SKINNY Cipher

Walkie_Talkie

Department of EECS
Indian Institute of Technology Bhilai

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Outline

Introduction

We Observed.

Following

- Classes of ciphers

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- SIMON and SPECK

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- Lightweight Tweakable Block ciphers and side-channel protected Impletations

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- Classes of ciphers
- SIMON and SPECK
- Lightweight Tweakable Block ciphers and side-channel protected Impletations
- Low-Latency implementations for Memory Encryption

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Specifications

Specifications of SKINNY Cipher.

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- Lightweight block ciphers of the SKINNY family

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- Lightweight block ciphers of the SKINNY family
- It has two block versions
- 64-bit block size and 128-bit block size
- SKINNY Follows tweakey framework
- Variant MANTIS

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- Binary matrix used in Mix column

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- Very efficient implementations
- both SW and HW
- Almost as light as possible

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- Key alternating-cipher

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Comparision.

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- Key alternating-cipher
- 4*4 internal state
- AES like SPN round
- Diffusion achieved by SR+MC
- added more rounds
- huge difference matrix

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Brownie Point Nominations

Security Analysis for Skinny Cipher are based on related-key model.

Security Analysis

- Integral Attacks

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- Integral Attacks
- Meet-In-The-Middle Attacks
- Impossible Differential Attacks
- Differential/Linear Cryptanalysis
- Slide Attacks

Integral Attacks

- Cell size can be 4 or 8 bits.

Integral Attacks

- AII(A)

Integral Attacks

- Balance(B)

