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DEPARTMENT OF DEFENSE

# BioAPI Conformance Test Suite

DoD Biometrics Management Office

January 2006



## Agenda

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- ▶ **Part 1: Background on BioAPI**
- ▶ **Part 2: Conformance Testing for BioAPI**



# Part 1: Background on BioAPI



## Background



To be interoperable, components within a system must adhere to common specifications or standards:

- ▶ Interface standards: define how the components interact
- ▶ Data interchange format standards: define what data records are exchanged

How can developers and consumers of information systems ensure conformance to standards?

- ▶ Development of base standards and detailed definitions of conformance clauses
- ▶ Development of standardized conformance testing methodologies and tools
- ▶ Perform conformance testing of system components using these methodologies and tools



# Application Programming Interface(API)



## ▶ API

- Defined way for a software application to communicate (request services and receive responses) with a technology/service module
- An API standard defines a common method of interfacing to a particular technology
- Usually composed of a set of function calls with data/control parameters and defined data structures

## ▶ BioAPI

- Ensure interchangeability of biometric system components
- Ensure biometric system tiers use common “language”
- Ensure independence from vendor implementations



## Advantages of BioAPI



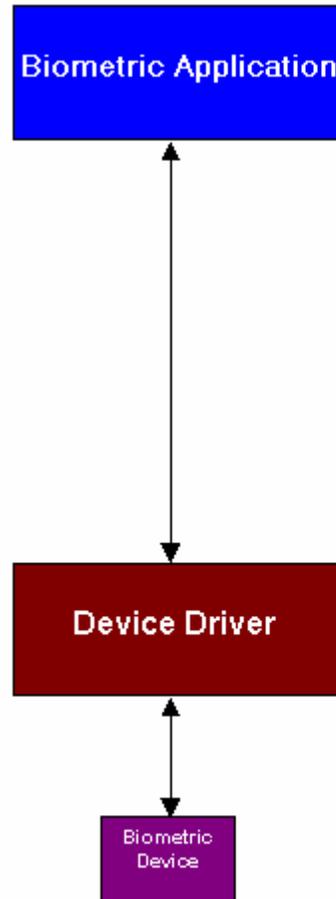
Simple application interfaces and standard modular access to biometric functions, algorithms, and devices allow:

- ▶ Rapid development of applications employing biometrics
- ▶ Flexible deployment of biometrics across platforms and operating systems
- ▶ Improved ability to exploit price performance advances in biometrics
- ▶ Enhanced implementation of multiple biometric modalities (e.g., fingerprint, voice, face, iris)



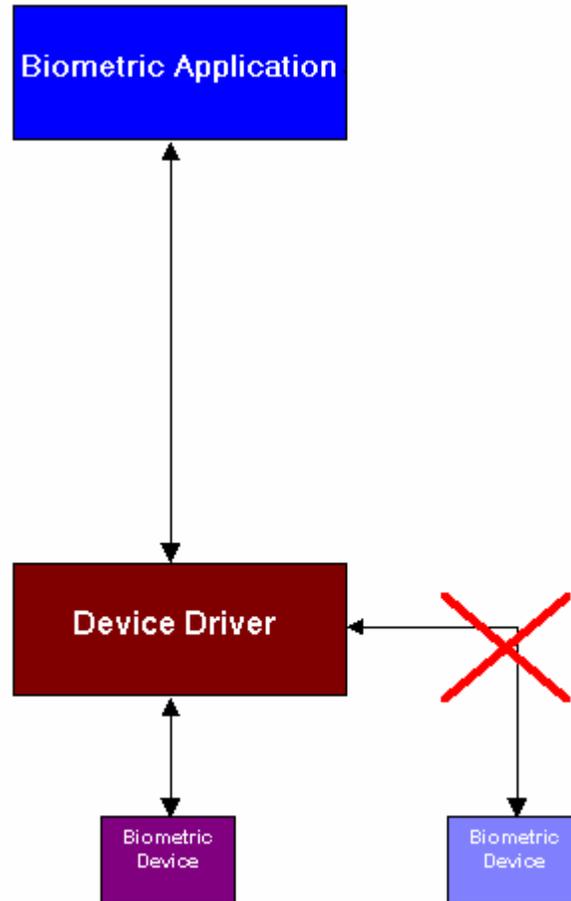
# Demonstration of Typical Biometric System Architecture

