



kubernetes





Task-6

Deploy the Wordpress application on Kubernetes and AWS using terraform including the following steps;

- 1. Write an Infrastructure as code using terraform, which automatically deploy the Wordpress application
- 2. On AWS, use RDS service for the relational database for Wordpress application.
- 3. Deploy the Wordpress as a container either on top of Minikube or EKS or Fargate service on AWS
- 4. The Wordpress application should be accessible from the public world if deployed on AWS or through workstation if deployed on Minikube.

Prerequisite Required to do this task:

- 1. Creation of a AWS profile and its configuration.
- 2. Terraform installed(Terraform.exe and path variable set)
- 3. Minikube installed and running

For Wordpress Application:-

Step 1: Create a deployment using terraform and expose the port of the wordpress using service

We have terraform code as follows:-

```
resource "null_resource" "minikubestart" {
    provisioner "local-exec" {
        command = "minikube start"
    }
}

provider "kubernetes" {
    config_context_cluster = "minikube"
}

resource "kubernetes_deployment" "wordpress" {
    metadata {
        name = "wp"
    }

spec {
    replicas = 3
    selector {
        match_labels = {
        env = "production"
        region = "IN"
```

```
App = "wordpress"
 match_expressions {
 key = "env"
 operator = "In"
 values = ["production" , "webserver"]
template {
 metadata {
 labels = {
  env = "production"
  region = "IN"
  App = "wordpress"
 spec {
 container {
  image = "wordpress:4.8-apache"
  name = "wp"
resource "kubernetes_service" "wordpresslb" {
metadata {
name = "wplb"
spec {
 selector = {
 app = "wordpress"
 port {
 protocol = "TCP"
 port = 80
 target_port = 80
 type = "NodePort"
```

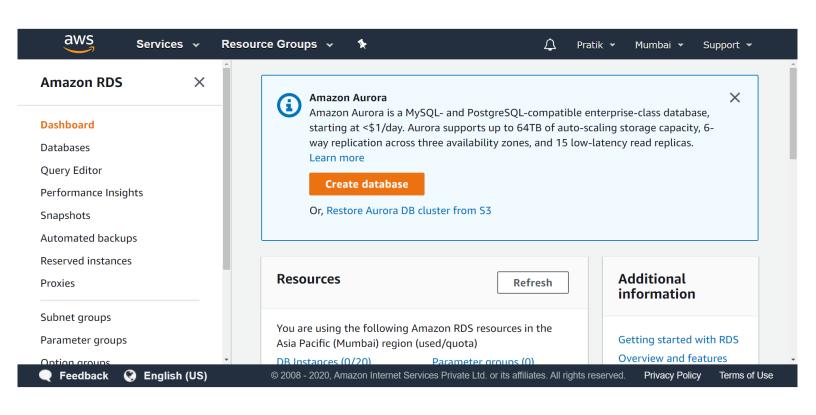
Step 2:- Creation of RDS on top of AWS.

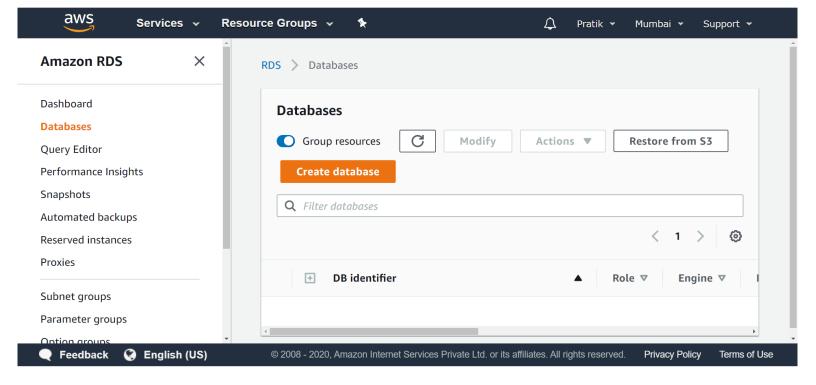
```
provider "aws" {
region = "ap-south-1"
profile = "mypratik"
allocated_storage = 20
identifier = "db-instance"
storage_type = "gp2"
engine = "mysql"
engine_version = "5.7.30"
instance_class = "db.t2.micro"
name = "mydb"
username = "pratik"
password = "root123456"
iam_database_authentication_enabled = true
parameter group name = "default.mysgl5.7"
skip final snapshot = true
publicly_accessible = true
tags = {
 Name = "sqldb"
```

