

Biometric Identity Assurance Services

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Synonyms

BIAS

Definition

Biometric Identity Assurance Services, or BIAS, is a cooperative standards project between the International Organization for Standardization / International Electrotechnical Commission Joint Technical Committee 1 Subcommittee SC 37 (ISO [8]/IEC JTC 1 SC 37) and the Organization for the Advancement of Structured Information Standards (OASIS) BIAS Technical Committee (TC). BIAS originated as a collaborative project between the OASIS BIAS TC and the International Committee for Information Technology Standards (INCITS) TC M1 on Biometrics. BIAS provides an open framework for deploying and invoking biometric-based identity assurance capabilities that can be readily accessed using services-based frameworks. BIAS services provide basic biometric identity assurance functionality as modular and independent operations which can be assembled in many different ways to perform and support a variety of business processes.

Main Body Text

Introduction

In reviewing the current biometric-related standards portfolio and **service oriented architecture** (SOA) references, it is apparent that a gap exists in the availability of standards related to biometric services. There are several existing biometric-related standards describing how to format either biometric data specifically or transactions containing identity information (including biometric information) for use in a particular application domain [1]. However, these standards do not readily fit into an SOA. As enterprise architectures are increasingly built on SOA models and standards, biometric applications, such as those that perform biometric capture functions, require a consistent set of services to access other biometric-based resources. In this context, a biometric resource could be a database with biometric information, a one-to-many search engine (also known as identification), or a system that performs one-to-one comparisons (also known as verification). It is often important to consider using web based protocols when planning and developing such systems to prevent against an entire system becoming obsolete because of individual components [9]. BIAS seeks to fill the gap by standardizing a set of

biometrics-based identity assurance capabilities that applications can invoke remotely across a services-oriented framework in order to access these biometric resources.

Scope

Although focused on biometrics, BIAS recognizes there are non-biometric elements to an identity. While the services have been built around biometric-related operations, non-biometric information can be referenced in several of the service calls. BIAS services do not prescribe or preclude the use of any specific biometric type. BIAS is primarily focused on remote service invocations, and therefore it does not deal directly with any local biometric devices. Recognizing the need for vendor independence, BIAS attempts to be technology, framework, and application domain independent.

BIAS establishes an industry-standard set of pre-defined and reusable biometric identity management services that allow applications and systems to be built upon an open-system standard rather than implementing custom one-off solutions for each biometric resource. BIAS defines basic biometric-related business level operations, including associated data definitions, without constraining the application or business logic that implements those operations. The basic BIAS services can be assembled to construct higher level, composite operations that support a variety of business processes.

OASIS, INCITS, and ISO Collaboration

Development of the BIAS standard requires expertise in two distinct technology domains: biometrics, with standards leadership initially provided by INCITS M1 [2], and service architectures, with standards leadership provided by OASIS [3]. After 2010, INCITS 442 was sent to ISO/IEC JTC 1 SC 37 as ISO/IEC 30108 for further standardization at a more international level. The current status of this project at ISO is at draft international standard (DIS). Upon official standardization of BIAS by ISO, the OASIS Biometrics TC plans to review modifications from the INCITS 442:2010 version of BIAS and the ISO version and update their web service profiles to align to the latest version of BIAS.

OASIS and INCITS have been collaborating to produce two associated standards. The INCITS M1 standard [4] defines biometric services used for identity assurance, which are invoked over a services-based framework. It is intended to provide a generic set of biometric (and related) functions and associated data definitions to allow remote access to biometric services. The related OASIS standard [5] specifies a set of patterns and bindings for the implementation of BIAS operations (which are defined in the INCITS M1 standard) using Web services and service-oriented methods within XML-based transactional Web services and service-oriented architectures. Existing standards are available in both fields and many of these standards provide the foundation and underlying capabilities upon which the biometric services depend. The INCITS standard leverages existing biometric and identity-related standards and formats. The OASIS standard leverages known information exchange and assurance patterns (such as message reliability acknowledgments) and functions (such as repository use and calls) arising in service-oriented systems, and potentially leverages those functions and features that already are embedded in existing SOA methods and standards.

Currently, the latest INCITS M1 standard was officially published July of 2010. This project was then submitted to ISO/IEC JTC 1 SC 37 to progress to international standardization. The international version is currently under development. The current status of this project is at DIS within ISO/IEC. It is projected to be published in late 2015. The OASIS standard, which depends on the INCITS M1 standard published in 2010, became an official OASIS Standard in October 2012.

Initially, the OASIS BIAS project was under development in a technical committee specific to BIAS, the OASIS Biometric Identity Assurance Services (BIAS) Integration TC. As of February 2013, this project has been moved to the OASIS Biometrics TC. This TC has a broader scope than the BIAS TC which allows other biometrics and web service related projects to be developed within the committee.

Architecture

The BIAS architecture consists of the following components: BIAS services (interface definition), BIAS data (schema definition), BIAS bindings, and an optional patron format (schema definition). The BIAS services expose a common set of operations to external requesters of these operations. These requesters may be an external system, a Web application, or an intermediary. The BIAS services themselves are platform and language independent. The BIAS services may be implemented with differing technologies on multiple platforms. For example, OASIS has defined simple object access protocol (SOAP)-based web service bindings for the BIAS services.

