World Academy of Science, Engineering and Technology
International Journal of Information and Communication Engineering
Vol:8, No:11, 2014

Efficient Fuzzy Classified Cryptographic Model for Intelligent Encryption Technique towards E-Banking XML Transactions

Authors : Maher Aburrous, Adel Khelifi, Manar Abu Talib

Abstract : Transactions performed by financial institutions on daily basis require XML encryption on large scale. Encrypting large volume of message fully will result both performance and resource issues. In this paper a novel approach is presented for securing financial XML transactions using classification data mining (DM) algorithms. Our strategy defines the complete process of classifying XML transactions by using set of classification algorithms, classified XML documents processed at later stage using element-wise encryption. Classification algorithms were used to identify the XML transaction rules and factors in order to classify the message content fetching important elements within. We have implemented four classification algorithms to fetch the importance level value within each XML document. Classified content is processed using element-wise encryption for selected parts with "High", "Medium" or “Low” importance level values. Element-wise encryption is performed using AES symmetric encryption algorithm and proposed modified algorithm for AES to overcome the problem of computational overhead, in which substitute byte, shift row will remain as in the original AES while mix column operation is replaced by 128 permutation operation followed by add round key operation. An implementation has been conducted using data set fetched from e-banking service to present system functionality and efficiency. Results from our implementation showed a clear improvement in processing time encrypting XML documents.

Keywords : XML transaction, encryption, Advanced Encryption Standard (AES), XML classification, e-banking security, fuzzy classification, cryptography, intelligent encryption

Conference Title : ICCCA 2014 : International Conference on Computer Communications and Applications
Conference Location : Kyoto, Japan
Conference Dates : November 13-14, 2014

Open Science Index, Information and Communication Engineering Vol:8, No:11, 2014 publications.waset.org/abstracts/16665.pdf