Bachelor in Informatics and Computing Engineering

Distributed and Partitioned Key-Value Store

Parallel and Distributed Computing

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June 3, 2022

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Chapter 1

Problem Description

A key-value store is a simple storage system that stores arbitrary data objects, the values, each of which is accessed by means of a key, very much like in a hash table. To ensure persistency, the data items and their keys must be stored in persistent storage, e.g. a hard disk drive (HDD) or a solid state disk (SSD), rather than in RAM.

By distributed, we mean that the data items in the key-value store are partitioned among different cluster nodes.

Our design is loosely based on Amazon's Dynamo, in that it uses consistent-hashing to partition the key-value pairs among the different nodes.

Chapter 2

Message Format

Chapter 3

Membership Service

3.1 Implementation

Chapter 4

Key-value Store

4.1 Implementation

Chapter 5

Replication

5.1 Implementation

5.2 Implications on membership and storage devices

Chapter 6

Fault-Tolerance

Chapter 7

Thread-pools

7.1 Implementation

Chapter 8

Test Client

Chapter 9

Conclusions

This project allowed us to deeply understand some computer concepts related to store .