Deploy a sample web application in AWS using Terraform

TASK

Steps required for building infrastructure and deploying our application according to the below Scenario/Use-case using Terraform

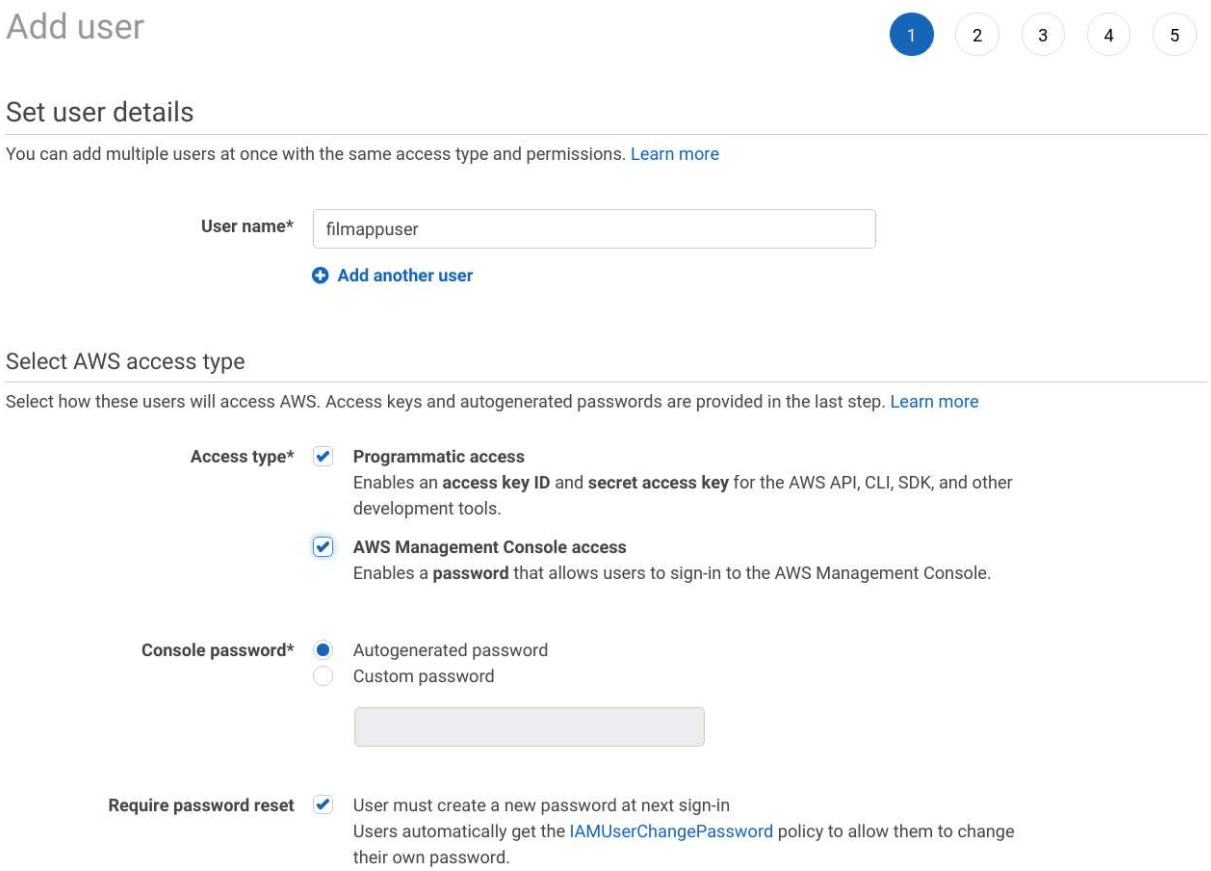
1. Create the key and security group which allows the port 80 .
2. Launch the EC2 instance.
3. In this EC2 instance use the key and security group which we have created in step 1.
4. Launch one Volume (EBS) and mount that volume into /var/www/html
5. Developer has uploded the code into github repo which also contains images.
6. Copy the github repo code into /var/www/html
7. Create S3 bucket, and copy/deploy the images from github repo into the S3 bucket and change the permission to public readable.
8. Launch your webpage

