

INTISARI

ANALISIS PERBANDINGAN PERFORMA *CONTINUOUS INTEGRATION/CONTINUOUS DEPLOYMENT* (CI/CD) MENGGUNAKAN AZURE DEVOPS DAN CIRCLECI

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Efisiensi dalam pengembangan perangkat lunak menjadi aspek krusial seiring dengan meningkatnya kompleksitas teknologi informasi dan kebutuhan akan rilis yang lebih cepat. *Continuous Integration/Continuous Deployment* merupakan pendekatan yang umum digunakan untuk mempercepat proses integrasi dan *deployment* secara otomatis. Penelitian ini membandingkan performa dua platform CI/CD berbasis *cloud*, yaitu Azure DevOps dan CircleCI, berdasarkan waktu eksekusi *pipeline*, penggunaan CPU, dan konsumsi memori. Pengujian dilakukan menggunakan satu repositori aplikasi Node.js yang diperbarui secara bertahap untuk merepresentasikan peningkatan kompleksitas sistem. Azure DevOps menjalankan *pipeline* secara *end-to-end* menggunakan *self-hosted agent* dalam lingkungan *Virtual Machine* (VM), sementara CircleCI hanya menjalankan proses CI dan mengarahkan *deployment* ke Railway sebagai layanan pihak ketiga. Hasil penelitian menunjukkan bahwa CircleCI unggul dari sisi efisiensi, dengan waktu eksekusi 43,92% lebih cepat, penggunaan CPU 67,83% lebih rendah, dan konsumsi memori 13,91% lebih hemat dibandingkan Azure DevOps. Di sisi lain, Azure DevOps memberikan kontrol lebih besar terhadap lingkungan eksekusinya dan integrasi sistem ke layanan Azure. Penelitian ini diharapkan dapat menjadi acuan dalam pemilihan platform CI/CD sesuai kebutuhan proyek dan kapasitas infrastruktur.

Kata kunci: *Cloud Computing*, CI/CD, *Pipeline*, Azure DevOps, CircleCI

ABSTRACT

PERFORMANCE COMPARISON ANALYSIS OF CONTINUOUS INTEGRATION/CONTINUOUS DEPLOYMENT (CI/CD) USING AZURE DEVOPS DAN CIRCLECI

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Efficiency in software development has become a crucial aspect in line with the increasing complexity of information technology and the growing demand for faster release cycles. Continuous Integration/Continuous Deployment (CI/CD) is a widely adopted approach to accelerate the integration and deployment process through automation. This study compares the performance of two cloud-based CI/CD platforms, Azure DevOps and CircleCI, based on pipeline execution time, CPU usage, and memory consumption. The evaluation was conducted using a Node.js application repository that was gradually updated to represent increasing system complexity. Azure DevOps executes the pipeline end-to-end using a self-hosted agent within a Virtual Machine (VM). In contrast, CircleCI handles only the CI process and delegates deployment (CD) to Railway as a third-party service. The results show that CircleCI is 43.92% faster in execution time, uses 67.83% less CPU, and consumes 13.91% less memory compared to Azure DevOps. On the other hand, Azure DevOps provides greater control over the execution environment, as well as system integration with Azure services. This study is expected to serve as a reference in selecting a CI/CD platform according to project requirements and infrastructure capacity.

Keywords: Cloud Computing, CI/CD, Pipeline, Azure DevOps, CircleCI