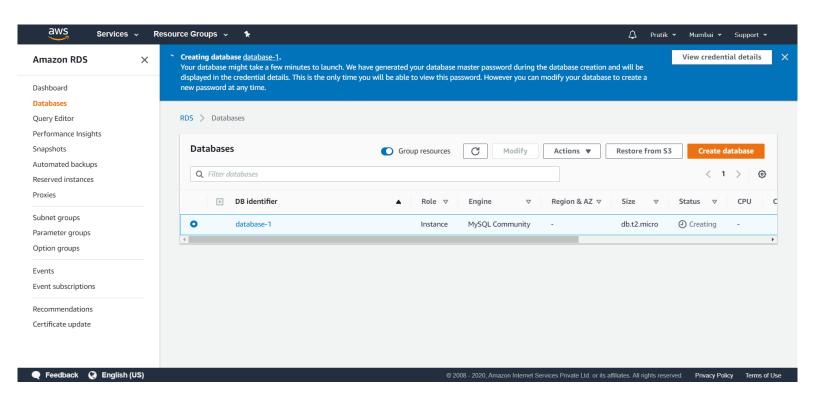
Step 3:- Providing IP to connect to Wordpress Application

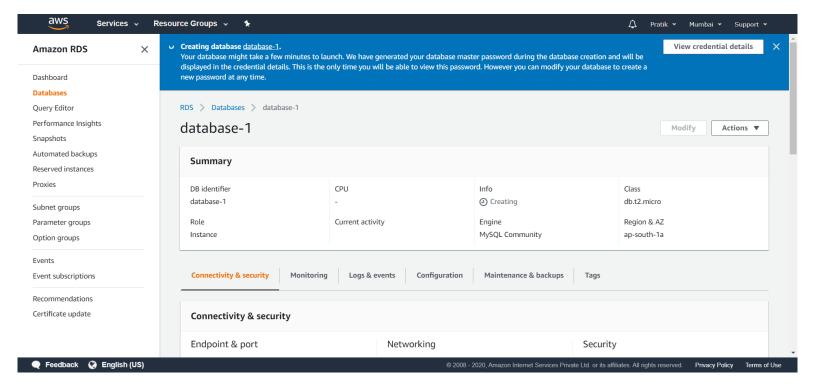
```
resource "null_resource" "minikubeservice"{
  provisioner "local-exec" {
     command = "minikube service list"
  }

depends_on = [
  kubernetes_deployment.wordpress,
  kubernetes_service.wordpresslb,
  aws_db_instance.mydb
]
```









Run terraform init command

Command Prompt

Microsoft Windows [Version 10.0.19041.450] (c) 2020 Microsoft Corporation. All rights reserved.

C:\Users\Asus>cd desktop

C:\Users\Asus\Desktop>cd terraformcodefiles

C:\Users\Asus\Desktop\terraformcodefiles>notepad task6.tf

C:\Users\Asus\Desktop\terraformcodefiles>terraform init

Initializing the backend...

Initializing provider plugins...

- Checking for available provider plugins...

Downloading plugin for provider "null" (hashicorp/null) 2.1.2...

The following providers do not have any version constraints in configuration, so the latest version was installed.

To prevent automatic upgrades to new major versions that may contain breaking changes, it is recommended to add version = "..." constraints to the corresponding provider blocks in configuration, with the constraint strings suggested below.

* provider.aws: version = "~> 2.70"

* provider.kubernetes: version = "~> 1.12"

* provider.null: version = "~> 2.1"

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.

C:\Users\Asus\Desktop\terraformcodefiles>

Run terraform validate command

Command Prompt Microsoft Windows [Version 10.0.19041.450] (c) 2020 Microsoft Corporation. All rights reserved. ::\Users\Asus>cd desktop C:\Users\Asus\Desktop>cd terraformcodefiles C:\Users\Asus\Desktop\terraformcodefiles>notepad task6.tf ::\Users\Asus\Desktop\terraformcodefiles>terraform init Initializing the backend... Initializing provider plugins... Checking for available provider plugins... Downloading plugin for provider "null" (hashicorp/null) 2.1.2... The following providers do not have any version constraints in configuration, so the latest version was installed. To prevent automatic upgrades to new major versions that may contain breaking changes, it is recommended to add version = "..." constraints to the corresponding provider blocks in configuration, with the constraint strings suggested below. provider.aws: version = "~> 2.70" provider.kubernetes: version = "~> 1.12" provider.null: version = "~> 2.1" my changes that are required for your infrastructure. All Terraform commands hould now work. f you ever set or change modules or backend configuration for Terraform, erun this command to reinitialize your working directory. If you forget, other ommands will detect it and remind you to do so if necessary. C:\Users\Asus\Desktop\terraformcodefiles>terraform validate Success! The configuration is valid.

