

## CASE STUDY -CREATING AN ARCHITECTURE USING TERRAFORM ON AWS

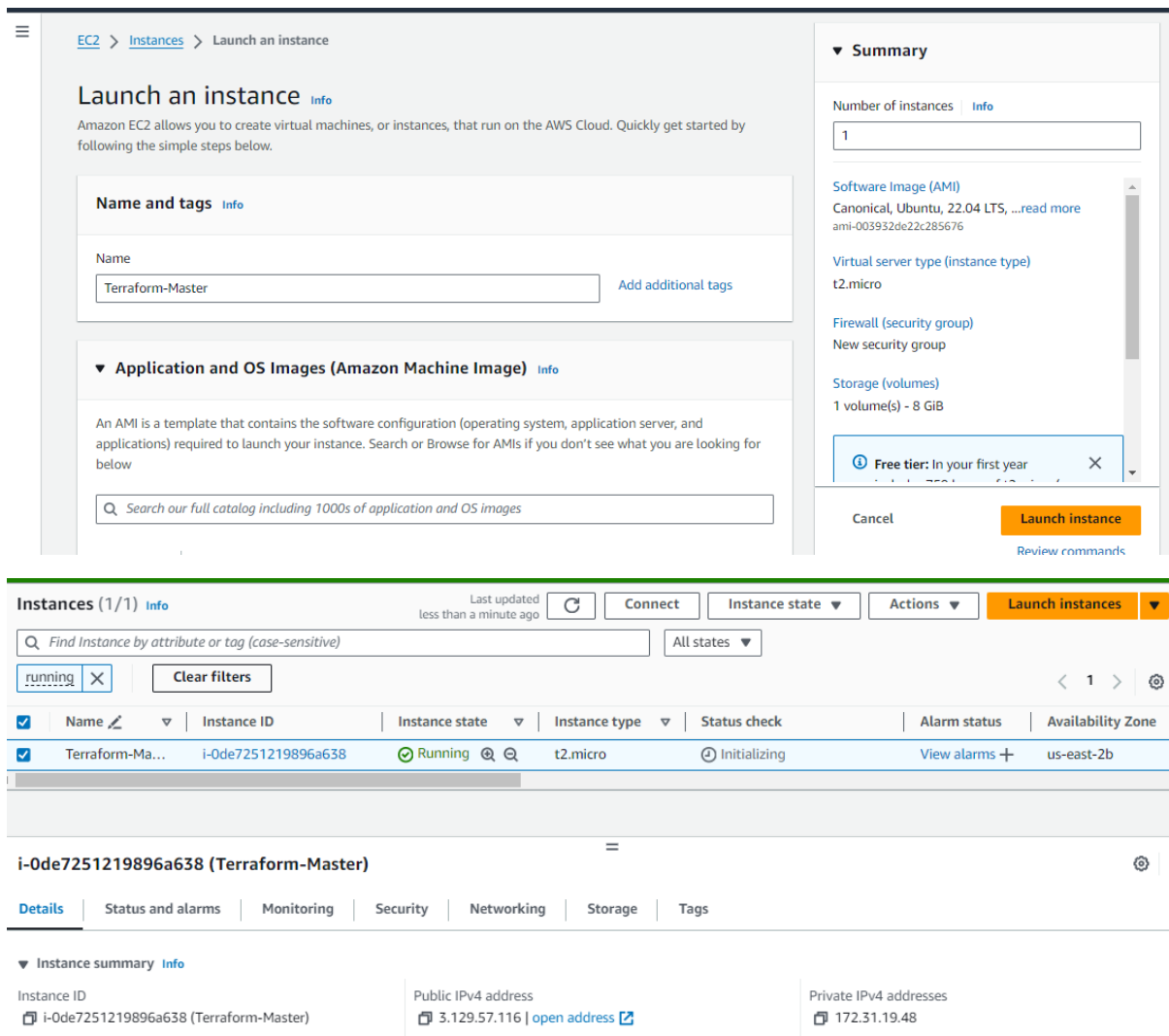
You work as a DevOps Engineer in leading Software Company. You have been asked to build an infrastructure safely and efficiently.

### The company Requirements:

1. Use AWS cloud Provider and the software to be installed is Apache2
2. Use Ubuntu AMI

### The company wants the Architecture to have the following services:

1. Create a template with a VPC, 2 subnets and 1 instance in each subnet
2. Attach Security groups, internet gateway and network interface to the instance



The screenshot displays the AWS Management Console interface. The top section shows the 'Launch an instance' wizard, which includes fields for 'Name and tags' (set to 'Terraform-Master') and 'Application and OS Images (Amazon Machine Image)'. The 'Summary' panel on the right lists the configuration: 1 instance, Canonical, Ubuntu, 22.04 LTS, t2.micro instance type, new security group, and 1 volume (8 GiB). The 'Launch instance' button is highlighted.

The bottom section shows the 'Instances (1/1)' list. The table below summarizes the instance details:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone
Terraform-Ma...	i-0de7251219896a638	Running	t2.micro	Initializing	View alarms +	us-east-2b

Below the table, the 'Details' tab for instance 'i-0de7251219896a638 (Terraform-Master)' is selected, showing the 'Instance summary' with the instance ID, public IPv4 address (3.129.57.116), and private IPv4 addresses (172.31.19.48).

