

JAYPEE INSTITUTE OF INFORMATION TECHNOLOGY



CNS Project Synopsis

Topic: Image Encryption & Decryption using AES

Group No. : 14

Batch : B11

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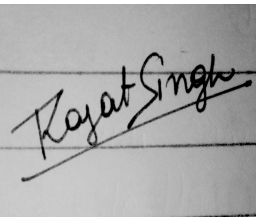

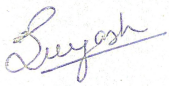
Course Code: 18B11CS212

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Declaration

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Abstract

Due to increasing use of image in various field, it is very important to protect the confidential image data from unauthorized access.

An Image Encryption and Decryption Using AES (Advance Encryption Standard) Algorithm is proposed in this project.

Introduction

Today almost all digital services like internet communication, medical and military imaging systems, multimedia system requires reliable security in storage and transmission of digital images. Due to faster growth in multimedia technology,

internet and cell phones, there is a need for security in digital images. Therefore there is a need for image encryption techniques in order to hide images from such attacks. In this system we use AES (Advanced Encryption Technique) in order to hide image. Such Encryption technique helps to avoid intrusion attacks.

Terminologies:

Encryption:

Encryption is the method by which information is converted into secret code that hides the information's true meaning

Decryption:

Decryption is the process of transforming data that has been rendered unreadable through encryption back to its unencrypted form.

Key:

In cryptography, a key is a variable value that is applied using an algorithm to a string or block of unencrypted text to produce encrypted text, or to decrypt encrypted text. The length of the key is a factor in considering how difficult it will be to decrypt the text in a given message.

Advanced Encryption Standard (AES):

The Advanced Encryption Standard, or AES, is an [encryption algorithm](#) created by the [National Institute of Science and Technology \(NIST\)](#) in 2001. The cipher utilized in AES is a block cipher from the Rijndael cipher family. When AES was created, three different Rijndael block ciphers were selected for use, to make AES even more secure. All three ciphers used were 128 bits, but the keys they each used were of different sizes: 128, 192, and 256 bits. This is considered a symmetric block cipher, as only one key is used in the [encryption](#) process.

Advantages of AES

- AES is more secure (it is less susceptible to cryptanalysis than 3DES).

- AES supports larger key sizes than 3DES's 112 or 168 bits.
- AES is faster in both hardware and software.

What we will build?

We have planned to develop a program that encrypts and decrypts the image files accurately. This will help in minimising the problem of data theft and leaks of other sensitive information. The file that we obtained after encryption is very safe and no one can steal data from this file. So, this file can be sent on a network without worrying. At the receiver side, the receiver has code for decrypting the image so that he can get the original image.

Research Papers:

- B. Subramanyan, V. M. Chhabria and T. G. S. Babu, "Image Encryption Based on AES Key Expansion," *2011 Second International Conference on Emerging Applications of Information Technology*, 2011, pp. 217-220, doi: 10.1109/EAIT.2011.60.
URL:<https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5734951&isnumber=5734894>
- Q. Zhang and Q. Ding, "Digital Image Encryption Based on Advanced Encryption Standard (AES)," *2015 Fifth International Conference on Instrumentation and Measurement, Computer, Communication and Control (IMCCC)*, 2015, pp. 1218-1221, doi: 10.1109/IMCCC.2015.261.
URL:<https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=7406040&isnumber=7405778>
- D. M. Alsaffar *et al.*, "Image Encryption Based on AES and RSA Algorithms," *2020 3rd International Conference on Computer Applications & Information Security (ICCAIS)*, 2020, pp. 1-5, doi: 10.1109/ICCAIS48893.2020.9096809.
URL:<https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9096809&isnumber=9096666>