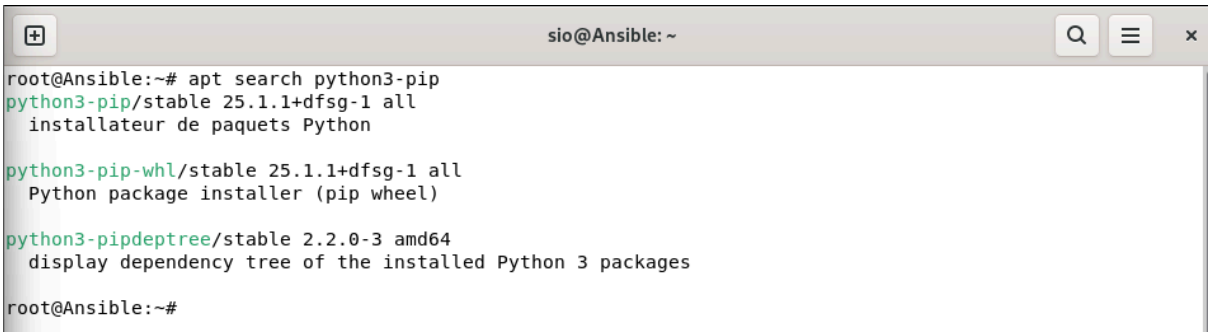
Chapitre 3 – Configuration de serveurs et d'applications avec Ansible

Table des matières :

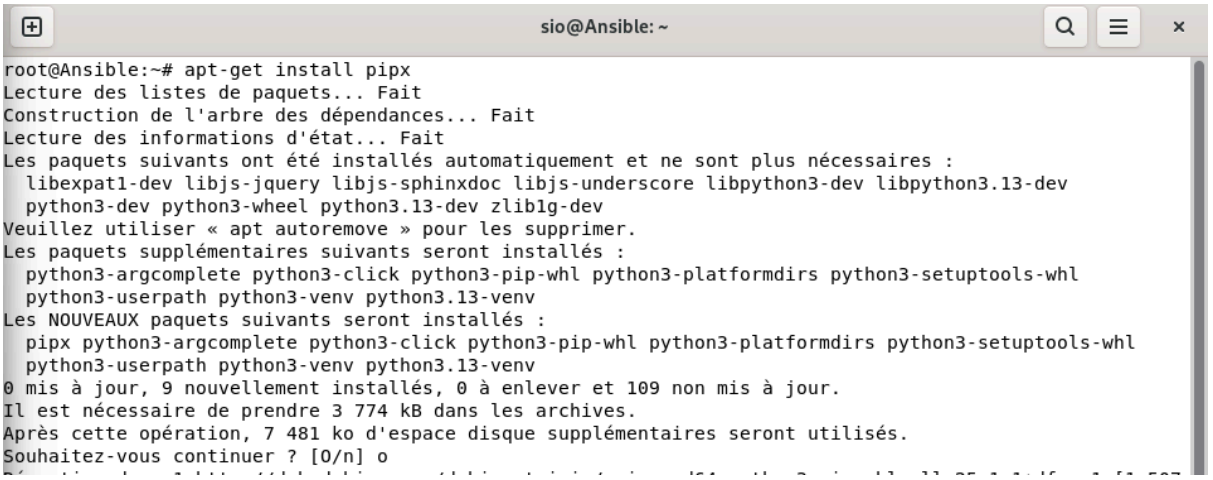
1. Installation d'Ansible.

▪ Modification du fichier /etc/hosts ainsi que /etc/hostname puis nous redémarrons la VM :

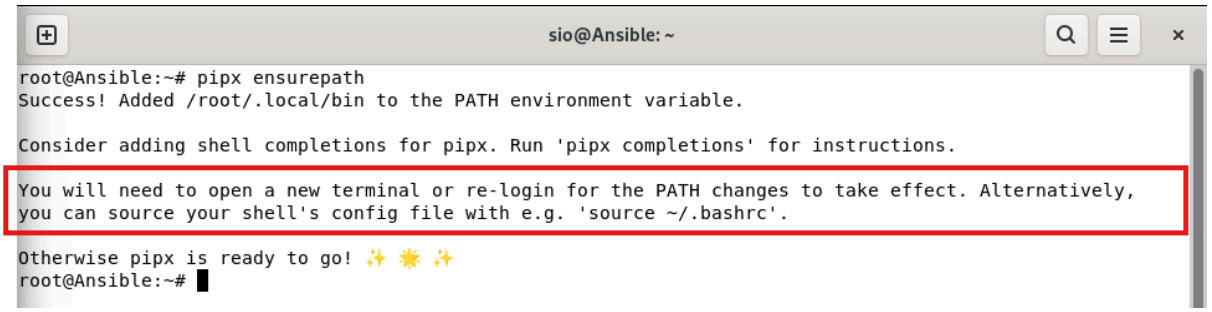
▪ Mise à jour de la liste des paquets

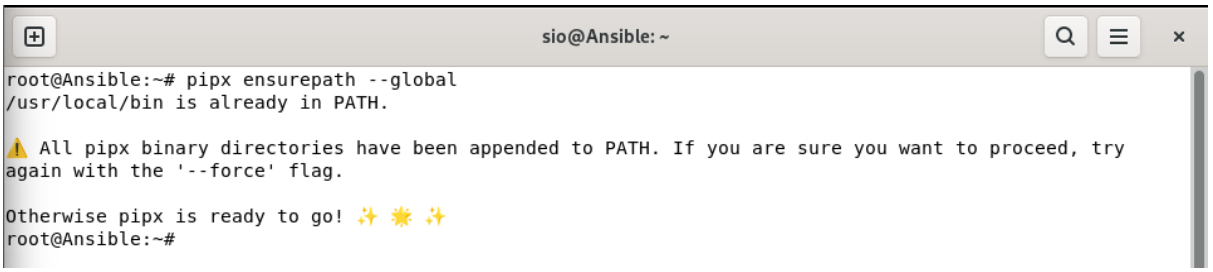


▪ Installation de pipx

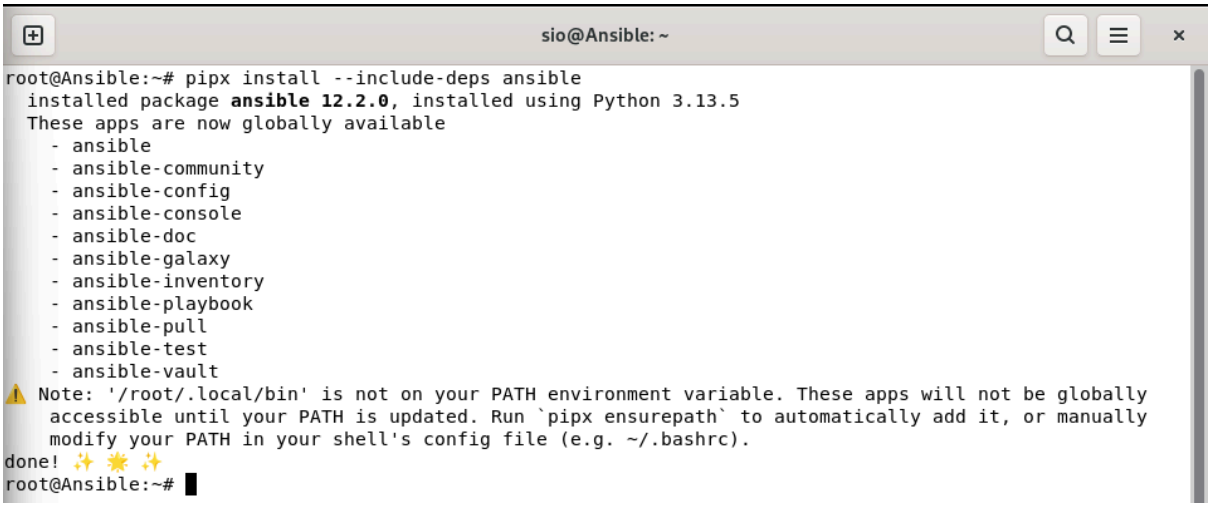


▪ Nous effectuons la commande pipx ensurepath afin que les exécutables soient bien présent dans la variable d'environnement path

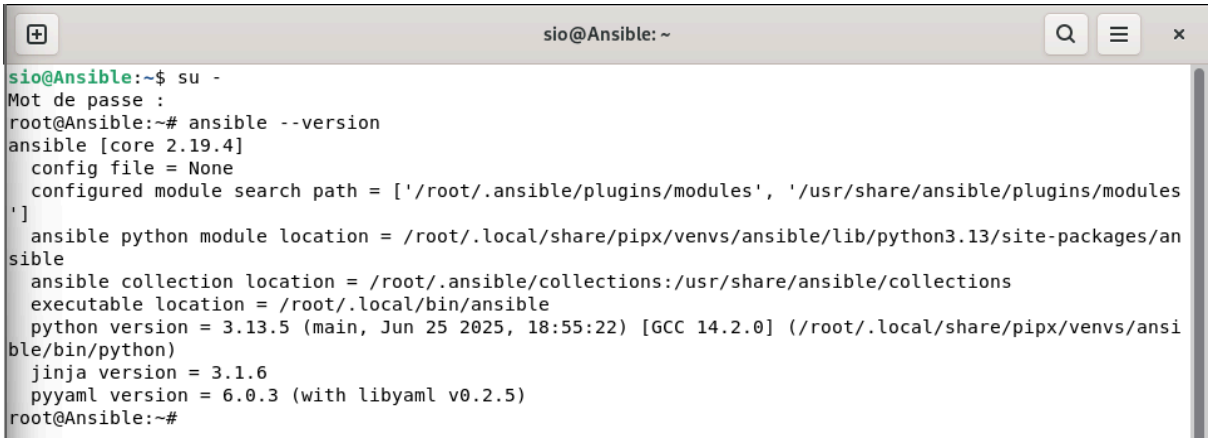




▪ Installation d'Ansible via pipx à l'aide de la commande pipx install --include-deps ansible



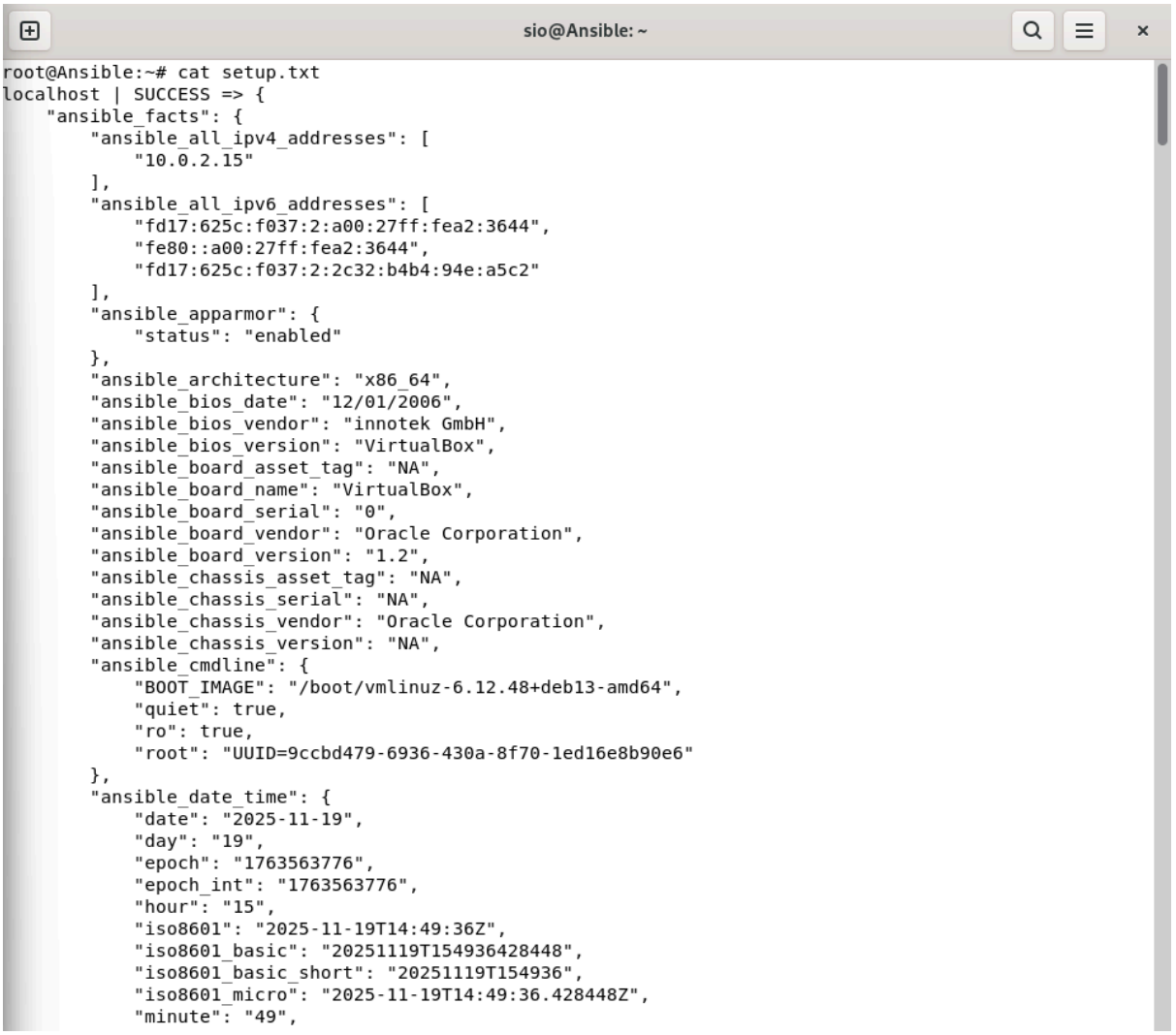
▪ Nous effectuons la commande ansible –version afin de savoir quelle version d'ansible est utilisée



2. Premier module avec Ansible

▪ Collecte de toutes les informations système de la machine locale avec Ansible pour ensuite les enregistrer dans un fichier .txt à l'aide de la commande : ansible -m setup localhost > setup.txt

▪ Affichage du contenu du fichier .txt



```
        "type": "ether"
    },
    "ansible_default_ipv6": {
        "address": "fd17:625c:f037:2:2c32:b4b4:94e:a5c2",
        "gateway": "fe80::2",
        "interface": "enp0s3",
        "macaddress": "08:00:27:a2:36:44",
        "mtu": 1500,
        "prefix": "64",
        "scope": "global",
        "type": "ether"
    },
    "ansible_device_links": {
        "ids": {
            "sda": [
                "ata-VBOX_HARDDISK_VB0bad951a-667206e4"
            ],
            "sda1": [
                "ata-VBOX_HARDDISK_VB0bad951a-667206e4-part1"
            ],
            "sda2": [
                "ata-VBOX_HARDDISK_VB0bad951a-667206e4-part2"
```

3. Aide et documentation officielle

3.1. Ansible-doc setup

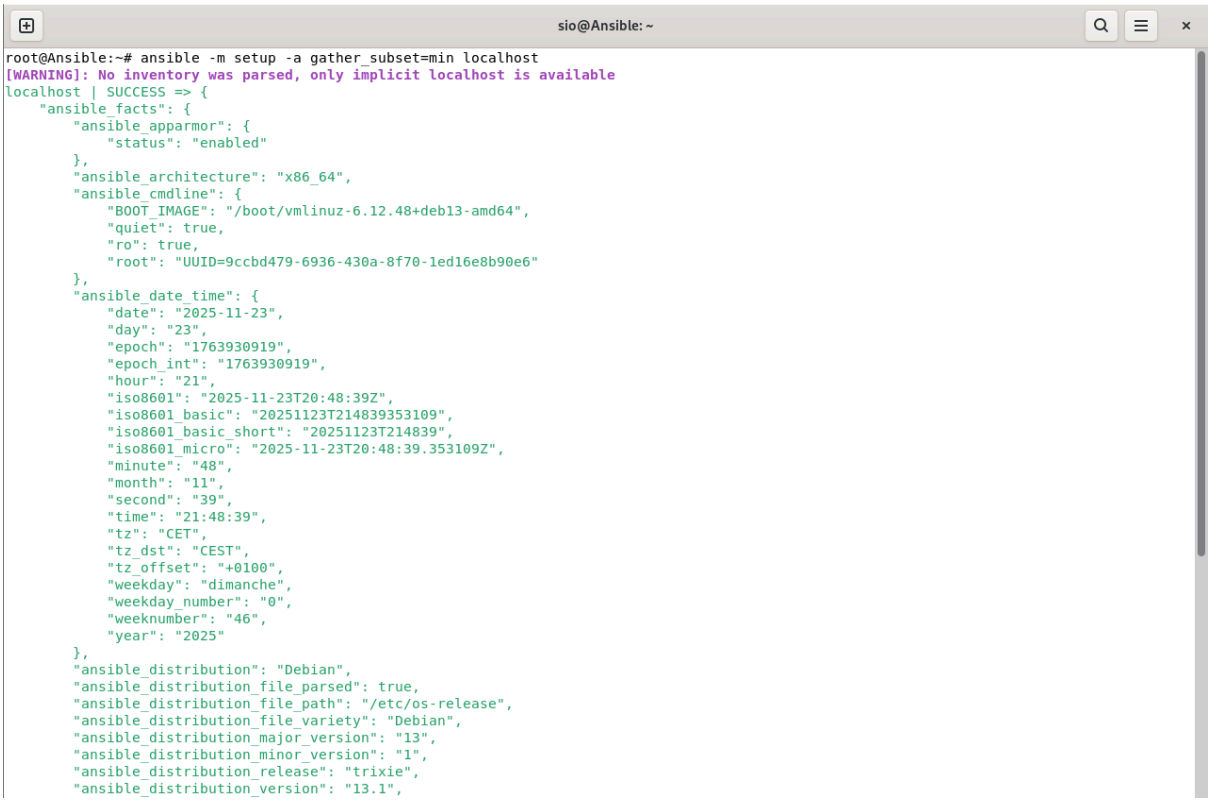
▪Affichage de la documentation officielle

```
sio@Ansible: ~
root@Ansible:~# ansible-doc setup
```

```
sio@Ansible: ~
> MODULE ansible.builtin.setup (/root/.local/share/pipx/venvs/ansible/lib/python3.13/site-packages/ansible/modules/setup.py)

  This module is automatically called by playbooks to gather useful variables about remote hosts that can be
  used in playbooks. It can also be executed directly by `/usr/bin/ansible' to check what variables
  are available to a host. Ansible provides many facts about the system, automatically.
  This module is also supported for Windows targets.

OPTIONS (red indicates it is required):

    fact_path  Path used for local ansible facts (`*.fact') - files in this dir will be run (if
               executable) and their results be added to `ansible_local' facts. If a file is not
               executable it is read instead. File/results format can be JSON or INI-format. The default
               `fact_path' can be specified in `ansible.cfg' for when setup is automatically called as
               part of `gather_facts'. NOTE - For windows clients, the results will be added to a
               variable named after the local file (without extension suffix), rather than
               `ansible_local'.
               Since Ansible 2.1, Windows hosts can use `fact_path'. Make sure that this path exists on the
               target host. Files in this path MUST be PowerShell scripts `.ps1' which outputs an
               object. This object will be formatted by Ansible as json so the script should be outputting a raw
               hashtable, array, or other primitive object.
         default: /etc/ansible/facts.d
         type: path

    filter  If supplied, only return facts that match one of the shell-style (fnmatch) pattern. An empty list
            basically means 'no filter'. As of Ansible 2.11, the type has changed from string to list and the
            default has became an empty list. A simple string is still accepted and works as a single pattern.
            The behaviour prior to Ansible 2.11 remains.
         default: []
         elements: str
         type: list
```

```
sio@Ansible: ~
    gather_subset  If supplied, restrict the additional facts collected to the given subset. Possible values:
                   `all', `all_ipv4_addresses', `all_ipv6_addresses', `apparmor', `architecture', `caps',
                   `chroot',`cmdline', `date_time', `default_ipv4', `default_ipv6', `devices', `distribution',
                   `distribution_major_version', `distribution_release', `distribution_version', `dns',
                   `effective_group_ids', `effective_user_id', `env', `facter', `fips', `hardware', `interfaces',
                   `is_chroot', `iscsi', `kernel', `local', `lsb', `machine', `machine_id', `mounts', `network',
                   `ohai', `os_family', `pkg_mgr', `platform', `processor', `processor_cores', `processor_count',
                   `python', `python_version', `real_user_id', `selinux', `service_mgr',
                   `ssh_host_key_dsa_public', `ssh_host_key_ecdsa_public', `ssh_host_key_ed25519_public',
                   `ssh_host_key_rsa_public', `ssh_host_pub_keys', `ssh_pub_keys', `system',
                   `system_capabilities', `system_capabilities_enforced', `systemd', `user', `user_dir',
                   `user_gecos', `user_gid', `user_id', `user_shell', `user_uid', `virtual',
                   `virtualization_role', `virtualization_type'. Can specify a list of values to specify a larger
                   subset. Values can also be used with an initial `!' to specify that that specific
                   subset should not be collected.  For instance: `!hardware,!network,!virtual,!ohai,!facter'. If
                   `!all' is specified then only the min subset is collected. To avoid collecting even the min
                   subset, specify `!all,!min'. To collect only specific facts, use `!all,!min', and specify the
:...skipping...
> MODULE ansible.builtin.setup (/root/.local/share/pipx/venvs/ansible/lib/python3.13/site-packages/ansible/modules/setup.py)

  This module is automatically called by playbooks to gather useful variables about remote hosts that can be
  used in playbooks. It can also be executed directly by `/usr/bin/ansible' to check what variables
  are available to a host. Ansible provides many facts about the system, automatically.
  This module is also supported for Windows targets.
```