Example:

```
ssh -i "salman-Ohio.pem" ubuntu@ec2-3-129-57-116.us-east-2.compute.amazonaws.com
```

**Note:** In most cases, the guessed username is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI username.

```
C:\Users\shaik\Downloads>ssh -i "salman-Ohio.pem" ubuntu@ec2-3-129-57-116.us-east-2.compute.amazonaws.com
The authenticity of host 'ec2-3-129-57-116.us-east-2.compute.amazonaws.com (3.129.57.116)' can't be established.
ED25519 key fingerprint is SHA256:QdjEekwBhd20MbxJCdW0fxfk6fnL05j0Kd+pGdu5TMU.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-3-129-57-116.us-east-2.compute.amazonaws.com' (ED25519) to the list of known hosts.
Welcome to Ubuntu 22.04.4 LTS (GNU/Linux 6.5.0-1022-aws x86_64)
```

```
C:\WINDOWS\system32\cmd. X + v
ubuntu@ip-172-31-19-48:~$ sudo hostnamectl set-hostname Terraform-Master
ubuntu@ip-172-31-19-48:~$ exit
logout
Connection to ec2-3-129-57-116.us-east-2.compute.amazonaws.com closed.
C:\Users\shaik\Downloads>ssh -i "salman-Ohio.pem" ubuntu@ec2-3-129-57-116.us-east-2.compute.amazonaws.com
```

```
ubuntu@Terraform-Master: ~ X + v
ubuntu@Terraform-Master:~$ sudo apt update
```

```
ubuntu@Terraform-Master: ~ X + v
ubuntu@Terraform-Master:~$ sudo nano terraform-install.sh
```

# Download and add the GPG key for the HashiCorp repository

```
wget -O- https://apt.releases.hashicorp.com/gpg | sudo gpg --dearmor -o
/usr/share/keyrings/hashicorp-archive-keyring.gpg
```

# Add the HashiCorp repository to your sources list

```
echo "deb [signed-by=/usr/share/keyrings/hashicorp-archive-keyring.gpg]
https://apt.releases.hashicorp.com $(lsb_release -cs) main" | sudo tee
/etc/apt/sources.list.d/hashicorp.list
```

# Update the package list and install Terraform

```
sudo apt update && sudo apt install terraform -y
```

```
ubuntu@Terraform-Master: ~ X + v
GNU nano 6.2 terraform-install.sh *
# Download and add the GPG key for the HashiCorp repository
wget -O- https://apt.releases.hashicorp.com/gpg | sudo gpg --dearmor -o /usr/share/keyrings/hashicorp-archive-keyring.gpg

# Add the HashiCorp repository to your sources list
echo "deb [signed-by=/usr/share/keyrings/hashicorp-archive-keyring.gpg] https://apt.releases.hashicorp.com $(lsb_release -cs) main" | sudo tee /etc

# Update the package list and install Terraform
sudo apt update && sudo apt install terraform -y
```

```
ubuntu@Terraform-Master: ~$ sudo nano terraform-install.sh
ubuntu@Terraform-Master:~$ sudo bash terraform-install.sh
--2024-09-01 12:27:06-- https://apt.releases.hashicorp.com/gpg
Resolving apt.releases.hashicorp.com (apt.releases.hashicorp.com)... 108.156.184.46, 108.156.184.65, 108.156.184.5, ...
Connecting to apt.releases.hashicorp.com (apt.releases.hashicorp.com)|108.156.184.46|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 3980 (3.9K) [binary/octet-stream]
Saving to: 'STDOUT'

-
100%[=====>] 3.89K --KB/s in 0s

2024-09-01 12:27:07 (1.26 GB/s) - written to stdout [3980/3980]

deb [signed-by=/usr/share/keyrings/hashicorp-archive-keyring.gpg] https://apt.releases.hashicorp.com jammy main
Hit:1 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Get:4 https://apt.releases.hashicorp.com jammy InRelease [12.9 kB]
Hit:5 http://security.ubuntu.com/ubuntu jammy-security InRelease
Get:6 https://apt.releases.hashicorp.com jammy/main amd64 Packages [149 kB]
Fetched 161 kB in 1s (182 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
48 packages can be upgraded. Run 'apt list --upgradable' to see them.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  terraform
0 upgraded, 1 newly installed, 0 to remove and 48 not upgraded.
Need to get 28.0 MB of archives.
After this operation, 89.1 MB of additional disk space will be used.
Get:1 https://apt.releases.hashicorp.com jammy/main amd64 terraform amd64 1.9.5-1 [28.0 MB]
Fetched 28.0 MB in 0s (79.8 MB/s)
```

```
ubuntu@Terraform-Master: ~$ terraform --version
Terraform v1.9.5
on linux_amd64
ubuntu@Terraform-Master:~$
```

```
ubuntu@Terraform-Master: ~$ ls
terraform-install.sh
ubuntu@Terraform-Master:~$ sudo nano main.tf
```

us-east-2.console.aws.amazon.com/ec2/home?region=us-east-2#Instances:search=running&v=3&case=tag:true%5C.client:false,\$regex=tags:false%5C.client:fa...

