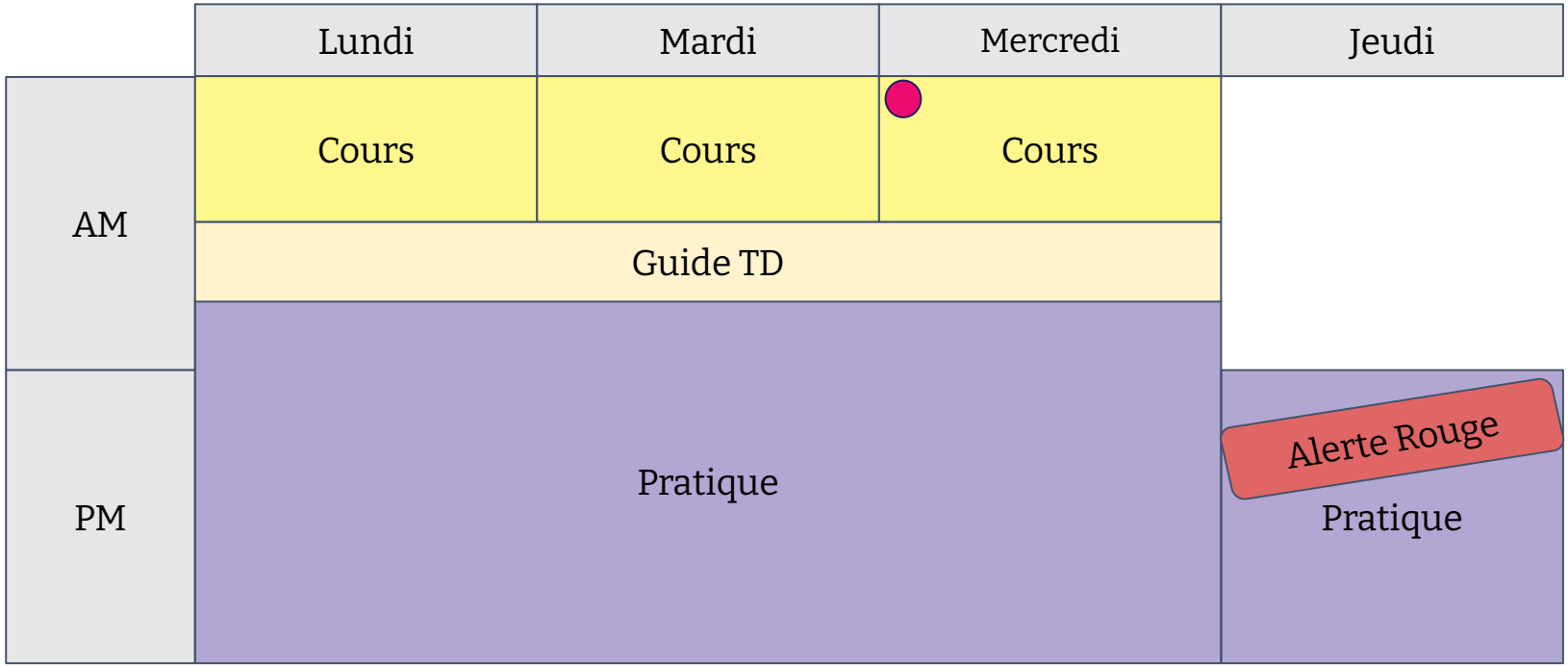
takima
mastering technology

Ansible

CPE -2023

Planning



Lundi 20/02 15h45-17h45

Examen écrit

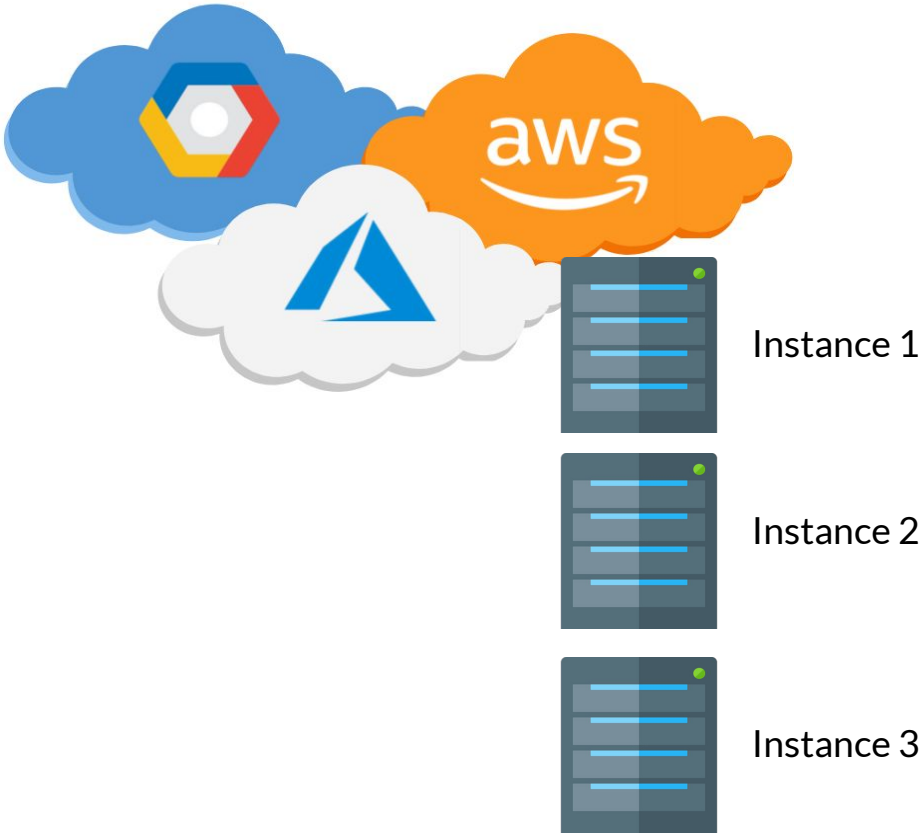
