



## Fachgebiet Internet-Technologien und Systeme Prof. Dr. Christoph Meinel

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### Secure Database Synchronization/Replication through Lock-Keeper

#### Introduction

With explosive growth of the Internet services, the distributed database technology has been an essential part of current web-based applications. However, all these databases over public networks have also created many dangerous opportunities for attacks. The task of data updating and backup as well as securing online databases has become a primary problem for most applications in e-commerce, e-government and e-learning, etc. The Lock-Keeper technology is a new network security solution which can provide secure data exchanges between two separate computers or networks without having to establish a direct physical connection.

In this project, we propose to use a new database replication and synchronization solution which using the Lock-Keeper system to physically separate the actual online database server with the sensitive internal network and simultaneously get real-time data update from an internal backup database.

The project aims to implement a standard and secure database synchronization/replication solution based on the Lock-Keeper technology, which can support most of popular databases, e.g. MySQL, SAP DB, Oracle, DB2, SQL Server, etc.

#### Tasks

- Study and comparison of the database synchronization/replication methods provided by popular database technologies
- Analysis of common database synchronization/replication protocols
- Proposal of a standard and secure database synchronization/replication solution
- Development of a Lock-Keeper “DB Syn/Rep module” by implementation of your proposed solution
- Performance measurements and system optimization

#### Requirements

- Strong knowledge on Linux, and database technology, e.g. MySQL, SAP DB, Oracle, DB2, SQL Server, etc.
- Good programming skill on Java and C/C++
- Other skills that are not essential but are desirable include R&D experience of security products, web scripting (any language).

#### References

- <http://www.hpi.uni-potsdam.de/~meinel/projects/lock-keeper.html>
- [http://www.siemens.ch/index.jsp?sdc\\_p=c175fi1092416lmno1280814ps2t4u1280z4&sdc\\_sid=17687295687&](http://www.siemens.ch/index.jsp?sdc_p=c175fi1092416lmno1280814ps2t4u1280z4&sdc_sid=17687295687&)



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- William R. Cheswick, Steven M. Bellovin, "Firewalls and Internet Security", Addison-Wesley, 1995.

### Project Partners



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