LAB 3

Github-repo: "https://github.com/nelaturuk/BCDV-4033/"

1. Setup the docker containers and check in the control node if Ansible is installed.

```
akshatsrivastava@Akshats-Air lab % docker compose up -d
WARN[0000] /Users/akshatsrivastava/BCDV4033_Devops/BCDV-4033/ansible/lab/docker-compose.yml: `version` is obsolete
[+] Running 3/3
 ! remote-host-two Warning pull access denied for node2, repository does not exist or m...    0.6s
 ! ansible Warning         pull access denied for ansible, repository does not exist or may req...   0.6s
 ! remote-host-one Warning pull access denied for node1, repository does not exist or m...    0.6s
[+] Building 0.5s (26/26) FINISHED                                               docker:desktop-linux
 => [remote-host-two internal] load build definition from Dockerfile            0.0s
 => => transferring dockerfile: 683B                                            0.0s
 => [remote-host-two internal] load metadata for docker.io/library/ubuntu:20.04  0.3s
 => [ansible internal] load build definition from Dockerfile                    0.0s
 => => transferring dockerfile: 159B                                            0.0s
 => [ansible internal] load metadata for docker.io/library/ubuntu:latest        0.4s
 => [remote-host-one internal] load build definition from Dockerfile            0.0s
 => => transferring dockerfile: 683B                                            0.0s
 => [remote-host-two auth] library/ubuntu:pull token for registry-1.docker.io   0.0s
 => [remote-host-one internal] load .dockerignore                              0.0s
 => => transferring context: 2B                                                0.0s
 => [remote-host-two internal] load .dockerignore                              0.0s


 => CACHED [ansible 3/3] RUN apt install ansible -y &&    apt install vim -y     0.0s
 => [ansible] exporting to image                                                0.0s
 => => exporting layers                                                         0.0s
 => => writing image sha256:8f3ae4fa5638a8aa97888ace7099591ba8b1a4f3bebb09f2e12233216e0d4fe7  0.0s
 => => naming to docker.io/library/ansible                                      0.0s
[+] Running 4/4
 ✔ Network lab_default  Created                                                 0.0s
 ✔ Container ansible    Started                                                 0.3s
 ✔ Container node2      Started                                                 0.3s
 ✔ Container node1      Started                                                 0.3s
```

2. Setup the docker containers and ssh into the remote nodes from the control node.

```
akshatsrivastava@Akshats-Air lab % docker ps
CONTAINER ID   IMAGE     COMMAND                CREATED         STATUS         PORTS     NAMES
d6a1a869e7d0   node2     "/usr/sbin/sshd -D"    21 seconds ago  Up 21 seconds  22/tcp    node2
ecd04c37e363   ansible   "/bin/bash"            21 seconds ago  Up 21 seconds            ansible
b1bd4c7718a4   node1     "/usr/sbin/sshd -D"    21 seconds ago  Up 21 seconds  22/tcp    node1
akshatsrivastava@Akshats-Air lab % docker exec -it ecd04c37e363 bash
root@ecd04c37e363:/# ansible --version
ansible [core 2.16.3]
  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
  ansible collection location = /root/.ansible/collections:/usr/share/ansible/collections
  executable location = /usr/bin/ansible
  python version = 3.12.3 (main, Apr 10 2024, 05:33:47) [GCC 13.2.0] (/usr/bin/python3)
  jinja version = 3.1.2
  libyaml = True
root@ecd04c37e363:/# ssh root@node1
The authenticity of host 'node1 (172.21.0.3)' can't be established.
ED25519 key fingerprint is SHA256:zsBHswWx37uNJBWIH6XnGhyUEohlK+nOcZYfPXIk+T0.
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 20.04.6 LTS (GNU/Linux 6.6.26-linuxkit aarch64)

 * 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@b1bd4c7718a4:~# exit
logout
Connection to node1 closed.
```

```
root@ecd04c37e363:/# ssh root@node2
The authenticity of host 'node2 (172.21.0.4)' can't be established.
ED25519 key fingerprint is SHA256:zsBHswWx37uNJBWIH6XnGhyUEohlK+nOcZYfPXIk+T0.
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.
root@node2's password:
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 6.6.26-linuxkit aarch64)

 * 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@d6a1a869e7d0:~# exit
logout
Connection to node2 closed.
```

```
root@ecd04c37e363:/# 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@ecd04c37e363:/# 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:iunr4MBN7iorkrXKx6XwsQpGrHnERyAN2uJ8ppfr6oE root@ecd04c37e363
The key's randomart image is:
+---[RSA 2048]----+
|oo.              |
|.o..             |
|o . .            |
|+o .             |
| =o+.    S        |
|=+Oo.+ .         |
|EB**B .          |
|O+=O.            |
|BOB=+.           |
+----[SHA256]-----+
root@ecd04c37e363:/# 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@ecd04c37e363:/# 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@ecd04c37e363:/# apt-get update && apt-get install -y vim
Hit:1 http://ports.ubuntu.com/ubuntu-ports noble InRelease
Hit:2 http://ports.ubuntu.com/ubuntu-ports noble-updates InRelease
Hit:3 http://ports.ubuntu.com/ubuntu-ports noble-backports InRelease
Hit:4 http://ports.ubuntu.com/ubuntu-ports noble-security InRelease
Reading package lists... Done
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
vim is already the newest version (2:9.1.0016-1ubuntu7.1).
0 upgraded, 0 newly installed, 0 to remove and 6 not upgraded.
```
```
root@18a0369dd2ae:/etc/ansible# cd /etc
root@18a0369dd2ae:/etc# mkdir ansibel
```

```
root@18a0369dd2ae:/etc# cd ansible
root@18a0369dd2ae:/etc/ansible# vi hosts
```

```
[dev]
host1 ansible_host=node1 ansible_user=root
[test]
host2 ansible_host=node2 ansible_user=root
~
~
~
~
~
~
~
~
```

```
root@18a0369dd2ae:/etc/ansible# ansible all -m ping
host1 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
host2 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
```

