

io-port 05531739

Li, Min; Sun, Xiaoxun; Wang, Hua; Zhang, Yanchun

Optimal privacy-aware path in Hippocratic databases.

Zhou, Xiaofang (ed.) et al., Database systems for advanced applications. 14th international conference, DASFAA 2009, Brisbane, Australia, April 21–23, 2009. Proceedings. Berlin: Springer (ISBN 978-3-642-00886-3/pbk). Lecture Notes in Computer Science 5463, 441-455 (2009).

Summary: Privacy becomes a major concern for both customers and enterprises in today's corporate marketing strategies, many research efforts have been put into developing new privacy-aware technologies. Among them, Hippocratic databases are one of the important mechanisms to guarantee the respect of privacy principles in data management, which adopt purpose as a central concept associated with each piece of data stored in the databases. The proposed mechanism provides basic principles for future database systems protecting privacy of data as a founding tenet. However, Hippocratic databases do not allow to distinguish which particular method is used for fulfilling a purpose. Especially, the issues like purpose hierarchies, task delegations and minimal privacy cost are missing from the proposed mechanism. In this paper, we extend these mechanisms in order to support inter-organizational business processes in Hippocratic databases. A comprehensive approach for negotiation of personal information between customers and enterprises based on user preferences is developed when enterprises offer their clients a number of ways to fulfill a service. We organize purposes into purpose directed graphs through AND/OR decomposition, which supports task delegations and distributed authorizations. Specially, customers have controls of deciding how to get a service fulfilled on the basis of their personal feeling of trust for any service customization. Quantitative analysis is performed to characterize privacy penalties dealing with privacy cost and customer's trust. Finally, efficient algorithms are given to guarantee the minimal privacy cost and maximal customer's trust involved in a business process.

doi:10.1007/978-3-642-00887-0_39