



The BioAPI Specification: Recipe for Interoperability & Interchangeability

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Overview

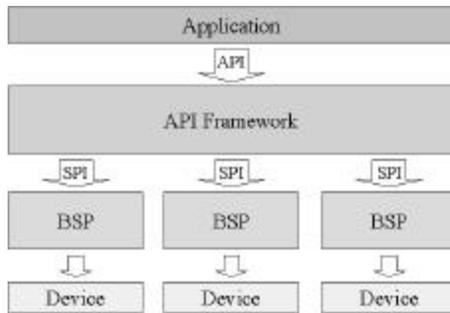
- Introduction
- The BioAPI Specification
- Reference Implementation
- Conformance Test Suite
- Linux Port
- Open Systems
- Products
- Summary



API Standards



A biometric API standard defines a generic way of interfacing to a broad range of biometric technologies.



Benefits:

- Easy substitution of biometric technologies
- Use of biometric technology across multiple applications
- Easy integration of multiple biometrics using the same interface
- Rapid application development - increased competition (tend to lower costs)



Who is the BioAPI Consortium?



- Founded in 1998
- Purpose:
 - Development of a standard biometric API to bring platform and device independence to application developers, integrators, and end-users
- Membership
 - Over 80 members
 - International
 - Representatives from industry, government, academia
 - Biometrics vendors, integrators, end-users; OEMs, IT
- Organization
 - 7 member steering committee
 - 4 working groups



BioAPI Membership

Acys Biometrics USA, Inc.
Ambition Global Co., Ltd.
Ankari, Inc.
Authentec
Barclays Bank
Bergdata USA, Inc.
BioFinger Tech. Corp.
BioLink Technologies Intl.
Biometix
Biometric Verification Inc.
Biometrics.co.za
BioNetrix
BioPassword Security Systems
BioScrypt Inc. *
BITS, Inc.
Cognitec AG
Compaq Computer Corp. *
Configate, Ltd.
Cyberlink Systems
Daon Intervaces Ltd.
Datastrip, Inc.
Defense Info. Sys. Agency
Dialog Comm. Systems AG
Digital Persona
eCryp, Inc.
Ethentica
eTrue, Inc.
Evive
Fidelica Microsystems, Inc.

Fingerprint Cards AB
Gemplus
Hewlett-Packard
Hunno Technologies, Inc.
Identification & Verification Intl.
Identification Systems
DERMALOG GMBH
Identix
Image Computing Inc. (ICI)
Infineon Technologies
Intel Corporation *
I/O Software, Inc.
Iridian Technologies *
ISC/US Inc.
ITT Industries
J. Markowitz Consulting
Janus Associates
Kaiser Permanente
Keyware Technologies
LCI SmartPen n.v.
Leading Edge Security Ltd.
Locus Dialogue
Logico Smartcard Solns GMBH
Miaxis Biometrics Company
Nanyang Tech. Univ.
National Biometrics Test Cen.
NIST *
**National Security Agency (NSA) **

*** Steering Committee**



NgeeAnn Polytechnic of Industry
NEC Corporation
Neurodynamics Ltd.
OKI Electric Industry Co., Ltd.
Omnikey
Precise Biometrics
Presideo
Raytheon
Recognition Systems
SAFLINK Corp. *
Sagem-Morpho
Sec2Wireless
Secugen
Sensecurity Pty. Ltd.
Startek
STMicroelectronics
Systemneeds, Inc.
TechGuard Security
Telework Corporation
Transaction Security
Transforming Technologies
TRW
Tunitas Group
UniSoft Corporation
Unisys *
Veridicom
Viatec Research
Visionics
Voice IQ, Inc.

BioAPI Specification

BASIC FUNCTIONS

- **BSP management functions**
 - **ModuleLoad**
 - Load BSP & enable events
 - **ModuleAttach**
 - Attach BSP to BioAPI framework
- **Enroll user**
 - **Enroll**
 - Create template & store in user account DB
- **Verify asserted identity (1:1)**
 - **Verify**
 - Live input matched against one stored template
- **Discover user's identity (1:N)**

