Spécialité : Réseaux Intelligents et Cybersécurité

Présenté par : COULIBALY DAOUDA DAVID & WAHID Moncef

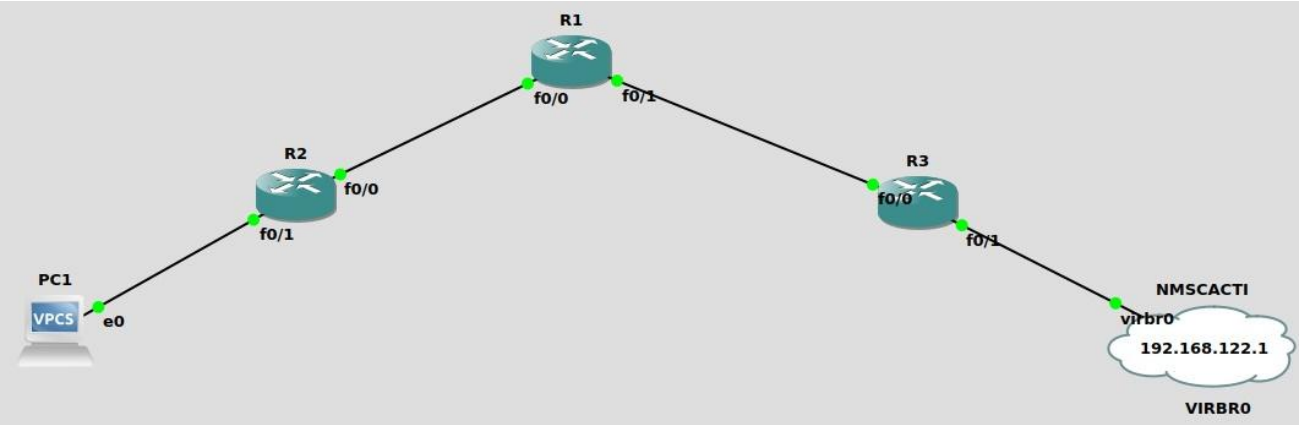
ANSIBLE

Encadré par:

Pr. Jihane JABRANE ENSA Khouribga

Année universitaire :2024/2025

Mettons la topologie sur GNS3 :



Après installé ansible par ces trois commandes :

apt-add-repository ppa:ansible/ansible
apt update
Apt install ansible

```
packages can be upgraded. Run 'apt list --upgradable' to see them.
vid@david-virtual-machine:~$ sudo apt install ansible
ading package lists... Done
ilding dependency tree... Done
ading state information... Done
e following additional packages will be installed:
ansible-core python-babel-localedata python3-babel python3-bcrypt
python3-jinja2 python3-jmespath python3-kerberos python3-markupsafe
python3-ntlm-auth python3-packaging python3-paramiko
python3-requests-kerberos python3-requests-ntlm python3-resolvelib
python3-winrm python3-xmltodict sshpass
```

Vérifions ansible est bien installé :

```
david@david-virtual-machine:~$ ls /etc/ansible
ansible.cfg  hosts  roles
david@david-virtual-machine:~$ ipconfig
Command 'ipconfig' not found, did you mean:
```

