Final Exam - Terraform Outputs

Name: Hanil Zarbailov

terraform plan output:

```
❯ terraform plan
data.aws_subnets.public_subnets: Reading...
data.aws_ami.ubuntu: Reading...
data.aws_subnets.public_subnets: Read complete after 2s [id=us-east-1]
data.aws_subnet.public_subnet: Reading...
data.aws_ami.ubuntu: Read complete after 2s [id=ami-0f9de6e2d2f067fca]
data.aws_subnet.public_subnet: Read complete after 0s [id=subnet-05e39308bb4a1d087]

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
  + create

Terraform will perform the following actions:

  # aws_instance.web_server will be created
  + resource "aws_instance" "web_server" {
      + ami                                  = "ami-0f9de6e2d2f067fca"
      + arn                                  = (known after apply)
      + associate_public_ip_address          = true
      + availability_zone                    = (known after apply)
      + cpu_core_count                       = (known after apply)
      + cpu_threads_per_core                 = (known after apply)
      + disable_api_stop                     = (known after apply)
      + disable_api_termination              = (known after apply)
      + ebs_optimized                        = (known after apply)
      + enable_primary_ipv6                  = (known after apply)
      + get_password_data                    = false
      + host_id                              = (known after apply)
      + host_resource_group_arn              = (known after apply)
      + iam_instance_profile                 = (known after apply)
      + id                                   = (known after apply)
      + instance_initiated_shutdown_behavior = (known after apply)
      + instance_lifecycle                   = (known after apply)
      + instance_state                       = (known after apply)
      + instance_type                        = "t3.medium"
      + ipv6_address_count                   = (known after apply)
      + ipv6_addresses                       = (known after apply)
      + key_name                             = (known after apply)
      + monitoring                           = (known after apply)
```

```
    + outpost_arn                        = (known after apply)
    + password_data                      = (known after apply)
    + placement_group                    = (known after apply)
    + placement_partition_number         = (known after apply)
    + primary_network_interface_id       = (known after apply)
    + private_dns                        = (known after apply)
    + private_ip                         = (known after apply)
    + public_dns                         = (known after apply)
    + public_ip                          = (known after apply)
    + secondary_private_ips              = (known after apply)
    + security_groups                    = (known after apply)
    + source_dest_check                  = true
    + spot_instance_request_id           = (known after apply)
    + subnet_id                          = "subnet-05e39308bb4a1d087"
    + tags                               = {
        + "Name" = "hanil-finalexam-builder-ec2"
      }
    + tags_all                           = {
        + "Name" = "hanil-finalexam-builder-ec2"
      }
    + tenancy                            = (known after apply)
    + user_data                          = (known after apply)
    + user_data_base64                   = (known after apply)
    + user_data_replace_on_change        = false
    + vpc_security_group_ids             = (known after apply)
  }

# aws_key_pair.builder_key will be created
+ resource "aws_key_pair" "builder_key" {
    + arn             = (known after apply)
    + fingerprint     = (known after apply)
    + id              = (known after apply)
    + key_name        = "hanilz-finalexam-builder_key"
    + key_name_prefix = (known after apply)
    + key_pair_id     = (known after apply)
    + key_type        = (known after apply)
    + public_key      = (known after apply)
    + tags_all        = (known after apply)
  }

# aws_security_group.sg will be created
+ resource "aws_security_group" "sg" {
    + arn                    = (known after apply)
    + description            = "Managed by Terraform"
    + egress                 = [
        + {
            + cidr_blocks      = [
                + "0.0.0.0/0",
```

```
        ]
      + description      = ""
      + from_port        = 0
      + ipv6_cidr_blocks = []
      + prefix_list_ids  = []
      + protocol         = "-1"
      + security_groups  = []
      + self             = false
      + to_port          = 0
    },
  ]
+ id                   = (known after apply)
+ ingress              = [
    + {
      + cidr_blocks      = [
          + "199.203.122.29/32",
        ]
      + description      = ""
      + from_port        = 22
      + ipv6_cidr_blocks = []
      + prefix_list_ids  = []
      + protocol         = "tcp"
      + security_groups  = []
      + self             = false
      + to_port          = 22
    },
    + {
      + cidr_blocks      = [
          + "199.203.122.29/32",
        ]
      + description      = ""
      + from_port        = 5001
      + ipv6_cidr_blocks = []
      + prefix_list_ids  = []
      + protocol         = "tcp"
      + security_groups  = []
      + self             = false
      + to_port          = 5001
    },
    + {
      + cidr_blocks      = [
          + "199.203.122.29/32",
        ]
      + description      = ""
      + from_port        = 8080
      + ipv6_cidr_blocks = []
      + prefix_list_ids  = []
      + protocol         = "tcp"
```

```
          + security_groups  = []
          + self             = false
          + to_port          = 8080
        },
    ]
  + name                 = (known after apply)
  + name_prefix          = (known after apply)
  + owner_id             = (known after apply)
  + revoke_rules_on_delete = false
  + tags_all             = (known after apply)
  + vpc_id               = "vpc-044604d0bfb707142"
}

# local_file.private_key will be created
+ resource "local_file" "private_key" {
  + content              = (sensitive value)
  + content_base64sha256 = (known after apply)
  + content_base64sha512 = (known after apply)
  + content_md5          = (known after apply)
  + content_sha1         = (known after apply)
  + content_sha256       = (known after apply)
  + content_sha512       = (known after apply)
  + directory_permission = "0777"
  + file_permission      = "0600"
  + filename             = "./hanilz-finalexam-builder_key.pem"
  + id                   = (known after apply)
}

# null_resource.validate_ip will be created
+ resource "null_resource" "validate_ip" {
  + id = (known after apply)
}

# time_sleep.wait_for_ip will be created
+ resource "time_sleep" "wait_for_ip" {
  + create_duration = "1m"
  + id              = (known after apply)
}

# tls_private_key.ssh_key will be created
+ resource "tls_private_key" "ssh_key" {
  + algorithm                   = "RSA"
  + ecdsa_curve                 = "P224"
  + id                          = (known after apply)
  + private_key_openssh         = (sensitive value)
  + private_key_pem             = (sensitive value)
  + private_key_pem_pkcs8       = (sensitive value)
  + public_key_fingerprint_md5  = (known after apply)
```

```
    + public_key_fingerprint_sha256 = (known after apply)
    + public_key_openssh            = (known after apply)
    + public_key_pem                = (known after apply)
    + rsa_bits                      = 4096
  }

Plan: 7 to add, 0 to change, 0 to destroy.

Changes to Outputs:
  + instance_public_ip   = (known after apply)
  + sg_id                = (known after apply)
  + ssh_key_name         = "hanilz-finalexam-builder_key"
  + ssh_private_key_path = (sensitive value)

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Note: You didn't use the -out option to save this plan, so Terraform can't guarantee to take
exactly these actions if you run "terraform apply" now.
```