Create an AWS account & credentials

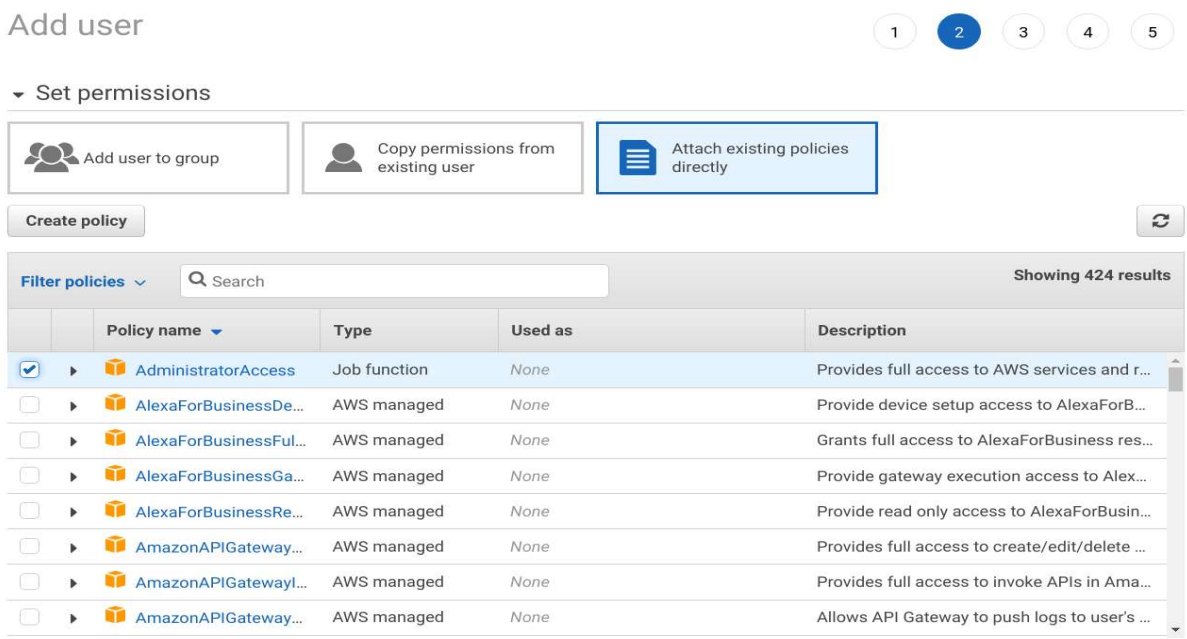
First, we need to sign up for an AWS account. Although you can pick the “Free” account, because of the resources we will be using there will still be a charge. You will want to tear down the infrastructure once you’ve finished and I’ll show you how to do that in this blog.

Once you have your AWS account, sign in as your root user. The email that you used to sign up is your username, but make sure you click **login as root account**. Once signed in, select **IAM** (Identity Access and Management) from the **Services** menu.

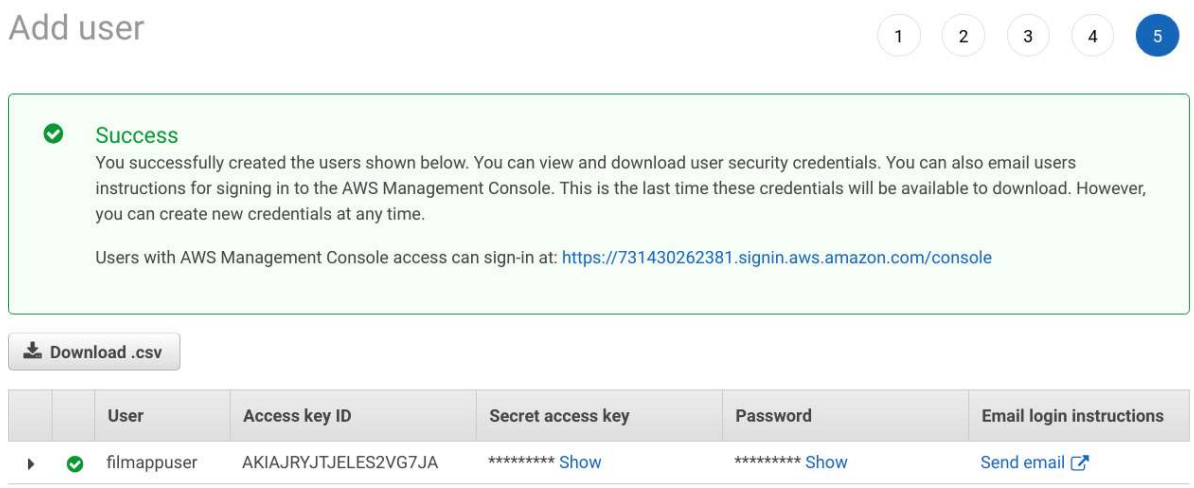
Select **Users** from the nav bar on the left side of the screen and click **Add User**. Create a user and make sure you give it both programmatic and console access.



Give the user `Administrator Access` either by creating a new role or by attaching the existing policy directly.



You can keep the defaults and accept everything else in the setup wizard, but make sure you take careful note of the `AWS_ACCESS_KEY_ID` and `AWS_SECRET_ACCESS_KEY` before you leave the Add user Success screen.



1.Create the key and security group which allows the port 80 .

- **Create Key Pair**: In the EC2 dashboard, generate a new `.pem` key pair and save it.
- **Move to Working Directory**: Place the downloaded `.pem` file in the directory where you're working with your Terraform files.