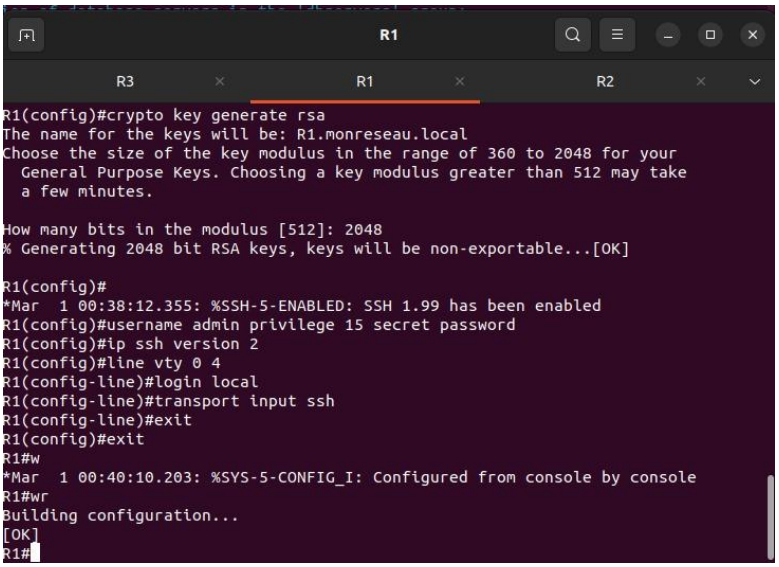
Configuration des 3 Routers :

```
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#int F1/0
R1(config-if)#ip addr 192.168.122.7 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#
*Mar  1 00:01:40.503: %LINK-3-UPDOWN: Interface FastEthernet1/0, changed state t
```

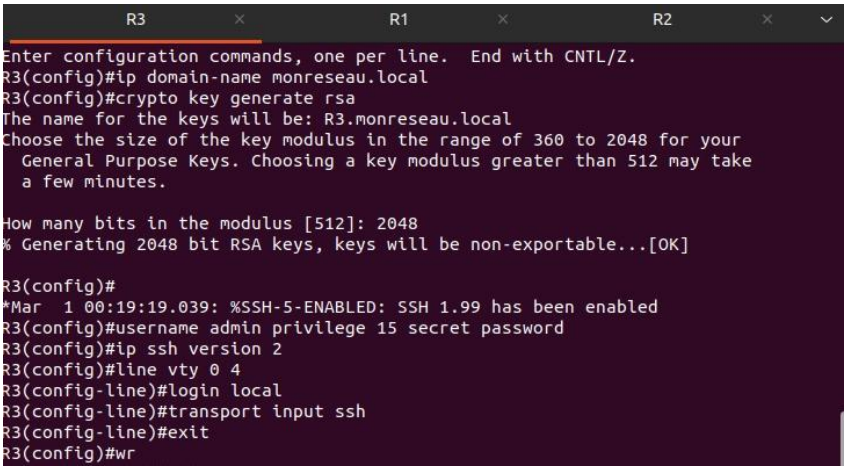
Test de connectivité :

```
david@david-virtual-machine:~$ ping 192.168.122.7
PING 192.168.122.7 (192.168.122.7) 56(84) bytes of data.
64 bytes from 192.168.122.7: icmp_seq=1 ttl=255 time=21.2 ms
64 bytes from 192.168.122.7: icmp_seq=2 ttl=255 time=11.7 ms
64 bytes from 192.168.122.7: icmp_seq=3 ttl=255 time=5.64 ms
64 bytes from 192.168.122.7: icmp_seq=4 ttl=255 time=0.689 ms
64 bytes from 192.168.122.7: icmp_seq=5 ttl=255 time=3.45 ms
```