terraform apply output:

```
❯ terraform apply
data.aws_subnets.public_subnets: Reading...
data.aws_ami.ubuntu: Reading...
data.aws_subnets.public_subnets: Read complete after 1s [id=us-east-1]
data.aws_subnet.public_subnet: Reading...
data.aws_subnet.public_subnet: Read complete after 0s [id=subnet-05e39308bb4a1d087]
data.aws_ami.ubuntu: Read complete after 1s [id=ami-0f9de6e2d2f067fca]

Terraform used the selected providers to generate the following execution plan. Resource
actions are indicated with the following symbols:
  + create

Terraform will perform the following actions:

  # aws_instance.web_server will be created
  + resource "aws_instance" "web_server" {
      + ami                          = "ami-0f9de6e2d2f067fca"
      + arn                          = (known after apply)
      + associate_public_ip_address  = true
      + availability_zone            = (known after apply)
      + cpu_core_count               = (known after apply)
      + cpu_threads_per_core         = (known after apply)
      + disable_api_stop             = (known after apply)
```

```
    + disable_api_termination            = (known after apply)
    + ebs_optimized                      = (known after apply)
    + enable_primary_ipv6                = (known after apply)
    + get_password_data                  = false
    + host_id                            = (known after apply)
    + host_resource_group_arn            = (known after apply)
    + iam_instance_profile               = (known after apply)
    + id                                 = (known after apply)
    + instance_initiated_shutdown_behavior = (known after apply)
    + instance_lifecycle                 = (known after apply)
    + instance_state                     = (known after apply)
    + instance_type                      = "t3.medium"
    + ipv6_address_count                 = (known after apply)
    + ipv6_addresses                     = (known after apply)
    + key_name                           = (known after apply)
    + monitoring                         = (known after apply)
    + outpost_arn                        = (known after apply)
    + password_data                      = (known after apply)
    + placement_group                    = (known after apply)
    + placement_partition_number         = (known after apply)
    + primary_network_interface_id       = (known after apply)
    + private_dns                        = (known after apply)
    + private_ip                         = (known after apply)
    + public_dns                         = (known after apply)
    + public_ip                          = (known after apply)
    + secondary_private_ips              = (known after apply)
    + security_groups                    = (known after apply)
    + source_dest_check                  = true
    + spot_instance_request_id           = (known after apply)
    + subnet_id                          = "subnet-05e39308bb4a1d087"
    + tags                               = {
        + "Name" = "hanil-finalexam-builder-ec2"
      }
    + tags_all                           = {
        + "Name" = "hanil-finalexam-builder-ec2"
      }
    + tenancy                            = (known after apply)
    + user_data                          = (known after apply)
    + user_data_base64                   = (known after apply)
    + user_data_replace_on_change        = false
    + vpc_security_group_ids             = (known after apply)
  }

# aws_key_pair.builder_key will be created
+ resource "aws_key_pair" "builder_key" {
    + arn             = (known after apply)
    + fingerprint     = (known after apply)
    + id              = (known after apply)
```

```
    + key_name        = "hanilz-finalexam-builder_key"
    + key_name_prefix = (known after apply)
    + key_pair_id     = (known after apply)
    + key_type        = (known after apply)
    + public_key      = (known after apply)
    + tags_all        = (known after apply)
  }

# aws_security_group.sg will be created
+ resource "aws_security_group" "sg" {
    + arn                    = (known after apply)
    + description            = "Managed by Terraform"
    + egress                 = [
        + {
            + cidr_blocks      = [
                + "0.0.0.0/0",
              ]
            + description      = ""
            + from_port        = 0
            + ipv6_cidr_blocks = []
