Deploy and Maintain Containerized Applications on AWS

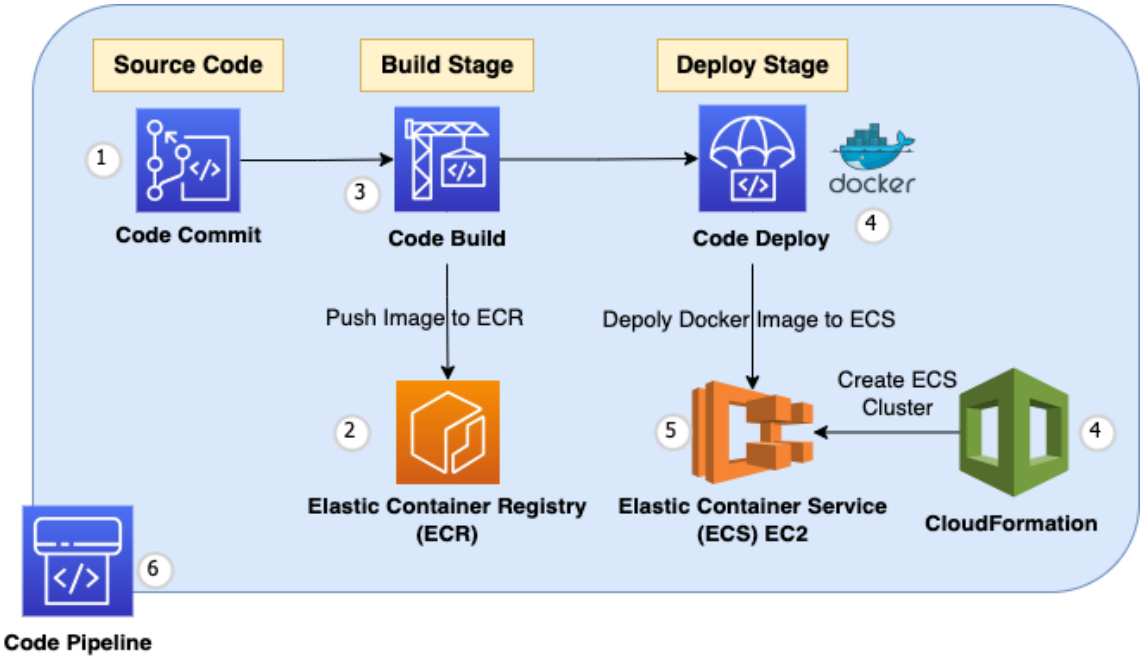
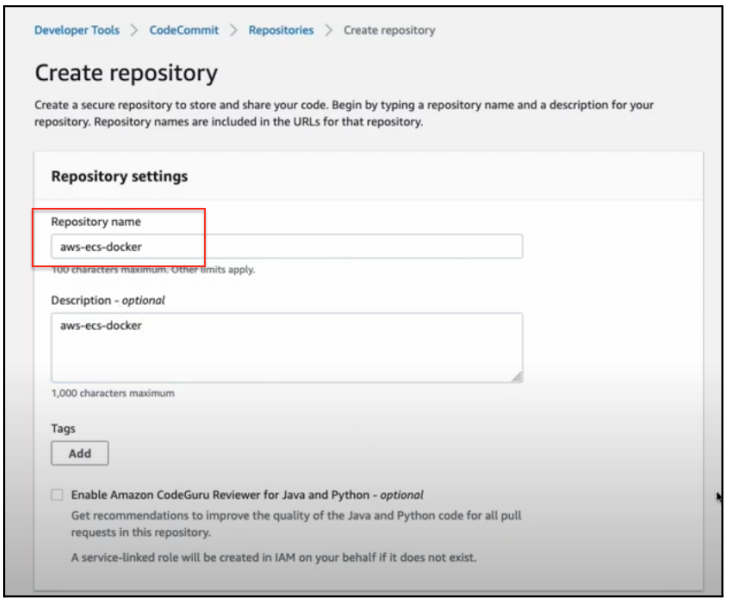


