

```
C:\Users\Administrator>docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
c3050dafd9a2	ubuntu:20.04	"/bin/bash"	22 hours ago	Up 22 hours		control_node
d9cc345ed240	ubuntu:20.04	"/bin/bash"	23 hours ago	Up 22 hours		remote_node2
2da1b6e73cad	ubuntu:20.04	"/bin/bash"	23 hours ago	Up 22 hours		remote_node1

```
C:\Users\Administrator>docker run -itd --name DavidHihucontrol_node --network ansible_lab ubuntu:20.04
9727305a689ae2b29b9e739f402c5a5865cf75521384f784116e2139b639f277
```

```
C:\Users\Administrator>docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
9727305a689a	ubuntu:20.04	"/bin/bash"	4 seconds ago	Up 3 seconds		DavidHihucontrol_node
c3050dafd9a2	ubuntu:20.04	"/bin/bash"	23 hours ago	Up 22 hours		control_node
d9cc345ed240	ubuntu:20.04	"/bin/bash"	23 hours ago	Up 22 hours		remote_node2
2da1b6e73cad	ubuntu:20.04	"/bin/bash"	23 hours ago	Up 22 hours		remote_node1

```
C:\Users\Administrator>docker run -itd --name DavidHihuremote_node1 --network ansible_lab ubuntu:20.04
5dddb5da187dbac468a999bce921a075800073fb3208acd3a3956c5a3a66e25
```

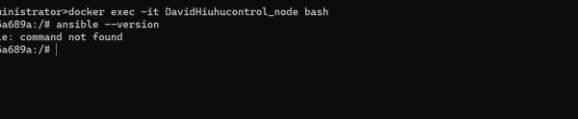
```
C:\Users\Administrator>docker run -itd --name DavidHihuremote_node2 --network ansible_lab ubuntu:20.04
d7037a85f87f3487338ef6e520f1189063b5ad1852d2334e0aed29b87121ae6e
```

```
C:\Users\Administrator>docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
d7037a85f87f	ubuntu:20.04	"/bin/bash"	7 seconds ago	Up 7 seconds		DavidHihuremote_node2
5dddb5da187d	ubuntu:20.04	"/bin/bash"	18 seconds ago	Up 17 seconds		DavidHihuremote_node1
9727305a689a	ubuntu:20.04	"/bin/bash"	About a minute ago	Up About a minute		DavidHihucontrol_node
c3050dafd9a2	ubuntu:20.04	"/bin/bash"	23 hours ago	Up 22 hours		control_node
d9cc345ed240	ubuntu:20.04	"/bin/bash"	23 hours ago	Up 22 hours		remote_node2
2da1b6e73cad	ubuntu:20.04	"/bin/bash"	23 hours ago	Up 22 hours		remote_node1

```
C:\Users\Administrator>
```

## check control node if Ansible is installed in DavidHiuhucontrol\_node



A screenshot of a Windows terminal window. The title bar shows a single tab labeled 'root@9727305a689a: /'. The terminal content shows a command being executed from a Windows command prompt, followed by the output from a Linux shell inside a Docker container.

```
C:\Users\Administrator>docker exec -it DavidHihucontrol_node bash
root@9727305a689a:/# ansible --version
bash: ansible: command not found
root@9727305a689a:/# |
```

## Ansible being installed

```

C:\Users\Administrator>cmd.exe -it DavidHuihucontrol_node bash
root@9727705a889a:/# ansible --version
bash: ansible: command not found
root@9727705a889a:/# apt update
Get:1 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal InRelease [265 kB]
94 [2 InRelease 14.2 MB/255 MB 5%] [1 InRelease 14.3 MB/114 MB 13%]

Get:1 http://archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 Packages [32.4 kB]
Get:15 http://archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [194 kB]
Get:16 http://archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages [3468 kB]
Get:17 http://archive.ubuntu.com/ubuntu focal-backports/universe amd64 Packages [28.6 kB]
Get:18 http://archive.ubuntu.com/ubuntu focal-backports/main amd64 Packages [55.2 kB]
Fetched 38.3 MB in 1min 6s (459 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
2 packages can be upgraded. Run 'apt list --upgradable' to see them.
root@9727705a889a:/# apt install -y ansible
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  ca-certificates distro-info-data file fuse-daemon krb-locale libbsd0 libcbor0.6 libedit2 libexpat1 libfdiso-1
  libgsasl-krb5-2 libgdbm-crypt3 libkeyutils1 libkrb5-3 libkrb5support libmagic-mgc libmagic1 libmpdec3 libnsl1
  libpython3-stftlib libpython3-8-minimal libpython3-8-stftlib libreadline8 libsqlite-0 libssl1.1 libxml2 libxml2-data
  libxmod libxshlib2 libzstd1 libzstd-minimal libzstd-runtime libzstd-snapshot libzstd-snapshot-client openssl public-key
  python3-argcomplete python3-certifi python3-cffi-backend python3-charadet python3-crypte python3-cryptography
  python3-distutils python3-dnspython python3-httplib2 python3-lima python3-jinja2 python3-jmespath python3-kerberos
  python3-lib2to3 python3-libcloud python3-lockfile python3-marksafe python3-matplotlib python3-netaddr python3-netifaces
  python3-nlge-auth python3-pkg-resources python3-requests python3-requests-kerberos python3-requests-nlge
  python3-rsa python3-saml python3-saml2 python3-six python3-socks python3-toml python3-typing python3-urllib3 python3-yaml
  python3.8 python3.8-minimal readline-common sgml-slash vz-utils
Suggested packages:
  cowsay sgmls krb5-doc krb5-user keychain libpam-ssh monkeysphere ssh-skpass python3-doc python3-tk python3-venv
  python-cryptography-doc python3-cryptography-vectors python-jinja2-doc python-lockfile-doc ipython3
  python-netaddr-docs python3-setsuptools python3-openssl python3-socks python3.8-venv python3.8-binutils
  libssl1.1-doc readline-doc

```



```
root@5ddd85da187d: /  
Setting up lsb-release (11.1.0ubuntu2) ...  
Setting up python3-argcomplete (1.8.1-1.3ubuntu1) ...  
Setting up python3-lib2to3 (3.8.10-0ubuntu1~20.04) ...  
Setting up python3-cffi-backend (1.14.6-1build1) ...  
Setting up python3-pkg-resources (45.2.0-1ubuntu0.1) ...  
Setting up python3-distutils (3.8.10-0ubuntu1~20.04) ...  
Setting up python3-lockfile (1:0.12.2-2ubuntu2) ...  
Setting up python3-ntlm-auth (1.1.0-1) ...  
Setting up python3-kerberos (1:1.10-3.1build1) ...  
Setting up python3-yaml (5.3.1-1ubuntu0.1) ...  
Setting up python3-chardet (3.0.4-4build1) ...  
Setting up python3-cryptography (2.8-3ubuntu0.2) ...  
Setting up python3-requests (2.22.0-2ubuntu1.1) ...  
Setting up python3-requests-kerberos (0.12.0-2) ...  
Setting up ansible (2.9.6+dfsg-1) ...  
Setting up python3-requests-ntlm (1.1.0-1) ...  
Setting up python3-libcloud (2.8.0-1) ...  
Setting up python3-minim (0.3.0-2) ...  
Processing triggers for libc-bin (2.31-0ubuntu9.14) ...  
Processing triggers for ca-certificates (20230311ubuntu0.20.04.1) ...  
Updating certificates in /etc/ssl/certs...  
0 added, 0 removed; done.  
Running hooks in /etc/ca-certificates/update.d...  
done.  
root@5ddd85da187d: /# ansible --version  
ansible 2.9.6  
  config file = /etc/ansible/ansible.cfg  
  configured module search path = ['/root/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']  
  ansible python module location = /usr/lib/python3/dist-packages/ansible  
  executable location = /usr/bin/ansible  
  python version = 3.8.10 (default, Nov 22 2023, 10:22:35) [GCC 9.4.0]  
root@5ddd85da187d: /#
```

Ansible installed

# Check, Setting up DavidHiuhuremote\_node2, Ansible not installed