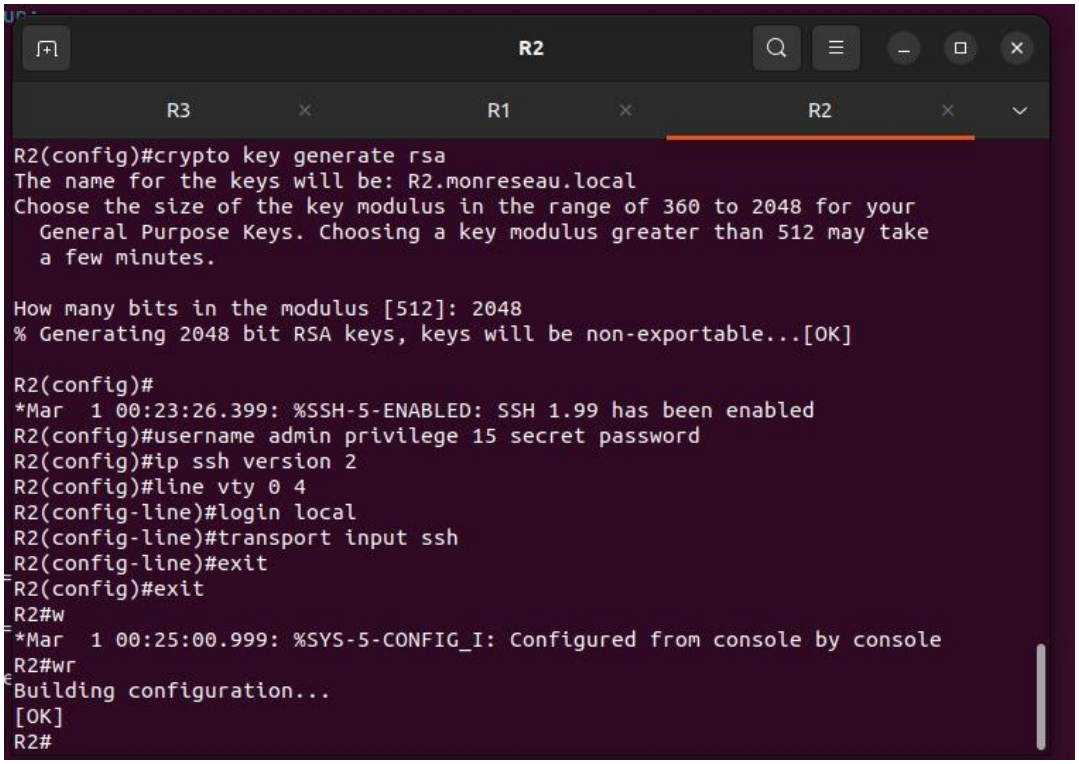
Configurons SSH dans R1 :



Configurons SSH dans R3 :



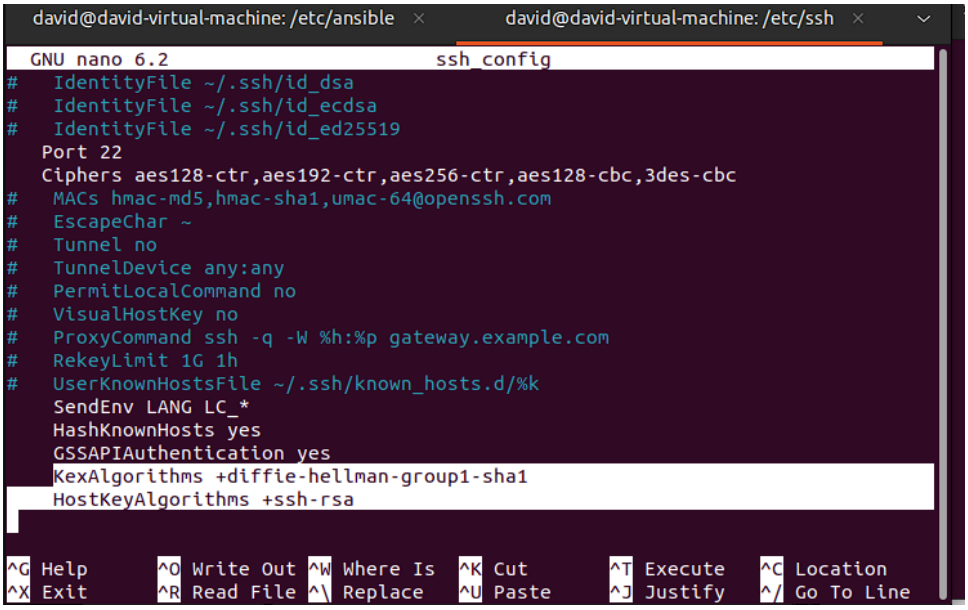
Configurons SSH dans R2 :