Fig 1: The Code Pipeline architecture describing the steps to deploy and maintain containerized applications utilizing Amazon ECR and ECS services

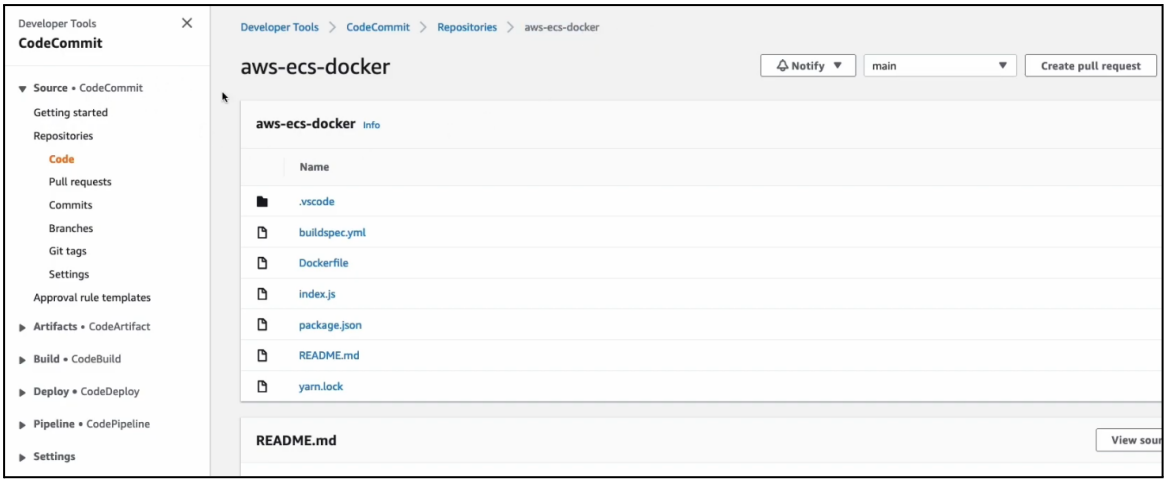
Task 1: Setup Code Commit Repository

1. Create a **CodeCommit** repository named 'aws-ecs-docker'



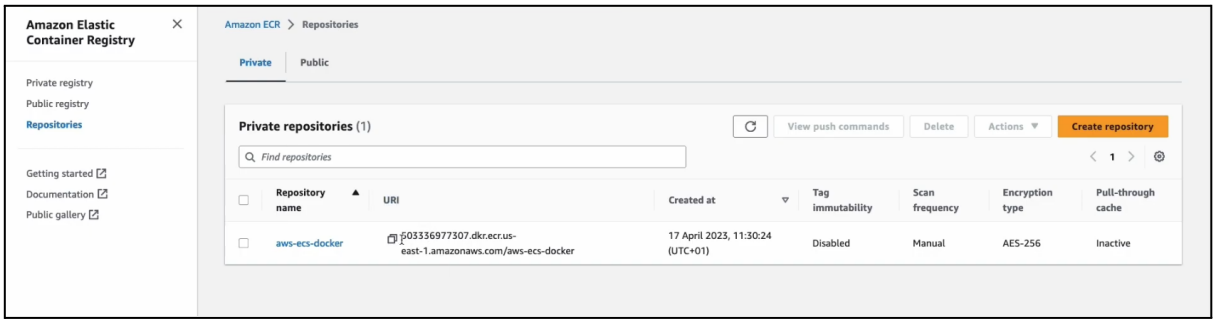
2. Go to **IAM** console and update permissions for 'AWSCodeCommitAccess'
3. Clone the repository to my local machine.
4. Push Source Code to the 'aws-ecs-docker' local repository.

