Terraform ECS Deployment

Prerequisites

1. AWS Account with an IAM User with administrative permissions.
2. Terraform installed.

Steps

1. Create the **ecs-terraform** directory.
2. Folders structure for the above-created directory:

```
ecs-terraform
├──.terraform.lock.hcl
├──locals.tf
├──main.tf
├──outputs.tf
├──providers.tf
├──terraform.tfstate
├──terraform.tfstate.backup
└──.terraform
```

> We need to only create *providers.tf*, *main.tf*, *outputs.tf*, & *locals.tf* files. Other files are generated while initiating terraform.

3. Create a *providers.tf* file inside the above-created directory.
4. Inside it, define the following:
    - terraform
        - required_providers
    - provider
        - docker
        - aws
5. Click code for reference.
6. The definition of *providers.tf* file is complete.
7. Now, create the *main.tf* file.
8. Inside *main.tf* file, we will use the following predefined modules:
    - vpc
    - s3
    - rds
    - ecr
    - load-balancer
    - ecs
9. Also define the following s3 resource for uploading local .env file:
    - aws_s3_object
10. Click code for reference.

11. The definition of *main.tf* file is complete.
12. Now we will create *outputs.tf* file.
13. Inside it, define the following outputs.
    - DB_HOST
    - bastion-host-ip
14. Click code for reference.
15. The definition of *outputs.tf* file is complete.
16. Now we will create *locals.tf* file.
17. Inside it, define the following variables:
    - vpc-properties
    - s3-properties
    - database-properties
    - bastion-properties
    - load-balancer-properties
    - ecs-properties
18. Click code for reference.
19. The definition of *locals.tf* file is complete.

> Make sure you give the appropriate values to the varibles defined in *locals.tf* file.

Provisioning the Infrastructure

Now we will provision the infrastructure by applying the above-created configuration files.

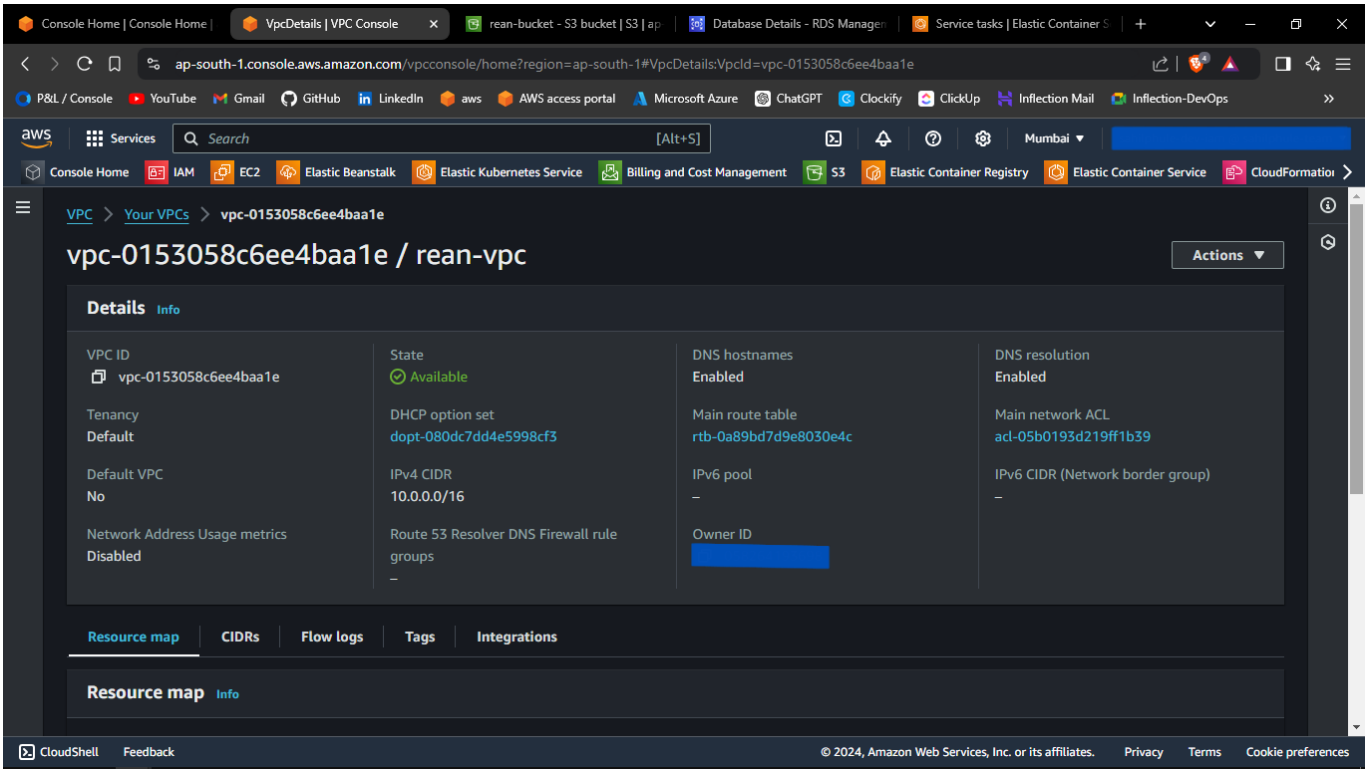
> Ensure AWS CLI is configured with appropriate AWS user credentials and enough permissions.