            + prefix_list_ids  = []
            + protocol         = "-1"
            + security_groups  = []
            + self             = false
            + to_port          = 0
          },
      ]
    + id                     = (known after apply)
    + ingress                = [
        + {
            + cidr_blocks      = [
                + "199.203.122.29/32",
              ]
            + description      = ""
            + from_port        = 22
            + ipv6_cidr_blocks = []
            + prefix_list_ids  = []
            + protocol         = "tcp"
            + security_groups  = []
            + self             = false
            + to_port          = 22
          },
        + {
            + cidr_blocks      = [
                + "199.203.122.29/32",
              ]
            + description      = ""
            + from_port        = 5001
```

```
          + ipv6_cidr_blocks = []
          + prefix_list_ids  = []
          + protocol         = "tcp"
          + security_groups  = []
          + self             = false
          + to_port          = 5001
        },
      + {
          + cidr_blocks      = [
              + "199.203.122.29/32",
            ]
          + description      = ""
          + from_port        = 8080
          + ipv6_cidr_blocks = []
          + prefix_list_ids  = []
          + protocol         = "tcp"
          + security_groups  = []
          + self             = false
          + to_port          = 8080
        },
    ]
  + name                   = (known after apply)
  + name_prefix            = (known after apply)
  + owner_id               = (known after apply)
  + revoke_rules_on_delete = false
  + tags_all               = (known after apply)
  + vpc_id                 = "vpc-044604d0bfb707142"
}

# local_file.private_key will be created
+ resource "local_file" "private_key" {
  + content              = (sensitive value)
  + content_base64sha256 = (known after apply)
  + content_base64sha512 = (known after apply)
  + content_md5          = (known after apply)
  + content_sha1         = (known after apply)
  + content_sha256       = (known after apply)
  + content_sha512       = (known after apply)
  + directory_permission = "0777"
  + file_permission      = "0600"
  + filename             = "./hanilz-finalexam-builder_key.pem"
  + id                   = (known after apply)
}

# null_resource.validate_ip will be created
+ resource "null_resource" "validate_ip" {
  + id = (known after apply)
}
```

```
  # time_sleep.wait_for_ip will be created
  + resource "time_sleep" "wait_for_ip" {
      + create_duration = "1m"
      + id              = (known after apply)
    }

  # tls_private_key.ssh_key will be created
  + resource "tls_private_key" "ssh_key" {
      + algorithm                     = "RSA"
      + ecdsa_curve                   = "P224"
      + id                            = (known after apply)
      + private_key_openssh           = (sensitive value)
      + private_key_pem               = (sensitive value)
      + private_key_pem_pkcs8         = (sensitive value)
      + public_key_fingerprint_md5    = (known after apply)
      + public_key_fingerprint_sha256 = (known after apply)
      + public_key_openssh            = (known after apply)
      + public_key_pem                = (known after apply)
      + rsa_bits                      = 4096
    }

Plan: 7 to add, 0 to change, 0 to destroy.

Changes to Outputs:
  + instance_public_ip   = (known after apply)
  + sg_id                = (known after apply)
  + ssh_key_name         = "hanilz-finalexam-builder_key"
  + ssh_private_key_path = (sensitive value)

Do you want to perform these actions?
  Terraform will perform the actions described above.
  Only 'yes' will be accepted to approve.

  Enter a value: yes

tls_private_key.ssh_key: Creating...
time_sleep.wait_for_ip: Creating...
tls_private_key.ssh_key: Creation complete after 1s
[id=412bb089b43d474656d289ec1e10e3cb0db060b3]
local_file.private_key: Creating...
local_file.private_key: Creation complete after 0s
[id=4425cd4c6db84b379380705ebf155bbaa3c684e1]
aws_key_pair.builder_key: Creating...
aws_security_group.sg: Creating...
aws_key_pair.builder_key: Creation complete after 1s [id=hanilz-finalexam-builder_key]
aws_security_group.sg: Creation complete after 4s [id=sg-018dfdfe5127c0e43]
aws_instance.web_server: Creating...
```