Interfacing SIM900... Downloads New Tab Python Exercises: C... MEGA Women's Health: 25... Imported

aws Services Search [Alt+S]

EC2 Dashboard EC2 Global View Events

Instances Instances Instance Types Launch Templates Spot Requests Savings Plans Reserved Instances Dedicated Hosts Capacity Reservations New

Images AMIs AMI Catalog

Elastic Block Store Volumes

Instances (1/1) Info Last updated 28 minutes ago Connect Instance state Action

Find Instance by attribute or tag (case-sensitive) All states

running Clear filters

Name	Instance ID	Instance state	Instance type	Status check
Terraform-Ma...	i-0de7251219896a638	Running	t2.micro	2/2 checks passed

i-0de7251219896a638 (Terraform-Master)

Details Status and alarms Monitoring Security Networking Storage Tags

Instance summary Info

Instance ID i-0de7251219896a638 (Terraform-Master)

Public IPv4 address 3.129.57.116 | open address

Private IPv4 addresses 172.31.19.48

Public IPv4 DNS ec2-3-129-57-116.us-east-2.compute.amazonaws.com | open address

IPv6 address -

Instance state Running

CloudShell Feedback

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aws Services Search [Alt+S]

Identity and Access Management (IAM)

Search IAM

Dashboard

Access management User groups

Access keys (0)

Use access keys to send programmatic calls to AWS from the AWS CLI, AWS Tools for PowerShell, AWS SDKs, or direct AWS API calls. You can have a maximum of two access keys (active or inactive) at a time. [Learn more](#)

Access key ID	Created on	Access key last used	Region last used	Service last used	Status
No access keys					

As a best practice, avoid using long-term credentials like access keys. Instead, use tools which provide short term credentials. [Learn more](#)

Create access key

IAM > Security credentials > Create access key

Step 1 Alternatives to root user access keys

Step 2 Retrieve access key

## Alternatives to root user access keys info

**Root user access keys are not recommended**

We don't recommend that you create root user access keys. Because you can't specify the root user in a permissions policy, you can't limit its permissions, which is a best practice.

Instead, use alternatives such as an IAM role or a user in IAM Identity Center, which provide temporary rather than long-term credentials. [Learn More](#)

If your use case requires an access key, create an IAM user with an access key and apply least privilege permissions for that user. [Learn More](#)

Continue to create access key?

☒ I understand creating a root access key is not a best practice, but I still want to create one.

Cancel Create access key

☑ Access key created

This is the only time that the secret access key can be viewed or downloaded. You cannot recover it later. However, you can create a new access key any time.

IAM > Security credentials > Create access key

Step 1

[Alternatives to root user access keys](#)

Step 2

Retrieve access key

Retrieve access key [info](#)

Access key

If you lose or forget your secret access key, you cannot retrieve it. Instead, create a new access key and make the old key inactive.

Access key	Secret access key
AKIA23WHUMHL5H4Z57FM	***** <a href="#">Show</a>

Access key best practices

- Never store your access key in plain text, in a code repository, or in code.
- Disable or delete access key when no longer needed.
- Enable least-privilege permissions.
- Rotate access keys regularly.

For more details about managing access keys, see the [best practices for managing AWS access keys](#).

Download .csv file

```
ubuntu@Terraform-Master:~$ sudo cat main.tf
provider "aws" {
  region = "us-east-2"
  access_key = "AKIA23WHUMHL5H4Z57FM"
  secret_key = "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"
}

# Create a VPC

resource "aws_vpc" "testvpc" {
  cidr_block = "10.0.0.0/16"

  tags = {
    Name = "testvpc"
  }
}

# Create a Public Subnet

resource "aws_subnet" "testsbnt1" {
  vpc_id = aws_vpc.testvpc.id
  cidr_block = "10.0.1.0/24"
  map_public_ip_on_launch = "true"
  availability_zone = "us-east-2a"

  tags = {
    Name = "testsbnt1"
  }
}

# Create a Private Subnet

resource "aws_subnet" "testsbnt2" {
  vpc_id = aws_vpc.testvpc.id
  cidr_block = "10.0.2.0/24"
  map_public_ip_on_launch = "false"
  availability_zone = "us-east-2b"

  tags = {
    Name = "testsbnt2"
  }
}
```

```

availability_zone = "us-east-2b"

tags = {
  Name = "testsbnt2"
}
}
# Create an Internet Gateway

resource "aws_internet_gateway" "testigw" {
  vpc_id = aws_vpc.testvpc.id
  tags = {
    Name = "testigw"
  }
}
# Create a Route Table for Public Subnet

resource "aws_route_table" "testrtb1" {
  vpc_id = aws_vpc.testvpc.id

  route {
    cidr_block = "0.0.0.0/0"
    gateway_id = aws_internet_gateway.testigw.id
  }

  route {
    ipv6_cidr_block = ":::/0"
    gateway_id = aws_internet_gateway.testigw.id
  }
}
# Associate Public Route Table with Public Subnet

resource "aws_route_table_association" "testassoc1" {
  subnet_id = aws_subnet.testsbnt1.id
  route_table_id = aws_route_table.testrtb1.id
}