Steps:

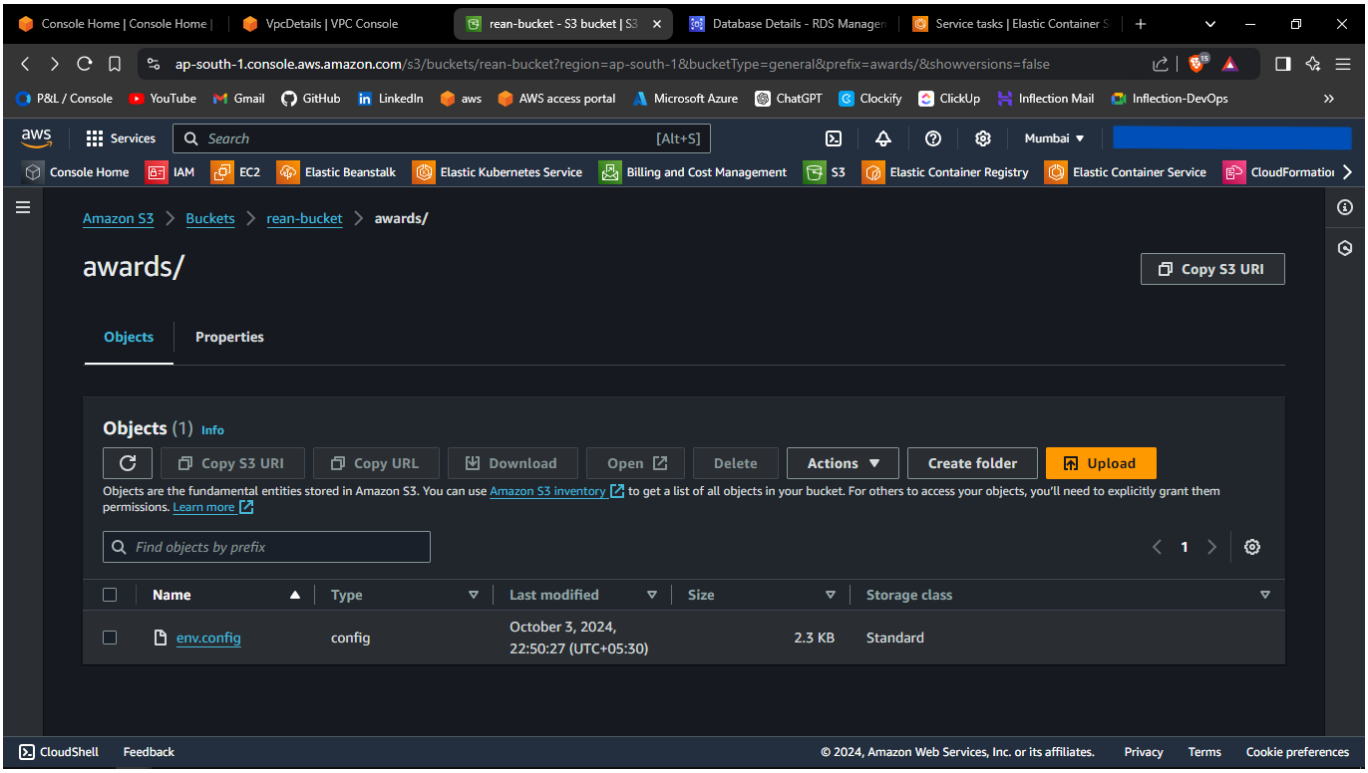
1. Open the PowerShell.
2. Change the directory to the above-created **ecs-terraform** directory using `cd` command.
3. Run the `terraform init` command to initialize the *terraform*.
4. Run the `terraform fmt --recursive` command to format the syntax of the files.
5. Run the `terraform validate` command to validate the configuration files.
6. Run the `terraform plan` command to plan the resources to be created.
7. Run the `terraform apply` command and if prompted, type `yes` to provision the infrastructure.
8. Run the `terraform output` command to get the values of defined variables in *outputs.tf* file.
9. Head to the AWS console, and verify the created resources.
10. Then,
    - Head towards EC2 dashboard.
    - Select *Load Balancers*, and select the created load balancer.
    - Copy the DNS address.
    - Paste the address in the browser to access the application.

