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## Information technology — Security techniques — Biometric information protection

*Technologies de l'information — Techniques de sécurité — Protection des informations biométriques*

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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. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

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## Introduction

As the Internet becomes a more pervasive part of daily life, various services are being provided via the Internet, such as Internet banking, remote healthcare, etc. In order to provide these services in a secure manner, the need for authentication mechanisms between subjects and the service being provided becomes even more critical. Some of the authentication mechanisms already developed include token based schemes, personal identification and transaction numbers (PIN/TAN), digital signature schemes based on public key cryptosystems, and authentication schemes using biometric techniques.

Biometrics – the automated recognition of individuals based on their behavioural and physiological characteristics – has come of age, and includes recognition technologies based on fingerprint image, voice patterns, iris image, facial image, and the like. The cost of biometric techniques has been decreasing while their reliability has been increasing, and both are now acceptable and viable for use as an authentication mechanism.

Biometric authentication introduces a potential discrepancy between privacy and authentication assurance. On the one hand, biometric characteristics are ideally an unchanging property associated with and distinct to an individual. This binding of the credential to the person provides strong assurance of authentication. On the other hand, this strong binding also underlies the privacy concerns surrounding the use of biometrics, such as unlawful processing of biometric data, and poses challenges to the security of biometric systems to prevent the compromise of biometric references. The usual solution to the compromise of an authentication credential – to change the password or issue a new token – is not generally available for biometric authentication because biometric characteristics, being either intrinsic physiological properties or behavioural traits of individuals, are difficult or impossible to change. At most another finger or eye could be enrolled, but the choices are usually limited. Therefore, appropriate countermeasures to safeguard the security of a biometric system and the privacy of data subjects are essential.

Biometric systems usually bind a biometric reference with other personally identifiable information (PII) for authenticating individuals. In this case, the binding is needed to assure the security of the data record containing biometric information. The increasing linkage of biometric references with other PII and the sharing of biometric information across legal jurisdictions make it extremely difficult for organizations to assure the protection of biometric information and to achieve compliance with various privacy regulations.