Ansible

vendredi 3 février 2023 09:38

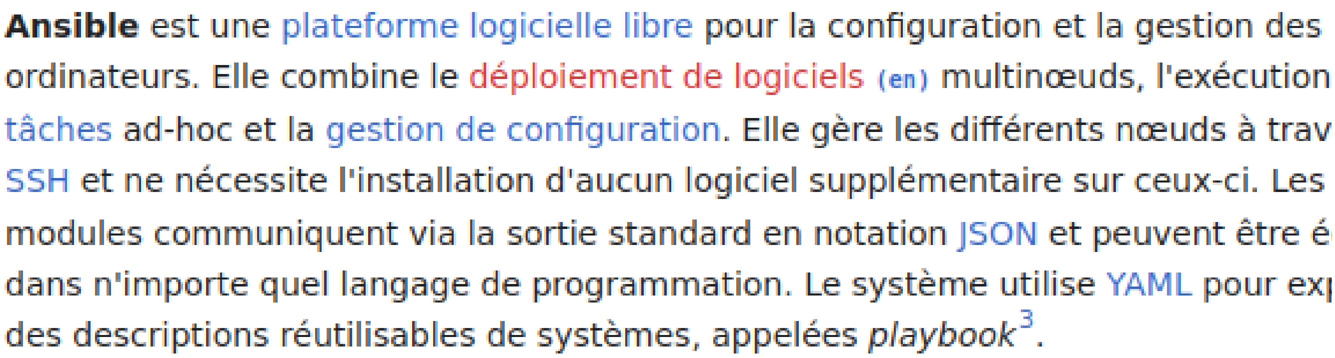
Formateur : Loup FORMENT

Documentation d'Ansible :

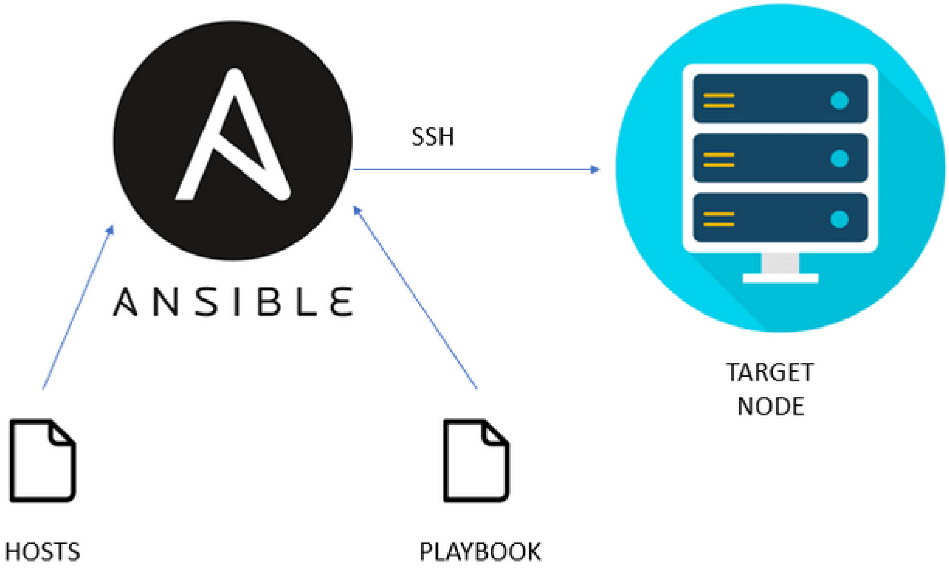
https://docs.ansible.com/ansible_community.html

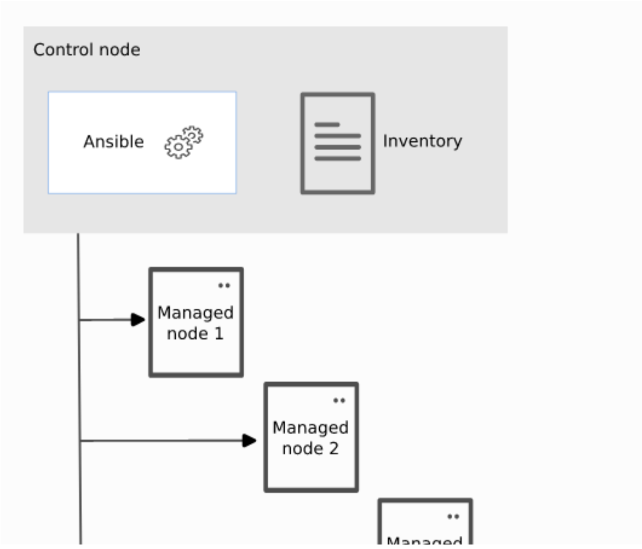
https://github.com/ansible/ansible

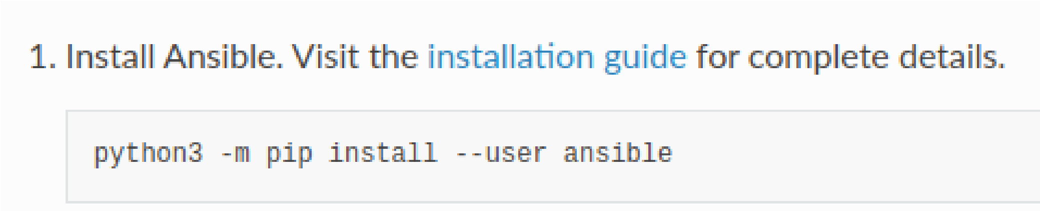
https://www.digitalocean.com/community/tutorials/how-to-install-and-configure-ansible-on-ubuntu-20-04



Ansible est une plateforme logicielle libre pour la configuration et la gestion des ordinateurs. Elle combine le déploiement de logiciels (en) multinœuds, l'exécution tâches ad-hoc et la gestion de configuration. Elle gère les différents nœuds à trav SSH et ne nécessite l'installation d'aucun logiciel supplémentaire sur ceux-ci. Les modules communiquent via la sortie standard en notation JSON et peuvent être é dans n'importe quel langage de programmation. Le système utilise YAML pour exp des descriptions réutilisables de systèmes, appelées *playbook*[3].







1. Install Ansible. Visit the installation guide for complete details.

```
python3 -m pip install --user ansible
```

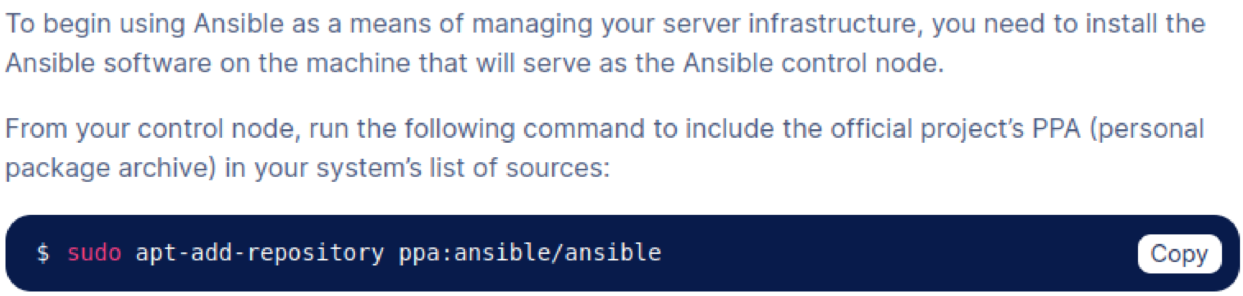
Installation QEMU :

sudo apt install qemu

sudo apt install aqemu

Aqemu : version GUI pour QEMU

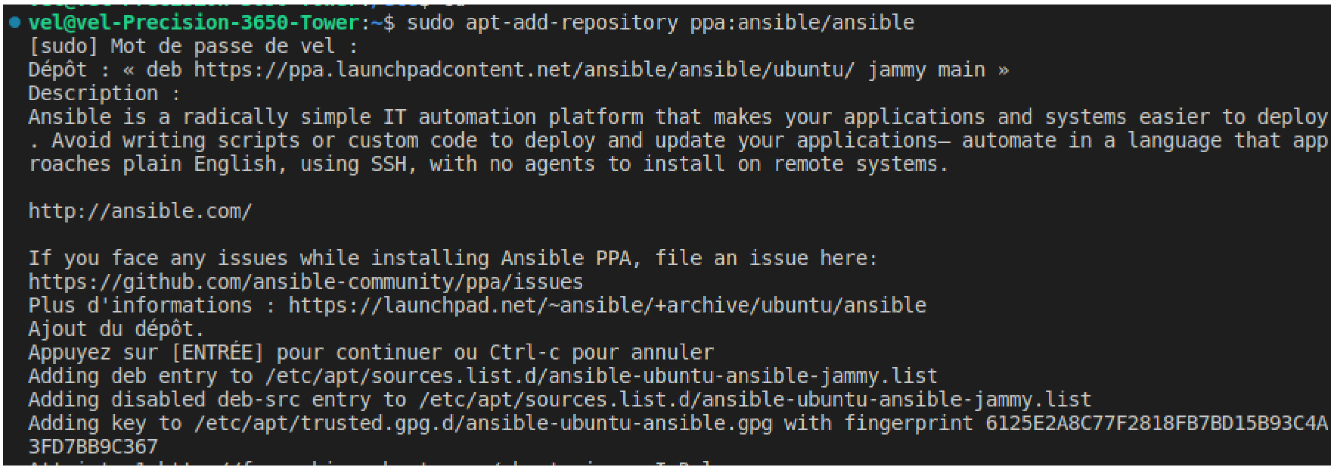
Ansible :



To begin using Ansible as a means of managing your server infrastructure, you need to install the Ansible software on the machine that will serve as the Ansible control node.