```
C:\Users\Administrator>docker ps -a
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS              NAMES
d7037a85f87f        ubuntu:20.04       "/bin/bash"        9 minutes ago       Up 9 minutes                DavidHiuhuremote_node2
8dddb5d187d         ubuntu:20.04       "/bin/bash"        10 minutes ago      Up 10 minutes                DavidHiuhuremote_node1
9727385a589a        ubuntu:20.04       "/bin/bash"        10 minutes ago      Up 10 minutes                DavidHiuhucontrol_node
c3080d4f49a2        ubuntu:20.04       "/bin/bash"        23 hours ago        Up 22 hours                control_node
09c345ed248         ubuntu:20.04       "/bin/bash"        23 hours ago        Up 22 hours                remote_node2
2da1b6e73cad        ubuntu:20.04       "/bin/bash"        23 hours ago        Up 22 hours                remote_node1

C:\Users\Administrator>root@d7037a85f87f:~#
PS C:\Users\Administrator> docker exec -it DavidHiuhuremote_node2 bash
root@d7037a85f87f:/# ansible --version
bash: ansible: command not found
root@d7037a85f87f:/#
```

## Install Ansible DavidHiuhuremote\_node2

```
PS C:\Users\Administrator> docker exec -it DavidHiuhuremote_node2 bash
root@d7037a85f87f:/# ansible --version
bash: ansible: command not found
root@d7037a85f87f:/# apt update
Get:1 http://archive.ubuntu.com/ubuntu focal InRelease [265 kB]
Get:2 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:3 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 Packages [29.7 kB]
Get:4 http://archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:5 http://security.ubuntu.com/ubuntu focal-security/restricted amd64 Packages [3318 kB]
Get:6 http://archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Get:7 http://archive.ubuntu.com/ubuntu focal/universe amd64 Packages [11.1 MB]
Get:8 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [3415 kB]
94% [7 Packages 6257 KB/11.3 MB 55%] [8 Packages 3139 KB/3415 KB 92%]
1880 KB/s 94%

root@d7037a85f87f:/#
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
ca-certificates distro-info-data file ieee-data krb5-locales libbsd0 libcbor0.6 libedit2 libexpat1 libfido2-1 libgssapi-krb5-2
libk5crypto3 libkeyutils1 libkrb5-3 libkrb5support0 libmagic-mgc libmagic1 libmde2 libnsl5 libpython3-stdlib
libpython3.8-minimal libpython3.8-stdlib libreadline8 libsqlite3-0 libssl1.1 libx11-6 libx11-data libxau6 libxcb1 libxdmcp6
libxext6 libxml2 libyaml-0-2 libz-release mime-support openssl-client openssl-publicsuffix python3 python3-argcomplete
python3-certifi python3-cffi-backend python3-chardet python3-crypto python3-cryptography python3-distutils python3-dnspython
python3-httplib python3-idna python3-jinja2 python3-jmespath python3-kerberos python3-lib2to3 python3-libcloud python3-lockfile
python3-marksafe python3-minimal python3-netaddr python3-ntlm-auth python3-pkg-resources python3-requests
python3-requests-kerberos python3-requests-ntlm python3-selenium python3-simplejson python3-six python3-urllib3 python3-winc
python3-yaml python3-yaml python3.8 python3.8-minimal readline-common wget xz-utils
Suggested packages:
coway sshpass krb5-doc krb5-user keychain libpam-ssh monkeysphere ssh-askpass python3-doc python3-tk python3-venv
python3-cryptography-doc python3-cryptography-vectors python-jinja2-doc python-lockfile-doc ipython python-netaddr-docs
python3-setuptools python3-openssl python3-socks python3.8-venv python3.8-doc binutils binfmt-support readline-doc
The following NEW packages will be installed:
ansible ca-certificates distro-info-data file ieee-data krb5-locales libbsd0 libcbor0.6 libedit2 libexpat1 libfido2-1
libgssapi-krb5-2 libk5crypto3 libkeyutils1 libkrb5-3 libkrb5support0 libmagic-mgc libmagic1 libmde2 libnsl5 libpython3-stdlib
libpython3.8-minimal libpython3.8-stdlib libreadline8 libsqlite3-0 libssl1.1 libx11-6 libx11-data libxau6 libxcb1 libxdmcp6
libxext6 libxml2 libyaml-0-2 libz-release mime-support openssl-client openssl-publicsuffix python3 python3-argcomplete
python3-certifi python3-cffi-backend python3-chardet python3-crypto python3-cryptography python3-distutils python3-dnspython
python3-httplib python3-idna python3-jinja2 python3-jmespath python3-kerberos python3-lib2to3 python3-libcloud python3-lockfile
python3-marksafe python3-minimal python3-netaddr python3-ntlm-auth python3-pkg-resources python3-requests
python3-requests-kerberos python3-requests-ntlm python3-selenium python3-simplejson python3-six python3-urllib3 python3-winc
python3-yaml python3-yaml python3.8 python3.8-minimal readline-common wget xz-utils
0 upgraded, 77 newly installed, 0 to remove and 2 not upgraded.
Need to get 22.0 MB of archives.
After this operation, 145 MB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libssl1.1 amd64 1.1.1.f-1ubuntu2.22 [1323 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libbsd0 amd64 0.11.0-1ubuntu0.2 [41.9 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libedit2 amd64 3.1-20210910-1ubuntu0.1 [122 kB]
Get:4 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libcbor0.6 amd64 0.10.2-1ubuntu0.1 [13.8 kB]
Get:5 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libfido2-1 amd64 1.12.0-1ubuntu0.1 [141 kB]
Get:6 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libexpat1 amd64 2.4.8-1ubuntu0.1 [105 kB]
Get:7 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libnsl5 amd64 1.3.0-2ubuntu0.1 [12.4 kB]
Get:8 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libpython3.8-stdlib amd64 3.8.10-1ubuntu0.1 [369 kB]
Get:9 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libpython3.8-minimal amd64 3.8.10-1ubuntu0.1 [22.8 kB]
Get:10 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3.8-minimal amd64 3.8.10-1ubuntu0.1 [22.8 kB]
Get:11 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3.8 amd64 3.8.10-1ubuntu0.1 [369 kB]
Get:12 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-amqp amd64 2.6.1-1ubuntu0.1 [14.8 kB]
Get:13 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-argcomplete amd64 1.12.1-1ubuntu0.1 [14.8 kB]
Get:14 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-certifi amd64 2020.6.20-1ubuntu0.1 [14.8 kB]
Get:15 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-cffi-backend amd64 1.14.0-1ubuntu0.1 [14.8 kB]
Get:16 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-chardet amd64 3.0.4-1ubuntu0.1 [14.8 kB]
Get:17 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-crypto amd64 2.1.2-1ubuntu0.1 [14.8 kB]
Get:18 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-cryptography amd64 3.1-1ubuntu0.1 [14.8 kB]
Get:19 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-distutils amd64 3.8.1-1ubuntu0.1 [14.8 kB]
Get:20 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-dnspython amd64 1.19.0-1ubuntu0.1 [14.8 kB]
Get:21 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-httplib amd64 0.7.0-1ubuntu0.1 [14.8 kB]
Get:22 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-idna amd64 2.10-1ubuntu0.1 [14.8 kB]
Get:23 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-jinja2 amd64 2.11.2-1ubuntu0.1 [14.8 kB]
Get:24 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-jmespath amd64 0.10.0-1ubuntu0.1 [14.8 kB]
Get:25 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-kerberos amd64 1.1.13-1ubuntu0.1 [14.8 kB]
Get:26 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-lib2to3 amd64 3.8.10-1ubuntu0.1 [14.8 kB]
Get:27 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-libcloud amd64 3.10.0-1ubuntu0.1 [14.8 kB]
Get:28 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-lockfile amd64 0.10.2-1ubuntu0.1 [14.8 kB]
Get:29 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-marksafe amd64 1.1.1-1ubuntu0.1 [14.8 kB]
Get:30 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-minimal amd64 3.8.10-1ubuntu0.1 [22.8 kB]
Get:31 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-netaddr amd64 0.8.0-1ubuntu0.1 [14.8 kB]
Get:32 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-ntlm-auth amd64 1.1.0-1ubuntu0.1 [14.8 kB]
Get:33 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-pkg-resources amd64 59.0.1-1ubuntu0.1 [14.8 kB]
Get:34 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-requests amd64 2.27.1-1ubuntu0.1 [14.8 kB]
Get:35 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-requests-kerberos amd64 0.12.0-2 [14.8 kB]
Get:36 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-requests-ntlm amd64 1.1.0-1 [14.8 kB]
Get:37 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-selenium amd64 3.141.0-1ubuntu0.1 [14.8 kB]
Get:38 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-simplejson amd64 3.16.0-1ubuntu0.1 [14.8 kB]
Get:39 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-six amd64 1.16.0-1ubuntu0.1 [14.8 kB]
Get:40 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-urllib3 amd64 1.26.5-1ubuntu0.1 [14.8 kB]
Get:41 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-winc amd64 0.1.0-1ubuntu0.1 [14.8 kB]
Get:42 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-yaml amd64 5.4.1-1ubuntu0.1 [14.8 kB]
Get:43 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-yaml python3.8 amd64 5.4.1-1ubuntu0.1 [14.8 kB]
Get:44 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3.8-minimal amd64 3.8.10-1ubuntu0.1 [22.8 kB]
Get:45 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3.8 amd64 3.8.10-1ubuntu0.1 [369 kB]
Get:46 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-amqp amd64 2.6.1-1ubuntu0.1 [14.8 kB]
Get:47 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-argcomplete amd64 1.12.1-1ubuntu0.1 [14.8 kB]
Get:48 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-certifi amd64 2020.6.20-1ubuntu0.1 [14.8 kB]
Get:49 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-cffi-backend amd64 1.14.0-1ubuntu0.1 [14.8 kB]
Get:50 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-chardet amd64 3.0.4-1ubuntu0.1 [14.8 kB]
Get:51 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-crypto amd64 2.1.2-1ubuntu0.1 [14.8 kB]
Get:52 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-cryptography amd64 3.1-1ubuntu0.1 [14.8 kB]
Get:53 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-distutils amd64 3.8.1-1ubuntu0.1 [14.8 kB]
Get:54 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-dnspython amd64 1.19.0-1ubuntu0.1 [14.8 kB]
Get:55 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-httplib amd64 0.7.0-1ubuntu0.1 [14.8 kB]
Get:56 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-idna amd64 2.10-1ubuntu0.1 [14.8 kB]
Get:57 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-jinja2 amd64 2.11.2-1ubuntu0.1 [14.8 kB]
Get:58 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-jmespath amd64 0.10.0-1ubuntu0.1 [14.8 kB]
Get:59 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-kerberos amd64 1.1.13-1ubuntu0.1 [14.8 kB]
Get:60 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-lib2to3 amd64 3.8.10-1ubuntu0.1 [14.8 kB]
Get:61 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-libcloud amd64 3.10.0-1ubuntu0.1 [14.8 kB]
Get:62 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-lockfile amd64 0.10.2-1ubuntu0.1 [14.8 kB]
Get:63 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-marksafe amd64 1.1.1-1ubuntu0.1 [14.8 kB]
Get:64 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-minimal amd64 3.8.10-1ubuntu0.1 [22.8 kB]
Get:65 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-netaddr amd64 0.8.0-1ubuntu0.1 [14.8 kB]
Get:66 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-ntlm-auth amd64 1.1.0-1ubuntu0.1 [14.8 kB]
Get:67 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-pkg-resources amd64 59.0.1-1ubuntu0.1 [14.8 kB]
Get:68 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-requests amd64 2.27.1-1ubuntu0.1 [14.8 kB]
Get:69 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-requests-kerberos amd64 0.12.0-2 [14.8 kB]
Get:70 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-requests-ntlm amd64 1.1.0-1 [14.8 kB]
Get:71 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-selenium amd64 3.141.0-1ubuntu0.1 [14.8 kB]
Get:72 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-simplejson amd64 3.16.0-1ubuntu0.1 [14.8 kB]
Get:73 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-six amd64 1.16.0-1ubuntu0.1 [14.8 kB]
Get:74 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-urllib3 amd64 1.26.5-1ubuntu0.1 [14.8 kB]
Get:75 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-winc amd64 0.1.0-1ubuntu0.1 [14.8 kB]
Get:76 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-yaml amd64 5.4.1-1ubuntu0.1 [14.8 kB]
Get:77 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-yaml python3.8 amd64 5.4.1-1ubuntu0.1 [14.8 kB]
Fetched 145 MB in 10s (14.5 MB/s)
debconf: delaying package configuration, since apt-utils is not installed
Setting up libbsd0 (0.11.0-1ubuntu0.1) ...
Setting up python3-argcomplete (1.12.1-1ubuntu0.1) ...
Setting up python3-lib2to3 (3.8.10-1ubuntu0.1) ...
Setting up python3-cffi-backend (1.14.0-1ubuntu0.1) ...
Setting up python3-pkg-resources (59.0.1-1ubuntu0.1) ...
Setting up python3-distutils (3.8.10-1ubuntu0.1) ...
Setting up python3-lockfile (0.10.2-1ubuntu0.1) ...
Setting up python3-ntlm-auth (1.1.0-1) ...
Setting up python3-kerberos (1.1.13-1ubuntu0.1) ...
Setting up python3-yaml (5.4.1-1ubuntu0.1) ...
Setting up python3-chardet (3.0.4-1ubuntu0.1) ...
Setting up python3-cryptography (3.1-1ubuntu0.1) ...
Setting up python3-requests (2.27.1-1ubuntu0.1) ...
Setting up python3-requests-kerberos (0.12.0-2) ...
Setting up ansible (2.9.6+dfsg-1) ...
Setting up python3-requests-ntlm (1.1.0-1) ...
Setting up python3-libcloud (3.10.0-1) ...
Setting up python3-minrm (0.3.0-2) ...
Processing triggers for libc-bin (2.31-0ubuntu9.14) ...
Processing triggers for ca-certificates (20230311ubuntu0.20.04.1) ...
Updating certificates in /etc/ssl/certs...
0 added, 0 removed, done.
Running hooks in /etc/ca-certificates/update.d...
done.
root@d7037a85f87f:/# ansible --version
ansible 2.9.6
  config file = /etc/ansible/ansible.cfg
  configured module search path = ['/root/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/lib/python3/dist-packages/ansible
  executable location = /usr/bin/ansible
  python version = 3.8.10 (default, Nov 22 2023, 10:22:35) [GCC 9.4.0]
root@d7037a85f87f:/#
```

Ansible installed

# Check SSH status and install openssh server in DavidHiuhucontrol\_node