▪ Collecte du minimum d'informations système sur la machine :

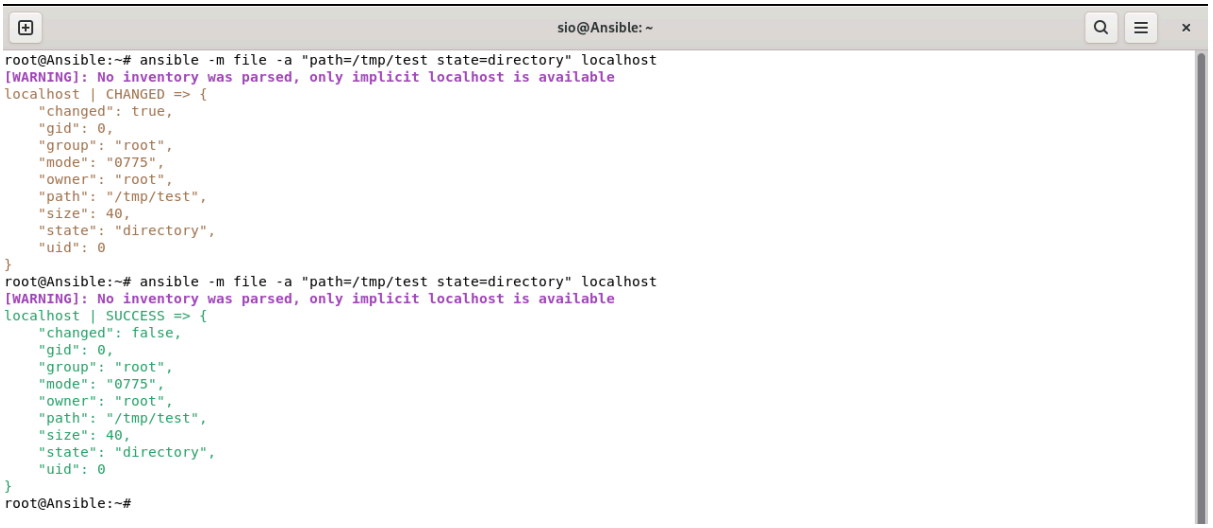


3.2. Documentation officielle

https://docs.ansible.com/

4. Idempotence : exemple avec gestion des répertoires

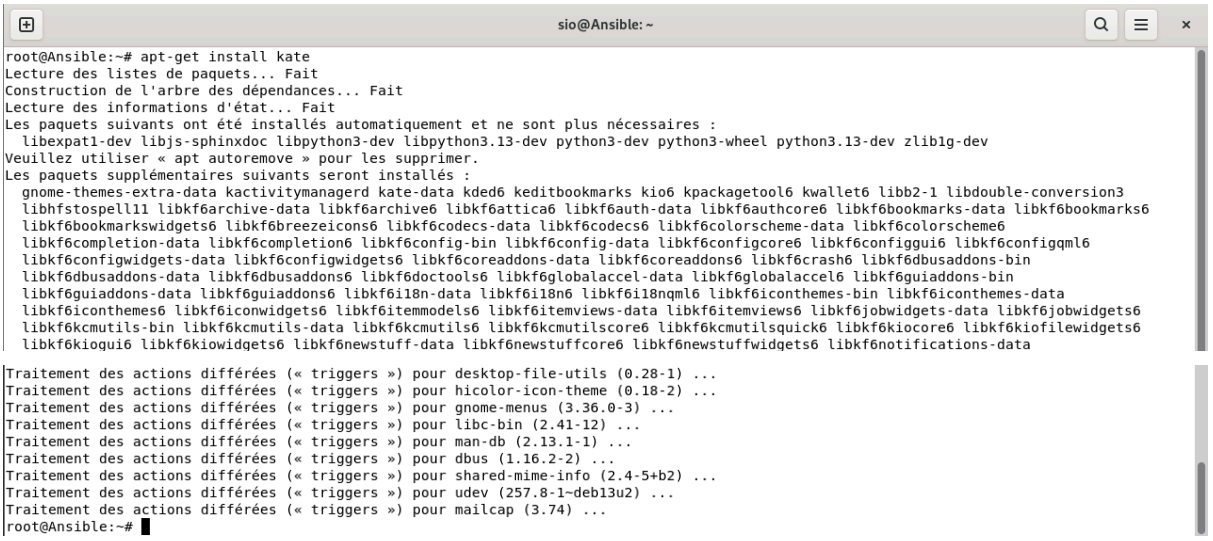
- Création du répertoire /tmp/test :



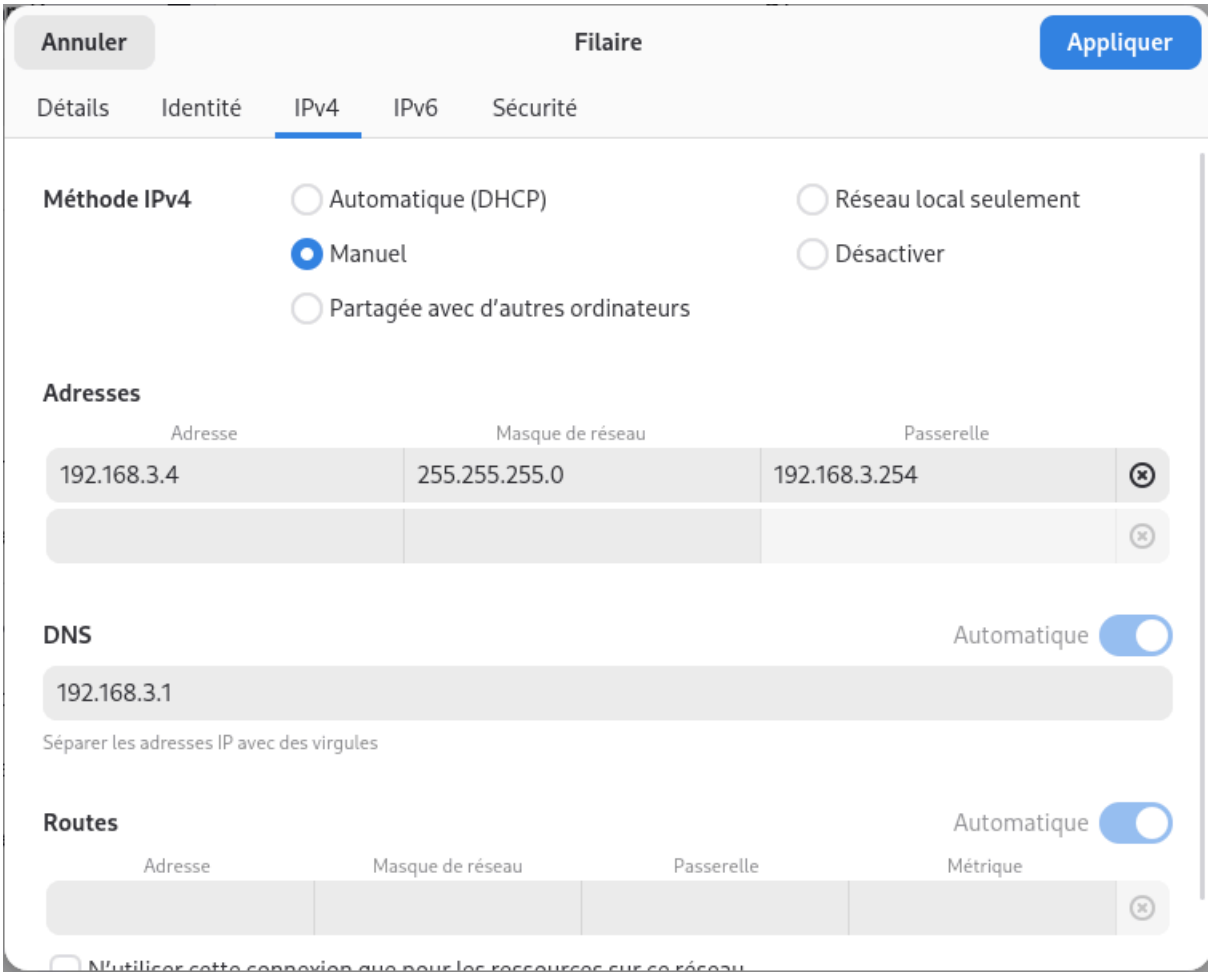
- Ajout des permissions de lecture, écriture et éxecution :

5. Création d'un fichier d'inventaire

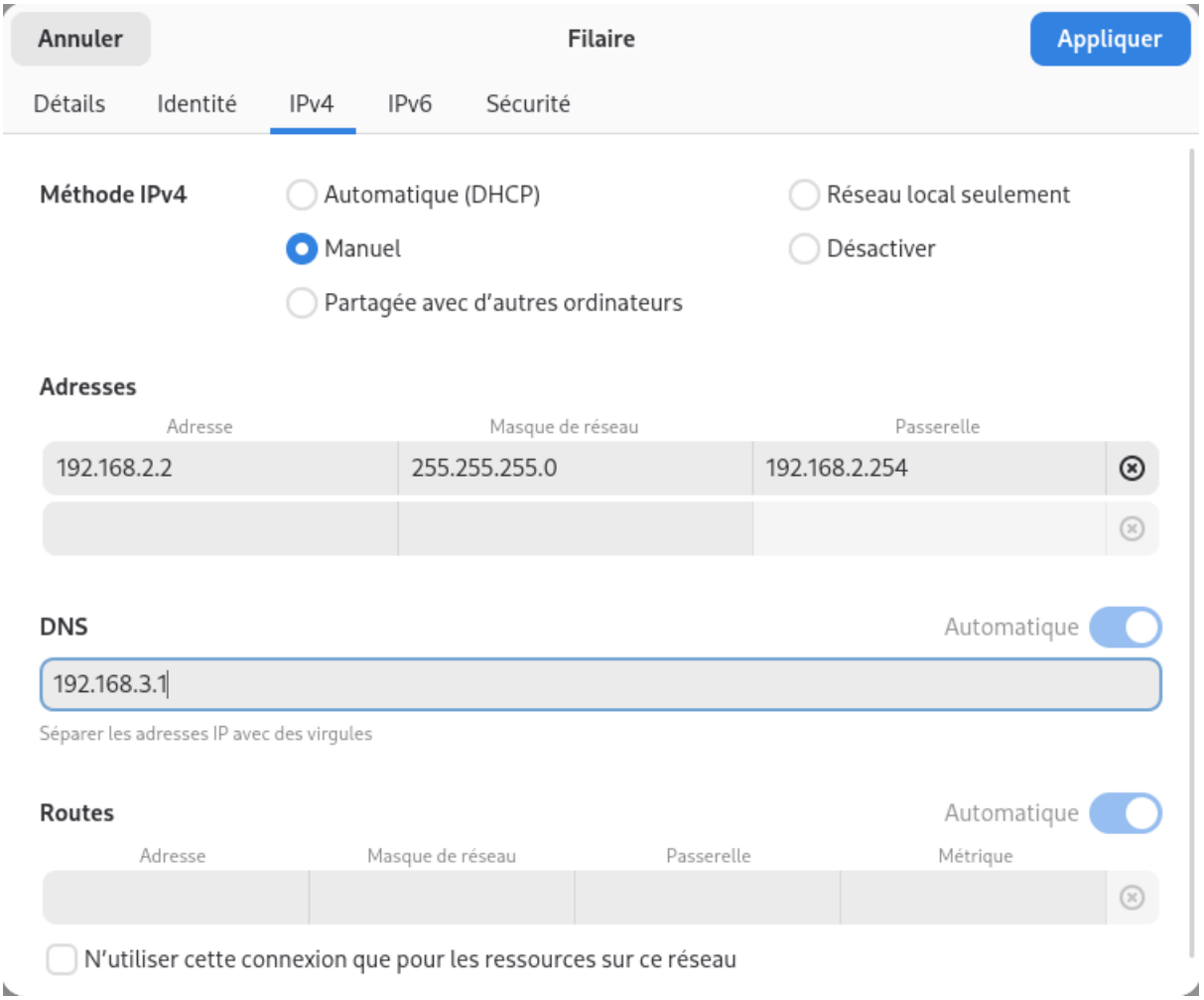
- Installation du module Kate



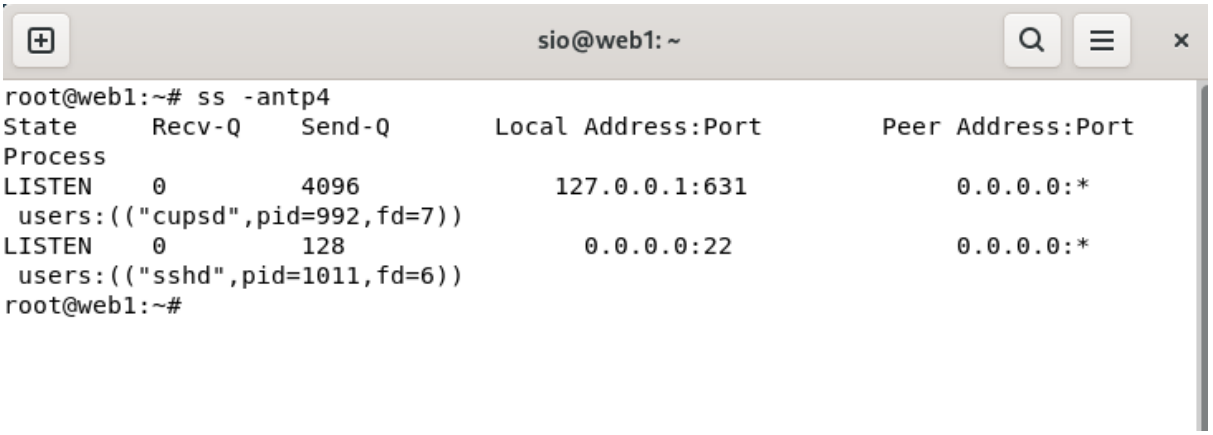
- VM Ansible : Réseau interne LAN



- VM web1 (clone Debian13) : Réseau interne DMZ

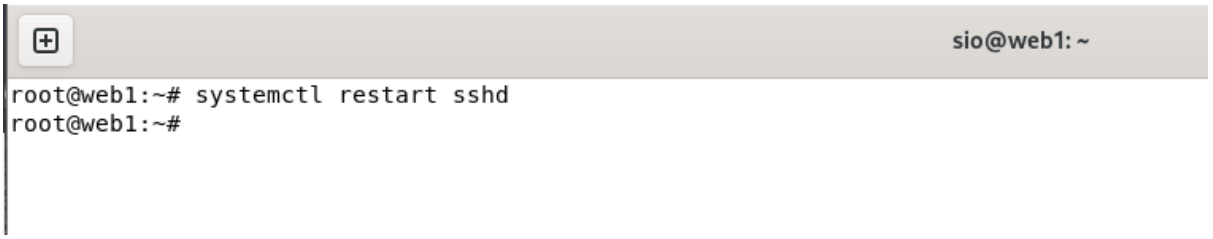


▪ Affichage des connexions réseau avec les processus associés

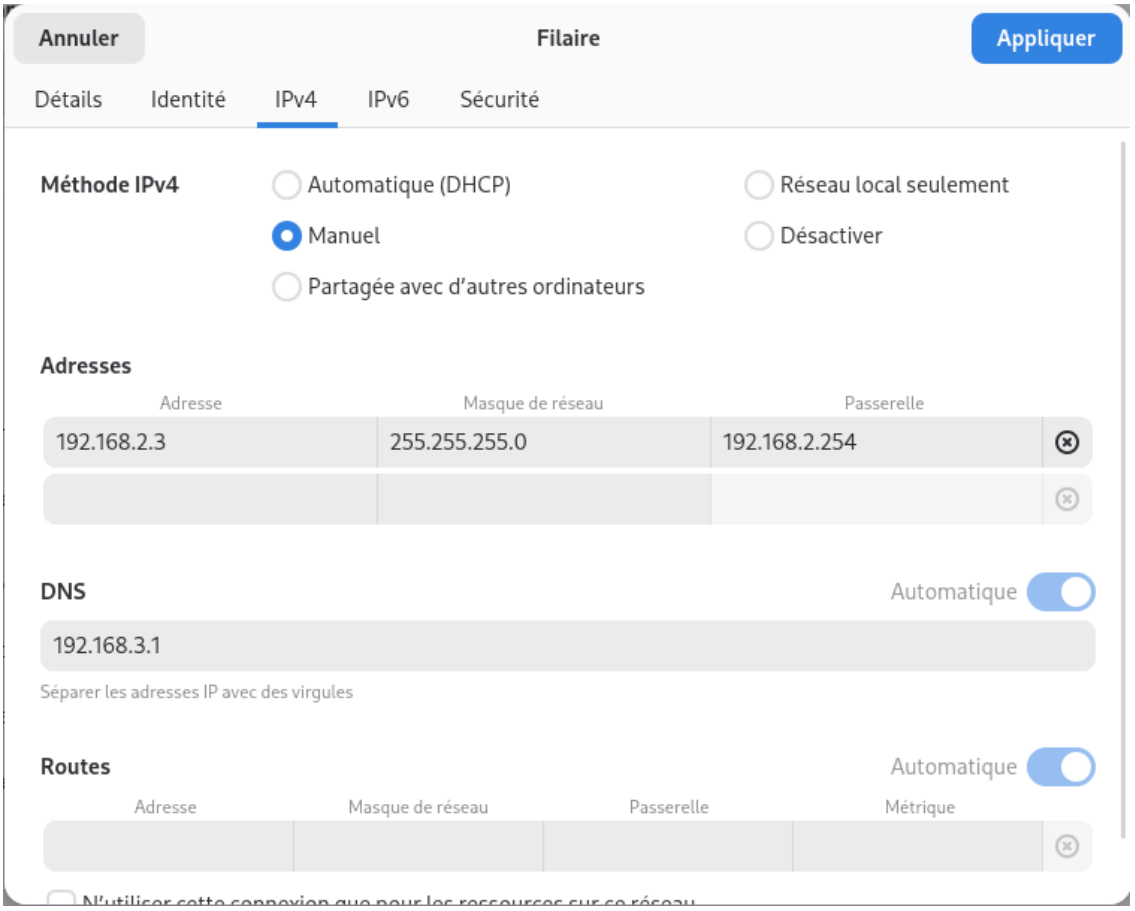


▪ Permission de l'accès ssh en décommentant la ligne "#PermitRootLogin"

