Brain-Task-App Documentation

Step 1: Cloning the repository

- git clone https://github.com/Vennilavan12/Brain-Tasks-App.git

Step 2: Dockerize the application using dockfile

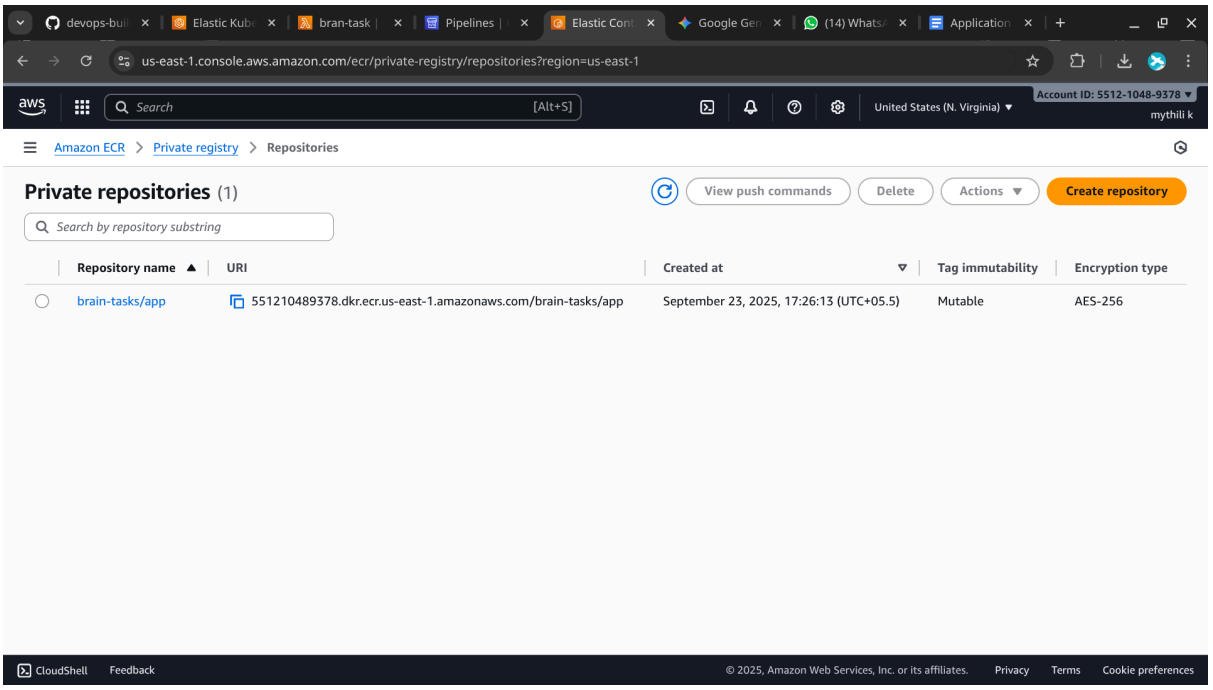
```
# Use a lightweight Nginx image to serve the static files.
FROM nginx:alpine

 # Copy the static files from the 'dist' directory into the Nginx web root.
COPY ./dist /usr/share/nginx/html

# Expose port 80 to the host machine.
EXPOSE 80

# The default command for the Nginx image starts the server.
CMD ["nginx", "-g", "daemon off;"]
```

