

```
gagandeepkaur@LAPTOP-S6L: X root@ai10f6a617c7:/ X gagandeepkaur@LAPTOP-S6L: X gagandeepkaur@LAPTOP-S6L: X + v
Welcome to Ubuntu 22.04.4 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

* Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
just raised the bar for easy, resilient and secure K8s cluster deployment.

https://ubuntu.com/engage/secure-kubernetes-at-the-edge

This message is shown once a day. To disable it please create the
/home/gagandeepkaur/.hushlogin file.
gagandeepkaur@LAPTOP-S6L9EA8N:~$ cd BCDV-4033
gagandeepkaur@LAPTOP-S6L9EA8N:~/BCDV-4033$ cd >>
-bash: syntax error near unexpected token `newline'
gagandeepkaur@LAPTOP-S6L9EA8N:~/BCDV-4033$ cd ..
gagandeepkaur@LAPTOP-S6L9EA8N:~$ sudo rm -r BCDV-4033
[sudo] password for gagandeepkaur:
gagandeepkaur@LAPTOP-S6L9EA8N:~$ git clone https://github.com/nelaturuk/BCDV-4033
Cloning into 'BCDV-4033'...
remote: Enumerating objects: 90, done.
remote: Counting objects: 100% (90/90), done.
remote: Compressing objects: 100% (58/58), done.
remote: Total 90 (delta 18), reused 69 (delta 7), pack-reused 0
Receiving objects: 100% (90/90), 6.69 MiB | 11.70 MiB/s, done.
Resolving deltas: 100% (18/18), done.
gagandeepkaur@LAPTOP-S6L9EA8N:~$ cd BCDV-4033/ansible/lab
gagandeepkaur@LAPTOP-S6L9EA8N:~/BCDV-4033/ansible/lab$ docker compose up
[+] Running 3/3
! remote-host-two Warning 6.7s
! ansible Warning 6.7s
! remote-host-one Warning 6.7s
[+] Building 227.6s (21/21) FINISHED docker:default
=> [remote-host-two internal] load build definition from Dockerfile 0.4s
=> => transferring dockerfile: 485B 0.0s
=> [remote-host-two internal] load .dockerignore 0.3s
=> => transferring context: 2B 0.0s
=> [remote-host-one internal] load build definition from Dockerfile 0.4s
=> => transferring dockerfile: 485B 0.0s
=> [remote-host-one internal] load .dockerignore 0.4s
```

```
gagandeepkaur@LAPTOP-S6L: X root@ai10f6a617c7:/ X gagandeepkaur@LAPTOP-S6L: X gagandeepkaur@LAPTOP-S6L: X + v
=> => sha256:a3785f78ab8547ae2710c89e627783cfa7ee7824d3468cae6835c9f4eae23ff7 1.15kB / 1.15kB 0.0s
=> => sha256:b6f50765242581c887ff1acc2511fa2d885c52d8fb3ac8c4bba131fd86567f2e 3.36kB / 3.36kB 0.0s
=> => sha256:1f1a2d56de1d604801a9671f301190704c25d604a416f59e03c04f5c6ffee0d6 1.42kB / 1.42kB 0.0s
=> => sha256:58690f9b18fca6469a14da4e212c96849469f9b1be6661d2342a4bf01774aa50 46.50MB / 46.50MB 6.6s
=> => sha256:b51569e7c50720acf6860327847fe342a1afbe148d24c529fb81df105e3eed01 857B / 857B 0.2s
=> => sha256:da8ef40b9ecabc2679fe2419957220c0272a965c5cf7e0269falaeeb8c56f2e1 528B / 528B 0.4s
=> => sha256:fb15d46c38dc1ea0b199006c3366ecd10c79d374f341687eb2cb23a2c8672e 170B / 170B 0.6s
=> => extracting sha256:58690f9b18fca6469a14da4e212c96849469f9b1be6661d2342a4bf01774aa50 11.2s
=> => extracting sha256:b51569e7c50720acf6860327847fe342a1afbe148d24c529fb81df105e3eed01 0.0s
=> => extracting sha256:da8ef40b9ecabc2679fe2419957220c0272a965c5cf7e0269falaeeb8c56f2e1 0.0s
=> => extracting sha256:fb15d46c38dc1ea0b199006c3366ecd10c79d374f341687eb2cb23a2c8672e 0.0s
=> [ansible 2/3] RUN apt-get update 50.7s
=> [remote-host-one 2/7] RUN apt-get update && apt-get install -y openssh-server 64.5s
=> [ansible 3/3] RUN apt install ansible -y && apt install vim -y 148.3s
=> [remote-host-one 3/7] RUN mkdir /var/run/ssh 0.6s
=> [remote-host-one 4/7] RUN echo 'root:password' | chpasswd 0.6s
=> [remote-host-two 5/7] RUN sed -i 's/PermitRootLogin prohibit-password/PermitRootLogin yes/' /etc/ssh/sshd_config 0.7s
=> [remote-host-two 6/7] RUN sed 's@session\s*required\s*pam_loginuid.so@session optional pam_loginuid.so@g' -i 0.8s
=> [remote-host-two 7/7] RUN echo "export VISIBLE=no" >> /etc/profile 0.8s
=> [remote-host-one] exporting to image 1.3s
=> => exporting layers 1.3s
=> => writing image sha256:b476c47aca3cc1a4befa805e665d6801b6bbe0c16827ce2c3ebd47d7f98ab6a5 0.0s
=> => naming to docker.io/library/node1 0.0s
=> [remote-host-two] exporting to image 1.3s
=> => exporting layers 1.3s
=> => writing image sha256:607a06e21748aaf742ff8c847b0f03f28be2d1a8f3d128d744c1c79222b86331 0.0s
=> => naming to docker.io/library/node2 0.0s
=> [ansible] exporting to image 14.8s
=> => exporting layers 14.8s
=> => writing image sha256:92d14ddd04ed520c4ac27ce95c99543d8a151a963da22a0961644261458624ea 0.0s
=> => naming to docker.io/library/ansible 0.0s
[+] Running 4/4
✓Network lab_default Created 0.2s
✓Container node2 Created 0.5s
✓Container ansible Created 0.5s
✓Container node1 Created 0.5s
Attaching to ansible, node1, node2
```

```
gagandeepkaur@LAPTOP-S6L9EA8N: ~$ docker exec -it ansible bash
root@a110f6a617c7:/# ansible --version
ansible 2.10.8
  config file = None
  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 = 3.10.12 (main, Nov 20 2023, 15:14:05) [GCC 11.4.0]
root@a110f6a617c7:/# ssh root@node1
The authenticity of host 'node1 (172.18.0.2)' can't be established.
ED25519 key fingerprint is SHA256:+5PHMgl6ihL/gvE31PfQdpvjLxc2U09RTeV8rXnjLb0.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'node1' (ED25519) to the list of known hosts.
root@node1's password:
Welcome to Ubuntu 16.04.7 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/advantage

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@cefc90a347b7:~# exit
logout
Connection to node1 closed.
root@a110f6a617c7:/# ssh root@node2
The authenticity of host 'node2 (172.18.0.4)' can't be established.
ED25519 key fingerprint is SHA256:+5PHMgl6ihL/gvE31PfQdpvjLxc2U09RTeV8rXnjLb0.
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
Warning: Permanently added 'node2' (ED25519) to the list of known hosts.
```

```
Warning: Permanently added 'node2' (ED25519) to the list of known hosts.
root@node2's password:
Welcome to Ubuntu 16.04.7 LTS (GNU/Linux 5.15.133.1-microsoft-standard-WSL2 x86_64)

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 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

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@7456fb9a7728:~# exit
logout
Connection to node2 closed.
root@a110f6a617c7:/# ansible all -m ping
[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'
root@a110f6a617c7:/# ssh-keygen -t rsa -b 2048
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa
Your public key has been saved in /root/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:82TySDTz6SWHndCp37Yu966lcD3w+afExRrsXfXWZsM root@a110f6a617c7
The key's randomart image is:
+---[RSA 2048]-----+
|
|      .
|     + .
|    + * o .
|   + * o . +
|  S O = o EX
|
+---+

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gagandeepkaur@LAPTOP-S6L: x root@a110f6a617c7: / gagandeepkaur@LAPTOP-S6L: x gagandeepkaur@LAPTOP-S6L: x + v
|      .+.++|
|      +*==+|
+-----[SHA256]-----+
root@a110f6a617c7:/# ssh-copy-id root@node1
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.ssh/id_rsa.pub"
/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@node1's password:

Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'root@node1'"
and check to make sure that only the key(s) you wanted were added.

root@a110f6a617c7:/# ssh-copy-id root@node2
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.ssh/id_rsa.pub"
/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@node2's password:

Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'root@node2'"
and check to make sure that only the key(s) you wanted were added.

root@a110f6a617c7:/# vi inventory.txt
root@a110f6a617c7:/# ansible-inventory -i inventory.txt --list
{
  "_meta": {
    "hostvars": {
      "host1": {
        "ansible_host": "node1",
        "ansible_user": "root"
      },
      "host2": {
        "ansible_host": "node2",
        "ansible_user": "root"
      }
    }
  }
}
```

