

Lecture 5

Review

- Strong Encryption Algorithm
 - Confusion
 - Diffusion

Symmetric Block Encryption

Block cipher

- the most commonly used symmetric encryption algorithms
- input: fixed-size blocks (Typically 64, 128 bit blocks), output: equal size blocks
- provide secrecy and/or authentication services
- Data Encryption Standard (DES), triple DES (3DES), and the Advanced Encryption Standard (AES)s
- Usually employ Feistel structure

Feistel Cipher Structure

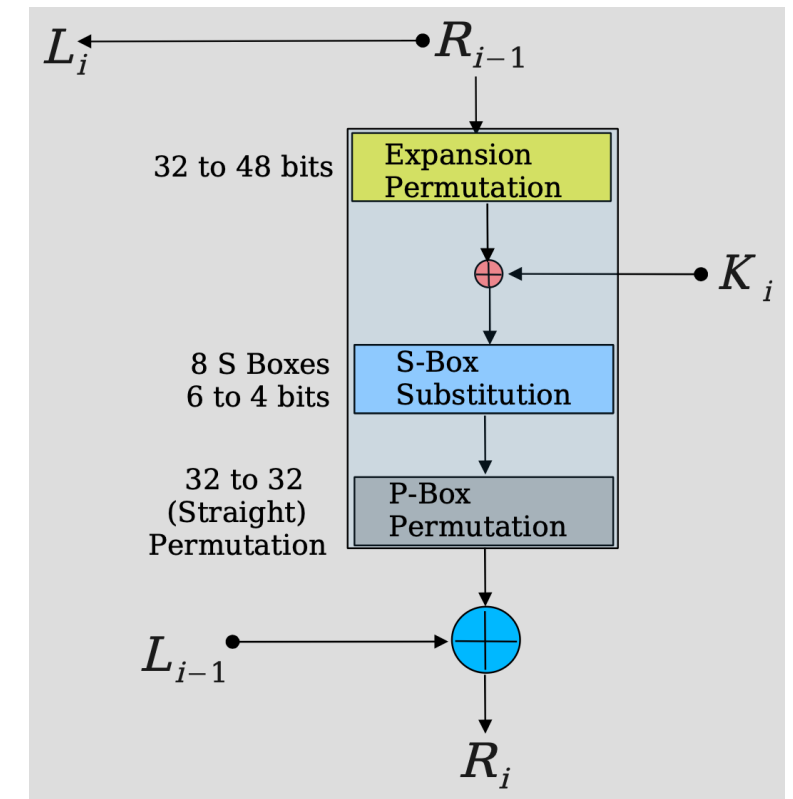
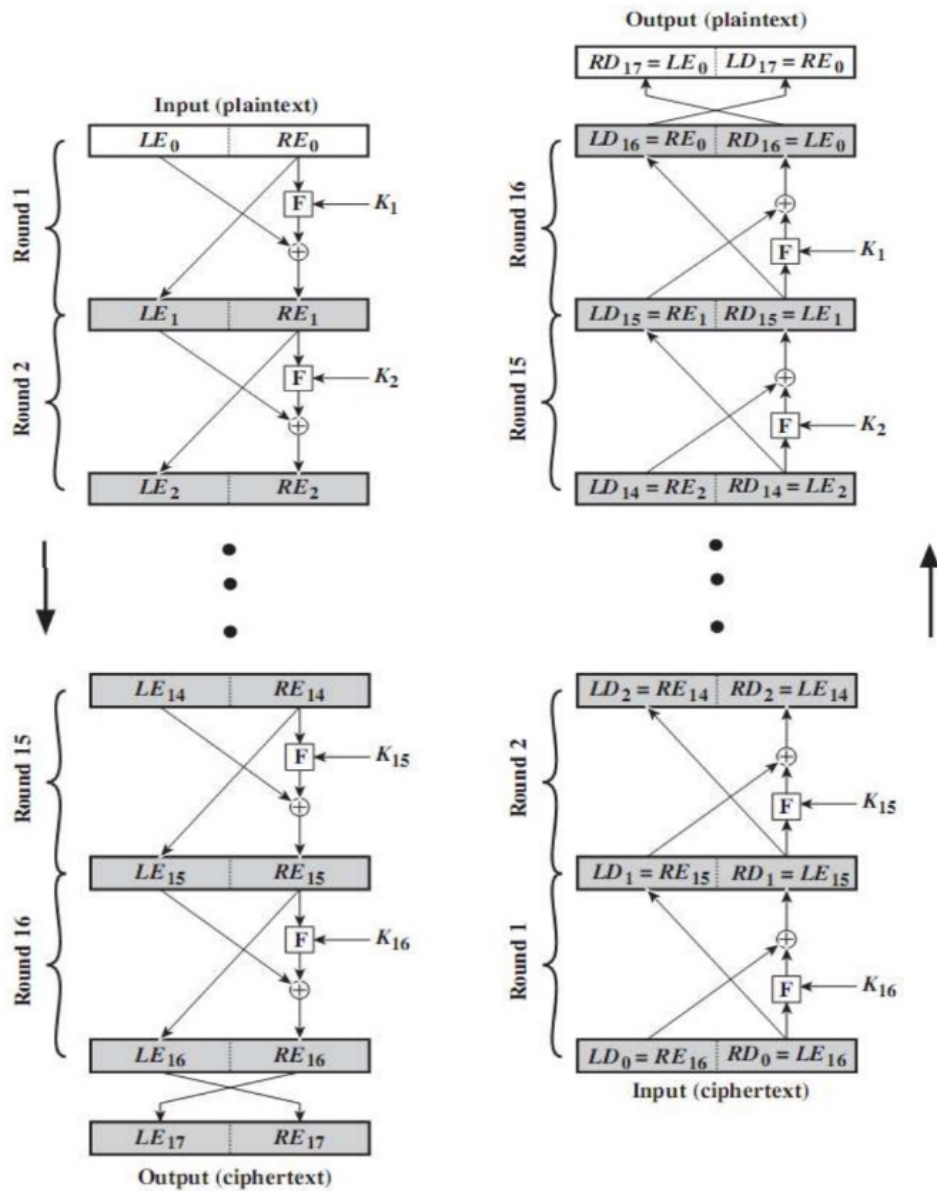
Feistel Cipher Structure

- most symmetric block ciphers are based on a **Feistel Cipher Structure**
- based on the two primitive cryptographic operations
 - *substitution* (S-box)
 - *permutation* (P-box)
- provide *confusion* and *diffusion* of message

Feistel Cipher Structure

- Horst Feistel devised the **feistel cipher** in the 1973
 - based on concept of invertible product cipher
- partitions input block into two halves
 - process through multiple rounds which
 - perform a substitution on left data half
 - based on round function of right half & subkey
 - then have permutation swapping halves
- implements Shannon's substitution-permutation network concept

Feistel Encryption and Decryption



DES encryption

- 64 bits plaintext
- 56 bits effective key length