Step 3: Build and run locally

- docker build -t brain-tasks-app .
- docker run -p 80:3000 brain-tasks-app

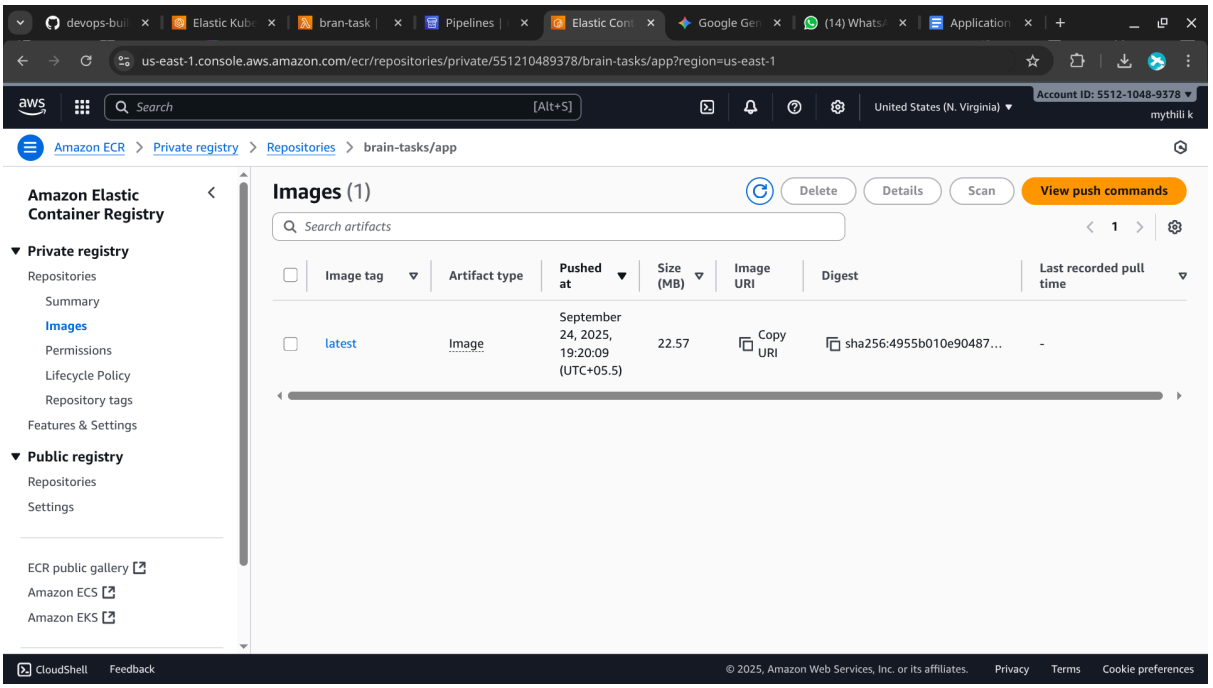
Step 4: Create a ECR repository

- aws ecr create-repository --repository-name brain-tasks-app



Step 5: Tag and push the image

- aws ecr get-login-password --region <your-region> | docker login --username AWS --password-stdin <aws_account_id>.dkr.ecr.<region>.amazonaws.com
- docker tag brain-tasks-app <your-ecr-uri>:latest
- docker push <your-ecr-uri>:latest

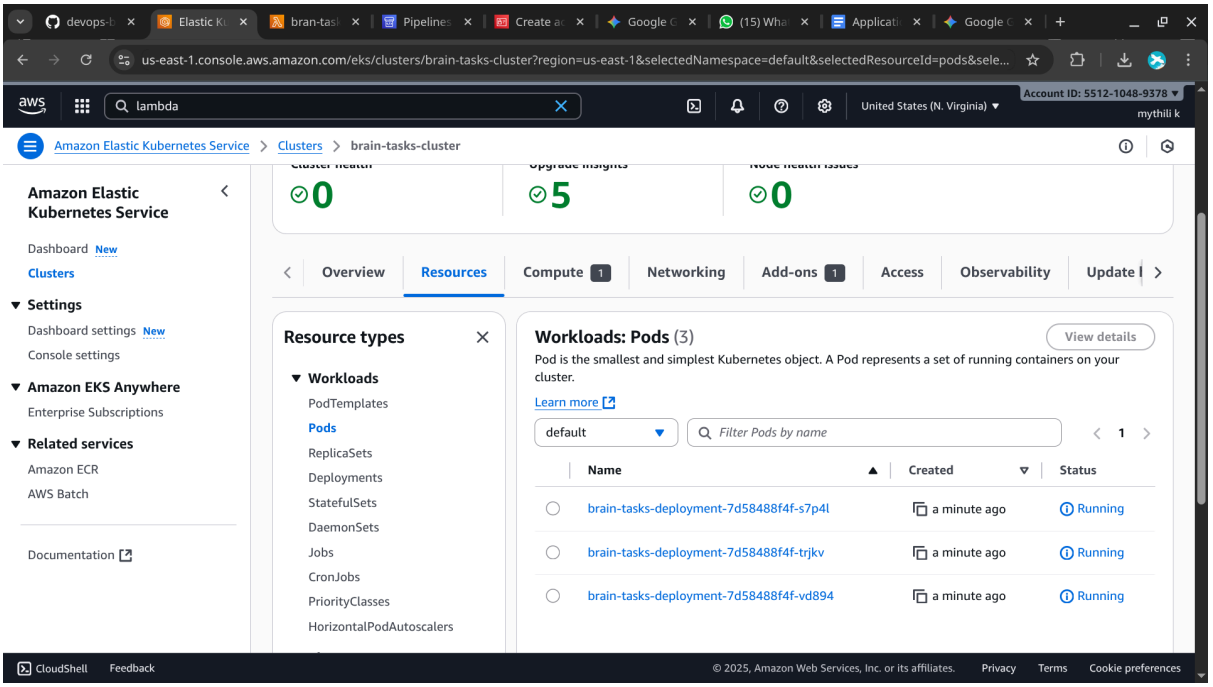


Step 6: Creation of AWS EKS cluster and verifying Cluster

Set up an EKS cluster. Ensure the IAM role for your worker nodes has permissions to create AWS Load Balancers. The EKS cluster must also be configured to allow access from your Lambda function.

- eksctl create cluster --name brain-tasks-cluster --region <your-region> --nodegroup-name brain-tasks-nodes --node-type t3.medium --nodes 2

```
t configure the requested permissions; the recommended way to provide IAM permissions for "vpc-cni" addon is via pod identity associa
tions; after addon creation is completed, add all recommended policies to the config file, under `addon.PodIdentityAssociations`, and
 run `eksctl update addon`
2025-09-26 21:24:47 [i]  creating addon: vpc-cni
2025-09-26 21:24:48 [i]  successfully created addon: vpc-cni
2025-09-26 21:24:48 [i]  creating addon: kube-proxy
2025-09-26 21:24:48 [i]  successfully created addon: kube-proxy
2025-09-26 21:24:49 [i]  creating addon: coredns
2025-09-26 21:24:49 [i]  successfully created addon: coredns
2025-09-26 21:26:51 [i]  building managed nodegroup stack "eksctl-my-task-cluster-nodegroup-standard-workers"
2025-09-26 21:26:51 [i]  deploying stack "eksctl-my-task-cluster-nodegroup-standard-workers"
2025-09-26 21:26:51 [i]  waiting for CloudFormation stack "eksctl-my-task-cluster-nodegroup-standard-workers"
2025-09-26 21:27:21 [i]  waiting for CloudFormation stack "eksctl-my-task-cluster-nodegroup-standard-workers"
2025-09-26 21:28:21 [i]  waiting for CloudFormation stack "eksctl-my-task-cluster-nodegroup-standard-workers"
2025-09-26 21:29:44 [i]  waiting for CloudFormation stack "eksctl-my-task-cluster-nodegroup-standard-workers"
2025-09-26 21:29:44 [i]  waiting for the control plane to become ready
2025-09-26 21:29:46 [✔]  saved kubeconfig as "/root/.kube/config"
2025-09-26 21:29:46 [i]  no tasks
2025-09-26 21:29:46 [✔]  all EKS cluster resources for "my-task-cluster" have been created
2025-09-26 21:29:46 [i]  nodegroup "standard-workers" has 2 node(s)
2025-09-26 21:29:46 [i]  node "ip-192-168-19-224.ap-south-1.compute.internal" is ready
2025-09-26 21:29:46 [i]  node "ip-192-168-58-97.ap-south-1.compute.internal" is ready
2025-09-26 21:29:46 [i]  waiting for at least 2 node(s) to become ready in "standard-workers"
2025-09-26 21:29:46 [i]  nodegroup "standard-workers" has 2 node(s)
2025-09-26 21:29:46 [i]  node "ip-192-168-19-224.ap-south-1.compute.internal" is ready
2025-09-26 21:29:46 [i]  node "ip-192-168-58-97.ap-south-1.compute.internal" is ready
2025-09-26 21:29:46 [✔]  created 1 managed nodegroup(s) in cluster "my-task-cluster"
2025-09-26 21:29:48 [i]  kubectl command should work with "/root/.kube/config", try 'kubectl get nodes'
2025-09-26 21:29:48 [✔]  EKS cluster "my-task-cluster" in "ap-south-1" region is ready
root@fedora-bubu:/home/bubu/Pictures/Brain-Tasks-App#
```



