

Study and Application of Lite Embedded Database

Premlatha Govindpur, Abhay Shivsingwale, Balaji Bongale, Pranay Shinde, Mukund Shewale

Dept of Information Technology, ICOER, Pune ,India

Abstract -The SQLite database systems are most used in Mobile database system. SQLite is an open source database engine and its some of the advantages like portable, reliable, high efficiency, small core and so on. We proposed a advanced SQLite database system to Windows(Computer system) platform, and we also introduced an C Unicode for SQLite. The open source embedded database SQLite can meet the needs of embedded systems better because of its advantages and we are provide a complex commanding functions for easy understanding of user. At the end, we are presented an application of Lite database system in embedded system that is about the data storing system which is based on Windows(Computer system). This application shows that it is high performance embedded database and is also suitable for embedded system.

Key Words: embedded system; embedded database; SQLite; cross compiling

1.INTRODUCTION

The software and hardware resources of embedded systems are limited, the realization of embedded applications is comparatively single and specific, data processing and the ability to maintain are don't asked for much, so the traditional database can not be used for embedded data management systems. It must be used embedded database to meet the needs of embedded systems which is small, fast, simple, reliable and easy-to-port.

SQLite is an open-source embedded database system, and has small overhead, efficient search features, so it is especially suitable for mobile phone, PDA, set-top boxes and other electrical equipments, and has good running ability in consumer applications which can be downloaded. Mobile communication technology can cover a wide range of communication areas and it is portable and it is easier to operate.

This technology is suitable for application of data frequently and long-distance data transmission. With the development of mobile communication technology and increasing people's demand for management of mobile data, embedded mobile

database technology, closely integrated with a variety of intelligent devices, has played an important role in the military field, academia, industry, and other departments. People want to use mobile devices to access to information at anytime and anywhere, using embedded database and other database platforms synchronously has become an inevitable necessity.

2. LITERATURE SURVEY

Use of SQLite on Embedded System

This design is for transplanting and using SQLite database management system on μ C/OS-II, the embedded real time operating system. The design has used μ C/OS-II, the open source operating system, μ C/FS, a file system transplanted on μ C/OS-II, and the SQLite database. By studying their design principles and methods, clarifying the overall structure and the links between the various parts, I try to design a specific application in series with them. The final system can be achieved in operation of addition, deletion, search and update of data and so on in the multi-task scheduling controlled by μ C/OS-II.

Application Research of Embedded Database SQLite

The traditional database cannot be used for the data management of embedded systems. Through the analysis of the characteristics of embedded database and SQLite's characteristics, the internal structure and function of API, it constructs the simulation environment of ARM-Linux and achieves the realization of SQLite in the ARM-Linux platform, including cross compiling, transplant process and application development, it also achieves the graphical user interface design based on Qt/Embedded.

Study and Application of SQLite Embedded Database System Based on Windows CE

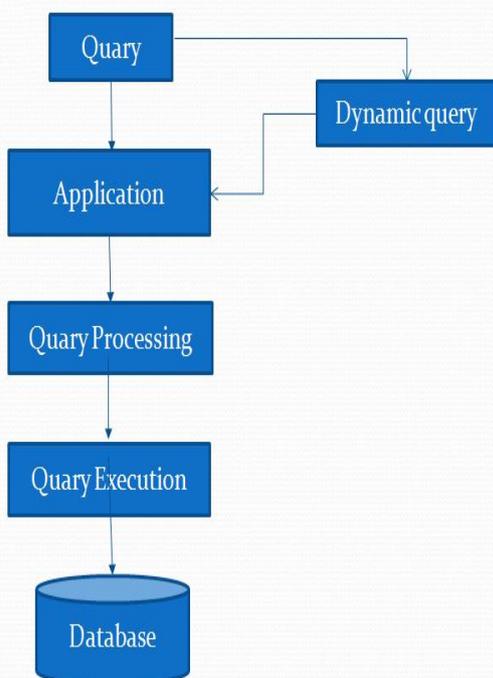
the SQLite is an open source embedded database engine. In this study, the features, architecture and development technology of SQLite are discussed. We

proposed a detailed porting process for SQLite to Windows CE platform, and we also introduce a C++ Unicode encapsulation for SQLite. The experiment shows that it is high performance embedded database and is suitable for embedded system.

3. SYSTEM ARCHITECTURE AND ALGORITHM

3.1 System Architecture

Architecture of LITE Database



3.2 System Algorithm

Symmetric key encryption technique

The growing dependence on computers to process information and transmit it across virtually connected systems has increased the need for security. Cryptography follows a set of mathematical techniques to provide information security, confidentiality, data integrity, authentication and non-repudiation. Encryption and decryption are the key concepts of cryptography. The process of encryption and decryption requires an encrypting key and decrypting key. Few cryptosystems use the same key

for both encryption and decryption called symmetric key/public key cryptography.

4. EXPERIMENTS AND ANALYSIS

The system is tested for Windows. They are windows2003, windows xp, windows 7, windows 8,8.1,10. The test results are as follows.

4.1. Compatibility Testing: We check the compatibility of our system by installing it on Windows. The compatibility passing rate is 100%.

4.2. Performance Testing: We test the starting time consumption, CPU utilization, and memory utilization. The average start time is 0.63 s; the average CPU utilization is 2.9%; the average memory utilization is 157KB. Compared with other Database Management System, this resource occupation is relatively much lower.

5. CONCLUSIONS

In this paper, we propose a Lite database privacy protection system, which is based on the windows. In this Lite database, operation insert, select, delete, update, drop. This increases the robustness of the system. Test results show that our system has good robustness and low resource consumption. We hope to introduce the new database language embedded system. In SQLite database system the problems occurred like complex command interface, user need to perform all the operation, security problems. However, something more can be done based on our works. We use easy to storage data to prevent the system.

REFERENCES

- 1) Rick F, van der Lans. Introduction to SQL: Mastering the Relational Database Language, Addison Wesley, 2006.
- 2) Michael Owens, The Definitive Guide to SQLite, USA: Apress, 2006, 341-362
- 3) Zeng Ziming, Zeng Yuanyuan, Research on the Model of Agent-based Embedded Database for Mobile Embedded System, The Seventh international Conference on Electronic Measurement and instruments, ICEMI' 2005.

4)David Zhang, Ou Shu-yun, "Application of Embedded Database", SCM and application of embedded system,2010,7,pp.5-7.

5)Wan Ma-ning, Guan Yong-han,Xiang jun, "Research on Typical Technologies of embedded database-SQLite and Berkeley DB", Information of Microcomputer,2012,22(1-2),pp.91-93.

6)Tang Min, Song Jie, "Principle and Application of Embedded Database SQLite", Knowledge and Technology of Computer,2009,4,pp.601-603.