▪ Redémarrage du service sshd



▪ VM bdd1 (clone Debian13) : Réseau interne DMZ



sio@bdd1: ~

```
root@bdd1:~# ss -antp4
State      Recv-Q     Send-Q         Local Address:Port          Peer Address:Port
Process
LISTEN     0          128                  0.0.0.0:22                 0.0.0.0:*
 users:(("sshd",pid=1009,fd=6))
LISTEN     0          4096               127.0.0.1:631                0.0.0.0:*
 users:(("cupsd",pid=995,fd=7))
root@bdd1:~#
```

sio@bdd1: ~

```
 GNU nano 8.4                  /etc/ssh/sshd_config

# Authentication:

#LoginGraceTime 2m
PermitRootLogin yes
#StrictModes yes
#MaxAuthTries 6
#MaxSessions 10

#PubkeyAuthentication yes
```

sio@bdd1: ~

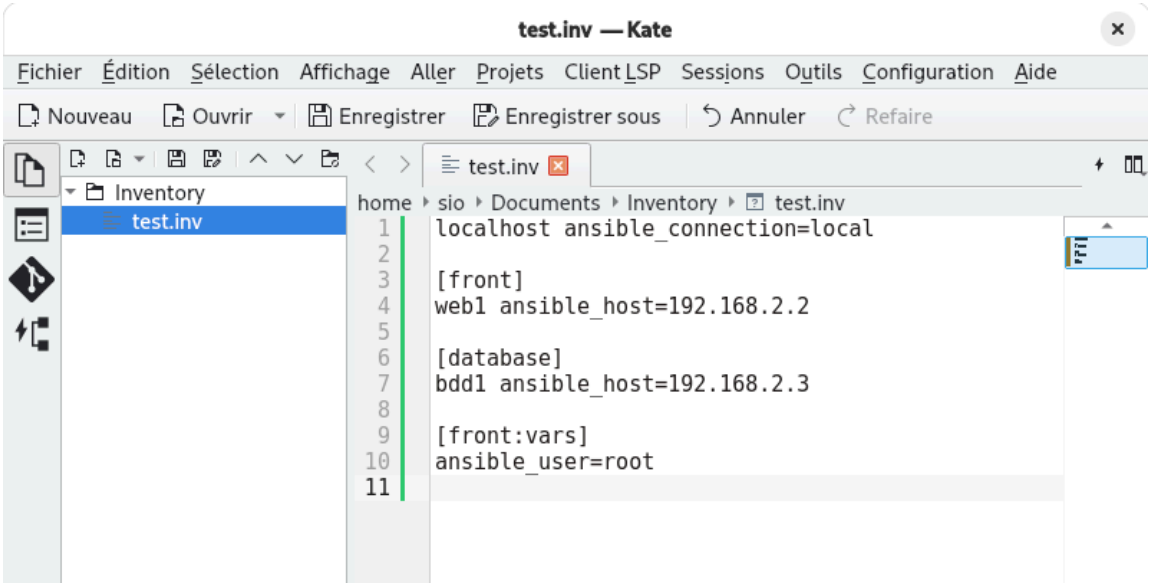
```
root@bdd1:~# systemctl restart sshd
root@bdd1:~#
```

▪ Fichier d'inventaire au format INI :

sio@Ansible: ~

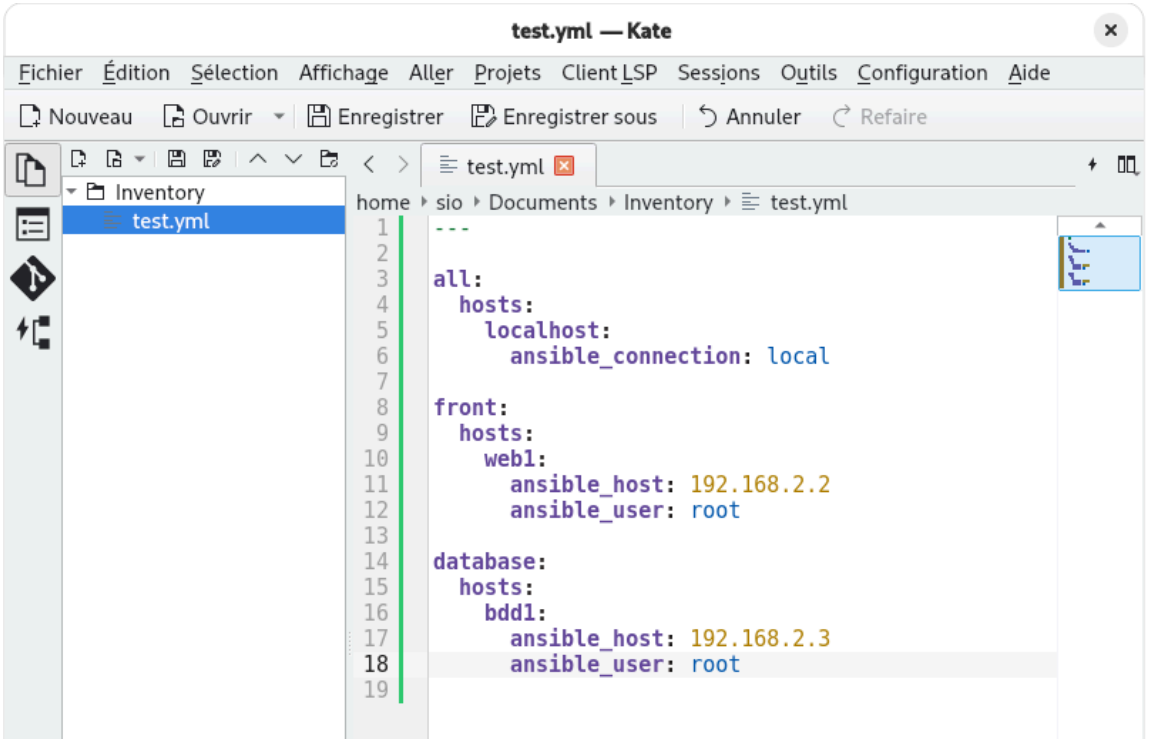
```
root@Ansible:~# cd /home/sio/Documents
root@Ansible:/home/sio/Documents# mkdir Inventory
root@Ansible:/home/sio/Documents# ls
Inventory
root@Ansible:/home/sio/Documents#
```

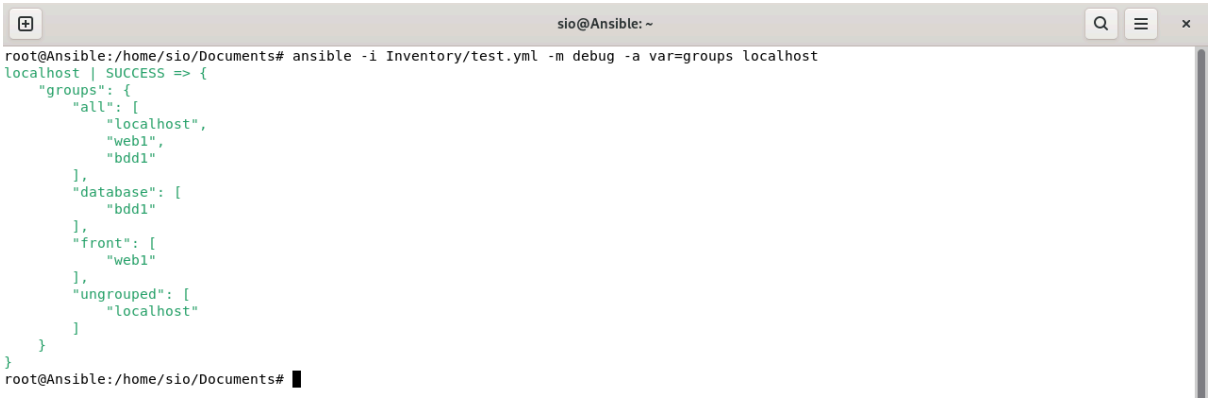
- Sur Kate, définition des hôtes que Ansible va gérer



- Exécution du script

▪ Fichier d'inventaire au format YAML :

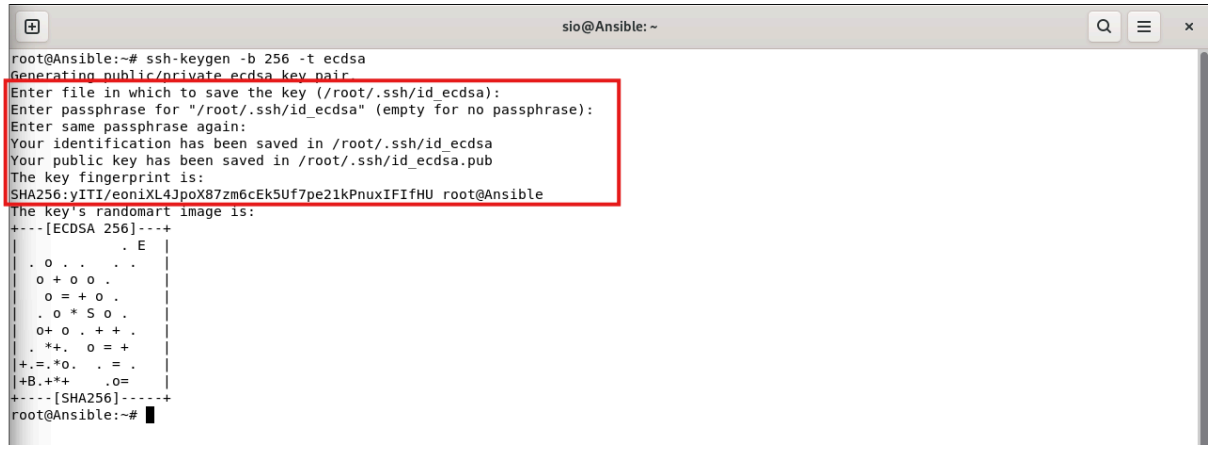




6. Connexion aux serveurs avec le protocole SSH

▪ Nous générons une paire de clé ssh de type ecdsa :

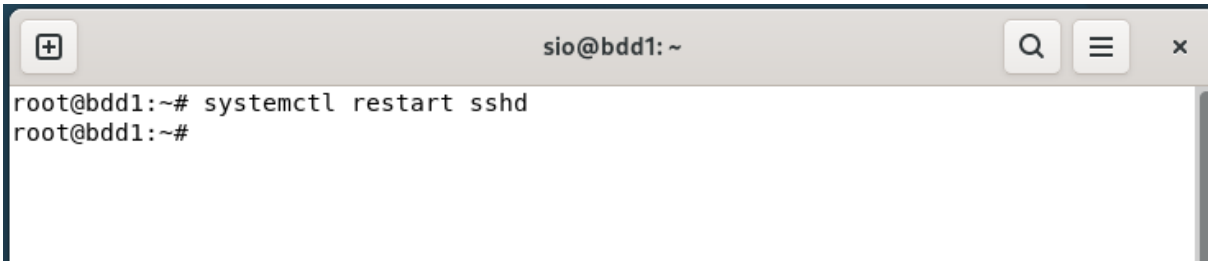
- MaPassPhrase comme passphrase



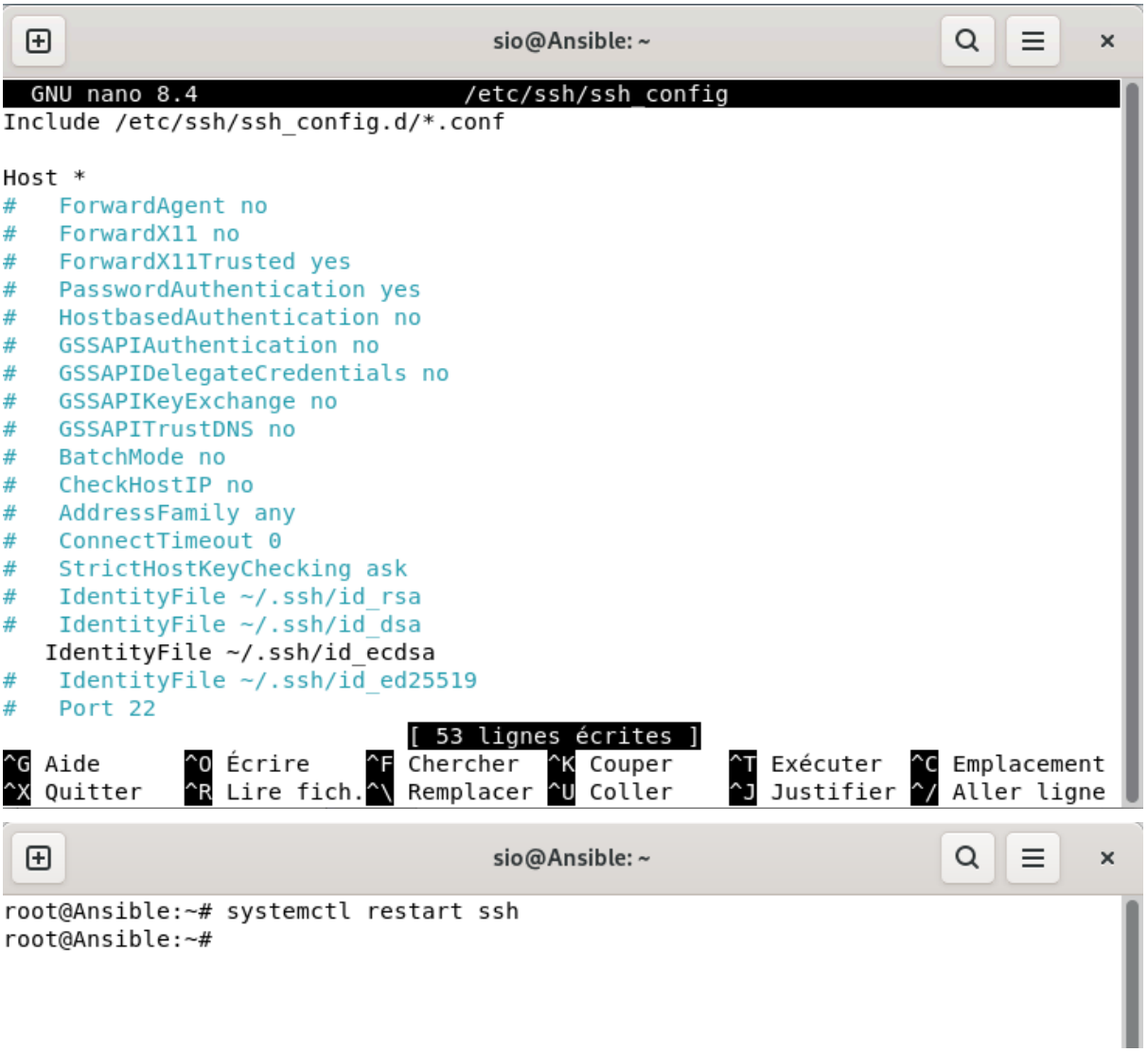
▪ Nous vérifions que les paires de clés privée ainsi que la paire de clé publique ont bien été générées

▪ Sur les deux serveurs SSH web1 et bdd1, nous décommentons les lignes PubkeyAuthentication yes et AuthorizedKeysFile dans le fichier de configuration du démon SSH : /etc/ssh/sshd_config :


```
root@web1:~# systemctl restart sshd
root@web1:~#
```



▪ Sur le client SSH Ansible, nous enlevons le # de commentaire dans le fichier de configuration du client ssh IdentityFile … :



Il s'agit maintenant d'envoyer, depuis le client SSH Ansible, la clé publique id_ecdsa.pub aux deux serveurs SSH web-1 et bdd-1.
Plutôt que de se servir de la commande scp et d'ajouter ensuite sur le serveur SSH web-1 la clé
publique du client SSH au fichier authorized_keys (ou bien de réaliser un simple copier/coller permis
par les additions invité), vous allez utiliser la commande spéciale ssh-copy-id. Le mot de passe du
compte root du serveur vous est demandé (c'est la dernière fois) :

▪ Nous envoyons la clé publique aux deux serveurs web1 et bdd1 à l'aide de la commande ssh :

```
sio@Ansible: ~
root@Ansible:~# ssh-copy-id -i .ssh/id_ecdsa.pub root@192.168.2.2
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: ".ssh/id_ecdsa.pub"
The authenticity of host '192.168.2.2 (192.168.2.2)' can't be established.
ED25519 key fingerprint is SHA256:VGQShOWT3H8BYmK+RUPxe516LgXCR/mBXvVOETmonwM.
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
root@192.168.2.2's password:

Number of key(s) added: 1

Now try logging into the machine, with: "ssh -i .ssh/id_ecdsa 'root@192.168.2.2'"
and check to make sure that only the key(s) you wanted were added.

root@Ansible:~#
```

