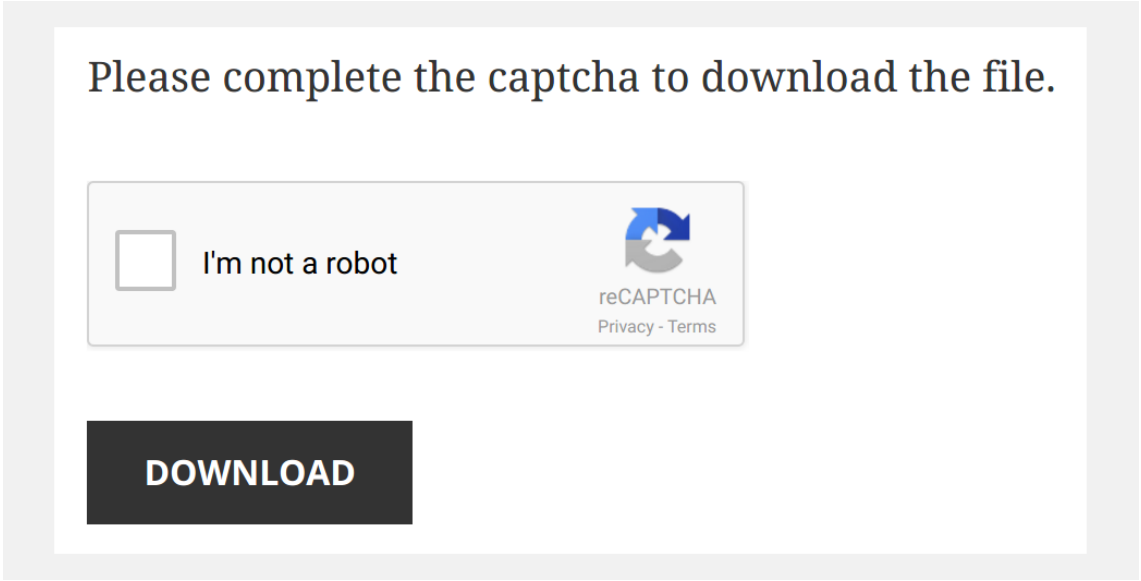
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[EPUB] Side Channel Attacks And Countermeasures For Embedded Systems

side channel attacks and countermeasures

Side Channel Attacks: Measures and Countermeasures
Side Channel Attacks, Countermeasures, Cache Based Attacks, Timing Attacks, Power Analysis Attacks I INTRODUCTION Cryptographic protocols are designed such that it is compu-tationally

SIDE-CHANNEL ATTACKS AND SOFTWARE COUNTERMEASURES
• An attacker mostly uses logical attacks if the target is unprotected (eg typical IoT devices): buffer overflows, ROP, protocol vulnerabilities, etc • All high security products embed countermeasures against side-channel and fault injection attacks Eg Smart Cards, payTV, military-grade devices • Using a combination of hardware and

Side Channel Attacks and Countermeasures
Side Channel Attacks and Countermeasures M Tehranipoor Introduction to Hardware Security & Trust University of Florida April 17, 2018 1 Acknowledgement:Several slides are obtained from Josep Balasch, KU Leuven ESAT / COSIC from his 5th International COSIC Course Outline nIntroduction nSide-Channel Emissions nAttacks Using Side-Channel Information qCountermeasures nSide-Channel Attacks …

Horizontal Side-Channel Attacks and Countermeasures on the ...
Horizontal Side-Channel Attacks and Countermeasures on the ISW Masking Scheme? Alberto Battistello1, Jean-S ebastien Coron2, Emmanuel Prou 3??, and Rina Zeitoun1 1 Oberthur Technologies, France fabattistello,rzeitoung@oberthurcom 2 University of Luxembourg jean-sebastiencoron@unilu 3 Sorbonne Universit es, UPMC Univ Paris 06, CNRS, INRIA, Laboratoire d'Informatique de Paris 6 …

Cross-core Microarchitectural Side Channel Attacks and ...
Cross-core Microarchitectural Side Channel Attacks and Countermeasures by Gorka Irazoqui A Dissertation Submitted to the Faculty of the WORCESTER POLYTECHNIC INSTITUTE In partial ful llment of the requirements for the Degree of Doctor of Philosophy in Electrical and Computer Engineering by April 2017 APPROVED: Professor Thomas Eisenbarth Professor Berk Sunar Dissertation Advisor …

asia-17-gorka-Cache side channel attack exploitability and ...
Cache Side Channel Attack: Exploitability and Countermeasures Gorka Irazoqui Xiaofei (Rex) Guo, PhD girazoki *noSPAM* wpiedu xiaofeirexguo*noSPAM* tetrationanalyticscom Who are We? • Gorka Irazoqui • PhD candidate in WPI • Intern at Intel in summer 2016 • Focus on micro-architectural attacks Who are We? • Xiaofei(Rex) Guo • Technical lead at Cisco Tetration Analytics

Electromagnetic and Machine Learning Side-Channel Attacks ...
Background Side-Channel Attacks Countermeasures Remarks •Profiled SCA attack: • Build offline template using an identical device • Perform attack on a similar device with fewer traces (more powerful attack) • Eg Statistical template attacks, machine learning based attacks EM/Power Analysis Attacks Non-Profiled Attacks Profiled Attacks SPARC Lab, ECE, Purdue ICSRL, ECE, Georgia Tech

