Deploy a Web Application in Docker Container on AWS Using Terraform

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Goal, tasks

- Goal – deploy a web application in Docker container by creating AWS infrastructure according to the given requirements
- Tasks:
  - Examine the specified AWS infrastructure and CI/CD pipeline requirements
  - Development of the Terraform project structure
  - Implementation of the application deployment procedure using Terraform

Amazon Web Services

S3

DynamoDB

IAM

Elastic Container Registry

Virtual Private Network

EC2

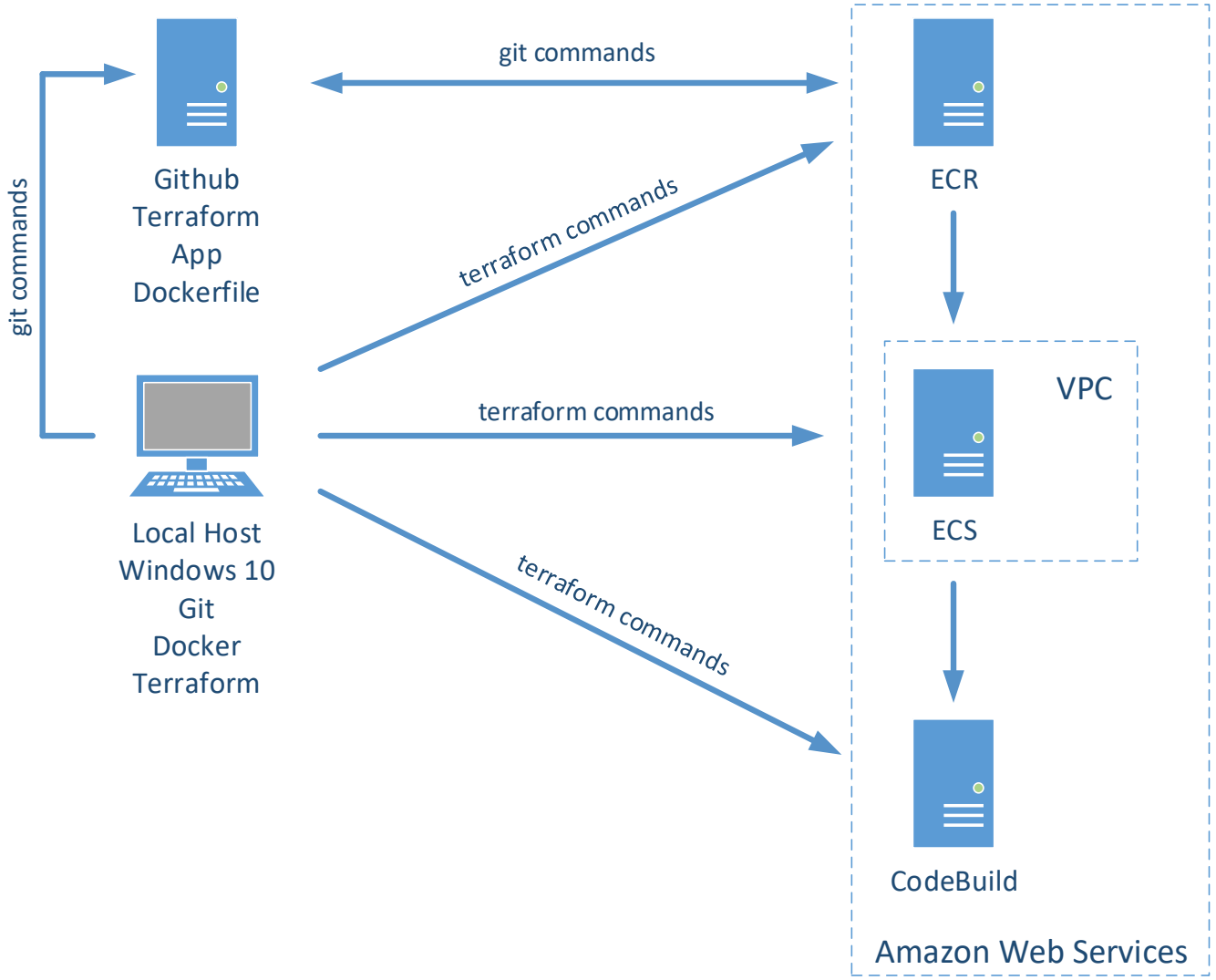
Elastic Container Service

Codebuild

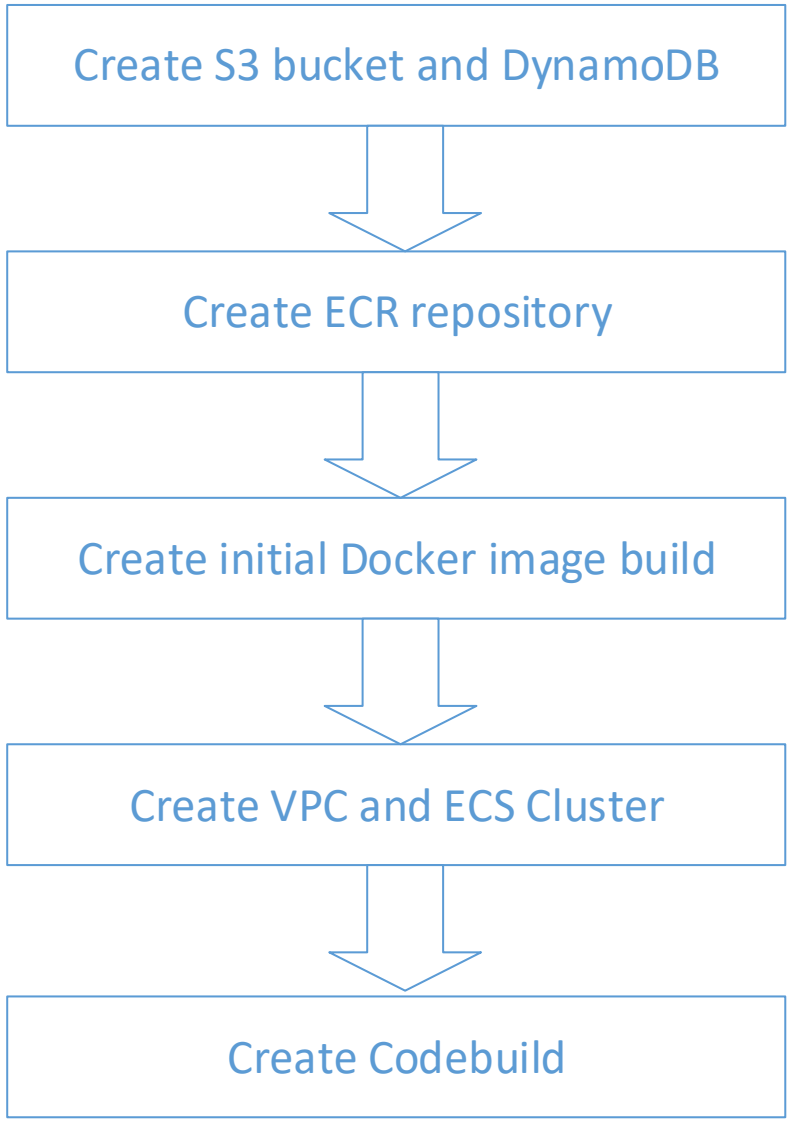
CloudWatch

Design - Software and technologies

- Git
- Terraform
- Docker
- Github
- AWS



CI/CD Pipeline



Terraform Project Structure

- project
  - app
  - modules
  - terraform
- app
  - web
    - index.html
    - Dockerfile
  - Makefile
- modules
  - s3
  - ecr
  - init-build
  - network
  - codebuild
- terraform
  - config
    - dev.tfvars
    - prod.tfvars
    - secret.tfvars
    - buildspec.yml
  - provider.tf
  - terraform.tf
  - variables.tf
  - main.tf
  - outputs.tf

Implementation – Main Steps

- Creating an account on AWS
- Creating an user with required permissions using AWS IAM (manually)
- Installing Terraform, Docker and Atom
- Creating Terraform modules
- Creating root Terraform module
- Creating configuration files (Makefile, Dockerfile, buildspec.yml , *.tfvars)
- Creating cloud infrastructure and CI/CD pipeline with the specified requirements on AWS
- Checking results