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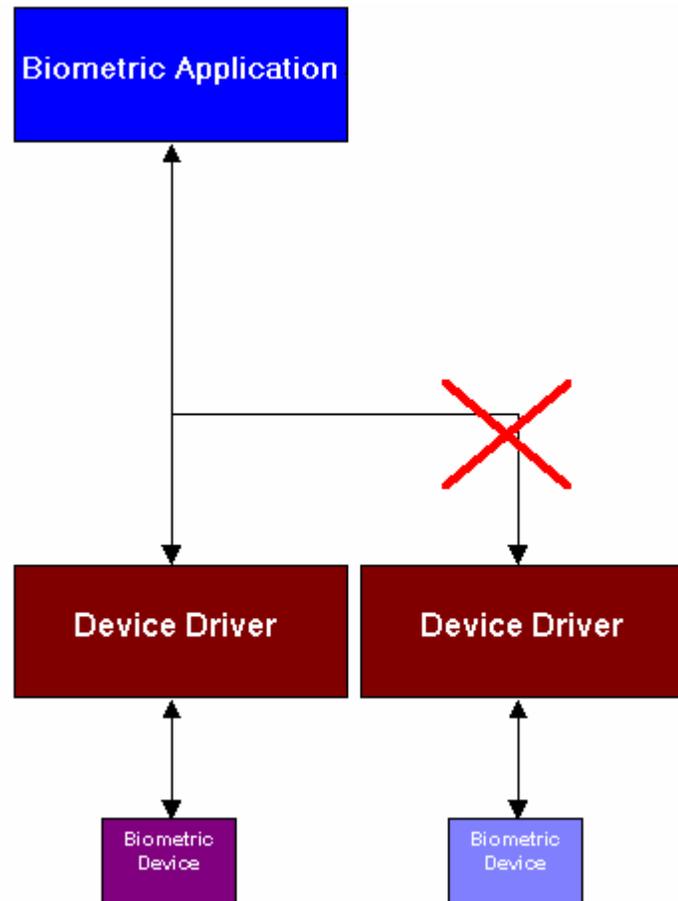