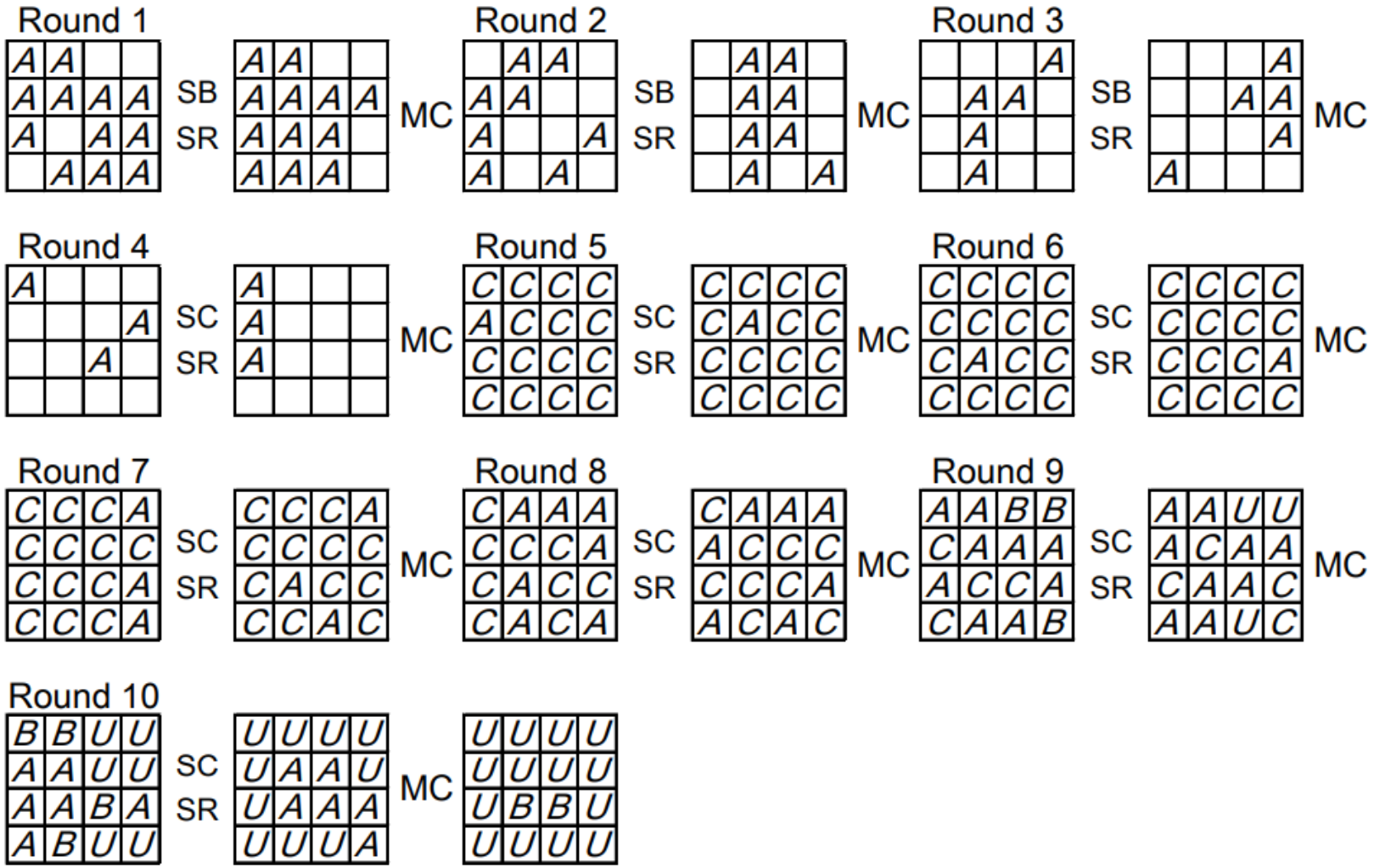
Integral Attacks

- Constant(C)

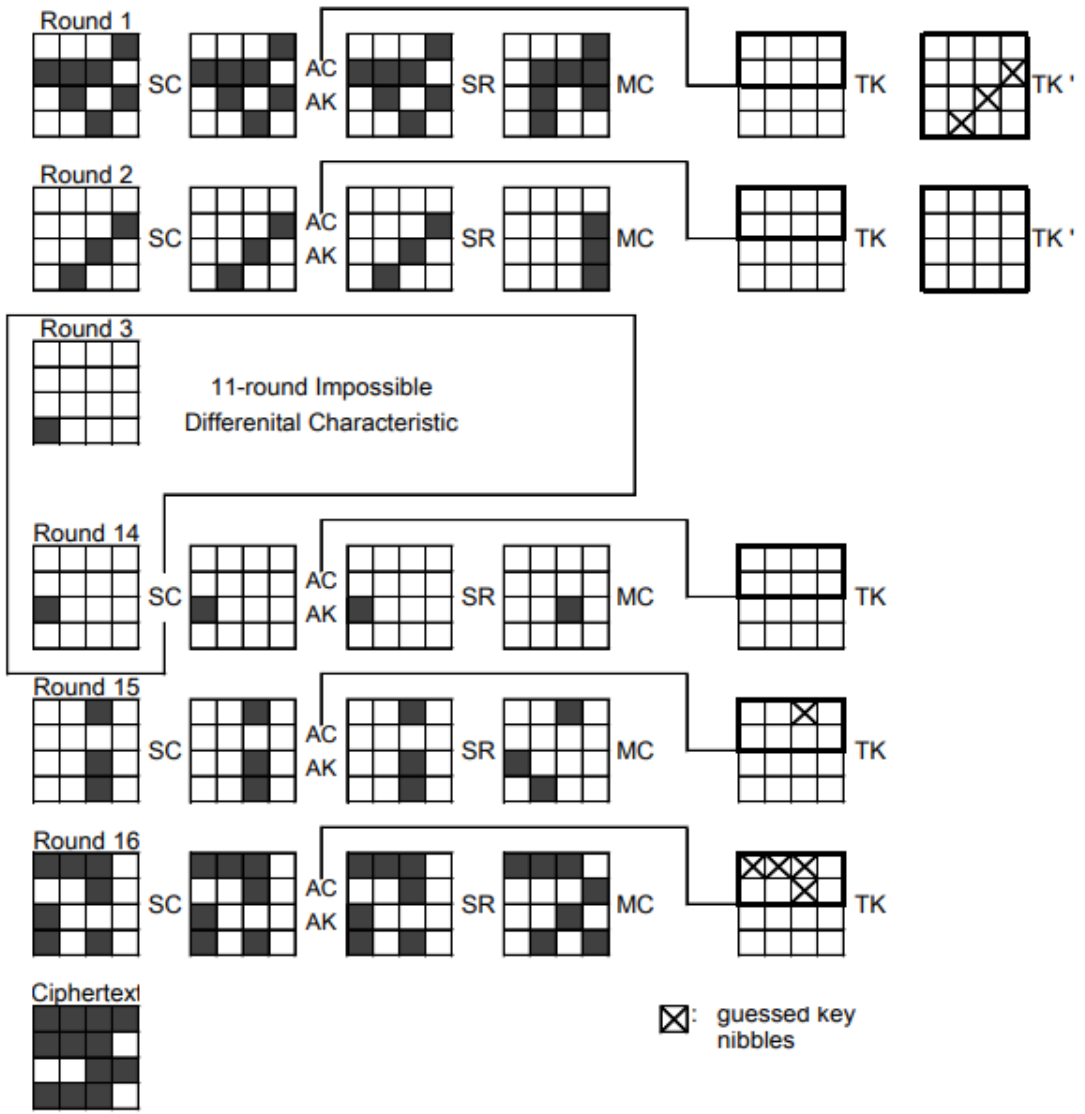
Integral Attacks

- Unknown(U)

10 round Encryption



16 round Encryption



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- We do this 4 time and we reach 14-round to 10-round by backward track.