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gagandeepkaur@LAPTOP-S6L: x root@a110f6a617c7: / gagandeepkaur@LAPTOP-S6L: x gagandeepkaur@LAPTOP-S6L: x + v
      "host2": {
        "ansible_host": "node2",
        "ansible_user": "root"
      }
    },
    "all": {
      "children": [
        "group1",
        "ungrouped"
      ]
    },
    "group1": {
      "hosts": [
        "host1",
        "host2"
      ]
    }
  }
}
root@a110f6a617c7:/# ansible all -i inventory.txt -m ping
host2 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": false,
  "ping": "pong"
}
host1 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": false,
  "ping": "pong"
}
root@a110f6a617c7:/# ansible all -m file -a "path=~/.tmp-file state=touch"
[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'
```

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gagandeepkaur@LAPTOP-S6L' x root@al10f6a617c7:/ x gagandeepkaur@LAPTOP-S6L' x gagandeepkaur@LAPTOP-S6L' x + v
root@al10f6a617c7:/# ansible -i inventory.txt all -m file -a "path=~tmp-file state=directory"
host2 | CHANGED => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": true,
  "gid": 0,
  "group": "root",
  "mode": "0755",
  "owner": "root",
  "path": "/root/tmp-file",
  "size": 4096,
  "state": "directory",
  "uid": 0
}
host1 | CHANGED => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": true,
  "gid": 0,
  "group": "root",
  "mode": "0755",
  "owner": "root",
  "path": "/root/tmp-file",
  "size": 4096,
  "state": "directory",
  "uid": 0
}
root@al10f6a617c7:/# vi create-file.yml
root@al10f6a617c7:/# ansible-playbook create-file.yml
[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 [all] *****
skipping: no hosts matched
```

```
gagandeepkaur@LAPTOP-S6L' x root@al10f6a617c7:/ x gagandeepkaur@LAPTOP-S6L' x gagandeepkaur@LAPTOP-S6L' x + v
not match 'all'

PLAY [all] *****
skipping: no hosts matched

PLAY RECAP *****

root@al10f6a617c7:/# ansible-playbook -i inventory.txt create-file.yml

PLAY [all] *****

TASK [Gathering Facts] *****
ok: [host2]
ok: [host1]

TASK [create a file] *****
changed: [host1]
changed: [host2]

PLAY RECAP *****
host1      : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
host2      : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

root@al10f6a617c7:/# vi create-file-dev.yml
root@al10f6a617c7:/# vi inventoty.txt
root@al10f6a617c7:/# vi inventory.txt
root@al10f6a617c7:/# ansible-playbook -i inventory.txt create-file-dev.yml

PLAY [dev] *****

TASK [Gathering Facts] *****
ok: [host1]

TASK [create a file] *****
changed: [host1]

PLAY RECAP *****
host1      : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