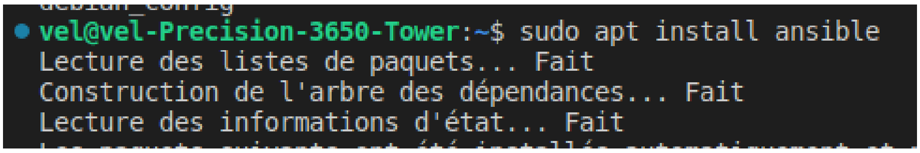
From your control node, run the following command to include the official project's PPA (personal package archive) in your system's list of sources:

```
$ sudo apt-add-repository ppa:ansible/ansible
```

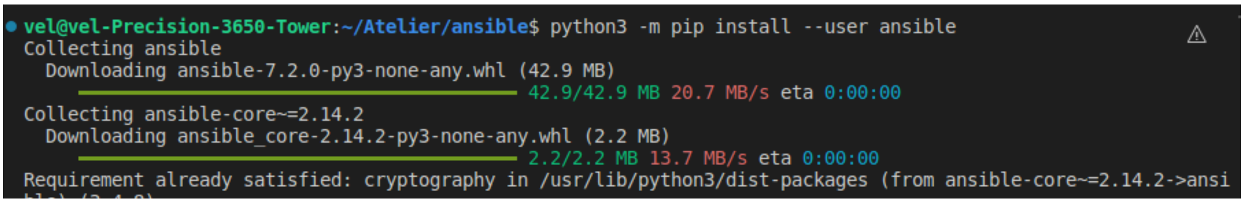


```
vel@vel-Precision-3650-Tower:~$ sudo apt-add-repository ppa:ansible/ansible
[sudo] Mot de passe de vel :
Dépôt : « deb https://ppa.launchpadcontent.net/ansible/ansible/ubuntu/ jammy main »
Description :
Ansible is a radically simple IT automation platform that makes your applications and systems easier to deploy
. Avoid writing scripts or custom code to deploy and update your applications— automate in a language that app
roaches plain English, using SSH, with no agents to install on remote systems.

http://ansible.com/

If you face any issues while installing Ansible PPA, file an issue here:
https://github.com/ansible-community/ppa/issues
Plus d'informations : https://launchpad.net/~ansible/+archive/ubuntu/ansible
Ajout du dépôt.
Appuyez sur [ENTRÉE] pour continuer ou Ctrl-c pour annuler
Adding deb entry to /etc/apt/sources.list.d/ansible-ubuntu-ansible-jammy.list
Adding disabled deb-src entry to /etc/apt/sources.list.d/ansible-ubuntu-ansible-jammy.list
Adding key to /etc/apt/trusted.gpg.d/ansible-ubuntu-ansible.gpg with fingerprint 6125E2A8C77F2818FB7BD15B93C4A
3FD7BB9C367
```

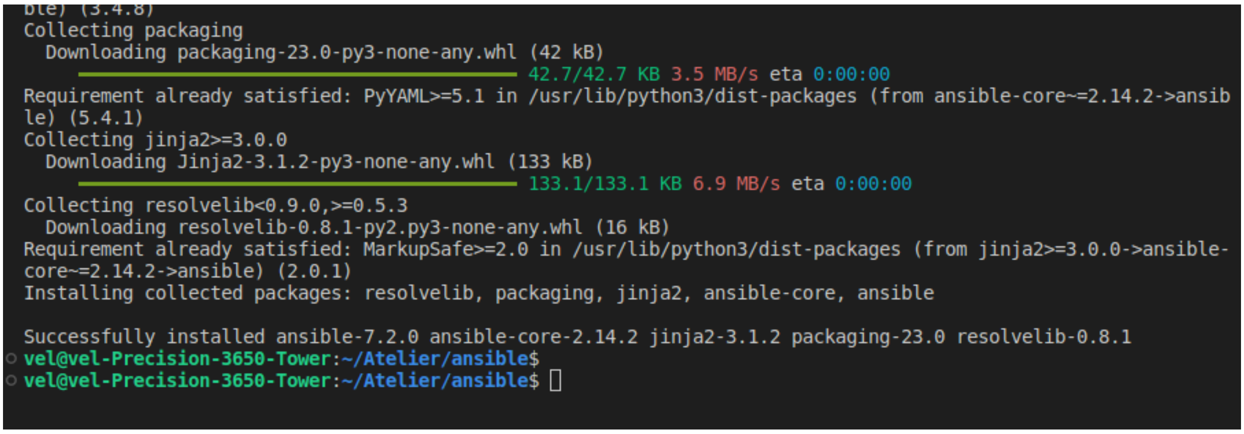
Installation Ansible : soit avec apt ou pip install



```
vel@vel-Precision-3650-Tower:~$ sudo apt install ansible
Lecture des listes de paquets... Fait
Construction de l'arbre des dépendances... Fait
Lecture des informations d'état... Fait
```



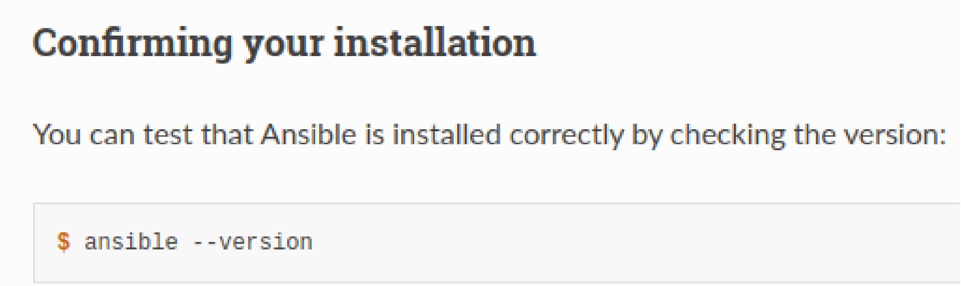
```
vel@vel-Precision-3650-Tower:~/Atelier/ansible$ python3 -m pip install --user ansible
Collecting ansible
  Downloading ansible-7.2.0-py3-none-any.whl (42.9 MB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 42.9/42.9 MB 20.7 MB/s eta 0:00:00
Collecting ansible-core~=2.14.2
  Downloading ansible_core-2.14.2-py3-none-any.whl (2.2 MB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 2.2/2.2 MB 13.7 MB/s eta 0:00:00
Requirement already satisfied: cryptography in /usr/lib/python3/dist-packages (from ansible-core~=2.14.2->ansi
```



```
ble) (3.4.8)
Collecting packaging
  Downloading packaging-23.0-py3-none-any.whl (42 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 42.7/42.7 KB 3.5 MB/s eta 0:00:00
Requirement already satisfied: PyYAML>=5.1 in /usr/lib/python3/dist-packages (from ansible-core~=2.14.2->ansib
le) (5.4.1)
Collecting jinja2>=3.0.0
  Downloading Jinja2-3.1.2-py3-none-any.whl (133 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 133.1/133.1 KB 6.9 MB/s eta 0:00:00
Collecting resolvelib<0.9.0,>=0.5.3
  Downloading resolvelib-0.8.1-py2.py3-none-any.whl (16 kB)
Requirement already satisfied: MarkupSafe>=2.0 in /usr/lib/python3/dist-packages (from jinja2>=3.0.0->ansible-
core~=2.14.2->ansible) (2.0.1)
Installing collected packages: resolvelib, packaging, jinja2, ansible-core, ansible

Successfully installed ansible-7.2.0 ansible-core-2.14.2 jinja2-3.1.2 packaging-23.0 resolvelib-0.8.1
vel@vel-Precision-3650-Tower:~/Atelier/ansible$
vel@vel-Precision-3650-Tower:~/Atelier/ansible$
```

Si jamais le fichier etc/ansible/hosts n'existe pas, il est tout à fait possible de le créer.