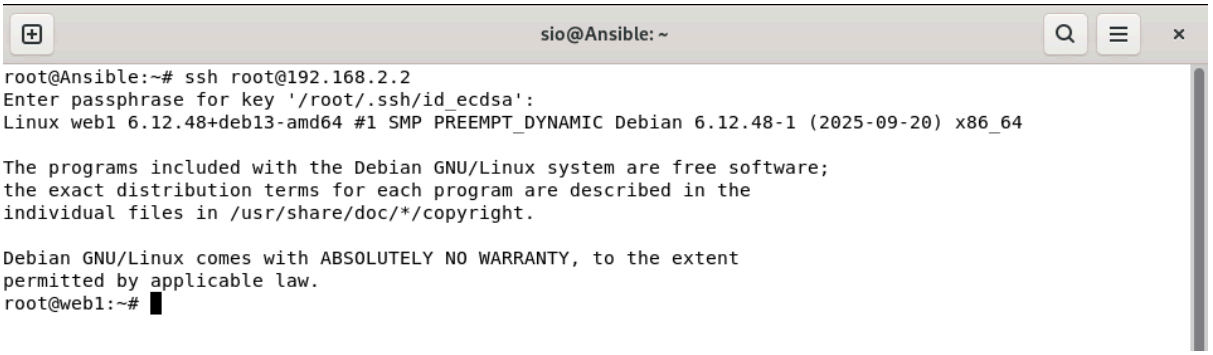
```
sio@Ansible: ~
root@Ansible:~# ssh-copy-id -i .ssh/id_ecdsa.pub root@192.168.2.3
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: ".ssh/id_ecdsa.pub"
The authenticity of host '192.168.2.3 (192.168.2.3)' can't be established.
ED25519 key fingerprint is SHA256:VGQShOWT3H8BYmK+RUPxe516LgXCR/mBXvVOETmonwM.
This host key is known by the following other names/addresses:
    ~/.ssh/known_hosts:1: [hashed name]
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
root@192.168.2.3's password:

Number of key(s) added: 1

Now try logging into the machine, with: "ssh -i .ssh/id_ecdsa 'root@192.168.2.3'"
and check to make sure that only the key(s) you wanted were added.

root@Ansible:~#
```

▪ Vérification que les deux serveurs aient bien reçu la paire de clé publique :

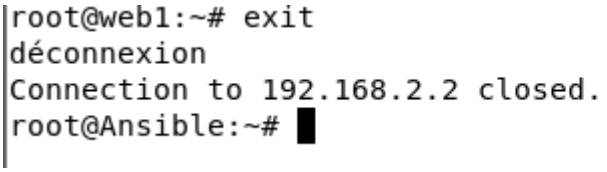
```
sio@web1: ~
root@web1:~# cd .ssh/
root@web1:~/.ssh# ls -l
total 4
-rw------- 1 root root 174 26 nov.  12:44 authorized_keys
root@web1:~/.ssh# cat authorized_keys
ecdsa-sha2-nistp256 AAAAE2VjZHNhLXNoYTItbmlzdHAyNTYAAAAIbmlzdHAyNTYAAABBBJHh3v1EPhOqMlrgTsv7qbUNJD3h8F9x
985LsDQ9zkB+MV7qdhr6AMrPQJk39cEZDRMSwHGV1ZXqd1ikorYlfCI= root@Ansible
root@web1:~/.ssh#
```

```
sio@bdd1: ~
root@bdd1:~# cd .ssh/
root@bdd1:~/.ssh# ls -l
total 4
-rw------- 1 root root 174 26 nov.  13:01 authorized_keys
root@bdd1:~/.ssh# cat authorized_keys
ecdsa-sha2-nistp256 AAAAE2VjZHNhLXNoYTItbmlzdHAyNTYAAAAIbmlzdHAyNTYAAABBBJHh3v1EPhOqMlrgTsv7qbUNJD3h8F9x
985LsDQ9zkB+MV7qdhr6AMrPQJk39cEZDRMSwHGV1ZXqd1ikorYlfCI= root@Ansible
root@bdd1:~/.ssh#
```

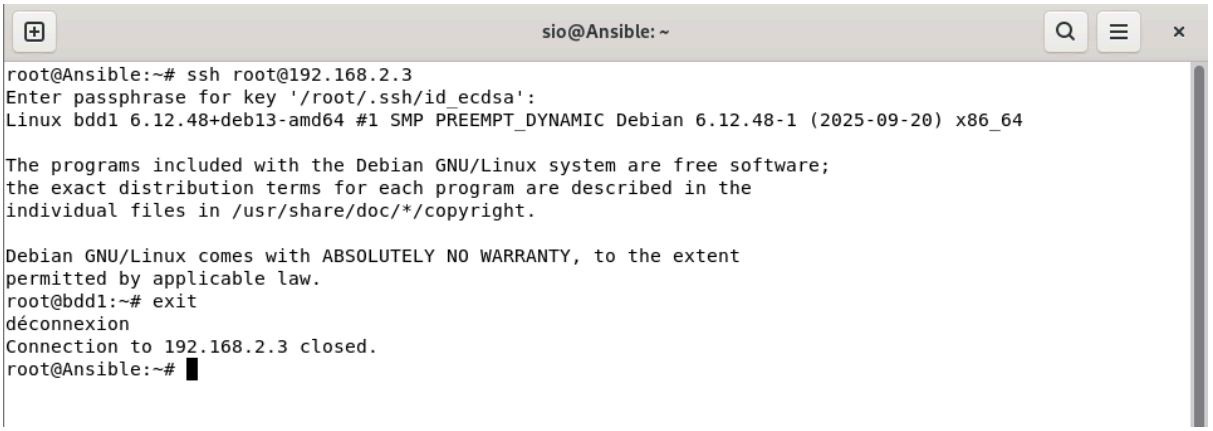
▪ Pour vérifier le bon fonctionnement de l'authentification par clés, nous nous connectons ensuite à partir du client SSH Ansible au serveur SSH web-1.



▪ Nous terminons la session SSH sur le client Ansible en saisissant exit.

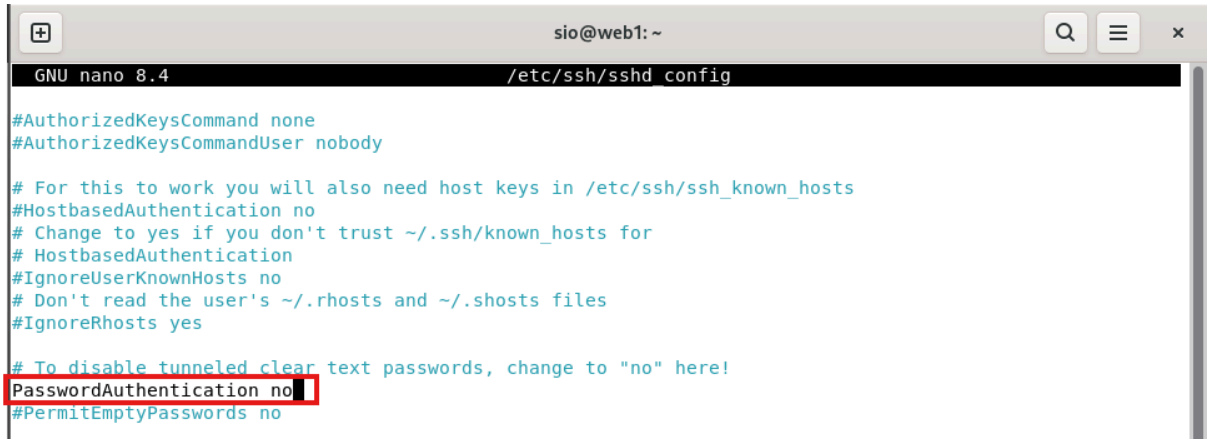


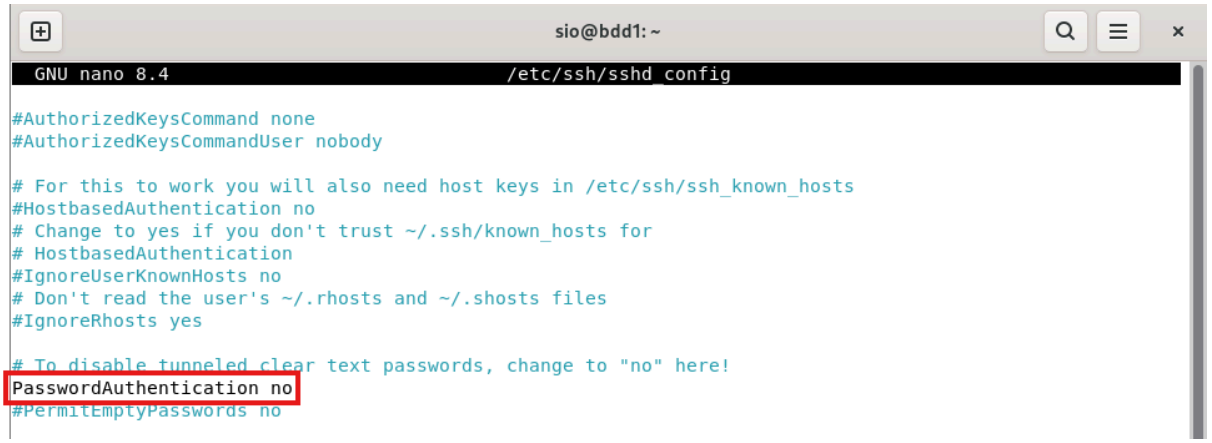
▪ Nous testons également la connexion au serveur ssh bdd-1 et nous terminons la session en saisissant exit.



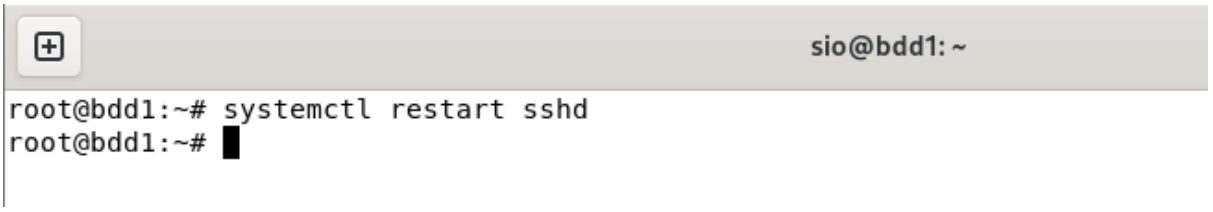
▪ Sur les deux serveurs SSH web-1 et bdd-1, nous désactivons l'authentification par mot de passe pour juste :

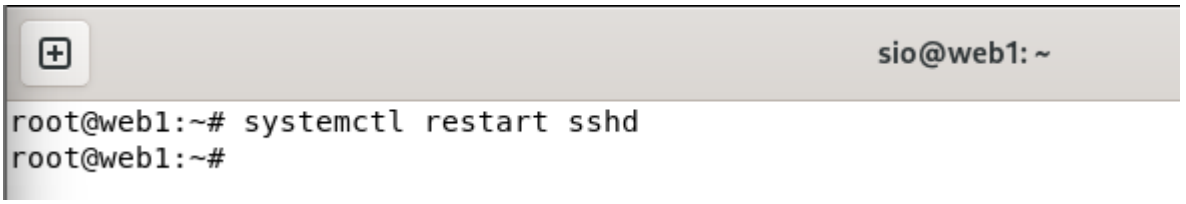
- Nous décommentons pour ce faire la directive PasswordAuthentication et nous lui affectons le paramètre no.



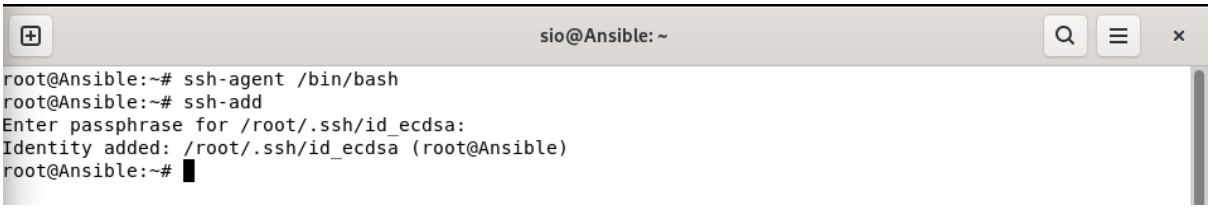


▪ Nous redémarrons ensuite sur chaque machine le service SSH pour que la modification du fichier soit prise en compte.



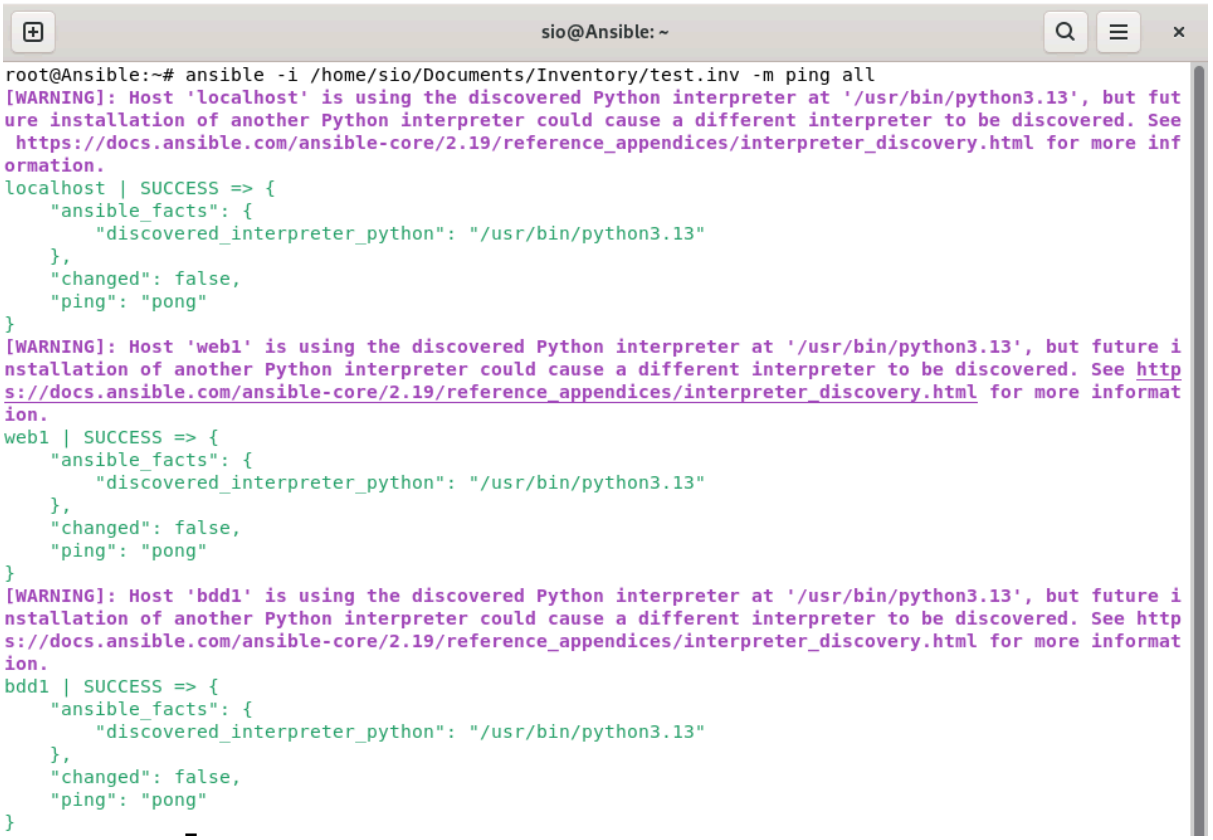


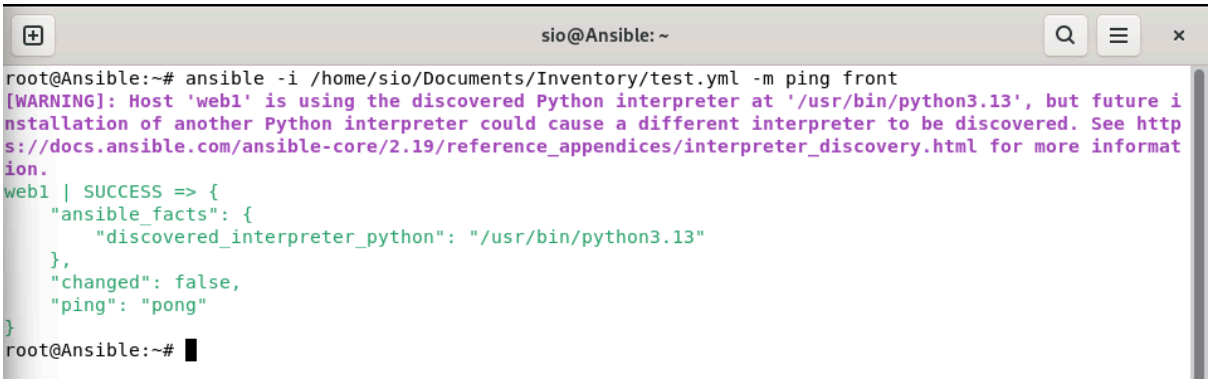
▪ Activation de l’agent SSH sur le client SSH Ansible en saisissant les commandes ssh-agent /bin/bash et ssh-add.