```

```

# Create a Private Route Table for Subnet 2

resource "aws_route_table" "testrtb2" {
  vpc_id = aws_vpc.testvpc.id

  route {
    cidr_block = "0.0.0.0/0"
    gateway_id = aws_nat_gateway.nat.id
  }

  tags = {
    Name = "testrtb2"
  }
}
# Associate Route Table with Private Subnet

resource "aws_route_table_association" "testassoc2" {
  subnet_id = aws_subnet.testsbnt2.id
  route_table_id = aws_route_table.testrtb2.id
}
# Assign ENI with IP

resource "aws_network_interface" "testeni1" {
  subnet_id = aws_subnet.testsbnt1.id
  private_ips = ["10.0.1.10"]
  security_groups = [aws_security_group.testsg.id]
}

resource "aws_network_interface" "testeni2" {
  subnet_id = aws_subnet.testsbnt2.id
  private_ips = ["10.0.2.10"]
  security_groups = [aws_security_group.testsg.id]
}
# Assign Elastic IP to ENI

```

```

ubuntu@Terraform-Master: ~
# Assign Elastic IP to ENI

resource "aws_eip" "testeip1" {
  domain = "vpc"
  network_interface = aws_network_interface.testeni1.id
  associate_with_private_ip = "10.0.1.10"
  depends_on= [aws_internet_gateway.testigw, aws_instance.Instance1]
  tags = {
    Name = "testeip1"
  }
}

# Create an Elastic IP Address for NAT Gateway

resource "aws_eip" "testeip2" {
  domain = "vpc"
  associate_with_private_ip = "10.0.2.10"
  depends_on= [aws_internet_gateway.testigw]
  tags = {
    Name = "testeip2"
  }
}

# Create a NAT Gateway for VPC

resource "aws_nat_gateway" "nat" {
  allocation_id = aws_eip.testeip2.id
  subnet_id = aws_subnet.testsbnt2.id

  tags = {
    Name = "nat"
  }
}

# Create a Security Group

resource "aws_security_group" "testsg" {
  description = "Allow limited inbound external traffic"

```

```

ubuntu@Terraform-Master: ~
# Create a Security Group

resource "aws_security_group" "testsg" {
  description = "Allow limited inbound external traffic"
  vpc_id = aws_vpc.testvpc.id
  name = "testsg"

  ingress {
    protocol = "tcp"
    cidr_blocks = ["0.0.0.0/0"]
    from_port = 22
    to_port = 22
  }

  ingress {
    protocol = "tcp"
    cidr_blocks = ["0.0.0.0/0"]
    from_port = 80
    to_port = 80
  }

  ingress {
    protocol = "tcp"
    cidr_blocks = ["0.0.0.0/0"]
    from_port = 443
    to_port = 443
  }

  egress {
    from_port = 0
    to_port = 0
    protocol = "-1"
    cidr_blocks = ["0.0.0.0/0"]
  }

  tags = {

```

```

    to_port = 0
    protocol = "-1"
    cidr_blocks = ["0.0.0.0/0"]
  }
  tags = {
    Name = "testsg"
  }
}
# Create Linux Server & Install/Enable Apache2 (Instance 1)
resource "aws_instance" "Instance1" {
  ami = "ami-0b8b44ec9a8f90422"
  instance_type = "t2.micro"
  availability_zone = "us-east-2a"
  key_name = "salman-Ohio"
  network_interface {
    device_index = 0
    network_interface_id = aws_network_interface.testeni1.id
  }

  user_data = <<-EOF
  #!/bin/bash
  sudo apt update -y
  sudo apt install apache2 -y
  sudo systemctl start apache2
  sudo systemctl enable apache2
  EOF

  tags = {
    Name = "Instance1"
  }
}
# Create Linux Server & Install/Enable Apache2 Here (Instance 2)

resource "aws_instance" "Instance2" {
  ami = "ami-0b8b44ec9a8f90422"
  instance_type = "t2.micro"
  availability_zone = "us-east-2b"

```

```

  user_data = <<-EOF
  #!/bin/bash
  sudo apt update -y
  sudo apt install apache2 -y
  sudo systemctl start apache2
  sudo systemctl enable apache2
  EOF

  tags = {
    Name = "Instance1"
  }
}
# Create Linux Server & Install/Enable Apache2 Here (Instance 2)

resource "aws_instance" "Instance2" {
  ami = "ami-0b8b44ec9a8f90422"
  instance_type = "t2.micro"
  availability_zone = "us-east-2b"
  key_name = "salman-Ohio"
  network_interface {
    device_index = 0
    network_interface_id = aws_network_interface.testeni2.id
  }

  user_data = <<-EOF
  #!/bin/bash
  sudo apt update -y
  sudo apt install apache2 -y
  sudo systemctl start apache2
  sudo systemctl enable apache2
  EOF

  tags = {
    Name = "Instance2"
  }
}
ubuntu@Terraform-Master:~$

```



```
ubuntu@Terraform-Master: ~$ terraform init
Initializing the backend...
Initializing provider plugins...
- Finding latest version of hashicorp/aws...
- Installing hashicorp/aws v5.65.0...
- Installed hashicorp/aws v5.65.0 (signed by HashiCorp)
Terraform has created a lock file .terraform.lock.hcl to record the provider
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.

