Australian Standard®

Information technology—Biometric application programming interface

Part 1: BioAPI specification

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- AUSTROADS
- Attorney General's Department
- Australian Business Limited
- Australian Electrical and Electronic Manufacturers Association
- Centrelink
- The Biometric Institute

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PREFACE

This Standard was prepared by the Standards Australia Committee IT-032, Biometric and Identification.

The objective of this Standard is to make available to the Australian biometrics community the core ISO SC37 standards published over the last 24 months, specifically the BioAPI specification.

This Standard is identical with, and has been reproduced from ISO/IEC 19784-1:2006, *Information technology—Biometric application programming interface*—Part 1*: BioAPI specification*.

As this Standard is reproduced from an international standard, the following applies:

(a) Its number appears on the cover and title page while the international standard number appears only on the cover.

(b) In the source text 'this part of ISO/IEC 19784' should read 'this Australian Standard'.

(c) A full point substitutes for a comma when referring to a decimal marker.

Reference to International Standard		*Australian Standard*	
ISO/IEC		AS ISO/IEC	
19785	Information technology—Common Biometric Exchange Formats Framework	19785	Information technology—Common Biometric Exchange Formats Framework
19785-1	Part 1: Data element specification	19785.1	Part 1: Data element specification
19785-2	Part 2:Procedures for the operation of the Biometric Registration Authority	19785.2	Part 2: Procedures for the operation of the Biometric Registration Authority

Only international references that have been adopted as Australian or Australian/New Zealand Standards have been listed.

The terms 'normative' and 'informative' are used to define the application of the annex to which they apply. A normative annex is an integral part of a standard, whereas an informative annex is only for information and guidance.

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INTRODUCTION

This part of ISO/IEC 19784, the BioAPI specification, provides a high-level generic biometric authentication model suited to most forms of biometric technology. No explicit support for multimodal biometrics is currently provided.

An architectural model is described which enables components of a biometric system to be provided by different vendors, and to interwork through fully-defined Application Programming Interfaces (APIs).

A key feature of the architecture is the BioAPI Framework, which supports calls by one or more application components (provided by different vendors, and potentially running concurrently) using the BioAPI API specification. The BioAPI Framework provides this support by invoking (through a Service Provider Interface, SPI) one or more biometric service provider (BSP) components (provided by different vendors, and potentially running concurrently) which can be dynamically loaded and invoked as required by an application component.

At the lowest level there is hardware or software that performs biometric functions such as capture, matching, or archiving. These parts of the architecture are called BioAPI Units, and can be integral to a BSP or can be supplied as part of a separate BioAPI Function Provider (BFP) component.

Interactions (through the BioAPI Framework) can occur between BSPs from different vendors provided data structures used to record information from the BioAPI Units they access conform to other International Standards, and in particular to ISO/IEC 19794 [5].

The final component of the BioAPI architecture is the recognition that a BSP can provide its biometric services either:

a) by the use of BioAPI Units that are integral to (that is, directly managed by) the BSP, or

b) by invoking, through the BioAPI Function Provider Interface (FPI), one or more BFP components (provided by different vendors) that manage BioAPI Units that are integral to the BFP.

NOTE: A BioAPI Unit may consist of software only, a combination of software and hardware (e.g., a biometric sensor, archive, or algorithm).

For each type of BioAPI Unit supported by a BSP (or BFP) there may be one or more BioAPI Units of that type which can be dynamically inserted and removed from the system. Insertion and removal generates events that can be signalled (through the BSP and the BioAPI Framework) to an application.

The BioAPI specification covers the basic biometric functions of Enrollment, Verification, and Identification (see Annex C), and includes a database interface to allow an application to manage the storage of biometric records through an archive BioAPI Unit managed by a BSP or BFP. This provides for optimum performance (e.g., when performing the biometric Identification function within a large population) of the archiving and biometric search processes.

The interface to the application provides primitives that allow it to manage the capture of biometric samples from a biometric sensor by accessing the corresponding BioAPI Unit, and the use of those biometric samples for Enrollment (storage in an application-controlled or BSP-controlled BIR database), and subsequent Verification or Identification against those stored records.

