

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

```
[+] Running 4/4
✓ Network lab_default Created
✓ Container node1 Started
✓ Container ansible Started
✓ Container node2 Started
PS C:\Users\Harold\github\BCDV-4033\ansible\lab> docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS        NAMES
e3e78a2ecaea   node2     "/usr/sbin/sshd -D"      5 minutes ago Up 5 minutes  22/tcp       node2
c7849917ecae   ansible   "/bin/bash"             5 minutes ago Up 5 minutes  22/tcp       ansible
ebe99542cb25   node1     "/usr/sbin/sshd -D"      5 minutes ago Up 5 minutes  22/tcp       node1
PS C:\Users\Harold\github\BCDV-4033\ansible\lab> docker exec -it ansible bash
root@c7849917ecae:/# 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@c7849917ecae:/# ssh root@node1
The authenticity of host 'node1 (172.19.0.4)' can't be established.
ED25519 key fingerprint is SHA256:0f50RhL8QIC0dsjWbMIUWr/qd/1BwYoyULvINFKio+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 'node1' (ED25519) to the list of known hosts.
```

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

```
root@ab6b63bbc206:/ansible# mkdir -p /etc/ansible
root@ab6b63bbc206:/ansible# echo -e "node1\nnode2" > /etc/ansible/hosts
root@ab6b63bbc206:/ansible# ansible all -m ping
node1 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": false,
  "ping": "pong"
}
node2 | SUCCESS => {
  "ansible_facts": {
```

```

root@c7849917ecae:/# ansible all -i inventory.txt -m shell -a "df -h"
host2 | CHANGED | rc=0 >>
Filesystem      Size  Used Avail Use% Mounted on
overlay          1007G   14G  943G   2% /
tmpfs             64M    0   64M   0% /dev
tmpfs             3.9G    0   3.9G   0% /sys/fs/cgroup
shm              64M    0   64M   0% /dev/shm
/dev/sdd         1007G   14G  943G   2% /etc/hosts
tmpfs             3.9G    0   3.9G   0% /proc/acpi
tmpfs             3.9G    0   3.9G   0% /sys/firmware
host1 | CHANGED | rc=0 >>
Filesystem      Size  Used Avail Use% Mounted on
overlay          1007G   14G  943G   2% /
tmpfs             64M    0   64M   0% /dev
tmpfs             3.9G    0   3.9G   0% /sys/fs/cgroup
shm              64M    0   64M   0% /dev/shm
/dev/sdd         1007G   14G  943G   2% /etc/hosts
tmpfs             3.9G    0   3.9G   0% /proc/acpi
tmpfs             3.9G    0   3.9G   0% /sys/firmware
root@c7849917ecae:/#

```

```

    },
    "group1": {
      "hosts": [
        "host1",
        "host2"
      ]
    }
  }
}
root@c7849917ecae:/# ansible all -i inventory.txt -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"
}
root@c7849917ecae:/# ansible -i inventory.txt host1 -m shell -a "free -m"
host1 | CHANGED | rc=0 >>
      total        used        free      shared  buff/cache   available
Mem:      7904        2172        1849          9        3882        5430
Swap:      2048           0        2048
root@c7849917ecae:/#

