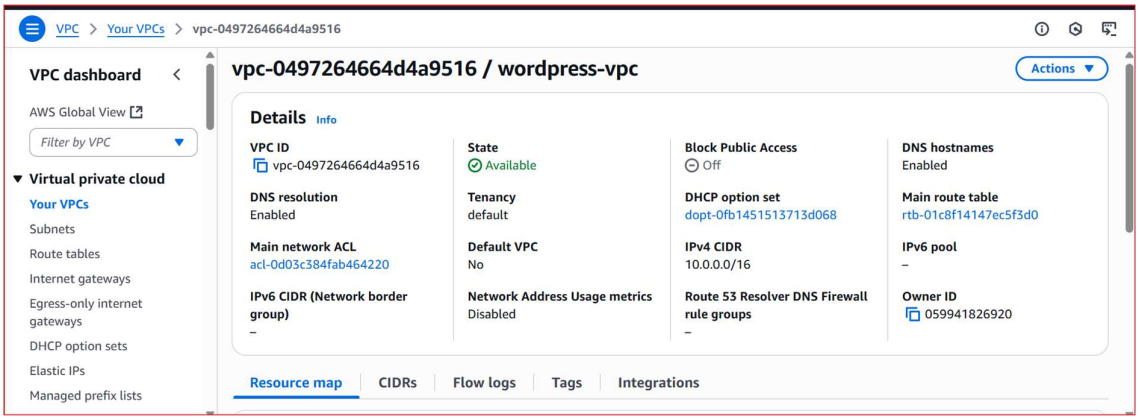
Architecture Overview

- **ECS Fargate**: Serverless container hosting for WordPress
- **RDS MySQL**: Managed database service
- **ALB**: Application Load Balancer for traffic distribution
- **VPC**: Virtual Private Cloud for network isolation
- **ECR**: Elastic Container Registry for WordPress image

Step 1: Create VPC and Networking

1.1 Create VPC

1. Go to **VPC Console** → **Create VPC**
2. Choose **VPC and more**
3. Configure:
    - **Name**: wordpress-vpc
    - **IPv4 CIDR**: 10.0.0.0/16
    - **Availability Zones**: 2
    - **Public subnets**: 2
    - **Private subnets**: 2
    - **NAT gateways**: 1 per AZ
    - **VPC endpoints**: None
4. Click **Create VPC**