This part of ISO/IEC 19784 also specifies the content of a biometric component registry (information about the biometric components that have been installed on the biometric system). It also provides a component registry interface for the management and inspection of that registry.

This part of ISO/IEC 19784 uses the C programming language (see ISO/IEC 9899) to specify the data structures and function calls that form the BioAPI interfaces.

Clause 6 describes the BioAPI architectural model and its components, and the interfaces that are specified between these components.

Clause 7 defines the data structures used in the BioAPI.

Clause 8 defines the function calls initiated by an application and supported by a conforming BioAPI Framework that are either handled internally by the BioAPI Framework (for example enumeration of installed BioAPI components) or mapped to a function provided by a BSP.

Clause 9 defines the function calls supported by a conforming BSP (and invoked by the BioAPI Framework in response to a call from a biometric application).

Clause 10 specifies the form of the biometric component registry and the component registry interface.

Clause 11 defines the handling of events and error returns.

Annex A is normative, and specifies details of conformance requirements and proformas that can be used by the vendor of a BioAPI Biometric Application, Framework, or BSP component to identify those functions and biometric record formats that must be supported.

NOTE: A future International Standard (ISO/IEC 24709) will address conformance testing for this BioAPI specification. [7]

Annex B is normative, and specifies the BioAPI biometric information record (BIR) as a CBEFF Patron Format in accordance with ISO/IEC 19785-1. It provides a description of the biometric record specified in this part of ISO/IEC 19784, together with the platform-independent bit-pattern representation of such a record for storage and transfer.

Annex C is informative, and provides a general tutorial on a number of aspects of the BioAPI specification.

Annex D is informative, and provides example code to illustrate calling sequences and to provide implementation guidance.

NOTES

AUSTRALIAN STANDARD

Information technology — Biometric application programming interface —

Part 1: BioAPI specification

1 Scope

This part of ISO/IEC 19784 defines the Application Programming Interface (API) and Service Provider Interface (SPI) for standard interfaces within a biometric system that support the provision of that biometric system using components from multiple vendors. It provides interworking between such components through adherence to this part of ISO/IEC 19784 and to other International Standards.

The BioAPI specification is applicable to a broad range of biometric technology types. It is also applicable to a wide variety of biometrically enabled applications, from personal devices, through network security applications, to large complex identification systems.

This part of ISO/IEC 19784 supports an architecture in which a BioAPI Framework supports multiple simultaneous biometric applications (provided by different vendors), using multiple dynamically installed and loaded (or unloaded) biometric service provider (BSP) components and BioAPI Units (provided by other different vendors), possibly using one of an alternative set of BioAPI Function Provider (BFP) components (provided by other vendors) or by direct management of BioAPI Units.

NOTE: Where BioAPI Units are provided by a different vendor fom a BSP, a standardised BioAPI Function Provider Interface (FPI) may be needed. This is outside the scope of this part of ISO/IEC 19784, but is specified by later parts for the different categories of FPI.

This part of ISO/IEC 19784 is not required (and should normally not be referenced) when a complete biometric system is being procured from a single vendor, particularly if the addition or interchange of biometric hardware, services, or applications is not a feature of that biometric system. (Such systems are sometimes referred to as "embedded systems".) Standardisation of such systems is not in the scope of this part of ISO/IEC 19784.

It is not in the scope of this part of ISO/IEC 19784 to define security requirements for biometric applications and biometric service providers.

NOTE: ISO 19092 provides guidelines on security aspects of biometric systems. [3]

The performance of biometric systems (particularly in relation to searches of a large population to provide the biometric identification capability) is not in the scope of this part of ISO/IEC 19784. Trade-offs between interoperability and performance are not in the scope of this part of ISO/IEC 19784.

This part of ISO/IEC 19784 specifies a version of the BioAPI specification that is defined to have a version number described as Major 2, Minor 0, or version 2.0.

NOTE: Earlier versions of the BioAPI specification were not International Standards.