Step 7: Kubernetes Files

deployment.yaml

```
apiVersion: apps/v1
kind: Deployment
metadata:
    name: brain-tasks-deployment
Spec:
  replicas: 3
   selector:
```

```
      matchLabels:
        app: brain-tasks-app
  template:
      metadata:
        labels:
          app: brain-tasks-app
  spec:
    containers:
    - name: brain-tasks-app
     image:
551210489378.dkr.ecr.us-east-1.amazonaws.com/brain-tasks/app:latest
    ports:
    - containerPort: 80
```

Service.yaml

```
apiVersion: v1
kind: Service
metadata:
  name: brain-tasks-service
  annotations:
      service.beta.kubernetes.io/aws-load-balancer-type: "external"
      service.beta.kubernetes.io/aws-load-balancer-target-group-arn:
"arn:aws:elasticloadbalancing:us-east-1:551210489378:loadbalancer/app/lb/0e93f76c2d388a
24"
spec:
    type: LoadBalancer
     selector:
       app: brain-tasks-app
 ports:
       - protocol: TCP
         port: 80
        targetPort: 80
```

Step 8: AWS Codebuild files

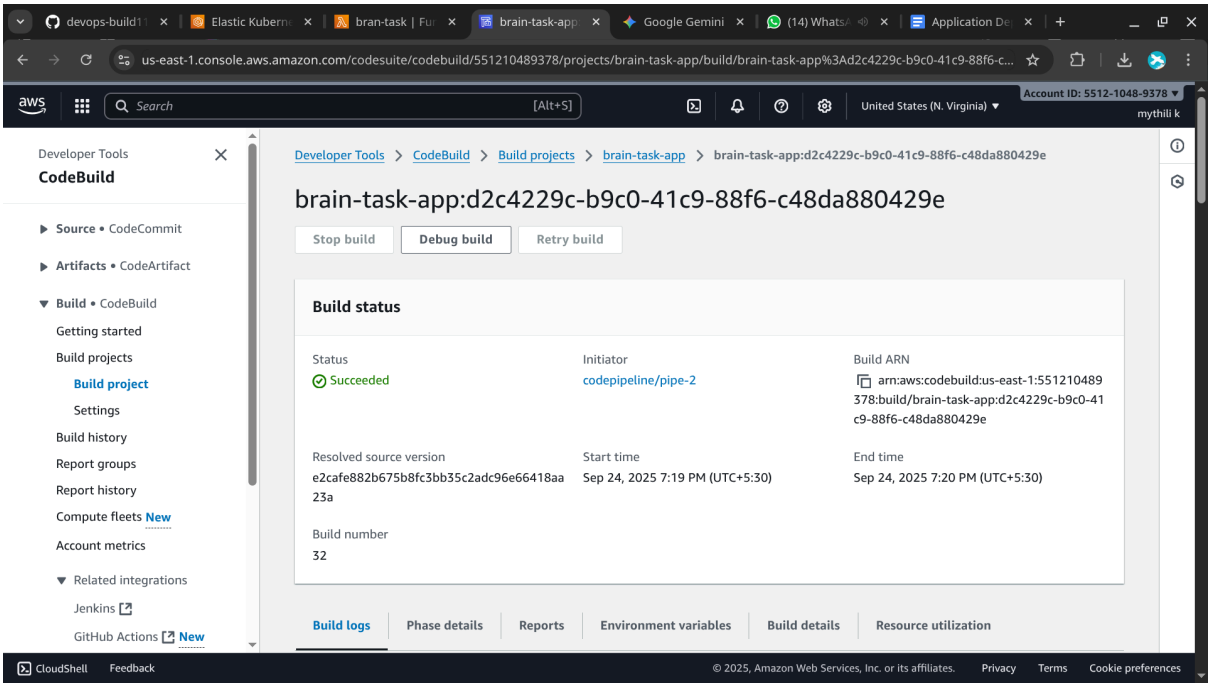
- Source: Link it to this GitHub repository.
- Environment: Choose a managed image like Amazon Linux 2.
- Buildspec: Use the buildspec.yml file from the repository to define the Docker build and artifact creation process.
- Environment Variables: Define the following variables: AWS_ACCOUNT_ID, AWS_DEFAULT_REGION, and IMAGE_REPO_NAME.