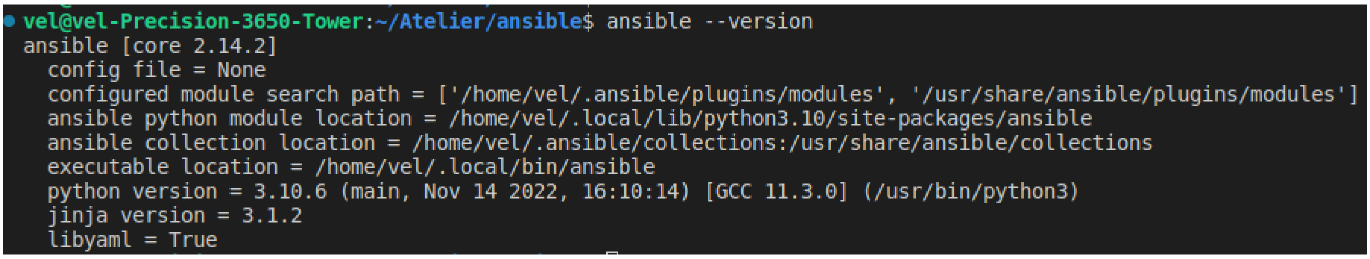
Vérifier version Ansible :



Confirming your installation

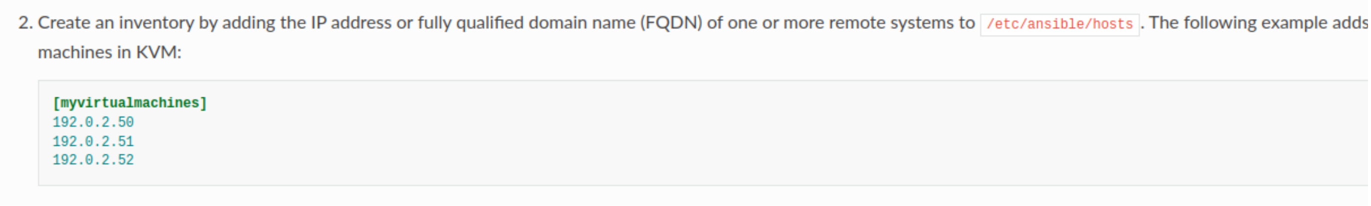
You can test that Ansible is installed correctly by checking the version:

```
$ ansible --version
```



```
vel@vel-Precision-3650-Tower:~/Atelier/ansible$ ansible --version
ansible [core 2.14.2]
  config file = None
  configured module search path = ['/home/vel/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']
  ansible python module location = /home/vel/.local/lib/python3.10/site-packages/ansible
  ansible collection location = /home/vel/.ansible/collections:/usr/share/ansible/collections
  executable location = /home/vel/.local/bin/ansible
  python version = 3.10.6 (main, Nov 14 2022, 16:10:14) [GCC 11.3.0] (/usr/bin/python3)
  jinja version = 3.1.2
  libyaml = True
```

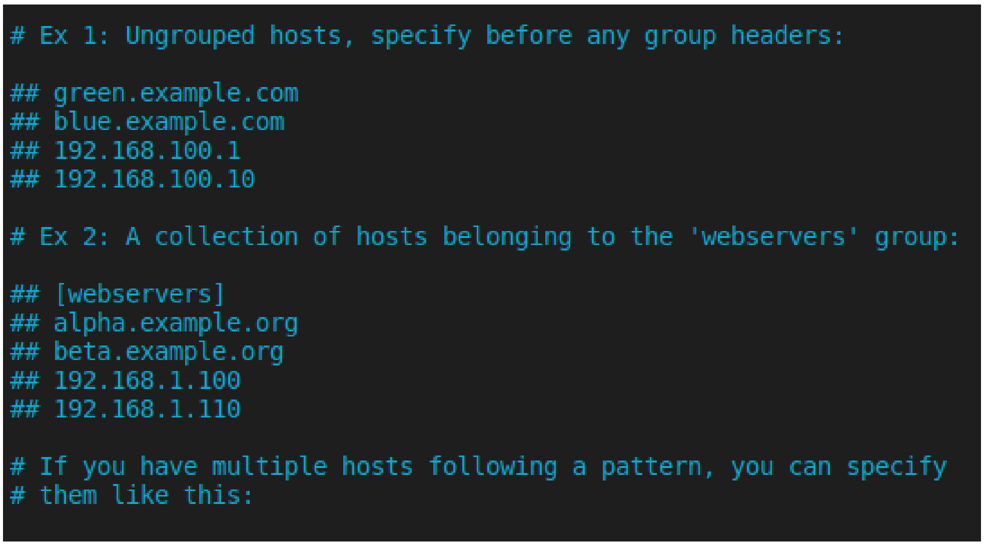
Créer un fichier inventaire de nos host :



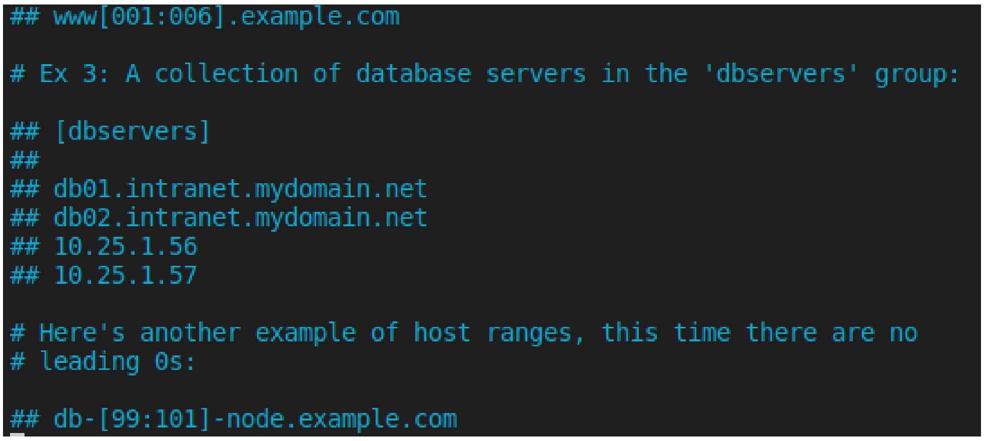
2. Create an inventory by adding the IP address or fully qualified domain name (FQDN) of one or more remote systems to `/etc/ansible/hosts`. The following example adds machines in KVM:

```
[myvirtualmachines]
192.0.2.50
192.0.2.51
192.0.2.52
```

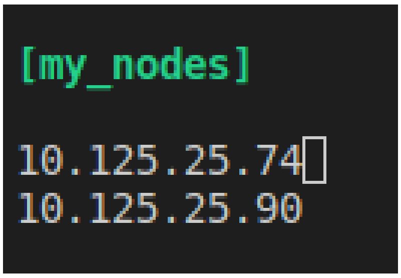
Exemple de configuration fichier host :



```
# Ex 1: Ungrouped hosts, specify before any group headers:

## green.example.com
## blue.example.com
## 192.168.100.1
## 192.168.100.10

# Ex 2: A collection of hosts belonging to the 'webservers' group:

## [webservers]
## alpha.example.org
## beta.example.org
## 192.168.1.100
## 192.168.1.110

# If you have multiple hosts following a pattern, you can specify
# them like this:
```

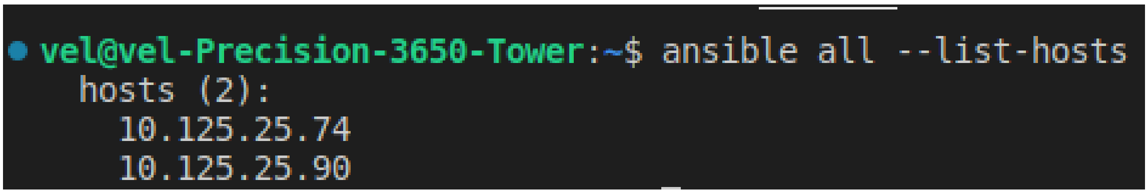


```
## www[001:006].example.com

# Ex 3: A collection of database servers in the 'dbservers' group:

## [dbservers]
##
## db01.intranet.mydomain.net
## db02.intranet.mydomain.net
## 10.25.1.56
## 10.25.1.57

# Here's another example of host ranges, this time there are no
# leading 0s:

## db-[99:101]-node.example.com
```

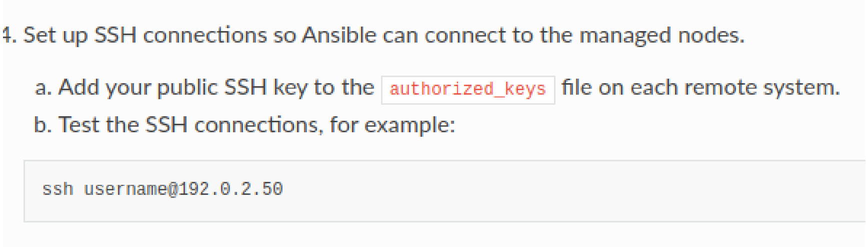


```
[my_nodes]

10.125.25.74
10.125.25.90
```

Nous pouvons vérifier la configuration de notre fichier hosts :



```
vel@vel-Precision-3650-Tower:~$ ansible all --list-hosts
  hosts (2):
    10.125.25.74
    10.125.25.90
```



