AWS Three tier architecture Project
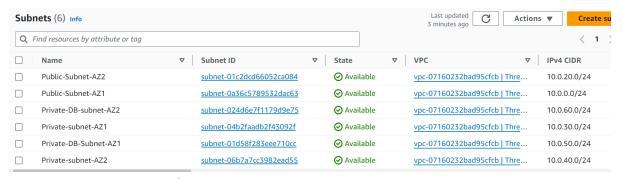
- Create an isolated network with the following components:
    - VPC
    - Subnets
    - Route Tables
    - Internet Gateway
    - NAT gateway
    - Security Groups

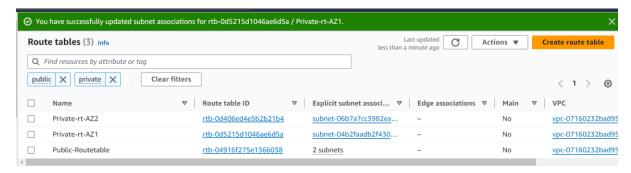- Create VPC with CIDR Range 10.0.0.0/16

	Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR
☐	–	vpc-07afcdf9fb49e1aae	⊘ Available	172.31.0.0/16	–
☑	Three-tier-architecture-VPC	vpc-07160232bad95cfcb	⊘ Available	10.0.0.0/16	–

Your VPCs (1/2) Info — Last updated 2 minutes ago — Actions ▾ — Create VPC

- Create 2 Public Subnets and 4 Private Subnets in 2 Availability Zones

Subnets (6) Info — Last updated 3 minutes ago — Actions ▾ — Create su...

	Name	Subnet ID	State	VPC	IPv4 CIDR
☐	Public-Subnet-AZ2	subnet-01c2dcd66052ca084	⊘ Available	vpc-07160232bad95cfcb	Thre...	10.0.20.0/24
☐	Public-Subnet-AZ1	subnet-0a36c5789532dac63	⊘ Available	vpc-07160232bad95cfcb	Thre...	10.0.0.0/24
☐	Private-DB-subnet-AZ2	subnet-024d6e7f1179d9e75	⊘ Available	vpc-07160232bad95cfcb	Thre...	10.0.60.0/24
☐	Private-subnet-AZ1	subnet-04b2faadb2f43092f	⊘ Available	vpc-07160232bad95cfcb	Thre...	10.0.30.0/24
☐	Private-DB-Subnet-AZ1	subnet-01d58f283eee710cc	⊘ Available	vpc-07160232bad95cfcb	Thre...	10.0.50.0/24
☐	Private-subnet-AZ2	subnet-06b7a7cc3982ead55	⊘ Available	vpc-07160232bad95cfcb	Thre...	10.0.40.0/24

- Create Internet Gateway and 2 NAT Gateways

Internet gateways (1) Info — Actions ▾ — Create internet gateway

	Name	Internet gateway ID	State	VPC ID	Owner
☐	Three-tier-IGW	igw-0e83fb42f3acddd69	⊘ Attached	vpc-07160232bad95cfcb	Three-tier-ar...	975050079

NAT gateways (2) Info — Actions ▾ — Create NAT gateway

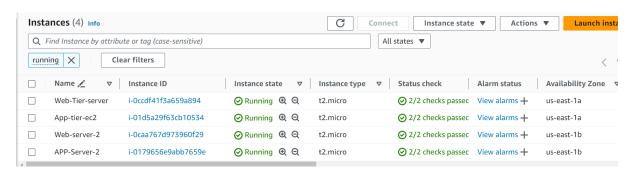|	Name	NAT gateway ID	Connectivity...	State	State message	Primary public I...	Primary
○	Nat-gw-AZ2	nat-0a8b867e6327a3118	Public	⊘ Available	–	44.212.113.197	10.0.20
○	Nat-gw-AZ1	nat-0e3cd906504eba78d	Public	⊘ Available	–	35.169.91.127	10.0.0.1

- Create 3 Route tables and attach IGW to public routes, add NAT gw to Private routes.
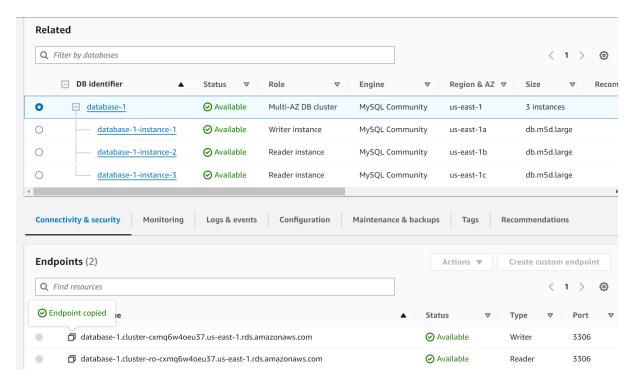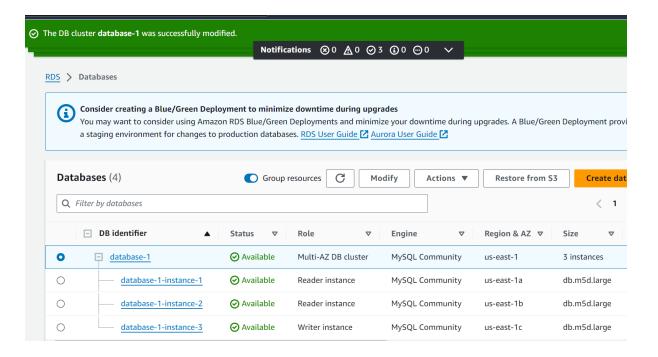

- Create Security Group and Configure.