# Demonstration of Typical Biometric System Architecture



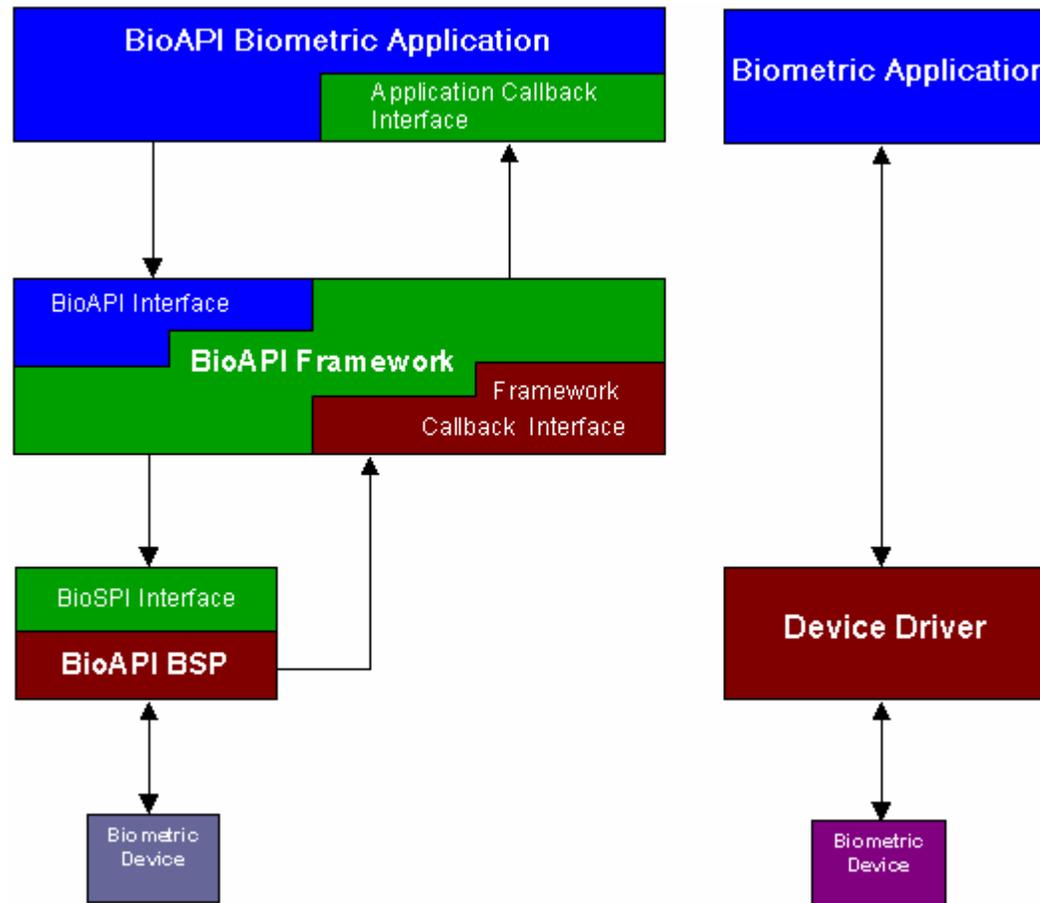


# Demonstration of Typical Biometric System Architecture



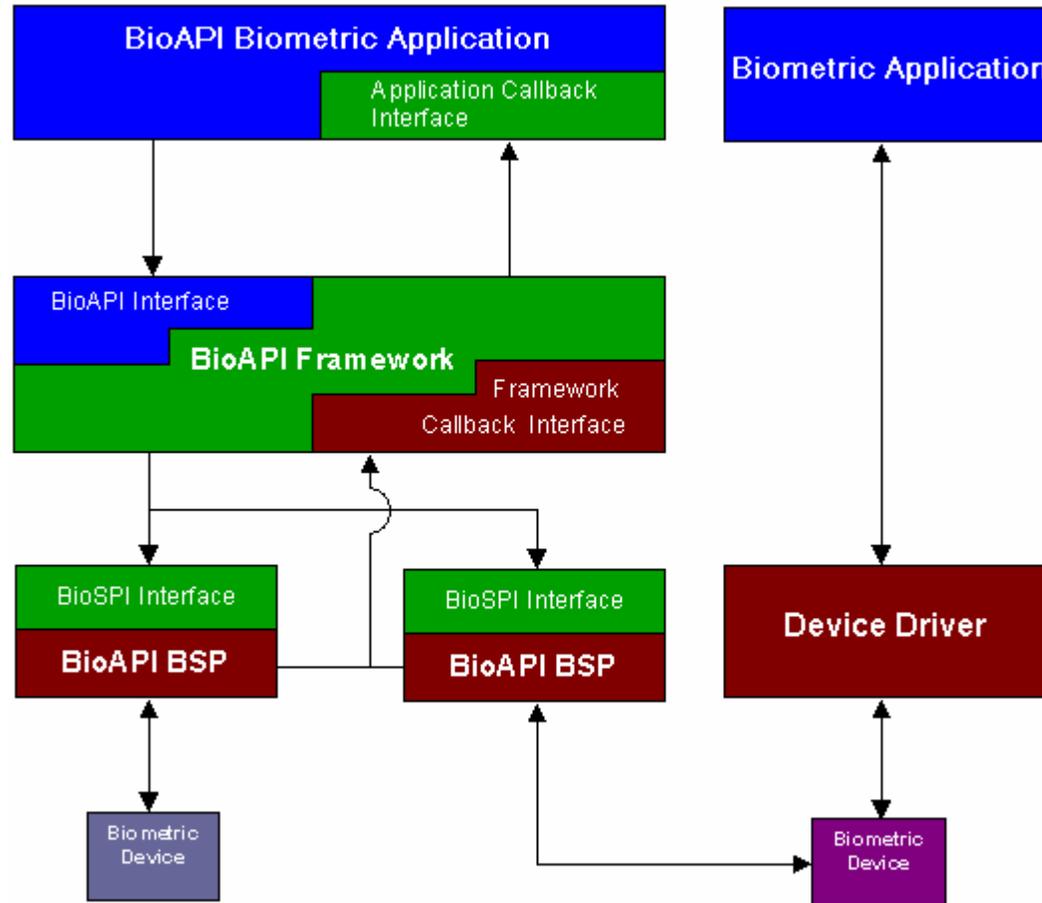


# Comparison of Typical and BioAPI System Architectures



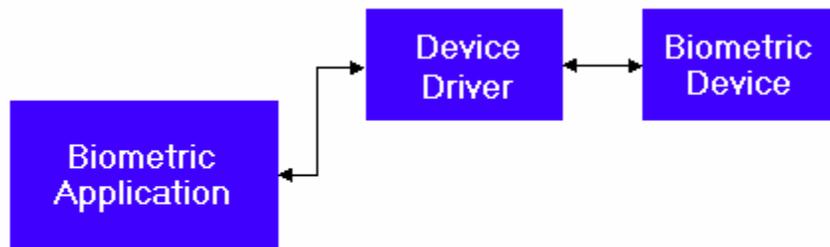


# Comparison of Typical and BioAPI System Architectures



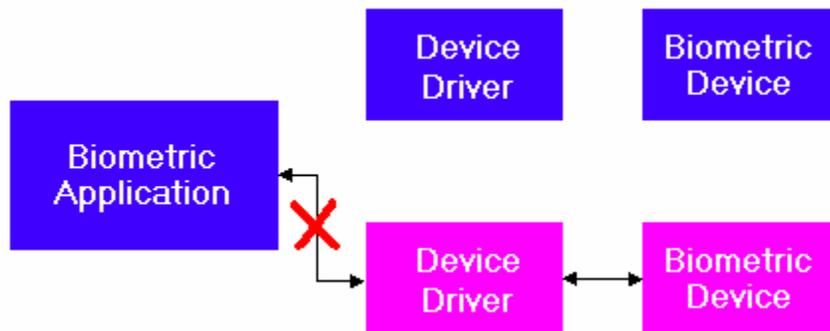


# Demonstration of BioAPI System Architecture



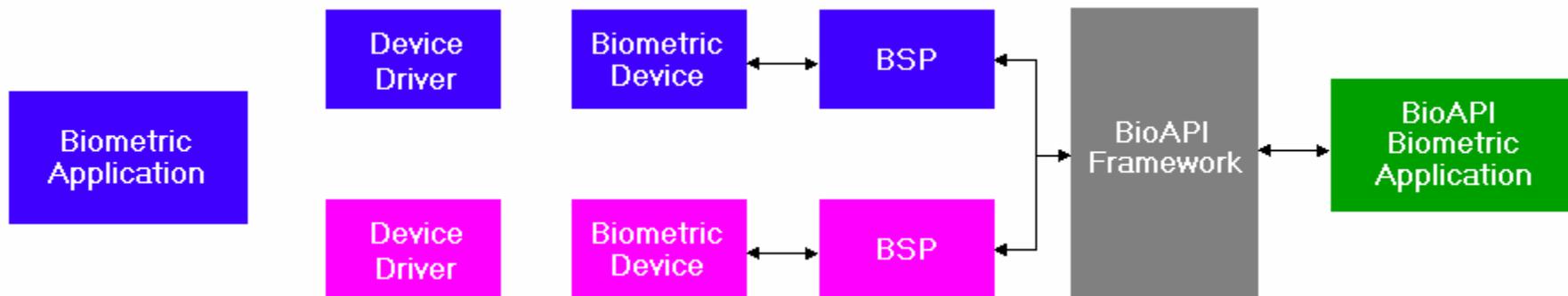


# Demonstration of BioAPI System Architecture





# Demonstration of BioAPI System Architecture





## References



### Additional resources for BioAPI information

- ▶ ANSI/INCITS 358-2002, The BioAPI Specification
- ▶ INCITS 1703-D, Conformance Testing Methodology for ANSI/INCITS 358-2002, BioAPI Specification
- ▶ ISO/IEC 19784, Biometric Application Program Interface (BioAPI) - Part 1 & 2
