

Created VPC with 1 public 2 private subnets. 3 EC2 instances(Jenkins,httpd,tomcat) in public subnet. RDS creation in private subnet. Hosted Jenkins,httpd webpage, studentapp. Using Terraform.

Script:-

Resource.tf file

```
resource "aws_vpc" "this_vpc" {
  cidr_block = "10.0.0.0/16"
  enable_dns_support = true
  enable_dns_hostnames = true
}

resource "aws_security_group" "this_sg" {
  vpc_id = aws_vpc.this_vpc.id
  name = "this_sg"
  ingress {
    from_port = 80
    to_port = 80
    protocol = "TCP"
    cidr_blocks = ["0.0.0.0/0"]
  }
  ingress {
    from_port = 443
    to_port = 443
    protocol = "TCP"
    cidr_blocks = ["0.0.0.0/0"]
  }
  ingress {
    from_port = 22
    to_port = 22
    protocol = "TCP"
    cidr_blocks = ["0.0.0.0/0"]
  }
  ingress {
    from_port = 8080
    to_port = 8080
    protocol = "TCP"
    cidr_blocks = ["0.0.0.0/0"]
  }
  ingress {
    from_port = 3306
    to_port = 3306
    protocol = "TCP"
    cidr_blocks = ["0.0.0.0/0"]
  }
  egress {
    from_port = 0
    to_port = 0
    protocol = "-1"
    cidr_blocks = ["0.0.0.0/0"]
  }
}

resource "aws_subnet" "public" {
  vpc_id = aws_vpc.this_vpc.id
  cidr_block = "10.0.1.0/24"
  availability_zone = "ap-southeast-1a"
  tags = {
    Name = "public"
  }
  map_public_ip_on_launch = true
}
```

```

resource "aws_subnet" "private" {
  vpc_id      = aws_vpc.this_vpc.id
  cidr_block  = "10.0.2.0/24"
  availability_zone = "ap-southeast-1b"
  tags = {
    Name = "private"
  }
  map_public_ip_on_launch = false
}

resource "aws_subnet" "private2" {
  vpc_id      = aws_vpc.this_vpc.id
  cidr_block  = "10.0.3.0/24"
  availability_zone = "ap-southeast-1c"
  tags = {
    Name = "private2"
  }
  map_public_ip_on_launch = false
}

resource "aws_internet_gateway" "this_ig" {
  vpc_id = aws_vpc.this_vpc.id
  tags = {
    Name = "this_ig"
  }
}

resource "aws_network_interface" "ninter" {
  subnet_id = aws_subnet.public.id
  tags = {
    Name = "ninter"
  }
}

resource "aws_route_table" "this_rt" {
  vpc_id = aws_vpc.this_vpc.id
  route {
    cidr_block = "0.0.0.0/0"
    gateway_id = aws_internet_gateway.this_ig.id
  }
  tags = {
    Name = "this_rt"
  }
}

resource "aws_route_table_association" "route_association" {
  subnet_id      = aws_subnet.public.id
  route_table_id = aws_route_table.this_rt.id
}

resource "aws_instance" "this_instance" {
  ami              = var.aws_ami
  instance_type    = var.aws_instance_type
  vpc_security_group_ids = [aws_security_group.this_sg.id]
  subnet_id        = aws_subnet.public.id
  tags = {
    Name = "this_instance"
  }
  root_block_device {
    volume_size = var.volume_size
  }
  user_data      = <<-EOF
  #!/bin/bash
  sudo yum update -y
  sudo wget -O /etc/yum.repos.d/jenkins.repo \
    https://pkg.jenkins.io/redhat-stable/jenkins.repo
  sudo rpm --import https://pkg.jenkins.io/redhat-stable/jenkins.io-2023.key
  >>>