```
root@9727305a689a: /  
C:\Users\Administrator>docker exec -it DavidHiuhucontrol_node bash  
root@9727305a689a:/# service ssh status  
ssh: unrecognized service  
root@9727305a689a:/# apt install -y openssh-server  
Reading package lists... Done  
Building dependency tree  
Reading state information... Done  
The following additional packages will be installed:  
  dbus dmsup gir1.2-glib-2.0 libapparmor1 libargon2-1 libcap2 libcryptsetup12 libdbus-1-3 libdevmapper1.02.1  
  libgirepository1.0-1 libglib2.0-0 libglib2.0-data libicu66 libip4tc2 libjson-c4 libkmod2 libnss-systemd  
  libpam-systemd librap0 libxkb2 ncurses-term networkd-dispatcher openssh-sftp-server python3-dbus python3-distro  
  python3-gi shared-mime-info ssh-import-id systemd systemd-sysv systemd-timesyncd tzdata ucf xdg-user-dirs  
Suggested packages:  
  default-dbus-session-bus | dbus-session-bus iw | wireless-tools molly-guard monkeysphere ssh-askpass ufw  
  python-dbus-doc python3-dbus-dbg systemd-container policykit-1  
The following NEW packages will be installed:  
  dbus dmsup gir1.2-glib-2.0 libapparmor1 libargon2-1 libcap2 libcryptsetup12 libdbus-1-3 libdevmapper1.02.1  
  libgirepository1.0-1 libglib2.0-0 libglib2.0-data libicu66 libip4tc2 libjson-c4 libkmod2 libnss-systemd  
  libpam-systemd librap0 libxkb2 ncurses-term networkd-dispatcher openssh-server openssh-sftp-server python3-dbus  
  python3-distro python3-gi shared-mime-info ssh-import-id systemd systemd-sysv systemd-timesyncd tzdata ucf  
  xdg-user-dirs  
0 upgraded, 35 newly installed, 0 to remove and 2 not upgraded.  
Need to get 17.5 MB of archives.  
After this operation, 75.8 MB of additional disk space will be used.  
Get:1 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libapparmor1 amd64 2.13.3-7ubuntu5.3 [35.4 kB]  
Get:2 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libcap2 amd64 1:2.32-1ubuntu0.1 [15.8 kB]  
Get:3 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libargon2-1 amd64 0-20171222-0.2 [19.2 kB]  
Get:4 http://archive.ubuntu.com/ubuntu focal/main amd64 libdevmapper1.02.1 amd64 2:1.02.167-1ubuntu1 [127 kB]  
2% [4 libdevmapper1.02.1 5529 B/127 kB 4%]
```

## Start SSH DavidHiuhucontrol\_node

