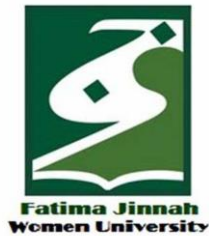


CLOUD COMPUTING LAB



SUBMITTED TO
SIR WAQAS & ENGR. SHOAIB

SUBMITTED BY
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2023-BSE-025

BSE V-A

Lab 14 – Terraform + Ansible: Dynamic Inventory, Roles & Automated Nginx/PHP & Docker Deployment

Task 0 – Lab Setup (Codespace & GH CLI)

- task0_codespace_open.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ gh codespace ssh -c refactored-acorn-x5gwq9w4qvr6c9p6j
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.8.0-1030-azure x86_64)

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

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.

@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $
```

- task0_env_check.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ aws --version
aws-cli/2.32.7 Python/3.12.12 Linux/6.8.0-1030-azure source/x86_64.alpine.3
@Hajrasarwar22 →/workspaces/CC-HajraSarwar-022 (main) $ terraform --version
Terraform v1.7.0
on linux_amd64

Your version of Terraform is out of date! The latest version
is 1.14.4. You can update by downloading from https://www.terraform.io/downloads.html
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ ansible --version || echo "ansible
ot yet installed"
ansible [core 2.20.0]
  config file = None
  configured module search path = ['/home/vscode/.ansible/plugins/modules', '/usr/share/ansib
le/plugins/modules']
  ansible python module location = /usr/lib/python3.12/site-packages/ansible
  ansible collection location = /home/vscode/.ansible/collections:/usr/share/ansible/collecti
ons
  executable location = /usr/bin/ansible
  python version = 3.12.12 (main, Oct 11 2025, 01:16:26) [GCC 15.2.0] (/usr/bin/python3)
  jinja version = 3.1.6
  pyyaml version = 6.0.3 (with libyaml v0.2.5)
```

- task0_aws_config.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ aws sts get-caller-identity
{
  "UserId": "AIDAX4WZ13P6I7RQDIYI",
  "Account": "542622959327",
  "Arn": "arn:aws:iam::542622959327:user/MyUser_CLI"
}
```

Task 1 – Generate SSH key & Initial Terraform

- task1_ssh_keygen_before.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ ls ~/.ssh
bash: task: command not found
```

- task1_ssh_keygen.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $
ssh-keygen -t ed25519 -f ~/.ssh/id_ed25519 -N ""
Generating public/private ed25519 key pair.
/home/codespace/.ssh/id_ed25519 already exists.
Overwrite (y/n)? y
Your identification has been saved in /home/codespace/.ssh/id_ed25519
Your public key has been saved in /home/codespace/.ssh/id_ed25519.pub
The key fingerprint is:
SHA256:HfX9oADM89vBLTPuAnBIJf2e237uZ1FXxELpRnH1iVc codespace@codespaces-79bf37
The key's randomart image is:
+--[ED25519 256]--+
|      . = 0      .. 0 = E |
|      .. = . .   . = 0 * |
|      . . + 0 .   = 0 + + |
|      0 .. 0 0 * . = . + |
|      0 S . . . *   + |
|      . + 0 .   |
|      . +      . |
|      0 0 . 0 |
|      0 . + 0 0 |
+-----[SHA256]-----+
```

- task1_ssh_keygen_after.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ ls -la ~/.ssh
total 32
drwx----- 2 codespace codespace 4096 Jan 30 15:24 .
drwxr-x--- 1 codespace codespace 4096 Jan 30 21:28 ..
```

- task1_terraform_tfvars_created.png

```
vpc_cidr_block = "10.0.0.0/16"
subnet_cidr_block = "10.0.10.0/24"
availability_zone = "me-central-1a"
env_prefix = "dev"
instance_type = "t3.micro"
public_key = "~/.ssh/id_ed25519.pub"
private_key = "~/.ssh/id_ed25519"
```

