Steps to Deploy

Step-by-Step Deployment Guide

General Pre-Deployment

AWS Account: Ensure you have an active AWS account.
AWS CLI Setup: Install and configure the AWS CLI with the appropriate credentials and default region.

One-Tier Architecture

Step 1: Create a Virtual Private Cloud (VPC)

Create VPC:
- Navigate to the VPC dashboard in the AWS Console.
- Create a new VPC with an IPv4 CIDR block (e.g., 10.0.0.0/16).

Create Subnets:
- Create six private subnets with different CIDR blocks within the VPC.
- Create three public subnets with different CIDR blocks within the VPC.

Configure Internet Gateway:
- Attach an internet gateway to the VPC.
- Update the route table associated with the public subnets to include a default route via the internet gateway.

Step 2: Deploy EC2 Server

Launch EC2 Instance:
- Select a suitable AMI (Amazon Machine Image).
- Choose an instance type and configure instance details within one of the public subnets.
- Add appropriate storage.
- Configure security group to allow traffic as needed (e.g., HTTP, HTTPS, SSH).

Allocate and Associate Elastic IP:
- Allocate an Elastic IP and associate it with the EC2 instance.

Step 3: Install Required Software

Access the EC2 Instance:
- Connect to the EC2 instance via SSH.

Install Software:
- Execute commands to install the required software (as specified earlier, like PHP 5.6 and MySQL).

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Step 4: Clone the GitHub Repository

Install Git:

- Install Git on the EC2 instance (sudo apt install git).

Clone Repository:

- Clone the desired GitHub repository (git clone https://github.com/LNcloud/college-major-project).

Two-Tier Architecture

Step 5: Create an RDS Database

Launch RDS Instance:

- Navigate to RDS in AWS Console.
- Create a new RDS instance (e.g., MySQL).
- Configure the database to be inside the VPC and make sure it's accessible from the EC2 instance.

Modify Application Configuration:

- Update the application configuration on the EC2 instance to use the RDS endpoint, username, and password.

Three-Tier Architecture

Step 6: Create EFS and Mount Images Folder

Create EFS File System:

- Navigate to EFS in the AWS Console.
- Create a new file system and associate it with the VPC.
- Configure mount targets in the private subnets.

Mount EFS on EC2:

- Install necessary mount utilities (sudo apt-get install -y nfs-common).
- Mount the EFS to /var/www/html/images.

Move Images:

- Transfer all images to the mounted EFS folder.

Auto Scaling and Load Balancing

Step 7: Setup Load Balancing and Auto Scaling

Create Load Balancer:

- Create an Application Load Balancer in the public subnet.

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- Configure listeners and target groups for the EC2 instance.

Create Auto Scaling Group:

- Set up an auto-scaling group that references the target group.
- Define scaling policies based on metrics like CPU utilization.

Disaster Recovery

Step 8: Setup Disaster Recovery

Replicate Architecture in Another Region:

- Repeat all steps in a secondary AWS region.

Configure Route 53:

- Set up Route 53 health checks and routing policies to manage traffic between the primary and secondary sites based on health checks.