Ansible

Infrastructure As Code

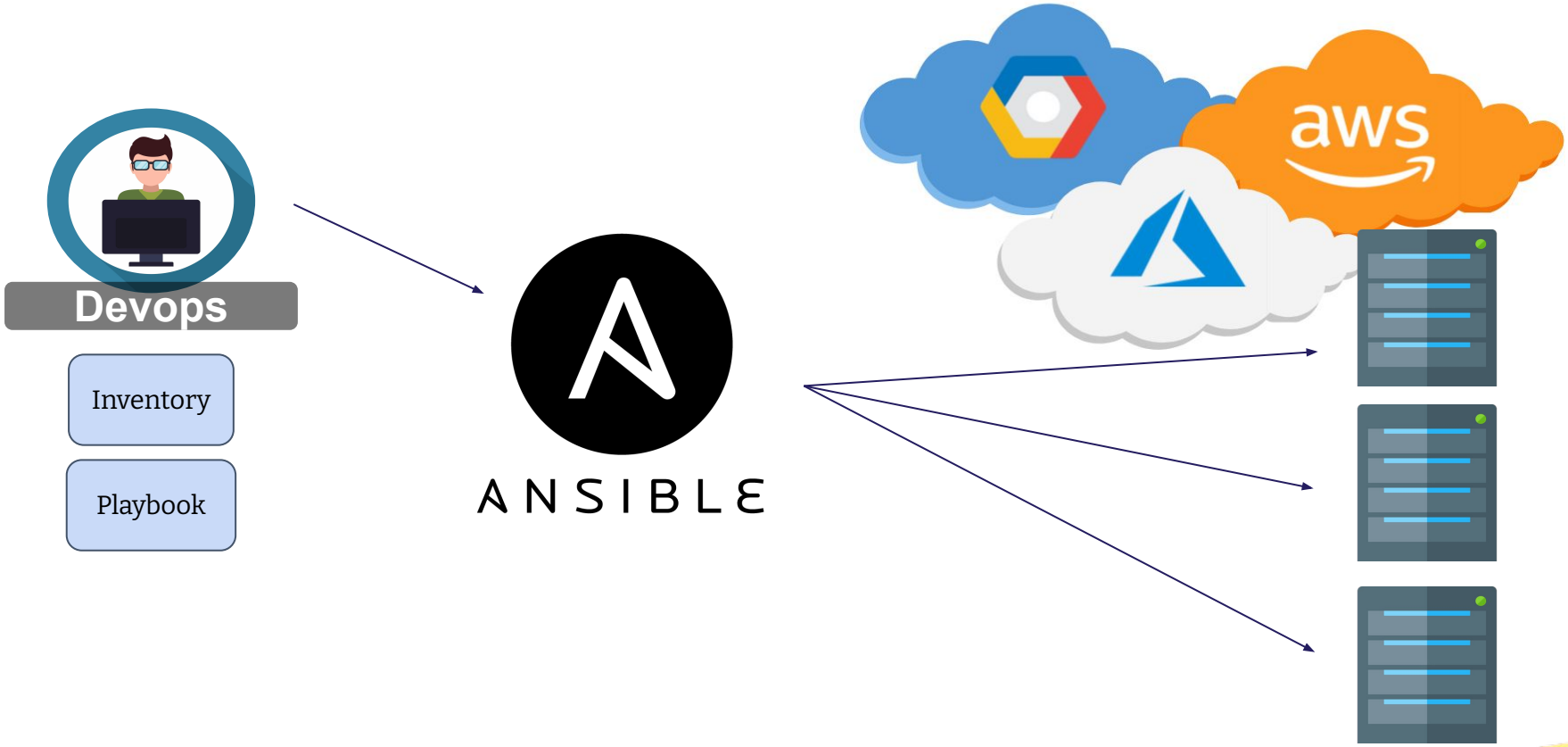
Manage and provision machines through readable and computable definition files