- Create Web tier(2 Public Web servers), App tier(2 Private servers)

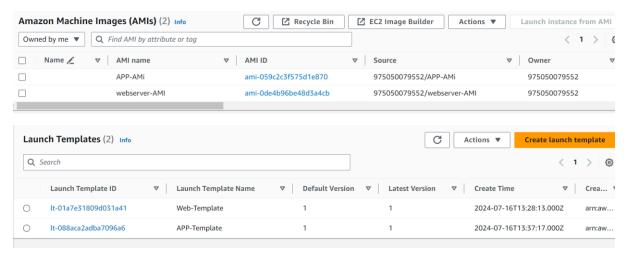- Create RDS and attach Private EC2 to RDS Database.

Related

	DB identifier ▲	Status ▽	Role ▽	Engine ▽	Region & AZ ▽	Size ▽	Recom
⦿	⊟ database-1	⊘ Available	Multi-AZ DB cluster	MySQL Community	us-east-1	3 instances	
○	database-1-instance-1	⊘ Available	Writer instance	MySQL Community	us-east-1a	db.m5d.large	
○	database-1-instance-2	⊘ Available	Reader instance	MySQL Community	us-east-1b	db.m5d.large	
○	database-1-instance-3	⊘ Available	Reader instance	MySQL Community	us-east-1c	db.m5d.large	

Connectivity & security Monitoring Logs & events Configuration Maintenance & backups Tags Recommendations

Endpoints (2)   Actions ▼   Create custom endpoint

⊘ Endpoint copied

	e	Status ▽	Type ▽	Port ▽
●	⎘ database-1.cluster-cxmq6w4oeu37.us-east-1.rds.amazonaws.com	⊘ Available	Writer	3306
●	⎘ database-1.cluster-ro-cxmq6w4oeu37.us-east-1.rds.amazonaws.com	⊘ Available	Reader	3306

- Failing of RDS makes reader as writer

⊘ The DB cluster **database-1** was successfully modified.

Notifications ⊗ 0 ⚠ 0 ⊘ 3 ⓘ 0 ⊖ 0 ⌄

RDS › Databases

ⓘ **Consider creating a Blue/Green Deployment to minimize downtime during upgrades**
You may want to consider using Amazon RDS Blue/Green Deployments and minimize your downtime during upgrades. A Blue/Green Deployment provi
a staging environment for changes to production databases. RDS User Guide ↗ Aurora User Guide ↗

Databases (4)   ⬤ Group resources ↻ Modify Actions ▼ Restore from S3 Create dat

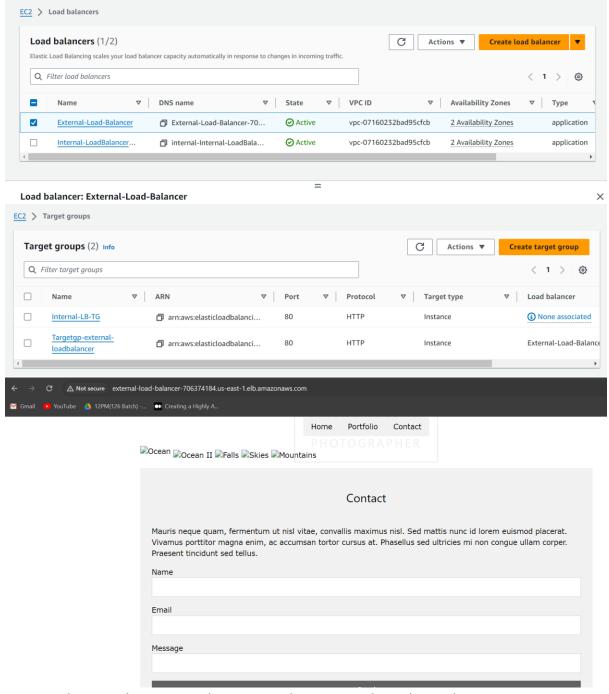|	DB identifier ▲	Status ▽	Role ▽	Engine ▽	Region & AZ ▽	Size ▽
⦿	⊟ database-1	⊘ Available	Multi-AZ DB cluster	MySQL Community	us-east-1	3 instances
○	database-1-instance-1	⊘ Available	Reader instance	MySQL Community	us-east-1a	db.m5d.large
○	database-1-instance-2	⊘ Available	Reader instance	MySQL Community	us-east-1b	db.m5d.large
○	database-1-instance-3	⊘ Available	Writer instance	MySQL Community	us-east-1c	db.m5d.large

