your inventory of hosts are your raw material.

-- <http://docs.ansible.com/ansible/playbooks.html>

”

# References

- [http://docs.ansible.com/ansible/intro\\_adhoc.html](http://docs.ansible.com/ansible/intro_adhoc.html)
- [http://docs.ansible.com/ansible/intro\\_inventory.html](http://docs.ansible.com/ansible/intro_inventory.html)
- [http://docs.ansible.com/ansible/intro\\_patterns.html](http://docs.ansible.com/ansible/intro_patterns.html)
- <http://docs.ansible.com/ansible/playbooks.html>
- [http://docs.ansible.com/ansible/playbooks\\_roles.html](http://docs.ansible.com/ansible/playbooks_roles.html)
- <http://docs.ansible.com/ansible/modules.html>
- <http://docs.ansible.com/ansible/YAMLSyntax.html>

# Questions?

Would be happy to answer them!

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Materials for the talk @  
<https://github.com/prodicus/talks>