- task1_terraform_init.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ terraform init
selections it made above. Include this file in your version control repository
so that Terraform can guarantee to make the same selections by default when
you run "terraform init" in the future.
```

Terraform has been successfully initialized!

You may now begin working with Terraform. Try running "terraform plan" to see any changes that are required for your infrastructure. All Terraform commands should now work.

If you ever set or change modules or backend configuration for Terraform, rerun this command to reinitialize your working directory. If you forget, other commands will detect it and remind you to do so if necessary.

- task1_terraform_apply_2_instances.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ terraform apply -auto-ap
prove
Apply complete! Resources: 10 added, 0 changed, 0 destroyed.

Outputs:

webserver_public_ips = [
  "3.28.74.36",
  "158.252.33.79",
]
```

- task1_terraform_output_ips.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ terraform output
webserver_public_ips = [
  "3.28.74.36",
  "158.252.33.79",
]
```

Task 2 – Static ansible inventory with 2 instances

- task2_ansible_install.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ ansible --version
ansible [core 2.20.0]
  config file = None
  configured module search path = ['/home/vscode/.ansible/plugins/modules', '/usr/share/ansib
le/plugins/modules']
  ansible python module location = /usr/lib/python3.12/site-packages/ansible
  ansible collection location = /home/vscode/.ansible/collections:/usr/share/ansible/collecti
ons
  executable location = /usr/bin/ansible
  python version = 3.12.12 (main, Oct 11 2025, 01:16:26) [GCC 15.2.0] (/usr/bin/python3)
  jinja version = 3.1.6
  pyyaml version = 6.0.3 (with libyaml v0.2.5)
```

- task2_terraform_output_ips.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ terraform output
webserver_public_ips = [
  "3.28.74.36",
  "158.252.33.79",
]
```

- task2_hosts_created.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ touch hosts
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ ls -ls hosts
0 -rw-rw-rw- 1 codespace codespace 0 Jan 30 21:42 hosts
```

- task2_ansible_ping_initial.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ 20.92.21.55 ansible_us
er=ec2-user ansible_ssh_private_key_file=~/.ssh/id_ed25519
158.252.33.79 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3.9"
  },
  "changed": false,
  "ping": "pong"
}
[WARNING]: Host '3.28.74.36' is using the discovered Python interpreter at '/usr/bin/python3.9',
t future installation of another Python interpreter could cause a different interpreter to be di
vered. See https://docs.ansible.com/ansible-core/2.20/reference_appendices/interpreter_discovery
ml for more information.
3.28.74.36 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3.9"
  },
  "changed": false,
  "ping": "pong"
}
```

- task2_hosts_with_common_args.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ ansible_ssh_common_args=
'-o StrictHostKeyChecking=no'
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $
```

- task2_ansible_ping_success.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ ansible all -i hosts -m ping
.html for more information.
158.252.33.79 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3.9"
  },
  "changed": false,
  "ping": "pong"
}
[WARNING]: Host '3.28.74.36' is using the discovered Python interpreter at '/usr/bin/python3.9',
t future installation of another Python interpreter could cause a different interpreter to be di
vered. See https://docs.ansible.com/ansible-core/2.20/reference_appendices/interpreter_discovery
ml for more information.
3.28.74.36 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3.9"
  },
  "changed": false,
  "ping": "pong"
}
```

Task 3 – Scale to 3 instances & group based inventory

- task3_terraform_apply_3_instances.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ terraform apply -auto-approve
Apply complete! Resources: 3 added, 0 changed, 0 destroyed.

Outputs:

webserver_public_ips = [
  "3.28.74.36",
  "158.252.33.79",
  "40.172.100.131",
]
```

