摘 要

随着因特网应用和计算机技术的飞速发展，数据库逐渐成为信息系统的核心部分并广泛应用于企业、金融机构、政府及国防等各个领域。其中，分布式关系型数据库以其低成本、高可靠性等特点成为当前数据库理论与应用领域的研究热点。

通过对分布式理论、关系型数据库理论及相关技术的学习和研究，本文基于Java语言实现了一个分布式的关系型数据库JSQL。JSQL主要包含五大模块，网络模块接受前端应用程序的连接请求，对客服端进行认证和授权，并对连接进行管理，可实现基于Mysql的通信协议，这样便于Mysql的用户方便的迁移到本系统上来；Sql的解析和执行模块接受客户端的SQL请求，然后解析和执行数据库存储的调用，返回执行结果；审计模块是存储和分析所有对数据库的更改情况，以可视化的方式向用户展示；数据库引擎模块利用了orientdb开源的数据库引擎，实现可靠的分布式存储；分布式模块利用hazlcast实现了数据库集群。基于以上功能模块，ＪＳＱＬ具有高可用性，可扩展性，负载均衡等特性，同时从数据库底层考虑了数据库安全审计需求，加入了数据审计图形化界面显示审计结果。

论文对系统进行了功能和性能测试。功能测试结果表明，系统在功能上符合分布式数据库的基本要求，审计系统的功能也达到本论文的要求。论文通过对性能测试结果进行分析，认为系统的性能基本达到本论文的要求。但是本系统对复制SQL语句的支持还不是很完善，最后提出了改进的方案。

关键词：分布式数据库，mysql，安全审计，OLTP，NOSQL

ABSTRACT

Database, operating system and compiler and called the three systems, can be said that the cornerstone of the entire computer software. Which is closer to the application layer database, is a lot of business support. This field after decades of development, There are new developments. From the beginning of the hierarchy database and relational database, to the recent hot Nosql database, and then to the recent Google Spanner and F1 as the representative of the NewSql database.

In the Internet age, the storage and access of massive data becomes the bottleneck of system design and use. For mass data processing, King, divided into two types: online transaction processing (OLTP) and online analytical processing (OLAP).

Relational database is based on the relational model of the database, which by means of aggregation algebra and other mathematical concepts and methods to deal with the database data. Which is the most popular mysql, mysql is an open source relational database, the advantage lies in the open source code, any business and individuals can according to their own needs to modify the source code mysql.

NoSQL database, called Not Only SQL, meaning that when the relational database is used when the relational database, not applicable There is no need to use relational database is not necessary, you can consider the use of more appropriate data storage.

Oracle, mysql and other traditional relational database is very mature and has been large-scale commercial, why use NoSQL database? mainly With the development of the Internet, the amount of data is growing, the performance requirements are getting higher and higher, the traditional database of congenital defects, namely stand-alone (single Library) performance bottlenecks, and difficult to expand. This is a stand-alone single library bottleneck, but difficult to expand, naturally unable to meet the growing mass of data storage And its performance requirements, so there will be a variety of different NoSQL products.

Although in the cloud computing era, the traditional database there are congenital defects, but NoSQL database can not be replaced, NoSQL can only For the traditional data supplement can not be replaced, so to avoid the shortcomings of traditional databases is the current era of large data must be resolved.

In order to solve these problems, such as mysql and other relational database, this article describes how to design and implement a compatible mysql protocol distributed database. He can automatically find the distributed database cluster nodes, Automatically allocate data to support massive data storage. Taking into account the increasingly important security of the database, from time to time the occurrence of database administrators or other attackers malicious changes in the database data, So the database developed by the database from the bottom of the database to join the audit function.

The main work of this paper is as follows:

Based on the realization of java language compatible mysql communication protocol database;

The realization of the database cluster, to achieve the database of high availability, scalability, load balancing and other characteristics;

From the bottom of the database to consider the database security, joined the data audit and other features.

Keywords: mysql, java, mysql, java, mysql

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第一章 系统测试

1.1 测试环境

本文的测试环境为个人的计算机。它的硬件和软件参与如下

1.硬件参数：

(a) CPU：intel(R) Xeon(R) E5620

(b) 内存：8G

(c) 磁盘：500G

(d) 网络：100Mbit/s

2.软件参数：

(a) 操作系统：windows10

(b) java版本：8.0

1.2 功能测试

1.2.1 数据库功能测试

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致 谢

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