```

```

        sudo yum upgrade
        sudo dnf install java-17-amazon-corretto -y
        sudo yum install jenkins -y
        sudo systemctl enable jenkins
        sudo systemctl start jenkins
    EOF
}

resource "aws_db_subnet_group" "this_subnet_group" {
    name          = "this_subnet_group"
    subnet_ids    = [aws_subnet.private.id, aws_subnet.private2.id]
    tags = {
        Name = "this_subnet_group"
    }
}

resource "aws_db_instance" "this_db" {
    allocated_storage = var.volume_size
    instance_class     = var.aws_db_instance_class
    engine              = var.aws_db_engine
    engine_version      = var.aws_db_engine_version
    username            = var.aws_db_master_username
    password            = var.aws_db_master_user_password
    port               = var.aws_db_port
    storage_type        = var.aws_db_storage_type
    tags = {
        Name = var.aws_db_name
    }
    vpc_security_group_ids = [aws_security_group.this_sg.id]
    db_subnet_group_name   = aws_db_subnet_group.this_subnet_group.name
}

resource "aws_instance" "apache" {
    ami          = var.aws_ami
    instance_type = var.aws_instance_type
    vpc_security_group_ids = [aws_security_group.this_sg.id]
    subnet_id    = aws_subnet.public.id
    tags = {
        Name = "apache"
    }
    root_block_device {
        volume_size = var.volume_size
    }
    user_data = <<-EOF
    #!/bin/bash
    sudo -i
    yum install httpd -y
    echo "hello guys" >> /var/www/html/index.html
    systemctl start httpd
    systemctl enable httpd
    EOF
}

resource "aws_instance" "tomcat" {
    ami          = var.aws_ami
    instance_type = var.aws_instance_type
    vpc_security_group_ids = [aws_security_group.this_sg.id]
    subnet_id    = aws_subnet.public.id
    tags = {
        Name = "tomcat"
    }
}

root_block_device {
    volume_size = var.volume_size
}

```

```

user_data      = <<-EOF
#!/bin/bash
sudo -i
curl -O https://d1cdn.apache.org/tomcat/tomcat-8/v8.5.99/bin/apache-tomcat-8.5.99.tar.gz
tar -xvzf apache-tomcat-8.5.99.tar.gz
yum install git -y
git init
git clone https://github.com/PratikBorge/Webapps.git
mv Webapps/student.war /apache-tomcat-8.5.99/webapps
mv Webapps/mysql-connector.jar /apache-tomcat-8.5.99/lib
yum install java -y
bash /apache-tomcat-8.5.99/bin/catalina.sh start
EOF
}
output "creations" {
  value = [
    aws_instance.this_instance.id,
    aws_db_instance.this_db.id,
    aws_instance.apache.id,
    aws_instance.tomcat.id,
    aws_internet_gateway.this_ig.id,
    aws_route_table.this_rt.id,
    aws_security_group.this_sg.id,
    aws_subnet.public.id,
    aws_subnet.private.id,
    aws_vpc.this_vpc.id,
    aws_db_subnet_group.this_subnet_group.id
  ]
}

```

Var.tf file

```

variable "aws_instance_type" {
  type    = string
  default = "t2.micro"
}

variable "aws_ami" {
  type    = string
  default = "ami-07a6e3b1c102cdba8"
}

variable "volume_size" {
  type    = number
  default = 10
}

variable "aws_db_engine" {
  type    = string
  default = "mysql"
}

variable "aws_db_engine_version" {
  type    = string
  default = "5.7"
}

variable "aws_db_instance_class" {
  type    = string
  default = "db.t2.micro"
}

variable "aws_db_master_user_password" {

```

```
type    = string
default = "12345678"
}
variable "aws_db_master_username" {
  type    = string
  default = "prat"
}
variable "aws_db_name" {
  type    = string
  default = "pratik"
}
variable "aws_db_port" {
  type    = string
  default = "3306"
}
variable "aws_db_storage_type" {
  type    = string
  default = "gp2"
}
```

Resources Created:-

The screenshot displays the AWS Management Console interface. The top navigation bar shows the user is logged in as 'pratikborge' in the 'Singapore' region. The main content area is divided into two sections.

Instances (5/7) info

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic IP
Master-jenkins	i-09a0e69a9a438630b	Stopped	t2.micro	-	View alarms	ap-southeast-1a	-	-	-
tomcat	i-0694a157308902169	Terminated	t2.micro	-	View alarms	ap-southeast-1a	-	-	-
apache	i-00600de5ce466d71d	Running	t2.micro	2/2 checks passed	View alarms	ap-southeast-1a	ec2-18-142-179-180.ap...	18.142.179.180	-
apache	i-05b1347c8b1948796	Terminated	t2.micro	-	View alarms	ap-southeast-1a	-	-	-
this_instance	i-0c1f5f6dfa17066a37	Terminated	t2.micro	-	View alarms	ap-southeast-1a	-	-	-
tomcat	i-0a9c1c3bca340f496	Running	t2.micro	2/2 checks passed	View alarms	ap-southeast-1a	ec2-13-250-42-194.ap...	13.250.42.194	-
this_instance	i-0be0039fa4b86fe00	Running	t2.micro	2/2 checks passed	View alarms	ap-southeast-1a	ec2-18-141-209-3.ap-s...	18.141.209.3	-