5. Commit the source to the remote ‘aws-ecs-docker’ repository on CodeCommit.



Task 2: Setup Docker Image on Amazon ECR

1. Create a new repository on AWS ECR named ‘aws-ecs-docker’

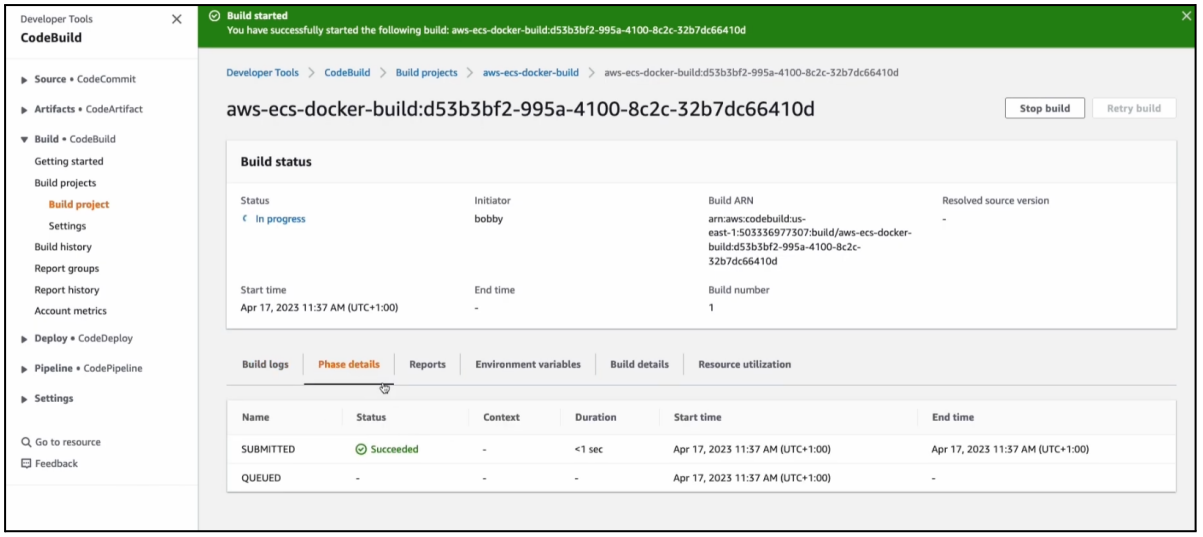


2. Update ‘Buildspce.yml’ from the ‘aws-ecs-docker’ repository on CodeCommit with appropriate repository URL, so it can build the code and create a docker image to be stored in the ‘aws-ecs-docker’ repository on ECR.

Task 3: Configure Build Project on AWS CodeBuild

1. Create a new Build Project on **CodeBuild** named ‘aws-ecs-docker-build’
    a. Add ‘AWS CodeCommit’ as the source provider in the ‘Source’ section, select the ‘aws-ecs-docker’ repository and select ‘main’ branch.
    b. Under the ‘Environment’ section, select the ‘Managed Image’ option.
        i. Choose Amazon Linux 2 with standard runtime and latest image.
        ii. Choose the existing ‘CodeBuildServiceRole.
    c. Select ‘Use a buildspec file’ option in the ‘Buildspec’ section.
    d. In the ‘Logs’ section, choose the ‘CloudWatch Logs’ option and name it as ‘aws-ecs-docker-logs’.