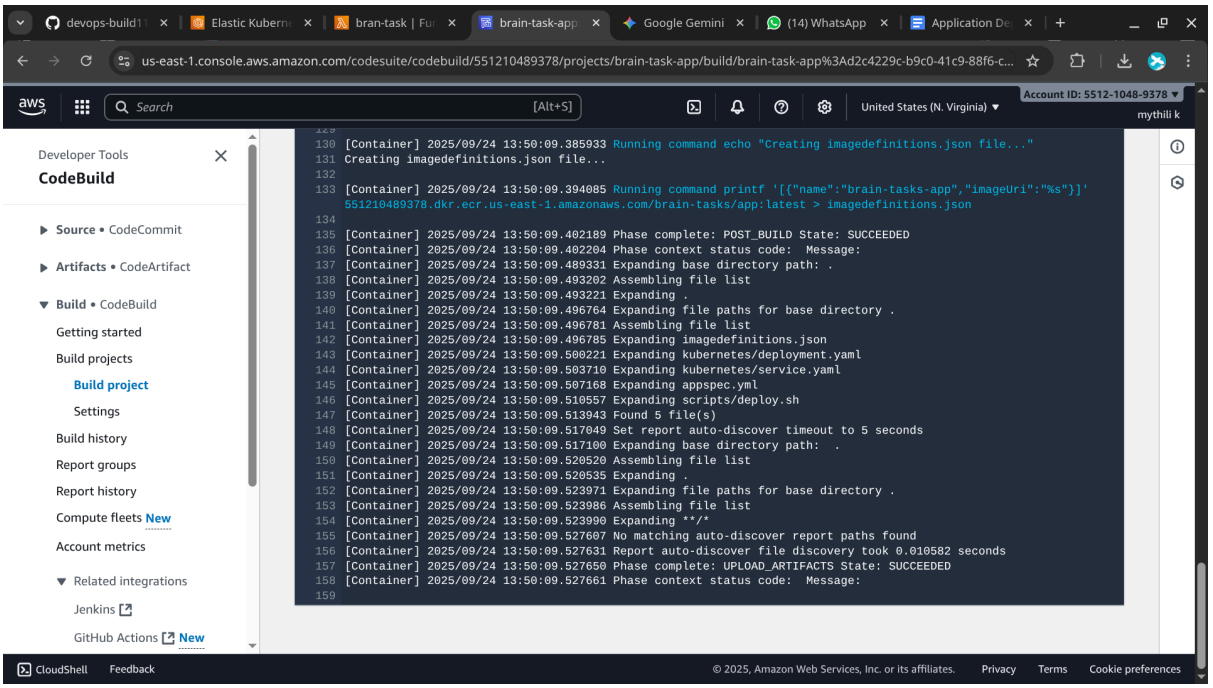
buildspec.yml

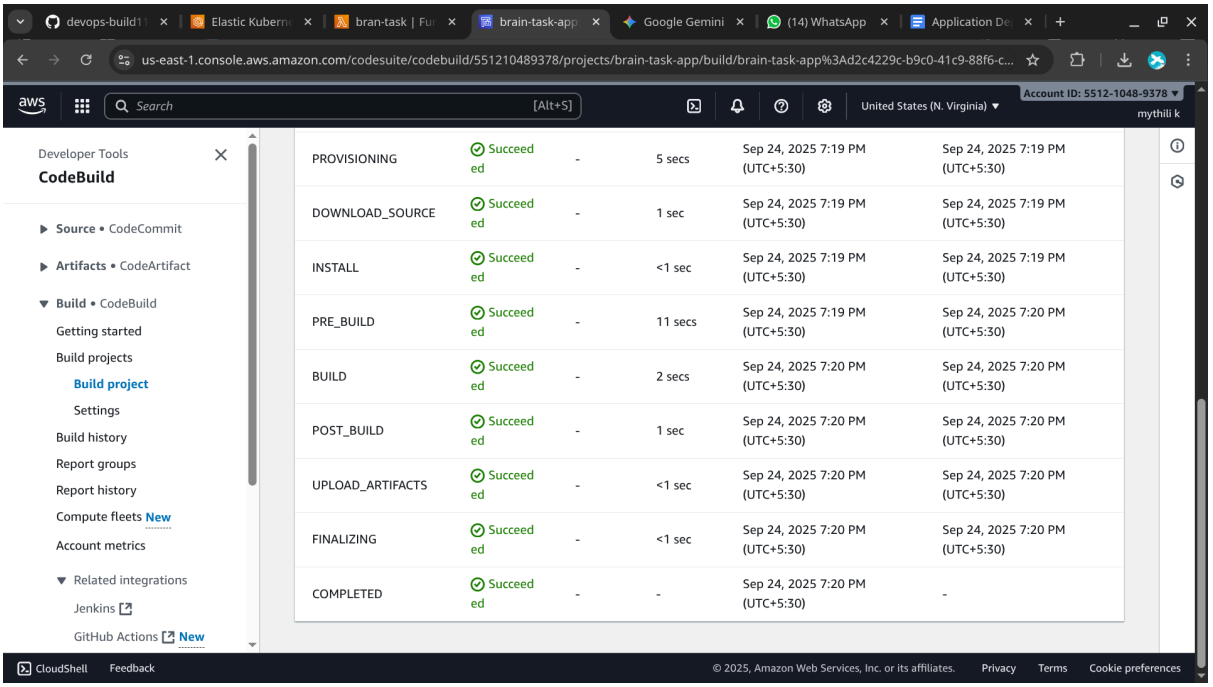
```
version: 0.2

phases:
  pre_build:
    commands:
      - echo "Logging in to Amazon ECR..."
      - aws ecr get-login-password --region us-east-1 | docker login
--username AWS --password-stdin 551210489378.dkr.ecr.us-east-1.amazonaws.com

build:
    commands:
      - echo "Building the Docker image..."
      - docker build -t brain-tasks-app .
      - docker tag brain-tasks-app:latest
551210489378.dkr.ecr.us-east-1.amazonaws.com/brain-tasks/app:latest

post_build:
    commands:
      - echo "Pushing the Docker image to ECR..."
      - docker push
551210489378.dkr.ecr.us-east-1.amazonaws.com/brain-tasks/app:latest
      - echo "Creating imagedefinitions.json file..."
      - printf '[{"name":"brain-tasks-app","imageUri":"%s"}]'
551210489378.dkr.ecr.us-east-1.amazonaws.com/brain-tasks/app:latest >
imagedefinitions.json

artifacts:
    files:
  - 'imagedefinitions.json'
      - 'kubernetes/deployment.yaml'
      - 'kubernetes/service.yaml'
      - 'appspec.yml'
      - 'scripts/deploy.sh'
```

