Conestoga College

Cloud Development and Operations

Sem - 2

Cloud Architectures and Infrastructure as Code

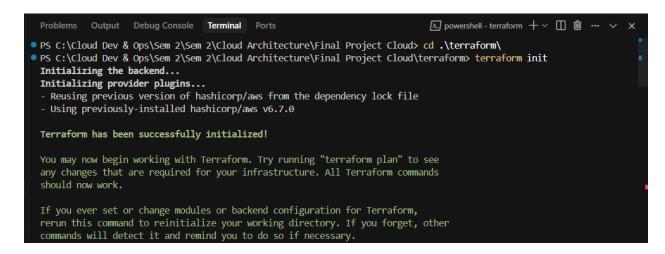
PROG8870

Final Project

Name:- Archit Patel

Professor:- Vikas Vattikonda

Terraform init:



Terraform plan:

```
Problems Output Debug Console Terminal Ports
PS C:\Cloud Dev & Ops\Sem 2\Sem 2\Cloud Architecture\Final Project Cloud\terraform> terraform plan
 aws_vpc.main: Refreshing state... [id=vpc-0a4fd325dbed943ab]
 aws_s3_bucket.private_buckets[2]: Refreshing state... [id=tf-private-bucket-3-archit8897679]
 aws_s3_bucket.private_buckets[3]: Refreshing state... [id=tf-private-bucket-4-archit8897679]
 aws_s3_bucket.private_buckets[1]: Refreshing state... [id=tf-private-bucket-2-archit8897679]
 aws_s3_bucket.private_buckets[0]: Refreshing state... [id=tf-private-bucket-1-archit8897679]
 aws_s3_bucket_versioning.versioning[2]: Refreshing state... [id=tf-private-bucket-3-archit8897679] aws_s3_bucket_versioning.versioning[1]: Refreshing state... [id=tf-private-bucket-2-archit8897679]
 aws_s3_bucket_versioning.versioning[3]: Refreshing state... [id=tf-private-bucket-4-archit8897679]
 aws_s3_bucket_versioning.versioning[0]: Refreshing state... [id=tf-private-bucket-1-archit8897679]
 aws_internet_gateway.igw: Refreshing state... [id=igw-070d80b202a11cabd]
 aws_subnet.secondary: Refreshing state... [id=subnet-0d7e1f5ca1f923505]
 aws_subnet.main: Refreshing state... [id=subnet-0cdf87ac783975aca]
 aws_security_group.allow_mysql: Refreshing state... [id=sg-02d4801537c9283cd]
 aws_security_group.allow_ssh: Refreshing state... [id=sg-0905d836301f60f4a]
 aws_route_table.main: Refreshing state... [id=rtb-0dcb2c7a5f22a6db1]
 aws_route_table_association.secondary: Refreshing state... [id=rtbassoc-00c5df1fa08c4add7]
 aws_route_table_association.main: Refreshing state... [id=rtbassoc-05254e01f741c8693]
 aws_db_subnet_group.main: Refreshing state... [id=main-subnet-group]
 aws_instance.web: Refreshing state... [id=i-0161ac08a5195e23c]
 Terraform used the selected providers to generate the following execution plan. Resource actions are
 indicated with the following symbols:
   + create
 Terraform will perform the following actions:
   # aws db instance.main will be created
   + resource "aws db instance" "main" {
       + address
                                                = (known after apply)
       + allocated storage
                                                 = 20
       + apply_immediately
                                                = false
                                                = (known after apply)
       + arn
       + auto_minor_version_upgrade
                                                 = true
       + availability_zone
                                                 = (known after apply)
       + backup retention period
                                                = (known after apply)
       + backup_target
                                                = (known after apply)
       + backup_window
                                                = (known after apply)
       + ca cert identifier
                                                 = (known after apply)
                                                 = (known after apply)
       + character set name
                                                  Ctrl+K to generate a command
```

```
Problems Output Debug Console Terminal Ports
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     + monitoring_role_arn
                                              = (known after apply)
      + multi az
                                              = (known after apply)
      + nchar_character_set_name
                                              = (known after apply)
                                              = (known after apply)
      + network_type
                                              = (known after apply)
     + option_group_name
     + parameter_group_name
                                             = (known after apply)
      + password
                                              = (sensitive value)
     + performance_insights_enabled
                                              = false
      + performance_insights_kms_key_id
                                             = (known after apply)
      + performance_insights_retention_period = (known after apply)
                                             = (known after apply)
      + publicly_accessible
                                             = true
                                              = "us-east-1"
      + region
     + replica mode
                                              = (known after apply)
      + replicas
                                              = (known after apply)
      + resource id
                                              = (known after apply)
      + skip final snapshot
                                             = true
      + snapshot_identifier
                                             = (known after apply)
      + status
                                             = (known after apply)
      + storage_throughput
                                              = (known after apply)
                                              = (known after apply)
      + storage_type
         + "Name" = "rds-mysql"
      + tags_all
            "Name" = "rds-mysql"
      + timezone
                                              = (known after apply)
      + username
                                              = (sensitive value)
      + vpc_security_group_ids
            "sg-02d4801537c9283cd",
Plan: 1 to add, 0 to change, 0 to destroy.
Note: You didn't use the -out option to save this plan, so Terraform can't guarantee to take exactly
these actions if you run "terraform apply" now.
                                                Ctrl+K to generate a command
```