Vérifié SSH est bien installé dans R1:

```
R1#show running-config | i ssh
ip ssh version 2
 transport input ssh
R1#
*Mar  1 00:22:18.767: SSH2 0: no matching cipher found: client chacha20-poly1305@openssh.com,aes128-ctr,aes192-ctr,aes256-ctr,aes128-gcm@openssh.com,
R1#ping 192.168.122.1
Type escape sequence to abort.
```

Modifions fichier ssh_config dans Ansible pour que les deux mettre en d'accord sur des critères de chiffrement :



Testons la connectivité SSH vers les 3 routeurs :

```
david@david-virtual-machine:/etc/ansible$ ssh admin@192.168.2.2
The authenticity of host '192.168.2.2 (192.168.2.2)' can't be established.
RSA key fingerprint is SHA256:eMXZCgh6EAIBfm/IvREL9Vu/c4sXq36gtYQnxy+f3F8.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.2.2' (RSA) to the list of known hosts.
(admin@192.168.2.2) Password:

R2#exit
Connection to 192.168.2.2 closed.
david@david-virtual-machine:/etc/ansible$ ssh admin@192.168.1.1
The authenticity of host '192.168.1.1 (192.168.1.1)' can't be established.
RSA key fingerprint is SHA256:cbrEpQ/inLdMpMdUuABDi1r26riuxAZhgPQw2WFnc/4.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.1.1' (RSA) to the list of known hosts.
(admin@192.168.1.1) Password:

R3#exit
Connection to 192.168.1.1 closed.
david@david-virtual-machine:/etc/ansible$ ssh admin@192.168.122.2
The authenticity of host '192.168.122.2 (192.168.122.2)' can't be established.
RSA key fingerprint is SHA256:cbrEpQ/inLdMpMdUuABDi1r26riuxAZhgPQw2WFnc/4.
This host key is known by the following other names/addresses:
    ~/.ssh/known_hosts:3: [hashed name]
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.122.2' (RSA) to the list of known hosts.
(admin@192.168.122.2) Password:
```

Ajoutons les routeurs au inventaires d'Ansible :

```
david@david-virtual-machine:/etc/ssh$ cd /etc/ansible
david@david-virtual-machine:/etc/ansible$ sudo nano hosts
```

```
  GNU nano 6.2                                                    hosts

# You can also use ranges for multiple hosts:

## db-[99:101]-node.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


# Ex4: Multiple hosts arranged into groups such as 'Debian' and 'openSUSE':

## [Debian]
## alpha.example.org
## beta.example.org

## [openSUSE]
## green.example.com
## blue.example.com


#Collection des hotes routeurs Cisco
[cisco_routers]
R1 ansible_host=192.168.1.2
R2 ansible_host=192.168.2.2
R3 ansible_host=192.168.122.2
#Collection des varaibles
[cisco_routers: vars]
ansible_network_os=ios
ansible_user=admin
ansible_password=password
ansible_connection=network_cli
```

Vérifions que les routers été bien ajouté :

```
david@david-virtual-machine:/etc/ansible$ sudo ansible-inventory --list
{
    "_meta": {
        "hostvars": {
            "R1": {
                "ansible_connection": "network_cli",
                "ansible_host": "192.168.1.2",
                "ansible_network_os": "ios",
                "ansible_password": "password",
                "ansible_user": "admin"
            },
            "R2": {
                "ansible_connection": "network_cli",
                "ansible_host": "192.168.2.2",
                "ansible_network_os": "ios",
                "ansible_password": "password",
                "ansible_user": "admin"
            },
            "R3": {
                "ansible_connection": "network_cli",
                "ansible_host": "192.168.122.2",
                "ansible_network_os": "ios",
                "ansible_password": "password",
                "ansible_user": "admin"
            }
        }
    },
    "all": {
        "children": [
            "ungrouped",
            "cisco_routers"
        ]
    },
    "cisco_routers": {
        "hosts": [
            "R1",
            "R2",
            "R3"
        ]
    }
}
david@david-virtual-machine:/etc/ansible$
```

