A Comparative Analysis of Asymmetric Encryption Schemes on Android Messaging Service

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Abstract : Today, Short Message Service (SMS) is an important means of communication. SMS is not only used in informal environment for communication and transaction, but it is also used in formal environments such as institutions, organizations, companies, and business world as a tool for communication and transactions. Therefore, there is a need to secure the information that is being transmitted through this medium to ensure security of information both in transit and at rest. But, encryption has been identified as a means to provide security to SMS messages in transit and at rest. Several past researches have proposed and developed several encryption algorithms for SMS and Information Security. This research aims at comparing the performance of common Asymmetric encryption algorithms on SMS security. The research employs the use of three algorithms, namely RSA, McEliece, and RABIN. Several experiments were performed on SMS of various sizes on android mobile device. The experimental results show that each of the three techniques has different key generation, encryption, and decryption times. The efficiency of an algorithm is determined by the time that it takes for encryption, decryption, and key generation. The best algorithm can be chosen based on the least time required for encryption. The obtained results show the least time when McEliece size 4096 is used. RABIN size 4096 gives most time for encryption and so it is the least effective algorithm when considering encryption. Also, the research shows that McEliece size 2048 has the least time for key generation, and hence, it is the best algorithm as relating to key generation. The result of the algorithms also shows that RSA size 1024 is the most preferable algorithm in terms of decryption as it gives the least time for decryption.

Keywords : SMS, RSA, McEliece, RABIN

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