- task3_terraform_output_3_ips.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ terraform output
webserver_public_ips = [
  "3.28.74.36",
  "158.252.33.79",
  "40.172.100.131",
]
```

- task3_ansible_single_ip_ping.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ ansible ec2 -i hosts -m ping
3.28.74.36 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3.9"
  },
  "changed": false,
  "ping": "pong"
}
[WARNING]: Host '158.252.33.79' is using the discovered Python interpreter at '/usr/bin/python3.9', but future installation of another Python interpreter could cause a different interpreter to be discovered. See https://docs.ansible.com/ansible-core/2.20/reference_appendices/interpreter_discovery.html for more information.
158.252.33.79 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3.9"
  },
  "changed": false,
  "ping": "pong"
}
```

- task3_ansible_droplet_ping.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ ansible droplet -i hosts -m ping
40.172.100.131 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3.9"
  },
  "changed": false,
  "ping": "pong"
}
```

- task3_ansible_all_ping.png


```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ ansible all -i hosts -m ping
158.252.33.79 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3.9"
  },
  "changed": false,
  "ping": "pong"
}
[WARNING]: Host '40.172.100.131' is using the discovered Python interpreter at '/usr/bin/python3.9', but future installation of another Python interpreter could cause a different interpreter to be discovered. See https://docs.ansible.com/ansible-core/2.20/reference_appendices/interpreter_discovery.html for more information.
40.172.100.131 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3.9"
  },
  "changed": false,
  "ping": "pong"
}
[WARNING]: Host '3.28.74.36' is using the discovered Python interpreter at '/usr/bin/python3.9', but future installation of another Python interpreter could cause a different interpreter to be discovered. See https://docs.ansible.com/ansible-core/2.20/reference_appendices/interpreter_discovery.html for more information.
3.28.74.36 | SUCCESS => {
  "ansible_facts": {
```

Task 4 – Global Ansible.cfg & first nginx playbook

- task4_global_ansible_cfg.png

```
[default]
host_key_checking = False
interpreter_python = /usr/bin/python3
~
~
```

- task4_my_playbook_created.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ touch my-playbook.yml
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ ls -la my-playbook.yml
-rw-rw-rw- 1 codespace codespace 0 Jan 30 22:02 my-playbook.yml
```

- task4_ansible_play_ec2.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ ansible-playbook -i hosts my-playbook.yml
TASK [install nginx and update cache] *****
changed: [3.28.74.36]
changed: [158.252.33.79]

TASK [start nginx server] *****
changed: [158.252.33.79]
changed: [3.28.74.36]

PLAY RECAP *****
158.252.33.79      : ok=3    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
3.28.74.36       : ok=3    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

- task4_nginx_browser_ec2.png



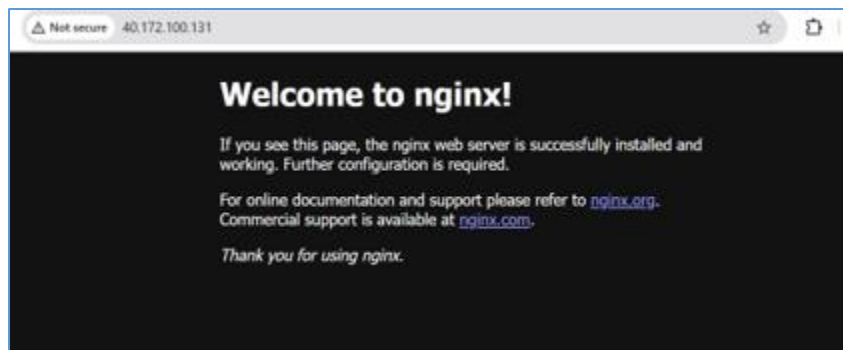
- task4_my_playbook_droplet.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ ansible-playbook -i hosts m
y-playbook.yaml
TASK [install nginx and update cache] *****
changed: [3.28.74.36]
changed: [158.252.33.79]

TASK [start nginx server] *****
changed: [158.252.33.79]
changed: [3.28.74.36]

