



## **SIRIS**

Next Generation Iris Recognition Technology

# SIRIS Biometric Platform

## Features and Benefits

- **Improved Iris Algorithms**  
SIRIS utilizes the new Daugman 07 iris algorithm invented by Dr. John Daugman. Daugman 07 represent years of dedicated research and development by the foremost expert in the field of iris biometrics who is now the Chief Iris Scientist for L1 Identity Solutions.
- **Speed**  
The underlying SIRIS architecture was built for performance in raw matching speed and throughput capability. With search speeds reaching over 1 billion matches per second, SIRIS will easily outpace any other identification system in the world.
- **Scalable**  
SIRIS is an enterprise level biometric platform designed to scale from small systems with less than 100 subjects operating on a single laptop, to country sized databases and beyond without critical and costly architecture changes.
- **Open Client Interface**  
Web based SOAP interface, Java JNI APIs, and a .NET interface option makes SIRIS very flexible and client side O/S independent.

SIRIS is the fastest and most accurate biometric matching platform in the world and is the result of cutting edge research and development efforts in the field of iris recognition technology.

The SIRIS platform is the only iris matching engine deploying the next generation algorithms by Dr. John Daugman which are exclusively licensed and sold by L1 Identity Solutions (L1). Dr. Daugman's existing algorithms are the basis for all major iris deployments in the world. The new L1 Daugman 07 (D07) algorithms utilize cutting edge image processing techniques such as **Active Contours** and **Off-Axis Gaze Correction** which vastly improves both FTE and FRR rates.

The SIRIS platform also introduces enhancements over the previous generation matching algorithms by utilizing advancements in computer technology such as 64 bit architecture and multi-core CPU technology. These improvements have brought about significant increases in speed and throughput capability.

SIRIS has been designed to easily scale from small solutions ranging from less than 100 subjects to an enterprise level architecture with hundreds of millions of subjects covering country wide installations.

The efficient data storing and matching design allows commercial off the shelf hardware to produce **matching speeds exceeding 1,000,000,000 matches per second.**

## SIRIS Core Components

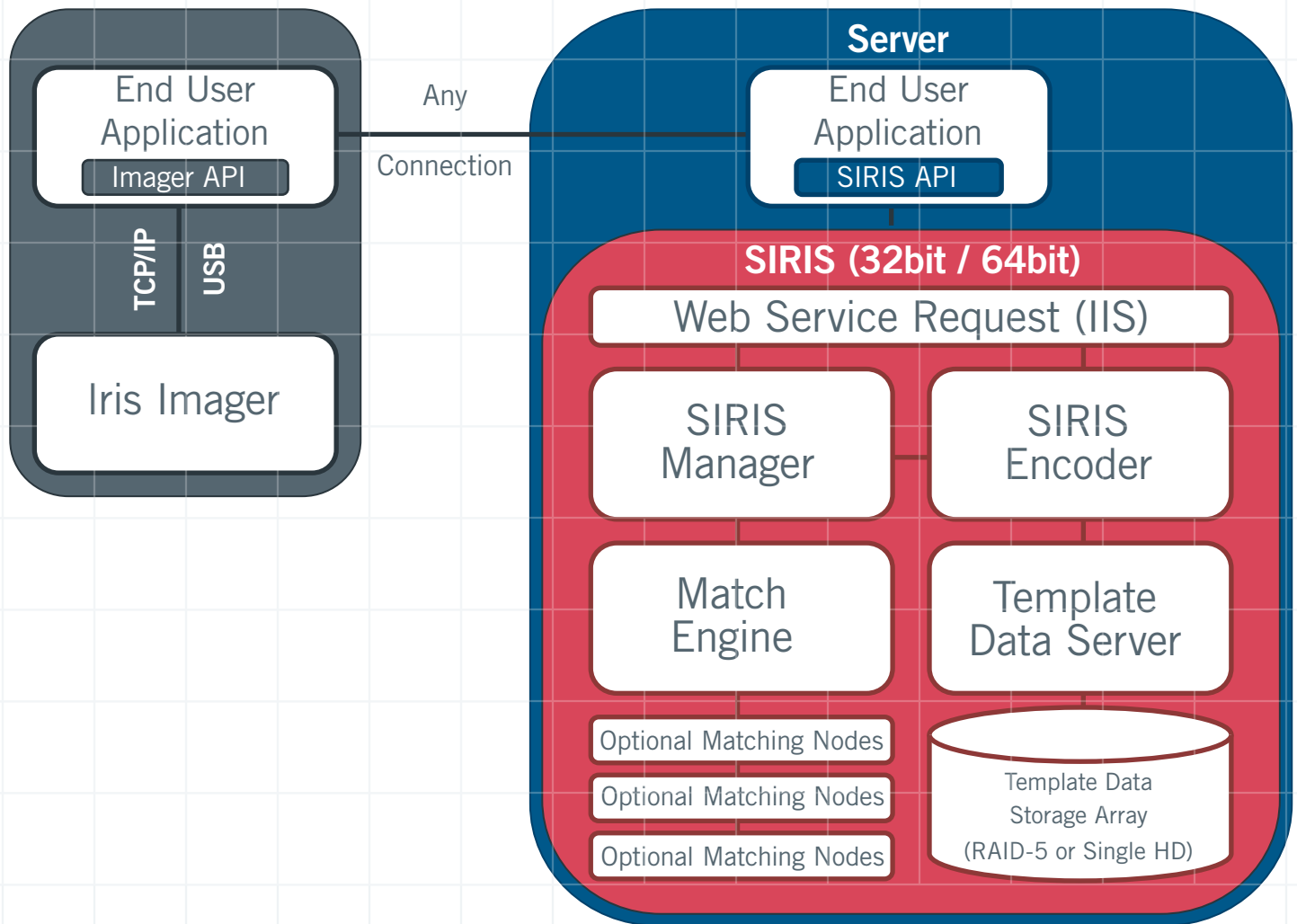
**SIRIS Web Service Request** - This component in the architecture handles web requests sent from the client application for either enrollment or identification operations. The web service provides a platform agnostic interface to developers and will forward web requests onto the SIRIS Manager which then internally routes these requests to the encoder, matching engine, or the Template Data Server.