```
64-linux-gnu/perl/5.30 /usr/share/perl/5.30 /usr/local/lib/site_perl /usr/lib/x86_64-linux-gnu/perl-base) at /usr/share/perl5/Debianconf  
/FrontEnd/Readline.pm line 7:)  
debconf: falling back to frontend: Teletype  
  
Creating config file /etc/ssh/sshd_config with new version  
Creating SSH2 RSA key; this may take some time ...  
3072 SHA256:ud/IKyQ0/17DpxhM0LTeJ0JrfvSvYGVrti/FLWUA root@9727305a689a (RSA)  
Creating SSH2 ECDSA key; this may take some time ...  
256 SHA256:ptewKXfY0/LWMAARsRt9P307JAJWML6E0PrBDVhejk root@9727305a689a (ECDSA)  
Creating SSH2 ED25519 key; this may take some time ...  
256 SHA256:KZAm5xQ0/87WJh0T6cJl6x5mdd0trTJLlt00 root@9727305a689a (ED25519)  
Created symlink /etc/systemd/system/ssh.service → /lib/systemd/system/ssh.service.  
Created symlink /etc/systemd/system/multi-user.target.wants/ssh.service → /lib/systemd/system/ssh.service.  
invoke-rc.d: could not determine current runlevel  
invoke-rc.d: policy-rc.d denied execution of start.  
Setting up libicu66:amd64 (66.1-2ubuntu2.1) ...  
Setting up gir1.2-glib-2.0:amd64 (1.64.1-1ubuntu20.04.1) ...  
Setting up libxml2:amd64 (2.9.10+dfsg-3ubuntu0.20.04.7) ...  
Setting up python3-gi (3.36.0-1) ...  
Setting up shared-mime-info (1.15-1) ...  
Setting up networkd-dispatcher (2.1-2ubuntu20.04.3) ...  
Created symlink /etc/systemd/system/multi-user.target.wants/networkd-dispatcher.service → /lib/systemd/system/networkd-dispatcher.ser  
vice.  
Processing triggers for systemd (245.4-4ubuntu3.23) ...  
Processing triggers for libc-bin (2.31-0ubuntu9.14) ...  
root@9727305a689a:/# service ssh status  
* sshd is not running  
root@9727305a689a:/# service ssh start  
* Starting OpenSSH Secure Shell server sshd  
root@9727305a689a:/# service ssh status  
* sshd is running  
root@9727305a689a:/# |
```

# Check SSH status and install openssh server in DavidHiuhuremote\_node1

```
root@5d5db5da187d:/# service ssh status  
ssh: unrecognized service  
root@5d5db5da187d:/# apt install -y openssh-server  
Reading package lists... Done  
Building dependency tree  
Reading state information... Done  
The following additional packages will be installed:  
  dbus dmsup gir1.2-glib-2.0 libapparmor1 libargon2-1 libcap2 libcryptsetup12 libdbus-1-3 libdevmapper1.02.1  
  libgirepository1.0-1 libglib2.0-0 libglib2.0-data libicu66 libip4tc2 libjson-c4 libkmod2 libnss-systemd libpam-systemd librap0  
  libxkb2 ncurses-term networkd-dispatcher openssh-sftp-server python3-dbus python3-distro python3-gi shared-mime-info  
  ssh-import-id systemd systemd-sysv systemd-timesyncd tzdata ucf xdg-user-dirs  
Suggested packages:  
  default-dbus-session-bus | dbus-session-bus iw | wireless-tools molly-guard monkeysphere ssh-askpass ufw python-dbus-doc  
  python3-dbus-dbg systemd-container policykit-1  
The following NEW packages will be installed:  
  dbus dmsup gir1.2-glib-2.0 libapparmor1 libargon2-1 libcap2 libcryptsetup12 libdbus-1-3 libdevmapper1.02.1  
  libgirepository1.0-1 libglib2.0-0 libglib2.0-data libicu66 libip4tc2 libjson-c4 libkmod2 libnss-systemd libpam-systemd librap0  
  libxkb2 ncurses-term networkd-dispatcher openssh-server openssh-sftp-server python3-dbus python3-distro python3-gi  
  shared-mime-info ssh-import-id systemd systemd-sysv systemd-timesyncd tzdata ucf xdg-user-dirs  
0 upgraded, 35 newly installed, 0 to remove and 2 not upgraded.  
Need to get 17.5 MB of archives.  
After this operation, 75.8 MB of additional disk space will be used.  
Get:1 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libapparmor1 amd64 2.13.3-7ubuntu5.3 [35.4 kB]  
1% [Waiting for headers]
```

## Start SSH DavidHiuhuremote\_node1

```
64-linux-gnu/perl/5.30 /usr/share/perl/5.30 /usr/local/lib/site_perl /usr/lib/x86_64-linux-gnu/perl-base) at /usr/share/perl5/Debianconf  
/FrontEnd/Readline.pm line 7:)  
debconf: falling back to frontend: Teletype  
  
Creating config file /etc/ssh/sshd_config with new version  
Creating SSH2 RSA key; this may take some time ...  
3072 SHA256:047MkYLDVQ6G6G90LHPQWj3vcrl14hIMhA+H3b00 root@5d5db5da187d (RSA)  
Creating SSH2 ECDSA key; this may take some time ...  
256 SHA256:0n7js04VQE/7R1U1UzW7ACFhaqs+w18cb32/ABFXV root@5d5db5da187d (ECDSA)  
Creating SSH2 ED25519 key; this may take some time ...  
256 SHA256:mc2pm0h0De06G7mWwMpyfUp9ED7J15S855 root@5d5db5da187d (ED25519)  
Created symlink /etc/systemd/system/ssh.service → /lib/systemd/system/ssh.service.  
Created symlink /etc/systemd/system/multi-user.target.wants/ssh.service → /lib/systemd/system/ssh.service.  
invoke-rc.d: could not determine current runlevel  
invoke-rc.d: policy-rc.d denied execution of start.  
Setting up libicu66:amd64 (66.1-2ubuntu2.1) ...  
Setting up gir1.2-glib-2.0:amd64 (1.64.1-1ubuntu20.04.1) ...  
Setting up libxml2:amd64 (2.9.10+dfsg-3ubuntu0.20.04.7) ...  
Setting up python3-gi (3.36.0-1) ...  
Setting up shared-mime-info (1.15-1) ...  
Setting up networkd-dispatcher (2.1-2ubuntu20.04.3) ...  
Created symlink /etc/systemd/system/multi-user.target.wants/networkd-dispatcher.service → /lib/systemd/system/networkd-dispatcher.ser  
vice.  
Processing triggers for systemd (245.4-4ubuntu3.23) ...  
Processing triggers for libc-bin (2.31-0ubuntu9.14) ...  
root@5d5db5da187d:/# service ssh status  
* sshd is not running  
root@5d5db5da187d:/# service ssh start  
* Starting OpenSSH Secure Shell server sshd  
root@5d5db5da187d:/# service ssh status  
* sshd is running  
root@5d5db5da187d:/# |
```

# Check SSH status and install openssh server in DavidHiuhuremote\_node2