PLAY RECAP *****
158.252.33.79 : ok=3 changed=2 unreachable=0 failed=0 skipped=0 resc
ued=0 ignored=0
```

- task4_nginx_browser_droplet.png



Task 5- Single Nginx Target Group

- task5_project_nginx_cfg_created.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ touch ansible.cfg
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ ls -ls ansible.cfg
0 -rw-rw-rw- 1 codespace codespace 0 Jan 30 22:10 ansible.cfg
```

- task5_project_nginx_cfg.png

```
lab_14 > Task > ⚙ ansible.cfg
1 [defaults]
2 host_key_checking=False
3 interpreter_python = /usr/bin/python3
```

- task5_main_tf_count_1.png


```
lab_14 > Task > main.tf
23 module "myapp-webserver" {
30   vpc_id = aws_vpc.myapp_vpc.id
31   subnet_id = module.myapp-subnet.subnet.id
32
33   # Loop count
34   count = 1
35   # Use count.index to differentiate instances
36   instance_suffix = count.index

```

- task5_terraform_output_single_ip.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ terraform apply -auto-approve
Apply complete! Resources: 0 added, 0 changed, 6 destroyed.
```

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ terraform output
webserver_public_ips = [
  "3.28.74.36",
  ]
```

- task5_my_playbook_nginx_group.png

```
Task > ! my-playbook.yaml
---
- name: Configure nginx web server
  hosts: nginx
  become: true
  tasks:
    - name: install nginx and update cache
      yum:
        name: nginx

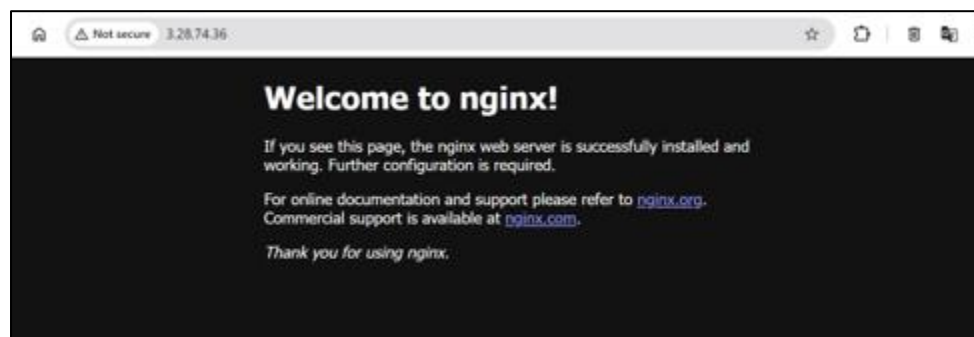
```

- task5_ansible_play_nginx_group.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ ansible-playbook -i hosts my-playbook.yaml
changed: [3.28.74.36]

PLAY RECAP *****
3.28.74.36 : ok=4 changed=1 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0
```

- task5_nginx_browser_single.png



Task 6- Ansible Managed SSL

- task6_my_playbook_ssl_section.png

```
- name: Configure nginx web server

- name: Configure SSL certificates
  hosts: nginx
  become: true
  tasks:
    - name: Create SSL private directory
      file:
        path: /etc/ssl/private
        state: directory
        mode: '0700'

    - name: Create SSL certs directory
      file:
```

- task6_ansible_play_ssl.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ ansible-playbook -i hosts m
y-playbook.yaml
TASK [Get IMDSv2 token] *****
ok: [3.28.74.36]

TASK [Get current public IP] *****
ok: [3.28.74.36]

TASK [Show current public IP] *****
ok: [3.28.74.36] => {
  "msg": "Public IP: 3.28.74.36"
}

TASK [Generate self-signed SSL certificate] *****
changed: [3.28.74.36]

PLAY RECAP *****
3.28.74.36 : ok=11 changed=3 unreachable=0 failed=0 skipped=0 resc
ued=0 ignored=0
```

