

Assignment 6: Deploy Portainer, Keycloak, and PostgreSQL via Terraform using Docker and PostgreSQL providers

Introduction

In this assignment, you will deploy Portainer, Keycloak, and PostgreSQL using Terraform. You will use Docker and PostgreSQL providers in Terraform to deploy these services.

Note The services that need to be deployed are listed in the `docker-compose.yml` file in the `assignment6` directory. To deploy the services using Terraform, you will need to convert the `docker-compose.yml` file to Terraform configuration files.

Part 1: Prepare Terraform configuration

1. Create a new directory called `assignment6` and navigate to it.
2. Create a new file called `providers.tf` and add the necessary provider configurations for Docker and PostgreSQL.
3. Run `terraform init` to initialize the providers.

Part 2: Deploy Portainer

1. Create a new file called `portainer.tf` and add the necessary configuration to deploy Portainer using the Docker provider.
2. Run `terraform plan` to see the execution plan.
3. Run `terraform apply` to deploy Portainer.

Part 3: Deploy Keycloak with PostgreSQL

1. Create a new file called `postgres.tf` and add the configuration to deploy PostgreSQL using the PostgreSQL provider.
2. Create a new file called `keycloak.tf` and add the necessary configuration to deploy Keycloak using the Docker provider.
3. Run `terraform plan` to see the execution plan.
4. Run `terraform apply` to deploy Keycloak with PostgreSQL.

Note The keycloak image should be built from the `Dockerfile.keycloak` file in the `assignment6` directory. You can use the `docker_image` resource in Terraform to prepare the Keycloak image before deploying.

Part 4: Verify the deployment

1. Verify that Portainer, Keycloak, and PostgreSQL are deployed successfully.

2. Access the Portainer web interface and verify that the Portainer container is running.
3. Access the Keycloak web interface and verify that the Keycloak container is running.

Submission

You need to submit the following files as a zip archive:

1. `providers.tf`
2. `portainer.tf`
3. `postgres.tf`
4. `keycloak.tf`
5. Screenshots of the deployed services (Portainer, Keycloak, PostgreSQL).
6. Screenshots of the execution plans for each step.
7. Screenshots of the `terraform apply` output for each step.