- *Create a* security group which allows the port 80 (optional)

2.Software Requirements

- **AWS CLIv2**

  To download :-
  https://awscli.amazonaws.com/AWSCLIV2.msi

- **Terraform**

  To download:-

  https://releases.hashicorp.com/terraform/1.5.6/terraform_1.5.6_windows_386.zip

- **VS Code**

  To download:-

  https://code.visualstudio.com/download

By adding these installation paths to your system's PATH environment variable, you'll be able to use the AWS CLI and Terraform commands without needing to specify their full paths each time.

3.Create S3 bucket, and copy/deploy the images from github repo into the S3 bucket and change the permission to public readable.

Step 1: Upload Images (if not done already)

1. Inside your S3 bucket, click the "Upload" button.
2. Select the images you want to upload from your local machine.
3. Follow the prompts to complete the upload.

Step 2: Change Object Permissions to Read-Only

1. Inside your S3 bucket, select the uploaded image objects.
2. Click on the "Actions" button, then select "Change permissions."
3. In the "Manage public permissions" dialog:
    - Choose "Grant public read access to this object(s)."
    - This will allow anyone to read the objects but not modify them.
    - Click "Save."

4.Code for building infrastructure

```
provider "aws" {
  region = "ap-south-1" # Set the AWS region
}

# ************************************************************
# Define an AWS security group
resource "aws_security_group" "allow_http_ssh" {
  name        = "allow_http"
  description = "Allow http inbound traffic"
ingress {
    description = "http"
    from_port   = 80
    to_port     = 80
    protocol    = "tcp"
```

```
    cidr_blocks = ["0.0.0.0/0"]

  }
ingress {
    description = "ssh"
    from_port   = 22
    to_port     = 22
    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"]
  }
tags = {
    Name = "allow_http_ssh"
  }
}
# ************************************************************

# Define an AWS EC2 instance
resource "aws_instance" "web" {
  ami           = "ami-06f621d90fa29f6d0" # Specify the AMI ID
  instance_type = "t2.micro"
  key_name = "27_firstkey" # Specify the key pair
  security_groups = ["launch-wizard-1"] # Associate security groups

  connection {
    type        = "ssh"
    user        = "ec2-user"
    private_key = file("27_firstkey.pem") # Provide private key path
    host        = aws_instance.web.public_ip
  }

  provisioner "remote-exec" {
    inline = [
      "sudo yum install httpd php git -y",    # Install necessary packages
      "sudo systemctl restart httpd",         # Restart the web server
      "sudo systemctl enable httpd",          # Enable the web server on boot
    ]
  }

  tags = {
```

```
    Name = "lwos1"
  }
}

# Define an AWS EBS volume
resource "aws_ebs_volume" "esb1" {
  availability_zone = aws_instance.web.availability_zone
  size              = 1
  tags = {
    Name = "lwebs"
  }
}

# Attach the EBS volume to the EC2 instance
resource "aws_volume_attachment" "ebs_att" {
  device_name = "/dev/sdh"
  volume_id   = aws_ebs_volume.esb1.id
  instance_id = aws_instance.web.id
  force_detach = true
}

# Define an output for the public IP of the instance
output "myos_ip" {
  value = aws_instance.web.public_ip
}

# Define a null resource for local execution
resource "null_resource" "nulllocal2"  {
  provisioner "local-exec" {
    command = "echo ${aws_instance.web.public_ip} > publicip.txt" # Store public
IP in a file
  }
}

# Define another null resource for remote execution
resource "null_resource" "nullremote3"  {
  depends_on = [
    aws_volume_attachment.ebs_att,
  ]

  connection {
    type        = "ssh"
    user        = "ec2-user"
    private_key = file("27_firstkey.pem") # Provide private key path
    host        = aws_instance.web.public_ip
```

```
  }

  provisioner "remote-exec" {
    inline = [
      "sudo mkfs.ext4 /dev/xvdh",              # Format the attached EBS volume
      "sudo mount /dev/xvdh /var/www/html",    # Mount the volume to
/var/www/html
      "sudo rm -rf /var/www/html/*",           # Remove existing content
      "sudo git clone https://github.com/Rizwantech5/tf-web-project.git
/var/www/html/"  # Clone a GitHub repository
    ]
  }
}

# Define one more null resource for local execution
resource "null_resource" "nulllocal1"  {
  depends_on = [
    null_resource.nullremote3,
  ]

  provisioner "local-exec" {
    command = "start chrome ${aws_instance.web.public_ip}" # Open the instance's
public IP in Chrome
  }
}
```

For complete/detailed code refer to this link:-

https://github.com/Rizwantech5/tf-web-project.git

5.How to run the code !!

Go to your current directory --> where
your xyz.tf extension file is saved in your system

Open the file which contains the terraform code in VS code, click on “terminal”. Once the terminal opens, run the following commands:

1. terraform init
2. terraform validate
3. terraform plan
4. terraform apply
5. terraform destroy

To configure your AWS account, we will run the

“aws configure” command