```

```

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:flr+i1jxDpBk7CG3h1YhZwGVagq3cmDlvqkUGcodzX0 root@c7849917ecae
The key's randomart image is:
+---[RSA 2048]-----+
|      oo*o      |
|      + .=. .   |
|      .+ .+OBE  |
|      ..+o+ oo.+ |
|      .oo= .o 5 . |
|      o.=. o . o  |
|      .+ + . = .  |
|      . o  B +    |
|      ..   o o.+  |
+---[SHA256]-----+
root@c7849917ecae:~# 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:
Permission denied, please try again.
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@c7849917ecae:~# ansible host2 -i inventory.txt -m apt -a "name=curl state=present" -b
root2 | CHANGED => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "cache_update_time": 1718165153,
  "cache_updated": false,
  "changed": true,
  "stderr": "debconf: delaying package configuration, since apt-utils is not installed\n",
  "stderr_lines": [
    "debconf: delaying package configuration, since apt-utils is not installed"
  ],
  "stdout": "Reading package lists...Building dependency tree...Reading state information...The following additional packages will be installed:\n libasn1-8-heimdal libbrotli1 libcurl4 libgssapi3-heimdal libhcrypto4-heimdal\n libheimdall8-heimdal libheimntls-heimdal libhs59-5-heimdal libldap-2.4-2 libldap-common libnghttp2-14\n libroken18-heimdal librtmp1 libssl2-2 libssl2-modules libssl2-modules-gssapi-mit\n libssl2-modules-gssapi-heimdal\n libssl2-modules-ldap libssl2-modules-openssl libssl2-modules-sql\nThe following NEW packages will be installed:V curl\n r1 libasn1-8-heimdal libbrotli1 libcurl4 libgssapi3-heimdal\n libhcrypto4-heimdal libheimdall8-heimdal libheimntls-heimdal\n libhs59-5-heimdal libkrb5-26-heimdal libldap-2.4-2 libldap-common\n libnghttp2-14 libroken18-heimdal librtmp1 libssl2-2 libssl2-modules\n libssl2-modules-db libssh-4 libwind0-heimdal\n0 upgraded, 20 newly installed, 0 to remove and 0 not upgraded.\nNeed to get 2068 kB of archives.\nAfter this operation, 6921 kB of additional disk space will be used.\nGet:1 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libbrotli1 amd64 1.0.7-6ubuntu0.1 [267 kB]\nGet:2 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libroken18-heimdal amd64 7.7.0+dfsg-1ubuntu1.4 [42.5 kB]\nGet:3 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libasn1-8-heimdal amd64 7.7.0+dfsg-1ubuntu1.4 [181 kB]\nGet:4 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libheimdall8-heimdal amd64 7.7.0+dfsg-1ubuntu1.4 [36.4 kB]\nGet:5 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libhcrypto4-heimdal amd64 7.7.0+dfsg-1ubuntu1.4 [18.1 kB]\nGet:6 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libwind0-heimdal amd64 7.7.0+dfsg-1ubuntu1.4 [40.7 kB]\nGet:7 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libhs59-5-heimdal amd64 7.7.0+dfsg-1ubuntu1.4 [107 kB]\nGet:8 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libkrb5-26-heimdal amd64 7.7.0+dfsg-1ubuntu1.4 [15.1 kB]\nGet:9 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libheimntls-heimdal amd64 7.7.0+dfsg-1ubuntu1.4 [15.1 kB]\nGet:10 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libgssapi3-heimdal amd64 7.7.0+dfsg-1ubuntu1.4 [96.5 kB]\nGet:11 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libssl2-modules-db amd64 2.1.27+dfsg-2ubuntu0.1 [14.7 kB]\nGet:12 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libssl2-modules amd64 2.1.27+dfsg-2ubuntu0.1 [49.3 kB]\nGet:13 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libldap-common all 2.4.49+dfsg-2ubuntu1.10 [16.5 kB]\nGet:14 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libldap-2.4-2 amd64 2.4.49+dfsg-2ubuntu1.10 [155 kB]\nGet:15 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libnghttp2-14 amd64 1.40.0-1ubuntu0.3 [29.9 kB]\nGet:16 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 librtmp1 amd64 2.4.20151223.gitf80666d-1-2build1 [54.9 kB]\nGet:17 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libssh-4 amd64 0.9.3-2ubuntu0.2 [171 kB]\nGet:18 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libcurl4 amd64 7.68.0-1ubuntu2.22 [235 kB]\nGet:19 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 curl amd64 7.68.0-1ubuntu2.22 [161 kB]\nGet:20 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libssl2-modules amd64 2.1.27+dfsg-2ubuntu0.1 [48.8 kB]\nFetched 2068 kB in 2s (1362 kB/s)\nSelecting previously unselected package libb

```

## Create first playbook

```

root@ab06b3bbc206:~# ansible-playbook -i inventory.txt create_first_playbook.yml
PLAY [localhost] *********************************************************************
TASK [create a file] *************************************************************
changed: [node1]
changed: [node2]

PLAY RECAP *********************************************************************
localhost:ok=2 changed=1 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0
node1:ok=2 changed=1 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0
node2:ok=2 changed=1 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0

root@ab06b3bbc206:~#

