
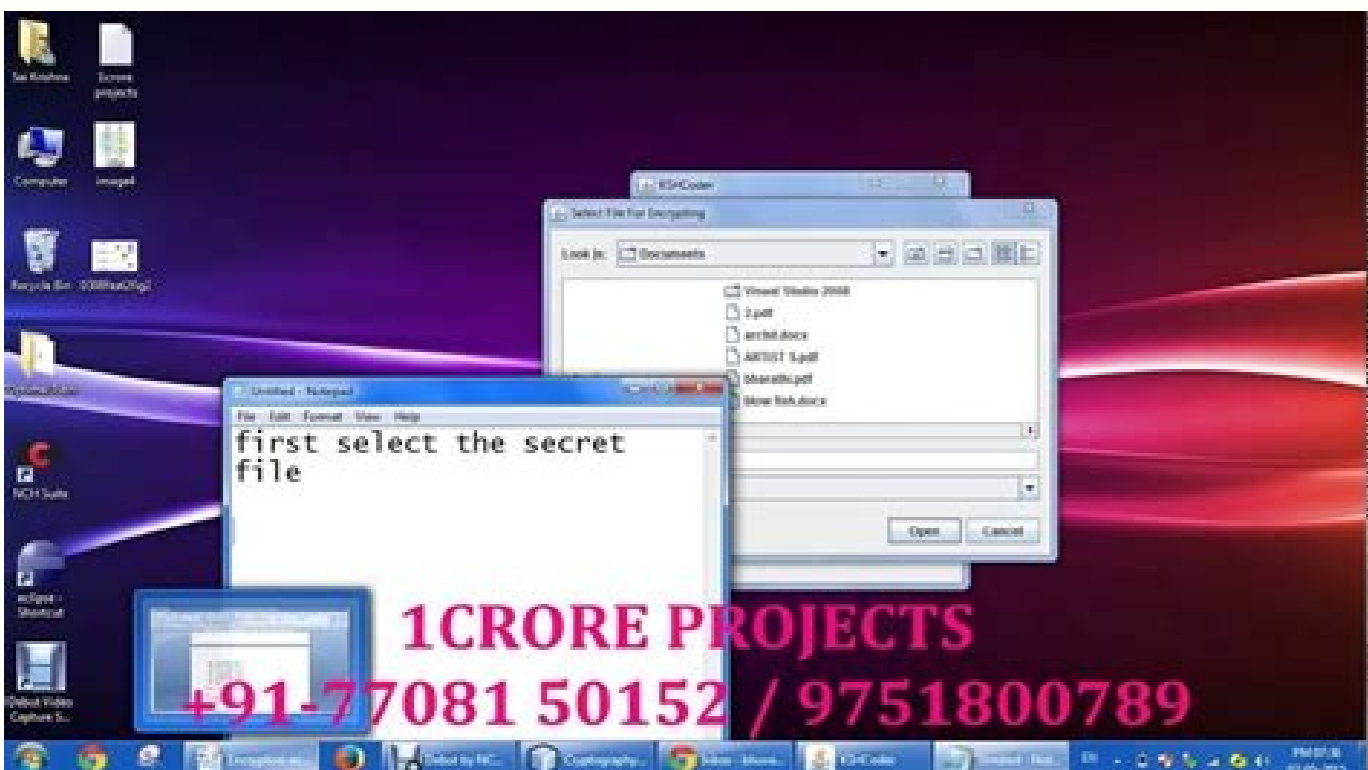
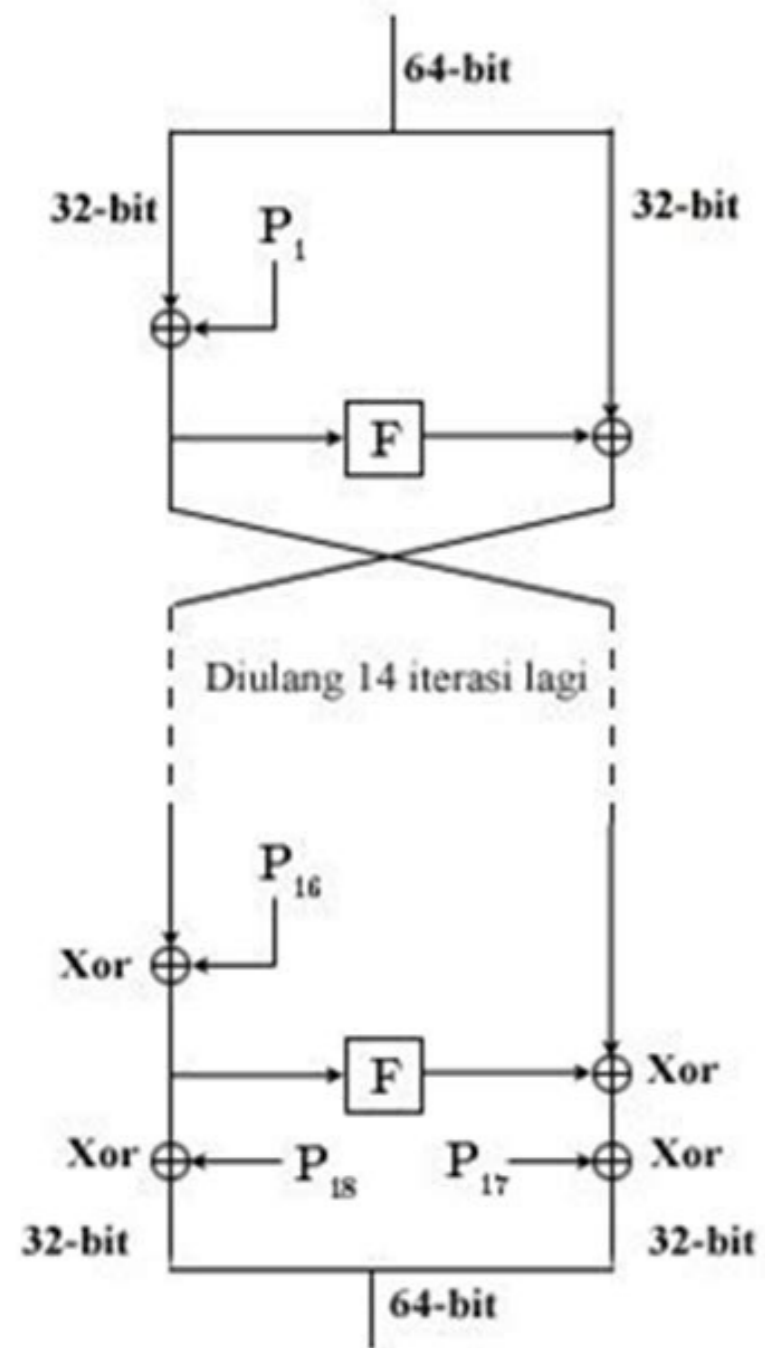
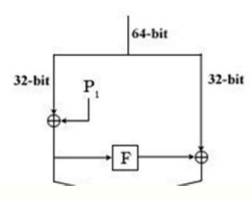


