**Take-Home Assignment**

**Implementation**: A simple web page was created and deployed to Tomcat.

**Architecture Design**: This is the first step in implanting this project. Networking was designed with focus on resilience. Provisioned 2 VPCs in US-East-1 and US-East-2 with 2 private subnets and 2 public subnets in each VPC (region).

VPC CIDR Block:

**VPC1**: 10.0.0.0/24

**VPC2**: 172.0.0.0/24

Please refer to “sublime text” file named “Networking Configuration” for all IP allocations and configuration details.

**Security:** Security was achieved by assigning appropriate security groups to resources and creating IAM user and associated policies adhering to principles of least privilege. For instance, I created user and granted admin permission to administrate Tomcat.

**High Availability**: This was implemented by deploying the application in an auto-scaling (AZ-resilient) that has self-healing capabilities, making application accessible at all times.

Scalability: Designed an auto-scaling group that scales based on CPU utilization metrics

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**Data Backup and Recovery:** A snapshot of the instance hosting the application was created. In addition, An Aurora PostgreSQL was created in multi-AZ environments and created a snapshot of the database cluster.

**Compliance and Auditing**: Compliance is achieved by creating security groups and user access required for a specific role.

**Monitoring and Logging**: Enabled CloudWatch for metric collection in AWS.

**Steps in implementing the project:**

1. Determine IP allocation, VPCs, CIDR block range, subnets, etc.
2. Provisioned networking
3. Designed a tomcat web page
4. Provisioned EC2-Instance for my JumpServer
5. Created authorized user, security groups
6. Bootstrapped an Application Server
7. Created Snapshot of Application Server
8. Created ELB and ASG (used the launch template of Application Server’s snapshot)
9. Created Aurora database.

The architecture below was my preferred approach because it gives more robustness, collaboration, and speed of delivery, but I had problems with my Kubernetes config file, which caused my pods to shutdown intermittently and hampers availability.

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