



UNIVERSITY OF TRENTO - Italy

Department of Information Engineering and Computer Science

Bachelor's Degree in Computer Science

FINAL DISSERTATION

EVALUATING MONGODB PERFORMANCE:

How and where NoSQL databases are getting over Relational Databases

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Academic year 2015/2016

Acknowledgements

In my experience, everything we do in our lives has some kind of contribution from the people that live around us at home, at school, at work, everywhere. Unless you are a hermit, of course. And there are different kinds of support people can give you, depending on the relation you have with them. On a more affective side, I'd like to thank my family for always believing in me and in what I do, and supporting me in my choices. My girlfriend and my friends, for their support and the great time I always spend with them and that helps me recovering from the overwhelming amount of commitments of every day life. And my course mates, for all the time we studied together sharing knowledge and useful suggestions. On the professional side, first I'd like to express my deepest gratitude to my Supervisor and Professor Alberto Montresor for the passion he transmitted me while teaching Algorithms on the second year, for involving me in interesting projects and for his supervision in this last work of my bachelor degree. I'd also like to thank my Erasmus Professor Erki Eassar for his skill in making me appreciate the course of Databases and for sharing me useful suggestions and materials even months after being his student in Tallinn University of Technology. At last, I'd like to acknowledge my internship tutors in Tai, Andrea Carpineti and David Votino, for their technical and motivational suggestions about the project from which this dissertation has origin, and my colleague Bruno Graziano for his precious help in configuring and maintaining the system of virtual machines that hosted my clients and my Mongo nodes for the main tests. Have a good reading.

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Summary

The IT world is evolving faster and faster every year, with new breaking technologies coming to our lives, even changing our way to communicate and live in our society. With the advent of social networks, cloud storage and computing, a new definition for the amount of data they involve has been coined: Big Data. The challenge of Big Data involves both developing better retrieving solutions using advanced data mining techniques and functional storage solutions. Several companies are switching their old systems and technologies to more scalable and reliable solutions to optimize their costs in terms of time and money, improving their profits. The company in which I am actually working entrusted me to develop a software in order to evaluate MongoDB, a new non-relational database technology in anticipation of a new contract from a customer that needs to support an application with several hundred thousand of users and millions of records. The challenge is to obtain acceptable results from Mongo in stressing conditions like a production software: retrieving data in less than 2 seconds, preventing loss of data and most importantly, preventing a system crash of the database. I entirely developed a Java software based on the Spring framework, following my project leader and my tutor directives, capable of launching specific benchmark tests aimed at stress-testing and maybe even crashing a virtual machine running a MongoDB instance. For my architecture used the technique of Microservices, that consists in building a modular application, with each module dedicated to a specific service. It is an advanced development technique that is getting more and more successful, also thanks to famous use cases such as Netflix, with the strength of easy reusability and maintainability of the software. My choice of this technique is due to a possible future experimentation of other storage technologies, even relational, as the modularity of the applications allow to quickly develop and connect a new module with drivers for other Database Management Systems. The choice of MongoDB was made by both our manager and our customer because of its ease of configuration and its availability as an open-source software.

1 Introduction

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3 Conclusioni

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Allegato A Titolo primo allegato

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