

TURUN YLIOPISTO — UNIVERSITY OF TURKU
FACULTY OF TECHNOLOGY



Research Proposal

Master's Thesis in Technology (DTEK1002)

Florian Dejonckheere

fwdejo@utu.fi

January 14, 2024

Contents

1	Abstract	2
2	Aims and goals	3
3	Literature	4
4	Research questions	5
5	Research methods	6
6	Contents	7
	References	8

1 Abstract

Modern applications designed to run in the cloud are often programmed as a set of microservices: a decomposition of the application based on logical boundaries in the domain logic. This separation of concerns brings along a number of advantages such as scalability, fault isolation and independent deployment. However, it also introduces a number of challenges, and generally increases the complexity of the codebase. In this thesis, we investigate and design a software architecture for deploying and managing monolithic microservices for dynamic languages. The architecture transparently decomposes the application into separate microservices based on logical boundaries, and deploys them in a distributed fashion. The deployed application is scaled up and down based on the current load, and the microservices are migrated between nodes to optimize resource usage. This approach allows developers to focus on the domain logic of the application, while allowing flexible deployment and scaling. The solution is designed to be language-agnostic, but we focus on the implementation for the Ruby programming language. We evaluate the architecture by implementing a proof-of-concept and comparing it to existing solutions.

2 Aims and goals

3 Literature

4 Research questions

5 Research methods

6 Contents

References

- Ghemawat, S., Grandl, R., Petrovic, S., Whittaker, M., Patel, P., Posva, I., & Vahdat, A. (2023). Towards Modern Development of Cloud Applications, 110–117. <https://doi.org/10.1145/3593856.3595909>
- Waldo, J., Wyant, G., Wollrath, A., & Kendall, S. (1994). A Note on Distributed Computing. *Sun Microsystem Laboratories*.