Screenshots of Provisioned Infrastructure

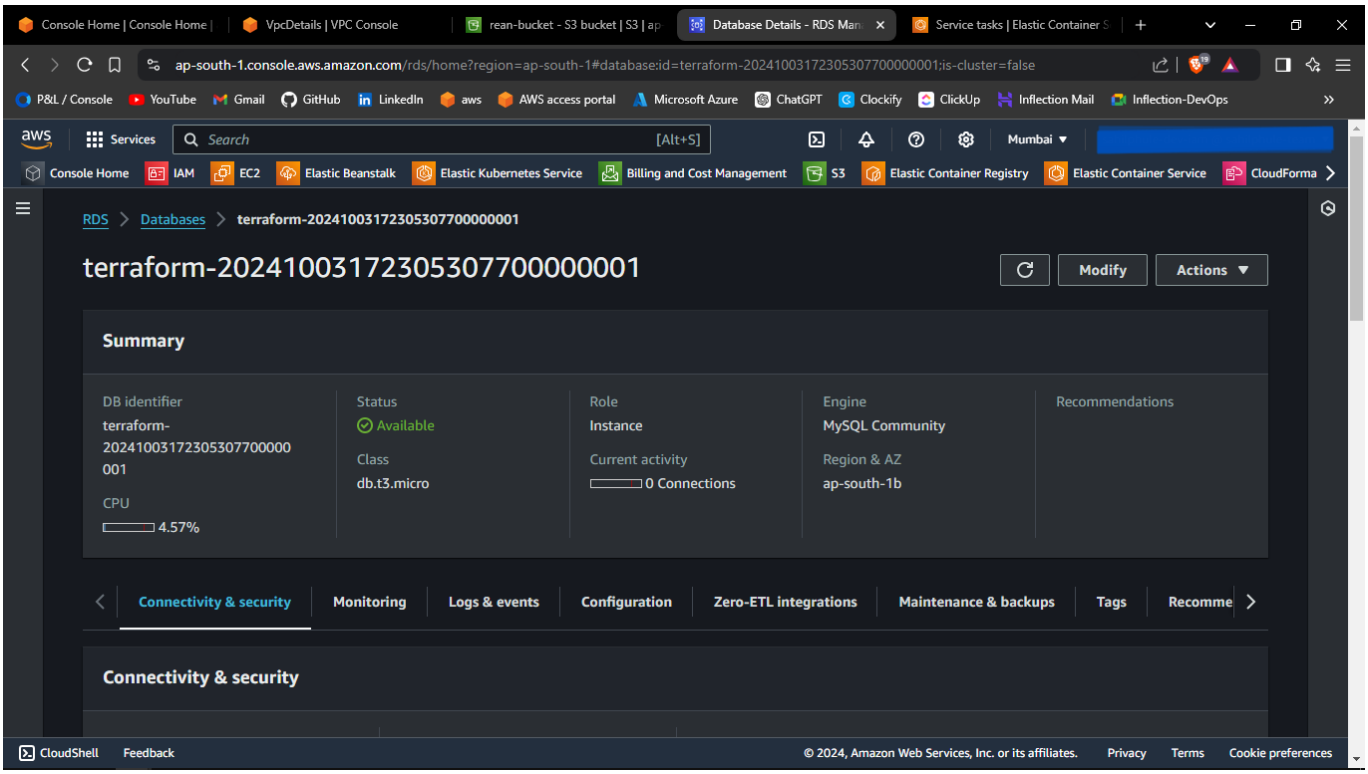
VPC Image



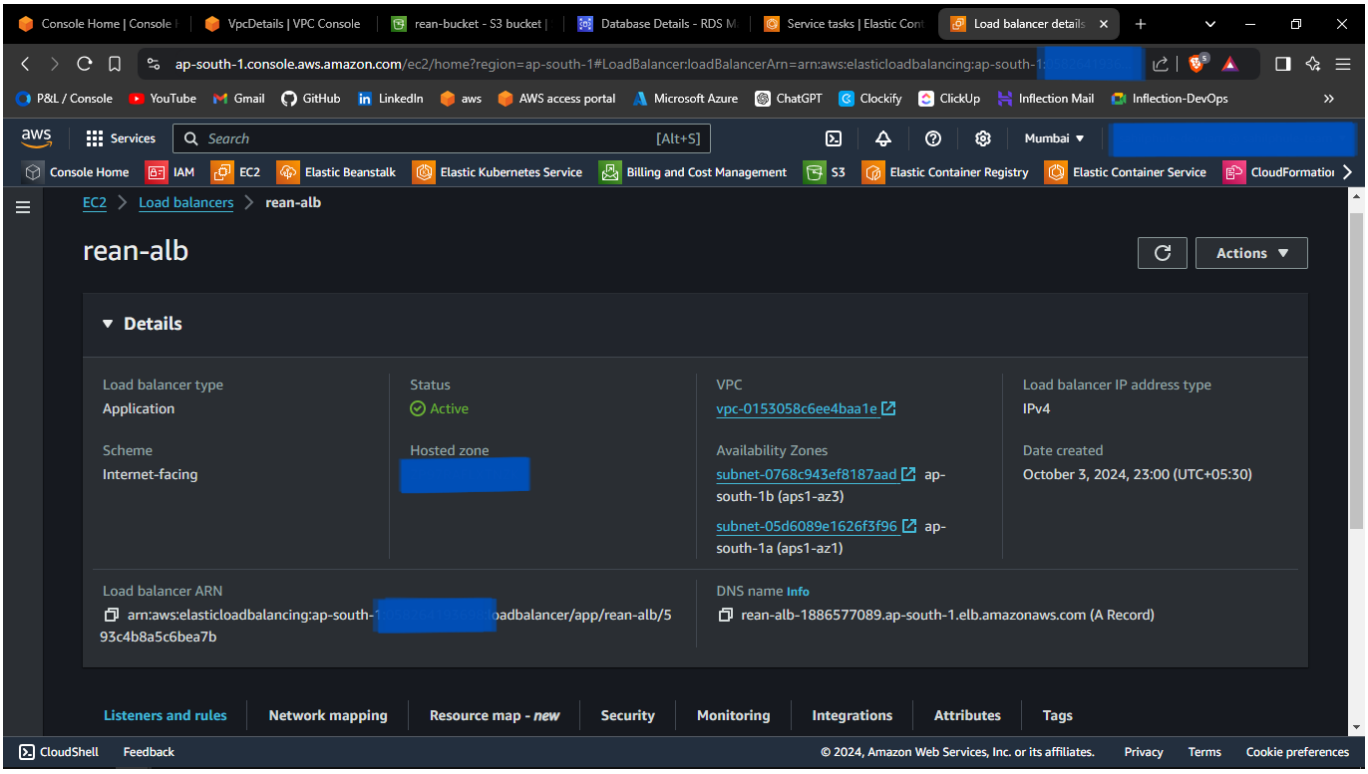
S3 Image



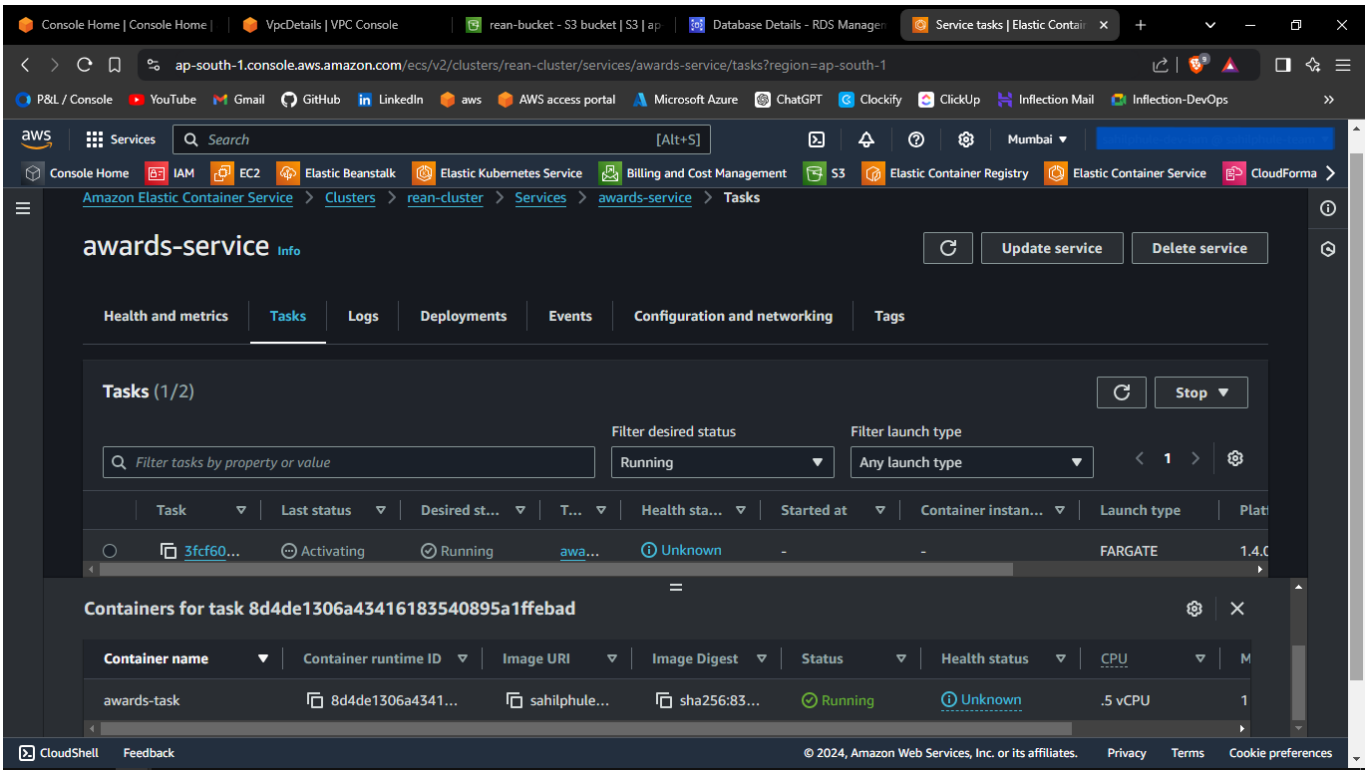
RDS Image



ALB Image



ECS Image

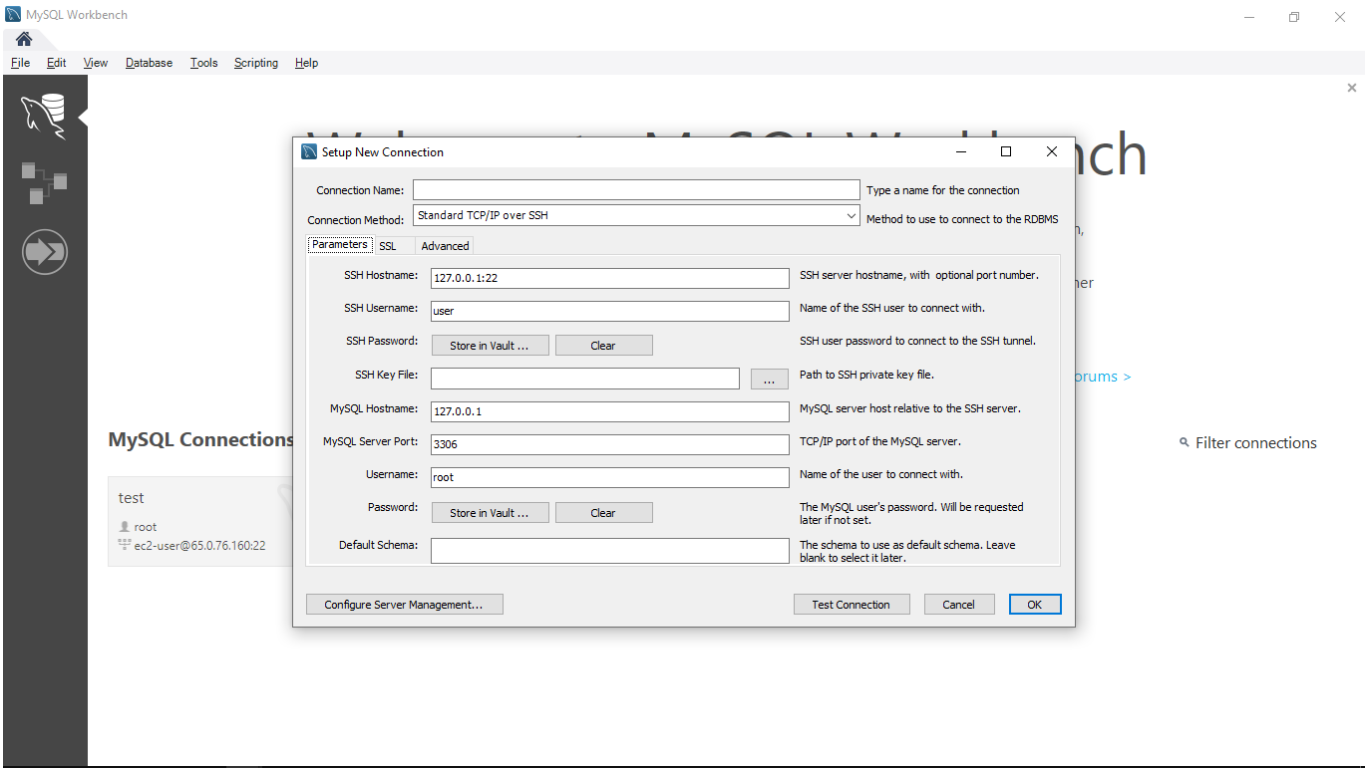