Masking as a Side-Channel Countermeasure in Hardware
Side-Channel Attacks: Power Analysis/EM Analysis/Timing Analysis Passive Active Invasive Probing Forcing PermanentFaults Semi-Invasive Optical Inspection Light Attack Radiation Attack Non-Invasive Side-ChannelAttacks Clock Glitch PowerGlitch Temperature 5 Embedded Security Group ISCISC 2016 Tutorial | Tehran | 6 September 2016 Amir Moradi Power Analysis Attacks In principle, power

Side-Channel Attacks: Ten Years After Its Publication and ...
Abstract Side-channel attacks are easy-to-implement whilst powerful attacks against cryptographic implementations, and their targets range from primitives, protocols, modules, and devices to even systems These attacks pose a serious threat to the security of cryptographic modules In consequence, cryptographic

implementations have to be evaluated for their resistivity against such attacks and

Cache Attacks and Countermeasures: the Case of AES ...

Cache Attacks and Countermeasures: the Case of AES (Extended Version) revised 2005-11-20 Dag Arne Osvik1, Adi Shamir2 and Eran Tromer2 1 dagarne@osvikno 2 Department of Computer Science and Applied Mathematics, Weizmann Institute of Science, Rehovot 76100, Israel {adishamir, erantromer}@weizmannacil Abstract We describe several software side-channel attacks based on ...

FourQ on embedded devices with strong countermeasures ...

FourQ on embedded devices with strong countermeasures against side-channel attacks Zhe Liu1;2, Patrick Longa3, Geovandro C C F Pereira2, Oscar Reparaz4, and Hwajeong Seo5 1 SnT, University of Luxembourg, Luxembourg 2 IQC, University of Waterloo, Canada fzheluliu,geovandropereirag@uwaterlooca 3 Microsoft Research, USA plonga@microsoftcom 4 ...

Side Channel Attacks and Countermeasures for Embedded Systems

Side Channel Attacks and Countermeasures for Embedded Systems Job de Haas Black Hat USA August 2, 2007 Black Hat USA 2007 Agenda • Advances in Embedded Systems Security – From USB stick to game console – Current attacks – Cryptographic devices • Side Channels explained – Principles – Listening to your hardware – Types of analysis • Attacks and Countermeasures

Adversarial Attack Based Countermeasures against Deep ...

•Targeted attacks fool the deep learning models to make it misclassify adversarial traces into specified target classes/labels They are the opposite of non-targeted

Review of Side Channel Attacks and Countermeasures on ECC ...

Review of Side Channel Attacks and Countermeasures on ECC, RSA, and AES Cryptosystems Lo'ai A Tawalbeh12, Hilal Houssain3, Turki F Al-Somani1 1 Computer Engineering Department, Umm Al-Qura University, Mecca, Saudi Arabia 2 Computer Engineering Department, Jordan University of Science and Technology, Jordan 3 Information and Knowledge Services Division, Jeddah, Saudi Arabia

Side Channels in the Cloud: Isolation Challenges, Attacks ...

Side-Channel Attacks (SCA) target highly sensitive data and computations, eg, cryptographic operations SCAs use a hidden channel that leaks information on an operation such as AES encryption, typically execution time or cache access patterns Such channels are commonly created in software implementation of cryptographic algorithms, in a number of techniques and mechanisms and ...

Formal Analysis of Cache Side-Channel Attacks and ...

Abstract Cache side-channel attacks are security attacks which are able to retrieve secret information by monitoring the cache, when it is shared

Secure Compilation of Side-Channel Countermeasures: The ...

mitigation against side-channel attacks, often with minimal ef-ficiency and deployment overheads Their effectiveness is often amenable to rigorous analysis: specifically, several popular coun- termeasures can be formalized as information flow policies, and correct implementation of the countermeasures can be verified with state-of-the-art analysis and verification techniques How ...

Black-Box Side-Channel Attacks Highlight the Importance of ...

Black-Box Side-Channel Attacks Highlight the Importance of Countermeasures – An Analysis of the Xilinx Virtex-4 and Virtex-5 Bitstream Encryption Mechanism – Amir Moradi, Markus Kasper, and Christof Paar Horst Görtz Institute for IT Security, Ruhr University Bochum, Germany {moradi, mkasper, cpaar}@cryptorubde Abstract This paper presents a side-channel analysis of the bitstream encryp

Machine Learning in Profiled Side- Channel Attacks and Low ...

EM side-channel attack can be used to attack commonplace IoT devices •The advancement in ML-based attacks can put a huge dent to the security of embedded devices •Countermeasures against both power/EM SCA attacks are very critical •In order for industry to adopt the countermeasures, it needs to be generic and low-overhead Remarks

Rigorous Analysis of Software Countermeasures against ...

Keywords Side channel attacks, Countermeasures, Caches 1 Introduction CPU caches reduce the latency of memory accesses on aver-age,butnotintheworstcaseThus,theyintroducevariations into the execution time of programs, which can be exploited byadversariestorecoversecrets,suchasprivateinformation about users or cryptographic keys [1, 8, 23, ...

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