

Ansible

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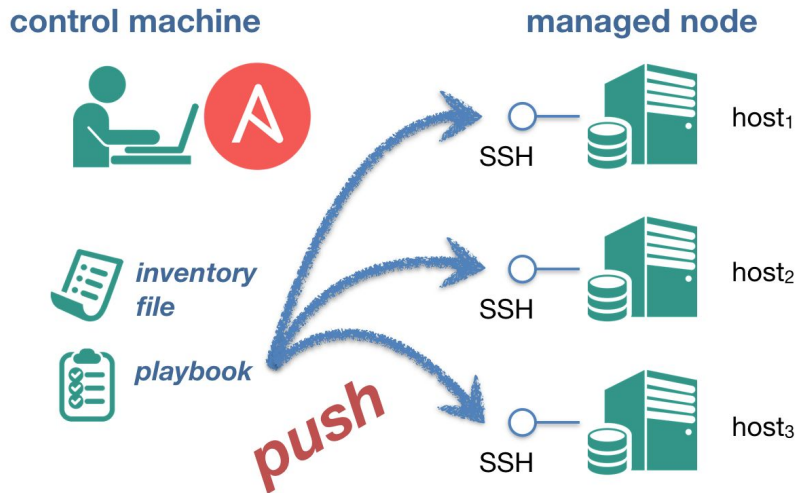
We want to setup 100+ servers

- How can we install OS?
 - PXE Boot
 - BMC OS Deployment
 - Disk cloning
- How can we install & configure software?
 - **Ansible**
 - Puppet
 - Chef



Ansible

- 自動化部署、操作工具
- 最大特點: Agentless
 - 被控制的機器不需要安裝其他程式, 只要有SSH Server 和 Python 就好



Installation

```
$ sudo apt install ansible  
or  
$ python3 -m pip install --user ansible
```

- 只要裝在 Control node 上 !



Ansible Inventory

- 控制的機器列表

```
# /etc/ansible/hosts
comp1
comp2
```

```
# /etc/hosts
10.18.18.1 comp1
10.18.18.2 comp2
```

- 使用方式

- 放在 /etc/ansible/hosts
- 使用 -i 選項指定
- 在 ansible.cfg 指定

```
# A more complicated example
```

```
[apollo]
10.88.88.31 head=True
10.88.88.[32:55] head=False
```

```
[hades]
10.11.11.1 head=True
10.11.11.2 head=False has_gpu=True
10.11.11.[3:4] head=False has_gpu=True
```



Ad-hoc Commands

- 手動下的簡單指令

```
$ ansible [host/group] -m [module] -a [parameters]
```

```
$ ansible all -m ping
```

```
$ ansible comp1 -m command -a 'uname -a'
```

```
$ ansible comp2 -m copy -a 'src=a.txt dest=/tmp/a.txt'
```

```
$ ansible comp2 -b -K -m command -a 'id'
```

-b: Become (sudo), -K: Ask for sudo password



常用的 Modules

- <https://sweworld.net/cheatsheets/ansible/#commonly-used-modules>
- **command**
 - 執行指令
- **shell**
 - 使用 shell 執行指令
- **apt**
 - 使用 apt 安裝/移除程式
- **copy**
 - 從 control node 複製檔案
- **file**
 - 建立/刪除/移動檔案/變更權限
- **lineinfile**
 - 在檔案中新增/移除一行
- **template**
 - 複製檔案模版, 並填入變數



Ansible Playbook

```
# hello_world.yml
- name: Hello World!
  hosts: all
  tasks:
    - name: Print 'Hello World'
      command: echo 'Hello World'
      register: res

    - name: Print stdout
      debug:
        msg: "{{ res.stdout }}"
```

```
$ ansible-playbook hello_world.yml
```



Ansible Playbook

```
# enable_ssh_gatewayports.yml
- name: Enable SSH GatewayPorts
  hosts: all
  tasks:
    - name: Add the line to enable GatewayPorts
      lineinfile:
        path: /etc/ssh/sshd_config
        line: GatewayPorts yes
        become: true

    - name: Reload sshd
      service:
        name: ssh
        state: reloaded
        become: true
```