```
ubuntu@Terraform-Master:~$
```

```
ubuntu@Terraform-Master:~$ terraform plan

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_eip.testeip1 will be created
+ resource "aws_eip" "testeip1" {
  + allocation_id      = (known after apply)
  + arn                 = (known after apply)
  + associate_with_private_ip = "10.0.1.10"
  + association_id      = (known after apply)
  + carrier_ip          = (known after apply)
  + customer_owned_ip   = (known after apply)
  + domain              = "vpc"
  + id                  = (known after apply)
  + instance            = (known after apply)
  + network_border_group = (known after apply)
  + network_interface    = (known after apply)
  + private_dns          = (known after apply)
  + private_ip          = (known after apply)
  + ptr_record           = (known after apply)
  + public_dns           = (known after apply)
  + public_ip           = (known after apply)
  + public_ipv4_pool     = (known after apply)
  + tags                = {
    + "Name" = "testeip1"
  }
  + tags_all            = {
    + "Name" = "testeip1"
  }
  + vpc                  = (known after apply)
}

# aws_eip.testeip2 will be created
+ resource "aws_eip" "testeip2" {
  + allocation_id      = (known after apply)
  + arn                 = (known after apply)
}
```

Plan: 16 to add, 0 to change, 0 to destroy.

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.

```
ubuntu@Terraform-Master:~$
```

```

ubuntu@Terraform-Master: ~$ terraform apply
aws_vpc.testvpc: Refreshing state... [id=vpc-08227f094b1c8868e]
aws_subnet.testsbnt2: Refreshing state... [id=subnet-06951980ac40ff6a6]
aws_internet_gateway.testigw: Refreshing state... [id=igw-0bb49190d67b7e892]
aws_subnet.testsbnt1: Refreshing state... [id=subnet-0502225d02da11056]
aws_security_group.testsg: Refreshing state... [id=sg-084f9233a37f3aa0e]
aws_eip.testeip2: Refreshing state... [id=eipalloc-019e4d58a933535aa]
aws_route_table.testrtb1: Refreshing state... [id=rtb-0143c8e976879fbce]
aws_network_interface.testeni2: Refreshing state... [id=eni-0e9a472194ced5062]
aws_network_interface.testeni1: Refreshing state... [id=eni-05cdaa9ae8dbcf15]
aws_route_table_association.testassoc1: Refreshing state... [id=rtbassoc-028fe31840a85d18d]
aws_nat_gateway.nat: Refreshing state... [id=nat-042538c565eaafe34]
aws_route_table.testrtb2: Refreshing state... [id=rtb-038180af973b29bbc]
aws_route_table_association.testassoc2: Refreshing state... [id=rtbassoc-00dfdd654b2b4a177]

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

Terraform will perform the following actions:

# aws_eip.testeip1 will be created
+ resource "aws_eip" "testeip1" {
  + allocation_id      = (known after apply)
  + arn                = (known after apply)
  + associate_with_private_ip = "10.0.1.10"
  + association_id     = (known after apply)
  + carrier_ip         = (known after apply)
  + customer_owned_ip  = (known after apply)
  + domain             = "vpc"
  + id                 = (known after apply)
  + instance           = (known after apply)
  + network_border_group = (known after apply)
  + network_interface   = "eni-05cdaa9ae8dbcf15"
  + private_dns         = (known after apply)
  + private_ip         = (known after apply)
  + ptr_record         = (known after apply)
  + public_dns         = (known after apply)
  + public_ip          = (known after apply)
}

```

Plan: 16 to add, 0 to change, 0 to destroy.

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

```

aws_vpc.testvpc: Creating...
aws_vpc.testvpc: Creation complete after 1s [id=vpc-08227f094b1c8868e]
aws_internet_gateway.testigw: Creating...
aws_security_group.testsg: Creating...
aws_subnet.testsbnt1: Creating...
aws_subnet.testsbnt2: Creating...
aws_internet_gateway.testigw: Creation complete after 0s [id=igw-0bb49190d67b7e892]
aws_route_table.testrtb1: Creating...
aws_eip.testeip2: Creating...
aws_subnet.testsbnt2: Creation complete after 1s [id=subnet-06951980ac40ff6a6]
aws_eip.testeip2: Creation complete after 1s [id=eipalloc-019e4d58a933535aa]
aws_nat_gateway.nat: Creating...
aws_route_table.testrtb1: Creation complete after 1s [id=rtb-0143c8e976879fbce]
aws_security_group.testsg: Creation complete after 2s [id=sg-084f9233a37f3aa0e]
aws_network_interface.testeni2: Creating...
aws_network_interface.testeni2: Creation complete after 1s [id=eni-0e9a472194ced5062]
aws_instance.Instance2: Creating...
aws_subnet.testsbnt1: Still creating... [10s elapsed]
aws_nat_gateway.nat: Still creating... [10s elapsed]
aws_subnet.testsbnt1: Creation complete after 11s [id=subnet-0502225d02da11056]
aws_network_interface.testeni1: Creating...
aws_route_table_association.testassoc1: Creating...
aws_route_table_association.testassoc1: Creation complete after 0s [id=rtbassoc-028fe31840a85d18d]
aws_network_interface.testeni1: Creation complete after 0s [id=eni-05cdaa9ae8dbcf15]
aws_instance.Instance1: Creating...
aws_nat_gateway.nat: Still creating... [20s elapsed]
aws_nat_gateway.nat: Still creating... [30s elapsed]
aws_nat_gateway.nat: Still creating... [40s elapsed]
aws_nat_gateway.nat: Still creating... [50s elapsed]
aws_nat_gateway.nat: Still creating... [1m0s elapsed]

```