Terraform apply:

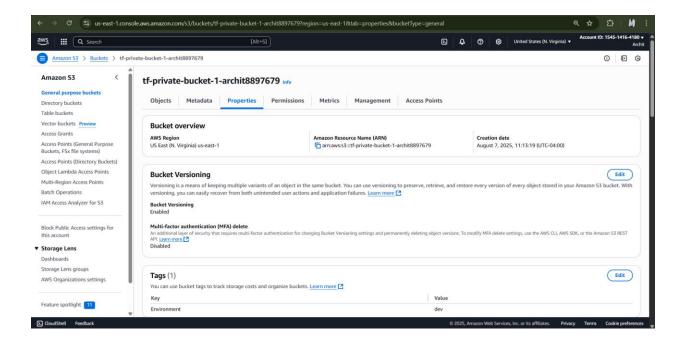
```
Problems Output Debug Console Terminal
                                        Ports
PS C:\Cloud Dev & Ops\Sem 2\Sem 2\Cloud Architecture\Final Project Cloud\terraform> terraform apply
aws_vpc.main: Refreshing state... [id=vpc-0a4fd325dbed943ab]
aws_s3_bucket.private_buckets[3]: Refreshing state... [id=tf-private-bucket-4-archit8897679]
aws_s3_bucket.private_buckets[0]: Refreshing state... [id=tf-private-bucket-1-archit8897679]
aws_s3_bucket.private_buckets[1]: Refreshing state... [id=tf-private-bucket-2-archit8897679]
aws_s3_bucket.private_buckets[2]: Refreshing state... [id=tf-private-bucket-3-archit8897679]
aws_s3_bucket_versioning.versioning[0]: Refreshing state... [id=tf-private-bucket-1-archit8897679]
aws_s3_bucket_versioning.versioning[2]: Refreshing state... [id=tf-private-bucket-3-archit8897679]
aws_s3_bucket_versioning.versioning[3]: Refreshing state... [id=tf-private-bucket-4-archit8897679]
aws_s3_bucket_versioning.versioning[1]: Refreshing state... [id=tf-private-bucket-2-archit8897679]
aws_subnet.secondary: Refreshing state... [id=subnet-0d7e1f5ca1f923505]
aws_internet_gateway.igw: Refreshing state... [id=igw-070d80b202a11cabd]
aws_subnet.main: Refreshing state... [id=subnet-0cdf87ac783975aca]
aws_security_group.allow_mysql: Refreshing state... [id=sg-02d4801537c9283cd]
aws_security_group.allow_ssh: Refreshing state... [id=sg-0905d836301f60f4a]
aws_db_subnet_group.main: Refreshing state... [id=main-subnet-group]
aws_route_table.main: Refreshing state... [id=rtb-0dcb2c7a5f22a6db1]
aws_instance.web: Refreshing state... [id=i-0161ac08a5195e23c]
aws_route_table_association.main: Refreshing state... [id=rtbassoc-05254e01f741c8693]
aws_route_table_association.secondary: Refreshing state... [id=rtbassoc-00c5df1fa08c4add7]
Terraform used the selected providers to generate the following execution plan. Resource actions are
indicated with the following symbols:
 + create
 ~ update in-place
Terraform will perform the following actions:
 # aws db instance.main will be created
  + resource "aws db instance" "main" {
     + address
                                             = (known after apply)
     + allocated_storage
                                             = 20
     + apply immediately
                                             = false
     + arn
                                             = (known after apply)
     + auto minor version upgrade
                                             = true
     + availability zone
                                             = (known after apply)
     + backup retention period
                                             = (known after apply)
     + backup_target
                                             = (known after apply)
     + backup window
                                             = (known after apply)
      + ca_cert_identifier
                                             = (known after apply)
                                              Ctrl+K to generate a command
```