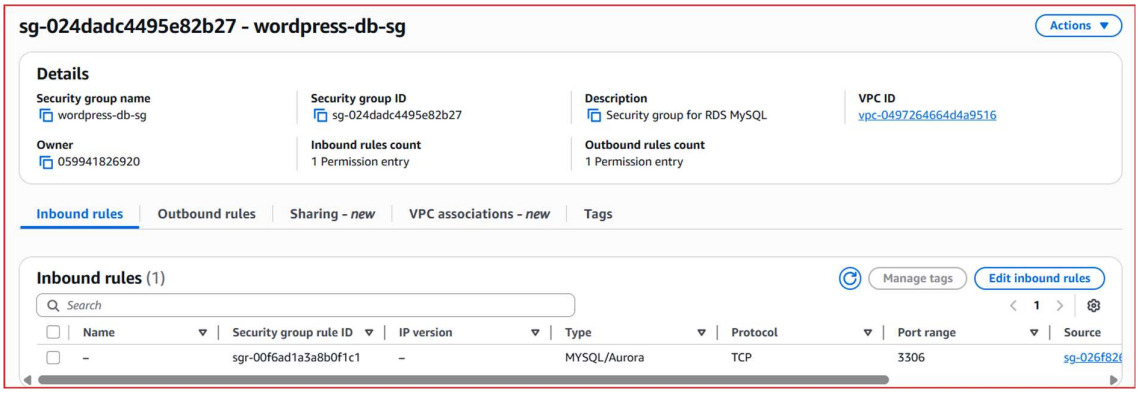


1.2 Create Security Groups

Database Security Group

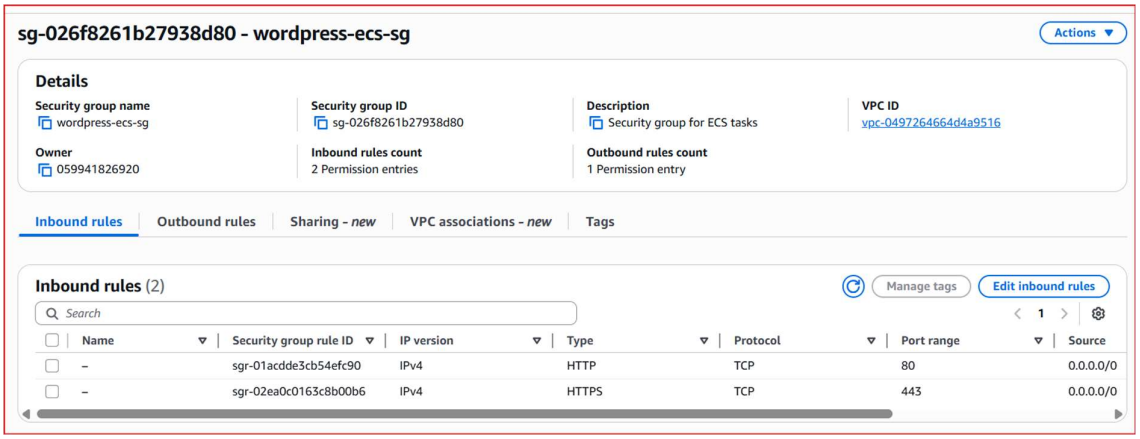
1. Go to **EC2 Console** → **Security Groups** → **Create Security Group**

2. Configure:
    - **Name**: wordpress-db-sg
    - **Description**: Security group for RDS MySQL
    - **VPC**: Select wordpress-vpc
3. **Inbound Rules**:
    - Type: MySQL/Aurora (3306)
    - Source: Custom (select ECS security group - we'll create this next)
4. Click **Create Security Group**



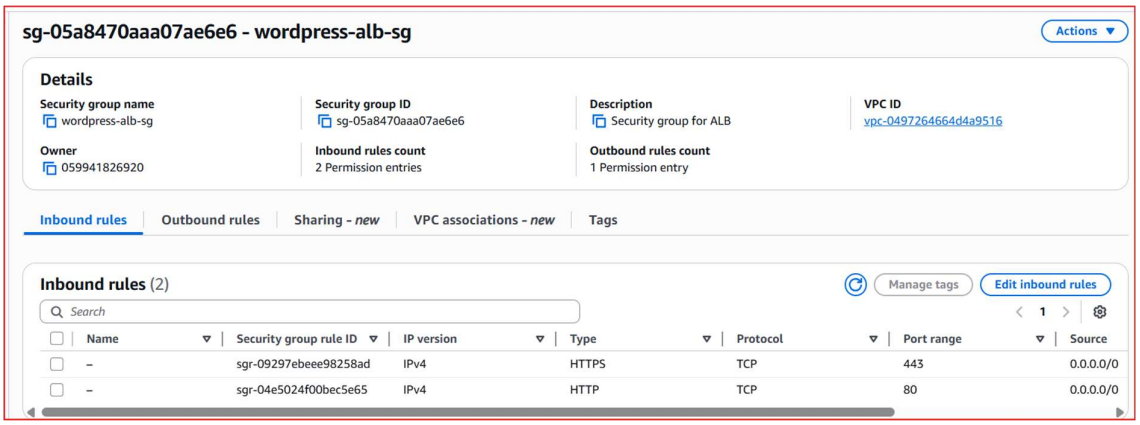
ECS Security Group

1. Create another security group:
    - **Name**: wordpress-ecs-sg
    - **Description**: Security group for ECS tasks
    - **VPC**: Select wordpress-vpc
2. **Inbound Rules**:
    - Type: HTTP (80), Source: Custom (select ALB security group - we will create this next)
    - Type: HTTPS (443), Source: Custom (select ALB security group - we will create this next)
3. Click **Create Security Group**