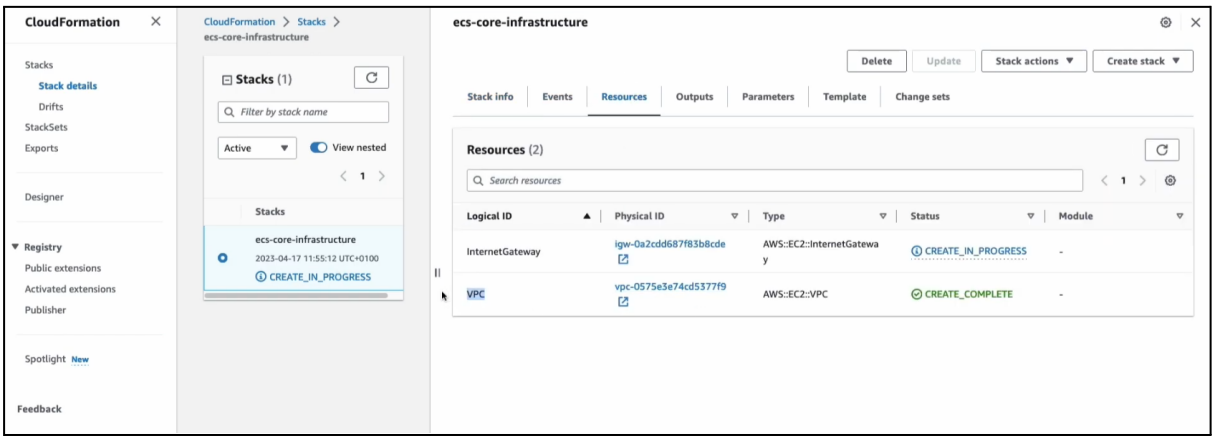
2. Now, create the Build Project and start building to validate the build stage.



Task 4: Configure Core Infrastructure using AWS CloudFormation

1. Create CloudFormation stack using the following command according to the 'core-infrastructure-setup.yml' file in the 'aws-cloudformation' folder. Next, validate the stack 'ecs-core-infrastructure' from the AWS CloudFormation.

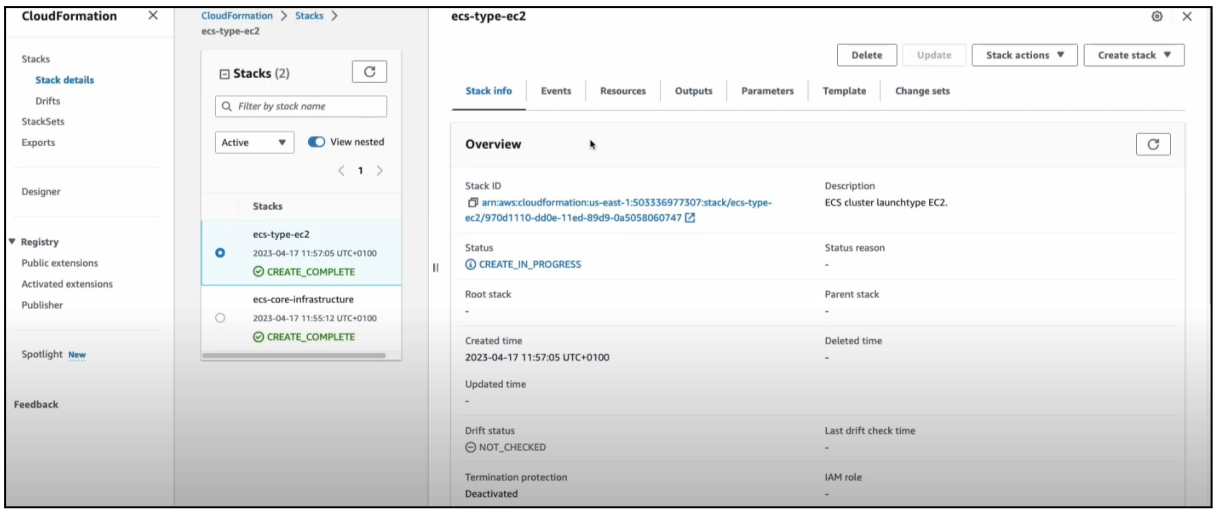
```
$ aws cloudformation create-stack --capabilities
CAPABILITY_IAM --stack-name ecs-core-infrastructure
--template-body file://./core-infrastructure-setup.yml
```



2. Create an ECS cluster based on EC2, by using the following command to create a cluster according to the 'ecs-ec2-with-cf.yml' file in the 'aws-cloudformation' folder. Then, validate the 'ecs-type-ec2' stack is active on AWS CloudFormation.

