

DevOps Bootcamp Capstone Project

1. Prerequisites

- <https://github.com/uym2/MySQL-and-Python>

2. Task

1. Using Terraform
 - i. Create an EKS cluster of two nodes
 - ii. Create an EC2 machine for Jenkins
 - iii. Create an ECR
2. Use Ansible to install and configure Jenkins
 - a. Install Jenkins
 - b. Configure Jenkins access
 - c. Install necessary plugins, if you are stuck install them manual
3. **Manually:** Add AWS credentials
4. **Manually:** Add Kubernetes access (kubeconfig)
5. Fork the above repo
6. Create Docker image for the code
7. Create Docker compose for the code and database to run
 - a. If I run docker-compose up I should be able to visit localhost and find the web app running
8. Create Kubernetes files
 - i. Deployment file for the python code (As **bonus** add liveness and readiness probes)
 - ii. Statefulset for MySQL, Use PV and PVCs
 - iii. Services for both database and code
 - iv. Configmap and secrets for code
 - v. Ingress using nginx controller
9. Install NGINX controller to the cluster using any preferred method
10. Configure Jenkins using pipeline as a code to build from github on every push on all branches
11. Configure github webhooks to integrate with Jenkins
12. The pipeline should
 - a. build new Docker images
 - b. Push image to ECR
 - c. It should deploy it to kubernetes
13. **BONUS:** The pipeline should output the url to the website

3. Expected Deliverables

A private Github repository containing:

- Installation guide in README.md file.
- Ansible scripts.
- Terraform scripts.
- Jenkins files.
- K8s manifests.
- Jenkins credentials
- Add my Github user "aabed" to your github as a contributor
- **BONUS:** a bash script that will run everything in terraform and ansible to create the infrastructure

4. References:

- <https://github.com/kubernetes/ingress-nginx>
- <https://plugins.jenkins.io/github/>
- <https://www.dbi-services.com/blog/jenkins-deploy-ansible-playbook-with-jenkins-plugin/>
- <https://github.com/geerlingguy/ansible-role-jenkins/blob/master/tasks/plugins.yml>
- <https://registry.terraform.io/modules/terraform-aws-modules/eks/aws/latest>
- https://registry.terraform.io/providers/hashicorp/aws/latest/docs/resources/ecr_repository
- <https://medium.com/@praveenvallepu/amazon-ecr-repository-with-terraform-3e430369900d>
- <https://kubernetes.io/docs/concepts/workloads/controllers/statefulset/>
- <https://kubernetes.io/docs/concepts/services-networking/ingress/>
- <https://www.jenkins.io/solutions/github/>
- <https://plugins.jenkins.io/amazon-ecr/>
- <https://docs.aws.amazon.com/eks/latest/userguide/create-kubeconfig.html>
- https://docs.aws.amazon.com/AmazonECR/latest/userguide/registry_auth.html
- <https://kubernetes.io/docs/tasks/configure-pod-container/configure-liveness-readiness-startup-probes/>
- <https://www.jenkins.io/doc/book/pipeline/jenkinsfile/>
- <https://www.freecodecamp.org/news/how-to-write-better-git-commit-messages/>
- <https://gitmoji.dev/>
- <https://education.github.com/git-cheat-sheet-education.pdf>
- <https://registry.terraform.io/providers/hashicorp/aws/latest/docs/resources/instance>
- <https://www.digitalocean.com/community/tutorials/how-to-use-ansible-with-terraform-for-configuration-management>
- <https://github.com/kubernetes/ingress-nginx/blob/main/docs/user-guide/nginx-configuration/annotations.md>
- https://join.slack.com/t/newworkspace-0jl7707/shared_invite/zt-1q95m5okh-erxRF020SHU0O_p1QohAvg