- `become: true`
 - Run as root (sudo)
- `-K`
 - Ask for sudo password

```
$ ansible-playbook -K enable_ssh_gatewayports.yml
```



Tasks

- Use **Ansible ad-hoc** command to install docker on both nodes
 - `curl https://get.docker.com | sh`
 - Use the [shell](#) module
 - Enable & start the docker systemd service
 - Use the [service](#) module
- Use **Ansible Playbook** to install singularity on both nodes
 - Download from https://github.com/sylabs/singularity/releases/download/v4.1.3/singularity-ce_4.1.3-jammy_amd64.deb
 - Use the [get_url](#) module
 - Install the deb file
 - Use the [apt](#) module



Solution

```
$ ansible all -b -K -m shell -a 'curl https://get.docker.com | sh'
$ ansible all -b -K -m service -a 'name=docker state=started enabled=yes'
```

```
- name: Install Singularity
  hosts: all
  tasks:
    - name: Download deb
      get_url:
        url:
          "https://github.com/sylabs/singularity/releases/download/v4.1.3/singularity-ce_4.1.3-jammy_a
          md64.deb"
        dest: /tmp/singularityce_4.1.3-jammy_amd64.deb

    - name: Install deb
      apt:
        deb: /tmp/singularityce_4.1.3-jammy_amd64.deb
        become: true
```



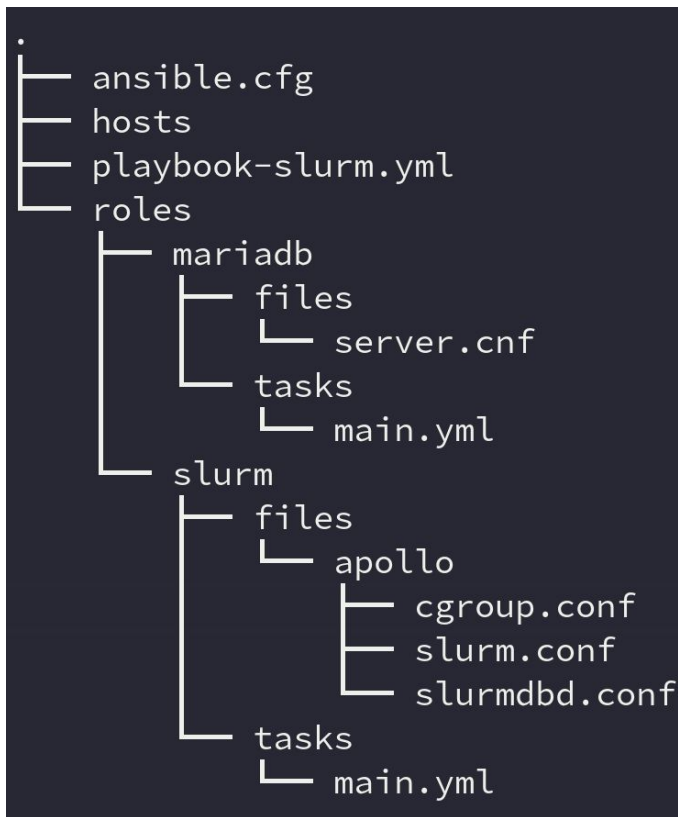
進階用法 - Ansible Roles

- 撰寫第一個Ansible Role
- Apollo Slurm Example

```
[apollo]
10.88.88.31 head=True
10.88.88.[32:55] head=False

[apollo:vars]
cluster_name=apollo
ansible_python_interpreter=/usr/bin/python
~
hosts
```

```
- hosts: apollo
  roles:
    - role: mariadb
      when: head
    - slurm
~
playbook-slurm.yml
```



Ansible Galaxy

- [Ansible Galaxy - Roles](#)
- 可以直接下載使用別人上傳的 Roles
- 也可以分享自己寫的 Roles



更多教學

- [學習 Ansible](#)
- [Ansible 文件 — ansible中文權威指南1.0.1 documentation](#)
- [現代 IT 人一定要知道的Ansible 自動化組態技巧](#)