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**BLOWFISH ENCRYPTION ALGORITHM FOR INFORMATION SECURITY**

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**ABSTRACT**

In this paper, a Blowfish encryption algorithm for information security is designed and analyzed. The work is done for networking and communication application for enhanced network security and defence applications. In the proposed Blowfish algorithm reduce rounds of algorithm and proposed single blowfish round. The design simulation is done by Xilinx ISE software using the language of VHDL. Cryptography is the one of the main categories of computer security that converts information from its normal form into an unreadable form. Its ability to secure the protected data against attacks and its speed and efficiency in doing so.

**Keywords:** blowfish, defence, xilinx software, cryptography.

**INTRODUCTION**

Blowfish is a symmetric block cipher that can be effectively used for encryption and safeguarding of data. It takes a variable-length key, from 32 bits to 448 bits, making it ideal for securing data. Blowfish was designed in 1993 by Bruce Schneier as a fast, free alternative to existing encryption algorithms. Blowfish is unpatented and license-free, and is available free for all uses. Blowfish Algorithm is a Feistel Network, iterating a simple encryption function 16 times. The block size is 64 bits, and the key can be any length up to 448 bits. Although there is complex initialization phase required before any encryption can take place, the actual encryption of data is very efficient on large microprocessors.

Each line - 32 bits. Algorithm keeps two sub-key arrays. The 18-entry P-array four 256-entry S-boxes. S-boxes accept 8-bit input. Produce 32-bit output. One entry of P-array is used every round. After final round, each half of data block is XORed with one of the two remaining unused P-entries. The blowfish algorithm Manipulates data in large blocks.

Has a 64-bit block size. It has a scalable key, from 32 bits to at least 256 bits. It Uses simple operations that are efficient on microprocessors e.g., exclusive-or, addition, table lookup, modular- multiplication. It does not use variable-length shifts or bit-wise permutations, or conditional jumps. Employs precomputable subkeys.

On large-memory systems, these subkeys can be precomputed for faster operation. Not precomputing the subkeys will result in slower operation, but it should still be possible to encrypt data without any precomputations. Consists of a variable number of iterations. For applications with a small key size, the trade-off between the complexity of a brute-force attack and a differential attack make a large number of iterations superfluous. Hence, it should be possible to reduce the number of iterations with no loss of security (beyond that of the reduced key size).

**BLOWFISH ENCRYPTION**

Basically, Blowfish encryption algorithm requires 32 bit microprocessor at a rate of one byte for every 26 clock cycles. Blowfish contains 16 rounds. Each round consists of XOR operation and a function. Each round consists of key expansion and data encryption. Key expansion generally used for generating initial contents of one array and data encryption uses a 16 round feistel network methods. Fig1 shows how blowfish algorithm works. plain text and key are the inputs of this algorithm. 64 bit plain text taken is divided into two 32 bits data and at each round the given key is expanded and stored in 18 p-array and gives 32 bit key as input and XOR ed with previous round data.

Then, for  $i = 1$  to 14:  
 $xL = xL \text{ XOR } P_i$   
 $xR = F(xL) \text{ XOR } xR$   
 Swap  $xL$  and  $xR$   
 After the sixteenth round, swap  $xL$  and  $xR$  again to undo the last swap.

Then,  $xR = xR \text{ XOR } P_{15}$  and  $xL = xL \text{ XOR } P_{16}$ .  
 Finally, recombine  $xL$  and  $xR$  to get the ciphertext

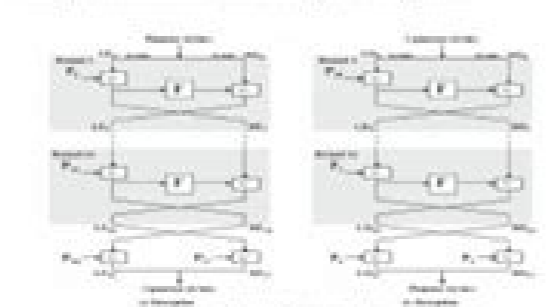


Figure-1. Blowfish encryption and decryption algorithm.



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