- task6_ssl_cert_file.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA (main) $ ssh ec2-user@3.28.74.36 -i
~/.ssh/id_ed25519
-----BEGIN CERTIFICATE-----
MIIDOTCCAIGgAwIBAgIUdHsr1NBx7xjvonqcIFzoyCz+nIowDQYJKoZIhvcNAQEL
BQAwFTETMBEGA1UEAwKM4yOC43NC4zNjAeFw0yNjAxMjg0OTA3MzBaFw0yNzAx
Mjg0OTA3MzBaMBUxEzARBgNVBAMTCjMuMjg0OTA3MzBaFw0yNzAxMjg0OTA3MzBa
AQUAAAIIBDwAwggEKAoIBAQCYS+o/3Yf87MvBGbnA8pN/FuyxitkkiCD6bhY5WVOA
AwVvKrPH28TBs3PDD02aREM7yWi5hqZMUfdWxkT9GDznEK9dBedHCGmXiGtvoHGH
RNQwlfCWfRdBwz9gHdvQw5W0uWpyobK+hkB8/mfElGiTr1hrX/cYBsyJrVA2Q2Ts
-----
```

- task6_ssl_key_file.png

```
[ec2-user@ip-10-0-10-145 ~]$ sudo cat /etc/ssl/private/selfsigned.key
-----BEGIN PRIVATE KEY-----
MIIEvgIBADANBgkqhkiG9w0BAQEFAASCBAgEAAoIBAQCYS+o/3Yf87MvB
GbnA8pN/FuyxitkkiCD6bhY5WVOAAwVvKrPH28TBs3PDD02aREM7yWi5hqZMUfdW
xkT9GDznEK9dBedHCGmXiGtvoHGHRNQwlfCWfRdBwz9gHdvQw5W0uWpyobK+hkB8
-----
```

Task 7 – PHP Frontend Deployment with Templates

- task7_files_templates_created.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA/lab_14/Task (main) $ mkdir -p files templates
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA/lab_14/Task (main) $ touch files/index.php
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA/lab_14/Task (main) $ touch templates/nginx.conf.j2
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA/lab_14/Task (main) $ ls -R
.:
ansible.cfg  locals.tf  my-playbook.yaml  terraform.tfstate  variables.tf
files       main.tf   outputs.tf         terraform.tfstate.backup
hosts       modules  templates          terraform.tfvars

./files:
index.php

./modules:
subnet  webserver

./modules/subnet:
main.tf  outputs.tf  variables.tf

./modules/webserver:
main.tf  outputs.tf  variables.tf

./templates:
nginx.conf.j2
```

- task7_my_playbook_web_deploy.png

```
- name: Configure SSL certificates
  tasks:

- name: Deploy Nginx website and configuration files
  hosts: nginx
  become: true
  tasks:
    - name: install php-fpm and php-curl
      yum:
        name:
          - php-fpm
          - php-curl
```

- task7_ansible_play_web_deploy.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA/lab_14/Task (main) $ ansible-playbook -i host
s my-playbook.yaml
TASK [install php-fpm and php-curl] *****
ok: [3.28.74.36]

TASK [Copy website files] *****
ok: [3.28.74.36]

