REPORT FROM THE :

3rd of june to the 7th of June 2024
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10th of June to the 14th June 2024

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INTRODUCTION

In this report, I will mention everything I worked on since two weeks. I will also mention the difficulties I encountered at he end and how I went about the issue. Before I go into details , I will list the topics I worked on ;

- kubernetes
- helm
- git-lab ci/cd
- worked on a project (app-github-jenkins-docker-kubernetes)

1.KUBERNETES

Over the past two weeks, I have dedicated a significant amount of time to learning and working with Kubernetes, the popular open-source container orchestration platform. I started by gaining a fundamental understanding of Kubernetes concepts, such as pods, deployments, services, and networking.

I practiced deploying and managing Kubernetes clusters using the kubectl command-line tool. This involved creating and managing Kubernetes objects like pods, deployments, and services, as well as exploring Kubernetes networking features like ClusterIP, NodePort, and LoadBalancer services.

One of the initial challenges I faced was configuring Kubernetes networking, particularly in terms of service discovery and load balancing. To overcome this, I delved deeper into the Kubernetes networking model, studying the various networking concepts and experimenting with different configurations. This helped me better understand how Kubernetes handles network communication between containers and external clients.

2.HELM

Alongside my work with Kubernetes, I have been exploring Helm, a popular package manager for Kubernetes. Helm allows you to create, package, and manage Kubernetes applications in the form of Helm charts.

I have learned how to create and manage Helm charts, which are packages that encapsulate the necessary Kubernetes resources to run an application. This involved understanding Helm's templating engine, how to define and configure Helm chart values, and how to package and deploy Helm charts to a Kubernetes cluster.

Creating Helm charts for complex applications with multiple components and dependencies was more complex than I initially anticipated. To address this challenge, I spent time studying Helm's documentation and examples, experimenting with different chart structures and templates, and seeking guidance from experienced team members when necessary.

3.GitLab CI/CD

Another focus area during the past two weeks was GitLab's Continuous Integration and Continuous Deployment (CI/CD) pipeline. I have been studying how to set up and configure GitLab runners, create pipeline definitions using the .gitlab-ci.yml file, and integrate with Kubernetes for automated deployment.

Integrating the GitLab CI/CD pipeline with Kubernetes for automated deployment was not straightforward. I had to familiarize myself with the GitLab CI/CD syntax, learn how to configure Kubernetes-specific tasks (such as deploying to a Kubernetes cluster), and troubleshoot any issues that arose during the pipeline execution.

To overcome these challenges, I referred to the GitLab documentation, watched tutorials, and experimented with various pipeline configurations. Gradually, I developed a better understanding of how to effectively leverage the GitLab CI/CD system and integrate it with Kubernetes for seamless application deployment.

4.App: GitHub, Jenkins, Docker, Kubernetes

In addition to the individual topics, I have also been working on a project that involves building and deploying a web application using a combination of GitHub, Jenkins, Docker, and Kubernetes.

This project has allowed me to apply the knowledge I've gained from the previous topics and integrate them into a real-world scenario. I have been using GitHub for source control, Jenkins for continuous integration, Docker for containerization, and Kubernetes for orchestration and deployment.

Throughout this project, I have encountered various challenges, such as setting up the appropriate CI/CD workflows, configuring Kubernetes resources, and troubleshooting deployment issues. However, by leveraging the skills I've developed in Kubernetes, Helm, and GitLab CI/CD, I have been able to overcome these challenges and make progress in deploying the application.

CONCLUSION

The past two weeks have been a valuable learning experience, and I feel that I have made significant progress in understanding and working with Kubernetes, Helm, GitLab CI/CD, and the integration of these technologies in a real-world application. I am excited to continue my exploration and to apply these skills to further projects and initiatives.