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SERVER-AIDED PUBLIC KEY ENCRYPTION WITH KEYWORD SEARCH

ABSTRACT

Public Key Encryption with Keyword Search (PEKS) is a well-known cryptographic primitive for secure searchable data encryption in cloud storage. Unfortunately, it is inherently subject to the (inside) off-line keyword guessing attack (KGA), which is against the data privacy of users. Existing countermeasures for dealing with this security issue mainly suffer from low efficiency and are impractical for real applications. In this work, we provide a practical and applicable treatment on this security vulnerability by formalizing a new PEKS system named Server-Aided Public Key Encryption with Keyword Search (SA-PEKS). In SA-PEKS, to generate the keyword ciphertext/trapdoor, the user needs to query a semi-trusted third party called Keyword Server (KS) by running an authentication protocol and hence security against the off-line KGA can be obtained. We then introduce a universal transformation from any PEKS scheme to a secure SA-PEKS scheme using the deterministic blind signature. To illustrate its feasibility, we present the first instantiation of SA-PEKS scheme by utilizing the FDH-RSA signature and the PEKS scheme

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proposed by Boneh et al. in Eurocrypt 2004. Finally, we describe how to securely implement the client-KS protocol with a rate-limiting mechanism against on-line KGA and evaluate the performance of our solutions in experiments.

EXISTING SYSTEM:

One of the typical solutions is the searchable encryption which allows the user to search and retrieve the encrypted data, and meanwhile preserve the data privacy. Searchable encryption can be realized in either symmetric or asymmetric encryption setting. The symmetric searchable encryption (SSE) is proposed by Song et al. and later a formal treatment by Curtmola et al. Despite the high efficiency in SSE schemes, they suffer from complicated secret key distribution problem. Searchable encryption in public key setting, originating from store-and-forward system, such as email system, in which a receiver can search data en-crypted under the receiver's public key on an outsourced storage system, is initiated by Boneh et al. They firstly introduced a more flexible primitive, namely Public Key Encryption with Keyword Search (PEKS) that enables a user to search encrypted data in the asymmetric encryption setting. In

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a PEKS system, using the receiver's public key, the sender attaches some encrypted keywords (referred to as PEKS ciphertexts) with the encrypted data. The receiver then sends the trapdoor of a to-be-searched keyword to the server for data searching. Given the trapdoor and the PEKS ciphertext, the server can test whether the keyword underlying the PEKS ciphertxt is equal to the one selected by the receiver. If so, the server sends the matching encrypted data to the receiver.

DISADVANTAGES OF EXISTING SYSTEM:

- Off-line keyword guessing attack (KGA), which is against the data privacy of users.
- Existing countermeasures for dealing with this security issue mainly suffer from low efficiency and are impractical for real applications.

PROPOSED SYSTEM:

In Proposed formalize a new PEKS system named Server- Aided Public Key Encryption with Keyword Search (SA-PEKS) to address the security vulnerability against (inside) offline KGA in existing PEKS systems. Our proposed solution can work transparently with any existing PEKS system and

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hence is much more applicable in practice. Secondly, we present a generic construction of SA-PEKS scheme with formal security analysis. Precisely, we propose a universal transformation from any PEKS scheme to an SA-PEKS scheme by utilizing a deterministic blind signature. Thirdly, to illustrate the feasibility of the proposed generic transformation, an instantiation of the SA-PEKS scheme is presented in this paper. We instantiate the scheme from the FDH-RSA blind signature and the PEKS scheme proposed by Boneh et al.. Lastly, we present the implementation of our solution and analyze its performance in experiments. Particularly, we show how to securely implement the client-KS protocol with a rate-limiting mechanism against on-line KGA.

ADVANTAGE OF PROPOSED SYSTEM:

- The Proposed (SA-PEKS) scheme achieves much better efficiency while providing resistance against both off-line and on-line KGAs.
- Securely implement the client-KS protocol with a rate-limiting mechanism against on-line KGA.

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SYSTEM SPECIFICATION

HARDWARE REQUIREMENTS

• Processor - Pentium –IV

• Speed - 1.1 Ghz

• RAM - 256 MB(min)

• Hard Disk - 20 GB

Key Board - Standard Windows Keyboard

Mouse - Two or Three Button Mouse

• Monitor - SVGA

SOFTWARE REQUIREMENTS

• Operating System : Windows 8

Front End : Java

Database : Mysql

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