Load Balancer Security Group

1. Create another security group:
    - **Name**: wordpress-alb-sg
    - **Description**: Security group for ALB
    - **VPC**: Select wordpress-vpc
2. **Inbound Rules**:
    - Type: HTTP (80), Source: 0.0.0.0/0
    - Type: HTTPS (443), Source: 0.0.0.0/0
3. Click **Create Security Group**



1.3 Update Database and ECS Security Group

1. Go back to wordpress-db-sg
2. Edit inbound rules and change the source to wordpress-ecs-sg
3. Go back to wordpress-ecs-sg
4. Edit inbound rules and change the source to wordpress-alb-sg

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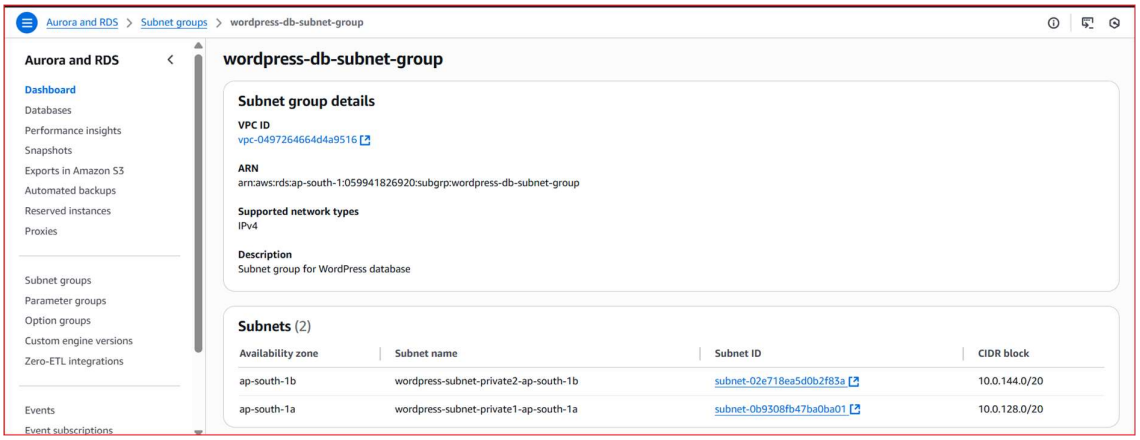
Step 2: Create RDS MySQL Database

2.1 Create DB Subnet Group

1. Go to **RDS Console → Subnet Groups → Create DB Subnet Group**
2. Configure:
    - **Name**: wordpress-db-subnet-group
    - **Description**: Subnet group for WordPress database
    - **VPC**: Select wordpress-vpc
    - **Availability Zones**: Select both AZs
    - **Subnets**: Select both private subnets
3. Click **Create**

