obtaining online sprp security through an optimal inverse-free construction

DIAC 2015, singapore

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29 september 2015

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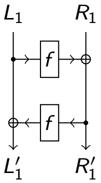
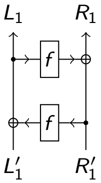


Figure : 2-round feistel encryption

Illustrated are encryption and decryption diagrams for two rounds of feistel. Here, f is an **ideal random function** which is generally implemented by a **blockcipher**.



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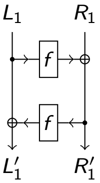

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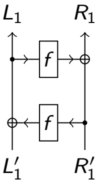

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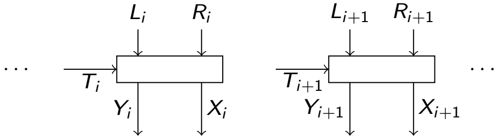

layer 1: sequential encryption, based on 2-round feistel

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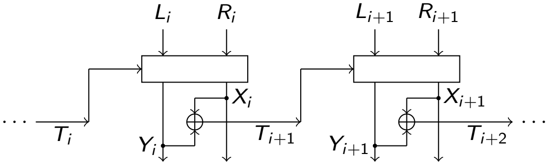

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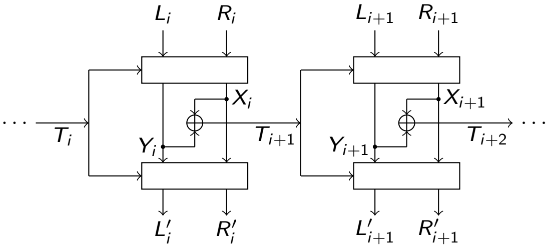

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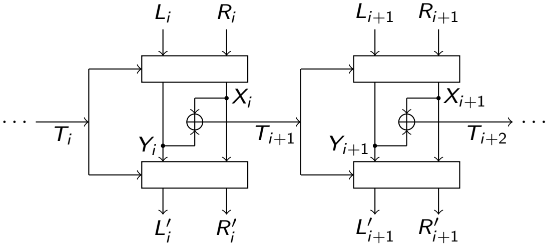

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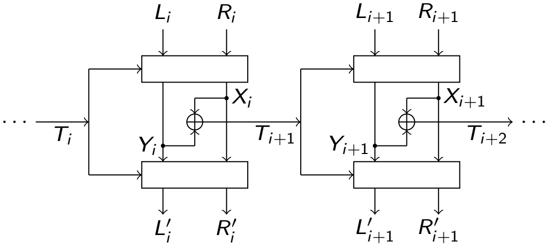

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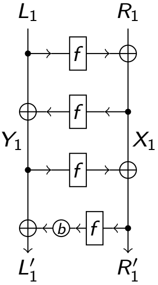

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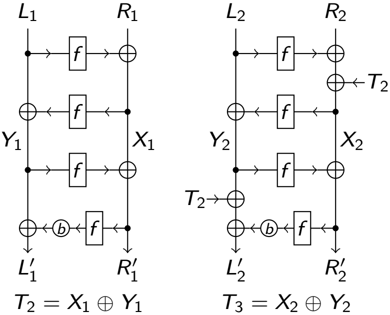

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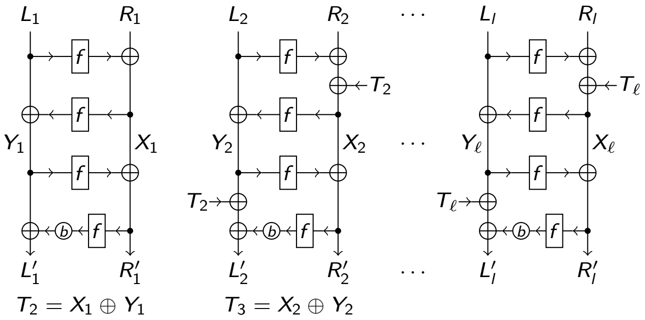