```
root@7037a85f87f:~# service ssh status
ssh: unrecognized service
root@7037a85f87f:~# apt install -y openssh-server
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  dbus dmsetup gir1.2-glib-2.0 libapparmor1 libargon2-1 libcap2 libcryptsetup12 libdbus-1-3 libdevmapper1.02.1
  libgirepository1.0-1 libglib2.0-0 libglib2.0-data libcrypt6 libip4tc2 libjson-c4 libkmod2 libnss-systemd libpam-systemd librap8
  libx12 ncurses-term networkd-dispatcher openssh-sftp-server python3-dbus python3-distro python3-gi shared-mime-info
  ssh-import-id systemd systemd-sysv systemd-timesyncd tzdata ucf xdg-user-dirs
Suggested packages:
  default-dbus-session-bus | dbus-session-bus fw | wireless-tools molly-guard monkeysphere ssh-askpass ufw python-dbus-doc
  python3-dbus-doc systemd-container policykit-1
The following NEW packages will be installed:
  dbus dmsetup gir1.2-glib-2.0 libapparmor1 libargon2-1 libcap2 libcryptsetup12 libdbus-1-3 libdevmapper1.02.1
  libgirepository1.0-1 libglib2.0-0 libglib2.0-data libcrypt6 libip4tc2 libjson-c4 libkmod2 libnss-systemd libpam-systemd librap8
  libx12 ncurses-term networkd-dispatcher openssh-sftp-server python3-dbus python3-distro python3-gi shared-mime-info
  ssh-import-id systemd systemd-sysv systemd-timesyncd tzdata ucf xdg-user-dirs
0 upgraded, 35 newly installed, 0 to remove and 2 not upgraded.
Need to get 17.5 MB of archives.
After this operation, 75.8 MB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libapparmor1 amd64 2.13.3-7ubuntu5.3 [35.4 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libcap2 amd64 1:2.32-2ubuntu0.1 [15.8 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal/main amd64 libargon2-1 amd64 0-20171227-0.2 [19.2 kB]
2% [Working]
```

## Start SSH DavidHiuhuremote\_node2

```
64-linux-gnu/perl/5.30 /usr/share/perl/5.30 /usr/local/lib/site_perl /usr/lib/x86_64-linux-gnu/perl-base) at /usr/share/perl5/Debconf
/FrontEnd/Readline.pm line 7.)
debconf: falling back to frontend: Teletype

Creating config file /etc/ssh/sshd_config with new version
Creating SSH2 RSA key; this may take some time ...
3072 SHA256:0fGcV01a1QmW0h9GhGzE9TebusGqW0LDQ1x70pds root@7037a85f87f (RSA)
Creating SSH2 ECDSA key; this may take some time ...
256 SHA256:0bh1nMLu9UCUBI+DWVYTFrwlE9sy+RapeMyhQSHHwA root@7037a85f87f (ECDSA)
Creating SSH2 ED25519 key; this may take some time ...
256 SHA256:YemHhZIEB0LQovhnhvQpUVC079/y0Vst1F3xM08 root@7037a85f87f (ED25519)
Created symlink /etc/systemd/system/ssh.service → /lib/systemd/system/ssh.service.
Created symlink /etc/systemd/system/multi-user.target.wants/ssh.service → /lib/systemd/system/ssh.service.
invoke-rc.d: could not determine current runlevel
invoke-rc.d: policy-rc.d denied execution of start.
Setting up libicu66:amd64 (66.1-2ubuntu2.1) ...
Setting up gir1.2-glib-2.0:amd64 (1.64.1-1-ubuntu20.04.1) ...
Setting up libx12:amd64 (2.9.18+dfsg-Subuntu0.20.04.7) ...
Setting up python3-gi (3.36.0-1) ...
Setting up shared-mime-info (1.15-1) ...
Setting up networkd-dispatcher (2.1-2-ubuntu20.04.3) ...
Created symlink /etc/systemd/system/multi-user.target.wants/networkd-dispatcher.service → /lib/systemd/system/networkd-dispatcher.service.
Processing triggers for systemd (245.4-4ubuntu3.23) ...
Processing triggers for libc-bin (2.31-0ubuntu9.14) ...
root@7037a85f87f:~# service ssh status
* sshd is not running
root@7037a85f87f:~# service ssh start
* Starting OpenBSD Secure Shell server sshd
root@7037a85f87f:~# service ssh status
* sshd is running
root@7037a85f87f:~#
```

## ssh into DavidHiuhuremote\_node1 from the control node

### DavidHiuhucontrol\_node

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
d7037a85f87f	ubuntu:20.04	"/bin/bash"	25 hours ago	Up 25 hours		DavidHiuhuremote_node2
5dddb5da187d	ubuntu:20.04	"/bin/bash"	25 hours ago	Up 25 hours		DavidHiuhuremote_node1
9727305a689a	ubuntu:20.04	"/bin/bash"	25 hours ago	Up 25 hours		DavidHiuhucontrol_node
c3050dafd9a2	ubuntu:20.04	"/bin/bash"	2 days ago	Up 47 hours		control_node
d9cc345ed240	ubuntu:20.04	"/bin/bash"	2 days ago	Up 47 hours		remote_node2
2dalb6e73cad	ubuntu:20.04	"/bin/bash"	2 days ago	Up 47 hours		remote_node1

```
PS C:\Users\Administrator> docker exec -it DavidHiuhucontrol_node bash
root@9727305a689a:~# ssh root@5dddb5da187d
The authenticity of host '5dddb5da187d (172.18.0.6)' can't be established.
ECDSA key fingerprint is SHA256:0nTjsb04YQE/7RI1U1zN7sCFkaq+s+wlBcb32/A8FXy.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '5dddb5da187d' (ECDSA) to the list of known hosts.
root@5dddb5da187d's password:
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.133.1-microsoft-standard-WSL2 x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

This system has been minimized by removing packages and content that are
not required on a system that users do not log into.

To restore this content, you can run the 'unminimize' command.

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.
```



## ssh into DavidHiuhuremote\_node2 from the control node

### DavidHiuhucontrol\_node

```
root@d7037a85f87f: ~  
d7037a85f87f  ubuntu:20.04  "/bin/bash"  25 hours ago  Up 25 hours  DavidHiuhuremote_node2  
5dddb5da187d  ubuntu:20.04  "/bin/bash"  25 hours ago  Up 25 hours  DavidHiuhuremote_node1  
9727305a689a  ubuntu:20.04  "/bin/bash"  25 hours ago  Up 25 hours  DavidHiuhucontrol_node  
c3050dafd9a2  ubuntu:20.04  "/bin/bash"  2 days ago   Up 47 hours  control_node  
d9cc345ed240  ubuntu:20.04  "/bin/bash"  2 days ago   Up 47 hours  remote_node2  
2da1b6e73cad  ubuntu:20.04  "/bin/bash"  2 days ago   Up 47 hours  remote_node1  
PS C:\Users\Administrator> docker exec -it DavidHiuhucontrol_node bash  
root@9727305a689a:/# ssh root@5dddb5da187d  
The authenticity of host '5dddb5da187d (172.18.0.6)' can't be established.  
ECDSA key fingerprint is SHA256:OnTjsb04YQE/7RI1U1zN7sCFkaq+s+wlBcb32/A8FXy.  
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes  
Warning: Permanently added '5dddb5da187d' (ECDSA) to the list of known hosts.  
root@5dddb5da187d's password:  
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.133.1-microsoft-standard-WSL2 x86_64)  
  
* Documentation:  https://help.ubuntu.com  
* Management:    https://landscape.canonical.com  
* Support:       https://ubuntu.com/pro  
  
This system has been minimized by removing packages and content that are  
not required on a system that users do not log into.  
  
To restore this content, you can run the 'unminimize' command.  
  
The programs included with the Ubuntu system are free software;  
the exact distribution terms for each program are described in the  
individual files in /usr/share/doc/*/copyright.  
  
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by  
applicable law.  
root@5dddb5da187d:~# ssh root@d7037a85f87f  
The authenticity of host 'd7037a85f87f (172.18.0.7)' can't be established.  
ECDSA key fingerprint is SHA256:0bhlnMLu9UcUBI+DwVvTYFrwLE9sy+RapeMykQSHhwA.  
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes  
Warning: Permanently added 'd7037a85f87f,172.18.0.7' (ECDSA) to the list of known hosts.  
root@d7037a85f87f's password:  
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.133.1-microsoft-standard-WSL2 x86_64)  
  
* Documentation:  https://help.ubuntu.com  
* Management:    https://landscape.canonical.com  
* Support:       https://ubuntu.com/pro  
  
This system has been minimized by removing packages and content that are  
not required on a system that users do not log into.  
  
To restore this content, you can run the 'unminimize' command.  
  
The programs included with the Ubuntu system are free software;  
the exact distribution terms for each program are described in the  
individual files in /usr/share/doc/*/copyright.  
  
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by  
applicable law.
```

## Creating directories using the ad-hoc command.