Demo – Results – Environment “dev”

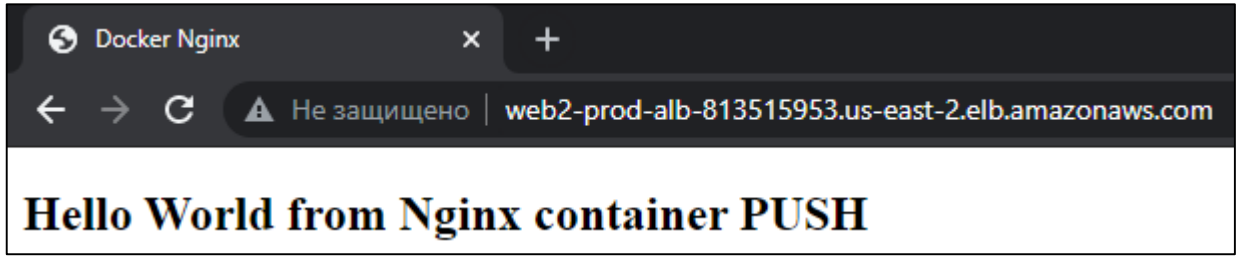
```
Outputs:

account_id = "447854022972"
alb_hostname = "web-dev-alb-1300980241.us-east-2.elb.amazonaws.com"
aws_ecr_repository_url = "447854022972.dkr.ecr.us-east-2.amazonaws.com/web-dev-nginx"
aws_region_name = "us-east-2"
codebuild_project_name = "web-dev-nginx"
dynamodb_table_name = "table-web-dev-nginx-us-east-2"
s3_bucket_arn = "arn:aws:s3:::bucket-web-dev-nginx-us-east-2"
s3_bucket_name = "bucket-web-dev-nginx-us-east-2.s3.amazonaws.com"
```

Demo – Results – Environment “prod”

```
Outputs:

account_id = "447854022972"
alb_hostname = "web2-prod-alb-813515953.us-east-2.elb.amazonaws.com"
aws_ecr_repository_url = "447854022972.dkr.ecr.us-east-2.amazonaws.com/web2-prod-nginx2"
aws_region_name = "us-east-2"
codebuild_project_name = "web2-prod-nginx2"
dynamodb_table_name = "table-web2-prod-nginx2-us-east-2"
s3_bucket_arn = "arn:aws:s3:::bucket-web2-prod-nginx2-us-east-2"
s3_bucket_name = "bucket-web2-prod-nginx2-us-east-2.s3.amazonaws.com"
```



Conclusions

- To deploy a web application in Docker container by creating a cloud infrastructure and CI/CD pipeline on AWS, it is advisable to use Terraform
- To implement different environments, you can use .tfvars files with specified variable values and store the .tfstate files in different S3 buckets

Changes from previous demo

- The Terraform project structure is modified
- The code is cleared
- The new github repo is created
- The README file is modified
- The presentation is adapted

Thank You

Github repository:

https://github.com/mykshtompel/demo_test