Run terraform apply or plan command

```
:\Users\Asus\Desktop\terraformcodefiles>terraform apply
on execution plan has been generated and is shown below.
Lesource actions are indicated with the following symbols:

+ create
 # aws_db_instance.mydb will be created
+ resource "aws_db_instance" "mydb" {
                                                                                                       = (known after apply)
            + address
               allocated_storage
apply_immediately
                                                                                                       = (known after apply)
= (known after apply)
              arn
auto_minor_version_upgrade
availability_zone
backup_retention_period
backup_window
ca_cert_identifier
                                                                                                      = (known after apply)
= true
= (known after apply)
              character_set_name
copy_tags_to_snapshot
db_subnet_group_name
delete_automated_backups
                                                                                                           false
(known after apply)
                                                                                                            true
(known after apply)
"mysql"
"5.7.30"
               engine_version
hosted_zone_id
iam_database_authentication_enabled
                                                                                                           true
(known after apply)
"db-instance"
(known after apply)
"db.t2.micro"
(known after apply)
(known after apply)
(known after apply)
(known after apply)
              identifier
identifier_prefix
instance_class
kms_key_id
license_model
               maintenance_window
monitoring_interval
                                                                                                           (known after apply)
(known after apply)
"mydb"
               monitoring_role_arn
               multi_az
name
                                                                                                       = myub
= (known after apply)
= "default.mysql5.7"
= (sensitive value)
               option_group_name
parameter_group_name
password
               performance insights enabled
               performance_insights_enabled = false
performance_insights_kms_key_id = (known after apply)
performance_insights_retention_period = (known after apply)
                                                                                                            (known after apply)
               port
publicly_accessible
replicas
```

```
## Additional Property Command Property
```

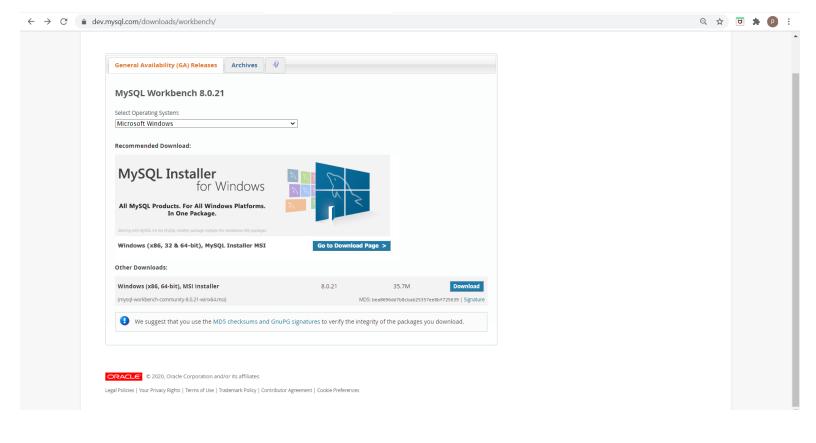
Now Run -minikube service list command in command prompt

