**Scenario:** You have a web application that accepts requests from the internet. Clients can send requests to query for data. When a request comes in, the web application queries a MySQL database and returns the data to the client.

**Instructions:** Design a three-tier architecture that follows AWS best practices by using services such as Amazon Virtual Private Cloud (Amazon VPC), Amazon Elastic Compute Cloud (Amazon EC2), Amazon Relational Database Service (Amazon RDS) with high availability, and Elastic Load Balancing (ELB). Create an architecture diagram that lays out your design, including the networking layer, compute layer, database layer, and anything else that’s needed to accurately depict the architecture. Write a few paragraphs that explain why you chose the AWS services that you used and how they would support the solution for the given scenario. Your explanation must describe how traffic flows through the different AWS components—from the client to the backend database, and back to the client.

**Answer:**

Graphical user interface, diagram, application

Description automatically generated

The architecture consists of the following:

* There is a VPC (region-specific) with two public and two private subnets spread across at least two availability zones.
* The public subnet will have one or more Amazon EC2 instances used to host the web application.
* The private subnet hosts the database layer. Amazon RDS for MySQL is used to host the backend database. The database would be configured to use multi-AZ (at least 2 AZ) deployment for high availability.
* IAM roles are assigned to EC2 instances to allow them to access AWS services securely.
* ELB is used to distribute traffic across multiple web servers to ensure scalability and high availability.
* Auto Scaling group for the Amazon EC2 instances automatically launches and terminates instances based on demand, ensuring that the group always has the desired number of healthy instances running.

**Traffic Flow:**

Client🡪Internet Gateway🡪ELB🡪EC2 instance🡪Amazon RDS

Diagram

Description automatically generated

Traffic flows as follows:

1. The client sends a request that enters the Amazon VPC through the Internet Gateway.

2. The Elastic Load Balancer (ELB) then distributes the incoming traffic to the available Amazon EC2 instances.

3. The Amazon EC2 instance queries the backend MySQL database stored in the Amazon RDS service, and returns the result to the client via the ELB.

**Summary**

The Amazon VPC and Amazon EC2 instances provide a highly scalable, customizable, and secure network and compute environment that can be easily adapted to meet the changing demands of the application. IAM roles ensure secure access to the AWS resources and services used in the architecture. ELB and AmazonEC2 Auto Scaling ensure that the architecture can handle fluctuations in traffic demand while maintaining high availability and scalability.