Proposal for Design of Continuous Integration/Continuous Deployment pipeline for Udapeople app

Overview

Continuous integration is the practice of merging all developers' working copies of code to a shared mainline several times a day. It is a development practice where every working copy of a developer's code is merged to a shared centralized mainline several times a day which will enables several developers to work together on udapeople application simultaneously while tracking the activities and commits made by each developers to the mainline.
Continous delivery is an engineering practice in which teams produce and release value in short cycles. With this practice, development team will produce and release ready features of the udapeople application in short cycles.
Continuous deployment is a software engineering approach in which value are delivered frequently through automated deployments. This is an approach which when implemented for the development of udapeople would automate the deployment of our application and enable ready features to be delivered frequently without any human intervention.

Solutions, Scope of Work, and Deliverables

First, the DevOps team will create a version control repository for our udapeople project using git, where the main working code will be committed to and each developer will have access to this repository and be able to commit any working code they have developed. This version control system tracks the activities and commits made by each developer. Then we shall set up a continuous integration pipeline using circleci, this pipeline will continuously pick up the codes committed to the git repository then it will build, test and analyze the code to check for security loop holes. We will also define the deployment resources to be used for the deployment of udapeople app using infrastructure as a code. This code will be run by the CI/CD pipeline to provision all resources needed for deployment of udapeople app. If this becomes successful, the pipeline will automatically deploy the working artifact produced by the continuous integration process. This pipeline will automatically deploy the artifact in the provisioned infrastructure. we shall also set up an ansible playbook to be used by the pipeline for configuring the provisioned server for the udapeople application. Then we shall finally configure Prometheus for monitoring the availability and performance of the udapeople application.

Advantages of Implementing CI/CD for udapeople application

1 . Catch Compile Errors After Merge: this pipeline will lead to reduced cost because it will enable the developers to spend less time on issues from new developer code
2. Catch Unit Test Failures: This pipeline will help to detect unit failures which will lead to less bugs in production and less time in testing thereby avoiding the cost of testing for failures in production
3. Detect Security Vulnerabilities: This pipeline will help to avoid the cost of embarrassing or costly security holes
4. Automate Infrastructure Creation: This pipeline will lead to less human error, Faster deployments and help to avoid unnecessary cost
5. Automate Infrastructure Cleanup: The pipeline will automatically clean up unused resources thereby reducing cost.
6. Faster and More Frequent Production Deployments: This pipeline will enable New value-generating features to be released more quickly thereby leading to increased revenue.
7. Deploy to Production without Manual Checks: It will result to less time to market and lead to increase in revenue.
8. Automated Smoke Tests: The pipeline will carry out automatic smoke test which will reduced downtime from a deploy-related crash or major bug thereby protecting revenue
9. Automated Rollback Triggered by Job Failure: The pipeline will automatically role back to last working version on event of failed deployment thereby protecting revenue

Cost Implication of implementing CI/CD for udapeople application

Implementing ci/cd for udapeople project will lead to reduced cost, increase in revenue and protection of revenue.