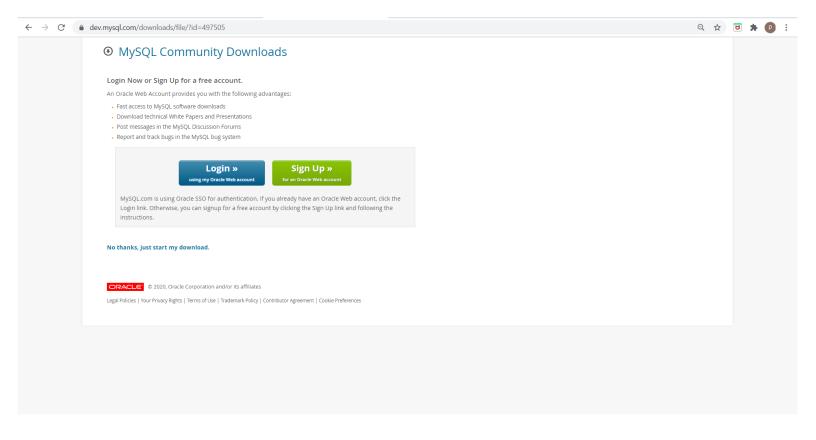
```
null_resource.minikubeservice (local-exec): Executing: ["cmd" "/C"
null resource.minikubeservice (local-exec):
null_resource.minikubeservice (local-exec):
                                                    NAMESPACE
                                                                                                   TARGET PORT
                                                                                NAME
null resource.minikubeservice (local-exec):
null resource.minikubeservice (local-exec):
                                              default
                                                                      kubernetes
                                                                                                   No node port
null_resource.minikubeservice (local-exec):
                                              default
                                                                      wplb
null_resource.minikubeservice (local-exec):
                                               kube-system
                                                                      kube-dns
                                                                                                   No node port
null resource.minikubeservice (local-exec):
                                               kube-system
                                                                      tiller-deploy
null_resource.minikubeservice (local-exec):
                                              kubernetes-dashboard
                                                                      dashboard-metrics-scraper
                                                                                                   No node port
null_resource.minikubeservice (local-exec):
                                              kubernetes-dashboard
                                                                      kubernetes-dashboard
                                                                                                   No node port
null resource.minikubeservice (local-exec):
null_resource.minikubeservice: Creation complete after 6s [id=8079379263171424586]
```

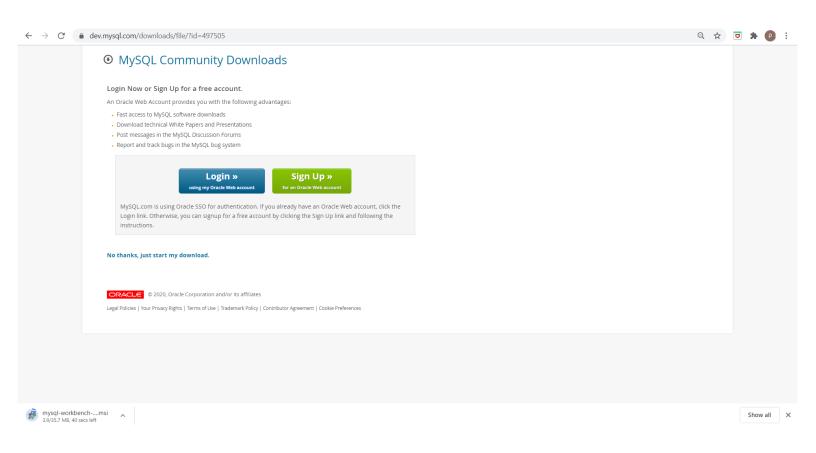
```
Apply complete! Resources: 5 added, 0 changed, 0 destroyed.
```