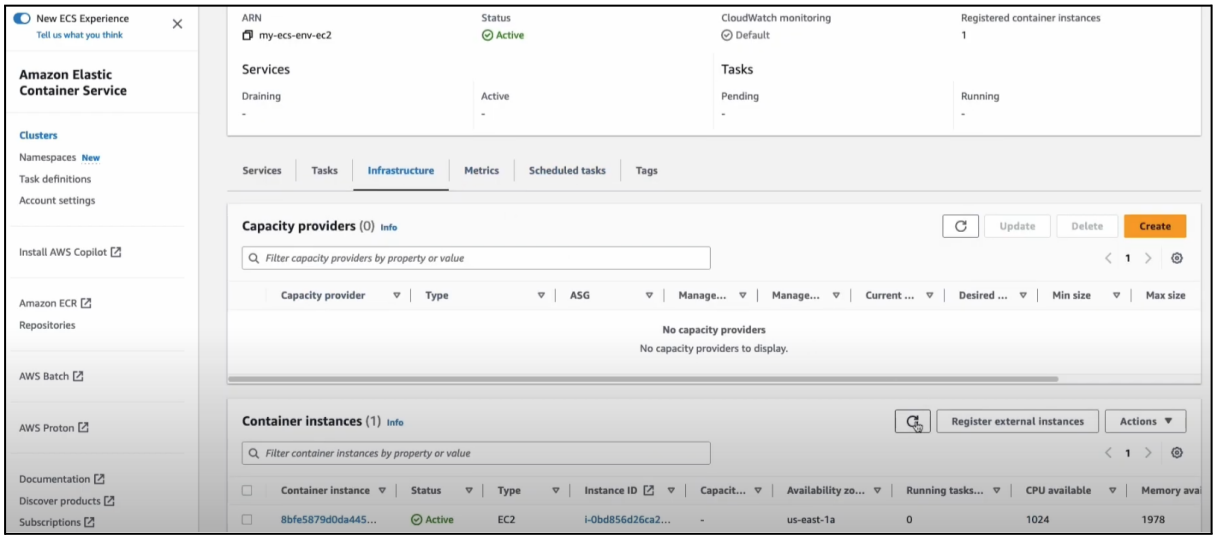
```
$ aws cloudformation create-stack --stack-name
ecs-type-ec2 --capabilities CAPABILITY_IAM
--template-body file://./ecs-ec2-with-cf.yml
```

3. Next, Go to the Amazon ECS to validate that the ‘my-ecs-env-ec2’ cluster and corresponding container instances are active.



Task 5: Configure Task Definition on Amazon ECS

1. Create new Task definition configuration named ‘exp-aws-ecs-docker’
    a. Specify container name as ‘exp-code-pipeline’ according to the buildspec file.
    b. Use the ECR ‘aws-ecs-docker’ repository URI for the Image URI of the container.
    c. Use Container port 3000
    d. Next, select ‘Amazon EC2 instance’ as the app environment.
    e. Select task role ‘ecsTaskExecutionRole’
2. Save the task definition file and validate if the task is running.



Task 6: Orchestrate CodePipeline

1. Go to CodePipeline and create a pipeline
    a. In the ‘Choose Pipeline settings’ name the pipeline as ‘aws-ecs-docker-pipeline’ and choose a service role.
    b. In the ‘Add source stage’, select AWS CodeCommit and ‘aws-ecs-docker’ repository as the source provider.

c. In the ‘Add build stage’, select AWS CodeBuild and ‘aws-ecs-docker-build’ followed by a single build option.
d. In the ‘Add deploy stage’, select AWS CodeDeploy and Amazon ECS as the deploy provider.
e. Next, choose ‘aws-ecs-env-ec2’ cluster, ‘exp-aws-ecs-docker-pipeline’ as the service, and ‘imagedefinitions.json’ as image definition file.

2. Save the pipeline settings and create the pipeline. Validate if the pipeline build is successful.