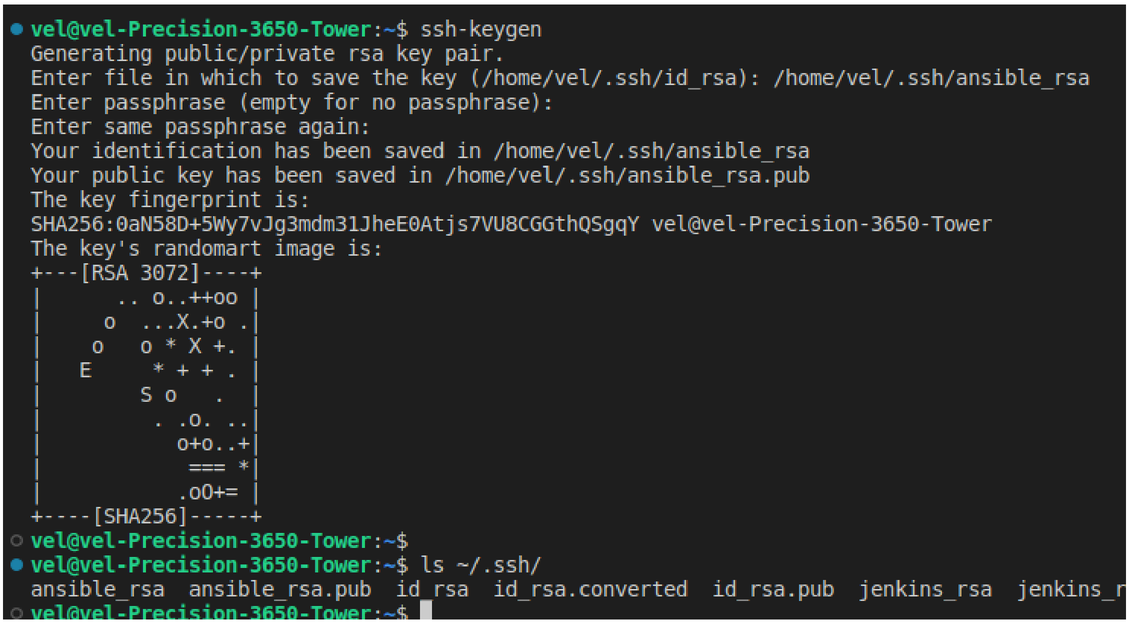
4. Set up SSH connections so Ansible can connect to the managed nodes.

   a. Add your public SSH key to the `authorized_keys` file on each remote system.

   b. Test the SSH connections, for example:

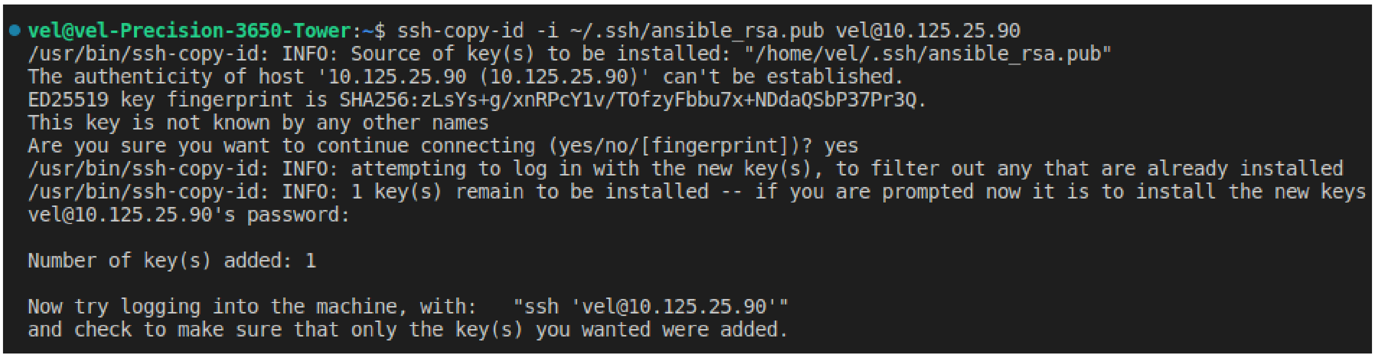
```
ssh username@192.0.2.50
```

Génération clé ssh



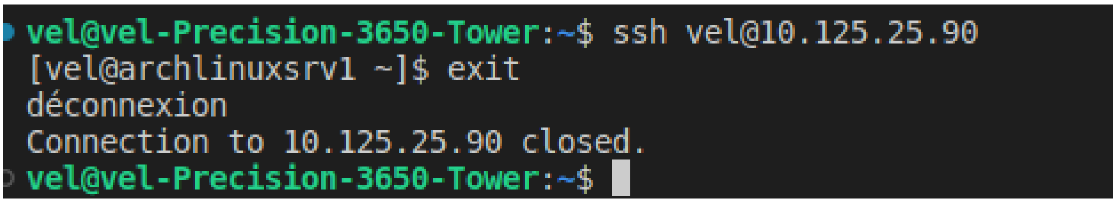
```
vel@vel-Precision-3650-Tower:~$ ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/home/vel/.ssh/id_rsa): /home/vel/.ssh/ansible_rsa
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/vel/.ssh/ansible_rsa
Your public key has been saved in /home/vel/.ssh/ansible_rsa.pub
The key fingerprint is:
SHA256:0aN58D+5Wy7vJg3mdm31JheE0Atjs7VU8CGGthQSgqY vel@vel-Precision-3650-Tower
The key's randomart image is:
+---[RSA 3072]----+
|      .. o..++oo |
|     o  ...X.+o .|
|    o   o * X +. |
|   E     * + + . |
|        S o   .  |
|         . .o. ..|
|           o+o..+|
|            === *|
|           .oO+= |
+----[SHA256]-----+
vel@vel-Precision-3650-Tower:~$
vel@vel-Precision-3650-Tower:~$ ls ~/.ssh/
ansible_rsa  ansible_rsa.pub  id_rsa  id_rsa.converted  id_rsa.pub  jenkins_rsa  jenkins_r
vel@vel-Precision-3650-Tower:~$
```

Envoie clé ssh de l'hôte sur les nodes

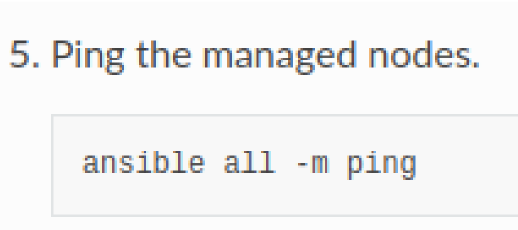


```
vel@vel-Precision-3650-Tower:~$ ssh-copy-id -i ~/.ssh/ansible_rsa.pub vel@10.125.25.90
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/vel/.ssh/ansible_rsa.pub"
The authenticity of host '10.125.25.90 (10.125.25.90)' can't be established.
ED25519 key fingerprint is SHA256:zLsYs+g/xnRPcY1v/TOfzyFbbu7x+NDdaQSbP37Pr3Q.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to install the new keys
vel@10.125.25.90's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh 'vel@10.125.25.90'"
and check to make sure that only the key(s) you wanted were added.
```

Test de connexion sur une VM :



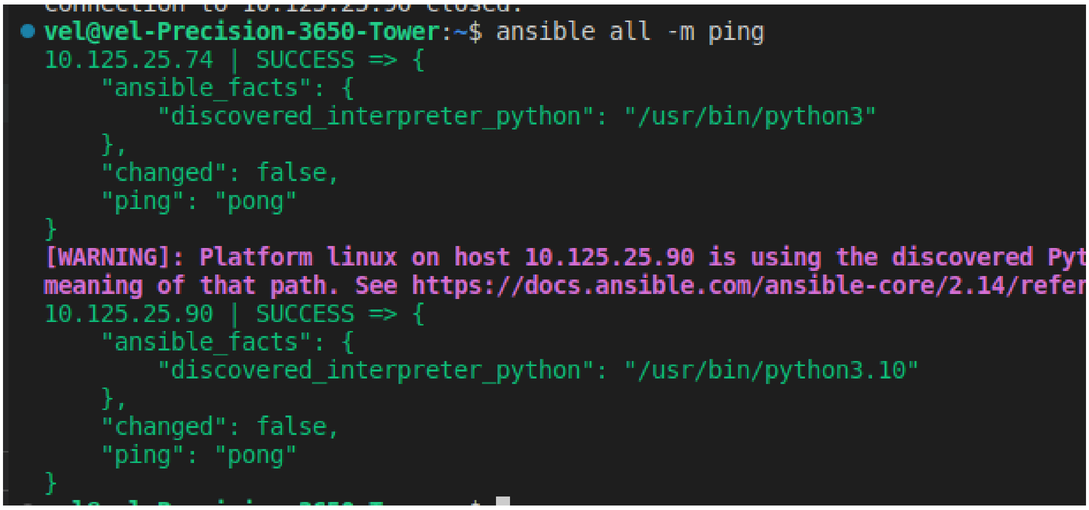
```
vel@vel-Precision-3650-Tower:~$ ssh vel@10.125.25.90
[vel@archlinuxsrv1 ~]$ exit
déconnexion
Connection to 10.125.25.90 closed.
vel@vel-Precision-3650-Tower:~$
```