appspec.yml

```
version: 0.0
os: linux
hooks:
BeforeInstall:
    - location: scripts/deploy.sh
      timeout: 300
      runas: root
```


us-east-1.console.aws.amazon.com/codesuite/codebuild/551210489378/projects/brain-task-app/build/brain-task-app%3Ad2c4229c-b9c0-41c9-88f6-c...
Developer Tools > CodeBuild > Build projects > brain-task-app > brain-task-app:d2c4229c-b9c0-41c9-88f6-c48da880429e
brain-task-app:d2c4229c-b9c0-41c9-88f6-c48da880429e
Stop build
Debug build
Retry build
Build status
Status
Succeeded
Initiator
codepipeline/pipe-2
Build ARN
arn:aws:codebuild:us-east-1:551210489378:build/brain-task-app:d2c4229c-b9c0-41c9-88f6-c48da880429e
Resolved source version
e2cafe882b675b8fc3bb35c2adc96e66418aa23a
Start time
Sep 24, 2025 7:19 PM (UTC+5:30)
End time
Sep 24, 2025 7:20 PM (UTC+5:30)
Build number
32
Build logs
Phase details
Reports
Environment variables
Build details
Resource utilization


us-east-1.console.aws.amazon.com/codesuite/codebuild/551210489378/projects/brain-task-app/build/brain-task-app%3Ad2c4229c-b9c0-41c9-88f6-c...
130 [Container] 2025/09/24 13:50:09.385933 Running command echo "Creating imagedefinitions.json file..."
131 Creating imagedefinitions.json file...
132
133 [Container] 2025/09/24 13:50:09.394085 Running command printf '[{"name":"brain-tasks-app","imageUri":"%s"}]' 551210489378.dkr.ecr.us-east-1.amazonaws.com/brain-tasks/app:latest > imagedefinitions.json
134
135 [Container] 2025/09/24 13:50:09.402189 Phase complete: POST_BUILD State: SUCCEEDED
136 [Container] 2025/09/24 13:50:09.402204 Phase context status code: Message:
137 [Container] 2025/09/24 13:50:09.489331 Expanding base directory path: .
138 [Container] 2025/09/24 13:50:09.493202 Assembling file list
139 [Container] 2025/09/24 13:50:09.493221 Expanding .
140 [Container] 2025/09/24 13:50:09.496764 Expanding file paths for base directory .
141 [Container] 2025/09/24 13:50:09.496781 Assembling file list
142 [Container] 2025/09/24 13:50:09.496785 Expanding imagedefinitions.json
143 [Container] 2025/09/24 13:50:09.500221 Expanding kubernetes/deployment.yaml
144 [Container] 2025/09/24 13:50:09.503710 Expanding kubernetes/service.yaml
145 [Container] 2025/09/24 13:50:09.507168 Expanding appspec.yml
146 [Container] 2025/09/24 13:50:09.510557 Expanding scripts/deploy.sh
147 [Container] 2025/09/24 13:50:09.513943 Found 5 file(s)
148 [Container] 2025/09/24 13:50:09.517049 Set report auto-discover timeout to 5 seconds
149 [Container] 2025/09/24 13:50:09.517100 Expanding base directory path: .
150 [Container] 2025/09/24 13:50:09.520520 Assembling file list
151 [Container] 2025/09/24 13:50:09.520535 Expanding .
152 [Container] 2025/09/24 13:50:09.523971 Expanding file paths for base directory .
153 [Container] 2025/09/24 13:50:09.523986 Assembling file list
154 [Container] 2025/09/24 13:50:09.523990 Expanding **/*
155 [Container] 2025/09/24 13:50:09.527607 No matching auto-discover report paths found
156 [Container] 2025/09/24 13:50:09.527631 Report auto-discover file discovery took 0.010582 seconds
157 [Container] 2025/09/24 13:50:09.527650 Phase complete: UPLOAD_ARTIFACTS State: SUCCEEDED
158 [Container] 2025/09/24 13:50:09.527661 Phase context status code: Message:
159



Step 9: Deployment using Lambda function

- Runtime: Python 3.9
- IAM Role: The function's execution role must have permissions for s3:GetObject on the CodePipeline artifact bucket, and full administrative access to your EKS cluster (eks:*).

