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Information security — Criteria and methodology for security evaluation of biometric systems —

Part 1: Framework

Sécurité de l'information — Critères et méthodologie pour l'évaluation de la sécurité des systèmes biométriques —

Partie 1: Cadre



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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

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Introduction

Biometric systems can be vulnerable to presentation attacks where attackers attempt to subvert the system security policy by presenting their natural biometric characteristics or artefacts holding copied or faked characteristics. Presentation attacks can occur during enrolment or identification/verification events. Techniques designed to detect presentation artefacts are generally different from those to counter attacks where natural characteristics are used. Defence against presentation attacks with natural characteristics typically relies on the ability of a biometric system to discriminate between genuine enrollees and attackers based on the differences between their natural biometric characteristics. This ability is characterized by the biometric recognition performance of the system. Biometric recognition performance and presentation attack detection have a bearing on the security of biometric systems. Hence, the evaluation of these aspects of performance from a security viewpoint will become important considerations for the procurement of biometric products and systems.

Biometric products and systems share many of the properties of other IT products and systems which are amenable to security evaluation using the ISO/IEC 15408 series and ISO/IEC 18045 in the standard way. However, biometric systems embody certain functionality that needs specialized evaluation criteria and methodology which is not addressed by the ISO/IEC 15408 series and ISO/IEC 18045. Mainly these relate to the evaluation of biometric recognition and presentation attack detection. These are the functions addressed in the ISO/IEC 19989 series.

ISO/IEC 19792 describes these biometric-specific aspects and specifies principles to be considered during the security evaluation of biometric systems. However, it does not specify the concrete criteria and methodology that are needed for security evaluation based on the ISO/IEC 15408 series.

The ISO/IEC 19989 series provides a bridge between the evaluation principles for biometric products and systems defined in ISO/IEC 19792 and the criteria and methodology requirements for security evaluation based on the ISO/IEC 15408 series. The ISO/IEC 19989 series supplements the ISO/IEC 15408 series and ISO/IEC 18045 by providing extended security functional components together with supplementary activities related to these requirements. The extensions to the requirements and supplementary activities found in the ISO/IEC 15408 series and ISO/IEC 18045 relate to the evaluation of biometric recognition and presentation attack detection which are particular to biometric systems.

This document consists of the introduction of the general framework for the security evaluation of biometric systems, including extended security functional components, and supplementary methodology and evaluation activities for the evaluator. The detailed recommendations are developed for biometric recognition aspects in ISO/IEC 19989-2 and for presentation attack detection aspects in ISO/IEC 19989-3.

In this document, the term "user" is used to mean the term "capture subject" used in biometrics.