7. Test de communication avec le module ping

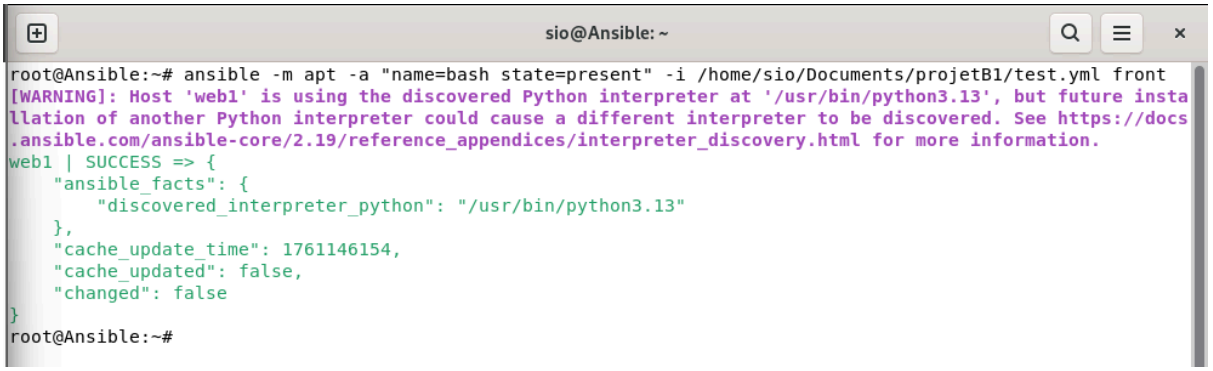
Nous réalisons le test de communication avec les machines de l'inventaire :



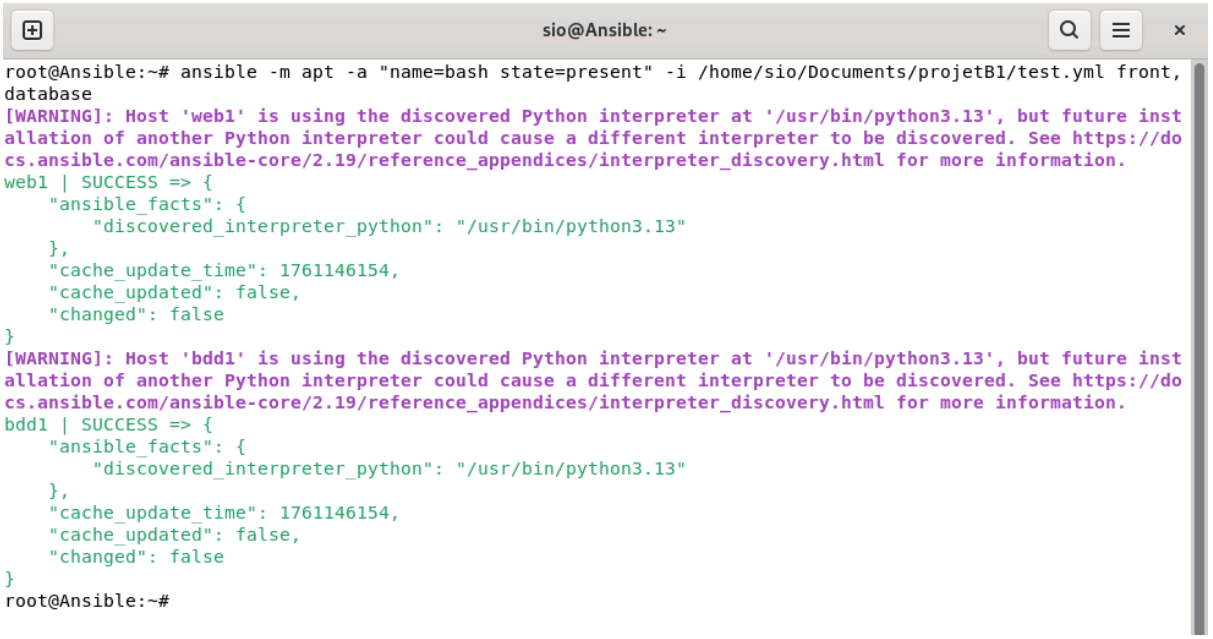


8. Installation d’un serveur Apache

Nous nous assurons de la présence d’un paquet :



- Si distribution différente :



- Installation du serveur Apache sur les machines du groupe front :

sio@Ansible: ~

```
root@Ansible:~# ansible -i /home/sio/Documents/projetB1/test.yml -m apt -a "name=apache2 state=present" front
[WARNING]: Host 'web1' is using the discovered Python interpreter at '/usr/bin/python3.13', but future installation of another Python interp
reter could cause a different interpreter to be discovered. See https://docs.ansible.com/ansible-core/2.19/reference_appendices/interpreter_
discovery.html for more information.
web1 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3.13"
    },
    "cache_update_time": 1761146154,
    "cache_updated": false,
    "changed": true,
    "stderr": "",
    "stderr_lines": [],
    "stdout": "Reading package lists...\nBuilding dependency tree...\nReading state information...\nThe following additional packages will b
e installed:\n  apache2-data apache2-utils\nSuggested packages:\n  apache2-doc apache2-suexec-pristine | apache2-suexec-custom ufw\nThe foll
owing NEW packages will be installed:\n  apache2 apache2-data apache2-utils\n0 upgraded, 3 newly installed, 0 to remove and 0 not upgraded.\
nNeed to get 599 kB of archives.\nAfter this operation, 1914 kB of additional disk space will be used.\nGet:1 http://deb.debian.org/debian t
rixie/main amd64 apache2-data all 2.4.65-2 [160 kB]\nGet:2 http://deb.debian.org/debian trixie/main amd64 apache2-utils amd64 2.4.65-2 [215
kB]\nGet:3 http://deb.debian.org/debian trixie/main amd64 apache2 amd64 2.4.65-2 [224 kB]\nFetched 599 kB in 11s (53.2 kB/s)\nSelecting prev
iously unselected package apache2-data.\r\n(Reading database ... \r(Reading database ... 5%\r(Reading database ... 10%\r(Reading database ..
. 15%\r(Reading database ... 20%\r(Reading database ... 25%\r(Reading database ... 30%\r(Reading database ... 35%\r(Reading database ... 40%
\r(Reading database ... 45%\r(Reading database ... 50%\r(Reading database ... 55%\r(Reading database ... 60%\r(Reading database ... 65%\r(Re
ading database ... 70%\r(Reading database ... 75%\r(Reading database ... 80%\r(Reading database ... 85%\r(Reading database ... 90%\r(Reading
 database ... 95%\r(Reading database ... 100%\r(Reading database ... 164926 files and directories currently installed.)\r\nPreparing to unpa
ck .../apache2-data_2.4.65-2_all.deb ...\r\nUnpacking apache2-data (2.4.65-2) ...\r\nSelecting previously unselected package apache2-utils.\
r\nPreparing to unpack .../apache2-utils_2.4.65-2_amd64.deb ...\r\nUnpacking apache2-utils (2.4.65-2) ...\r\nSelecting previously unselected
 package apache2.\r\nPreparing to unpack .../apache2_2.4.65-2_amd64.deb ...\r\nUnpacking apache2 (2.4.65-2) ...\r\nSetting up apache2-data (
2.4.65-2) ...\r\nSetting up apache2-utils (2.4.65-2) ...\r\nSetting up apache2 (2.4.65-2) ...\r\nEnabling module mpm_event.\r\nEnabling modu
le authz_core.\r\nEnabling module authz_host.\r\nEnabling module authn_core.\r\nEnabling module auth_basic.\r\nEnabling module access_compat
.\r\nEnabling module authn_file.\r\nEnabling module authz_user.\r\nEnabling module alias.\r\nEnabling module dir.\r\nEnabling module autoind
ex.\r\nEnabling module env.\r\nEnabling module mime.\r\nEnabling module negotiation.\r\nEnabling module setenvif.\r\nEnabling module filter.
\r\nEnabling module deflate.\r\nEnabling module status.\r\nEnabling module reqtimeout.\r\nEnabling conf charset.\r\nEnabling conf localized-
error-pages.\r\nEnabling conf other-vhosts-access-log.\r\nEnabling conf security.\r\nEnabling conf serve-cgi-bin.\r\nEnabling site 000-defau
lt.\r\nCreated symlink '/etc/systemd/system/multi-user.target.wants/apache2.service' → '/usr/lib/systemd/system/apache2.service'.\r\n\nCreat
ed symlink '/etc/systemd/system/multi-user.target.wants/apache-htcacheclean.service' → '/usr/lib/systemd/system/apache-htcacheclean.service'
.\r\r\nProcessing triggers for man-db (2.13.1-1) ...\r\n",
```

```
    "stdout_lines": [
        "Reading package lists...",
        "Building dependency tree...",
        "Reading state information...",
        "The following additional packages will be installed:",
        "  apache2-data apache2-utils",
        "Suggested packages:",
        "  apache2-doc apache2-suexec-pristine | apache2-suexec-custom ufw",
        "The following NEW packages will be installed:",
        "  apache2 apache2-data apache2-utils",
        "0 upgraded, 3 newly installed, 0 to remove and 0 not upgraded.",
        "Need to get 599 kB of archives.",
        "After this operation, 1914 kB of additional disk space will be used.",
        "Get:1 http://deb.debian.org/debian trixie/main amd64 apache2-data all 2.4.65-2 [160 kB]",
        "Get:2 http://deb.debian.org/debian trixie/main amd64 apache2-utils amd64 2.4.65-2 [215 kB]",
        "Get:3 http://deb.debian.org/debian trixie/main amd64 apache2 amd64 2.4.65-2 [224 kB]",
        "Fetched 599 kB in 11s (53.2 kB/s)",
        "Selecting previously unselected package apache2-data.",
        "(Reading database ... ",
        "(Reading database ... 5%",
        "(Reading database ... 10%",
        "(Reading database ... 15%",
        "(Reading database ... 20%",
        "(Reading database ... 25%",
        "(Reading database ... 30%",
        "(Reading database ... 35%",
        "(Reading database ... 40%",
        "(Reading database ... 45%",
        "(Reading database ... 50%",
        "(Reading database ... 55%",
        "(Reading database ... 60%",
        "(Reading database ... 65%",
        "(Reading database ... 70%",
        "(Reading database ... 75%",
        "(Reading database ... 80%",
        "(Reading database ... 85%",
        "(Reading database ... 90%",
        "(Reading database ... 95%",
        "(Reading database ... 100%",
```

```
        "(Reading database ... 164926 files and directories currently installed.)",
        "Preparing to unpack .../apache2-data_2.4.65-2_all.deb ...",
        "Unpacking apache2-data (2.4.65-2) ...",
        "Selecting previously unselected package apache2-utils.",
        "Preparing to unpack .../apache2-utils_2.4.65-2_amd64.deb ...",
        "Unpacking apache2-utils (2.4.65-2) ...",
        "Selecting previously unselected package apache2.",
        "Preparing to unpack .../apache2_2.4.65-2_amd64.deb ...",
        "Unpacking apache2 (2.4.65-2) ...",
        "Setting up apache2-data (2.4.65-2) ...",
        "Setting up apache2-utils (2.4.65-2) ...",
        "Setting up apache2 (2.4.65-2) ...",
        "Enabling module mpm_event.",
        "Enabling module authz_core.",
        "Enabling module authz_host.",
        "Enabling module authn_core.",
        "Enabling module auth_basic.",
        "Enabling module access_compat.",
        "Enabling module authn_file.",
        "Enabling module authz_user.",
        "Enabling module alias.",
        "Enabling module dir.",
        "Enabling module autoindex.",
        "Enabling module env.",
        "Enabling module mime.",
        "Enabling module negotiation.",
        "Enabling module setenvif.",
        "Enabling module filter.",
        "Enabling module deflate.",
        "Enabling module status.",
        "Enabling module reqtimeout.",
        "Enabling conf charset.",
        "Enabling conf localized-error-pages.",
        "Enabling conf other-vhosts-access-log.",
        "Enabling conf security.",
        "Enabling conf serve-cgi-bin.",
        "Enabling site 000-default.",
        "Created symlink '/etc/systemd/system/multi-user.target.wants/apache2.service' → '/usr/lib/systemd/system/apache2.service'.",
        "",
        "Created symlink '/etc/systemd/system/multi-user.target.wants/apache-htcacheclean.service' → '/usr/lib/systemd/system/apache-htcache
clean.service'.",
        "",
        "Processing triggers for man-db (2.13.1-1) ..."
    ]
}
root@Ansible:~#
```

- Création du fichier de configuration .ansible.cfg :

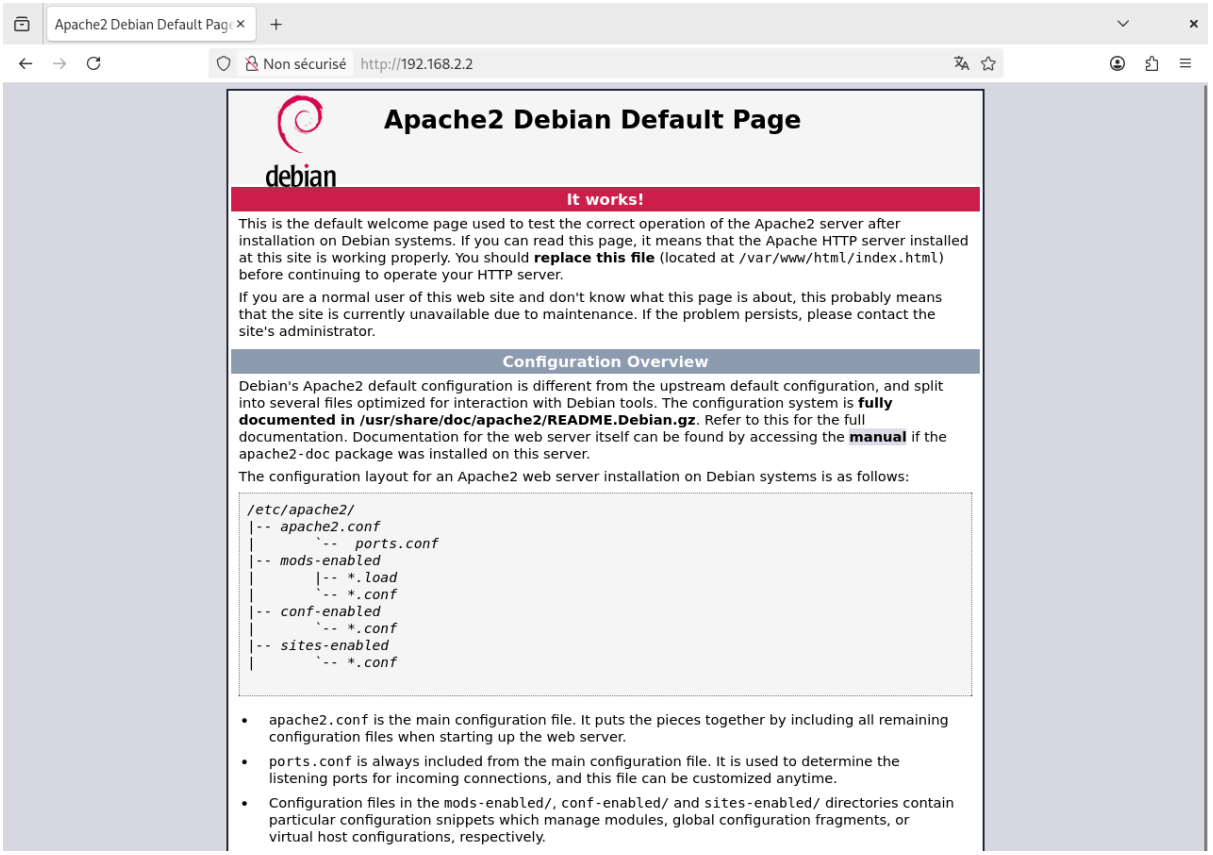
```
sio@Ansible: ~
  GNU nano 8.4                                    .ansible.cfg
[defaults]
interpreter_python=auto_silent
```

```
sio@Ansible: ~
root@Ansible:~# ansible -i /home/sio/Documents/projetB1/test.yml -m apt -a "name=apache2 state=present" front
web1 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3.13"
    },
    "cache_update_time": 1761146154,
    "cache_updated": false,
    "changed": false
}
root@Ansible:~#
```

Systemctl status apache2 sur la VM web-1 :

```
sio@web1: ~
root@web1:~# systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)
     Active: active (running) since Sun 2025-11-30 10:36:44 CET; 13min ago
 Invocation: 443776c3130444f3902ee4bb2cea18c9
       Docs: https://httpd.apache.org/docs/2.4/
   Main PID: 2213 (apache2)
      Tasks: 55 (limit: 4619)
     Memory: 6.9M (peak: 7M)
        CPU: 176ms
     CGroup: /system.slice/apache2.service
             ├─2213 /usr/sbin/apache2 -k start
             ├─2215 /usr/sbin/apache2 -k start
             └─2216 /usr/sbin/apache2 -k start

nov. 30 10:36:44 web1 systemd[1]: Starting apache2.service - The Apache HTTP Server...
nov. 30 10:36:44 web1 apachectl[2212]: AH00558: apache2: Could not reliably determine the server's fully qualified domain name, using 192.1
nov. 30 10:36:44 web1 systemd[1]: Started apache2.service - The Apache HTTP Server.
lines 1-17/17 (END)
```

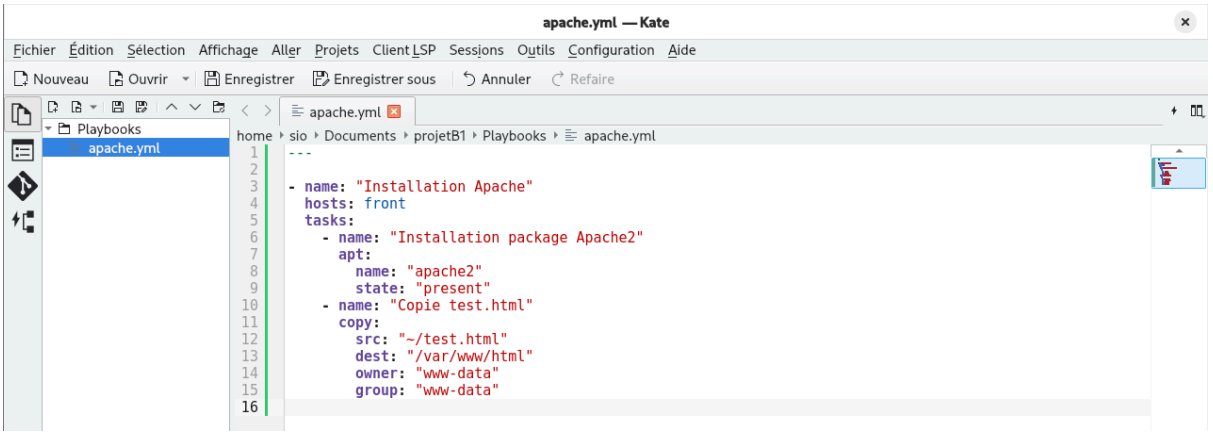
- Test depuis la VM Ansible :

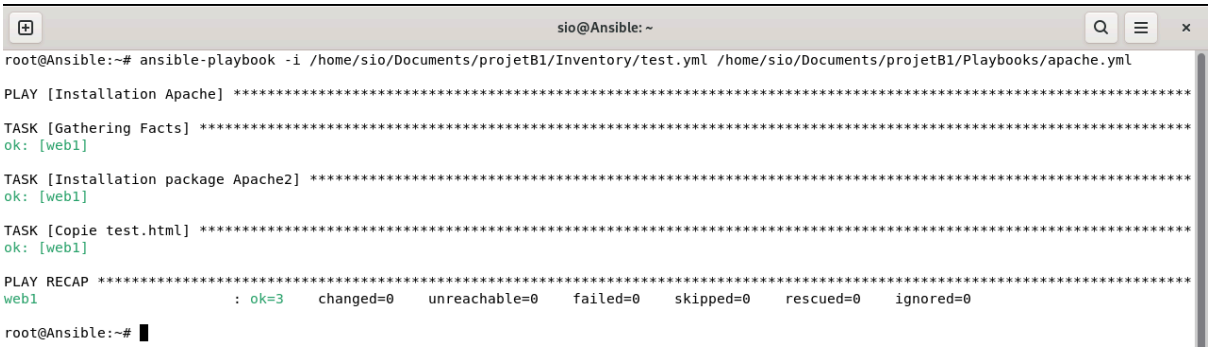


- Création de la page test.html pour la copier dans le répertoire de publication avec Ansible :