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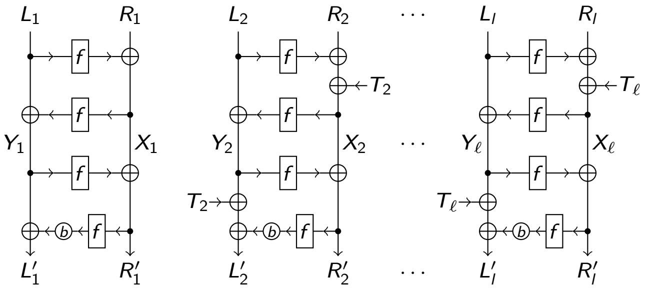

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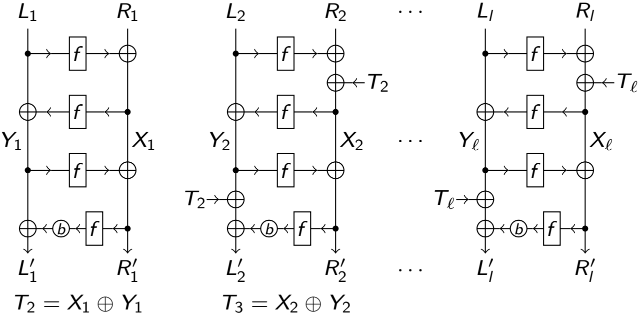

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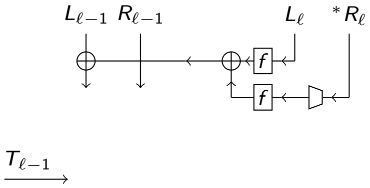

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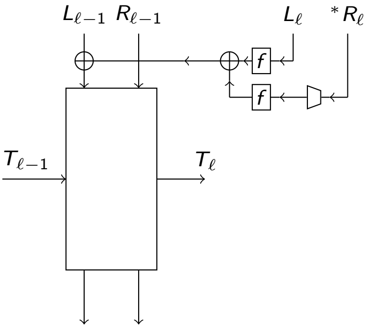

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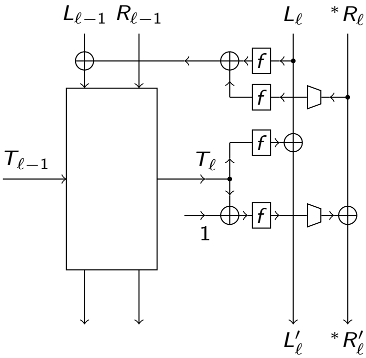

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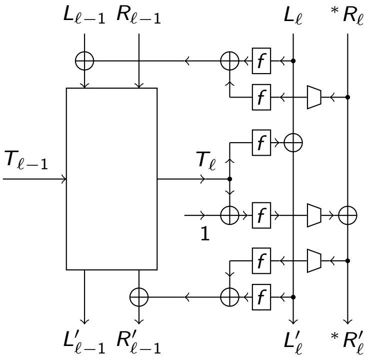

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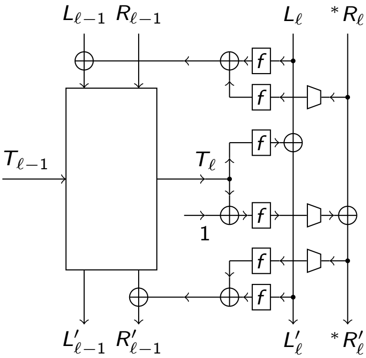

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AEZ	5	no
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- the simulator **mimics the distribution of unverified plaintext** as would be released by the real oracle.

robust authenticated encryption

For **authenticated encryption schemes** that **release unverified plaintext** even for invalid ciphertexts, one can desire that this released plaintext reveals nothing about the encryption function that can damage the privacy or authenticity of other encryptions. In a recent work, **Huang, Krovatz and Rogaway** have come up with a notion of **robust authenticated encryption**, which can be described by the following distinguishing game:

- the ideal random oracles use a **pseudorandom injective function** for handling encryption and valid decryption queries;
- the ideal decryption oracle uses a **simulator** for handling invalid decryption queries;
- the simulator **mimics the distribution of unverified plaintext** as would be released by the real oracle.

