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Department of Master of Computer Applications

13-06-2024

IV Semester
MCA491P - Major Project

Enabling Observability for Microservices

This project will focus on enabling observability for microservices within the domain of DevOps and Site Reliability Engineering (SRE). Observability is crucial for understanding the internal state of a system based on telemetry data (Logs, Traces and Metrics), which is of high importance for complex systems with microservices. The need for this project arises from the challenges in monitoring and troubleshooting microservices due to their distributed nature, frequent deployments, continuous integration, and Continuous delivery. The project aims to implement an observability solution using Elastic Cloud to provide comprehensive visibility into the performance and health of microservices thereby improving reliability and efficiency.

The project will adopt a procedural methodology. This methodology will ensure a cohesive and efficient implementation process, which is essential for achieving reliable results. The project will leverage Elastic Cloud, specifically utilizing tools such as Logstash for log processing, Kibana for data visualization, beats for data collection, Rules and Alerts to take relevant actions etc. To configure and manage the Elastic Cloud infrastructure, the project will utilize Terraform, Kubernetes for container orchestration, Argo CD will be employed for continuous delivery. The project will be divided into several key modules: infrastructure setup with Terraform, container orchestration with Kubernetes, and observability deployment using openTelemetry etc. Each module will employ the appropriate tools to achieve its specific objectives, ensuring a cohesive and efficient observability solution.

The expected outcomes of the project include the ability to monitor real-time performance metrics , visualize log data, and trace request flows across microservices. The key findings will highlight the system's capability to detect and diagnose bugs and errors promptly, leading to faster incident resolution and improved system reliability.

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