time_sleep.wait_for_ip: Still creating... [10s elapsed]
aws_instance.web_server: Still creating... [10s elapsed]
aws_instance.web_server: Creation complete after 15s [id=i-0a2965979a7894608]
time_sleep.wait_for_ip: Still creating... [20s elapsed]
time_sleep.wait_for_ip: Still creating... [30s elapsed]
time_sleep.wait_for_ip: Still creating... [40s elapsed]
time_sleep.wait_for_ip: Still creating... [50s elapsed]
time_sleep.wait_for_ip: Still creating... [1m0s elapsed]
time_sleep.wait_for_ip: Creation complete after 1m0s [id=2025-03-17T09:26:13Z]
null_resource.validate_ip: Creating...
null_resource.validate_ip: Provisioning with 'local-exec'...
null_resource.validate_ip (local-exec): Executing: ["/bin/sh" "-c" "   retries=4\n interval=30\n   for i in $(seq 1 $retries); do\n   if [-z \"44.203.104.19\"]; then\n echo \"Attempt $i: Public IP address not assigned yet, retrying in $interval seconds...\"\n sleep $interval\n   else\n   echo \"Public IP address assigned: 44.203.104.19\"\n exit 0\n   fi\n   done\n   echo \"ERROR: Public IP address was not assigned after $retries attempts.\" >&2\n   exit 1\n"]
null_resource.validate_ip (local-exec): Public IP address assigned: 44.203.104.19
null_resource.validate_ip: Creation complete after 0s [id=5366214657218156378]