- ▶ ISO/IEC 24709, Conformance Testing for BioAPI - Part 1 & 2



# Part 2: Conformance Testing for BioAPI



## Conformance to BioAPI



BioAPI – the cornerstone standard for multi-component biometric system architectures

- ▶ Interchangeability of biometric system components
- ▶ Independence from vendor's implementations
- ▶ Simplified implementation of multiple biometric modalities (e.g. fingerprint, voice, face, iris)

### Conformance of BioAPI components

- ▶ Do vendor products conform to BioAPI Standards?
- ▶ Is it possible to validate claims of conformance?
- ▶ How do we validate for conformance?



# Vendor Claims of BioAPI Conformance



## BioAPI conformance based on vendor self-claim\*

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- ▶ A4Vision (face)
- ▶ SoftPro (signature)
- ▶ Wondernet (signature)
- ▶ Dermalog GmbH Identification Systems (fingerprint)
- ▶ Fingerprint Cards AB (fingerprint)
- ▶ HumanScan AG (multiple)
- ▶ Secugen (fingerprint)
- ▶ BioScript (fingerprint)
- ▶ Secugen (fingerprint)
- ▶ Janus Associates (application)
- ▶ Identix (face)
- ▶ IdentAlink (fingerprint)
- ▶ OSS Nokalva (application)
- ▶ Neven Vision (face)
- ▶ Upek (fingerprint)
- ▶ Iridian (iris)
- ▶ Cognitec (face)
- ▶ Precise Biometrics (fingerprint)
- ▶ Oki Electronic Industry (iris)
- ▶ Titanium Technology (face)
- ▶ Recognition Systems (hand geometry)
- ▶ Nitgen (fingerprint)
- ▶ Saflink (application)

\*Vendor list is based on information from the BioAPI Consortium Website as well as research on specific Biometric Vendors



# Validation of Vendor Claims



## National Standards

- ▶ INCITS Project 1703-D – Conformance Testing Methodology for ANSI INCITS 358-2002, BioAPI Specification

## International Standards

- ▶ ISO/IEC 24709: Conformance Testing for BioAPI
  - Part 1: Methods and Procedures
  - Part 2: Test Assertions