Ansible

Why ?



How ?



Ansible

What ?

An Open Source IT automation engine

1. **Provisioning**
   Set up AUTOMATED INFRASTRUCTURE or CLOUD VMs

2. **Configuration management**
   Applications, OS, device.
   Start and stop services, install/update applications, implement security policy, ...etc

3. **Application deployment**

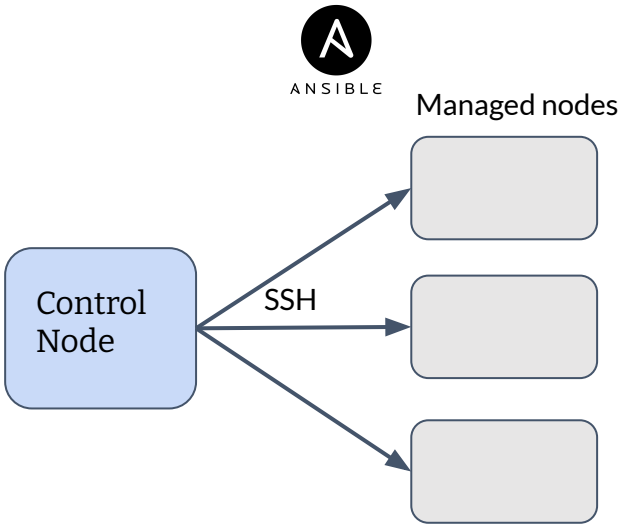
Ansible just requires **Python and SSH**

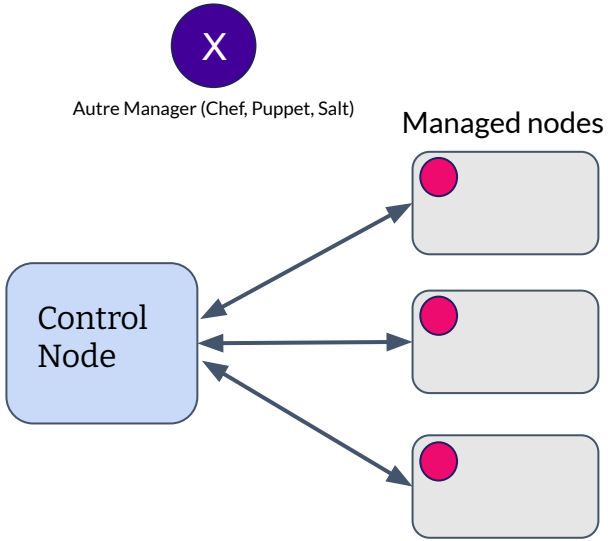
How ?

Ansible is Agentless (SSH)