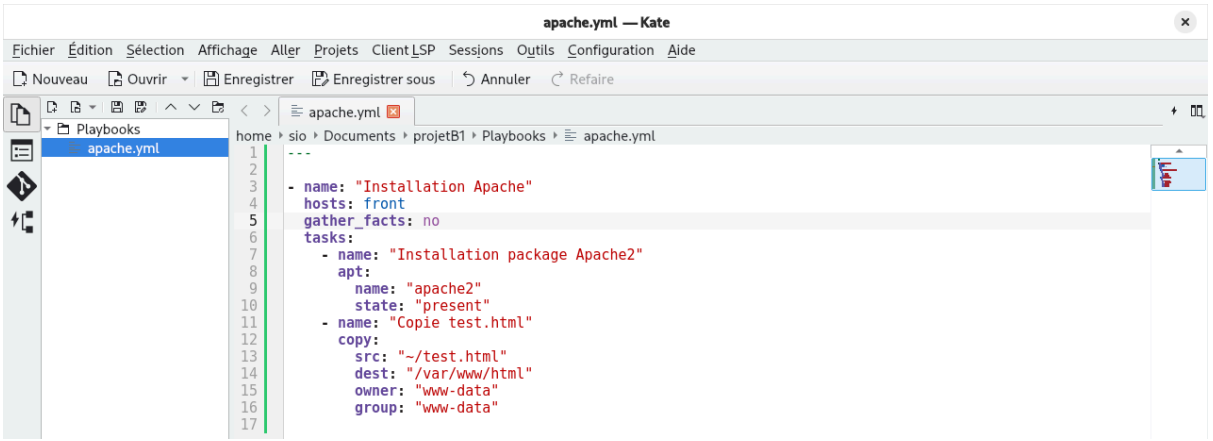
9. Premier playbook

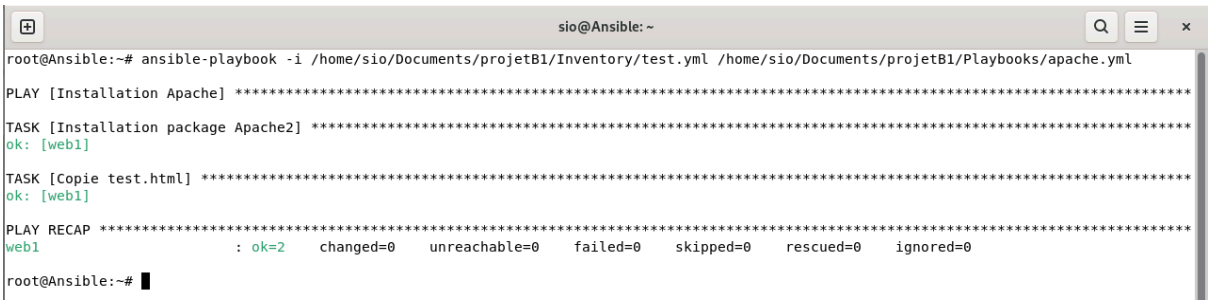
- Création du Playbook apache.yml :





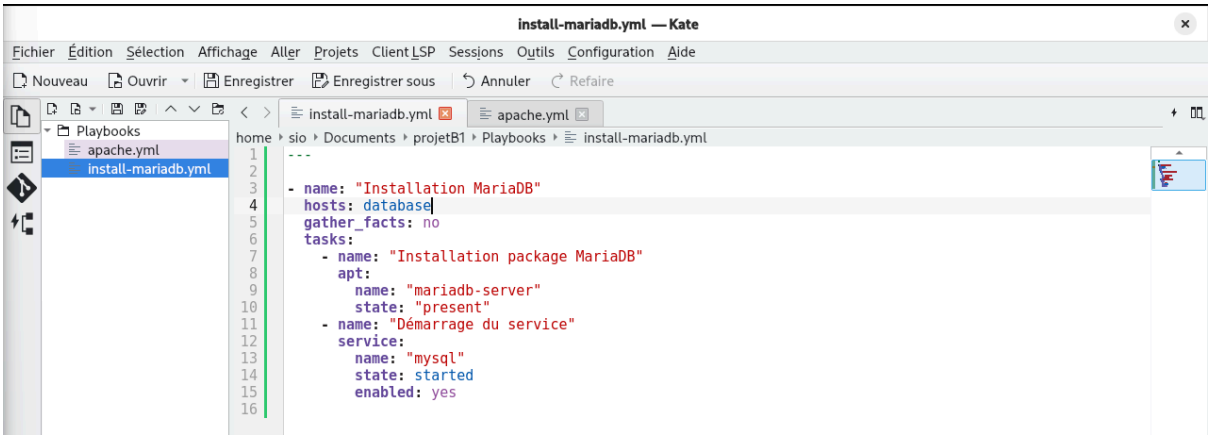
▪ Nous ajoutons le paramètre (gather_facts : no) afin de permettre la non récupération des informations concernant les machines :





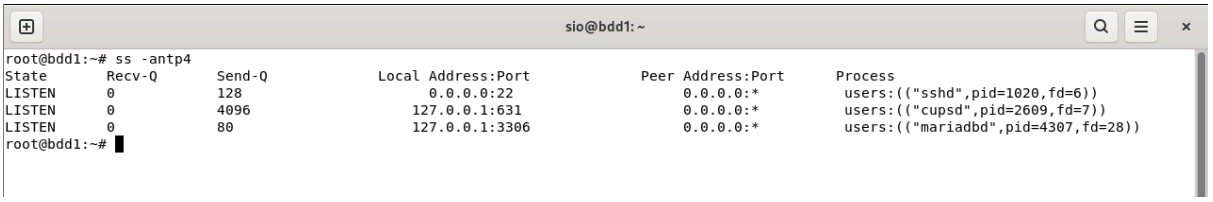
10. Installation d'un serveur MariaDB

▪ Installation du serveur MariaDB sur les machines du groupe database à partir du Playbook install-mariadb.yml :



▪ Vérification sur la VM bdd-1 :

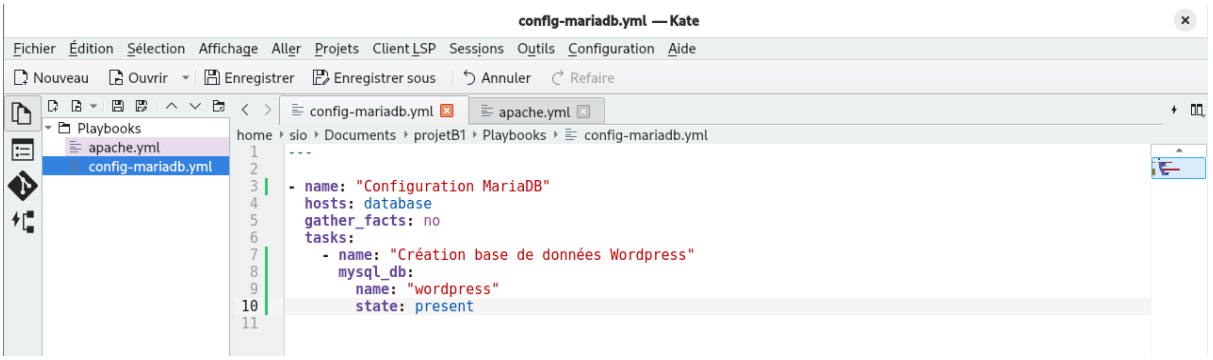
▪ Vérification sur la VM bdd-1 :



```
sio@bdd1: ~
root@bdd1:~# systemctl status mariadb
● mariadb.service - MariaDB 11.8.3 database server
     Loaded: loaded (/usr/lib/systemd/system/mariadb.service; enabled; preset: enabled)
     Active: active (running) since Sun 2025-11-30 11:36:04 CET; 2min 9s ago
 Invocation: 7ac4d4801f564b978665ff933291539a
       Docs: man:mariadbd(8)
             https://mariadb.com/kb/en/library/systemd/
   Main PID: 4307 (mariadbd)
     Status: "Taking your SQL requests now..."
      Tasks: 11 (limit: 30491)
     Memory: 123.6M (peak: 128.4M)
        CPU: 1.481s
     CGroup: /system.slice/mariadb.service
             └─4307 /usr/sbin/mariadbd

nov. 30 11:36:03 bdd1 mariadbd[4307]: 2025-11-30 11:36:03 0 [Note] Plugin 'wsrep-provider' is disabled.
nov. 30 11:36:03 bdd1 mariadbd[4307]: 2025-11-30 11:36:03 0 [Note] InnoDB: Buffer pool(s) load completed at 251130 11:36:03
nov. 30 11:36:04 bdd1 mariadbd[4307]: 2025-11-30 11:36:04 0 [Note] Server socket created on IP: '127.0.0.1', port: '3306'.
nov. 30 11:36:04 bdd1 mariadbd[4307]: 2025-11-30 11:36:04 0 [Note] mariadbd: Event Scheduler: Loaded 0 events
nov. 30 11:36:04 bdd1 mariadbd[4307]: 2025-11-30 11:36:04 0 [Note] /usr/sbin/mariadbd: ready for connections.
nov. 30 11:36:04 bdd1 mariadbd[4307]: Version: '11.8.3-MariaDB-0+deb13u1 from Debian'  socket: '/run/mysqld/mysqld.sock'  port: 3306  -- Pl>
nov. 30 11:36:04 bdd1 /etc/mysql/debian-start[4336]: Upgrading MariaDB tables if necessary.
nov. 30 11:36:04 bdd1 systemd[1]: Started mariadb.service - MariaDB 11.8.3 database server.
nov. 30 11:36:04 bdd1 /etc/mysql/debian-start[4349]: Checking for insecure root accounts.
nov. 30 11:36:04 bdd1 /etc/mysql/debian-start[4354]: Triggering myisam-recover for all MyISAM tables and aria-recover for all Aria tables
lines 1-24/24 (END)
```

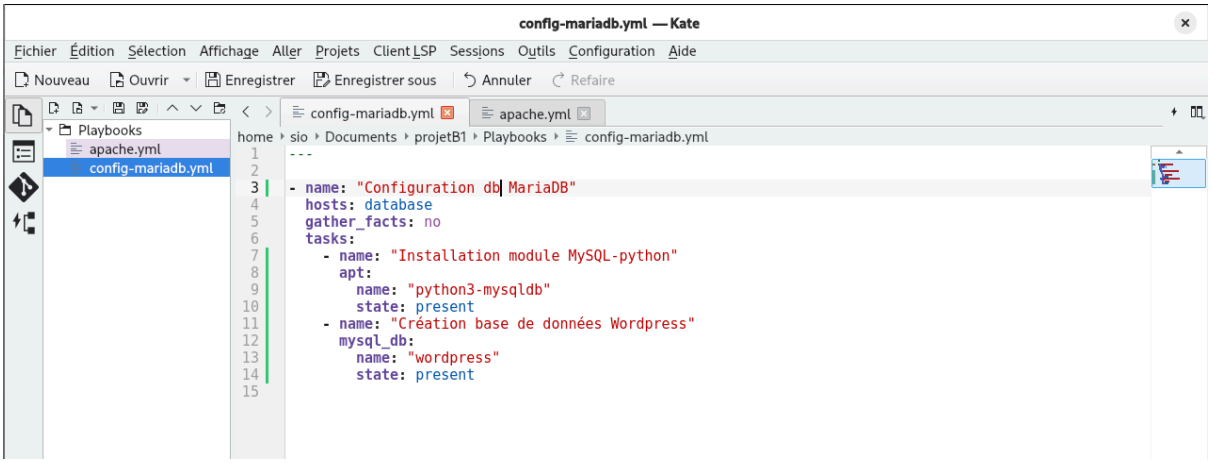
11. Configuration de la base de données

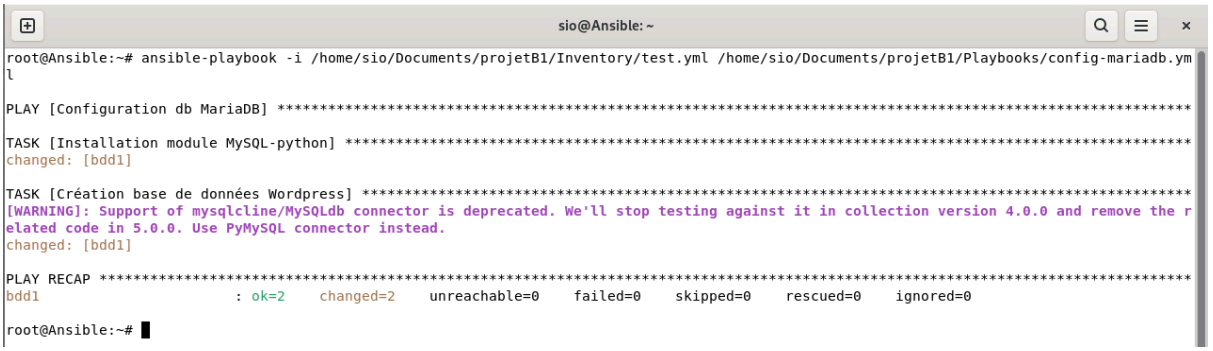
▪ Création de la base de données wordpress à partir du Playbook config-mariadb.yml : module mysql_db



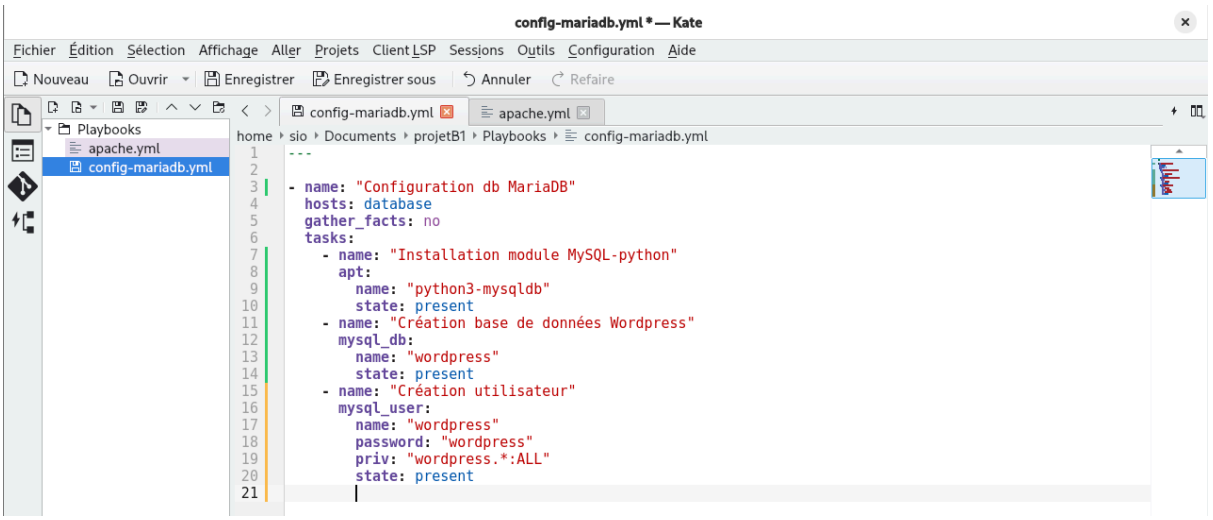

```
sio@Ansible: ~
root@Ansible:~# ansible-playbook -i /home/sio/Documents/projetB1/Inventory/test.yml /home/sio/Documents/projetB1/Playbooks/config-mariadb.ym
l

PLAY [Configuration MariaDB] ***************************************************************************************************************

TASK [Création base de données Wordpress] **************************************************************************************************
[ERROR]: Task failed: Module failed: A MySQL module is required: for Python 2.7 either PyMySQL, or MySQL-python, or for Python 3.X mysqlclie
nt or PyMySQL. Consider setting ansible_python_interpreter to use the intended Python version.
Origin: /home/sio/Documents/projetB1/Playbooks/config-mariadb.yml:7:7

5   gather_facts: no
6   tasks:
7     - name: "Création base de données Wordpress"
        ^ column 7

fatal: [bdd1]: FAILED! => {"ansible_facts": {"discovered_interpreter_python": "/usr/bin/python3.13"}, "changed": false, "msg": "A MySQL modu
le is required: for Python 2.7 either PyMySQL, or MySQL-python, or for Python 3.X mysqlclient or PyMySQL. Consider setting ansible_python_in
terpreter to use the intended Python version."}

PLAY RECAP *********************************************************************************************************************************
bdd1                       : ok=0    changed=0    unreachable=0    failed=1    skipped=0    rescued=0    ignored=0

root@Ansible:~#
```

▪ Installation du module avant la création de la base de données :

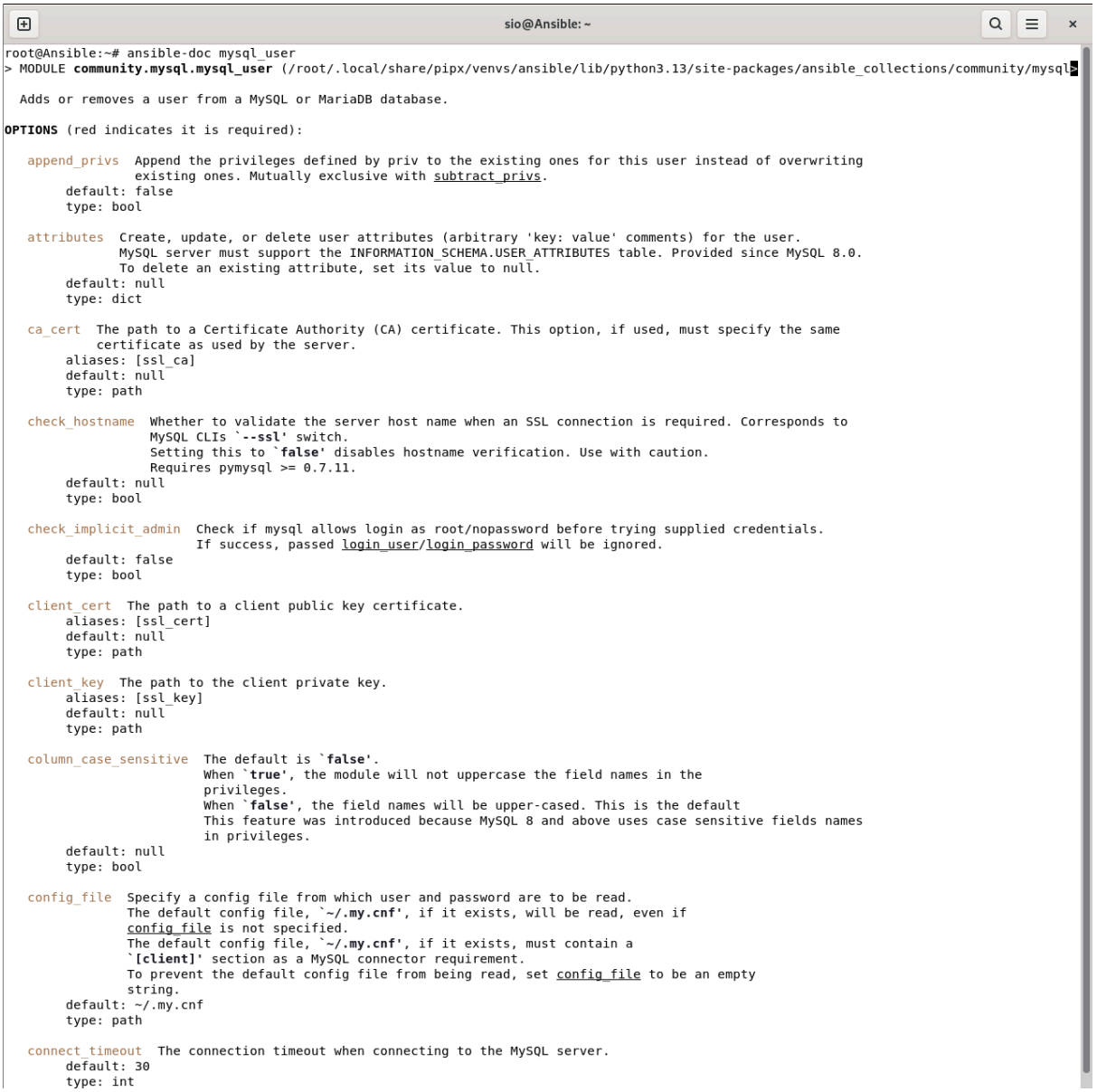




▪ Création de l'utilisateur SQL « wordpress » et nous octroyons des droits sur les tables de la base de données wordpress à l'utilisateur wordpress : module mysql_user