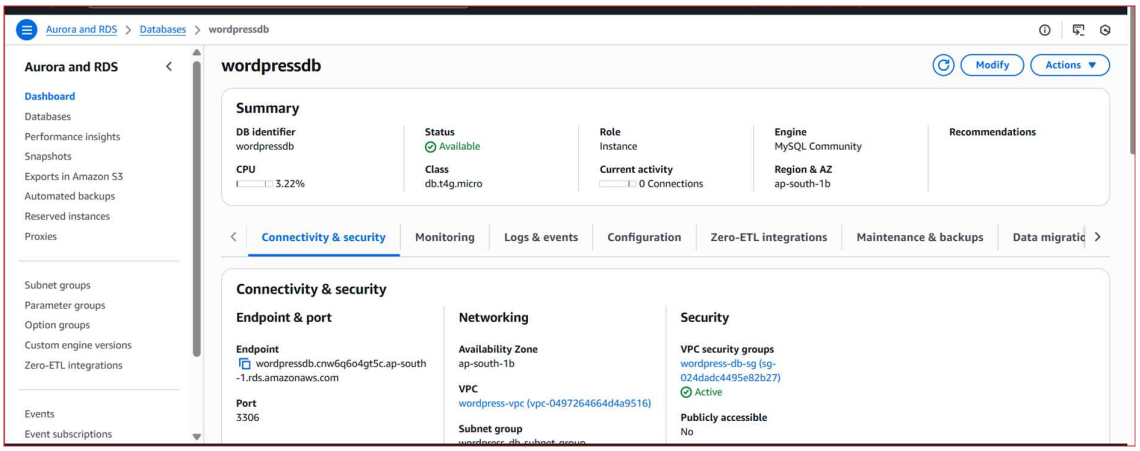


2.2 Create RDS Instance

1. Go to **RDS Console → Create Database**
2. **Engine Options**:
    - **Engine**: MySQL
    - **Version**: Latest (e.g., 8.0.35)
    - **Template**: Free tier (or Production for production use)
3. **Settings**:
    - **DB Instance Identifier**: wordpress-db
    - **Master Username**: admin
    - **Master Password**: Create a secure password (save this!)
4. **DB Instance Class**:
    - Free tier: db.t3.micro
    - Production: db.t3.small or larger

5. **Storage**:
    - Storage Type: General Purpose SSD (gp2)
    - Allocated Storage: 20 GB (minimum)
6. **Connectivity**:
    - **VPC**: wordpress-vpc
    - **DB Subnet Group**: wordpress-db-subnet-group
    - **VPC Security Groups**: wordpress-db-sg
    - **Availability Zone**: No preference
    - **Public Access**: No
7. **Additional Configuration**:
    - **Initial Database Name**: wordpress
    - **Backup Retention**: 7 days
    - **Monitoring**: Enable Enhanced Monitoring (optional)
8. Click **Create Database**

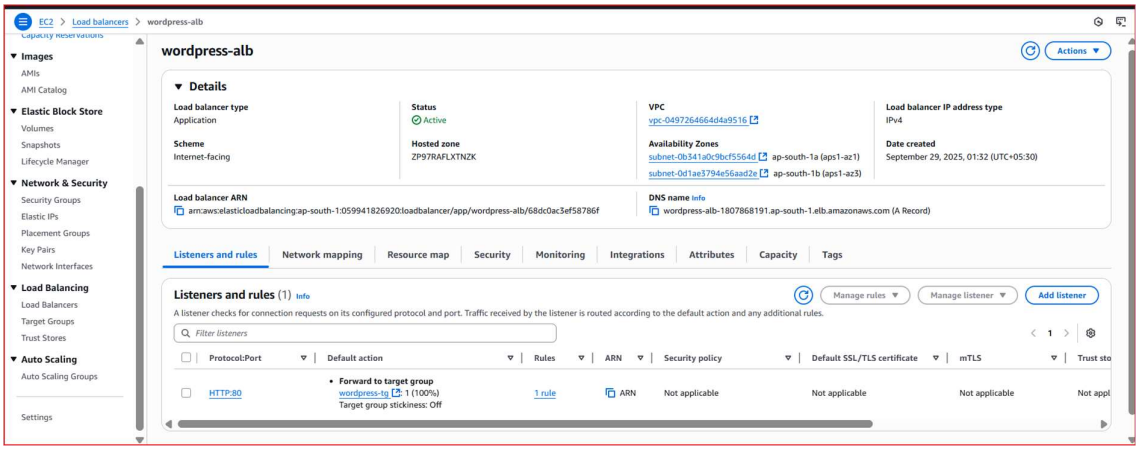
Note: Database creation takes 10-15 minutes. Note down the endpoint when ready.