5. Ping the managed nodes.

```
ansible all -m ping
```

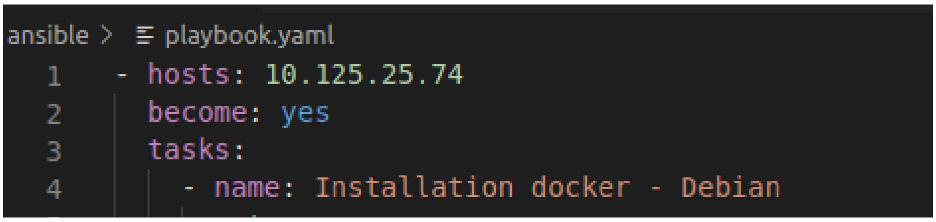
Suite à la configuration du fichier host + des envois de clés SSH -> test de ping sur toute les machines contenu dans le groupe "**My_Nodes**" du fichier host



```
Connection to 10.125.25.90 closed.
vel@vel-Precision-3650-Tower:~$ ansible all -m ping
10.125.25.74 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
[WARNING]: Platform linux on host 10.125.25.90 is using the discovered Pyt
meaning of that path. See https://docs.ansible.com/ansible-core/2.14/refer
10.125.25.90 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3.10"
    },
    "changed": false,
    "ping": "pong"
}
```

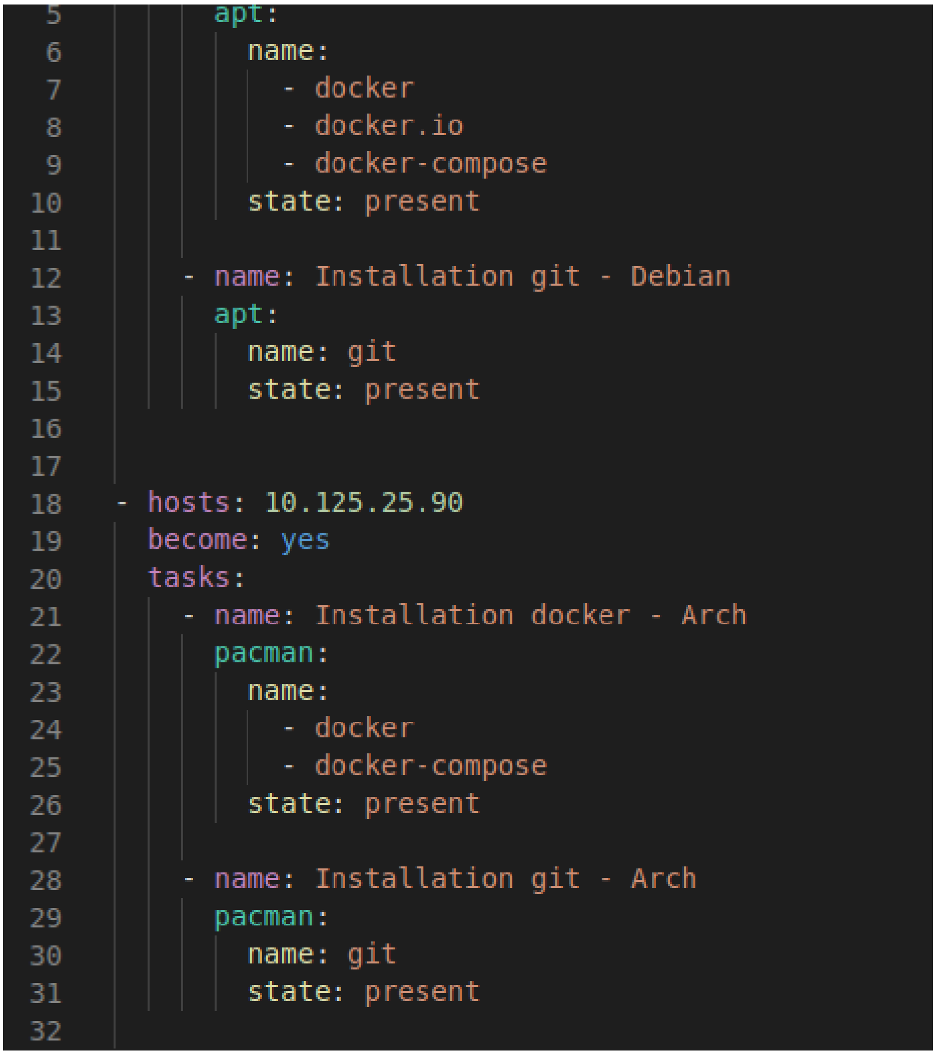
Configuration d'un fichier playbooks :

- On définit le ou les hosts sur lesquels les commandes vont s'exécuter
- On sépare les tâches par nom
- Dans chaque tâche on peut exécuter une ou plusieurs commande ou utiliser des modules pour allez plus vite (apt pour installer un paquet – git quand on doit récupérer un dépôt git)
- Faire très attention à l'indentation

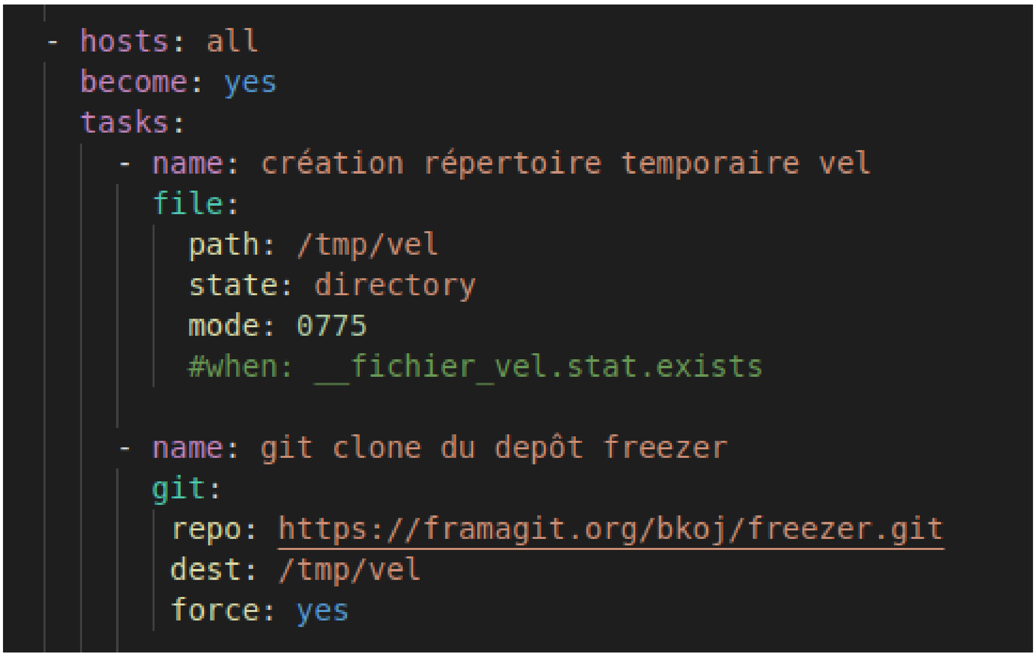


ansible > playbook.yaml

```
- hosts: 10.125.25.74
  become: yes
  tasks:
    - name: Installation docker - Debian
```



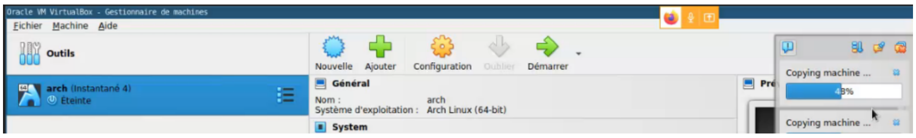
```yaml
      apt:
        name:
          - docker
          - docker.io
          - docker-compose
        state: present

    - name: Installation git - Debian
      apt:
        name: git
        state: present


- hosts: 10.125.25.90
  become: yes
  tasks:
    - name: Installation docker - Arch
      pacman:
        name:
          - docker
          - docker-compose
        state: present

    - name: Installation git - Arch
      pacman:
        name: git
        state: present

```

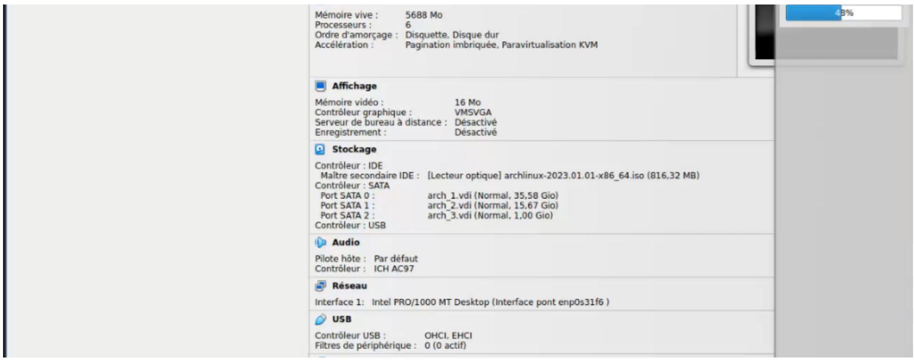


```yaml
- hosts: all
  become: yes
  tasks:
    - name: création répertoire temporaire vel
      file:
        path: /tmp/vel
        state: directory
        mode: 0775
        #when: __fichier_vel.stat.exists

    - name: git clone du depôt freezer
      git:
       repo: https://framagit.org/bkoj/freezer.git
       dest: /tmp/vel
       force: yes
```

Correction :

Pour gagner du temps à la création de VM : on peut les cloner





Mémoire vive : 5688 Mo
Processeurs : 6
Ordre d'amorçage : Disquette, Disque dur
Accélération : Pagination imbriquée, Paravirtualisation KVM