Documentation sur le module mysql_user :



```
sio@Ansible: ~
root@Ansible:~# ansible-playbook -i /home/sio/Documents/projetB1/Inventory/test.yml /home/sio/Documents/projetB1/Playbooks/config-mariadb.yml

PLAY [Configuration db MariaDB] ************************************************************************************************************

TASK [Installation module MySQL-python] ****************************************************************************************************
ok: [bdd1]

TASK [Création base de données Wordpress] **************************************************************************************************
[WARNING]: Support of mysqlcline/MySQLdb connector is deprecated. We'll stop testing against it in collection version 4.0.0 and remove the related code in 5.0.0. Use PyMySQL connector instead.
ok: [bdd1]

TASK [Création utilisateur] ****************************************************************************************************************
[WARNING]: Option column_case_sensitive is not provided. The default is now false, so the column's name will be uppercased. The default will be changed to true in community.mysql 4.0.0.
changed: [bdd1]

PLAY RECAP *********************************************************************************************************************************
bdd1                       : ok=3    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

root@Ansible:~#
```

12. Installation d'un serveur PHP

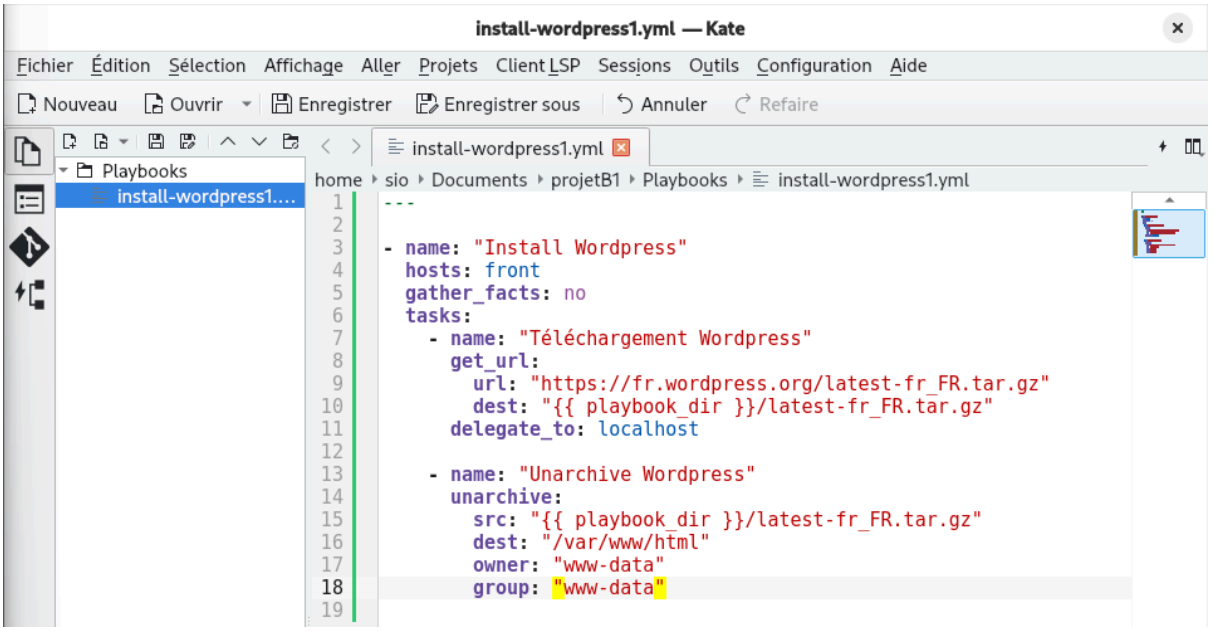
- Création du Playbook php.yml :

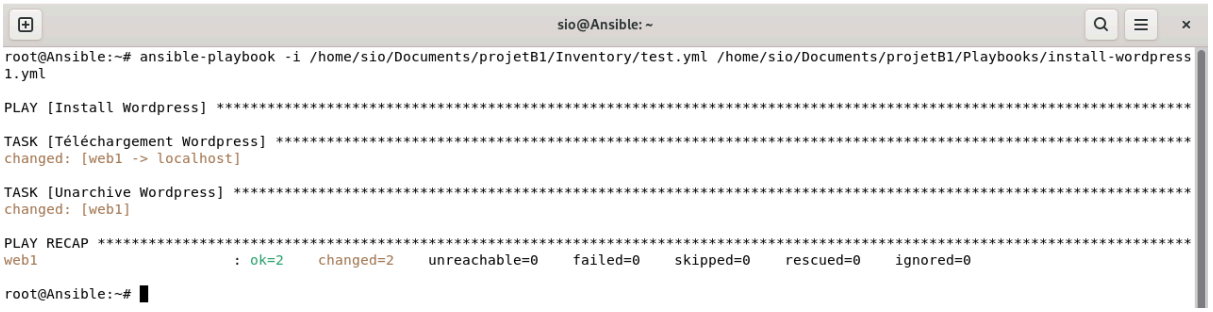
```
php-apache.yml — Kate
Fichier  Édition  Sélection  Affichage  Aller  Projets  Client LSP  Sessions  Outils  Configuration  Aide
Nouveau  Ouvrir  Enregistrer  Enregistrer sous  Annuler  Refaire
Playbooks
php-apache.yml
php-apache.yml
home ▸ sio ▸ Documents ▸ projetB1 ▸ Playbooks ▸ php-apache.yml
1  ---
2
3  - name: "Installation de PHP et Apache2"
4    hosts: front
5    gather_facts: no
6    tasks:
7      - name: "Installation PHP"
8        apt:
9          name: "php,php-mysql,libapache2-mod-php,php-curl,php-gd,php-mcrypt,php-zip"
10         state: present
11
12     - name: "Installation Apache2"
13       apt:
14         name: "apache2"
15         state: present
16
17     - name: "Démarrer Apache"
18       service:
19         name: "apache2"
20         state: started
21         enabled: yes
22
```

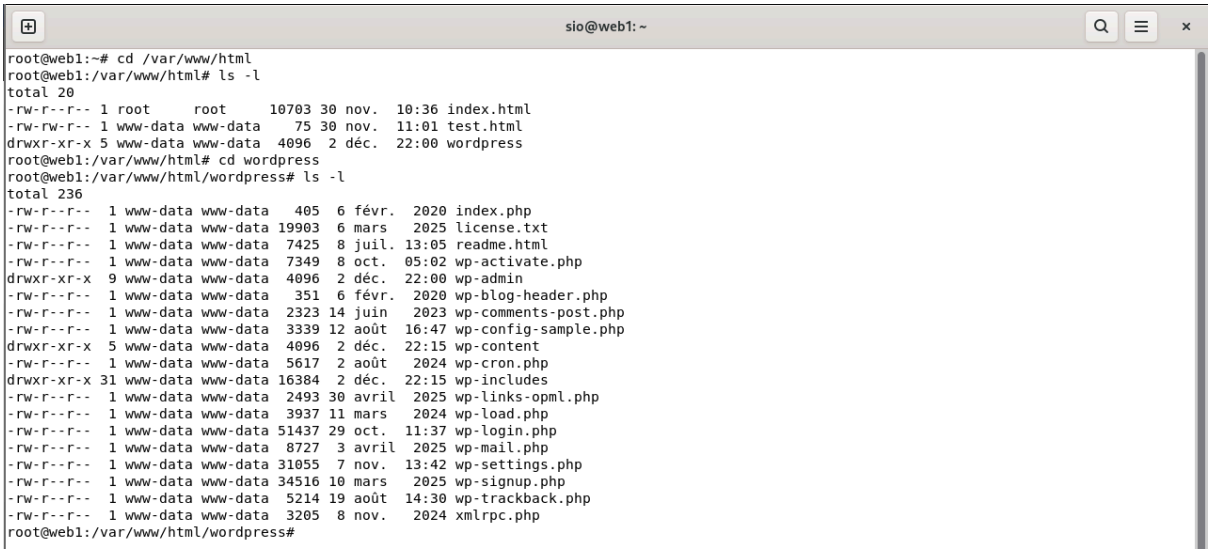
```
sio@Ansible: ~
root@Ansible:~# ansible-playbook -i /home/sio/Documents/projetB1/Inventory/test.yml /home/sio/Documents/projetB1/Playbooks/php-apache.yml

PLAY [Installation de PHP et Apache2] ******************************************************************************************************

TASK [Installation PHP] ********************************************************************************************************************
changed: [web1]

TASK [Installation Apache2] ****************************************************************************************************************
ok: [web1]

TASK [Démarrer Apache] *********************************************************************************************************************
ok: [web1]

PLAY RECAP *********************************************************************************************************************************
web1                       : ok=3    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

root@Ansible:~#
```

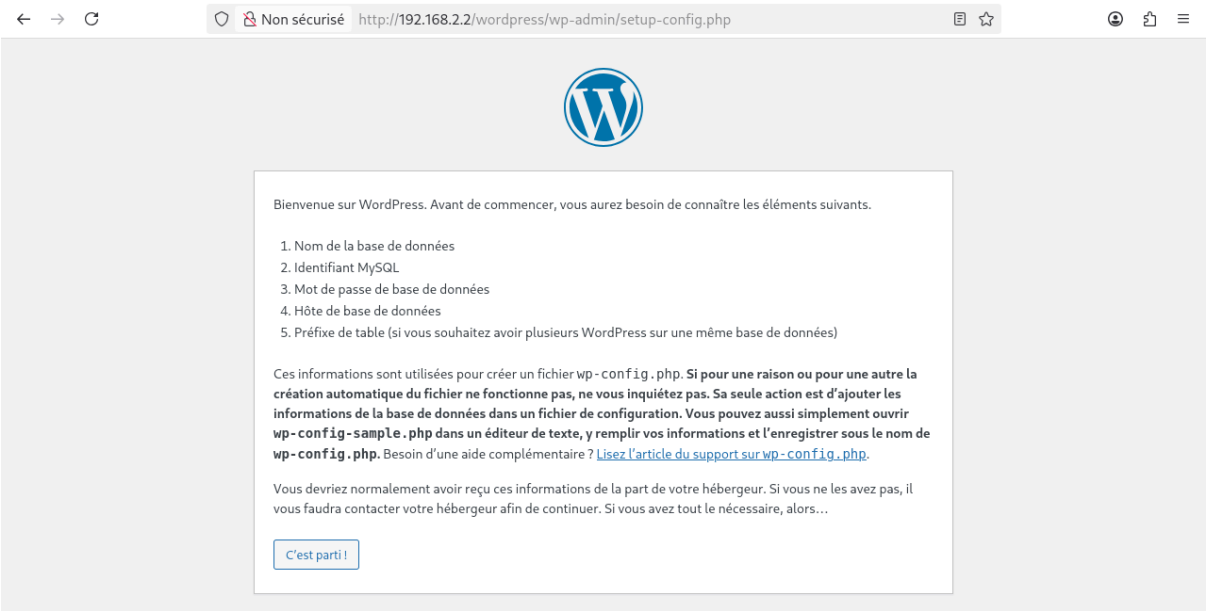
13. Installation de Wordpress

- Nous créons le Playbook install-wordpress1.yml

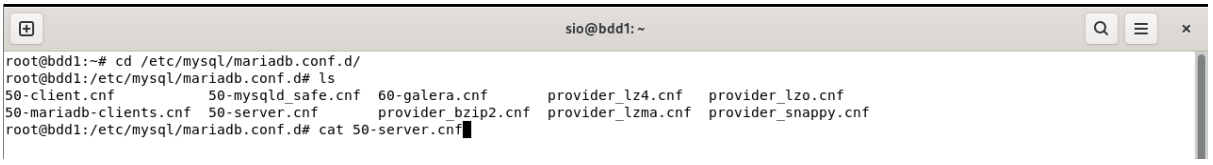


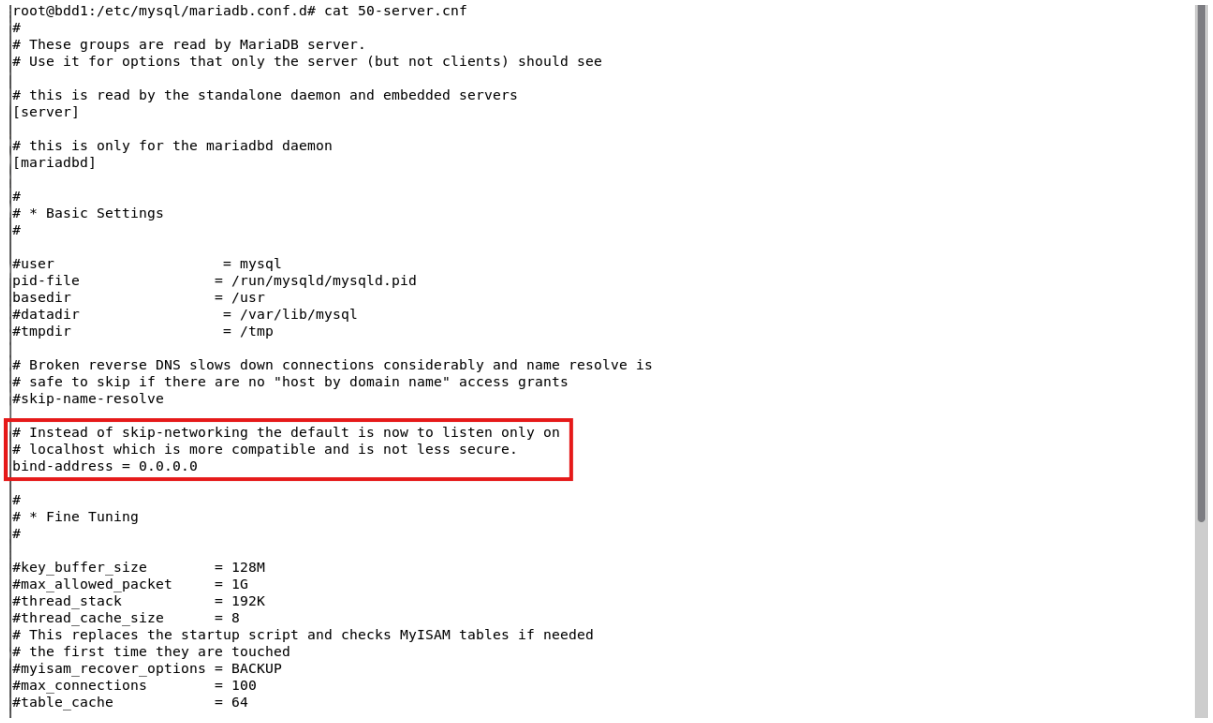




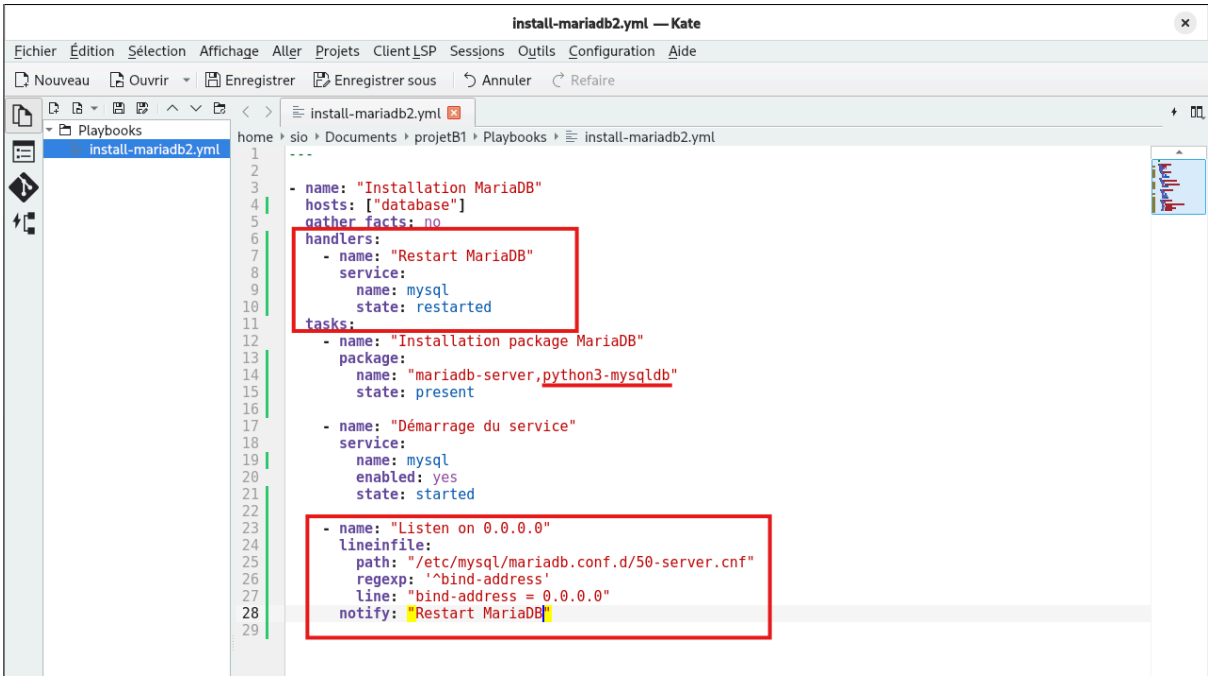


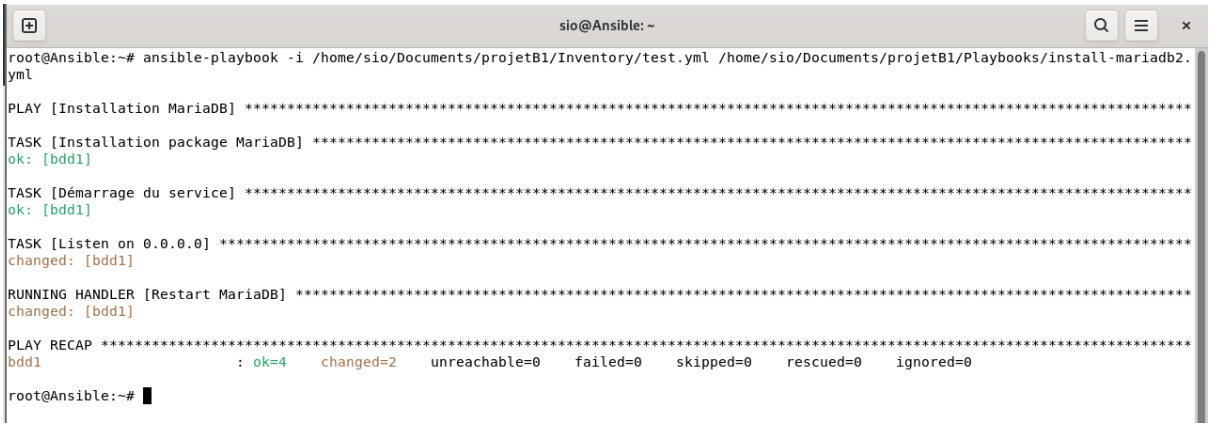
▪ Nous effectuons un grep bind-address /etc/mysql/mariadb.conf.d/50-server.cnf sur la machine bdd-1 afin de montrer que mariadb écoute depuis 127.0.0.
machine.
Nous affichons également le fichier 50-server.cnf afin de montrer la ligne bind-address.