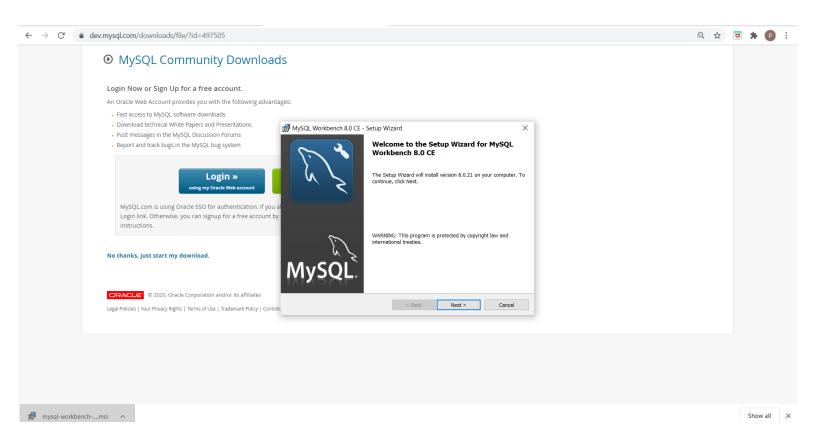
Download a Popular SQL Client:-

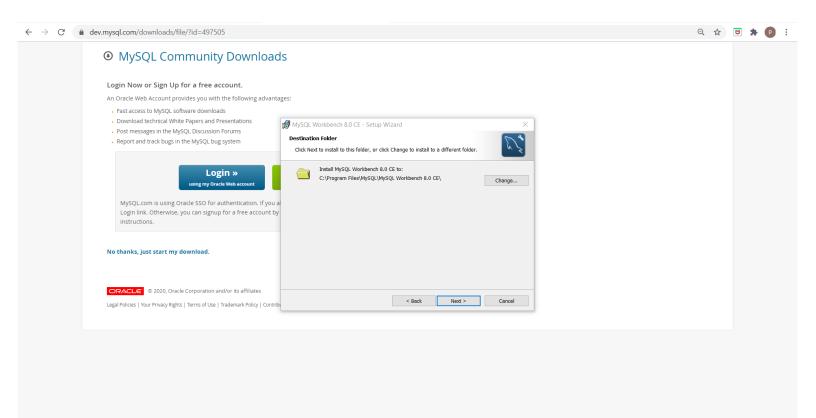
- 1.Database instance creation is complete and status changes to available, you can connect to a database on the DB instance using any standard SQL client.
- 2.In this step, we will download MySQL Workbench.
- 3. Go to the Download MySQL Workbench page to download and install MySQL Workbench. For Additional information ,go through the MySQL Docs.
- 4.Note: Remember to run MySQL Workbench from the same device from which you created the DB Instance. The security group your database is placed in is configured to allow connection only from the device from which you created the DB instance.