Instances: i-00600de5ce466d71d (apache), i-0a9c1c3bca340f496 (tomcat), i-0be0039fa4b86fe00 (this_instance)

Monitoring

Alarm recommendations

CPU utilization (%)

Network in (bytes)

Network out (bytes)

Network packets in (count)

Network packets out (count)

Disk reads (bytes)

Disk read operations (operations)

Disk writes (bytes)

sg-0d17263d427a47f91 - this_sg

Details

Security group name: this_sg

Security group ID: sg-0d17263d427a47f91

Description: Managed by Terraform

VPC ID: vpc-0c3d0d381806c3ba

Owner: 471112957025

Inbound rules count: 5

Outbound rules count: 1

Inbound rules (5)

Name	Security group rule...	IP version	Type	Protocol	Port range	Source	Description
-	sg-0f802da83a779d3a0	IPv4	MySQL/Aurora	TCP	3306	0.0.0.0/0	-
-	sg-0d9d527835a2b7...	IPv4	Custom TCP	TCP	8080	0.0.0.0/0	-
-	sg-03aace5ac122d9b5	IPv4	SSH	TCP	22	0.0.0.0/0	-
-	sg-096a370176a179...	IPv4	HTTPS	TCP	443	0.0.0.0/0	-
-	sg-0298ee802461669ce	IPv4	HTTP	TCP	80	0.0.0.0/0	-

The image displays a sequence of screenshots from a web browser, showing the configuration of AWS resources and the initial setup of Jenkins.

Top Screenshot: AWS VPC Details

The browser shows the AWS Management Console for the VPC `vpc-0c940dc381806e5ba`. The details include:

- VPC ID: `vpc-0c940dc381806e5ba`
- State: `Available`
- Tenancy: `Default`
- DHCP option set: `dhopt-0cd3a4a6e697e6d3b`
- Default VPC: `No`
- Network Address Usage metrics: `Disabled`
- DNS hostnames: `Enabled`
- Main route table: `rtb-00f83867a5a6c996f`
- IPv6 pool: `-`
- Owner ID: `471112957025`

The Resource map shows the VPC connected to three subnets (`ap-southeast-1a`, `ap-southeast-1b`, `ap-southeast-1c`) and two route tables (`rtb-00f83867a5a6c996f`, `this_rt`).

Second Screenshot: AWS RDS Instance Details

The browser shows the AWS Management Console for the RDS instance `terraform-20240302174937816700000002`. The details include:

- DB identifier: `terraform-20240302174937816700000002`
- Status: `Available`
- Class: `db.t2.micro`
- CPU: `4.00%`
- Role: `Instance`
- Engine: `MySQL Community`
- Region & AZ: `ap-southeast-1c`

The Connectivity & security section shows the endpoint `terraform-20240302174937816700000002.ct88c4e20312.ap-southeast-1.rds.amazonaws.com` and the port `3306`.

Third Screenshot: Jenkins Unlock Screen

The browser shows the Jenkins "Getting Started" screen. The text reads:

Unlock Jenkins

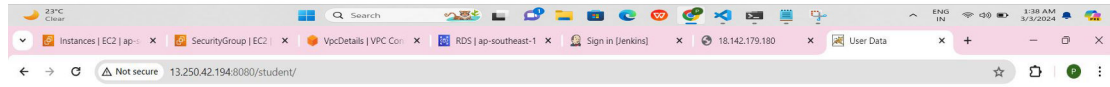
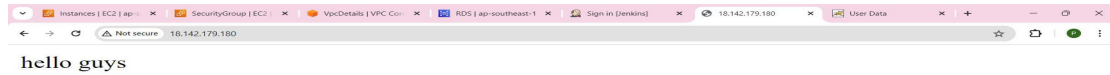
To ensure Jenkins is securely set up by the administrator, a password has been written to the log (not sure where to find it) and this file on the server:

```
/var/lib/jenkins/secrets/initialAdminPassword
```

Please copy the password from either location and paste it below.

Administrator password

[Continue](#)



Student Registration Form

Student Name	<input type="text"/>
Student Address	<input type="text"/>
Student Age	<input type="text"/>
Student Qualification	<input type="text"/>
Student Percentage	<input type="text"/>
Year Passed	<input type="text"/>
<input type="button" value="register"/>	