**SIRIS Manager** - This critical component is a work flow manager and provides decision logic, resource management, and routes external requests from the web service to the individual components in the SIRIS Architecture.

**SIRIS Encoder** - The SIRIS™ Encoder module takes in raw iris images in multiple industry standard formats (BMP, JPEG, ISO, NIST, and PrivateID™ data packets) and outputs an L1 D07 iris template. The encoder module also has the ability to re-package legacy Daugman 2Pi templates into D07 format making SIRIS 100% backwards compatible with existing iris databases.



# Example SIRIS Architecture



**SIRIS Match Engine** - The SIRIS Match Engine takes probe templates during the enrollment or recognition procedures and compares them to gallery templates loaded in RAM and returns a match result. As part of the new improvements, the SIRIS Match Engine has been optimized to utilize advances in computer technology including 64 bit Windows architecture and multi-core CPU processing technology. These advancements give SIRIS a significant advantage in speed and throughput capability over the previous generation iris matching engines.

**SIRIS Template Data Server** - The Template Data Server utilizes a dedicated disk array known as the Template Data Storage Array for persistent storage. It can perform add, remove and template lookup operations required by the solution for iris template management. The Template Data Server is built to manage multiple requests from the SIRIS Manager in a time critical environment. This module also performs data initialization into the Match Engine by loading existing enrollment templates into RAM.

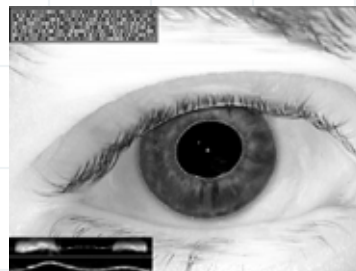
**SIRIS Template Data Storage Array** - This dedicated disk array works in a single hard drive setup for smaller installations or a high speed RAID 5 configuration to deal with the demands from the Template Data Server. All iris data (images and templates) are stored within this storage facility using a GUID as a unique identifier.

## System Requirements

- 32 or 64 bit Windows 2003 Server (Standard or Enterprise Edition)
- HTTP / SOAP API protocol
- IIS 6.0 for hosting the web service interface
- WinSock 2.1 for internal communications
- TCP/IP network infrastructure
- 1.5 GB RAM per 1M subjects for matching processes
- Single HD or RAID 5 array for image and template storage
  - Storage volume sizing depends on image compression and database size (no compression recommended)
    - No compression @ 300KB/image ~ 600GB per million subjects
    - Zip Compression ~ 400GB per million subjects
    - JPEG Compression @ 1:15 ratio ~ 100GB per million subjects

## L1 Daugman 07 Algorithms

- Significant improvements in False Reject and Failure to Enroll rates
- Employs **Active Contours** for iris and pupillary boundary extraction
- Utilizes **Off-Axis Gaze Correction**
- Improved eyelash and eyelid detection and exclusion
- Legacy templates upgradeable from industry standard Daugman 2Pi algorithm



Iris image encoded using Daugman 07 showing the effectiveness of Active Contour Technology

### About L-1 Identity Solutions

L-1 Identity Solutions (NYSE: ID), formed in 2006 from the merger of Viisage and Identix, offers a comprehensive set of products and solutions for protecting and securing personal identities and assets. Leveraging the industry's most advanced multi-modal biometric platform for finger, face and iris recognition, our solutions provide a circle of trust around all aspects of an identity and the credentials assigned to it – including proofing, enrollment, issuance and usage. With the trust and confidence in individual identities provided by L-1 Identity Solutions, government entities, law enforcement and border management agencies, and commercial enterprises can better guard the public against global terrorism, crime and identity theft fostered by fraudulent identity. L-1 Identity Solutions is headquartered in Stamford, CT. For more information, visit [www.l1id.com](http://www.l1id.com).

## Qualifications

Developed the HIIDE™, PIER-T™, and PIER 2.3™ iris and multi-modal biometric devices for the US Dept of Defense and other government agencies

Deploying a total of 10,000 HIIDE, PIER 2.3, and PIER-T units to the US DOD as part of the BAT, BISA, and other similar systems

International partner network of niche organizations to large blue chip integrators providing local customization and integration services

Exclusive licensors and patent holders of the industry standard Daugman 2Pi and new Daugman 07 algorithms

Division of L1 Identity Solutions (NYSE - ID)

757 Arnold Drive,  
Suite D  
Martinez, CA 94553  
Telephone: 925-229-2212  
Toll Free: 800-557-5549  
Facsimile: 925-228-6568

[www.L1id.com](http://www.L1id.com)