```
aws_route_table_association.testassoc2: Creation complete after 0s [id=rtbassoc-00dfdd654b2b4a177]

Error: creating EC2 Instance: operation error EC2: RunInstances, https response error StatusCode: 400, RequestID: 2319da4f-e6be-445c-9a80-ee03461a2328, api error InvalidKeyPair.NotFound: The key pair 'Terraform' does not exist

    with aws_instance.Instance1,
    on main.tf line 173, in resource "aws_instance" "Instance1":
    173: resource "aws_instance" "Instance1" {}

Error: creating EC2 Instance: operation error EC2: RunInstances, https response error StatusCode: 400, RequestID: e6f72b15-17f6-401d-92ab-449df77f9a59, api error InvalidKeyPair.NotFound: The key pair 'Terraform' does not exist

    with aws_instance.Instance2,
    on main.tf line 197, in resource "aws_instance" "Instance2":
    197: resource "aws_instance" "Instance2" {}
```

Plan: 3 to add, 1 to change, 0 to destroy.

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

```
aws_instance.Instance2: Creating...
aws_instance.Instance1: Creating...
aws_route_table.testrtb2: Modifying... [id=rtb-038180af973b29bbc]
aws_route_table.testrtb2: Modifications complete after 0s [id=rtb-038180af973b29bbc]
aws_instance.Instance2: Still creating... [10s elapsed]
aws_instance.Instance1: Still creating... [10s elapsed]
aws_instance.Instance2: Still creating... [20s elapsed]
aws_instance.Instance1: Still creating... [20s elapsed]
aws_instance.Instance2: Still creating... [30s elapsed]
aws_instance.Instance1: Still creating... [30s elapsed]
aws_instance.Instance1: Creation complete after 32s [id=i-09aeabaf2b25c6c0e]
aws_eip.testeip1: Creating...
aws_instance.Instance2: Creation complete after 32s [id=i-0993601ebec0b57d8]
aws_eip.testeip1: Creation complete after 1s [id=eipalloc-0175632987fbdcd116]
