

ABSTRACT

The microservice architecture is gaining attention from the industry because of the capabilities it offers in optimizing system architecture. The microservice architectural style can replace the monolithic architecture because of the flexibility to adapt to changing technologies and help to better organize the development team. However, in its implementation there are still problems when communication between services in microservices uses HTTP synchronous or API-based (API-Driven). The solution offered to this problem is to apply container technology which is integrated with Event-Driven Architecture (asynchronous) to handle internal communication between microservices. So that it can overcome performance problems in microservices. The result of this research is the implementation of Event-Driven Architecture on microservices. Response time Event-Driven Architecture is faster with an average difference of 319.46 ms, error rate Event-Driven Architecture is lower with an average difference of 4.56%, and CPU usage Event-Driven is lower with an average difference of 42.69 ms.

Keywords: *Container Technology, Docker, Event-Driven Architecture, Kubernetes, Microservices*

ABSTRAK

Arsitektur *microservice* mendapat perhatian dari industri karena kemampuan yang ditawarkannya dalam optimalisasi arsitektur sistem. Gaya arsitektur *microservice* dapat menggantikan arsitektur *monolithic* karena fleksibilitas untuk beradaptasi dengan perubahan teknologi dan membantu penataan tim pengembang lebih baik. Namun, dalam implementasinya masih terdapat permasalahan ketika komunikasi antara layanan dalam *microservice* menggunakan HTTP *synchronous* atau berbasis API (*API-Driven*). Solusi yang ditawarkan atas permasalahan tersebut adalah menerapkan teknologi *container* yang diintegrasikan dengan *Event-Driven Architecture (asynchronous)* untuk menangani komunikasi internal antara layanan *microservice*. Sehingga dapat mengatasi permasalahan kinerja pada *microservice*. Hasil dari penelitian ini adalah implementasi *Event-Driven Architecture* pada *microservice*. *Response time Event-Driven Architecture* lebih cepat dengan rata-rata selisih 319.46 ms, *error rate Event-Driven Architecture* lebih rendah dengan rata-rata selisih 4.56%, dan *CPU usage Event-Driven* lebih rendah dengan rata-rata selisih 42.69 ms.

Kata Kunci: *Container Technology, Docker, Event-Driven Architecture, Kubernetes, Microservices*