Abstract

Cryptography is the discipline of encoding and decoding messages. Cryptography is used frequently in people’s daily lives to keep sensitive information, such as credit card information, safe. Many everyday activities can be easily monitored by unintended third parties via Internet. Hill cipher is a classic cryptography based on linear algebra that is simply a linear transformation represented by a matrix. The encoding and decoding process in Hill cipher involves matrix multiplication, which is potentially time consuming, making it one of the most well-studied problems in this field. In this paper, we implement the message passing interface (MPI) and MapReduce methods to demonstrate their effectiveness in expediting Hill cipher algorithm in parallel algorithms on a multi-core system. Simulation results show that the efficiency rates of MPI and MapReduce are 93.71 % and 53.43 respectively, with a multi-core processor on the large file size, indicating better performances compared with sequential methods.

References

**Index Terms**

Computer Science Algorithms

**Keywords**

Cryptography, Hadoop, Hill Cipher, MPI, MapReduce, Matrix Multiplication.