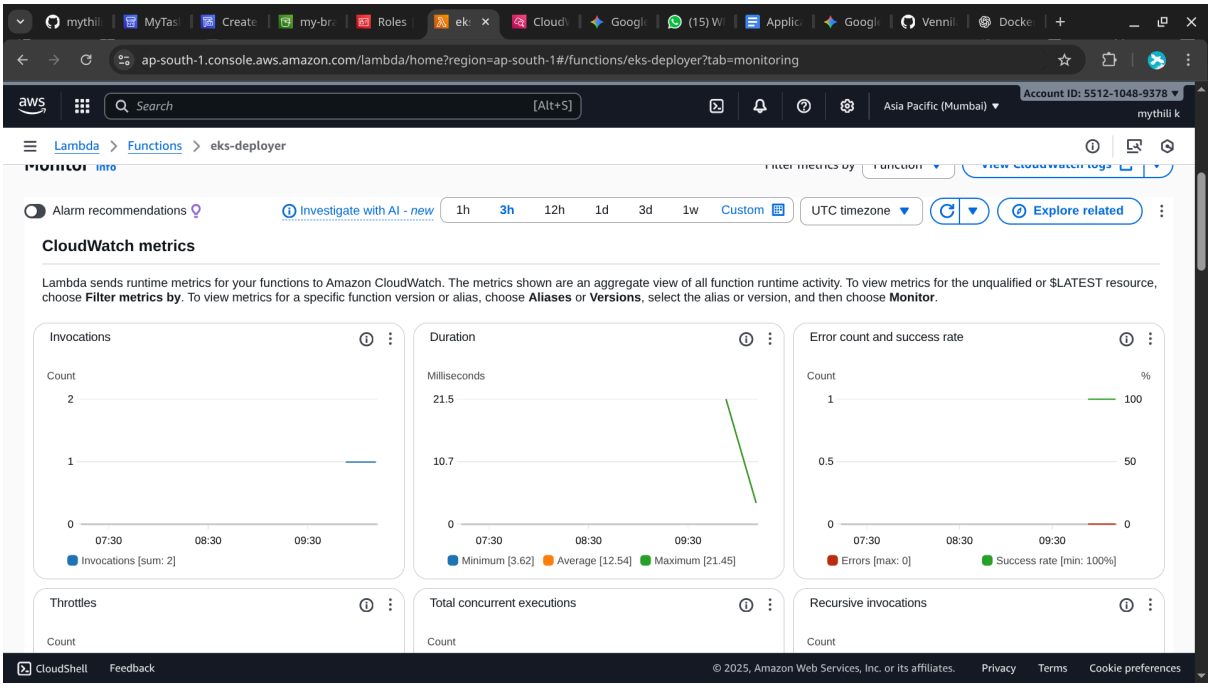
Lambda_function.py

```
import os
import subprocess
import logging

logger = logging.getLogger()
logger.setLevel(logging.INFO)

def handler(event, context):
    try:
        logger.info("Starting Lambda deployment function...")

        # Get environment variables from Lambda configuration
        cluster_name = os.environ.get("EKS_CLUSTER_NAME")
        aws_region = os.environ.get("AWS_REGION")

        # 1. Download and configure kubectl
        logger.info("Downloading and configuring kubectl...")
        subprocess.run(
```

```
        ["curl", "-o", "/tmp/kubectl",

"https://s3.us-west-2.amazonaws.com/amazon-eks/1.24/2022-09-21/bin/linux/amd64/kubectl
"]
    )
    os.chmod("/tmp/kubectl", 0o755)
    os.environ["PATH"] = os.environ["PATH"] + ":/tmp"

    # 2. Configure kubeconfig for EKS cluster access
    logger.info("Configuring kubeconfig...")
    subprocess.run([
        "aws", "eks", "update-kubeconfig",
        "--name", cluster_name,
        "--region", aws_region
    ], check=True)

    # 3. Execute the custom deployment script from the artifacts
    logger.info("Executing custom deployment script...")
    subprocess.run(["chmod", "+x", "./scripts/deploy.sh"], check=True)
    subprocess.run(["./scripts/deploy.sh"], check=True)

    logger.info("Deployment successful.")
    return {"statusCode": 200, "body": "Deployment successful"}

except subprocess.CalledProcessError as e:
    logger.error(f"Deployment failed: {e}")
    return {"statusCode": 500, "body": f"Deployment failed: {e.output}"}
except Exception as e:
    logger.error(f"An unexpected error occurred: {e}")
    return {"statusCode": 500, "body": "An unexpected error occurred"}
```

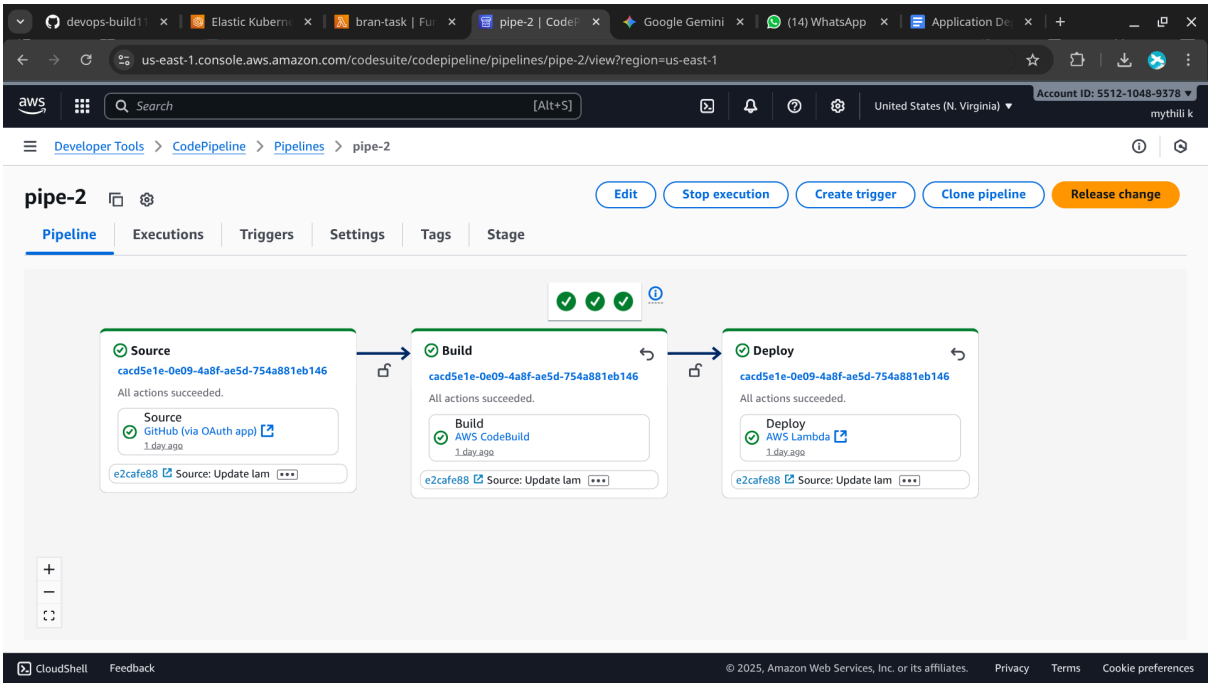
Step 10: Deploying application via Lambda

```
#!/bin/bash

# Apply Kubernetes deployment and service
kubectl apply -f kubernetes/deployment.yaml
kubectl apply -f kubernetes/service.yaml

# Wait for the deployment to be ready
kubectl rollout status deployment/brain-tasks-deployment --namespace default
```



