Masaryk University
Faculty of Informatics

Use of Transactions within a Reactive Microservices Environment

Master's Thesis

Martin Štefanko

Brno, Fall 2017

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Hereby I declare that this paper is my original authorial work, which I have worked out on my own. All sources, references, and literature used or excerpted during elaboration of this work are properly cited and listed in complete reference to the due source.

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Advisor: Bruno Rossi, PhD

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thanks

Abstract

abstract

Keywords

transactions, Narayana, JTA, reactive, microservices, asynchronous, saga

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1 Introduction

2 Distributed transaction management

This chapter introduces the basic concepts of distributed transactions and common problems of managing transactions across multiple nodes.

2.1 Consensus protocols

2.1.1 ACID

2.1.2 2PCP

2.2 Saga pattern

A saga, as described in the original publication [1], is a long lived transaction that can be written as a sequence of transactions that can be interleaved with other transactions. Each operation that is a part of the saga represents an unit of work that can be undone by the compensation action. The saga guarantees that either all operations complete successfully, or the corresponding compensation actions are run for all executed operations to cancel the partial processing.

2.2.1 Subtransaction

3 Communication forms

3.1 CQRS

3.2 Axon framework

4 Conclusion

Bibliography

[1] H. Garcia-Molina and K. Salem, "Sagas," *ACM SIGMOD Record*, vol. 16, no. 3, pp. 249–259, 1987.