

A Survey of Tools, Techniques, and Best Practices: CI/CD Integration in DevOps Workflows

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Abstract: *The modern software development requires quickness, dependability, and flexibility that are not always provided by traditional methodologies. DevOps, as a collaborative model, has been developed to overcome these challenges by combining development and operations through automation and continuous feedback. This paper provides a detailed discussion of the CI/CD integration in DevOps processes, the tools, techniques, and practices that should be considered in order to improve performance, scalability, and efficiency of automation. Some of Infrastructure as code (IaC), automated testing, performance optimization methodologies, continuous integration and delivery pipelines, and other important topics are discussed in the research. The results show that DevOps implementation enhances software delivery speed and collaboration, and increases system reliability by simplifying development and deployment. Also, the cloud-native approaches like service meshes and micro services architecture are compatible with scalability and resilience even more. In general, this paper highlights that properly executed DevOps principles can help to transform the software delivery process into a fast, automated, and efficient activity that allows organizations to deliver the releases on time and realize operational efficiency.*

Keywords: Cloud Computing, DevOps Practices, Continuous Integration (CI), Continuous Delivery (CD), Cloud-Native Architecture