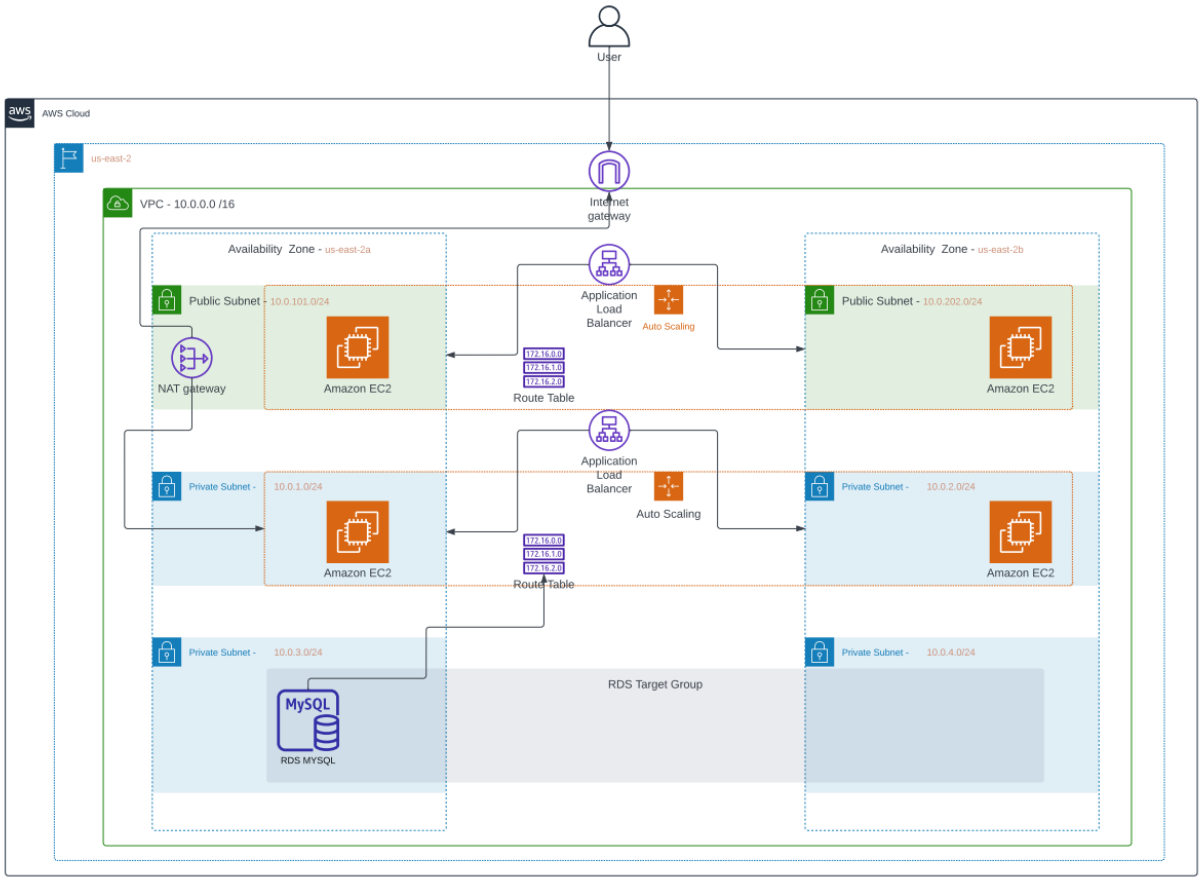
Three-Tier Infrastructure Overview:

In my infrastructure setup, I utilize three primary Terraform files to manage and orchestrate the resources:

1. **main-sources.tf: This file serves as the backbone of my Terraform configuration. It contains references to the primary data sources and any shared resources or modules that might be used across different parts of the infrastructure.**
2. **network-architecture.tf: As the name suggests, this file focuses on defining and setting up the network infrastructure for my environment. It includes configurations for elements like VPCs, subnets, route tables, and security groups. Essentially, it outlines the overall network layout and how different resources communicate with one another.**
3. **provider.tf: This is where I configure my Terraform provider settings, specifically for AWS. The file contains essential credentials and configurations, such as the AWS region, access key, and secret key. This file helps Terraform understand how to interact with the AWS services and in which region to provision the resources.**

By segregating my configuration into these distinct files, I ensure clarity, modularity, and ease of management for my infrastructure code.