Apply complete! Resources: 7 added, 0 changed, 0 destroyed.

Outputs:

instance_public_ip = "44.203.104.19"
sg_id = "sg-018dfdfe5127c0e43"
ssh_key_name = "hanilz-finalexam-builder_key"
ssh_private_key_path = <sensitive>
```

# SSH into EC2 instance:

```
❯ ssh -i
"/Users/hanilz/Downloads/test/matrix-finalexam/terraform/hanilz-finalexam-builder_key.pem"
ubuntu@3.89.81.217
Welcome to Ubuntu 22.04.5 LTS (GNU/Linux 6.8.0-1024-aws x86_64)

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

 System information as of Mon Mar 17 09:42:12 UTC 2025

  System load: 0.1   Processes: 110
  Usage of /:   21.8% of 7.57GB   Users logged in: 0
  Memory usage: 5%   IPv4 address for ens5: 172.31.4.198
  Swap usage: 0%
```
```

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

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.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-4-198:~$
```

# Step 2 - installing docker and docker-compose

## Part 1 - update package manager

```
ubuntu@ip-172-31-4-198:~$ sudo apt update && sudo apt upgrade -y
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [128 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease [127 kB]
Get:4 http://security.ubuntu.com/ubuntu jammy-security InRelease [129 kB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 Packages
[14.1 MB]
Get:6 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe Translation-en [5652
kB]
Get:7 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 c-n-f Metadata
[286 kB]
Get:8 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse amd64 Packages
[217 kB]
Get:9 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse Translation-en [112
kB]
```
```

Get:10 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse amd64 c-n-f Metadata [8372 B]
Get:11 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [2388 kB]
Get:12 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main Translation-en [396 kB]
Get:13 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 c-n-f Metadata [18.4 kB]
Get:14 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 Packages [3108 kB]
Get:15 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted Translation-en [548 kB]
Get:16 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 c-n-f Metadata [652 B]
Get:17 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [1193 kB]
Get:18 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe Translation-en [293 kB]
Get:19 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 c-n-f Metadata [28.6 kB]
Get:20 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 Packages [53.3 kB]
Get:21 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse Translation-en [13.6 kB]
Get:22 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 c-n-f Metadata [732 B]
Get:23 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main amd64 Packages [67.7 kB]
Get:24 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main Translation-en [11.1 kB]
Get:25 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main amd64 c-n-f Metadata [388 B]
Get:26 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/restricted amd64 c-n-f Metadata [116 B]
Get:27 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 Packages [30.0 kB]
Get:28 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe Translation-en [16.6 kB]
Get:29 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 c-n-f Metadata [672 B]
Get:30 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/multiverse amd64 c-n-f Metadata [116 B]
Get:31 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [2145 kB]
Get:32 http://security.ubuntu.com/ubuntu jammy-security/main Translation-en [333 kB]
Get:33 http://security.ubuntu.com/ubuntu jammy-security/main amd64 c-n-f Metadata [13.5 kB]
Get:34 http://security.ubuntu.com/ubuntu jammy-security/restricted amd64 Packages [2986 kB]