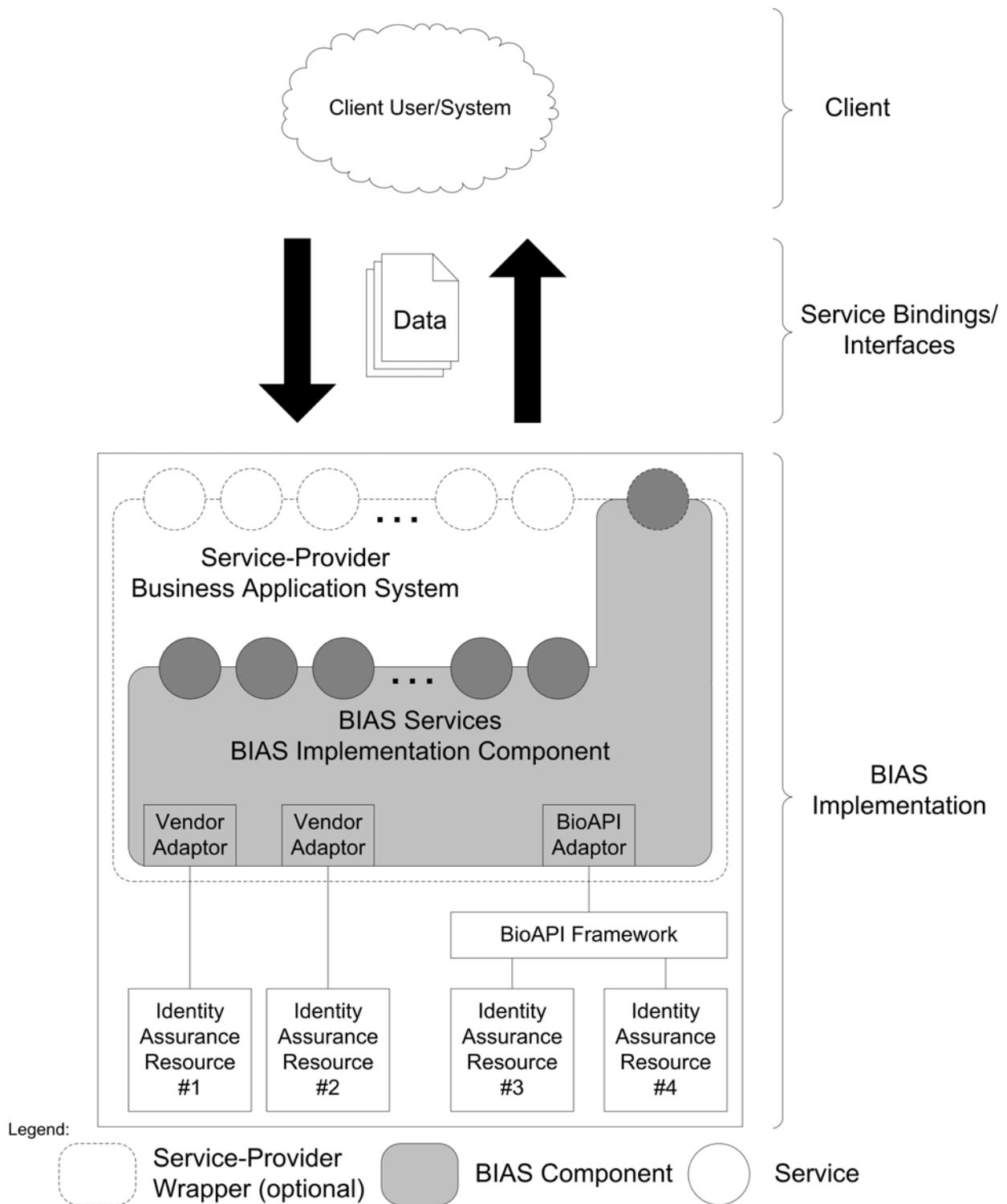


Figure 1

Figure 1 depicts the BIAS services within an application environment. BIAS services provide basic biometric functionality as modular and independent operations which can be publicly exposed directly and/or utilized indirectly in support of a service-provider's own public services.

During the development of BIAS in ISO/IEC JTC 1 SC 37, the architecture has remained the same. However, operations and data structures have been added or modified to allow for a wider utility as discussed by the subcommittee and subject matter experts.

Services

BIAS defines two categories of services, primitive and aggregate. Primitive services are basic, lower-level operations that are used to request a specific capability. Aggregate services operate at a higher-level, performing a sequence of primitive or other operations (e.g., image processing or template creation) in a single request. One example of an aggregate service may be where a one-to-many search (identify) which results in a ‘no match’ is immediately followed by the addition of the biometric sample into that search population (i.e., automatic enrollment); this is a series of primitive operations.

BIAS provides primitive services for the following areas:

1. Managing subject information: adding or deleting subjects, or associating multiple subjects into a single group.
2. Managing biographic information: adding, updating, deleting, or retrieving biographic information on a particular subject
3. Managing biometric information: adding, updating, deleting, or retrieving biometric information on a particular subject
4. Biometric searching/processing: performing biometric one-to-one or one-to-many searches, checking biometric quality, performing biometric fusion, or transforming biometric data from one format to another

BIAS also defines several aggregate services. The intent of BIAS is to standardize the service request; organizational business rules will determine how the service is actually implemented. The standard aggregate services include: Enroll, Identify, Verify, and Retrieve Information.

Summary

The BIAS standard represents the first collaboration between ISO/IEC JTC 1 SC 37, INCITS M1, and OASIS, bringing these organizations together to define a set of standardized biometric services that can be invoked within a services-oriented framework. The services are defined at two levels, primitive and aggregate, and correspond to basic biometric operations. BIAS is technology and vendor independent, so it may be implemented with differing technologies on multiple platforms.

Related Entries

Standardization

References

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Definitional Entries

Service-oriented architecture

SOA are software architectures in which reusable services are deployed onto application servers and then consumed by clients in different applications or business processes [6]. SOA is a paradigm for organizing and utilizing distributed capabilities that may be under the control of different ownership domains. It provides a uniform means to offer, discover, interact with and use capabilities to produce desired effects consistent with measurable preconditions and expectations [7].