Step 3: Create Application Load Balancer

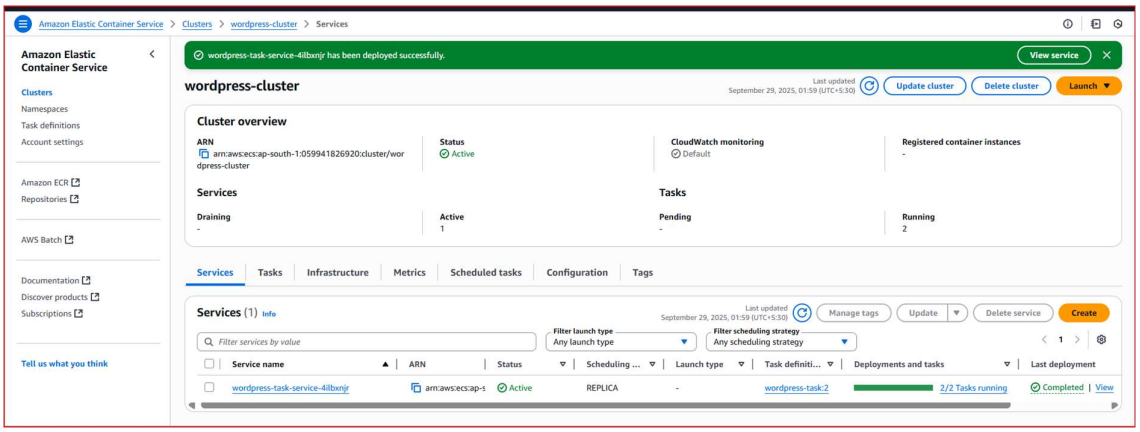
1. Go to **EC2 Console → Load Balancers → Create Load Balancer**
2. Choose **Application Load Balancer**
3. **Basic Configuration**:
    - **Name**: wordpress-alb
    - **Scheme**: Internet-facing
    - **IP Address Type**: IPv4

4. **Network Mapping**:
    - **VPC**: wordpress-vpc
    - **Mappings**: Select both public subnets
5. **Security Groups**: Select wordpress-alb-sg
6. **Listeners and Routing**:
    - **Protocol**: HTTP, **Port**: 80
    - **Default Action**: Create new target group
        - **Target Group Name**: wordpress-tg
        - **Target Type**: IP
        - **Protocol**: HTTP, **Port**: 80
        - **VPC**: wordpress-vpc
        - **Health Check Path**: /
7. Click **Create Load Balancer**



Step 4: Create ECS Cluster

1. Go to **ECS Console → Clusters → Create Cluster**
2. **Cluster Configuration**:
    - **Cluster Name**: wordpress-cluster
    - **Infrastructure**: AWS Fargate (serverless)
3. **Monitoring**: Enable Container Insights (optional)
4. Click **Create**



Step 5: Create Task Definition

5.1 Create Task Definition

1. Go to **ECS Console → Task Definitions → Create New Task Definition**
2. **Task Definition Configuration**:
    - **Task Definition Family**: wordpress-task
    - **Launch Type**: AWS Fargate
    - **Operating System**: Linux/X86_64
    - **CPU**: 0.5 vCPU (512)
    - **Memory**: 1 GB (1024)
    - **Task Role**: ecsTaskExecutionRole (create if doesn't exist)
    - **Task Execution Role**: ecsTaskExecutionRole

5.2 Configure Container

1. **Container Details**:
    - **Name**: wordpress
    - **Image URI**: wordpress:latest
    - **Port Mappings**:
        - Container Port: 80
        - Protocol: TCP
        - Port Name: wordpress-80-tcp
2. **Environment Variables**:

WORDPRESS_DB_HOST=<RDS_ENDPOINT>:3306

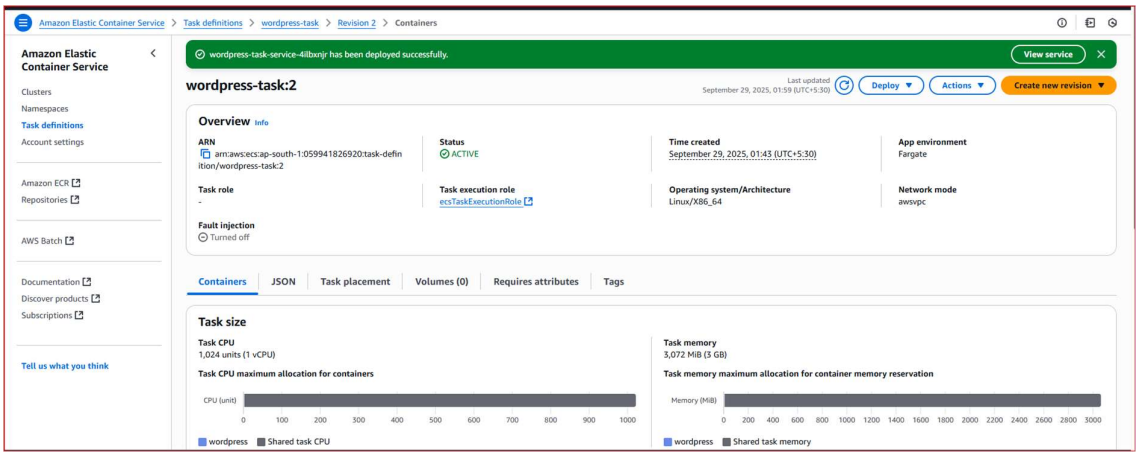
WORDPRESS_DB_USER=admin

WORDPRESS_DB_PASSWORD=<YOUR_DB_PASSWORD>

WORDPRESS_DB_NAME=wordpress

Replace <RDS_ENDPOINT> with your actual RDS endpoint and <YOUR_DB_PASSWORD> with your database password.

3. **Logging** (Optional):
    - Enable **Use log collection**
    - **Log Driver**: awslogs
    - **Log Group**: Create new: /ecs/wordpress-task
4. Click **Create**