Get:35 http://security.ubuntu.com/ubuntu jammy-security/restricted Translation-en [527 kB]
Get:36 http://security.ubuntu.com/ubuntu jammy-security/restricted amd64 c-n-f Metadata [584 B]
Get:37 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 Packages [966 kB]
Get:38 http://security.ubuntu.com/ubuntu jammy-security/universe Translation-en [207 kB]
Get:39 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 c-n-f Metadata [21.6 kB]
Get:40 http://security.ubuntu.com/ubuntu jammy-security/multiverse amd64 Packages [46.6 kB]
Get:41 http://security.ubuntu.com/ubuntu jammy-security/multiverse Translation-en [10.7 kB]
Get:42 http://security.ubuntu.com/ubuntu jammy-security/multiverse amd64 c-n-f Metadata [516 B]
Fetched 36.2 MB in 8s (4617 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
7 packages can be upgraded. Run 'apt list --upgradable' to see them.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following packages will be upgraded:
  cryptsetup cryptsetup-bin cryptsetup-initramfs libcryptsetup12 python3-jinja2 snapd sosreport
7 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
1 standard LTS security update
Need to get 28.8 MB of archives.
After this operation, 515 kB of additional disk space will be used.
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libcryptsetup12 amd64 2:2.4.3-1ubuntu1.3 [211 kB]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 cryptsetup-initramfs all 2:2.4.3-1ubuntu1.3 [25.6 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 cryptsetup-bin amd64 2:2.4.3-1ubuntu1.3 [145 kB]
Get:4 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 cryptsetup amd64 2:2.4.3-1ubuntu1.3 [194 kB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 python3-jinja2 all 3.0.3-1ubuntu0.4 [108 kB]
Get:6 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 snapd amd64 2.67.1+22.04 [27.8 MB]
Get:7 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 sosreport amd64 4.8.2-0ubuntu0~22.04.1 [360 kB]
Fetched 28.8 MB in 0s (57.8 MB/s)
Preconfiguring packages ...
(Reading database ... 65857 files and directories currently installed.)
Preparing to unpack .../0-libcryptsetup12_2%3a2.4.3-1ubuntu1.3_amd64.deb ...
Unpacking libcryptsetup12:amd64 (2:2.4.3-1ubuntu1.3) over (2:2.4.3-1ubuntu1.2) ...
Preparing to unpack .../1-cryptsetup-initramfs_2%3a2.4.3-1ubuntu1.3_all.deb ...

```
Unpacking cryptsetup-initramfs (2:2.4.3-1ubuntu1.3) over (2:2.4.3-1ubuntu1.2) ...
Preparing to unpack .../2-cryptsetup-bin_2%3a2.4.3-1ubuntu1.3_amd64.deb ...
Unpacking cryptsetup-bin (2:2.4.3-1ubuntu1.3) over (2:2.4.3-1ubuntu1.2) ...
Preparing to unpack .../3-cryptsetup_2%3a2.4.3-1ubuntu1.3_amd64.deb ...
Unpacking cryptsetup (2:2.4.3-1ubuntu1.3) over (2:2.4.3-1ubuntu1.2) ...
Preparing to unpack .../4-python3-jinja2_3.0.3-1ubuntu0.4_all.deb ...
Unpacking python3-jinja2 (3.0.3-1ubuntu0.4) over (3.0.3-1ubuntu0.3) ...
Preparing to unpack .../5-snapd_2.67.1+22.04_amd64.deb ...
Unpacking snapd (2.67.1+22.04) over (2.66.1+22.04) ...
Preparing to unpack .../6-sosreport_4.8.2-0ubuntu0~22.04.1_amd64.deb ...
Unpacking sosreport (4.8.2-0ubuntu0~22.04.1) over (4.7.2-0ubuntu1~22.04.2) ...
Setting up snapd (2.67.1+22.04) ...
snapd.failure.service is a disabled or a static unit not running, not starting it.
snapd.snap-repair.service is a disabled or a static unit not running, not starting it.
Setting up python3-jinja2 (3.0.3-1ubuntu0.4) ...
Setting up sosreport (4.8.2-0ubuntu0~22.04.1) ...
Setting up libcryptsetup12:amd64 (2:2.4.3-1ubuntu1.3) ...
Setting up cryptsetup-bin (2:2.4.3-1ubuntu1.3) ...
Setting up cryptsetup (2:2.4.3-1ubuntu1.3) ...
Setting up cryptsetup-initramfs (2:2.4.3-1ubuntu1.3) ...
update-initramfs: deferring update (trigger activated)
Processing triggers for libc-bin (2.35-0ubuntu3.9) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for dbus (1.12.20-2ubuntu4.1) ...
Processing triggers for initramfs-tools (0.140ubuntu13.4) ...
update-initramfs: Generating /boot/initrd.img-6.8.0-1024-aws
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
```