Affichage

Mémoire vidéo : 16 Mo
Contrôleur graphique : VMSVGA
Serveur de bureau à distance : Désactivé
Enregistrement : Désactivé

Stockage

Contrôleur : IDE
Maître secondaire IDE : [Lecteur optique] archlinux-2023.01.01-x86_64.iso (816,32 MB)
Contrôleur : SATA
Port SATA 0 : arch_1.vdi (Normal, 35,58 Gio)
Port SATA 1 : arch_2.vdi (Normal, 15,67 Gio)
Port SATA 2 : arch_3.vdi (Normal, 1,00 Gio)
Contrôleur : USB

Audio

Pilote hôte : Par défaut
Contrôleur : ICH AC97

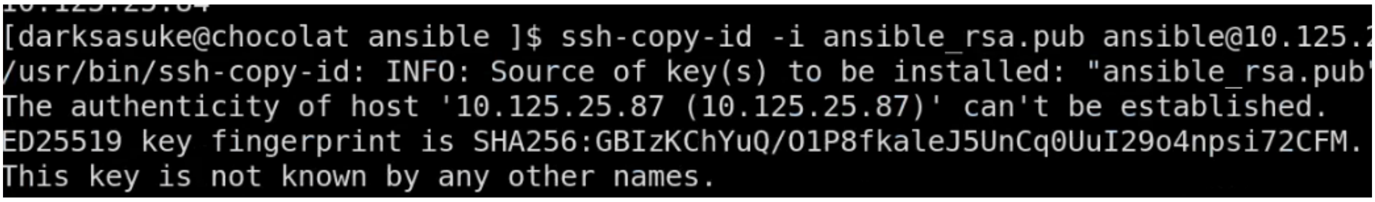
Réseau

Interface 1: Intel PRO/1000 MT Desktop (Interface pont enp0s31f6)

USB

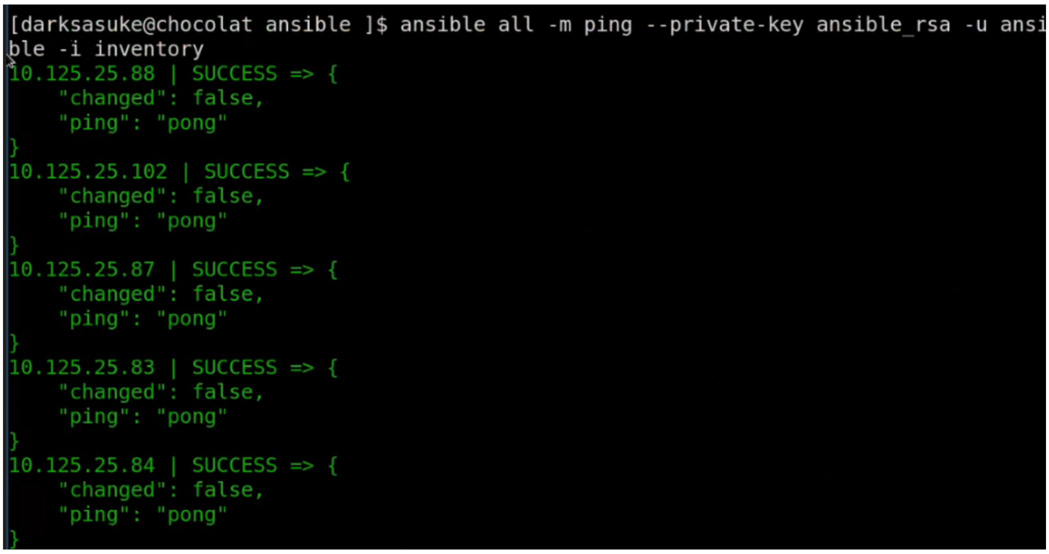
Contrôleur USB : OHCI, EHCI
Filtres de périphérique : 0 (0 actif)

Installation ansible et envoie des clé de l'hôte aux VM :



```
10.125.25.84
[darksasuke@chocolat ansible ]$ ssh-copy-id -i ansible_rsa.pub ansible@10.125.
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "ansible_rsa.pub
The authenticity of host '10.125.25.87 (10.125.25.87)' can't be established.
ED25519 key fingerprint is SHA256:GBIzKChYuQ/01P8fkaleJ5UnCq0UuI29o4npsi72CFM.
This key is not known by any other names.
```

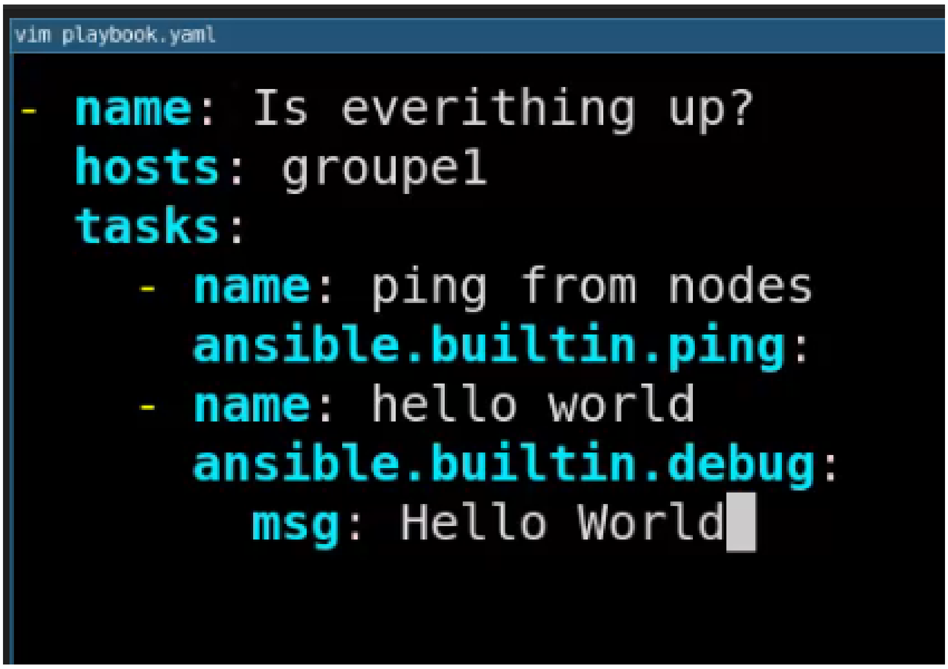
Test du ping :



```
[darksasuke@chocolat ansible ]$ ansible all -m ping --private-key ansible_rsa -u ansi
ble -i inventory
10.125.25.88 | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
10.125.25.102 | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
10.125.25.87 | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
10.125.25.83 | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
10.125.25.84 | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
```

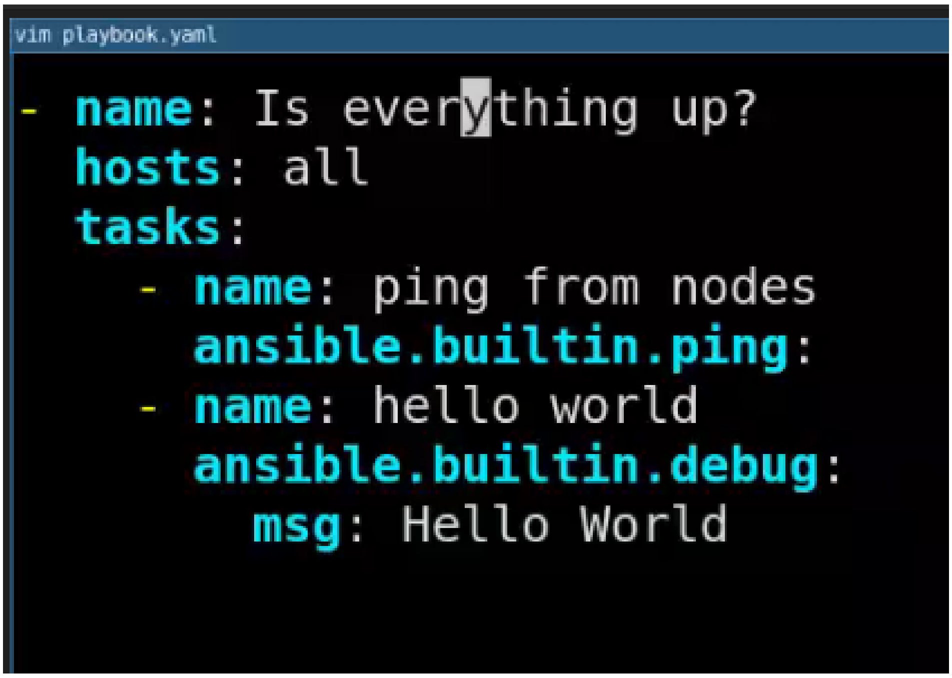
Fichier playbook :

Pour vérifier que les machines sont up :