```
Administrator: Command Pro x + v
c3050dafd9a2 ubuntu:20.04 "/bin/bash" 24 hours ago Up 23 hours control_node
d9cc345ed240 ubuntu:20.04 "/bin/bash" 24 hours ago Up 23 hours remote_node2
2da1b6e73cad ubuntu:20.04 "/bin/bash" 24 hours ago Up 23 hours remote_node1

C:\Users\Administrator>docker exec -it DavidHiuhucontrol_node ansible localhost -m command -a "mkdir my_directory_control_node warn=false"
localhost | CHANGED | rc=0 >>

C:\Users\Administrator>docker exec -it DavidHiuhuremote_node1 ansible localhost -m command -a "mkdir my_directory_remote_node1 warn=false"
localhost | CHANGED | rc=0 >>

C:\Users\Administrator>docker exec -it DavidHiuhuremote_node2 ansible localhost -m command -a "mkdir my_directory_remote_node2 warn=false"
localhost | CHANGED | rc=0 >>

C:\Users\Administrator>

root@5dddb5da187d: /
root@5dddb5da187d:/# ls
bin dev home lib32 libx32 mnt opt root sbin sys usr
boot etc lib lib64 media my_directory_remote_node1 proc run srv tmp var
root@5dddb5da187d:/#

root@d7037a85f87f: /
root@d7037a85f87f:/# ls
bin dev home lib32 libx32 mnt opt root sbin sys usr
boot etc lib lib64 media my_directory_remote_node2 proc run srv tmp var
root@d7037a85f87f:/#
```

```
root@9727305a689a: /
9727305a689a ubuntu:20.04 "/bin/bash" About an hour ago Up About an hour DavidHiuhucontrol_node
c3050dafd9a2 ubuntu:20.04 "/bin/bash" 24 hours ago Up 23 hours control_node
d9cc345ed240 ubuntu:20.04 "/bin/bash" 24 hours ago Up 23 hours remote_node2
2da1b6e73cad ubuntu:20.04 "/bin/bash" 24 hours ago Up 23 hours remote_node1

C:\Users\Administrator>docker exec -it DavidHiuhucontrol_node ansible localhost -m command -a "mkdir my_directory_control_node warn=false"
localhost | CHANGED | rc=0 >>

C:\Users\Administrator>docker exec -it DavidHiuhuremote_node1 ansible localhost -m command -a "mkdir my_directory_remote_node1 warn=false"
localhost | CHANGED | rc=0 >>

C:\Users\Administrator>docker exec -it DavidHiuhuremote_node2 ansible localhost -m command -a "mkdir my_directory_remote_node2 warn=false"
localhost | CHANGED | rc=0 >>

C:\Users\Administrator>docker exec -it DavidHiuhucontrol_node bash
root@9727305a689a:/# ls
bin dev home lib32 libx32 mnt opt root sbin sys usr
boot etc lib lib64 media my_directory_control_node proc run srv tmp var
root@9727305a689a:/#
```

Create the file playbook yml and create file in both nodes. Show using screenshot that you have successfully created the file using playbook nano create\_file.yml from the DavidHiuhucontrol\_node

```
PS C:\Users\Administrator> docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED    STATUS    PORTS    NAMES
d7037a85f87f   ubuntu:20.04 "/bin/bash"            27 hours ago Up 27 hours DavidHiuhuremote_node2
5dddb5da187d   ubuntu:20.04 "/bin/bash"            27 hours ago Up 27 hours DavidHiuhuremote_node1
9727305a689a   ubuntu:20.04 "/bin/bash"            27 hours ago Up 27 hours DavidHiuhucontrol_node
c3050dafd9a2   ubuntu:20.04 "/bin/bash"            2 days ago Up 2 days control_node
d9cc345ed240   ubuntu:20.04 "/bin/bash"            2 days ago Up 2 days remote_node2
2da1b6e73cad   ubuntu:20.04 "/bin/bash"            2 days ago Up 2 days remote_node1

PS C:\Users\Administrator> docker exec -it DavidHiuhucontrol_node bash
root@9727305a689a:/# nano create_file.yml

root@9727305a689a:/# nano create_file.yml
name: create_file.yml
hosts: control_node
tasks:
  - name: Create directory
    command: mkdir -p /root/.ssh
  - name: Create file
    copy:
      src: /root/.ssh/authorized_keys
      dest: /root/.ssh/authorized_keys
    content: "The are identical files CREATED ON 28th FEB 2024"
```



```
PS C:\Users\Administrator> docker ps -a
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS        NAMES
d7037a85f87f   ubuntu:20.04 "/bin/bash"            27 hours ago   Up 27 hours                   DavidHiuhuremote_node2
5dddb5da187d   ubuntu:20.04 "/bin/bash"            27 hours ago   Up 27 hours                   DavidHiuhuremote_node1
9727305a689a   ubuntu:20.04 "/bin/bash"            27 hours ago   Up 27 hours                   DavidHiuhucontrol_node
c3050dafd9a2   ubuntu:20.04 "/bin/bash"            2 days ago     Up 2 days                   control_node
d9cc345ed240   ubuntu:20.04 "/bin/bash"            2 days ago     Up 2 days                   remote_node2
2da1b6e73cad   ubuntu:20.04 "/bin/bash"            2 days ago     Up 2 days                   remote_node1
PS C:\Users\Administrator> docker exec -it DavidHiuhucontrol_node bash
root@9727305a689a:/# nano create_file.yml
root@9727305a689a:/# nano inventory.ini
```

```
GNU nano 4.8
[remote_nodes]
d7037a85f87f ansible_host_key_checking=False
5dddb5da187d ansible_host_key_checking=False
```

```
PS C:\Users\Administrator> docker ps -a
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS        NAMES
d7037a85f87f   ubuntu:20.04 "/bin/bash"            27 hours ago   Up 27 hours                   DavidHiuhuremote_node2
5dddb5da187d   ubuntu:20.04 "/bin/bash"            27 hours ago   Up 27 hours                   DavidHiuhuremote_node1
9727305a689a   ubuntu:20.04 "/bin/bash"            27 hours ago   Up 27 hours                   DavidHiuhucontrol_node
c3050dafd9a2   ubuntu:20.04 "/bin/bash"            2 days ago     Up 2 days                   control_node
d9cc345ed240   ubuntu:20.04 "/bin/bash"            2 days ago     Up 2 days                   remote_node2
2da1b6e73cad   ubuntu:20.04 "/bin/bash"            2 days ago     Up 2 days                   remote_node1
PS C:\Users\Administrator> docker exec -it DavidHiuhucontrol_node bash
root@9727305a689a:/# nano create_file.yml
root@9727305a689a:/# nano inventory.ini
root@9727305a689a:/# nano ansible.cfg
```

USEFUL DURING  
RUNNING OF THE CI

```
GNU nano 4.8
[defaults]
host_key_checking = False
```

```
PS C:\Users\Administrator> docker ps -a
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS        NAMES
d7037a85f87f   ubuntu:20.04 "/bin/bash"            27 hours ago   Up 27 hours                   DavidHiuhuremote_node2
5dddb5da187d   ubuntu:20.04 "/bin/bash"            27 hours ago   Up 27 hours                   DavidHiuhuremote_node1
9727305a689a   ubuntu:20.04 "/bin/bash"            27 hours ago   Up 27 hours                   DavidHiuhucontrol_node
c3050dafd9a2   ubuntu:20.04 "/bin/bash"            2 days ago     Up 2 days                   control_node
d9cc345ed240   ubuntu:20.04 "/bin/bash"            2 days ago     Up 2 days                   remote_node2
2da1b6e73cad   ubuntu:20.04 "/bin/bash"            2 days ago     Up 2 days                   remote_node1
PS C:\Users\Administrator> docker exec -it DavidHiuhucontrol_node bash
root@9727305a689a:/# nano create_file.yml
root@9727305a689a:/# nano inventory.ini
root@9727305a689a:/# nano ansible.cfg
root@9727305a689a:/# LS
bash: LS: command not found
root@9727305a689a:/# ls
ansible.cfg  boot  dev  home  lib  lib64  media  my_directory_control_node  proc  run  srv  tmp  var
bin          create_file.yml  etc  inventory.ini  lib32  libx32  mnt  opt  root  sbin  sys  usr
```

Two remote nodes are defined in the .ini file.

Making a folder to store the file `mkdir -p /D.Hiuhu28THFEB2024`

My destination folder: `/D.Hiuhu28THFEB2024/DHiuhu28.txt`

Note: let's check my remote nodes via listing of contents