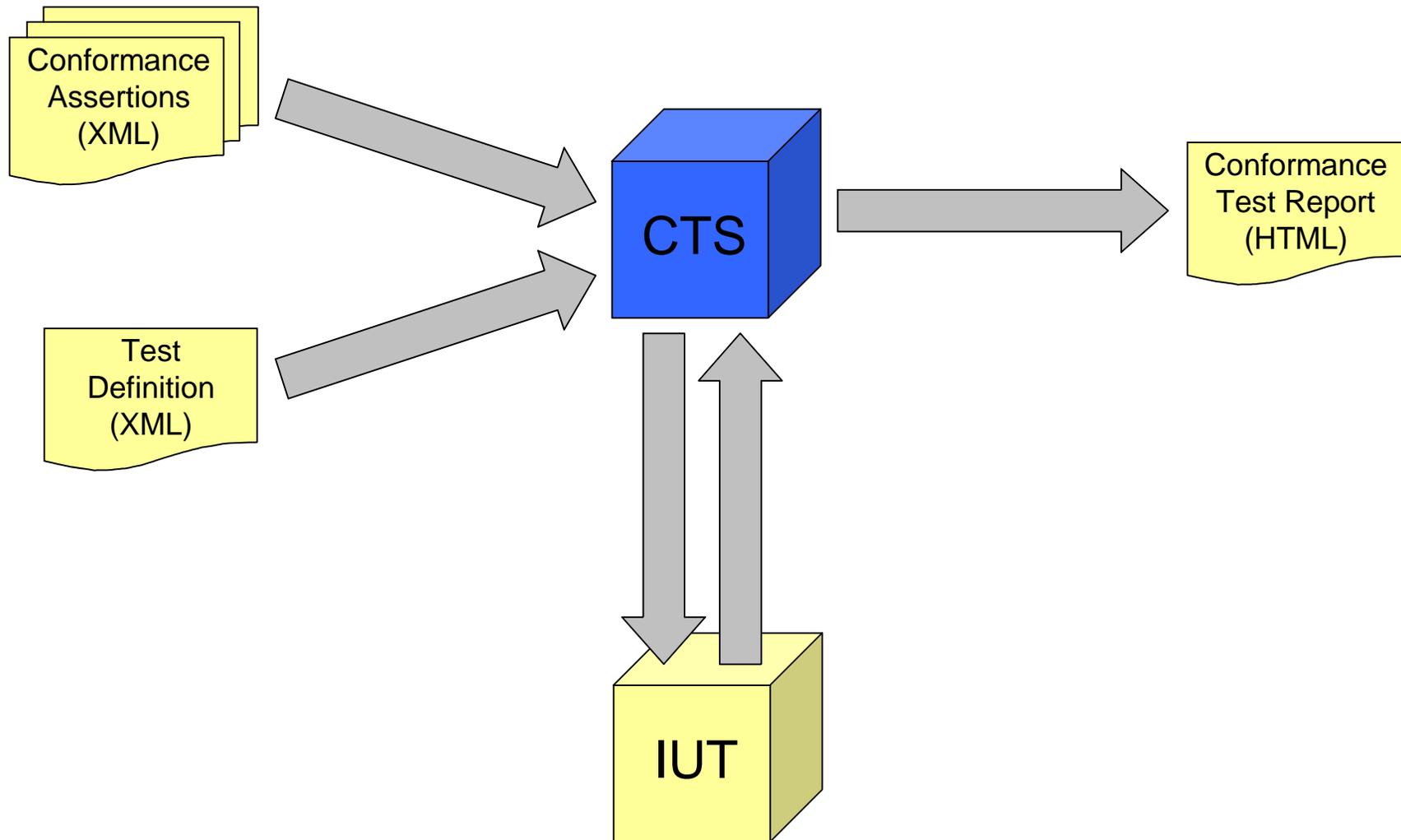
## BioAPI Conformance Test Suite (CTS)



- ▶ BioAPI CTS is an implementation of a standardized conformance testing methodology
- ▶ BioAPI CTS assesses the conformance of an Implementation Under Test (IUT) to the BioAPI specification
  - IUT can be composed of the following BioAPI software implementations
    - BioAPI application
    - BioAPI Biometric Service Provider (BSP)