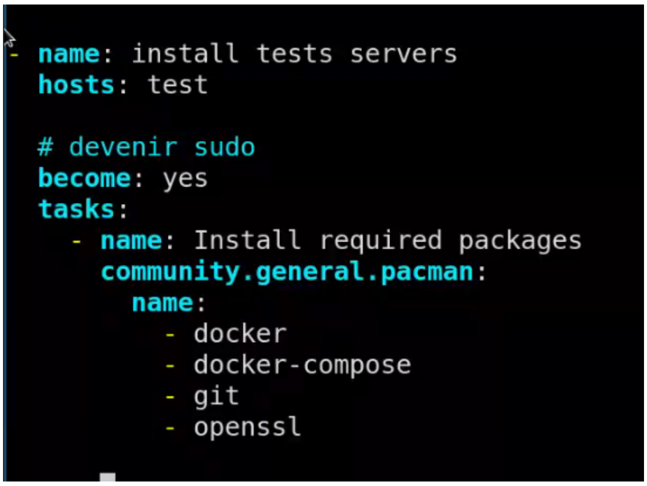


```
vim playbook.yaml
- name: Is everithing up?
  hosts: groupe1
  tasks:
    - name: ping from nodes
      ansible.builtin.ping:
    - name: hello world
      ansible.builtin.debug:
        msg: Hello World
```

Hosts: all pour toute les machines peu importe le groupe

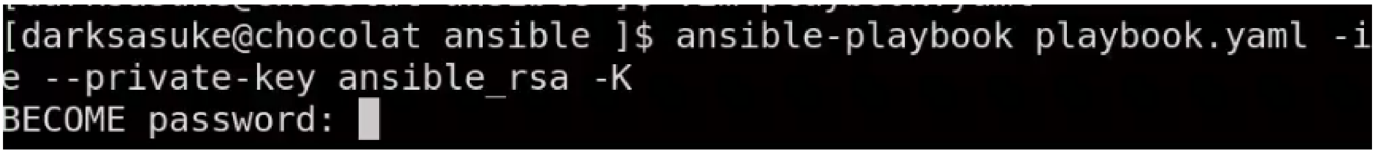


```
vim playbook.yaml
- name: Is everything up?
  hosts: all
  tasks:
    - name: ping from nodes
      ansible.builtin.ping:
    - name: hello world
      ansible.builtin.debug:
        msg: Hello World
```



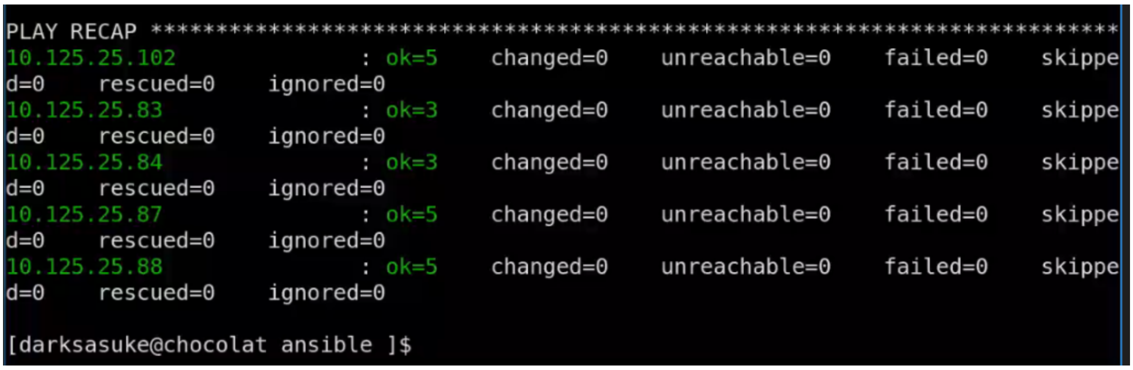
```
- name: install tests servers
  hosts: test

  # devenir sudo
  become: yes
  tasks:
    - name: Install required packages
      community.general.pacman:
        name:
          - docker
          - docker-compose
          - git
          - openssl
```

Exécution du playbook

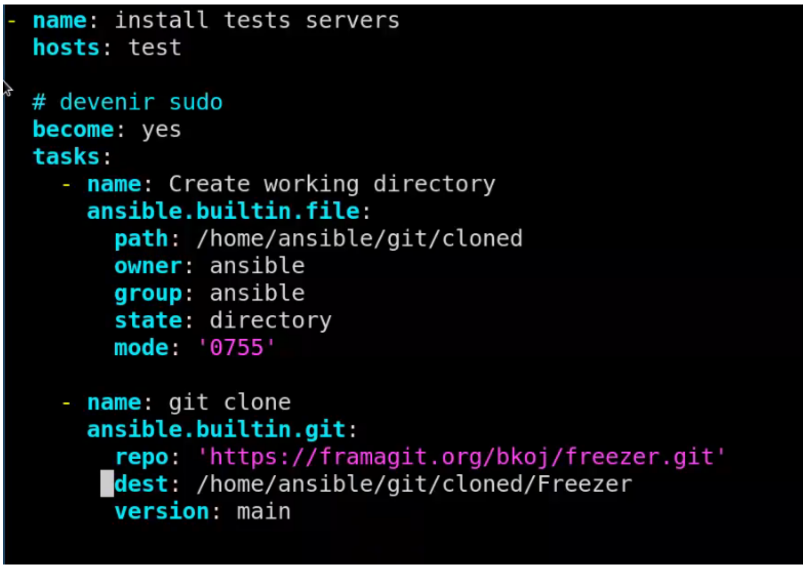


```
[darksasuke@chocolat ansible ]$ ansible-playbook playbook.yaml -i
e --private-key ansible_rsa -K
BECOME password:
```

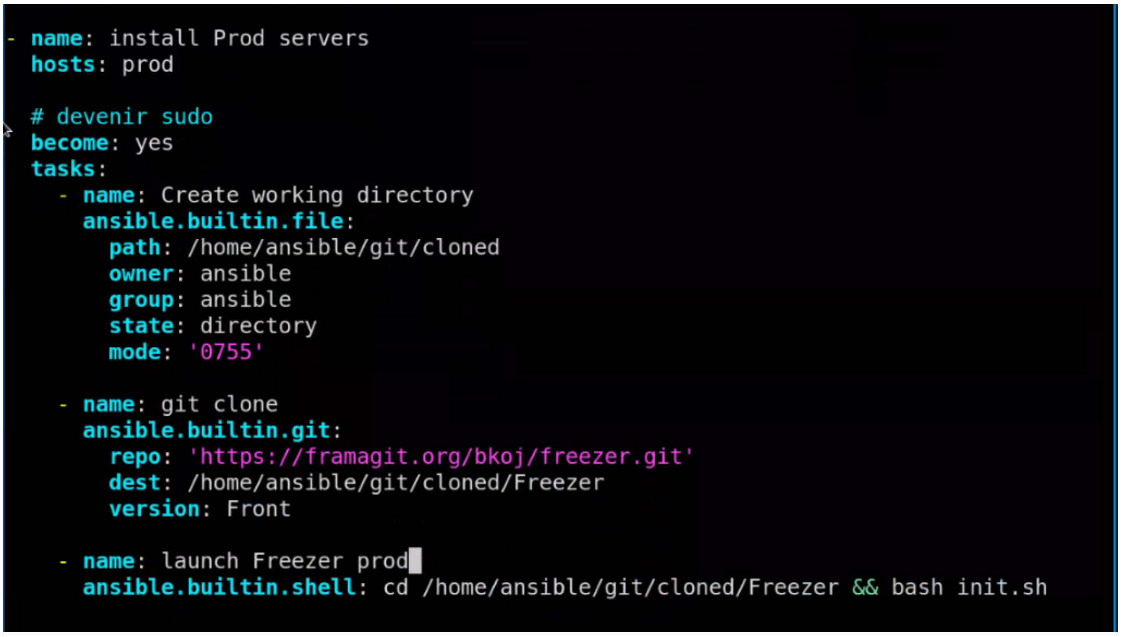
Bien faire attention à changer d'utilisateur quand on veut exécuter le playbook : on risque sinon d'avoir des problèmes de droit à l'exécution -> ansible se connecte en ssh, i lfaut se connecter sur l'utilisateur distant (**-u user_distant**) et la bonne clé privée **(--private-key keyfile**) associé à la bonne clé publique envoyé sur les nodes



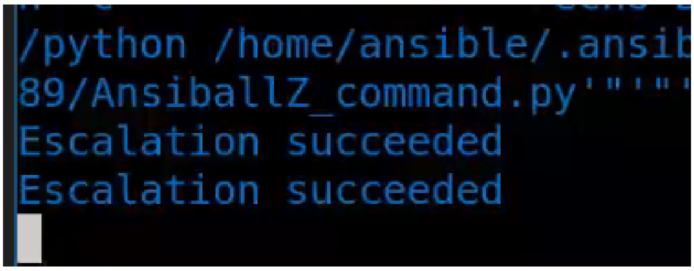
```
PLAY RECAP *************************************************************************
10.125.25.102              : ok=5    changed=0    unreachable=0    failed=0    skippe
d=0    rescued=0    ignored=0
10.125.25.83               : ok=3    changed=0    unreachable=0    failed=0    skippe
d=0    rescued=0    ignored=0
10.125.25.84               : ok=3    changed=0    unreachable=0    failed=0    skippe
d=0    rescued=0    ignored=0
10.125.25.87               : ok=5    changed=0    unreachable=0    failed=0    skippe
d=0    rescued=0    ignored=0
10.125.25.88               : ok=5    changed=0    unreachable=0    failed=0    skippe
d=0    rescued=0    ignored=0

[darksasuke@chocolat ansible ]$
```