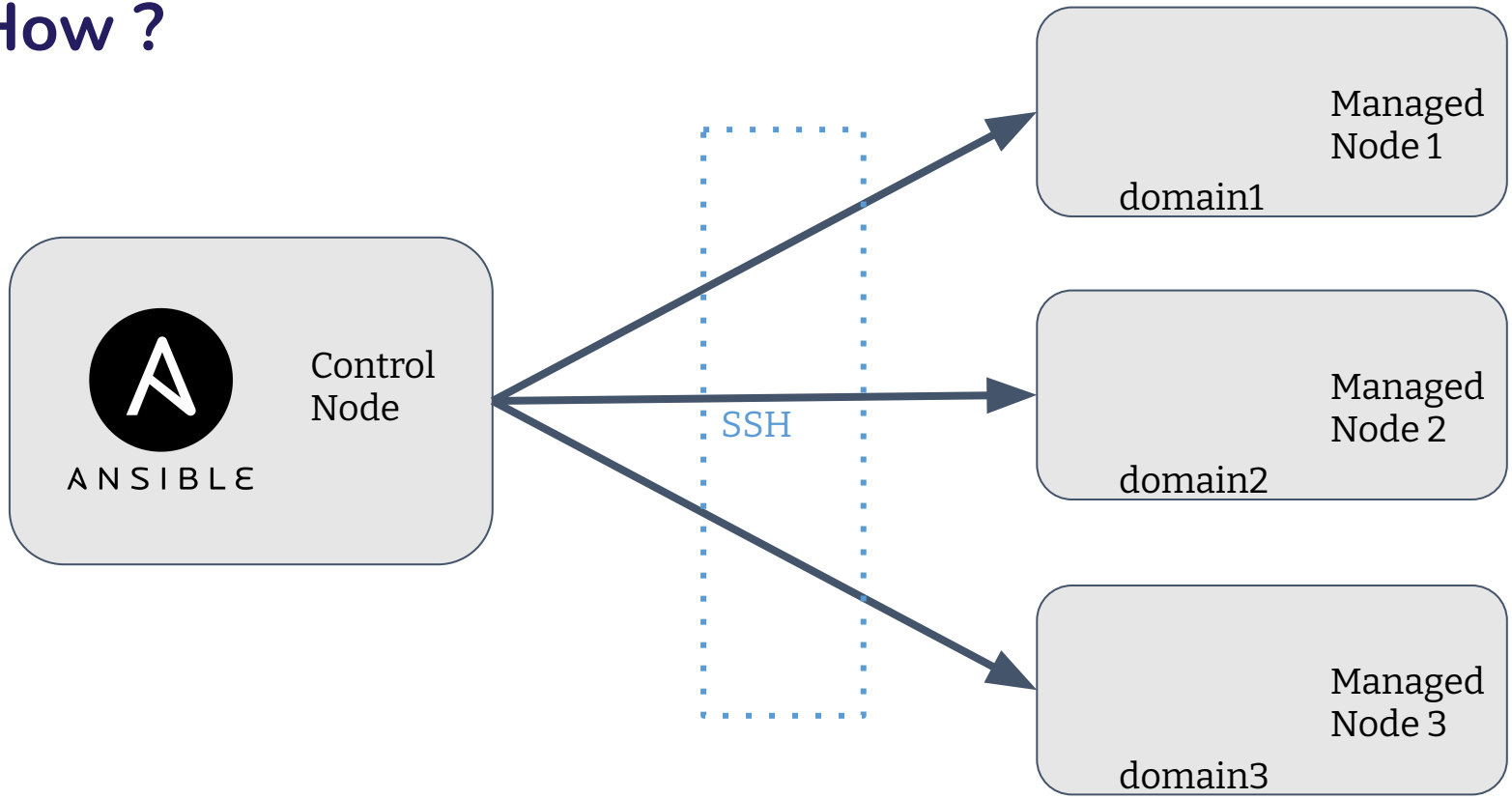
No need to install agents on nodes

Declarative vs Imperative

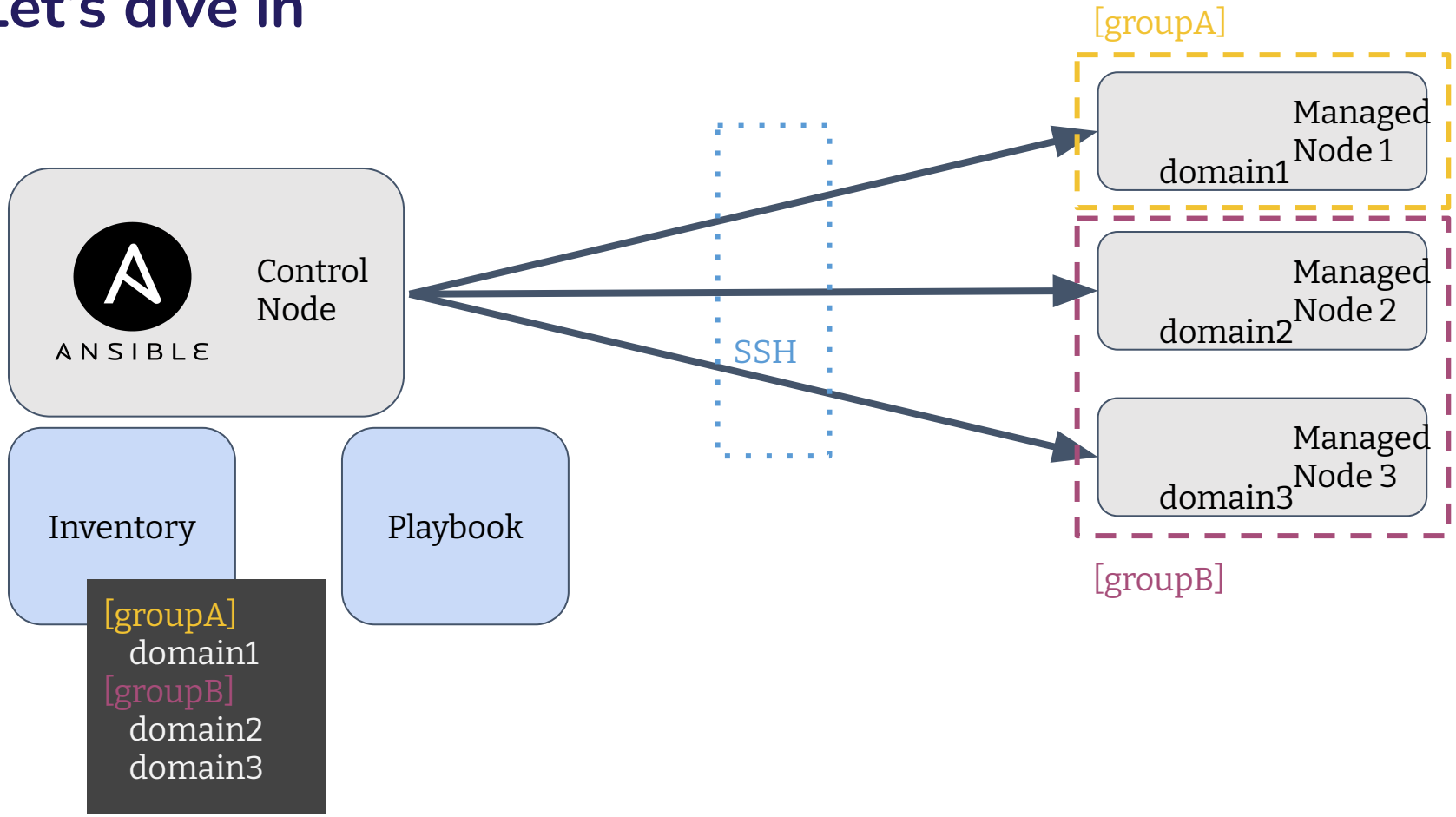




How ?

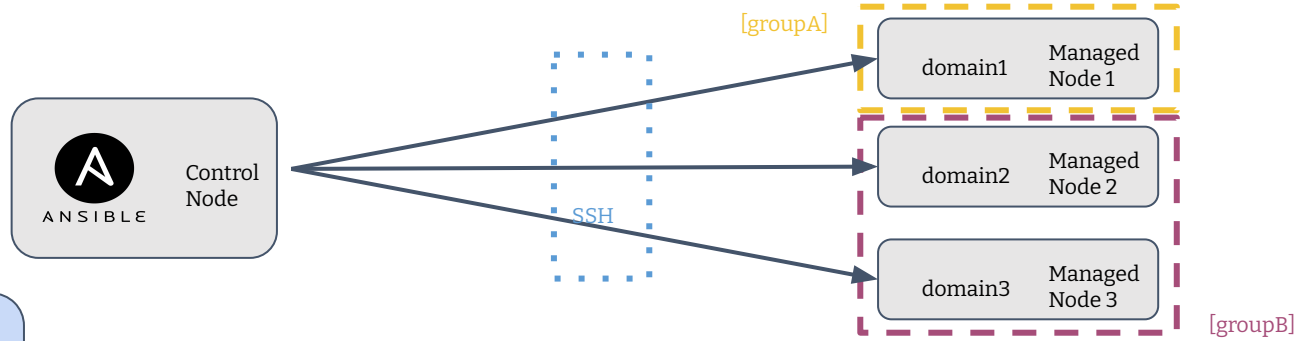

Control Node
ANSIBLE
SSH
Managed Node 1
domain1
Managed Node 2
domain2
Managed Node 3
domain3

Let's dive in


[groupA]
Managed Node 1
domain1
Managed Node 2
domain2
Managed Node 3
domain3
[groupB]
ANSIBLE
Control Node
SSH
Inventory
Playbook
[groupA]
domain1
[groupB]
domain2
domain3

