

Developing Web Applications Using Kubernetes and Helm

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Master's thesis · 2025

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The thesis analyses the application of Kubernetes and Helm in modern web application development and delivery, with particular focus on DevOps processes, scalability, automation, and operational efficiency. In addition to the theoretical analysis, a practical web application implementation using Docker, Kubernetes, and Helm was developed, and the performance and behaviour of the solution were monitored under realistic conditions. The methodology covers the technical, organisational, and operational aspects of introducing these technologies, including complexity, security, and costs. The results show that Kubernetes and Helm can significantly improve automation, consistency, and scalability in delivery, but their successful application requires appropriate expertise, well-designed processes, and careful infrastructure management.

Keywords: Kubernetes · Helm · Web applications