

Privacy Preserving in Distributed verifiable Data Control in cloud Storage

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Abstract:

Cloud computing economically enables the paradigm of data service outsourcing. However, to protect data privacy, sensitive cloud data have to be encrypted before outsourced to the commercial public cloud, which makes effective data utilization service a very challenging task. Although traditional searchable encryption techniques allow users to securely search over encrypted data through keywords. In this paper, we define and solve the problem of secure ranked keyword search over encrypted cloud data.

I. INTRODUCTION

The content-aware search scheme, which can make semantic search more smart. The Conceptual Graphs (CGs) as a knowledge representation tool. In order to conduct numerical calculation, transfer original CGs into their linear form with some modification and map them to numerical vectors. Next, employ the technology of multi-keyword ranked search over encrypted cloud data as the basis against two threat models and raise PRSCG and PRSCG-TF to resolve the problem of privacy-preserving smart semantic search based on conceptual graphs

Specifically, we explore the statistical measure approach, i.e., relevance score, from information retrieval to build a secure searchable index, and develop a one-to-many order-preserving mapping technique to properly protect those sensitive score information. Thorough analysis when compared to previous searchable encryption schemes, while correctly realizing the goal of ranked keyword search.

FEASIBILITY STUDY

TECHNICAL FEASIBILITY:

Evaluating the technical feasibility is the trickiest part of a

feasibility study. This is because, at this point in time, not too many detailed design of the system, making it difficult to access issues like performance, costs on (account of the kind of technology to be deployed) etc. A number of issues have to be considered while doing a technical analysis.

- i) Understand the different technologies involved in the proposed system :
Before commencing the project, we have to be very clear about what are the technologies that are to be required for the development of the new system.
- ii) Find out whether the organization currently possesses the required technologies:

Is the required technology available with the organization?

If so is the capacity sufficient?

For instance – “Will the current printer be able to handle the new reports and forms required for the new system?”

ECONOMIC FEASIBILITY:

Economic feasibility attempts to weigh the costs of developing and implementing a new system, against the benefits that would accrue from having the new system in place. This feasibility

study gives the top management the economic justification for the new system.

A simple economic analysis which gives the actual comparison of costs and benefits are much more meaningful in this case. In addition, this proves to be a useful point of reference to compare actual costs as the project progresses. There could be various types of intangible benefits on account of automation. These could include increased customer satisfaction, improvement in product quality better decision making timeliness of information, expediting activities, improved accuracy of operations, better documentation and record keeping, faster retrieval of information, better employee morale.

OPERATIONAL FEASIBILITY:

Proposed projects are beneficial only if they can be turned into information systems that will meet the organizations operating requirements. Simply stated, this test of feasibility asks if the system will work when it is developed and installed. Are there major barriers to Implementation? Here are questions that will help test the operational feasibility of a project:

- Is there sufficient support for the project from management from users? If the current system is well liked and used to the extent that persons will not be able to see reasons for change, there may be resistance.
- Are the current business methods acceptable to the user? If they are not, Users may welcome a change that will bring about a more operational and useful systems.
- Have the user been involved in the planning and development of the project?
- Early involvement reduces the chances of resistance to the system and in
- General and increases the likelihood of successful project.

Since the proposed system was to help reduce the hardships encountered. In the existing manual system, the new system was considered to be operational feasible.

EXISTING SYSTEM

We show that existing proposals to achieve *anonymity* in search logs are insufficient in the light of attackers who can actively influence the search log. However, we show that it is impossible to achieve good utility with differential privacy.

DISADVANTAGES

Existing work on publishing frequent item sets often only tries to achieve anonymity or makes strong assumptions about the background knowledge of an attacker.

PROPOSED SYSTEM

The main focus of this paper is search logs, our results apply to other scenarios as well. For example, consider a retailer who collects customer transactions. Each transaction consists of a basket of products together with their prices, and a time-stamp. In this case can be applied to publish frequently purchased products or sets of products. This information can also be used in a recommender system or in a market basket analysis to decide on the goods and promotions in a store.

ADVANTAGES

Our results show that yields comparable utility to OPSE while at the same time achieving much stronger privacy guarantees.

CONCLUSION

In this paper, compared with the previous study, we propose two more secure and efficient schemes to solve the problem of privacy preserving smart semantic search based on conceptual graph over encrypted outsourced data. Considering

various semantic representation tools, we select conceptual graphs as our semantic carrier because of its excellent ability of expression and extension. To improve the accuracy of retrieval, we use trexex to simplify the key sentence and make it more generalizable. We transfer CG into its linear form with some modification creatively which makes quantitative calculation on CG and fuzzy retrieval in semantic level possible. We use different methods to generate indexes and construct two different schemes with two enhanced schemes respectively against two threat models by introducing the frame of MRSE. We implement our scheme on the real data set to prove its effectiveness and efficiency.

