

Service Fabric and cloud-based applications run on a distributed Microservices architecture.

Viengsamai Vilayphone

Abstract: This thesis investigates the design and implementation of distributed, cloud-based applications using the Microservices architecture, with a specific focus on the Service Fabric platform. As monolithic applications face scalability and maintenance challenges in modern cloud environments, the Microservices approach offers a modular solution by decomposing applications into independently deployable services. Service Fabric, a distributed systems platform developed by Microsoft, provides essential capabilities for managing the lifecycle, reliability, and orchestration of these microservices across a cluster. This study examines the core architectural principles of Service Fabric, including its programming models, state management, and partitioning strategies. Through a practical case study, the thesis demonstrates the deployment and operation of a cloud-native application, analyzing performance, fault tolerance, and resource utilization. The findings highlight how Service Fabric effectively addresses common distributed computing challenges, such as service discovery, load balancing, and failure recovery. This research contributes to the understanding of robust cloud application development, offering insights into the trade-offs and best practices for leveraging Service Fabric in production-grade microservices ecosystems.

Keywords: Service Fabric, Microservices, Cloud Computing, Distributed Architecture