```
root@9727305a689a: /
PS C:\Users\Administrator> docker exec -it DavidHiuhucontrol_node bash
root@9727305a689a:/# nano create_file.yml
root@9727305a689a:/# nano inventory.ini
root@9727305a689a:/# nano ansible.cfg
root@9727305a689a:/# LS
bash: LS: command not found
root@9727305a689a:/# ls
ansible.cfg  boot          dev  home          lib  lib64  media  my_directory_control_node  proc  run  srv  tmp  var
bin          create_file.yml  etc  inventory.ini  lib32 libx32  mnt    opt                      root  sbin sys  usr
root@9727305a689a:/# nano create_file.yml
root@9727305a689a:/# ansible-playbook -i inventory.ini create_file.yml --ask-pass --ask-become-pass -e 'ANSIBLE_CONFIG=./ansible.cfg'
SSH password:
BECOME password[defaults to SSH password]:

PLAY [Create file on remote nodes] *****
TASK [Gathering Facts] *****ok: [d7037a85f87f]
ok: [5dddb5da187d]

TASK [Create directory] *****[WARNING]: Consider using the file module with state=directory rather than running 'mkdir'. If you need to use command because file is
insufficient you can add 'warn: false' to this command task or set 'command_warnings=False' in ansible.cfg to get rid of this message.
changed: [5dddb5da187d]
changed: [d7037a85f87f]

TASK [Create file] *****change
d: [d7037a85f87f]
changed: [5dddb5da187d]

PLAY RECAP *****5dddb5da187d
d7037a85f87f      : ok=3    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
                  : ok=3    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

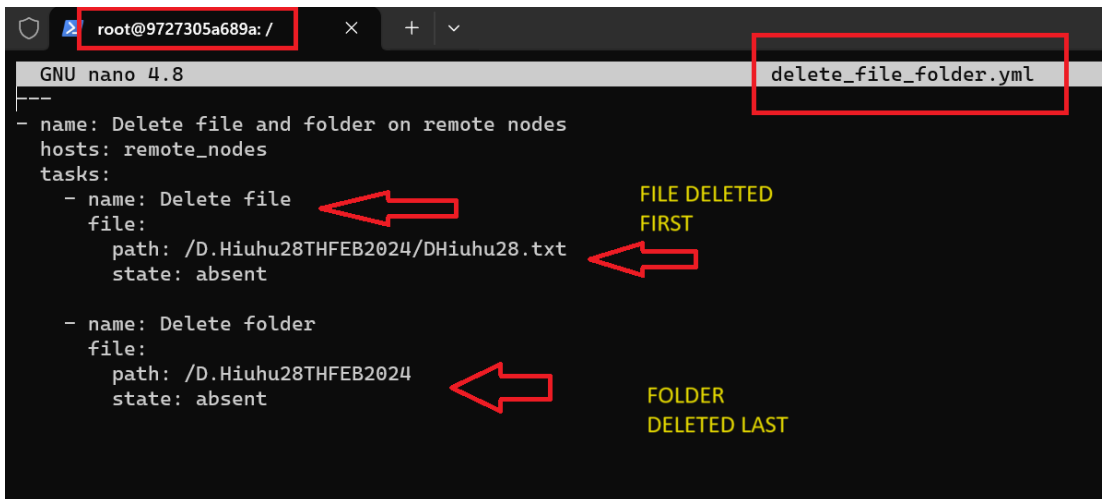
root@9727305a689a:/#
```

```
root@5dddb5da187d: /D.Hiuhu28THFEB2024
root@5dddb5da187d:/# ls
bin  boot  dev  etc  home  lib  lib32  lib64  libx32  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr
root@5dddb5da187d:/# ls
D.Hiuhu28THFEB2024  boot  etc  lib  lib64  media  opt  root  sbin  sys  usr
bin              dev  home  lib32  libx32  mnt  proc  run  srv  tmp  var
root@5dddb5da187d:/# cd D.Hiuhu28THFEB2024/
root@5dddb5da187d:/D.Hiuhu28THFEB2024# ls
DHiuhu28.txt
root@5dddb5da187d:/D.Hiuhu28THFEB2024#

root@d7037a85f87f: /D.Hiuhu28THFEB2024
root@d7037a85f87f:/# ls
bin  boot  dev  etc  home  lib  lib32  lib64  libx32  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr
root@d7037a85f87f:/# ls
D.Hiuhu28THFEB2024  boot  etc  lib  lib64  media  opt  root  sbin  sys  usr
bin              dev  home  lib32  libx32  mnt  proc  run  srv  tmp  var
root@d7037a85f87f:/# cd D.Hiuhu28THFEB2024/
root@d7037a85f87f:/D.Hiuhu28THFEB2024# ls
DHiuhu28.txt
root@d7037a85f87f:/D.Hiuhu28THFEB2024#
```

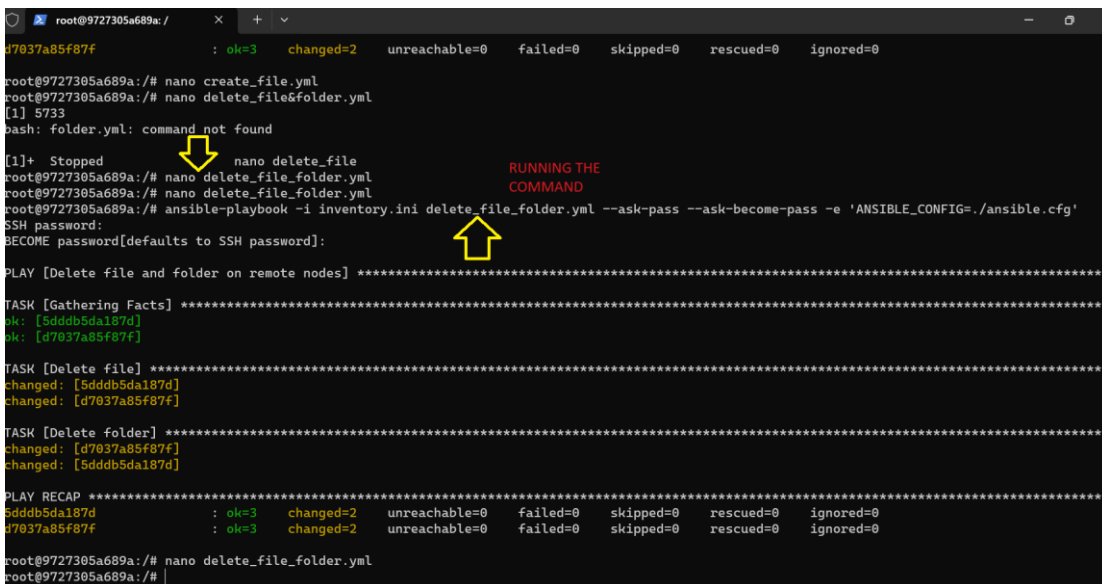
Create a new playbook to delete the file you created previously

I created a play book delete\_file&folder.yml



```
GNU nano 4.8 delete_file_folder.yml
---
- name: Delete file and folder on remote nodes
  hosts: remote_nodes
  tasks:
    - name: Delete file
      file:
        path: /D.Hiuhu28THFEB2024/DHiuhu28.txt
        state: absent

    - name: Delete folder
      file:
        path: /D.Hiuhu28THFEB2024
        state: absent
```



```
root@9727305a689a: /
d7037a85f87f : ok=3 changed=2 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0

root@9727305a689a: /# nano create_file.yml
root@9727305a689a: /# nano delete_file&folder.yml
[1] 5733
bash: folder.yml: command not found

[1]+  Stopped                  nano delete_file
root@9727305a689a: /# nano delete_file_folder.yml
root@9727305a689a: /# ansible-playbook -i inventory.ini delete_file_folder.yml --ask-pass --ask-become-pass -e 'ANSIBLE_CONFIG=./ansible.cfg'
SSH password:
BECOME password[defaults to SSH password]:

PLAY [Delete file and folder on remote nodes] *****

TASK [Gathering Facts] *****
ok: [5dddb5da187d]
ok: [d7037a85f87f]