For the further work, we will explore the possibility of semantic search over encrypted cloud data with natural language processing technology.

REFERENCES

- [1] S. Miranda-Jimnez, A. Gelbukh, and G. Sidorov, "Summarizing conceptual graphs for automatic summarization task," *Conceptual Structures for STEM Research and Education*, Springer Berlin Heidelberg, pp.245-253,2013.
- [2] R. Ferreira, L. de Souza Cabral, and R. D. Lins, "Assessing sentence scoring techniques for extractive text summarization," *Expert Systems with Applications*, vol.40, no.14, pp.5755-5764, 2013.
- [3] M. Liu, R. Calvo, and A. Aditomo, "Using wikipedia and conceptual graph structures to generate questions for academic writing support," *Learning Technologies*, IEEE Transactions on, vol.5, no.3, pp.251-263,2012.
- [4] M. Heilman, and N. A. Smith, "Extracting simplified statements for factual question generation," *Proceedings of QG2010: The Third Workshop on Question Generation*, pp.11-20,2010.
- [5] D. X. Song, D. Wagner, and A. Perrig, "Practical techniques for searches on encrypted data," *Proceedings of Security and Privacy, 2000 IEEE Symposium on*, pp.44-55,2000.
- [6] Y. -C. Chang and M. Mitzenmacher, "Privacy preserving keyword searches on remote encrypted data," *Proceedings of ACNS*, pp.391-421,2005.
- [7] R. Curtmola, J. A. Garay, S. Kamara, and R. Ostrovsky, "Searchable symmetric encryption: improved definitions and efficient constructions," *Proceedings of ACM CCS*, pp.79-88,2006.
- [8] C. Wang, N. Cao, and J. Li, "Secure ranked keyword search over encrypted cloud data," *Proceedings of Distributed Computing Systems (ICDCS), 2010 IEEE 30th International Conference on*, pp.253-262,2010.
- [9] N. Cao, C. Wang, and M. Li, "Privacy-preserving multi-keyword ranked search over encrypted cloud data," *Parallel and Distributed Systems*, IEEE Transactions on, vol.25, no.1, pp.222-233,2014.
- [10] W. Sun, B. Wang, and N. Cao, "Privacy-preserving multi-keyword text search in the cloud supporting similarity-based ranking," *Proceedings of the 8th ACM SIGSAC symposium on Information, computer and communication security*, pp.71-82,2013.
- [11] R. Li, Z. Xu, and W. Kang, "Efficient multi-keyword ranked query over encrypted data in cloud computing," *Future Generation Computer Systems*, vol.30, pp.179-190,2014.