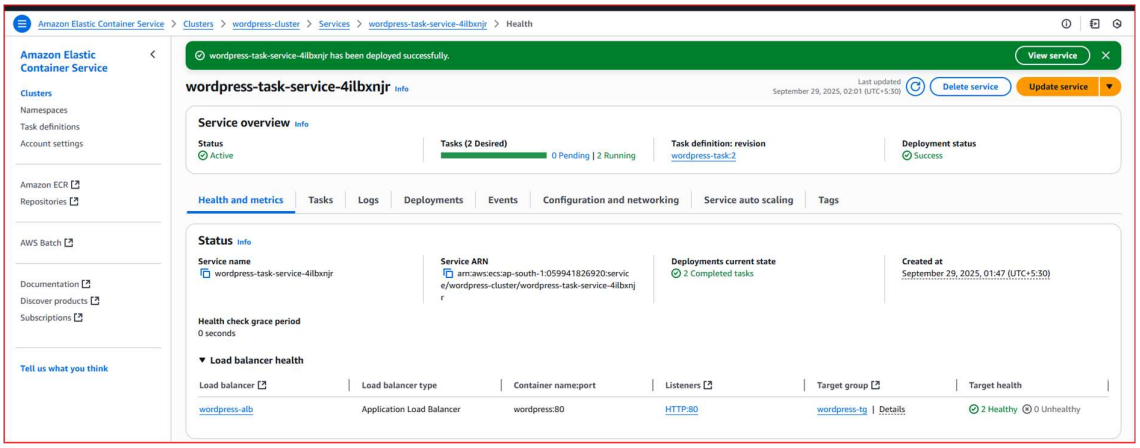


Step 6: Create ECS Service

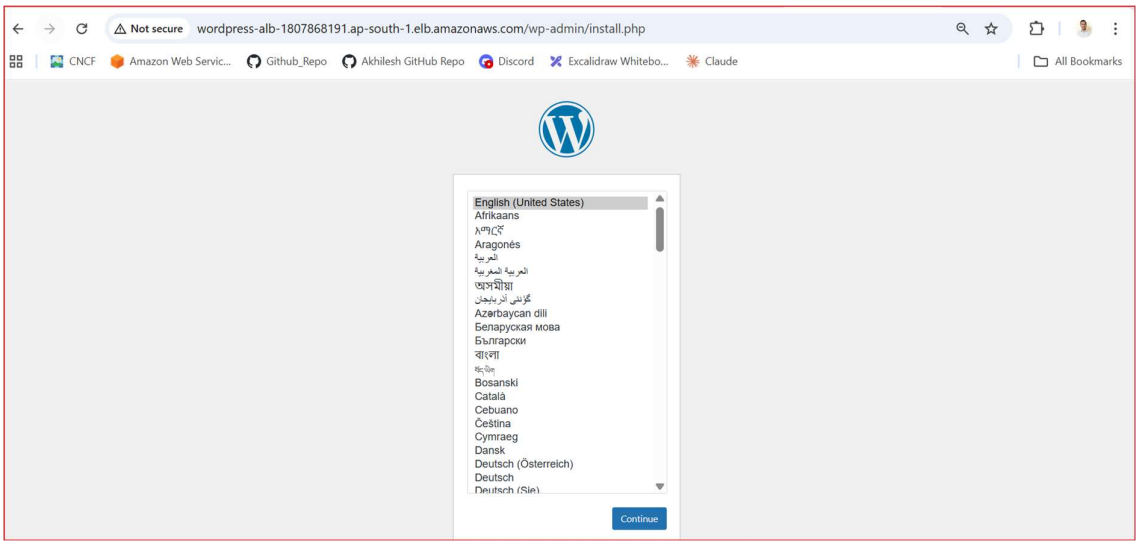
1. Go to **ECS Console** → **Clusters** → Select wordpress-cluster
2. **Services** tab → **Create Service**
3. **Deployment Configuration**:
    - **Application Type**: Service
    - **Task Definition**: Select wordpress-task
    - **Service Name**: wordpress-service
    - **Desired Tasks**: 2
4. **Networking**:
    - **VPC**: wordpress-vpc
    - **Subnets**: Select private subnets
    - **Security Groups**: Select wordpress-ecs-sg

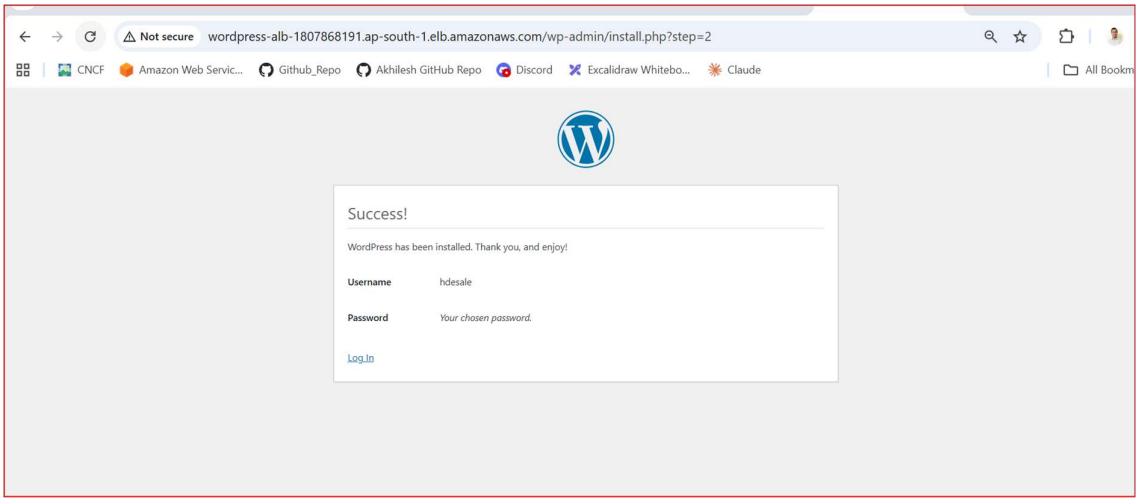
- **Public IP**: Enabled (required for Fargate in private subnets with internet access)

5. **Load Balancing**:
   - **Load Balancer Type**: Application Load Balancer
   - **Load Balancer**: Select wordpress-alb
   - **Target Group**: Select wordpress-tg
   - **Container**: wordpress 80:80
6. Click **Create Service**



Step 7: Access WordPress using ALB DNS





The Security Flow :

Internet → Load Balancer → WordPress Containers → Database

✓ Allowed ✓ Allowed ✓ Allowed

Internet → Database (Direct)

❌ BLOCKED by wordpress-db-sg