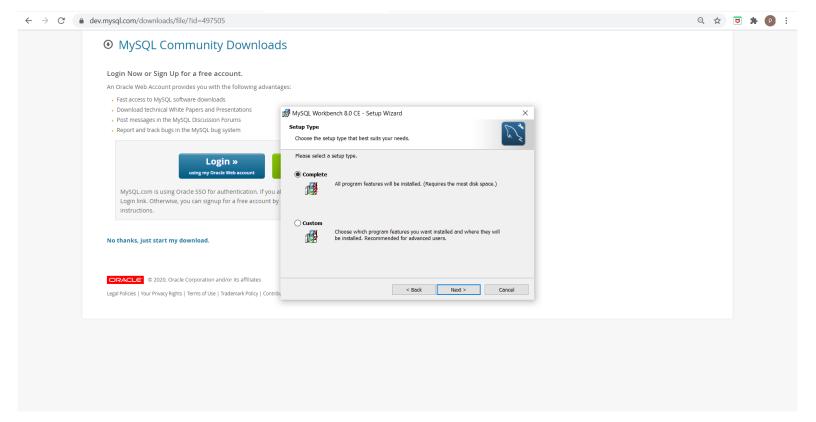


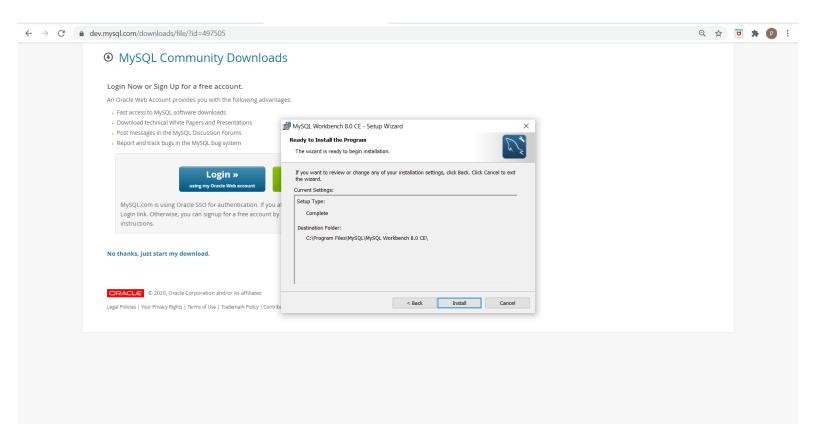


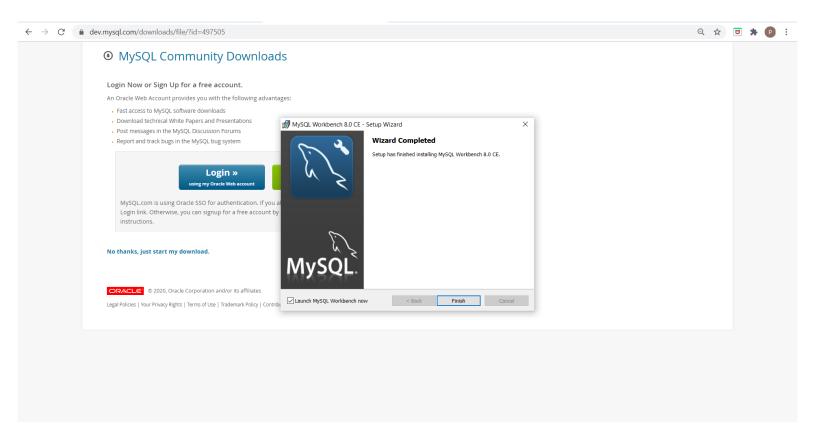


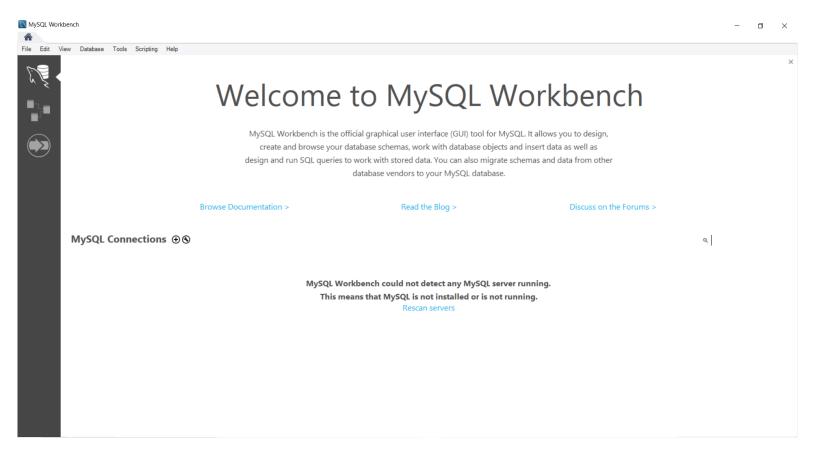






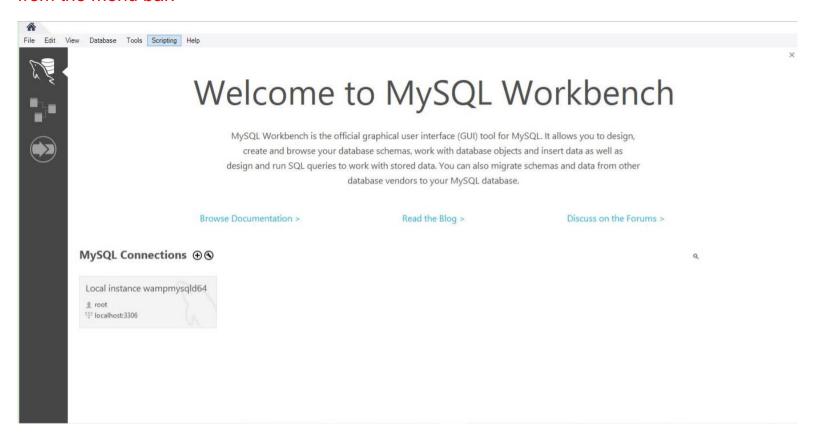






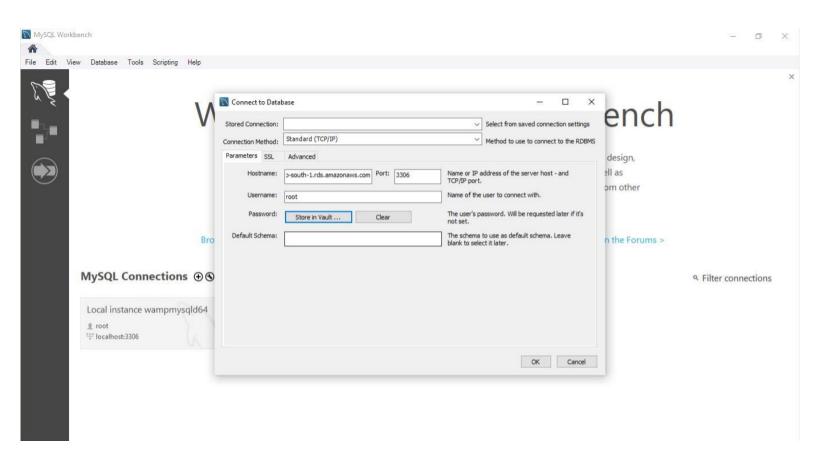
Step 3: Connect to the MySQL Database. In this step, we will connect to the database we created using MySQL Workbench.