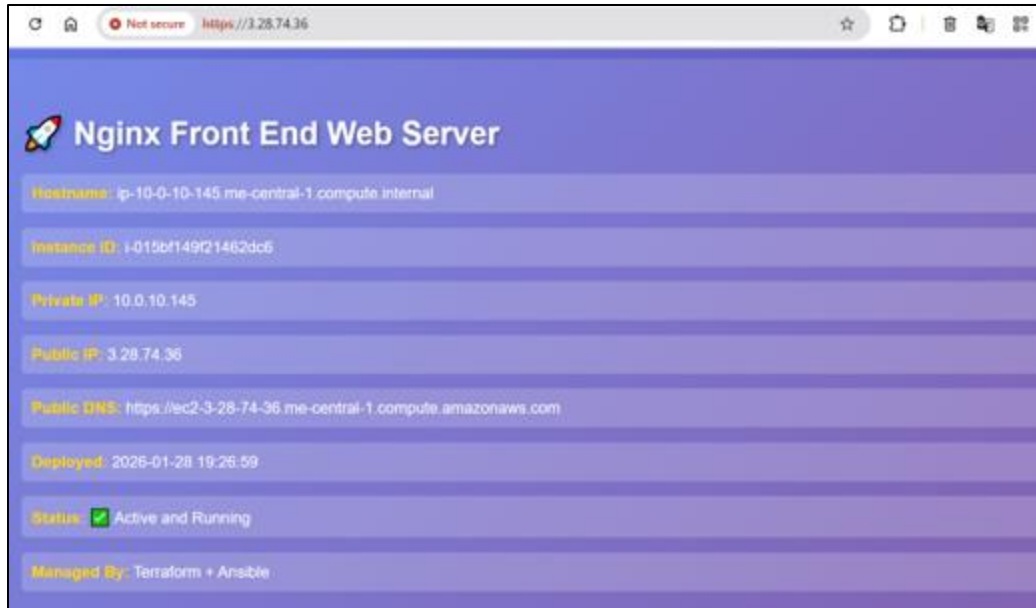
TASK [Copy nginx.conf template] *****
changed: [3.28.74.36]

TASK [Restart nginx] *****
changed: [3.28.74.36]

TASK [Start and enable php-fpm] *****
changed: [3.28.74.36]

PLAY RECAP *****
3.28.74.36 : ok=19 changed=3 unreachable=0 failed=0 skipped=0 resc
```

- task7_php_https_browser.png



Task 8 – Docker & Docker Compose

- task8_terraform_apply_docker_instance.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA/lab_14/Task (main) $ terraform apply -auto-approve
Apply complete! Resources: 7 added, 0 changed, 0 destroyed.
```

- task8_terraform_output_new_ip.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA/lab_14/Task (main) $ terraform output
webserver_public_ips = [
  "40.172.234.49",
```

- task8_hosts_docker_servers.png

```
[docker_servers]
40.172.234.49

[docker_servers:vars]
ansible_ssh_private_key_file=~/.ssh/id_ed25519
ansible_user=ec2-user
```

- task8_my_playbook_docker.png

```
---
- name: Configure Docker
  hosts: all
  become: true
  tasks:
    - name: install docker and update cache
      yum:
```

- task8_ansible_play_docker.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA/lab_14/Task (main) $ ansible-playbook -i hosts m
y-playbook.yaml
TASK [restart docker service] *****
changed: [40.172.234.49]

PLAY RECAP *****
40.172.234.49      : ok=8    changed=4    unreachable=0    failed=0    skipped=0    resc
ued=0    ignored=0
```

- task8_docker_ps_remote.png

```
@hamnaMahmood20 → /workspaces/CC-Hamna-Mahmood-25-BSE-VA/lab_14/Task (main) $ ssh ec2-user@40.172.234.49
-i ~/.ssh/id_ed25519

** The server may need to be upgraded. See https://openssh.com/pq.html

      #_
    ~\  ####_      Amazon Linux 2023
  ~ ~ \ #####\
  ~ ~  \###|
  ~ ~   \#/_ ____ https://aws.amazon.com/linux/amazon-linux-2023
    ~ ~   V~' '->
      ~ ~
      ~ ~. _ .
      ~ ~ \ / \
      ~ ~  /m/'

Last login: Wed Jan 28 19:37:09 2026 from 4.240.39.194
[ec2-user@ip-10-0-10-136 ~]$ sudo docker ps
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
[ec2-user@ip-10-0-10-136 ~]$ exit
logout
```

Task 9 – Gitea Docker

- task9_my_playbook_add_user_to_docker.png

```
lab_14 > Task > ! my-playbook.yml
12   - name: Install Docker Compose
16     tasks:
41
42   - name: Adding user to docker group
43     hosts: all
44     become: true
45     vars_files:
46       - project-vars.yml
47     tasks:
48       - name: add user to docker group
49         user:
```

