BioAPI

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BioAPI?

- The BioAPI Specification defines an open system standard application program interface (API) that allows software applications to communicate with a broad range of biometric technologies in a common way.

- Evolution

  - HA-API
  - BioAPI 1.0
  - BioAPI 1.1
  - ANSI INCITS 358
  - ISO/IEC 19784-1
BioAPI architecture
BioAPI functions

- Biometric Operations
- Database Operations
- Unit Operations
- Component Management Functions
- Data Handle Operations
- Utility Functions
- Callback & Event Operations
Biometric operations

**BASIC FUNCTIONS**

- **Enroll User**
  - Enroll
    - Creates template (stored in user account DB and/or BSP DB)
- **Verify asserted identity (1:1)**
  - Verify
    - Live input matched against one stored template
- **Discover User’s identity (1:N)**
  - Identify
    - Live input matched against set of stored templates

**PRIMITIVE FUNCTIONS**

- **Capture**
  - Captures biometric data from sensor
- **CreateTemplate**
  - Creates enrollment template
    - NewTemplate can be an adaptation of a StoredTemplate
- **Process**
  - Converts “intermediate” to “processed” BIR for matching
- **Process with Aux BIR**
- **VerifyMatch**
  - Performs 1:1 match
- **IdentifyMatch**
  - Performs 1:N match against specified DB
- **Import**
  - Imports non-real-time data for processing
**BioAPI features**

- **Standardizes functions PLUS**
  - Platform independent
  - Standard biometric data record format (CBEFF)
  - Normalizes scoring & thresholding

- **Rich feature set** supports:
  - Client/server implementations
  - Model adaptation
  - Application control of GUI
  - App or BSP/internal database options
  - Data payloads
  - Configuration flexibility through basic and primitive operations

- **Optional capabilities**
  - Return of raw/audit data
  - Return of quality
  - Application-controlled GUI
  - GUI streaming callbacks
  - Detection of source presence
  - Payload carry
  - BIR signing
  - BIR encryption
  - Return of FRR
  - Model adaptation
  - Binning
  - Self-contained device
Technology modules (BSPs)

- Technology modules instantiate the service provider interface, biometric algorithms, and device interface (currently monolithic)
- Provide biometric services to applications
  - Biometric “engine”
  - Biometric service provider (BSP)
- Can be distributed between platforms (i.e., client/server configuration)
- Generally responsible for user interface (GUI), as default
- May encompass one or more technologies
- Typically implemented as a “wrapper” around an existing SDK
- May use proprietary or standard data formats (must be registered)
- May support 1:1, 1:N, or both
- May include an internal or BSP controlled database
- May be instantiated in software or a combination of software & hardware
  - May be a self-contained device
  - May be a “combo” or “hybrid” device
  - May use a dedicated or commodity device
BSP

Application

Technology Module

“wrapper”
- Function translation
- Data translation/packaging
- Score mapping
- User interface
- Error handling/timeouts
- Data caching/handle mgmt

SDK
- Biometric operations
- Capture
- Processing
- Matching
- Algorithms
- Device interface/control
- Countermeasures

Device driver

Device

Module Registry
(Framework) Reference Implementation

• BioAPI runtime software
  – Middleware framework between BioAPI compliant application and BioAPI compliant BSP

• Major functions:
  – Module loading/attaching
  – Module management
  – Module registry
  – Call passthrough/API-SPI translation

• Components
  – Framework, MDS
  – Password BSP (sample)
  – Sample app/exerciser
  – Installers

• Written in C, Win32 implementation
• Based on proven CDSA HRS code base
• Code portable to other environments
  – No OS specific calls
  – Port library / file system access
• Open source/public domain
• Downloadable from web
• Versions (V1.1): Win32, Linux, Solaris, WinCE
### BioAPI BIR

#### Header (SBH)
- **Format ID**
  - Owner: 4
  - Type: 1
- **Creation Date**: 4
- **Creation Time**: 3
- **Expiration Date**: 4
- **Index (UUID)**: 16

#### “Opaque” Biometric Data Block (BDB)
- **Biometric Type**: 2
- **Owner Type**: 2

#### Security Block (SB)
- **Product ID**
  - Owner: 2
  - Type: 2

#### BIR Data Type
- **Version**: 1
- **Type**: 1

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W3C Workshop on SIV
BioAPI related projects

• US version
  – Fusion amendment
  – Conformance Test Methodology

• ISO version
  – Part 2: Archive Function Provider Interface (FPI)
  – Part 3: BioAPI Lite
  – Part 4: Sensor FPI
  – Amd 2: Security
  – Amd 3: Frameworkless
  – Conformance Test Methodology (4 parts)
  – Java version*
  – Tenprint capture using BioAPI
  – BioAPI Interworking Protocol (BIP)

*US projects based on v2.0
Tools

- Win32 framework reference implementation
- Linux/Solaris reference implementation
- WinCE reference implementation
- JNI wrapper, C# wrapper
- PAM interface
- Conformance test suites
- BioAPI Helper
- Best practices document (draft)
- Website
- Developers listserve

www.bioapi.org
For your attention!

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