RANCANG BANGUN SISTEM MANAJEMEN SIKLUS HIDUP VIRTUAL MACHINE BERBASIS WEB PADA MULTI-HOST VMWARE ESXI
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INTISARI

RANCANG BANGUN SISTEM MANAJEMEN SIKLUS HIDUP *VIRTUAL MACHINE* BERBASIS WEB PADA *MULTI-HOST* VMWARE ESXI

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Pengelolaan virtual machine pada beberapa host VMware ESXi secara terpisah dapat meningkatkan kompleksitas administrasi dan pemantauan sistem. Penelitian ini bertujuan merancang dan membangun sistem manajemen *virtual machine* berbasis web yang mampu mengelola beberapa *host* VMware ESXi secara terpusat. Sistem dikembangkan menggunakan React, FastAPI, pyVmomi, dan SSH untuk menyediakan fitur pengelolaan *virtual machine*, pengelolaan *host*, pemantauan sumber daya, operasi *power on* dan *power off virtual machine*, pengelompokan *host*, serta akses konsol *virtual machine* berbasis web.

Pengujian dilakukan melalui skenario *cache performance, virtual machine operations, parallel operations, load test, dan endpoint comparison*. Hasil pengujian menunjukkan bahwa mekanisme cache mampu mempercepat waktu respons hingga 44-85 kali, operasi paralel meningkatkan kinerja hingga 3,7–3,8 kali, serta sistem mampu mempertahankan *throughput* sekitar 1000 *request per second* (RPS). Hasil penelitian menunjukkan bahwa sistem yang dikembangkan mampu mendukung pengelolaan lingkungan virtualisasi *multi-host* secara terpusat dan efisien pada skala kecil hingga menengah.

Kata kunci : *virtual machine*, VMware ESXi, pyVmomi, manajemen *multi-host*, virtualisasi.

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ABSTRACT

DESIGN AND DEVELOPMENT OF A WEB-BASED VIRTUAL MACHINE LIFECYCLE MANAGEMENT SYSTEM FOR MULTI-HOST VMWARE ESXI ENVIRONMENTS

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Managing virtual machines across multiple VMware ESXi hosts separately can increase the complexity of administration and system monitoring. This study aims to design and develop a web-based virtual machine management system capable of centrally managing multiple VMware ESXi hosts. The system was developed using React, FastAPI, pyVmomi, and SSH to provide virtual machine management, host management, resource monitoring, power control, host grouping, and web-based virtual machine console access.

The system was evaluated through cache performance, virtual machine operations, parallel operations, load testing, and endpoint comparison scenarios. Results show that the caching mechanism improved response time by approximately 44-85 times, parallel operations achieved performance improvements of approximately 3.7–3.8 times, and the system maintained a throughput of around 1000 requests per second (RPS). These results indicate that the developed system can provide centralized and efficient management of multi-host virtualization environments for small to medium-scale deployments.

Keyword: virtual machine, VMware ESXi, pyVmomi, multi-host management, virtualization.