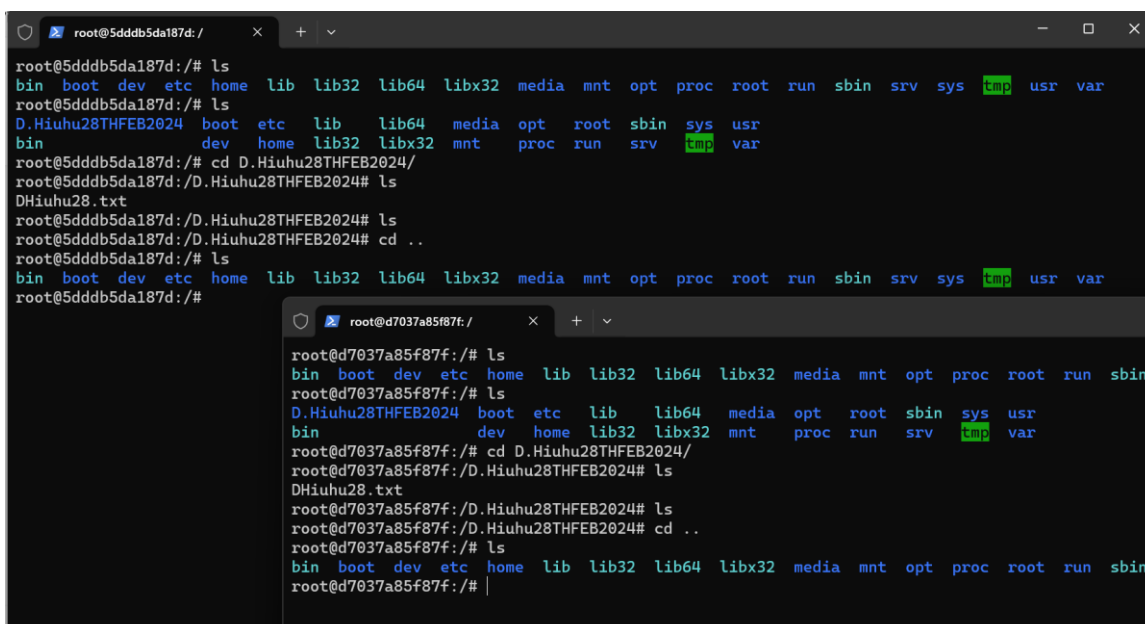
TASK [Delete file] *****
changed: [5dddb5da187d]
changed: [d7037a85f87f]

TASK [Delete folder] *****
changed: [d7037a85f87f]
changed: [5dddb5da187d]

PLAY RECAP *****
5dddb5da187d : ok=3 changed=2 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0
d7037a85f87f : ok=3 changed=2 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0

root@9727305a689a: /# nano delete_file_folder.yml
root@9727305a689a: /#
```

Below, you will see both the file and folder don't exist any more



```
root@5dddb5da187d: /# ls
bin boot dev etc home lib lib32 lib64 libx32 media mnt opt proc root run sbin srv sys tmp usr var
root@5dddb5da187d: /# ls
D.Hiuhu28THFEB2024 boot etc lib lib64 media opt root sbin sys usr
bin dev home lib32 libx32 mnt proc run srv tmp var
root@5dddb5da187d: /# cd D.Hiuhu28THFEB2024/
root@5dddb5da187d: /D.Hiuhu28THFEB2024# ls
DHiuhu28.txt
root@5dddb5da187d: /D.Hiuhu28THFEB2024# ls
root@5dddb5da187d: /D.Hiuhu28THFEB2024# cd ..
root@5dddb5da187d: /# ls
bin boot dev etc home lib lib32 lib64 libx32 media mnt opt proc root run sbin srv sys tmp usr var
root@5dddb5da187d: /#

root@d7037a85f87f: /# ls
bin boot dev etc home lib lib32 lib64 libx32 media mnt opt proc root run sbin
root@d7037a85f87f: /# ls
D.Hiuhu28THFEB2024 boot etc lib lib64 media opt root sbin sys usr
bin dev home lib32 libx32 mnt proc run srv tmp var
root@d7037a85f87f: /# cd D.Hiuhu28THFEB2024/
root@d7037a85f87f: /D.Hiuhu28THFEB2024# ls
DHiuhu28.txt
root@d7037a85f87f: /D.Hiuhu28THFEB2024# ls
root@d7037a85f87f: /D.Hiuhu28THFEB2024# cd ..
root@d7037a85f87f: /# ls
bin boot dev etc home lib lib32 lib64 libx32 media mnt opt proc root run sbin
root@d7037a85f87f: /#
```

# Group

```
root@c3050dafd9a2: /
GNU nano 4.8 update-test-node.yml
- name: Update test node
  hosts: test
  become: yes

tasks:
  - name: Ensure apt package manager is up to date
    apt:
      update_cache: yes

  - name: Install apache2 on test node
    apt:
      name: apache2
      state: present
      when: ansible_hostname == 'test-node'

  - name: Start apache2 on test node
    service:
      name: apache2
      state: started
      when: ansible_hostname == 'test-node'
```

```
PLAY [Update test node] *****

TASK [Gathering Facts] *****
ok: [test-node]
ok: [other-node]

TASK [Ensure apt package manager is up to date] *****
ok: [test-node]
ok: [other-node]

TASK [Install apache2 on test node] *****
changed: [test-node]

TASK [Start apache2 on test node] *****
changed: [test-node]

PLAY RECAP *****
test-node      : ok=4    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
other-node     : ok=2    changed=0    unreachable=0    failed=0    skipped=1    rescued=0    ignored=0
```

**Lab3 – Install Nodejs using nodejs yam1. There is a issue with yam1 file you need to fix it. Once installed you will get the node and npm version screenshots. Also, the successful playbook run screenshot.**

```

dhiuhu@DESKTOP-ATLGL31:~$ nano install_nodejs.yaml
install_nodejs.yaml
--
hosts: localhost
become: true
gather_facts: true
tasks:
  - name: Install prerequisites
    apt:
      name: "{{ item }}"
      state: present
    with_items:
      - curl
      - build-essential
      - libssl-dev
      - libffi-dev
      - python3
      - python3-pip

  - name: Download and install nvm
    shell: curl -o- https://raw.githubusercontent.com/nvm-sh/nvm/v0.38.0/install.sh | bash
    args:
      executable: /bin/bash

  - name: Load nvm script
    script: |
      source ~/.bashrc
    become_user: your_username # replace 'your_username' with your actual username

  - name: Install Node.js
    command: nvm install {{ nodejs_version }}
    vars:
      nodejs_version: "14.17.4"

[... Dead 23 lines ...]

dhiuhu@DESKTOP-ATLGL31:~$ nano install_nodejs.yaml
dhiuhu@DESKTOP-ATLGL31:~$ ansible-playbook --ask-become-pass install_nodejs.yaml
BECOME password:
[WARNING]: No inventory was parsed, only implicit localhost is available
[WARNING]: provided hosts list is empty, only localhost is available. Note that the implicit localhost does not match 'all'

PLAY [localhost] *************************************************************************************************************************************
ASK [Gathering Facts] *************************************************************************************************************************************
k: [localhost]

ASK [Install prerequisites] *************************************************************************************************************************************
DEPRECATION WARNING: Invoking 'apt' only once while using a loop via squash_actions is deprecated. Instead of using a loop to supply multiple items and specifying 'name: ["{{ item }}"]', please use 'name: [\'curl\', \'build-essential\', \'libssl-dev\', \'libffi-dev\', \'python3\', \'python3-pip\']' and remove the loop. This feature will be removed from Ansible-base in version 2.11. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
k: [localhost] => (item=[\'curl\', \'build-essential\', \'libssl-dev\', \'libffi-dev\', \'python3\', \'python3-pip\'])

ASK [Download and install nvm] *************************************************************************************************************************************
[WARNING]: Consider using the get_url or uri module rather than running 'curl'. If you need to use command because get_url or uri is insufficient you can add 'warn: false' to this command task or set 'command_warnings=False' in ansible.cfg to get rid of this message.
changed: [localhost]

ASK [Load nvm script] *************************************************************************************************************************************
atal: [localhost]: FAILED! => {"changed": false, "msg": "Could not find or access 'source'\nSearched in:\n\t/home/dhiuhu/files/source\n\t/home/dhiuhu/source\n\t/home/dhiuhu/files/source\n\t/home/dhiuhu/source on the Ansible Controller.\nIf you are using a module and expect the file to exist on the remote, see the remote_src option"}

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

dhiuhu@DESKTOP-ATLGL31:~$ nano install_nodejs.yaml
dhiuhu@DESKTOP-ATLGL31:~$ node -v
v18.0.0
dhiuhu@DESKTOP-ATLGL31:~$ npm -v
6.6.0
dhiuhu@DESKTOP-ATLGL31:~$ █

```