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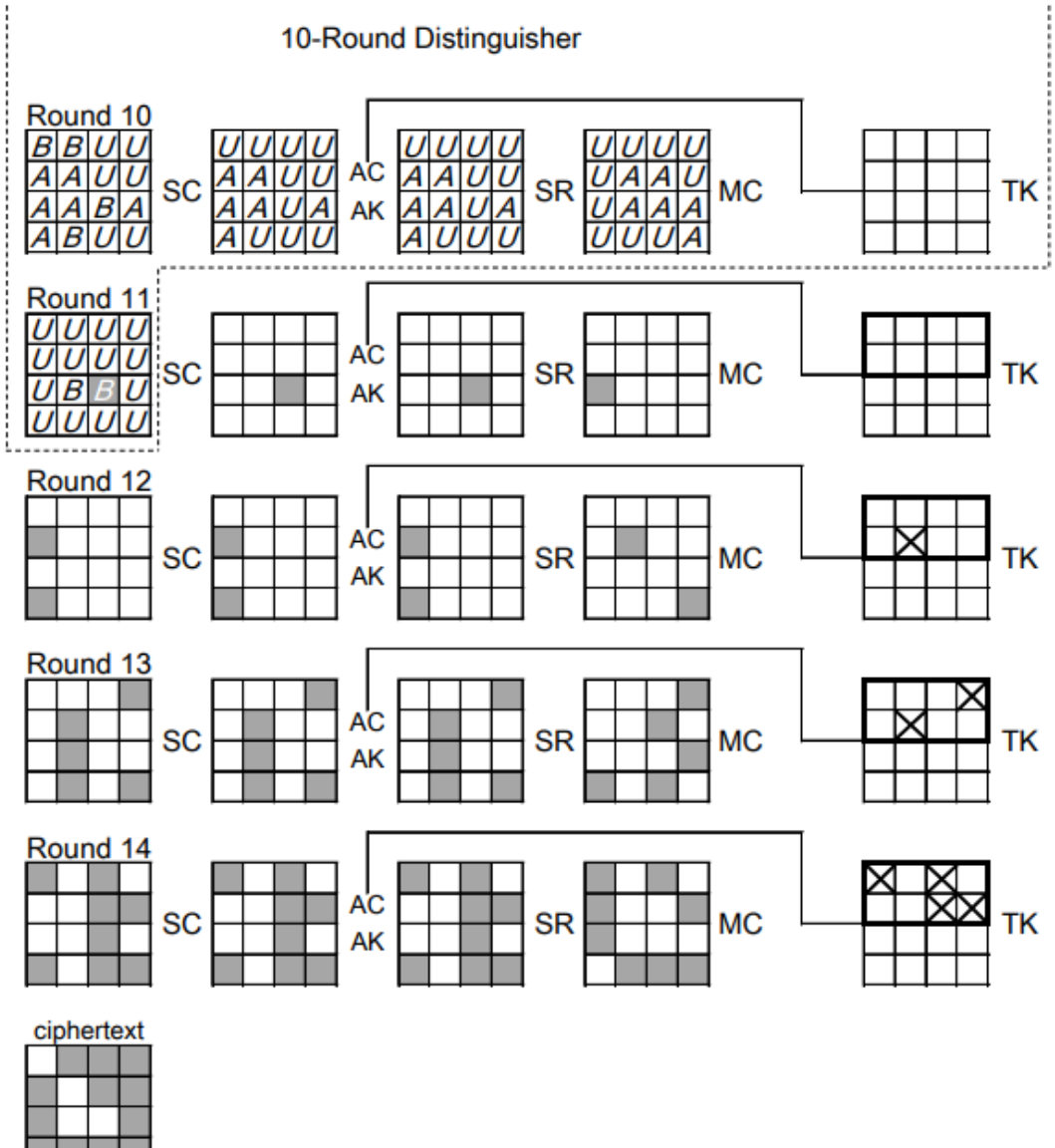

Meet-In-The-Middle Attacks

With the help of this,Number of attack rounds can be calculate by considering the maximum length of three features.Basically it work on SPN structure.

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- Security analysis

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- Rationale of SKINNY
- Security analysis
- Implementations

Thanks

Team Members

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Implementation Info

- Github Link: https://github.com/ashishksuraj/Crypto-term_paper