```

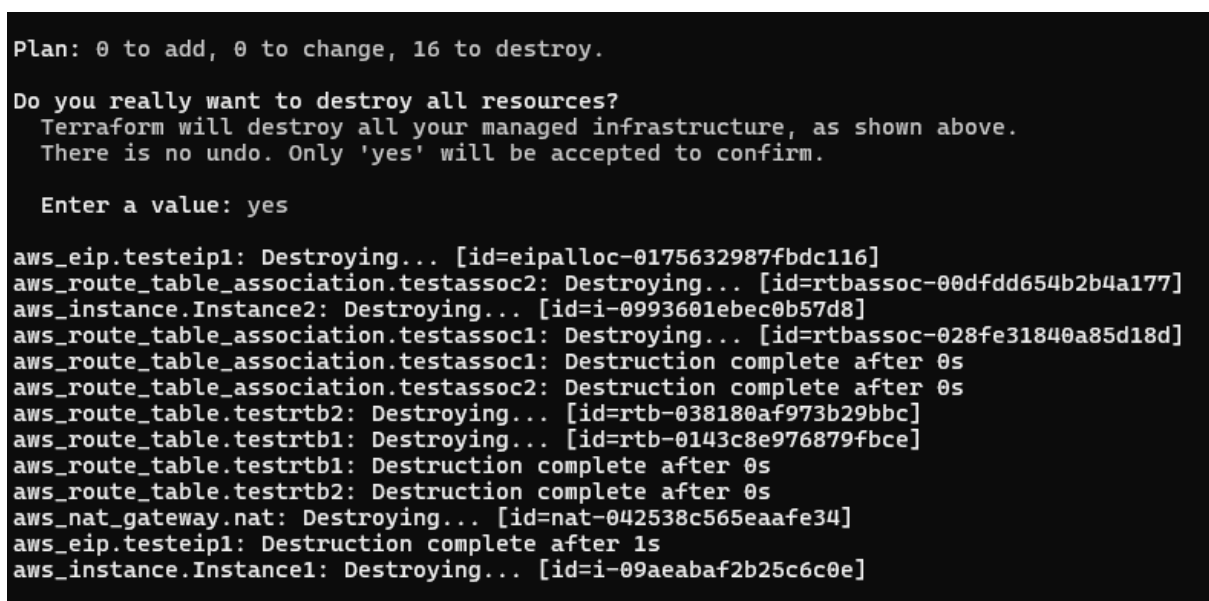
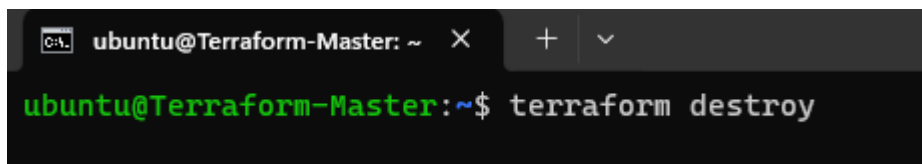
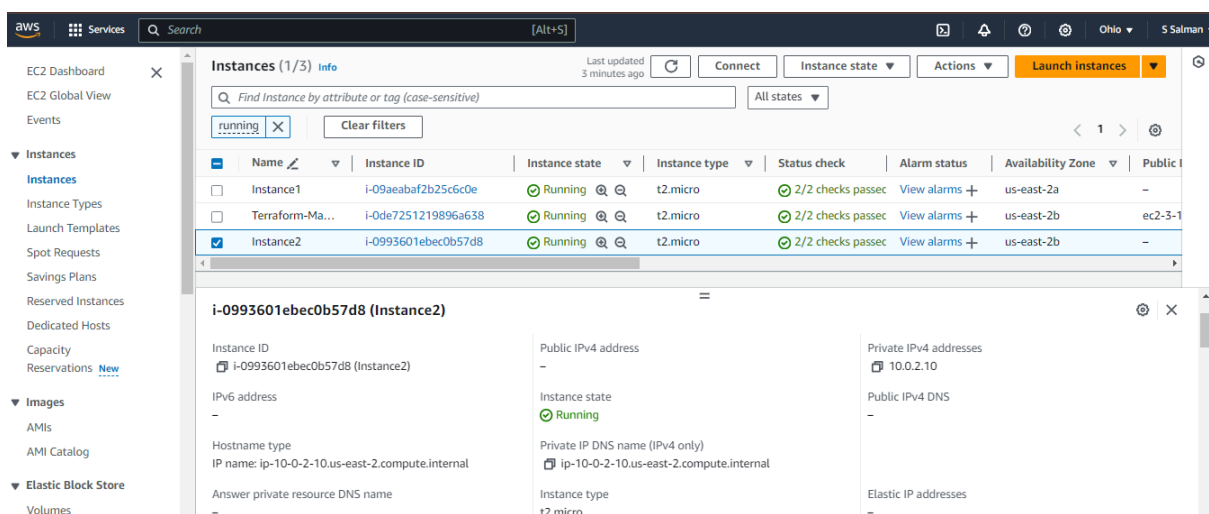
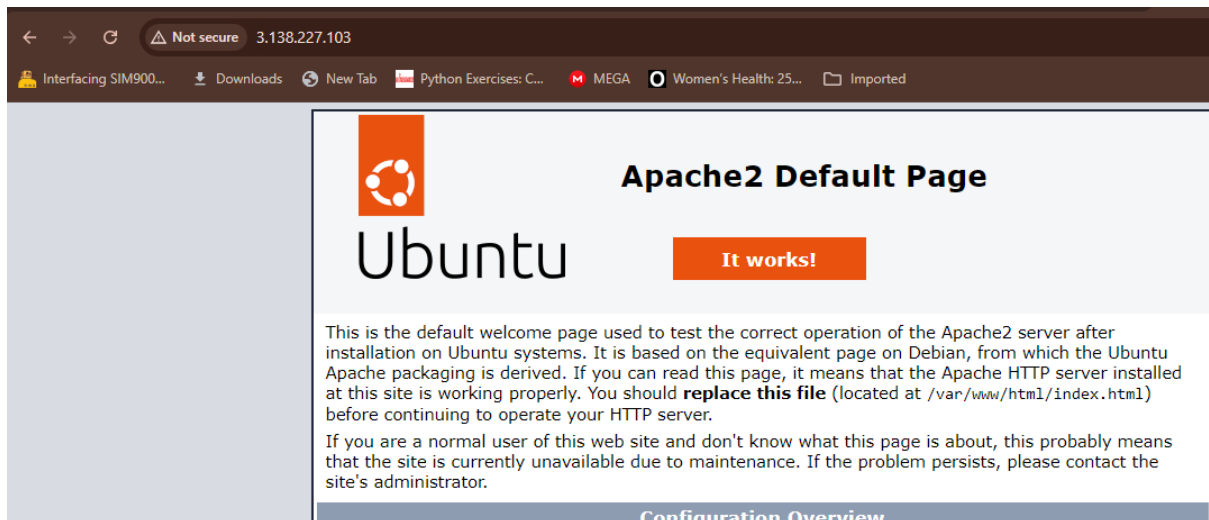
Apply complete! Resources: 3 added, 1 changed, 0 destroyed.  
ubuntu@Terraform-Master:~\$

The screenshot shows the AWS Management Console 'Instances' page. The left sidebar contains navigation links for EC2 Dashboard, EC2 Global View, Events, Instances, Instance Types, Launch Templates, Spot Requests, and Savings Plans. The main content area shows a table of instances with columns for Name, Instance ID, Instance state, Instance type, Status check, Alarm status, Availability Zone, and Public IP. Three instances are listed, all with a 'Running' status and green status check icons.

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP
Instance1	i-09aeabaf2b25c6c0e	Running	t2.micro	2/2 checks passed	View alarms	us-east-2a	-
Terraform-Ma...	i-0de7251219896a638	Running	t2.micro	2/2 checks passed	View alarms	us-east-2b	ec2-3-1
Instance2	i-0993601ebec0b57d8	Running	t2.micro	2/2 checks passed	View alarms	us-east-2b	-

The screenshot shows the details of the selected instance, 'Instance1' (i-09aeabaf2b25c6c0e). The instance is in a 'Running' state. The details panel shows various attributes including Instance ID, IP addresses, Instance state, Hostname type, and Elastic Block Store volumes.

Attribute	Value
Instance ID	i-09aeabaf2b25c6c0e (Instance1)
Public IPv4 address	3.138.227.103   open address
Private IPv4 addresses	10.0.1.10
Instance state	Running
Private IP DNS name (IPv4 only)	ip-10-0-1-10.us-east-2.compute.internal
Instance type	t2.micro
Elastic IP addresses	3.138.227.103 (testeip1) [Public IP]



Enter a value: yes