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Problems Output Debug Console Terminal Ports
     + snapshot_identifier
                                             = (known after apply)
     + status
                                              = (known after apply)
     + storage_throughput
                                              = (known after apply)
                                              = (known after apply)
     + storage_type
      + tags
         + "Name" = "rds-mysql"
      + tags_all
         + "Name" = "rds-mysql"
     + timezone
                                             = (known after apply)
                                              = (sensitive value)
      + username
      + vpc_security_group_ids
         + "sg-02d4801537c9283cd",
 # aws_vpc.main will be updated in-place
 ~ resource "aws_vpc" "main" {
     ~ enable_dns_hostnames
                                             = false -> true
       id
                                             = "vpc-0a4fd325dbed943ab"
       tags
           "Name" = "main-vpc"
        # (19 unchanged attributes hidden)
Plan: 1 to add, 1 to change, 0 to destroy.
Do you want to perform these actions?
 Terraform will perform the actions described above.
 Only 'yes' will be accepted to approve.
 Enter a value: yes
aws_vpc.main: Modifying... [id=vpc-0a4fd325dbed943ab]
aws_vpc.main: Still modifying... [id=vpc-0a4fd325dbed943ab, 10s elapsed]
aws_vpc.main: Modifications complete after 12s [id=vpc-0a4fd325dbed943ab]
aws_db_instance.main: Creating...
aws_db_instance.main: Still creating... [10s elapsed]
                                               Ctrl+K to generate a command
```

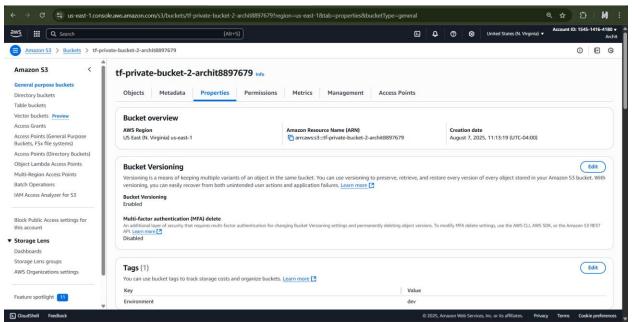
```
Problems Output Debug Console Terminal Ports
                                                                                     ☑ powershell - terraform + ∨ Ⅲ 🛍 ··· ∨ ×
Do you want to perform these actions?
  Terraform will perform the actions described above.
  Only 'yes' will be accepted to approve.
  Enter a value: yes
aws_vpc.main: Modifying... [id=vpc-0a4fd325dbed943ab]
aws_vpc.main: Still modifying... [id=vpc-0a4fd325dbed943ab, 10s elapsed]
aws_vpc.main: Modifications complete after 12s [id=vpc-0a4fd325dbed943ab]
aws db instance.main: Creating...
aws_db_instance.main: Still creating... [10s elapsed]
aws_db_instance.main: Still creating... [20s elapsed]
aws_db_instance.main: Still creating... [30s elapsed]
aws_db_instance.main: Still creating... [40s elapsed]