- Login to Public EC2 server connect from Public server to private server
  And install Mysql in private server.
- Copy endpoint url and login into database in private server.

```
[root@ip-10-0-20-166 ~]# vi project.pem
[root@ip-10-0-20-166 ~]# ssh -i "project.pem" ec2-user@10.0.40.248
The authenticity of host '10.0.40.248 (10.0.40.248)' can't be established.
ED25519 key fingerprint is SHA256:Id2Vbp1K1Qtz0+9PU/CDbjOZ7Jh3wMd5FS6T4NCN39s.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.0.40.248' (ED25519) to the list of known hosts.
        #_
   ,\_   ####_        Amazon Linux 2023
  ~~  \_#####\
  ~~     \###|
  ~~       \#/ ___    https://aws.amazon.com/linux/amazon-linux-2023
   ~~       V~' '->
    ~~~         /
      ~~._.   _/
        _/ _/
       _/m/'
Last login: Tue Jul 16 11:53:25 2024 from 10.0.0.191
[ec2-user@ip-10-0-40-248 ~]$ mysql --version
mysql  Ver 15.1 Distrib 10.5.23-MariaDB, for Linux (x86_64) using  EditLine wrapper
[ec2-user@ip-10-0-40-248 ~]$ mysql -h database-1.cluster-cxmq6w4oeu37.us-east-1.rds.amazonaws.com -u admin -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MySQL connection id is 87
Server version: 8.0.35 Source distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MySQL [(none)]> create database sample;
Query OK, 1 row affected (0.004 sec)

MySQL [(none)]> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
| rajesh             |
| sample             |
| sys                |
+--------------------+
```

- Create AMI and Launch Template for Public and Private servers.

- Create 2 target Groups and Create 2 Application Load balancer for External and internal Layer, attach 2 Public Ec2 server mention pending as below.

- Create Web Autoscaling group and App Autoscaling group and test the result.
  New EC2 instances are creating as per below image.

Instances (7) Info   ⟳   Connect   Instance state ▼   Actions ▼   **Launch inst**

🔍 Find Instance by attribute or tag (case-sensitive)   All states ▼   ‹

	Name ✎ ▽	Instance ID	Instance state ▽	Instance type ▽	Status check	Alarm status	Availability Zone ▽
☐	Web-Tier-server	i-0ccdf41f3a659a894	⊘ Running 🔍 🔍	t2.micro	⊘ 2/2 checks passed	View alarms +	us-east-1a
☐		i-04d4c7fd57dcc6ee4	⊘ Running 🔍 🔍	t2.micro	⏱ Initializing	View alarms +	us-east-1a
☐	App-tier-ec2	i-01d5a29f63cb10534	⊘ Running 🔍 🔍	t2.micro	⊘ 2/2 checks passed	View alarms +	us-east-1a
☐		i-0c94fe7886fa3c1f2	⊘ Running 🔍 🔍	t2.micro	⏱ Initializing	View alarms +	us-east-1b
☐	Web-server-2	i-0caa767d973960f29	⊘ Running 🔍 🔍	t2.micro	⊘ 2/2 checks passed	View alarms +	us-east-1b
☐	APP-Server-2	i-0179656e9abb7659e	⊘ Running 🔍 🔍	t2.micro	⊘ 2/2 checks passed	View alarms +	us-east-1b

Instances (7) Info   ⟳   Connect   Instance state ▼   Actions ▼   **Launch instances**

🔍 Find Instance by attribute or tag (case-sensitive)   All states ▼

Instance state = running ✕   Clear filters   ‹ 1 ›

	Name ✎ ▽	Instance ID	Instance state ▽	Instance type ▽	Status check	Alarm status	Availability Zone ▽
☐	Web-Tier-server	i-0ccdf41f3a659a894	⊘ Running 🔍 🔍	t2.micro	⊘ 2/2 checks passed	View alarms +	us-east-1a
☐		i-04d4c7fd57dcc6ee4	⊘ Running 🔍 🔍	t2.micro	⊘ 2/2 checks passed	View alarms +	us-east-1a
☐	App-tier-ec2	i-01d5a29f63cb10534	⊘ Running 🔍 🔍	t2.micro	⊘ 2/2 checks passed	View alarms +	us-east-1a
☐		i-0c94fe7886fa3c1f2	⊘ Running 🔍 🔍	t2.micro	⊘ 2/2 checks passed	View alarms +	us-east-1b
☐	Web-server-2	i-0caa767d973960f29	⊘ Running 🔍 🔍	t2.micro	⊘ 2/2 checks passed	View alarms +	us-east-1b
☐	APP-Server-2	i-0179656e9abb7659e	⊘ Running 🔍 🔍	t2.micro	⊘ 2/2 checks passed	View alarms +	us-east-1b
☐		i-0e480f35cdd7ed2af	⊘ Running 🔍 🔍	t2.micro	⏱ Initializing	View alarms +	us-east-1b