```

```
docker-compose.yml M X
ansible > lab > docker-compose.yml
You, 7 minutes ago | 2 authors (Keerthi Nelaturu and one other)
1 version: '3'
2 services:
3     ansible:
4         container_name: ansible
5         image: ansible
6         tty: true
7         stdin_open: true
8         build:
9             context: ./ansible
10
11
12     remote-host-one:
13         container_name: node1
14         image: node1
15         build:
16             context: ./node1
17
18     remote-host-two:
19         container_name: node2
20         image: node2
21         build:
22             context: ./node1
23
24 networks:
25     net:
        You, 1 second ago • Uncommitted changes

OUTPUT PROBLEMS DEBUG CONSOLE TERMINAL PORTS GITLENS

    ],
    "module_setup": true
  },
  "changed": false
}
root@ab6b63bbc206:/ansible# ansible all -a uptime
node2 | CHANGED | rc=0 >>
00:07:56 up 8:51, 1 user, load average: 0.18, 0.22, 0.22
node1 | CHANGED | rc=0 >>
00:07:56 up 8:51, 1 user, load average: 0.18, 0.22, 0.22
root@ab6b63bbc206:/ansible#
```

```
OUTPUT PROBLEMS DEBUG CONSOLE TERMINAL PORTS GITLENS

    ]
}
root@c7849917ecae:/# ansible host1 -i inventory.txt -m service -a "name=cron state=restarted" -b
host1 | CHANGED => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": true,
  "name": "cron",
  "state": "started"
}
root@c7849917ecae:/#
```

Playbook group

```

ok: [host1]

TASK [create a file on dev group] *****
changed: [host1]

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

root@ab6b63bbc206:/ansible# ansible dev -m shell -a "ls -l /tmp/dev-file"
host1 | CHANGED | rc=0 >>
-rw-r--r-- 1 root root 0 Jun 16 01:17 /tmp/dev-file
root@ab6b63bbc206:/ansible#

```

## Role

```

-rw-r--r-- 1 root root 0 Jun 16 01:17 /tmp/dev-file
root@ab6b63bbc206:/ansible# ansible-galaxy init my_role
- Role my_role was created successfully
root@ab6b63bbc206:/ansible# cd my_role
root@ab6b63bbc206:/ansible/my_role# ansible-galaxy install geerlingguy.postgresql
Starting galaxy role install process
- downloading role 'postgresql', owned by geerlingguy
- downloading role from https://github.com/geerlingguy/ansible-role-postgresql/archive/3.5.2.tar.gz
- extracting geerlingguy.postgresql to /root/.ansible/roles/geerlingguy.postgresql
- geerlingguy.postgresql (3.5.2) was installed successfully
root@ab6b63bbc206:/ansible/my_role# vim /ansible/postgres.yaml
root@ab6b63bbc206:/ansible/my_role#

```

```

root@ab6b63bbc206:/ansible/my_role# ansible all -m shell -a "psql --version"
host2 | CHANGED | rc=0 >>
psql (PostgreSQL) 12.18 (Ubuntu 12.18-0ubuntu0.20.04.1)
host1 | CHANGED | rc=0 >>
psql (PostgreSQL) 12.18 (Ubuntu 12.18-0ubuntu0.20.04.1)
root@ab6b63bbc206:/ansible/my_role#

```

```

ok: [host1]
ok: [host2]

TASK [geerlingguy.postgresql : Define postgresql_log_dir.] *****
ok: [host1]
ok: [host2]

TASK [geerlingguy.postgresql : Define postgresql_effective_log_dir, if postgresql_log_dir is absolute] *****
skipping: [host1]
skipping: [host2]

TASK [geerlingguy.postgresql : Define postgresql_effective_log_dir, if postgresql_log_dir is relative] *****

```

```

skipping: [host1]
skipping: [host2]

TASK [geerlingguy.postgresql : include_tasks] *****
included: /root/.ansible/roles/geerlingguy.postgresql/tasks/setup-Debian.yml for host1, host2

TASK [geerlingguy.postgresql : Ensure PostgreSQL Python libraries are installed.] *****
changed: [host2]
changed: [host1]

TASK [geerlingguy.postgresql : Ensure PostgreSQL packages are installed.] *****

```

## Handle

```

ok: [host1]
TASK [install apache] *****
changed: [host1]

RUNNING HANDLER [host static webpage] *****
changed: [host1]

PLAY RECAP *****
host1                : ok=3    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

root@ab6b63bbc206:/ansible#

```

## Vault

```

root@ab6b63bbc206:/ansible# ansible-vault view /ansible/vault.yml | cat
Vault password:
secret_key: "my_secret_key"
database_password: "my_db_password"

root@ab6b63bbc206:/ansible#

```

```

root@ab6b63bbc206:/ansible# ansible-playbook /ansible/role-vault.yml --ask-vault-pass
Vault password:

PLAY [all] *****

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

TASK [Print the secret key] *****
ok: [host1] => {
    "msg": "The secret key is my_secret_key"
}

```

```

k: [host1] => {
    "msg": "The database password is my_db_password"
}

k: [host2] => {
    "msg": "The database password is my_db_password"
}

PLAY RECAP *****
host1                : ok=3    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
host2                : ok=3    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

root@ab6b63bbc206:/ansible#

```