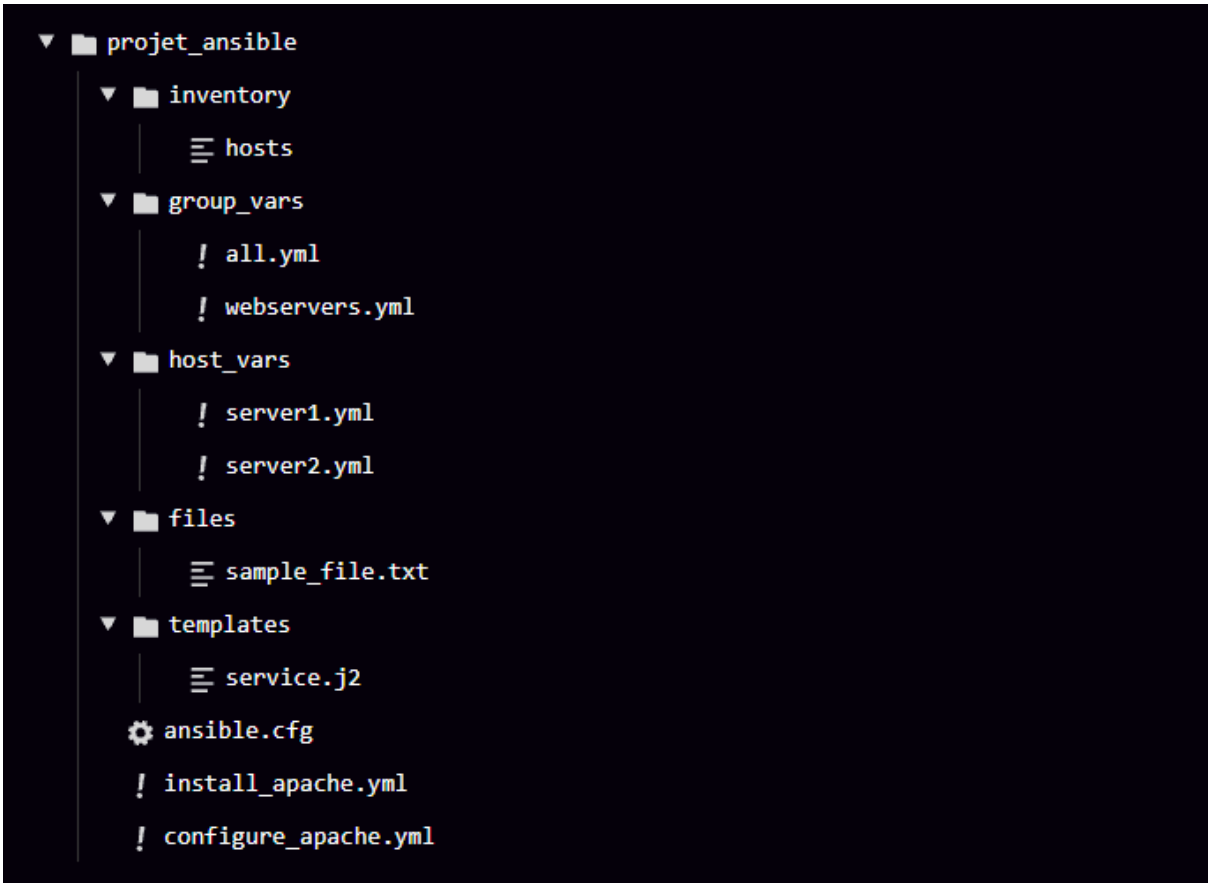




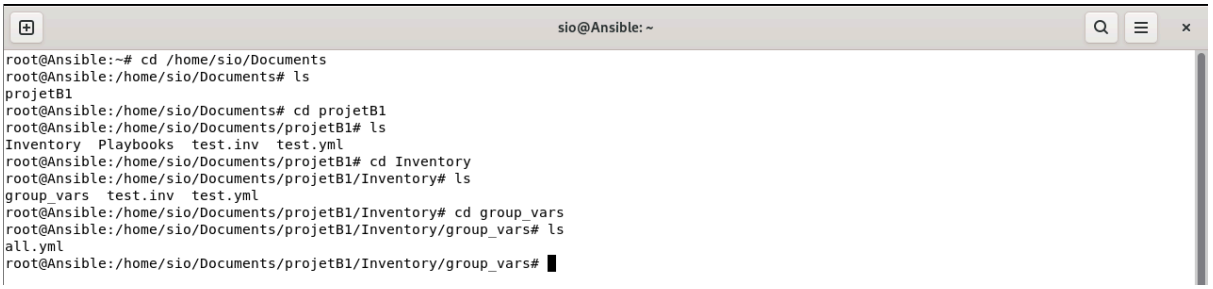
- Création du Playbook Install-Mariadb2



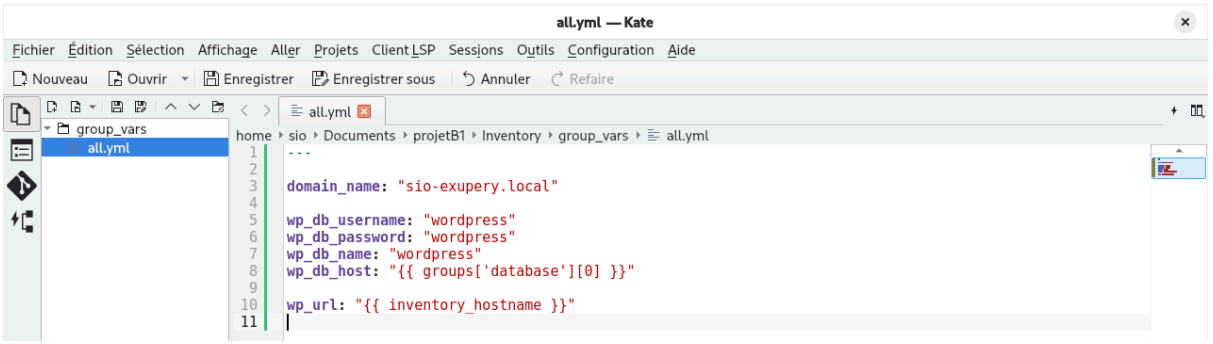




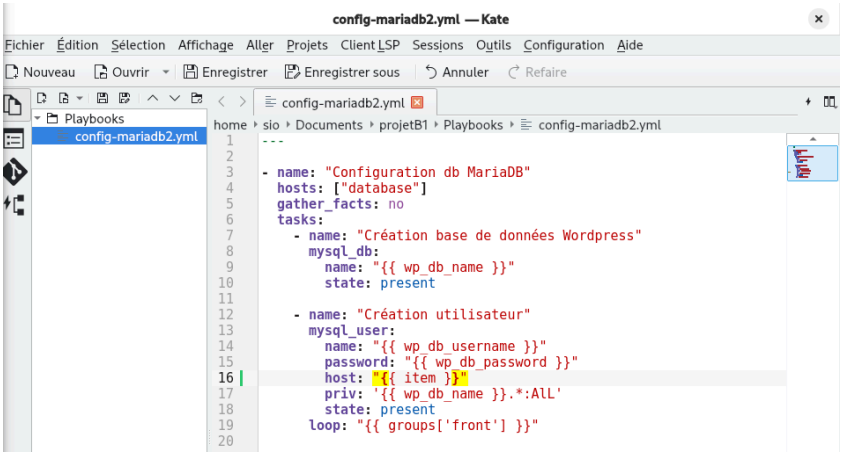
▪ Création du répertoire group_vars dans le répertoire Inventory :



```
root@Ansible:~# cd /home/sio/Documents
root@Ansible:/home/sio/Documents# ls
projetB1
root@Ansible:/home/sio/Documents# cd projetB1
root@Ansible:/home/sio/Documents/projetB1# ls
Inventory  Playbooks  test.inv  test.yml
root@Ansible:/home/sio/Documents/projetB1# cd Inventory
root@Ansible:/home/sio/Documents/projetB1/Inventory# ls
group_vars  test.inv  test.yml
root@Ansible:/home/sio/Documents/projetB1/Inventory# cd group_vars
root@Ansible:/home/sio/Documents/projetB1/Inventory/group_vars# ls
all.yml
root@Ansible:/home/sio/Documents/projetB1/Inventory/group_vars#
root@Ansible:/home/sio/Documents/projetB1/Inventory/group_vars#
root@Ansible:/home/sio/Documents/projetB1/Inventory/group_vars#
root@Ansible:/home/sio/Documents/projetB1/Inventory/group_vars#
root@Ansible:/home/sio/Documents/projetB1/Inventory/group_vars#
root@Ansible:/home/sio/Documents/projetB1/Inventory/group_vars# cd projetB1
bash: cd: projetB1: Aucun fichier ou dossier de ce nom
root@Ansible:/home/sio/Documents/projetB1/Inventory/group_vars# cd
root@Ansible:~# cd /home/sio/Documents
root@Ansible:/home/sio/Documents# cd projetB1
root@Ansible:/home/sio/Documents/projetB1# cd Inventory
root@Ansible:/home/sio/Documents/projetB1/Inventory# mkdir group_vars
```



▪Création du Playbook config-mariadb2.yml : création de la base de données et de l'utilisateur SQL avec les modules mysql_db et mysql_user pour chaque machine du groupe database



```
sio@Ansible: ~

root@Ansible:~# ansible-playbook -i /home/sio/Documents/projetB1/Inventory/test.yml /home/sio/Documents/projetB1/Playbooks/config-mariadb2.y
ml

PLAY [Configuration db MariaDB] ************************************************************************************************************

TASK [Création base de données Wordpress] **************************************************************************************************
[WARNING]: Support of mysqlcline/MySQLdb connector is deprecated. We'll stop testing against it in collection version 4.0.0 and remove the r
elated code in 5.0.0. Use PyMySQL connector instead.
ok: [bdd1]

TASK [Création utilisateur] ****************************************************************************************************************
[WARNING]: Option column_case_sensitive is not provided. The default is now false, so the column's name will be uppercased. The default will
 be changed to true in community.mysql 4.0.0.
changed: [bdd1] => (item=web1)

PLAY RECAP *********************************************************************************************************************************
bdd1                       : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

root@Ansible:~#
```

▪Création du Playbook install-wordpress2.yml

Nouveau | Ouvrir | Enregistrer | Enregistrer sous | Annuler | Refaire

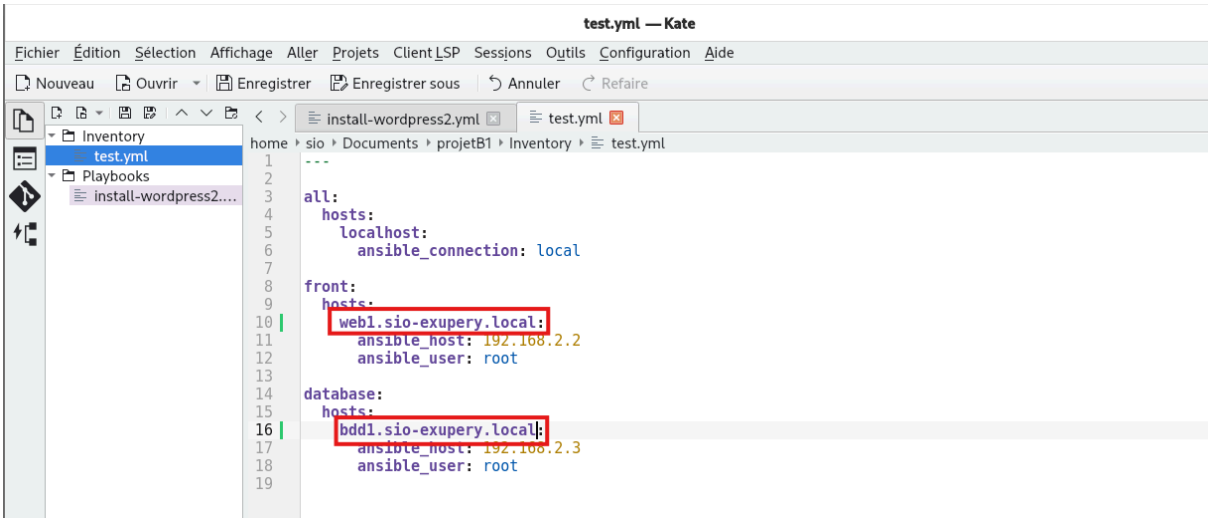
Inventory
test.yml
Playbooks
install-wordpress2....

install-wordpress2.yml | test.yml

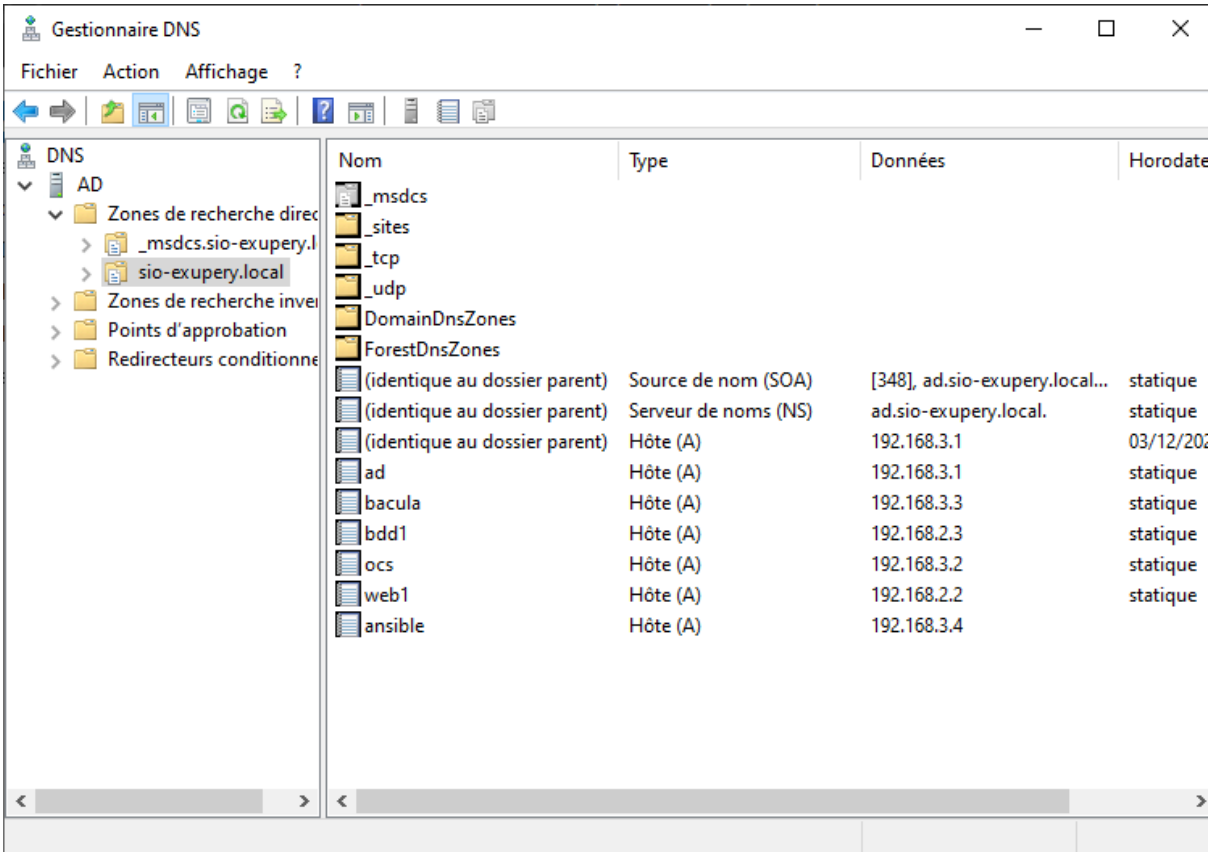
home ▸ sio ▸ Documents ▸ projetB1 ▸ Playbooks ▸ install-wordpress2.yml

```yaml
---

- name: "Install Wordpress"
  hosts: front
  gather_facts: no
  vars:
    wp_path: "/var/www/html"
  tasks:

    - name: "Install wp-cli"
      get_url:
        url: https://raw.githubusercontent.com/wp-cli/builds/gh-pages/phar/wp-cli.phar
        dest: "/usr/local/bin/wp-cli"
        owner: root
        group: root
        mode: "0755"

    - name: "Download WP"
      command: >
        wp-cli core download
        --allow-root --no-color --path='{{ wp_path }}'
        --locale='fr_FR'
      args:
        creates: "{{ wp_path }}/wp-load.php"

    - name: "Configure WP"
      command: >
        wp-cli core config
        --allow-root --no-color --path='{{ wp_path }}'
        --dbname='{{ wp_db_name }}'
        --dbuser='{{ wp_db_username }}'
        --dbpass='{{ wp_db_password }}'
        --dbhost='{{ wp_db_host }}'
      args:
        creates: "{{ wp_path }}/wp-config.php"

    - name: "Install WP"
      run_once: yes
      command: >
        wp-cli core install.
        --allow-root --no-color --path='{{ wp_path }}'
        --title='Blog Bl' --url=http://{{ wp_url }}/
        --admin_name='admin'
        --admin_email='admin@sio-exupery.fr'
        --admin_password='Azerty0'
        --skip-email
      changed_when: "'installed successfully.' in _.stdout"
      register: _
```

▪ Modification du fichier d'inventaire :



▪ Création des enregistrements DNS dans la zone sio-exupery.local :



14. Installation d’un serveur HAproxy

15. Ansible et administration machine Windows