aws_db_instance.main: Still creating... [50s elapsed]
aws_db_instance.main: Still creating... [1m0s elapsed]
aws_db_instance.main: Still creating... [1m10s elapsed]
aws_db_instance.main: Still creating... [1m20s elapsed]
aws_db_instance.main: Still creating... [1m30s elapsed] aws_db_instance.main: Still creating... [1m40s elapsed]
aws_db_instance.main: Still creating... [1m50s elapsed]
aws_db_instance.main: Still creating... [2m0s elapsed]
aws_db_instance.main: Still creating... [2m10s elapsed]
aws_db_instance.main: Still creating... [2m20s elapsed]
aws_db_instance.main: Still creating... [2m30s elapsed] aws_db_instance.main: Still creating... [2m40s elapsed]
aws_db_instance.main: Still creating... [2m50s elapsed]
aws_db_instance.main: Still creating... [3m0s elapsed]
aws_db_instance.main: Still creating... [3m10s elapsed]
aws_db_instance.main: Still creating... [3m20s elapsed] aws_db_instance.main: Still creating... [3m30s elapsed]
aws db instance.main: Still creating... [3m40s elapsed]
aws_db_instance.main: Still creating... [3m50s elapsed]
aws_db_instance.main: Still creating... [4m0s elapsed]
aws_db_instance.main: Still creating... [4m10s elapsed]
aws_db_instance.main: Creation complete after 4m15s [id=db-S35E273STTML6XC6TQ7YIK20U4]
