Abstract

Cryptography and Steganography are two techniques commonly used to secure and safely transmit digital data. Nevertheless, they do differ in important ways. In fact, cryptography scrambles data so that they become unreadable by eavesdroppers; while, steganography hides the very existence of data so that they can be transferred unnoticed. Basically, steganography is a technique for hiding data such as messages into another form of data such as images. Currently, many types of steganography are in use; however, there is yet no known steganography application for query languages such as SQL. This paper proposes a new steganography method for textual data. It encodes input text messages into SQL carriers made up of SELECT queries. In effect, the output SQL carrier is dynamically generated out of the input message using a dictionary of words implemented as a hash table and organized into 65 categories, each of which represents a particular character in the language. Generally speaking, every character in the message to hide is mapped to a random word from a corresponding category in the dictionary. Eventually, all input characters are transformed into output words which are then put together to form an SQL query. Experiments conducted, showed how the proposed method can operate on real examples proving the theory behind it. As future work, other types of SQL queries are to be researched including INSERT, DELETE, and UPDATE queries, making the SQL carrier quite puzzling for malicious third parties to recuperate the secret message that it encodes.
References

- Peter Wayner, 2009. Disappearing cryptography: information hiding: steganography & watermarking, 3rd Edition, Morgan Kaufmann Publishers.
- Greg Kipper, 2004. Investigator’s Guide to Steganography, Auerbach Publications.
- W. Bender, D. Gruhl, N. Morimoto, and A. Lu, 1996. Techniques for data hiding, IBM Systems Journal, vol. 35, no. 3-4, pp. 313-336.
- Fabien A. P. Petitcolas, Ross J. Anderson and Markus G. Kuhn, 1999. Information Hiding - A Survey, Proceedings of the IEEE, special issue on protection of multimedia content, vol. 87, no. 7, pp. 1062-1078.
- Eric Cole, 2003. Hiding in Plain Sight: Steganography and the Art of Covert Communication, Wiley Publishing.
- Johnson, N. F. and Jajodia, S., 1998. Exploring steganography: Seeing the unseen, Computer Journal, vol. 31, no. 2, pp. 26–34.
- Jessica Fridrich, 2009. Steganography in Digital Media: Principles, Algorithms, and Applications, Cambridge University Press.
- Bret Dunbar, 2002. Steganographic Techniques and their use in an Open-Systems Environment, The Information Security Reading Room, SANS Institute.
- Mohammad Shahreza, 2008. Text Steganography by Changing Words Spelling, ICACT.
- C. Zhi-li, H. Liu-sheng, Y. Zhen-shan, Z. Xin-xin, Z. Xue-ling, 2008. Effective Linguistic Steganography Detection, IEEE 8th International Conference on Computer and Information Technology Workshops.
- Adnan Gutub and Manal Fattani, 2007. A Novel Arabic Text Steganography Method Using Letter Points and Extensions, World Academy of Science, Engineering and Technology, Vol. 27.
- Sudeep Ghosh, 2007. StegHTML: A message hiding mechanism in HTML tags.
- S. Low, N. Maxemchuk, J. Brassil, L. O’apos;Gorman, 1995. Document marking and identification using both line and word shifting, Proceedings of the 14th Annual Joint Conference of the IEEE Computer and Communications Societies, INFOCOM 95.
- W. Bender, D. Gruhl, N. Morimoto, A. Lu, 1996. Techniques for data hiding IBM Systems Journal, vol. 35, no 3, pp. 313-336.
- M. H. Shirali-Shahreza, M. Shirali-Shahreza, 2008. A New Synonym Text Steganography, IEEE International Conference on Intelligent Information Hiding and Multimedia Signal Processing.
- M. Shirali-Shahreza, M. H. Shirali-Shahreza, 2007. Text Steganography in Chat, 3rd IEEE/IFIP International Conference in Central Asia on Internet.
- Gregory Kipper, 2004. Investigator’s guide to steganography, CRC Press.
- Mark Stamp, 2006. Information Security-Principles and Practice, Wiley Student Edition.
- C. Date, H. Darwen, 1997. A Guide to the SQL standard: a user’s guide to the standard database language SQL, 4th edition, Addison Wesley.
- Larry Nyhoff, 2004. ADTs, Data Structures, and Problem Solving with C++, Prentice
A Generation-based Text Steganography Method using SQL Queries

Hall.

Index Terms

Computer Science  Security

Keywords

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