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IT Security techniques — Test tool requirements and test tool calibration methods for use in testing non-invasive attack mitigation techniques in cryptographic modules —

Part 2: Test calibration methods and apparatus

Techniques de sécurité IT — Exigences de l'outil de test et méthodes d'étalonnage de l'outil de test utilisées pour tester les techniques d'atténuation des attaques non invasives dans les modules cryptographiques —

Partie 2: Méthodes et appareillage d'étalonnage et d'essai

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Contents

Page

Foreword

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Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 27, *Information security, cybersecurity and privacy protection*.

A list of all parts in the ISO/IEC 20085 series can be found on the ISO website.

Introduction

Cryptographic modules provide cryptographic services and protect critical security parameters. Protection of critical security parameters can either be logical, physical, or both. Information such as knowledge of critical security parameters can leak out of the cryptographic module during operation, if the module is not designed to mitigate such leakage. Without mitigation, a malevolent attacker can record available side-channel leakage. This leakage is a physical quantity related to the critical security parameters and can be analysed in a manner to extract information about those parameters. Such analysis is passive, in that it simply collects the side-channel leakage measurements which can be freely acquired with an apparatus. Notice that the measurement tool can, as well, be adaptively controlled. This kind of extraction and analysis is referred to as non-invasive. Techniques that allow the extraction of critical security parameters out of this non-invasive leakage is termed an *attack* on the module.

Non-invasive attack testing is a method to determine whether the leakage of a cryptographic module can be exploited to extract critical security parameters. A non-invasive attack test tool returns a pass status if the cryptographic module leakage is determined to be of a minimal amount which may prevent disclosure of critical security parameters. Otherwise, it returns a fail status.

This document focuses on the calibration of the side-channel measurement tool. This calibration process enables two measurement tools to record measurements equally usable in terms of side channel analysis. Calibration is presented as the combination of two techniques:

a) definition of a method for calibration;

b) requirement of a reference cryptographic module (called an artefact) to define a clear threshold between test results, in terms of fail or pass.

Both aspects are covered in this document.

IT Security techniques — Test tool requirements and test tool calibration methods for use in testing non-invasive attack mitigation techniques in cryptographic modules —

Part 2:
Test calibration methods and apparatus

1 Scope

This document specifies the test calibration methods and apparatus used when calibrating test tools for cryptographic modules under ISO/IEC 19790 and ISO/IEC 24759 against the test metrics defined in ISO/IEC 17825 for mitigation of non-invasive attack classes.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 17825, *Information technology — Security techniques — Testing methods for the mitigation of non-invasive attack classes against cryptographic modules*

ISO/IEC 19790, *Information technology — Security techniques — Security requirements for cryptographic modules*

ISO/IEC 20085-1, *IT Security techniques — Test tool requirements and test tool calibration methods for use in testing non-invasive attack mitigation techniques in cryptographic modules — Part 1: Test tools and techniques*