



# ABIS® Search Engine

## Technical Specifications

### Benefits and Features

- High Quality Face, Finger and Iris Biometrics
- Top Tier Scores in Government Biometric Benchmarks
- Highly Modular Architecture Deployable with No Single Point of Failure
- High Availability Configurations Supported Out-of-the Box
- Open Accessible Architecture for Easy Integration
- WS-I Compliant Web Services for Easy Orchestration into Business Processes
- Customizable Management Services for Direct Alerts
- Custom and Standard Notification Queues for Integration to IT System Management Consoles
- Full and Customizable Audit Trail to COTS databases or a Central Repository of Choice
- Built-in Transaction Replication Service for Dual Sites and Disaster Replay Processing

ABIS® Search Engine, a product in L-1's ABIS® System identity management suite, is a multi-biometric identification platform that may be used either on its own or with other ABIS System products to build biometric identity management solutions. ABIS Search Engine offers L-1's high quality face recognition, fingerprint and iris biometrics that have performed in the top tier of monitored government benchmarks. These biometrics may be used stand alone or in any combination to support multi-modal identity management. ABIS Search Engine can be deployed in a wide range of solution scales, from modest single server identification systems up to the largest national-scale multi-biometric identity management solutions on server grids.

### Biometric Functions

ABIS Search Engine offers image processing, biometric matching and gallery management services. Image processing services include quality assessment of biometric sample images, extraction of feature templates from images, and segmentation of multi-sample images, such as four-finger slap and dual-eye iris images. Biometric matching services support identification search against named galleries, with support for an unlimited number of galleries. For example, a solution might require separate biometric galleries for example adult registrants, juvenile registrants and watch listed persons. Galleries may be replicated on multiple servers both to provide a required throughput of searches and to provide redundancy in support of a Service Level Agreement availability goal. Biometric matching services also offer 1:1 image-to-template and image-to-image verification matching in each mode. Gallery management services support addition and removal of identification records to/from named search galleries. These services are deliberately simple, accepting only biometric templates for inclusion in searchable galleries. They do not provide broader identity record-keeping services such as storage of images or selection of a representative set for persons with duplicate enrollments.

### Deployment

ABIS Search Engine is 64-bit mode software operating on either Windows Server 2008 or Red Hat Enterprise Linux 5 and on server hardware with AMD or Intel CPUs having x86-64 micro-architecture. The highest speed is obtained on modern Intel CPUs with the SSE4.2 instruction set and on AMD CPUs supporting the SSE4a instruction set, as a result of optimizations, but

operation is possible on earlier CPU models. L-1 provides guidance on server models and specification-sheets for numbers of servers and their configurations required to satisfy specified transaction rates, gallery sizes and biometric accuracies. ABIS Search Engine requires no other third-party products for basic operation with all gallery data stored in the OS file systems.

### Business Process Integration

ABIS Search Engine is designed as server-based software exposing Web Services as the functional integration interface. These Web Services are based on the web standards in the Web Services Interoperability organization's Basic Profile 1.1 which specifies the correct application of these various standards to ensure optimum interoperability. ABIS Search Engine is ready for integration into business processes using orchestration tools.

### High Availability Readiness

ABIS® Search Engine is a highly modular architecture composed of seven types of software packages interconnected by transactions queues, providing ample opportunities for deployment in very high availability server configurations. Within ABIS Search Engine, a JMS Broker, Jakarta Apache ActiveMQ, provides the fundamental communications fabric between all services, offering an open standards compliant communications mechanism in a pure failover configuration with no single point of failure. In this configuration there is more than one JMS Broker in each Search Engine system configuration, and each of those Brokers stores every request and response communication in every queue in the system. One broker is considered a primary, and the other broker is considered a failover component. In the event of the failure of either component, the parallel Broker automatically begins servicing requests. All components in the system are configured with both Brokers by default.

The JMS fabric updates all message queues with A-C-I-D discipline, ensuring all transactions complete consistently or are rolled back. All ABIS Search Engine components use a competition-based approach to servicing message queues which can balance load inherently across servers, even if heterogeneous, and can provide redundancies that enable continuity of service in the event of hardware failures.

## IT Operations Integration

ABIS Search Engine's ActiveMQ JMS fabric is an open environment with accessible queues, accessible configuration parameters, and accessible notifications topics that enable Search Engine management services to be integrated into the larger IT operations environment:

### MONITORING SERVICE

Monitoring Service continuously monitors all system notification, trace, and performance messages through the JMS queues and continually monitors all known system components for health and liveness in regular intervals. It is configured with several built-in filters to send administrative alarms and diagnostic messages and additional custom alerts may be defined with delivery via email and/or JMS alerts. This service exposes a number of methods that may be used to change service behavior, such as the Notification Level Limit. The system also exposes an Alerts queue for direct integration of ABIS alerts into IT system management console applications.

### AUDIT SERVICE

This service is the central point of trace, alert and transaction logging. It allows transaction archiving and contains all the information about system backup and restore points. It uses an RDBMS for persistence of all data, defaulting to the H2 open source database, but with support for Oracle and MySQL. Multiple Audit Services and RDBMS storage targets are possible to implement high volume audit capacity and no single point of failure availability designs. Customized in-depth operations reports on ABIS Search Engine performance can be implemented in any generic report writing tool based on the Audit Database(s).

### REPLICATION SERVICE

This service performs transaction replication to alternate systems and transaction replay to the point of failure in disaster recovery operations. This is an integration-ready component designed to be used within a customer backup infrastructure in either manual or automated mode.

### CONFIGURATION SERVICE

This service is the central point of system configuration of ABIS Search Engine and it manages software licensing, a System Map containing the distributed system configuration and growth plan and biometric parameter settings. Like the Audit Service, it uses an RDBMS for persistence of all data, defaulting to the H2 open source database, but with support for Oracle and MySQL and multiple Configuration Services and RDBMS storage targets.

### SPARE POOL SERVICE

This service is defined by a Spare Pool configuration section in the System Map. The System Map defines a growth plan for the galleries associated with each Identification Biometric Service. The growth plan allows the system to re-allocate a server from the Spare Pool to a Biometric Service gallery when the gallery's existing servers near capacity due to natural growth. The introduction of additional hardware servers to accommodate growth usually begins with the addition of new servers to the System Map as Spare Pool members.

In summary, ABIS Search Engine is richly equipped with interfaces, services and tools for the integration of ABIS into IT operations' management infrastructure.

## SUPPORT PLANS

In the US, L-1 provides remote help desk support on 24/7 and 9/5 schedules. On-site support staff are available on an annual contract basis.

Internationally, L-1 partners with IT support specialists throughout the world, to ensure the support for your identity management solution is local in your time zone, local in your language and responsive to your needs. L-1 partners are extensively trained in administration and operation of the ABIS System and are backed by a 24/7 continuously manned help desk center staffed with ABIS System experts.

## PROFESSIONAL SERVICES

L-1 offers competitive professional services that include:

- Installation and system commissioning
- Application design, integration and customization
- Training of IT and end user staff

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