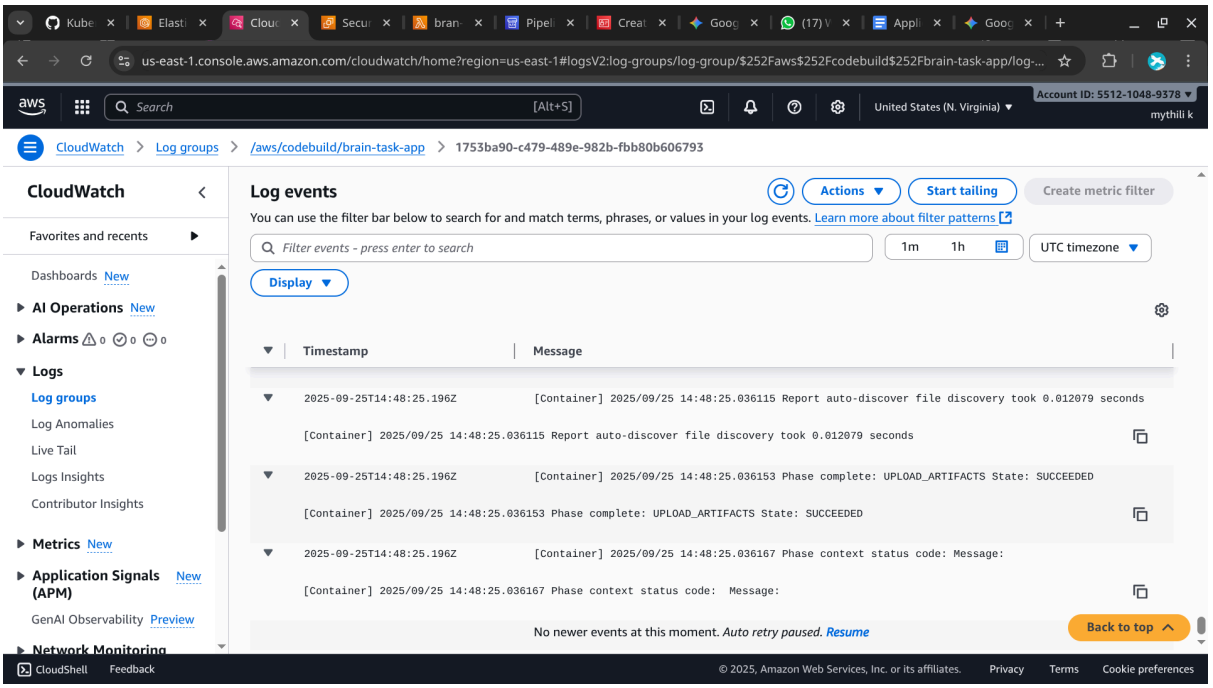
Step 11: Setting up Code-Pipeline

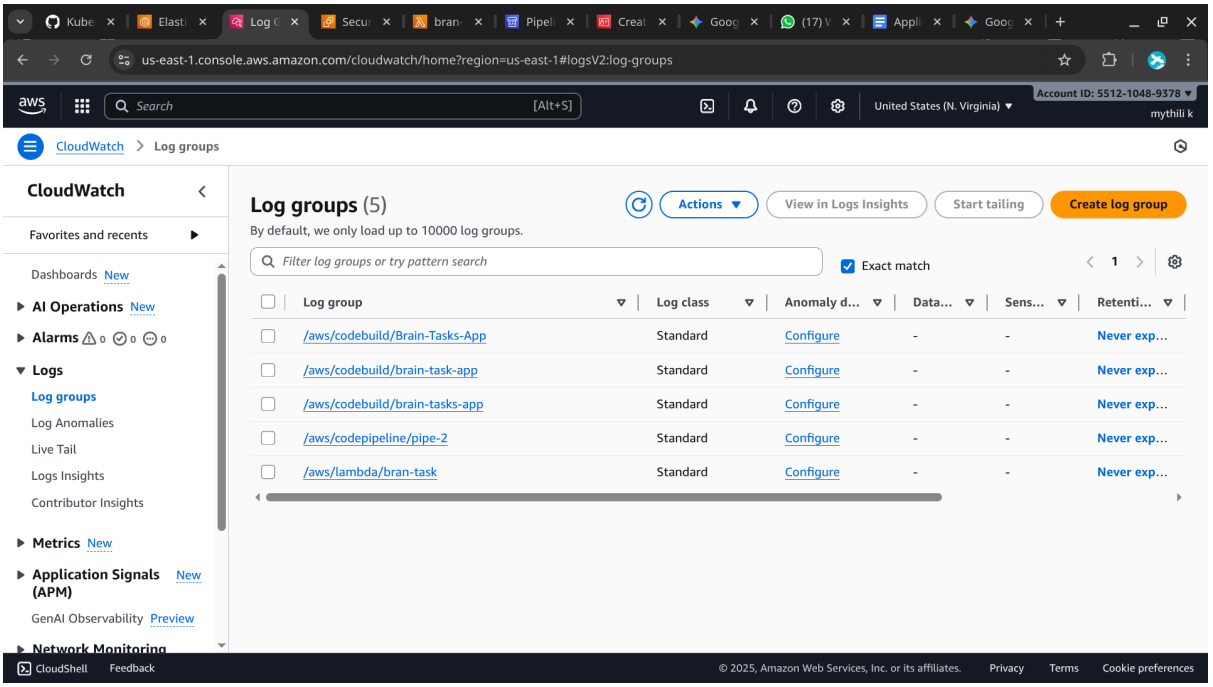
- Source Stage: Select GitHub and link to this repository.
- Build Stage: Choose the CodeBuild project you created.
- Deploy Stage: Select AWS Lambda as the action provider and choose the Lambda function you created. Configure the input artifact to be the output from the "Build" stage.



Step 12: Monitoring

- Enable logs in codebuild and lambda
- Use kubectl logs for pods logs in EKS
- Use kubectl get svc to get loadbalancer url



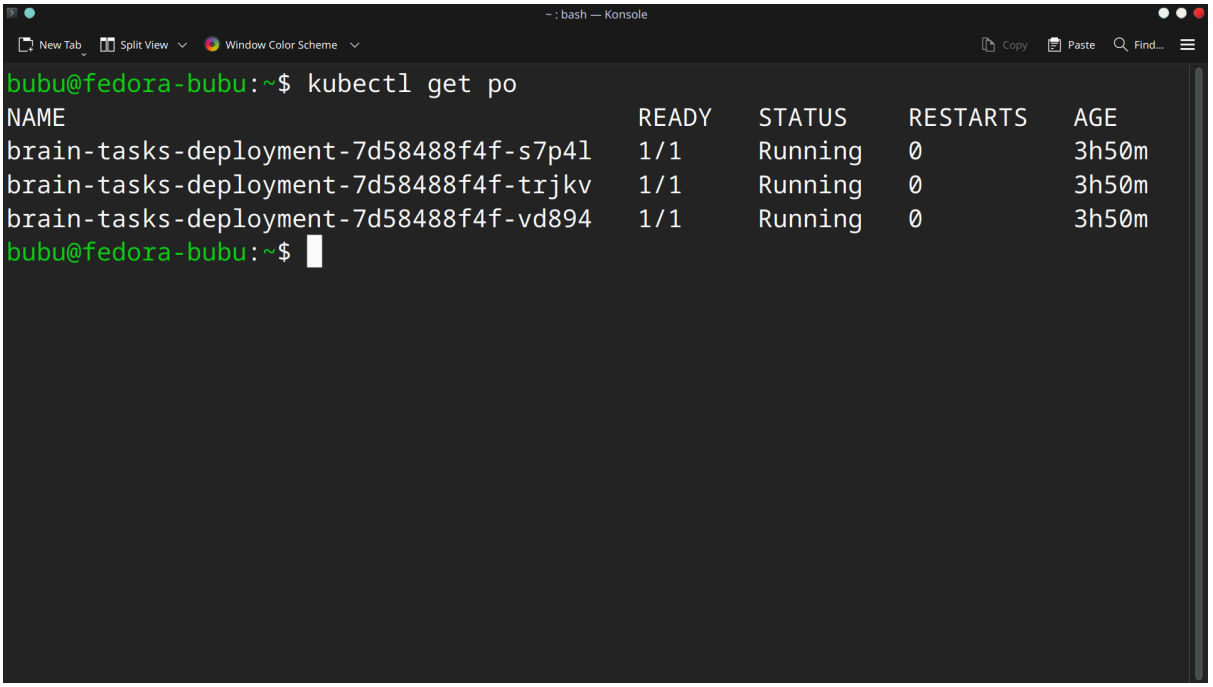


Step 13: Git Commands

- git init
- git remote add origin https://github.com/yourusername/brain-tasks-app-deploy.git
- git add .
- git commit -m "Initial commit with deployment"
- git push -u origin main

Step 14: Output

After a successful deployment, the AWS Load Balancer ARN for the application can be found in the EC2 console.



~ : bash — Konsole

New Tab Split View Window Color Scheme Copy Paste Find...

```
bubu@fedora-bubu:~$ kubectl get svc
NAME                 TYPE           CLUSTER-IP      EXTERNAL-IP
                     PORT(S)        AGE
brain-tasks-service  LoadBalancer   10.100.11.106   ae773b9e401834694b69f66e8d12f3ab-83a60a31650ca33d.elb.us-e
ast-1.amazonaws.com  80:31762/TCP   109s
kubernetes           ClusterIP      10.100.0.1      <none>
                     443/TCP        2d5h
bubu@fedora-bubu:~$
```

Not secure ae773b9e401834694b69f66e8d12f3ab-83a60a31650ca33d.elb.us-east-1.amazonaws.com

Brain Tasks

Organize your thoughts, simplify your life

+ Create Task

Search tasks...

All Tasks | Pending | Completed | Priority

No tasks found!

Create your first task to get started