1. Launch the MySQL Workbench application and go to Database > Connect to DB (Ctrl+U) from the menu bar.

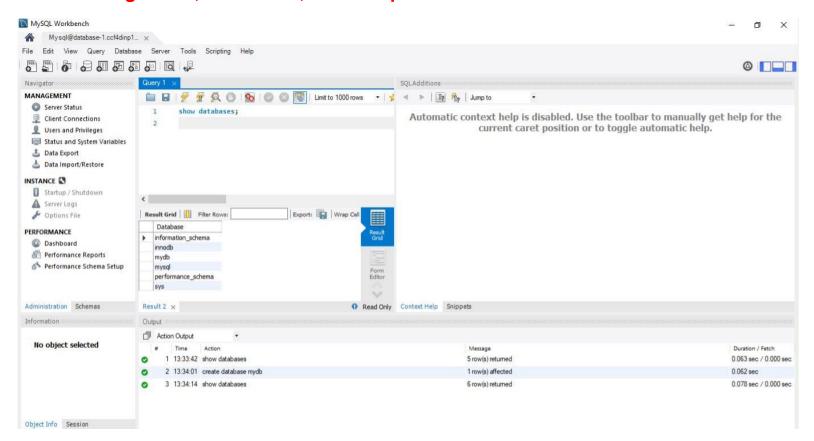


2. A dialog box appears. The following data should be entered in dialog box:

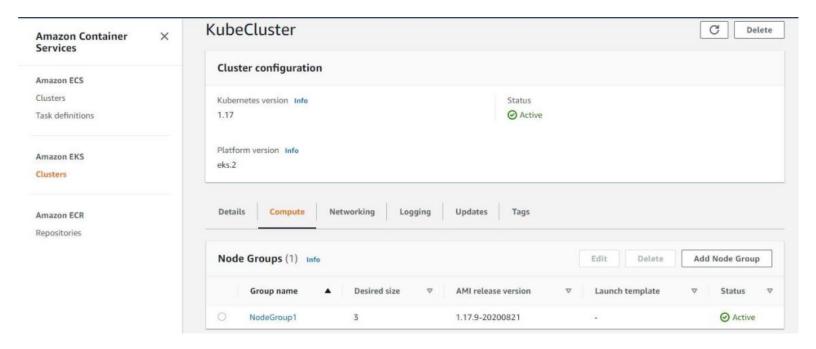
- Hostname: You can find your hostname on the Amazon RDS
- Port: The default value should be 3306.
- ➤ Username: Type in the username you created for the Amazon RDS database. Password: Click Store in Vault (or Store in Keychain on macOS) and enter the password that you used when creating the Amazon RDS database. Click OK
- > After entering password the following screenshot will appear. This shows your completion on MySQL workbench.

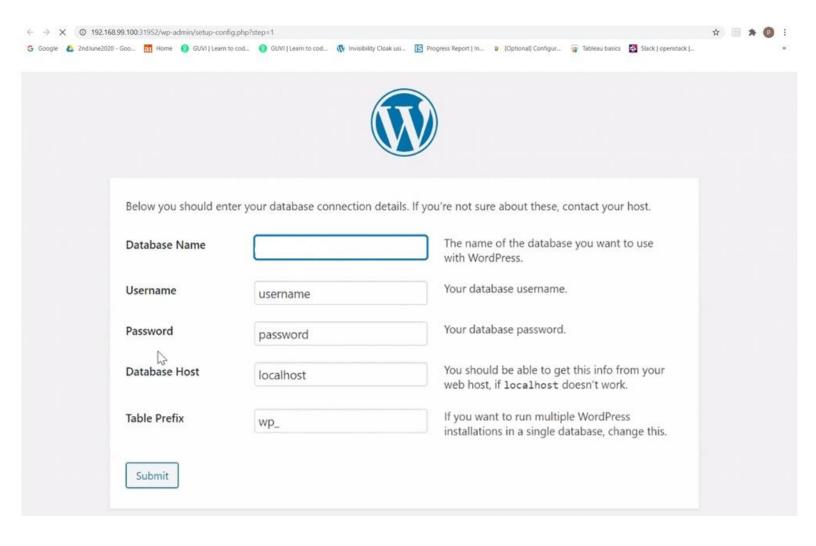


3. Now we are connected to the database! On the MySQL Workbench, you will be able start creating tables, insert data, and run queries.