robust authenticated encryption game

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real (based on f)		**ideal** (based on pri g)	
$\boxed{\text{enc}}$	$\boxed{\text{dec}}$	$\boxed{\text{enc}}$	$\boxed{\text{dec}}$

the ideal oracle first chooses a **pseudorandom injection** g

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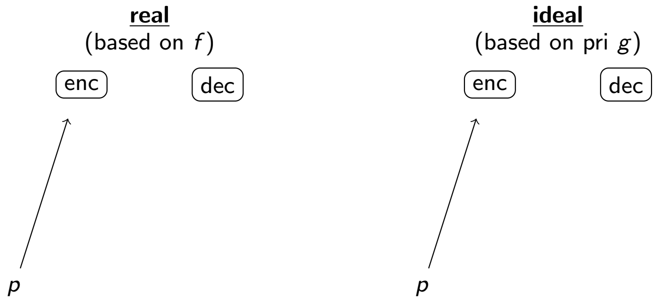

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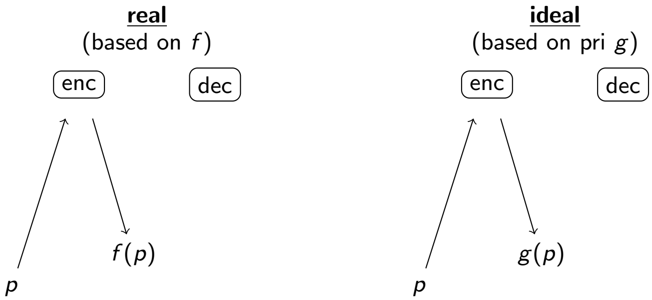

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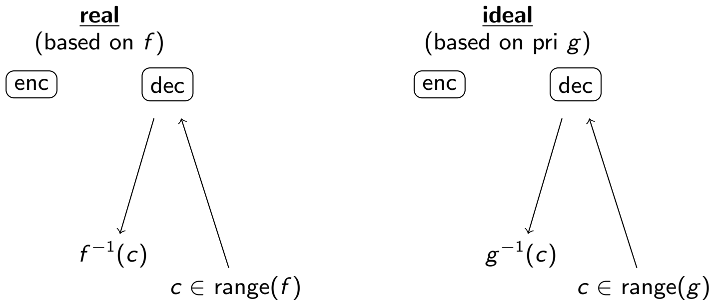

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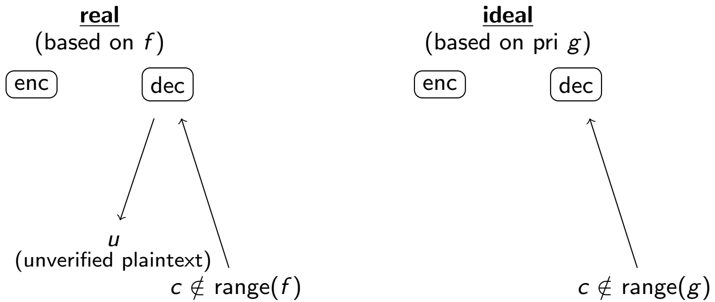

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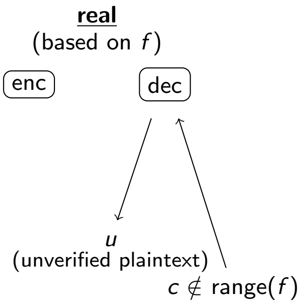

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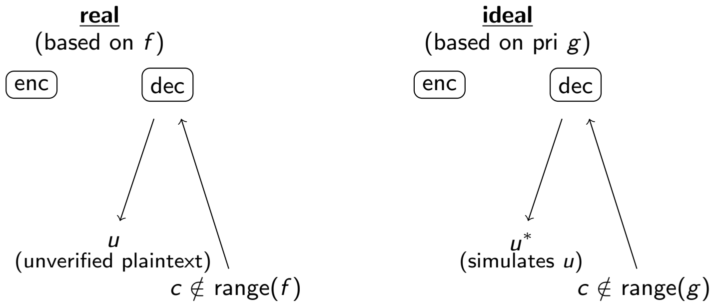

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that's all folks!