Power Analysis Attacks Revealing The Secrets Of Smart Cards Author Stefan Mangard Published On October 2010

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Power Analysis Attacks Revealing The

Power Analysis Attacks: Revealing the Secrets of Smart ...
types of power analysis attacks, template attacks usually consist of two phases: A first phase, in which the characterization takes place, and a second phase, in which the characterization is used for an attack S31 General Description According to Chapter 4, power traces can be characterized by a multivariate

Power Analysis Attacks: Revealing the Secrets of Smart ...
cryptosystem using an appropriate analysis of its power consumption Those attacks are called power analysis attacks Power consumption traces are recorded during the execution of the cryptosystem using a high-speed oscilloscope The analysis of the power traces may provide information on the secret key

Power Analysis Attack - hitcon.org
•Power Analysis Attacks - Foundation - Example on AES-128 - Workflows 2 Traditional Cryptanalysis Attackers can only observe the external information What if we can see insides? 3 Attacks on Implementations Invasive Semi-invasive Non-invasive Microprobing …

Power Analysis Attacks of Modular Exponentiation in Smartcards
3 Partially supported by NSF Grant CCR-9800070 Power Analysis Attacks of Modular Exponentiation in Smartcards Thomas S Messerges1, Ezzy A

Dabbish1, Robert H Sloan2,3 1Motorola Labs, Motorola 1301 E Algonquin Road, Room 2712, Schaumburg, IL 60193 {tomas, dabbish}@ccrlmotcom

Introduction to Power Analysis - KU Leuven

From power analysis to power analysis attacks • If sequence of patterns, timing or amplitude depends on secret values, power analysis attacks can possibly reveal the secrets • Taxonomy: attacks categorized according to approach, requirements, adversarial power, etc • …

Introduction to Power Analysis

secret values, power analysis attacks can possibly reveal the secrets • Taxonomy: attacks categorized according to approach, requirements, adversarial power, etc • Categories and criteria not 100% clear, definitions vary, transitions are smooth Albena, 31052011 ECRYPT II Summer School - Benedikt Gierlichs 11 [JO05] Power analysis attacks

1 Breaking Smartcards Using Power Analysis

The basic setup is the same for all the power analysis attacks The attacker has physical access to a microcontroller and can record the external data bus as well as the current intensity (See Figure 2) A Simple Power Analysis Simple Power Analysis (SPA) is a …

On the Power of Power Analysis in the Real World: A …

power consumption traces However, almost ten years later, there is a surprising discrepancy between the well established theory of power analysis (cf, eg, the CHES workshop proceedings since 1999) and the very few, if any, confirmed DPA attacks on real-world security systems The targets considered in …

Side-Channel Analysis (SCA) Countermeasures

Side-Channel Analysis (SCA) Countermeasures Reference Mangard et al, "Power Analysis Attacks, Revealing the Secrets of Smart Cards", Springer, 2009 Power analysis attacks are effective because the power consumption of crypto devices depends on intermediate values The overall goal of countermeasures is to avoid or reduce these dependencies

Revealing AES Encryption Device Key on 328P …

Power analysis attacks can be launched with simple equipment and attacks in a short time Power analysis is a potent and useful attack against the actual implementation of the cryptographic algorithm on the hardware From the various sources Revealing AES Encryption Device Key on 328P Microcontrollers with Differential Power

Secure Application Programming in the Presence of Side …

7 Secure Application Programming in the presence of Side Channel Attacks by Marc Witteman, Riscure Figure 3: An “unlooper” device makes use of fault injection (US$ 100) Faults can be injected in several ways: Power glitches can disturb the power supply to the …

Security of Side Channel Power Analysis Attack in Cloud …

attacks side channel power analysis attack is a newer type of attack In this paper, we proposed a way to mitigate these types of attacks through a Police Virtual Machine (Police VM) The Police VM provides false power consumption information to attackers and they cannot get real power consumption information from user VM

Introduction: Security Aspects Introduction: Embedded …

A Tisserand, CNRS{IRISA{CAIRN Power Analysis and Cryptosystem Security: Attacks and Countermeasures 27/69 Various Types of Attacks attack observation perturbation invasive timing analysis power analysis EMR analysis fault injection probing reverse engineering theoretical maths dico etc EMR = Electromagnetic radiation A Tisserand, CNRS{IRISA

Software Protection Against Fault and Side Channel Attacks

11 Power Analysis Attacks Power analysis started taking hold since the seminal work of P Kocher et al [33] There are di erent types of analytic techniques Simple power analysis (SPA) is when individual cryptographic operations can be clearly distringuished and attributed to speci c key bits

Cryptographic Hardware for Embedded Systems ECE 3894

Power Analysis Part IIb Cryptographic Hardware for Embedded Systems ECE 3894 Fall 2019 Assoc Prof Vincent John Mooney III Georgia Institute of Technology • This lecture covers Chapter 4, “Statistical Characteristics of Power Traces,” of Power Analysis Attacks: Revealing the …

Side Channel Analysis and Embedded Systems Impact and ...

Embedded Systems Impact and Countermeasures Job de Haas Source: Kocher, P Design and Validation Strategies for Obtaining Assurance in Countermeasures to Power Analysis and Related Attacks Black Hat Europe 2008 “Power A nalysis Attacks - Revealing the Secrets of

Reusable Garbled Circuit Implementation of AES to Avoid ...

power consumption Differential Power Analysis (DPA) can extract a secret key by measuring the power used while a device is executing the any algorithm This research explores the susceptibility of current implementations of Circuit Garbling to power analysis attacks and a simple variant to obfuscate

Embedded System Security

Power Analysis • Operating current drawn by hardware is correlated to computations being performed • In most IC’s, logic gates and losses due to parasitic capacitance are major contributors to power consumption • Two types ‣Single power analysis ‣Differential Power analysis

Physical Cryptanalysis of KeeLoq Code Hopping Applications

tems We present the first successful differential power analysis attacks on numerous commercially available products employing KeeLoq code hopping Our new techniques combine side-channel cryptanalysis with specific properties of the KeeLoq algorithm They allow for efficiently revealing both the secret key of a remote transmitter and the manu-

ECE 579C Applied Cryptography and Physical Attacks

algorithms, such as AES and RSA Physical attacks on cryptographic systems, such as timing and power analysis, and fault injection attacks are discussed and applied Countermeasures to protect practical security systems against physical attacks complete the course Concepts are reinforced with project -like programming exercises