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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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## Contents

<b>Foreword.....</b>	<b>v</b>
<b>Introduction.....</b>	<b>vi</b>
<b>1 Scope.....</b>	<b>1</b>
<b>2 Normative references.....</b>	<b>1</b>
<b>3 Terms and definitions.....</b>	<b>1</b>
<b>4 Abbreviated terms.....</b>	<b>6</b>
<b>5 Security and privacy considerations .....</b>	<b>6</b>
<b>6 System description.....</b>	<b>9</b>
<b>7 Information assets.....</b>	<b>14</b>
<b>8 Threat analysis .....</b>	<b>16</b>
<b>9 Security requirements and recommendations .....</b>	<b>20</b>
<b>10 Privacy requirements and recommendations.....</b>	<b>24</b>
<b>Annex A (informative) Implementation example .....</b>	<b>27</b>
<b>Annex B (informative) Authentication assurance and assurance level .....</b>	<b>39</b>
<b>Bibliography .....</b>	<b>46</b>

<b>Foreword.....</b>	<b>v</b>
<b>Introduction.....</b>	<b>vi</b>
<b>1 Scope.....</b>	<b>1</b>
<b>2 Normative references.....</b>	<b>1</b>
<b>3 Terms and definitions.....</b>	<b>1</b>
<b>4 Abbreviated terms.....</b>	<b>6</b>
<b>5 Security and privacy considerations .....</b>	<b>6</b>
5.1 General.....	6
5.2 Security challenges common to all biometric systems.....	6
5.3 Why one would choose to go for remote modes instead of local modes?.....	7
5.4 Security and privacy challenges specific to remote modes .....	8
5.4.1 General.....	8
5.4.2 Sharing biometric information with remote services .....	8
5.4.3 Security heterogeneity of remote services information system.....	9
<b>6 System description.....</b>	<b>9</b>
6.1 Generic architecture .....	9
6.2 Entities and components.....	10
6.2.1 Biometric system .....	10
6.2.2 Relying Party agent.....	11
6.2.3 Authentication agent .....	11
6.2.4 Relying Party server .....	11
6.2.5 Authentication server .....	11
6.3 Biometric system application models.....	11
6.4 Types of authentication workflow for remote mode.....	13

7	Information assets	13
8	Threat analysis	15
8.1	Threats related to the biometric system	15
8.2	Threats related to the authentication and relying party agents	16
8.3	Threats related to the authentication and relying party servers	17
8.4	Threats to communication between agents and servers	18
9	Security requirements and recommendations	19
9.1	General	19
9.2	Biometric system	19
9.3	Mobile Device – side	21
9.4	Server-side	22
9.5	Communication between agents and server	23
10	Privacy requirements and recommendations	23
	Annex A (informative) Implementation example	26
A.1	General	26
A.2	Type 1 – example architectures and example workflow	26
A.2.1	Example architectures	26
A.2.2	Example of workflow	28
A.2.2.1	Overview	28
A.2.2.2	Authentication	28
A.3	Type 2 – example architectures	29
	Annex B (informative) Authentication assurance and assurance level	34
B.1	Introduction	34
B.1.1	General	34
B.1.2	Considerations for authentication assurance	34
B.1.3	Assurance levels	35
B.1.4	Achieving the required level of authentication assurance	35
B.2	Mitigation of the threats of acquiring biometric data for use in mounting presentation attacks	36
B.2.1	General	36
B.2.2	Threat mitigation by transformation of the BR and BP	36
B.2.3	Threat mitigation against preparation of presentation attack	36
B.3	Threat mitigations for authentication credentials	37
B.4	Threat mitigations for proofs	38
B.4.1	Need for proofs	38
B.4.2	Mitigation of threats to the proof(s)	38
B.5	Biometric authentication assurance levels vector	39
	Bibliography	41

## 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](http://www.iso.org/members.html) and [www.iec.ch/national-committees](http://www.iec.ch/national-committees).

## 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 ~~could~~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 (BPU) locally connected to mobile devices, e.g. a USB key with embedded fingerprint sensor, which can be plugged into the mobile device;
- 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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