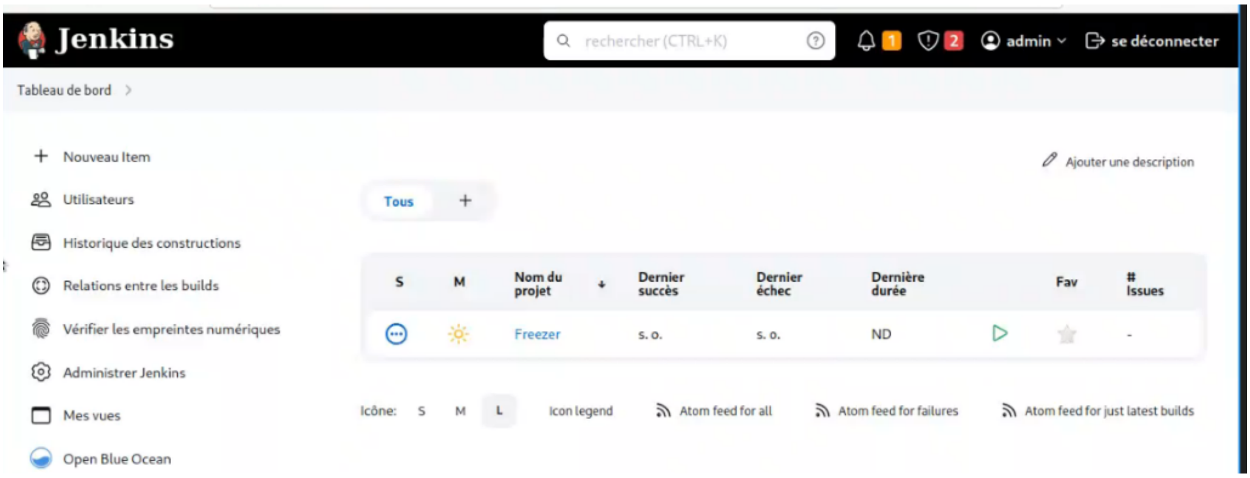
```yaml
- name: install tests servers
  hosts: test

  # devenir sudo
  become: yes
  tasks:
    - name: Create working directory
      ansible.builtin.file:
        path: /home/ansible/git/cloned
        owner: ansible
        group: ansible
        state: directory
        mode: '0755'

    - name: git clone
      ansible.builtin.git:
        repo: 'https://framagit.org/bkoj/freezer.git'
        dest: /home/ansible/git/cloned/Freezer
        version: main
```



```yaml
- name: install Prod servers
  hosts: prod

  # devenir sudo
  become: yes
  tasks:
    - name: Create working directory
      ansible.builtin.file:
        path: /home/ansible/git/cloned
        owner: ansible
        group: ansible
        state: directory
        mode: '0755'

    - name: git clone
      ansible.builtin.git:
        repo: 'https://framagit.org/bkoj/freezer.git'
        dest: /home/ansible/git/cloned/Freezer
        version: Front

    - name: launch Freezer prod
      ansible.builtin.shell: cd /home/ansible/git/cloned/Freezer && bash init.sh
```



```
/python /home/ansible/.ansib
89/AnsiballZ_command.py'"'"'
Escalation succeeded
Escalation succeeded
```



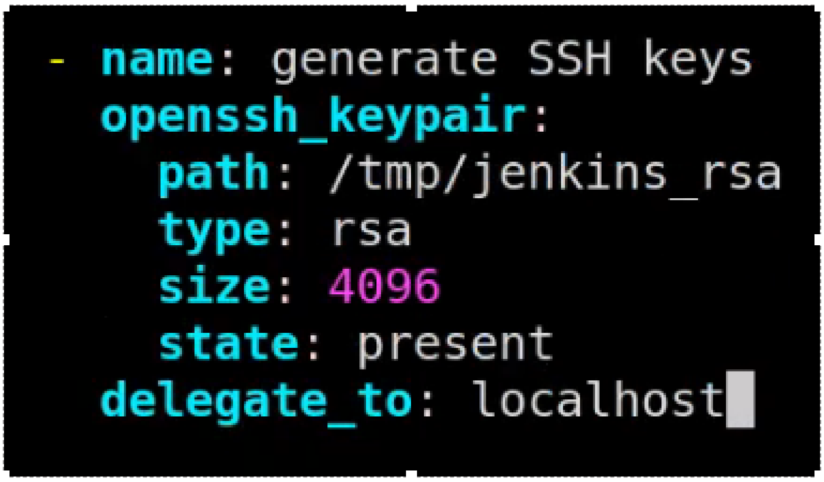
S	M	Nom du projet ↓	Dernier succès	Dernier échec	Dernière durée		Fav	# Issues
		Freezer	s. o.	s. o.	ND	▷	☆	-

File d'attente des constructions

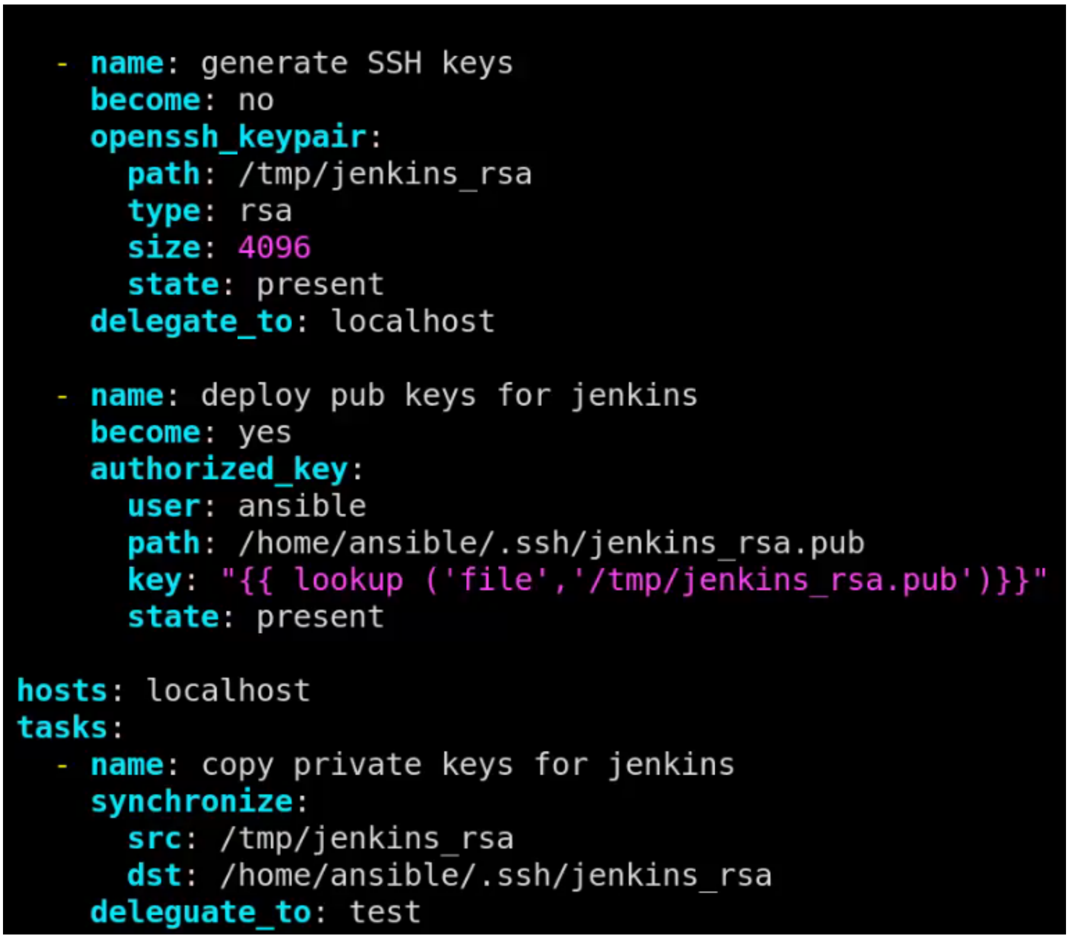
File d'attente des constructions vide

État du lanceur de compilations

Génération clé ssh



```
- name: generate SSH keys
  openssh_keypair:
    path: /tmp/jenkins_rsa
    type: rsa
    size: 4096
    state: present
  delegate_to: localhost
```



```
  - name: generate SSH keys
    become: no
    openssh_keypair:
      path: /tmp/jenkins_rsa
      type: rsa
      size: 4096
      state: present
    delegate_to: localhost

  - name: deploy pub keys for jenkins
    become: yes
    authorized_key:
      user: ansible
      path: /home/ansible/.ssh/jenkins_rsa.pub
      key: "{{ lookup ('file','/tmp/jenkins_rsa.pub')}}"
      state: present

hosts: localhost
tasks:
  - name: copy private keys for jenkins
    synchronize:
      src: /tmp/jenkins_rsa
      dst: /home/ansible/.ssh/jenkins_rsa
    deleguate_to: test
```