PRIMITIVE FUNCTIONS

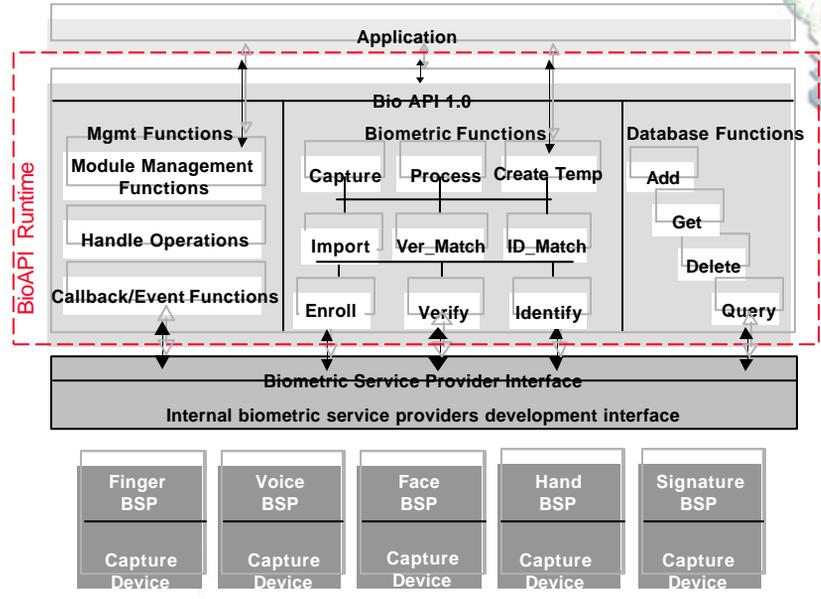
- **Capture**
 - CapturedBIR is an "intermediate" BIR
 - Purpose recorded in BIR
 - AuditData is "raw" BIR
- **CreateTemplate**
 - Purpose must be "Enroll..."
 - NewTemplate can be an adaptation of a StoredTemplate
- **Process**
 - Purpose must be Verify or Identify
 - Converts "intermediate" to "processed" BIR (if algorithm installed in BSP)
- **VerifyMatch**
 - Perform 1:1 match
- **IdentifyMatch**
 - Perform 1:N match against specified DB
- **Import**
 - Imports non-real-time data for processing

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
- Client/server communication
- Self-contained device



BioAPI Architecture



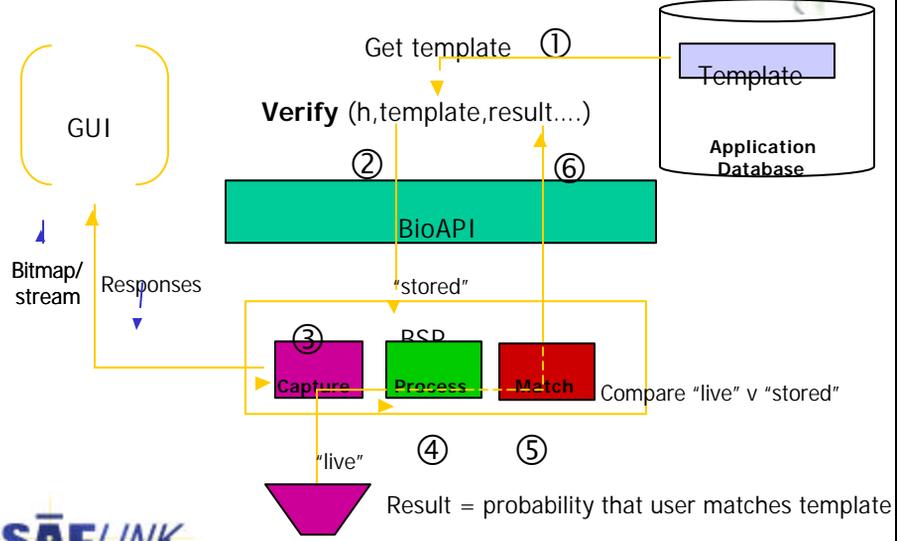
BioAPI Features



- Standardizes functions PLUS
 - Standard biometric data record format (CBEFF)
 - Normalizes scoring & thresholding
- Rich feature set supports:
 - True client/server implementations
 - Model adaptation
 - Application control of GUI
 - App or BSP/internal database options
 - Data payloads
 - Configuration flexibility through basic and primitive operations



How does it work?



