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Information security, cybersecurity and privacy protection — Security and privacy requirements for authentication using biometrics on mobile devices —

Part 2: Remote modes

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Foreword

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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 27553 series can be found on the ISO and IEC websites.

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 and www.iec.ch/national-committees.

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Introduction

As the computational and functional capabilities of mobile devices rapidly evolve, authentication technologies using biometrics based on physiological or behavioural characteristics (e.g. fingerprint, face, voiceprint) have been developed and widely adopted in various mobile applications. Compared to traditional authentication methods on mobile devices such as passwords, patterns, or SMS messages, biometric characteristics are easy to use and not shareable. Since authentication methods using biometrics can provide a secure, reliable and more convenient solution, they have become an attractive topic for both industry and academia.

However, the fragmentation of computing environments for mobile devices (e.g. different operating systems, different trusted environment implementations, different biometric system implementations, open computation environments in mobile devices, and open communication networks between mobile devices and servers) often results in inconsistent implementations, which can increase vulnerabilities and attack risks against mobile devices. This fragmentation makes it even more necessary to analyse security challenges, threats, and security frameworks for authentication using biometrics on mobile devices and to specify the high-level security requirements that can mitigate the security risks for applications of authentication using biometrics in mobile devices.

This document is the second part of the ISO/IEC 27553 series, which puts forward the security and privacy requirements for authentication using biometrics on mobile devices. Biometrics in the ISO/IEC 27553 series is used for authentication using mobile devices, whose result is consumed by relying parties. This document is applicable to cases where the biometric data or derived biometric data are transmitted between the mobile devices and the remote services in either or both directions. Those cases are called remote modes in this document. A typical example of remote modes is the case where biometric processing is partially done on the mobile device and partially done remotely, and the result of authentication is consumed by relying parties.

Other typical examples include cases where:

— presentation attack detection is delegated to a remote service;

— a biometric reference (i.e. enrolled biometric data) is stored on an outsourced storage and sent onto mobile devices;

— biometric comparison is executed within a server or distributed between mobile device and the server.

Applications embodying remote modes of operation can introduce additional threats to biometric information protection and privacy compared to local modes of operation. The transmission of biometric information or storage in a server implies security and privacy threats that can be difficult to mitigate for organization with insufficient maturity level of security. Privacy threats can include:

— leveraging eavesdropped, lost or stolen biometric data to forge an authentication;

— exploiting biometric data for identity theft in various scenarios (not limited to authentication);

— generating fake biometric data based on AI tools.

This document provides high-level security requirements, taking into account that biometrics are persistent a lifetime, for authentication using biometrics on mobile devices for remote modes, including security requirements for functional components and security requirements for communication. Further detailed security requirements are not covered here as they are implementation-dependent. This document also analyses security challenges, threats and security frameworks for authentication using biometrics on mobile devices.

The following contents are out of scope of this document:

— identity proofing and enrolment using biometrics on mobile devices;

— external Biometric Processing Units (BPUs) locally connected to mobile devices, e.g. a USB key with embedded fingerprint sensor, which can be plugged into the mobile device;

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— the use of biometrics for authentication to applications that are entirely local to the mobile device and no remote service is involved;

— cases where the biometric data or derived biometric data never leave the mobile devices (see ISO/IEC 27553-1 for those cases).

While identity proofing and enrolment are not covered in this document, risks and threats exist and consequently they are an integral part of the security posture of an organization relying on authentication using biometrics on mobile devices.

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Information security, cybersecurity and privacy protection — Security and privacy requirements for authentication using biometrics on mobile devices —

Part 2: Remote modes

1 Scope

This document provides high-level security and privacy requirements for authentication using biometrics on mobile devices, in particular, for functional components, communication, storage and remote processing.

This document is applicable to remote modes, i.e. the cases where:

— the biometric sample is captured through mobile devices, and

— the biometric data or derived biometric data are transmitted between the mobile devices and the remote services in either or both directions.

The following are out of scope of this document:

— the cases where the biometric data or derived biometric data never leave the mobile devices (i.e. local modes),

— the preliminary steps for biometric enrolment before authentication procedure, and

— the use of biometric identification as part of the authentication.

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 18031, *Information technology — Security techniques — Random bit generation*

ISO/IEC 24745:2022, *Information security, cybersecurity and privacy protection — Biometric information protection*

ISO/IEC 27002:2022, *Information security, cybersecurity and privacy protection — Information security controls*

ISO/IEC 29100:2024, *Information technology — Security techniques — Privacy framework*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

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