```
gagandeepkaur@LAPTOP-S6L: X root@110f6a617c7: / gagandeepkaur@LAPTOP-S6L: X gagandeepkaur@LAPTOP-S6L: X + v
root@110f6a617c7:/# vi nodejs.yml
root@110f6a617c7:/# vi nodejs.yml
root@110f6a617c7:/# ansible-playbook nodejs.yml
[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 [all] *****
skipping: no hosts matched

PLAY RECAP *****

root@110f6a617c7:/# ansible-playbook -i inventory.txt nodejs.yml

PLAY [all] *****

TASK [Gathering Facts] *****
ok: [host1]
ok: [host2]

TASK [Update apt cache] *****
[WARNING]: Updating cache and auto-installing missing dependency: python3-apt
ok: [host2]
ok: [host1]

TASK [Install Node.js dependencies] *****
changed: [host2] => (item=curl)
changed: [host1] => (item=curl)
changed: [host1] => (item=software-properties-common)
changed: [host2] => (item=software-properties-common)

TASK [Add NodeSource repository] *****
fatal: [host2]: FAILED! => [{"changed": false, "msg": "Failed to update apt cache: E:The method driver /usr/lib/apt/methods/https could not be fo
und., W:Is the package apt-transport-https installed?, E:Failed to fetch https://deb.nodesource.com/node_14.x/dists/xenial/InRelease , E:Some i
ndex files failed to download. They have been ignored, or old ones used instead."}]
fatal: [host1]: FAILED! => [{"changed": false, "msg": "Failed to update apt cache: E:The method driver /usr/lib/apt/methods/https could not be fo
und., W:Is the package apt-transport-https installed?, E:Failed to fetch https://deb.nodesource.com/node_14.x/dists/xenial/InRelease , E:Some i
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```
gagandeepkaur@LAPTOP-S6L: X root@110f6a617c7: / gagandeepkaur@LAPTOP-S6L: X gagandeepkaur@LAPTOP-S6L: X + v
- hosts: localhost
  become: yes
  gather_facts: no
  vars:
    git_repo_url: https://github.com/gagandeep2580/BCDV-4033-ASSINGNMENT.git
    repo_path: /your/local/repo/path
    repo_branch: master
  tasks:
    - name: Add the NodeSource repository
      apt_repository:
        repo: "deb https://deb.nodesource.com/node_14.x jammy main"
        state: present
        update_cache: yes

    - name: Add Node.js GPG key
      apt_key:
        url: https://deb.nodesource.com/gpgkey/nodesource.gpg.key
        state: present

    - name: Run the equivalent of "apt-get update" as a separate step
      apt:
        update_cache: yes

    - name: Install required packages
      apt:
        name: "{{ item }}"
        state: present
      loop:
        - git
        - curl
        - wget
        - nginx
        - nodejs

    - name: Clone a private repository
      git:
-- INSERT --
1
```