3. Try to create a directory uisng the ad-hoc command. PResent screenshots of the sucessful ansible run and directory in the nodes.

```
root@18a0369dd2ae:/# ansible all -m file -a "path=/tmp/tmp-file state=touch"
host1 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": true,
    "dest": "/tmp/tmp-file",
    "gid": 0,
    "group": "root",
    "mode": "0644",
    "owner": "root",
    "size": 0,
    "state": "file",
    "uid": 0
}
host2 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": true,
    "dest": "/tmp/tmp-file",
    "gid": 0,
    "group": "root",
    "mode": "0644",
    "owner": "root",
    "size": 0,
    "state": "file",
    "uid": 0
}
root@18a0369dd2ae:/tmp# ssh root@node1 ls -l /tmp
total 0
-rw-r--r-- 1 root root 0 Jun 15 15:28 tmp-file
root@18a0369dd2ae:/tmp# ssh root@node2 ls -l /tmp
total 0
-rw-r--r-- 1 root root 0 Jun 15 15:28 tmp-file
```

4. Create the file playbook yml and create file in both nodes. Show using screenshot that you have successfully created the file using playbook

```
root@18a0369dd2ae:/# vi cf.yml
root@18a0369dd2ae:/# ansible-playbook cf.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    ignor
ed=0

root@18a0369dd2ae:/# vi cf.yml
root@18a0369dd2ae:/# ansible-playbook cf.yml

PLAY [test] **********************************************************************

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

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

PLAY RECAP ***********************************************************************
host2                      : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignor
ed=0

root@18a0369dd2ae:/# 
```

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```
---
- hosts: dev
  tasks:
    - name: create a file
      file:
        path: /tmp/file-playbook1
        state: touch
~
~
~
~
~
~
---
- hosts: test
  tasks:
    - name: create a file
      file:
        path: /tmp/file-playbook1
        state: touch
~
~
~
~
root@18a0369dd2ae:/# ssh root@node1 ls /tmp
file-playbook1
tmp-file
root@18a0369dd2ae:/# ssh root@node2 ls /tmp
file-playbook1
tmp-file
```

5. Create a new playbook to delete the file you created previously. Submit screenshots for the playbook run and screenshots that the file has been deleted from both nodes

```
root@18a0369dd2ae:/# ansible-playbook df.yml

PLAY [dev] ************************************************************************

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

TASK [Delete the file] ***********************************************************
changed: [host1]

PLAY RECAP ***********************************************************************
host1                      : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignor
ed=0

root@18a0369dd2ae:/# ssh root@node1 ls /tmp
file-playbook1
```

```
---
- hosts: dev
  tasks:
    - name: Delete the file
      file:
        path: /tmp/tmp-file
        state: absent