- task9 my playbook deploy containers.png


```

lab_14 > Task > ! my-playbook.yaml
42 - name: Adding user to docker group
47   tasks:
66     - name: fail if docker is not accessible
70
71 - name: Deploy Docker Containers
72   hosts: all
73   become: true
74   user: "{{ normal_user }}"
75   vars_files:
76     - project-vars.yaml
77   tasks:
78     - name: check if docker-compose file exists

```

- task9_compose_yaml.png

```

Task > compose.yaml
services:
  gitea:
    image: gitea/gitea:latest
    container_name: gitea
    environment:
      - DB_TYPE=postgres
      - DB_HOST=db:5432
      - DB_NAME=gitea
      - DB_USER=gitea

```

- task9_ansible_play_gitea.png

```

@HamnaMahmood20 → /workspaces/CC-Hamna-Mahmood-25-BSE-VA/lab_14/Task (main) $ ansible-playbook -i host
y-playbook.yaml
PLAY RECAP *****
40.172.234.49      : ok=16   changed=2    unreachable=0    failed=0    skipped=1    resc
ued=0    ignored=0

```

- task9_sg_ingress_3000.png

```

4 > Task > modules > webserver > main.tf
resource "aws_security_group" "web_sg" {
  ingress {
  }
  ingress {
    from_port = 3000
    to_port   = 3000
    protocol  = "tcp"
    cidr_blocks = ["0.0.0.0/0"]
  }
}

```

- task9_terraform_apply_sg_3000.png

```

@HamnaMahmood20 → /workspaces/CC-Hamna-Mahmood-25-BSE-VA/lab_14/Task (main) $ terraform apply -auto-appro
ve
Apply complete! Resources: 0 added, 1 changed, 0 destroyed.

Outputs:

webserver_public_ips = [
  "40.172.234.49",
]

```

- task9_gitea_browser.png

Initial Configuration

If you run Gitea inside Docker, please read the [documentation](#) before changing any settings.

Database Settings

Gitea requires MySQL, PostgreSQL, MSSQL, SQLite3 or TiDB (MySQL protocol).

Database Type: PostgreSQL

Host: db:5432

Username: gitea

Password: [masked]

Database Name: gitea

SSL: Disable

Schema: [blank]

Leave blank for database default ("public").

Port number the Gitea web server will listen on.

Gitea Base URL: http://40.172.234.49:3000/

Base address for HTTPS clone URLs and email notifications.

Log Path: /data/gitea/log

Log files will be written to this directory.

☒ Enable Update Checker

Checks for new version releases periodically by connecting to gitea.io.

Optional Settings

- Email Settings
- Server and Third-Party Service Settings
- Administrator Account Settings

These configuration options will be written into: /data/gitea/conf/app.ini

Install Gitea

Task 10 – Automating Ansible

- task10_null_resource_main_tf.png

```
resource "null_resource" "configure_server" {
  triggers = {
    webserver_public_ips_for_aws = join(",", [for i in module.myapp-webserver :
  ]

  depends_on = [module.myapp-webserver]

  provisioner "local-exec" {
    command = <<-EOT
```

- task10_terraform_destroy_before_null.png

```
@HamnaMahmood20 ➔ /workspaces/CC-Hamna-Mahmood-25-BSE-VA/lab_14/Task (main) $ terraform destroy -auto-approve
aws_vpc.myapp_vpc: Destruction complete after 1s

Destroy complete! Resources: 7 destroyed.
```

- task10_terraform_apply_with_local_exec.png

```
@HamnaMahmood20 →/workspaces/CC-Hamna-Mahmood-25-BSE-VA/lab_14/Task (main) $ terraform apply -auto-approve
Apply complete! Resources: 8 added, 0 changed, 0 destroyed.

Outputs:
webserver_public_ips = [
  "158.252.83.213",
]
```