Testons la connectivité au Routeurs depuis Ansible :

```
david@david-virtual-machine:/etc/ansible$ sudo ansible cisco_routers -m ping
[WARNING]: ansible-pylibssh not installed, falling back to paramiko
R3 | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
R2 | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
R1 | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
david@david-virtual-machine:/etc/ansible$
```

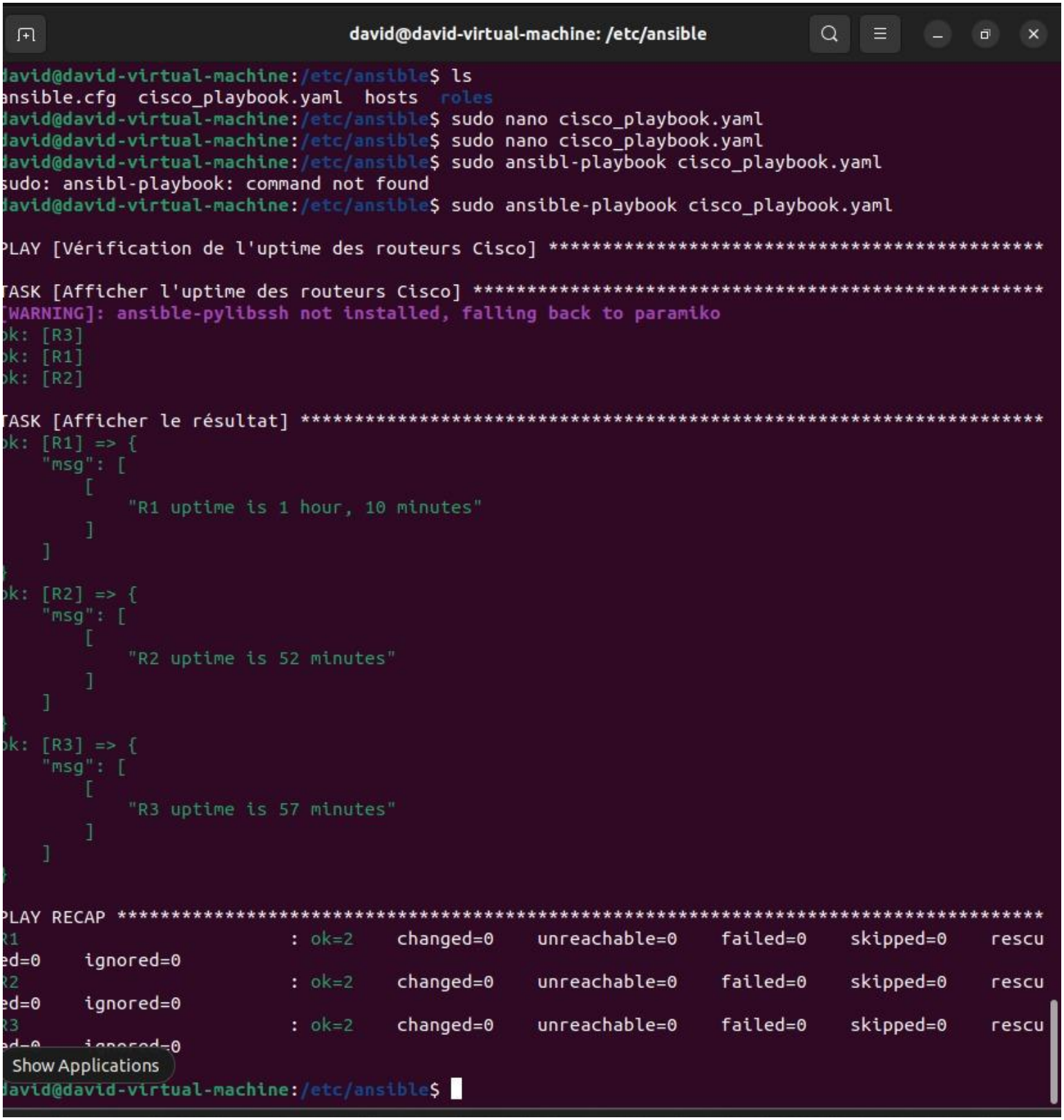
Créons un nouveau playbook :

```
 GNU nano 6.2                          cisco_playbook.yaml
---
- name: une description de Uptime routers Cisco ios
  hosts: R1-router
  gather_facts: false


  tasks:
    - name: afficher Uptime
      ios_command:
        commands: show version | include uptime
      register: output


    - name: result
      debug:
        msg:"{{ output.stdout_lines}}"
```