Apply complete! Resources: 1 added, 1 changed, 0 destroyed.
PS C:\Cloud Dev & Ops\Sem 2\Sem 2\Cloud Architecture\Final Project Cloud\terraform>
                                                     Ctrl+K to generate a command
```

S3 Bucket + Versioning Enable

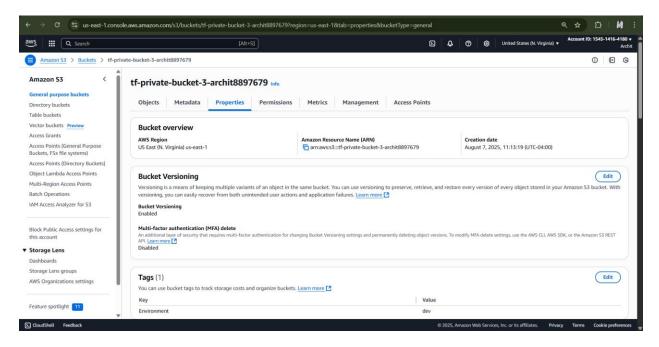
1. tf-private-bucket-1-archit8897679



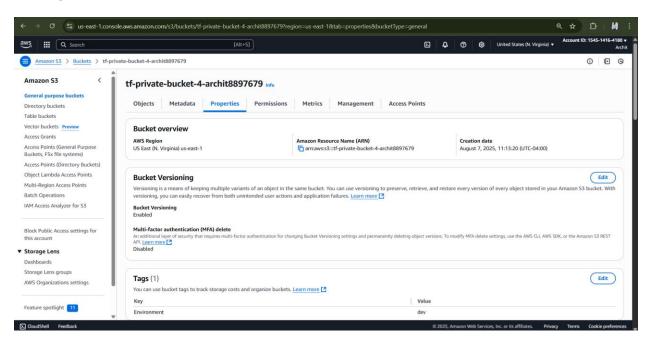
2. tf-private-bucket-2-archit8897679



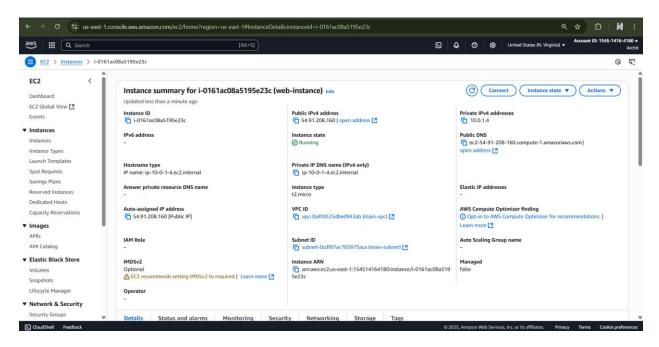
3. tf-private-bucket-3-archit8897679



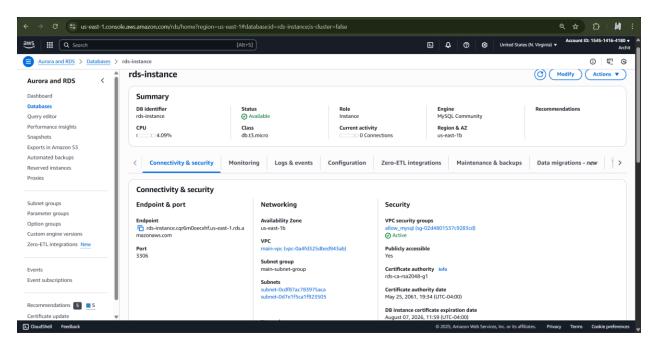
4. tf-private-bucket-4-archit8897679



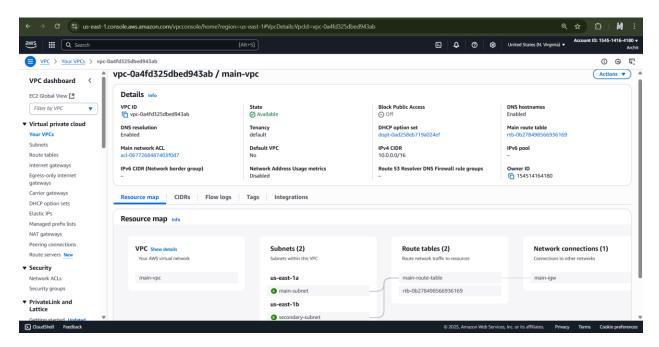
EC2 Instance



RDS Database

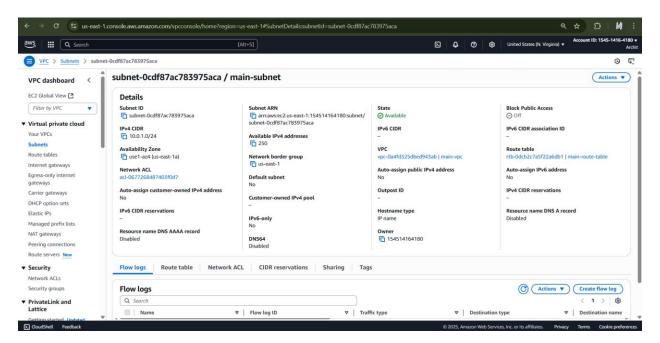


VPC

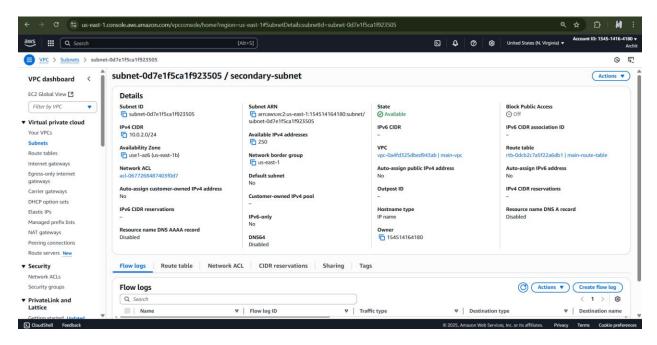


Subnets

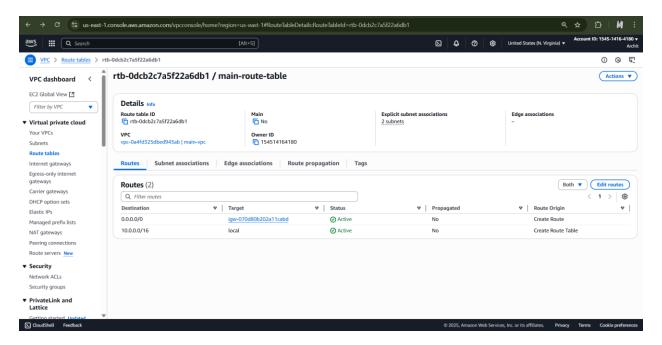
1. main subnet



2. secondary subnet

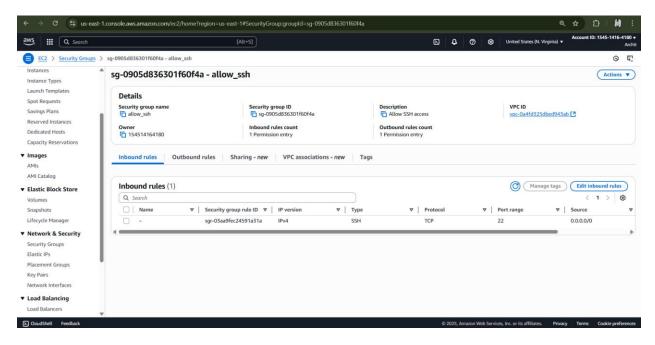


Route Tables

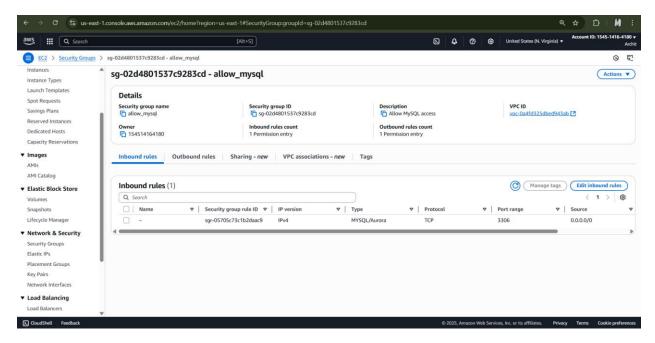


Security Groups

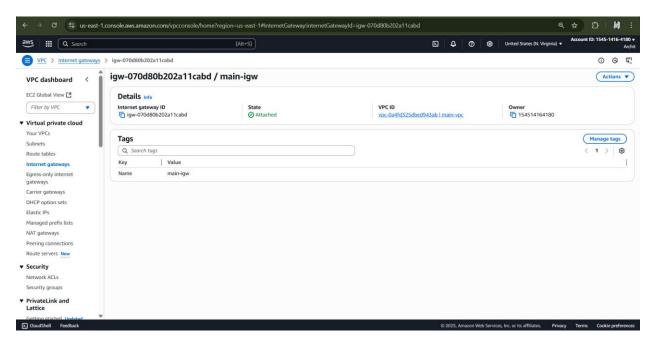
1. allow_ssh with port 22



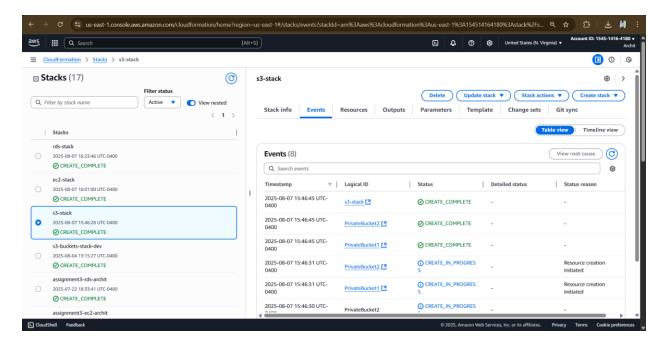
2. allow_mysql with port 3306



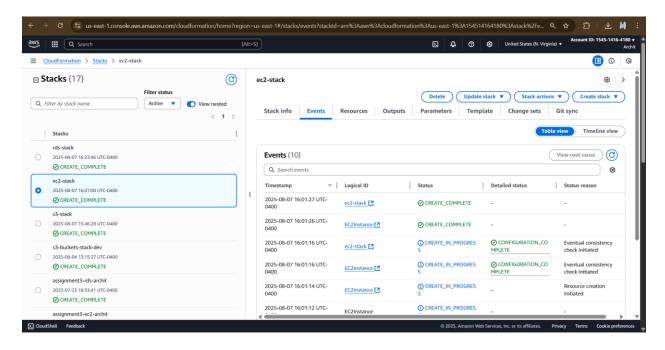
Internet Gateway



CloudFormation S3 Stack



EC2 Stack



RDS Stack