Connection to the RDS database through Bastion Host using MySQL Workbench

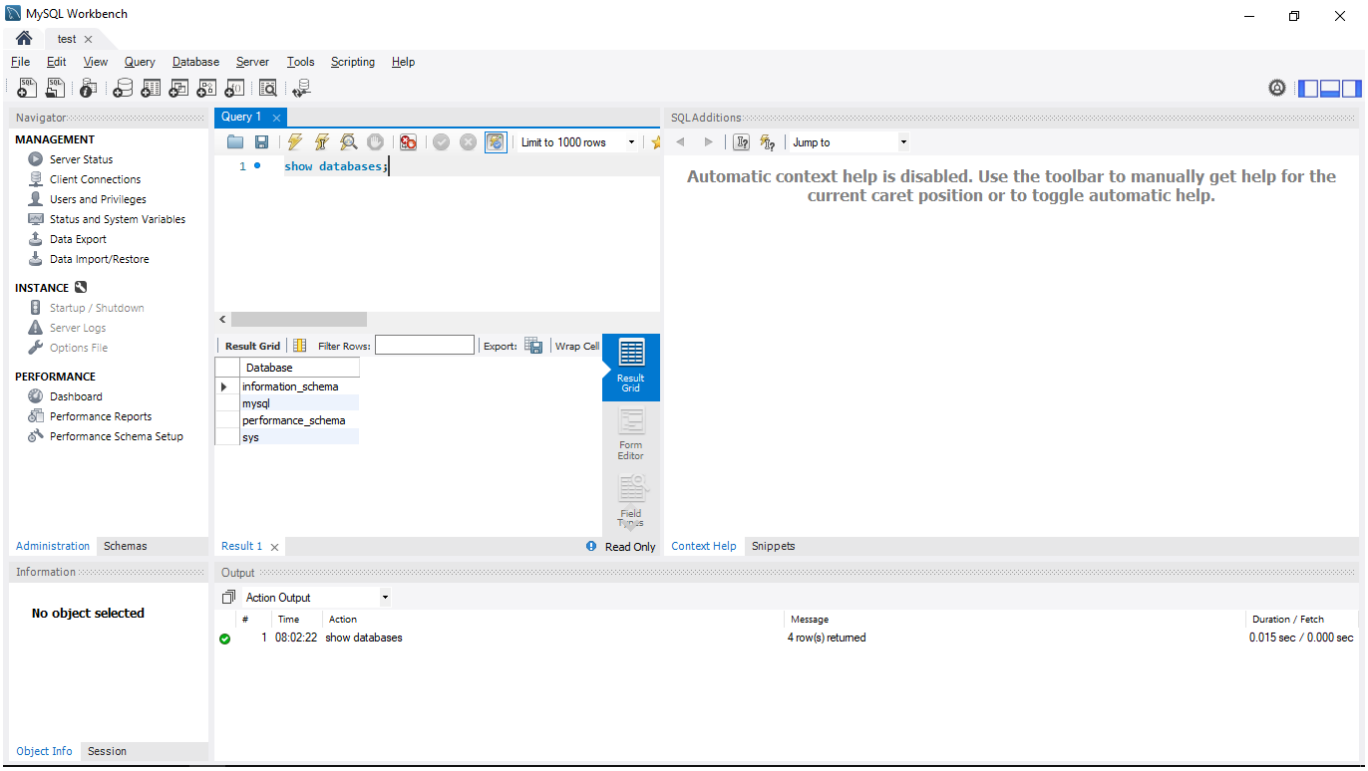
1. Open MySQL Workbench.
2. Click Add Connection.
3. Select connection method as **Standard TCP/IP over SSH**.
4. In SSH Hostname, enter *bastion-host-ip:22* where bastion-host-ip is received from `terraform output`.
5. In SSH Username, enter *ec2-user*.
6. In SSH Key File, select *bastion-key.pem* file passed in above *locals.tf* file from your local computer.
7. In MySQL Hostname, enter *DB_HOST* where DB_HOST is received from `terraform output`.
8. In the Password section, select *Store in Vault*, and enter the password passed in above-created *locals.tf* file.
9. Click *OK* and open the connection.
10. Now you can run mysql commands to access databases, and verify the successful connection of *ecs-container*.

Screenshots of MySQL Workbench

Connection Page



Commands Page



Destroy the provisioned infrastructure

1. To destroy infrastructure, change directory to the above-created **ecs-terraform** directory using `cd` command.
2. Run `terraform destroy` & if prompted, type `yes`.
3. Infrastructure will be destroyed.
