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Comparison Analysis and Systematic Study on Secure Transmission of Data in the Cloud Using Steganographic Techniques and Cryptographic Algorithms

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Data and information can be considered the most precious assets in electronic communication systems, but security has become a concern in this competitive world. Cloud computing has emerged as the most exciting technology for on-demand computing, and it is now used by the military, healthcare, education, financial, and a variety of other organizations to handle their large volume of information. Cloud computing has many benefits including efficiency, high performance, scalability, accessibility, backup, and recovery. Security is a primary concern in cloud computing because everyone in the organization shares the same cloud platform. The most significant issue for the user is securely saving, retrieving, and transmitting data through the cloud network and storage. Cryptography and steganography can be defined as the most popular techniques that can be used to enhance data security. Cryptography scrambles the messages into an unintelligible format, while steganography hides the message as it is not observable to the attacker. High-level security is given for both the sender and the receiver inside the cloud platform when cryptography is used along with steganography. This paper analyses the performance of cryptographic and steganographic techniques and suggests the best hybrid cryptographic algorithms and multilayer steganographic techniques that can be combined for efficient and secure data transmission in the cloud. This proposed system will provide availability, integrity, authenticity, confidentiality, and non-repudiation to the data and information.

Keywords*: asymmetric key cryptography, cryptography, image steganography, steganography, symmetric key cryptography*