ABSTRACT

PERFORMANCE ANALYSIS OF MICROSERVICES ARCHITECTURE-BASED APPLICATIONS ON KUBERNETES USING A RASPBERRY PI 4 COMPUTER CLUSTER

Oleh

Regi Apriandi

19102283

The increasing number of technology users requires an application support infrastructure to increase its ability to continue serving users. Therefore, application support infrastructure is needed to be able to provide active services. Applications with microservices architecture can run independently, which means that when a failure occurs in one system, it does not affect other systems. The use of Kubernetes on a Raspberry Pi cluster computer can facilitate the management of containers that run to run an application, this is very important to be able to use Kubernetes on a Raspberry Pi cluster computer which in this study used as many as three Raspberry Pi for application support infrastructure to save on infrastructure costs. From the analysis of application performance, the system can handle requests well up to 50000 requests with an error rate of only 2.03% on Blog applications that process data from the database and process images from the NFS server. In addition, the throughput is monitored quite well at 43,066 transactions/second, which means that every second the system can process 43 pages of applications. However, the delay value is quite large in testing 500 connections up to 1000 at a value of 6.3795 to 8.6926 seconds, but it is quite good in testing with several 100 connections which are worth 1.3978 seconds. Server availability keeps application services active when there is a system failure on one of the nodes, but there is a decrease in application performance in the 30 to 50-second period. CPU usage is dominant on the masternode which processes a lot of data traffic by the NFS server and database at 96.2773%, but RAM usage tends to be small from the three nodes due to the dominant process using the CPU.

Keywords*: *Microservices*, Kubernetes, Raspberry Pi, *Computer Cluster