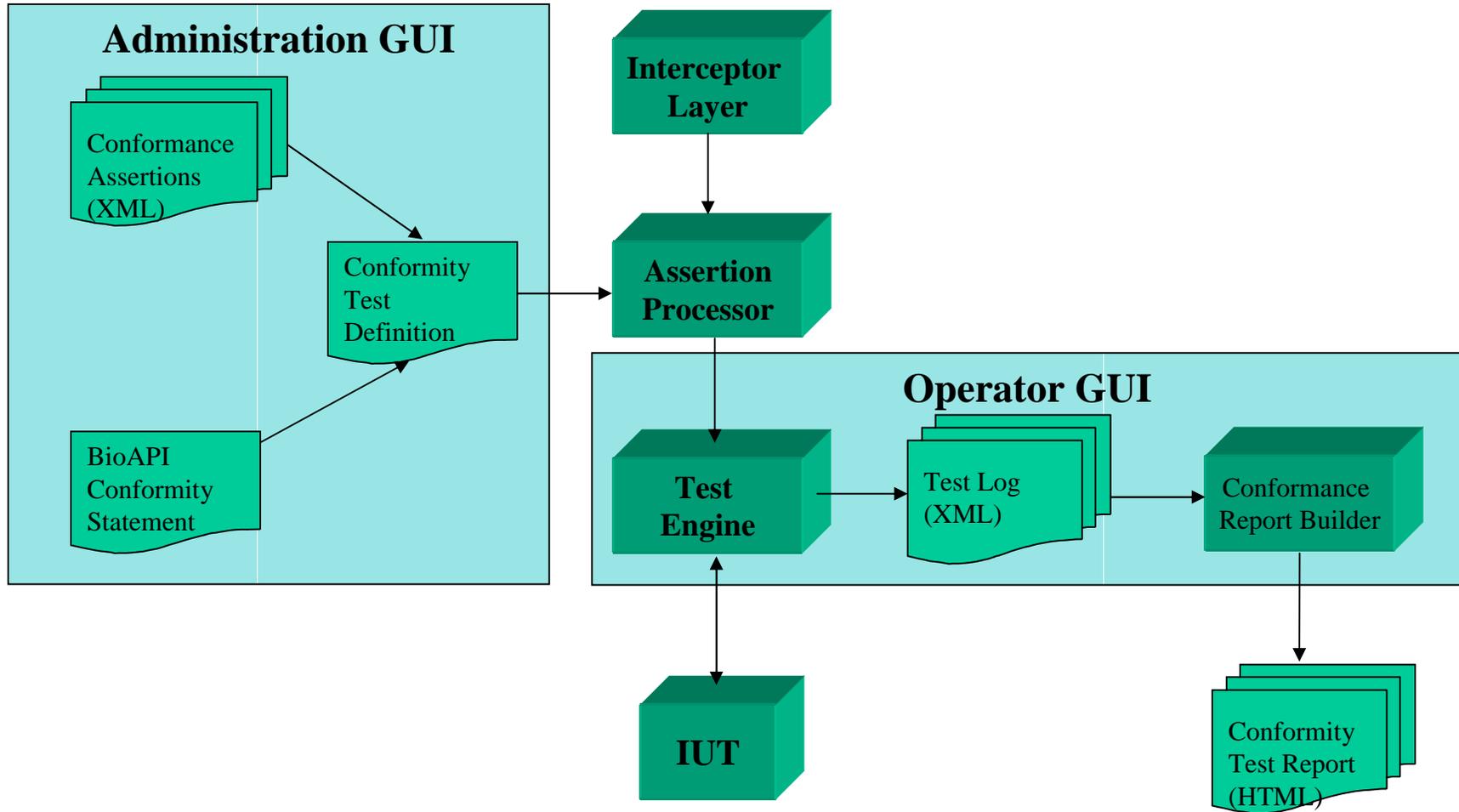


# CTS Process Flow



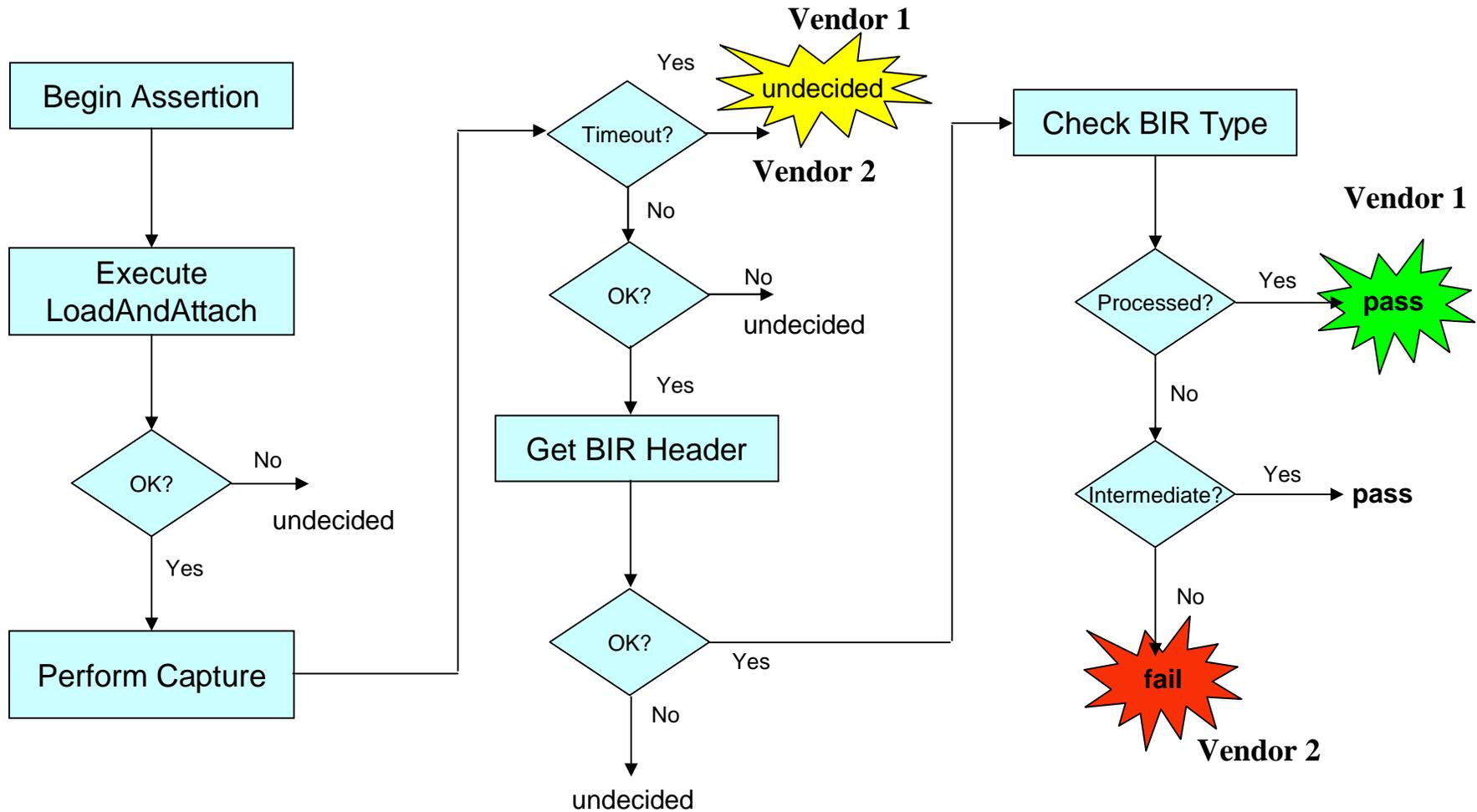


# CTS Operation and Components





# Example of Test Assertion Logic





## References



### Additional resources for BioAPI CTS information

- ▶ BioAPI CTS Requirements document
- ▶ BioAPI CTS Design document
- ▶ ANSI/INCITS 358-2002, The BioAPI Specification
- ▶ INCITS 1703-D, Conformance Testing Methodology for ANSI/INCITS 358-2002, BioAPI Specification
- ▶ ISO/IEC 24709, Conformance Testing for BioAPI



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