```
aws_eip.testeip1: Destroying... [id=eipalloc-0175632987fbdcl16]
aws_route_table_association.testassoc2: Destroying... [id=rtbassoc-00dfdd654b2b4a177]
aws_instance.Instance2: Destroying... [id=i-0993601ebec0b57d8]
aws_route_table_association.testassoc1: Destroying... [id=rtbassoc-028fe31840a85d18d]
aws_route_table_association.testassoc1: Destruction complete after 0s
aws_route_table_association.testassoc2: Destruction complete after 0s
aws_route_table.testrtb2: Destroying... [id=rtb-038180af973b29bbc]
aws_route_table.testrtb1: Destroying... [id=rtb-0143c8e976879fbce]
aws_route_table.testrtb1: Destruction complete after 0s
aws_route_table.testrtb2: Destruction complete after 0s
aws_nat_gateway.nat: Destroying... [id=nat-042538c565eaafe34]
aws_eip.testeip1: Destruction complete after 1s
aws_instance.Instance1: Destroying... [id=i-09aeabaf2b25c6c0e]
aws_instance.Instance2: Still destroying... [id=i-0993601ebec0b57d8, 10s elapsed]
aws_nat_gateway.nat: Still destroying... [id=nat-042538c565eaafe34, 10s elapsed]
aws_instance.Instance1: Still destroying... [id=i-09aeabaf2b25c6c0e, 10s elapsed]
aws_instance.Instance2: Still destroying... [id=i-0993601ebec0b57d8, 20s elapsed]
aws_nat_gateway.nat: Still destroying... [id=nat-042538c565eaafe34, 20s elapsed]
aws_instance.Instance1: Still destroying... [id=i-09aeabaf2b25c6c0e, 20s elapsed]
aws_instance.Instance2: Destruction complete after 30s
aws_network_interface.testeni2: Destroying... [id=eni-0e9a472194ced5062]
aws_network_interface.testeni2: Destruction complete after 0s
aws_nat_gateway.nat: Still destroying... [id=nat-042538c565eaafe34, 30s elapsed]
aws_instance.Instance1: Destruction complete after 29s
aws_network_interface.testeni1: Destroying... [id=eni-05cdaa9ae8dbcfa15]
aws_network_interface.testeni1: Destruction complete after 1s
aws_subnet.testsbnt1: Destroying... [id=subnet-0502225d02da11056]
aws_security_group.testsg: Destroying... [id=sg-084f9233a37f3aa0e]
aws_subnet.testsbnt1: Destruction complete after 0s
aws_security_group.testsg: Destruction complete after 0s
aws_nat_gateway.nat: Still destroying... [id=nat-042538c565eaafe34, 40s elapsed]
aws_nat_gateway.nat: Still destroying... [id=nat-042538c565eaafe34, 50s elapsed]
aws_nat_gateway.nat: Destruction complete after 51s
aws_eip.testeip2: Destroying... [id=eipalloc-019e4d58a933535aa]
aws_subnet.testsbnt2: Destroying... [id=subnet-06951980ac40ff6a6]
aws_subnet.testsbnt2: Destruction complete after 0s
aws_eip.testeip2: Destruction complete after 1s
aws_internet_gateway.testigw: Destroying... [id=igw-0bb49190d67b7e892]
aws_internet_gateway.testigw: Destruction complete after 0s
aws_vpc.testvpc: Destroying... [id=vpc-08227f094b1c8868e]
aws_vpc.testvpc: Destruction complete after 1s
```

Destroy complete! Resources: 16 destroyed.

ubuntu@Terraform-Master:~\$ |

EC2 Dashboard

EC2 Global View

Events

Instances

Instances

Instance Types

Launch Templates

Instances (6) info

Last updated less than a minute ago

Connect

Instance state

Actions

Launch instances

Find Instance by attribute or tag (case-sensitive)

All states

< 1 >

<input type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public
<input type="checkbox"/>	Instance1	i-09aeabaf2b25c6c0e	Terminated	t2.micro	-	View alarms	us-east-2a	-
<input type="checkbox"/>	Terraform-Ma...	i-0de7251219896a638	Running	t2.micro	2/2 checks passed	View alarms	us-east-2b	ec2-3-1
<input type="checkbox"/>	Instance2	i-0993601ebec0b57d8	Terminated	t2.micro	-	View alarms	us-east-2b	-