About Kube Cluster:-





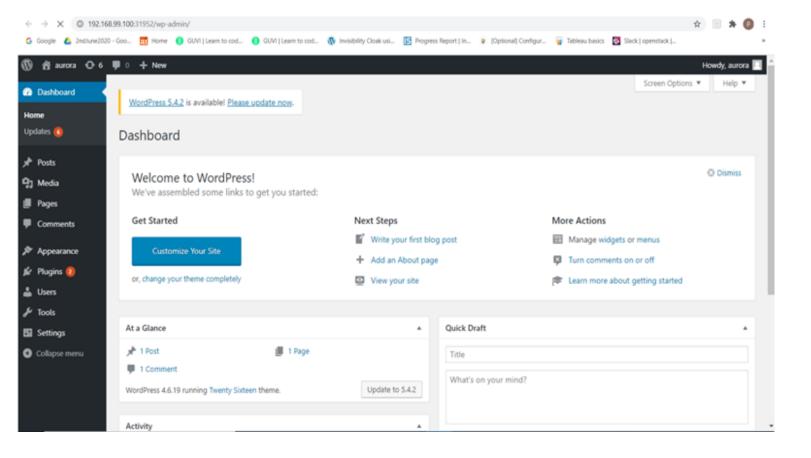




Already Installed

You appear to have already installed WordPress. To reinstall please clear your old database tables first.

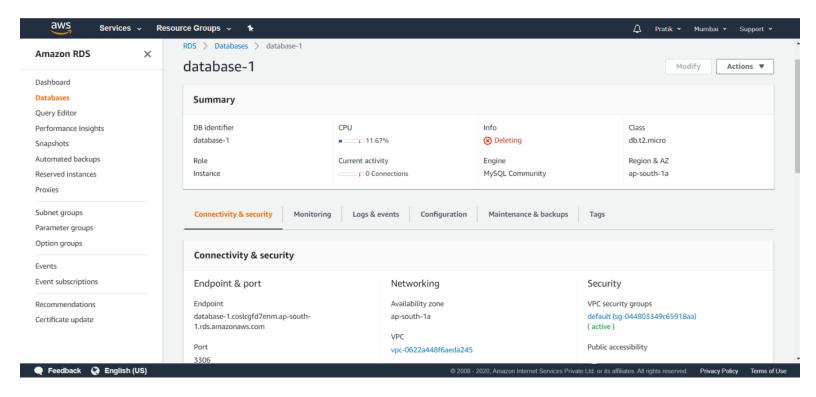


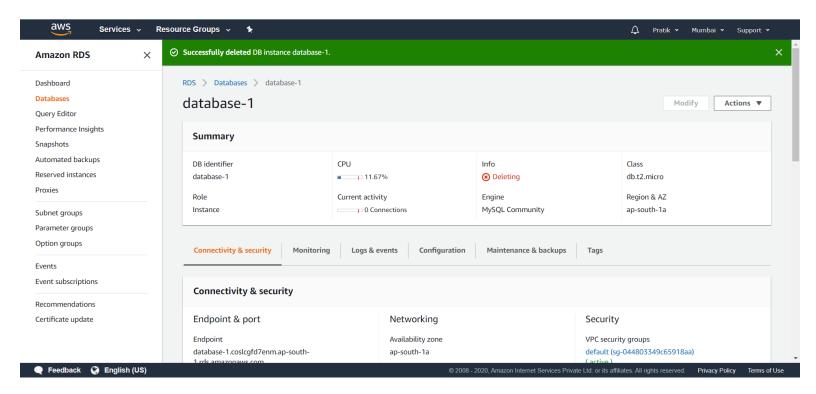


Automatically destroyed the task using terraform destroy command:-

```
:\Users\Asus\Desktop\terraformcodefiles>terraform destroy
null_resource.minikubestart: Refreshing state... [id=348086797605676458]
kubernetes_service.wordpresslb: Refreshing state... [id=default/wplb]
kubernetes_deployment.wordpress: Refreshing state... [id=default/wp]
An execution plan has been generated and is shown below.
Resource actions are indicated with the following symbols:
Terraform will perform the following actions:
 wait_for_rollout = true -> null
       metadata {
            annotations
                             = 1 -> null
= {} -> null
= "wp" -> null
= "default" -> null
            generation
            labels
            name
            namespace
            resource_version = "108322" -> null
                             = "/apis/apps/v1/namespaces/default/deployments/wp" -> null
= "a1cc0936-858f-4c02-aa88-1996a631f1fe" -> null
            self link
            uid
        spec {
            min_ready_seconds
                                       = false -> null
            paused
            progress_deadline_seconds = 600 -> null
                                       = 3 -> null
            replicas
            revision_history_limit
                                       = 10 -> null
                match_labels = {
- "App" = "wordpress"
                     "env"
                              = "production"
                     "region" = "IN"
                match_expressions {
```

Manually destroying Amazon RDS:-





Completed Task-6 Successfully Thanks for Reading!!!