~
~
```

```
root@18a0369dd2ae:/# vi df.yml
root@18a0369dd2ae:/# ansible-playbook df.yml

PLAY [test] ***********************************************************************************

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

TASK [Delete the file] ***********************************************************************
changed: [host2]

PLAY RECAP ************************************************************************************
host2                      : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignor
ed=0

root@18a0369dd2ae:/# ssh root@node2 ls /tmp
file-playbook1
```

```
# delete_file.yml
---
- hosts: test
  tasks:
    - name: Delete the file
      file:
        path: /tmp/tmp-file
        state: absent

~
~
```

6. Create a new playbook for test group and demonstrate using the playbook output that you have updated only the test node

```
root@18a0369dd2ae:/# vi tf.yml
root@18a0369dd2ae:/# ansible-playbook tf.yml

PLAY [test] ***********************************************************************************

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

TASK [Update test node] **********************************************************************
changed: [host2]

PLAY RECAP ************************************************************************************
host2                      : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignor
ed=0

root@18a0369dd2ae:/# ssh root@node1 ls /tmp
file-playbook1
root@18a0369dd2ae:/# ssh root@node2 ls /tmp
file-playbook1
test_update
```

```
# update_test_node.yml
---
- hosts: test
  tasks:
    - name: Update test node
      file:
        path: /tmp/test_update
        state: touch

~
```

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

```
root@18a0369dd2ae:/# vi node.yml
root@18a0369dd2ae:/# ansible-playbook node.yml

PLAY [all] *********************************************************************************************

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

TASK [Update apt cache] *******************************************************************************
ok: [host1]
ok: [host2]

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

TASK [Add NodeSource GPG key] ***********************************************************************
changed: [host1]
changed: [host2]

TASK [Add NodeSource repository] ********************************************************************
changed: [host1]
changed: [host2]

TASK [Install Node.js] ********************************************************************************
changed: [host1]
changed: [host2]

TASK [Install build-essential] **********************************************************************
changed: [host2]
changed: [host1]

PLAY RECAP ********************************************************************************************
host1                      : ok=7    changed=4    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
host2                      : ok=7    changed=4    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

```
---
- hosts: all
  gather_facts: yes
  become: yes
  tasks:
    - name: Update apt cache
      apt:
        update_cache: yes

    - name: Install Node.js dependencies
      apt:
        name: "{{ item }}"
        state: present
      loop:
        - curl
        - software-properties-common

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

    - name: Add NodeSource repository
      apt_repository:
        repo: "deb https://deb.nodesource.com/node_14.x {{ ansible_distribution_release }} main"
        state: present
        update_cache: yes
        filename: nodesource

    - name: Install Node.js
      apt:
        name: nodejs
        state: present

    - name: Install build-essential
      apt:
        name: build-essential
        state: present

root@18a0369dd2ae:/# vi node.yml
root@18a0369dd2ae:/# ssh root@node1 node -v
v14.21.3
root@18a0369dd2ae:/# ssh root@node2 node -v
v14.21.3
```

8. Use the example node.yaml and clone the Lab 1 repo to both the nodes. Build the node modules

```
root@18a0369dd2ae:/# vi lab1.yml
root@18a0369dd2ae:/# ansible-playbook lab1.yml

PLAY [all] *********************************************************************************************

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

TASK [Install git] ************************************************************************************
ok: [host2]
ok: [host1]

TASK [Clone the repository] ***************************************************************************
changed: [host2]
changed: [host1]

TASK [Install node modules] ***************************************************************************
changed: [host1]
changed: [host2]

PLAY RECAP ********************************************************************************************
host1                      : ok=4    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
host2                      : ok=4    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

```yaml
---
- hosts: all
  gather_facts: yes
  become: yes
  tasks:
    - name: Install git
      apt:
        name: git
        state: present

    - name: Clo   Follow link (cmd + click)
      git:
        repo: 'https://github.com/akshatsri19/ScalableBlockchain.git'
        dest: /tmp/lab1-repo
        update: yes

    - name: Install node modules
      npm:
        path: /tmp/lab1-repo/BCDV4033/Calculator
        state: present
```

```
root@18a0369dd2ae:/# ssh root@node1 ls /tmp/lab1-repo/BCDV4033/Calculator
Jenkinsfile
Lab1ScreenRecording.mov
calculator.js
calculator.test.js
dist
eslint.config.mjs
node_modules
package-lock.json
package.json
```