Ansible

Let's dive in



Inventory

```
[groupA]
        domain1
[groupB]
        domain2
        domain3
```

Playbook

Play

```
---
- hosts: groupB
  remote_user: user

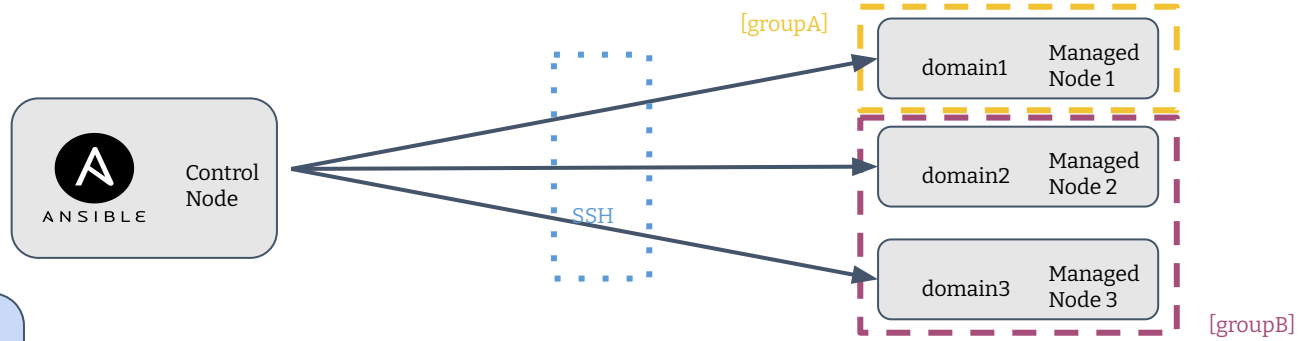
  tasks:
    - name: Ensure apache is at the latest version
        yum:
        name: httpd
        state: latest
    - name: Write the apache config file
        template:
          src: /srv/httpd.j2
          dest: /etc/httpd.conf

  roles:
    - common
    - deploy
```

...

Ansible

Let's dive in



Inventory

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Playbook

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  roles:
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```

Task

Role

Module

Role common

```
tasks:
  - name: Close all ports
    iptables:
      policy: drop
  - name: Open port 80
    firewalld:
      port: 80/tcp
  - name: Open port 22
    firewalld:
      port: 22/tcp
```

Ansible

Inventory

- Ansible needs to know where to run the commands
- Ansible's inventory is a list of machines
- Hosts and Groups
- Host/Group Variables
- Tags, SSH keys, Aliases, Login User ...

Save your whole infrastructure in a file

/etc/ansible/hosts (exemple au format INI):

```
mail.example.com

[webservers]
foo.example.com
192.168.10.29

[dbservers]
one.example.com
two.example.com
  three.example.com
```

équivalent au format **YAML**:

```
all:
  hosts:
    mail.example.com:
  children:
    webservers:
      hosts:
        foo.example.com:
        192.168.10.29:
    dbservers:
      hosts:
        one.example.com:
        two.example.com:
          three.example.com:
```

Ansible

Inventory/setup.yml

```yaml
---
all:
  vars:
    ansible_user: myuser
    ansible_ssh_private_key_file: /path/to/my/ssh/key
  children:
    prod:
      hosts: my.dns.takima.io
...
```

Modules

- Lots of build in modules :
  - setup : Display all the informations Ansible has on a host
  - ping : Ping a host to see if ansible can access it
  - yum : Install a package
  - service : Start / Stop SystemD daemons
  - docker_container : Manage docker containers
- Can add new ones :
  - https://galaxy.ansible.com/
  - Write them (in python)

Ansible v2.9
has about 3,681 modules

Ansible

playbook.yml

```yaml
---
- hosts: all
  become: yes ## Yes I want to become a super user
  roles:
    - httpd
    - firewalld
...
```

Tasks/main.yml

```
---
    # Install mysql_db
    -    name: Install mysql
         yum:  ## I am a module
           name: mysql_db
           state: present
```

Good practice

- Proper file structure
- Keep your plays small (<100 lines)
- Use GIT
- Version & release
- Document -> README file
- Use linting

A couple playbooks and roles file structure :

```
# playbooks
site.yml
webservers.yml
fooservers.yml
roles/
    common/
        tasks/
        handlers/
        library/
        files/
        templates/
        vars/
        defaults/
        meta/
    webservers/
        tasks/
        defaults/
          meta/
```

Enough speaking.
Take me to the code !

http://school.pages.takima.io/devops-resources/