- [12] Z. Fu, X. Sun, and Q. Liu, "Achieving Efficient Cloud Search Services: Multi-keyword Ranked Search over Encrypted Cloud Data Supporting Parallel Computing," *IEICE Transactions on Communications*, vol.E98-B,no.1, pp.190-200,2015.
- [13] Z. Xia, X. Wang, and X. Sun, "A Secure and Dynamic Multikeyword Ranked Search Scheme over Encrypted Cloud Data," *Parallel and Distributed Systems, IEEE Transactions on*, vol.27,no.2,pp.340-352,2015.
- [14] Z. Fu, J. Shu, and X. Sun, "Semantic keyword search based on trie over encrypted cloud data," *Proceedings of the 2nd international workshop on Security in cloud computing*, ACM, pp.59-62,2014.
- [15] J. F. Sowa, "Conceptual structures: information processing in mind and machine," 1983.
- [16] J. F. Sowa, *Conceptual Graphs*. In: *Handbook of Knowledge Representation*, pp.213-237,2008.
- [17] J. Zhong, H. Zhu, and J. Li, *Conceptual graph matching for semantic search. Conceptual structures: Integration and interfaces*, Springer Berlin Heidelberg, pp.92-106,2002.
- [18] G. S. Poh, M. S. Mohamad, and M. R. Zaba, *Structured encryption for conceptual graphs. Advances in Information and Computer Security*, Springer Berlin Heidelberg, pp.105-122,2012.
- [19] S. Hensman, and J. Dunnion, "Automatically building conceptual graphs using VerbNet and WordNet," *Proceedings of the 2004 international symposium on Information and communication technologies*, Trinity College Dublin, pp.115-120,2004.
- [20] W. K. Wong, D. W. Cheung, and B. Kao, "Secure KNN computation on encrypted databases," *Proceedings of the 2009 ACM SIGMOD International Conference on Management of data*, pp.139-152,2009.
- [21] Z. Fu, K. Ren, J. Shu, X. Sun, and F. Huang, "Enabling Personalized Search over Encrypted Outsourced Data with Efficiency Improvement," *Parallel and Distributed Systems, IEEE Transactions on*, vol.27,no.9, pp.2546-2559,2016.
- [22] Z. Fu, X. Sun, S. Ji, and G. Xie, "Towards Efficient Contentaware Search over Encrypted Outsourced Data in Cloud," *The 35th Annual IEEE International Conference on Computer Communications (IEEE INFOCOM)*, San Francisco, CA, 2016, DOI: 10.1109/INFOCOM.2016.7524606.
- [23] S. Zerr, E. Demidova, D. Olmedilla, W. Nejdl, M. Winslett, and S. Mitra, "Zerber: r-Confidential Indexing for Distributed Documents," *Proc. 11th Int'l Conf. Extending Database Technology (EDBT'08)*, pp.287-298,2008.
- [24] J. Zobel and A. Moffat, "Exploring the Similarity Space," *ACM SIGIR Forum*, vol.32, pp.18-34,1998.
- [25] C. Chen, X. Zhu, P. S. J. Hu, S. Guo, Z. tari, and A. Y. Zomaya, "An efficient privacy-Preserving Ranked Keyword Search Method," *Parallel and Distributed Systems, IEEE Transactions on*, 2015.
- [26] Z. Fu, F. Huang, X. Sun, A. V. Vasilakos, and C. Yang, "Enabling Semantic Search based on Conceptual Graphs over Encrypted Outsourced Data," *Services Computing, IEEE Transactions on*, 2016. DOI:10.1109/TSC.2016.2622697.

- [27] S. Kamara, C. Papamanthou, and T. Roeder, "Dynamic searchable symmetric encryption," Proceedings of the 2012 ACM conference on Computer and communications security, pp.965-976,2012.
- [28] R. Curtmola, J. Garay, and S. Kamara, "Searchable symmetric encryption: improved definitions and efficient constructions," Proceedings of the 13th ACM conference on Computer and communications security, pp.79-88,2006.
- [29] M. Chase, and S. Kamara, "Structured encryption and controlled disclosure," In Advances in Cryptology-ASIACRYPy 2010, Springer Berlin Heidelberg, pp.577-594,2010.
- [30] R. D. Lins, and S. J. Simske, "A multi-tool scheme for summarizing textual documents," Proceedings of 11st IADIS international conference WWW/INTERNET, pp.1-8,2012.
- [31] Z. Fu, X. Wu, C. Guan, X. Sun, and K. Ren, "Towards Efficient Multi-keyword Fuzzy Search over Encrypted Outsourced Data with Accuracy Improvement", IEEE Transactions on Information Forensics and Security, vol.11,no.12, pp.2706-2716,2016.
DOI:10.1109/TIFS.2016.2596138.
- [32] Z. Xia, X. Wang, L. Zhang, Z. Qin, X. Sun, and K. Ren, "A Privacy preserving and Copy-deterrence Content-based Image Retrieval Scheme in Cloud Computing," IEEE Transactions on Information Forensics and Security, 2016.
DOI:10.1109/TIFS.2016.2590944.
- [33] Y. Ren, J. Shen, J. Wang, J. Han, and S. Lee, "Mutual Verifiable Provable Data Auditing in Public Cloud Storage," Journal of Internet Technology, vol.16,no.2, pp.317-323,2015.
- [34] B. Gu, and V. S. Sheng, "A Robust Regularization Path Algorithm for -Support Vector Classification," IEEE Transactions on Neural Networks and Learning Systems,2016;DOI:10.1109/TNNLS.2016.2527796.
- [35] G. Sankareswari, S. Selvi, and R. Vidhyalakshmi, "Enabling secure outsourced cloud data," Information Communication and Embedded Systems (ICICES), 2014 International Conference on, IEEE, pp.1-6,2014.
- [36] J. Wang, X. Chen, and X. Huang, "Verifiable auditing for outsourced database in cloud computing," IEEE Transactions on Computers, vol.64,no.11, pp.3293-3303,2015.
- [37] F. Cheng, Q. Wang, and Q. Zhang, "Highly Efficient Indexing for Privacy-Preserving Multi-keyword Query over Encrypted Cloud Data," International Conference on Web-Age Information Management, pp.348-359,2014