

## ABSTRACT

Forest and land fires are a growing problem in Indonesia. With the development of hardware technologies such as computers, the use of GIS seems to be an effective shortcut for analyzing events. Kubernetes is an open-source platform for managing containerized application workloads, offering declarative configuration and automation.

This thesis designs the Google Maps API System tool for forest and land fires using a real-time database on microservices infrastructure with an output point of fire location and the output of sensor readings used. In general, the process that occurs in the design of the location of the forest fire point will be detected by sensors. Then firebase will store forest fire data, which will simultaneously be updated on the website. Clients can see the extent of forest fires through a browser on their respective desktops.

Based on the results of the performance tests that have been carried out, it can be concluded that the use of Kubernetes microclusters can provide advantages when compared to those built monolithically, because so far it has often been the case that website monitoring like this is prone to downs if only relying on monolithic servers, which have been generally used until now. Unlike Kubernetes, which uses microservice technology, which has several advantages in its features. Then, for each test performed, there was no significant change in memory usage. In the analysis of the results of the comparison data with 7 tests that have been carried out, there are 6 tests that mean that the service built with the Kubernetes microcluster is superior to the monolithic one, namely hits per second of 2354 ms, latency of 3599 ms, response code 720, success code, CPU utilization of 13.84% , error rate 0.00% , and throughput of 112/sec.

**Keywords :** GIS, Fire Detection, Kubernetes, Microservices.