Reference Implementation



- BioAPI runtime software
 - Middleware 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
- BSPs in development
- Linux port in progress

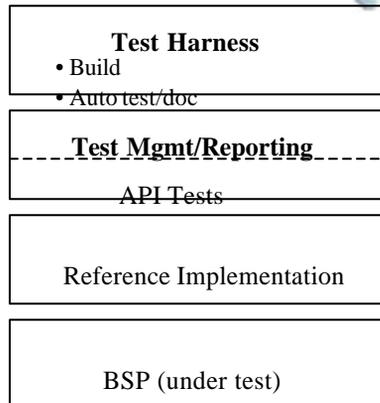


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Conformance Test Suite



- Effort initiated
 - Lead by Iridian Tech
- Coordinating with DoD BMO
- Potential vendor(s) identified
- Effort estimate developed
- Detailed project plan/SOW in progress
- Goals:
 - Single CTS
 - Publicly available (open source)
 - Broad use by vendors, end users, labs, consortium
- No certification/branding program yet planned, but being considered

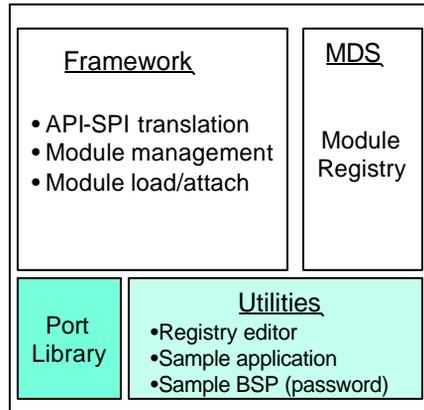


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Linux Port



- Plan to begin porting effort immediately since release of Ver 1.1 of Win32 reference implementation
- CDSA HRS already ported
 - BioAPI uses same code base, same port library
- Effort estimated to be relatively small
 - Plug in new port library
 - Recompile, debug
 - Optionally port utilities



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Open Systems



- Platform (OS) independent
 - Designed for use in any environment
 - Supports cross-platform implementations
 - Heterogeneous environments
 - Can support Windows, Unix, Linux, Java
- Open system standards provide:
 - Broader market for biometric technologies
 - Lower risk to integrators & end users
 - Adds flexibility
 - Expands selections

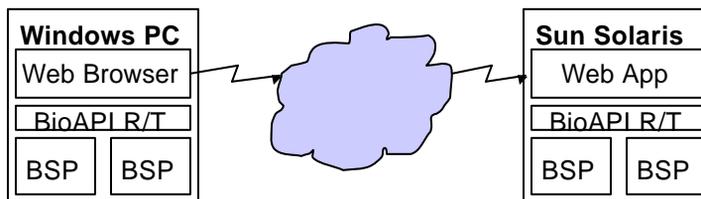


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Open Systems (cont'd)



- Scenario
 - Windows workstation with browser
 - Sun Solaris web server
- BioAPI is public domain & open source



Open Systems = Freedom of Choice



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BioAPI Status



- Ver 1.1 of specification released 16 March 2001
 - Minor corrections to Ver 1.0 published 30 Mar 2000
- Reference implementation released concurrently
 - Final version
 - Beta 1 released Sep 2000
- Conformance test suite and Linux ports in progress
- BioAPI User's & Developer's Seminar held 6 Apr 00
 - Transcripts (tutorial format) in progress
- Membership continues to grow (currently 80+)
- US DoD BMO and GSA Smart Card Program requiring BioAPI compliance
- Compatible with CBEFF, ANSI X9.84, CDSA HRS
- NIST Interoperability Test Bed



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BioAPI Compliant Products



- Announced:
 - Visionics (face)
 - SOFTPRO (signature)
 - PenFlow (signature)
 - Identification Systems Dermalog GmbH (fingerprint)
 - Fingerprint Cards (fingerprint)
- Reported in progress:
 - Ikendi (fingerprint)
 - Infineon (fingerprint)
 - STMicro (fingerprint)
 - BioScrypt (fingerprint)
 - Iridian (iris)
 - Cognitec (face)

- Notes:
 - BioAPI compliance is based on vendor self-claim. The BioAPI Consortium does not warrant product conformance to the BioAPI specification.
 - Check with vendors to confirm product availability.



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Project Opportunities



- Reference Implementation Ports
 - Unix, Linux, Windows CE, Mac, Java
- Conformance Test Suite
- Performance Test Suite
- Interoperability Demonstrations
 - BioAPI + other related standards
- Prototype BSPs
 - Using various optional capabilities



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Summary



- It's here!
 - BioAPI Specification Ver 1.1
 - Reference Implementation 1.1
- Products on their way
 - BSP announcements already started
- www.bioapi.org