Lançons le PLAYBOOK :



BONUS :

MODIFIONS Playbook pour changer @ ip de Router :

```
  GNU nano 6.2                                cisco_playbook.yaml
---
- name: Configurer une interface Cisco
  hosts: R1-router
  gather_facts: false

  tasks:
    - name: Changer l'adresse IP de l'interface FastEthernet1/0
      ios_config:
        lines:
          - ip address 192.168.1.2 255.255.255.0
          - no shutdown  # Active l'interface si elle est désactivée
        parents: interface FastEthernet1/0
      notify: Sauvegarder la configuration

  handlers:
    - name: Sauvegarder la configuration
      ios_config:
        save_when: modified
```

Lançons Playbook & testons la connectivité au ancien @IP:

```
the offending line appears to be:


tasks:
^ here
david@david-virtual-machine:/etc/ansible$ sudo nano cisco_playbook.yaml
david@david-virtual-machine:/etc/ansible$ sudo nano cisco_playbook.yaml
david@david-virtual-machine:/etc/ansible$ sudo ansible-playbook cisco_playbook.yaml
[WARNING]: Invalid characters were found in group names but not replaced, use -vvvv to see
details

PLAY [Configurer une interface Cisco] ************************************************************

TASK [Changer l'adresse IP de l'interface FastEthernet1/0] ***************************************
[WARNING]: ansible-pylibssh not installed, falling back to paramiko
fatal: [R1]: FAILED! => {"changed": false, "module_stderr": "timeout value 30 seconds reached while trying to send command: b'ip address 192.168
ILURE\nSee stdout/stderr for the exact error"}

PLAY RECAP ***************************************************************************************
R1                         : ok=0    changed=0    unreachable=0    failed=1    skipped=0    rescued=0    ignored=0

david@david-virtual-machine:/etc/ansible$ ping 192.168.122.7
PING 192.168.122.7 (192.168.122.7) 56(84) bytes of data.
From 192.168.122.1 icmp_seq=1 Destination Host Unreachable
From 192.168.122.1 icmp_seq=2 Destination Host Unreachable
From 192.168.122.1 icmp_seq=3 Destination Host Unreachable
From 192.168.122.1 icmp_seq=4 Destination Host Unreachable
^C
--- 192.168.122.7 ping statistics ---
5 packets transmitted, 0 received, +4 errors, 100% packet loss, time 5152ms
pipe 4
david@david-virtual-machine:/etc/ansible$ sudo ansible-playbook cisco_playbook.yaml
[WARNING]: Invalid characters were found in group names but not replaced, use -vvvv to see
details

PLAY [Configurer une interface Cisco] ************************************************************

TASK [Changer l'adresse IP de l'interface FastEthernet1/0] ***************************************
[WARNING]: ansible-pylibssh not installed, falling back to paramiko
^C [ERROR]: User interrupted execution
david@david-virtual-machine:/etc/ansible$ sudo nano cisco_playbook.yaml
david@david-virtual-machine:/etc/ansible$
```