Main-resources.tf file:

Web Tier:

- **EC2 Configuration**: Uses **t2.micro** instances based on the AMI **ami-02b8534ff4b424939**.
- **Auto Scaling Group**: Maintains 2 to 3 instances for high availability.
- **Services**: Apache web server serves a custom HTML page.
- **Access**: Instances are provisioned with public IPs for direct accessibility.

Application Tier:

- **EC2 Configuration**: Employs **t2.micro** instances, leveraging the AMI **ami-02b8534ff4b424939**.
- **Auto Scaling Group**: Configured to have a minimum of 2 and a maximum of 3 instances, ensuring resilience.
- **Software**: Pre-equipped with MySQL.
- **Network**: Positioned in private subnets, safeguarding from direct public access.

Data Tier:

- **RDS Setup**: Utilizes MySQL (version **8.0**) on a **db.t2.micro** instance, backed by 100 GB of **gp3** storage.
- **Subnet & Access**: Hosted in private subnets to restrict public access.
- **High Availability**: Multi-AZ deployment is active, offering enhanced reliability.
- **Security**: Connections are governed by a designated security group.

Network-architecture.tf:

VPC

- **Name:** three-tier-vpc
- **CIDR Block:** 10.0.0.0/16

Subnets

- **Public Subnets:**
    1. **Name:** three-tier-pub-sub-1
        - **CIDR Block:** 10.0.101.0/24
        - **Availability Zone:** us-east-2a
    2. **Name:** three-tier-pub-sub-2
        - **CIDR Block:** 10.0.202.0/24
        - **Availability Zone:** us-east-2b
- **Private Subnets:**
    1. **Name:** three-tier-pvt-sub-1
        - **CIDR Block:** 10.0.1.0/24
        - **Availability Zone:** us-east-2a
    2. **Name:** three-tier-pvt-sub-2
        - **CIDR Block:** 10.0.2.0/24
        - **Availability Zone:** us-east-2b
    3. **Name:** three-tier-pvt-sub-3
        - **CIDR Block:** 10.0.3.0/24
        - **Availability Zone:** us-east-2a
    4. **Name:** three-tier-pvt-sub-4
        - **CIDR Block:** 10.0.4.0/24
        - **Availability Zone:** us-east-2b

Internet Connectivity

- **Internet Gateway:** three-tier-igw
- **NAT Gateway:** three-tier-natgw-01
    - **Location:** three-tier-pub-sub-1

Route Tables

1. **Name:** three-tier-web-rt (For public subnets)
    - **Route:** 0.0.0.0/0 via Internet Gateway
2. **Name:** three-tier-app-rt (For private subnets)
    - **Route:** 0.0.0.0/0 via NAT Gateway

Security Groups

1. **Name:** three-tier-alb-sg-web
    - **Purpose:** Load balancer security group for the web tier
    - **Ingress/Egress:** Allow all
2. **Name:** three-tier-alb-sg-app
    - **Purpose:** Load balancer security group for the app tier
    - **Ingress:** Allow port 80 traffic from the web tier's security group
3. **Name:** three-tier-ec2-asg-sg-web
    - **Purpose:** Web tier instances' security group
    - **Ingress:** Allow all traffic, allow SSH (port 22) and HTTP (port 80) from anywhere
4. **Name:** three-tier-ec2-asg-sg-app
    - **Purpose:** App tier instances' security group
    - **Ingress:** Allow ICMP, SSH, and HTTP traffic from the web tier's security group
5. **Name:** three-tier-db-sg
    - **Purpose:** Database tier security group
    - **Ingress:** Allow MySQL (port 3306) from specific CIDR ranges, and allow SSH from app tier

Load Balancers

1. **Name:** three-tier-web-lb
    - **Type:** Application Load Balancer (external)
    - **Target Group:** three-tier-web-lb-tg
    - **Listener:** HTTP on port 80

Provider.tf:

Terraform and AWS Provider Configuration:

- **Source**: hashicorp/aws
- **Region**: us-east-2
- **Access Key**: ########################## (Note: This should be kept private!)
- **Secret Key**: ########################## (Note: This is sensitive and should never be exposed!)