Part 2 - Installing Docker, starting and enabling it

```
ubuntu@ip-172-31-4-198:~$ sudo apt install -y docker.io
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
```

```
  bridge-utils containerd dns-root-data dnsmasq-base pigz runc ubuntu-fan
Suggested packages:
  ifupdown aufs-tools cgroupfs-mount | cgroup-lite debootstrap docker-buildx
docker-compose-v2 docker-doc rinse zfs-fuse | zfsutils
The following NEW packages will be installed:
  bridge-utils containerd dns-root-data dnsmasq-base docker.io pigz runc ubuntu-fan
0 upgraded, 8 newly installed, 0 to remove and 0 not upgraded.
Need to get 78.7 MB of archives.
After this operation, 301 MB of additional disk space will be used.
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 pigz amd64
2.6-1 [63.6 kB]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 bridge-utils
amd64 1.7-1ubuntu3 [34.4 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 runc
amd64 1.1.12-0ubuntu2~22.04.1 [8405 kB]
Get:4 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64
containerd amd64 1.7.24-0ubuntu1~22.04.1 [37.3 MB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64
dns-root-data all 2024071801~ubuntu0.22.04.1 [6132 B]
Get:6 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64
dnsmasq-base amd64 2.90-0ubuntu0.22.04.1 [374 kB]
Get:7 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd64
docker.io amd64 26.1.3-0ubuntu1~22.04.1 [32.5 MB]
Get:8 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 ubuntu-fan all
0.12.16 [35.2 kB]
Fetched 78.7 MB in 1s (65.6 MB/s)
Preconfiguring packages ...
Selecting previously unselected package pigz.
(Reading database ... 65865 files and directories currently installed.)
Preparing to unpack .../0-pigz_2.6-1_amd64.deb ...
Unpacking pigz (2.6-1) ...
Selecting previously unselected package bridge-utils.
Preparing to unpack .../1-bridge-utils_1.7-1ubuntu3_amd64.deb ...
Unpacking bridge-utils (1.7-1ubuntu3) ...
Selecting previously unselected package runc.
Preparing to unpack .../2-runc_1.1.12-0ubuntu2~22.04.1_amd64.deb ...
Unpacking runc (1.1.12-0ubuntu2~22.04.1) ...
Selecting previously unselected package containerd.
Preparing to unpack .../3-containerd_1.7.24-0ubuntu1~22.04.1_amd64.deb ...
Unpacking containerd (1.7.24-0ubuntu1~22.04.1) ...
Selecting previously unselected package dns-root-data.
Preparing to unpack .../4-dns-root-data_2024071801~ubuntu0.22.04.1_all.deb ...
Unpacking dns-root-data (2024071801~ubuntu0.22.04.1) ...
Selecting previously unselected package dnsmasq-base.
Preparing to unpack .../5-dnsmasq-base_2.90-0ubuntu0.22.04.1_amd64.deb ...
Unpacking dnsmasq-base (2.90-0ubuntu0.22.04.1) ...
Selecting previously unselected package docker.io.
Preparing to unpack .../6-docker.io_26.1.3-0ubuntu1~22.04.1_amd64.deb ...
```

```
Unpacking docker.io (26.1.3-0ubuntu1~22.04.1) ...
Selecting previously unselected package ubuntu-fan.
Preparing to unpack .../7-ubuntu-fan_0.12.16_all.deb ...
Unpacking ubuntu-fan (0.12.16) ...
Setting up dnsmasq-base (2.90-0ubuntu0.22.04.1) ...
Setting up runc (1.1.12-0ubuntu2~22.04.1) ...
Setting up dns-root-data (2024071801~ubuntu0.22.04.1) ...
Setting up bridge-utils (1.7-1ubuntu3) ...
Setting up pigz (2.6-1) ...
Setting up containerd (1.7.24-0ubuntu1~22.04.1) ...
Created symlink /etc/systemd/system/multi-user.target.wants/containerd.service →
/lib/systemd/system/containerd.service.
Setting up ubuntu-fan (0.12.16) ...
Created symlink /etc/systemd/system/multi-user.target.wants/ubuntu-fan.service →
/lib/systemd/system/ubuntu-fan.service.
Setting up docker.io (26.1.3-0ubuntu1~22.04.1) ...
Adding group `docker' (GID 122) ...
Done.
Created symlink /etc/systemd/system/multi-user.target.wants/docker.service →
/lib/systemd/system/docker.service.
Created symlink /etc/systemd/system/sockets.target.wants/docker.socket →
/lib/systemd/system/docker.socket.
Processing triggers for dbus (1.12.20-2ubuntu4.1) ...
Processing triggers for man-db (2.10.2-1) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.

ubuntu@ip-172-31-4-198:~$ sudo systemctl start docker
ubuntu@ip-172-31-4-198:~$ sudo systemctl enable docker

```

Part 3 - Installing Docker-Compose

```
ubuntu@ip-172-31-4-198:~$ sudo curl -L
"https://github.com/docker/compose/releases/latest/download/docker-compose-$(uname
-s)-$(uname -m)" -o /usr/local/bin/docker-compose
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
```

```
                                 Dload  Upload   Total   Spent    Left  Speed
  0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:--:--     0
  0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:--:--     0
100 71.4M  100 71.4M    0     0   118M      0 --:--:-- --:--:-- --:--:--  245M
ubuntu@ip-172-31-4-198:~$ sudo chmod +x /usr/local/bin/docker-compose
```

Part 4 - Add User to the Docker Group

```
sudo usermod -aG docker $USER
newgrp docker
```

Part 5 - validating docker and docker-compose are installed

```
ubuntu@ip-172-31-4-198:~$ docker --version
Docker version 26.1.3, build 26.1.3-0ubuntu1~22.04.1
ubuntu@ip-172-31-4-198:~$ docker-compose --version
Docker Compose version v2.34.0
```